SINAPSI S.r.l.
Via delle Querce 11/13
06083 **Bastia Umbra** (PG) Italy
T.+39 **075 8011604** F.+39**075 8014602**
www.sinapsitech.it|**info@sinapsitech.it**

EQUOBOX RTUEVO1T Datalogger for meters with M-Bus wired and wireless protocol connected via repeater

User Guide

Rev 1.3

This manual refers to the Firmware starting from:

- **WI: 3.05**
- **FW: 4.4_2.0_2.9**

CONTENTS

Acronyms

Dynamic DNS	Dynamic Domain Name System
LAN	Local Area Network
M-Bus	Meter Bus
W.M-Bus	Wireless Meter Bus
USB	Universal Serial Bus
VPN	Virtual Private Network
SGH NET	Sinapsi Global Hub Net

1. OVERVIEW

1.1. Device functions

The RTUEVO1T reads M-Bus devices connected directly to the RTUEVO1T as well as M-Bus devices connected to the RTUEVO1T via level converters as well as W.M-Bus devices connected to the RTUEVO1T via repeater.

It can be used:

- Alone with up to 20 directly connected (*****), wired M-Bus devices
- As a master on an M-Bus network with up to six connected level converters and a total of 250 logical M-Bus devices and/or
- As a master on the M-Bus network with up to 23 level converters and 500 wireless devices per converter

***** Device means an M-Bus load unit (≤ 1.5 mA)

1.2. M-Bus properties

1.2.1 Wired M-Bus

The M-Bus system (Meter Bus) is a communications protocol per EN13757-2.

It has the following benefits:

- Highly secure data transmission
- Low wiring costs
- Can be greatly expanded without additional amplifiers
- High number of connectable devices
- Recognizes both battery-powered as well as mains powered devices
- Automated device recognition
- A very large number of systems and devices available
- Various bus topologies can be used (line, bus, star, or tree topology)

1.2.2 Wireless M-Bus

The wireless M-Bus system communicates using the communications protocol per EN13757-4.

The system also has the following benefits:

- Various network topologies available for radio read out
- The system can be extended over a large area using additional Smart repeater sinapsi**tech®**
- Optimum connection by the repeater to the RTUEVO1T (mesh network)

2. MOUNTING

It is designed for mounting on 35 mm rails.

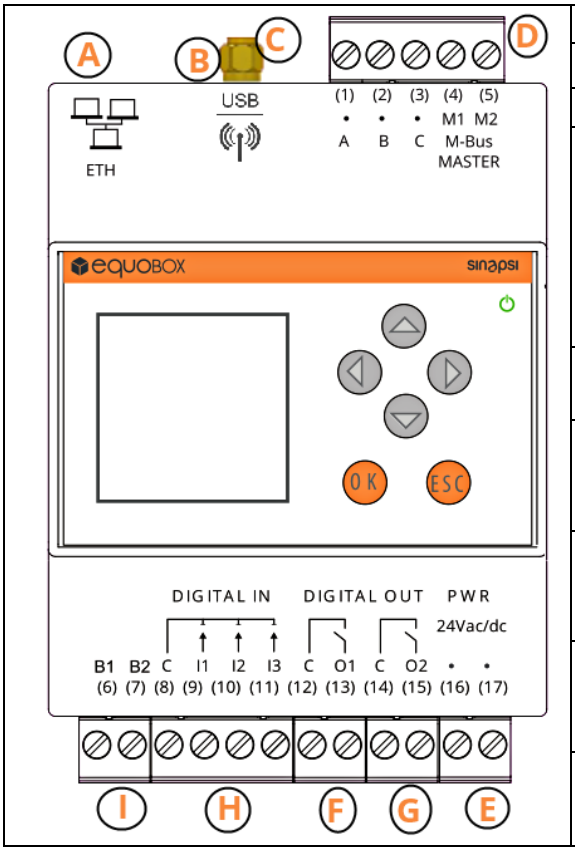
It takes up the equivalent of four standard modules on the rails.

Additional information on mounting is available in the mounting instructions for the RTUEVO1T.

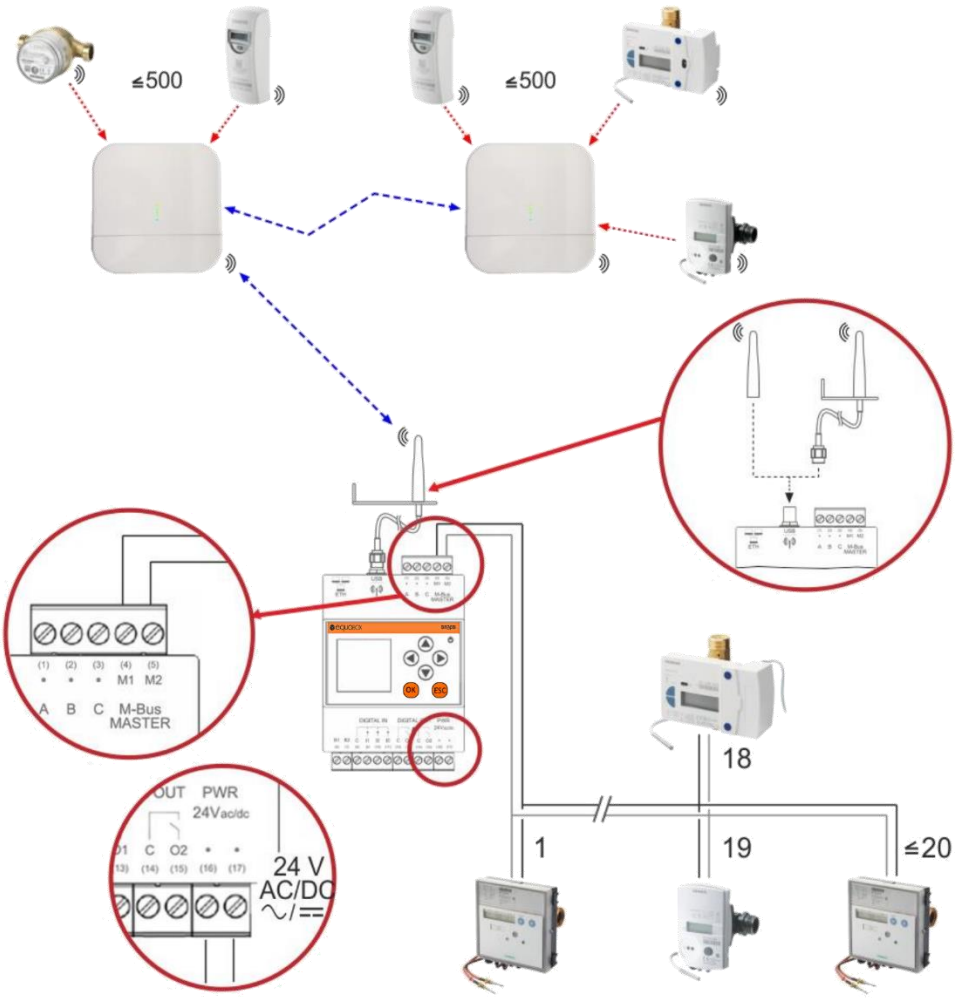
3. CONNECTIONS

3.1. RTUEVO1T

The RTUEVO1T has the following connection terminals / LEDs.



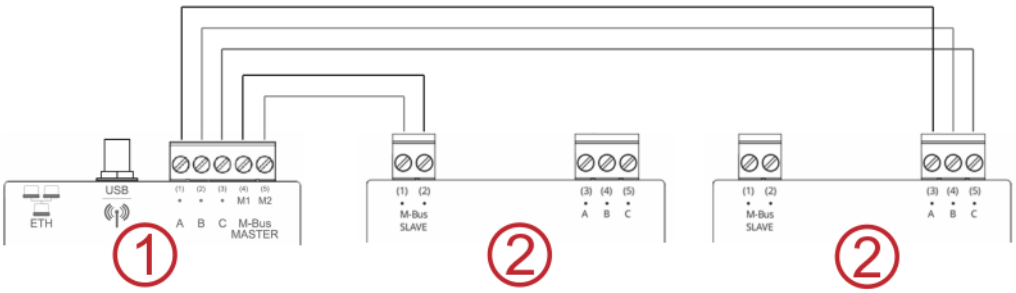
A	Ethernet connection
B	USB connection (no function)
C	Antenna connection
D	Terminals (1), (2) and (3): Connections via RS232 for following level converters (A = TX; B = RX; C = GND) Terminals (4) and (5): Connections M1 and M2 for M-Bus devices and follow-on level converters
E	Terminals (16) and (17): Power supply AC/DC 24 V
F	Terminals (12) and (13): Relay connections for digital output 1, max. AC/DC 30 V
G	Terminals (14) and (15): Relay connections for digital output 2, max. AC/DC 30 V
H	Terminals (9), (10) and (11): Connections for digital inputs. Terminal (8): reference for digital inputs
I	Terminals (6) and (7) are not used. Do not apply electricity to these terminals



Terminals (1) and (2) on the level converter are connected to line M1M2 on the M-Bus datalogger. In addition, a maximum of 20 M-Bus devices can be connected directly to terminals M1 and M2.

To connect the level converter to the M-Bus datalogger on ABC, connect the terminals A (3), B (4) and C (5) of the SIN.LC1 or A (5), B (6) and C (7) SIN.LC250 to terminals A (1), B (2), C (3) of the M-Bus datalogger.

Important: M-Bus devices cannot be connected directly to terminals A, B, C.



1 Datalogger as master for 20 devices

2 Level converter as slave for additional M-Bus devices

4. ENGINEERING

4.1. Topology

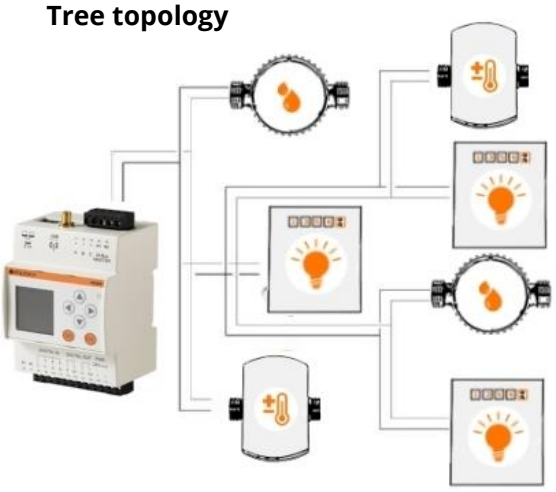
4.1.1 Wired M-Bus devices

The M-Bus permits various network topologies. The devices can be connected to the level converter or the RTUEVO1T in a line, bus, star, or tree topology, or a combination thereof.

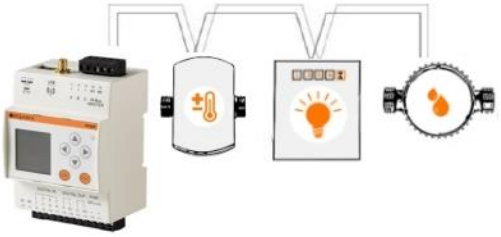
Ring topology is not permitted. Bus cable polarity is not relevant, simplifying installation.

Star topology

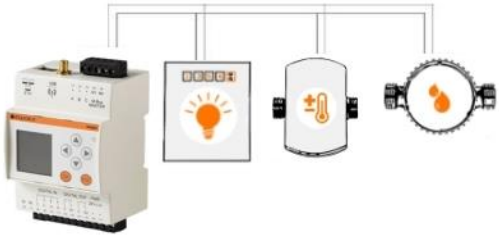
Tree topology



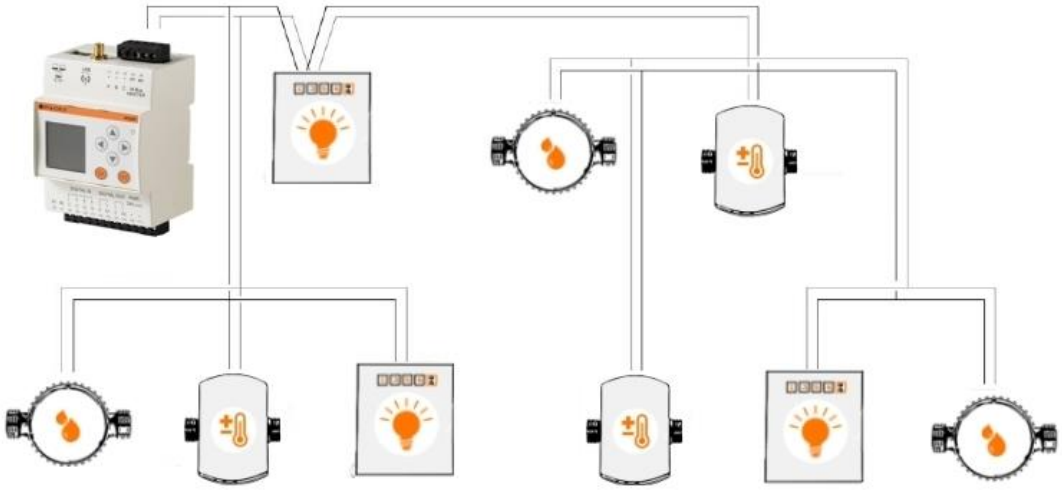
Line topology



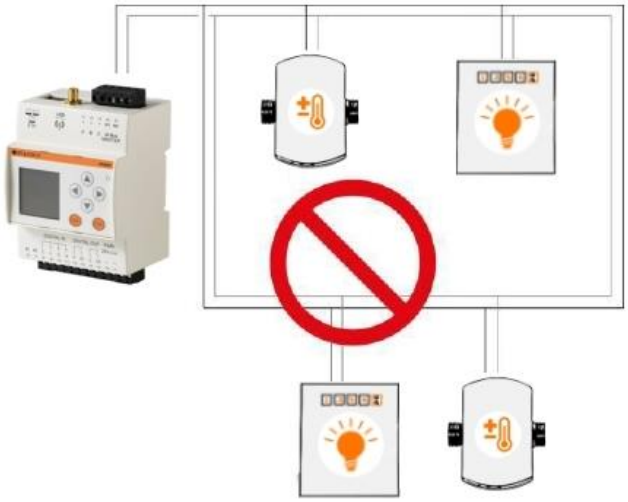
Bus topology



Combination of topologies

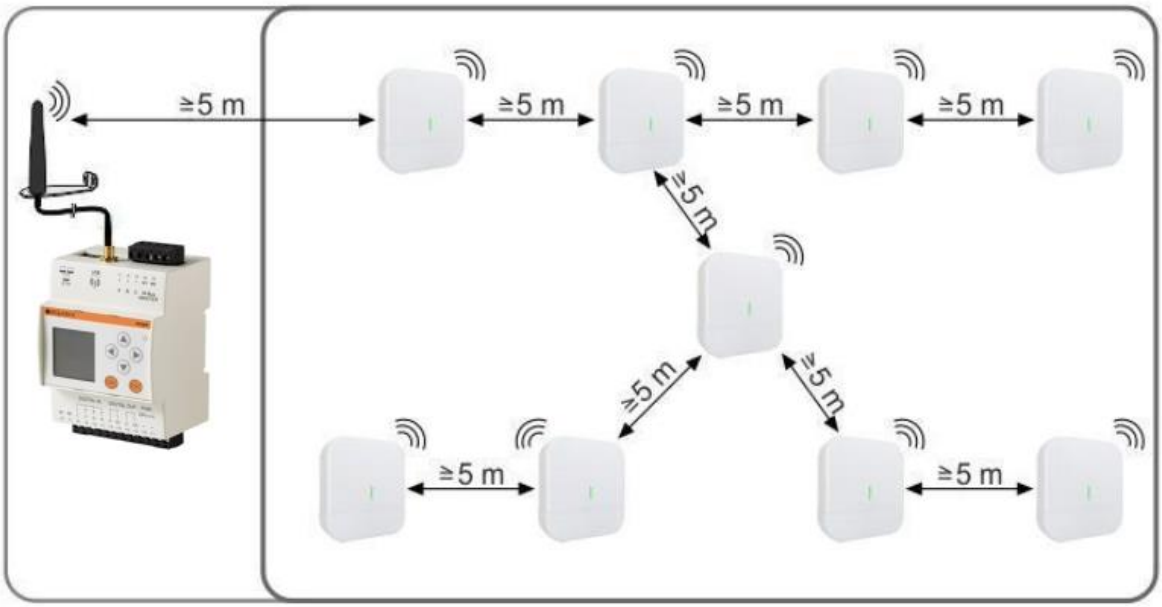


Ring topology



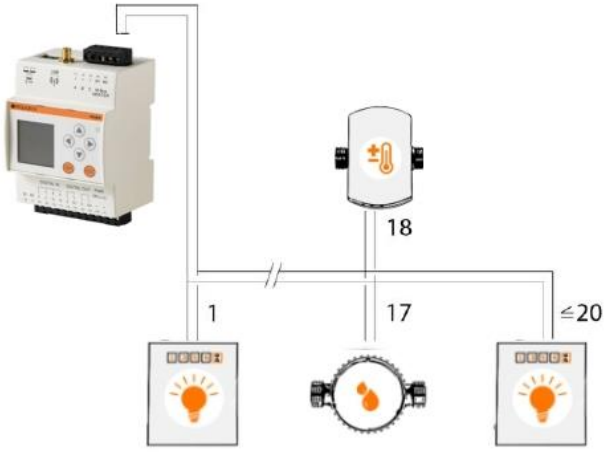
4.1.2 Wireless devices

The RTUEVO1T permits read out using various network topologies.
The repeaters are self-organizing and search for the optimum connection to the datalogger.



4.2. Operation modes

The RTUEVO1T is used to read up to 20 directly connected devices (20 units M-Bus loads (*)).
A PC / Internet browser reads the data either locally over Ethernet or from anywhere over the Internet.



(*) 1 M-Bus load ≤ 1,5 mA

4.2.1 RTUEVO1T with level converters

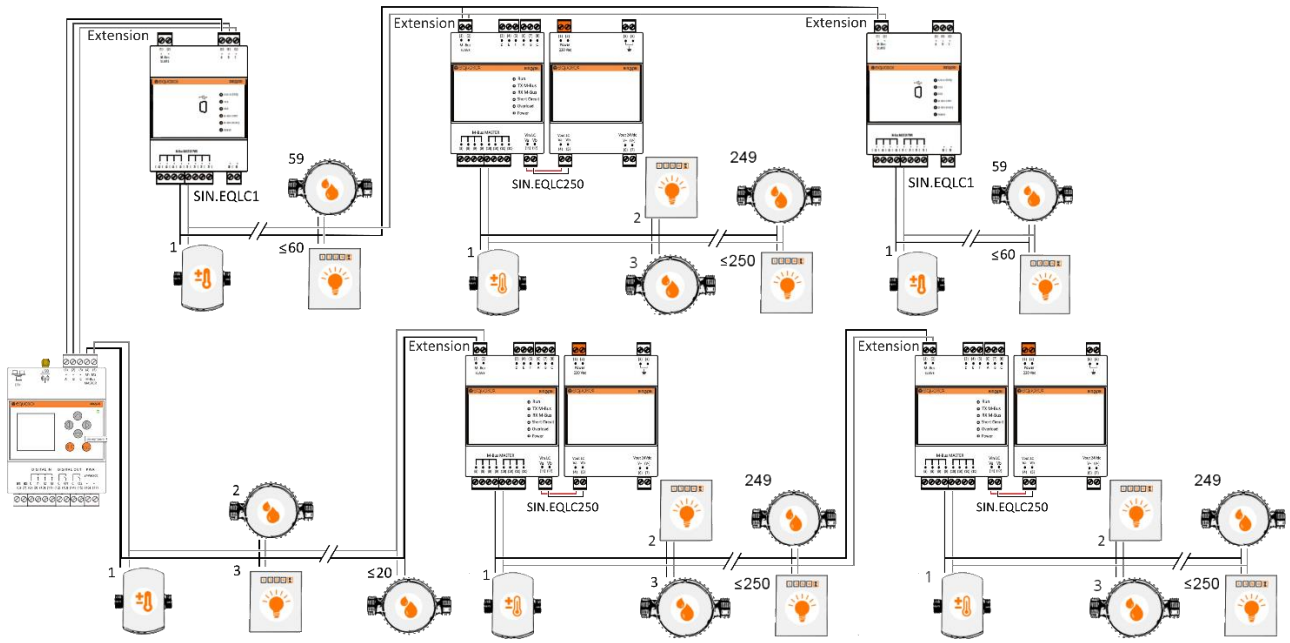
The datalogger is equipped with additional level converters over two lines to extend the system by up to 500 logical M-Bus devices (max. 250 per line).

The datalogger is operated as the master. Up to 20 M-Bus devices (20 units M-Bus loads) can be directly connected (Line M1M2).

The level converters are connected as slaves to the datalogger RTUEVO1T. Up to 60 M-Bus devices (60 units M-Bus loads) can be connected to the level converter SIN.EQLC1 and up to 250 M-Bus devices can be connected to the level converter SIN.EQLC250 (250 simple M-Bus loads).

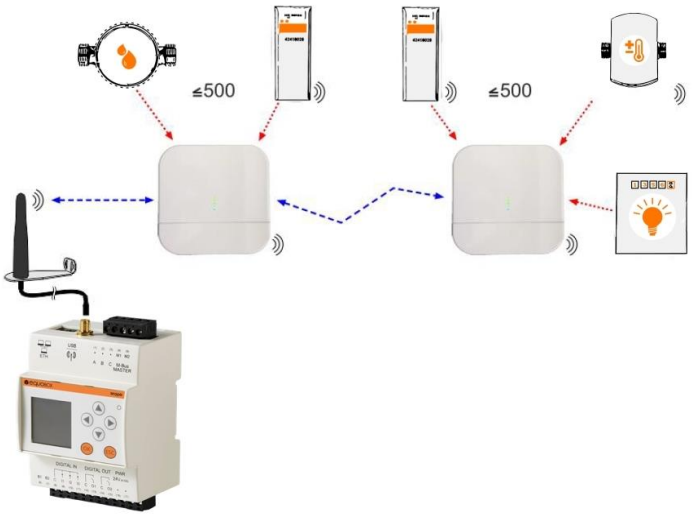
A maximum of six level converters (SIN.EQLC1, SIN.EQLC250) can be connected to each line with a maximum of 250 M-Bus devices per line.

Moreover, up to 20 M-Bus devices can be connected directly to terminals M1 and M2.



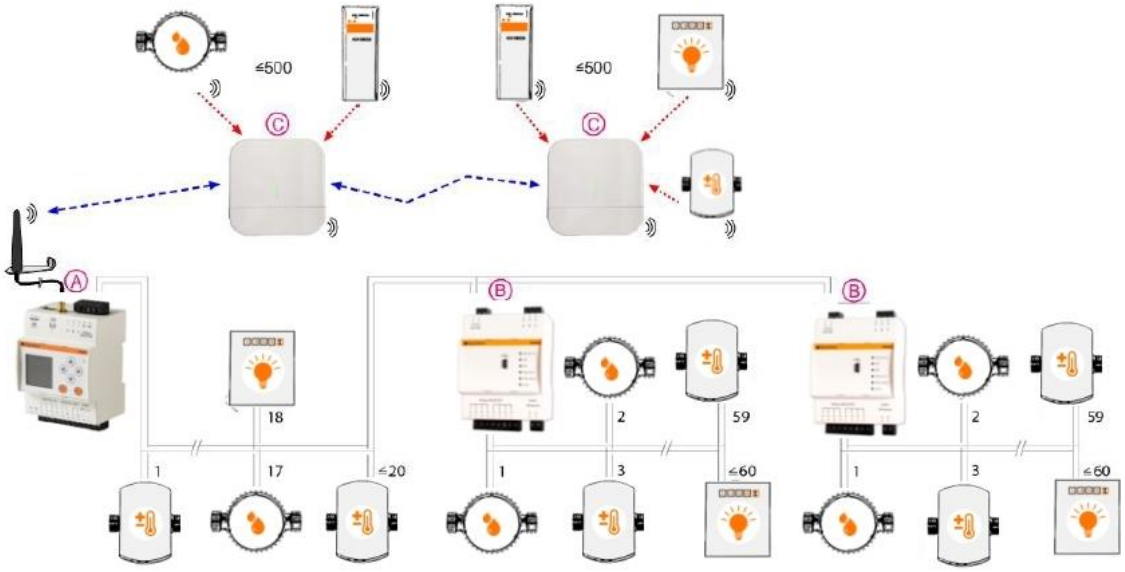
4.2.2 RTUEVO1T with repeaters

The RTUEVO1T can be equipped with additional repeaters to extend the system up to 2.500 wireless devices. Communication between the RTUEVO1T and repeaters takes place over a mesh RF protocol (backbone network). A minimum of one M-Bus RTUEVO1T and one repeater is required to read out wireless devices. The backbone RF network can consist of a maximum of 23 repeater. Communication between the repeaters and wireless devices takes place over the W. M-Bus protocol. The repeaters save the consumption data from the devices in its environment, while forwarding the data to other repeaters, up to the RTUEVO1T (the other repeaters act as repeaters in this case).



