HEIDELBERG, NOVEMBER 2023

ABB EQmatic Energy Analyzer QA/S x.yy.1

KNX, M-Bus and Modbus – Building Academy Smart Buildings

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Agenda

Introduction
Basic
– Planning
– Installing
– Commissioning
  - Connecting to the device and commissioning wizard
  - Main menu “Management”
  - Main menu “System”
  - Main menu “Dashboard”
  - Main menu “Analytics”
  - Main menu “Load control”
  - ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Advanced
– Provide measured values (Modbus TCP and REST API)
– Data sharing via Modbus TCP to KNX (PLC Controller AC500 with integrated KNX interface, ABB Cylon®, Visualisation software, BMS, …)

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Introduction

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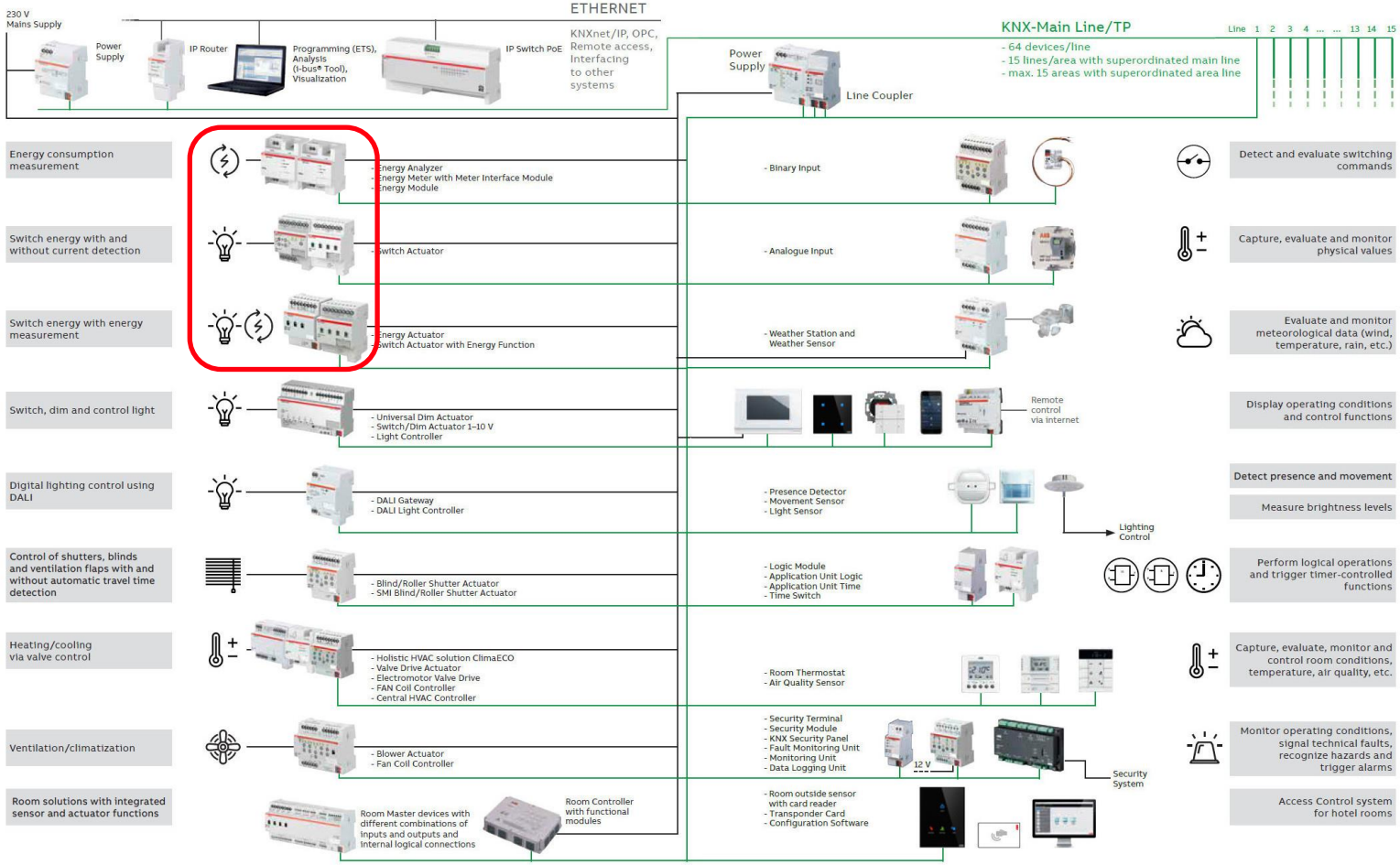
ABB EQmatic Energy Analyzer QA/S

Meter Interface Module ZS/S and EQmeters

Modbus RTU – KNX Gateway MG/S

KNX Energy Module EM/S and Energy Actuator SE/S

Switch Actuators SA/S Professional with Energy Functions



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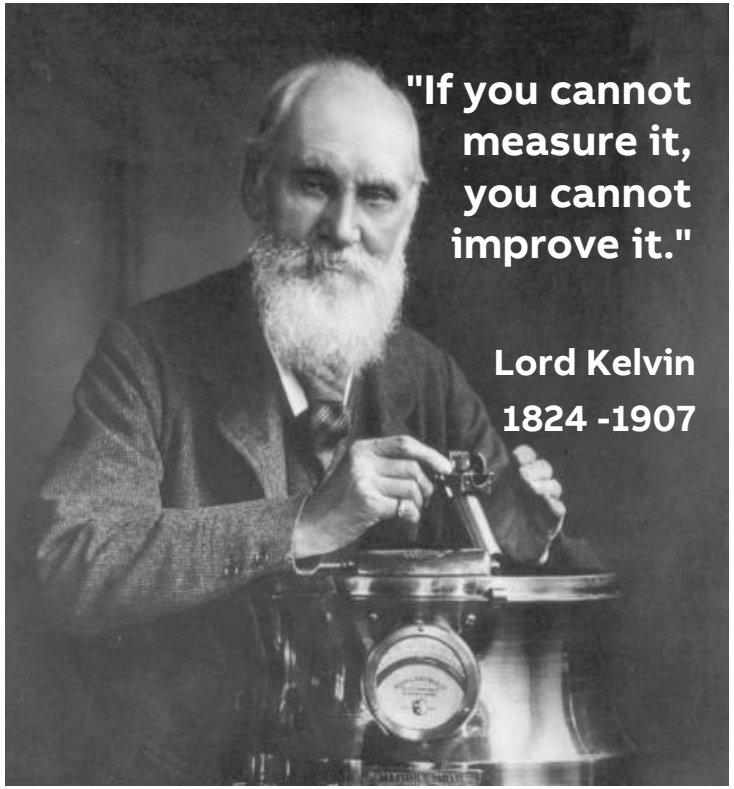
Overview

Why measuring energy consumption?

- Internal billing
- Fair sharing of costs
- Implementation of energy management systems (ISO 50001)
- Sustainable construction (EN 15232 energy efficiency of buildings), energy label, sustainability certificate (Leed), …
- Consumption becomes transparent
- Creation of incentives for cost savings
- Review of consumer behavior
- Change in consumer behavior
- Monitoring of the installation → Detection of “energy thieves”
- Approach to automation
- Load management
- …



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Overview

What is ABB EQmatic?

ABB EQmatic

- is a compact and web-based solution offering for applications in the segment of energy management/-efficiency
- enables customers to record, visualize and process sub-metering data
- is a simple, **ready-to-use solution** for recording, visualizing and analyzing energy and consumption data
- **closes the gap** between field devices (meters) and high-level software applications
- is designed for **Energy-/Facility Manager** or any other operator in **small and mid size commercial buildings**

Transparency (Cost & Consumption)

Improve energy efficiency

Sustainability

Reduce costs

§ Fulfil regulations (e.g. ISO 50001)

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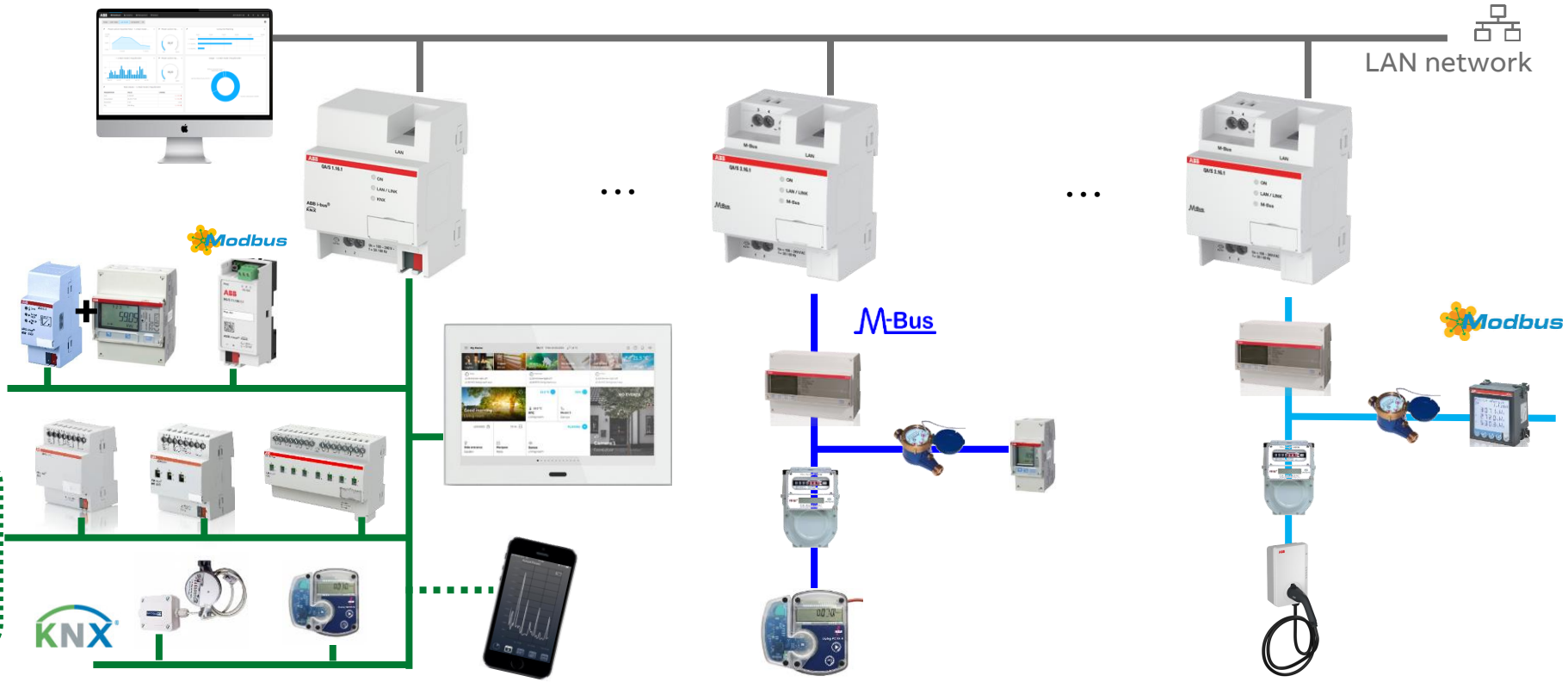
Overview

ABB EQmatic – ABB offers various solutions

Solution for recording, evaluation and displaying of different consumption and generation values (energy, heat, water, gas) with Energy Analyzer QA/S

Solution for providing measured values with KNX Meter Interface Module ZS/S & EQmeters and Modbus RTU – KNX Gateway MG/S

Decentral solution of energy measurement in a load circuit with KNX Energy Module EM/S, Energy Actuator SE/S and Switch Actuator SA/S Professional Range with Energy Functions



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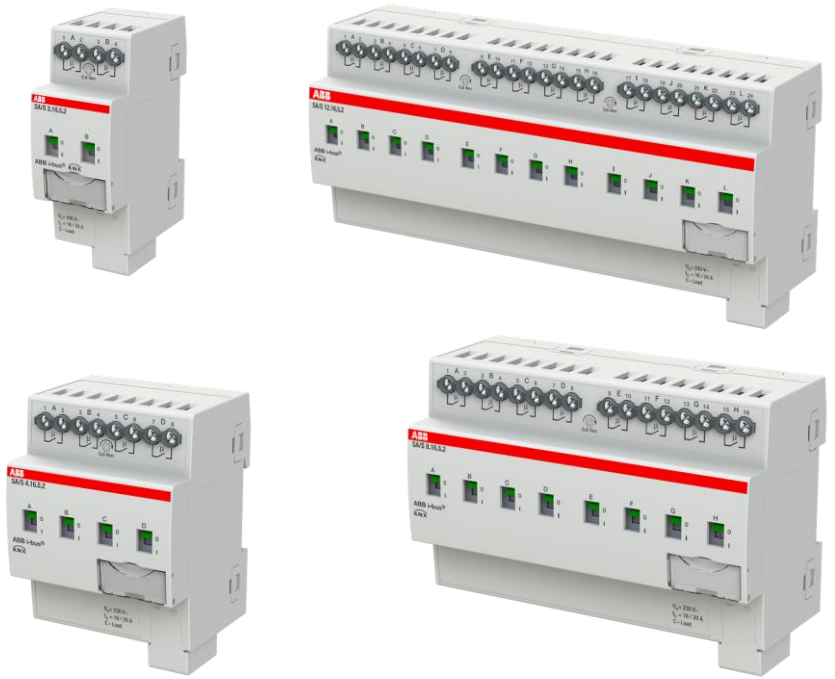
Overview

Switch Actuator SA/S Professional Range with Energy Func.

- High-switching-capacity devices with extended functionality for industry standard applications
- Main features:
  - 2 / 4 / 8 / 12 outputs
  - 16/20A C-Load (high capacity)
  - Manual operation (voltage independent)
- Same functionality like Switch Actuators professional but with **additional Energy Functions**
  - Measurement of current per channel
  - Calculation of power out of fixed or dynamic voltage and power factor (each with group object to receive changed values)
  - Calculation of energy consumption out of power multiplied with time
  - Evaluation of load regarding thresholds, up to 6 or single ranges can be enabled



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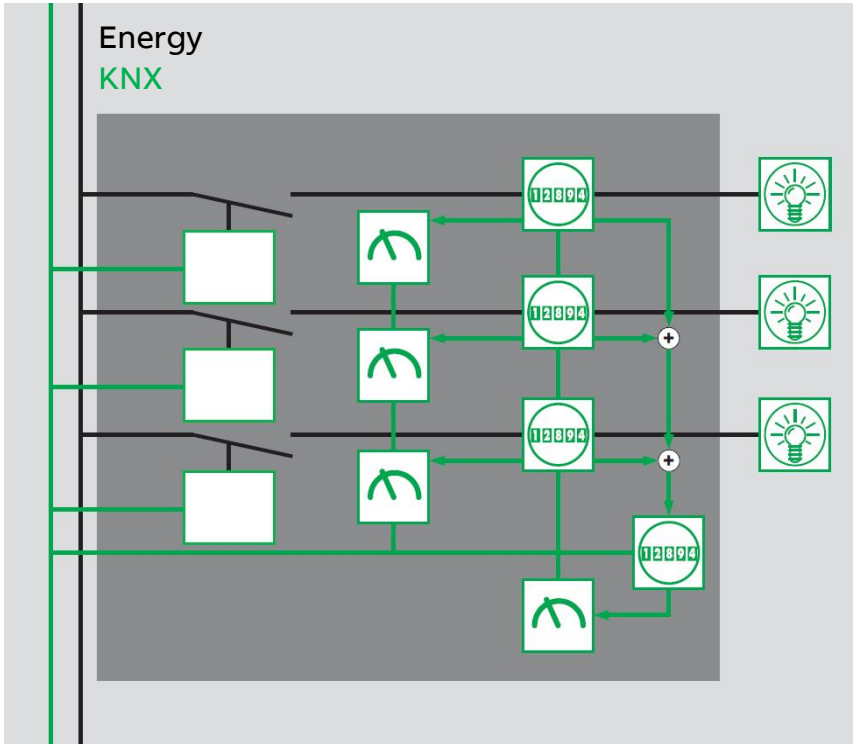
Overview

KNX Energy Actuator SE/S 3.16.1

- The ABB i-bus® KNX Energy Actuator SE/S 3.16.1 is a Switch Actuator that records the energy consumption of the connected electrical loads in the building
- The Energy Actuator determines the active energy consumption per switching output
- Furthermore, it provides the total consumption of all three outputs
- All meter values can be sent cyclically, on request or when a start or stop event has occurred such as a time, operating period or when a defined consumption threshold is reached
- Additionally, when a stop event occurs, the assigned output can be switched off



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Overview

KNX Energy Actuator SE/S 3.16.1

- For each channel, the active power, current and voltage as well as further electrical variables (apparent power, crest factor, power factor and frequency) can be measured
- The measured values are made available via KNX
- They can be monitored with threshold values
- Should an overshoot or undershoot of a defined threshold occur, a warning can be sent or a channel switched
- The ETS application also enables a simple load management functionality, where up to ten Energy Actuators can be interconnected
- The electrical loads connected to the three floating switch outputs can be switched via the KNX or switched manually directly on the device

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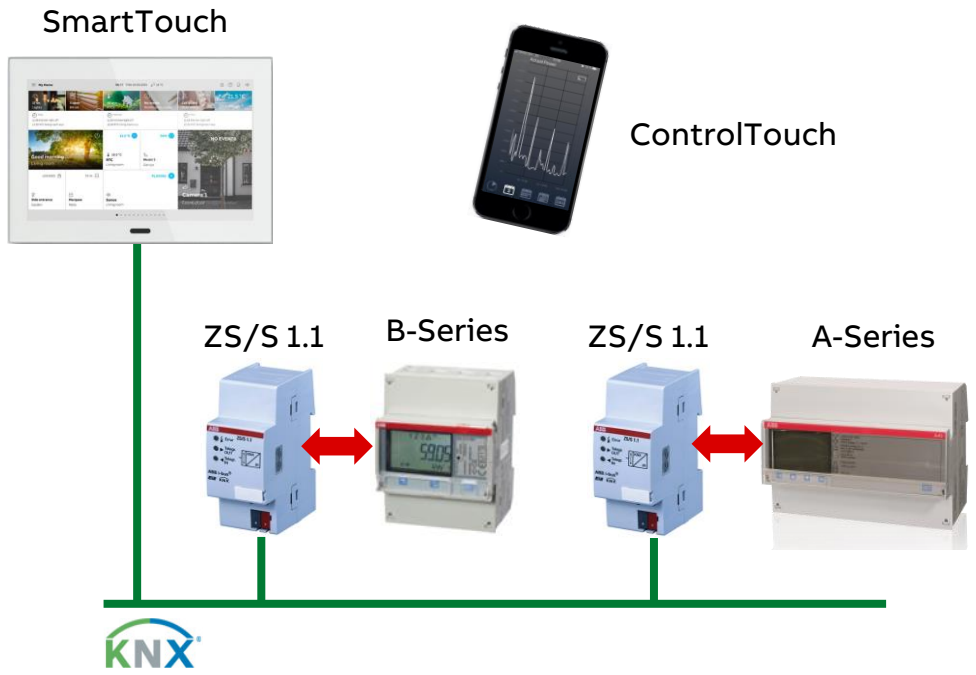
Overview

KNX Meter Interface Module ZS/S

- Electronic energy meters make the current energy values available on the KNX bus system in conjunction with a KNX interface (remote meter reading via KNX)
- Consumption and measured values of electrical energy meters are collected via the Meter Interface Module ZS/S 1.1 and transferred via the ABB i-bus KNX
- The device features an infrared interface which is used to read the data from ABB energy meters
- The measured data can be intermediately stored, evaluated and visualized from here
- The information and data which is read can be used for example for billing purposes, energy optimisation, visualisation or monitoring of installations



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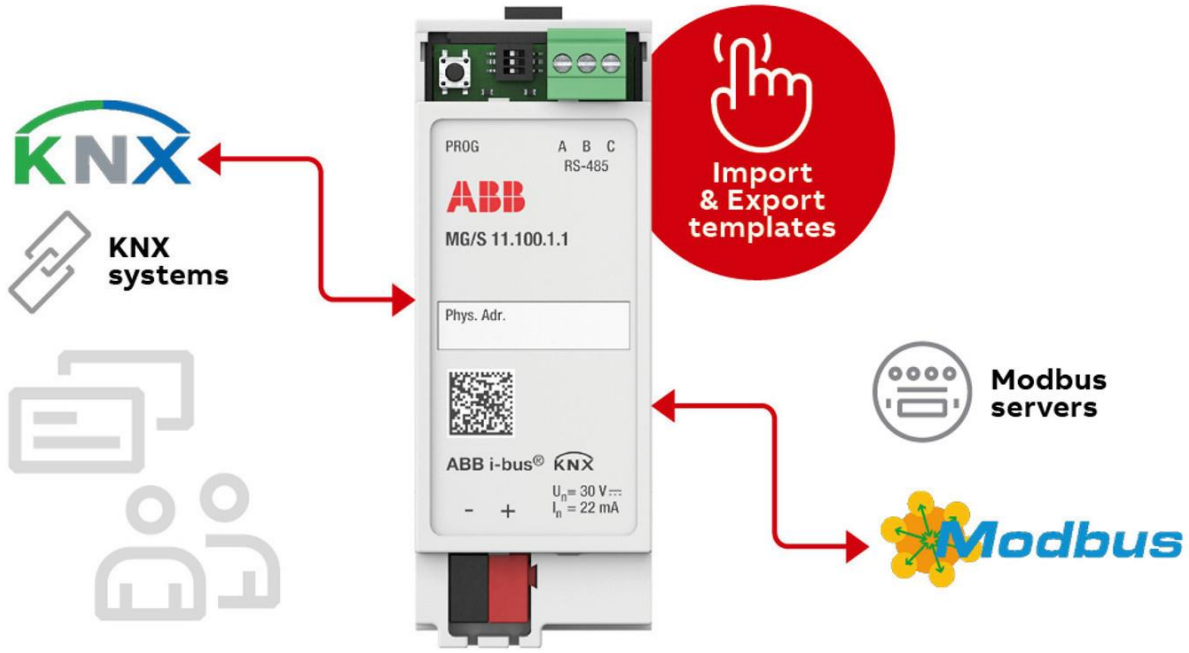
Overview

Modbus KNX Gateway MG/S

- The Modbus KNX Gateway works as a Modbus RTU client and makes it easy to integrate Modbus devices (server) via RS-485 into a KNX system
- This way, the KNX system perceives the entire Modbus installation as if it were another KNX device of the system
- The gateway is a compact modular installation device
- The Modbus KNX Gateway is a bidirectional gateway with 100 freely configurable data points
- For this purpose, the gateway continuously polls the Modbus devices and assigns the Modbus data points to KNX
- Furthermore, commands are sent from KNX to Modbus
- Modbus-KNX mapping templates are available for download from a database
- Links: → Webinar recording → Webinar presentation



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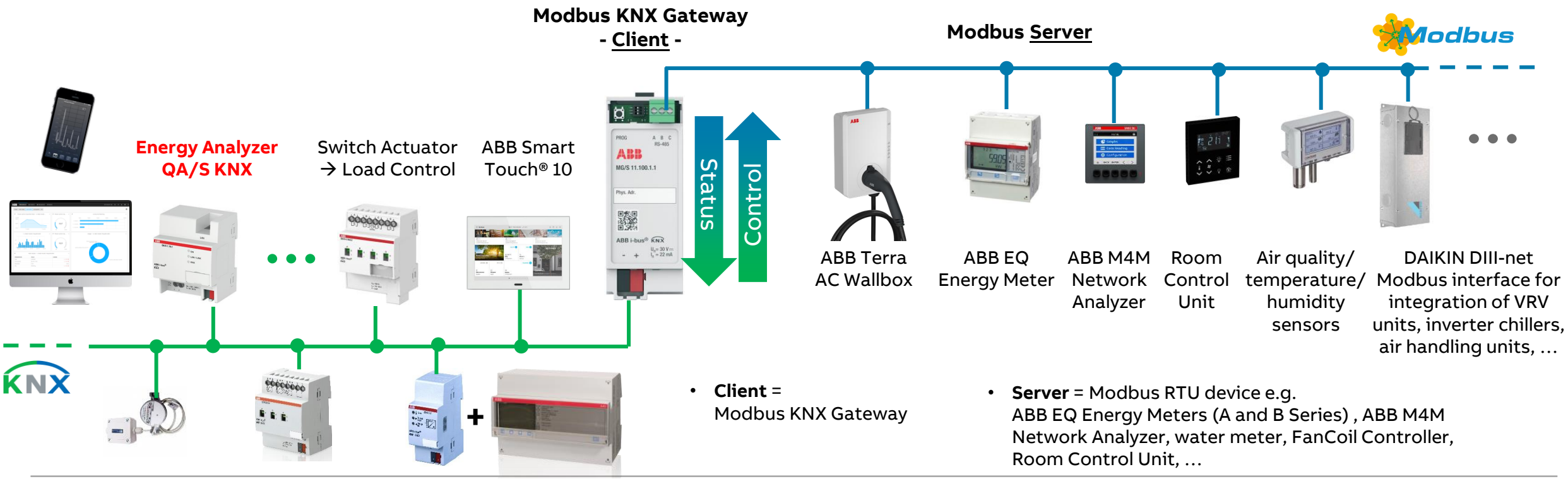
Overview

Modbus KNX Gateway MG/S



- **Client** = Modbus KNX Gateway

- **Server** = Modbus RTU device e.g. ABB EQ Energy Meters (A and B Series) , ABB M4M Network Analyzer, water meter, FanCoil Controller, Room Control Unit, …

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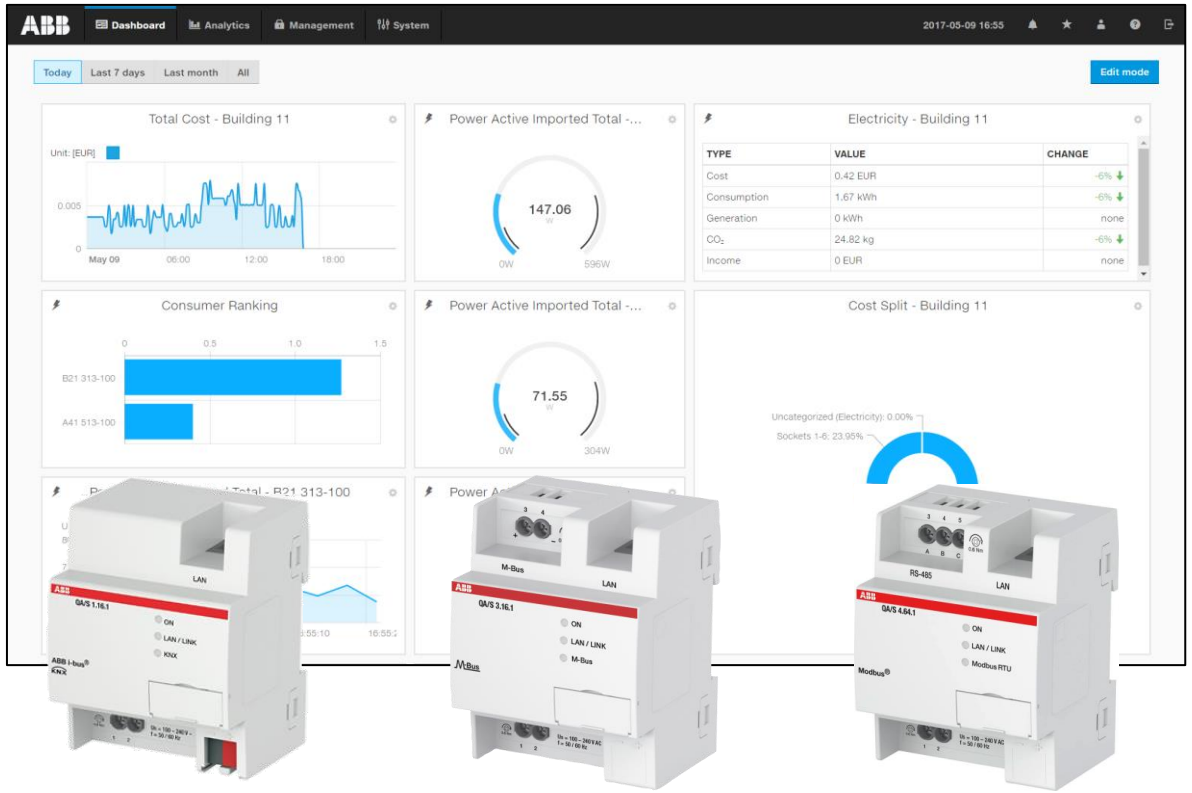
Overview

Energy measurement

- The recording of energy variables and values, as well as their processing, is continually gaining in significance
- This is not just due to the rising energy costs but also due to the frequently demanded evaluation and reading possibilities via a decentralized reading station
- The features of the ABB EQmatic series help to meet these requirements and can provide operators and users with convenient, cost-effective solutions for modern energy management
- ABB offers a wide range of devices and solutions specially designed for these applications



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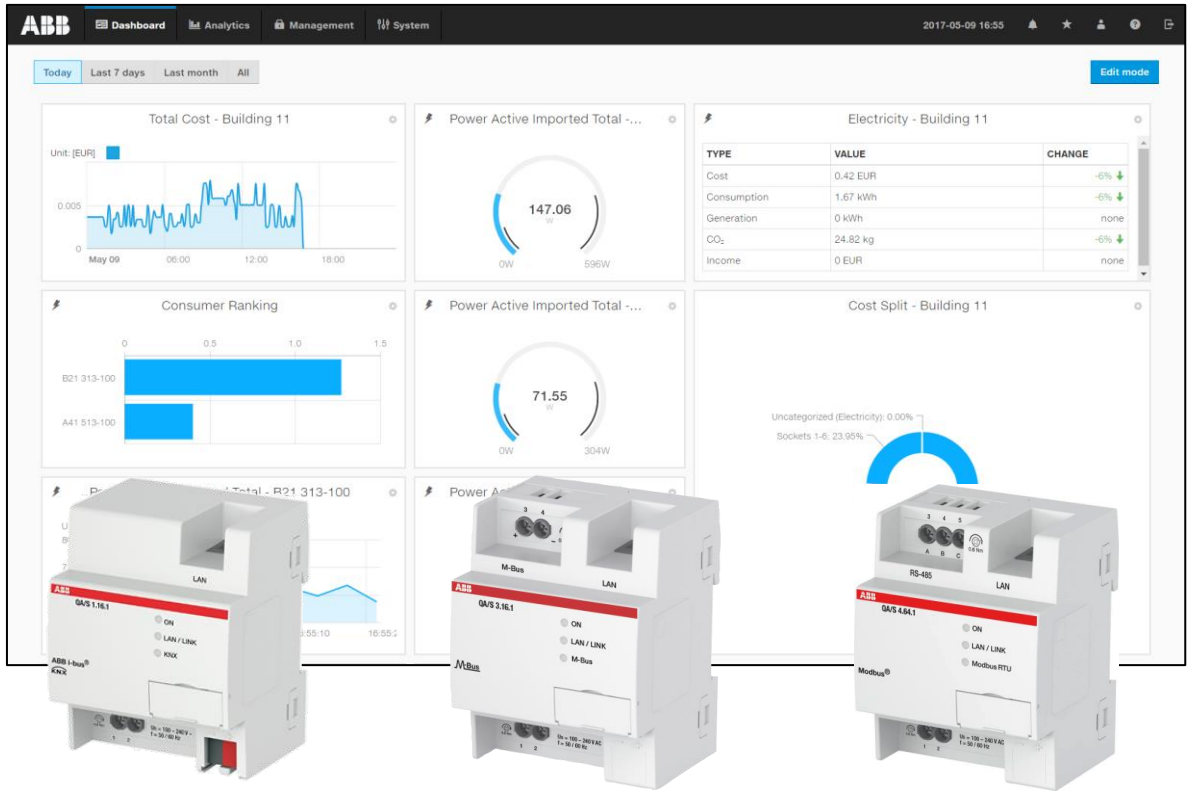
Overview

ABB EQmatic

- ABB EQmatic series devices are compact modular installation devices designed to monitor and display consumption and measured values
- They log and store consumption data for electricity, gas, water or heat meters

- This means that they can help those operating purpose-built premises or commercial buildings (offices, hotels, schools, public buildings) to implement energy management systems such as ISO 50001 or to put in place low-voltage installations compliant with VDE 0100-801
- As a result, they make building energy flows and costs transparent



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Overview

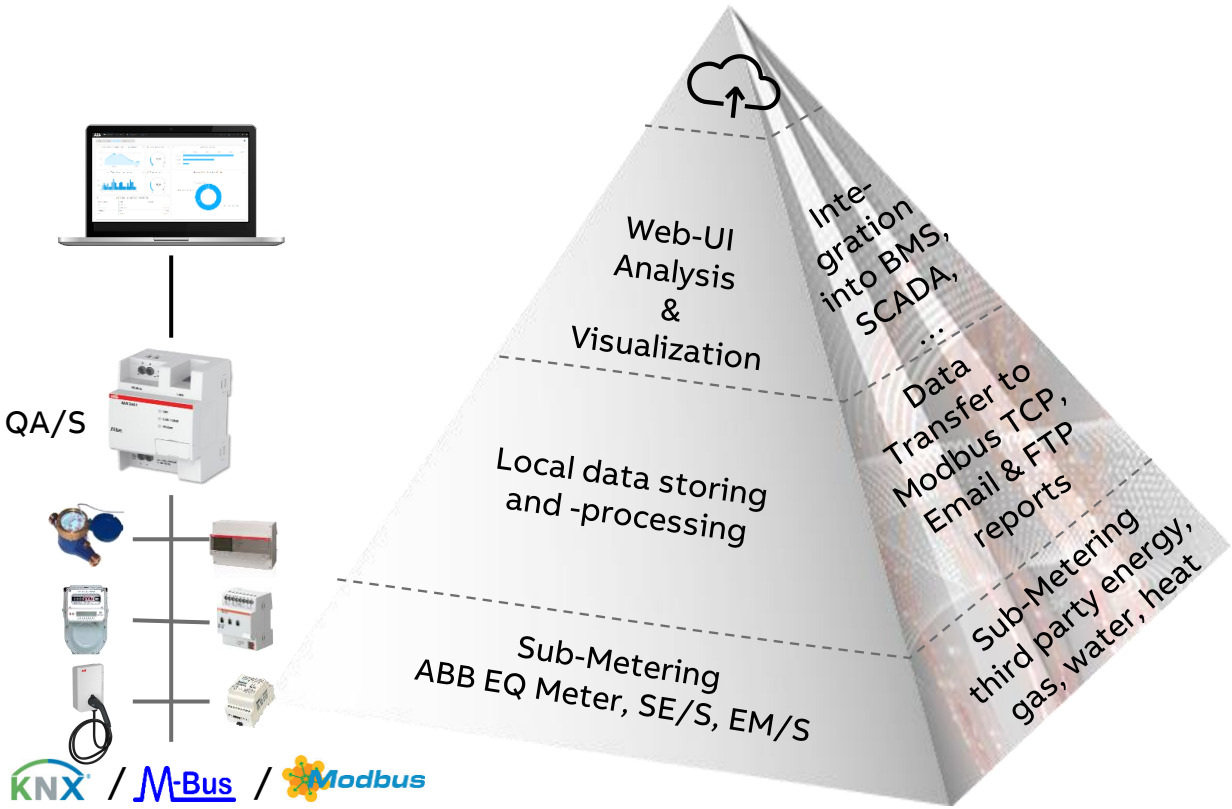
Device technology

ABB EQmatic Energy Analyzer QA/S collects data from

- ABB i-bus® KNX meters and sensors
- M-Bus meters
- Modbus RTU meters

Functions

- The user interface is accessed via a web browser
- Display and evaluation of historical consumption and measurement data
- Cost & consumption analysis for electricity, water, heat, gas
- Storage of meter data for at least 3 years
- Cyclical (e.g. monthly) export of reports to FTP servers or email
- Transfer of data to higher-level systems via Modbus TCP or Rest API e.g. BMS, Visualisation, ABB Cylon®, SCADA, PLC Controller AC500 with integrated KNX interface , …



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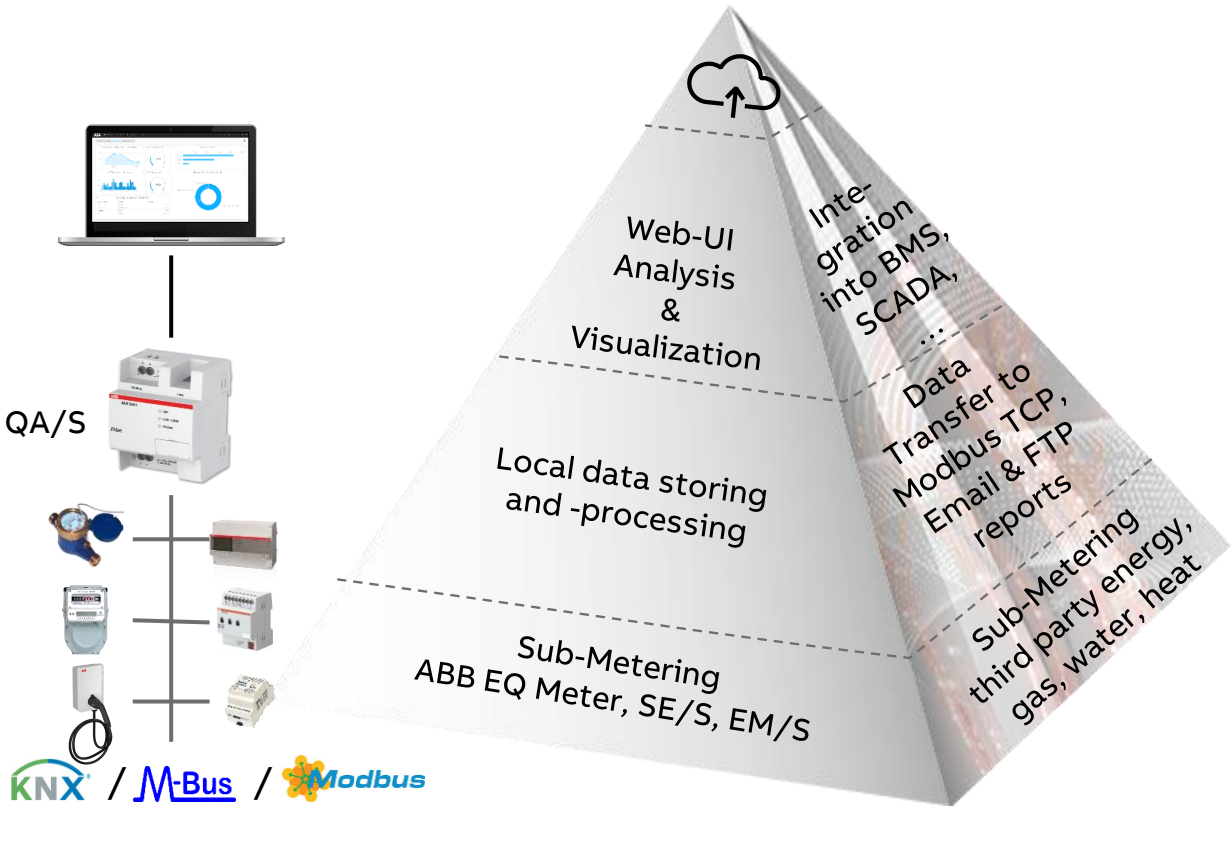
Overview

Device technology

- ABB EQmatic Energy Analyzer are compact, web-based standalone devices for energy management applications
- They log, store, display and analyze consumption data for up to 16 or 64 electricity, gas, water or heat meters
- Device access is via web browser (integrated web server)
- They automatically detect ABB A and B Series Energy Meters and M2M Modbus Network Analyzer during commissioning
- Third party meters (water, gas,…) or pulse adapters must be manually configured and added to the system



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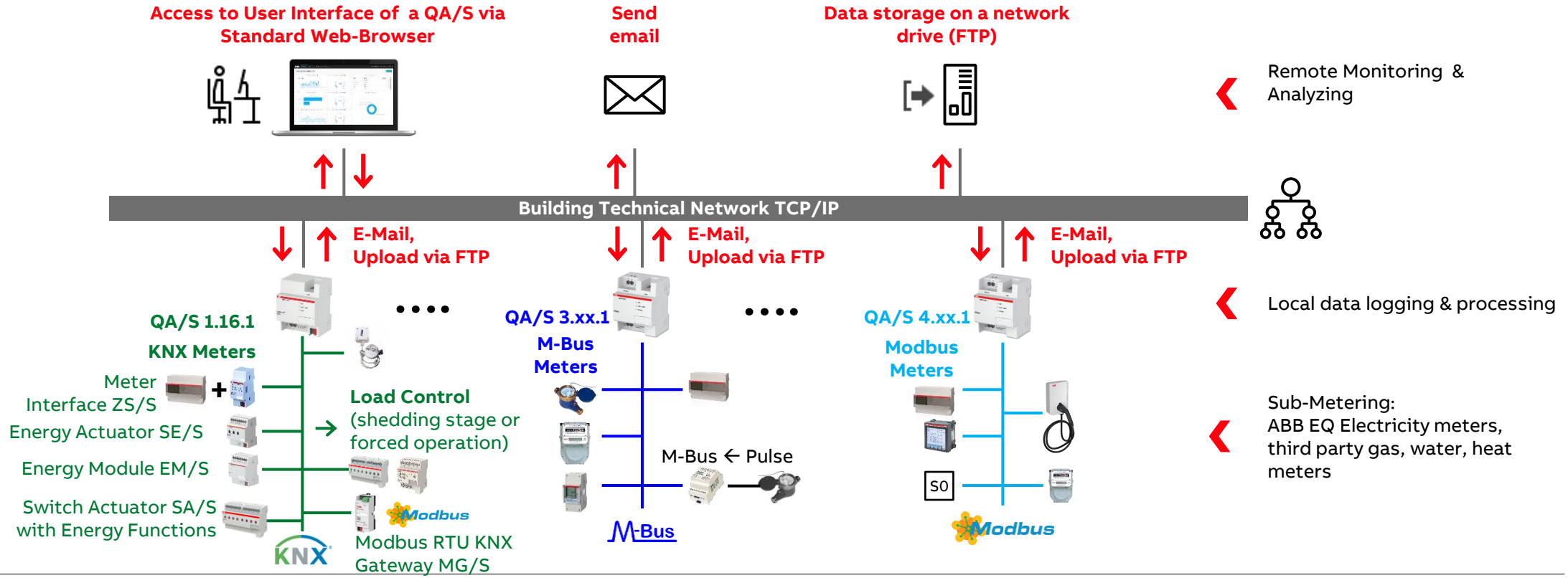
Overview

Energy Analyzer QA/S as local and central data logger



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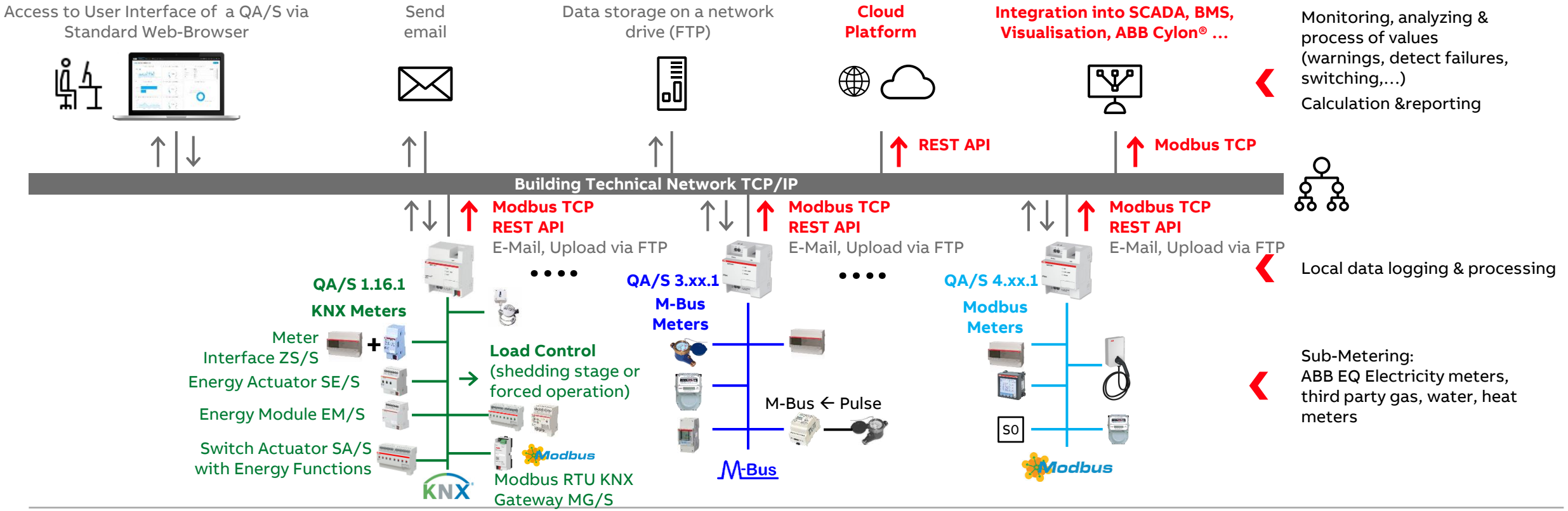
Overview

Data sharing via Modbus TCP & REST API – QA/S as a Gateway between field devices and super ordinate system



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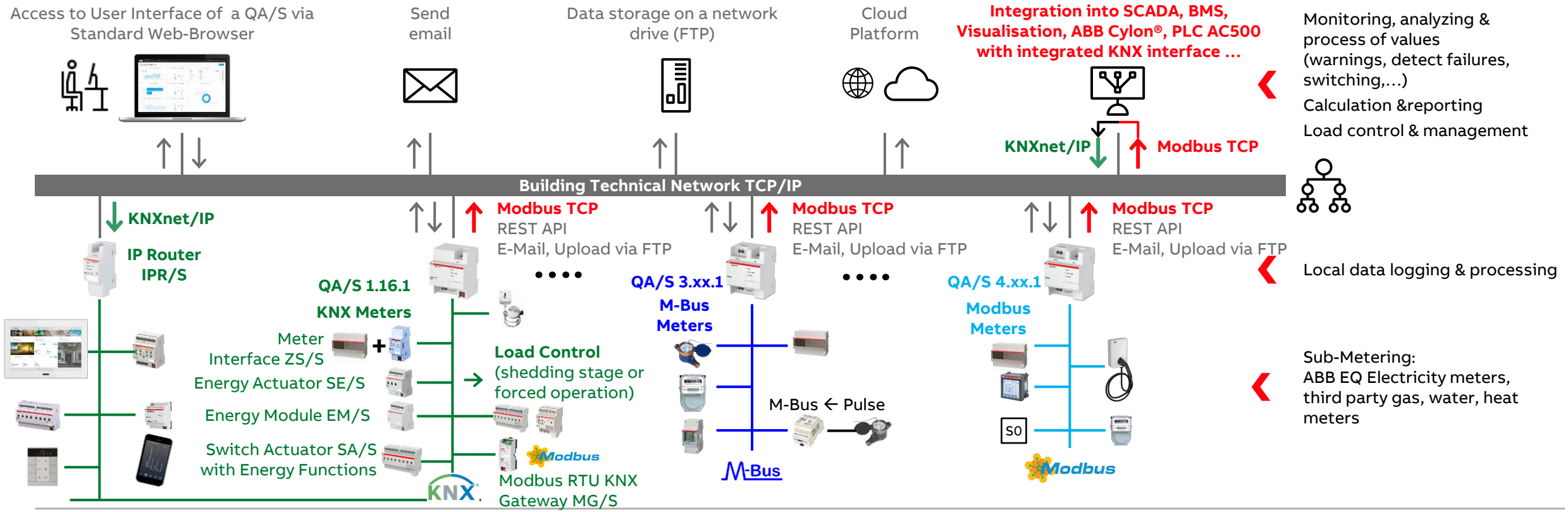
Overview

Data sharing via Modbus TCP, conversion via a KNX interface and forwarding to KNX



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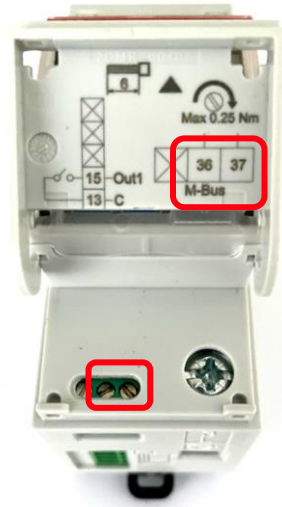
Overview

ABB Energy Meters – A and B Series

- The ABB EQ Energy Meters are designed as intermediate meters and offer a wide range of functions for countless applications
- The meters are available in various variants:
  Meters for single- or three-phase measurement, as well as meters for direct connection or transformer rated
- The energy meters are optionally available with integral serial interfaces for M-Bus or Modbus RTU (RS485)
- The ABB A and B Series Energy Meters and M2M Modbus Network Analyzer are automatically detected and configured during commissioning



B21 113-100
M-Bus

B21 112-100
Modbus

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Overview

Connection of a meter to the M-Bus

- Meter with built-in M-Bus interface
  - ABB EQ Energy Meters (A and B Series) are optionally available with integral serial interfaces for M-Bus or Modbus RTU (RS485) and detected and configured automatically
  - Third-party meters are to be parameterized during commissioning
- Meter with pulse output
  → Pulse adapter for M-Bus
- Meter for connecting a pulse output module
  → Pulse adapter for M-Bus
- Meter for connecting a bus module
  → M-Bus module

B21 113-100
M-Bus

NZR
M-Bus

Pulse adapter
(Relay)

M-Bus

Pulse output module
(Itron)

M-Bus module
(NZR)

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Overview

M-Bus module for a meter

- The M-Bus module is used for adaptation of meters to the M-Bus system, e.g. water meter
- When connected to the M-Bus network the module is energized
- A built-in battery ensures that metering despite sustained failure of the M-Bus network; the resulting is stored in non-volatile Flash info of the processor
- Manufacturer: NZR (Germany)
  https://www.nzr.de/en/home.html

M-Bus

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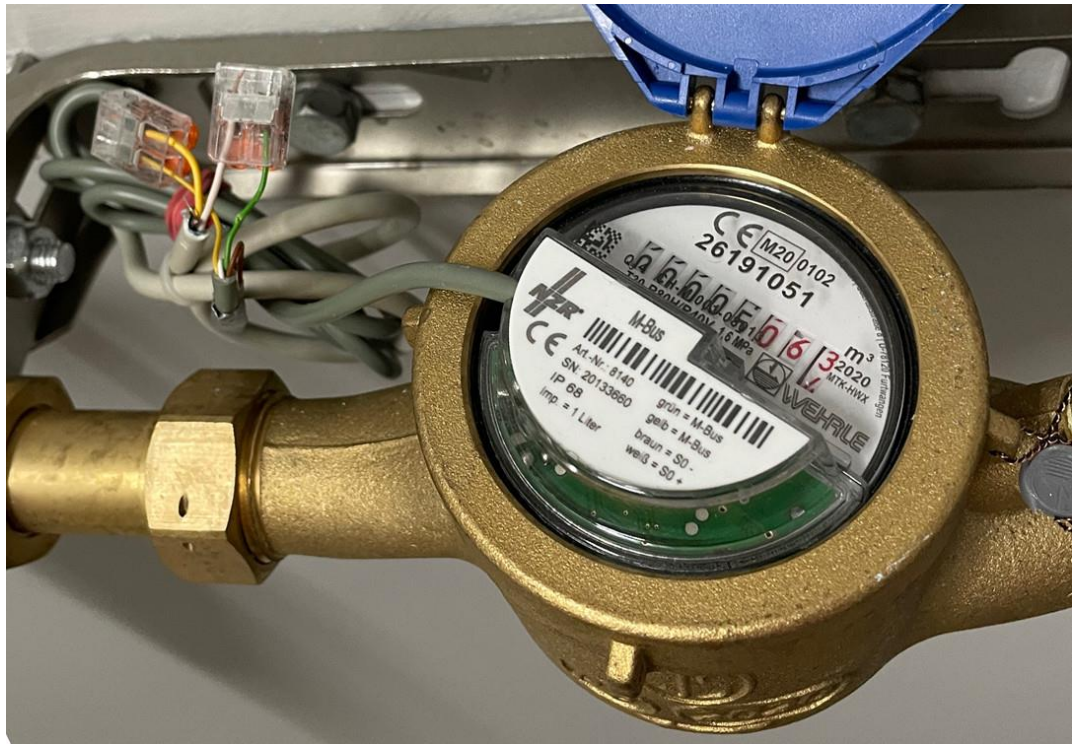
Overview

M-Bus module for a meter



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Overview

Pulse module for a meter and pulse adapter for M-Bus

Pulse output module

- The pulse output module generates pulses (e.g. 1 pulse per 10 liter) similar to those generated by reed relays (dry contact)
- Manufacturer: Itron https://www.itron.com/emea/solutions/product-catalog/cyble-sensor

M-Bus pulse adapter

- The pulse adapter allows the use of a meter or module with pulse output as a M-Bus slave
- So for example, data from a simple gas, water or energy meter can central be read out by M-Bus
- Manufacturer: Relay https://www.relay.de/en/

pulses

M-Bus

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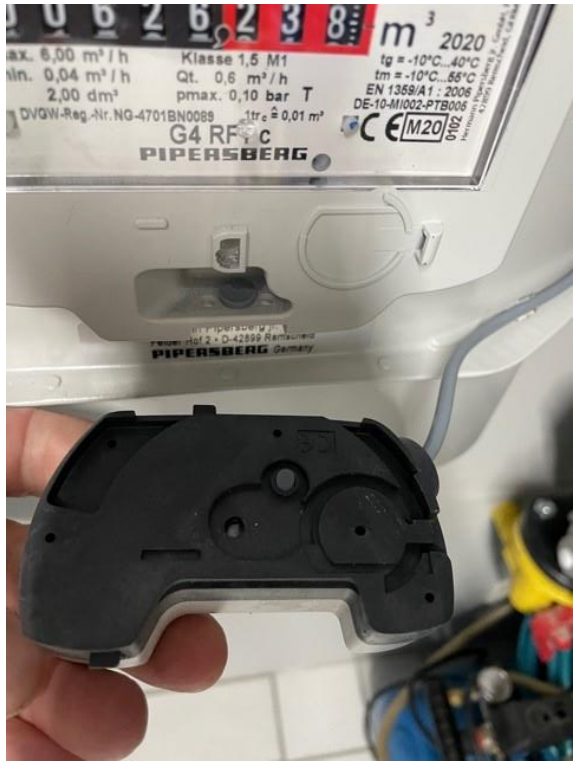
Overview

Pulse output module for a meter



Pulses

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Overview

Pulse adapter for M-Bus

Pulses

M-Bus

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Overview

Device technology – software

- Display and evaluation of historical consumption and measured data via configurable charts
- Cost and consumption analysis for media such as electricity, water, heat and gas
- Display of CO_2 emission and Energy Performance Indicator (EnPI)
- Storage of metering data from up to 16/64 meters for at least 3 years
- Data export (file, e-Mail, FTP, Modbus TCP)
- User addition and administration functions (simultaneous access for up to 10 users)
- Notifications when connected meters fail
- Alarms
- Load control (only for KNX)
- Environmental sensor data (only for KNX)

QA/S 1.16.1

KNX

QA/S 3.xx.1

M-Bus

QA/S 4.xx.1

Modbus

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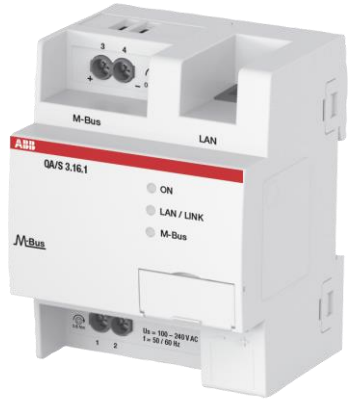
Overview

Device technology – hardware

- Energy Analyzer QA/S 1.16.1 KNX
  - QA/S 1.16.1 max. 16 meters
- Energy Analyzer QA/S 3.xx.1 M-Bus
  - M-Bus master to DIN EN 13757-2
  - QA/S 3.16.1 max. 16 meters
    QA/S 3.64.1 max. 64 meters
- Energy Analyzer QA/S 4.xx.1 Modbus
  - Modbus RTU master
  - QA/S 4.16.1 max. 16 meters
    QA/S 4.64.1 max. 64 meters
- Modular installation device (MDRC)
- Mounting width: 4 space units
- Display elements (LEDs)
- LAN connection
- Supply voltage 100…240 V AC

QA/S 1.16.1

KNX



QA/S 3.xx.1

M-Bus

QA/S 4.xx.1

Modbus

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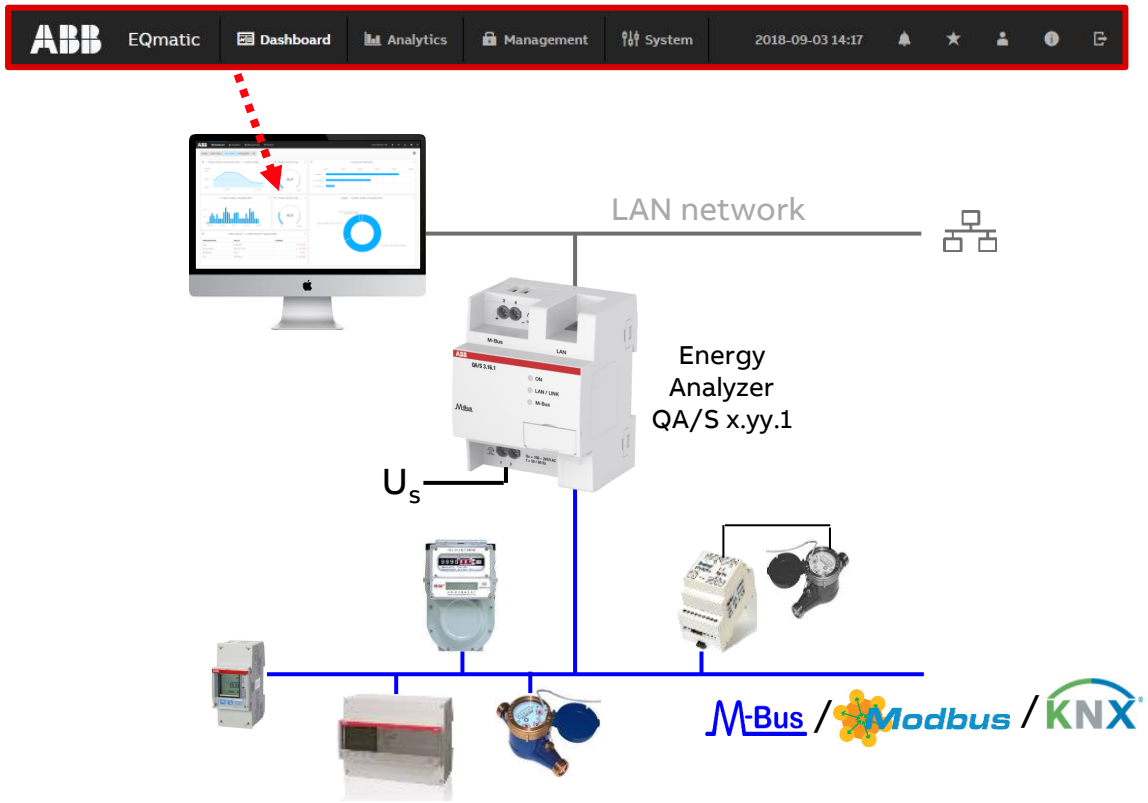
Overview

User interface: Main menu

- The device has a user interface for commissioning and operating purposes
- To access the user interface there must be an IP connection to the device
- The user interface offers
  - A configurable dashboard
  - Graphical analysis functions (historical data, benchmark - time interval, instantaneous values, …)
  - Management
  - System settings
  - Load control (only for KNX)



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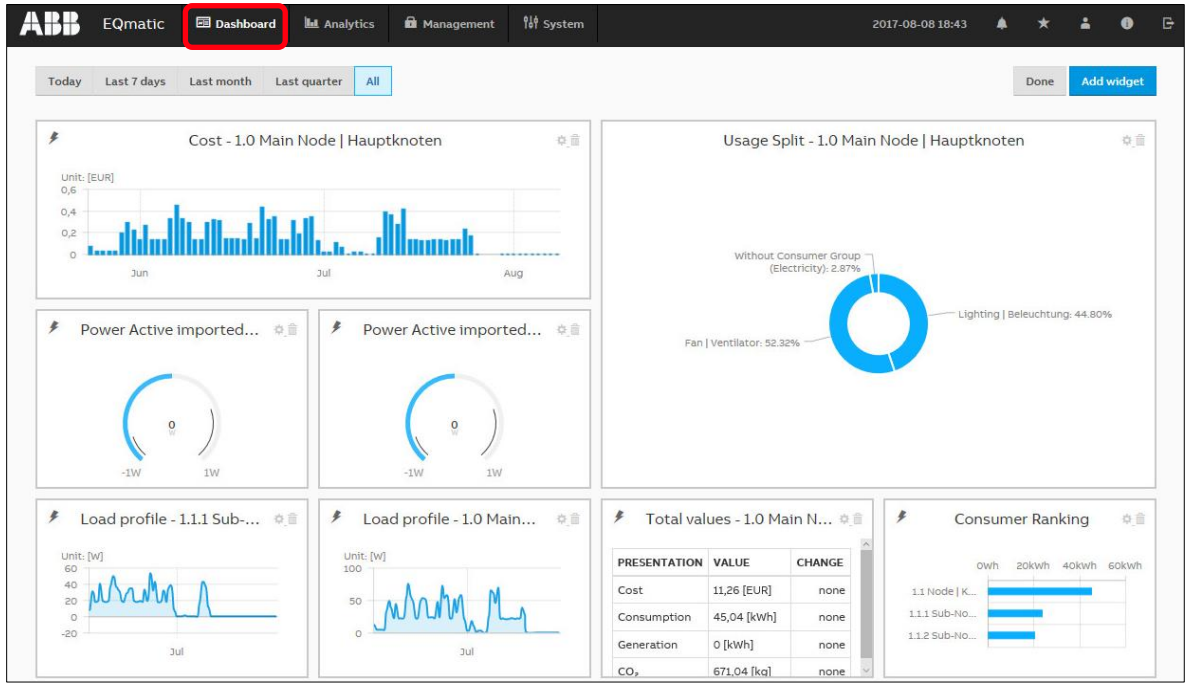
Overview

Main menu: Dashboard

- The dashboard provides a rapid overview of costs and consumers in the building
- In the dashboard you can configure user-defined views using widgets (graphical display elements) and alarms (e.g. measured value is exceeded)



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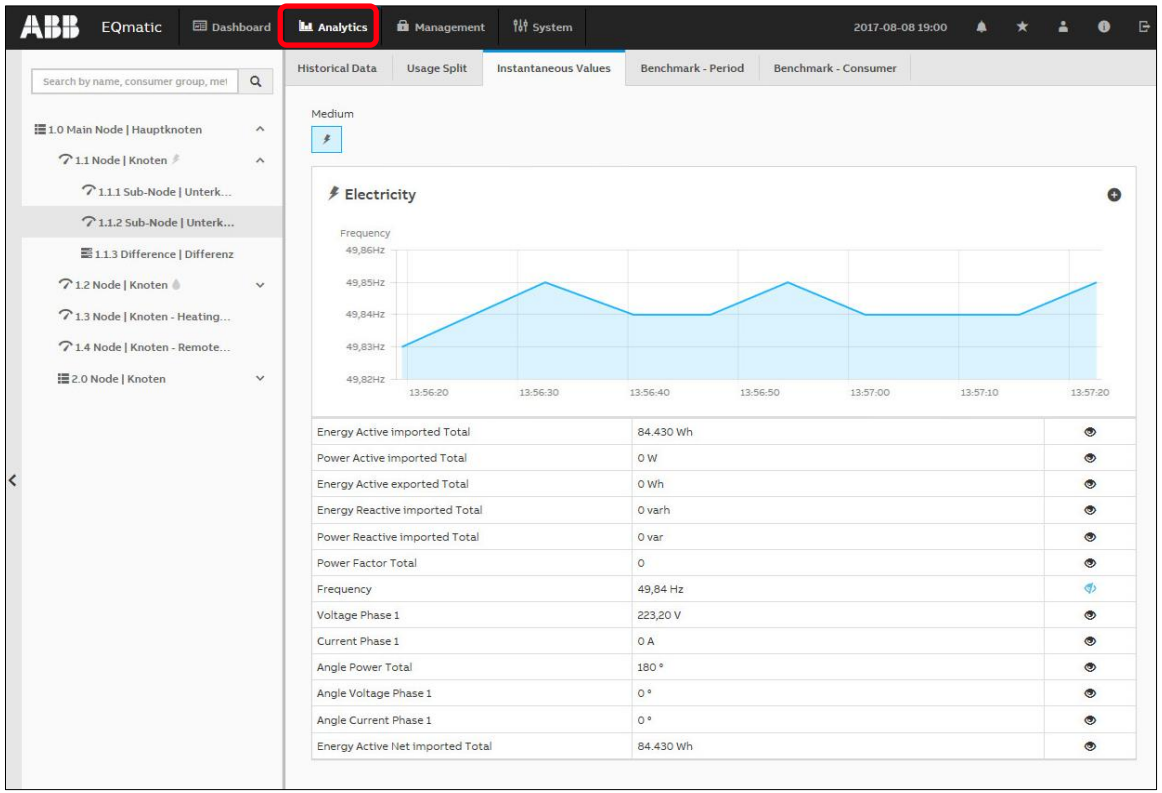
Overview

Main menu: Analytics – Instantaneous Values

- This function displays the instantaneous value of a single data point in real time
- The desired metering point or meter must first be selected in the metering structure
- Depending on the meter's scope of functions, various data points are available for display



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Overview

Main menu: Analytics – Historical Data

– For analysis and display of historical measured data

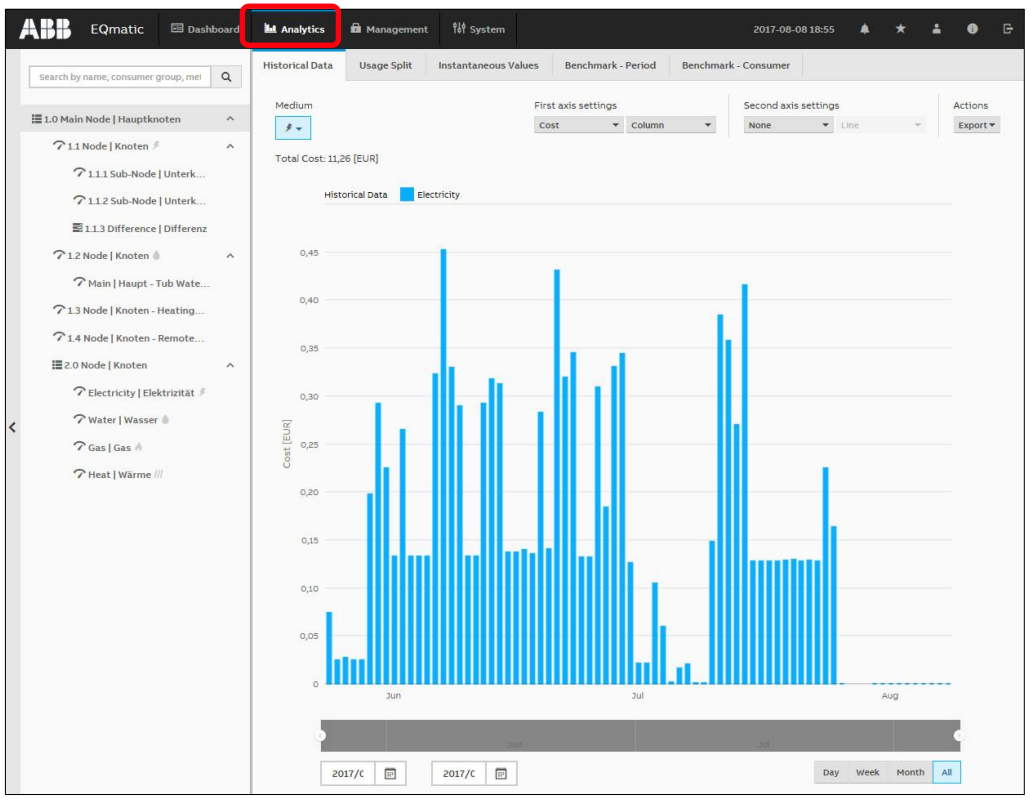

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: Analytics – Usage

- For analysis and display of
  - Cost
  - Consumption
  - Generation
  - Income
- …
- per medium or consumer group
  - Lighting
  - Cooling
  - Ventilation
- …

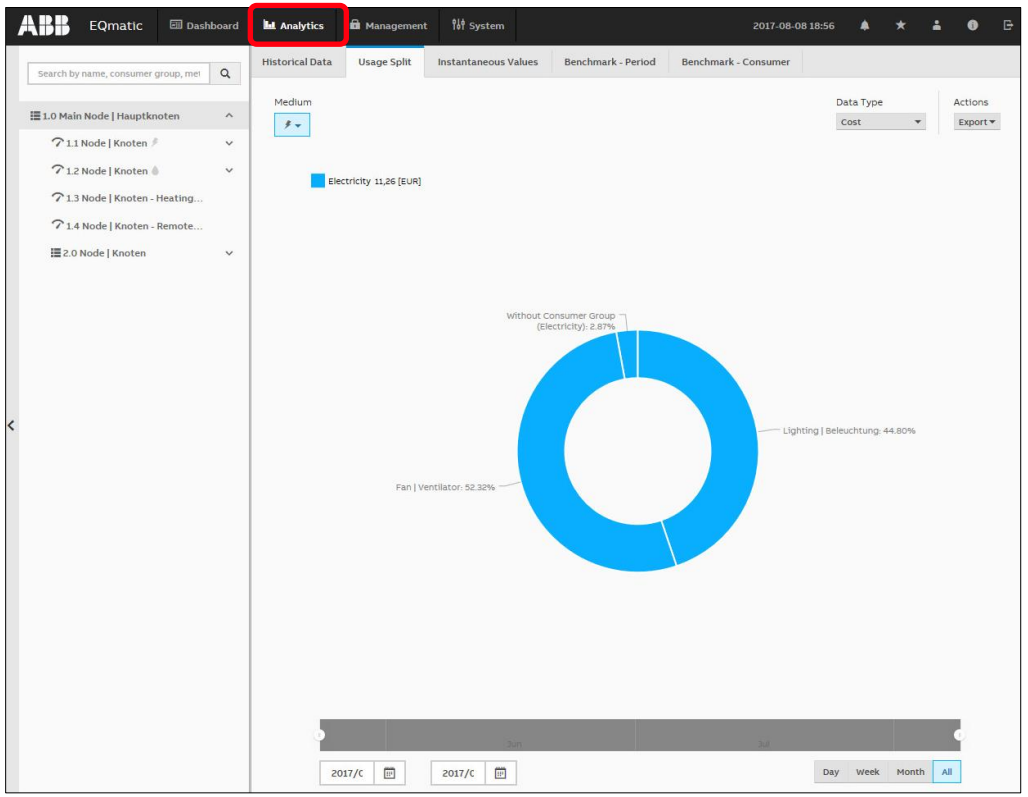

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: Analytics – Benchmark Period

– To compare a consumer or node referred to two time intervals (e.g. current month and previous month)

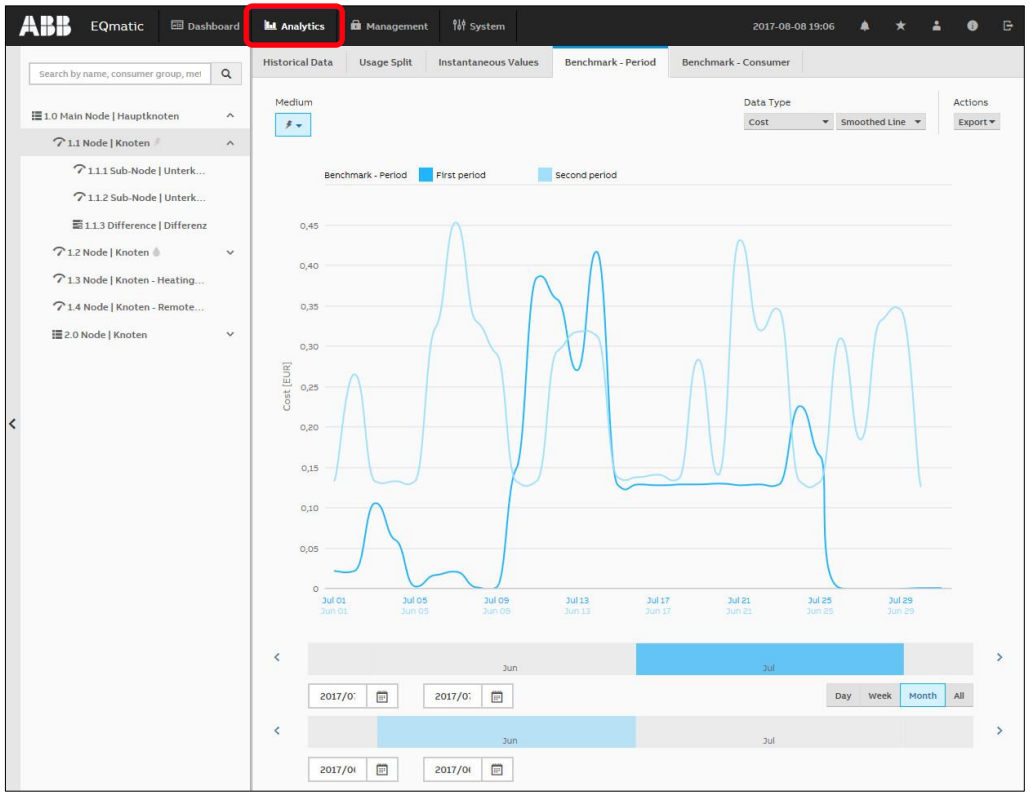

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: Analytics – Benchmark Consumer

– To compare up to five consumers or nodes referred to a time interval

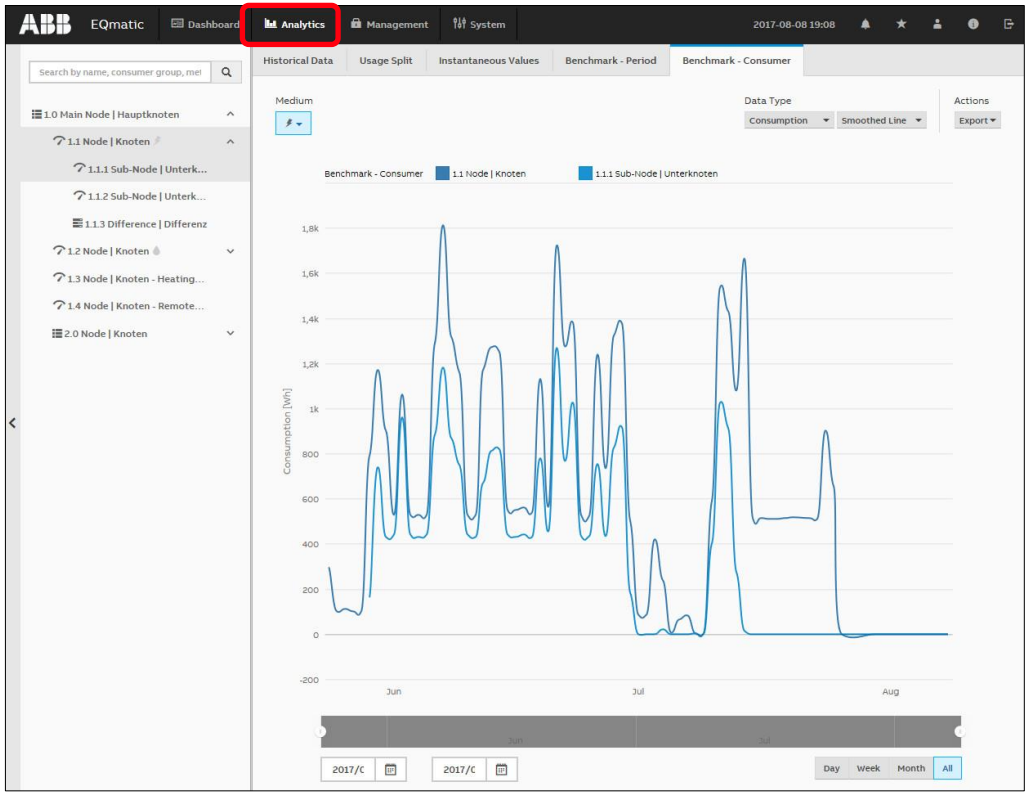

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: Analytics – Reports

- This function automatically sends analyzes and evaluations to different recipients
- The data can either be sent by email or to an FTP server
- Example: Send saved consumption figures or costs for a meter once a month to a recipient by email in the file format .xlsx for further evaluation and archiving
- Reports configured are displayed and managed in an overview table

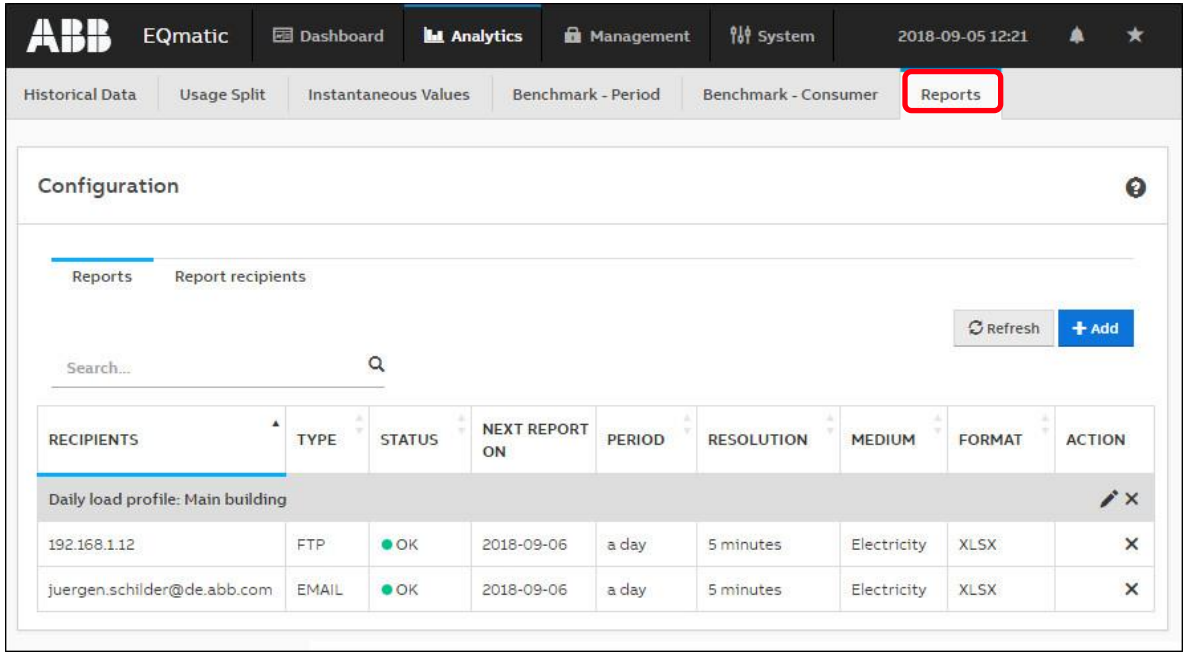

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: Analytics – Alarms

- Alarm ranges can be configured for any data point via the analysis function or dashboard
- If a configurable value is exceeded, notification is sent to e-mail recipients and event is written to the alarm log

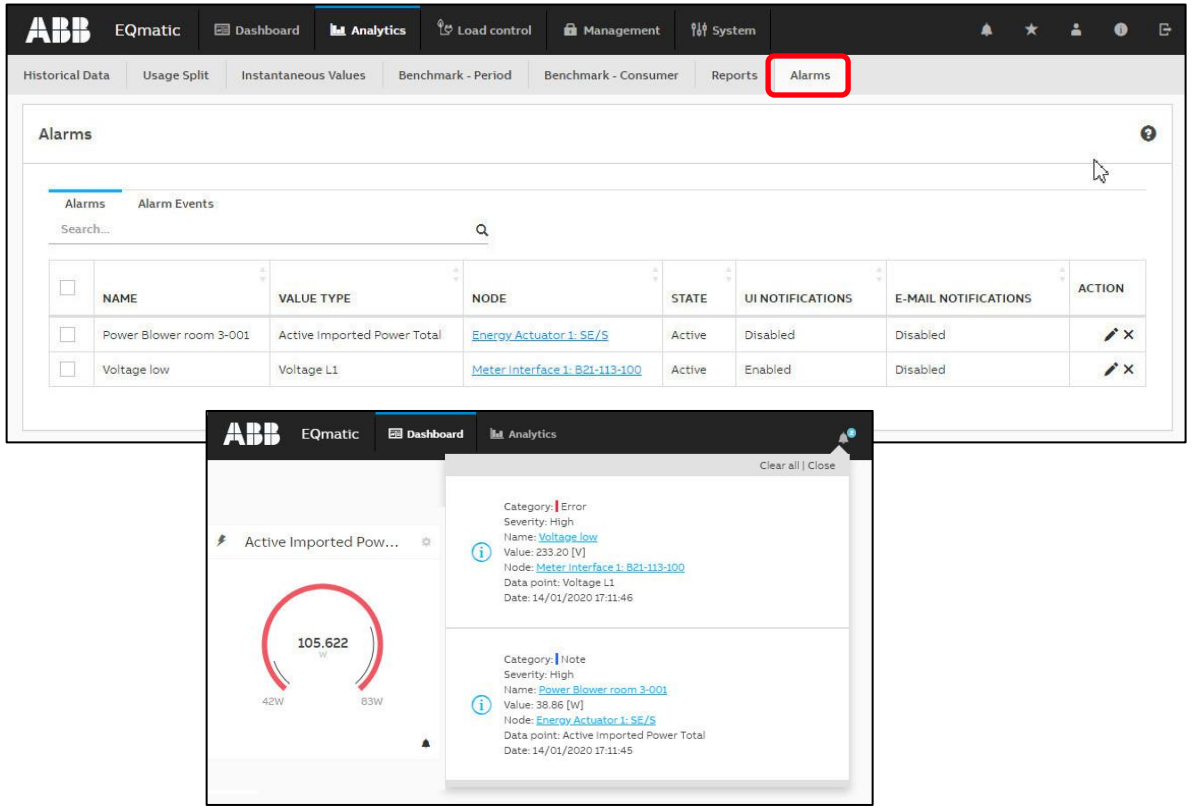

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: Load control (only for QA/S 1.16.1 KNX)

- With the Load Control Management function, load shedding sequences can be prioritized based on the electrical power values received from electricity meters
- The load control parameter must be activated in the ETS so that the load control can be displayed and operated via the user interface

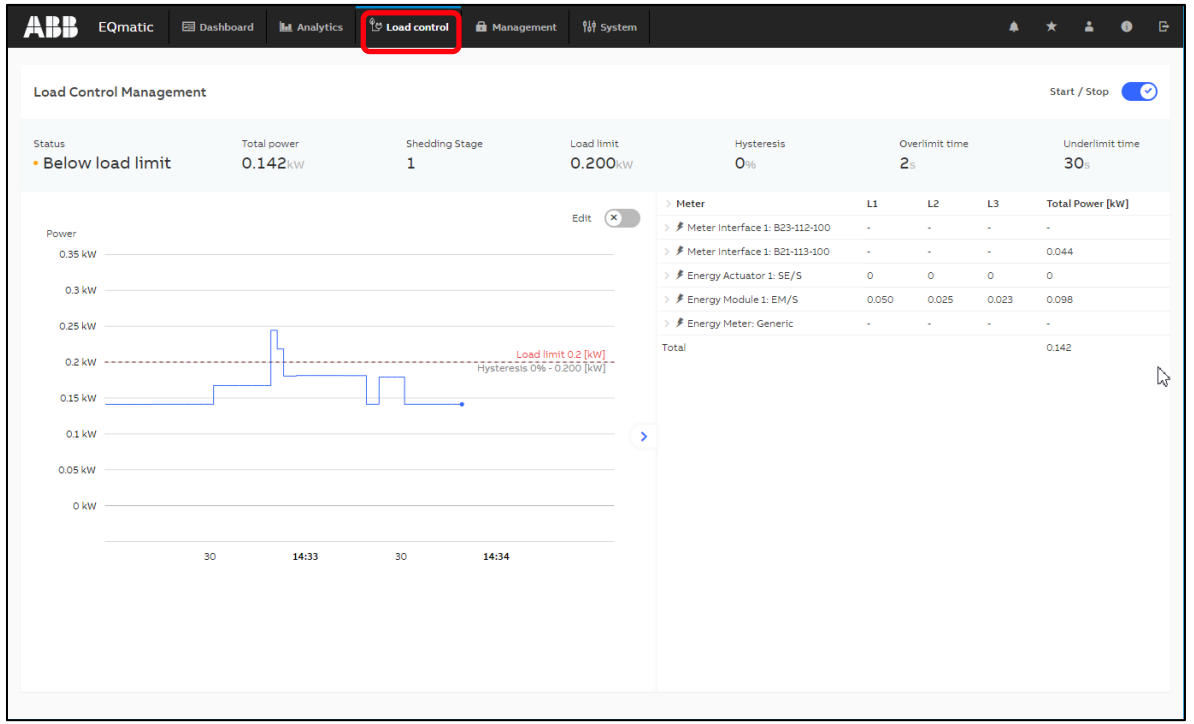

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: Management

– The *Management* menu can be used to make settings (Administrator rights are required)
  - Meter Management
  - Metering Structure
  - User Management
  - Tariff and Units
  - Consumer Groups
  - Data Sharing

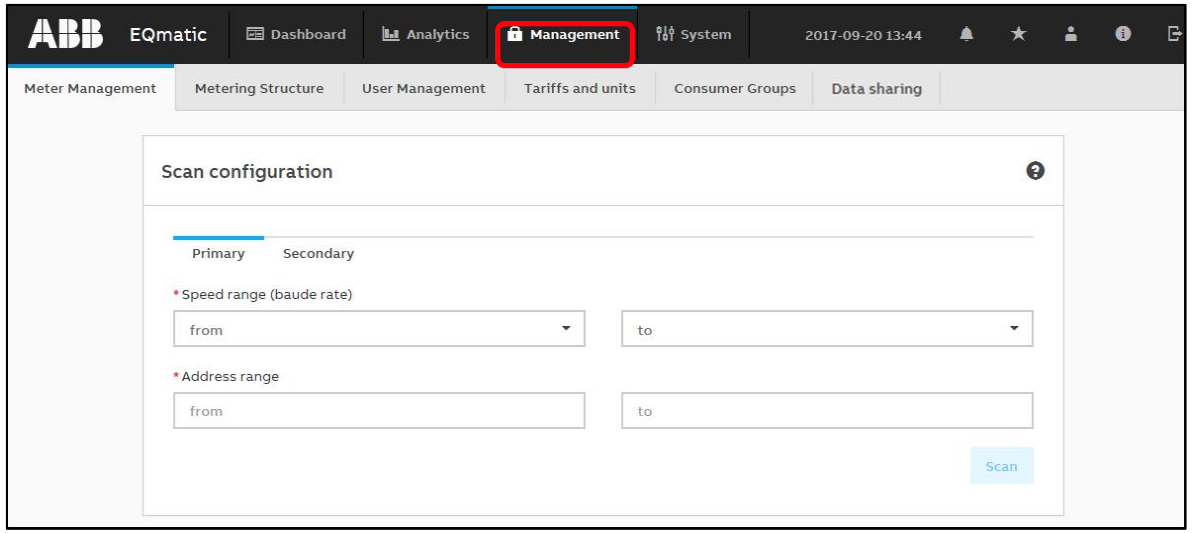

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Main menu: System Settings

– Basic settings are made in the *System* menu (Administrator rights are required)
  - General
  - Date and Time
  - Network
  - Update
  - SMTP Configuration
  - SSL Certificate
  - SSH Access
  - Erase data
  - System Log
  - System diagnostics

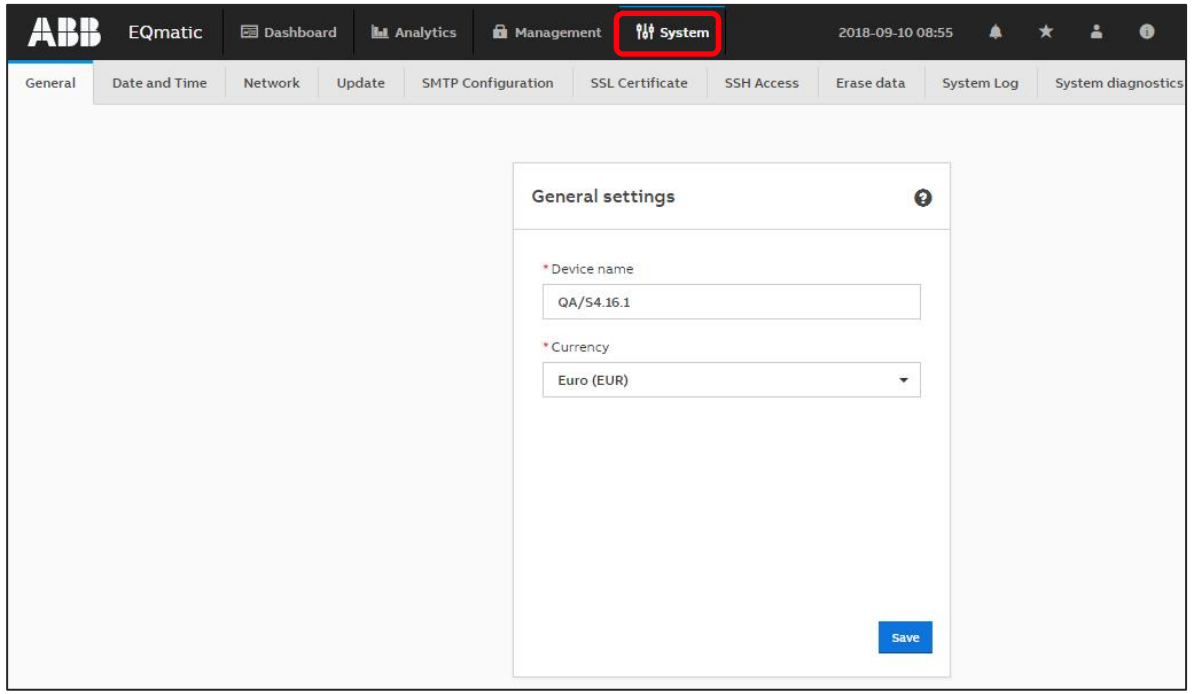

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Dashboard

ABB Energy Analyzer QA/S

– record, store, visualize and analyze consumption and generation data of gas, water and energy meters

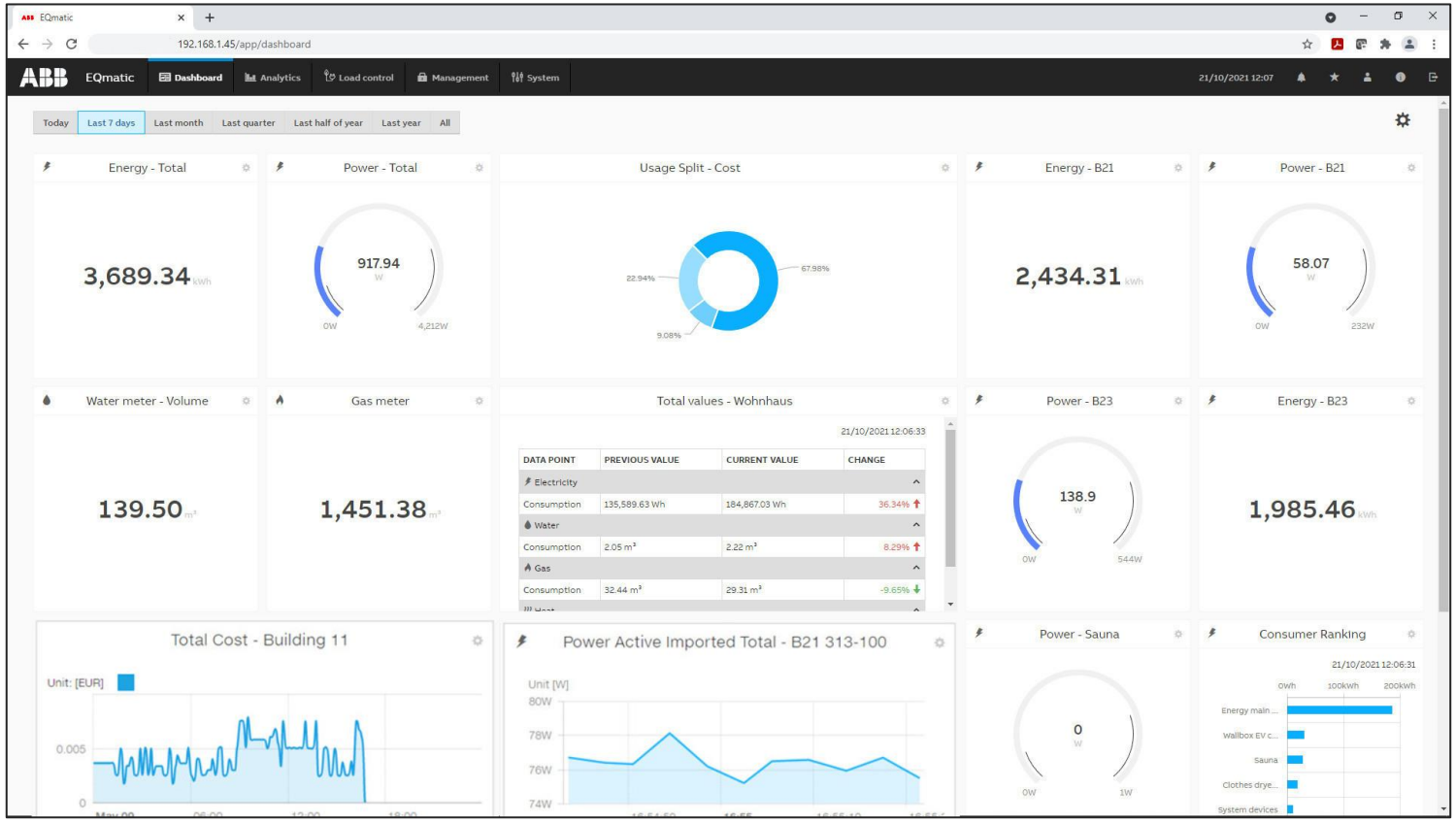

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Analytics – Instantaneous Values

ABB Energy Analyzer QA/S

– record, store, visualize and analyze consumption and generation data of gas, water and energy meters

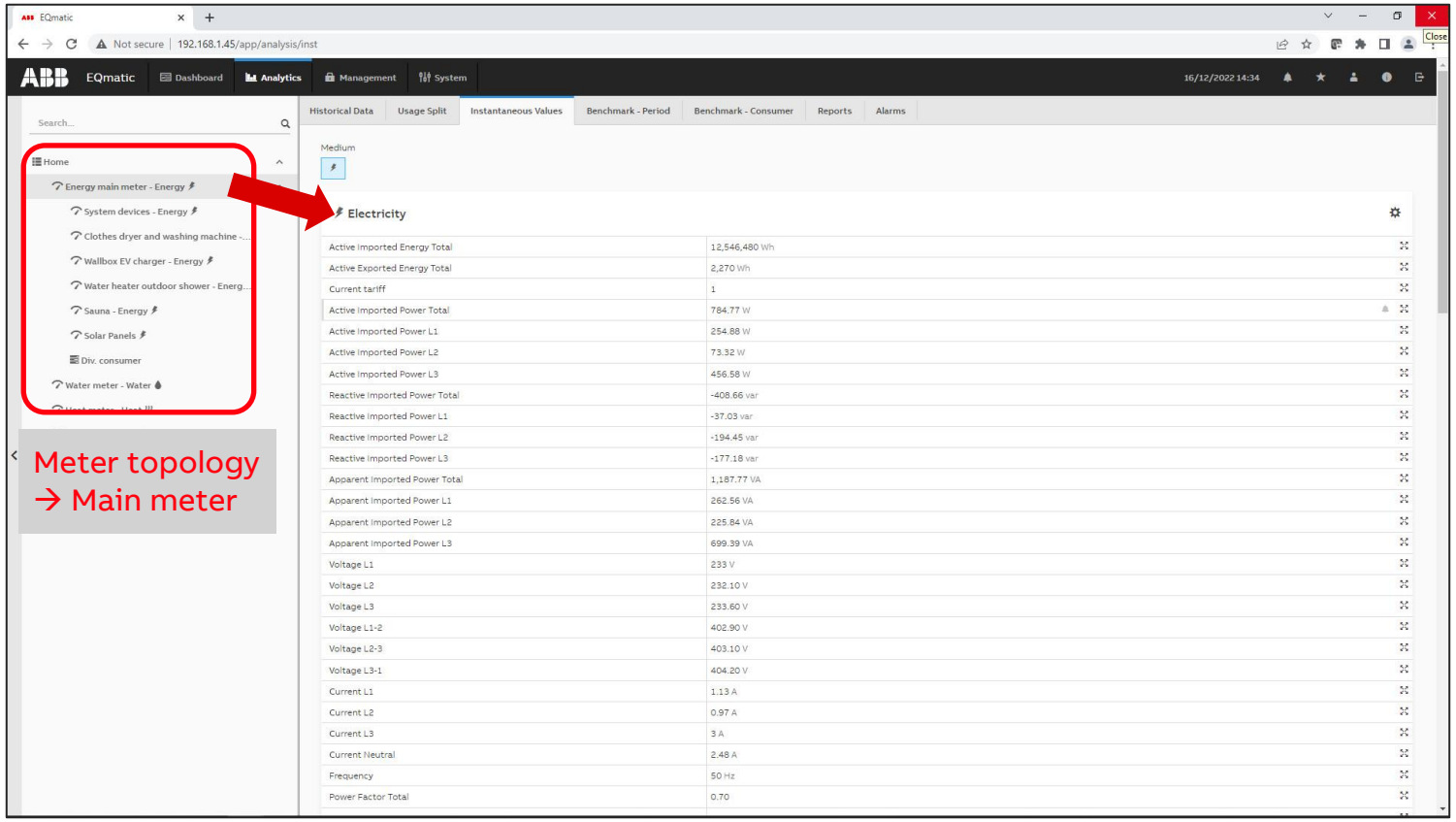

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Analytics – Historical Data

ABB Energy Analyzer QA/S

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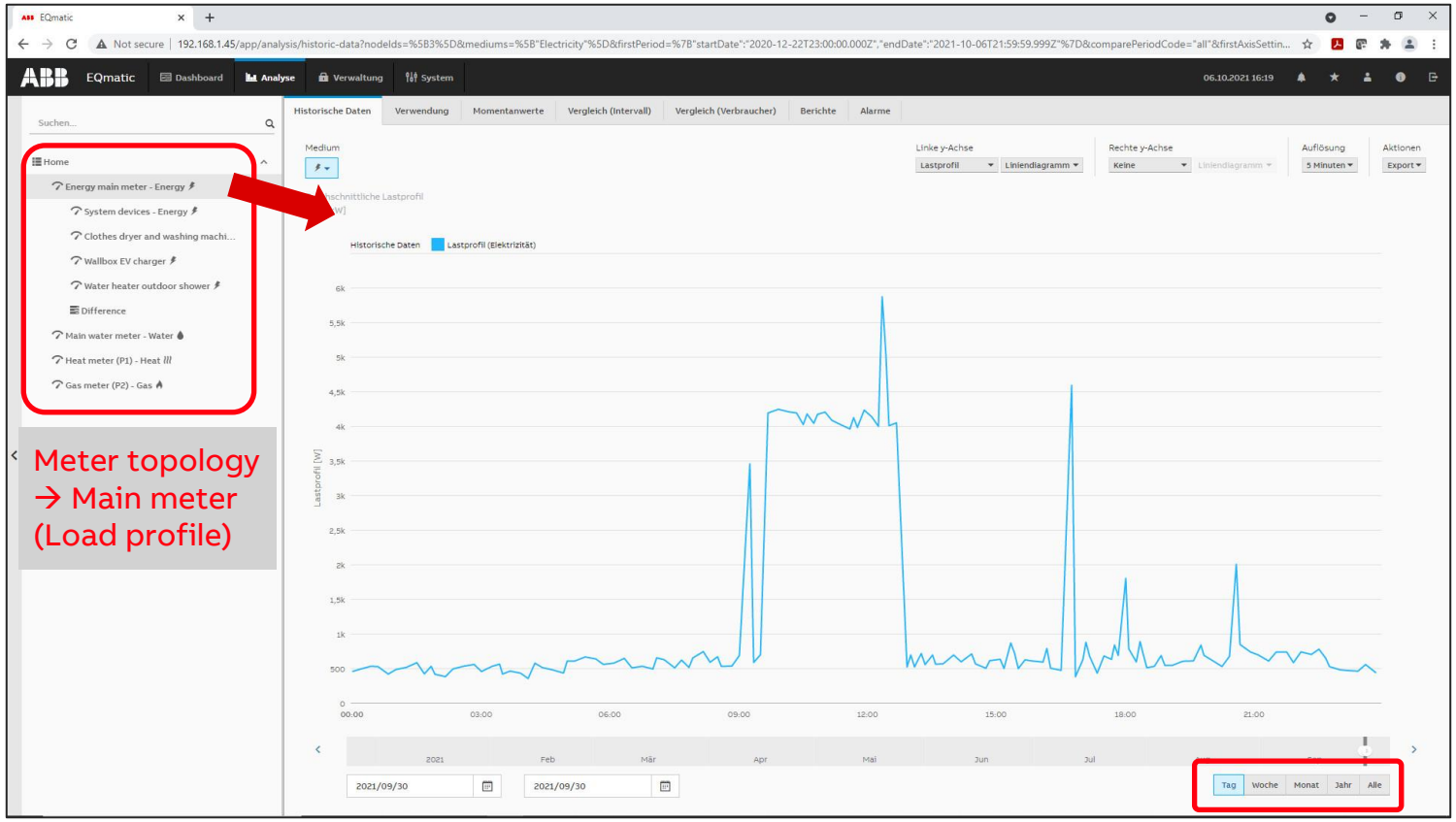

ABB EQmatic Energy Analyzer QA/S x.yy.1

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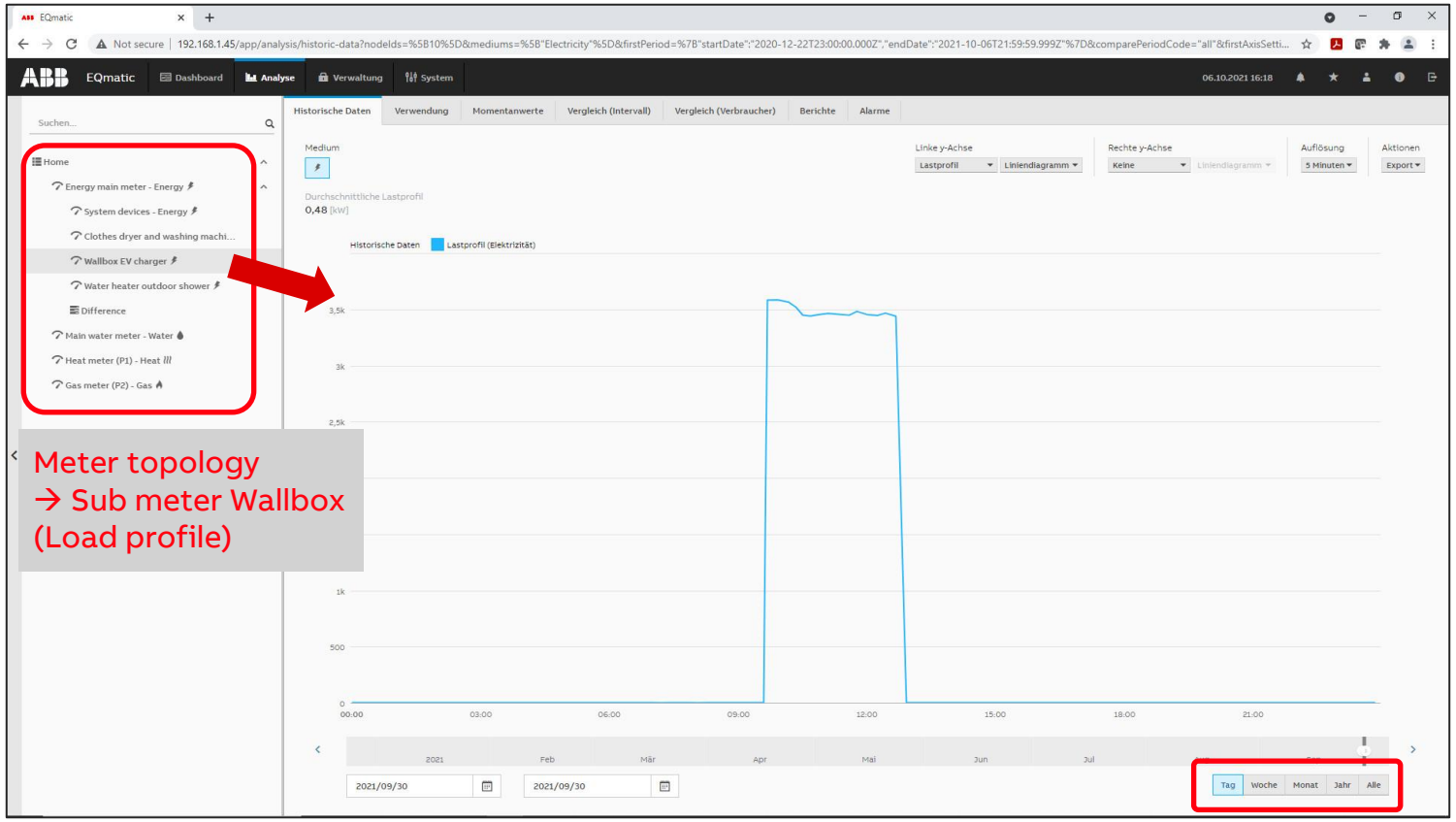

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

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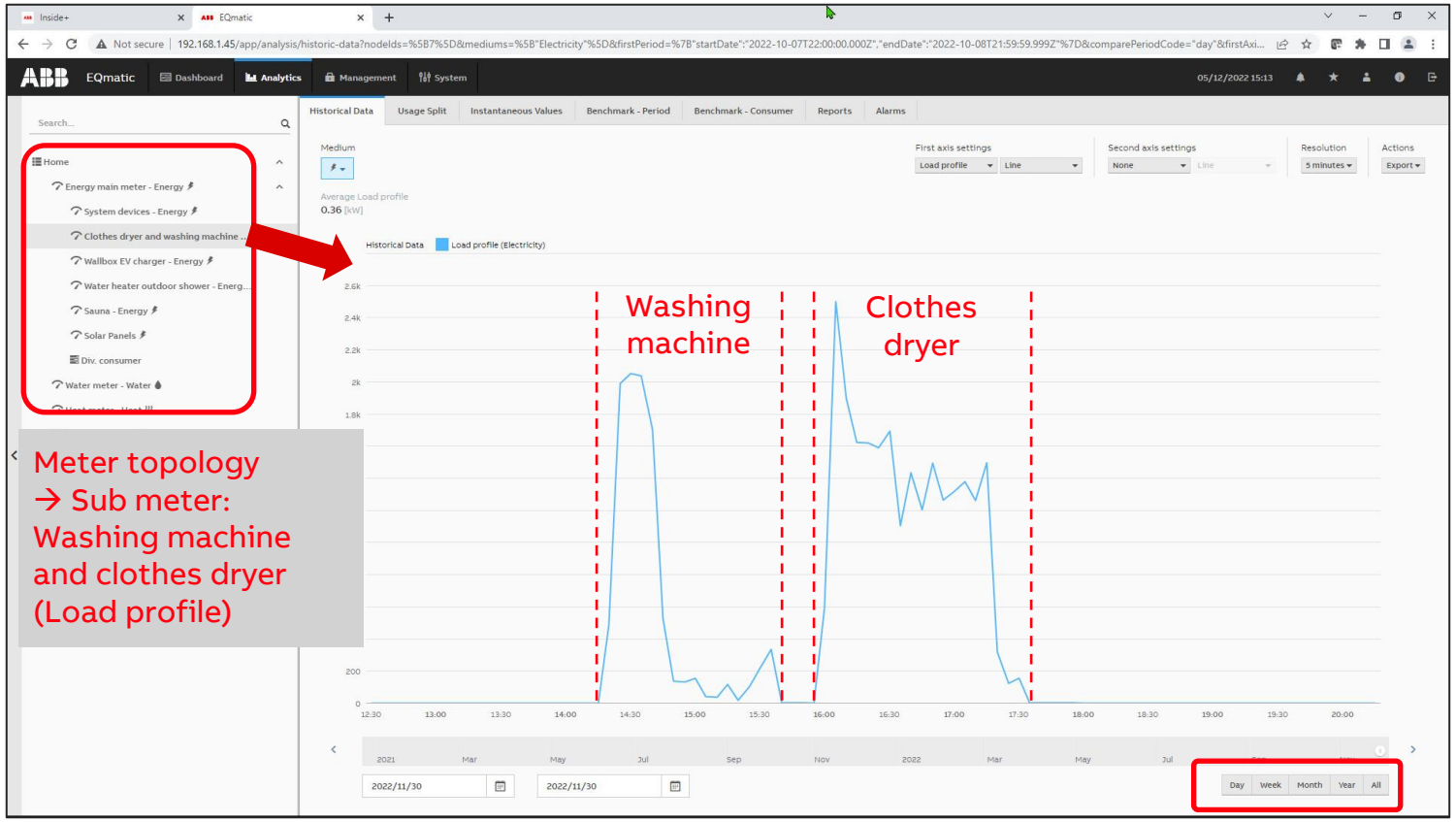

ABB EQmatic Energy Analyzer QA/S x.yy.1

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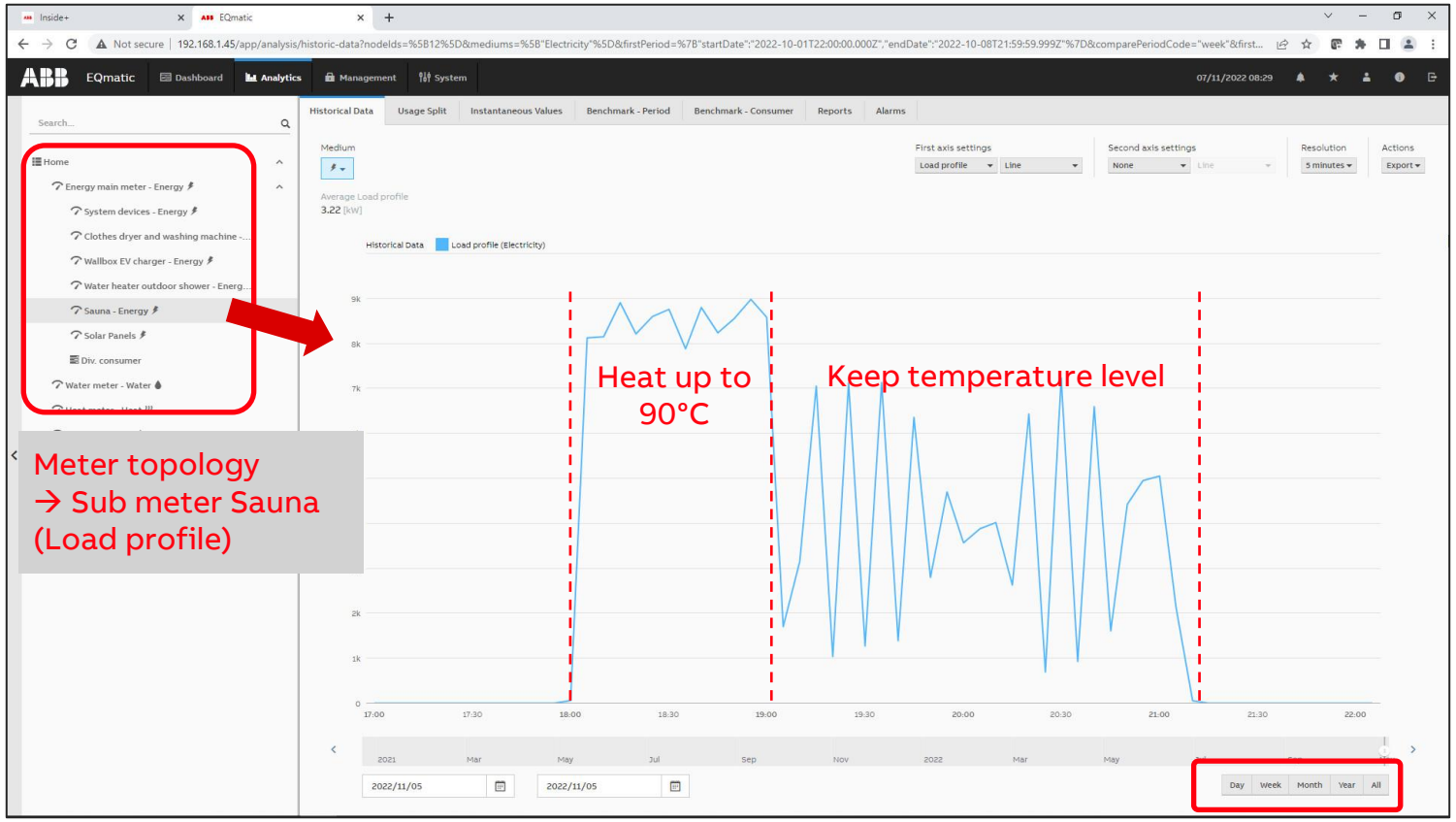

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Analytics – Historical Data

ABB Energy Analyzer QA/S

– record, store, visualize and analyze consumption and generation data of gas, water and energy meters

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Analytics – Historical Data

ABB Energy Analyzer QA/S

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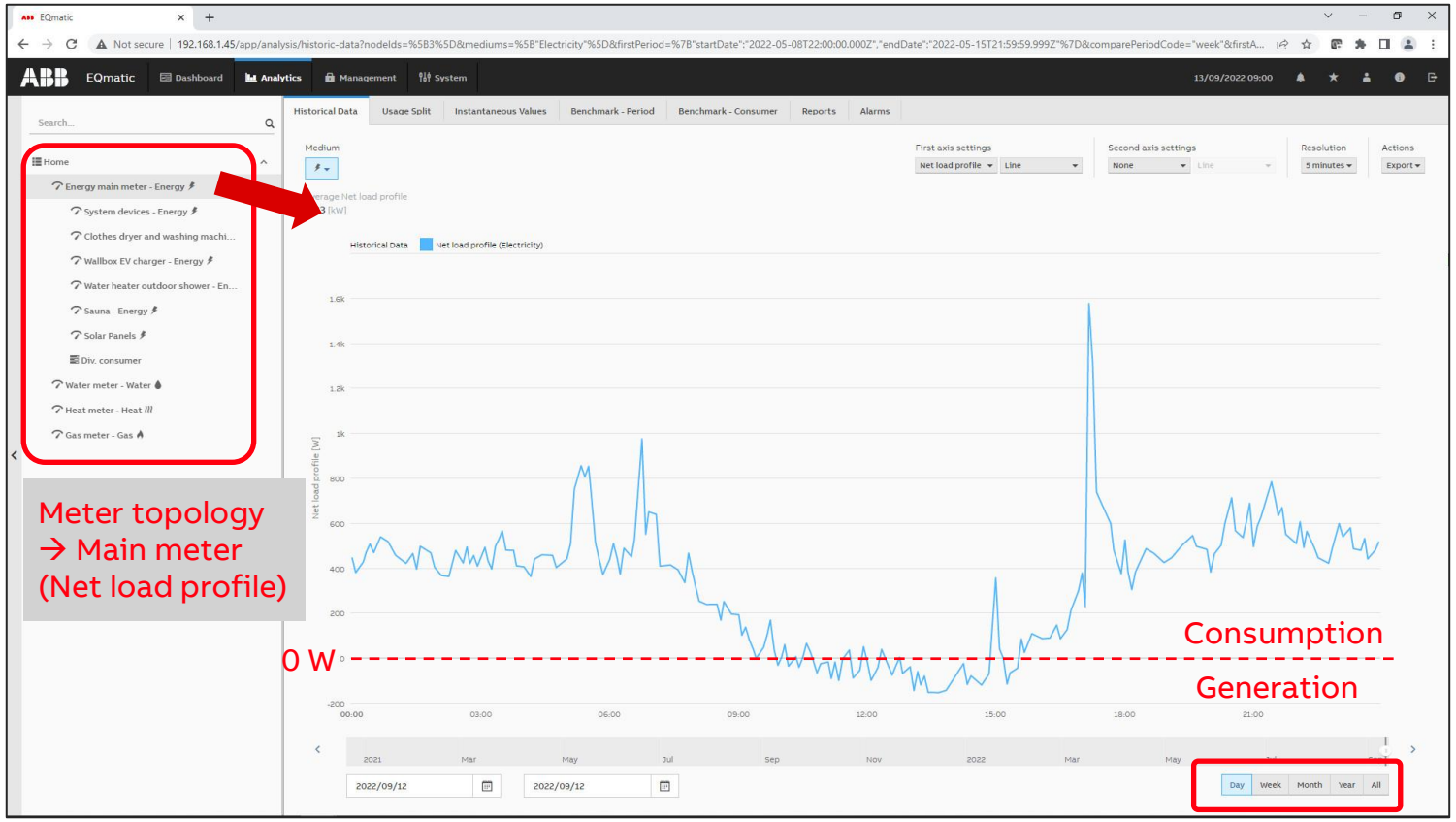

ABB EQmatic Energy Analyzer QA/S x.yy.1

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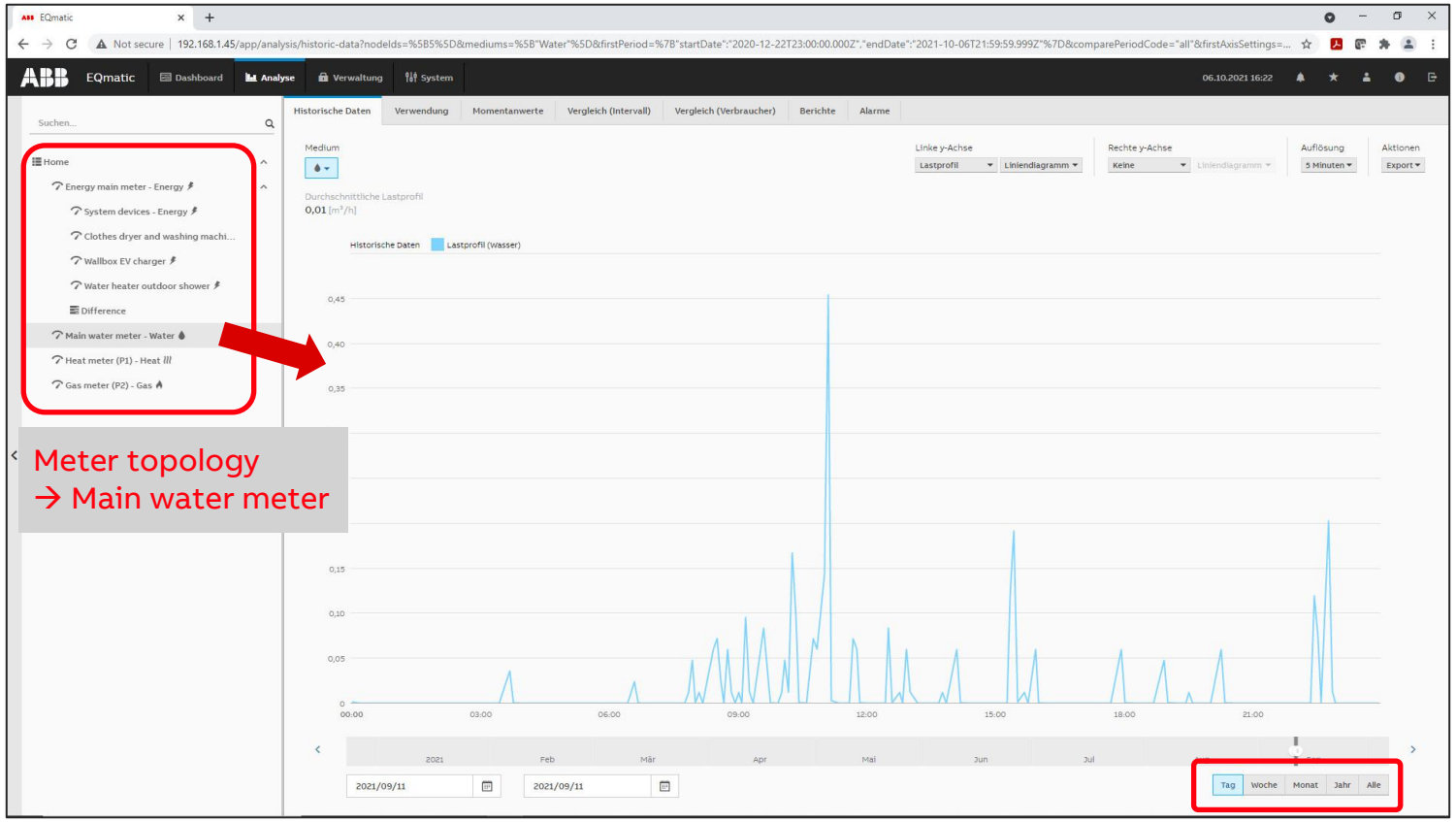

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

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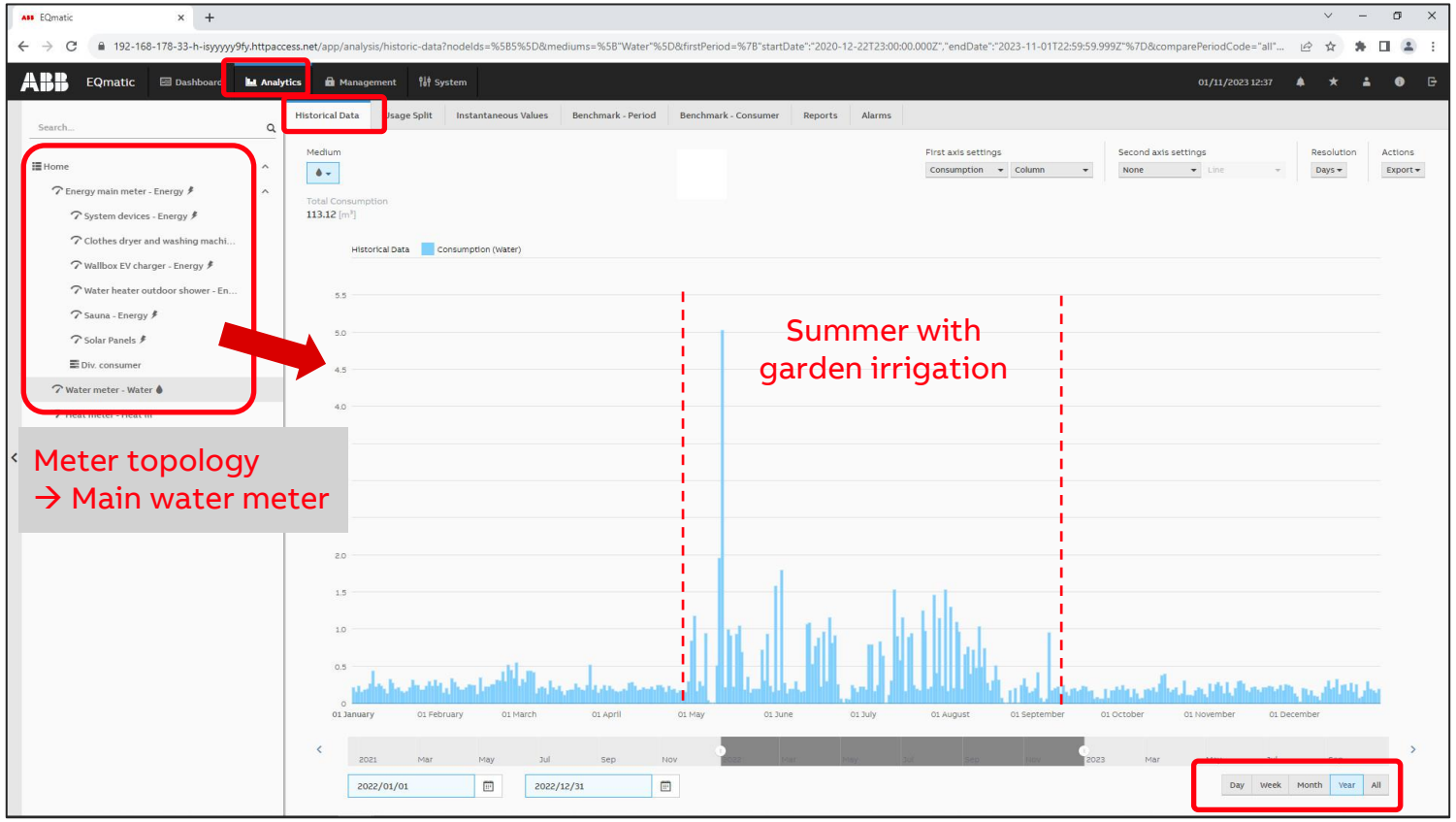

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Analytics – Historical Data

ABB Energy Analyzer QA/S

– record, store, visualize and analyze consumption and generation data of gas, water and energy meters

A constant flow of water is detected!

Cause:

– The toilet flush siphon bell is defective due to aging

– 400 liters of water loss per day!

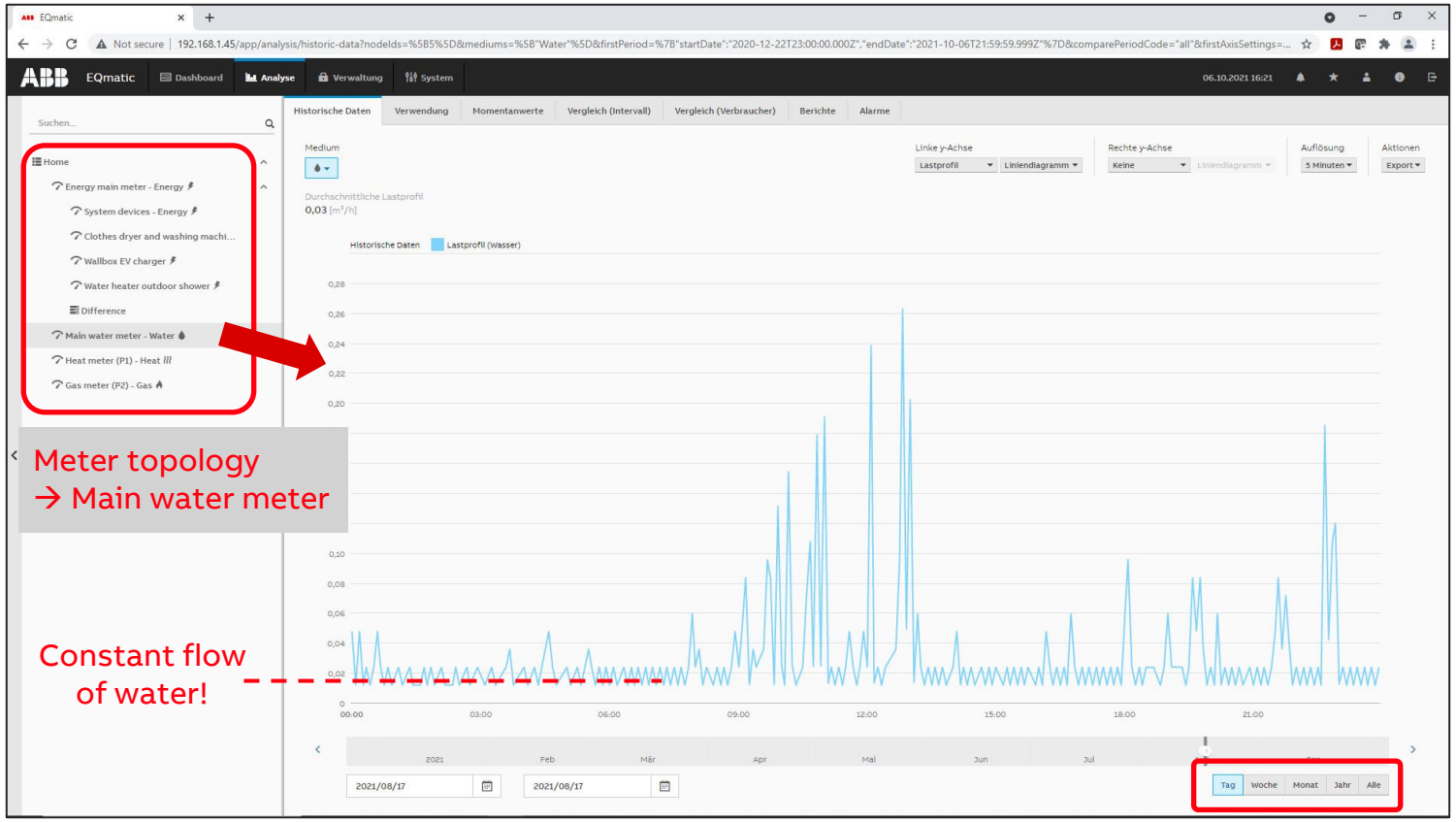

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Analytics – Historical Data

ABB Energy Analyzer QA/S

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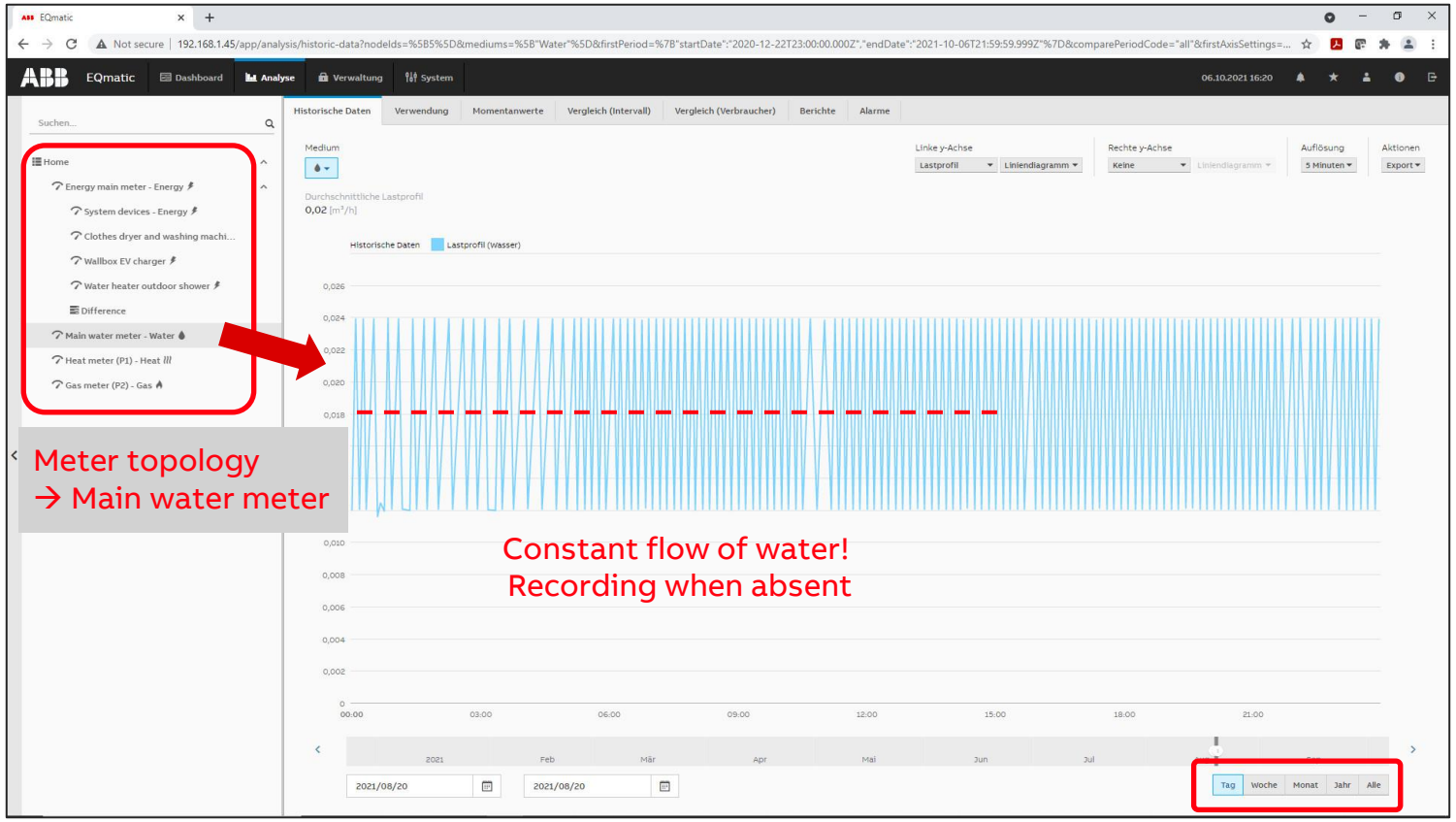

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Example: Analytics – Historical Data

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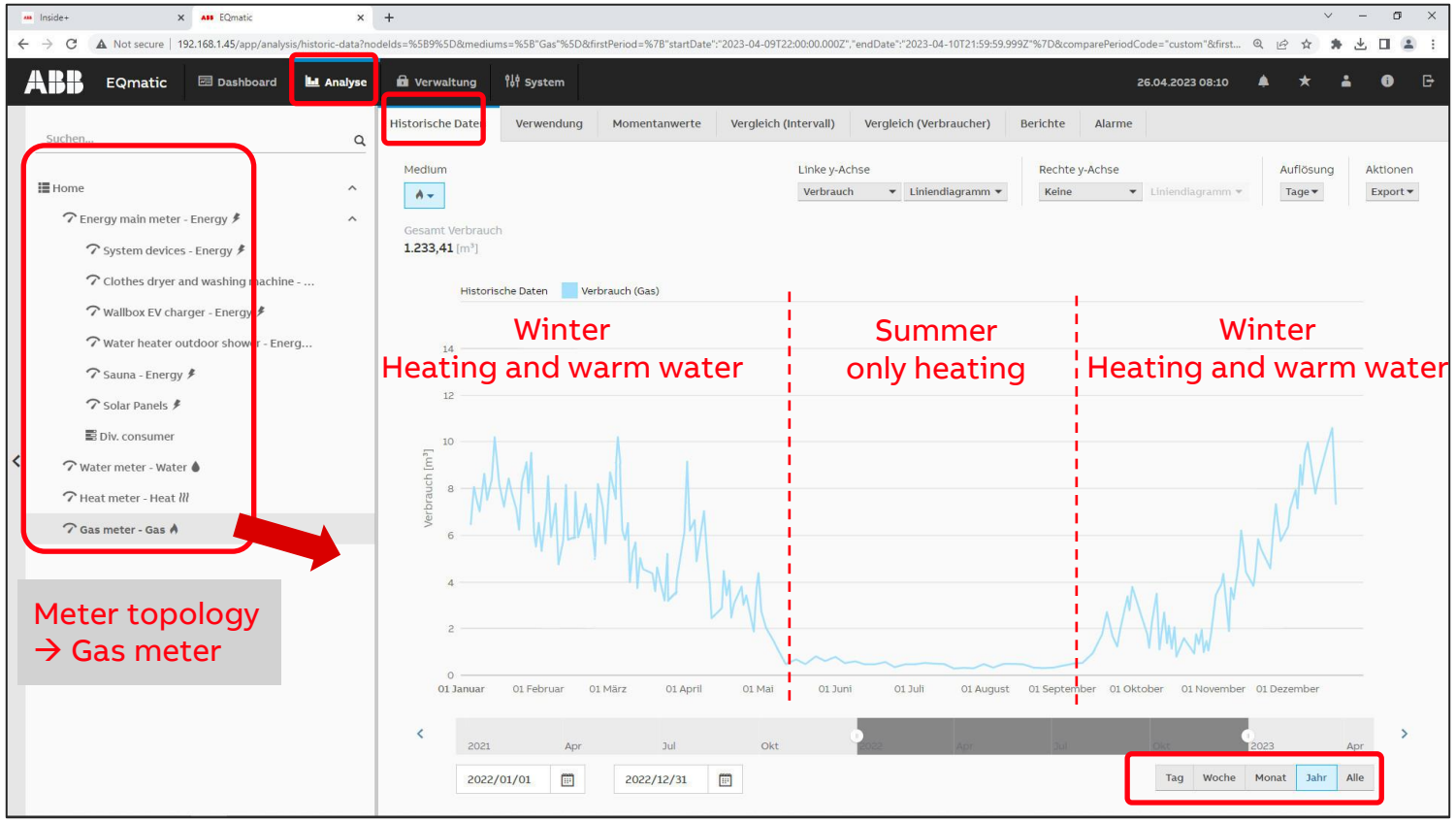

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

ABB i-bus® KNX

- KNX is an open standard (see EN 50090, ISO/IEC 14543) for commercial and domestic building automation administered by the KNX Association cvba, a non-profit organisation
- KNX devices can manage lighting, blinds and shutters, HVAC, security systems, energy management, audio video, white goods, displays, remote control, etc.
- KNX can use an use several physical communication media: twisted pair, powerline, RF (KNX-RF) and IP (KNXnet/IP)
- On this network, the devices form distributed applications and tight interaction is possible
- The KNX Association had 478 registered hardware and software vendor members from 44 nations

Source: WIKIPEDIA

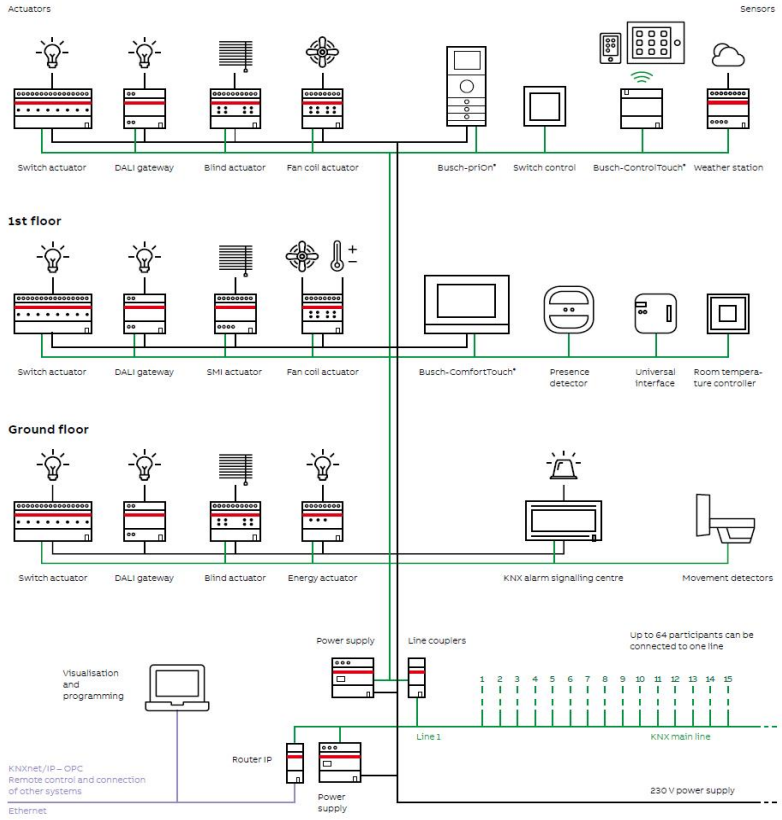

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

M-Bus

- M-Bus (Meter-Bus) is a technical standard (EN 13757-2), applying its rules, e.g. in electricity meters, allows the electricity consumption to be transmitted as measured data
- The gas, heat or water consumption can also be measured and transmitted by meters with M-Bus
- The special feature here is remote reading, which involves additional connected devices transmitting their collected data over the Internet or the mobile telecommunications network. This can eliminate the need for humans to read the meters

Source: WIKIPEDIA

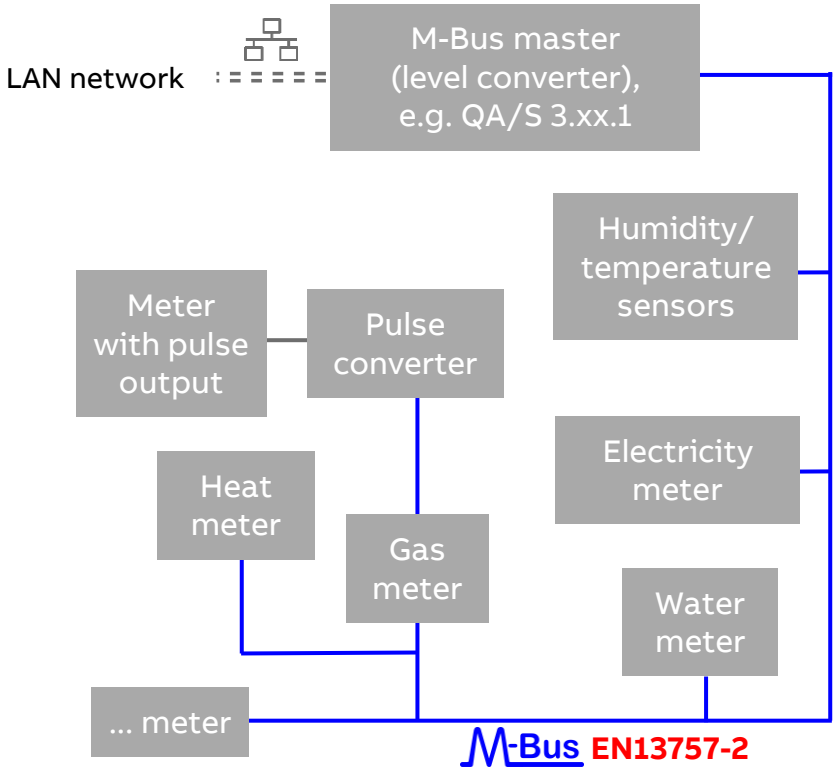

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Modbus RTU (RS485)

- Modbus is a serial communications protocol originally published by Modicon in 1979 for use with its programmable logic controllers (PLCs)
- Modbus has become a de facto standard communication protocol and is now a commonly available means of connecting industrial electronic devices
- The main reasons for the use of Modbus in the industrial environment are:
  - Developed with industrial applications in mind
  - Openly published and royalty-free
  - Easy to deploy and maintain

Source: WIKIPEDIA

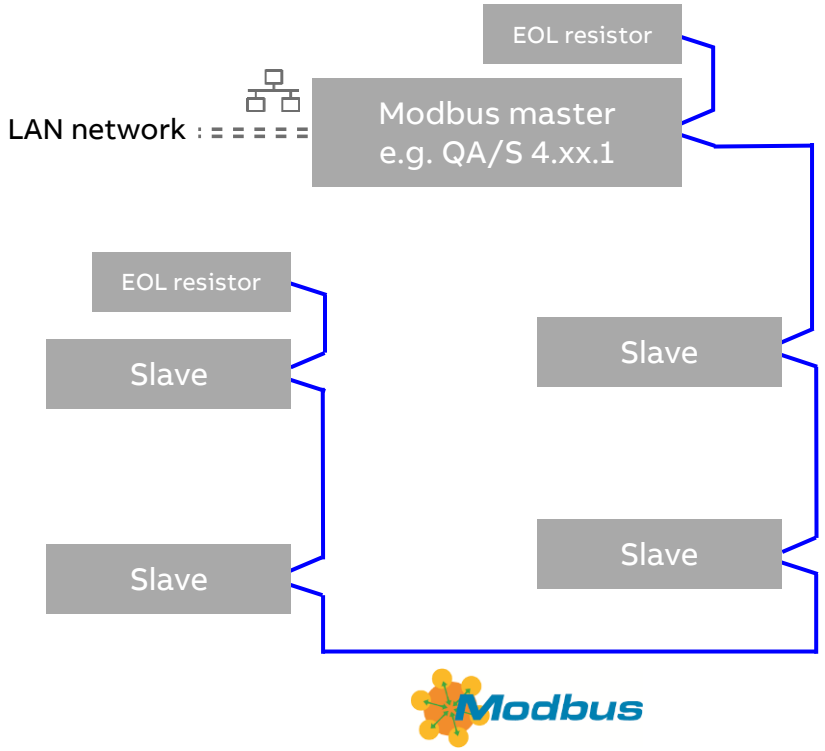

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Device overview

	QA/S 1.16.1	QA/S 3.16.1	QA/S 3.64.1	QA/S 4.16.1	QA/S 4.64.1
Protocol	KNX	M-Bus		Modbus RTU	
Max. devices	16	16	64	16	64
Design	Modular installation device (MDRC)				
Order code	2CDG 110 224 R0011	2CDG 110 226 R0011	2CDG 110 227 R0011	2CDG 110 228 R0011	2CDG 110 229 R0011
All devices have the same settings and menus (dashboard, historical data, …) → Only the commissioning step for scanning the connected meters (KNX, M-Bus or Modbus) is different → The KNX Energy Analyzer QA/S 1.16.1 offers additional features via KNX (e.g. load control)					

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Technical documents

www.abb.com/KNX

→ Products and Downloads

→ Energy Management

→ QA/S x.yy.1 Energy Analyzer

- Product Manual
- Technical datasheet
- Installation and operating instructions
- Specification text
- Product information
- Presentation slides
- CE declaration of conformity
- • •

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Training

Webinar recordings and slides

- "ABB EQmatic Energy Analyzer QA/S KNX" (January 2020) Link→PDF and Link→MP4
- "ABB EQmatic Energy Analyzer QA/S M-Bus and Modbus" (September 2018) Link→PDF and Link→MP4
- Webinar "ABB EQmatic Energy Analyzer QA/S 3.x.1" (October 2017) Link→PDF and Link→MP4

More documents are available on the Training & Qualification Database for ABB Home and Building Automation https://go.abb/ba-training

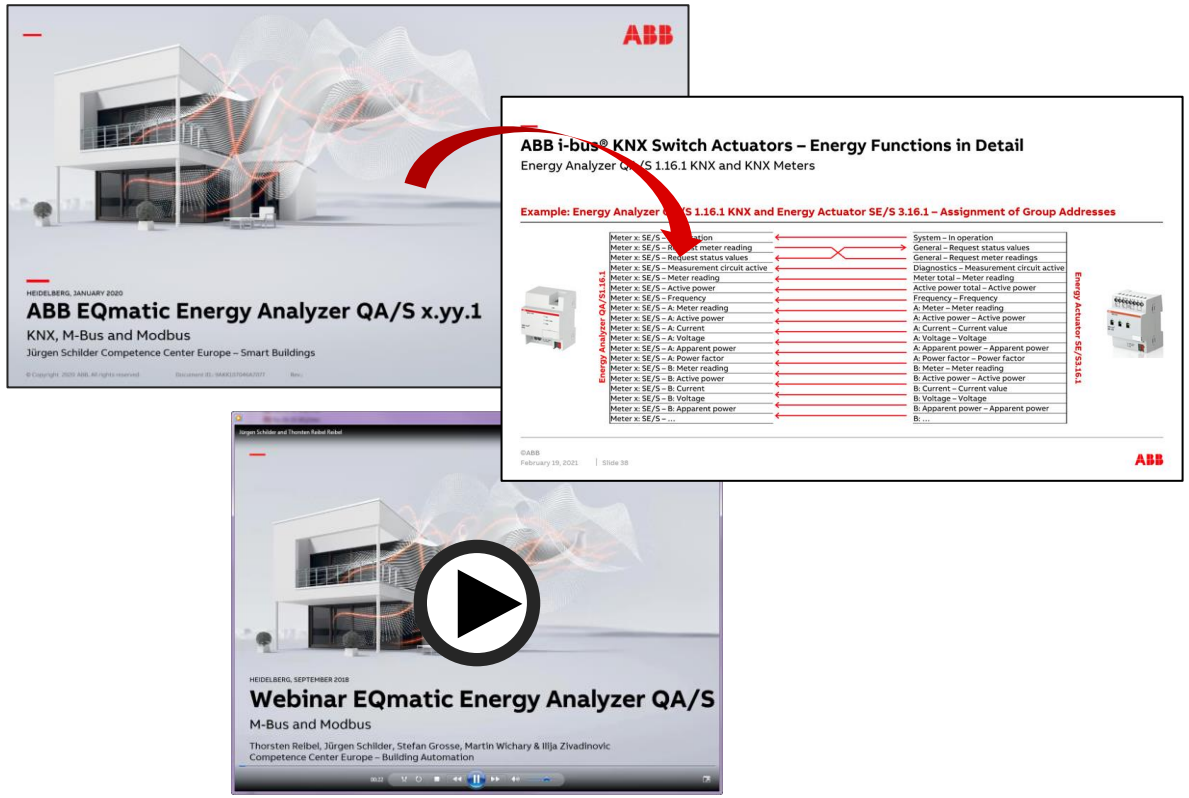

ABB EQmatic Energy Analyzer QA/S x.yy.1

Overview

Training

Webinar recordings and slides

- "ABB EQmatic Energy Analyzer QA/S – Commissioning of third-party meters" (February 2021)
  Link→PDF and Link→MP4
- "ABB EQmatic Energy Analyzer QA/S 1.16.1 KNX – Commissioning of ABB KNX meters" (February 2021)
  Link→PDF and Link→MP4
- KNX Switch Actuators – Energy Functions in Detail (Nov. 2020)
  Link→PDF and Link→MP4
- KNX Switch Actuators – Energy Functions (Nov. 2020)
  Link→PDF and Link→MP4
- …

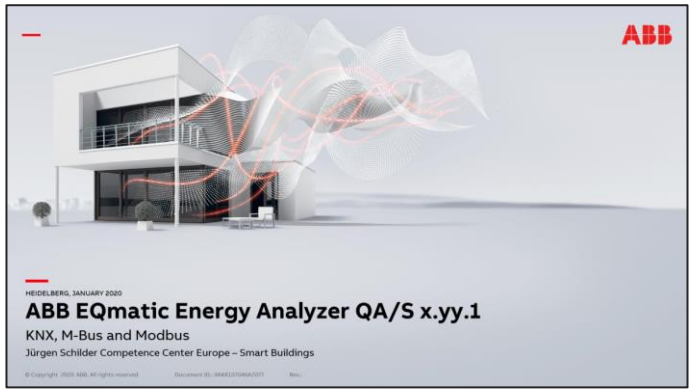

ABB EQmatic Energy Analyzer QA/S x.yy.1

Conclusion

Compact energy monitoring solution

This allows the customer to assign and monitor sub-metering data via web-based devices to improve energy efficiency and to lower costs

- Energy and cost allocation
- Reduce costs
- Compliance with local provisions (e.g. ISO 50001, RT 2012)

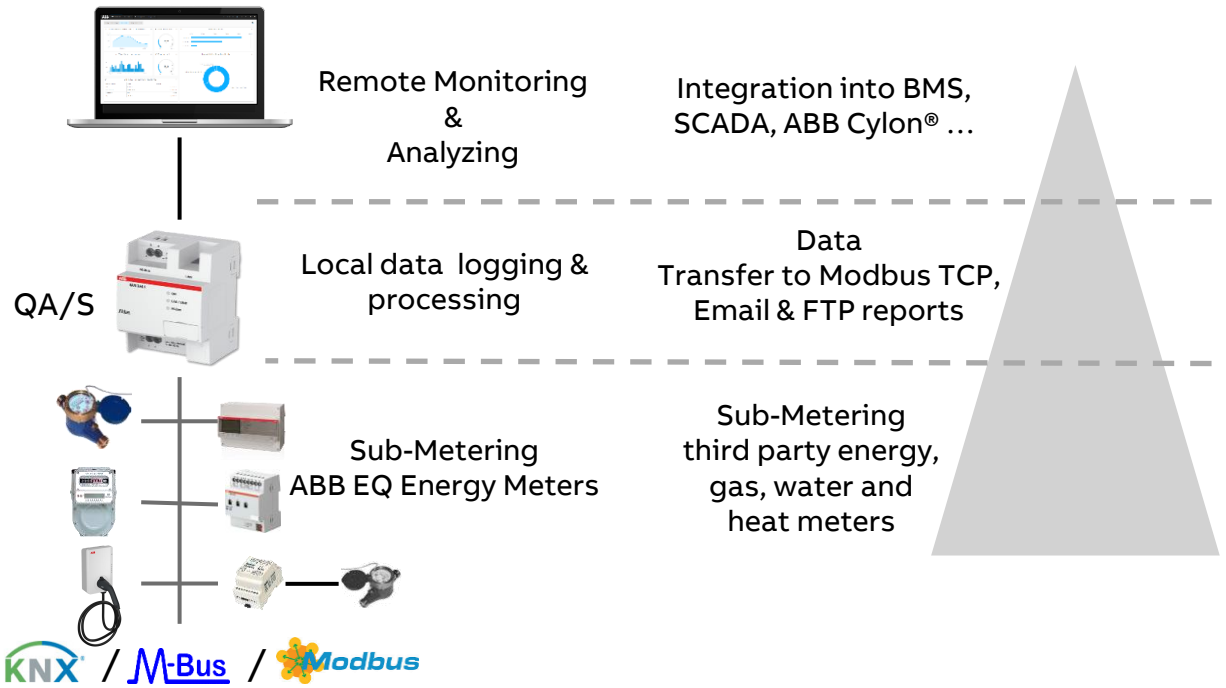

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 1

The Energy Analyzer QA/S 1.xx.1 records meter data via

A Modbus

B M-Bus

C KNX

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 1

The Energy Analyzer QA/S 1.xx.1 records meter data via

A Modbus

B M-Bus

C KNX

ABB EQmatic collects data from KNX meters and saves them locally in the device database

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 2

The Energy Analyzer QA/S 3.xx.1 records meter data via

A Modbus

B M-Bus

C S0 pulse outputs

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 2

The Energy Analyzer QA/S 3.xx.1 records meter data via

A Modbus

B M-Bus

C S0 pulse outputs

ABB EQmatic collects data from M-Bus meters and saves them locally in the device database

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 3

The Energy Analyzer QA/S 4.xx.1 records meter data via

A Modbus

B M-Bus

C KNX

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 3

The Energy Analyzer QA/S 4.xx.1 records meter data via

A Modbus

B M-Bus

C KNX

ABB EQmatic collects data from Modbus meters and saves them locally in the device database

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 4

Which types of consumption data can be recorded?