4.2.3 Combined plants

One RTUEVO1T can read out up to 500 wired and 2.500 wireless devices.



A RTUEVO1T as master
B Lever converter as slave (on ABC bus or M-Bus)
C W. M-Bus repeater as participant

4.2.4 Readout data

A PC/Internet browser reads the data on all operation modes either locally over Ethernet or from anywhere over the Internet using a PC/Internet browser.

4.3. Power supply

Select an AC/DC 24 V power supply with at least 14.5 / 15 VA and voltage tolerances as described in the technical data.

4.4. M-Bus

4.4.1 M-Bus addressing

M-Bus uses two addressing types to recognize and communicate with wired M-Bus devices:

- Primary addressing:
  Up to 250 primary addresses can be assigned to an M-Bus primary. The primary address is normally assigned during M-Bus device commissioning.
- Secondary addressing:
  Secondary addressing consists of 8 bytes and permits the assignment of any number. In the default setting, the secondary address for a M-Bus device matches the serial number issued by the device manufacturer. The assignment prevents address conflicts on the M-Bus and permits addressing of more than 250 M-Bus devices on a plant.

4.4.2 Sizing the wired M-Bus plant

Allowable cable types:

- Shielded telephone cable 0.5 mm2 (4 x 0.8 mm)
- NYM cable (1.5 mm2)
- Maximum capacitive cable load of 152 nF/km

4.4.3 Bus expansion

If using cable with a cross-section of 0.6 mm2, you must cut the information in half on "Maximum distance" and "Number of devices" from the following table.

Plant type	Maximum distance	Total cable length	Cable diameter	Number of devices (slaves)	Max. transmission rate
Small residential buildings	350 m	1000 m	0.8 mm^2	250	9600 Baud
Large residential buildings	350 m	4000 m	0.8 mm^2	250	2400 Baud
				64	9600 Baud
Small developments	1000 m	4000 m	0.8 mm^2	64	2400 Baud
Large developments	3000 m*	5000 m	1.5 mm^2	64	2400 Baud
Direct vicinity	5000 m*	7000 m	1.5 mm^2	16	300 Baud
Point-to-point connection	10000 m*	10000 m	1.5 mm^2	1	300 Baud

*Shielded cabling required at a distance in excess of 1000 m (see EN13757-2 appendix E).

4.4.4 Signal specifications

M-Bus	Condition	Minimum	Typical	Maximum	Unit of measure
Transfer rate	$C_{segment} \leq 382nF$	300	2400	9600	Baud
Bus current	SIN.EQRTUEVO1T	0		30	mA

5. INSTALLATION

Prerequisite

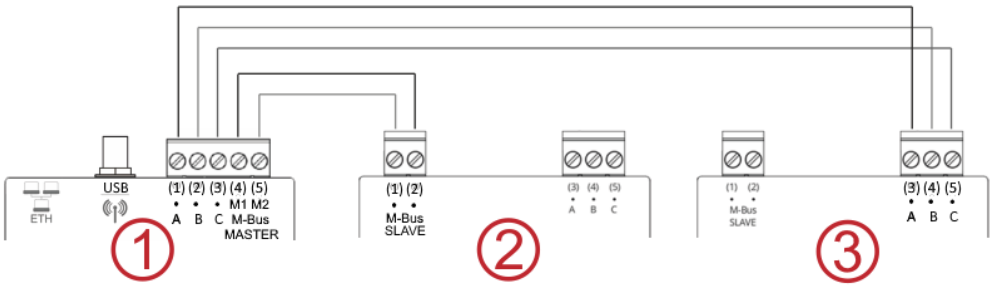
Connections between devices are based on the selected operating mode as illustrated in the sections below.

Important: Do not connect power to the devices prior to installation!

5.1. Connect RTUEVO1T and level converter

Terminals (1) and (2) on the level converter are connected to terminals M1 (4) and M2 (5) on the M-Bus RTUEVO1T.

Terminals A (3), B (4) and C (5) on the level converter are connected to terminals A (1), B (2) and C (3) on the M-Bus RTUEVO1T.



1 RTUEVO1T as master for 20 devices (see paragraph 5.4)
2 Level converter as slave for an additional 60 (using LC1) or 250 (using LC250) devices
3 Level converter connected via ABC as slave for an additional 60 (using LC1) or 250 (using LC250) devices

5.2. Connect RTUEVO1T and repeater

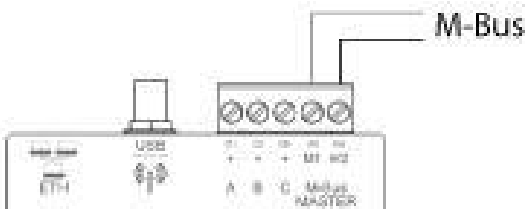
Install the supplied antenna to access the repeater. By setting identical mesh network parameters both in the RTUEVO1T and in the repeater, W.M-Bus devices can be received. See paragraph 8.4.4.1 Device settings.

5.3. Connect RTUEVO1T to PC

A network cable is used to connect the RTUEVO1T and PC/LAN. See Connect RTUEVO1T to PC or LAN

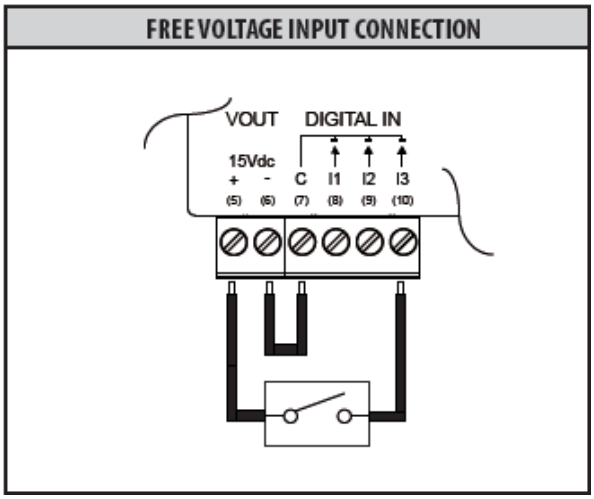
5.4. Connect M-Bus devices to RTUEVO1T

Up to 20 devices can be connected directly to the RTUEVO1T. They are connected to terminals M1 (4) and M2 (5).



5.5. Digital inputs on RTUEVO1T

RTUEVO1T provides 3 digital inputs I1, I2, and I3 to connect potential-free contacts (e.g. switches, relays). The contacts are connected as follows:

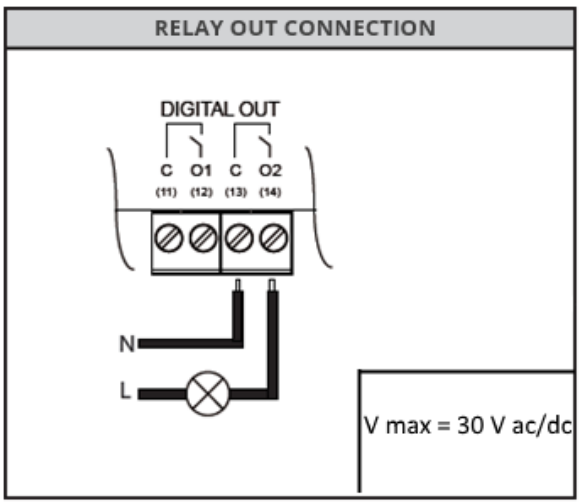


- Input I1:
  Connect the external contact with terminals C (8) and I1 (9).
- Input I2:
  Connect the external contact with terminals C (8) and I2 (10).
- Input I3:
  Connect the external contact with terminals C (8) and I3 (11).

5.6. Digital outputs on RTUEVO1T

The RTUEVO1T has two relays that can be used as digital outputs. They can connect a load or be used as contacts to activate other systems. Terminals O1 (13) and O2 (15) can be controlled locally on the RTUEVO1T or remotely via the Internet (see section **8.3.4 Inputs/Outputs**).

Connect as follows to control, for example, a load:



6. COMMISSIONING

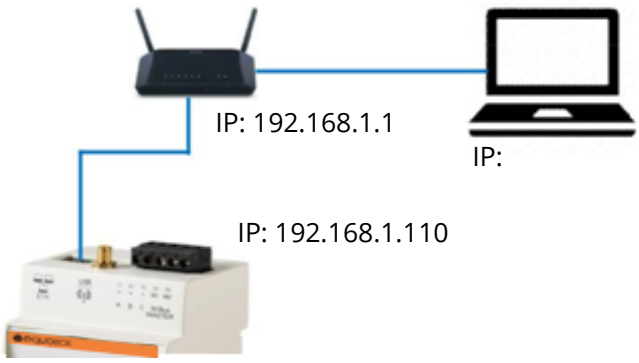
Prerequisites

Ensure the following prior to commissioning the RTUEVO1T:

- The electrical connection must be fused (fuse or circuit breaker) The power supply must be at the device's rated voltage.
  The power supply must be sufficient to operate the device.
- The router (if available) must be configured as per the description.
- The network plug must be wired correctly to exchange data and connected to the ETH connection on the RTUEVO1T
- In the event a level converter is connected to the RTUEVO1T, connect it as a slave on the RTUEVO1T's master output.

6.1. Connect RTUEVO1T to PC or LAN

RTUEVO1T has an Ethernet connection to directly connect to a local PC or connection to a PC over LAN.

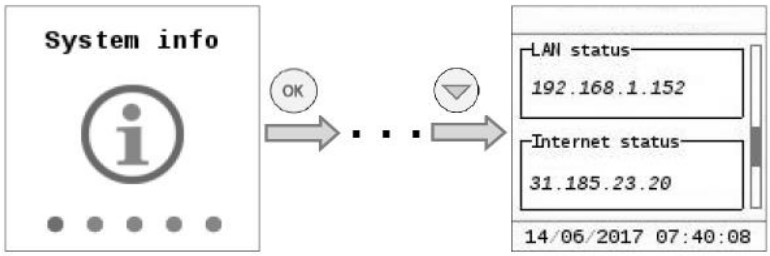


Default settings for connecting to the RTUEVO1T:

IP address:	192.168.1.110
Network mask:	255.255.255.0
IP address assignment:	Static

Proceed as follows to connect a PC to RTUEVO1T:

- Use an Ethernet cable per standard T568A or T568B (1:1 or crossover) to connect RTUEVO1T with a PC (directly) or LAN. If using the LAN, also connect the PC to the LAN.
- Check whether an IP address is displayed on RTUEVO1T in menu **System info**, under **LAN Status**.



Connection over LAN	Use a DHCP server for dynamic IP address or a fixed IP address if the PC and RTUEVO1T are integrated on an existing LAN. Contact your network administrator about the fixed or dynamic IP address to be used. You can change the LAN settings via the local operation of the RTUEVO1T.
Direct PC connection	Configure the IP address on the PC network settings or RTUEVO1T so that the PC and RTUEVO1T are on the same network. In the example above, the PC must have a static IP address 192.168.1.xxx (with xxx of 1 and 254, but NOT 110) and the network mask must be set to 255.255.255.0.
IP address ranges	The following IP addresses are reserved for private networks: • Class A: 10.0.0.0–10.255.255.255. • Class B: 172.16.0.0–172.31.255.255. • Class C: 192.168.0.0–192.168.255.255 (typical for home networks).
Access to RTUEVO1T	To access RTUEVO1T, enter the RTUEVO1T IP address (e.g. https://192.168.1.110) in the browser (Chrome, Safari, Firefox, Edge). Additional information on router configuration is available in the Appendix.

6.2. M-Bus commissioning on RTUEVO1T

After installation and after all connections are established, the M-Bus is commissioned as per the following steps:

Check M-Bus

On the level converter LC1, check that the "**M-Bus Ready**" LED is on and the "**M-Bus Error**" LED is off.

On the level converter LC250, check that the "**Run**" LED is on and the "**M-Bus Error**" LED is off.

First time log in

You must set the RTUEVO1T language the first time RTUEVO1T is activated. The following languages are currently available:

- German
- English
- Italian
- French
- Dutch

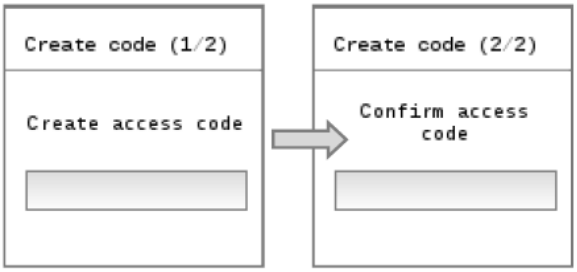
Notes

The language selected during the initial login applies to both the display as well as the software user interface of RTUEVO1T. You can change the language after initial login for the display and user interface of RTUEVO1T anytime and independently.

See section "**7.4.5 Settings menu**" (display). You can change the language for the RTUEVO1T at any time in the software user interface. See section "**8.2.1 Select the datalogger language**" (software interface).

Access code

Define an 8-digit access code. Use the  and  navigation buttons to set a number from 0...9. Press OK to go to the next digit. You must re-enter the 8-digit access code to confirm it.



Change access code

The access code can be changed at any time to protect against unauthorized access. See paragraph "**Operating**" section "Change access code".

Start meter search

In the **Meter search** main menu, start the search for connected M-Bus devices. Detailed information on the meter search workflow is available in section "**7.4.3 Wired search menu**".

Continue settings on RTUEVO1T

At the conclusion of the meter search, we recommend accessing the RTUEVO1Tvia the Internet browser to conclude the configuration. You can enter plant data and other settings via the Internet browser. For access to RTUEVO1T, see section "**Connect RTUEVO1T to PC or LAN**.

Enter meter name

Assign each device a unique name, e.g. "Apartment 1, "Warehouse", "Hot water" to simplify evaluation of reports with consumption data or device information. Display menu selection **Settings → Wired devices → Device settings**. See paragraph **8.4.3.1 Devices settings**

Enter plant data

Plant data includes information on user, address, etc. The data is displayed in the report header and permits clear assignment of the measured data to a plant. Display menu selection **Settings → System → Plant data**, see paragraph "**8.4.1.1 Plant data**".

Email settings

RTUEVO1T can email you reports, events, messages, anomalies, and errors. See "**8.4.2.2 Email configuration**".

6.3. Commission repeater on RTUEVO1T

To simplify the evaluation of reports on consumption data or device information on the RTUEVO1T assign each device a clear and unique name to each meter, for example, "Apartment 1", "Basement", "Hot water". See Section **Settings /Wireless Devices/ Device settings**.

6.4. RTUEVO1T troubleshooting

The datalogger does not switch on. The green LED is off.

- Using a multimeter, check whether the required operating voltage AC/DC 24 V +/- 10 % is available between terminals (15) and (16).

The display is switched off.

- The display switches off automatically after 10 minutes. Press any button to switch on the display.

The RTUEVO1T does not recognize any devices.

- Check to ensure the wiring is correct between the RTUEVO1T and connected M-Bus devices.
- Check to ensure the wiring is correct between the RTUEVO1T and the level converters.
- Check M-Bus wiring for short circuits.

The RTUEVO1T does not recognize all M-Bus devices.

- Check to ensure the wiring is correct between the RTUEVO1T and unrecognized devices.
- Using a multimeter, check whether the bus voltage on the unrecognized devices is between DC 24 V and 42 V.
- Ensure that the communication settings on the RTUEVO1T are compatible with the M-Bus devices (transmission rate, addressing)
- Check to ensure that the number of connected M-Bus devices does not exceed the maximum permitted amount.

The RTUEVO1T does not recognize all radio devices.

- Ensure that the unrecognized devices are not located too far from the RTUEVO1T and that the radio signal is not too weakened by cement or metal walls
- Ensure that the unrecognized devices are loaded to the RTUEVO1T list and that contact to the wireless M-Bus devices, recognized by the RTUEVO1T, is not interrupted.
- Please note that some wireless M-Bus devices only transmit their data at intervals of multiple hours
- Use the web interface or the SIN.EQSW1 software to ensure that the mesh network is operational.

No connection with the RTUEVO1T.

- Check the PC network address. The RTUEVO1T uses an IP address 192.168.1.110 as the default. As a result, the PC must have an IP address of 192.168.1.xxx (with xxx not equal to 110).
- Ensure that a firewall is not blocking TCP/IP Port 80 or 443.
- Please contact your local IT administrator for excluding network problems.

7. RTUEVO1T: OPERATION ON THE DEVICE

7.1. Select default operating language

The language set on the display is the default language.

You can set the default operating language directly on the display. After entering the password, you can select the language on the main menu at **Settings → System → Select language** by pressing the and buttons.

The following languages are available:

- English
- German
- Italian
- French
- Dutch

Each time the language is set or changed on the display; it remains the default language until the next change. The default language is used on the following:

- Display functions
- RTUEVO1T default language for the login
- Automatic reports on all RTUEVO1T

Important! The language set locally on the RTUEVO1T is also used for sending emails and to generate reports and alarm notifications. It is very important that the language is set correctly locally on RTUEVO1T during commissioning.

7.2. Buttons

RTUEVO1T has six buttons to navigate menus on the display. The button functions are based on the displayed menu.

OK	• Confirm a field or a set value • Access to the main or sub-menu
ESC	• Cancel a field selection or value • Return from a sub-menu to a main menu
	• Go to previous main menu or sub-menu • Move cursor to the left
	• Go to next main menu or sub-menu • Move cursor to the right
	• Scroll up one page • Select / switch from letters A...Z and digits 0...9
	• Scroll down one page • Select / switch from letters A...Z and digits 0...9

7.3. Operating

Measured data and basic settings are displayed on a colour display. The display switches off automatically to save energy after 10 minutes.

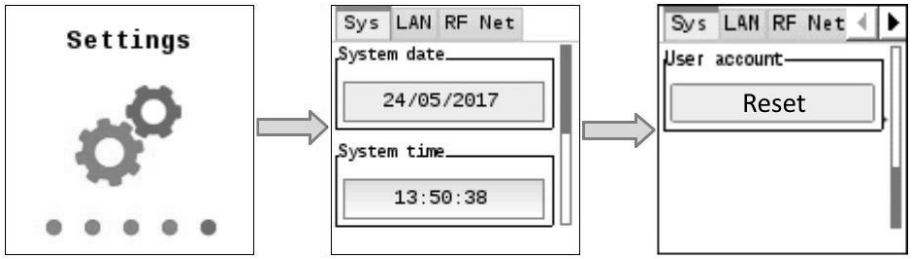
Access code entry

Press a navigation button to switch on the display. The display to enter the access code opens.

Enter the access code. The cursor flashes at the current position. Select individual numbers using the arrow keys and and confirm with the OK button. The cursor goes to the next position on the 8-digit access code.

Change access code

The access code on RTUEVO1T can be changed as follows:



Select **Settings / System / Reset code** and press the **OK** button to reset the access code.

The current access code must be entered before you can enter and confirm the new code.

The display changes automatically to the System info main menu once the access code is changed.

The code must be entered again if an incorrect access code is entered or the new access code does not match the confirmation. There is no limit to the number of attempts.

Note

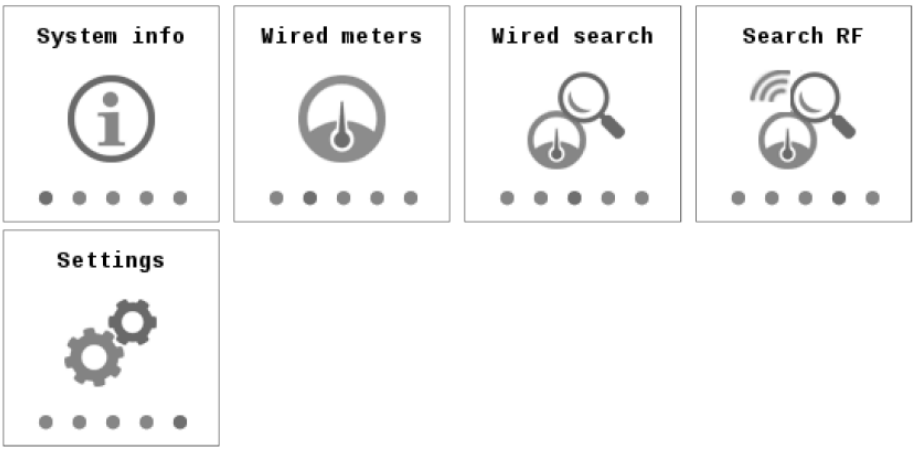
You can reset the access code for local access on RTUEVO1T using web access.

Important!

For security reasons, define a new access code locally on the RTUEVO1T as soon as possible after a reset.

7.4. Main menu

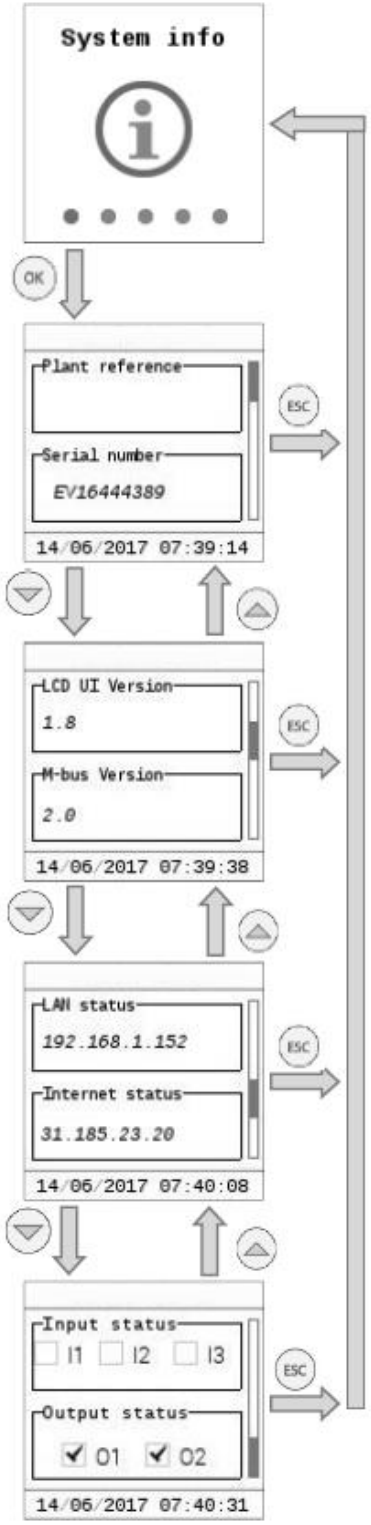
The main menu displays after correctly entering the access code. It consists of five pages: **System info, Wired meters, Wired search, Search RF** and **Settings.**



System info	Includes information on RTUEVO1T and connection status.
Wired meters	Displays the list of connected M-Bus devices and makes it possible to display the data.
Wired search	Starts the search for connected device as per the last saved changes.
Search RF	Starts the search for RF devices using the last saved settings.
Settings	Includes some RTUEVO1T settings.

7.4.1 System info menu

Select the **System info** main menu and press the **OK** button to go to the submenu



- Plant name
- Serial number (required for support calls).

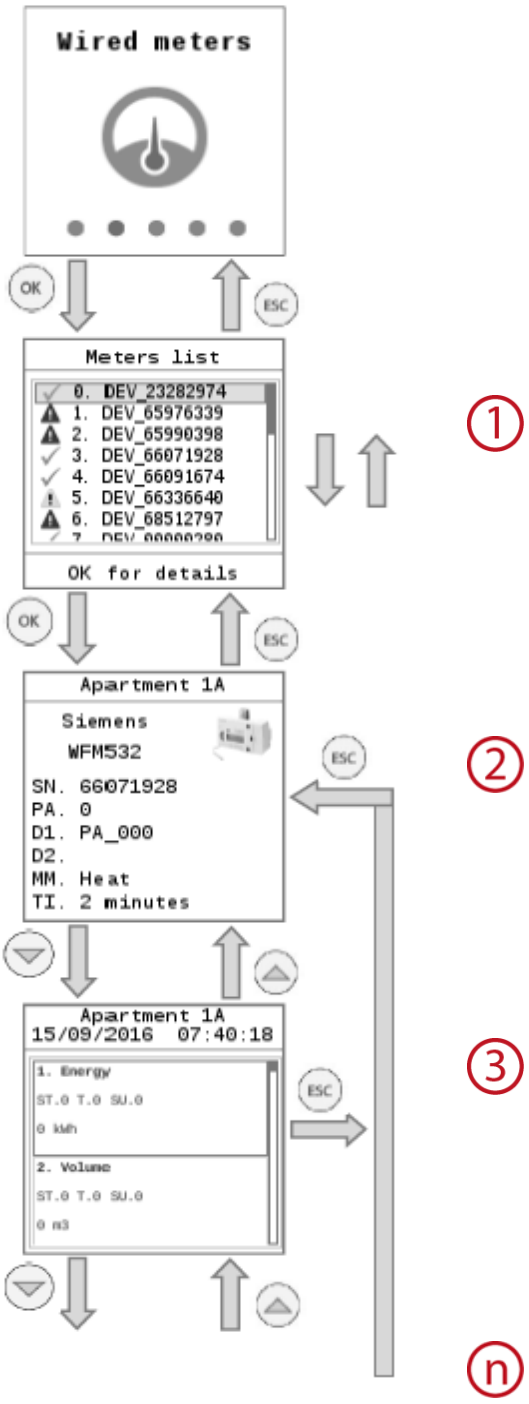
- LCD UI Version (local UI version)
- M-Bus firmware version

- LAN connection status and IP address (if connection is available).
- Internet connection status and public IP address for external access (if connection is available).

- Input status (indicates the status of the three inputs)
- Output status (indicates the status of the two relay outputs)

7.4.2 Wired meters menu

Select the wired meters main menu and press **OK** to go to the sub menus.



① List of saved meters. Each meter is identified by the first 8 digits of the serial number (e.g. 5434563).

The following symbols are displayed in the first column:

- OK: The last readout was successful.
- Device error: An error was reported to the RTUEVO1T via M-Bus.
- Communications error: No communications with the device.

You can navigate through the list with the ▲ and ▼ navigation buttons.
Press **OK** to go to the data for the selected meter.

② The first panel provides general information on the selected meter:

SN: Serial Number: fabrication number

PA: Primary Address

D1: Description, designation

LN: Line (connection): M1M2 or via serial bus ABC

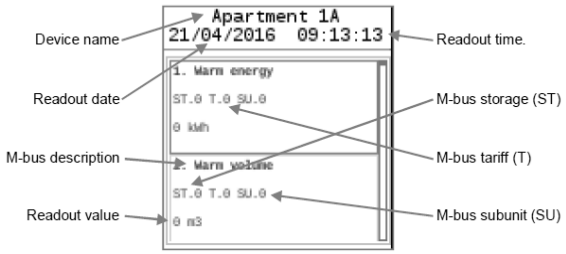
MM: Medium

TI: Time Interval: readout frequency

③ Displays the values from the last meter readout, if available.

The ▲ and ▼ navigation buttons take you to additional meter fields for this readout time.

ⓝ The following image explains in detail the meter configuration fields shown on the display.



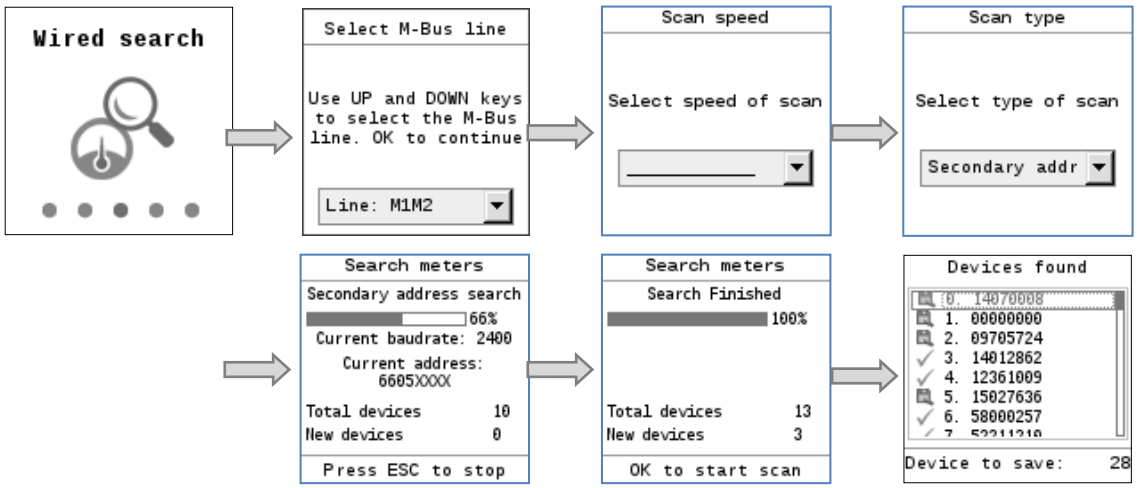
Device name	The setting is selected over web operation in the menu **Settings → Wired devices → Device settings** → Select the device → **Data point settings**
Readout date	Displays the date of the meter readout
Readout time	Displays the time of the meter readout
M-Bus description	Displays the field description as per the M-Bus protocol
M-Bus storage:	Displays the storage number of the displayed M-Bus data point. See the meter documentation for additional information
M-Bus tariff	Displays the tariff number of the displayed M-Bus data point. See the meter documentation for additional information
M-Bus subunit	Displays the number of the subunit for the M-Bus data point. See the meter documentation for additional information
Readout value	Displays the value with unit at the time of the meter readout

Important The display only displays meter fields where the option **Display data** is selected. The setting is selected over web operation in the menu **Settings → Wired devices → Device settings** → Select the device → **Data point settings**

7.4.3 Wired search menu

In the Wired search menu, press **OK** to start a scan for connected meters. The default search criteria:

- M-Bus line: M1M2
- Scan speed: 2400 bp
- Scan type: Secondary address

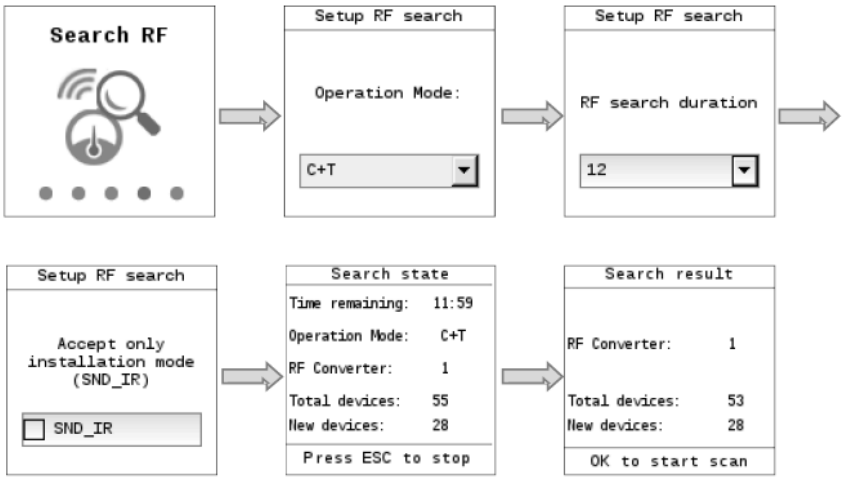


M-Bus line	Select the M-Bus line to scan for meters: via M1-M2 or via ABC
Scan speed	Select the baud rate used by RTUEVO1T to scan for meters: 300 bps and 2,400 bps / 300 bps / 600 bps / 1,200 bps / 2,400 bps / 4,800 bps /9,600 bps
Scan type	Select the M-Bus addressing type used in the scan: Primary + secondary address / Primary address / Secondary address

Check meters and save	A list of devices found is displayed after the meter scan is finished. Press **OK** to save all newly found meters and add them to the device list. The **ESC** button does not add the newly found meters to the device list. To edit meter settings over web operation, see menu **Settings / Wired devices/Device settings**.

7.4.4 RF search menu

Select the RF search main menu and press **OK** to start the search for RF devices.



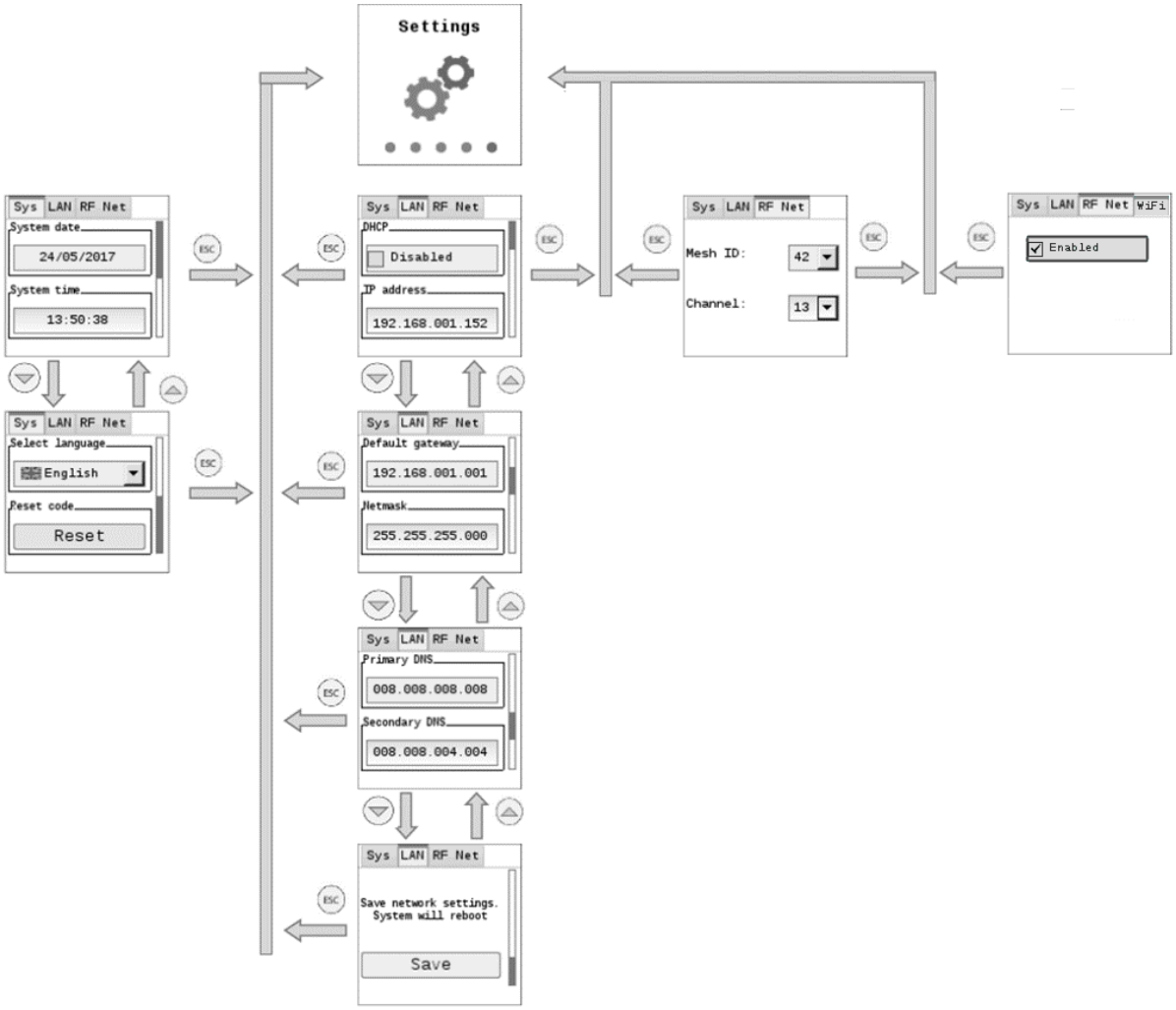
Operation mode	Select the operation mode. Ensure that the operation mode for M-Bus is the same for both the repeater as well as the devices on the RF network. The following values are available: **S, T, C+T, C+T & S**.
RF search duration	Select the duration of the search. Values 1 to 24 are available.
Installation mode	You can limit the search and only display devices in installation mode by selecting **SND_IR**: Function.

7.4.5 Settings menu

The **Settings** menu has three sub-menus:

- System
- LAN
- RF network

– You can navigate the submenus with the ◁ and ▷ navigation buttons.
– You can navigate within the submenus with the △ and ▽ navigation buttons.
– The OK button selects a field for editing and then confirms the entered value.



7.4.5.1 System

The **System** sub-menu has the following settings:

System date	Enter the current date of the RTUEVO1T.
System time	Enter the current time of the RTUEVO1T.
Select language	Select the language on the RTUEVO1T display.
Important!	The language set locally on the RTUEVO1T is also used for sending emails and to generate reports and alarm notifications. As a result, it is important to select the correct language during RTUEVO1T commissioning.
Reset code	To change the current access code. You are requested to enter a new access code.
User Account	Reset all previously created users. New users can be created. Leave all other settings unchanged.

7.4.5.2 LAN

The **LAN** sub-menu has the following settings:

DHCP	Enable or disable the DHCP client on the RTUEVO1T. The RTUEVO1T draws its IP address automatically from the DHCP server (router) if the DHCP client is enabled.

The following parameters must be entered manually if the DHCP client is disabled:

IP address	IP address of the RTUEVO1T. It cannot be set with DHCP enabled. Default value: 192.168.0.110
Default gateway	The standard gateway represents the interface between the local and public network. You typically enter the IP address for the router here. Need not be set if the DHCP is enabled. Default value: 192.168.1.1
Network mask	The IP subnet mask sets the size of the network. Need not be set if the DHCP is enabled. Default value: 255.255.255.0
Primary DNS	The DNS name server (domain name system) on the Internet connects a globally valid name to a domain with an IP address (e.g. domain www.xxxxxxx.com with IP address 146.254.191.150). The setting corresponds to the IP address for the next router or DNS name server that recognizes for its part a queried name (domain) or another DNS name server. The setting is typically identical to the setting for the standard Gateway. Need not be set for "DHCP = Enabled" If the DHCP settings are deactivated, please contact your local administrator for the specification of the parameters. Default value DNS1: 8.8.8.8
Secondary DNS	A secondary DNS name server is only defined for redundant systems. Settings are typically empty. Need not be set if the DHCP is enabled. Default value DNS2: 8.8.4.4
Save	The current network settings are saved and RTUEVO1T restarts.

7.4.5.1 RF network

You can set the following In the RF network submenu:

Mesh ID	Enter the mesh ID. Ensure that all Smart repeater sinapsitech® are on the same mesh network.
Channel	Mesh network channel: You can change the channel ID here in the event of faults.

8. RTUEVO1T BROWSER OPERATION

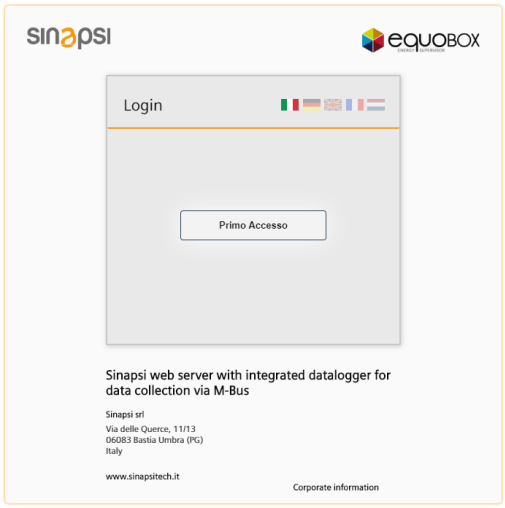
8.1. Registration & login

8.1.1 Prerequisite

The datalogger and the PC are connected to the same network and the network access is configured.
See section **6.1.1** Connect RTUEVO1T to PC or LAN.

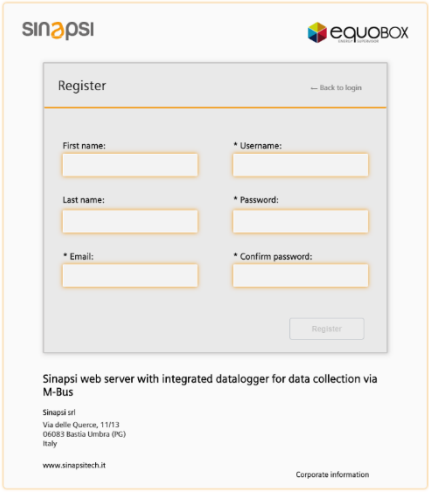
8.1.2 Initial registration

To access datalogger, enter the datalogger IP address (e.g. https://192.168.1.110) in the browser (Chrome, Edge, Safari, Firefox).



Complete the mandatory fields to register and receive access to the datalogger:

- Email
- Username
- Password
- Confirm password



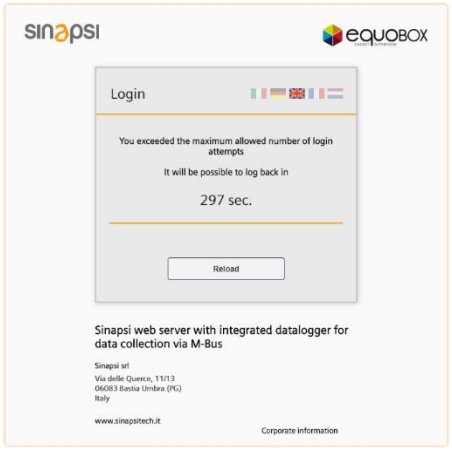
The password must meet the following conditions:

- At least 8 characters
- Three of the following 4 criteria must be fulfilled:
  - Lowercase letters
  - Uppercase letters
  - A digit
  - A special character

Important The register button is only enabled after meeting the password conditions.

Sign in

You are notified if you enter an incorrect login or password. The login is locked on the datalogger for five minutes (300 s) after a maximum of six attempts.



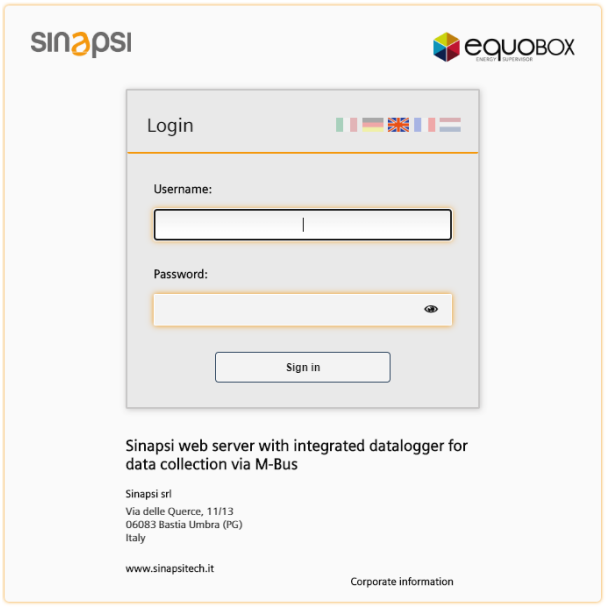
Contact the administrator if the user or maintainer forgets the access data. The administrator can delete the current account and set up a new one.

Very important

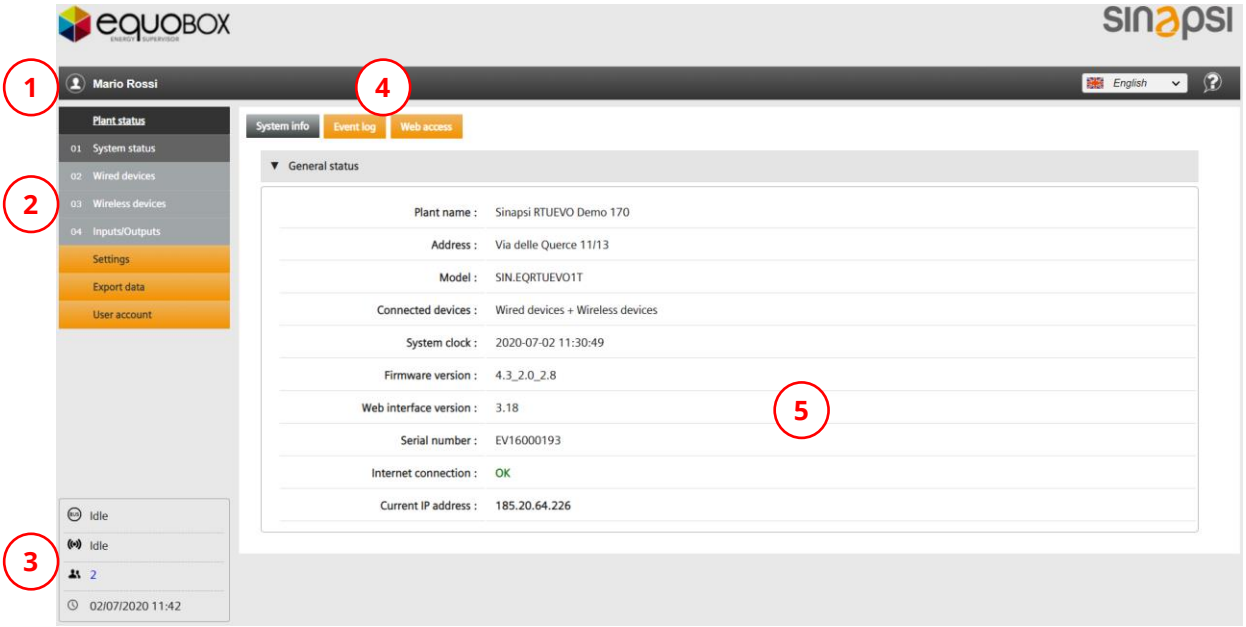
Loss of administrator password:
For security reasons if the administrator losses the access data, he need to contact the customer service of Sinapsi via email at **service@sinapsitech.it** to restore the password!

Sign in

Datalogger goes to the Login page after successful registration. You can now log in using the new username and password.



8.2. Home



1 The following information is displayed on the title line:
- Name of the logged in user.
- Language selection.

Information on "Open source software" packets and licenses.

2 Primary navigation using the main menus:
- Plant status
- Settings
- Export data
- User account

3 Status Information:
- M-Bus status
- Status M-Bus radio
- Number of logged on users
- Date and time.

4 Secondary navigation using sub-menus

5 Information on menu and sub-menu page

8.2.1 Select the datalogger language

You can set the operating language for the software interface in the title line to the right.
The following languages are available:
- English
- German
- Italian
- French
- Dutch

Important!

The default language used on the login is selected and displayed on the display of the datalogger. The language setting in the login window applies exclusively to the current session. The language setting on the datalogger software interface apply exclusively for the current session after login.

All automatic reports use the default language. Select **default operating language**.

All manual reports created on the datalogger use the language for the current session.

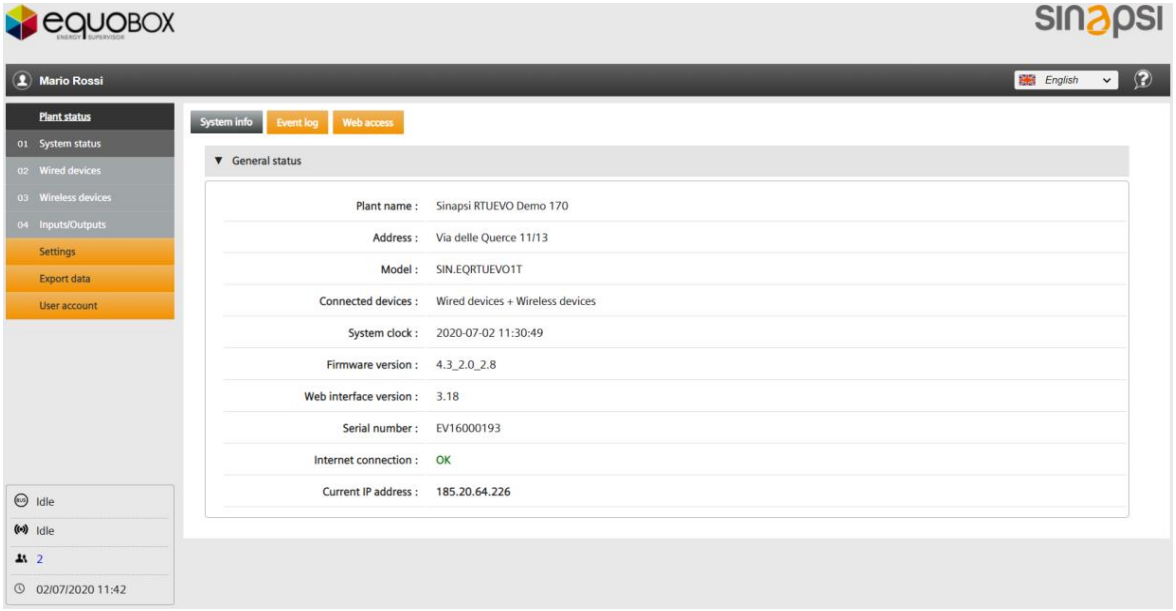
8.3. Plant status

The Plant status main menu displays all important information on the datalogger, connected devices, and events occurring on the bus.