A. Any media such as electricity, gas, water or heat

B. Only Gas and water

C. Only electricity

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 4

Which types of consumption data can be recorded?

A Any media such as electricity, gas, water or heat

B Only Gas and water

C Only electricity

Consumption data of electricity, gas, water or heat

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer(s) is correct?

Question 5

The consumption data are ...

A ... recorded and forwarded to a higher management level (via Modbus TCP)

B ... saved, evaluated and displayed with a web browser

C ... recorded and sent on the KNX bus via an integrated interface

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer(s) is correct?

Question 5

The consumption data are ...

A … recorded and forwarded to a higher management level (via Modbus TCP)

B … saved, evaluated and displayed with a web browser

C … recorded and sent on the KNX bus via an integrated interface

Storing, analyzing and displaying data and sharing with other systems via Modbus TCP

Planning

ABB EQmatic Energy Analyzer QA/S x.yy.1

Planning

The appropriate standards, directives, regulations and specifications of the appropriate country should be observed when planning and setting up electrical installations

Operate the device only within the specified technical data

The Energy Analyzer is designed for use in 10/100 BaseT networks compliant to IEEE 802.3. The device features an AutoSensing function and sets the baud rate (10 or 100 Mbit) automatically.

Bus-specific requirements (e.g. max. cable length, etc.) must be observed

- Further information and documentation about M-Bus: www.m-bus.com
  - Standard EN 13757-1, “Communication systems for meters – Part 1: Data exchange”
  - Standard EN 13757-2, “Communication systems for meters – Part 2: Wired M-Bus communication”
  - Standard EN 13757-3, “Communication systems for meters – Part 3: Application protocols”
- Further information and documentation about Modus: www.modbus.org
- Further information and documentation about KNX: www.abb.com/knx and www.knx.org

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ABB EQmatic Energy Analyzer QA/S x.yy.1

What is M-Bus?

M-Bus (Meter-Bus) is a European standard for remotely reading gas, water, heat or electricity meters

- The M-Bus interface is designed for communication over two-wire lines
- This bus satisfies the special requirements for remotely powered or battery-operated meters
- The M-Bus is based on the master-slave principle
- The meters send the collected measured values and data to a common master for further processing on request
- A unique address must be set in each meter
- Master = Level converter, e.g. QA/S 3.xx.1 Energy Analyzer
- Slave = M-Bus device/meter (e.g. ABB electricity meter from the A and B series, water meter, heat meter, gas meter, etc., with M-Bus interface)
- An M-Bus installation can consist of up to 250 addresses (meters)

The QA/S 3.xx.1 Energy Analyzer supports up to 16 or 64 meters, depending on the device type

ABB EQmatic Energy Analyzer QA/S x.yy.1

What is M-Bus?

The M-Bus is designed for baud rates from 300 to 9,600 baud

ABB meters from the A and B series can communicate at baud rates of 2,400 to 9,600 baud

The baud rate must be set in the meter

The M-Bus interface is protected against polarity reversal, i.e. the wires of the cable used can be interchanged

The M-Bus supports different bus topologies

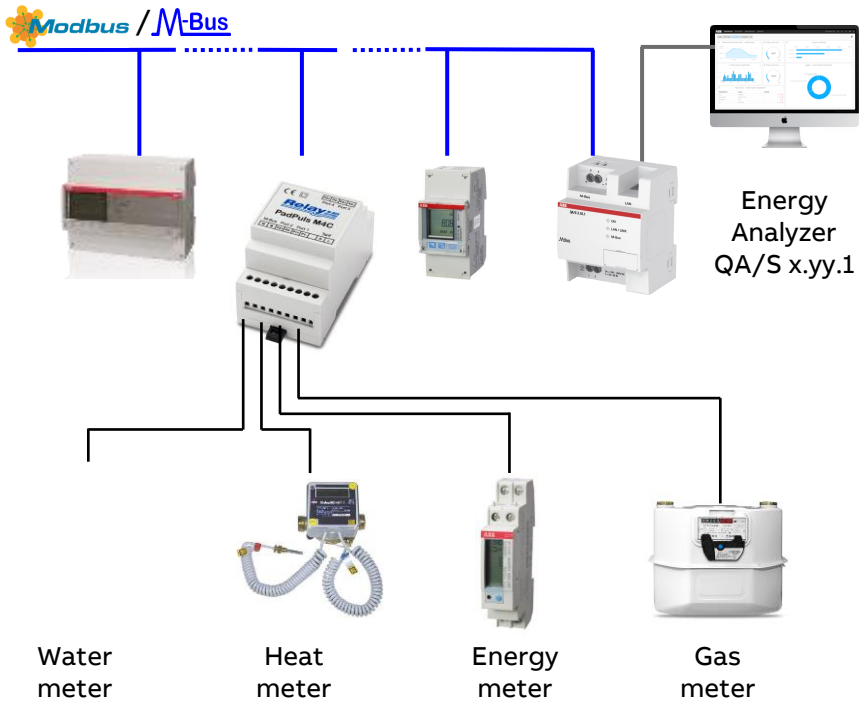
– The cables should be kept as short as possible

– A combination star, tree and linear structure is typically used; a ring structure is impermissible

ABB EQmatic Energy Analyzer QA/S x.yy.1

M-Bus pulse adapter M-Bus

- A pulse adapter is used to adapt consumption measuring devices, e.g. electricity, gas or water meters, to the M-Bus/Modbus system
- The measuring devices must feature a floating pulse output or a mounted pulse module for sensing
- Pulse adapters with different numbers of channels are available as rail-mounted devices and in surface mounted enclosures, etc.
- Configuration (primary address, medium, unit, …) is performed using a programming adapter and software



Meter with pulse output or pulse module for scanning

ABB EQmatic Energy Analyzer QA/S x.yy.1

Energy Analyzer M-Bus QA/S 3.xx.1: Technical data

- Energy Analyzer, M-Bus master to DIN EN 13757-2
- Max. number of M-Bus slaves on QA/S 3.16.1: 16
- Max. number of M-Bus slaves on QA/S 3.64.1: 64
- M-Bus baud rate: 300; 600; 1,200; 2,400; 4,800; 9,600
- Operating voltage: Us 100…240 V AC, 50/60 Hz
- Power consumption at 230 V AC < 10 W
- Device leakage loss at 230 V AC < 3 W at 230 V AC
- Simultaneous access to web browser for up to 10 users
- Retrieval/storage of meter data every 5 minutes
- IP security: HTTPS, SSL
- Data export: JPG, PNG, CSV, XLSX, PDF
- Data transfer: Modbus TCP
- Report: FTP and e-mail

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Energy Analyzer M-Bus QA/S 3.xx.1: Technical data

- Storage capacity with up to 64 M-Bus slaves: min. 3 years
- IP network connection: Ethernet 10 / 100 Mb to IEEE 802.3
- Temperature range in operation: -5 °C … +45 °C
- Environmental conditions: humidity max. 93%; dew formation must be ruled out
- Design: modular installation device (MDRC) in Pro M design
- Dimensions: 90 x 70 x 64 mm (H x W x D)
- Mounting: On 35 mm mounting rail to DIN EN 60 715
- Mounting position: Any
- Display elements: LEDs to indicate operational readiness, network connection and M-Bus operational readiness
- Operating element: Reset button

ABB EQmatic Energy Analyzer QA/S x.yy.1

What is Modbus RTU?

- Modbus is a serial communication protocol that was developed and published for use with programmable logic controllers (PLC)
- Modbus RTU (remote terminal unit) is the most common implementation available for Modbus
- It is a communication method for the transmission of information via serial cables between electronic devices
- The device that requests the information is termed the Modbus master
- The devices that send the information are Modbus slaves
- In a standard Modbus network there is one master and up to 247 slaves each with a unique slave address from 1 to 247

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What is Modbus RTU?

Bus principle RS485

- The Modbus standard uses the RS485 standard
- This standard defines the physical layer of the Modbus interface
- The data are transmitted in serial form via a 2-wire bus (RS485)
- The RS485 standard is based on the master – slave method and defines the bus cable as a cable with a start and an end that are each terminated using an EOL resistor RT (T=Termination)
- Master = level converter (e.g. QA/S 4.xx.1 Energy Analyzer)
- Slave = Modbus device/meter (e.g. ABB electricity meter from the A and B series, water meter, heat meter, gas meter, etc., with Modbus RTU interface)

Transmission speed: 300; 600; 1,200; 2,400; 4,800; 9,600; 19,200; 38,400; 57,600; 115,200 baud

Polarity: Attention must be paid to the correct polarity of the core pairs during installation because incorrect poling will invert the data signal

ABB EQmatic Energy Analyzer QA/S x.yy.1

What is Modbus RTU?

Topology

- The optimal cable topology for the Modbus RTU is a purely linear structure
- Droplines to individual devices with a maximum length of 1 m are allowed
- These droplines are not terminated

Cable types

- A twisted pair, screened cable is recommended as the bus cable
- The cable type J-Y(St)Y n x 2 x 0.8mm is suitable, for instance
- The screen is to be connected to PE at one end
- The bus cable must be terminated with resistors (120 Ω, 0.25 W) at both ends so that only minimal reflections are produced
- The serial communication on the RS485 interface operates most efficiently if the source and load impedance are matched at 120 Ohm
- The EOL resistors are connected in parallel with terminals A and B and are included in the scope of delivery

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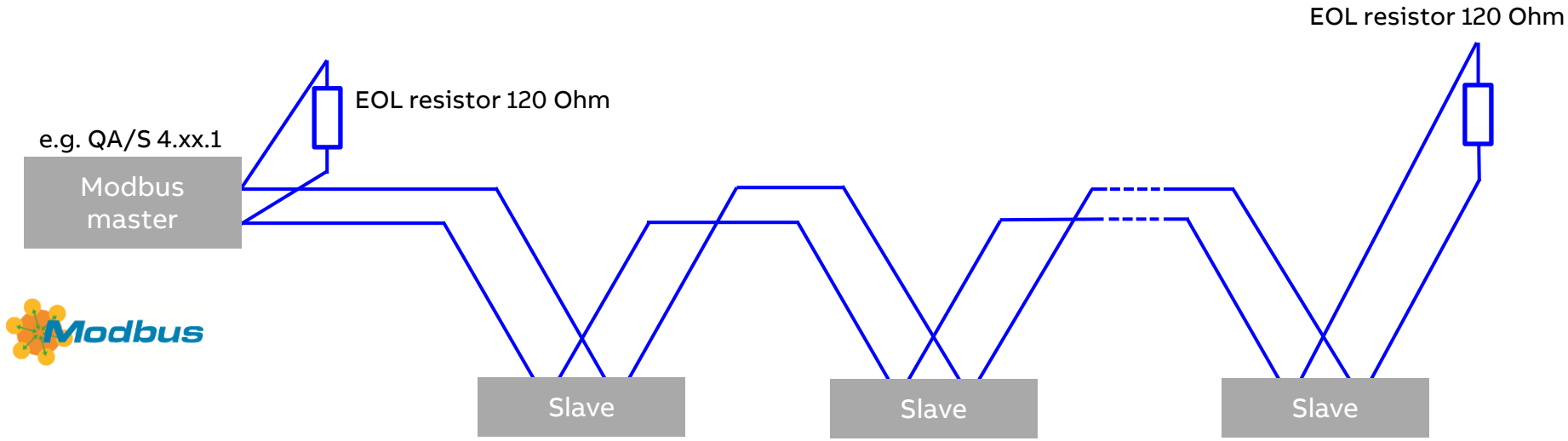
What is Modbus RTU?



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What is Modbus RTU?

Cable length

– The RS485 specification limits the cable length to 1,200 m, the number of devices in the bus to 32 and stipulates a linear topology (daisy chain)

Number of devices

– The number of Modbus devices depends on the unit load (UL) of the RS485 transceivers
– In the worst case a transceiver has 1 UL
– An RS485 segment is specified for 32 UL
– If more devices are to be connected, a repeater must be used
– Modern RS485 transceivers have 1/4 or 1/8 UL

If only such devices are used, 128 or 256 users are possible without repeaters

Note

– The ABB A and B Series Energy Meters have a unit load of 1/8 UL
– Therefore 64 ABB meters can be connected to the QA/S 4.64.1 Energy Analyzer without repeaters

ABB EQmatic Energy Analyzer QA/S x.yy.1

Energy Analyzer Modbus RTU QA/S 4.xx.1: Technical data

- Energy Analyzer, Modbus-Bus master
- Max. number of Modbus RTU slaves on QA/S 4.16.1: 16
- Max. number of Modbus RTU slaves on QA/S 4.64.1: 64
- Modbus baud rate: 1,200; 2,400; 4,800; 9,600; 19,200; 38,400; 57,600; 115,200
- Operating voltage: Us 100…240 V AC, 50/60 Hz
- Power consumption at 230 V AC < 10 W
- Device leakage loss at 230 V AC < 3 W at 230 V AC
- Simultaneous access to web browser for up to 10 users
- Retrieval/storage of meter data every 5 minutes
- IP security: HTTPS, SSL
- Data export: JPG, PNG, CSV, XLSX, PDF
- Data transfer: Modbus TCP
- Report: FTP and e-mail

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Energy Analyzer Modbus RTU QA/S 4.xx.1: Technical data

- Storage capacity with up to 64 Modbus RTU slaves: min. 3 years
- IP network connection: Ethernet 10 / 100 Mb to IEEE 802.3
- Temperature range in operation: -5 °C … +45 °C
- Environmental conditions: humidity max. 93%; dew formation must be ruled out
- Design: modular installation device (MDRC) in Pro M design
- Dimensions: 90 x 70 x 64 mm (H x W x D)
- Mounting: On 35 mm mounting rail to DIN EN 60 715
- Mounting position: Any
- Display elements: LEDs to indicate operational readiness, network connection and Modbus RTU operational readiness
- Operating element: Reset button

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ABB EQmatic Energy Analyzer QA/S x.yy.1

What is KNX?

- KNX is the synonym for smart home and intelligent building control
- In this innovative system, all devices communicate with one another via a single bus cable which is installed alongside the normal power lines
- This means that all electrical functions are connected with one another via the bus system, both in residential and commercial buildings
- With the KNX system, the buildings we occupy are easier to manage and control, resulting in increased flexibility, security, economic efficiency and convenience
- The operational flexibility of an KNX electrical installation allows the everyday working or living environment to be easily adapted to the individual's needs - now and in the future
- Utilizing KNX means cost advantages throughout the entire lifetime: From planning and implementation, through the building phase, sale or rental, right up to operation and administration
- This ensures that the building well be up-to-date and profitable in the long-term thus ensuring a short amortization period

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What is KNX?

Main Advantages

- International Standard, therefore future proof (EN13321-1/2, ISO/IEC14543-3, in US ANSI/ASHRAE standard 135, SAC GB/T 20965,…
- By product certification, KNX guarantees Interoperability & Interworking of products
- KNX stands for high product quality (ISO 9001)
- A unique manufacturer independent Engineering Tool Software ETS®
- KNX can be used for all applications in home and building control
- KNX is fit for use in different kind of buildings: New or existing buildings, one family houses or large size buildings
- KNX supports several communication media (TP, PL, RF and IP)
- KNX can be coupled to other systems (BACnet, DALI, DMX, RS485, M-BUS, …)
- KNX is independent from any hard- or software technology

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What is KNX?

Application Areas

- Lighting control and regulation
- Heating, ventilation, cooling
- Blinds and shutter control
- Security and monitoring
- Energy and load management
- Visualisation and operation
- Central automatic
- Remote control / maintenance
- Interface to other control systems
- ...

ABB EQmatic Energy Analyzer QA/S x.yy.1

What is KNX?

The KNX structure created is very flexible in its design due to the possible connection of the devices: linear, tree and star wiring configurations are allowed

The topological configuration includes lines and areas

A line is the smallest unit

– Up to 64 devices can be connected to a line

– At most 15 lines can be combined via line couplers to one area

– A bus system can be extended up to 15 areas (app. 15,000 devices and max. 57,000)

Transmission speed: 9,600 bit/s

Bus access method: CSMA/CA

“Programming” by the Engineering Tool Software ETS

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Energy Analyzer KNX QA/S 1.16.1: Technical data

- KNX device certified according to EN 50491
- Max. number of KNX meters: 16
- Maximum number of group objects: 1,630
- Maximum number of group addresses: 2,000
- KNX Bus voltage 21…32 V DC
- KNX current consumption, bus < 12 mA
- Operating voltage: Us 100…240 V AC, 50/60 Hz
- Power consumption at 230 V AC < 10 W
- Device leakage loss at 230 V AC < 3 W at 230 V AC
- Simultaneous access to web browser for up to 10 users
- Retrieval/storage of meter data every 5 minutes
- IP security: HTTPS, SSL

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Energy Analyzer KNX QA/S 1.16.1: Technical data

- Data export: JPG, PNG, CSV, XLSX, PDF
- Data transfer: Modbus TCP
- Report: FTP and e-mail
- Storage capacity with up to 16 KNX devices: min. 3 years
- IP network connection: Ethernet 10 / 100 Mb to IEEE 802.3
- Temperature range in operation: -5 °C … +45 °C
- Environmental conditions: humidity max. 93%; dew formation must be ruled out
- Design: modular installation device (MDRC) in Pro M design
- Dimensions: 90 x 70 x 64 mm (H x W x D)
- Mounting: On 35 mm mounting rail to DIN EN 60 715
- Mounting position: Any
- Display elements: LEDs to indicate operational readiness, network connection and KNX bus operational readiness
- Operating element: Reset button

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 1

What supply voltage does a Energy Analyzer QA/S require?

- **A** 12…240 V AC/DC
- **B** 12…24 V DC
- **C** 100…240 V AC

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 1

What supply voltage does a Energy Analyzer QA/S require?

A 12…240 V AC/DC

B 12…24 V DC

C 100…240 V AC

Operating voltage: U_s 100…240 V AC

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 2

What are the connections on the Energy Analyzer QA/S 1.16.1?

A Supply voltage, Modbus RTU and IP network

B Supply voltage, M-Bus and IP network

C KNX bus connection, supply voltage and IP network

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 2

What are the connections on the Energy Analyzer QA/S 1.16.1?

A Supply voltage, Modbus RTU and IP network

B Supply voltage, M-Bus and IP network

C KNX bus connection, supply voltage and IP network

Supply voltage – KNX – IP network

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 3

What are the connections on the Energy Analyzer QA/S 3.xx.1?

A Supply voltage, Modbus RTU and IP network

B Supply voltage, M-Bus and IP network

C KNX bus connection, supply voltage and IP network

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 3

What are the connections on the Energy Analyzer QA/S 3.xx.1?

A Supply voltage, Modbus RTU and IP network

B Supply voltage, M-Bus and IP network

C KNX bus connection, supply voltage and IP network

Supply voltage – M-Bus – IP network

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 4

What are the connections on the Energy Analyzer QA/S 4.xx.1?

A Supply voltage, Modbus RTU and IP network

B Supply voltage, M-Bus and IP network

C KNX bus connection, supply voltage and IP network

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 4

What are the connections on the Energy Analyzer QA/S 4.xx.1?

A Supply voltage, Modbus RTU and IP network

B Supply voltage, M-Bus and IP network

C KNX bus connection, supply voltage and IP network

Supply voltage – Modbus RTU – IP network

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 5

What functions do all Energy Analyzer QA/S offer?

A

- Cost/consumption analysis for media such as electricity and water
- Networking several Energy Analyzer QA/S devices via IP network
- CO_2 emissions display

B

- Data export to xls, csv, pdf, etc.
- Addition of Favorites
- Load management by avoiding load peaks

C

- Storage of metering data from up to 64 meters for at least 3 years
- Display and evaluation of historical consumption/measured data
- Customizable dashboard with predefined widgets

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 5

What functions do all Energy Analyzer QA/S offer?

A

- Cost/consumption analysis for media such as electricity and water
- Networking several Energy Analyzer QA/S devices via IP network
- CO_2 emissions display

B

- Data export to xls, csv, pdf, etc.
- Addition of Favorites
- Load management by avoiding load peaks

C

- Storage of metering data from up to 64 meters for at least 3 years
- Display and evaluation of historical consumption/measured data
- Customizable dashboard with predefined widgets

Storing metering data – historical consumption/measured data – configurable dashboard

Installing

ABB EQmatic Energy Analyzer QA/S x.yy.1

Installation

- Attention! Hazardous voltage! Mounting and commissioning may be carried out only by electrical specialists
- The appropriate standards, directives, regulations and specifications of the appropriate country should be observed when setting up electrical installations
- Operate the device only within the specified technical data
- The device must be operated only in an enclosed housing (distribution board)
- Refer to the product manual or the installation and operating instructions for a detailed description of installation and commissioning

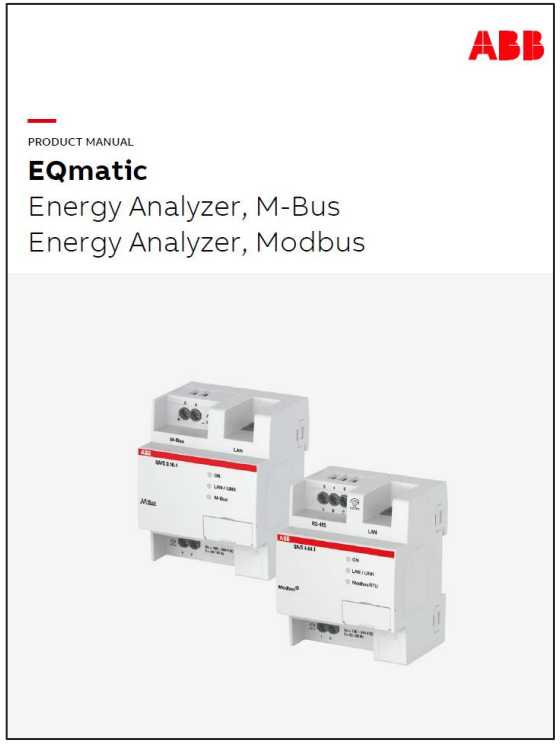

ABB EQmatic Energy Analyzer QA/S x.yy.1

Mounting and installation

- The device is a modular installation device for quick installation in distribution boards on 35 mm mounting rails to DIN EN 60 715
- The installation position can be selected as required
- Electrical connection and M-Bus/Modbus connection are performed via screw terminals
- The connection to the ABB i-bus® KNX is established via the supplied bus connection terminal (QA/S 1.16.1 KNX)
- The device is ready for operation once the operating voltage is on and the initialization process has finished (green LED lights up continuously)
- The device must be accessible for operation, testing, visual inspection, maintenance and repair in compliance with DIN VDE 0100-520

QA/S 3.xx.1

M-Bus

QA/S 4.xx.1

Modbus

QA/S 1.16.1

KNX

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Scope of delivery

- Energy Analyzer QA/S x.yy.1 with label carrier
- Installation and operating instructions
- Lettering inlay for label carrier
- IP address assignment is set to automatic addressing (DHCP/AutoIP)
- Language: Dependent on the language setting in the browser used
- Currency: EUR
- QA/S 4.xx.1 Modbus
  - Two EOL resistors 120 Ohm

  QA/S 1.16.1 KNX
  - KNX physical address 15.15.255
  - Bus connection terminal (red/black)
  - KNX connection cover cap

Montage- und Betriebsanleitung
Installation and Operating Instructions
Mode d´emploi
Instrucciones de montaje de servicio
Istruzioni per l´uso
Montage- en bedieningshandleiding
Instrukcja montażu i eksploatacji
Руководство по монтажу и эксплуатации
安装和操作手册

QA/S 3.16.1
QA/S 3.64.1

DE Energie Analyzer, M-Bus
EN Energy Analyzer, M-Bus
FR Energy Analyzer, M-Bus
ES Medidor de Energía, M-Bus
IT Energy Analyzer, M-Bus
NL Energy Analyzer, M-Bus
PL Analizator Energii, M-Bus
RU Интерфейс, M-Bus
CN 能源信息管理器, M-Bus

2CDG941193P0001

ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 1.16.1 KNX: Connection diagram

1	Label carrier
2	KNX programming LED (red)
3	KNX programming button
4	KNX connection
5	Cover cap
6	Us supply voltage connection
7	Ethernet/LAN connection
8	ON LED (green)
9	LAN/LINK LED (yellow)
10	KNX telegram LED (yellow)
11	Reset button (behind label carrier)

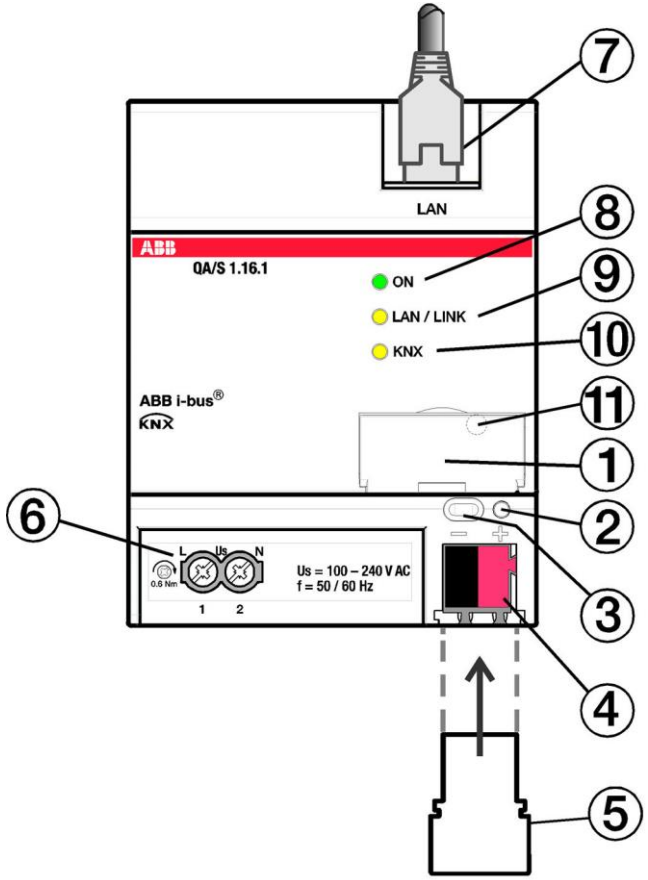


ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 3.xx.1 M-Bus: Connection diagram

1	Power supply connection U_s
2	M-Bus slave/meter connection
3	Ethernet/LAN connection
4	ON LED (green)
5	LAN/LINK LED (yellow)
6	M-Bus LED (yellow)
7	Reset button (behind label carrier)
8	Label carrier

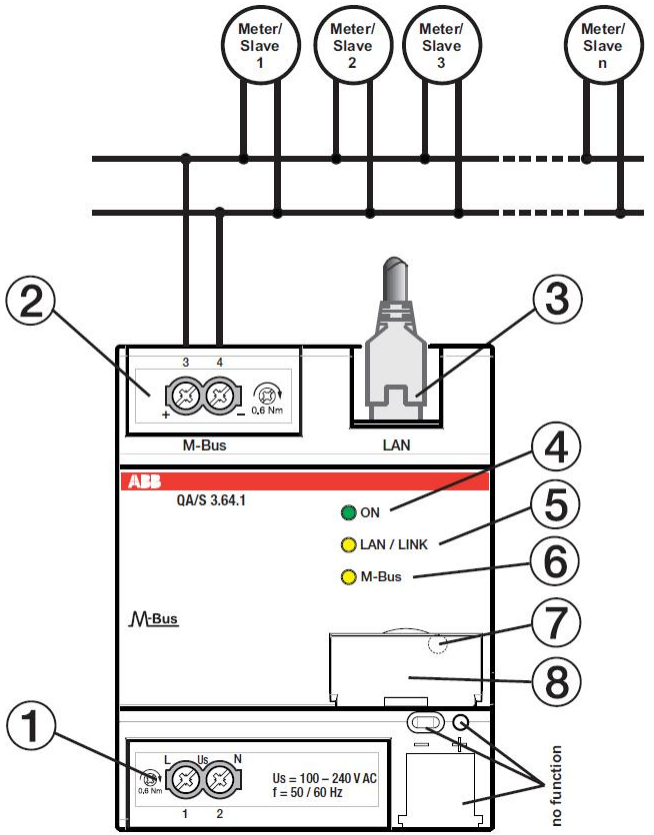


ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 4.xx.1 Modbus: Connection diagram

1	Power supply connection U_s
2	Modbus slaves/meter connection (RS485)
3	Ethernet/LAN connection
4	ON LED (green)
5	LAN/LINK LED (yellow)
6	Modbus RTU LED (yellow)
7	Reset button (behind label carrier)
8	Label carrier

- The bus cable must be terminated with resistors (120 Ω, 0.25 W) at both ends
- A third conductor must interconnect all the devices of the bus (terminal “C” – common)

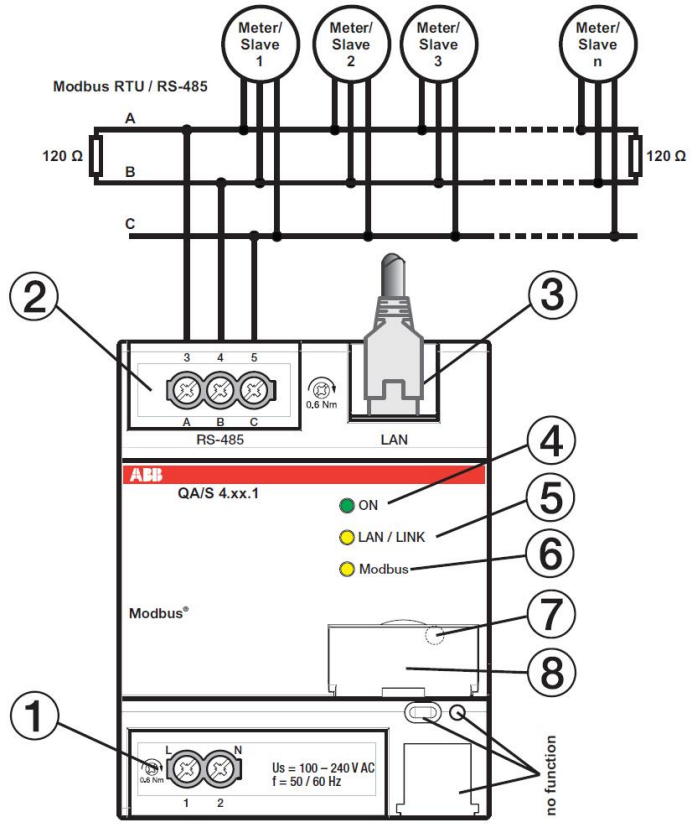
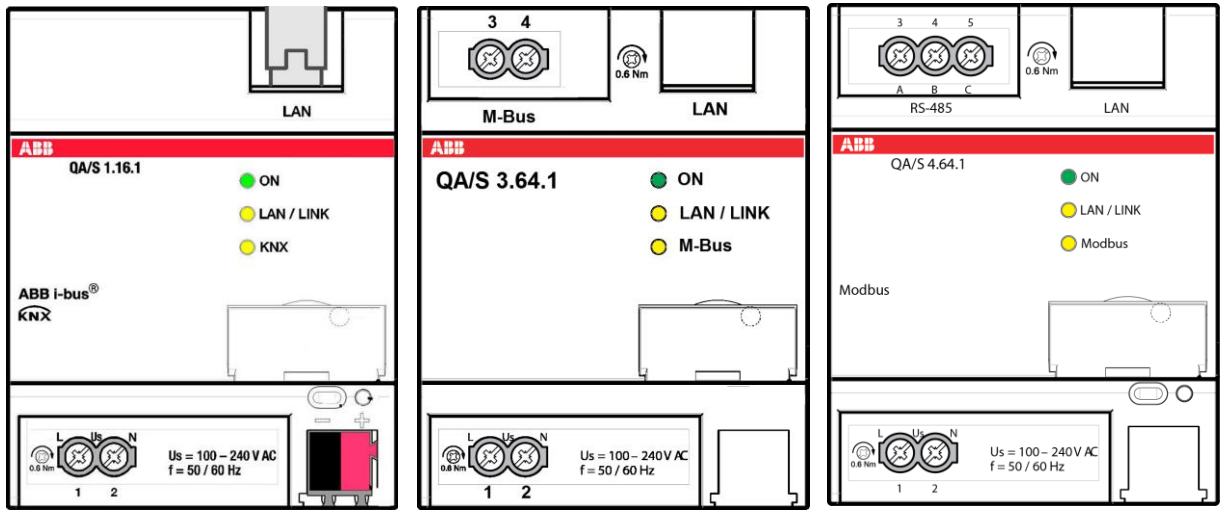


ABB EQmatic Energy Analyzer QA/S x.yy.1

Display elements

LED	Function	Description
ON	ON	Operating system initialization process complete. Supply voltage on. The device is ready for operation.
	OFF	No supply voltage during operating system initialization process.
	Flashing (1 Hz)	During initialization.
	FLASHING (3 Hz)	Resetting network settings and restarting the device
	FLASHING (10 Hz)	Factory reset; internal error.
LAN/Link	OFF	No supply voltage. No network connection.
	FLASHING	Network connection OK. Telegram traffic.
M-Bus/ Modbus	ON	Supply voltage OK, device ready for operation and M-Bus/Modbus/KNX connected.
	OFF	No supply voltage. M-Bus/Modbus/KNX not connected.
	FLASHING (1 Hz)	Scanning process for slaves/devices.
	FLASHING (3 Hz)	Resetting network settings and restarting the device.
	FLASHING (10 Hz)	Resetting to factory settings.



QA/S 1.16.1 KNX

QA/S 3.xx.1 M-Bus

QA/S 4.xx.1 Modbus

ABB EQmatic Energy Analyzer QA/S x.yy.1

Installation steps

No tools needed!

Fastening on a mounting rail

- Place the DIN rail holder on the upper edge of the DIN rail and push down.
- Push the lower part of the device toward the DIN rail until the DIN rail holder engages.
- The device is now mounted on the DIN rail.

Removing from the mounting rail

- Press on the top of the device
- Release the bottom of the device from the DIN rail
- Lift the device up and off the DIN rail

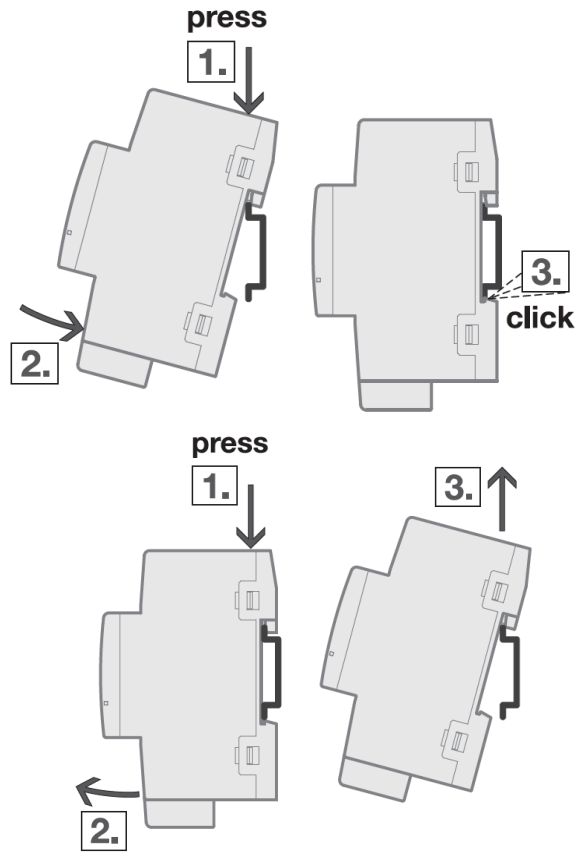


ABB EQmatic Energy Analyzer QA/S x.yy.1

Installation steps

In order to avoid dangerous touch voltages, which originate through feedback from differing phase conductors, all-pole disconnection must be observed when extending or modifying the electrical connections

- Fastening device on mounting rail
- Connecting the lines for
  - Supply voltage
  - M-Bus, Modbus or KNX (meters/slaves)
  - Ethernet/LAN

QA/S 3.xx.1

M-Bus

QA/S 4.xx.1

Modbus

QA/S 1.16.1

KNX

ABB EQmatic Energy Analyzer QA/S x.yy.1

Installation steps

- Connecting the supply voltage
- The operating system starts, and the yellow M-Bus/Modbus/KNX LED lights up
- When the operating system has finished loading, the yellow M-Bus/Modbus/KNX LED goes off and the green ON LED starts to flash while the application is loading
- When the application has finished loading, the green ON LED stops flashing and lights up continuously with the yellow M-Bus/Modbus/KNX LED
- The initialization process is complete
- The device is ready for operation and can be put into operation with a web browser

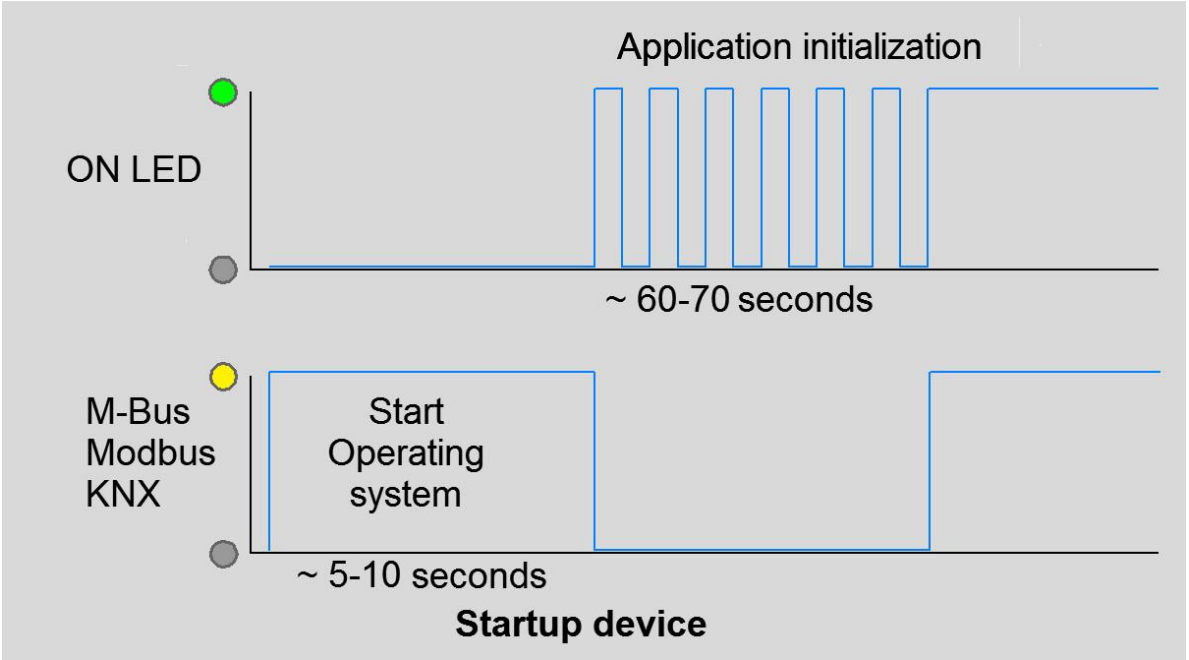


ABB EQmatic Energy Analyzer QA/S x.yy.1

Resetting the device

There are several ways to reset the device:

- Restarting (device reset only)
- Restarting and resetting the network settings
- Resetting to factory settings (deleting configuration and all data)

To reset the device, use the Reset button, which is behind the label carrier

- Open the label carrier cover
- Press the “Reset” button to perform a reset

Press for	Action	LED
< 2 sec.	No reaction	ON LED (green): ON M-Bus/Modbus/KNX LED (yellow): ON
> 2 s and < 10 sec.	**1. Restart** Pressing and releasing the Reset button restarts the device	ON LED (green): Flashing (3 Hz) M-Bus/Modbus/KNX LED (yellow): ON
> 10 < 20 sec.	**2. Restart and reset the network settings** Pressing and releasing the Rese button resets the IP address to automatic address assignment (DHCP) and restarts the device	ON LED (green): Flashing (3 Hz) M-Bus/Modbus/KNX LED (yellow): Flashing (3 Hz)
> 20 sec.	**3. Restart and reset to factory settings.** Pressing and releasing the Reset button deletes all user-defined settings, network settings and database entries	ON LED (green): Flashing (10 Hz) M-Bus/Modbus/KNX LED (yellow): Flashing (10 Hz)

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 1

The Energy Analyzer QA/S is suitable for installation

- **A** on a 35 mm mounting rail in any installation position in distribution boards or small housings
- **B** outdoors and indoors
- **C** only in horizontal position in distribution boards or small housings

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 1

The Energy Analyzer QA/S is suitable for installation

A on a 35 mm mounting rail in any installation position in distribution boards or small housings

B outdoors and indoors

C only in horizontal position in distribution boards or small housings

Installation in distribution boards in any installation position

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 2

How can operational readiness be checked?

A Press the “Manual operation” button for longer than 2 seconds. The green ON LED flashes green (1 Hz).

B The yellow M-Bus/Modbus/KNX LED flashes yellow (3 Hz) and waits for metering data.

C The green ON LED lights up permanently after the initialization process.

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 2

How can operational readiness be checked?

A Press the “Manual operation” button for longer than 2 seconds. The green ON LED flashes green (1 Hz).

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C The green ON LED lights up permanently after the initialization process.

The green ON LED lights up permanently

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 3

How is the Energy Analyzer QA/S 1.16.1 connected with the KNX meters?

A All KNX meters are connected with the Energy Analyzer QA/S 1.16.1 only in a line structure and the bus cable must be terminated with EOL resistors (120 Ω) at both ends.

B The Energy Analyzer QA/S 1.16.1 permits wireless connection in accordance with the wireless KNX RF standards.

C All KNX meters are connected with the Energy Analyzer QA/S 1.16.1 in any structure (star, tree, line, …) according to KNX standards

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 3

How is the Energy Analyzer QA/S 1.16.1 connected with the KNX meters?

A All KNX meters are connected with the Energy Analyzer QA/S 1.16.1 only in a line structure and the bus cable must be terminated with EOL resistors (120 Ω) at both ends.

B The Energy Analyzer QA/S 1.16.1 permits wireless connection in accordance with the wireless KNX RF standards.

C All KNX meters are connected with the Energy Analyzer QA/S 1.16.1 in any structure (star, tree, line, …) according to KNX standards

Two-wire TP line in star, tree or line topology

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 4

How is the Energy Analyzer QA/S 3.xx.1 connected with the M-Bus meters (slaves)?

A. All M-Bus meters (slaves) are connected with the Energy Analyzer QA/S 3.xx.1 via a two-wire line.

B. The KNX interface integrated into the Energy Interface supports the connection of M-Bus meters as well.

C. The Energy Analyzer QA/S 3.xx.1 permits wireless connection in accordance with the wireless M-Bus standard (EN 13757-4).

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 4

How is the Energy Analyzer QA/S 3.xx.1 connected with the M-Bus meters (slaves)?

A All M-Bus meters (slaves) are connected with the Energy Analyzer QA/S 3.xx.1 via a two-wire line.

B The KNX interface integrated into the Energy Interface supports the connection of M-Bus meters as well.

C The Energy Analyzer QA/S 3.xx.1 permits wireless connection in accordance with the wireless M-Bus standard (EN 13757-4).

Two-wire line in star, tree or line topology

ABB EQmatic Energy Analyzer QA/S x.yy.1

Which answer is correct?

Question 5

How is the Energy Analyzer QA/S 4.xx.1 connected with the Modbus RTU meters?

A The Energy Analyzer QA/S 4.xx.1 permits wireless connection in accordance with the wireless Modbus standard.

B All Modbus meters are connected with the Energy Analyzer QA/S 4.xx.1 in a line structure and the bus cable must be terminated with EOL resistors (120 Ω) at both ends.

C All Modbus meters are connected with the Energy Analyzer QA/S 4.xx.1 in any structure (star, tree, line, …).

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Which answer is correct?

Question 5

How is the Energy Analyzer QA/S 4.xx.1 connected with the Modbus RTU meters?

A. The Energy Analyzer QA/S 4.xx.1 permits wireless connection in accordance with the wireless Modbus standard.

B. All Modbus meters are connected with the Energy Analyzer QA/S 4.xx.1 in a line structure and the bus cable must be terminated with EOL resistors (120 Ω) at both ends.

C. All Modbus meters are connected with the Energy Analyzer QA/S 4.xx.1 in any structure (star, tree, line, …).

Line structure with EOL resistors

Commissioning

Connecting to the device and commissioning wizard

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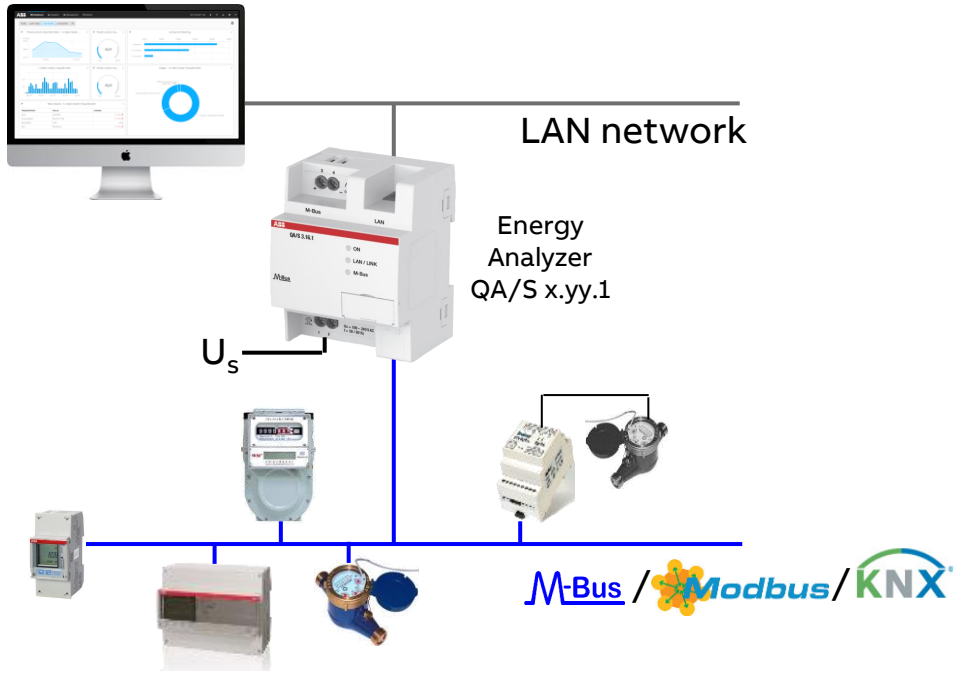
Commissioning requirements

- PC/laptop with web browser for commissioning and operating
- ETS (Engineering Tool Software) is used to parametrize the QA/S 1.16.1 KNX
- The QA/S is ready for operation and a LAN connection is established
- The PC/laptop and the QA/S are in the same IP network (read out IP address of QA/S with the i-bus Tool or a network scanner tool)
- Meters are operating and connected to M-Bus/Modbus/KNX on the QA/S
- The M-Bus/Modbus/KNX devices comply with the current standard
- The M-Bus and Modbus devices are connected and configured according to manufacturer's instructions (e.g. speed, primary address, transformer ratios, etc.)



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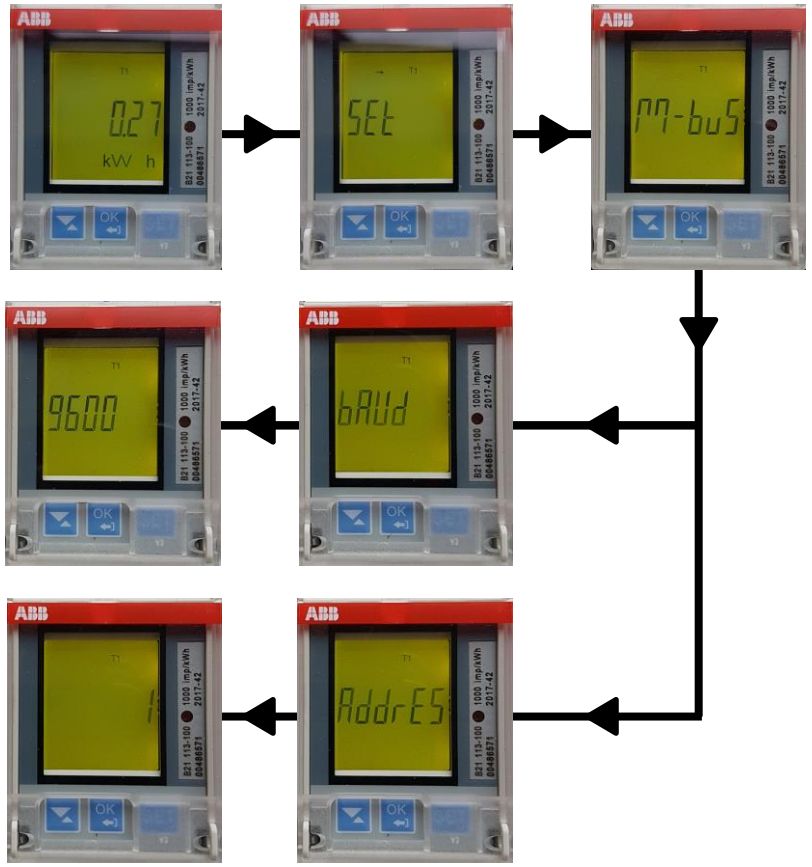
Example: Set the wired M-Bus interface

1. Select “SET” in the main menu and press OK
2. Select “M-Bus” and press OK
3. Press ▼ once to get to the next menu “Baud”
   - The display will show the baud rate
   - Set baud rate (e.g. 9600)
4. Press ▼ once to get to the next menu “Address”
   - The display will show the address
   - Set address (e.g. 001)



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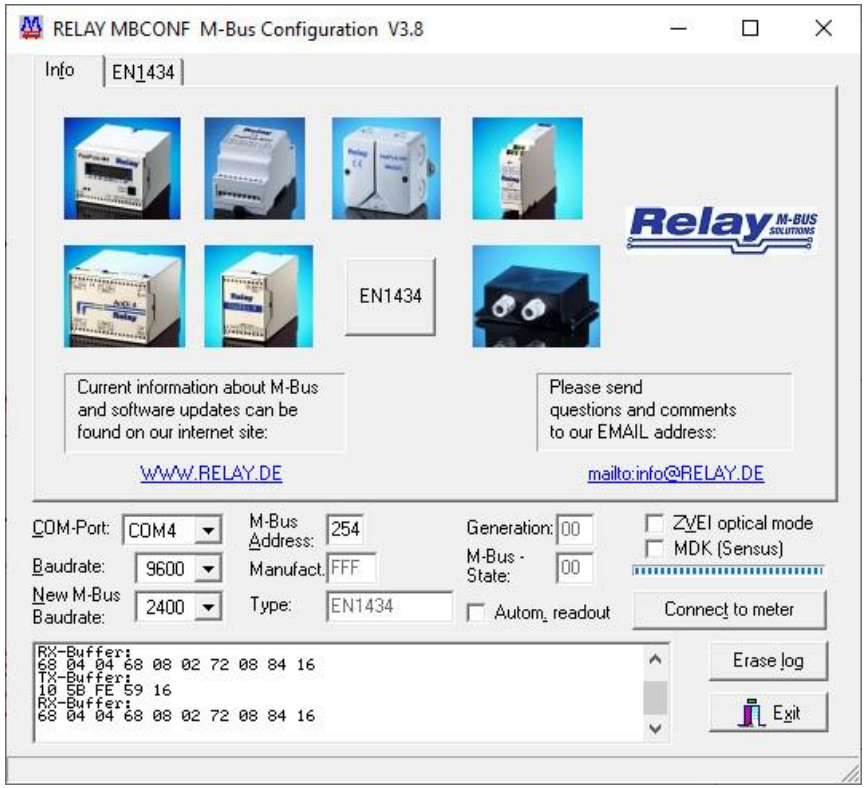
Configuration of M-Bus devices

- M-Bus devices (slaves) are often delivered with an unknown primary address or primary address “0”
- Settings can be made with an interface and configuration software
  - Primary address
  - ID (secondary address)
  - Initial meter reading (counter)
  - Current date and time
  - Medium (water, energy,…)



M-Bus master with USB-Interface

Source: www.relay.de/en/

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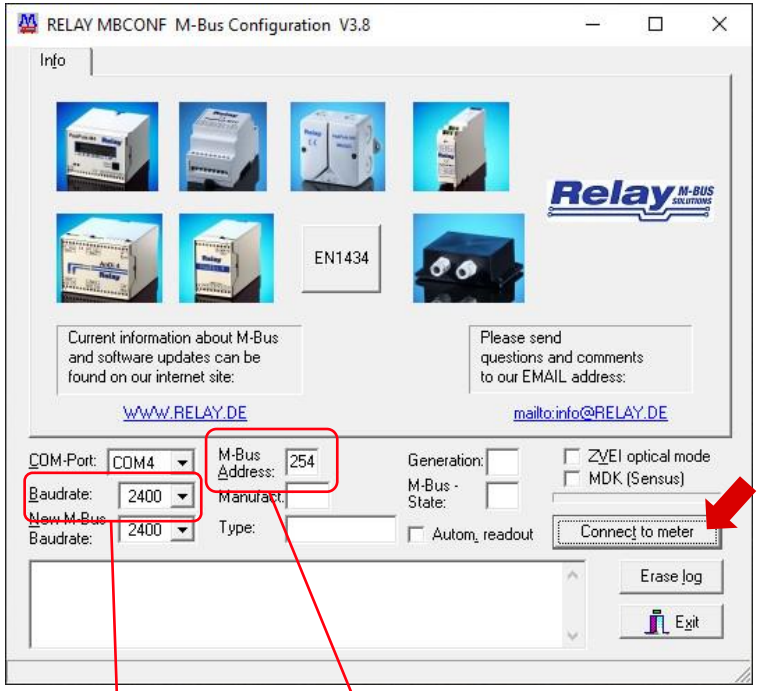
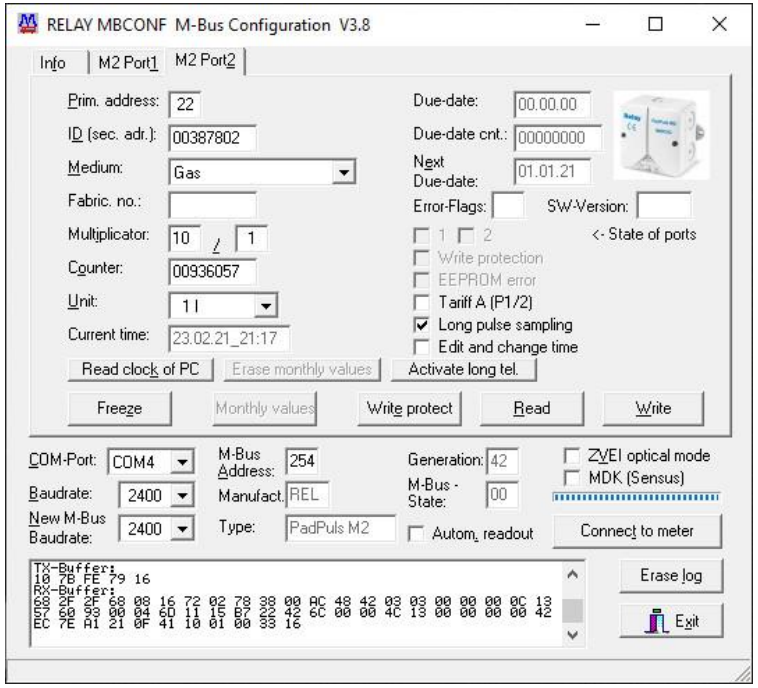
Configuration of M-Bus devices

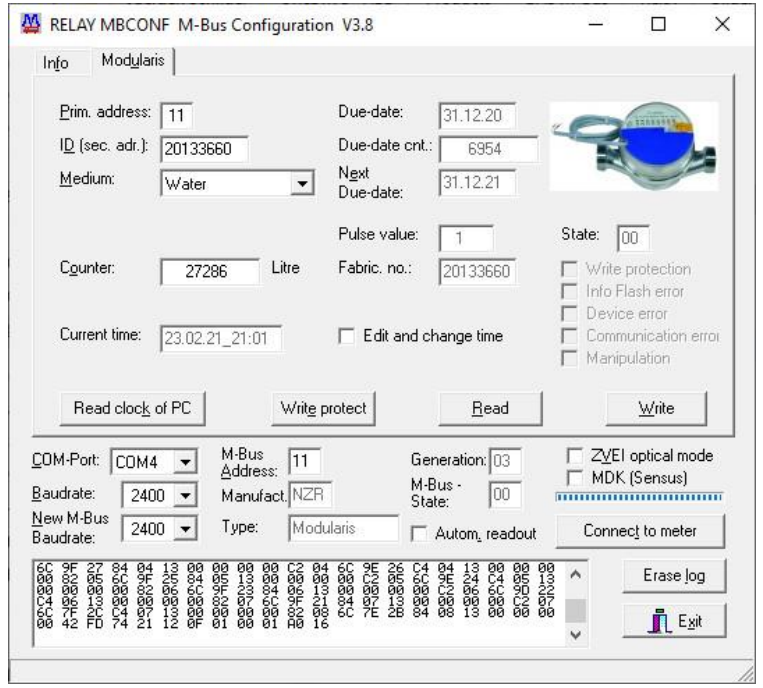


Speed (baud rate)

Primary address 0…250 or 254 for broadcast



Gas meter (pulse adapter)



Water meter

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Commissioning steps: The steps are identical except for scanning the connected meters

ETS parameterization

Parameterization of QA/S and KNX meters in the ETS

Connect device

Start ABB i-bus® Tool to detect ABB EQmatic device in your local network

Open web site and log in

Follow wizard instructions

System Settings

Set user name + password

Set date and time

Set network settings

Meter Management I

Configure settings for Bus scan

Perform scan to detect connected meters
→ ABB meters are automatically configured
→ Configure third-party meters

The Energy Analyzer QA/S 1.16.1 KNX and KNX meters are configured via the ETS

Meter Management II

Configure tariffs and units

Define consumer groups, e.g. HVAC, lighting, etc. (optionally)

Building structure

Configure Building Structure:
- Manually (tree structure)
- Automatically (flat list)

You're done!

Configure Dashboard

Start your analytics

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Commissioning Energy Analyzer QA/S 1.16.1 KNX

To display and process the QA/S values of KNX meters, both the QA/S and the KNX meters must first be configured and parametrized in ETS

- Add the QA/S and KNX meters to the project
- Set the parameters of the QA/S and KNX meters, e.g.
  - Date and time source (KNX, User Interface or time server)
  - Meter settings: Meter Interface Module ZS/S, Energy Actuator SE/S, Energy Module EM/S, Electricity (generic), Gas (generic), Water (generic), Heat (generic)
  - Load control
- Assign group addresses
- Download individual address and application programs

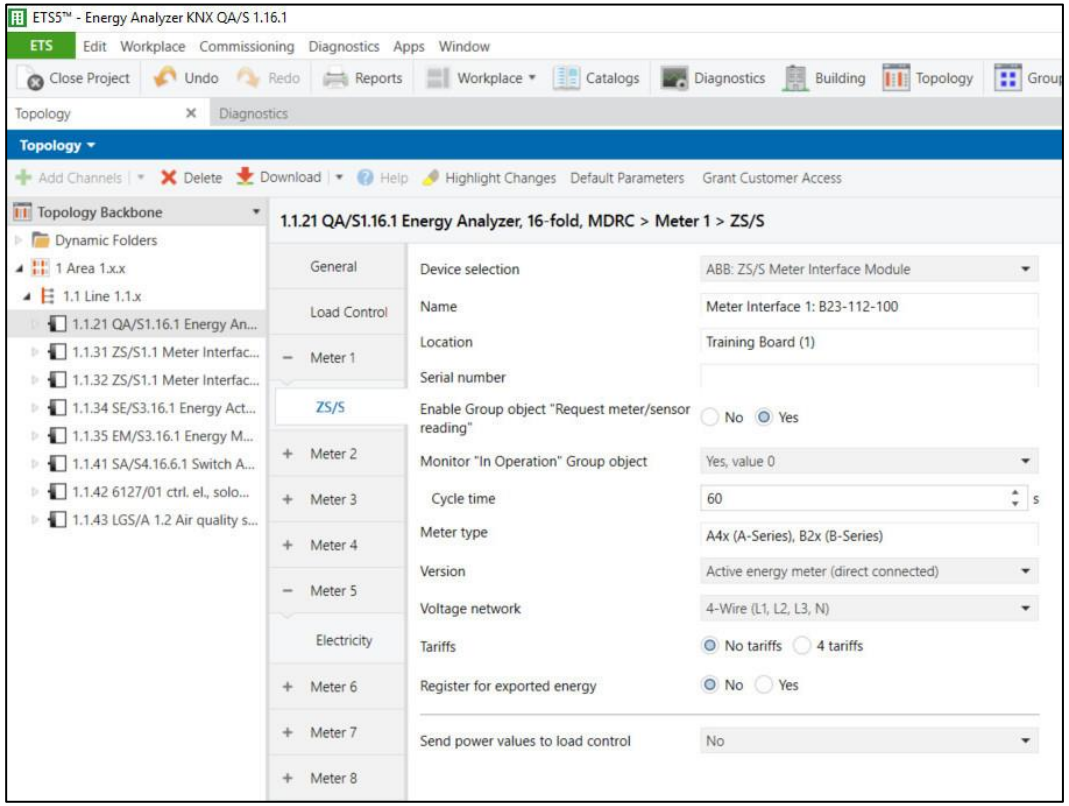


ABB EQmatic Energy Analyzer QA/S x.yy.1

Access via the ABB i-bus® Tool

- The ABB i-bus® Tool is free software that provides help with commissioning
- The device can be accessed with the ABB i-bus® Tool during initial commissioning
- IP address assignment in the QA/S is set to automatic addressing (DHCP/autoIP) at the factory, and the IP address can be read with the ABB i-bus® Tool
- Download the ABB i-bus® Tool and install it on the Windows PC/laptop
- Download link: www.abb.com/knx

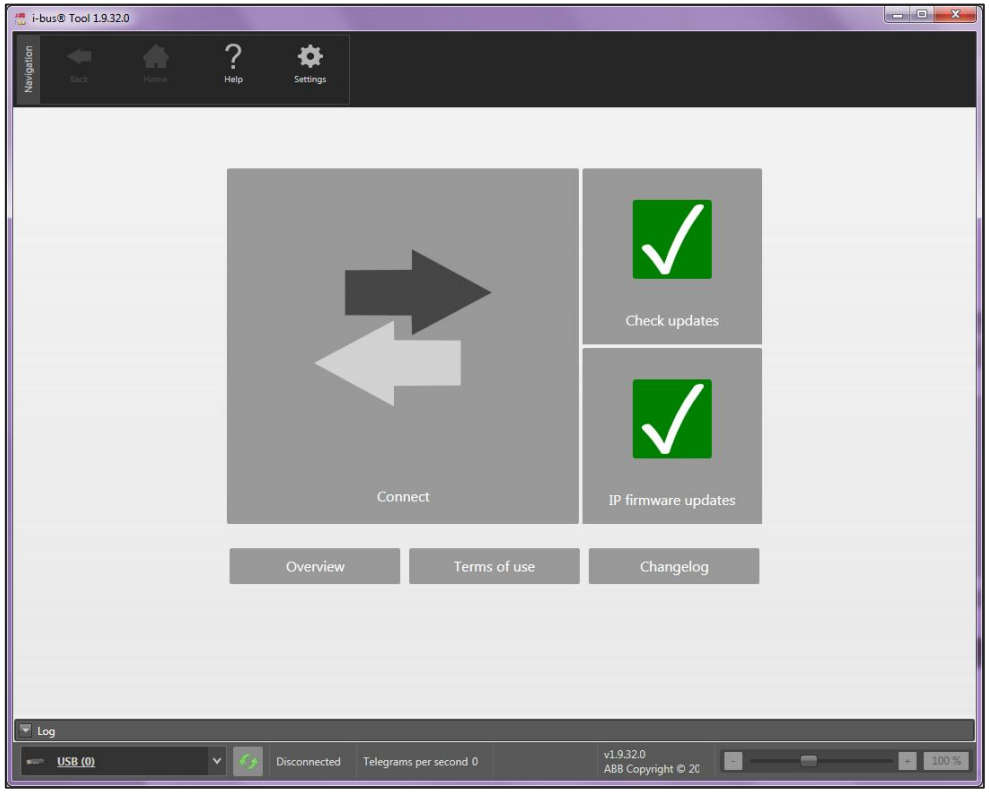


ABB EQmatic Energy Analyzer QA/S x.yy.1

Access via the ABB i-bus® Tool

Start the ABB i-bus® Tool

Click:

– “Connect”

– “IP devices”

– “Discovery”

The ABB i-bus® Tool automatically searches for known IP devices in the local network

Select the desired Energy Analyzer QA/S from the table (click)

Click the “Open Website” button

The default web browser opens, and the start screen of the Energy Analyzer appears

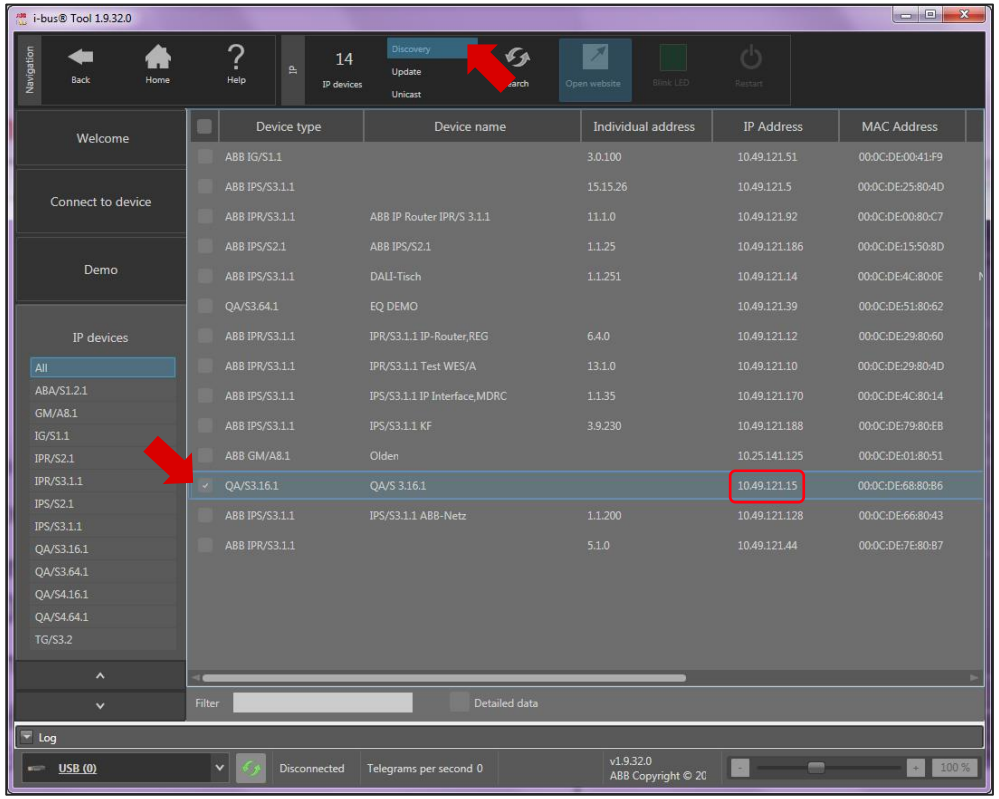


ABB EQmatic Energy Analyzer QA/S x.yy.1

User interface

The connection to the device's web server is established

Enter the user name and the password

Default user name and password on delivery

– Username: admin

– Password: admin

Follow the instructions in the commissioning wizard to proceed with commissioning

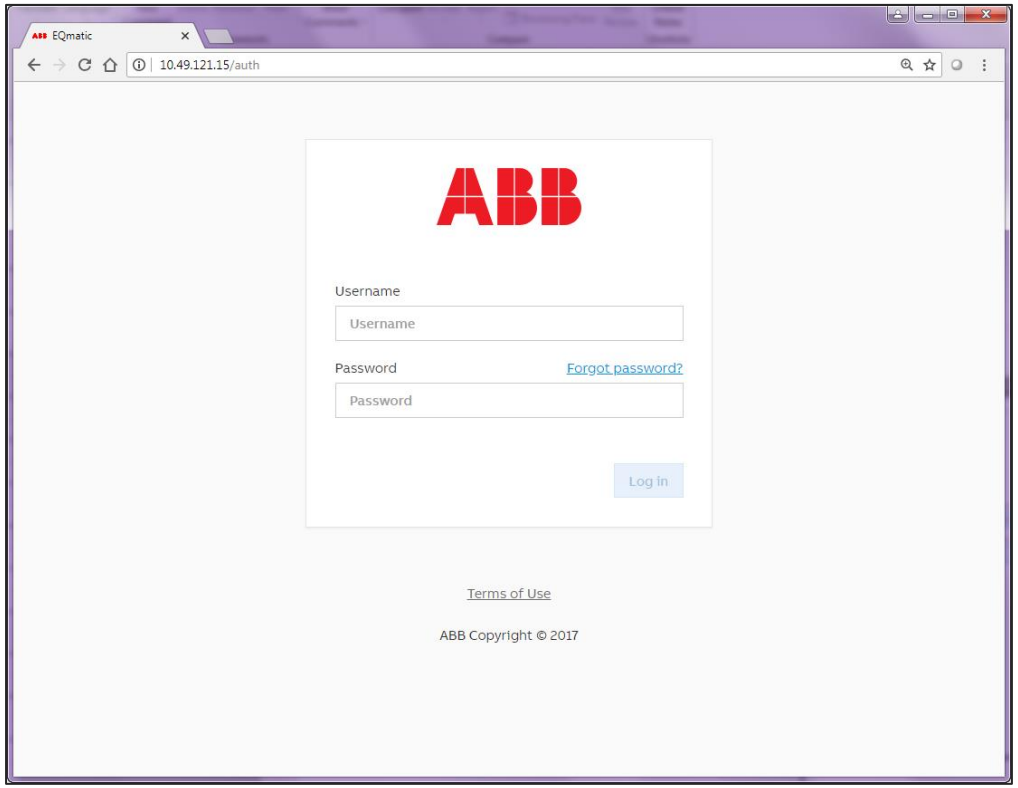


ABB EQmatic Energy Analyzer QA/S x.yy.1

Commissioning wizard (1)

Once a connection to the device is established, the commissioning wizard starts for the first time

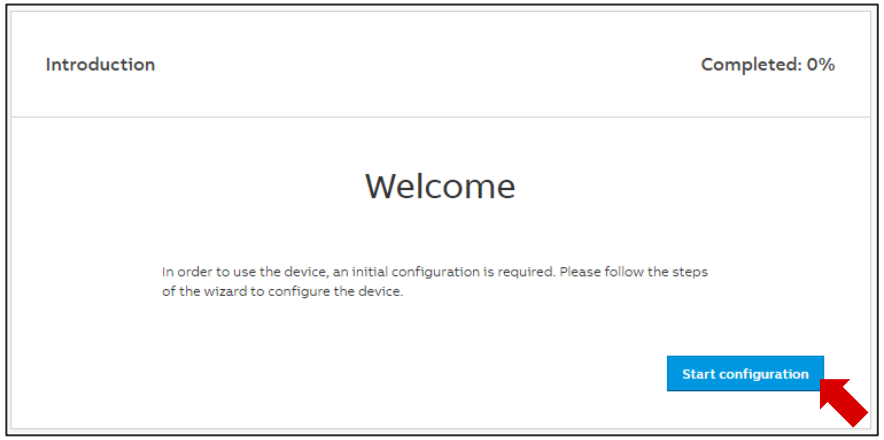
The steps are identical except for scanning the connected meters (M-Bus or Modbus)

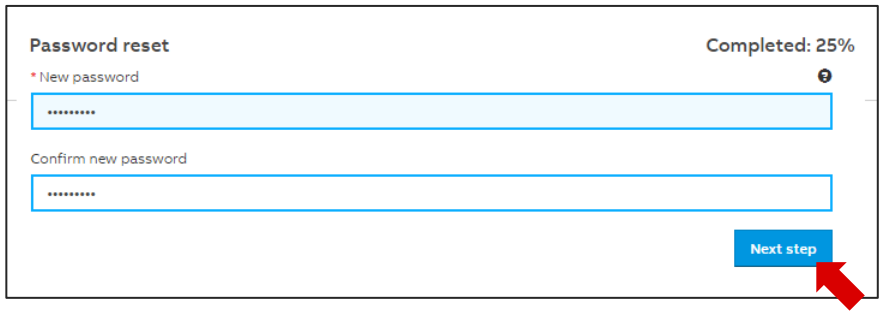
It guides the user through the steps and basic settings required for initial commissioning

– Read and confirm the terms and conditions of use

– Change the default password

- This is important for device and data security
- The password is expected to be at least 9 characters long and contain capital letters, small letters and non-letter (numeric or special) symbols





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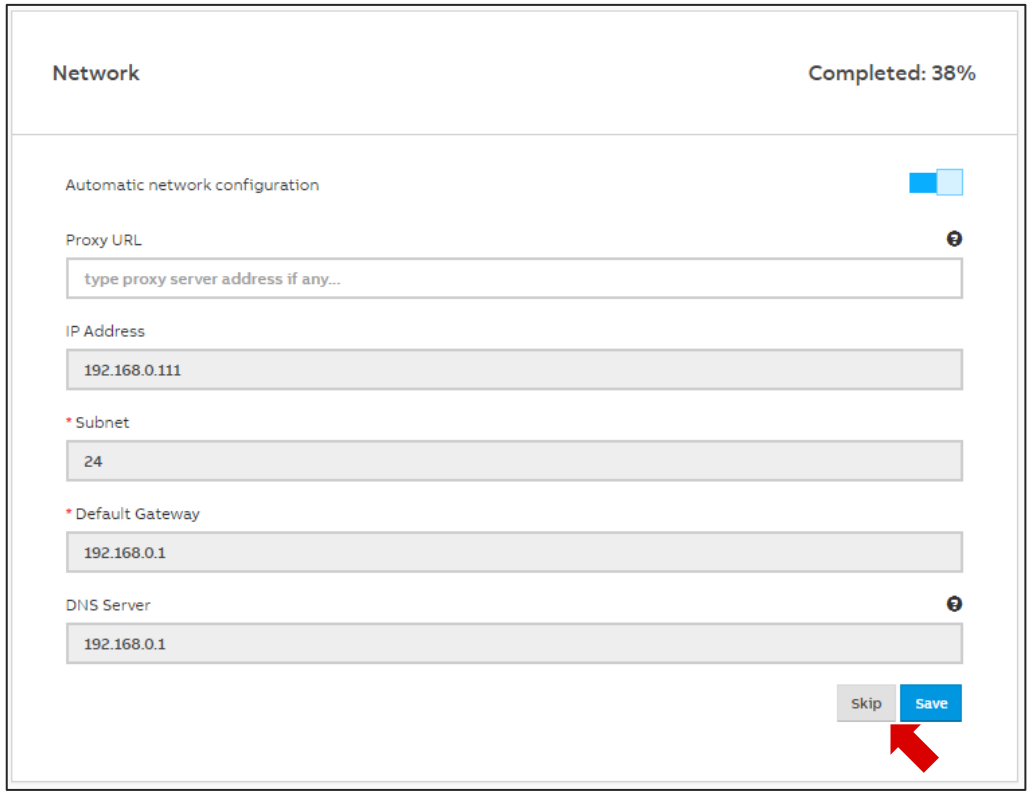
Commissioning wizard (2)

- Change the network settings if necessary
- QA/S 1.16.1 KNX: All network configuration, except from proxy configuration, is only possible via ETS