8.3.1 System status

System status displays system information, the event log and status information of SGH NET.

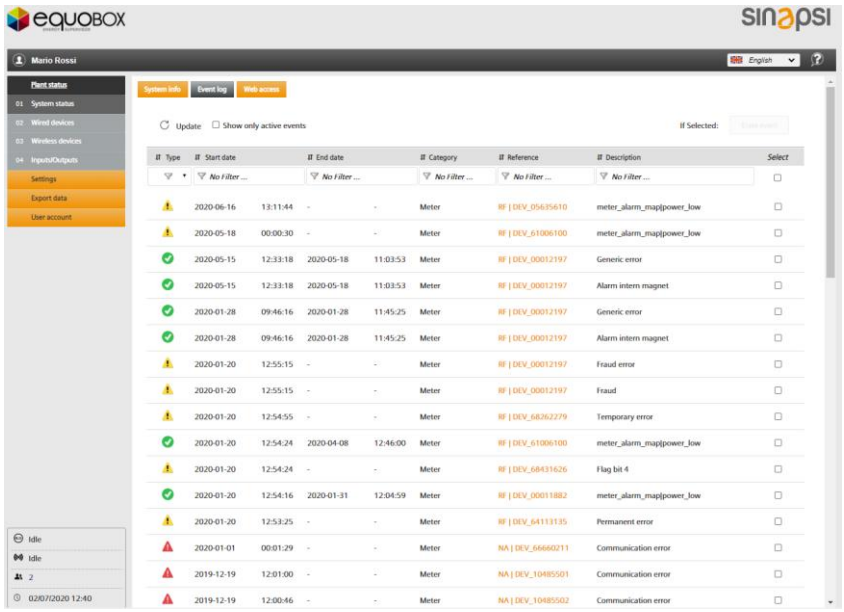
8.3.1.1 System Information



The following information is available under System status:

- Plant name: name of the plant.
- Address: plant location.
- Model: displays the datalogger type designation.
- Connected devices: displays the type of connected devices (wired devices and/or wireless).
- System clock: current datalogger date and time.
- Firmware version: displays the firmware version installed on the datalogger.
- Web interface version: displays the installed version of the web user interface.
- Serial number: display the datalogger serial number.
- Internet connection: displays the current status of the datalogger Internet connection.
- Current IP address: displays datalogger's last public IP address.

8.3.1.2 Event log



The event log records the following events:

- Alarms and warnings
- Change of state of inputs/outputs
- Send status of emails
- Send status of information via FTP

The following information can be read by event:

- Type
- Start date/time
- End date/time
- Category
- Reference
- Description

The following event status can be displayed:

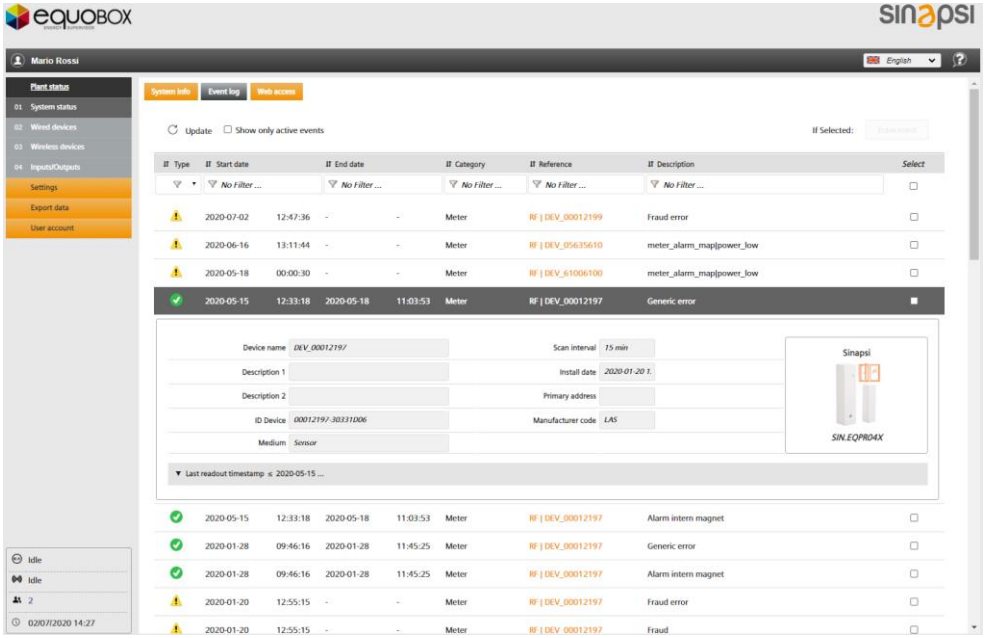
- Device OK: Reported alarms or warnings are correct.
- Device fault: A device fault reported via M-Bus.
- Communications error: Communication with M-Bus device not possible.
- Email successfully sent.
- The email could not be sent (over 3 days at 15 minutes intervals, not successful).
- FTP The readout file was successfully transmitted to an FTP server.
- FTP The readout file was unable to be transmitted to an FTP server (over 3 days at 15 minute intervals, unsuccessful).
- IN Change of state registered at an input.
- OUT Change of state registered at an output.

Simply set filters for each column to limit search results by specific events.
The event log registers up to 1000 events. The oldest event is removed after 1000 events.
Individual lines on the event log or the entire list can be deleted.
Proceed as follows:

- Delete individual rows: Select the event check box to be deleted and then click **Delete event** in the upper end of the list. The **Delete event** is enabled if at least one line is selected.
- Delete complete list: Select the check box on the title line and then **Delete event** to irretrievably delete the entire event log.

Note **Display only active events** to list only currently pending alarms and input/output status.

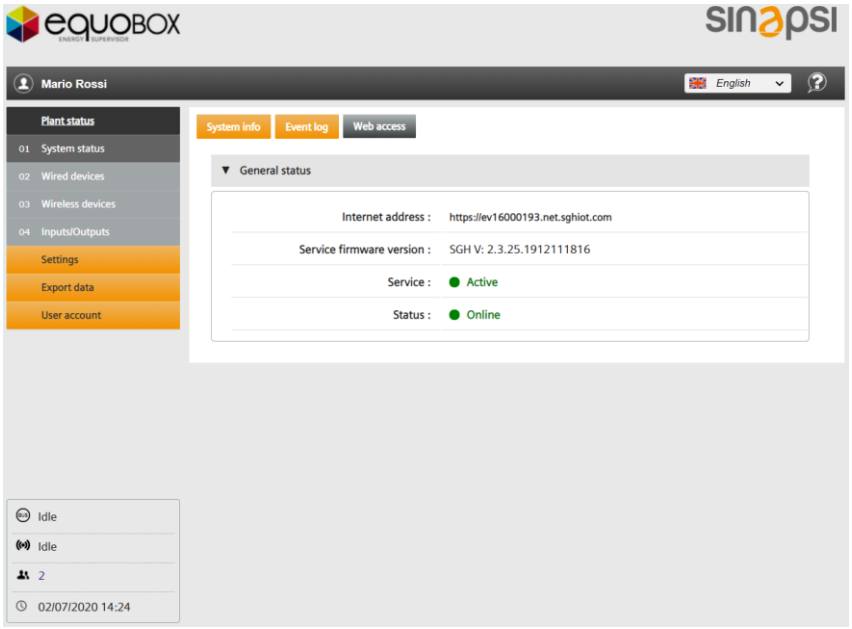
Click a line to display event details, e.g. the sent email including appendix and the last readout data just prior to the fault.



8.3.1.3 SGH NET

Sinapsi Global Hub Net is a service that allows all users to reach the RTUEVO1T wherever it is in the world as if it were connected via LAN.

Important To use this service, it is necessary to check whether the incoming and outgoing communication to port 1194 with UDP protocol is allowed.

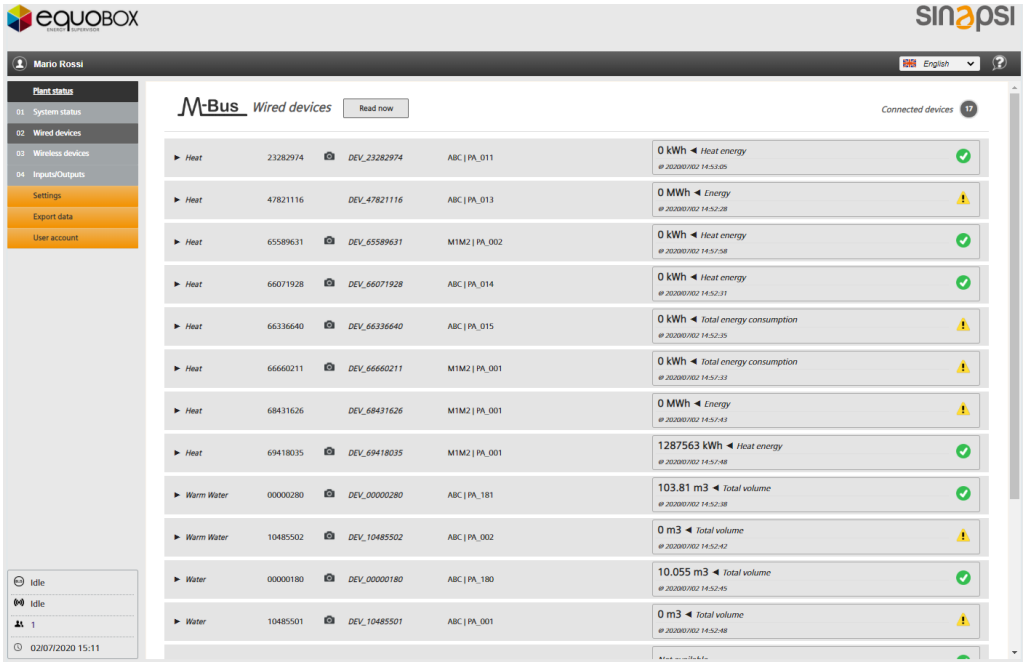


The following information is available under SGH NET status:

Internet address: The host name of the internet address to reach the RTUEVO1T. Click on the address or type on the address bar of the browser to connect to the RTUEVO1T

8.3.2 Wired devices

The Wired devices overview lists all M-Bus devices located on the network in an abbreviated form.



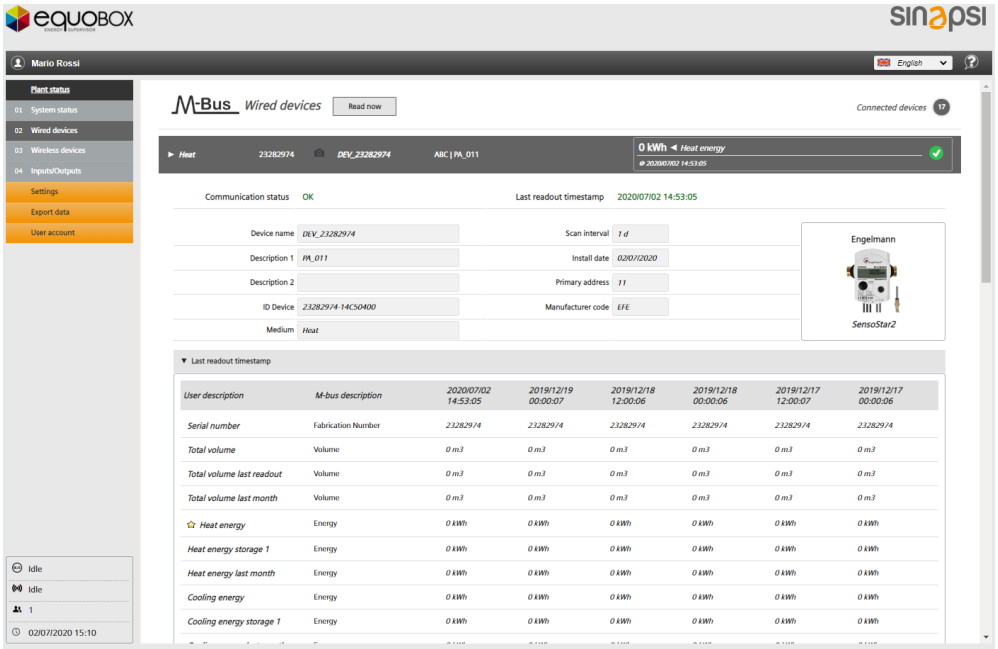
The following information can be read out per line (per M-Bus device):

- Medium
- Serial number (secondary address)
- Availability of device image
- Device Name (By default it's DEV_serial)
- Description: the bus where the meter is connected (M1M2 or ABC) and description
- Main value (=> Can be selected, see Section "**Settings→Wired devices**")
- Last readout timestamp
- Device state

The following device status can be displayed:

- Device ok
- Device fault
- Communication error

Click a line to list additional device information



The information is grouped into three categories:

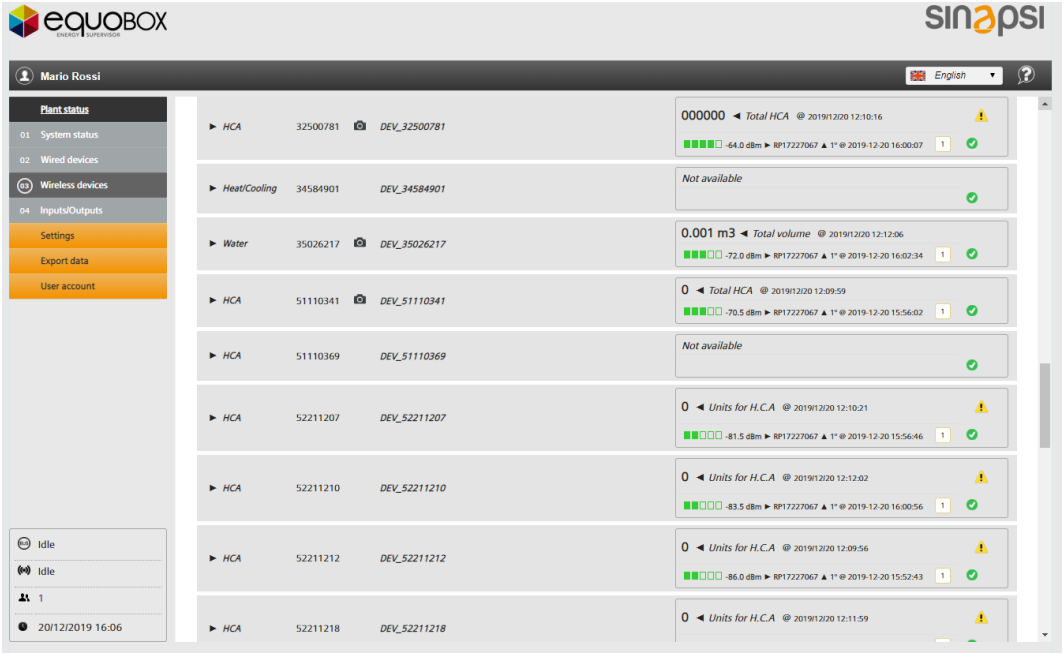
- Device information: General device data (name, description, ID, medium, etc.)
- Last readout timestamp: Displays the values of the last 6 readouts.
- Alarm status: Shows the faults on the device and which ones are registered, sent via email, the event type and the status.

The data points for display in detail, can be predefined in the menu **Settings / Wired devices / Device settings**.

Click **Read now** to manually trigger a complete readout of the data from all devices.

8.3.3 Wireless devices

The Wireless devices overview lists all the M-Bus Wireless devices on the network in a compact form.



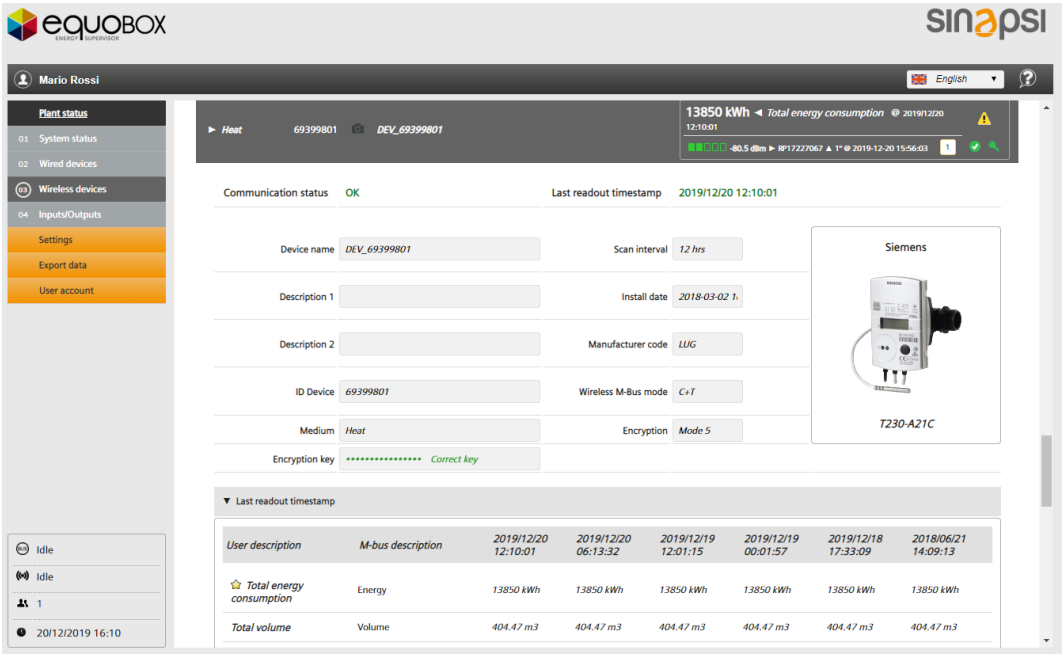
The following information can be read per line (i.e. per M-Bus wireless devices):

- Medium
- Serial number
- Availability of device image
- Device Name (By default it's DEV_serial)
- Description: Customized by the user (e.g. installation point)
- Main value (=> Can be selected, see Section "**Settings→Wireless devices**")
- Last readout timestamp
- Device state: active alarm signalling
- Reception signal strength
- Serial of the RPT868XT repeater that last sent the device data.
- Date and time of last transmission of the data
- Number of repeaters that receive data from the wireless M-Bus device
- Cryptographic key required to read the meter data: green → correct key, red → incorrect or not inserted key.

The following device status can be displayed:

- Device is OK
- Device fault
- Communication error

Click a line to list additional information on a particular device.

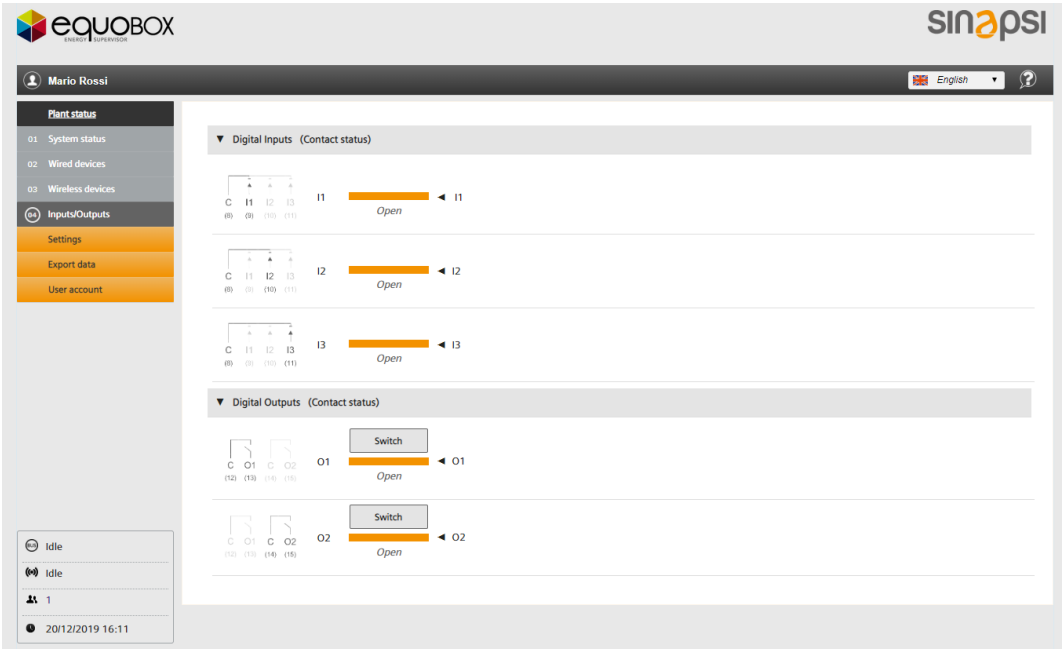


The information is grouped into three categories:

- Device information: General device information (Name, description, ID, medium, polling interval, installation date, manufacturer code, RF mode, encryption, etc.)
- Last read out timestamp: Displays the values of the last 6 read outs.
- Alarm state: Shows the faults on the device and which ones are registered, sent via email, the event type and the status.

8.3.4 Inputs/Outputs

Displays the current status (open/closed) of inputs/outputs on datalogger.



The following information can be read by input/output:

- Image of connection terminals on datalogger
- Short description: I = Input, O = Output
- Status: Open/closed
- Designation

Click **Switch** to manually switch the digital outputs (available for the user type “Administrator”).

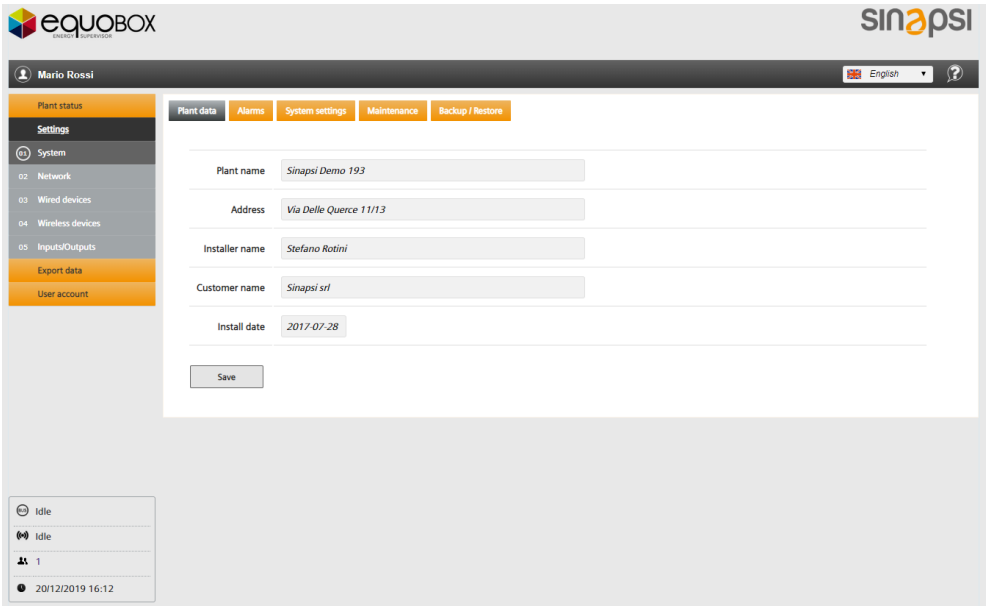
8.4. Settings

8.4.1 System

8.4.1.1 Plant data

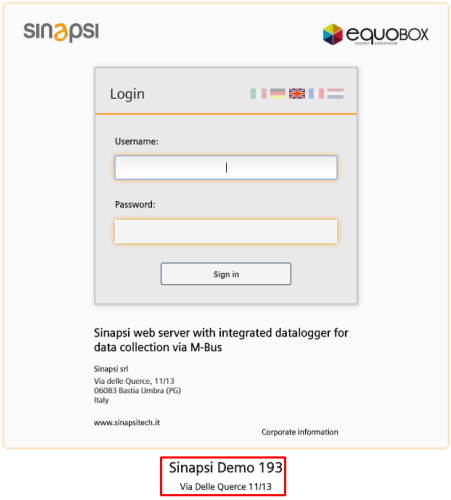
The following plant data can be assigned to datalogger:

- Plant name
- Address
- Installer name
- Customer name
- Install date (the current date by default)



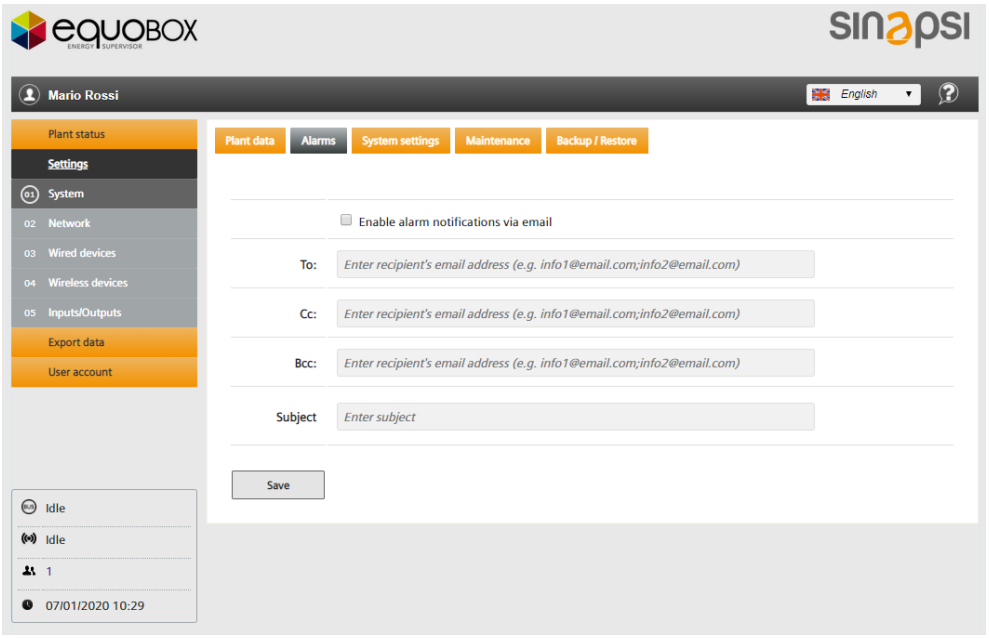
Note The edited data must be confirmed with **Save**.

The plant name and address are displayed on the home page in the lower section to easily ID the datalogger, even before logging in.



8.4.1.2 Alarms

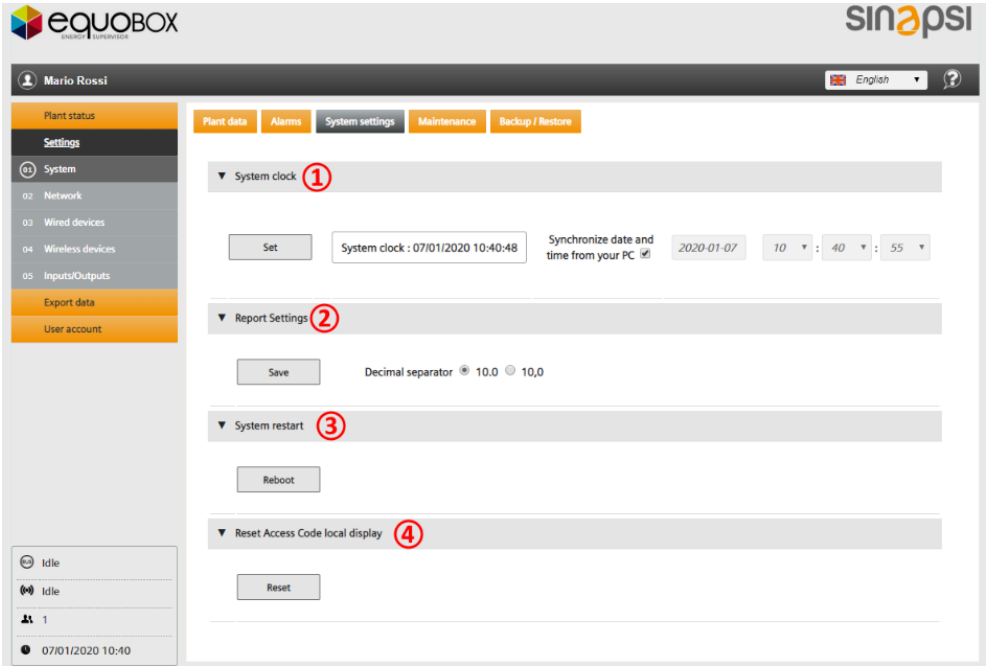
As soon as datalogger detects an alarm, it sends an alarm notification to the designated email address:



Emails are only sent if **Enable alarm notifications via email** is selected.
The alarm notification can be simultaneously sent to multiple recipients. Multiple email addresses must be separated by a semi-colon (;). The email subject line can be individually set to simplify classification in the event of multiple plants. Confirm it with **Save**.

8.4.1.3 System settings

System settings has 4 areas:

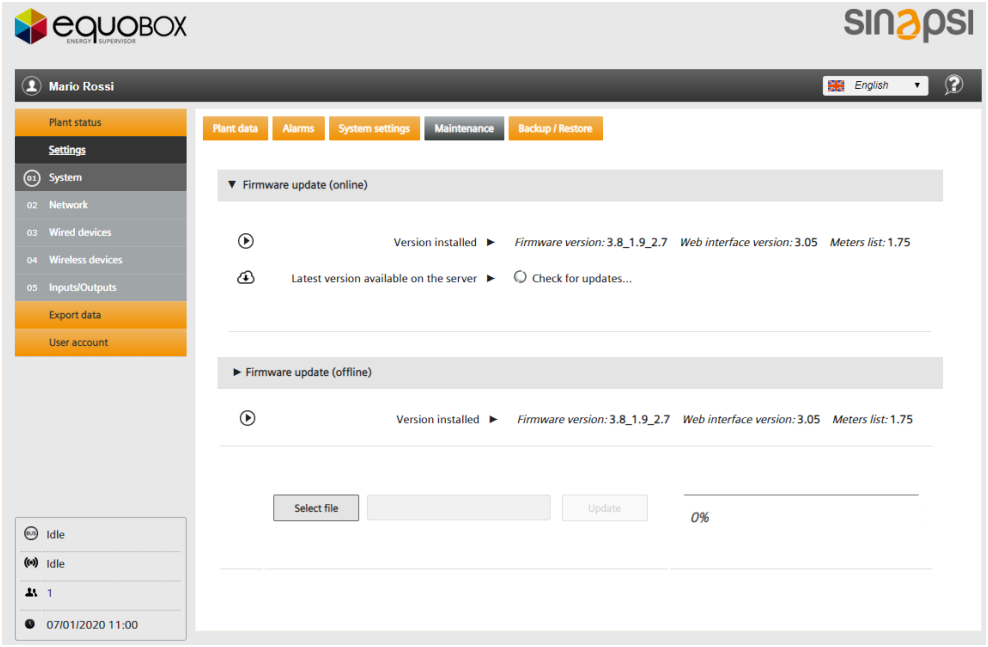


1. **System clock**: You can automatically sync the system clock with the PC or enter it manually.
2. **Report Settings**: You can select whether to use a period or a comma as the decimal separator.
3. **System restart**: You can remotely restart the datalogger pushing **Restart** button.
4. **Reset access code local display:** You can reset the access code for local access on datalogger. For security reasons, immediately change the password locally on the datalogger after a reset.

Important! The local access code cannot be entered remotely. You must visit the plant.

8.4.1.4 Maintenance

The page is used to update the datalogger firmware.



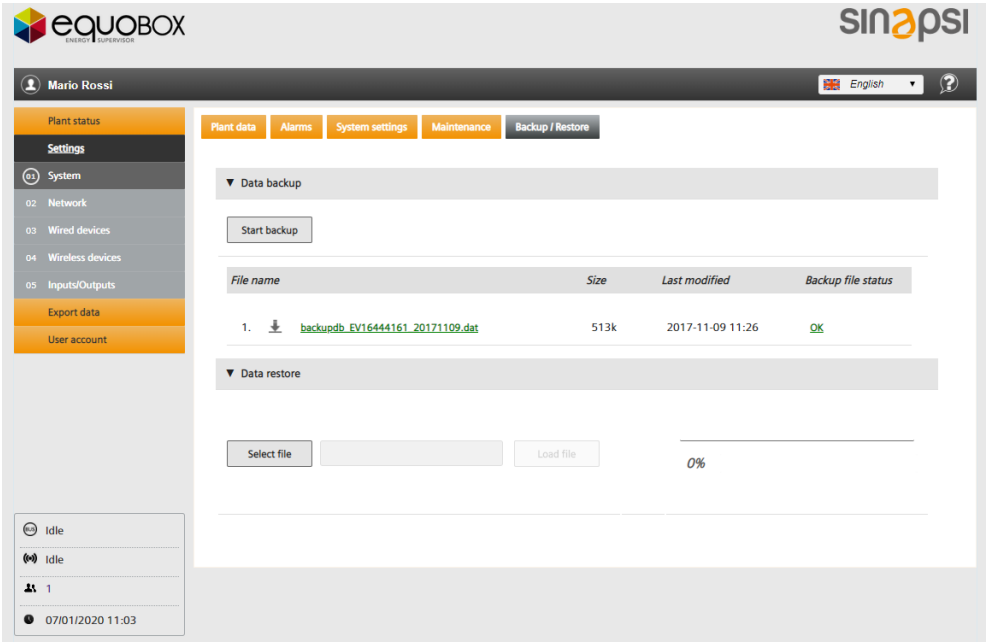
The firmware can be updated online or offline. The appropriate firmware can be installed directly from the Internet on the datalogger (online) or via PC (offline).

Datalogger restarts after updating. Install progress as well as restart is displayed.

Important! After a firmware update all data are available again. It is recommended to do a backup and to save the data on a PC before the actualization.

8.4.1.5 Backup / restore

All datalogger data is backed up and / or restored on this page.



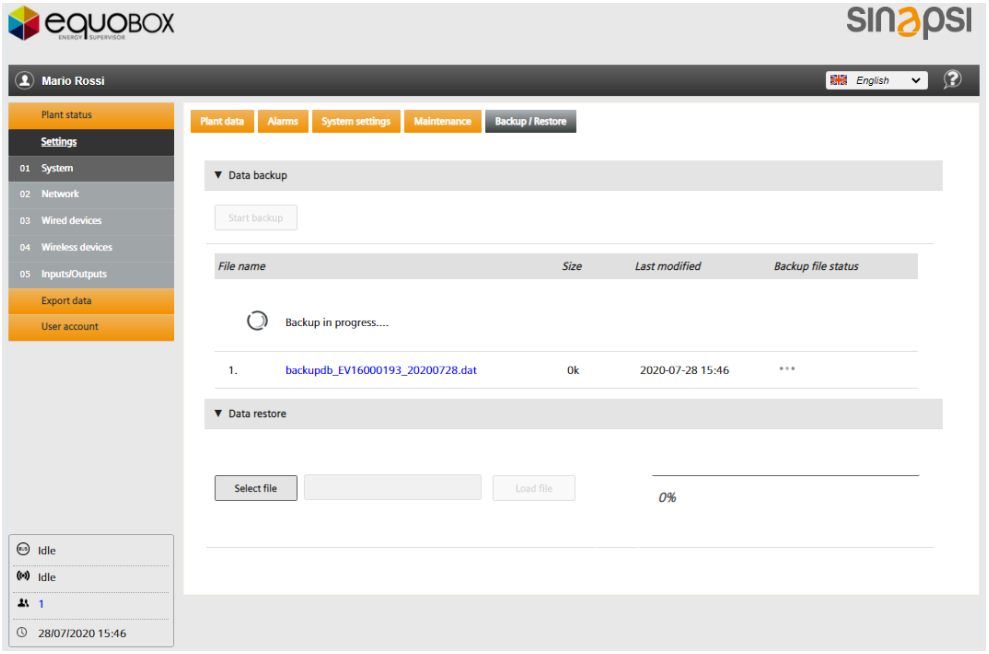
Important! We recommend regularly backing up datalogger data.

Data backup

The following information is displayed on each data backup:

- File name
- Size
- Last modified
- Backup file status

The backup file can be downloaded on a PC by clicking or the file name and then uploaded to the same or another datalogger.



Important! Always copy backup files to your PC. This is the only way to load the backup file from a defective datalogger to a new datalogger.

Important! The backup file is encrypted. The device data cannot be altered.

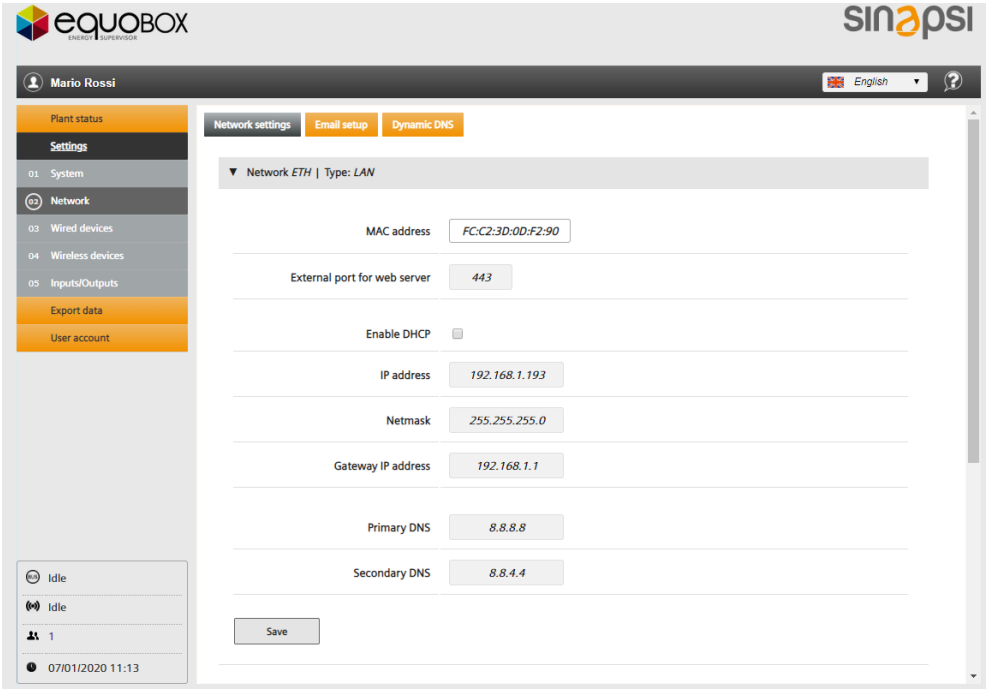
Data restore

To transmit a backup file to datalogger, select the appropriate file (**Select file**) and install (**Load file**). Datalogger restarts after updating. Install progress as well as restart is displayed.

Important! This workflow irretrievably removes all data and settings on the current datalogger. As a result, we recommend conducting a backup of the current data prior tore storing.

8.4.2 Network

8.4.2.1 Network settings



The following information and settings are available:

- Datalogger MAC address.
- External port for datalogger: This is only an information of the external port used by the RTUEVO1T. This external port number must be the same in the port forwarding settings of the router.
- Enable DHCP for the DHCP server (router) to automatically assign the IP address.
- Datalogger IP address if a fixed IP address is assigned.
- Network mask.
- Gateway IP address: IP address for the standard gateway (e.g. Router).
- Primary DNS: The primary DNS name server (Domain Name System) address
- Secondary DNS: Secondary DNS name server address

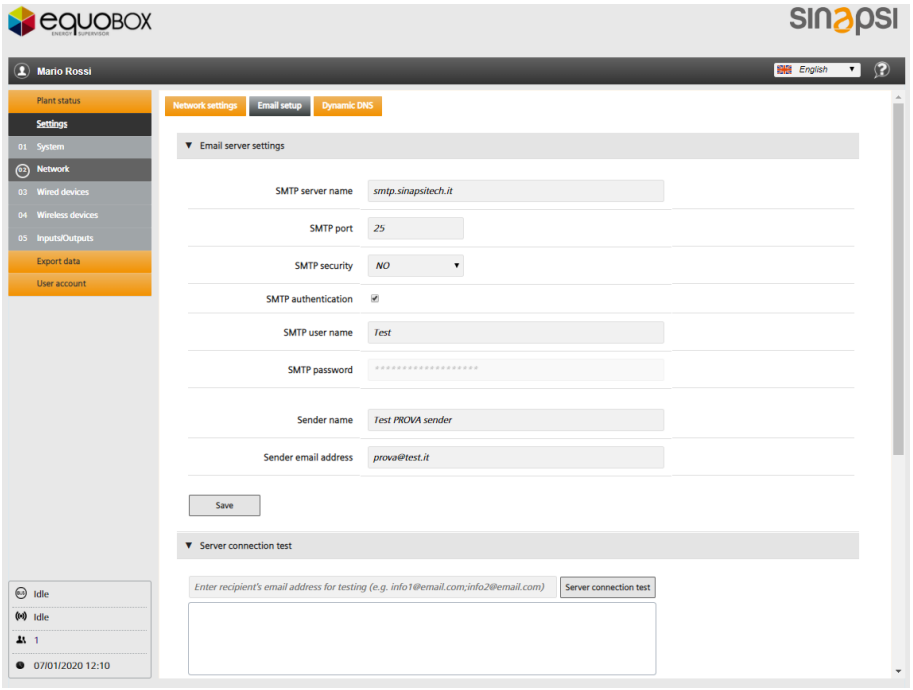
Click **Save** to confirm changes to the above parameters.

Important! Be careful when changing these settings! Ask your local network administrator for the required data on network configuration.

Datalogger is not suitable for connecting directly to the Internet; it must be connected via a modem. This type of router typically has a firewall.

8.4.2.2 Email configuration

The following data of your mail server must be entered for forwarding emails:



Email server settings

The following email server settings are available:

- SMTP server name: the address for the SMTP server.
- SMTP port: the port number used by the SMTP server.
- SMTP security: selection of either SSL or TLS security. The setting NO sends the emails without encryption; do not use this setting for security reasons.
- SMTP authentication: enter whether the SMPT server requires authentication.
- SMTP username: username for accessing the SMTP server.
- SMTP password: password for accessing the SMTP server.
- Sender name: sender's name that appears in the email address (if your SMTP server allows it).
- Sender email address: the sender's personalized email address (if your SMTP server allows it).

Important! Be careful when changing these settings! Check with your email provider for the required email server settings.

Click **Save** to confirm changes to the above parameters.

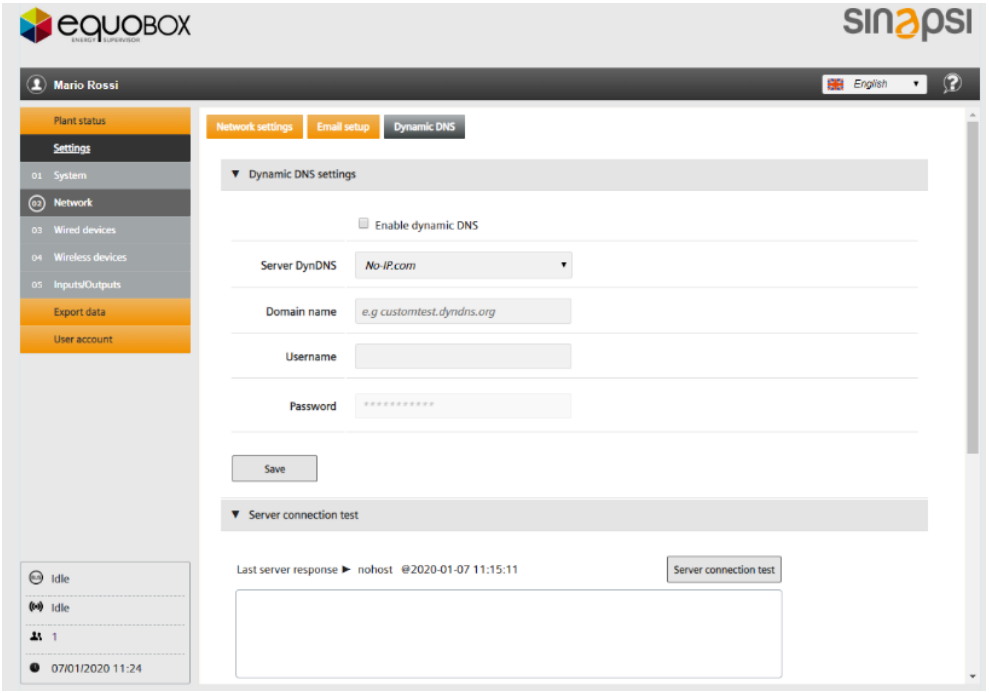
Email server connection test

Clicking **Server connection test**, you can check the connection to the e-mail server by sending a report to an e-mail address of your choice.

The results are displayed as soon as the message is sent:

8.4.2.3 Dynamic DNS

Dynamic DNS or DDNS is a service that allows you to always associate a DNS name with the same public IP address as a host.



Important! You must first set up an account at the provider to use the DynDNS or No-IP server.

Dynamic DNS settings

The datalogger must inform the service of changes to the dynamic IP address for the datalogger to communicate via the setup DynDNS service. The Dynamic DNS must be set on the datalogger as follows:

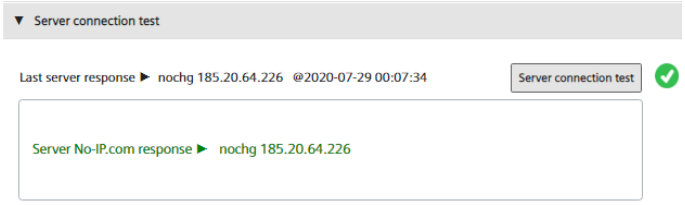
- Enable Dynamic DNS settings: Allows datalogger to use a dynamic DNS service
- Server DynDNS: The following two Dynamic DNS providers are available:
  - No-IP.com
  - DynDNS.com
- Domain name: Name provided to you by your dynamic DNS supplier.
- Username: Username for accessing the dynamic DNS server
- Password: Password for accessing the dynamic DNS server

Important! Be careful when changing these settings! Ask your network administrator for the required data on network configuration.

Click **Save** to confirm changes to the above parameters.

Server connection test

You can test the connection to the DynDNS server.
The results are displayed

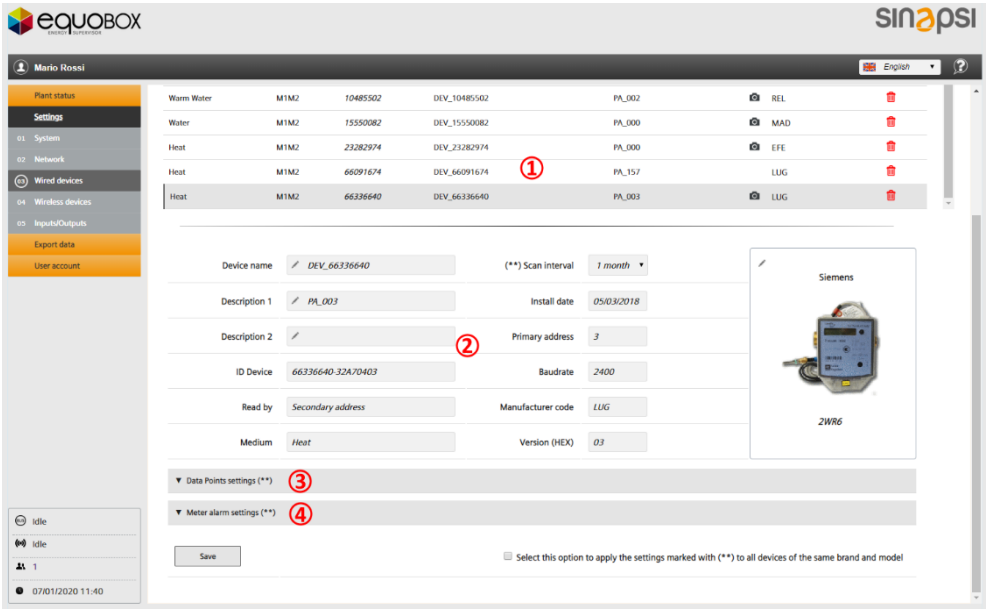


8.4.3 Wired devices

8.4.3.1 Devices settings

In this panel, you have access to the device list and can change settings.

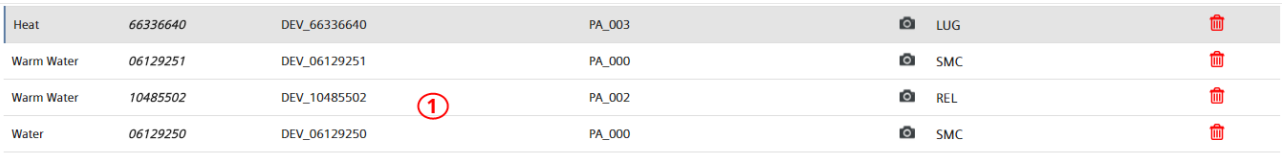
Note The list is empty if no device search has been run. The devices that are found and saved are displayed on the list after a device search.