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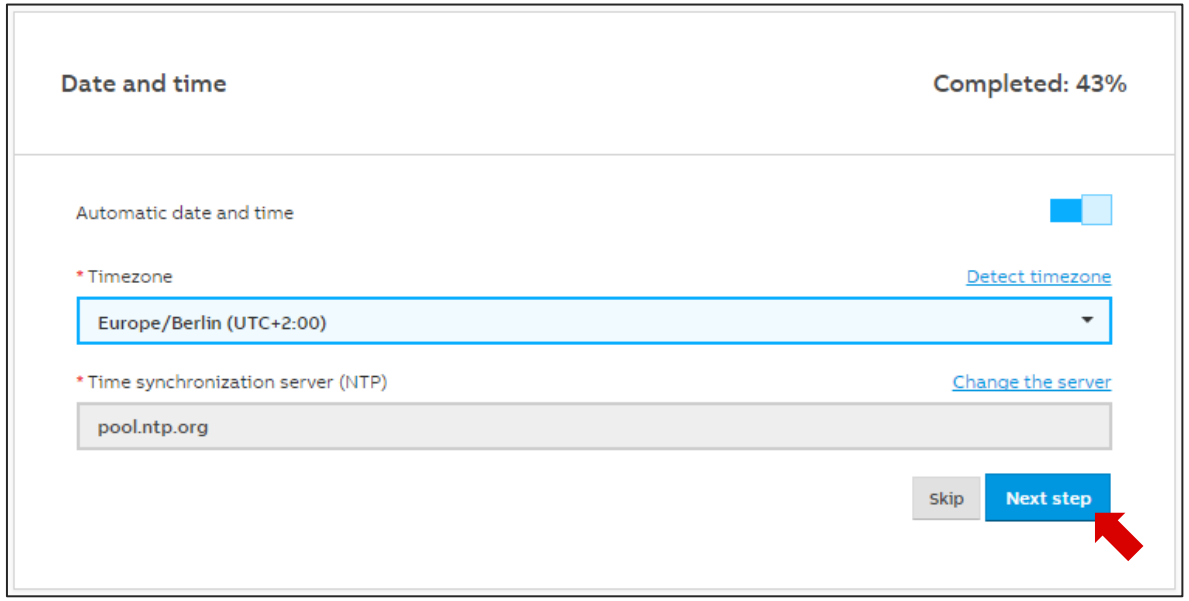
Commissioning wizard (3)

- Configure the date and time
- QA/S 1.16.1 KNX: Date and time can also be received via KNX (3 byte and 8 byte)



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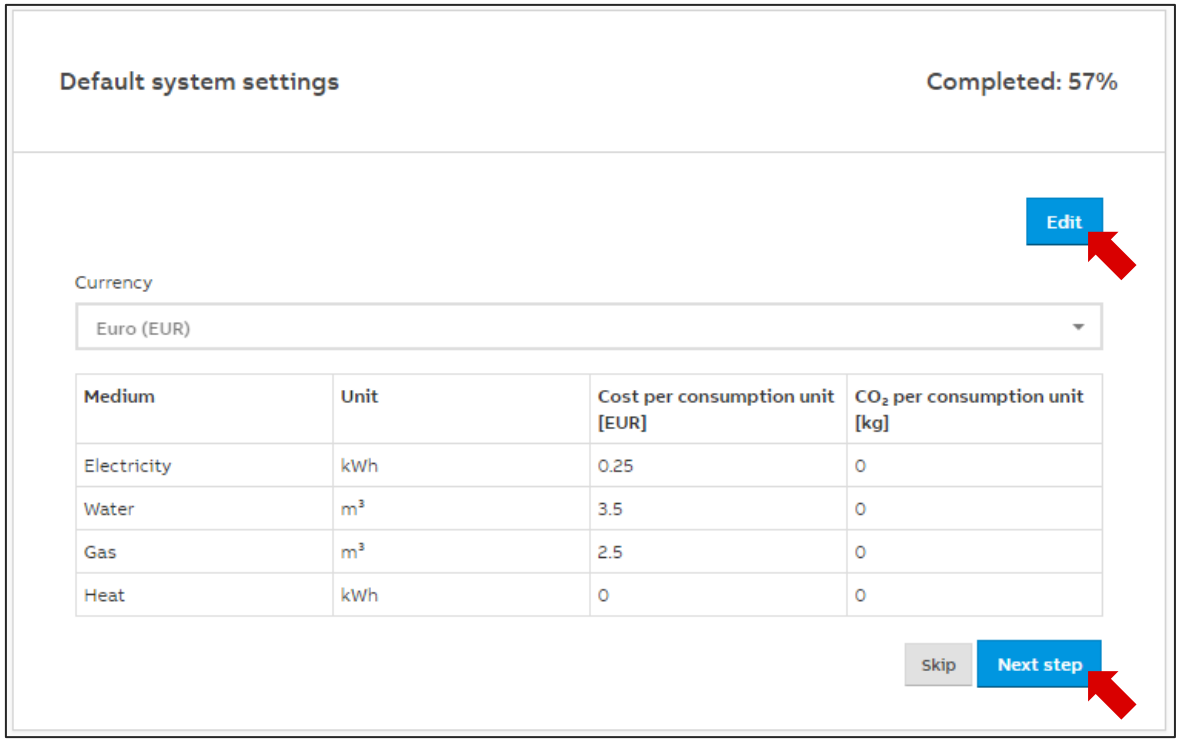
Commissioning wizard (4)

– Configure the currency, costs and CO_2 factor per consumption unit



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QA/S 3.xx.1 M-Bus: Commissioning wizard (5):

- This step is absolutely essential during commissioning to be able to add, configure and manage M-Bus devices
- Scan the bus for connected M-Bus devices
- This scanning process uses either
  - Primary addressing
  - Secondary addressing
- Limit the scan range as much as possible to reduce the scanning process time
- Scanning can take several minutes depending on the scan settings and the number of M-Bus devices

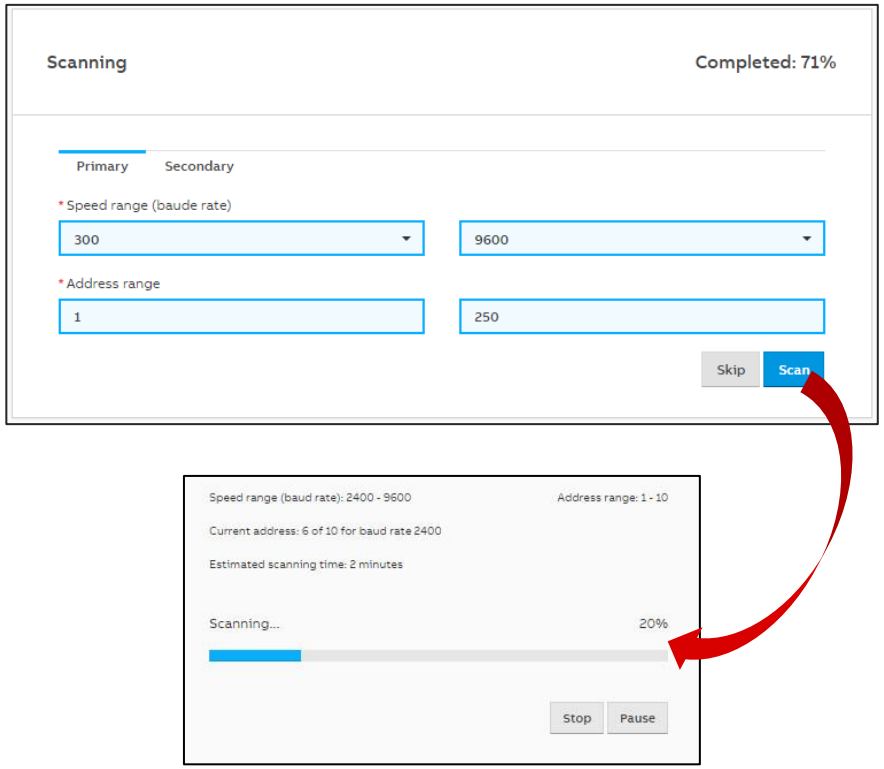

ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 3.xx.1 M-Bus: Commissioning wizard (5):

Scanning via the primary address

- The search for devices connected is based on their primary address
  - Each M-Bus device must be assigned to a unique primary address
  - Duplicate addresses cause address conflicts!
- The primary addresses must be set beforehand on the relevant M-Bus devices
- Address range: 1…250
  - Set the limits for the primary address range
- Speed range (baud rate): 300, 600, 1200, 2400, 4800, 9600
  - Set the speed range used for scanning for M-Bus devices connected

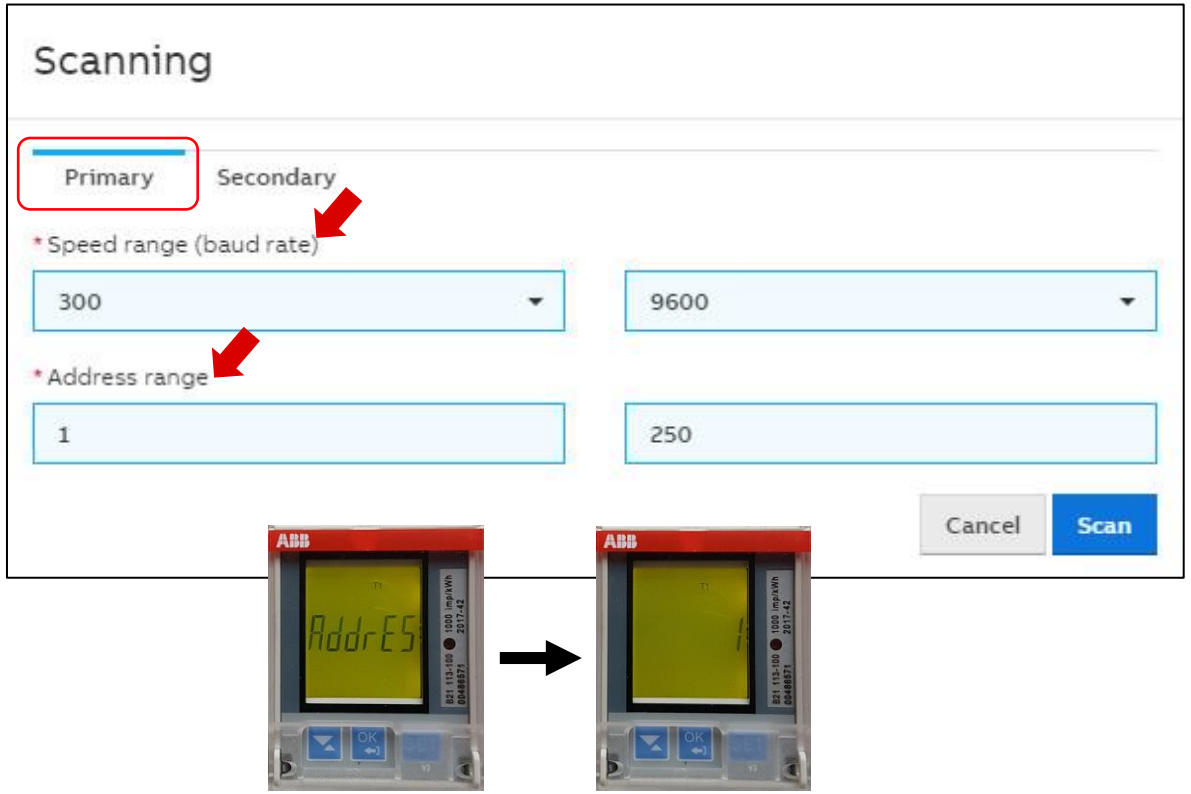

ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 3.xx.1 M-Bus: Commissioning wizard (5):

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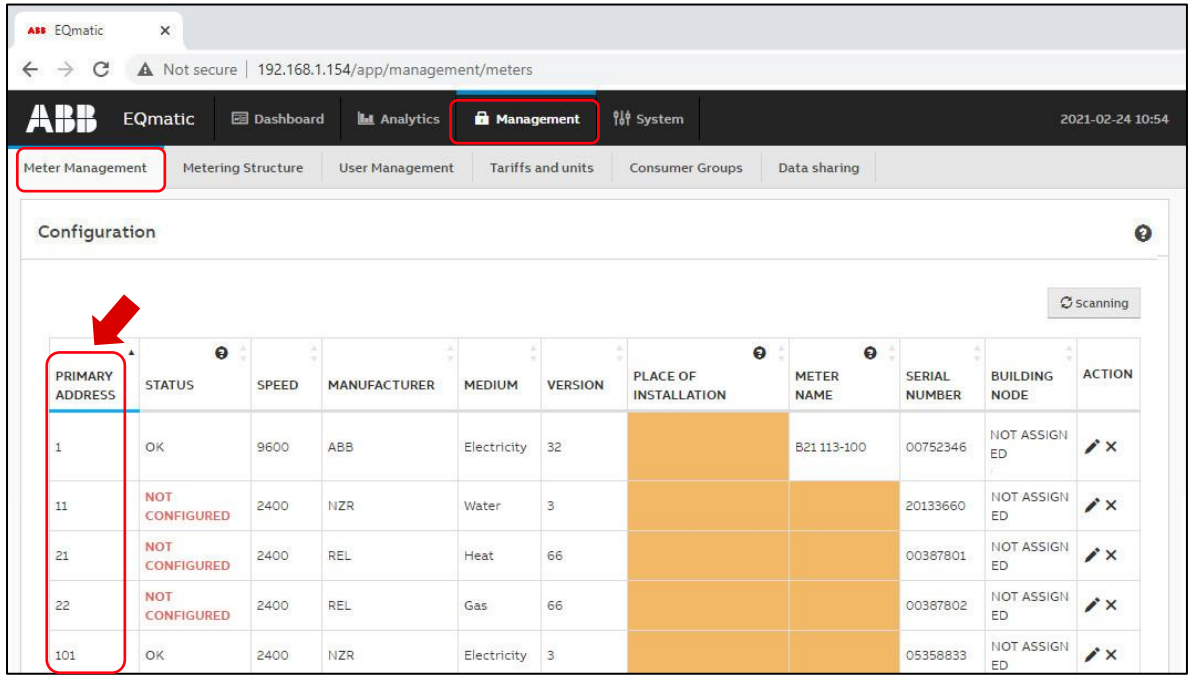


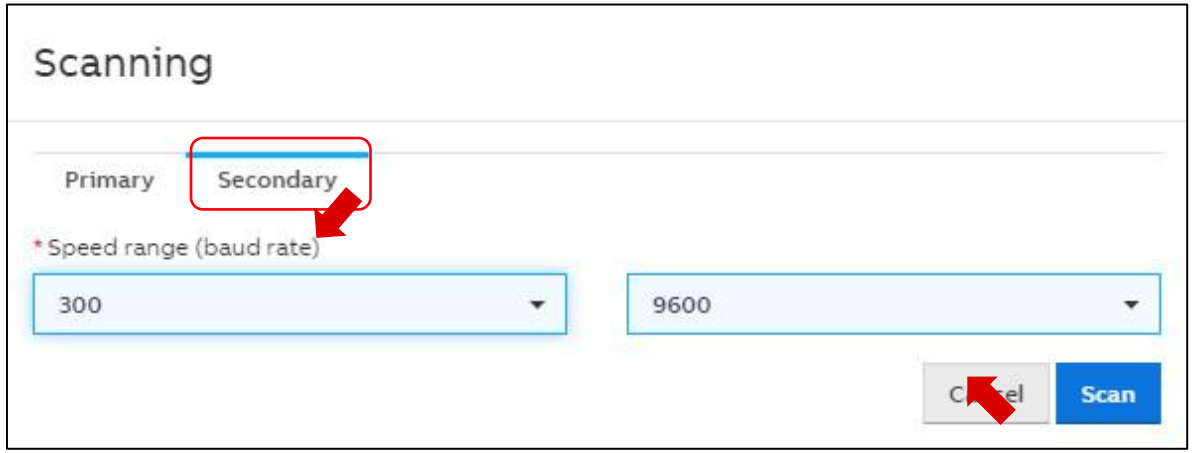
Detected meters will be listed in the *Meter Management* menu

ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 3.xx.1 M-Bus: Commissioning wizard (5):

Scanning via the secondary address

- If you select this option, M-Bus devices are scanned based exclusively on their secondary address
- In this case, there is no unique addressing (primary address) in the related M-Bus device
  → The primary address is unknown or is “0” in the delivery state and cannot be changed
- The device serial number is generally used as the secondary address
- The serial number of ABB meters is on the nameplate on the front of the device, e.g. 00486571
- Speed range (baud rate): 300, 600, 1200, 2400, 4800, 9600
  - Set the speed range used for scanning for M-Bus devices connected



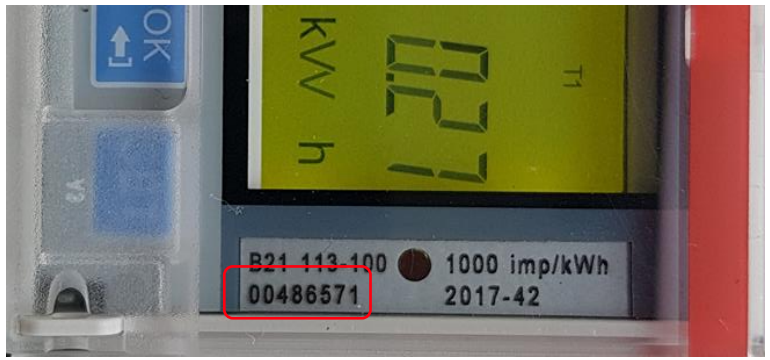


ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 3.xx.1 M-Bus: Commissioning wizard (5):

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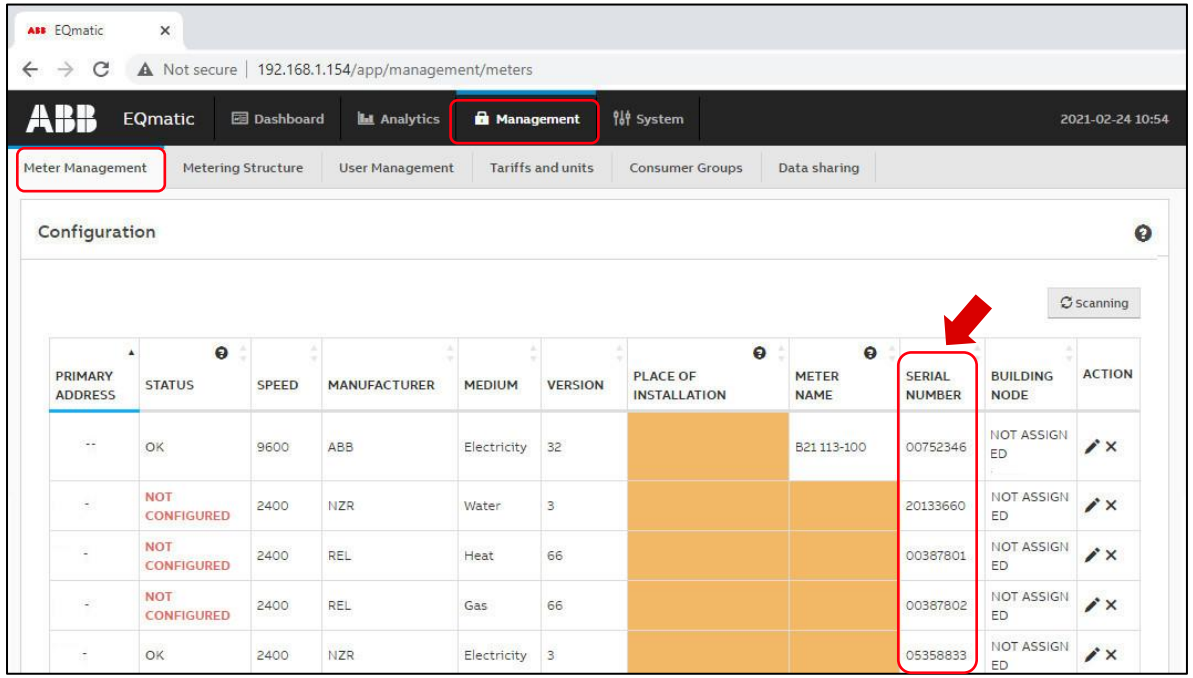


Detected meters will be listed in the *Meter Management* menu

ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 4.xx.1 Modbus: Commissioning wizard (5):

- Scan the bus for connected Modbus devices and create the automatic metering structure
  - 1,200 … 115,200 baud
  - Address range 1 … 247
- Limit the scan range as much as possible to reduce the scanning process time, e.g.
  ABB EQmeters (default): Baud rate “19200”, Parity “Even”, Byte size “8” and stop bits “1”
- Detected meters will be listed in the *Meter Management* menu
- Clicking on “Skip” allows the user to search for connected Modbus devices or slaves in the *Management* menu later on and to select creation of a manual or automatic metering structure

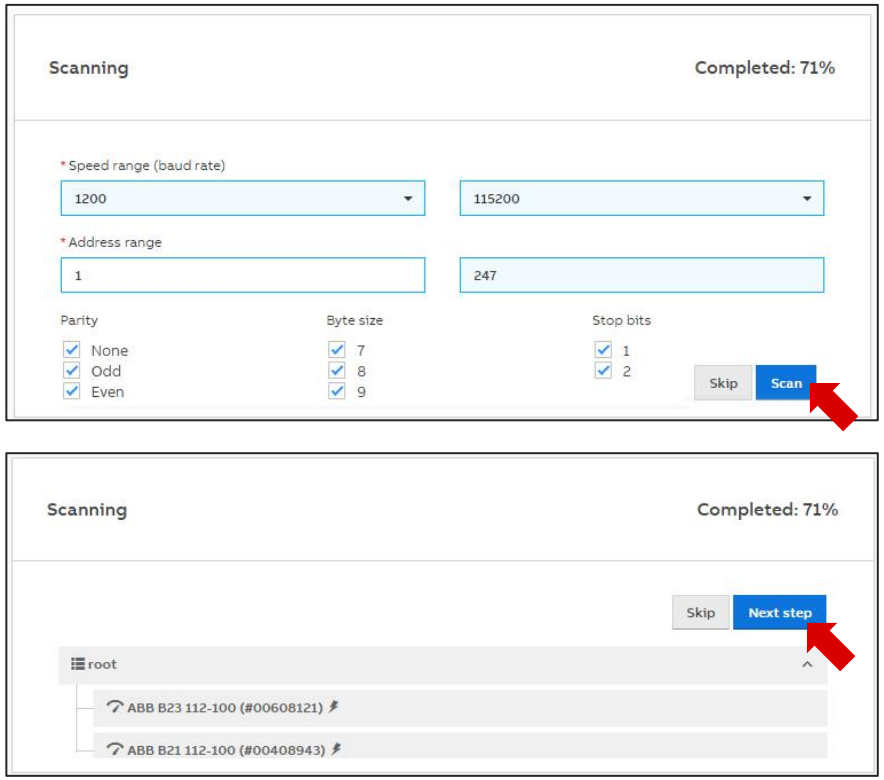


ABB EQmatic Energy Analyzer QA/S x.yy.1

QA/S 1.16.1 KNX: Commissioning wizard (5):

- The Energy Analyzer QA/S1.16.1 KNX and the KNX meters must first be configured and parametrized in ETS
- The manual or automatic metering structure will be created later in the menu “Management” → “Metering Structure”

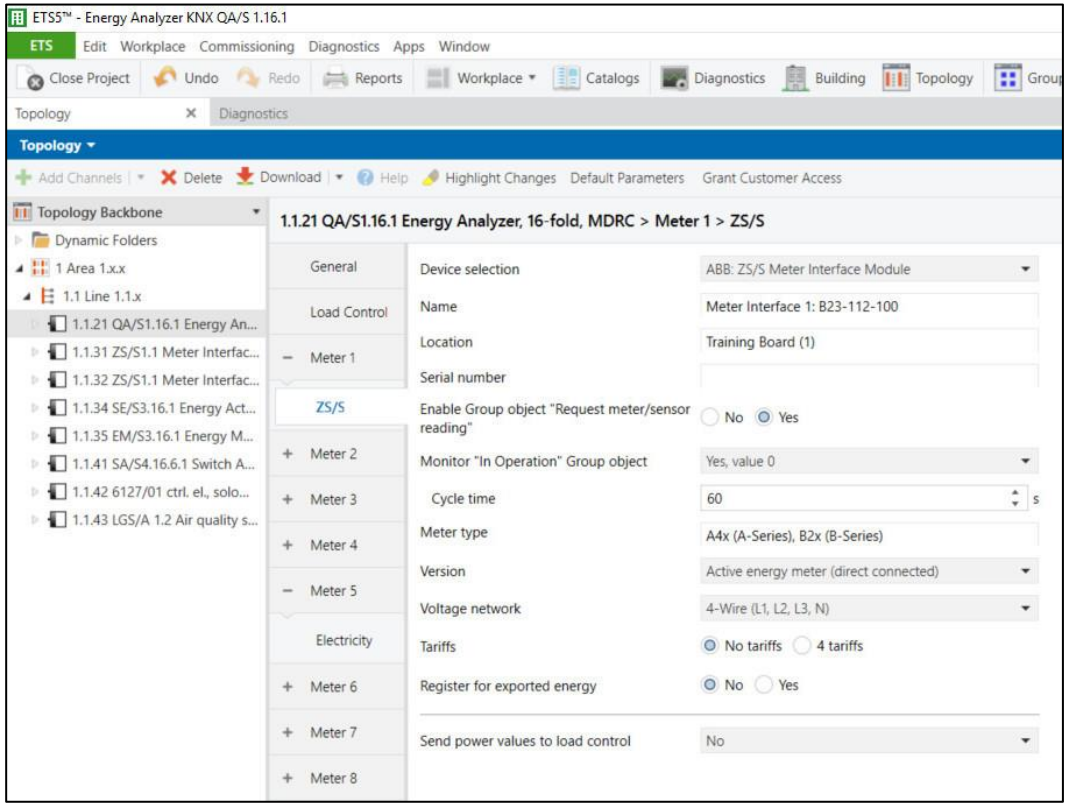


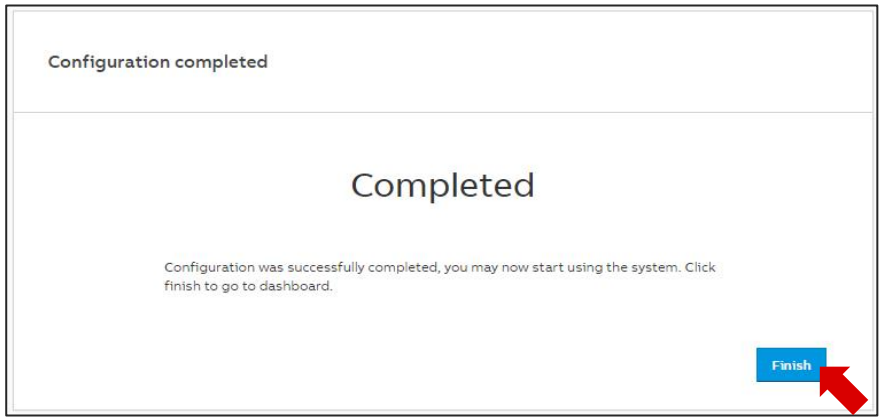
ABB EQmatic Energy Analyzer QA/S x.yy.1

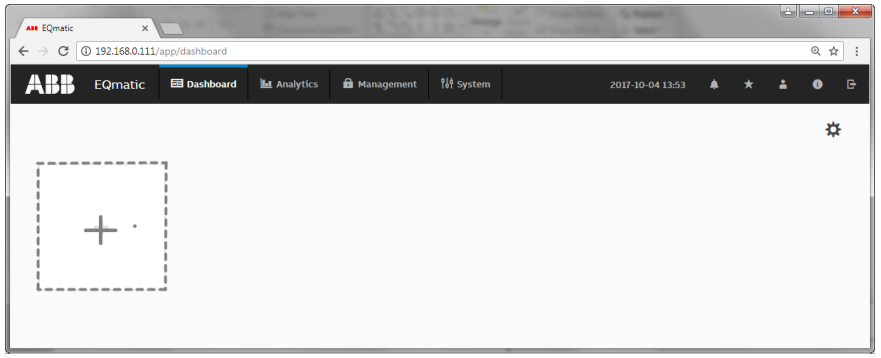
Commissioning wizard (6)

Configuration has been completed successfully

The device is ready for operation

The *main* menu with the individually configurable dashboard is displayed





Commissioning

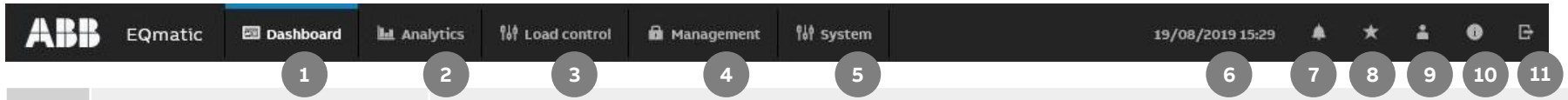
Main menu

ABB EQmatic Energy Analyzer QA/S x.yy.1

Main menu

Main menu structure

Users can navigate around the system using the main menu at the top of the user interface screen. Depending on the selection, a sub-menu may be displayed.



1	Dashboard	Customizable dashboard for displaying the most important data and measured values.
2	Analytics	Detailed analysis of costs, consumption, instantaneous values, benchmarks and comparison functions by consumer. Further processing and export of data and analyses. Automatic report function via email or FTP.
3	Load control	Power dependent load control for switching loads and consumers on and off (only for QA/S 1.16.1 KNX)
4	Management	Used to commission and manage the devices/meters, metering structures, users, tariffs/units and data transfer.
5	System	Basic device and system settings, e.g. date, time etc. as well as diagnostics.
6	Date and time	Displays the current system date and time. Clicking this field displays the date and time setting options.
7	Notifications	Displays notifications such as: • Available system updates • Errors from connected meters: timeouts/conflicts, short circuits, etc. • Alarm notification: threshold exceeded • Time synchronization: no connection to NTP server
8	Favorites	Quick access to previously configured analyses.
9	User profile	Displays user settings and information such as name, password and access rights. The user language as well as the log-out options can be set.
10	System information	Displays device information such as type, name, current firmware version, serial number, and terms and conditions of use.
11	Logout	Used to log out and end a session.

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ABB EQmatic Energy Analyzer QA/S x.yy.1

Main menu

System Notifications

Displays notifications, e.g. system updates etc.

Click to open for more information

- M-Bus/Modbus RTU device error:
  Timeout or collision
- M-Bus/Modbus RTU error:
  Short circuit or open circuit
- Update available
- Time synchronization:
  No connection to NTP server

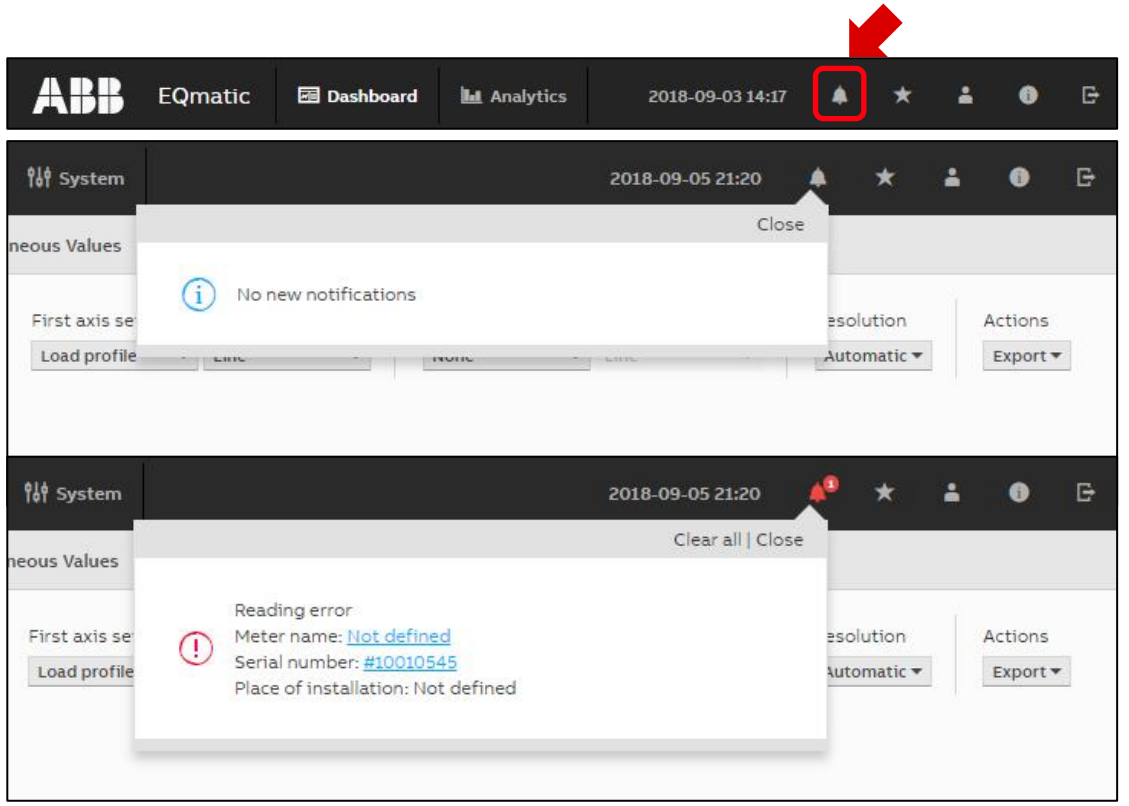


ABB EQmatic Energy Analyzer QA/S x.yy.1

Main menu

Favorites

Quick link to jump to previously configured favorites analysis diagrams

The favorites can be created in the Analytics menu:

- Historical Data
- Usage Split
- Benchmark - Period
- Benchmark - Consumer

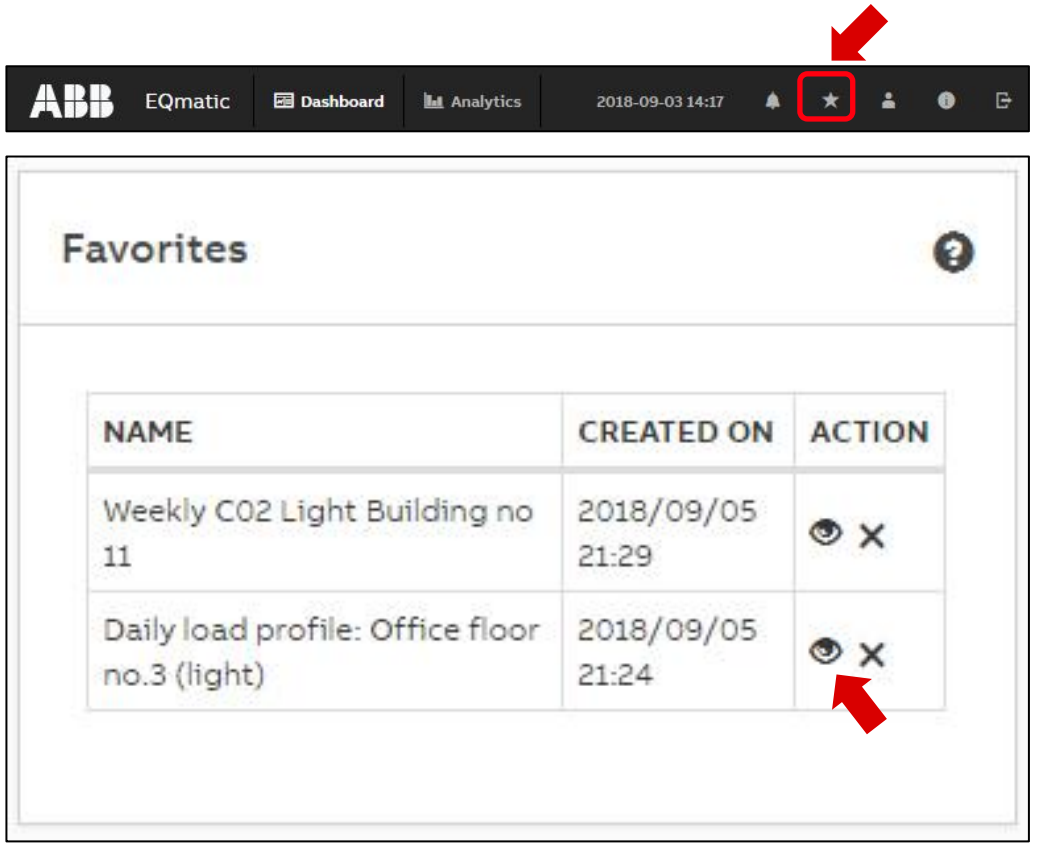


ABB EQmatic Energy Analyzer QA/S x.yy.1

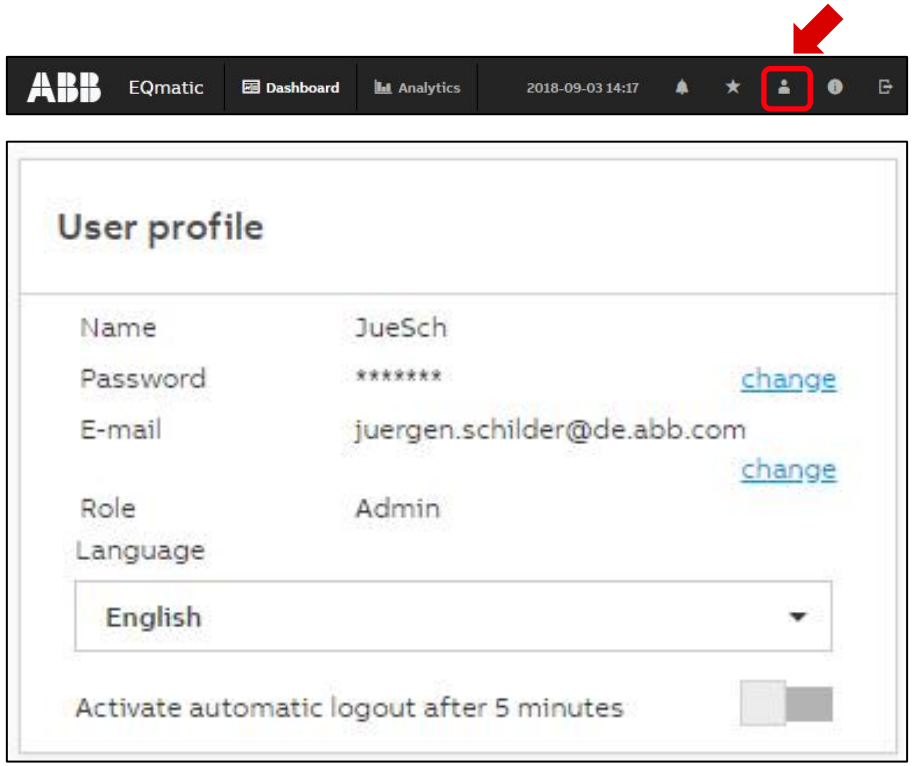
Main menu

User Profile

Displays user settings and information

- Name
- Password
- Email address
- Role and access rights
- The user language as well as the log-out options can be set

Users can be added, configured and deleted in the *Management* menu



Logged in user with administrator rights

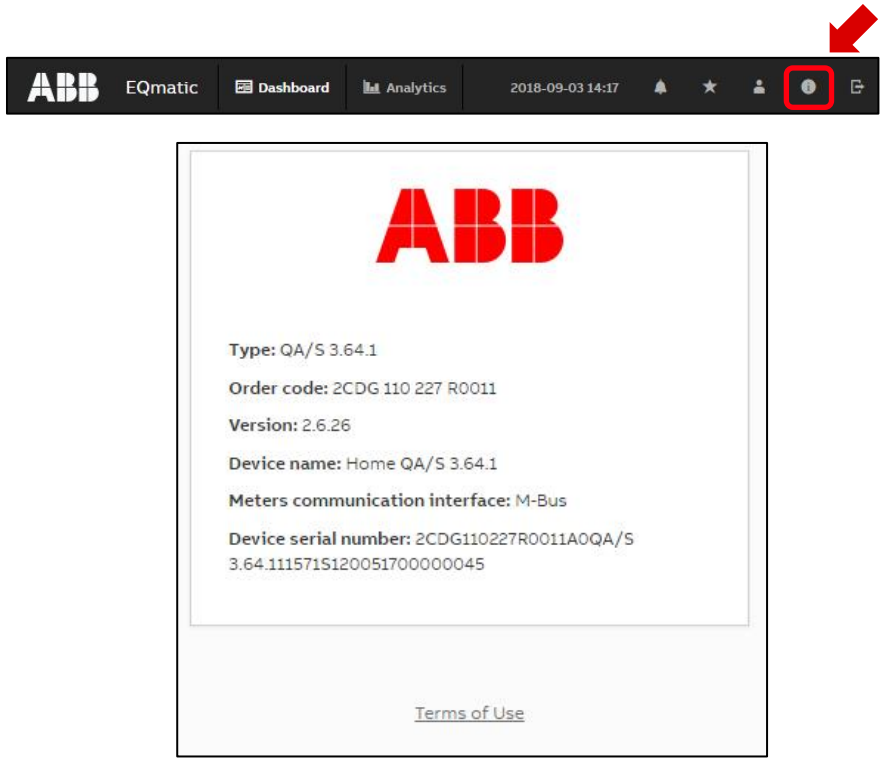
ABB EQmatic Energy Analyzer QA/S x.yy.1

Main menu

System Information

Displays device information

- Type
- Order code
- Current firmware version
- Device name
- Meter communication interface (M-Bus or Modbus)
- Device serial number



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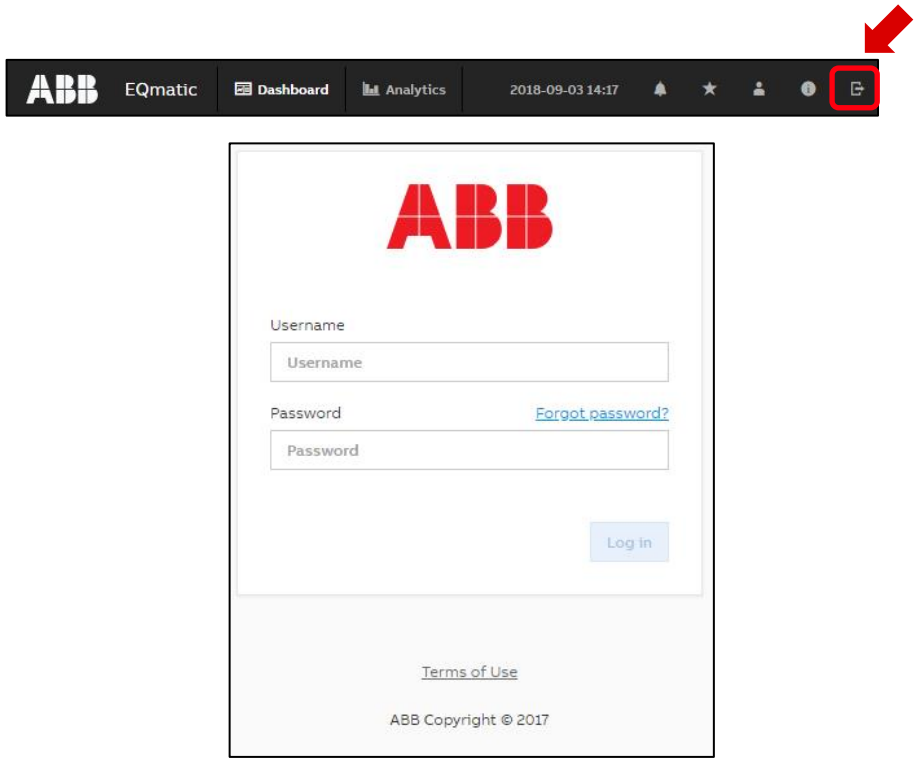
Main menu

Logout

Used to log out and end a session



Commissioning

Main menu “Management”

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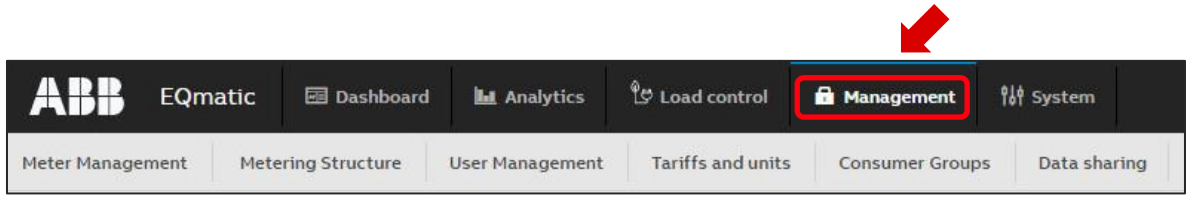
Menu “Management”

Management

The Management menu is used to make the following setting:

- Meter Management
  Note: Different in the device M-Bus, Modbus and KNX device configuration
- Metering Structure
- User Management (administration)
- Tariffs and Unit
- Consumer Groups
- Data Sharing
  (transfer to higher-level systems)

Note:
Access only with “administrator” authorization



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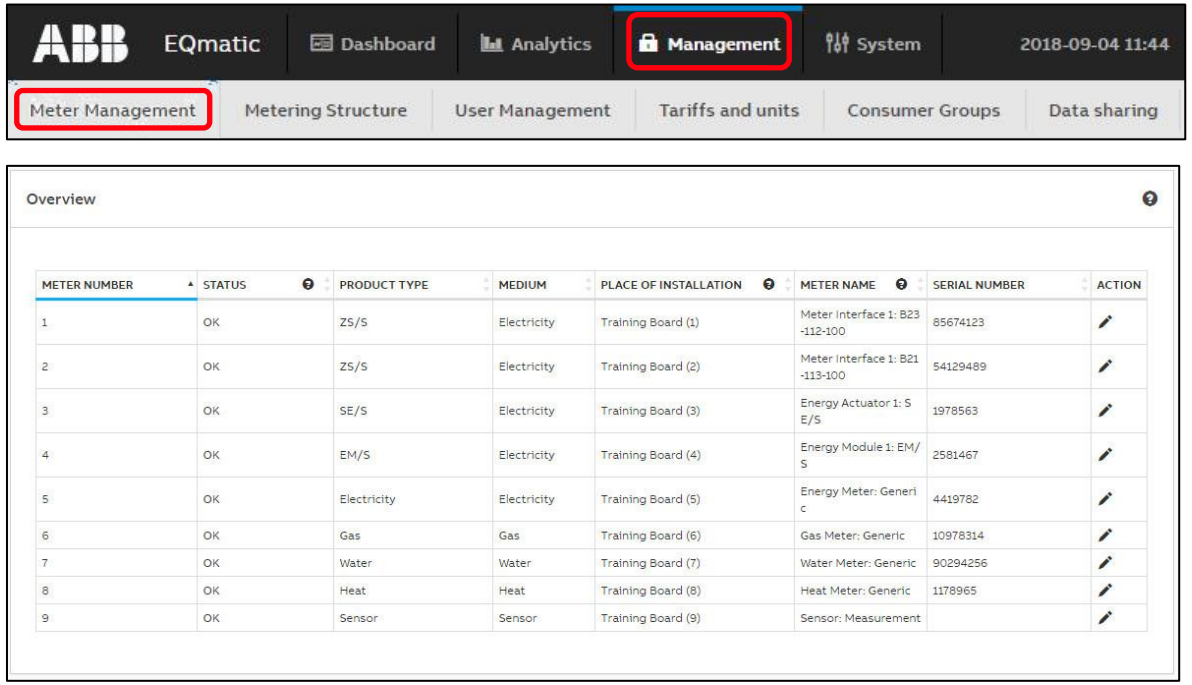
Menu “Management”

Meter Management: QA/S 1.16.1 KNX

- KNX meters are displayed in the meter management overview table once they are configured in ETS , assigned group addresses and downloaded
- No settings can be made in the UI
- The changing of parameters has to be done in the ETS and then reloaded into the KNX devices
- The changes (e.g. nodes in the metering structure) must be updated in the UI



METER NUMBER	STATUS	PRODUCT TYPE	MEDIUM	PLACE OF INSTALLATION	METER NAME	SERIAL NUMBER	ACTION
1	OK	ZS/S	Electricity	Training Board (1)	Meter Interface 1: B23 -112-100	85674123	
2	OK	ZS/S	Electricity	Training Board (2)	Meter Interface 1: B21 -113-100	54129489	
3	OK	SE/S	Electricity	Training Board (3)	Energy Actuator 1: S E/S	1978563	
4	OK	EM/S	Electricity	Training Board (4)	Energy Module 1: EM/ S	2581467	
5	OK	Electricity	Electricity	Training Board (5)	Energy Meter: Generi c	4419782	
6	OK	Gas	Gas	Training Board (6)	Gas Meter: Generic	10978314	
7	OK	Water	Water	Training Board (7)	Water Meter: Generic	90294256	
8	OK	Heat	Heat	Training Board (8)	Heat Meter: Generic	1178965	
9	OK	Sensor	Sensor	Training Board (9)	Sensor: Measurement		

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Menu “Management”

Meter Management: QA/S 1.16.1 KNX

All KNX devices are shown along with their information in the overview table below

METER NUMBER	STATUS	PRODUCT TYPE	MEDIUM	PLACE OF INSTALLATION	METER NAME	SERIAL NUMBER	ACTION
1	OK	ZS/S	Electricity	Training Board (1)	Meter Interface 1: B23 -112-100	85674123	
2	OK	ZS/S	Electricity	Training Board (2)	Meter Interface 1: B21 -113-100	54129489	
3	OK	SE/S	Electricity	Training Board (3)	Energy Actuator 1: S E/S	1978563	

Meter Number	Indicates the meter number as configured in ETS
Status	OK: Meter configured and connected. Reading enabled. ERROR, possible causes: • Installation error (L and N transposed) • IR communication error (only with ZS/S) • Hardware fault • Reading disabled (only with SE/S and EM/S) DISCONNECTED: Device not connected to bus or has no power supply.
Product Type	Displays the product in use (e.g. ZS/S) depending on the selection made in ETS
Medium	Displays the medium to be measured on the device
Place of installation	The installation location must be entered in ETS. This is recommended so that the device is easier to identify and assign when configuring the metering structure. Duplicate names are allowed.
Meter Name	The meter name must be entered in ETS. This is recommended so that the device is easier to identify and assign when configuring the metering structure. Duplicate names are allowed.
Serial Number	The serial number must be entered in ETS. This is recommended so that the device is easier to identify and assign when configuring the metering structure.
Action	A view of the available data points for the meter. Opens the information and table view for the available data points. All of the meter's data points are listed in the table even if the meter is not linked with a group address via ETS, in which case the data point is shown as "0" in the table.

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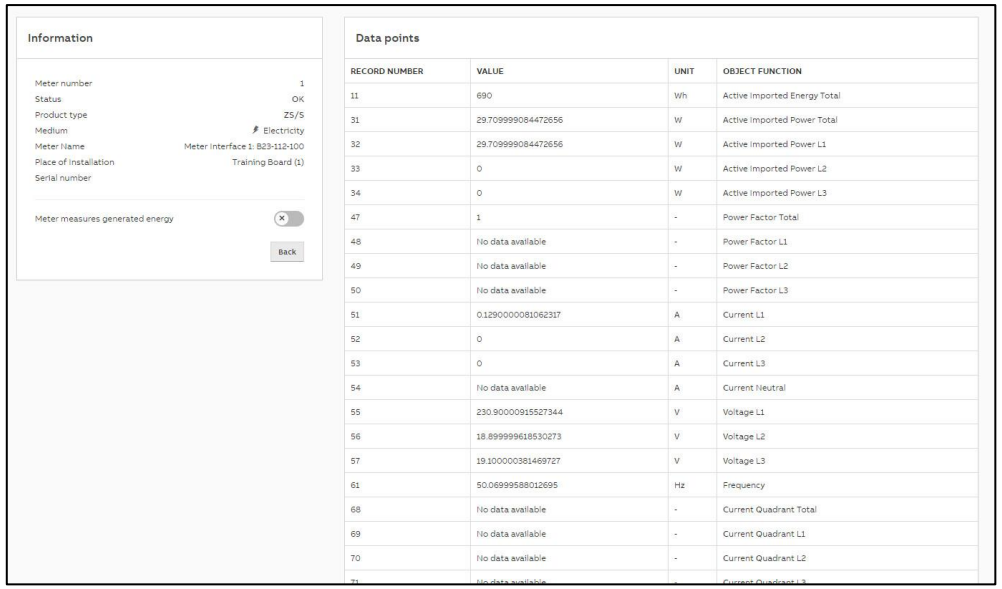
Menu “Management”

Meter Management: QA/S 1.16.1 KNX

- Click the “Edit” icon in the overview table to see more information (e.g. instantaneous value) about the KNX meter
- Available data points, which depend on the meter type, are listed in the data points list

METER NUMBER	STATUS	PRODUCT TYPE	MEDIUM	PLACE OF INSTALLATION	METER NAME	SERIAL NUMBER	ACTION
1	OK	ZS/S	Electricity	Training Board (1)	Meter Interface 1: B23 -112-100	85674123	
2	OK	ZS/S	Electricity	Training Board (2)	Meter Interface 1: B21 -113-100	54129489	
3	OK	SE/S	Electricity	Training Board (3)	Energy Actuator 1: S E/S	1978563	



Information

Meter number	1
Status	OK
Product type	ZS/S
Medium	Electricity
Meter Name	Meter Interface 1: B23-112-100
Place of installation	Training Board (1)
Serial number	

Meter measures generated energy

Back

Data points

RECORD NUMBER	VALUE	UNIT	OBJECT FUNCTION
11	690	Wh	Active Imported Energy Total
31	29.709999084472656	W	Active Imported Power Total
32	29.709999084472656	W	Active Imported Power L1
33	0	W	Active Imported Power L2
34	0	W	Active Imported Power L3
47	1	-	Power Factor Total
48	No data available	-	Power Factor L1
49	No data available	-	Power Factor L2
50	No data available	-	Power Factor L3
51	0.1290000081062317	A	Current L1
52	0	A	Current L2
53	0	A	Current L3
54	No data available	A	Current Neutral
55	230.90000915527344	V	Voltage L1
56	18.899999618530273	V	Voltage L2
57	19.100000381469727	V	Voltage L3
61	50.06999588012695	Hz	Frequency
68	No data available	-	Current Quadrant Total
69	No data available	-	Current Quadrant L1
70	No data available	-	Current Quadrant L2

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Menu “Management”

Meter Management: QA/S 3.xx.1 M-Bus

- The *Meter Management* menu is used to make all the settings for the detection of M-Bus devices connected
- This scan or scanned by commissioning wizard is absolutely essential during commissioning to be able to add, configure and manage devices
- After the scan, all M-Bus devices detected are listed in a table
- It is the basis for assigning devices to the metering structure later on
- Scanning can take several minutes depending on the scan settings and the number of M-Bus devices
- Limit the scan range as much as possible to reduce the scanning process time

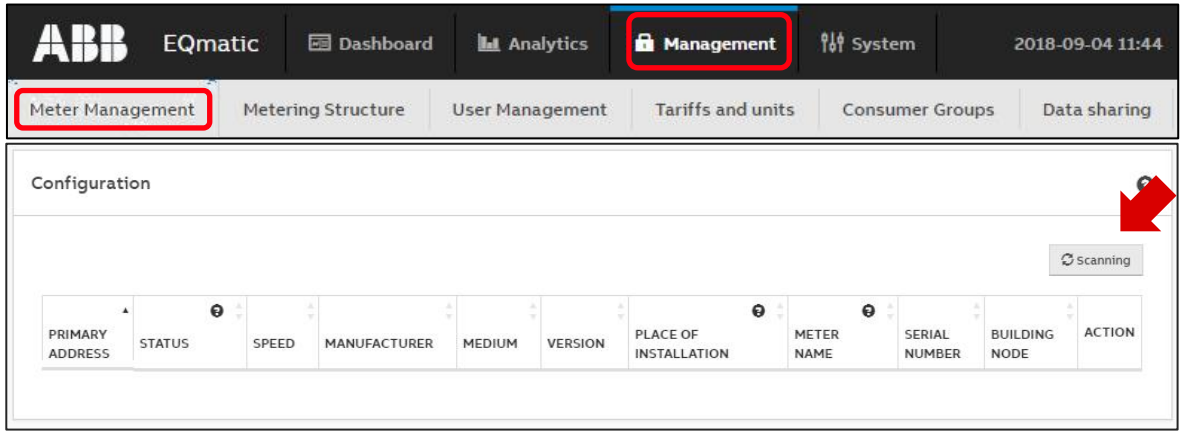


ABB EQmatic Energy Analyzer QA/S x.yy.1

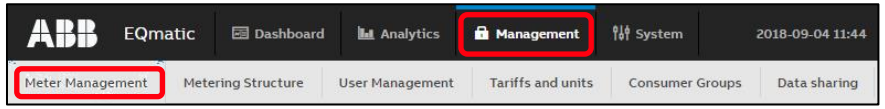
Menu “Management”

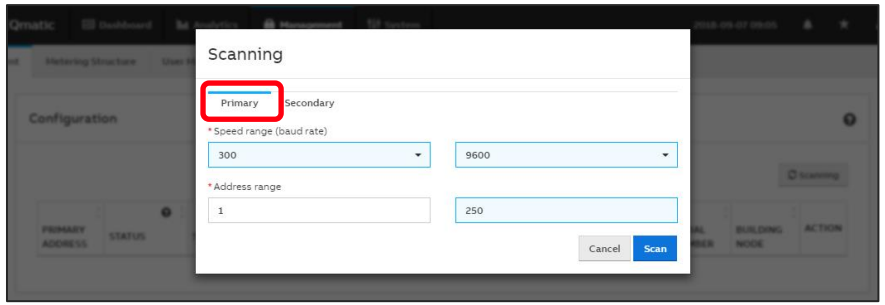
Meter Management: QA/S 3.xx.1 M-Bus

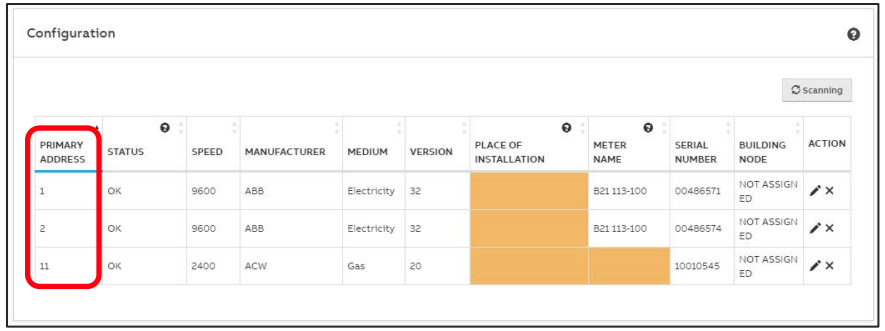
This scanning process uses either primary or secondary addressing

Primary:

- The primary addresses must be set before-hand on the relevant device (M-Bus slave)
- The primary address is pre-set to “0” on ABB meters in the factory
- Each M-Bus device must be assigned a unique primary address (1 … 250)
- Duplicate addresses cause address conflicts!







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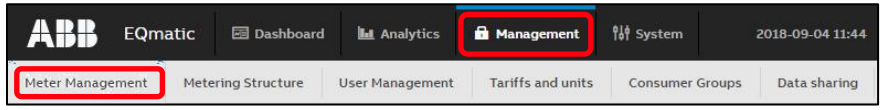
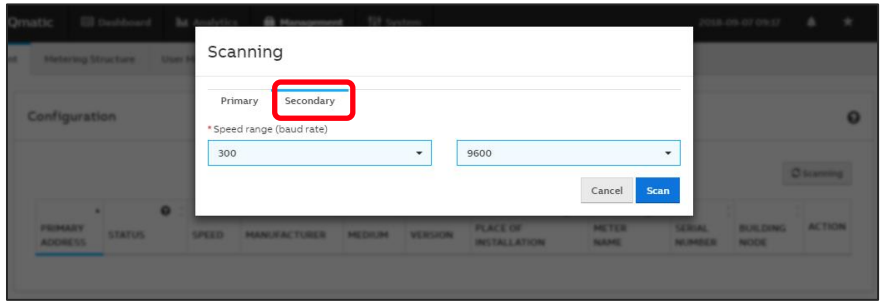
Menu “Management”

Meter Management: QA/S 3.xx.1 M-Bus

Secondary:

- Scan based exclusively on secondary address
- There is no unique (primary) addressing in the related M-Bus device
- The devices respond with speed, manufacturer, medium, version and serial number
- The device serial number is generally used as the secondary address
- It is an 8-digit number printed to the device
- The serial number of ABB meters is on the nameplate on the front of the device, e.g. 00486571





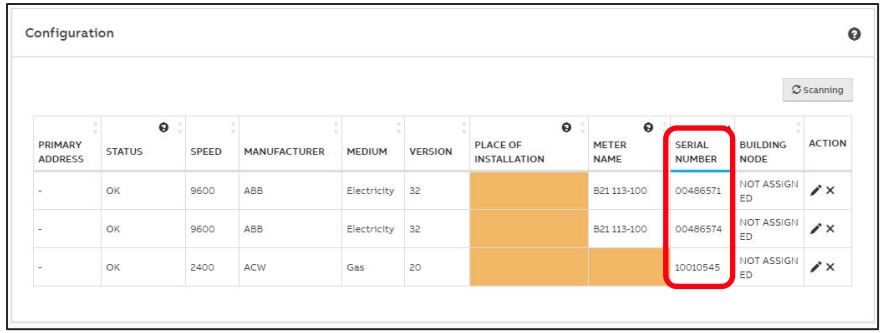
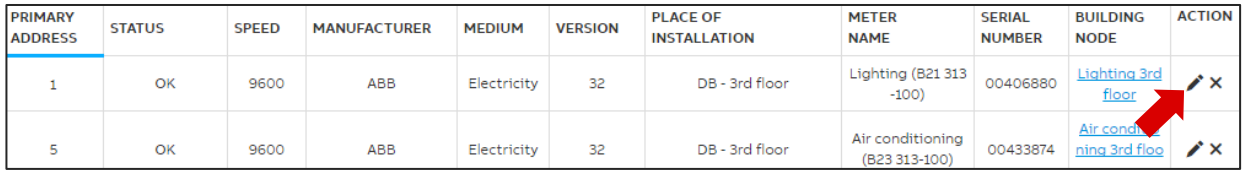


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Management”

Meter Management: QA/S 3.xx.1 M-Bus

After a successful scan, all detected M-Bus devices are shown along with their information in the overview table below



PRIMARY ADDRESS	STATUS	SPEED	MANUFACTURER	MEDIUM	VERSION	PLACE OF INSTALLATION	METER NAME	SERIAL NUMBER	BUILDING NODE	ACTION
1	OK	9600	ABB	Electricity	32	DB - 3rd floor	Lighting (B21 313 -100)	00406880	Lighting 3rd floor	
5	OK	9600	ABB	Electricity	32	DB - 3rd floor	Air conditioning (B23 313-100)	00433874	Air conditioning 3rd floo	

Primary address	Shows the primary address set in the M-Bus device.
Status	OK: Meter detected, configured and connected Collision: Address conflict. Devices with same primary address or identical serial number Not configured: Device is not configured. Click on edit button. Disconnected: Device is not available or is disconnected from the M-Bus.
Speed	Shows the speed set in the M-Bus device
Manufacturer	Shows the manufacturer (max. 3 characters, e.g. ABB)
Medium	Shows which medium is measured by the M-Bus device
Version	Shows the firmware version in the M-Bus device
Place of installation	Enter the place the device is installed here. This action is recommended so that the device is easier to identify and assign on configuring the metering structure. Duplicate names are allowed.
Meter name	For ABB meters, the type designation is used by default as the device name after a scan. This can be overwritten. Enter a name for the device here. This action is recommended so that the device is easier to identify and assign on configuring the metering structure. Duplicate names are allowed.
Serial number	Shows the serial number (= secondary address) of the M-Bus device
Assignment	Shows the assignment of the M-Bus device based on the metering structure configured
Action	Used to edit and configure the M-Bus device (opens the window for configuring the meter or removes the M-Bus device from the system).

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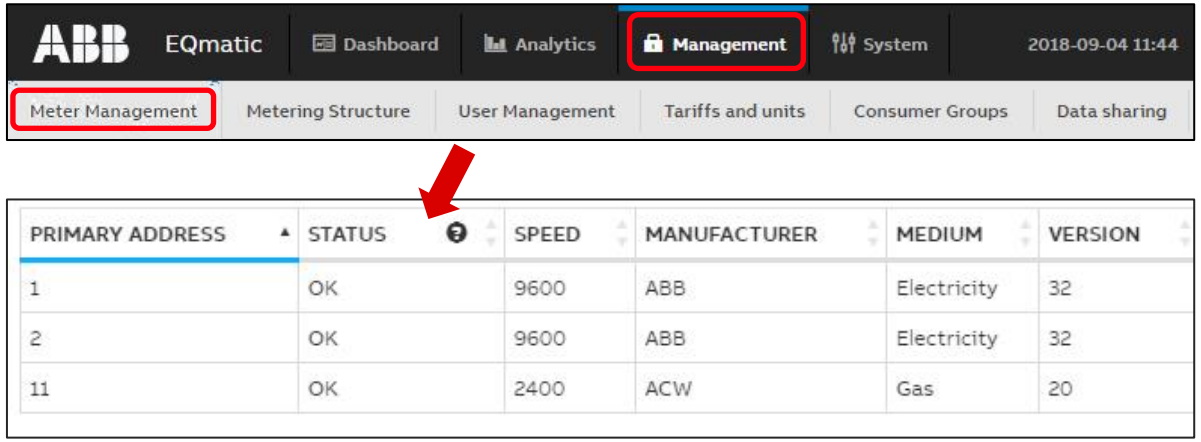
Menu “Management”

Meter Management: QA/S 3.xx.1 M-Bus

An M-Bus device is considered configured (status OK) as soon as one of the data points for consumption has been configured

- Electricity meter:
  - Active energy (kWh)
  - Active power (W)
- Water meter:
  - Volume (m^3)
- Gas meter:
  - Volume (m^3)
- Heat meter:
  - Active energy (kWh)



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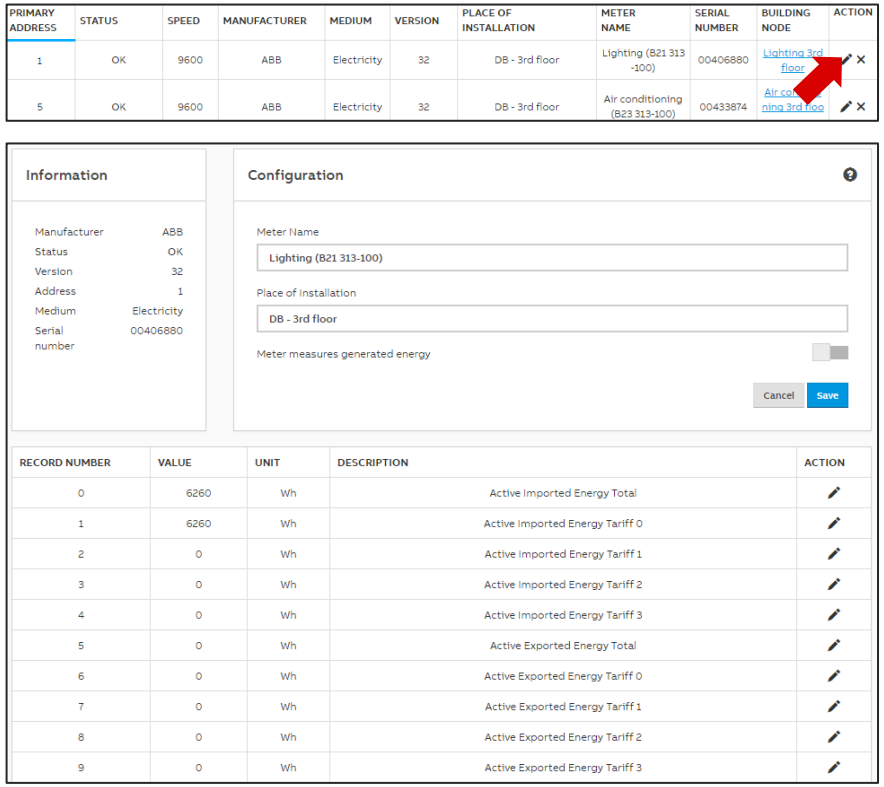
Menu “Management”

Meter Management: QA/S 3.xx.1 M-Bus

- ABB EQ A4x/B2x meters are automatically detected after scanning and do not need to be configured
- Available data points, which depend on the meter type, are listed in the data points list
- If a M-Bus device is shown as “Not Configured” or “Not detected” after scanning, you need to configure the device or its data points
- Click the “Edit” icon in the device overview of the M-Bus device to be configured
  - Meter name: For ABB meters, the type designation (e.g. A41 513-100) is used by default as the meter name
  - Place of installation: To enter the physical place where the M-Bus device is installed



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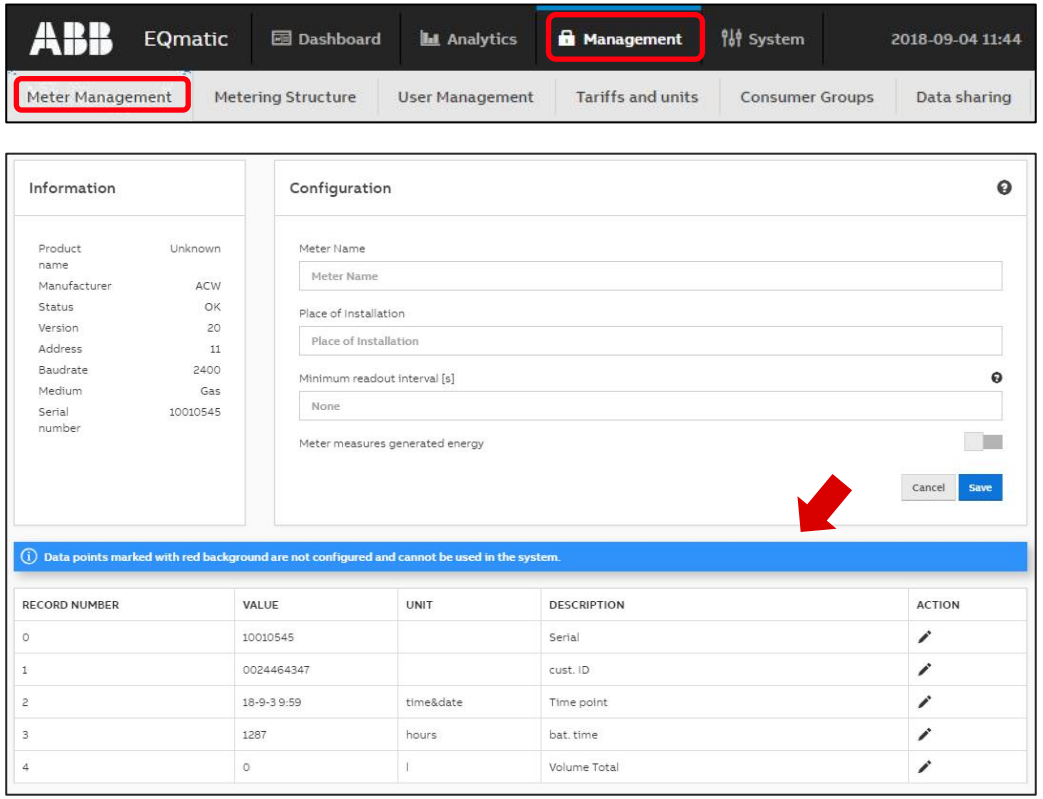
Menu “Management”

Meter Management: QA/S 3.xx.1 M-Bus

To add a manufacturer-specific data point, you need to configure it, e.g. gas meter



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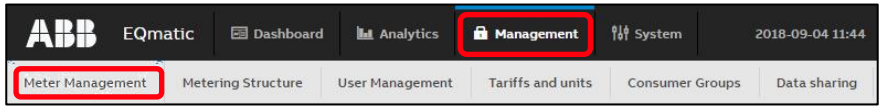
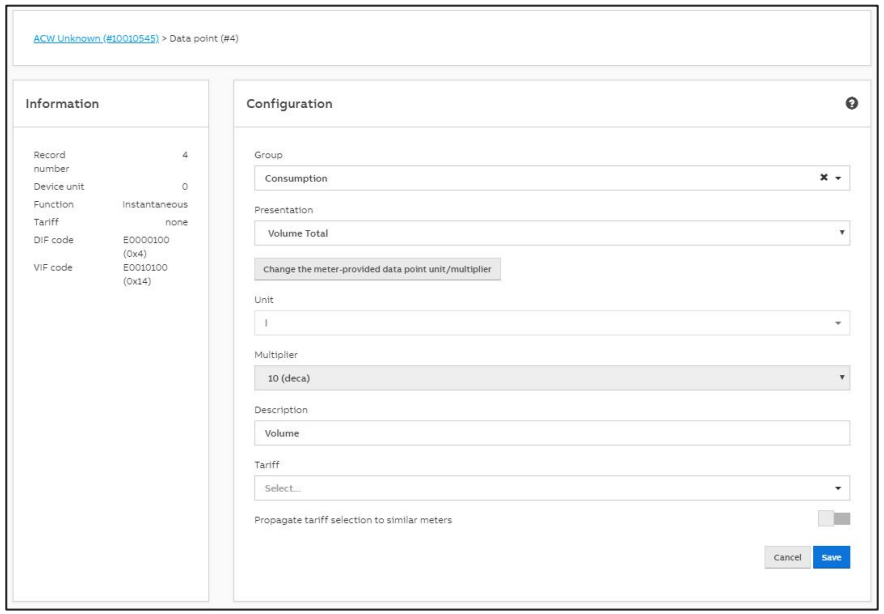
Menu “Management”

Meter Management: QA/S 3.xx.1 M-Bus

The required data point information must be entered in the configuration dialog

- Group (consumption, generation, ...)
- Presentation
- Unit
- Multiplier
- Description
- Tariff





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Menu “Management”

Meter Management: QA/S 4.xx.1 Modbus

- The *Meter Management* menu is used to make all the settings for the detection of Modbus devices connected
- After the scan, all Modbus devices detected are listed in a table
- This scan or scanned by commissioning wizard is absolutely essential during commissioning to be able to add, configure and manage devices
- It is the basis for assigning devices to the metering structure later on
- In the supplied state, the meter models and the register mapping are saved with data points for ABB EQ meters of type A4x, B2x and M2M
- As an alternative to a scan, devices can also be added manually to the system

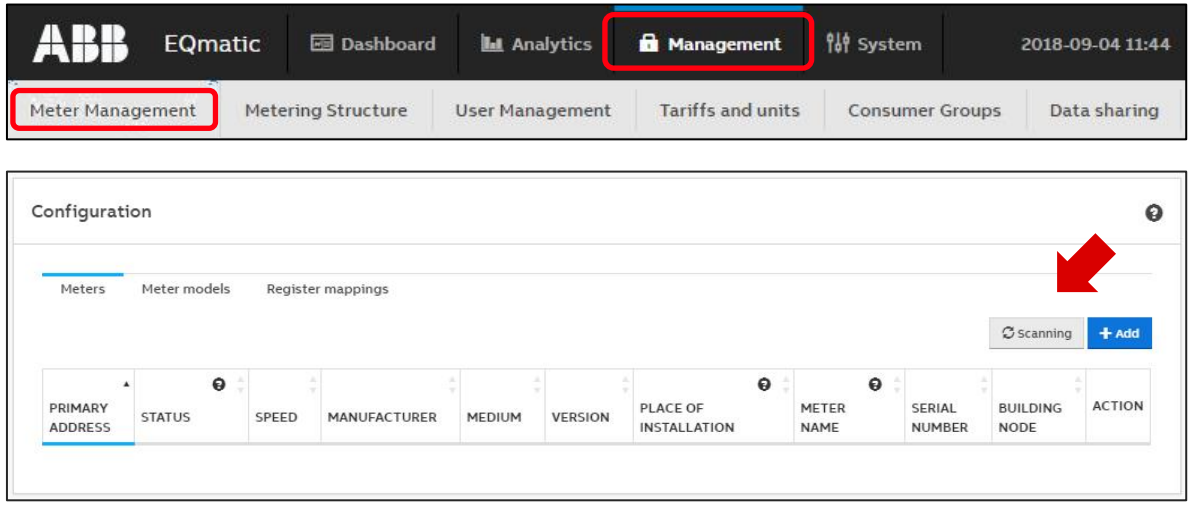


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Management”

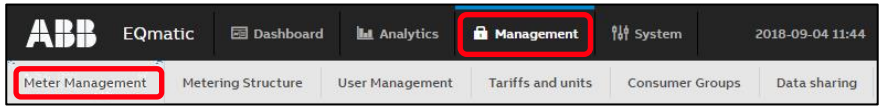
Meter Management: QA/S 4.xx.1 Modbus

To scan the bus for meters connected, first the speed range (speed), address range, parity, byte size and stop bits must be set

- The primary addresses must be set before-hand on the relevant devices (Modbus slaves)
- Each Modbus device must be assigned a unique primary address (1 … 247)
- Duplicate addresses cause address conflicts!
- ABB meters are supplied from the factory with the primary address 1”, speed “19,200”, parity “even”, byte size “8” and stop bits “1”

Scanning can takes several minutes depending on the scan settings and the number of Modus devices

Limit the scan range as much as possible to reduce the scanning process time



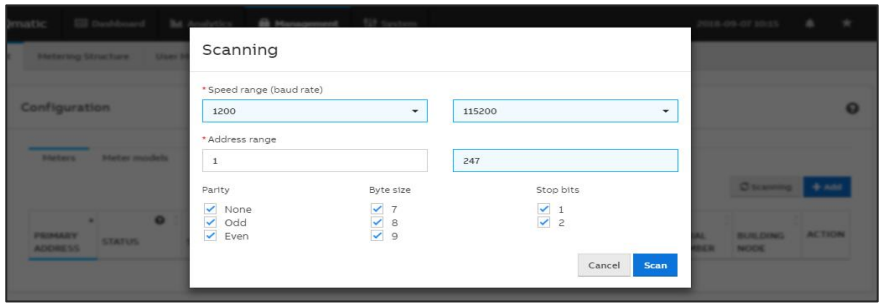


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Management”

Meter Management: QA/S 4.xx.1 Modbus

- As an alternative to a scan, meters can also be added manually to the Energy Analyzer
- For this purpose the device-specific information must be specified

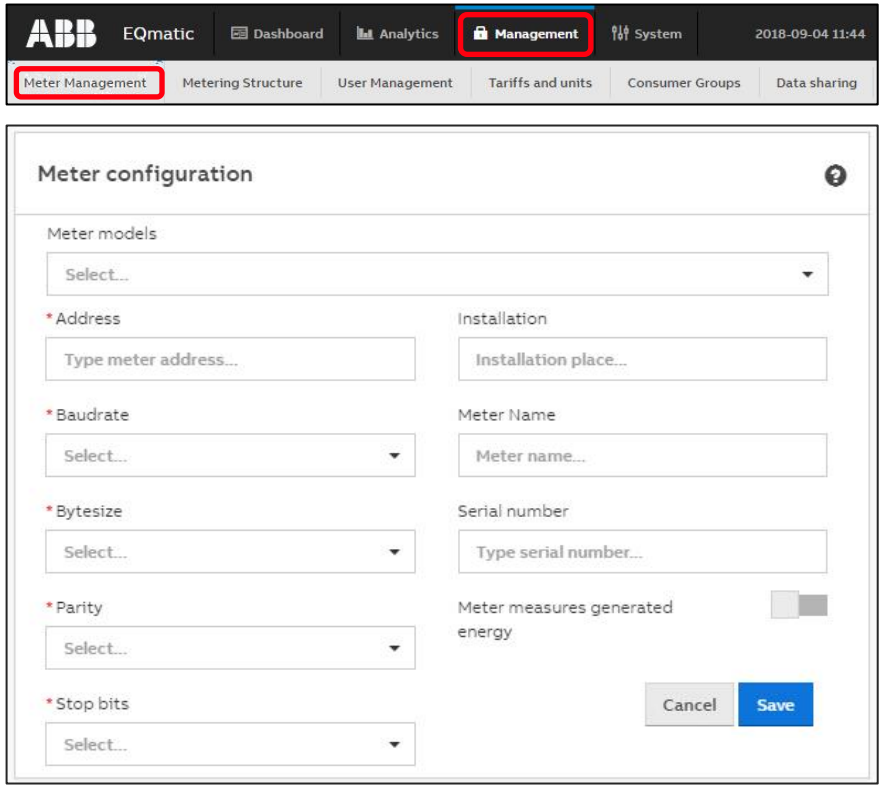


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Management”

Meter Management: QA/S 4.xx.1 Modbus

After a successful scan, all Modbus devices detected are shown along with the information they provided in the table below

PRIMARY ADDRESS	STATUS	SPEED	MANUFACTURER	MEDIUM	VERSION	PLACE OF INSTALLATION	METER NAME	SERIAL NUMBER	BUILDING NODE	ACTION
1	OK	19200	ABB	Electricity	768	DB - 7th floor	Electrical HEAT	00608121	NOT ASSIGNED	
2	OK	19200	ABB	Electricity	768	DB - 7th floor	Socket outlets	00408943	NOT ASSIGNED	

Primary address	Shows the primary address set in the device.
Status	OK: Meter detected, configured and connected. System ready for operation. NOT CONFIGURED: Device model is linked to register mapping, however at least 1 data point is not configured. Configure using . NOT IDENTIFIED: Register mapping defined but meter model unknown or register mapping defined but linked with wrong meter model. DISCONNECTED: - Device not connected to bus or has no power supply, data points incorrectly configured in register mapping or not available in device or collision (address conflict). Devices with same primary address and speed
Speed	Shows the speed set in the device
Manufacturer	Shows the manufacturer (max. 3 characters, e.g. ABB)
Medium	Shows the medium to be measured on the device
Version	Shows the firmware version in the device
Place of installation	Enter the place the device is installed here. This action is recommended so that the device is easier to identify and assign on configuring the metering structure. Duplicate names are allowed.
Meter name	For ABB meters, the type designation is used by default as the device name after a scan. This can be overwritten. Enter a name for the device here. This action is recommended so that the device is easier to identify and assign on configuring the metering structure. Duplicate names are allowed.

ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Management”

Meter Management: QA/S 4.xx.1 Modbus

After a successful scan, meter models configured as in the previous instructions are detected and marked in the table with the status OK
→ The system is now ready for operation

Should one of the following status messages appear in the table after the scan, the meter model or register mapping with data points must be configured, corrected or added

- Not configured
- Not identified
- Disconnected

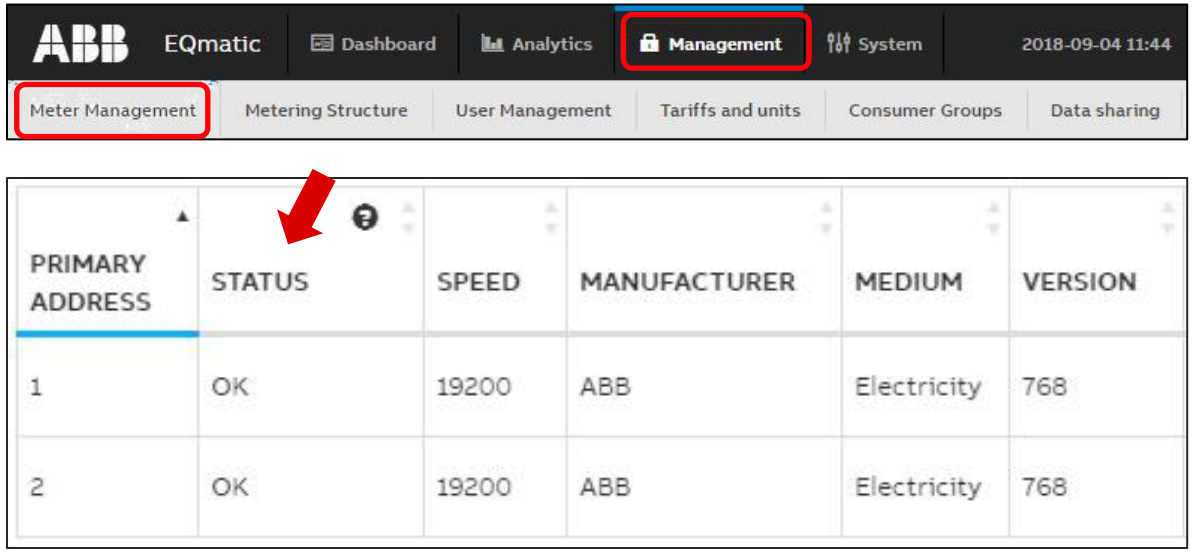


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Management”

Meter Management: QA/S 4.xx.1 Modbus

For correct operation, as a minimum the data point for the product name and one of the following data points for consumption must be configured

- Electricity meter:
  - Active energy (kWh)
  - Active power (W)
- Water meter:
  - Volume (m^3)
- Gas meter:
  - Volume (m^3)
- Heat meter:
  - Active energy (kWh)

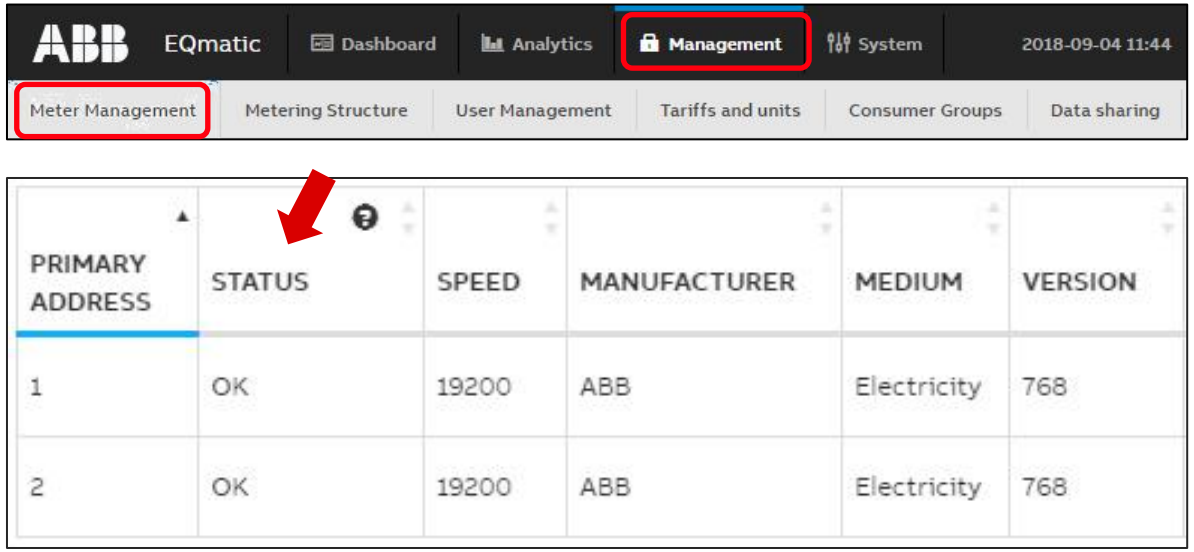


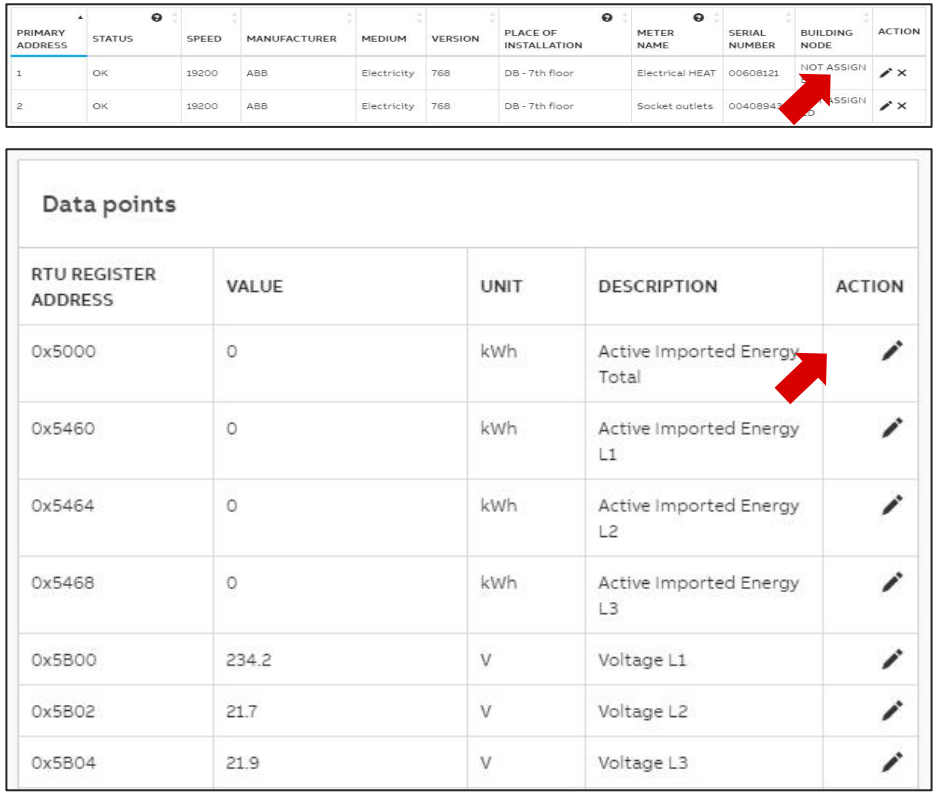
ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Management”

Meter Management: QA/S 4.xx.1 Modbus

- ABB EQ A4x/B2x meters and M2M Modbus Network analyzer are automatically detected after scanning and do not need to be configured (e.g. data points)
- The data points are visible if you open the Edit function for the required meter in the table of meters detected
- The data points can be edited as required

1	**RTU register address**	Shows the register address for the related data point.
2	**Value**	Shows the currently measured value for the data point.
3	**Unit**	Shows the physical unit of the related data point. Some data points may not have a unit, e.g. number of power failures.
4	**Description**	Describes the related data point. If the data point is manufacturer-specific and needs to be configured, this situation will be shown here.
5	**Action**	Used to edit and configure a data point



PRIMARY ADDRESS	STATUS	SPEED	MANUFACTURER	MEDIUM	VERSION	PLACE OF INSTALLATION	METER NAME	SERIAL NUMBER	BUILDING NODE	ACTION
1	OK	19200	ABB	Electricity	768	DB - 7th floor	Electrical HEAT	00608121	NOT ASSIGN	
2	OK	19200	ABB	Electricity	768	DB - 7th floor	Socket outlets	00408943	ASSIGN	

Data points

RTU REGISTER ADDRESS	VALUE	UNIT	DESCRIPTION	ACTION
0x5000	0	kWh	Active Imported Energy Total	
0x5460	0	kWh	Active Imported Energy L1	
0x5464	0	kWh	Active Imported Energy L2	
0x5468	0	kWh	Active Imported Energy L3	
0x5B00	234.2	V	Voltage L1	
0x5B02	21.7	V	Voltage L2	
0x5B04	21.9	V	Voltage L3	

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Menu “Management”

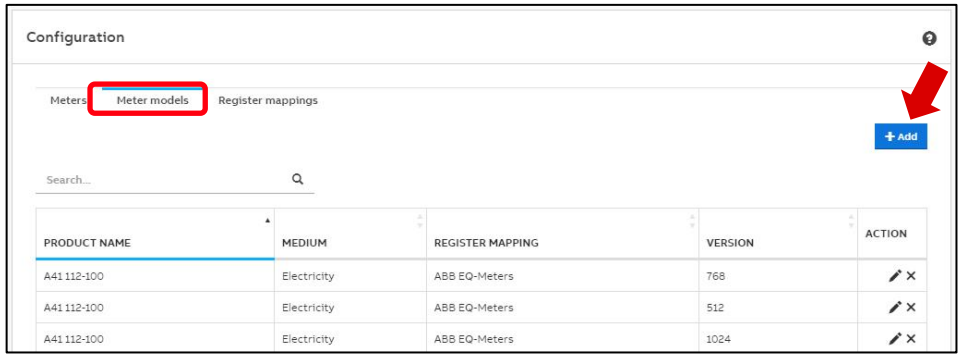
Meter Management: QA/S 4.xx.1 Modbus

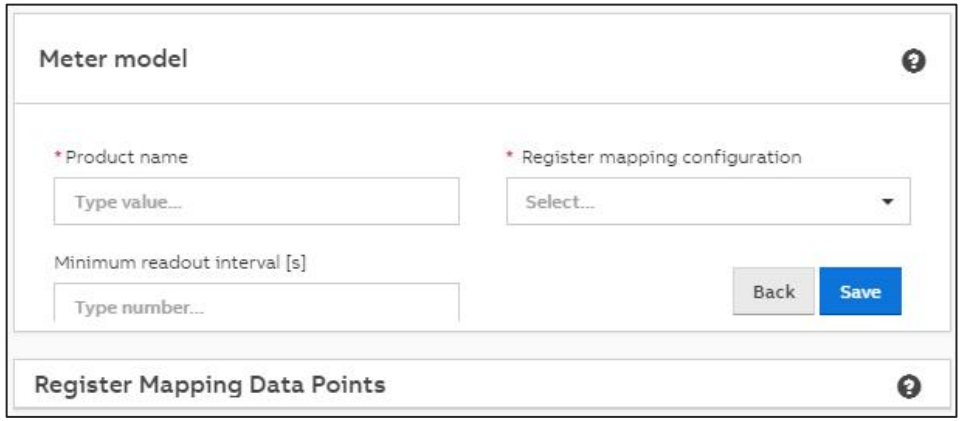
To configure or add new Modbus devices, it is necessary to define the meter model as well as the register mapping and related data points

General procedure to add to the Energy Analyzer a new Modbus device that is not yet saved in the system:

1. Add meter model
2. Select register mapping or configure new mapping
3. Configure data points for register mapping
4. Start scan or add device manually

Here the register mapping and device model can be added in any order





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Menu “Management”

Metering Structure

This function is used to specify the required metering structure for the building or infrastructure

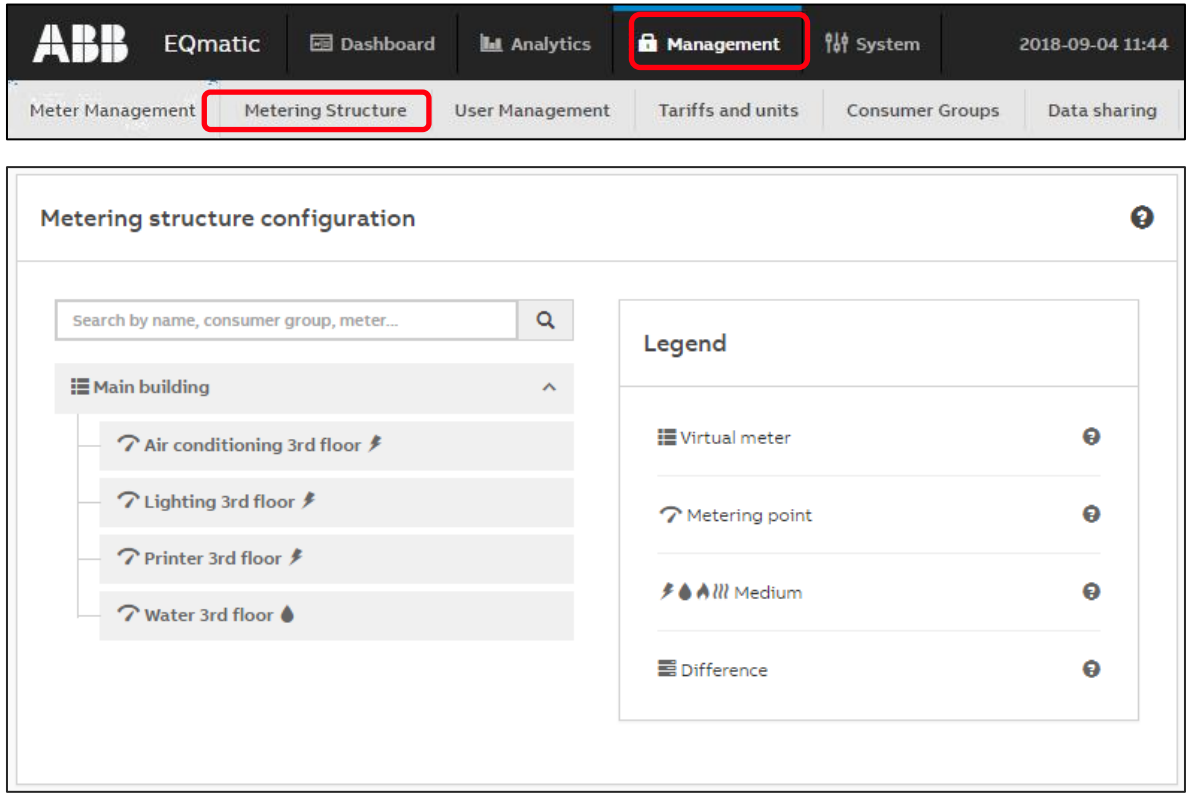
This makes navigation easier when carrying out analyses later on

Data aggregation or totals settings are also made here

There are various options available

– Manual Structure

– Automatic Structure
  This structure is additionally created when the M-Bus or Modbus is scanned for devices or slaves with the commissioning wizard



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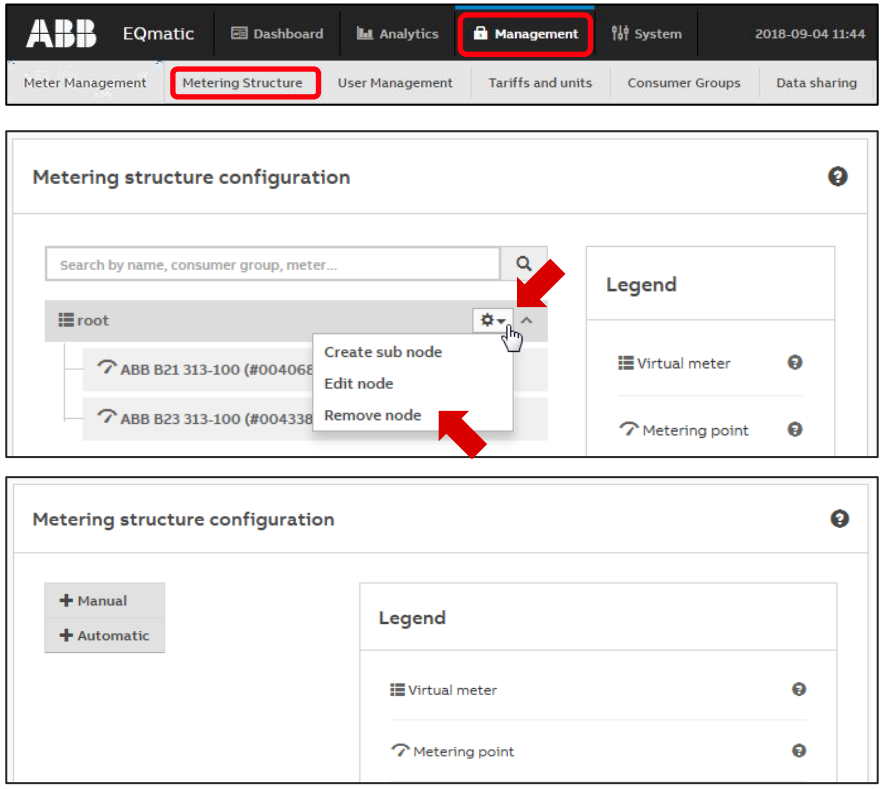
Menu “Management”

Metering Structure

- The “Automatic metering structure” created with the commissioning wizard or an existing metering structure can be removed by deleting the main node
- A selection button for creating a manual or automatic metering structure is then displayed
- An automatically created metering structure can be manually edited and changed as required at any time



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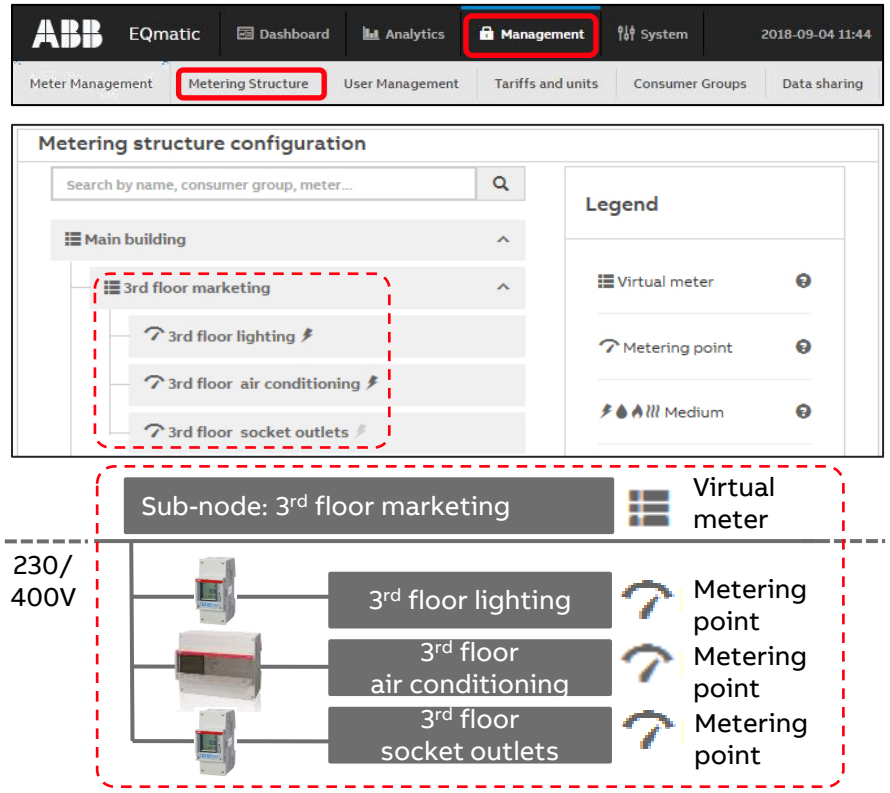
Menu “Management”

Metering Structure

It can consist of the following sub-nodes:

- Virtual meter
  No meters can be assigned. It summarizes consumption and/or measured data from subordinate nodes (additional virtual meters or metering points) of the first level in the tree structure
- Metering point
  A metering point only ever consists of one meter assigned to it
- Difference
  It is automatically created and calculated and indicates the difference between the collected data of the superordinate node and the sum of the collected data of the sub-nodes



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Menu “Management”

Metering Structure

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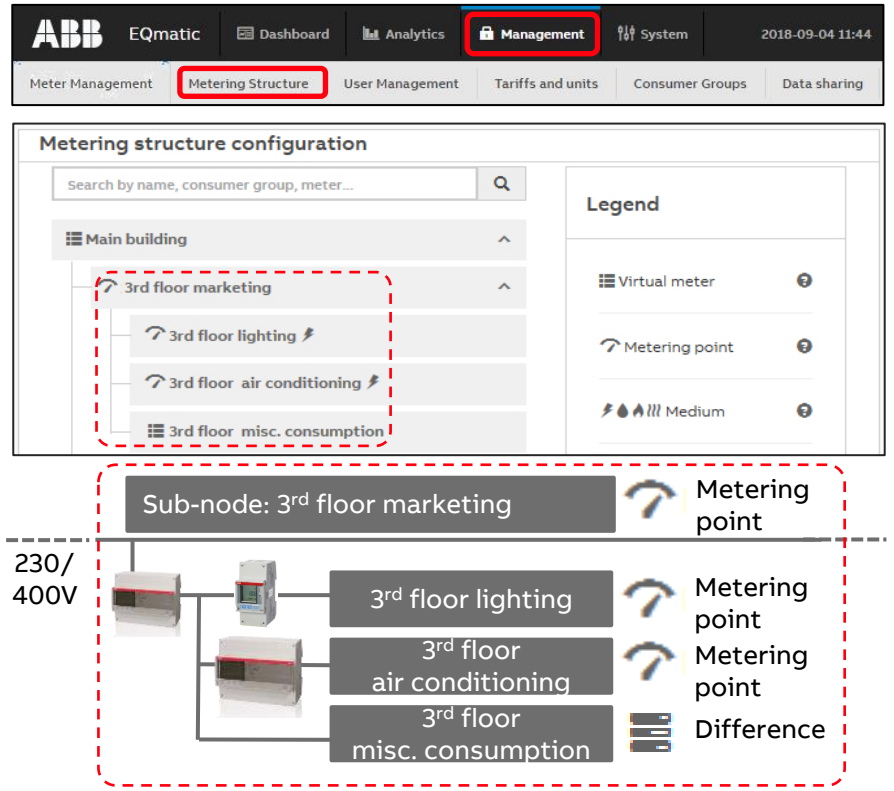

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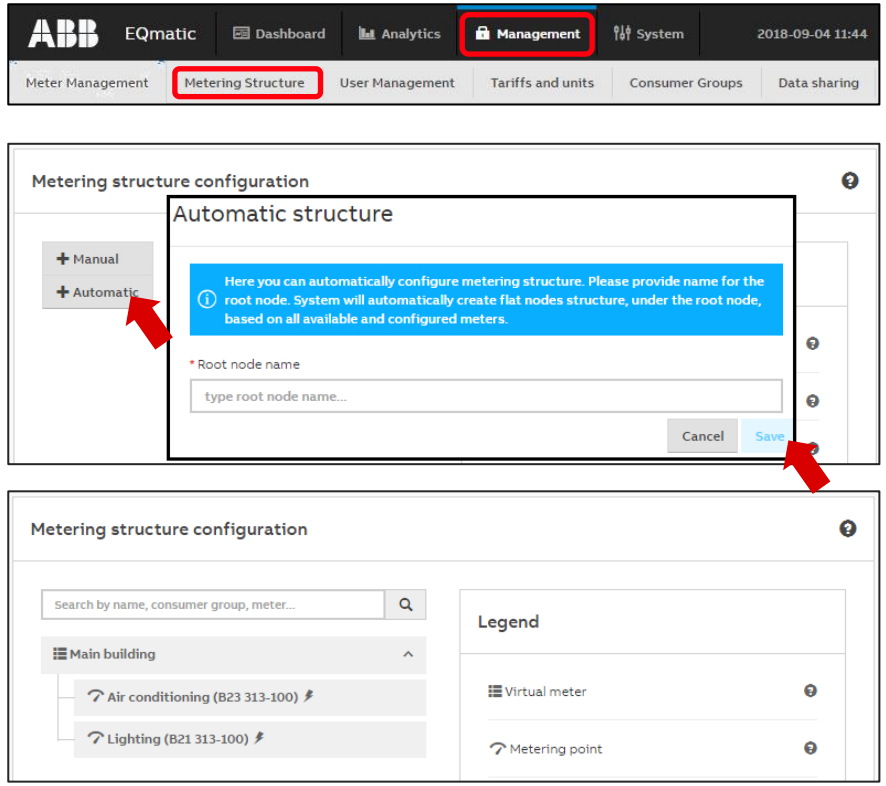
Menu “Management”

Metering Structure: Automatic Structure

- With the Automatic Structure, a configuration window for the main node opens
- Here, you need to enter the name of the building to which the meters are assigned, for example
- Detected and configured devices are then automatically displayed in a flat (non-nested) list under the main node
- The main node represents a virtual meter
- This aggregates data points or values that can be physically added together (e.g. energy in kWh, power in W) in the main node



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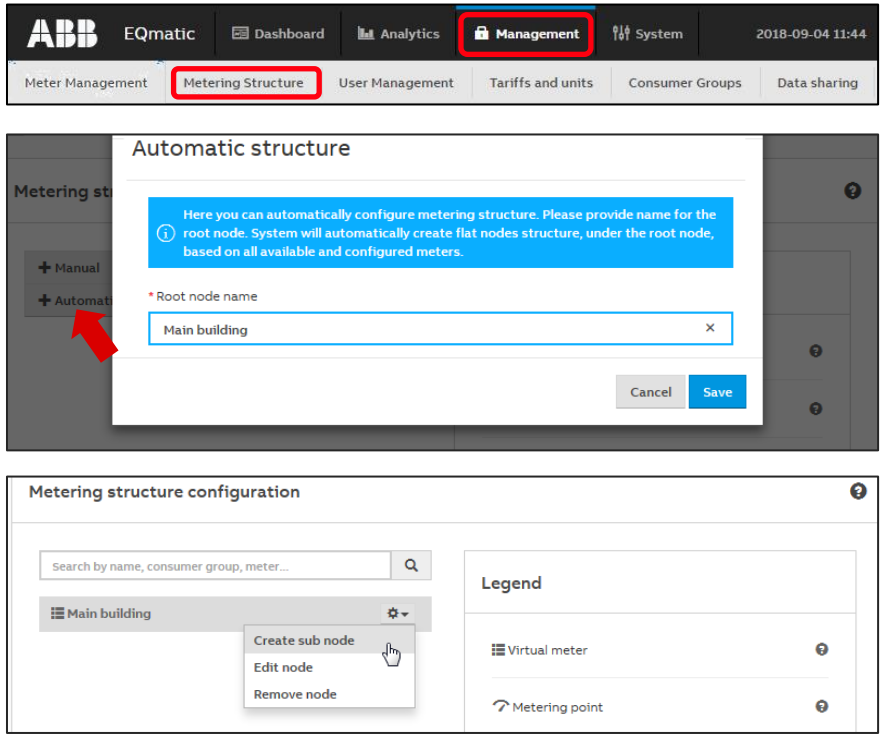
Menu “Management”

Metering Structure: Manual Structure

- The Manual Structure allows you to set up a custom topology (main and sub-nodes)
- With a Manual Structure, physical meters are assigned to a logical metering structure
- The Manual Structure can be used, for example, to show consumers and costs for a cost center or an organization
- The Metering Point and Virtual Meter structural elements are provided for this purpose



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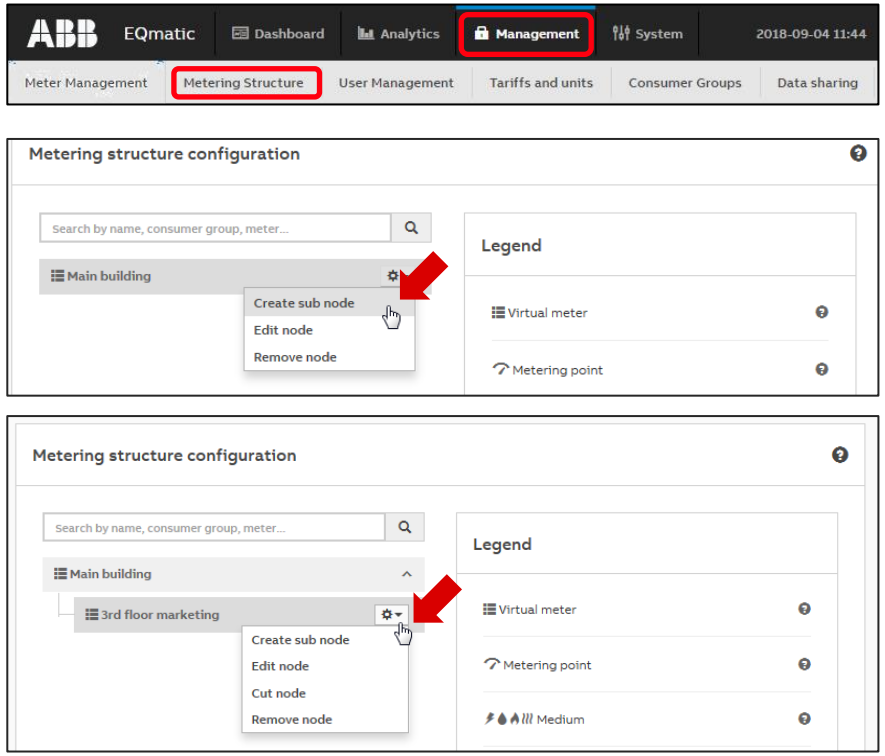
Menu “Management”

Metering Structure: Manual Structure

Clicking on the configuration icon opens the sub-menu:

- Create sub-node:
  A sub-node is created for the current node
  - Virtual Meter
  - Metering Point
  - Difference
- Edit:
  The dialog window for editing a node is displayed
- Delete:
  The node is deleted from the system
- The user can click and drag sub-nodes to move them in the structure



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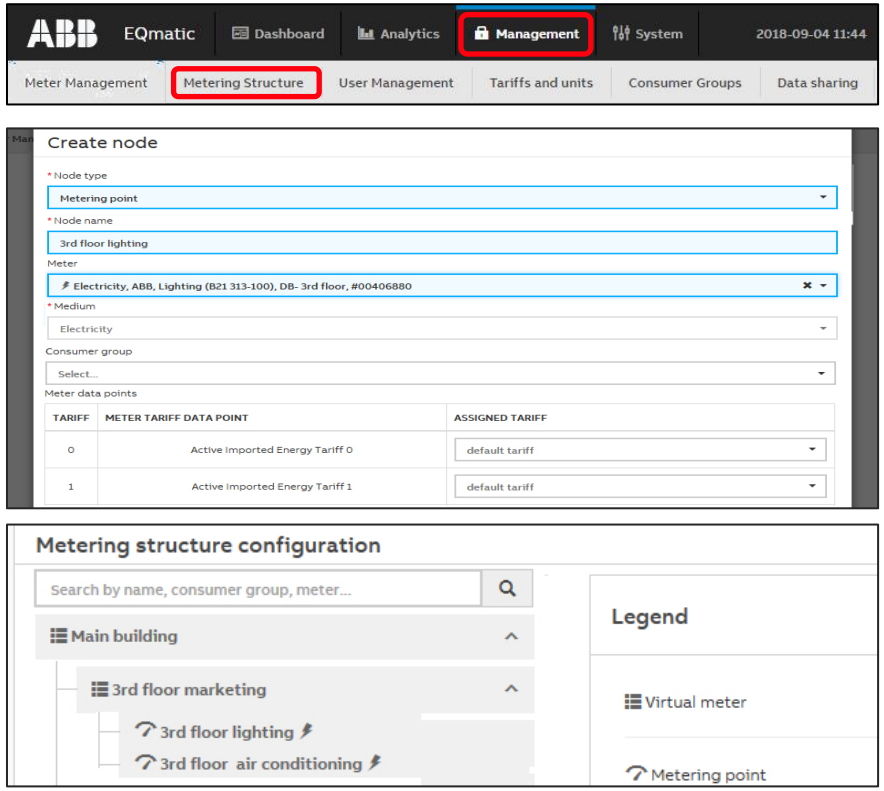
Menu “Management”

Metering Structure: Manual Structure

Dialog window for editing a node

- Node type: Metering Point
- Name: Used to name the node
- Meter: This parameter links the node to a physical meter. Meters are only displayed for selection if they have been added to the system via Meter Management and correctly configured
- Medium: Here, enter and set the medium that you wish the metering point to log
- Consumer group: This is used to select and assign a consumer group
- Meter data points: This is used to select and assign a data point



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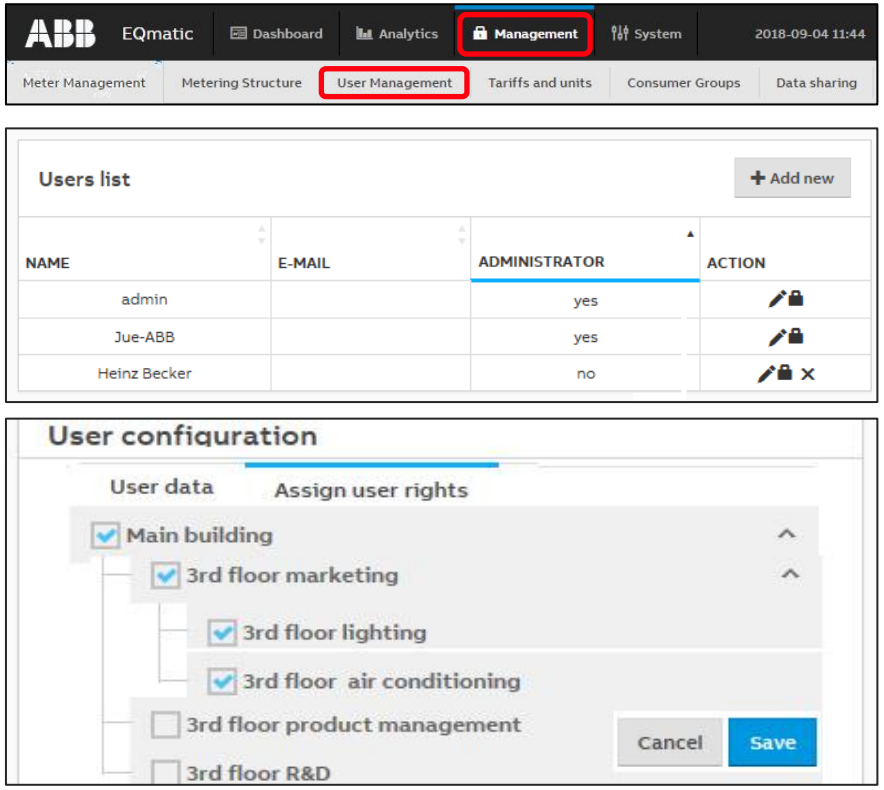
Menu “Management”

User Management

- In User Management you can add, configure and delete users
- You can add as many users as you wish
- Up to 10 users can access the system at any one time
- The language can be set and different access rights assigned to the users
- This function limits users to the areas they are authorized
- The email address is required to send users automatically reports or a message about resetting the password if the "password is forgotten“



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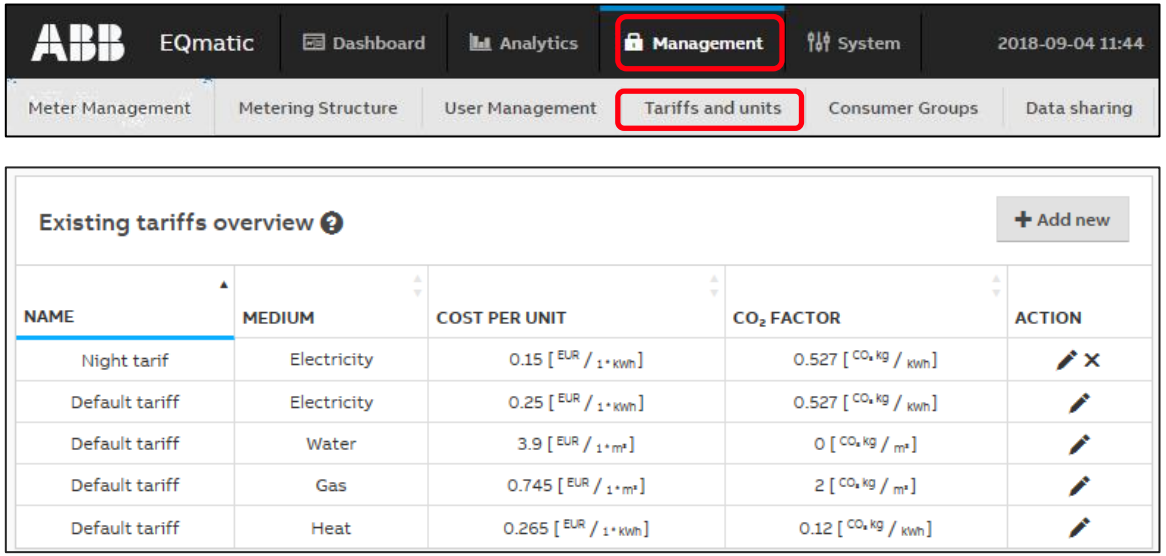
Menu “Management”

Tariffs and Units

- The tariff settings are used to configure tariffs
- This information is necessary for the subsequent calculation and display of costs
- Refer to your latest bill, or your contract, for details of your current tariff
- One tariff is pre-configured per medium from the factory; the costs per unit are set to "0.”
- You can add further tariffs



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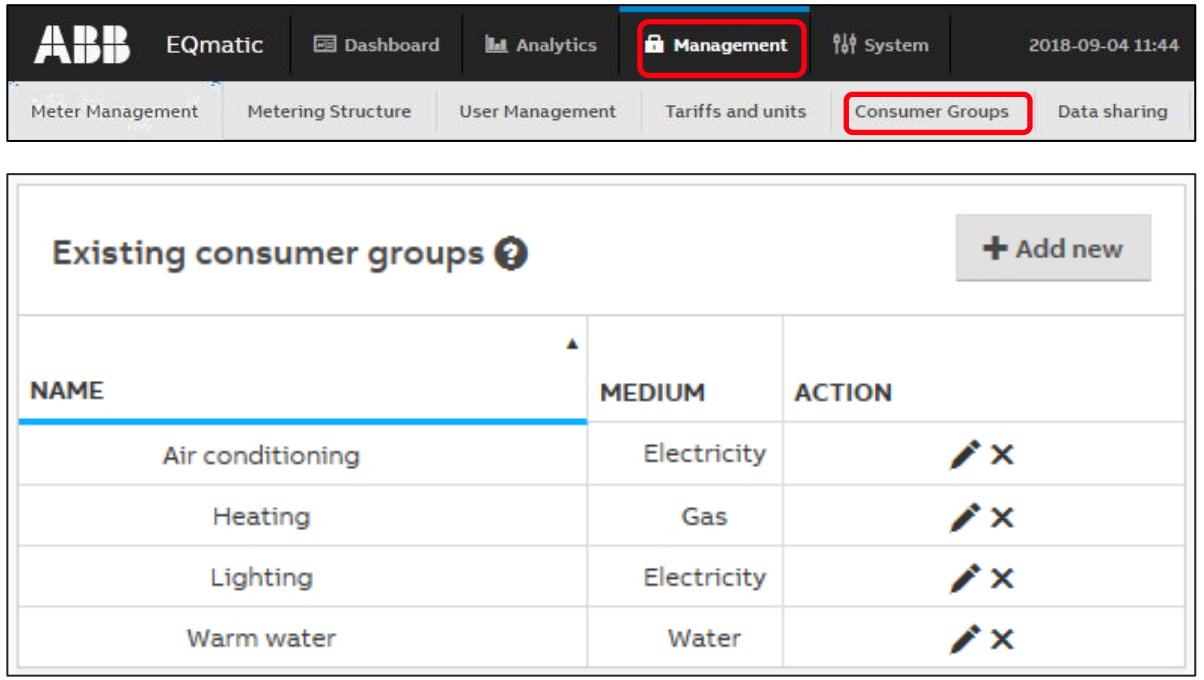
Menu “Management”

Consumer Groups

- Consumer groups are used to evaluate costs and consumption by application in the *Analytics* → *Usage* menu
- For example, you can display electrical energy costs by consumer groups such as lighting, sockets and air conditioning
- In order to be able to do this, a separate meter must be installed and assigned to a consumer group via the *Management* → *Metering Structure* menu



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Menu “Management”

Data sharing via Modbus TCP

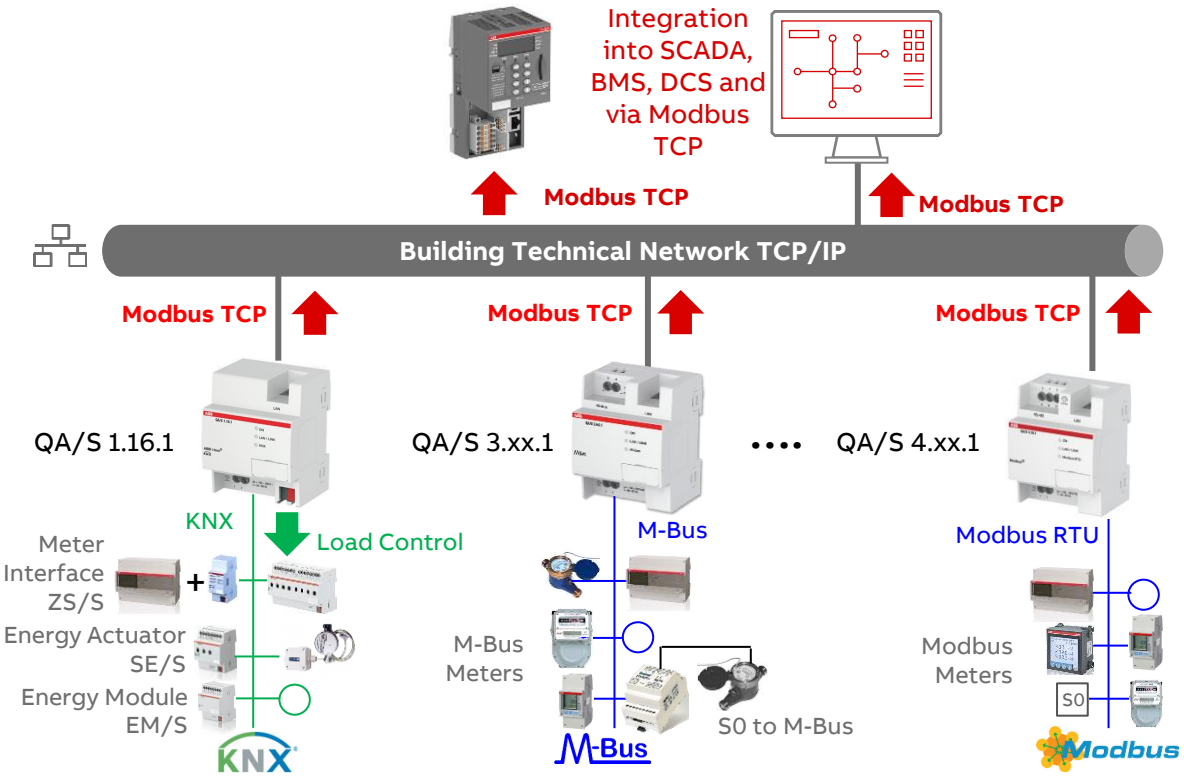
The data sharing functions below are used to forward and utilize measured data in higher-level systems (e.g. building management systems, SCADA or web services).

– Modbus TCP

– REST API

Both communication interfaces can be used at once

Note:
Using Modbus TCP and REST API requires IT programming expertise



Basic | Planning | Installing | Commissioning

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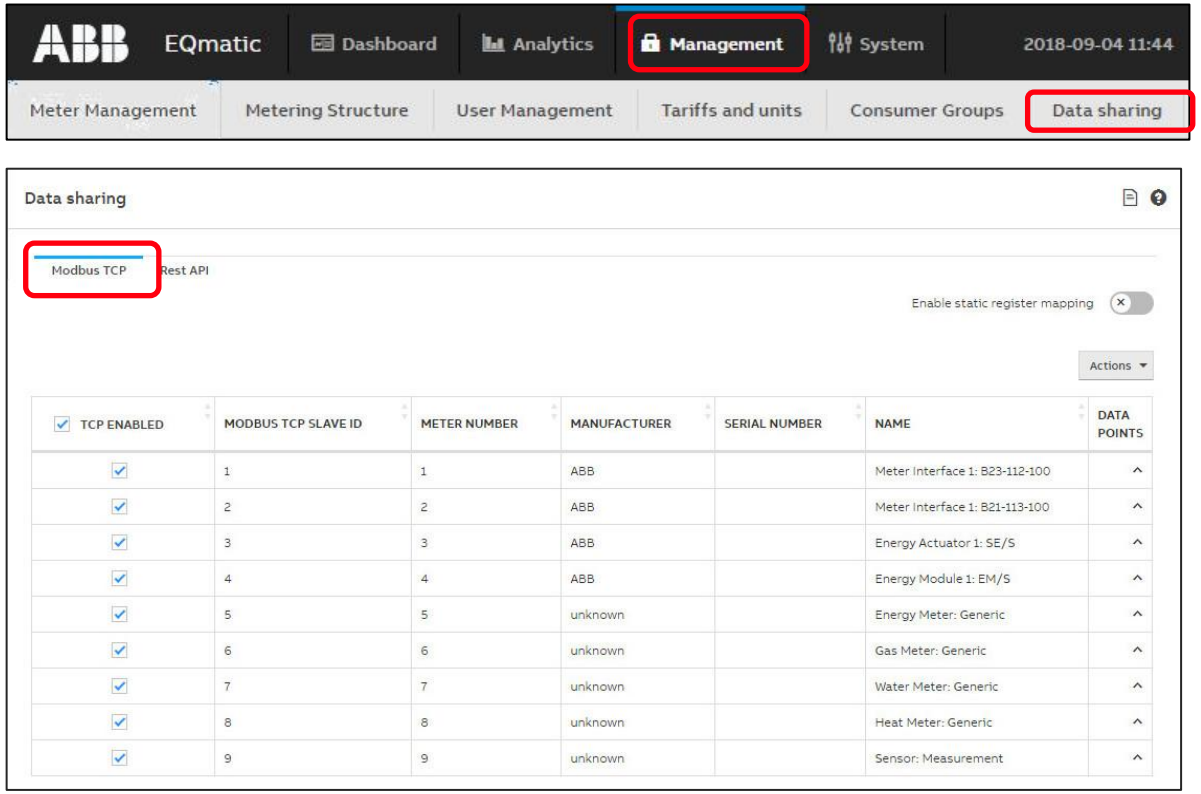
Menu “Management”

Data sharing via Modbus TCP

- The data transfer via Modbus TCP function is available for forwarding and using measured data in higher-level systems (e.g. building management systems, SCADA etc.)
- A Client-server communication is established via Modbus TCP
- This communication requires a TCP connection to be set up between a client (e.g. a PC) and the server (e.g. the Energy Analyzer QA/S x.yy.1)
- The TCP port 502 reserved for Modbus is used for communication
- If there is a firewall between the server and client, it must be ensured the TCP port configured is opened



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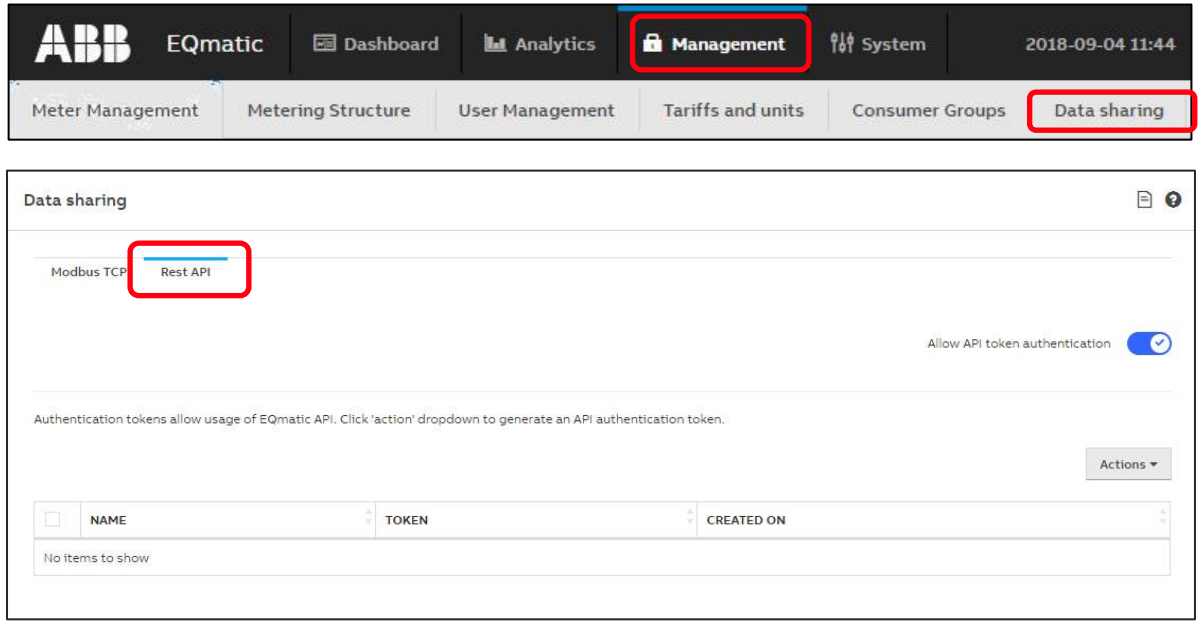
Menu “Management”

Data sharing via REST API

- An API (Application Programming Interface) enables two programs to communicate with each other
- REST (Representational State Transfer) is mainly used by web browsers and is a common programming style for web services
- REST API provides easier access to lots of web services, e.g. If you need to set up your own cloud server or create a customer-specific application
- Data can be accessed using HTTP commands such as GET, PUT, POST, DELETE



Commissioning

Main menu “System”

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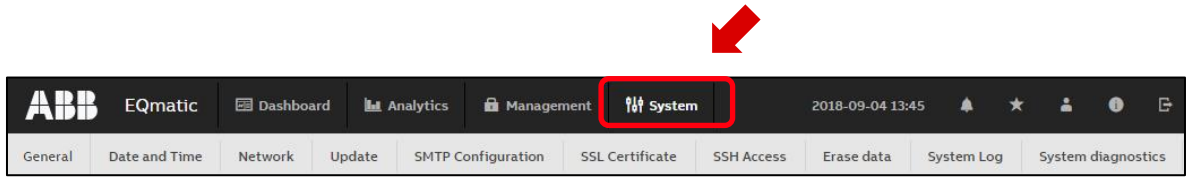
Menu “System”

System

Basic settings are made in the System menu

- General
- Date and time
- Network settings
- Update
- SMTP configuration
- SSL certificate
- SSH access
- Erase data
- System log
- System diagnostics

Note:
Access only with “administrator” authorization



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Menu “System”

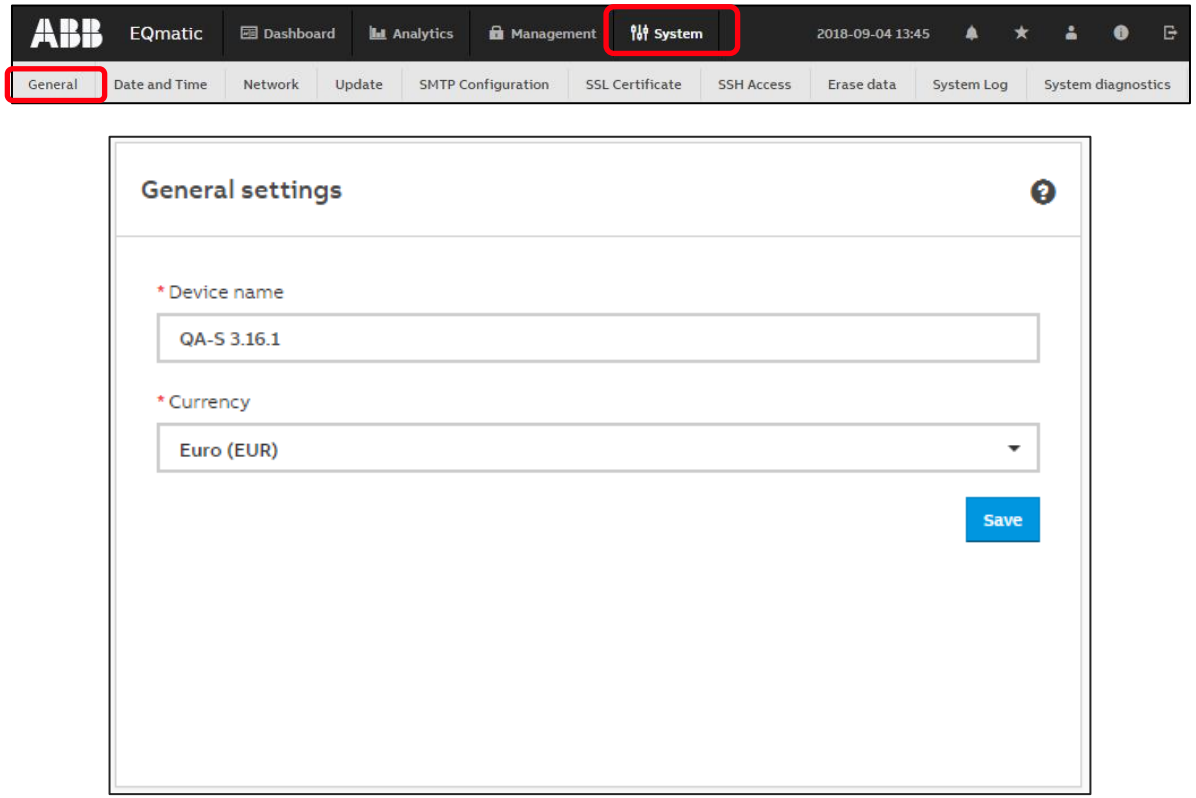
General

Device Name

– For assigning a device name
– The device name is displayed in the ABB i-bus® Tool
– QA/S 1.16.1 KNX: The device name is assigned in the ETS

Currency

– For setting the currency for cost calculation or display



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Menu “System”

Date and Time

Automatic or manual date and time setting can be selected

Automatically Off:

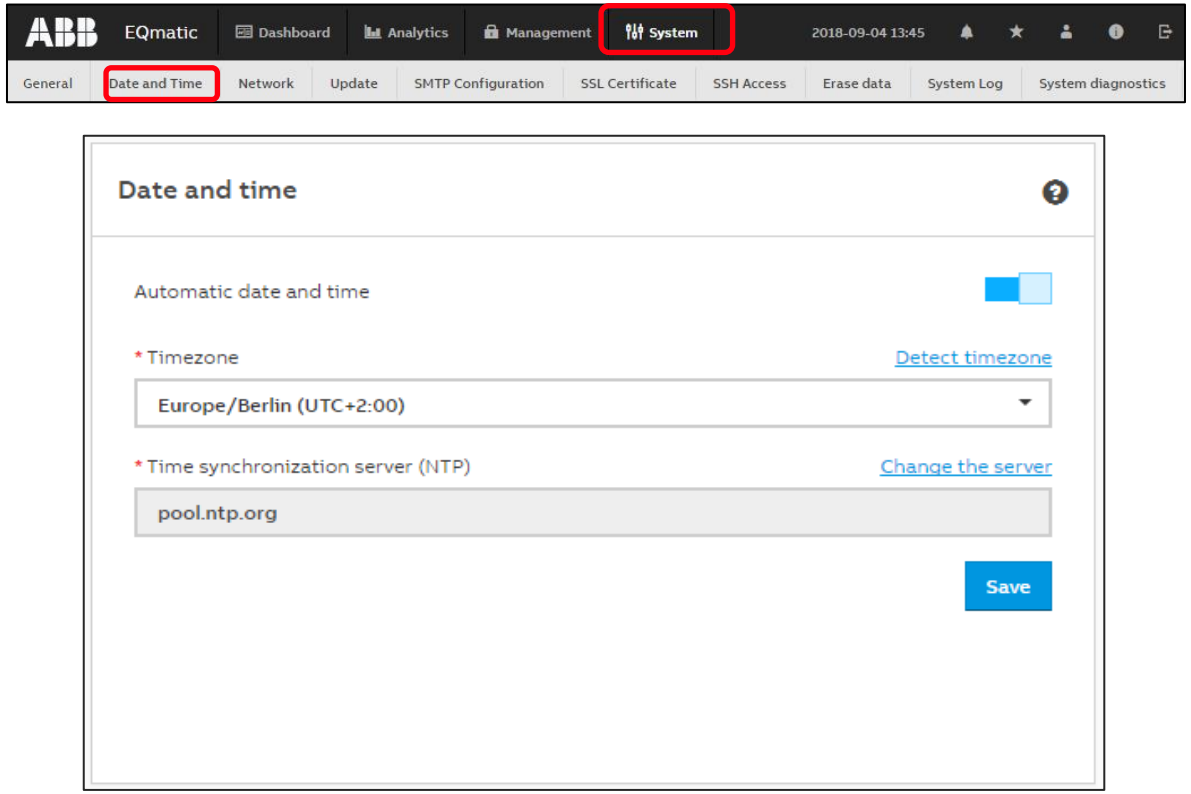
– For manual setting of the time, date and time zone

Automatically On:

– The address/URL of the time server (e.g. pool.ntp.org) must be entered in the “Time synchronization server (NTP)” field

– The “Change the server” option must be used to change the server

QA/S 1.16.1 KNX: Date and time can also be received via KNX (3 byte and 8 byte)



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Menu “System”

Network

Automatic or manual addressing can be selected

Automatic network configuration On:

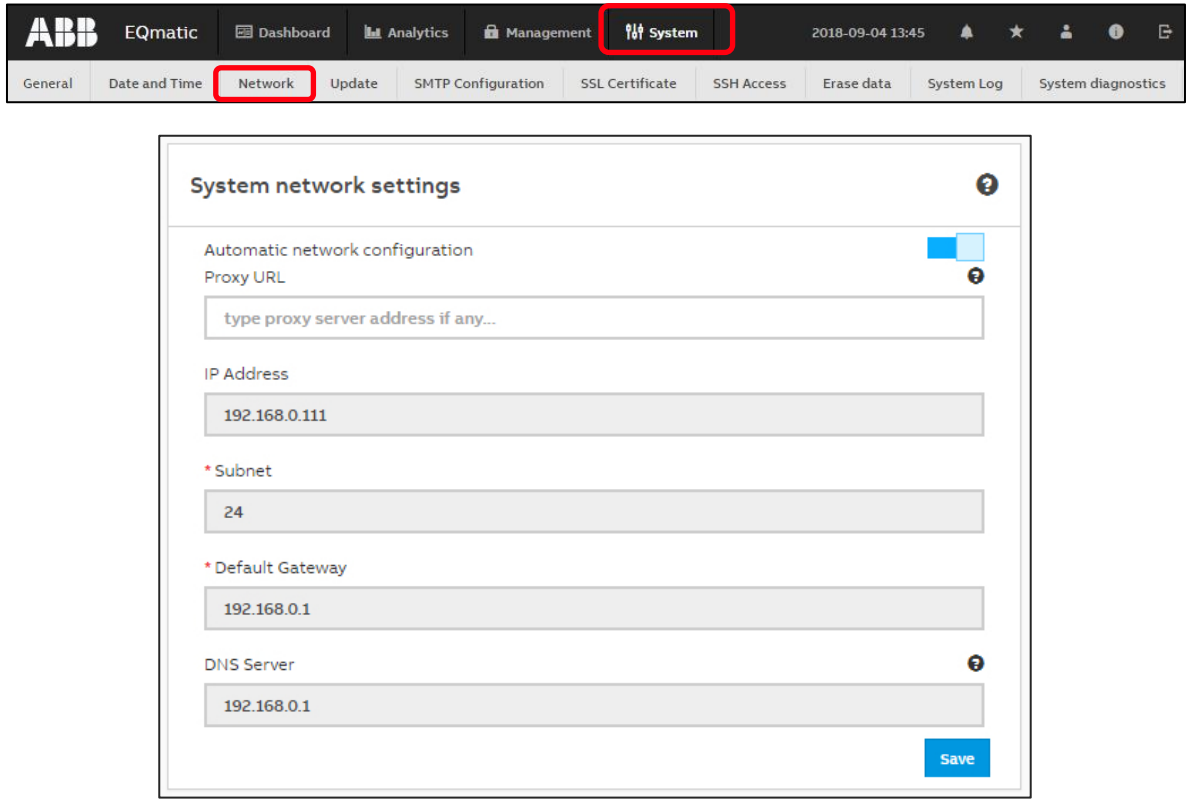
– The device’s network settings are assigned automatically by a DHCP server in the network or by a router with DHCP functionality

– If no automatic assignment of the network settings takes place via DHCP, then a standard network setting will be made in the Auto IP range: 169.254.1.0 – 169.254.254.255

Automatic network configuration Off:

– The device’s network settings must be entered manually

QA/S 1.16.1 KNX: All network configuration, except from proxy configuration, is only possible via ETS



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Menu “System”

Update

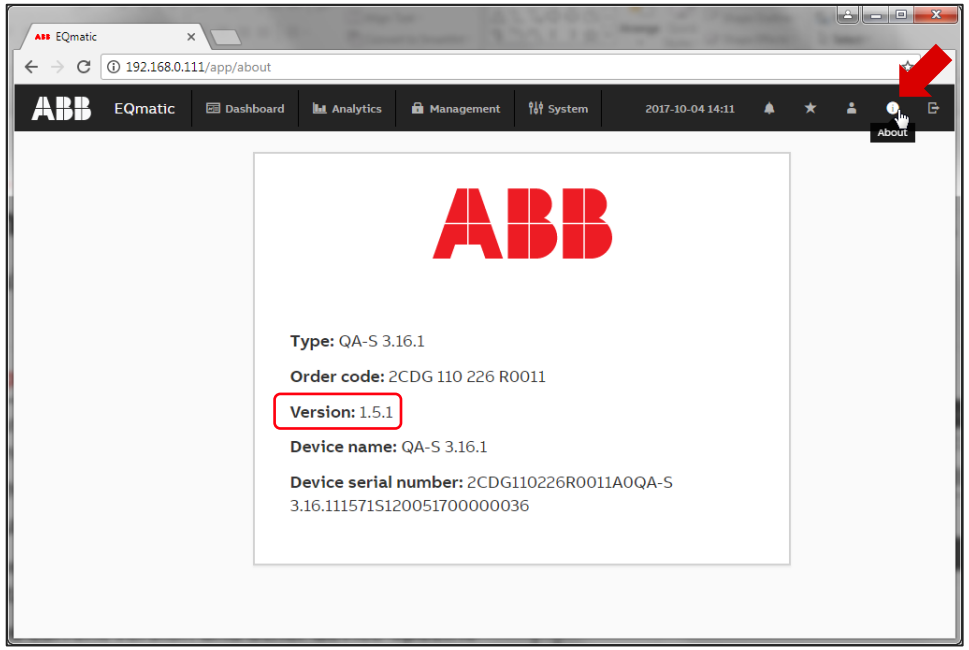
Various options are available for updating the device or the firmware to the latest version

– Manual update

– Automatic update

The data and configuration in the device are retained during an update

The current version and other device-specific information can be retrieved via the menu item “Device information” in the main menu



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Menu “System”

Update – Manual update

The update packages are available under the following download link

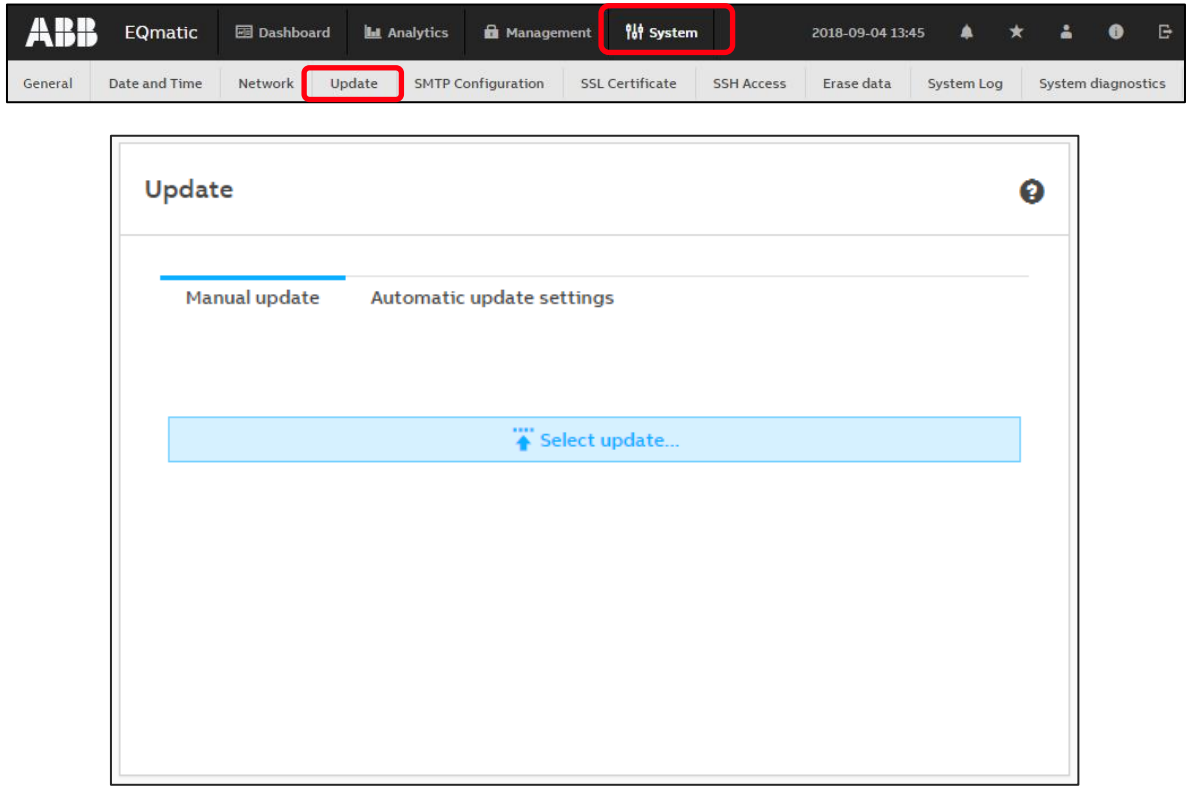
www.abb.com/knx
→ Products and Downloads
→ Energy Management
→ QA/S x.yy.1 Energy Analyzer

Save the latest firmware version to your PC/laptop

Click “Select update” and select the update file on the drive

Follow the instructions

The device will be rebooted after the update, and you will have to log in again



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Menu “System”

Update – Automatic update

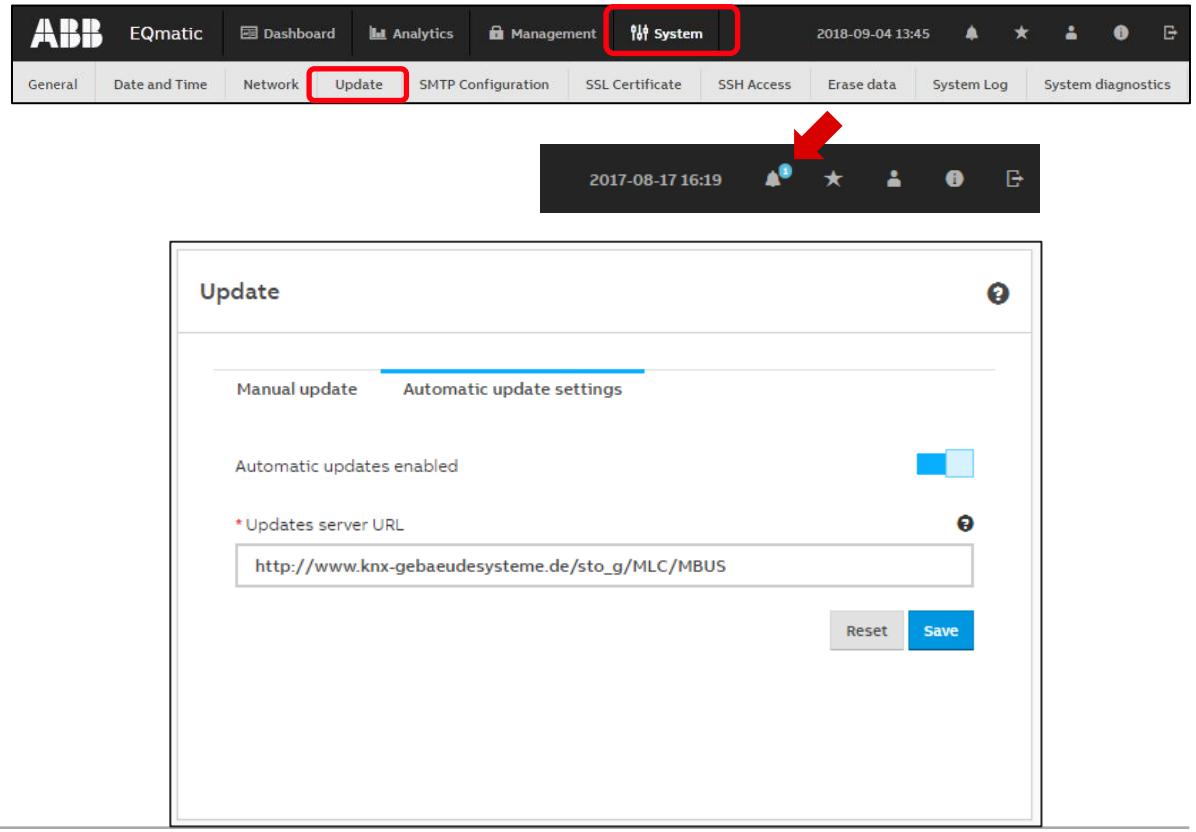
The automatic update must be activated

The address/URL of the update server must be entered

The “Notifications” icon in the menu bar will inform you when a new update becomes available

Click on the notification and follow the instructions

The device will be rebooted after the update, and you will have to log in again



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Menu “System”

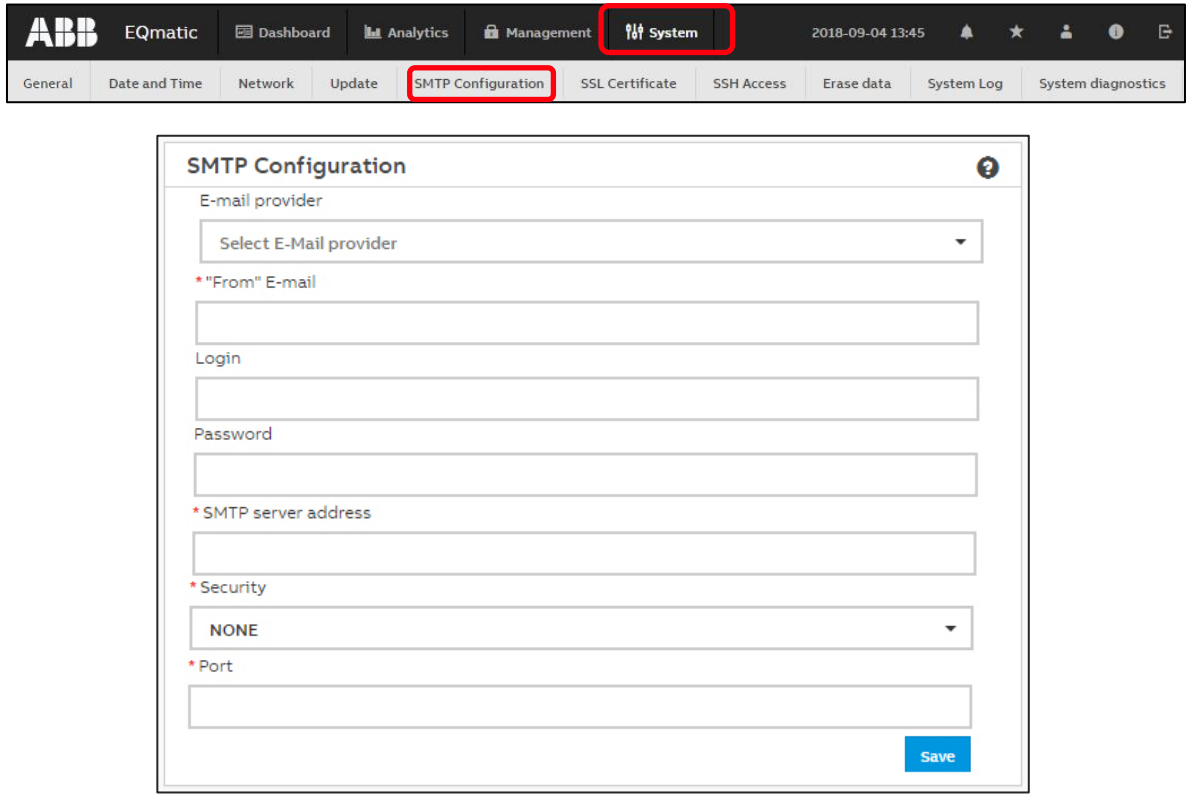
SMTP Configuration

These settings configure the SMTP server

These settings are required so that the device can send messages, notifications (e.g. when the password is reset) and automatic reports via e-mail to users or recipients

You can configure the settings manually or by pre-selecting an e-mail service provider

Note: The required settings will be made available by the relevant provider



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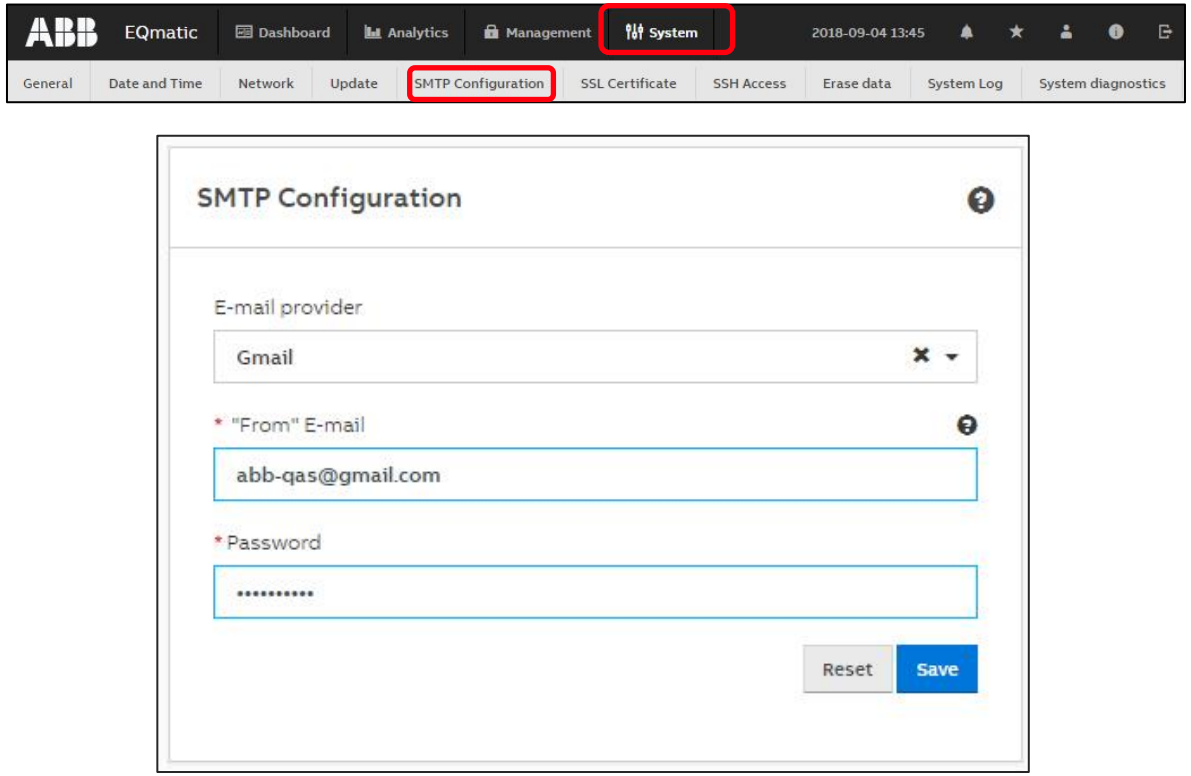
Menu “System”

Date and Time

Example: Gmail

- Email provider: Gmail (Google)
- “From” Email: xyz@gmail.com
  (email of sender for all emails sent by QA/S)
- Password: *****



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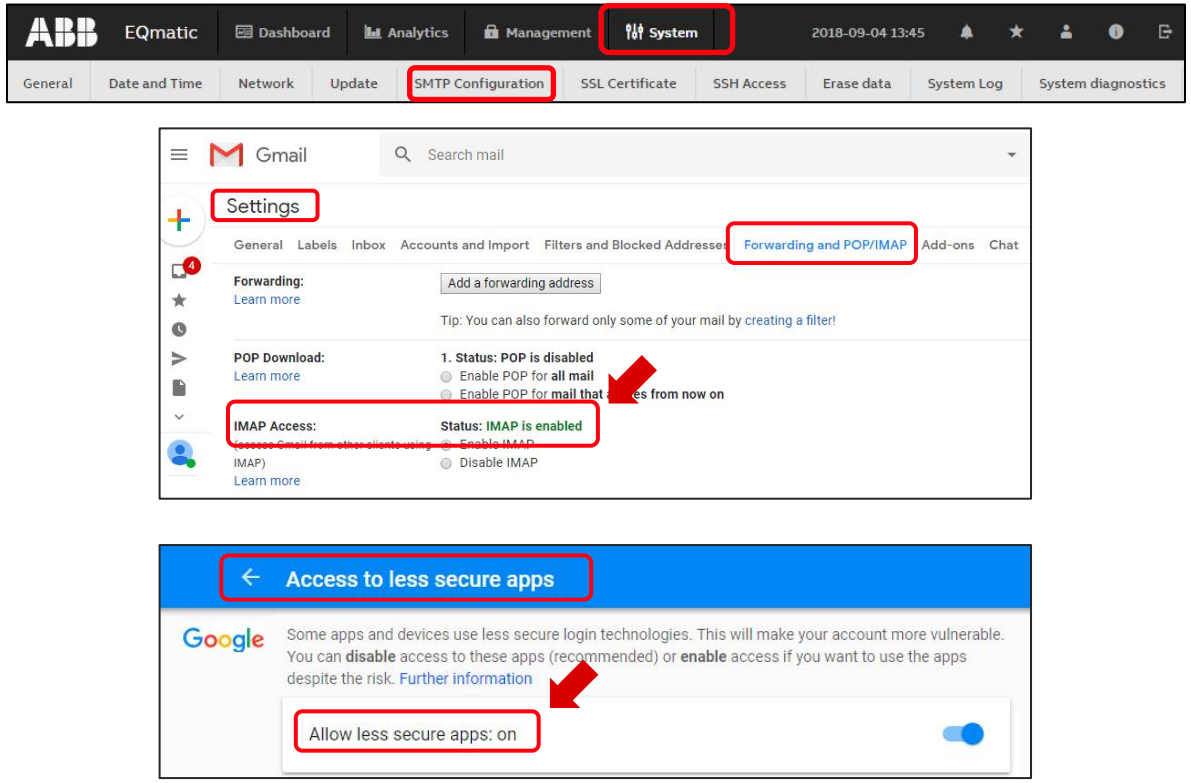
Menu “System”

SMTP Configuration

Depending on the provider special account settings must be made

Example: Gmail

- IMAP access: Enable
  (access Gmail from other clients using IMAP)
  → Account setting → Forwarding &POP/IMAP
- Allow less secure apps: On
  Some apps and devices use less secure login technologies. This will make your account more vulnerable. You can disable access to these apps (recommended) or enable access if you want to use the apps despite the risk.