The display is structured as follow:

1. List of all the saved meters found on the M-Bus lines connected in ABC or on the M1M2 line
2. Selected counter settings
3. Data points settings
4. Meter alarm settings

1. Saved meters list



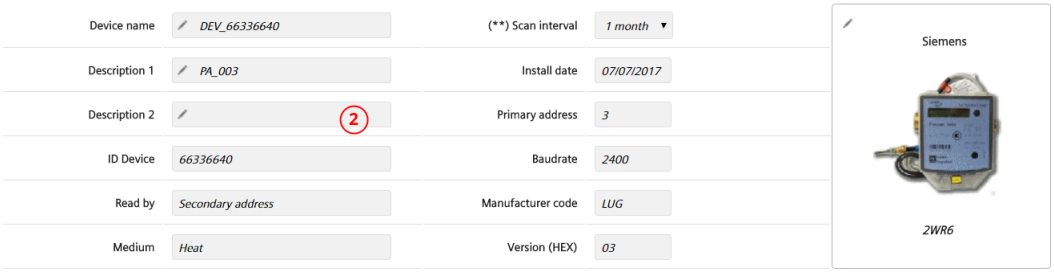
- Medium: Display the medium
- M-Bus line: Displays from which line between ABC or M1M2 the saved meter was detected
- Serial number: Displays the meter serial number
- Device name: Displays the meter name as entered under device name
- Description: Displays the text entered under Description 1
- : Indicates that a product image is available for the device
- Manufacturer code: Displays the 3-letter code of the device manufacturer
- Delete: Click the trash can to delete the device from the list.

The list of wired devices can be exported as an .xls or .csv file. Click the corresponding symbol:

Serial number	Device name (X)	Description (X)	Manufacturer code	Medium	M-Bus line
6129250	DEV_06129250	PA_000	SMC	Water	M1M2
6129251	DEV_06129251	PA_000	SMC	Warm Water	M1M2
7964864	DEV_07964864	PA_000	LSE	Heat/Cooling	M1M2
10485501	DEV_10485501	PA_001	REL	Water	M1M2
10485502	DEV_10485502	PA_002	REL	Warm Water	M1M2
15550082	DEV_15550082	PA_000	MAD	Water	M1M2
23282974	DEV_23282974	PA_000	EFE	Heat	M1M2
66091674	DEV_66091674	PA_157	LUG	Heat	M1M2
66336640	DEV_66336640	PA_003	LUG	Heat	M1M2

2. Device settings

Click the device line to view the setting for the device



Free text settings:

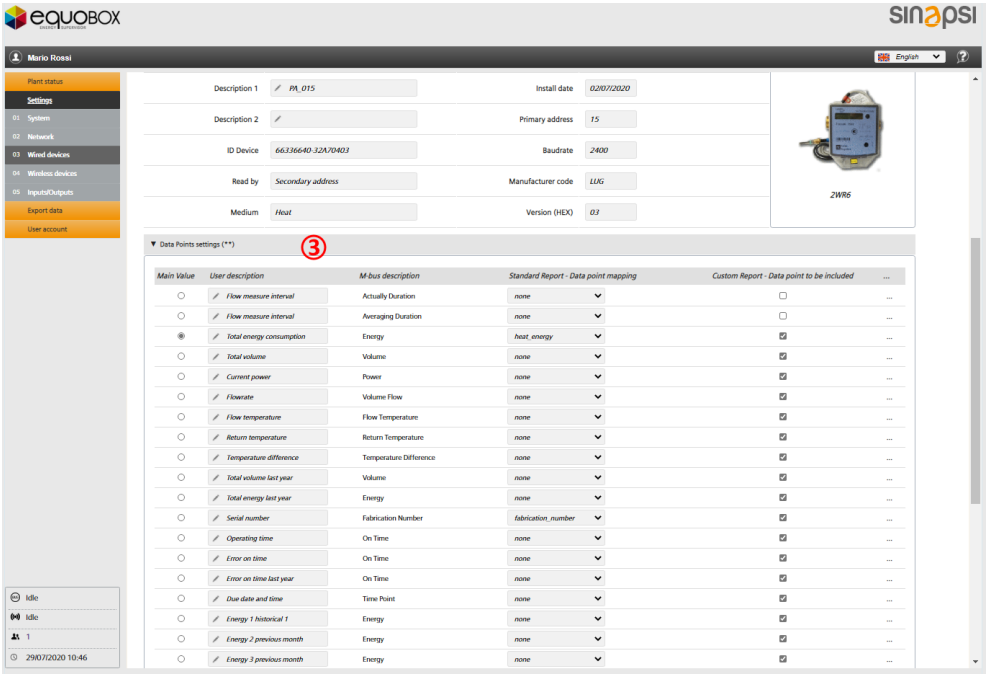
- Device name: You can assign a name to the device (e.g. Apartment 123).
- Description 1: Device description as indicated in the device list.
- Description 2: Additional description
- Scan interval: 15 min. / 60 min., 6 h, 12 h, 1 day, 7 days, 1 month
- Install date: You can add an installation date
- The device image can be set by clicking the  as needed. You can select the appropriate image from the datalogger device database.

Click **Save** to save the edited values.

Settings that cannot be changed:

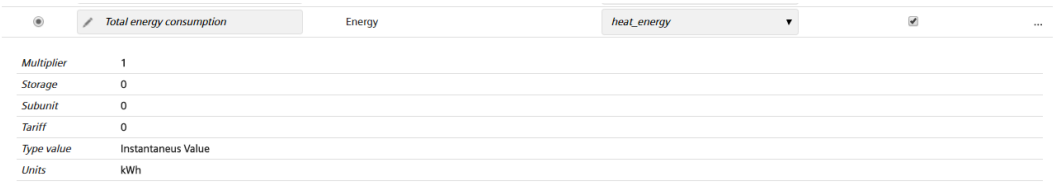
- ID Device: Displays the device serial number
- Read by: Displays whether the meter is read via the primary or secondary address.
- Medium: Displays the medium measured by the device.
- Primary address: Displays the device's primary address (1...250)
- Baud rate: Displays the transmission rate between the device and datalogger.
- Manufacturer code: Displays the manufacturer's code.
- Version (HEX): Displays the device version.

3. Data Points settings



- Main Value: You can select the value for display on the **Plant status→Wired devices** overview
- User description: The data point designation can be edited
- M-Bus description: Designation of the data point according to the M-Bus specification

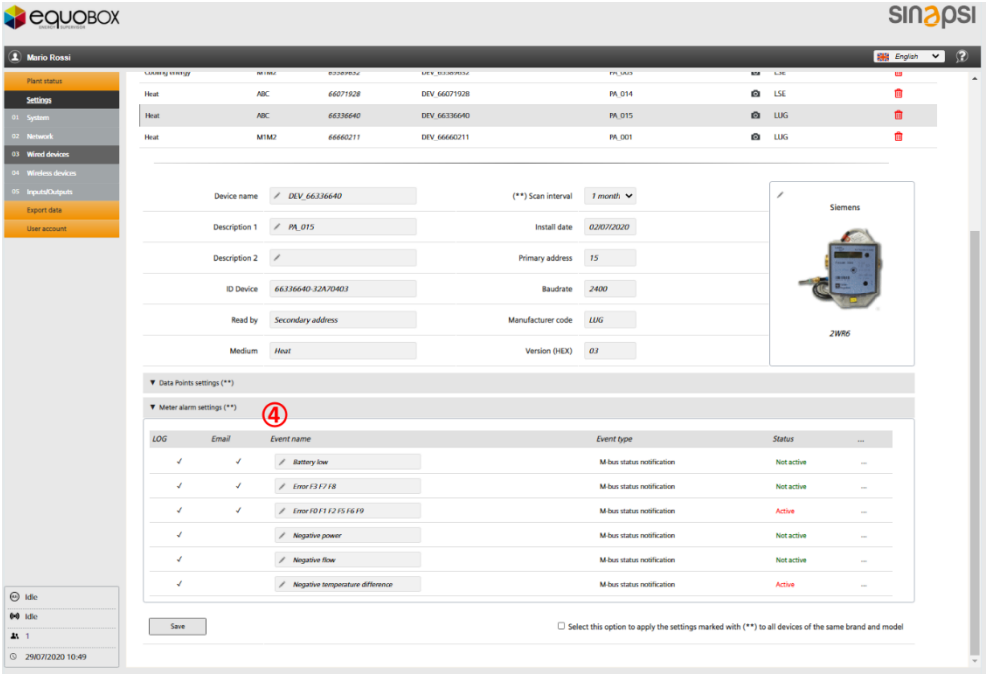
- Standard report – Data point mapping: Assigns data points to predefined columns on the standard report. Only one data point can be assigned to a specific column for each device. Data points with the "none" settings are not displayed in the standard report
- Custom Report – Data point to be included: Select the data points to be included in the custom report
- "...": Click the "..." column to display additional details (Multiplier, Storage, Subunit, Tariff, Type value und Units) on the selected data point. The details can help you come up with a meaningful user description.



Click **Save** to save the edited settings.

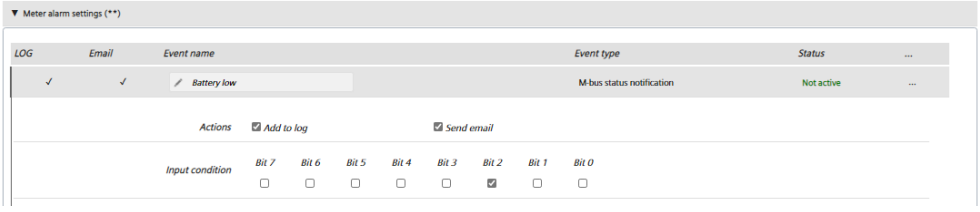
4. Alarm settings meters

For each device it is possible to display a series of error messages which are available via M-Bus.



The following information and settings are available.

- LOG: When an error occurs, displays whether the message is logged in the event log.
- Email: When an error occurs, displays whether an email is sent with the error message.
- Event name: The event name is predefined. It can, however, be changed as needed.
- Event type: Displays the event type received from the device.
- Status: Displays whether the alarm is active or not active.



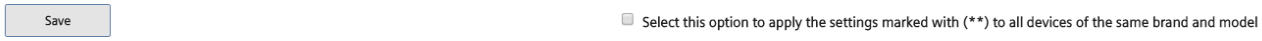
Click "..." to open a new panel with the following settings:

- Actions:
  - Add to log: Select if it is added to the event log when this alarm occurs.

  - Send email: Select whether notification is sent by email when this alarm occurs.
- Input conditions:
  You can select the bit from the M-Bus status byte for the device that represents the corresponding alarm notification.

Click **Save** to apply the alarm settings. You must confirm to apply the settings!

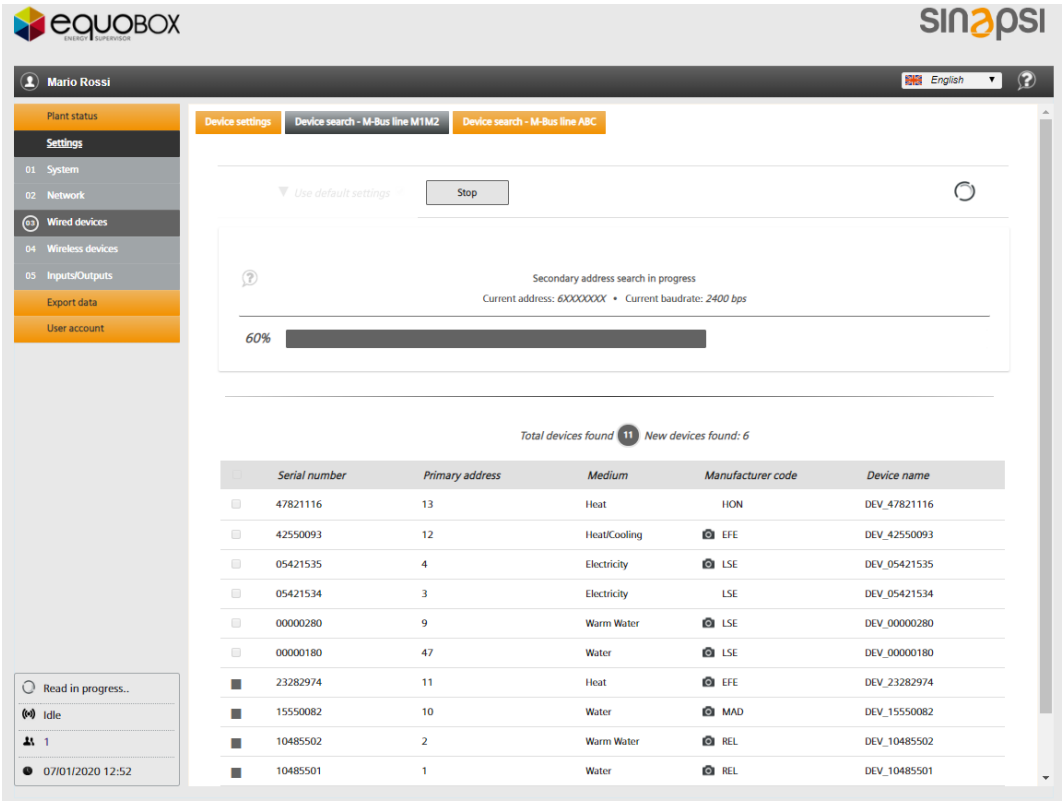
By selecting the check box, if multiple devices of the same type are installed on the plant, settings identified by (**) can be transfer the settings to all devices of the same type.



8.4.3.2 Device search: M-Bus line M1M2 / M-Bus line ABC

You can either perform the device search individually on line M1M2 or line ABC respectively, or search both lines in parallel.

For device searches, you can select whether to use the default settings or to search by specific criteria.



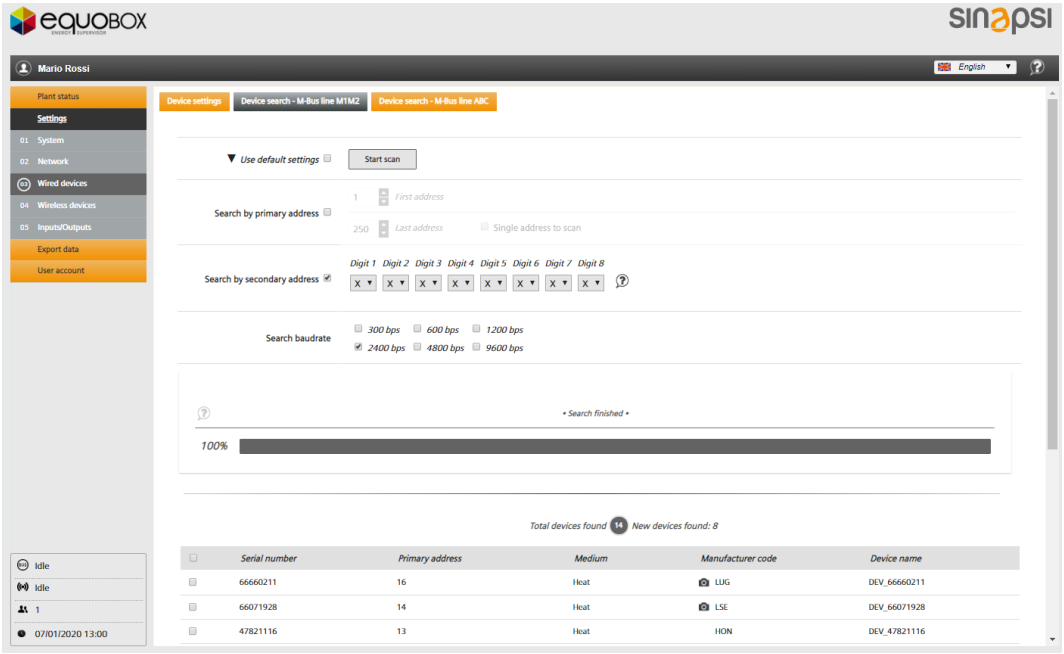
The entire bus is scanned for connected M-Bus devices if **Use default settings** is selected and you click **Start scan**.

Note: Start by scanning with **Use default settings**. Only use the customized device search if the search by default settings fails to recognize one or more devices. This can be the case if a data collision occurs on the bus during the automatic search or if the device does not operate at the standard baud rate. Refer to the device documentation for the data.

Using default setting the datalogger searches for devices by the secondary address at a baud rate of 2400 bps.

Customized search: M-Bus line M1M2 / M-Bus line ABC

Unchecking **Use default settings**, you can customize the type of search for devices on the bus.



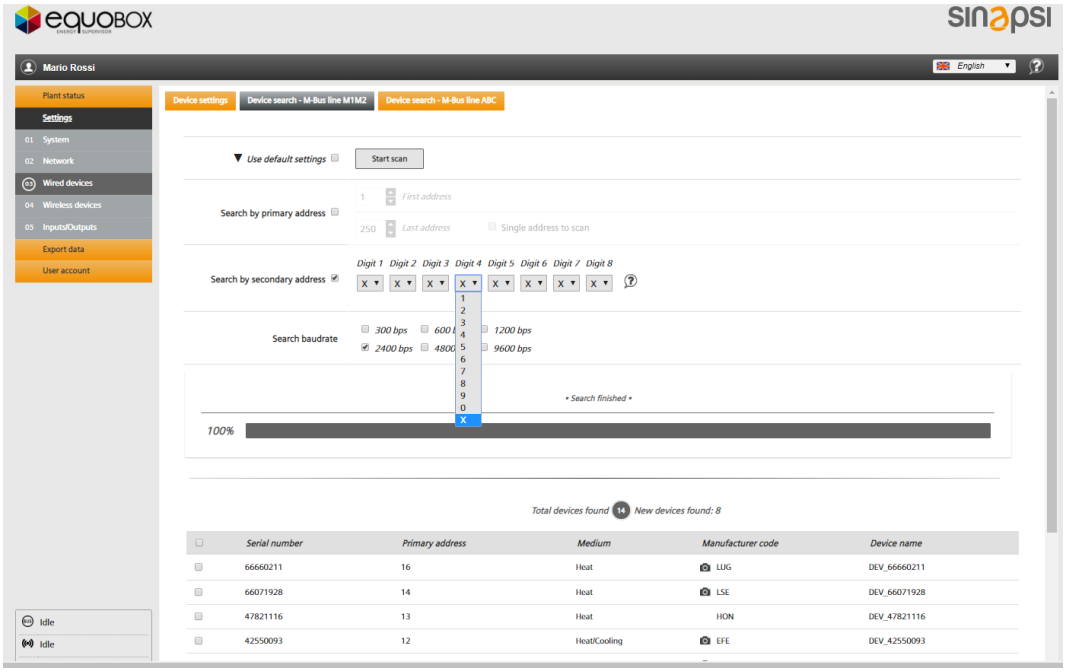
You can customize a search to search by the following criteria:

- Primary address
- Secondary address
- Baud rate

Search by primary address:
You can select or clear a search by primary address.

- First address: You can define the start address for the search
- Last address: You can define the end address for the search
- Single address: You can scan by a specific primary address.

Search by secondary address:
You can select or clear a search by secondary address (serial number).

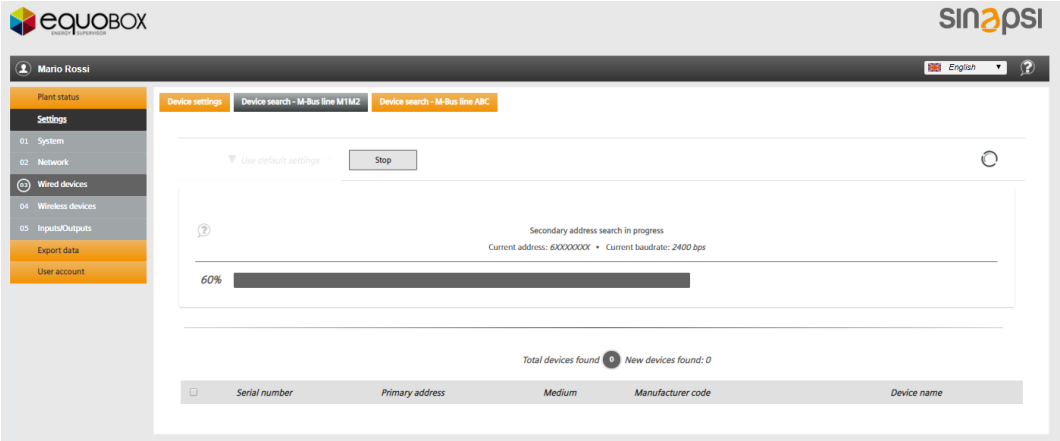


To shorten the search time, you can limit the search range for secondary addresses using the settings for Digit 1 through Digit 8.

Search baud rate:
You can enter the corresponding baud rate for the device search if devices deviate from the default baud rate (refer to the device documentation for the baud rate). You can search for devices by a specific baud rate (300 / 600 / 1200 / 2400 / 4800 / 9600 bps). Multiple baud rates can be selected as well. The device search is longer, if multiple baud rates are selected at the same time.

Click **Start scan**.

Progress is indicated by the progress bar.



Search results
All found devices are listed at the conclusion of the device search. Select one or more devices and Add, to add the new devices to the device list.

Important! Devices that are not saved are rejected.

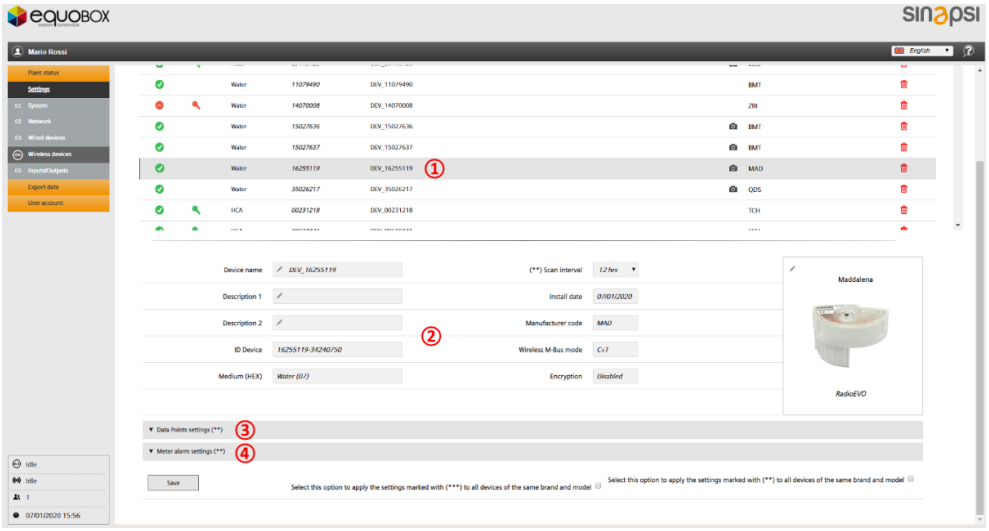
The following must be listed at a minimum for any found device:

- Serial number
- Primary address
- Medium
- Manufacturer code with optional device image
- Automatically generated device name.

8.4.4 Wireless devices

8.4.4.1 Device settings

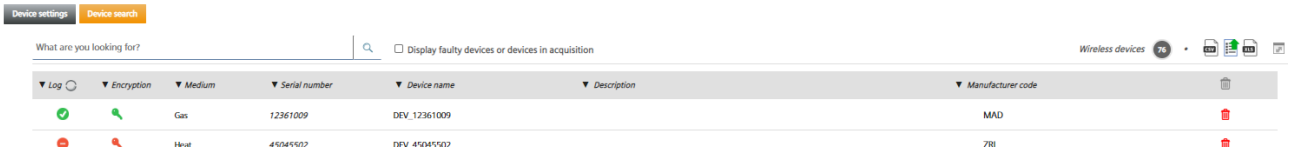
In this panel, you have access to the list of wireless devices and can change settings. List is empty if no device search has been run. The meters that are found and saved are displayed on the list after a device search.