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Menu “System”

SSL Certificate

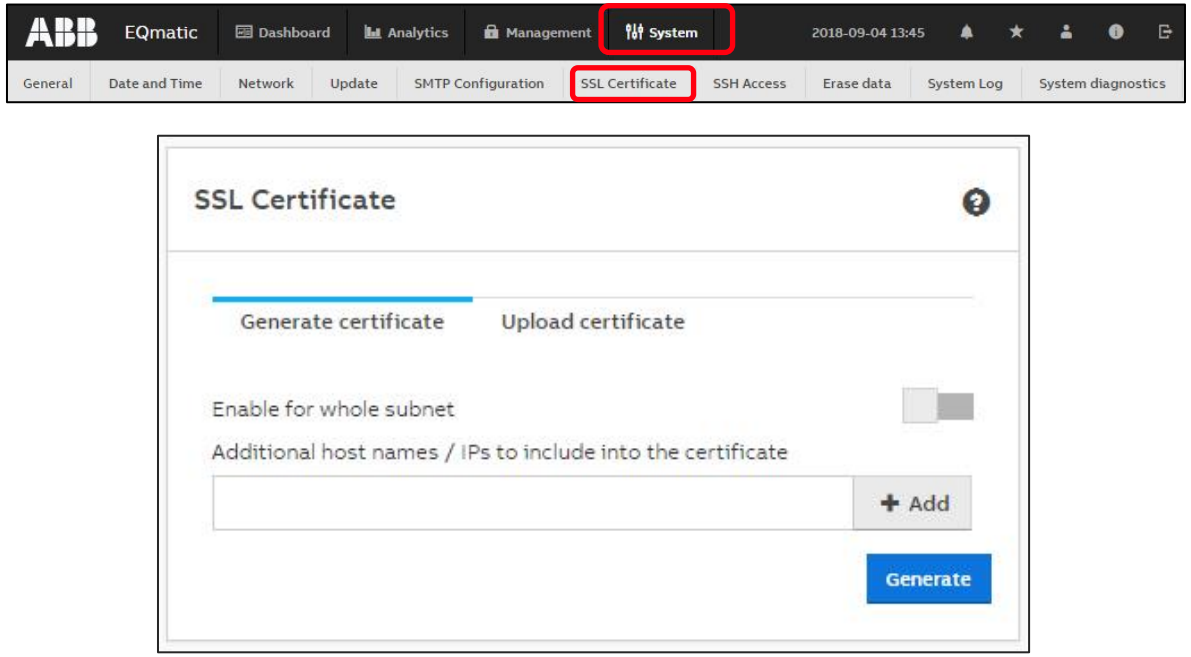
SSL stands for "secure sockets layer"

Using an SSL certificate will encrypt the data transmitted to the computer on opening a website, for example

SSL certificates can be used to encrypt data for web pages or e-mails, for example

The following options are available for handling SSL certificates:

- Upload certificate
- Generate certificate
  https://ssl-trust.com/
- Delete certificate



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Menu “System”

SSH Access

A secure network connection to the web server can be established using SSH (Secure Shell)

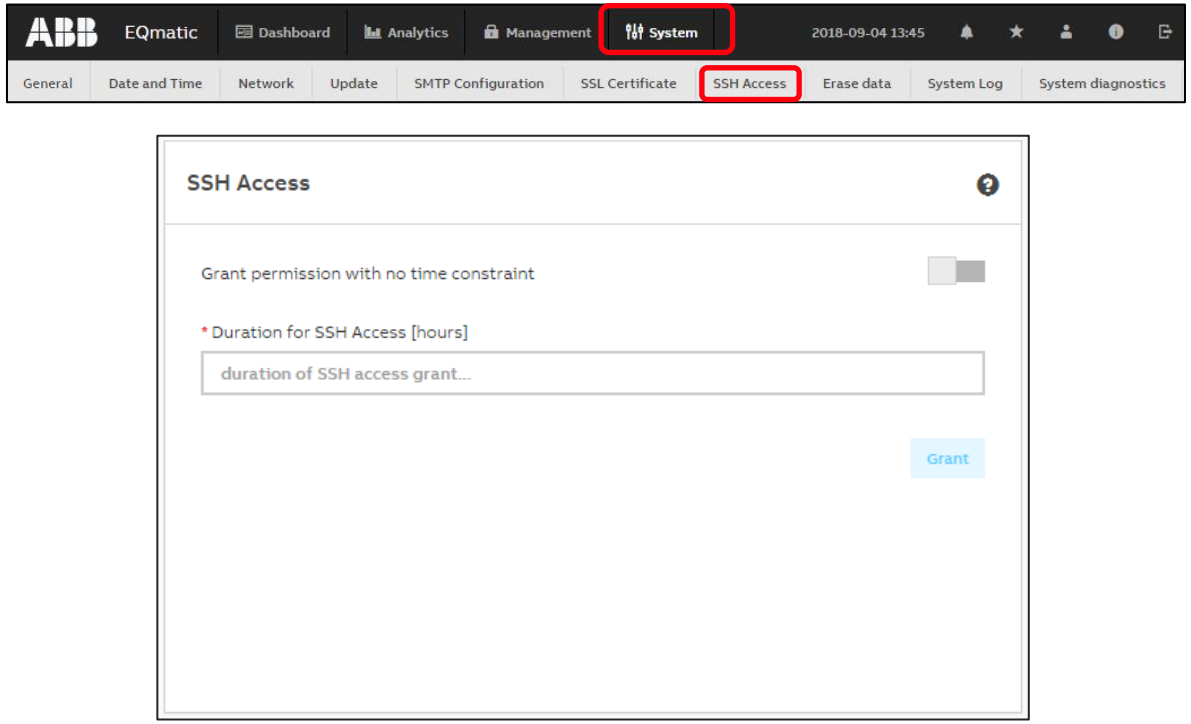
This access can then be used for servicing and maintenance purposes by the manufacturer

Authorization with time limit

– Access can be restricted to a certain number of hours with this parameter
– Duration for 1 … 168 hour

Grant permission with no time constraint

– When this function is activated via the slide control, SSH access is permanently available



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Menu “System”

Erase data

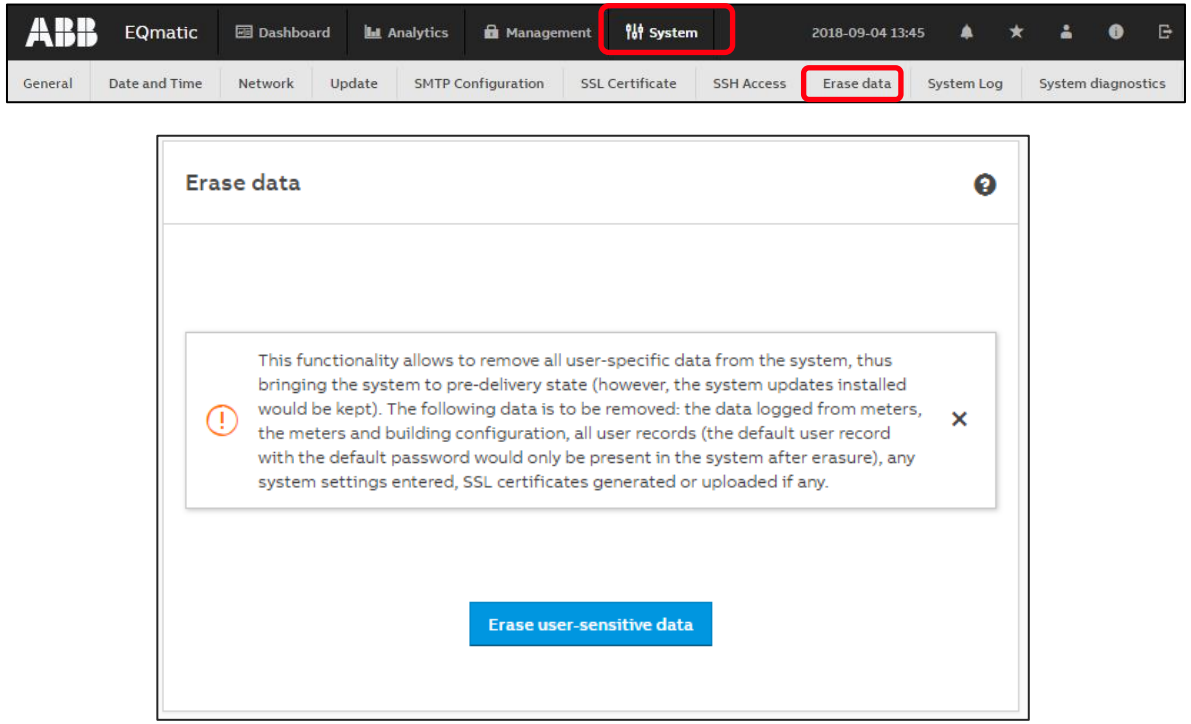
This function allows you to delete all saved data and user-specific information from the system

This resets the system to its supplied state

The most recently installed system update is retained

The following data are reset to the factory settings or deleted:

- Devices and meters
- All meter data saved
- Meter configurations and metering structure configured
- Users and associated information (users and passwords are reset to the factory settings)
- All system settings
- SSL certificates (if any)
- QA/S 1.16.1 KNX: ETS parameter setting, group addresses and individual physical address



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Menu “System”

System Log

This function logs and timestamps all relevant information about the system and connected devices:

- IP network settings
- Date/time (Manual | Automatic)
- Reset to factory settings
- Device restart
- Firmware update
- Meter/device has been assigned to a new node
- Node has been deleted/added from/to metering structure
- User added/deleted
- User logged in/logged out

The System Log can also be restricted to a period using the calendar settings and exported as a file (e.g. xlsx).

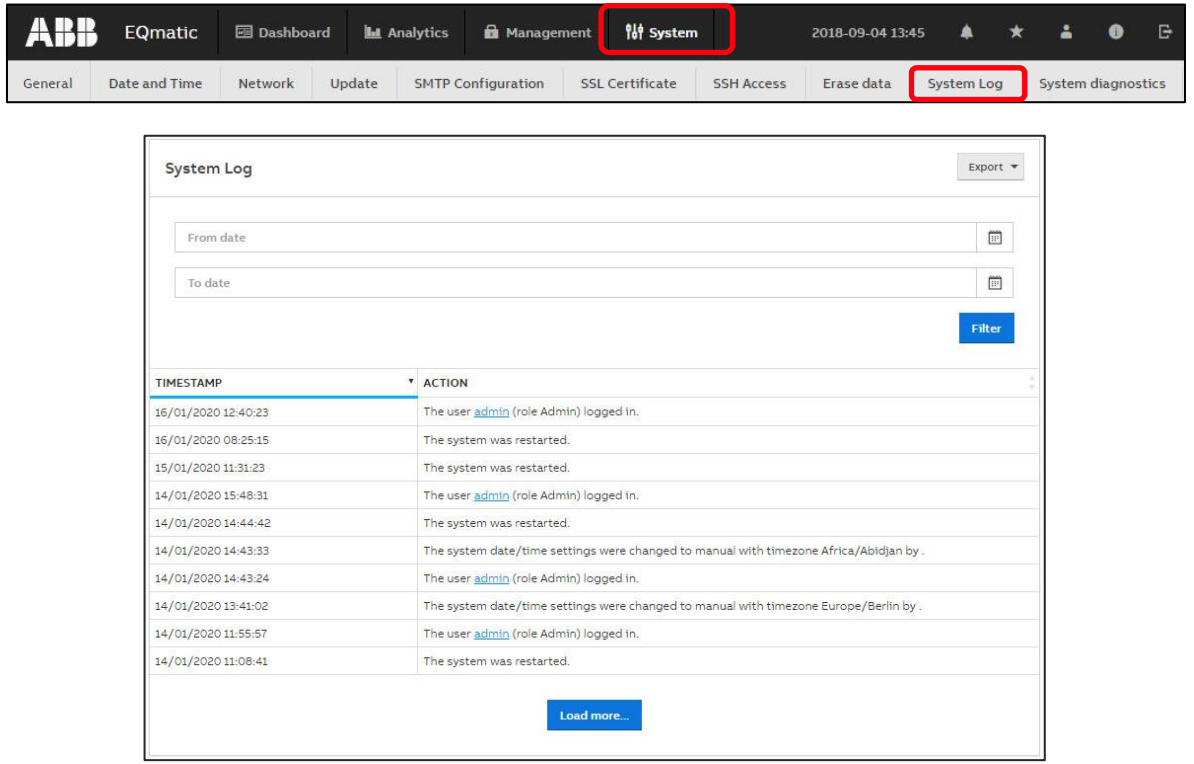

ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “System”

System diagnostics

The System diagnostics function provides information on the device performance and the actual device status and is used for general diagnostics

The following information is available:

- Memory
- Database storage
- CPU utilization

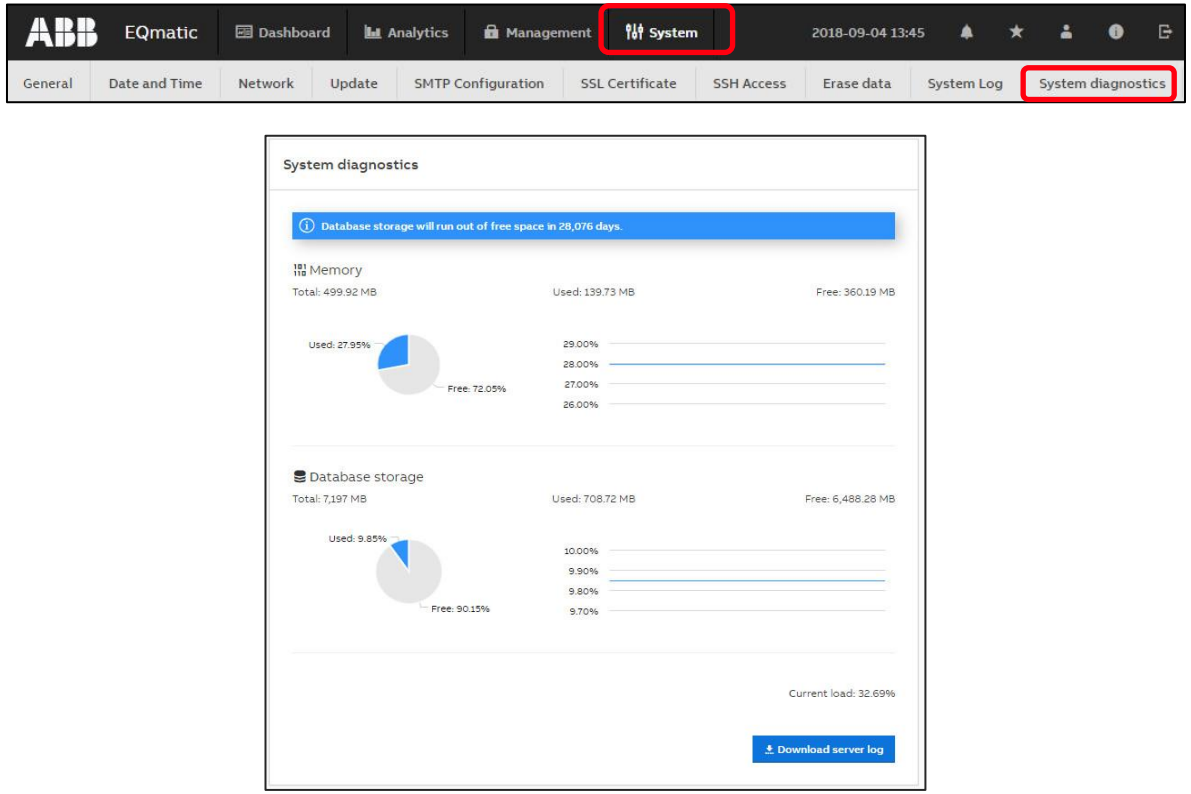

ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “System

Troubleshooting: Device access

The Energy Analyzer QA/S x.yy.1 user interface cannot be accessed:

- Check the connections, cables and network connection, etc.
- Start the i-bus® Tool and scan the network for IP devices. Select the device in question and click “Open Website.” The Login page opens. Enter the access data.
- If the device is not listed in the i-bus® Tool after a network scan
  - Check the PC’s/laptop’s network settings; switch off the firewall if necessary
  - Restart and reset the network settings (see manual). A new IP address may be assigned via DHCP. Start the i-bus® Tool and scan the network.

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Menu “System

Troubleshooting: M-Bus

No or several M-Bus devices do not respond:

- Short circuit on the M-Bus?
- Line not connected correctly or line severed?
- Energy Analyzer ready for operation, supply voltage available?
- The voltage at the M-Bus terminals is at least 24 V?
- Identical baud rates (300; 2,400; 9,600) set on the Energy Analyzer and the bus device(s)?

One M-Bus device does not respond:

- Bus address not assigned
- Bus address incorrect
- M-Bus device not connected
- M-Bus line severed
- Check M-Bus address of the device

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Menu “System

Troubleshooting: Modbus (RS485)

To minimize potential sources of faults, a few basic aspects should be taken into account on the usage of RS485

Determine the communication characteristics of a device before the system design is completed

Pay attention to the following points here:

- Two-wire or four-wire system
  - RS485 systems can be either two-wire or four-wire systems
  - The two-wire configuration - with the additional earth wire - reduces the wiring costs, however it is limited to half duplex communication (cannot receive and transmit at the same time)
  - The majority of RS485 devices have two-wire configurations.
- How high is the response time of the device (processing time)?
- What is the address range of the device that can be programmed?
- Which speed is supported?

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Which answer is correct?

Question 1

During commissioning ...

A … the meters can be manually inserted from a catalog and configured offline. Addressing is performed later.

B … the meters must be in operation, connected to the M-Bus/Modbus/KNX of the QA/S and configured (e.g. baud rate, primary address).

C … the meters must not be recording any measured values. Switch off the circuit or shut off the water supply, for example.

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Which answer is correct?

Question 1

During commissioning ...

A … the meters can be manually inserted from a catalog and configured offline. Addressing is performed later.

B … the meters must be in operation, connected to the M-Bus/Modbus/KNX of the QA/S and configured (e.g. baud rate, primary address).

C … the meters must not be recording any measured values. Switch off the circuit or shut off the water supply, for example.

The meters must be ready for operation and configured

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Which answer is correct?

Question 2

The commissioning wizard can be used to …

A … perform all necessary steps and basic settings in the Energy Analyzer QA/S during initial commissioning.

B … configure the connected M-Bus/Modbus/KNX devices (meters) (e.g. baud rate, primary address,…).

C … search for known IP devices in the local network and thereby read the network address of the Energy Analyzer QA/S.

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Which answer is correct?

Question 2

The commissioning wizard can be used to …

A … perform all necessary steps and basic settings in the Energy Analyzer QA/S during initial commissioning.

B … configure the connected M-Bus/Modbus/KNX devices (meters) (e.g. baud rate, primary address,…).

C … search for known IP devices in the local network and thereby read the network address of the Energy Analyzer QA/S.

Perform all necessary steps and basic settings during initial commissioning

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Which answer is correct?

Question 3

The metering structure …

A … is only optional. The M-Bus/Modbus/KNX devices can be managed in the topology view as well.

B … must be created separately for each medium (electricity, gas, …).

C … is used for simple navigation and analysis. The physical meters are assigned to a logical metering structure.

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Which answer is correct?

Question 3

The metering structure …

A … is only optional. The M-Bus/Modbus/KNX devices can be managed in the topology view as well.

B … must be created separately for each medium (electricity, gas, …).

C … is used for simple navigation and analysis. The physical meters are assigned to a logical metering structure.

Navigation, analysis and assignment of the meters

Commissioning

Main menu “Dashboard”

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Menu “Dashboard”

Dashboard

The dashboard provides a rapid overview of costs and consumption figures in the building

Users can configure customized views using widgets

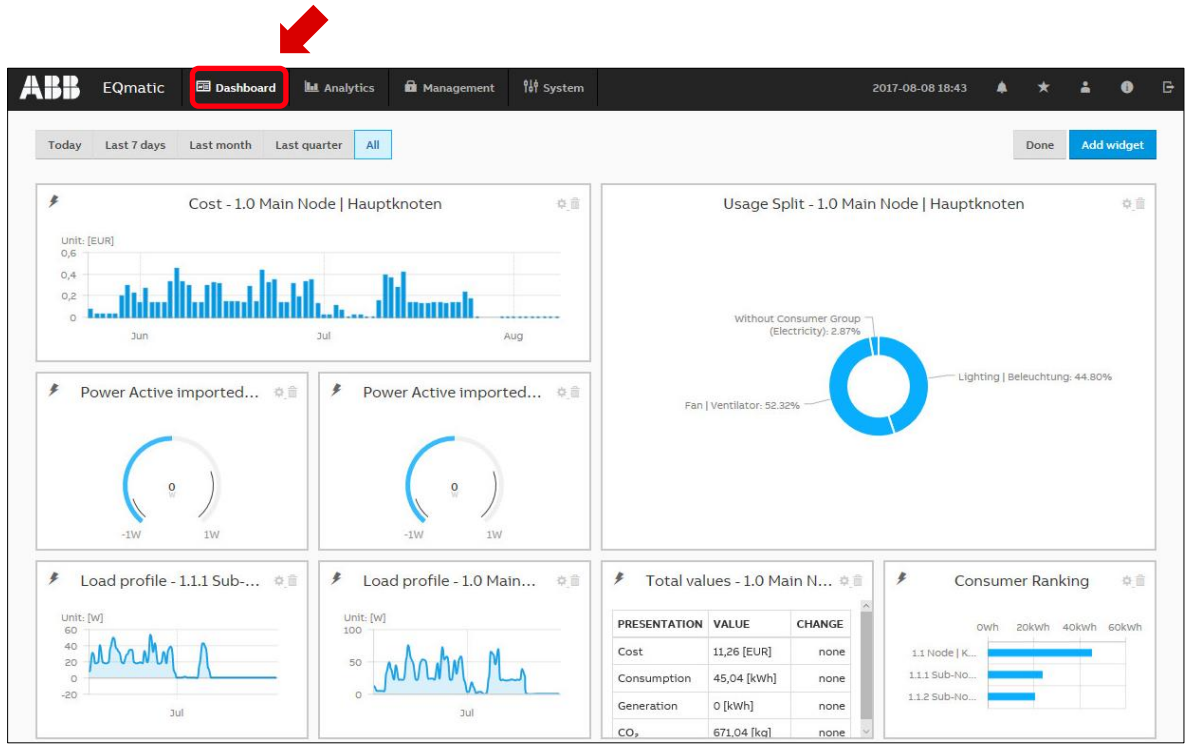
A widget is a configurable graphic display element

Widgets are configured in edit mode

Each user creates his or her own dashboard with up to 24 widgets

Note:

Data for evaluation and analysis are not yet available after commissioning. This means that the dashboard is empty at that point. Make sure that connected devices are configured and that at least one meter is assigned to the metering structure.



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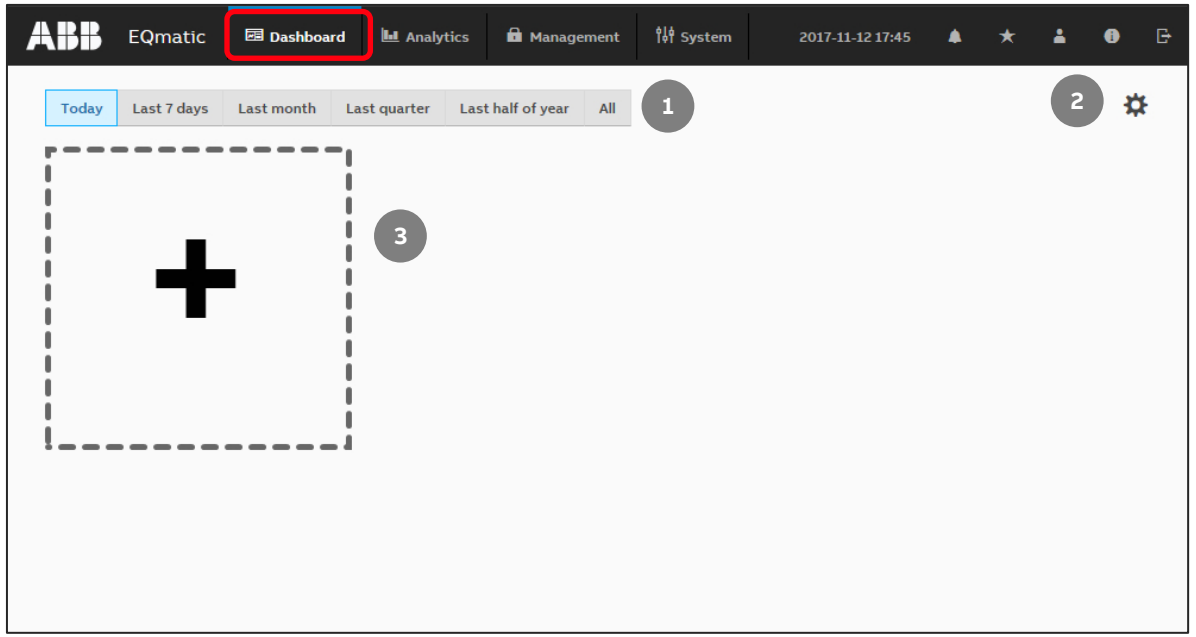
Menu “Dashboard”

Widgets

1	Presets	Selects and displays current day, week, month, year, all. Presets are shown dynamically, depending on the measuring period.
2	Edit	Activates edit mode: • Add widget • Place widget using drag & drop • Enlarge/reduce widget • Configure widget • Delete widget • Save
3	Add widget	Used to add and configure a widget. Only displayed in edit mode.



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Menu “Dashboard”

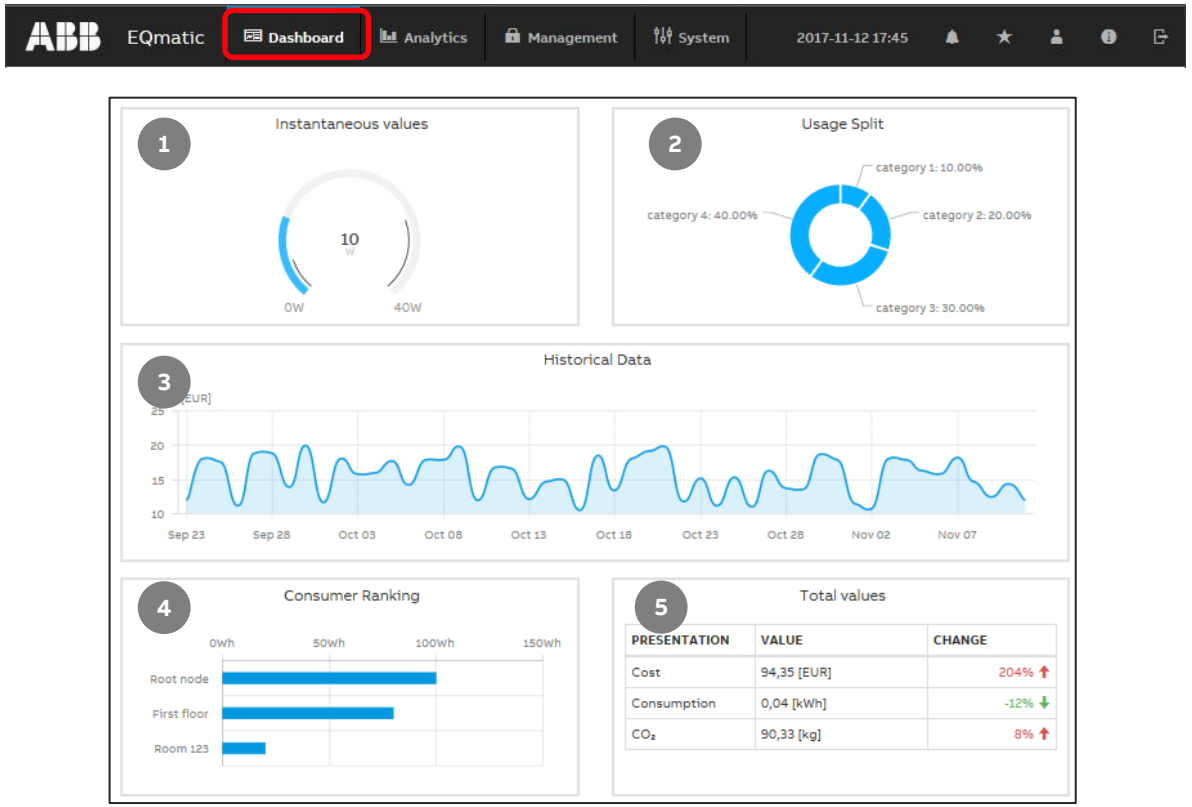
Widgets

Widgets are used to configure and lay out the dashboard.

The following widgets are available:

- Instantaneous Values 1
- Usage Split 2
- Historical Data 3
- Consumer Ranking 4
- Total values (performance indicators) 5

To add a widget to the dashboard, activate edit mode ⚙ and click the "Add widget" button



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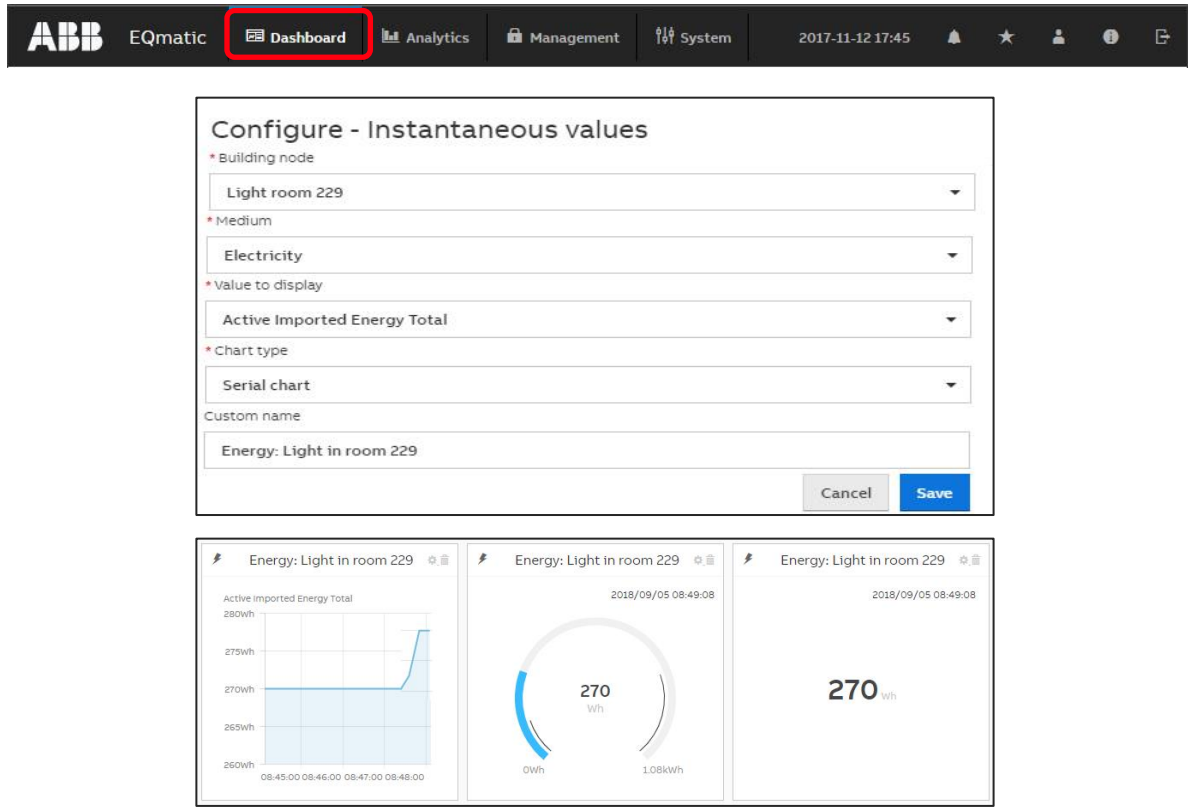
Menu “Dashboard”

Widget – Instantaneous Values

Used to display measured values, e.g. power, current, voltage etc. in real time.

The following options are available to configure the widget:

- Building node (used to select the meter and/or building section depending on the metering structure configured)
- Medium (electricity, water, gas, …)
- Value to display (selection of data points)
- Chart type (Serial Chart, Gauge, Single value)
- Custom name



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Menu “Dashboard”

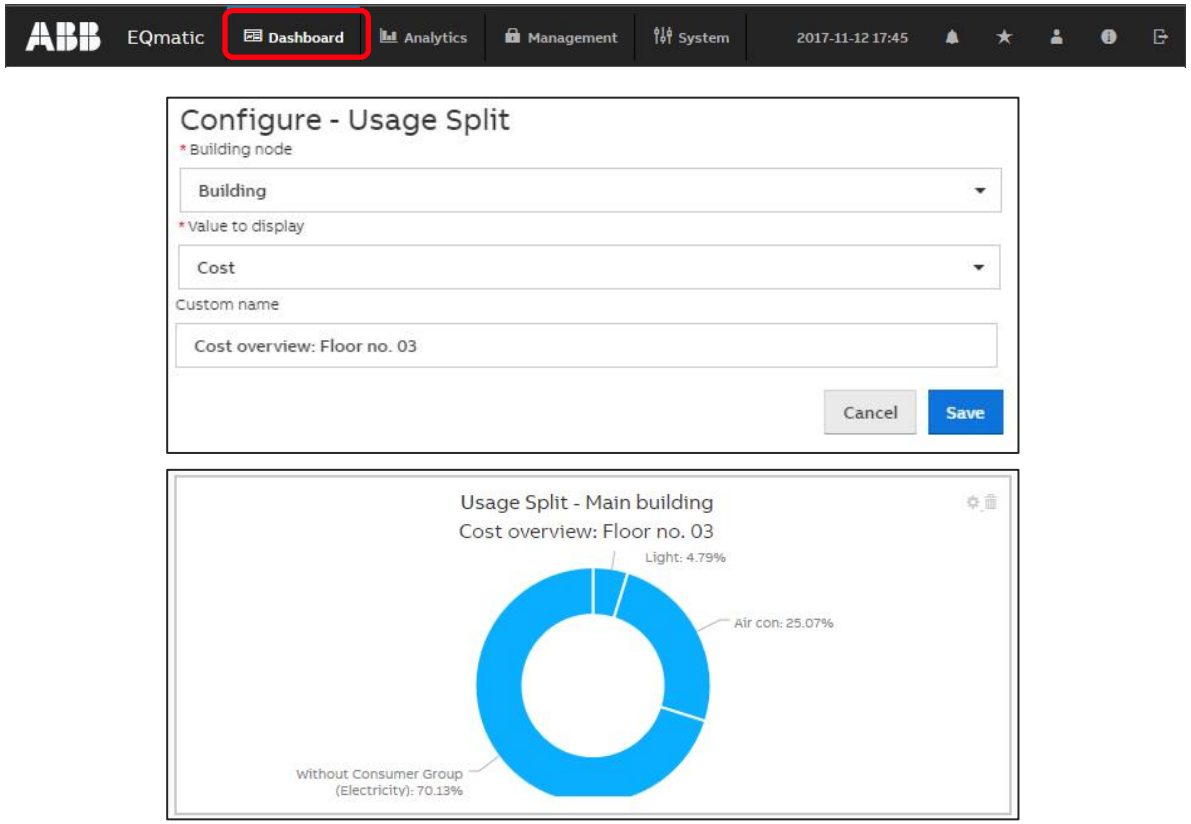
Widget – Usage Split

Used to display the relative distribution of total cost, income or CO_2 emissions

The values are displayed according to the selected time interval (day, month, etc.) and available consumer groups

The following options are available to configure the widget:

- Building node (selection of the meter or building section depending on the metering structure configured)
- Value to display (costs, income, CO_2)
- Custom name



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Menu “Dashboard”

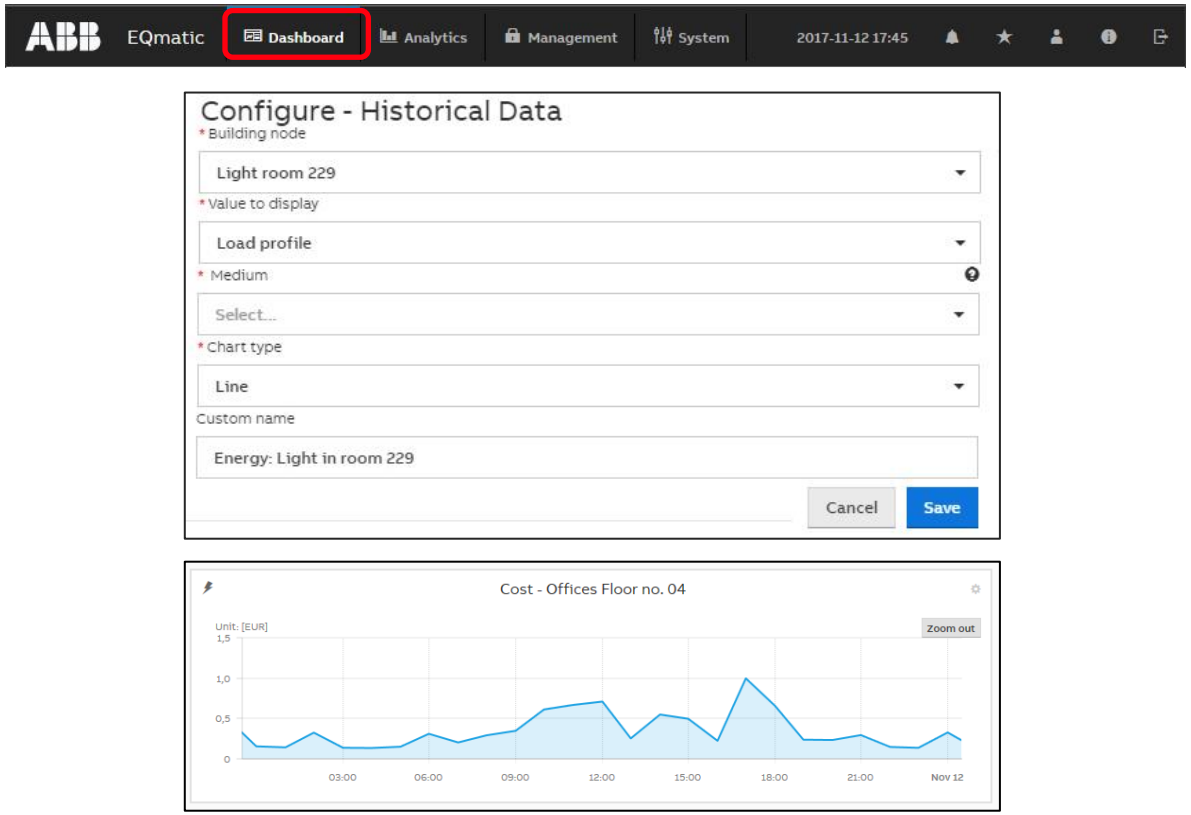
Widget – Historical Data

Used to display historical total cost/ consumption data for a selected node or meter, by medium

The values are displayed according to the selected time interval (day, month, etc.).

The following options are available to configure the widget:

- Building node (selection of the meter or building section depending on the metering structure configured)
- Value to display (costs, consumption, generation, income, CO2, load profile)
- Medium (electricity, water, gas, …)
- Chart type (line, column, smoothed line, step)
- Custom name



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Menu “Dashboard”

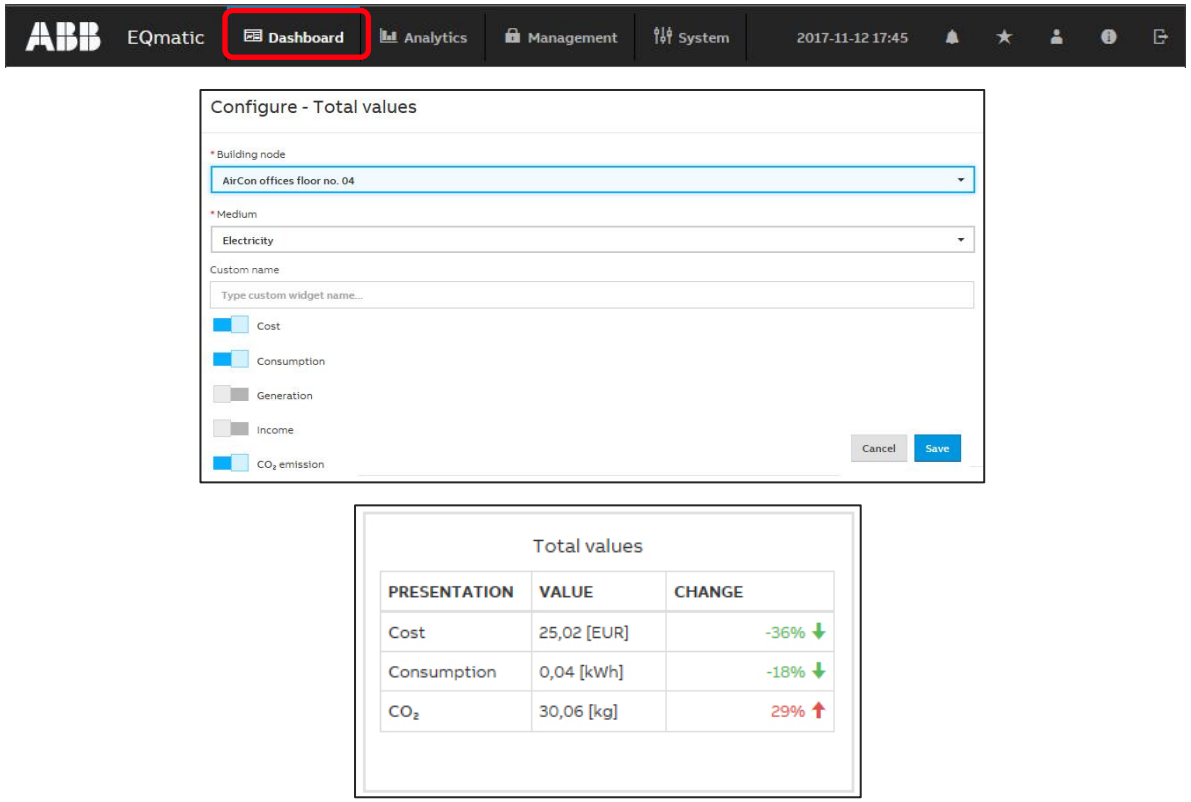
Widget – Total Values

Used to display typical total values for a medium

The values and the relative changes between the current and the previous time interval are displayed

The following options are available to configure the widget:

- Building node (selection of the meter or building section depending on the metering structure configured)
- Medium (electricity, water, gas, …)
- Value to display (cost, consumption, generation, income, CO2 emission)
- Custom name



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Menu “Dashboard”

Widget – Consumer Ranking

Used to display the highest consumers in an installation, by medium

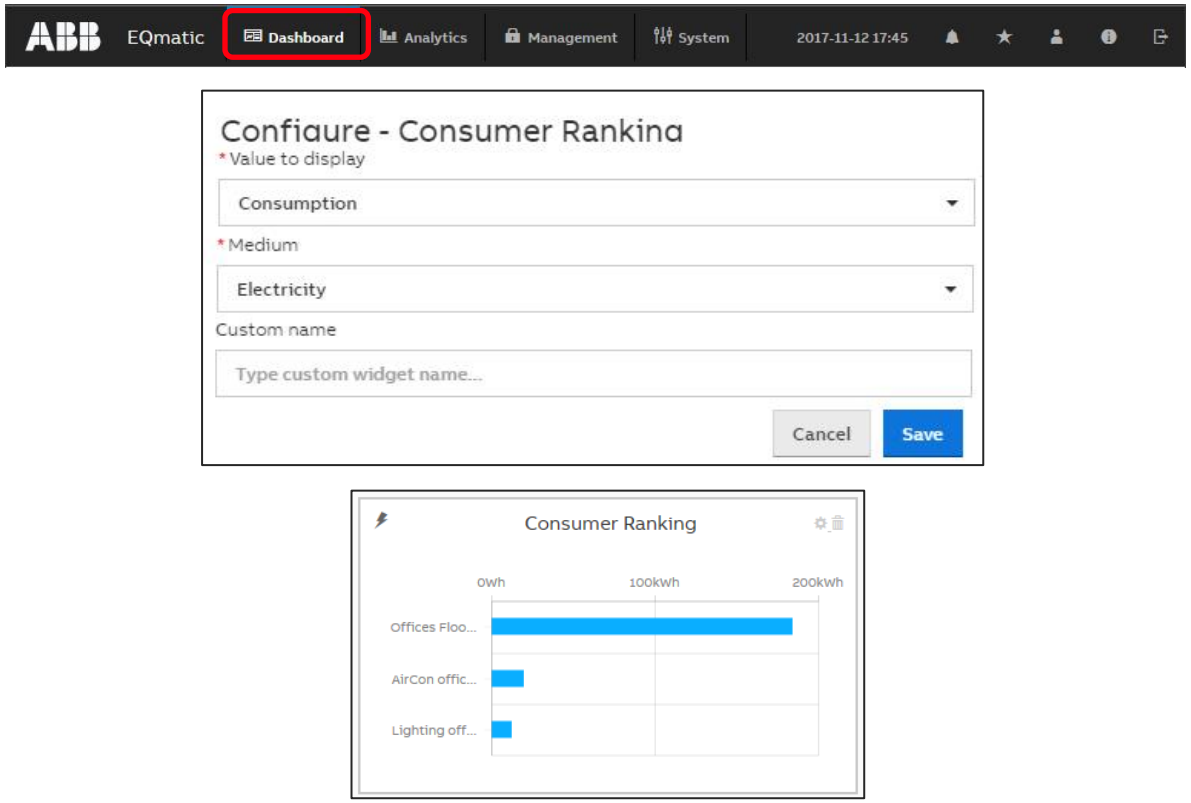
A maximum of 5 consumers are displayed in the widget

The following options are available to configure the widget:

– Value to display (costs, consumption, generation, income, CO_2)

– Medium (electricity, water, gas, …)

– Custom name



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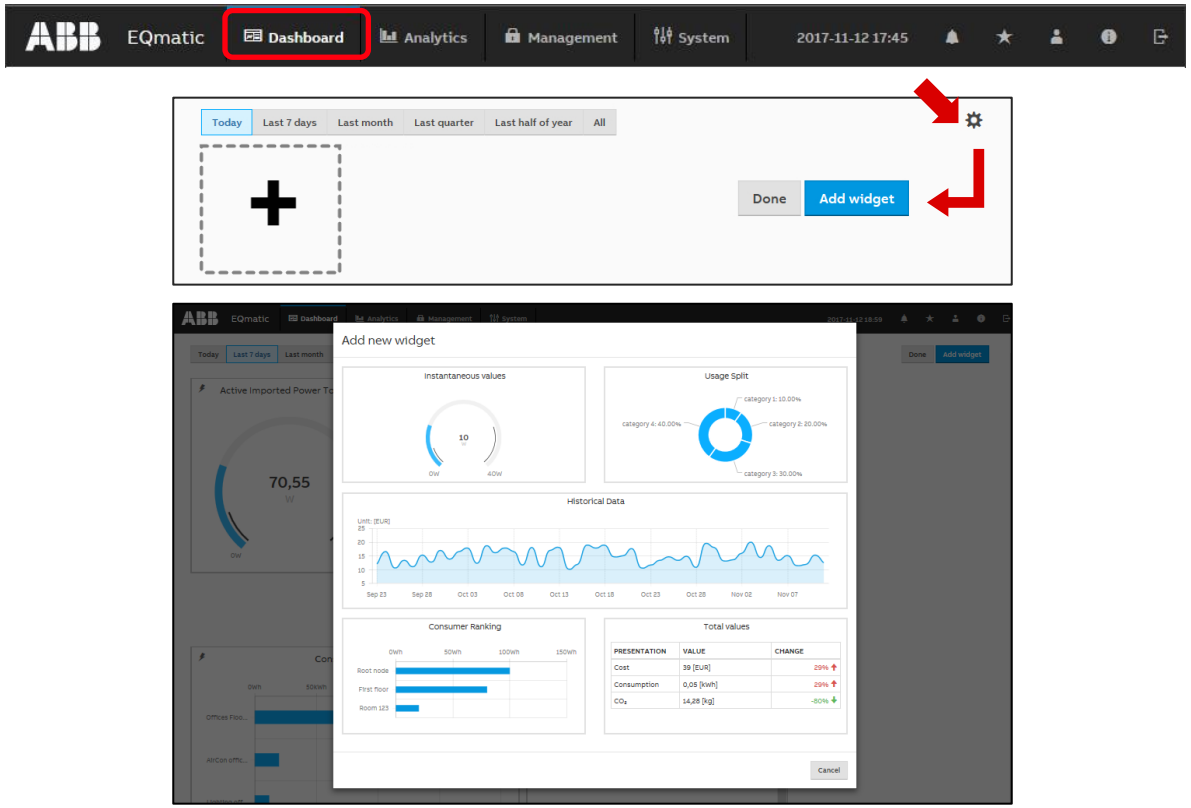
Menu “Dashboard”

Add a widget

To add a widget to the dashboard, activate the edit mode (click the ⚙ button) and click the “Add Widget” button

This opens a dialog window containing available widgets

- Instantaneous Values
- Usage Split
- Historical Data
- Total Values
- Consumer Ranking



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Menu “Dashboard”

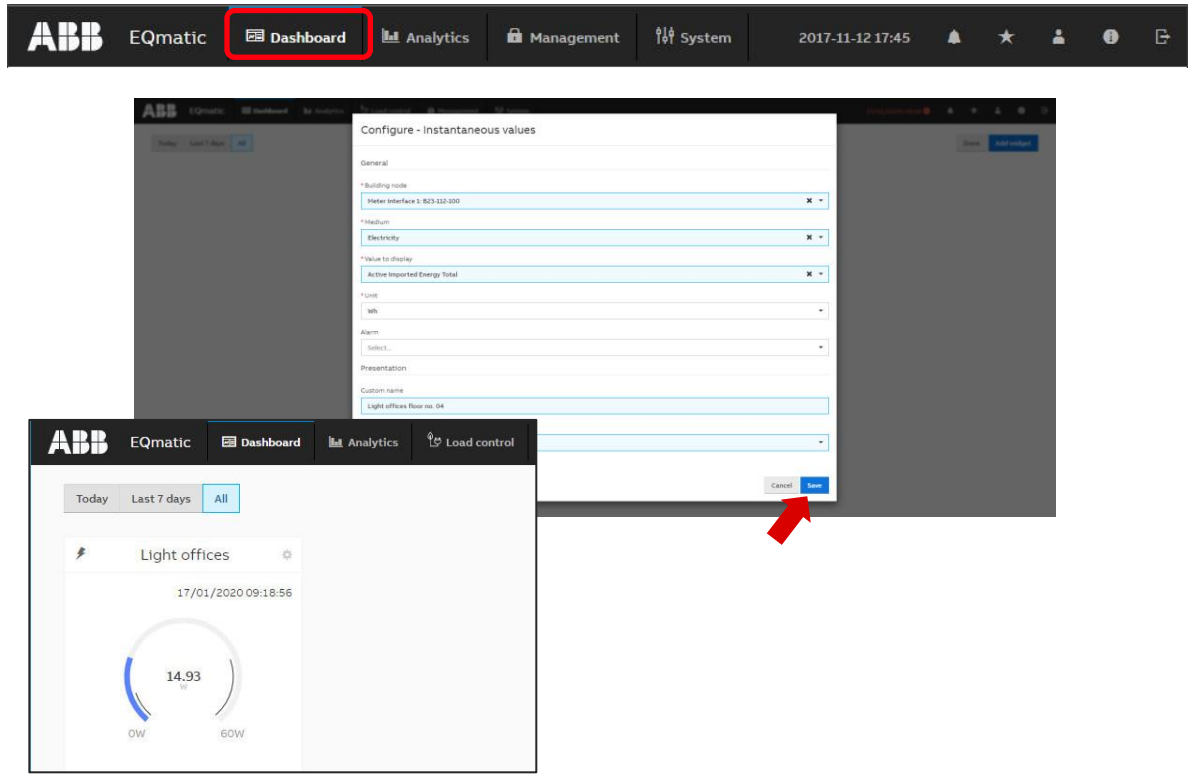
Add a widget

…

Make the settings in the selected widget

Save the widget or the settings using the “Save” button

The widget will now be displayed on the dashboard



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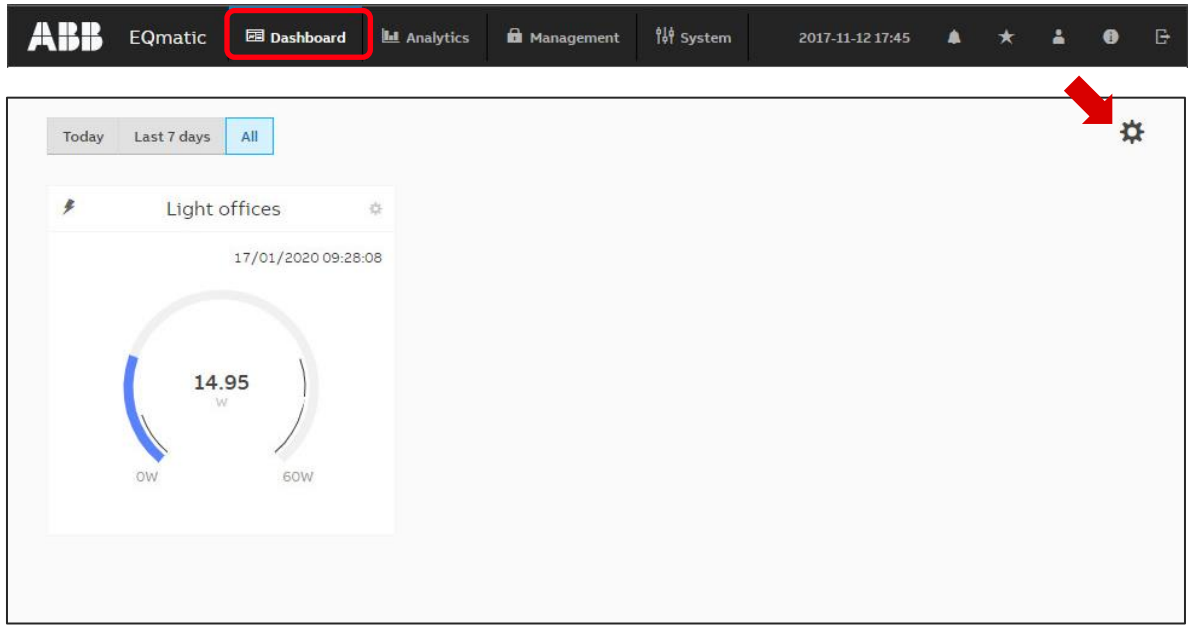
Menu “Dashboard”

Configure a widget

To configure widgets, activate edit mode using the ⚙ button

Options:

- Place widget using drag & drop
- Enlarge/reduce widget
- Configure widget (opens a configuration window)
- Delete widget



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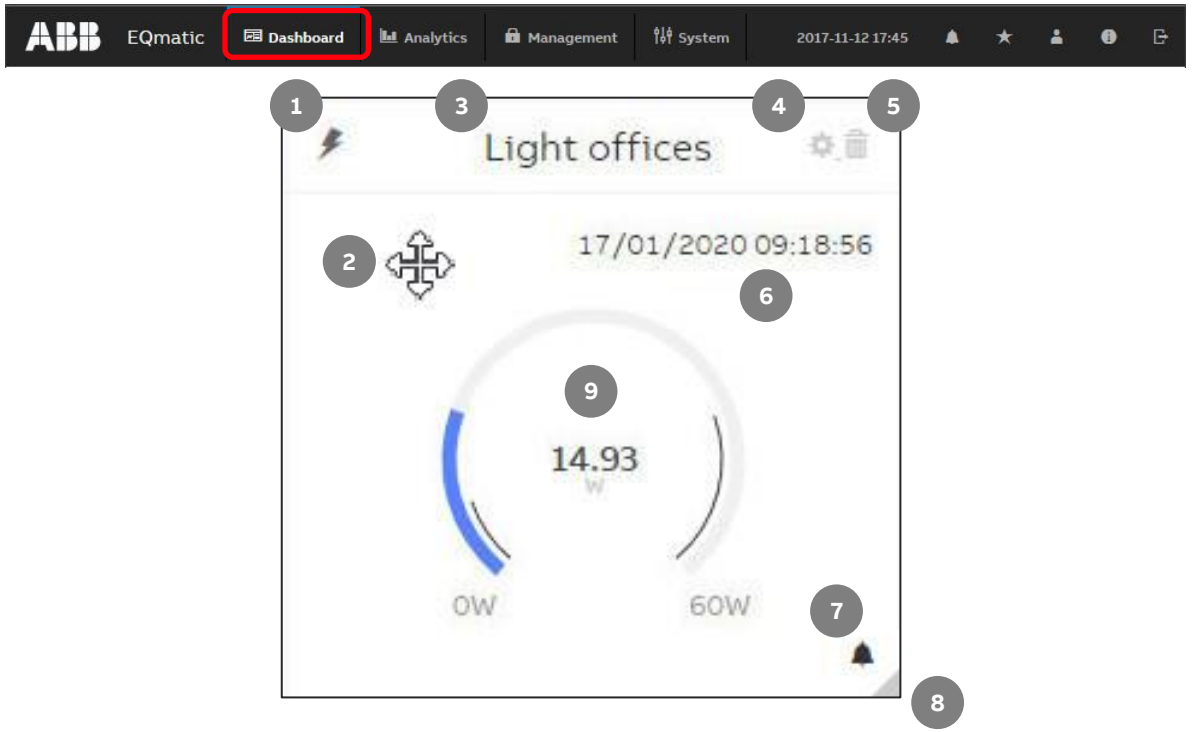
Menu “Dashboard”

Configure a widget

1	Medium	This symbol indicates the selected medium in the widget.
2	Cross-hair	Used to arrange the widget on the dashboard via drag & drop.
3	Widget Name	Using *Edit*, you can give the widget a unique name.
4	Edit	Opens a window where you can configure the widget.
5	Delete	Deletes widgets from the dashboard page.
6	Date/Time	Indicates the date and time when the widget was last updated. You can show/hide this with *Edit*.
7	Alarm	Indicates whether there is an alarm configured for the widget or measured value; this is only possible with widgets for instantaneous values. Clicking the icon opens the alarm configuration window. → More details in menu “Analytics” – “Alarms”
8	Customize	Used to enlarge/reduce the widget via drag & drop.
9	Value display	How the measured value appears in the display depends on how the widget is configured (as a gauge chart, serial chart or value).



Commissioning

Main menu “Analytics”

ABB EQmatic Energy Analyzer QA/S x.yy.1

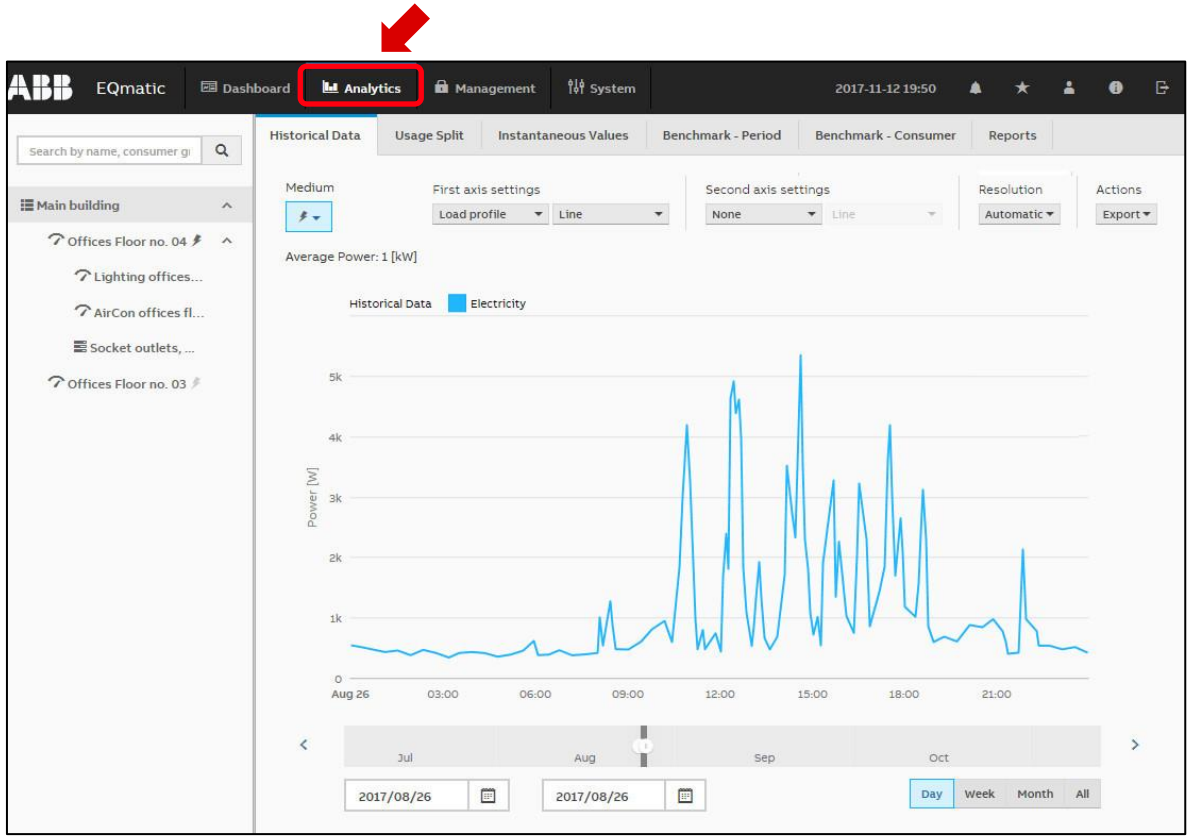
Menu “Analytics”

Analytics

The analysis functions are used for the detailed examination and representation of costs, consumption figures and other measured values

The following analyses can be performed:

- Historical Data
- Usage Split
- Instantaneous Values
- Benchmark - Period
- Benchmark - Consumer
- Reports
- Alarms



Basic | Planning | Installing | Commissioning

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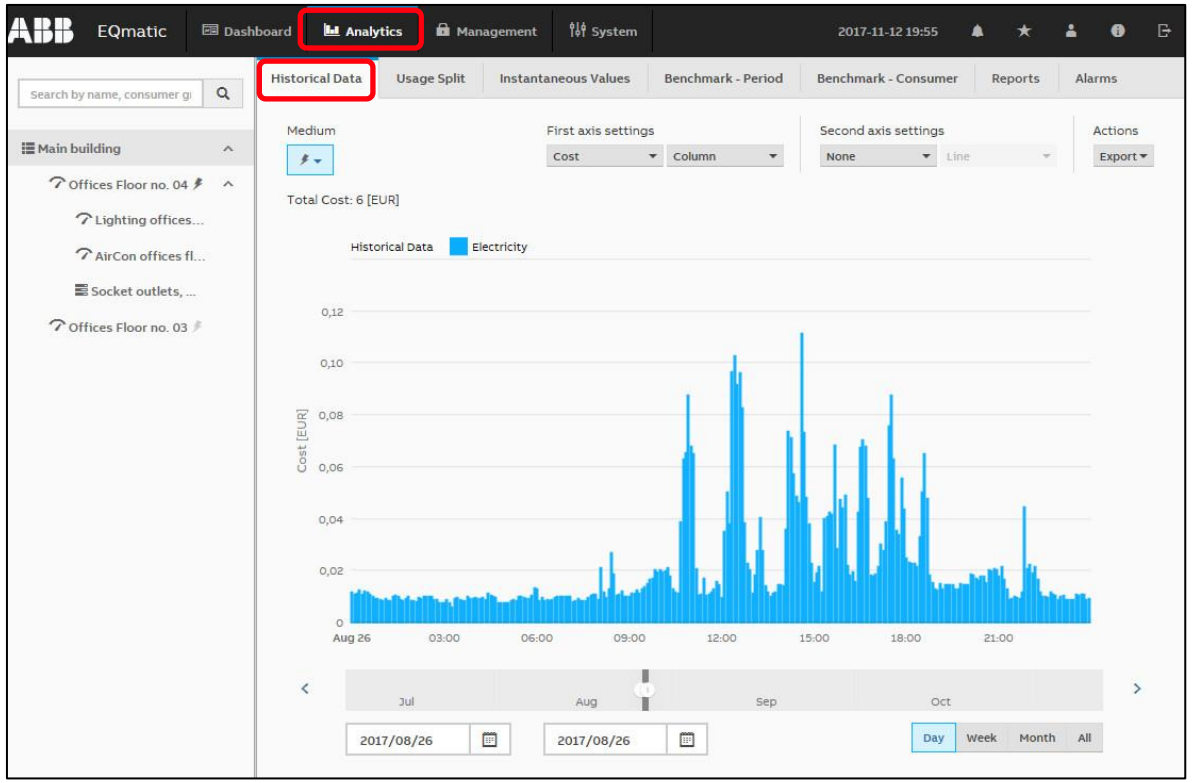
Menu “Analytics”

Historical Data

For analysis and display of historical data

- Measured data for evaluation are not yet available to the system after commissioning. The device saves data every 5 minutes, so measured data will be available after 5 minutes at the earliest
- The display of historical data also depends on the magnitude of the connected load and the meter’s transmission behavior/resolution
- The following prerequisites must be met to display measured data
- Devices are configured and ready for operation
- Metering structure is configured
- At the maximum system capacity, historical data can be stored for at least 3 years



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Menu “Analytics”

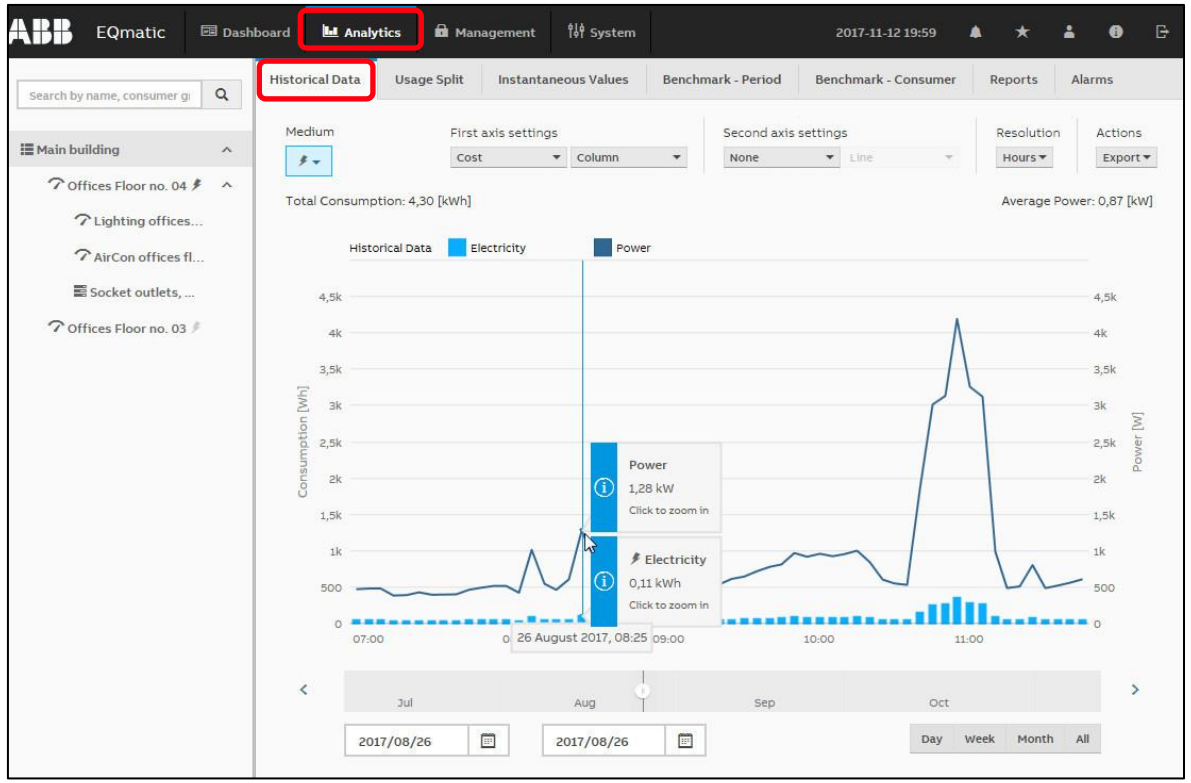
Analytics

For analysis and display of historical data

– The desired unit
  - Cost
  - Consumption
  - Income
  - CO_2
  - Load profile (performance)

  is displayed in
  - one diagram (left Y-axis) or
  - two diagrams (left and right Y-axes)

  as
  - Line
  - Column
  - Smoothed line
  - Step



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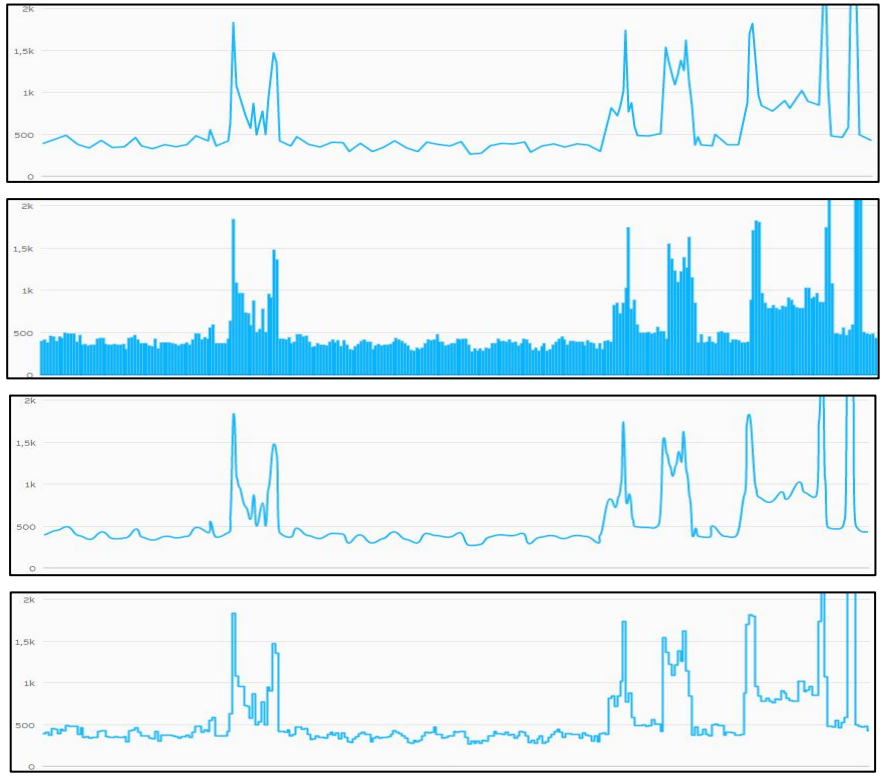
Menu “Analytics”

Analytics

For analysis and display of data the desired unit can be displayed as

- Line
- Column
- Smoothed line
- Step



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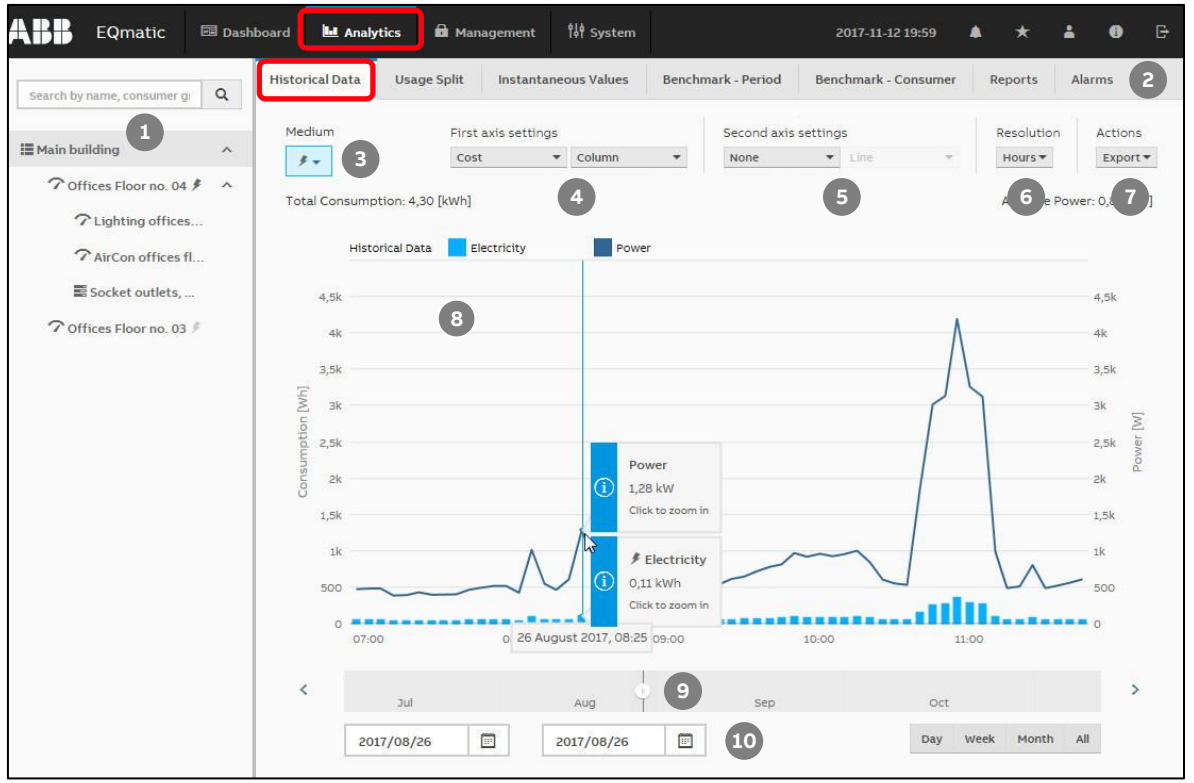
Menu “Analytics”

Historical Data

1	Metering structure	Used to navigate and select a consumer or node. The metering structure must first be configured in Management > Metering Structure. Click the”<“ icon to show or hide the metering structure.
2	Analysis functions	Menu for selecting the required analysis function. Options: • Historical Data • Usage Split • Instantaneous Values • Benchmark - Period • Benchmark - Consumer • Reports • Alarms
3	Media	Displays the media available in the system. Depending on the connected devices, the utilities electricity, water, gas and heat are displayed here. The devices must be assigned to a metering structure for this purpose. If devices have been assigned to consumer groups (e.g. lighting, electrical sockets, air conditioning, etc.), they can be recalled via the submenu
4	First axis settings	Used to select the required unit (e.g. costs, consumption, load profile, etc.) and to display it on the chart (e.g. column chart, line chart, load profile, etc.).
5	Second axis settings	Used to select the required unit (e.g. costs, consumption, etc.) and to display it on the chart (e.g. column chart, line chart, etc.).
6	Resolution	Resolution setting for the chart display; dependent on the time unit (day, week etc.) selected in Presets.
7	Actions	Used to select further data processing options (e.g. Save as image, Export to .xlsx, csv, Save as favorite, Print chart).
8	Chart area	Displays the data graphically. Click and drag or click a value on the chart to zoom.
9	Slider	Used to limit and move the required period.
10	Calendar function	Used to enter the required period (from/to).



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Menu “Analytics”

Usage Split

Used to analyze and display

- Cost
- Consumption
- Generation
- Income
- CO_2

per medium or consumer group

- Lighting
- Cooling
- Ventilation
- …

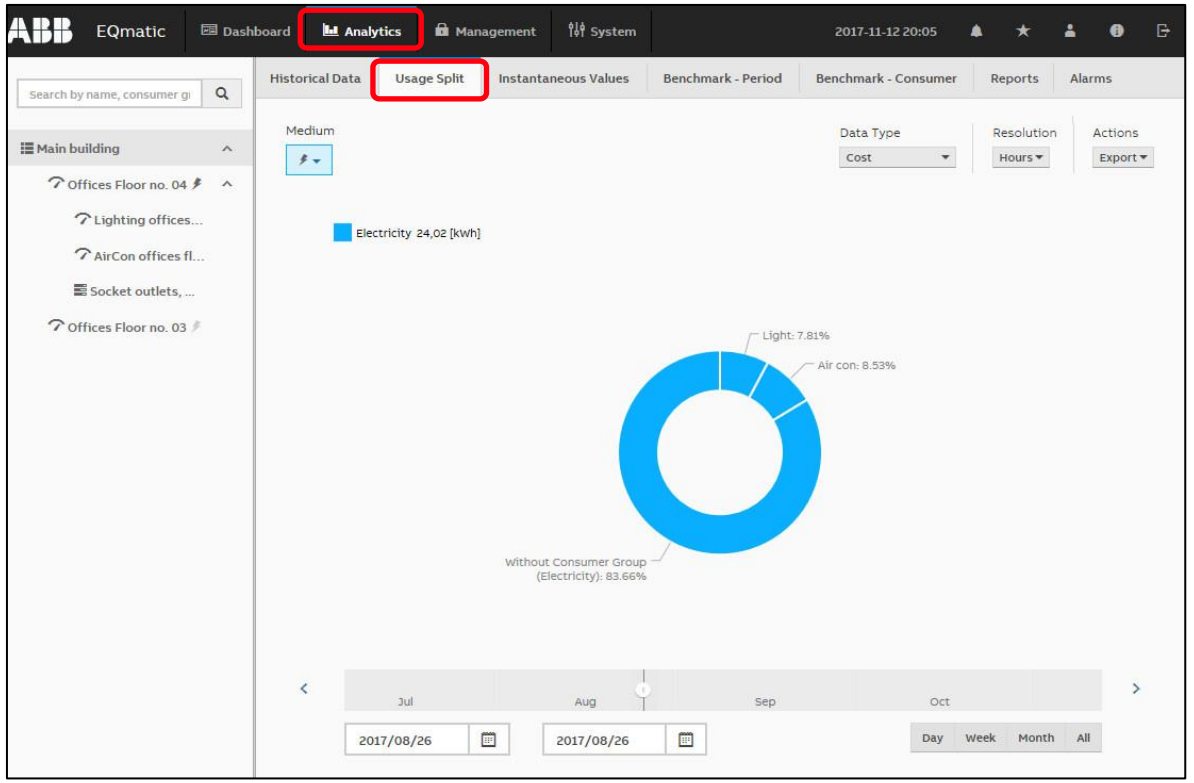


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Analytics”

Usage Split

1	Metering structure	Used to navigate and select a consumer or node. The metering structure must first be configured in Management > Metering Structure. Click the icon to show or hide the metering structure.
2	Analysis functions	Menu for selecting the required analysis function. Options: • Historical Data • Usage Split • Instantaneous Values • Benchmark - Period • Benchmark - Consumer • Reports • Alarms
3	Media	Displays the media available in the system. Depending on the connected devices, the utilities electricity, water, gas and heat are displayed here. If devices have been assigned to consumer groups (e.g. lighting, electrical sockets, air conditioning, etc.), they can be recalled via the submenu .
4	Data Type	Used to select the required data type (e.g. costs, consumption etc.).
5	Resolution	Resolution setting for the chart display; dependent on the time unit (day, week etc.) selected in Presets.
6	Actions	Used to select further data processing options (e.g. Save as image, Export to .xlsx, csv, Save as favorite, Print chart).
7	Chart area	Displays the data graphically. Click and drag or click a value on the chart to zoom.
8	Slider	Used to limit and move the required period.
9	Calendar function	Used to enter the required period (from/to).
10	Presets	Selects and displays current day, week, month, year, all. Presets are shown dynamically, depending on the measuring period: Day: always visible; Week: after 2 days: Month: after 7 days: Year: after 6 months: All: Always visible

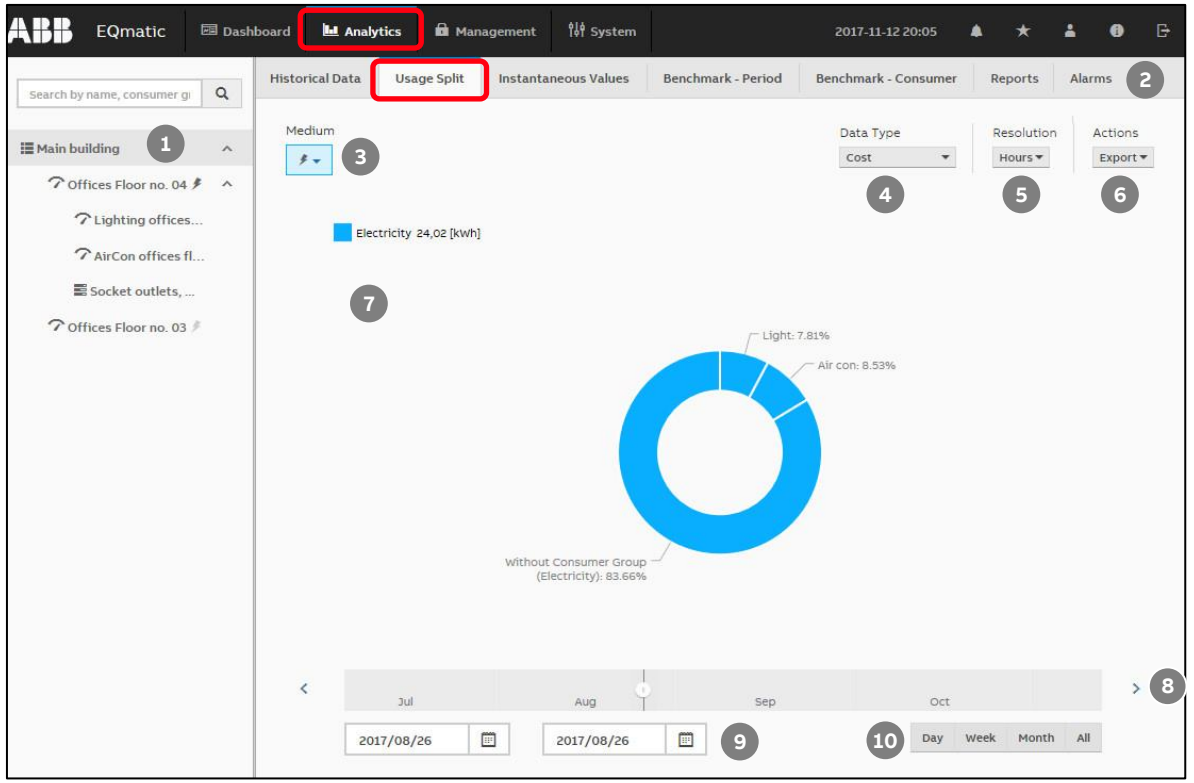


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Analytics”

Instantaneous Values

This function displays the instantaneous value for a single data point in real time

The value is displayed on a serial chart

You must first select the required metering point or meter in the metering structure

Depending on the meter's functionality, various data points are available for display

The values in the diagram are updated depending on:

- Baud rate of the devices
- Number of devices in the system
- Data resolution and transmission behavior of the M-Bus/Modbus/KNX meter
- The minimum update time is 5 seconds

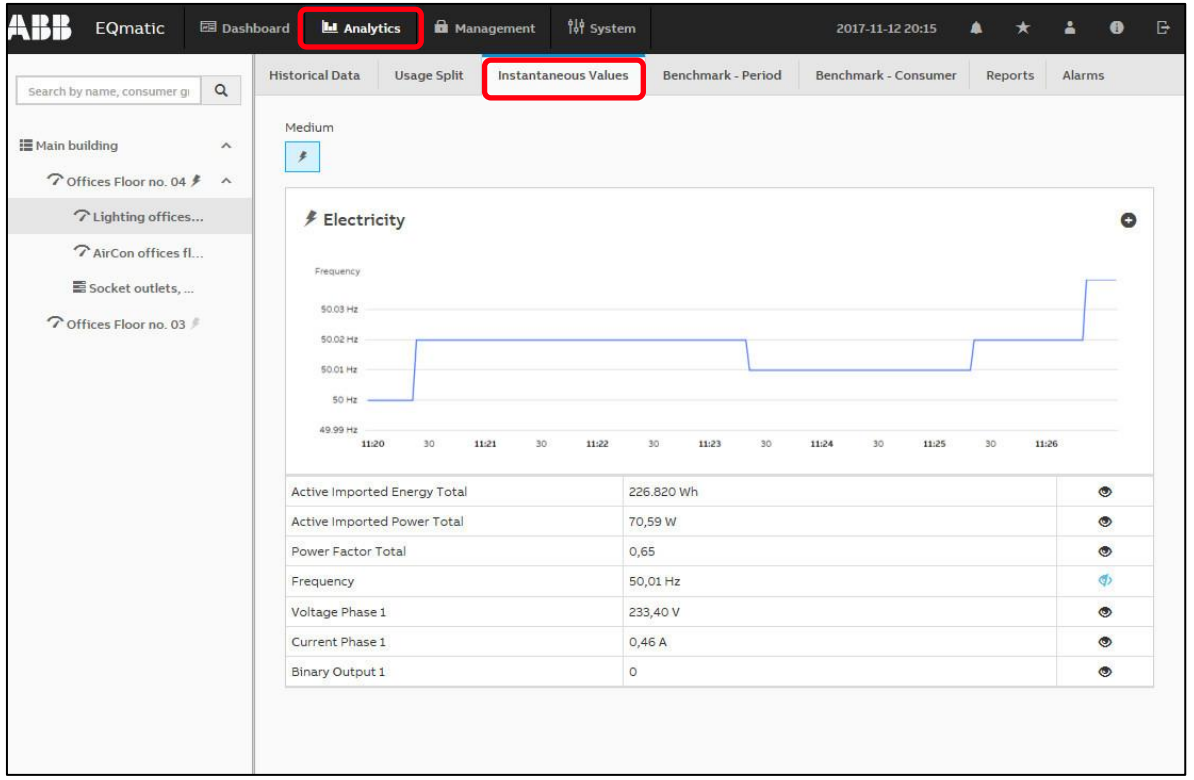
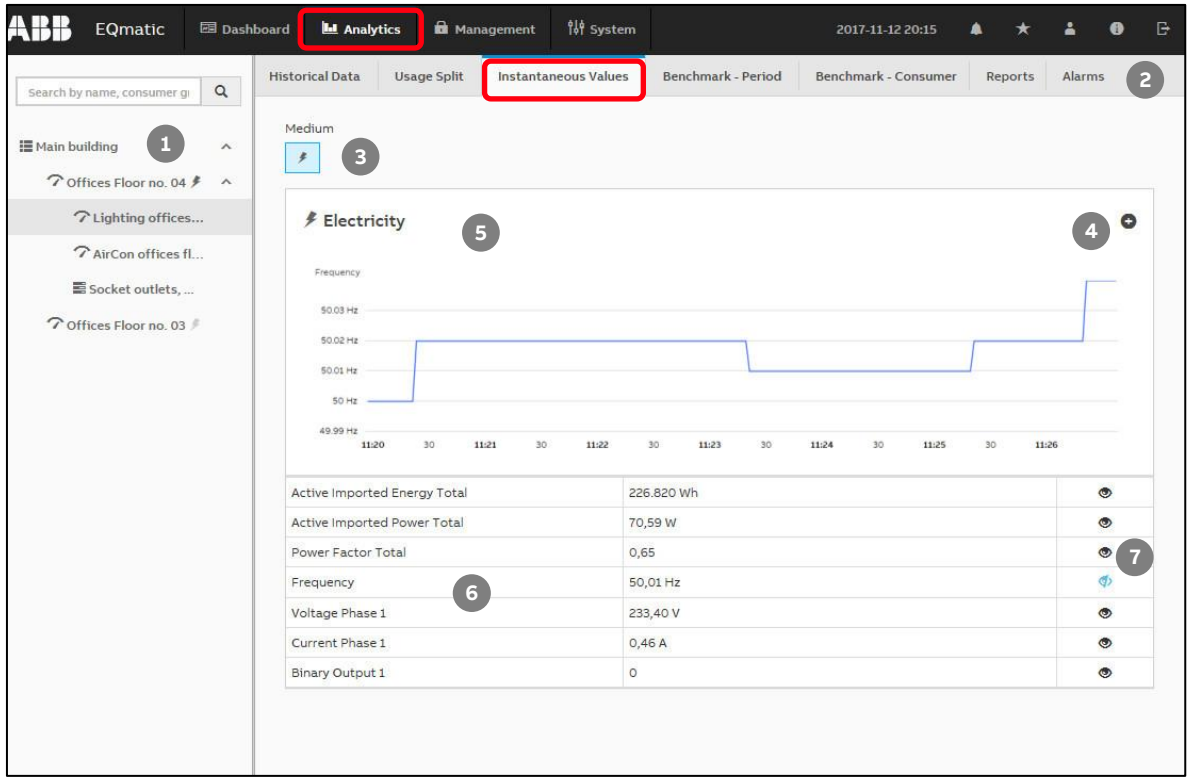


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Analytics”

Instantaneous Values

1	Metering structure	Used to navigate and select a consumer or node. Click the “<“ icon to show or hide the metering structure.
2	Analysis functions	Menu for selecting the required analysis function.
3	Media	Displays the media available in the system. Depending on the connected devices, the utilities electricity, water, gas and heat are displayed here.
4	Edit	Opens the window for selecting and adding available data points to the table for subsequent display.
5	Chart area	Graphically displays the data point selected on a serial chart.
6	Table	The meter data points are listed in the table depending on the functionality and the available meter data points selected.
7	Display	Clicking the icon displays the data point or measured value in the serial chart. If a data point is accompanied by the alarm icon , an alarm has been configured for it. Clicking the icon opens the alarm configuration window.



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Menu “Analytics”

Benchmark – Period

To compare a consumer or node over two time intervals (e.g. current month, previous month)

– The desired data type
- Cost
- Consumption
- Generation
- Income
- CO_2
- Load profile

is displayed as
- Line
- Column
- Smoothed line
- Step

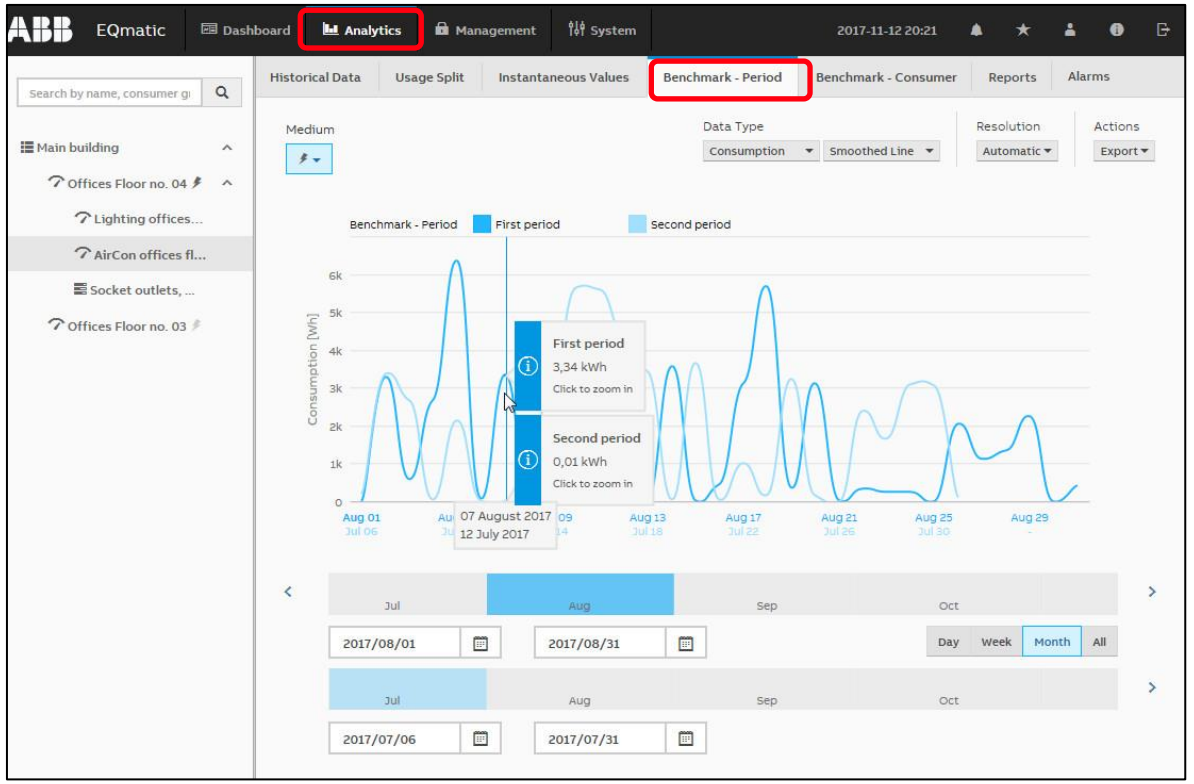
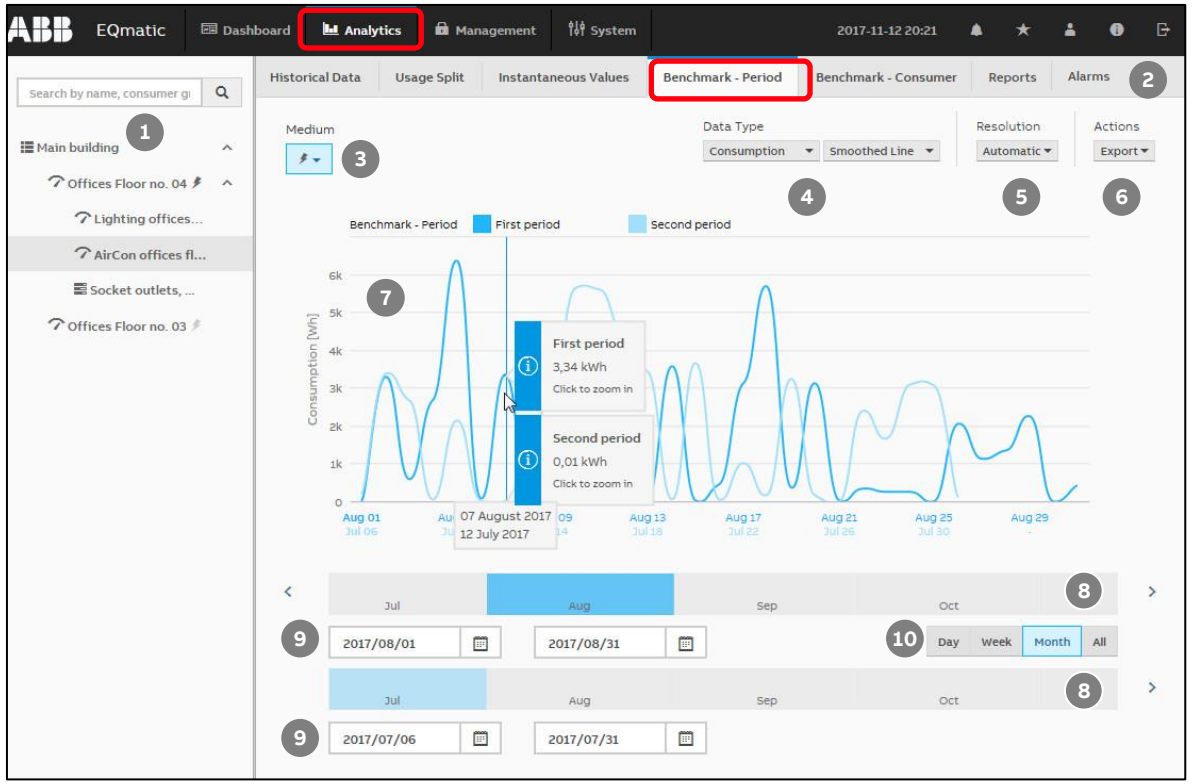


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Analytics”

Benchmark – Period

1	Metering structure	Used to navigate and select a consumer or node. The metering structure must first be configured in Management > Metering Structure. Click the “<“ icon to show or hide the metering structure.
2	Analysis functions	Menu for selecting the required analysis function. Options: • Historical Data • Usage Split • Instantaneous Values • Benchmark - Period • Benchmark - Consumer • Reports • Alarms
3	Media	Displays the media available in the system. Depending on the connected devices, the utilities electricity, water, gas and heat are displayed here. If devices have been assigned to consumer groups (e.g. lighting, electrical sockets, air conditioning, etc.), they can be recalled via the submenu .
4	Data type	Used to select the required data type (e.g. costs, consumption etc.).
5	Resolution	Resolution setting for the chart display; dependent on the time unit (day, week etc.) selected in Presets.
6	Actions	Used to select further data processing options (e.g. Save as image, Export to .xlsx, csv, Save as favorite, Print chart).
7	Chart area	Displays the data graphically. Click and drag or click a value on the chart to zoom.
8	Slider	Used to limit and move the required period.
9	Calendar function	Used to enter the required period (from/to).
10	Presets	Selects and displays current day, week, month, year, all. Presets are shown dynamically, depending on the measuring period



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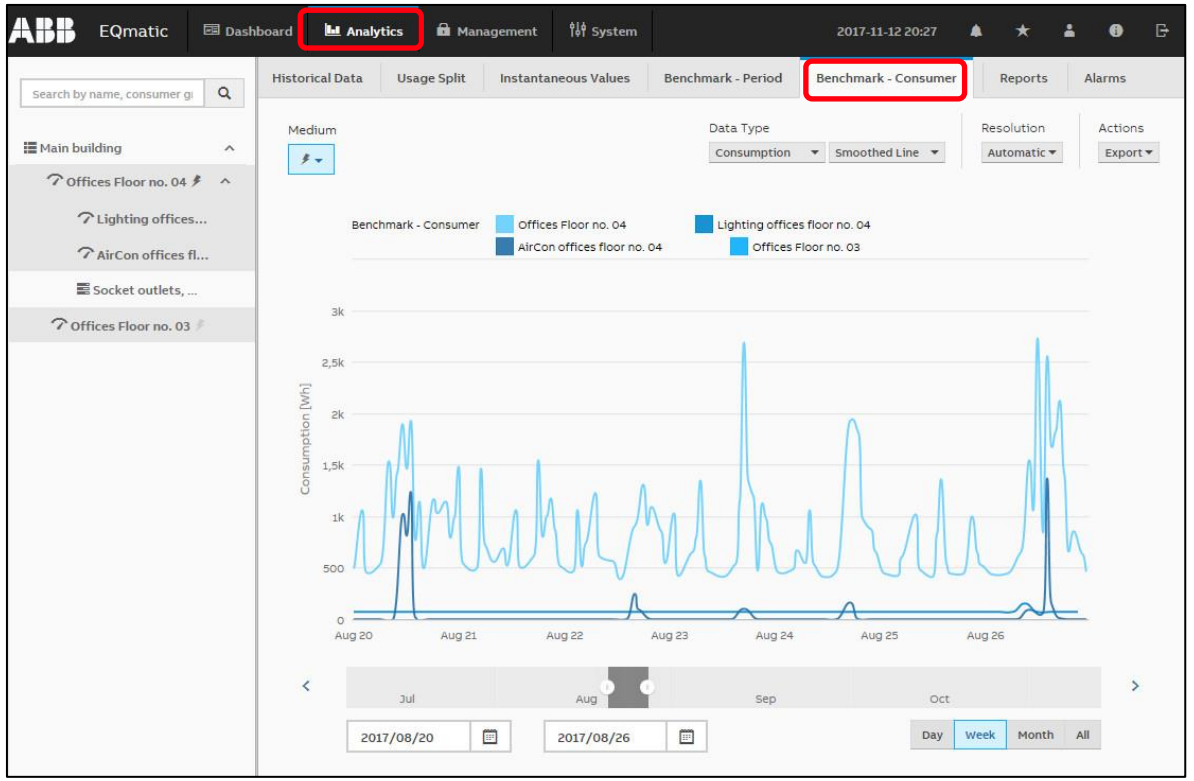
Menu “Analytics”

Benchmark – Consumer

Used to compare up to 5 consumers or nodes over an time interval

– The desired data type
  - Cost
  - Consumption
  - Generation
  - Income
  - CO_2
  - Load profile

  is displayed as
  - Line
  - Column
  - Smoothed line
  - Step



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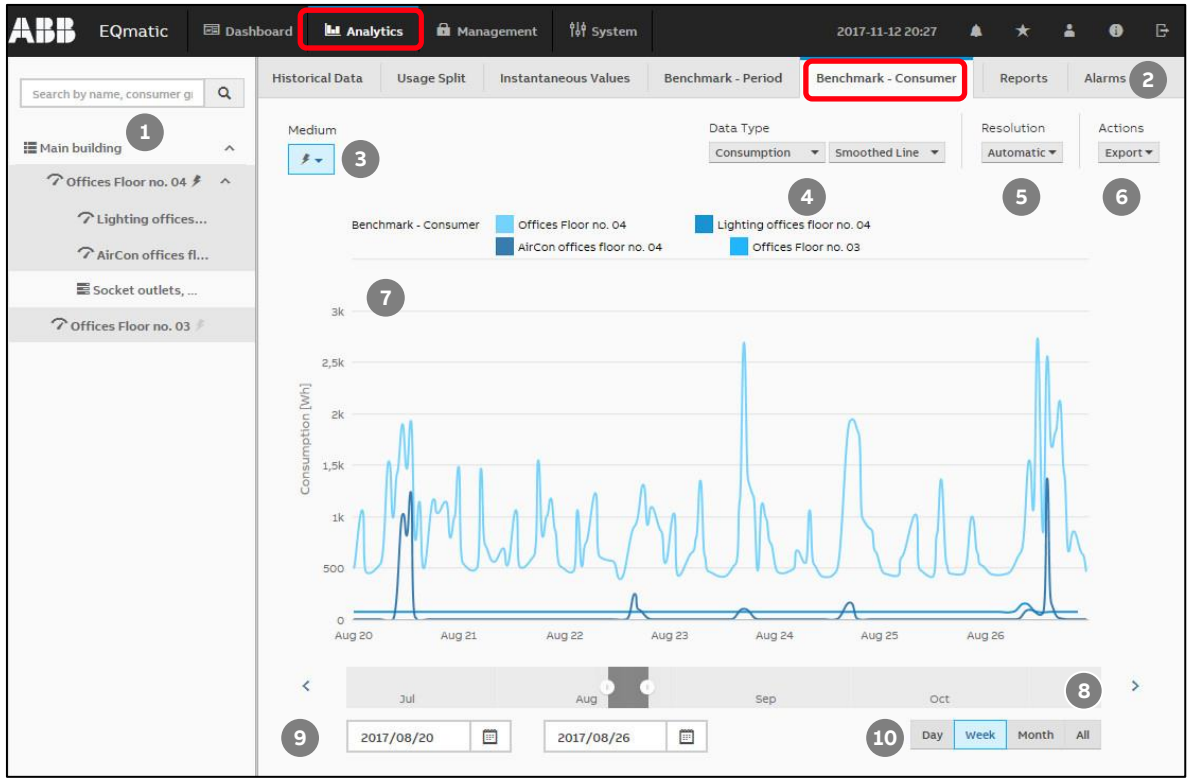
Menu “Analytics”

Benchmark – Consumer

1	Metering structure	Used to navigate and select a consumer or node. The metering structure must first be configured in Management > Metering Structure. Click the “<“ icon to show or hide the metering structure.
2	Analysis functions	Menu for selecting the required analysis function. Options: • Historical Data • Usage Split • Instantaneous Values • Benchmark - Period • Benchmark - Consumer • Reports • Alarms
3	Media	Displays the media available in the system. Depending on the connected devices, the utilities electricity, water, gas and heat are displayed here. If devices have been assigned to consumer groups (e.g. lighting, electrical sockets, air conditioning, etc.), they can be recalled via the submenu .
4	Data type	Used to select the required data type (e.g. costs, consumption etc.).
5	Resolution	Resolution setting for the chart display; dependent on the time unit (day, week etc.) selected in Presets.
6	Actions	Used to select further data processing options (e.g. Save as image, Export to .xlsx, csv, Save as favorite, Print chart).
7	Chart area	Displays the data graphically. Click and drag or click a value on the chart to zoom.
8	Slider	Used to limit and move the required period.
9	Calendar function	Used to enter the required period (from/to).
10	Presets	Selects and displays current day, week, month, year, all. Presets are shown dynamically, depending on the measuring period



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Menu “Analytics”

Reports

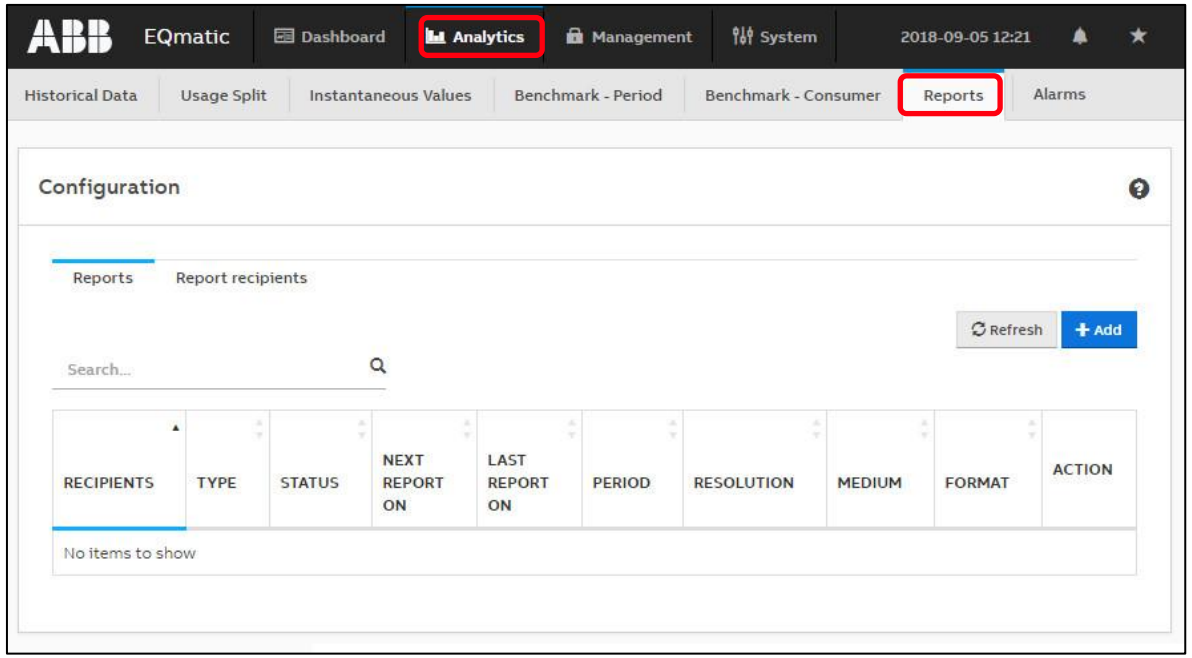
This function allows to send analyses and evaluations to various recipients automatically

The data can be sent data either by e-mail and/or to an FTP server

Example: Send saved consumption figures or costs for a meter once a month to a recipient by e-mail in the file format “.xlsx” for further evaluation and archiving

Reports configured are displayed and managed in an overview table

To send emails, the settings for the SMTP server must have been made in the *System* menu



Note:
Available for QA/S 3.xx.1 M-Bus from version 2.0.0 and QA/S 1.16.1 KNX

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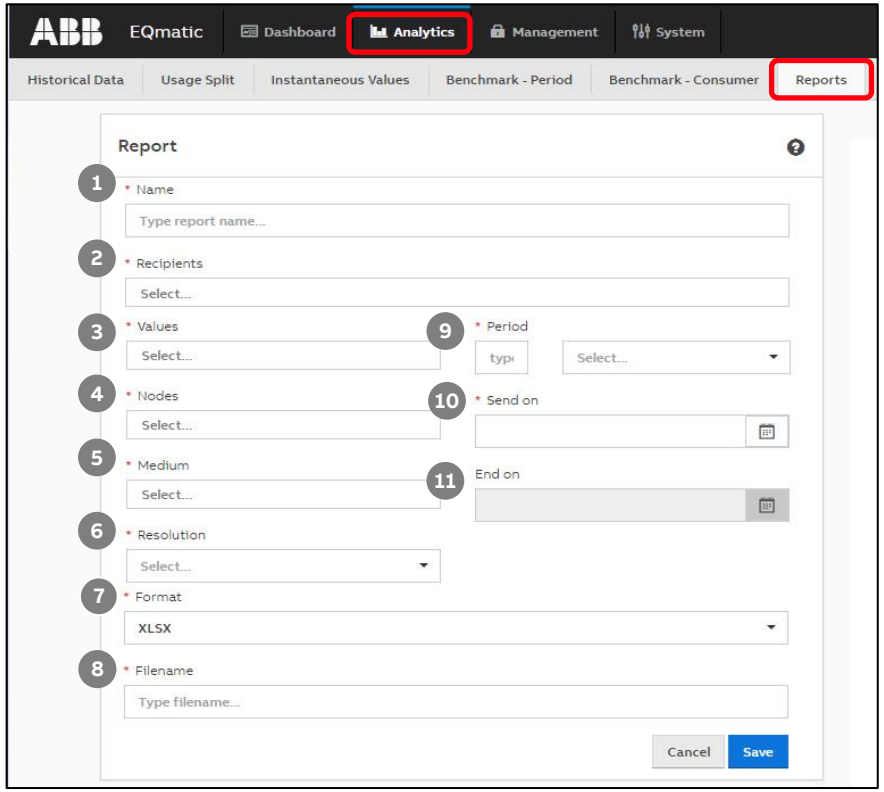
Menu “Analytics”

Reports

Configuration of a report:

- There are various parameters available to help you configure reports
- Enter the required values and parameters in the window and save the report

1	Name	Enter report name.
2	Recipients	Configure report recipients (email or FTP).
3	Values	Select the values to be sent in the report (e.g. consumption, costs). Multiple selection possible.
4	Nodes	Select the required node or meter. Multiple selection possible.
5	Medium	Select the medium (e.g. electricity, gas, water, heat). Multiple selection possible.
6	Resolution	Select the data resolution for the report (e.g. hourly, daily).
7	Format	Select the file format for the report (e.g. XLSX, CSV).
8	Filename	Enter the filename.
9	Period	Select the sending interval or period for the report (e.g. 1 x / week).
10	Send on	Set when the report is to be sent for the first time.
11	End on	Set when the report is to be sent for the last time.



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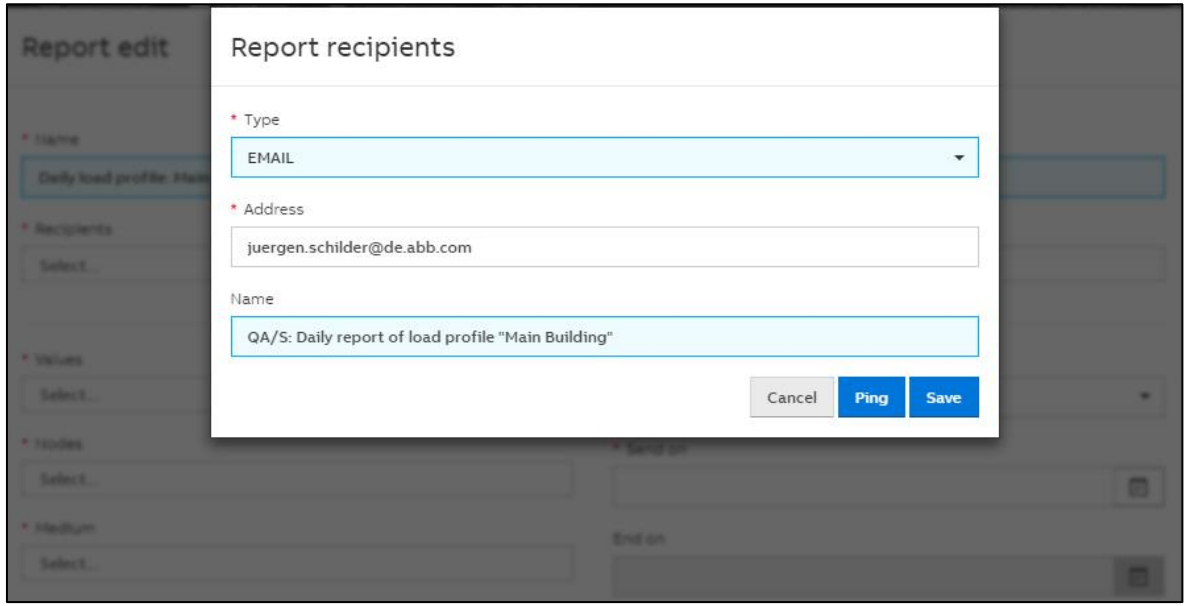
Menu “Analytics”

Reports

Recipient of the report: Email



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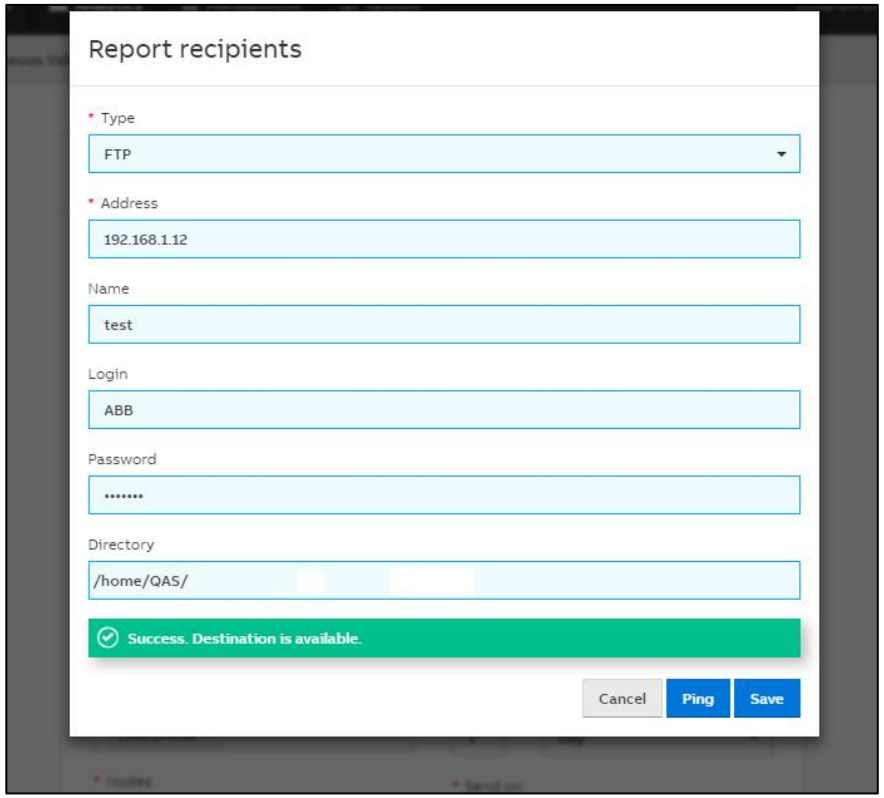
Menu “Analytics”

Reports

Recipient of the report: FTP server



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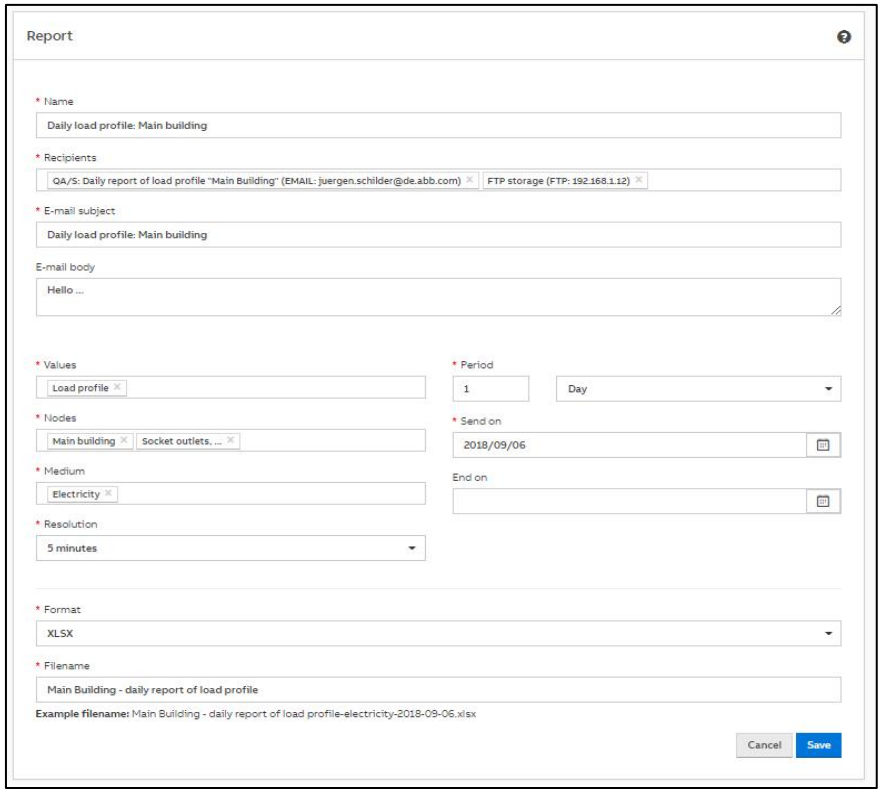
Menu “Analytics”

Reports

The report “Daily load profile: Main building” will be sent daily via email and FTP with the values “Load profile” of the nodes “main building” and “Sockets outlets”



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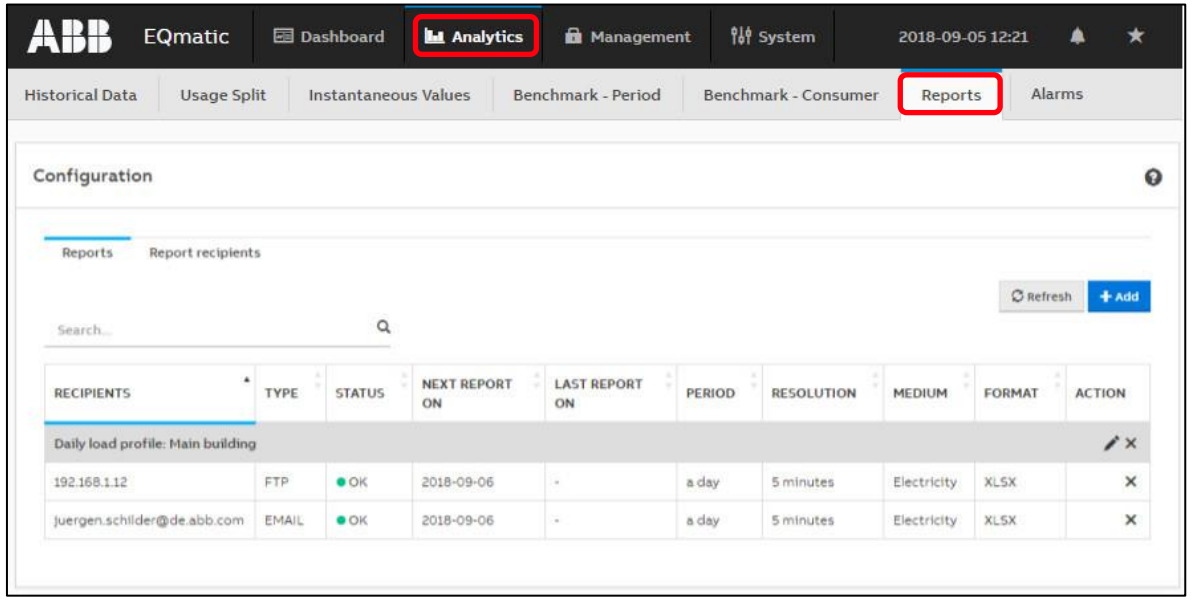
Menu “Analytics”

Reports

Overview of all reports incl. recipients



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Menu “Analytics”

Reports

Received email with the values “Load profile” of the nodes “main building” and “Sockets outlets”

Resolution 5 min.

	A	B	C	D
1	Timestamp	Main building Load Profile (kW)	Socket outlets, ... Load Profile (kW)	Sum (kW)
2	2018-09-05 00:00	0,41547	0,35611	0,77158
3	2018-09-05 00:05	0,42000	0,36019	0,78019
4	2018-09-05 00:10	0,45489	0,39668	0,85157
5	2018-09-05 00:15	0,44738	0,38955	0,83693
6	2018-09-05 00:20	0,47773	0,42043	0,89816
7	...	...	...	...
286	2018-09-05 23:40	0,48005	0,41979	0,89984
287	2018-09-05 23:45	0,48005	0,41607	0,89612
288	2018-09-05 23:50	0,48000	0,41835	0,89835
289	2018-09-05 23:55	0,43486	0,37183	0,80669

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Menu “Analytics”

Alarms

This function can be used to configure one or more limit values for each measured value

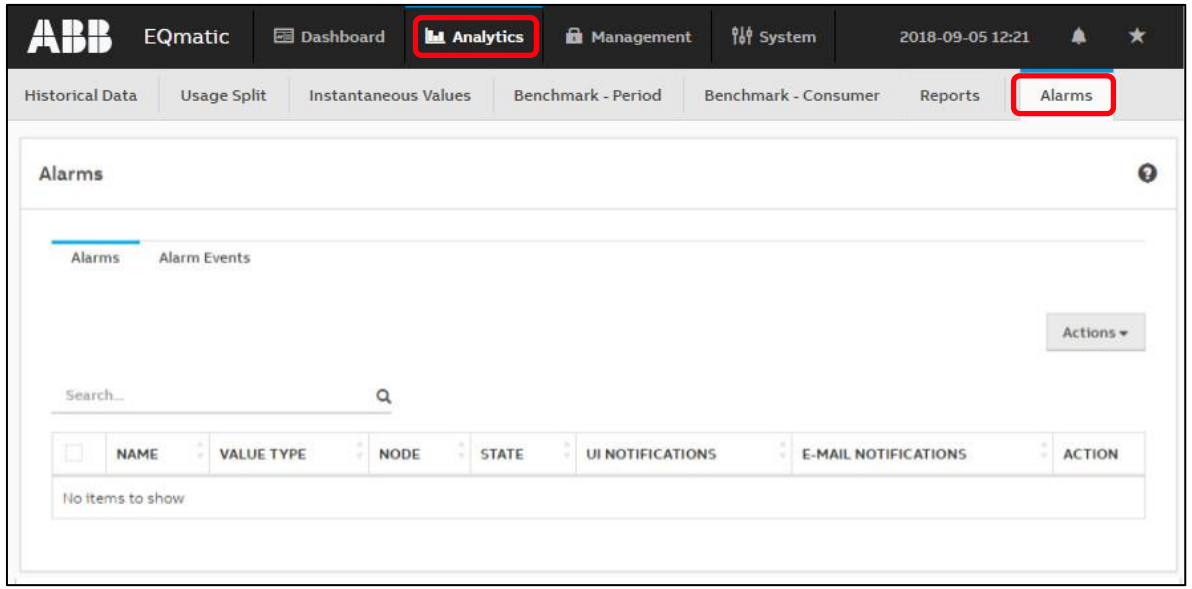
If the limit is exceeded, an alarm function can be configured and a choice can be made between different actions (notification in the dashboard and/or sending an email)

If an alarm occurs, the configured action is carried out and the occurrence of the alarm is written to the event log

Configured alarms are displayed and managed in an *Alarms* overview table

Any number of alarms can be configured

The occurrence of an alarm is managed in the event memory in the *Alarm Events* table



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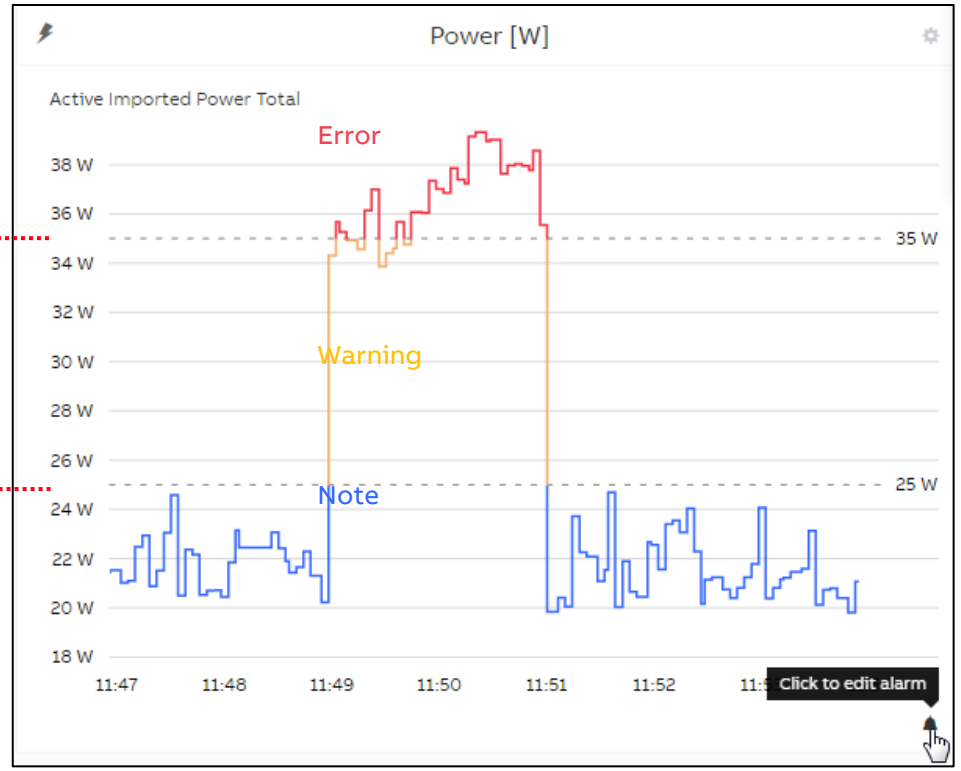
Menu “Load control”

Dashboard

E-Mail

User Interface

Notification when the value is “<“ or “>” than the alarm limit



Alarm category

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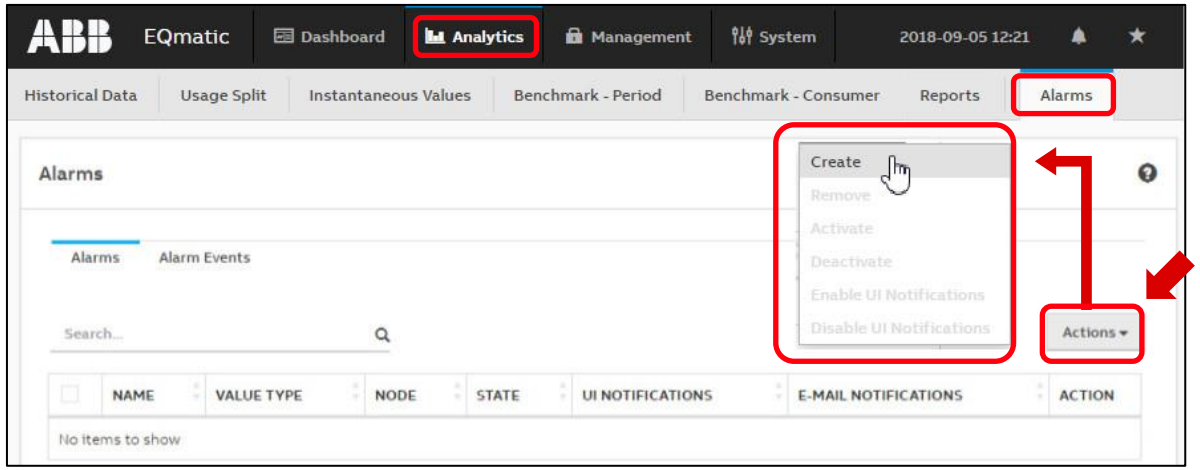
Menu “Analytics”

Alarms – Configuring via the analytics function

The Actions button provides the following options:

- Create: Opens the alarm configuration window
- Remove: Deletes the alarms selected using the check boxes in the overview table, removing them from the overview and the system
- Activate: Primes the alarms selected using the check boxes in the overview table
- Enable UI Notifications: Switches on UI pop-up notifications for the alarms selected using the check boxes in the overview table.
- Disable UI Notifications: Switches off UI pop-up notifications for the alarms selected using the check boxes in the overview table.



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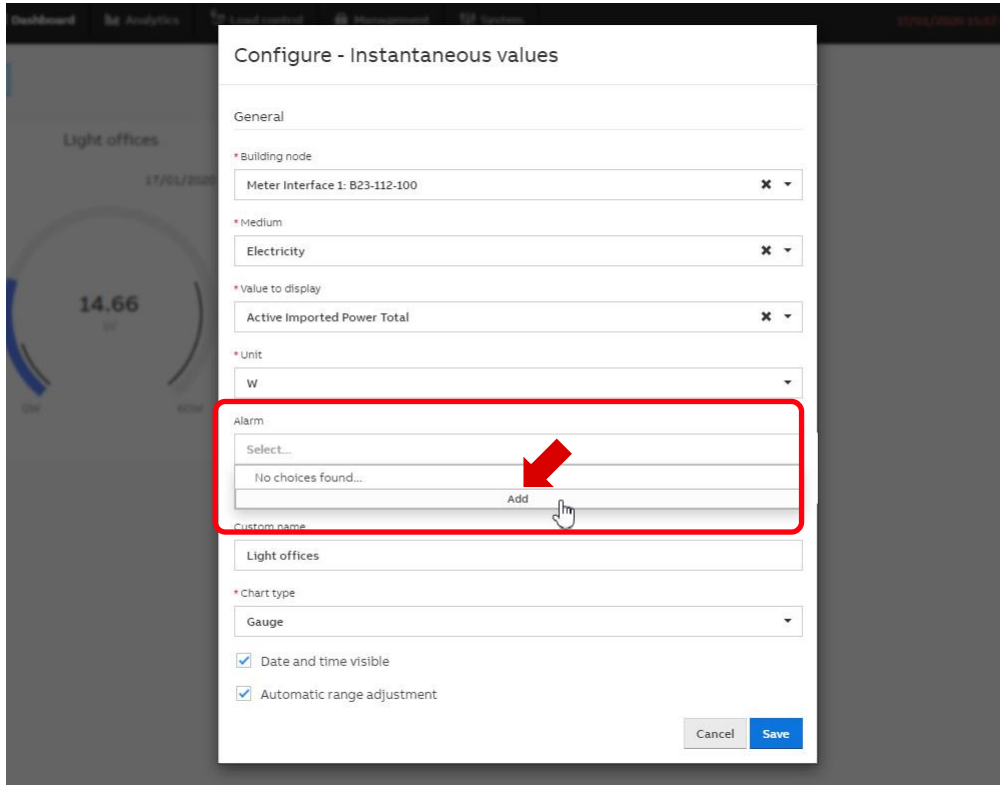
Menu “Analytics”

Alarms – Configuring via the dashboard

Activate the edit mode in the dashboard and click on the “Configure Widget” button

Go to “Alarm” and click the “Add" button

The alarm configuration window opens
(as for configuring via the analytics function)



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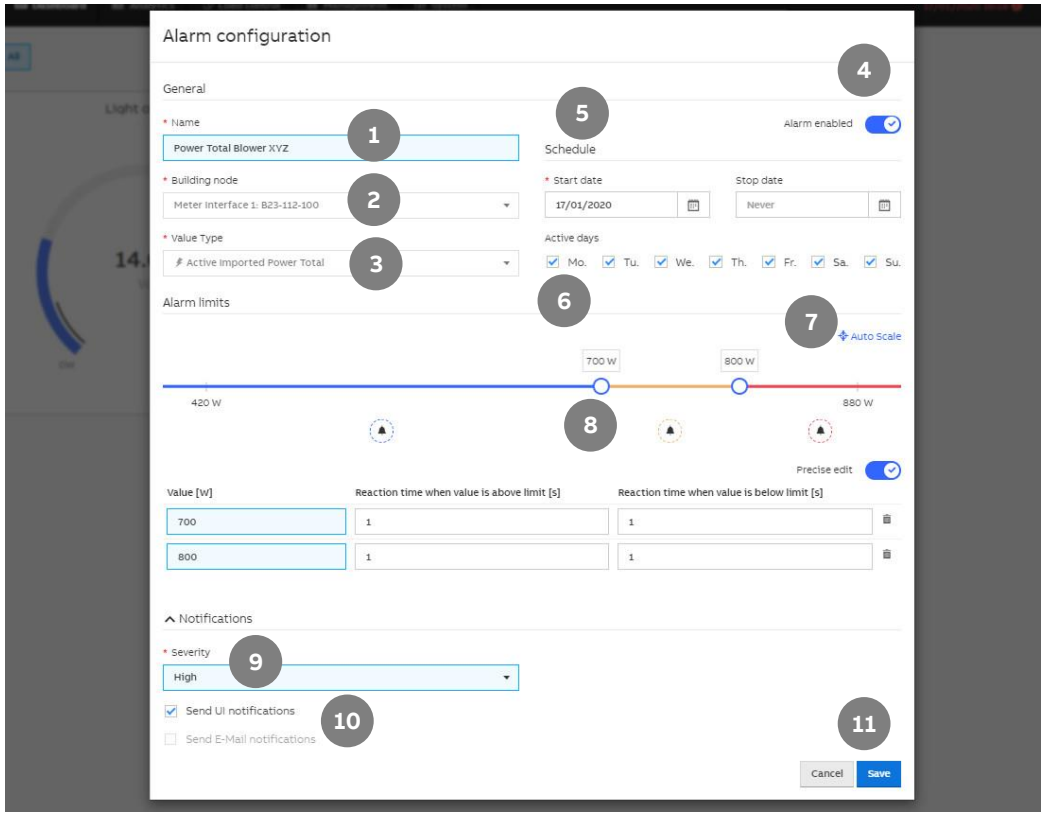
Menu “Analytics”

Alarms – Configuring window

1	Name	Enter a name for the alarm.
2	Building node	Select the building node or associated meter/device.
3	Value Type	Select the data point (e.g. active power) for the alarm configuration.
4	Alarm enabled	Prime the alarm using the slider.
5	Schedule	Configure a period (start and stop dates) during which you want the alarm to be active. Leaving the stop date empty leaves the alarm enabled indefinitely.
6	Active days	Select the weekdays when you want the alarm to be active.
7	Auto Scale	Where there are several threshold values configured, clicking this distributes them evenly along the threshold line.
8	Alarm limits	Clicking a point (threshold value) on the line provides additional parameters for entering the threshold value and reaction times. A threshold can be moved along the line using drag & drop. You can add as many thresholds as necessary by mousing over the line. A new point (threshold) appears; click to configure it. Each threshold value or range must be assigned an alarm category by clicking : • Error (red) • Warning (orange) • Note (blue) The alarm category color codes are carried over to the widget display and Alarm Events table. If you choose a serial chart as a widget, the configured alarm thresholds are displayed as broken lines in the chart.
...		



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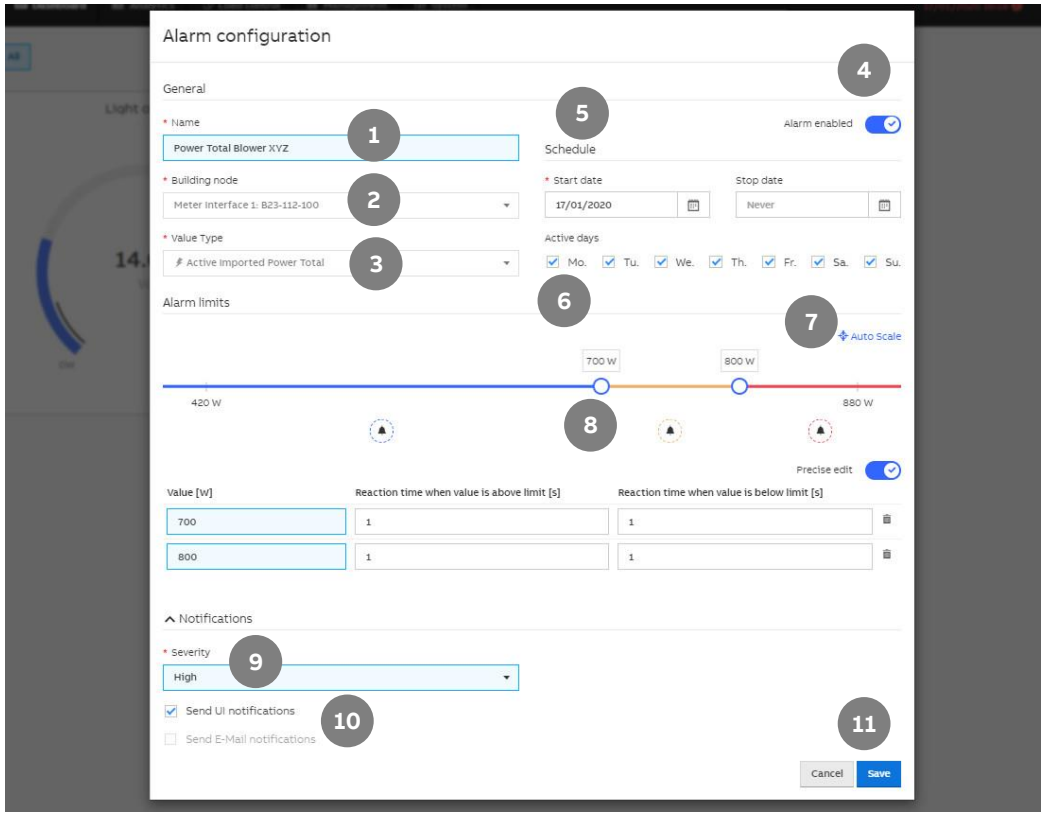
Menu “Analytics”

Alarms – Configuring window

...		
9	Severity	Alarm priority specification. Options: • High • Medium • Low
10	Send UI notifications Send E-mail notifications	To activate the relevant notification(s), select the check boxes. If an alarm occurs, the pop-up notification appears in the Information icon. To receive email notifications you need to enter SMTP settings. You can enter a custom message for each notification. Aside from this, the email will contain details about the alarm: • Date/Time • Building node • Value Type • Threshold exceeded • Alarm category and severity
11	Save	Saves the current configurations. The configured alarm appears in the Alarms overview table.