The display is structured as follows:

1. List of all devices found on M-Bus
2. Device settings
3. Data points settings
4. Meter alarm settings

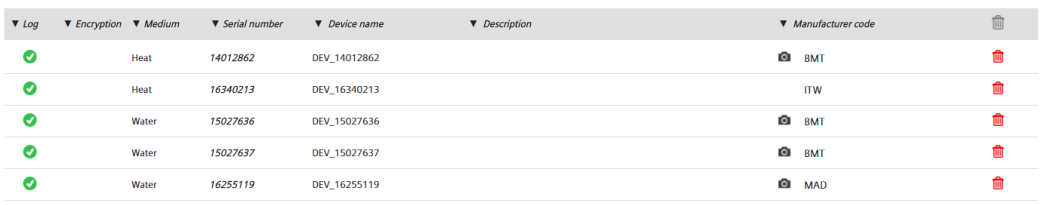
Also, it is possible:



- To search a device
- To display only faulty devices or devices in acquisition
- Display all the saved meters
- To export the list of wireless devices as an .xls or .csv file clicking the corresponding symbol:

Serial number	Device name	Description	Manufacturer code	Medium	AES Key	Current status
14012862	DEV_14012862		BMT	Heat	NO	OK
16340213	DEV_16340213		ITW	Heat	NO	OK
15027636	DEV_15027636		BMT	Water	NO	OK
15027637	DEV_15027637		BMT	Water	NO	OK
16255119	DEV_16255119		MAD	Water	NO	OK

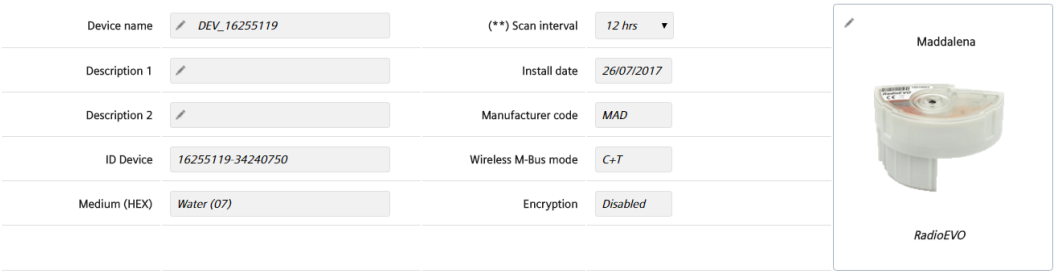
Device list



- First column: Indicates whether the device was accepted or not
- Encryption: Indicates whether the device is encrypted
- Medium: Displays the medium
- Serial number: Displays the meter serial number
- Device name: Displays the meter name as entered under device name
- Description: Displays the text entered under Description 1
- : Indicates that a product image is available for the device.
- Manufacturer code: Displays the 3-letter code of the device manufacturer.
- Delete: Click the trash can to delete the device from the list.

Device settings

Click the device line to view the settings for the device:



Free text settings:

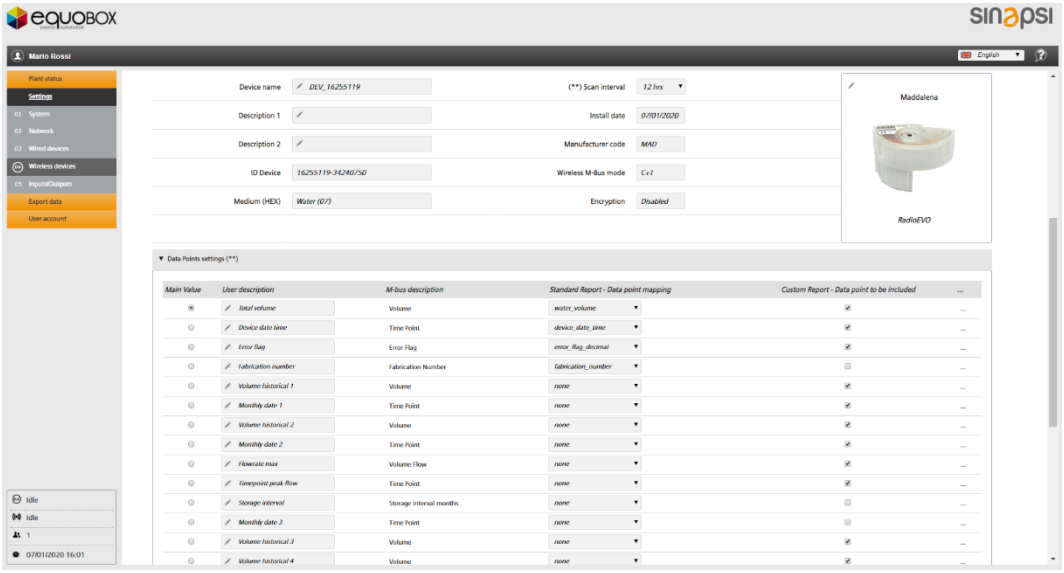
- Device name: You can assign a name to the device (e.g. Apartment 123).
- Description 1: Device description as indicated in the device list.
- Description 2: Additional description
- Scan interval: 15 min. / 60 min., 6 h, 12 h, 1 day, 7 days, 1 month
- Installation date.
- The device image can be set by clicking the as needed. You can select the appropriate image from the datalogger device database.

Click **Save** to save the edited values.

Settings that cannot be changed:

- ID Device: Displays the device serial number
- Medium (HEX): Displays the medium measured by the device.
- Manufacturer code: Displays the manufacturer's code (if included in the database).
- Radio mode: Indicates the device's radio mode.
- Encryption: Indicates whether encryption is enabled or disabled.

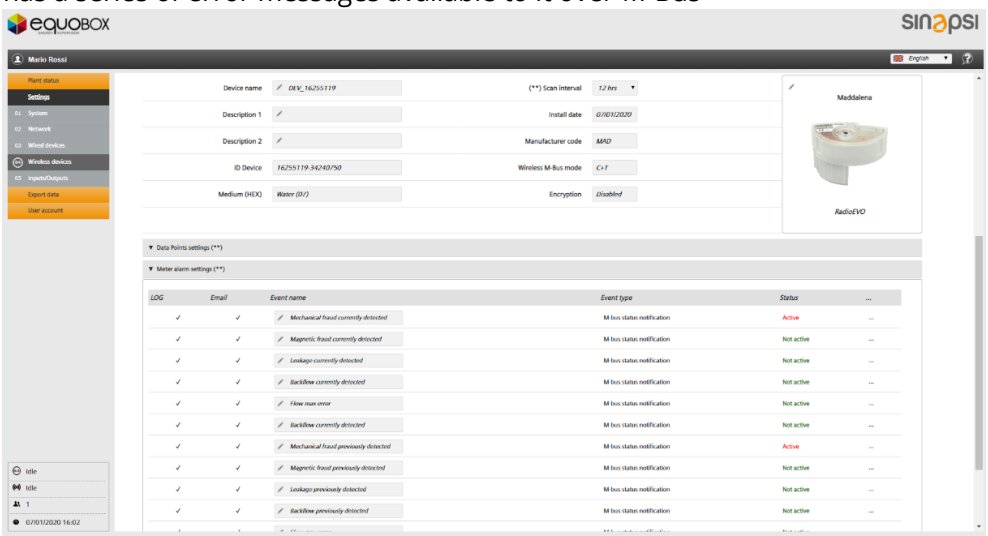
Data Point settings



- Main Value: You can select the value for display on the **Plant status/Wireless** overview
- User description: The data point designation can be edited.
- M-Bus description: Designation of the data point according to the M-Bus specification
- Standard report – Data point mapping: Assigns data points to predefined columns on the standard report. Only one data point can be assigned to a specific column for each device. Data points with the "none" settings are not displayed in the standard report.
- Custom Report – Data point to be included: Select the data points to be included in the custom report.
- "...": Click the "..." column to display additional details (Subunit, Storage, Tariff, Type value, Multiplier and Units) on the selected data point. The details can help you come up with a meaningful user description.

Alarms settings meters

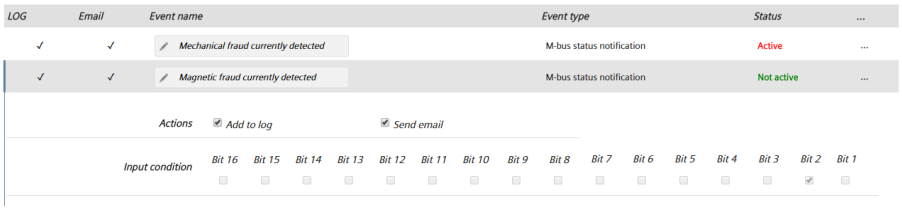
Each device has a series of error messages available to it over M-Bus



The following information and settings are available.

- LOG: Displays whether the error message was registered in the event log.

- Email: Displays whether an email was sent due to the error message.
- Event name: The event name is predefined. It can, however, be changed as needed.
- Event type: Displays the event type received from the device.
- Status: Displays whether the alarm is active or not active.



Click "..." to open a new panel with the following settings:

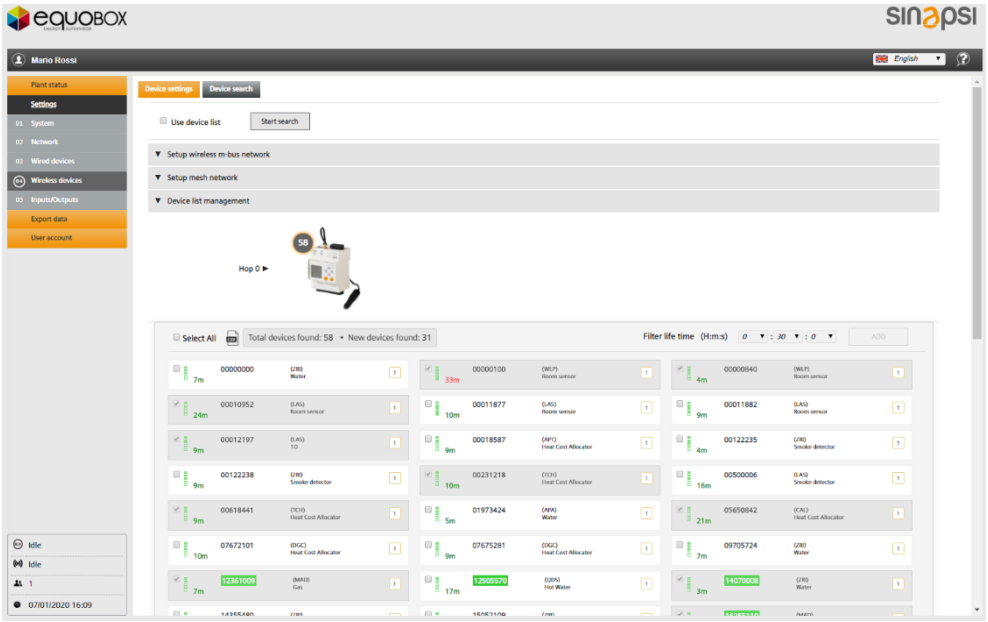
- Actions:
  - Add to log: Select whether this alarm is added to the event log.
  - Send email: Select whether notification is sent by email when this alarm occurs.
- Input conditions:
  You can select the bit from the M-Bus status byte for the device that represents the corresponding alarm notification.

Click **Save** to apply the alarm settings. You must confirm to apply the settings!

By selecting the check box, if multiple devices of the same type are installed on the plant, settings identified by (**) can be transfer the settings to all devices of the same type.

8.4.4.2 Device Search

For device search, you can select whether to search for a repeater on a specific mesh network or for a wireless meter that communicates with a specific RF converter within an M-Bus radio network.



Setup M-Bus radio network

The repeater and wireless devices communication over the M-Bus wireless network.

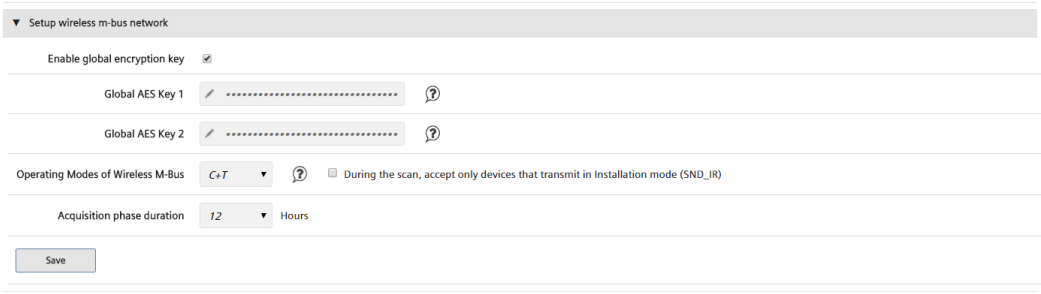
Settings that can be freely edited:

- Global encryption key: The global encryption is used during the automatic search.
- Global AES Key 1: The global encryption key is used during the automatic search.
- Global AES Key 2: The global encryption key is used during automatic search.
- M-Bus wireless operation mode: You can enter the M-Bus operation mode.
  The following values are available: S, T, C+ T, S & C + T.

You can further limit the search to devices in installation mode only (SND_IR) or/and the walk-by devices.

- Acquisition phase duration: You can enter the duration of the device search in hours (1 to 24).

Click **Save** to save the changed values.



Configure mesh network

RTUEVO1T and smart repeater communicate over a mesh RF protocol (Backbone network). Settings that can be freely edited:

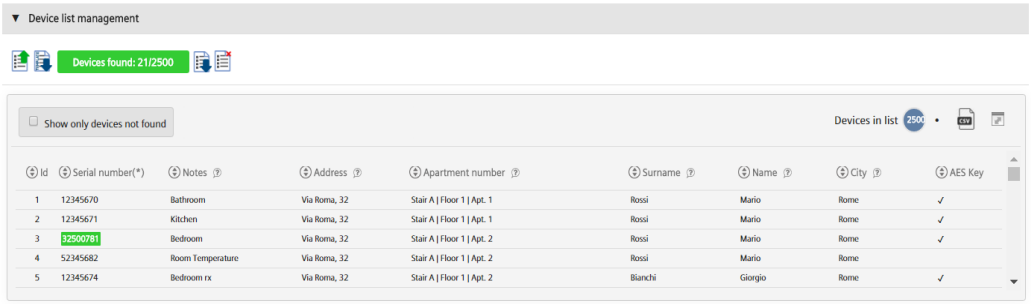
- Mesh ID: You can enter the mesh ID for the mesh network. Ensure that all smart repeaters sinapsi**tech®** are on the same mesh network.
- Channel: It is advisable to change this option only upon indication of the Sinapsi SRL operators in case of faults. Make sure all sinapsitech® repeaters are on the same mesh channel.

Click **Save** to save the changed values.

Click **Start search** to start the search.
The wireless symbol flashes while searching

Device list management

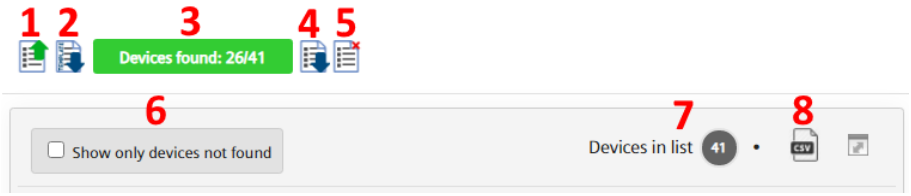
This option simplifies the commissioning and management of the plant. In fact, by uploading a .csv or .rpt file where all the desired meters are listed, it is possible to view the meters already found and those still that are not. In addition, the list allows you to have a clear and simplified registry for each of them.



In fact, the following information of the meters explained with an example is displayed:

id	Serial Device	Note	Address	Internal	Surname	Name	City	AES Key
1	12345678	Bathroom	Fifth Avenue	1-A	Apartment A	Floor1	New York	✔
2	11223344	Living room	Fifth Avenue	2-A	Apartment B	Floor2	New York	✔

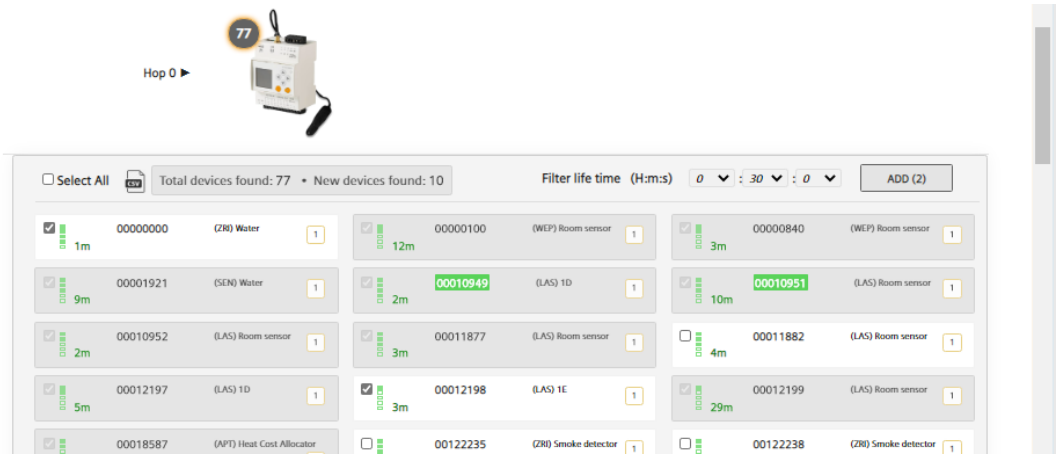
Important! Using the list also greatly simplifies the addition of the AES cryptographic keys of the meters that need it. In fact, in addition to being able to insert them individually by selecting them from the *Device Settings* section, these can be inserted simply by adding them on the corresponding row of the counter on the list to be loaded.



1. Click to upload a list on datalogger
2. Download a list template
3. Display the founded devices
4. Download the current list file
5. Delete the current list
6. Show only devices not found
7. Display the devices in list
8. Download the current list with current status

Search results

All devices found are listed under the image of the RTUEVO1T. Select one or more devices and click **Add** to add and then save and manage the desired new meters.



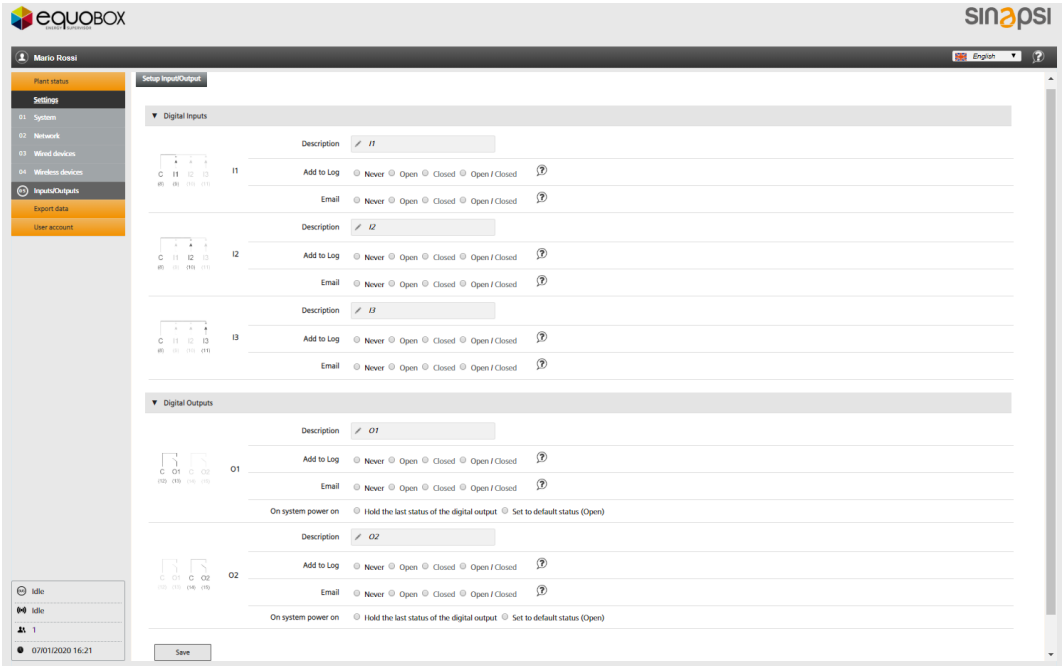
For any found device, are displayed the following information:

- Serial number
- Strength of signal
- Last communication
- Manufacturer code
- Medium
- Number of repeaters that reached the wireless device

Important! Devices that are not saved are not managed by the system.

8.4.5 Inputs/Outputs

The SIN.EQRTUEVO1T has three digital inputs (I1, I2, I3) and 2 digital outputs (O1, O2).



The following settings are possible on each digital input and output:

- Description: Each input/output can be labelled with an individual name.
- Add to log: Select whether to log a change of state to an input/output in the event log:
  - Never
  - Open: Only if the state is open or changes to open.
  - Closed: Only if the state is closed or changes to closed.
  - Open/close: For any change of state.
- Email: Select whether to send an email (see Settings / System / Alarms), if the input/output registers a change of state:
  - Never
  - Open: Only if the state is open or changes to open.
  - Closed: Only if the state is closed or changes to closed.
  - Open/close: For any change of state.

You can also select the output state for an output after a loss of power:

- Hold the last output state.
- Set to default state "open".

Click **Save** to save the edited settings.

8.5. Export data

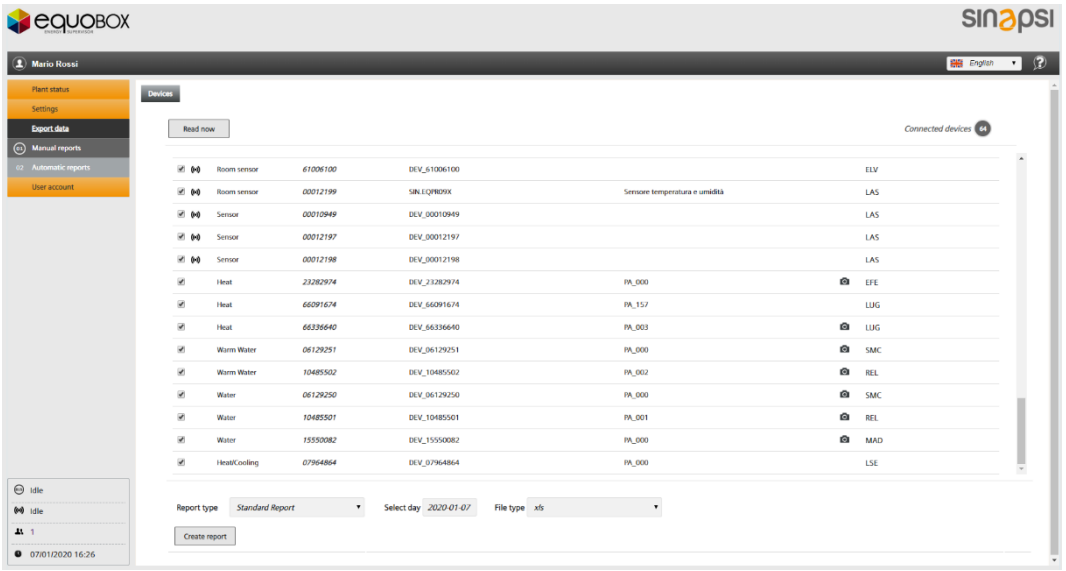
Data logged by datalogger can be exported as a report for further processing.
There are two ways to create a report:

- Manual reports
- Automatic reports

8.5.1 Manual reports

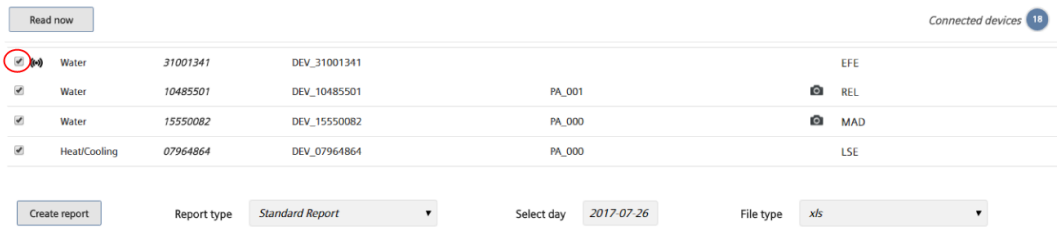
8.5.1.1 Create report

The meters for which you want a report, must be selected. The wired ones must be read before creating a report, otherwise, as is the case for wireless meters, the latest saved data will be available with time interval as per setting (see paragraphs *8.4.3.1 Devices settings* and *8.4.4.1 Device settings* respectively for wired and wireless devices). Click Read Now to read the devices in the list.



Select the devices to be included in the report.

Select the check box in the title line to select all the devices on the list.



Note To simplify the search for the desired device, sort the list alphabetically by clicking ▼.

The following selections need to be made before you can generate the report:

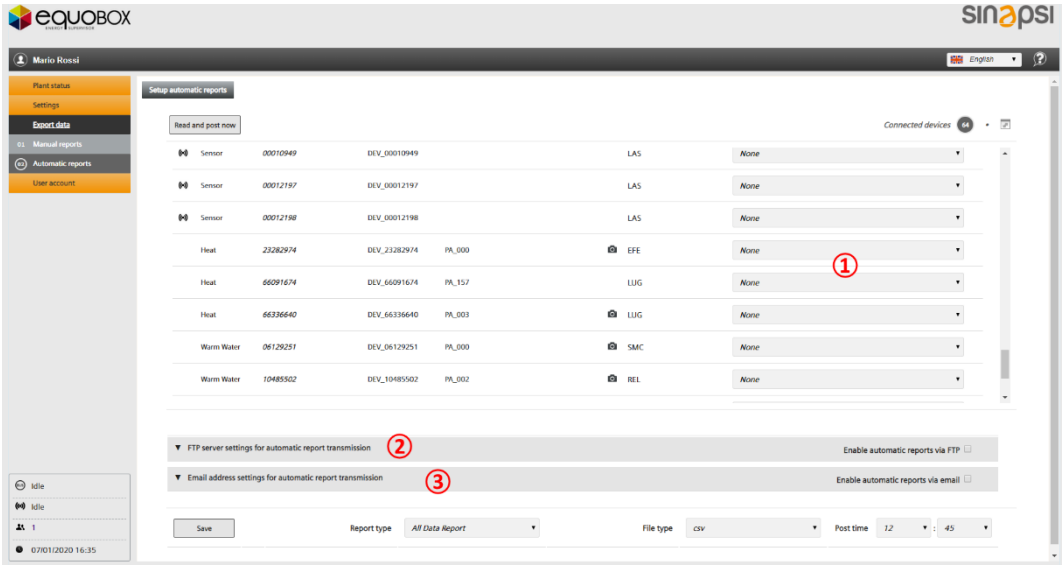
- Report type (select between):
  - Standard report: This report includes only the data points on devices that were assigned a standard column in the device settings (see Data points settings).
  - Customized report: This report includes only data points on devices selected in the Customized report column in device settings (see Data points settings).
  - Report all data: This report includes all data points from all devices.
- Select day: Select the read date of devices data used for the report. The current date is always the default date. You can also select a date in the past.
- File type: Select one of the following file formats:
  - .csv format: Exports the data as a .csv file.
  - .xls format: Exports the data as an .xls file.

– .txt format: Exports the data as a .txt file.

Click **Create report** to generate the report and start the download. The filename is automatically generated. Additional information on the various report types is available in section "*8.5.3 Creating reports*".

8.5.2 Automatic reports

Read and post now, immediately reads all the devices on the overview list and sends the data per the settings below.

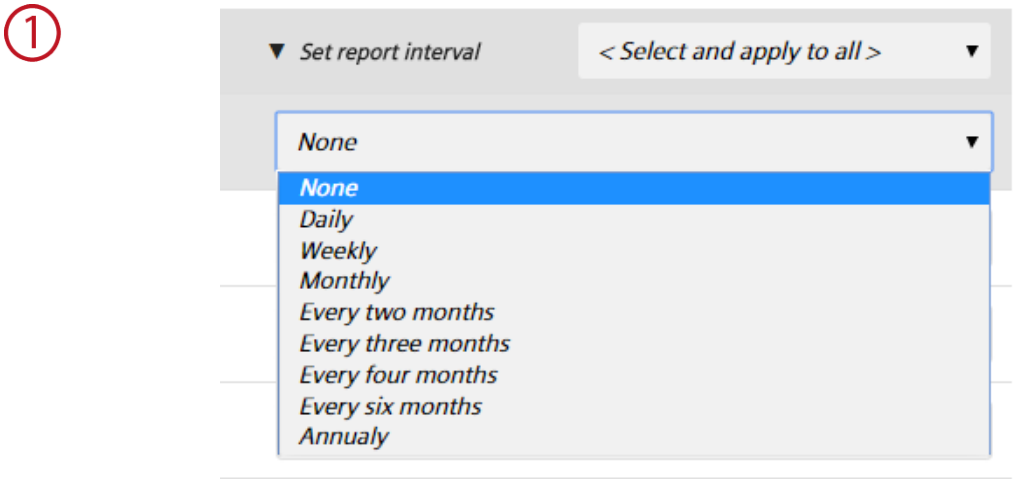


The following data is available on each device:

- Medium
- Serial number
- Device name
- Description
- Manufacturer code
- Report interval

8.5.2.1 Report interval

Select the interval for generating report.



The following options are available:

- None: No report is generated.
- Daily: The report is generated daily at "post time" for the previous 24 hours.
- Weekly: The report is generated on Monday at "post time" for the last week.

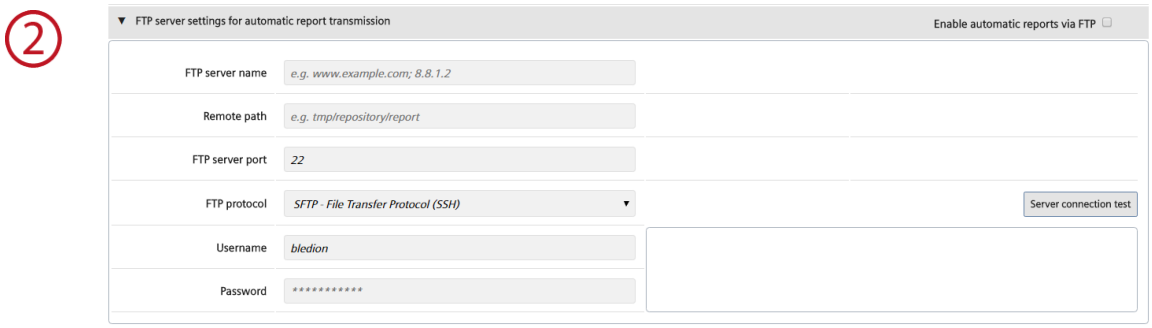
- Monthly: The report is generated on the last day of the month at “post time”.
- Every two months: The report is generated on the last day of the second month at “post time” for the last two months.
- Every three months: The report is generated on the last day of the third month at “post time” for the last three months.
- Every four months: The report is generated on the last day of the fourth month at “post time” for the last four months.
- Every 6 months: The report is generated on the last day of the sixth month at “post time” for the last six months.
- Annually: The report is generated on the last day of the year at midnight for the previous year.

Selecting a report interval in the title applies the setting to all devices on the list.

Click **Save** to save your entries.

8.5.2.2 Set up FTP server for automatic report transmission

Select **Enable automatic reports via FTP** if each report is sent to an FTP server and enter the FTP server information.



- FTP server name: Enter the address for the FTP server
- Path (Remote): You can enter a path on the FTP server for saving reports.
- FTP server port: Enter the port for the FTP server
- FTP protocol: Select the FTP protocol. The following protocols are available:
  - SFTP – File Transfer Protocol (SSH)
  - FTP – File Transfer Protocol (TLS)
  - FTP – Unencrypted (unsecured)
- We recommend against using “FTP- unencrypted” for security reasons.
- Username: Username to access the FTP server.
- Password: Password for FTP server access

Click **Server connection test** to test the connection to the FTP server. The file ftp_test_connection.txt is saved to the FTP server.

Click **Save** to save your entries.

8.5.2.3 Set up email address for automatic report transmission

Select **Enable automatic reports via email** to send a report to one or more email addresses and enter the corresponding email addresses including the subject line.

You can separate individual addresses with the semicolon (;) if a report is sent to multiple addresses.

Click **Save** to save your entries.

The following settings are required to generate automatic reports:

- Report type: Select between (for details, see “Manual reports):
  - Standard report:
  - Customized report
  - Report "All data"

Additional information on the various report types is available in Section “Creating reports”.

- File type: Select one of the following file formats:
  - .csv format: Exports the data as a .csv file.
  - .xls format: Exports the data as an .xls file.
  - .txt format: Exports the data as a .txt file.
- Post time: The time the readout of the selected devices is performed and the report file is generated and sent out.

Please note that this can take several minutes depending on the number of devices and the M-Bus baud rate.

Click **Save** to save your entries.

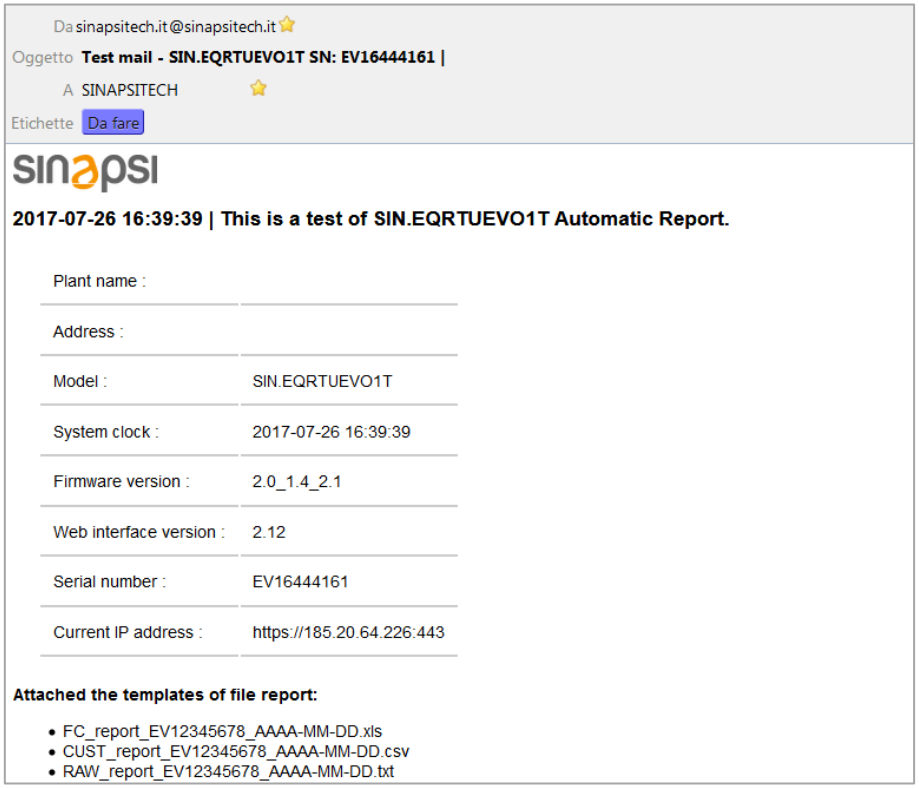
8.5.3 Creating reports

Reports can be sent via

- E-mail
- FTP server

8.5.3.1 Email

The email looks as follows


Da sinapsitech.it@sinapsitech.it

Oggetto **Test mail - SIN.EQRTUEVO1T SN: EV16444161 |**

A SINAPSITECH

Etichette Da fare

sinapsi

2017-07-26 16:39:39 | This is a test of SIN.EQRTUEVO1T Automatic Report.

Plant name :	
Address :	
Model :	SIN.EQRTUEVO1T
System clock :	2017-07-26 16:39:39
Firmware version :	2.0_1.4_2.1
Web interface version :	2.12
Serial number :	EV16444161
Current IP address :	https://185.20.64.226:443

Attached the templates of file report:

- FC_report_EV12345678_AAAA-MM-DD.xls
- CUST_report_EV12345678_AAAA-MM-DD.csv
- RAW_report_EV12345678_AAAA-MM-DD.txt

- Header: See settings in Section “Automatic reports”.
- Plants: Displays the name of the read file including the datalogger serial number, creation date and time.
- Plant information: Displays information on the object and datalogger (see System Status)

The following report types are available:

- Standard report

- Individual reports
- All data report

8.5.3.2 Standard report

The Standard report lists all read devices. A device corresponds to one line. Each column is the same for each device. The corresponding column is empty if a device does not have a certain value. The columns must be assigned to the corresponding data points in the device settings in the "**Standard Report - Data points mapping**" column, see Data points settings.

File Name	Report Date	Report Time	Plant Reference	Firmware version	Total devices cabled	Total devices wireless	Serial Number				
FC_report_EV12345678_AAAA-MM-DD.xls	DD/MM/AAAA	HH:mm:ss	Plant Address	x.yz|x1.y1_x2.y2_x3.y3	k	0	EV12345678				
count	**primary_address**	**device_serial_number**	**name_device**	**device_description**	**device_detail**	**device_measure_hex**	**0=wired|1=wireless**	**model_id**	**readout_date**	**readout_time**	**communication_status**

8.5.3.3 Customized report

A Customized report displays each device with two lines: The first line describes the content and the second the corresponding values. The number of columns varies by device and selected data points. Only the data points selected in the "**Custom Report - Data point to be included**" column in the device settings are listed, , see *Data points settings*.

File Name	Report Date	Report Time	Plant Referer	Firmware ver	Total devices	Total devices	Serial Number									
CUST_report	DD/MM/AAA	HH:mm:ss	Sinapsi_12 |	x.yz|x1.y1_x	k	0	EV12345678									
count	primary_add	device_serial	name_device	device_descr	device_detai	device_meas	0=wired|1=w	model_id	readout_dat	readout_tim	communicati	col 1	col 2	col 3	col 4	...

8.5.3.4 Report "All data"

Report all data displays each device with two lines: The first line describes the content and the second the corresponding values. The numbers of columns vary for each device depending on device type. **All data points** are listed that can be read.

File Name	Report Date	Report Time	Plant Reference	Firmware version	Total devices cabled	Total devices wireless	Serial Number						
raw_report_EV12345678_AAAA-MM-DD.csv	DD/MM/AAAA	HH:mm:ss	Sinapsi_12 |	admin - Admin123 - Via delle querce 11/13	x.yz|x1.y1_x2.y2_x3.y3	k	0	EV12345678					
count	primary_address	device_serial_number	name_device	device_description	device_detail	device_measure_hex	0=wired|1=wireless	model_id	readout_date	readou			

Note The number in the reports are depicted as follows:

- Period as a decimal point separator

8.6. User account

The User account menu displays all registered users and creates a new user.

Moreover, all login attempts are registered (logbook).

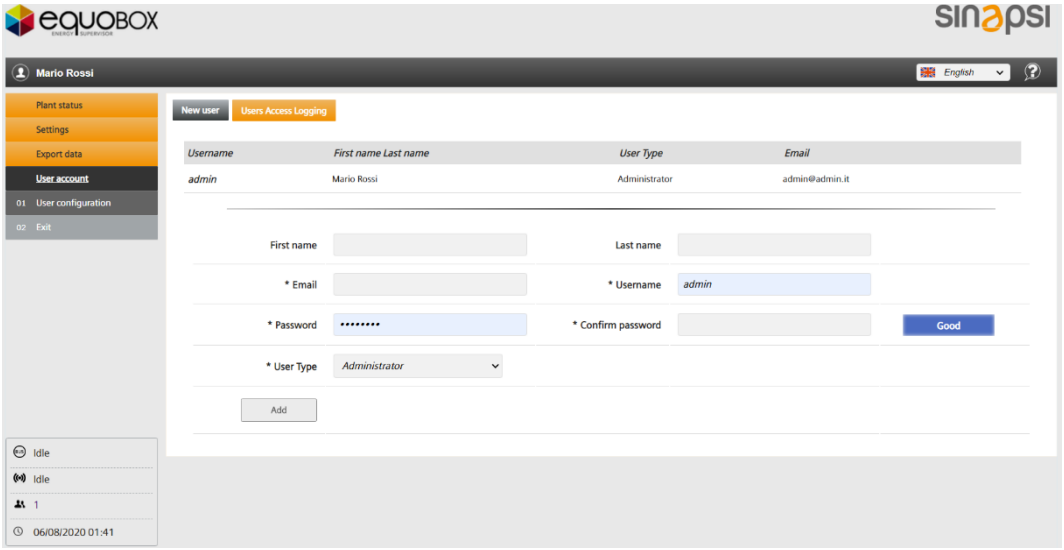
Click Exit to log off datalogger.

8.6.1 User configuration

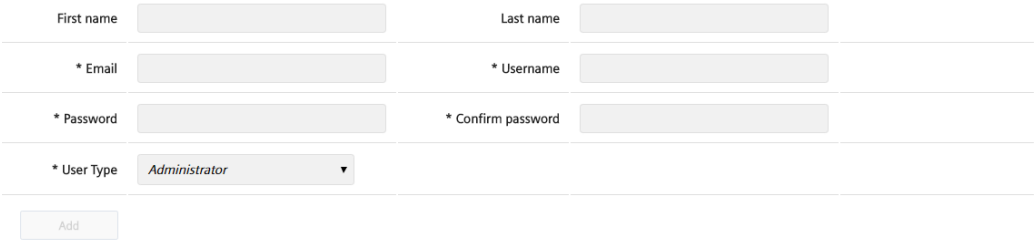
8.6.1.1 New User

The New user creates a new user account on datalogger.

At the same time, it provides information on all previously registered users, including access rights (user type).



You must be logged in administrator to change user data or create a new user.



Enter the new user data and click **Add**:

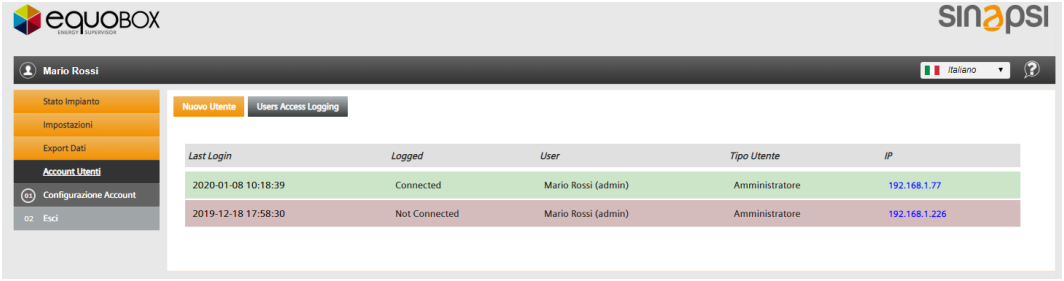
- First name
- Last name
- Email
- Username
- Password including
- Confirm password
- User type:
  - **User**: Users have a restricted view on datalogger and cannot change or enter settings.
  - **Maintainer**: Maintainers have a restricted view on datalogger. They can change or enter some settings compared to users.
  - **Administrator**: Administrators have access to all data and functions.

Menu	Administrator	Maintainer	User
Plant state	U	R	R
Settings	U	R	-
Export data	U	U	U
User account	U	-	-

U = Unrestricted access
R = Restricted access
- = no access

8.6.1.2 User access logging

All login actions are registered on datalogger.



The following information is retained for each login:

- Last login: Date & time the user logged in.
- Logged: User status.
- User: First and last name of the user
- User type: Administrator / Maintainer / User
- IP address: IP address of the PC used by the user to access datalogger

User access data is registered for the last 28 days.

8.6.2 Log off

Click **Exit** to log off datalogger without further warning.

9. APPENDIX

9.1. Router configuration

9.1.1 Port forwarding

Normally is not necessary to set

Datalogger uses the following port:

- 443 (fixed port for HTTPS protocol)
- 1194 (fixed port for VPN)

To access the datalogger from the Internet, you must setup a port forwarding rule in the router to the IP address and port 443 of the datalogger. The external port number can be defined freely but has to be unique within the router.

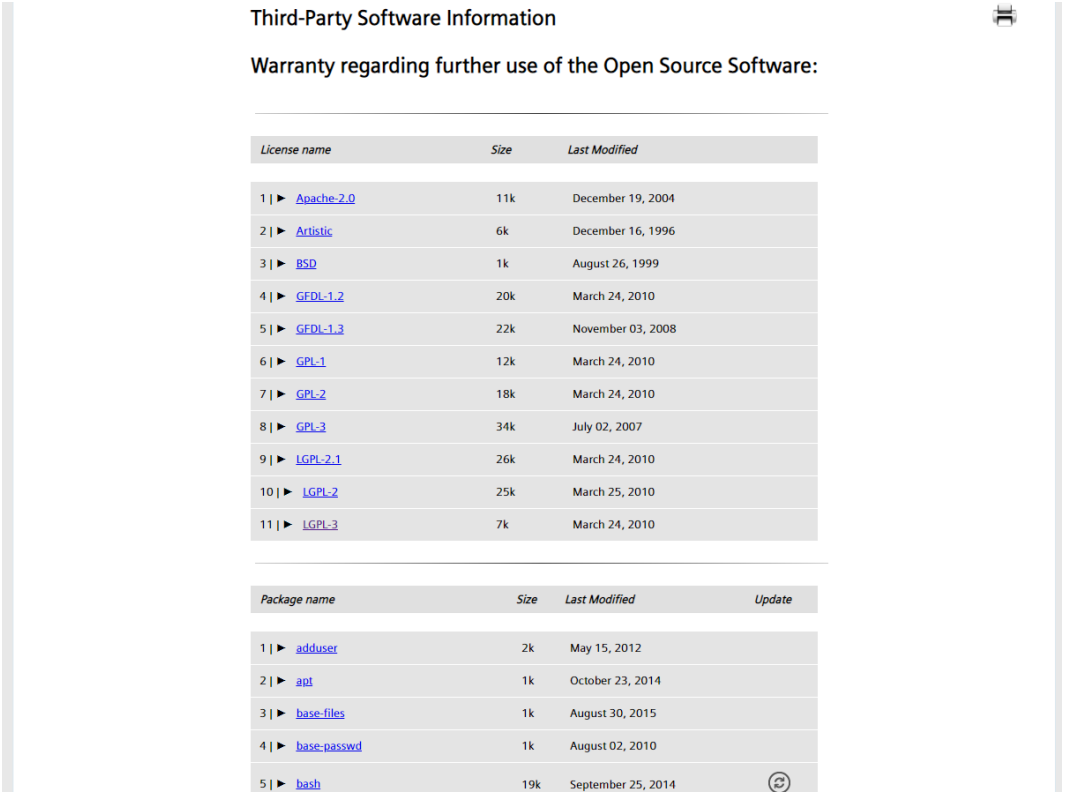
The chosen external port number must also to be entered in the LAN settings.

9.2. Open Source Software

Open Source Software (OSS) is used on datalogger.

9.2.1 License information

The license texts of all Open Source Software packages can be viewed individually at 



Third-Party Software Information

Warranty regarding further use of the Open Source Software:

License name	Size	Last Modified
1 | ► Apache-2.0	11k	December 19, 2004
2 | ► Artistic	6k	December 16, 1996
3 | ► BSD	1k	August 26, 1999
4 | ► GFDL-1.2	20k	March 24, 2010
5 | ► GFDL-1.3	22k	November 03, 2008
6 | ► GPL-1	12k	March 24, 2010
7 | ► GPL-2	18k	March 24, 2010
8 | ► GPL-3	34k	July 02, 2007
9 | ► LGPL-2.1	26k	March 24, 2010
10 | ► LGPL-2	25k	March 25, 2010
11 | ► LGPL-3	7k	March 24, 2010

Package name	Size	Last Modified	Update
1 | ► adduser	2k	May 15, 2012	
2 | ► apt	1k	October 23, 2014	
3 | ► base-files	1k	August 30, 2015	
4 | ► base-passwd	1k	August 02, 2010	
5 | ► bash	19k	September 25, 2014	

9.2.2 Tools for packages upgrading

All packages subject to a GPL-3 or LGPL-3 license must be made upgradable to experienced users for legal licensing reasons. The packages are labelled on the list with .

6 | ► binutils	2k	January 05, 2015	
7 | ► bsdutils	1k	December 11, 2012	
8 | ► ca-certificates	18k	September 24, 2014	
9 | ► coreutils	12k	January 26, 2013	
10 | ► cpio	1k	December 22, 2014	
11 | ► cron	4k	July 03, 2012	
12 | ► dash	3k	March 01, 2012	
13 | ► dbus	11k	February 05, 2015	
14 | ► debconf-i18n	3k	September 11, 2012	
15 | ► debconf	3k	September 11, 2012	
16 | ► debian-archive-keyring	1k	November 21, 2006	
17 | ► debianutils	8k	June 28, 2012	
18 | ► dialog	1k	March 03, 2012	
19 | ► diffutils	2k	October 16, 2011	

Sinapsi regularly provides firmware updates to the datalogger. This occurs exclusively through firmware updates (online or offline). The tool for package upgrades is not required to operate and maintain the datalogger.

Important!

Caution: Datalogger can no longer be used as the M-Bus master as soon as a package is changed with this tool! Access to datalogger over web operation and local operation is no longer possible! All data is deleted on the datalogger for security reasons! This procedure can no longer be rescinded and a new datalogger must be purchased if the tool is accidentally used to update a package! Only the Linux base system remains on the device after completing a package update.

The device can then be accessed via an SSH connection through Ethernet port 192.168.1.110. Use username **root** and password **12345678**.