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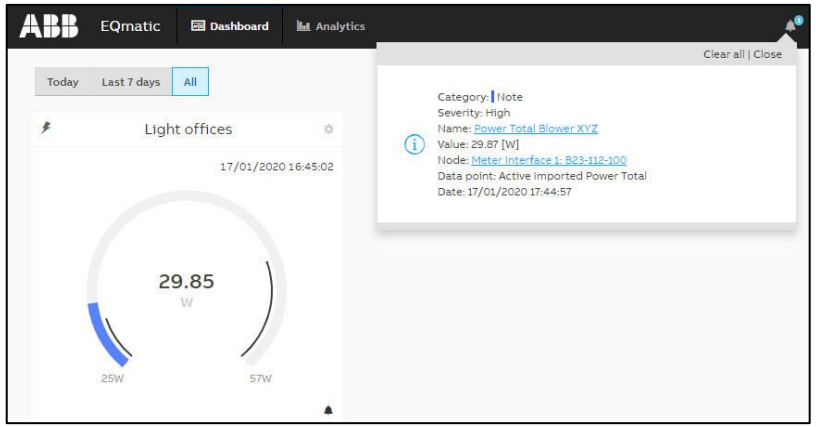
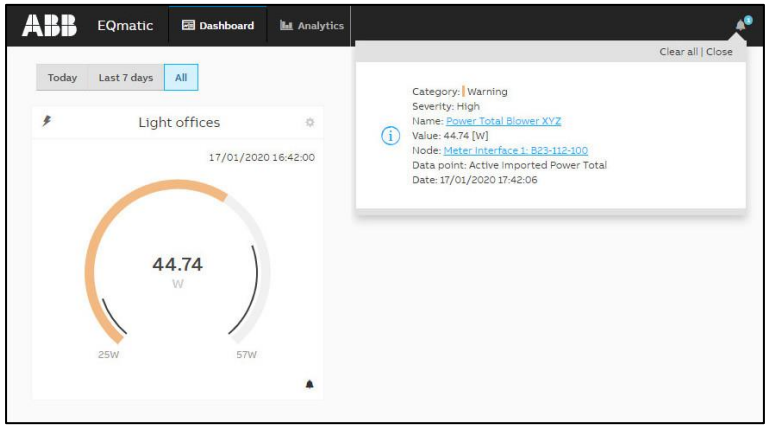
Menu “Analytics”

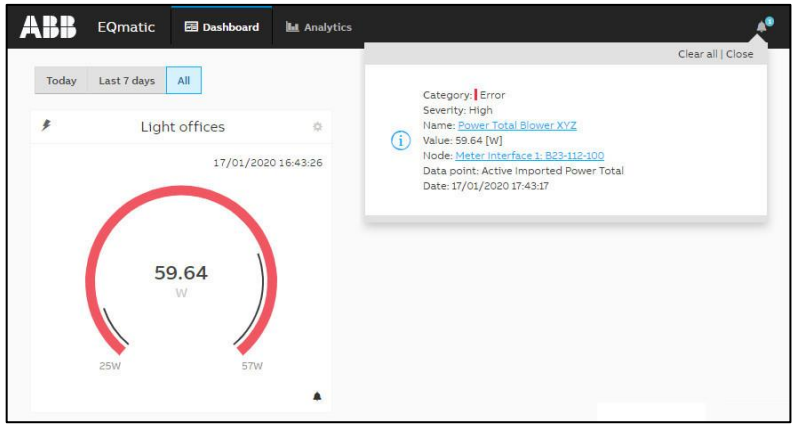
Alarms – Dashboard values and UI notifications



Alarm category “Note” (blue)

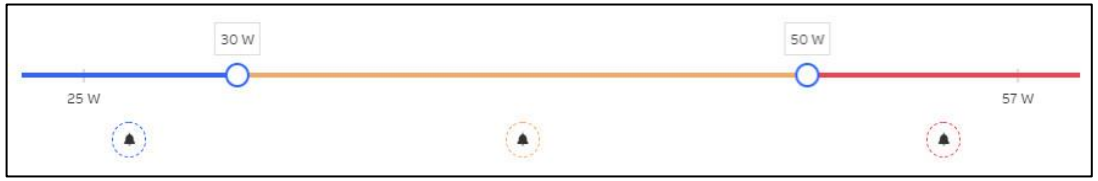


Alarm category “Warning” (orange)



Alarm category “Error” (red)

Alarm limits:



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Menu “Analytics”

Alarm events

Alarm events are managed and displayed in an overview table showing when each alarm occurred and when it was cleared

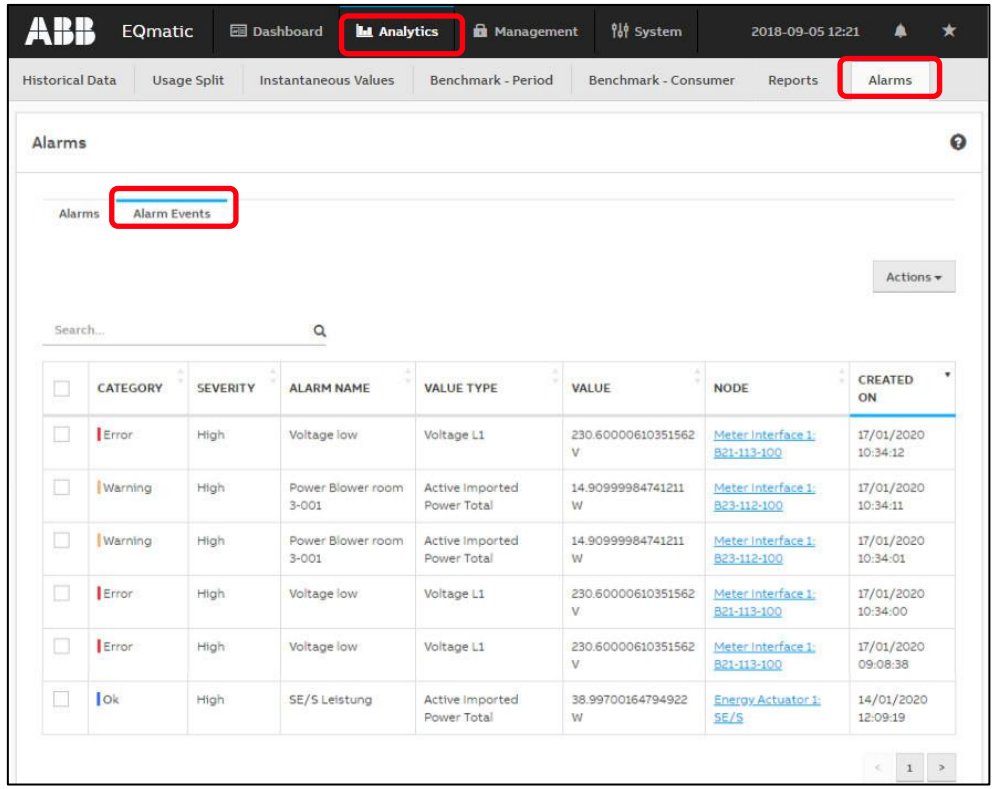
The alarms overview can be exported in various formats

– XLSX

– CSV

– JSON

for further processing



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Menu “Analytics”

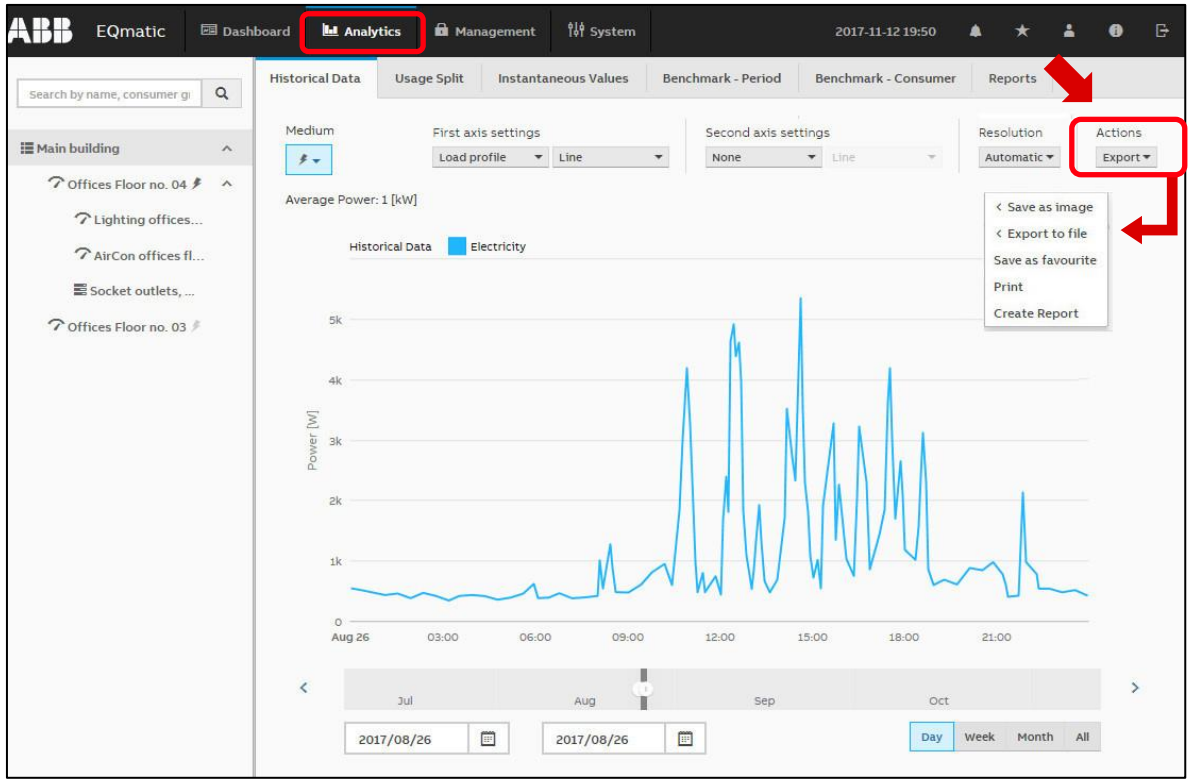
Actions

Available in the menu:

- Historical Data
- Usage Split
- Benchmark - Period
- Benchmark - Consumer

Used to select further data processing options

- Save as image
- Export to file
- Save as favorite
- Print
- Create report



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Menu “Analytics”

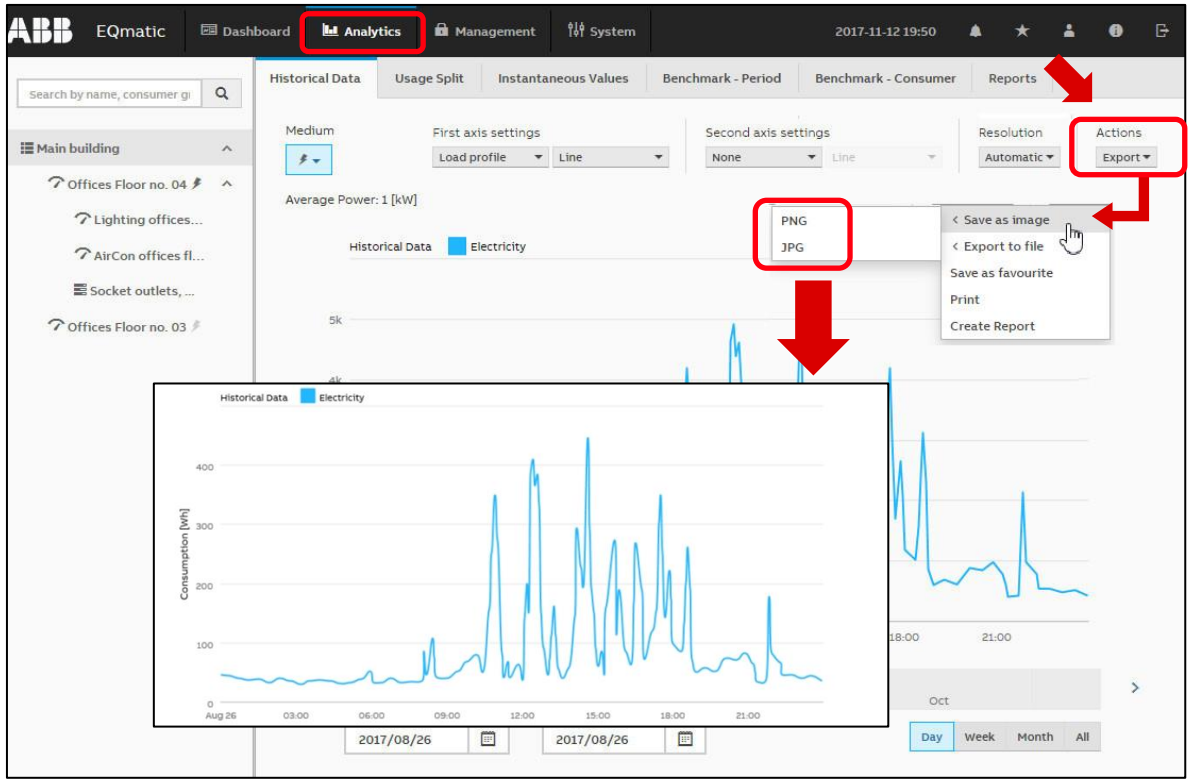
Actions – Save as image

The diagram of the consumer or node selected in the metering structure is saved as a graphic file in the format

– PNG

– JPG

over the selected time interval



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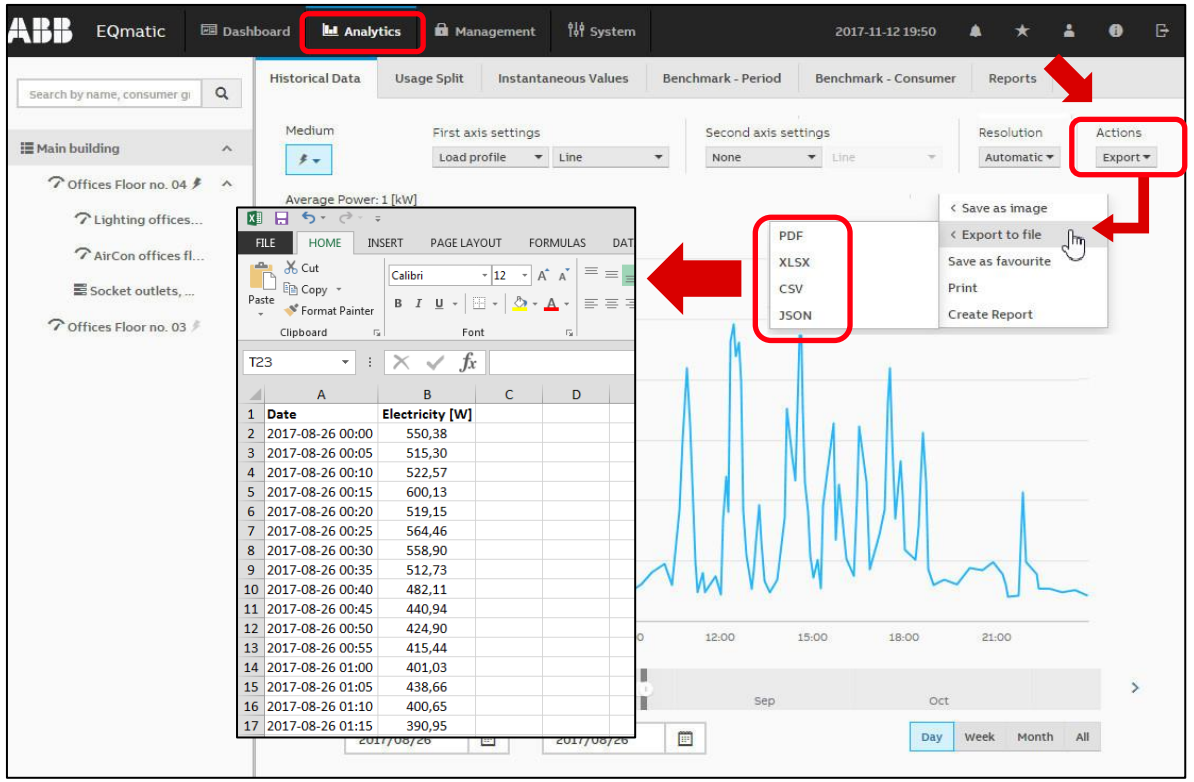
Menu “Analytics”

Actions – Export to file

The historical data of the consumer or node selected in the metering structure are exported over the selected time interval as

- PDF
- XLSX
- CSV
- JSON



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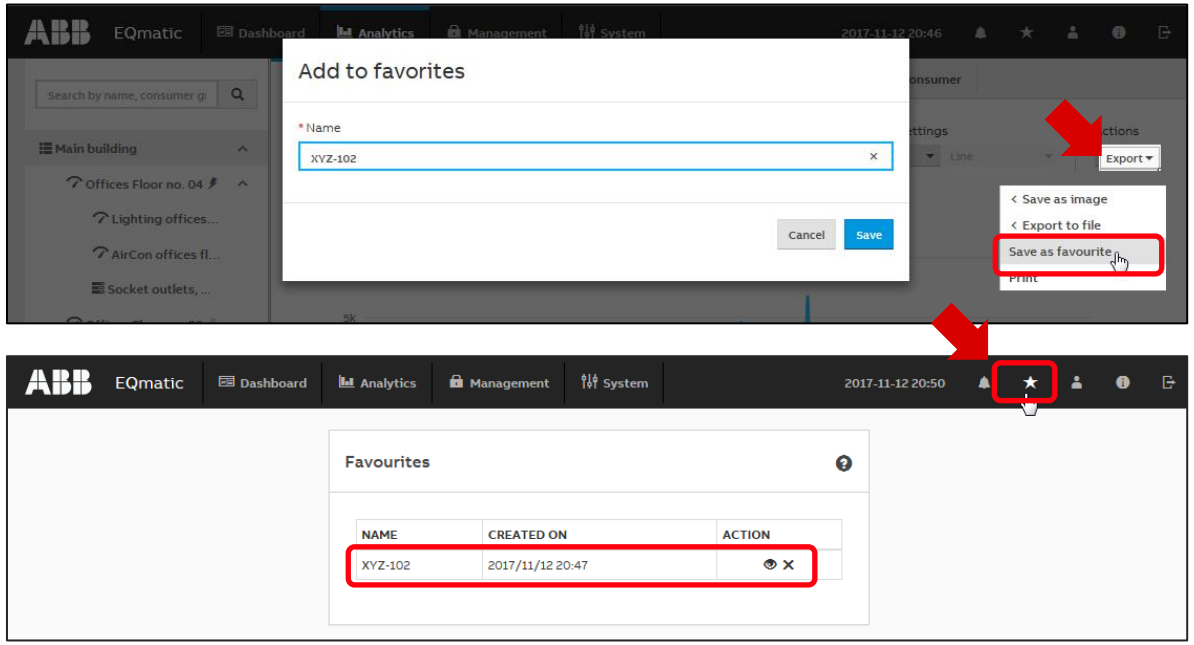
Menu “Analytics”

Actions – Save as favorite

The consumer or node selected in the metering structure is saved in the *Favorites* bar with the time interval



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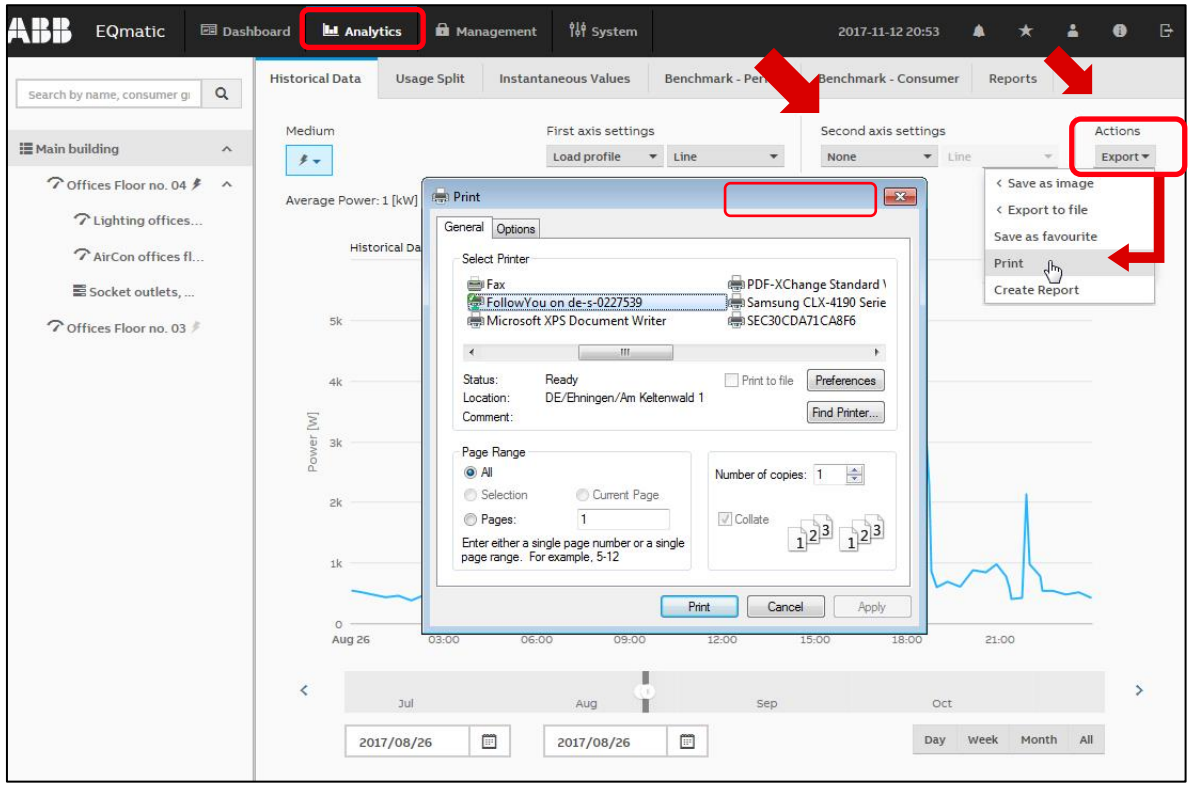
Menu “Analytics”

Actions – Print

The diagram of the consumer or node selected in the metering structure is printed over the selected time interval



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Menu “Analytics”

Actions – Report

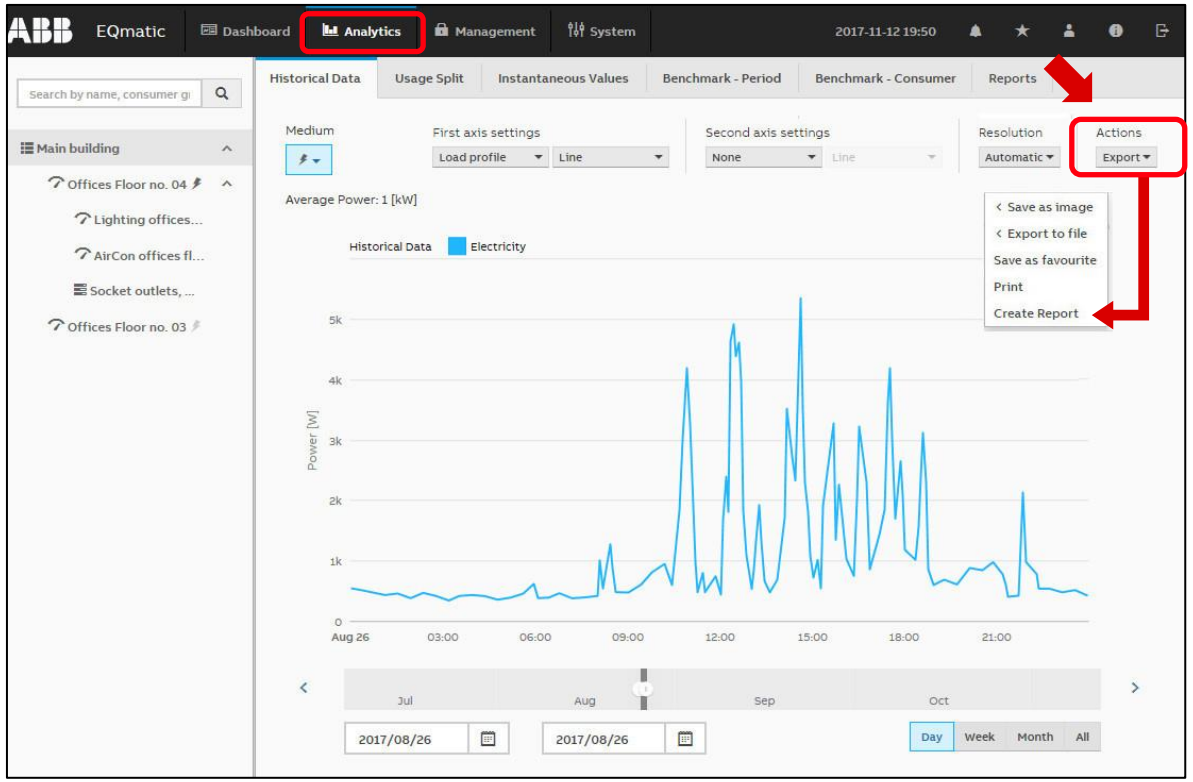
This function allows to send analyses and evaluations to various recipients automatically

The data can be sent data either by e-mail and/or to an FTP server

– There are various parameters available to help you configure reports

– Enter the required values and parameters in the window and save the report

More information in the “*Analytics → Reports*” menu



Commissioning

Main menu “Load control”

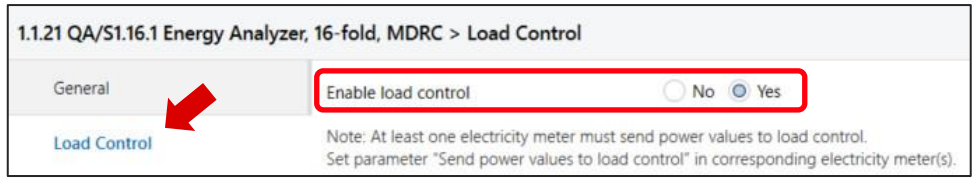
ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

Load control

With the Load Control Management function, load shedding sequences can be prioritized based on the electrical power values received from electricity meters

In order to be able to display and operate the load control via the user interface, it must first be activated in the ETS using the “Enable load control” parameter



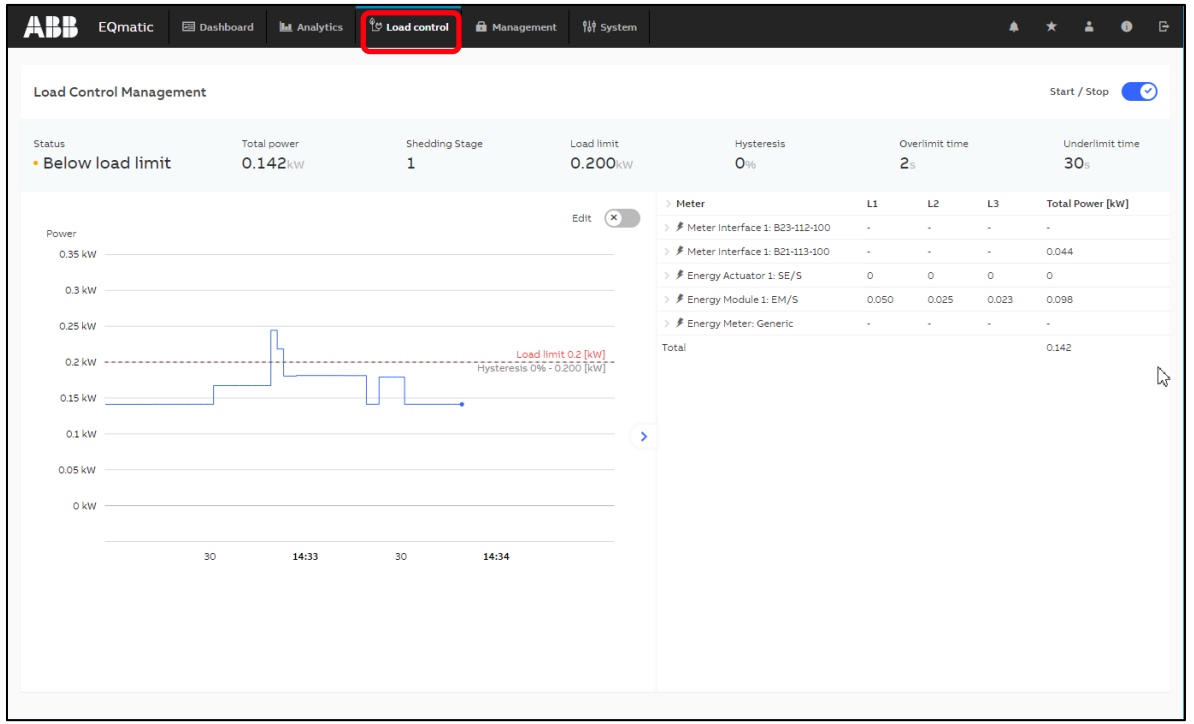


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

Load control

Load control is a function that enables an Energy Analyzer QA/S 1.16.1 KNX to manage an electrical installation energy-efficiently based on an adjustable load limit, by sending switching commands to KNX

The Energy Analyzer (master) 1 receives power values from up to 16 energy meters 2 3 (slaves, e.g. SE/S, EM/S, ZS/S and third party)

The values are then internally added to the total power value

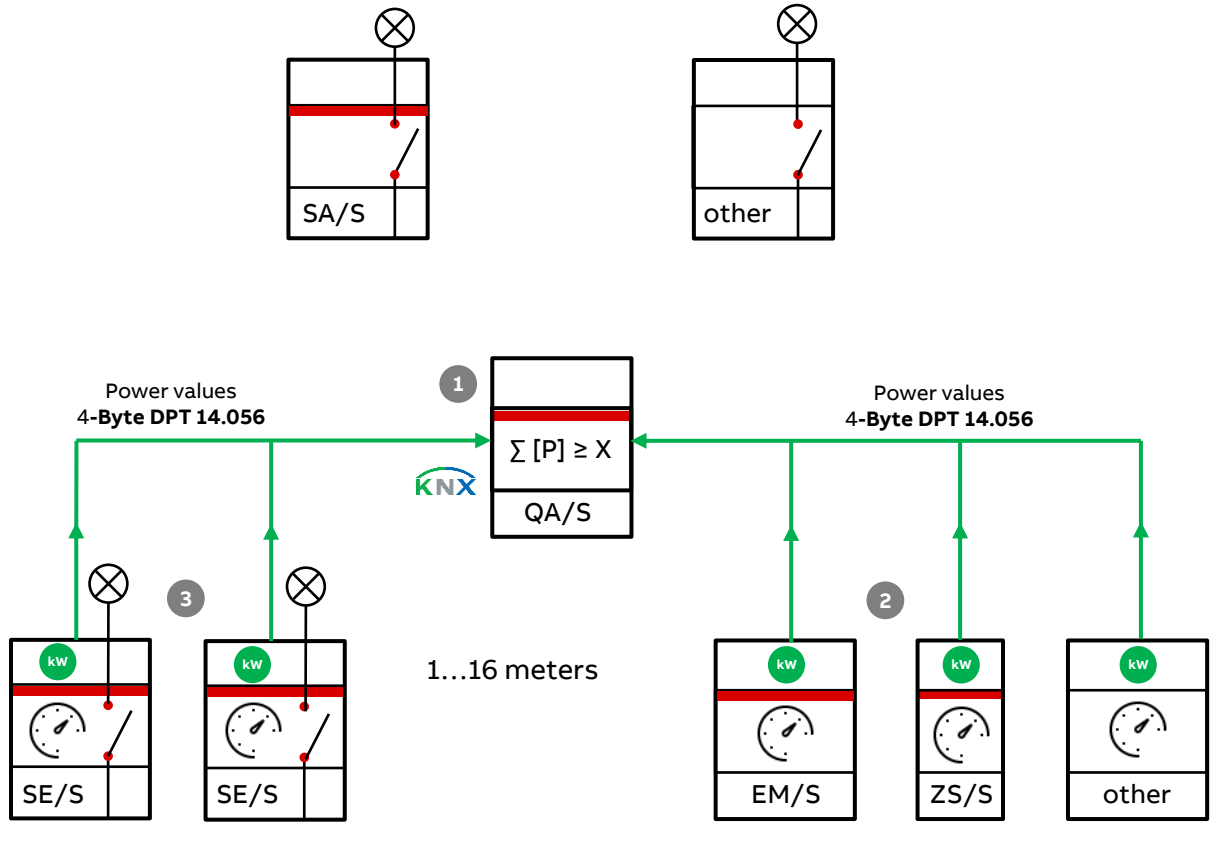


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

Load control

Load control is a function that enables an Energy Analyzer QA/S 1.16.1 KNX to manage an electrical installation energy-efficiently based on an adjustable load limit, by sending switching commands to KNX

The Energy Analyzer (master) 1 receives power values from up to 16 energy meters 2 3 (slaves, e.g. SA/S, SE/S, EM/S, ZS/S and third party)

The values are then internally added to the total power value

If the sum of the power values exceeds the user-defined load limit setting, the device sends shedding stages 1…8 4 to KNX

All ABB devices (e.g. Switch Actuator SA/S, Energy Actuator SE/S 3.16.1) featuring the “*Receive shedding stages*” group object (DPT 236.001) are suitable for use with the load shedding function

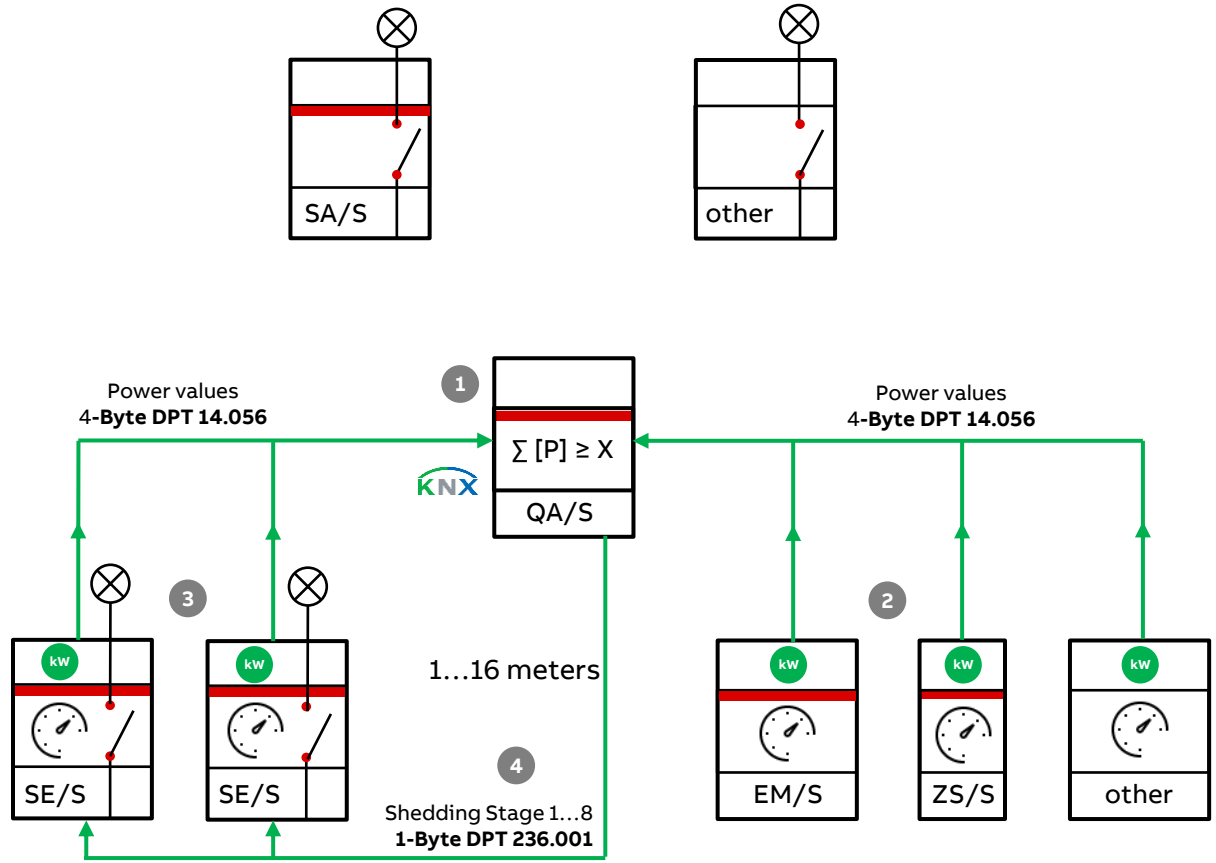


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

Load control

The Energy Actuator (3) features power measurement and a switch actuator function

As a result, it can send power values to the load control function and at the same time, receive shedding stages to switch connected consumers on and off

This means that a shedding stage can be set in the Energy Actuator for each output

The slave receives the shedding stage and switches all outputs set with this stage

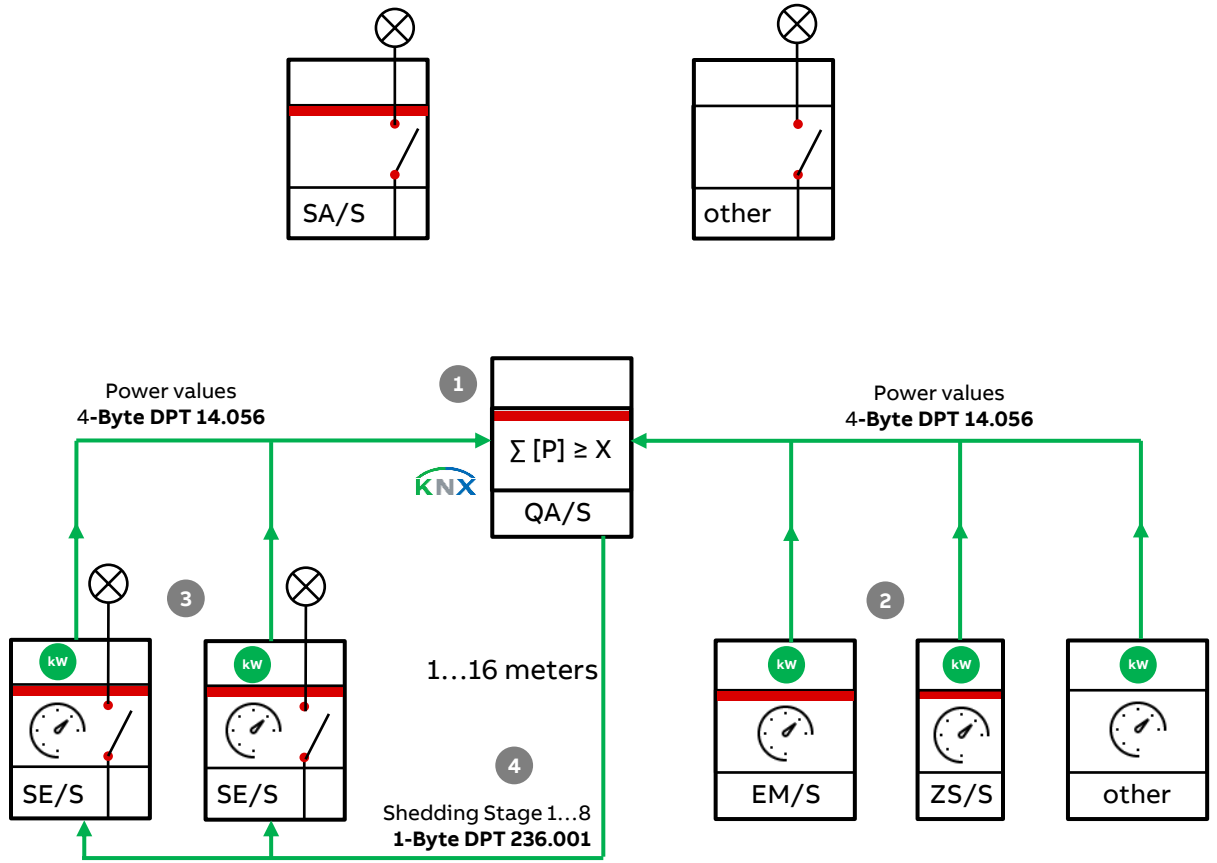


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

Load control

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Devices 6 (e.g. switch actuators) without the “*Receive shedding stages”* group object can still be integrated in load control using the 1-bit group objects “*Send load shedding stage 1…8”* 5

The master increases the shedding stage until "Send sum power values" falls back below the load limit

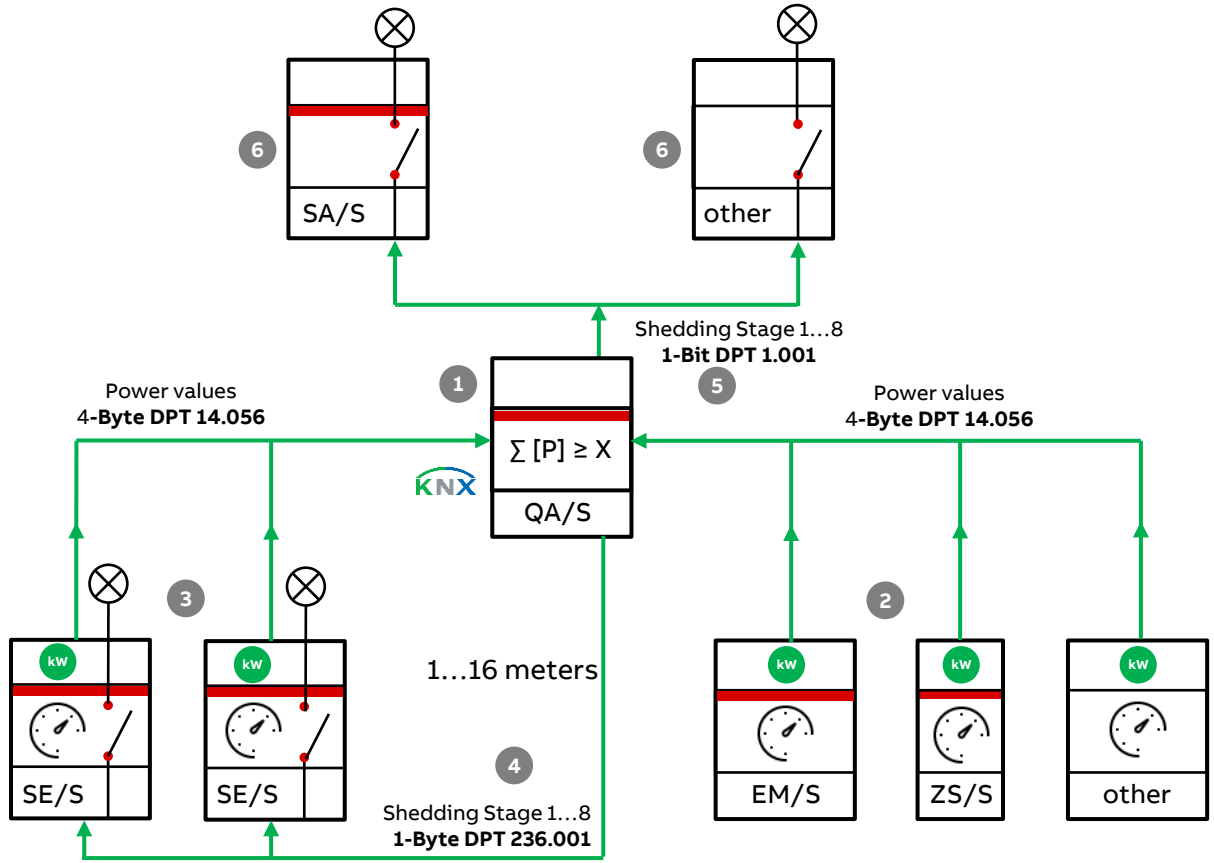


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

How load control works

The number of shedding stages that load control (the master) can send is defined based on the number of priority stages to be switched on the meters (slaves)

For instance, if a system has only two priority stages (where priority 1 is always on and priority 2 can be switched off as necessary), one load shedding stage is enough

In the master, you can set a load limit that must not be exceeded

Alternatively there is a load limit that can be changed via KNX

As a rule, the power values received from the slaves should be sent with a change

When the master then receives a new power value, the sum of the values is recalculated and if applicable, a shedding stage sent to KNX

The cyclic monitoring time can be enabled

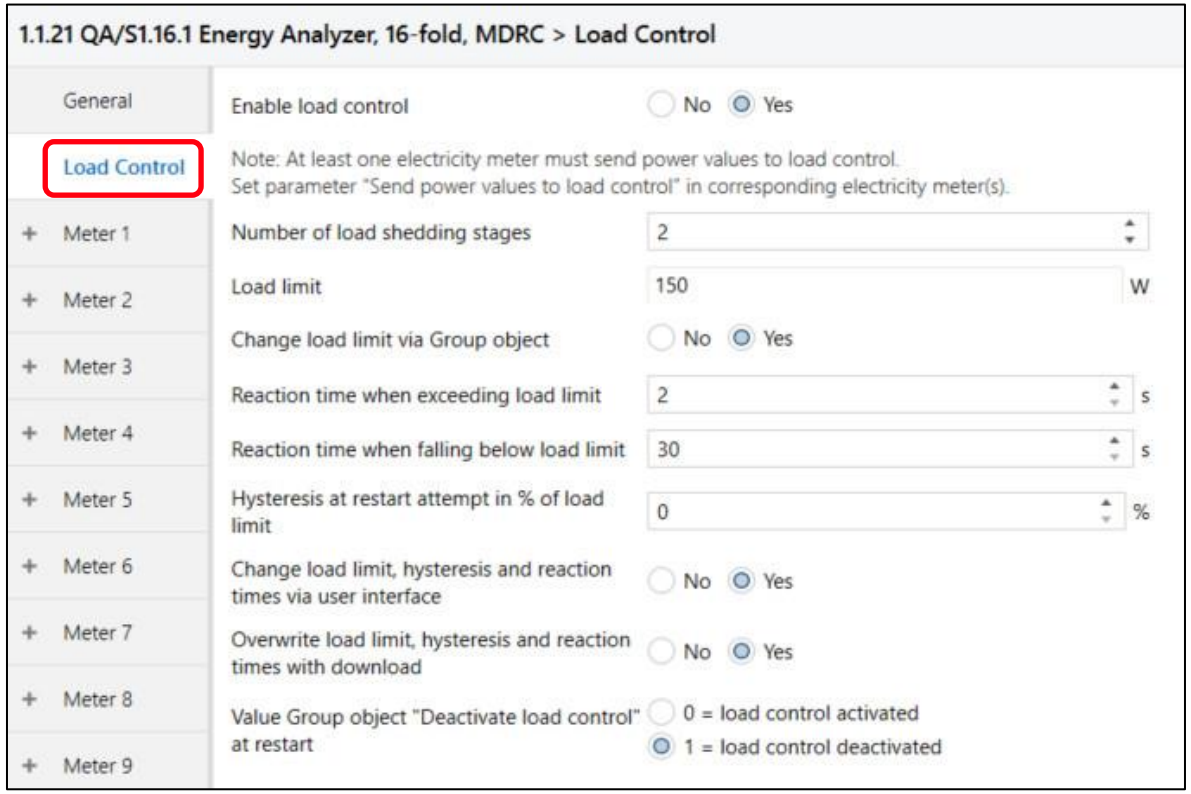


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

How load control works

Set the over/underlimit reaction times according to how quickly you wish the system to react

If the load limit is exceeded, shedding stage 1 is sent to KNX after the overlimit reaction time

If the load then exceeds the limit again, the next shedding stage up is sent after the reaction time, and so on, until the load falls back below the limit

Once the reaction time has run after the load falls below the limit, the master reduces the shedding stage (attempted restart)

Take account of relay lifetime when setting reaction times

Set up the system so that load control is only active at peak times, or set long enough over/underlimit reaction times to prevent excessive switching

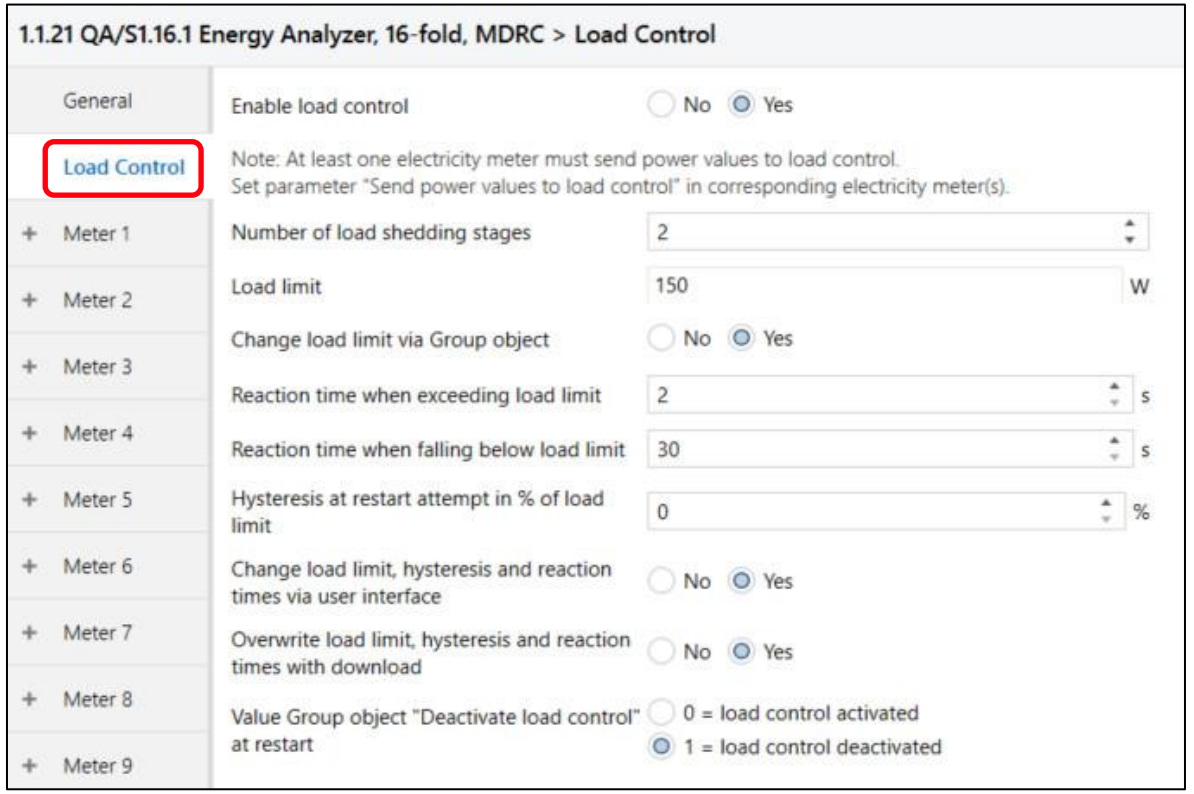


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

How load control works – QA/S Meter settings

The meters must be set which power values should be sent internally to the load control and taken into account in the calculation

For example:

- Meter Interface ZS/S1.1: 4-wire meter (B23-112-100):
  - No, Sum of all phases, Phase 1, Phase 2, Phase 3; Phase 1&2, Phase 1&3 and Phase 2&3
- Meter Interface ZS/S1.1 : 2-wire meter (B21-113-100)
  - Yes or No
- Energy Actuator SE/S3.16.1:
  - No, Total, Channel A, Channel B, Channel C; Channel A&B, Channel A&C and Channel B&C
- Energy Module EM/S3.16.1:
  - No, Total, Channel A, Channel B, Channel C; Channel A&B, Channel A&C and Channel B&C

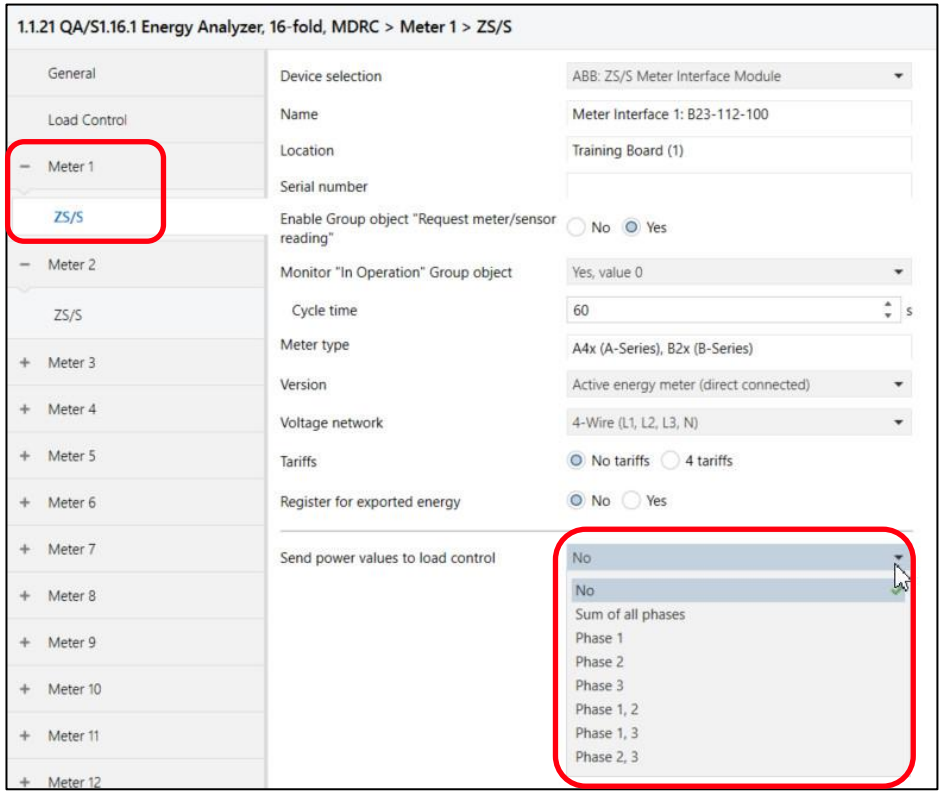


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

How load control works – Settings Energy Actuator

The following parameters must be set in the Energy Actuator SE/S for each output

- Load shedding stage: Options: 1…8
  (at which shedding stage the output is switched off)
- Shedding stage can be changed via object: No or Yes
- Slave is controlled via “external object” (send by QA/S)
- Behaviour at recovery of bus voltage

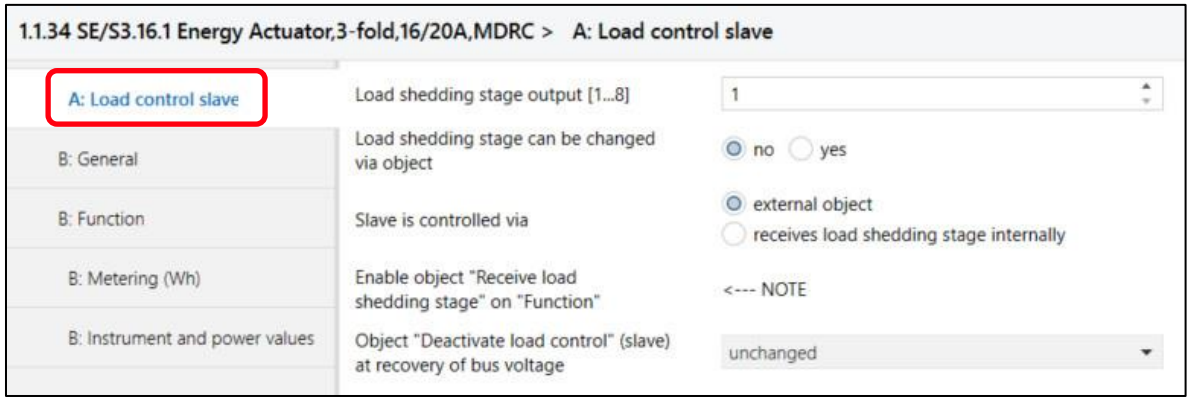


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX) – Assignment of group addresses: Power values

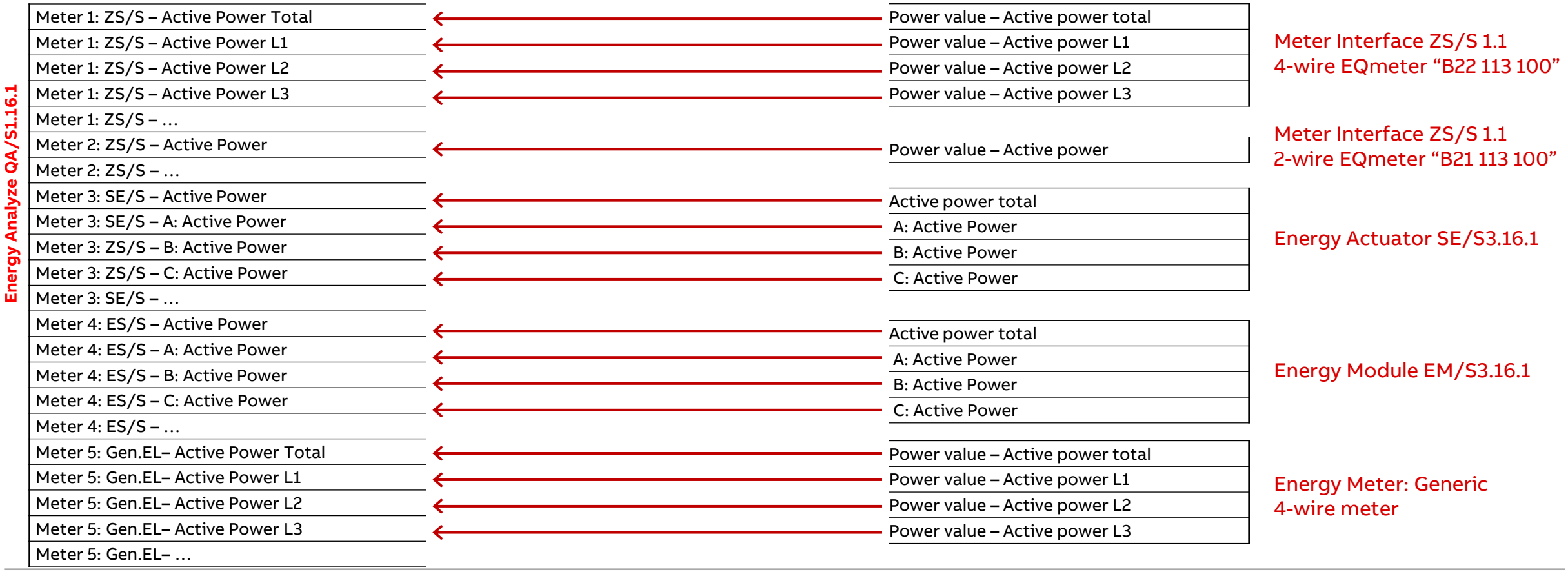
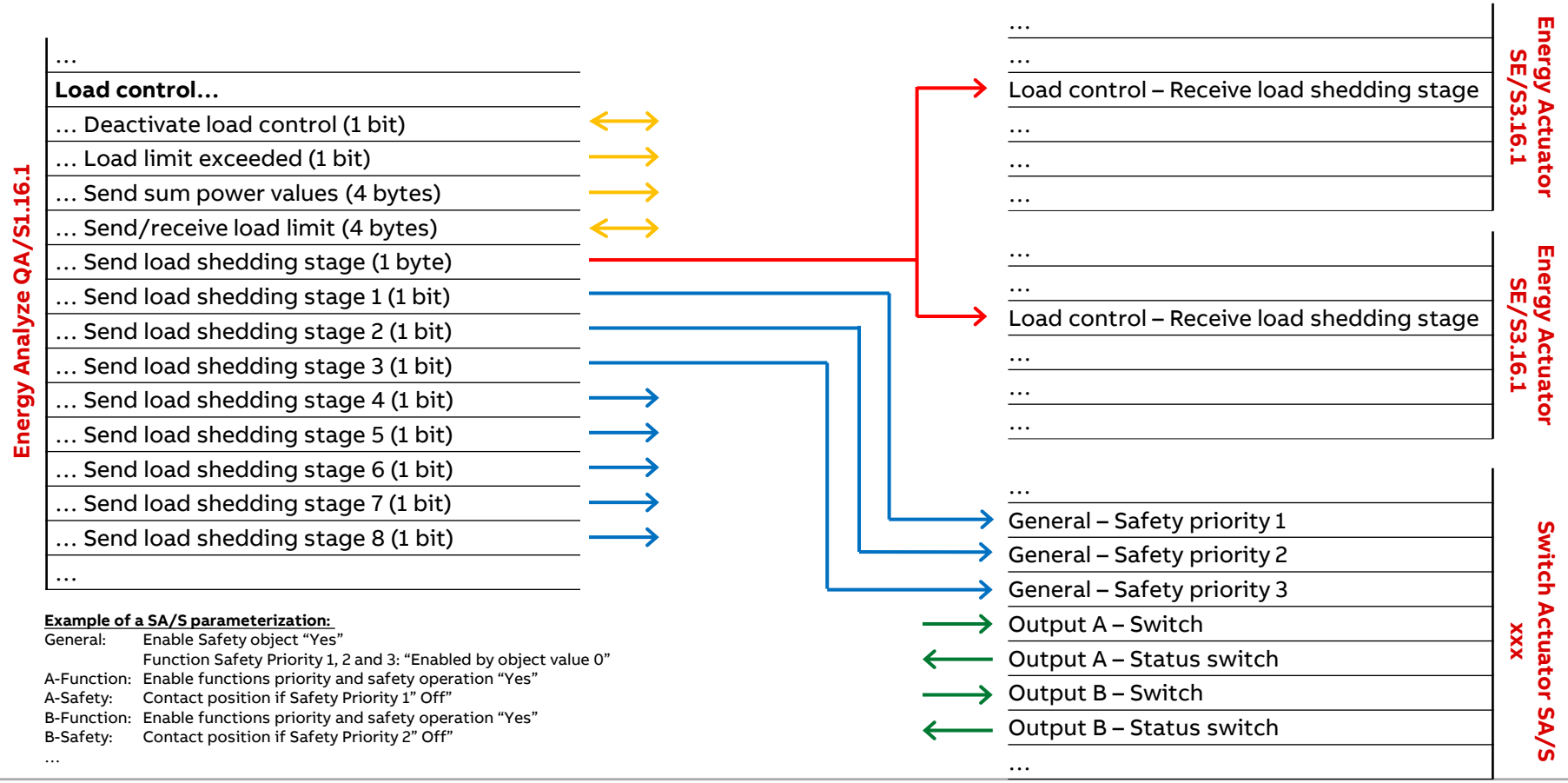


ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX) – Assignment of group addresses



Example of a SA/S parameterization:

General:	Enable Safety object “Yes”
	Function Safety Priority 1, 2 and 3: “Enabled by object value 0”
A-Function:	Enable functions priority and safety operation “Yes”
A-Safety:	Contact position if Safety Priority 1” Off”
B-Function:	Enable functions priority and safety operation “Yes”
B-Safety:	Contact position if Safety Priority 2” Off”

…

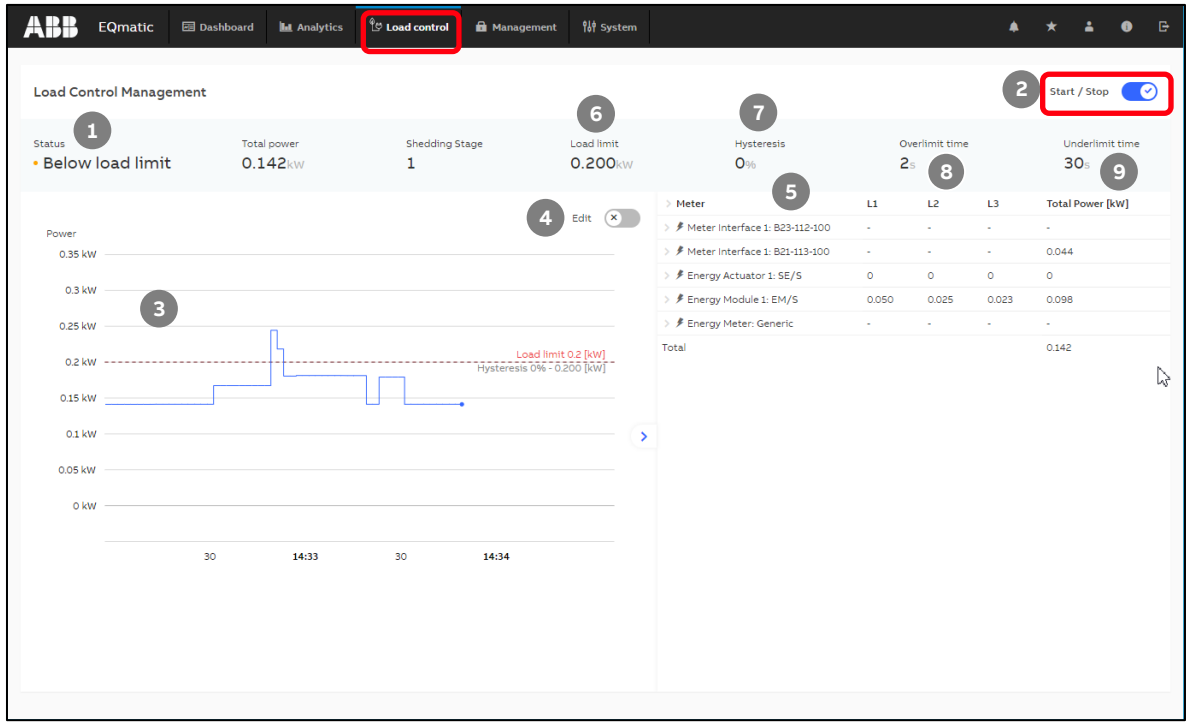
ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

Load control

1	Load control status overview	Displays the load control status options and present measured values or settings
		• Status
		  • Disabled: Load control is not enabled via ETS
		  • Stopped: Load control has been stopped (via ETS or the UI)
		  • Ideal: Total power is within the load limit and no shedding stage is active
		  • Over Limit: Total power is above the load limit
		  • Under Limit: Total power is within the load limit and at least one shedding stage is active
		  • Between: Total power is above the load limit minus the hysteresis and at least one shedding stage is active
		• Total power: Displays the total power (in kW) of the meters/slaves sending their values to load control
		• Shedding Stage: Displays the present shedding stage (0–8)

2	Start/Stop	Slider for activating load control
3	Chart of current power	Blue line: current power Red line: load limit Broken gray line: hysteresis
4	Edit	The values for *Load limit*, *Hysteresis* and *Overlimit/Underlimit time* can be changed with the *Edit* function. The load limit and hysteresis in the chart can be changed using drag & drop.
5	Meter/slave overview	The meters listed here are sending their power values for inclusion in the total power calculation and are taken into account in load control. Click the “>” icon to show or hide the table.
…		



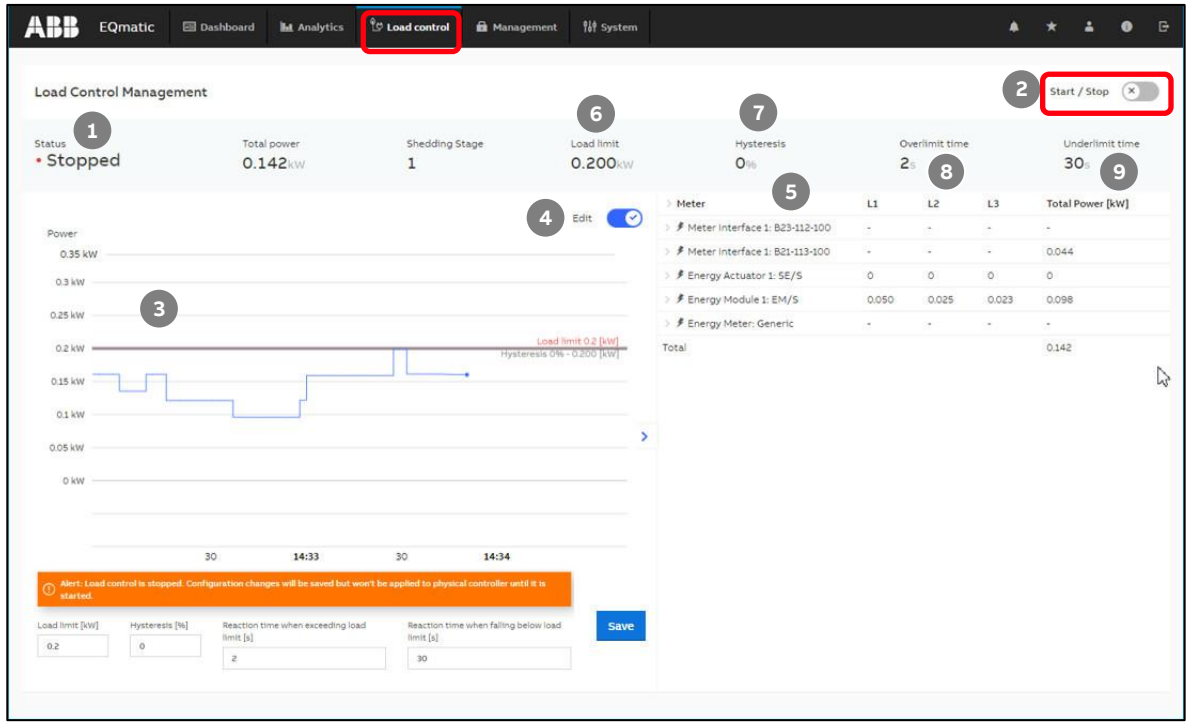
Load control is enabled

ABB EQmatic Energy Analyzer QA/S x.yy.1

Menu “Load control” (only for QA/S 1.16.1 KNX)

Load control

...		
6	Load limit	Enter the desired load limit here
7	Hysteresis	If the system is often overloaded during operation, the hysteresis can prevent a shedding stage from repeatedly switching on and off. The hysteresis is subtracted from the load limit. The shedding stage is not reduced again until the system falls below the load limit minus the hysteresis.
8	Overlimit time	If the sum of the power values exceeds the set load limit, load control sends shedding stages to the bus based on the time set here. The shedding stage increases until the power falls below the load limit. The reaction time restarts before each stage increase.
9	Underlimit time	If the power falls back below the limit (i.e. if enough slaves were switched off), the master waits for the length of time set here and then starts reducing the shedding stages in reverse order until it reaches stage 0 (i.e. all slaves are enabled) or the load limit is exceeded again.
	Save	Saves the settings after you edit the following parameters: • Load limit • Hysteresis • Overlimit time • Underlimit time



Edit mode (load control is disabled)

Commissioning

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Commissioning

To display and process the QA/S values of KNX meters, both the QA/S and the KNX meters must first be configured and parametrized in ETS

- Add the QA/S and KNX meters to the project
- Set the parameters of the QA/S and KNX meters, e.g.
  - Date and time source (KNX, User Interface or time server)
  - Meter settings: Meter Interface Module ZS/S, Energy Actuator SE/S, Energy Module EM/S, Electricity (generic), Gas (generic), Water (generic), Heat (generic)
  - Load control
- Assign group addresses
- Download individual address and application programs

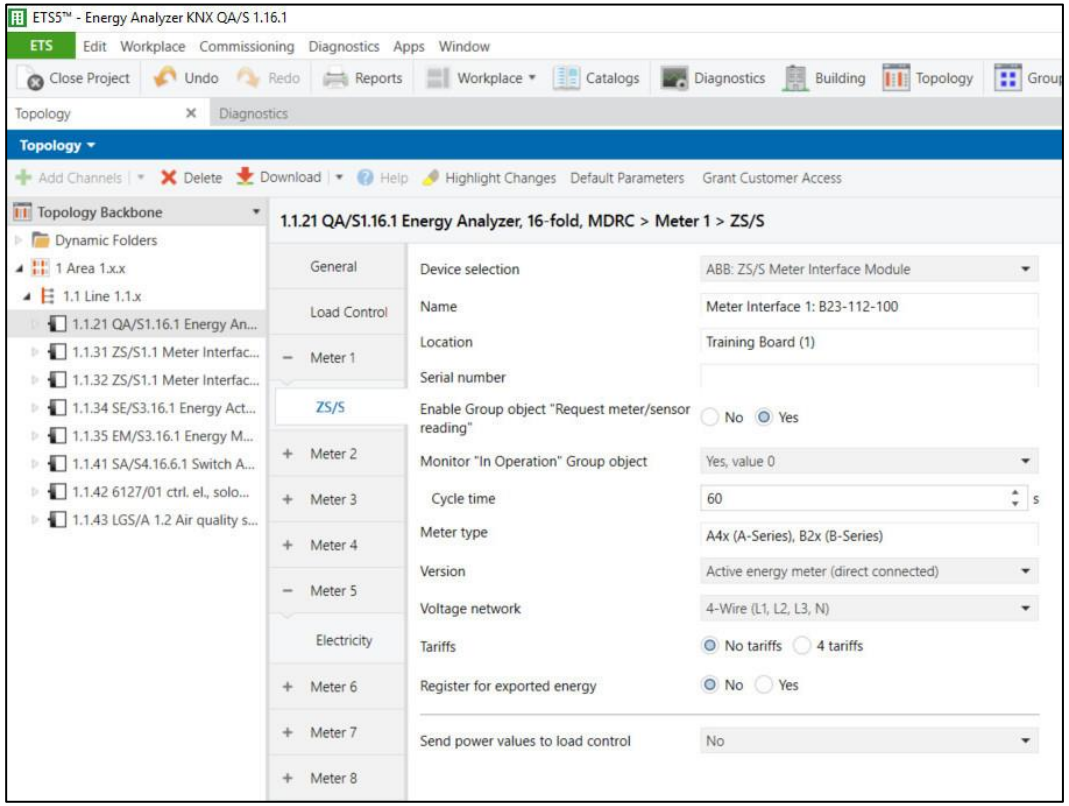


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: General

1	Device name In this field, you can enter a unique name for the device. It is used for identification purposes, for example, if there are several identical energy analyzers in a single installation. The name entered here appears in the i-bus® Tool and UI under System Information
2	Send delay after bus voltage recovery • 2…255 s
3	Enable group object "In operation“ • No • Yes – send with value 0 or 1 This parameter enables the In operation group object. This group object signals the presence of the device on KNX and can be monitored by an external device.
4	Cycle time • 1 … 65535 s This parameter determines the interval at which the In operation group object sends a telegram.

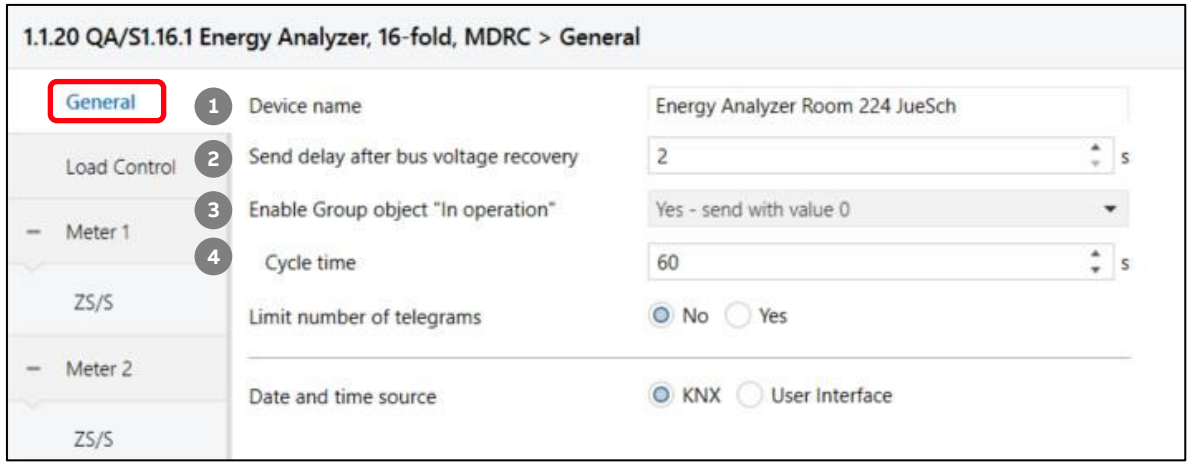


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: General

5	Limit number of telegrams • No • Yes and max. number of sent telegrams This parameter determines whether the number of telegrams the device sends to the bus is limited (telegram rate limitation
6	Date and time source • KNX • User Interface This parameter determines how the device's system time is received . • KNX: The system time is received via a clock in the KNX installation. • User Interface: The system time has to be set via the UI in System > Date and Time

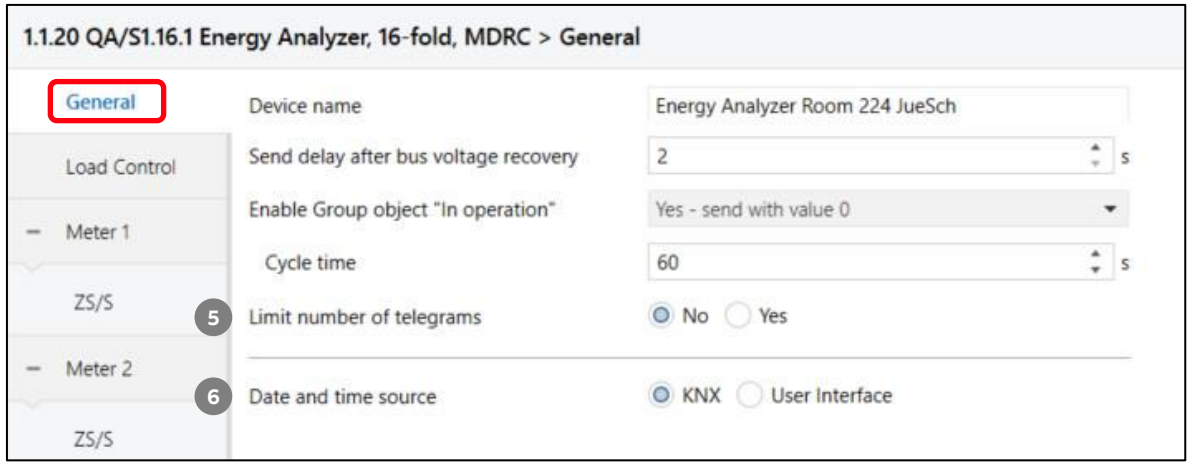


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Load control

1	Enable load control This parameter enables the Load Control function. Enabling the function shows the parameters and associated group objects. • No: The Load Control function is not enabled. • Yes: The Load Control function is enabled in ETS and in the UI
2	Number of load shedding stages • 1…2…8 This parameter determines how many load shedding stages are used. Each slave assigned to load control is assigned, according to priority, to a shedding stage. If the load limit is exceeded, load control sends shedding stages to the bus. Starting with stage 1, the shedding stage is increased until the load is back within the limit. If the load drops below the limit, the shedding stage is reduced again.
3	Load limit • 1….200000.000 W This parameter defines the load limit for the overall system
4	Change load limit via Group object This parameter enables the Send/receive load limit group object, which changes the load limit parametrized in ETS. • No: The load limit can only be changed in ETS. • Yes: The Send/receive load limit group object is enabled.

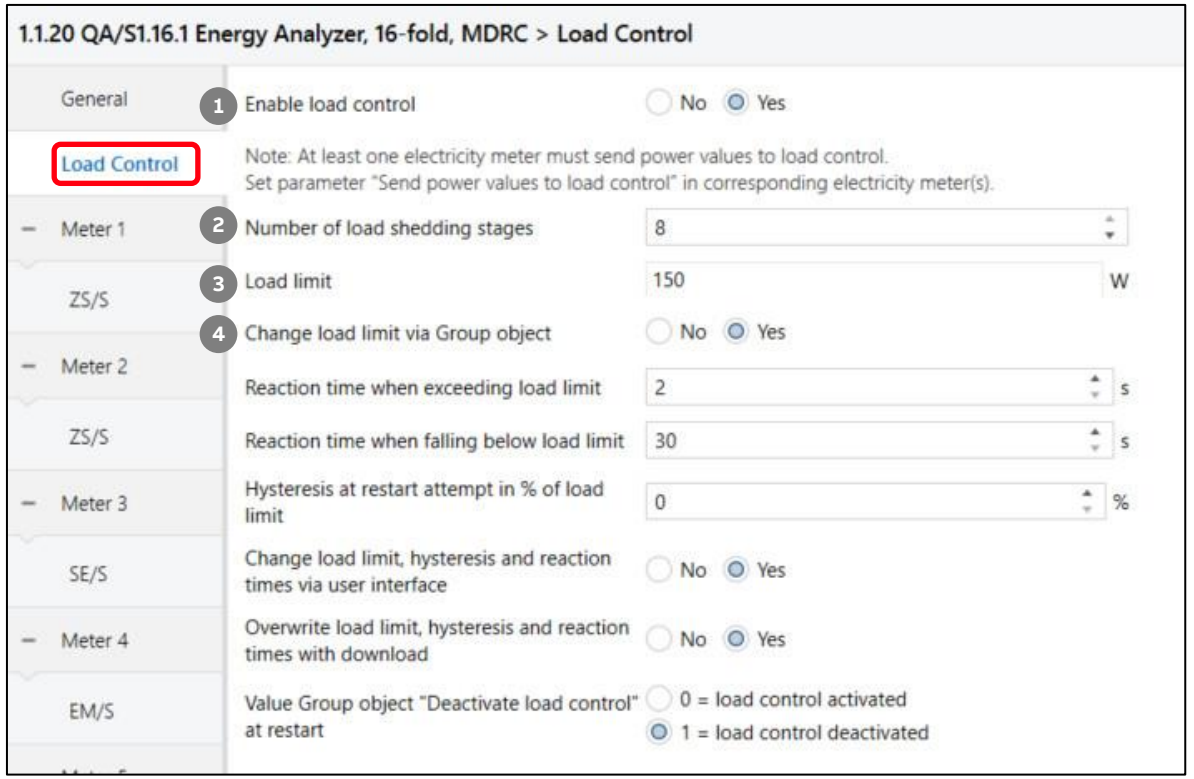


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Load control

5	Reaction time when exceeding load limit • Options: 2…60 s This parameter determines at what point load control starts sending load shedding stages if the load limit is exceeded. If the sum of the power values exceeds the set load limit, load control sends shedding stages to the bus based on the time set here. The shedding stage increases until the power falls below the load limit. The reaction time restarts before each stage increase
6	Reaction time when falling below load limit • 30…65535 s This parameter determines at what point load control starts reducing the shedding stages if the power falls below the load limit. If the power falls back below the limit (i.e. if enough slaves were switched off), load control waits for the length of time set here and then starts reducing the shedding stages in reverse order until it reaches stage 0 (i.e. all slaves are enabled) or the load limit is exceeded again.
7	Hysteresis at restart attempt in % of load limit • Options: 0…100 % This parameter determines the hysteresis for an attempted restart. If the system is often overloaded during operation, the hysteresis can prevent a shedding stage from repeatedly switching on and off. The hysteresis is subtracted from the load limit. The shedding stage is not reduced again until the system falls below the load limit minus the hysteresis

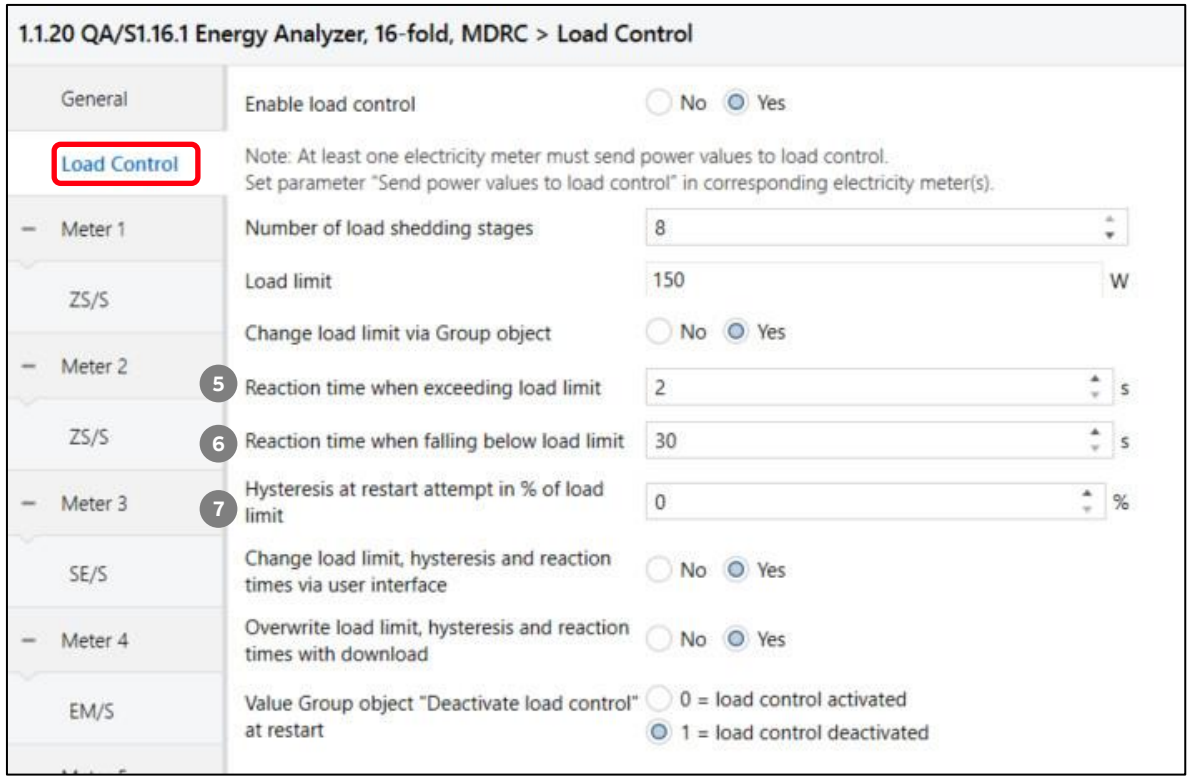


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Load control

8	Change load limit, hysteresis and reaction times via user interface • No • Yes This parameter determines whether the load limit, hysteresis and reaction times can be changed via the UI
9	Overwrite load limit, hysteresis and reaction times with download • No • Yes This parameter determines whether the values entered in the UI for load limit, hysteresis and reaction times are applied in ETS when there is a download.
10	Value Group object "Deactivate load control" at restart • 0 = Load control activated • 1 = Load control deactivated This parameter determines the value written to the "Deactivate load control" group object after a device restart.

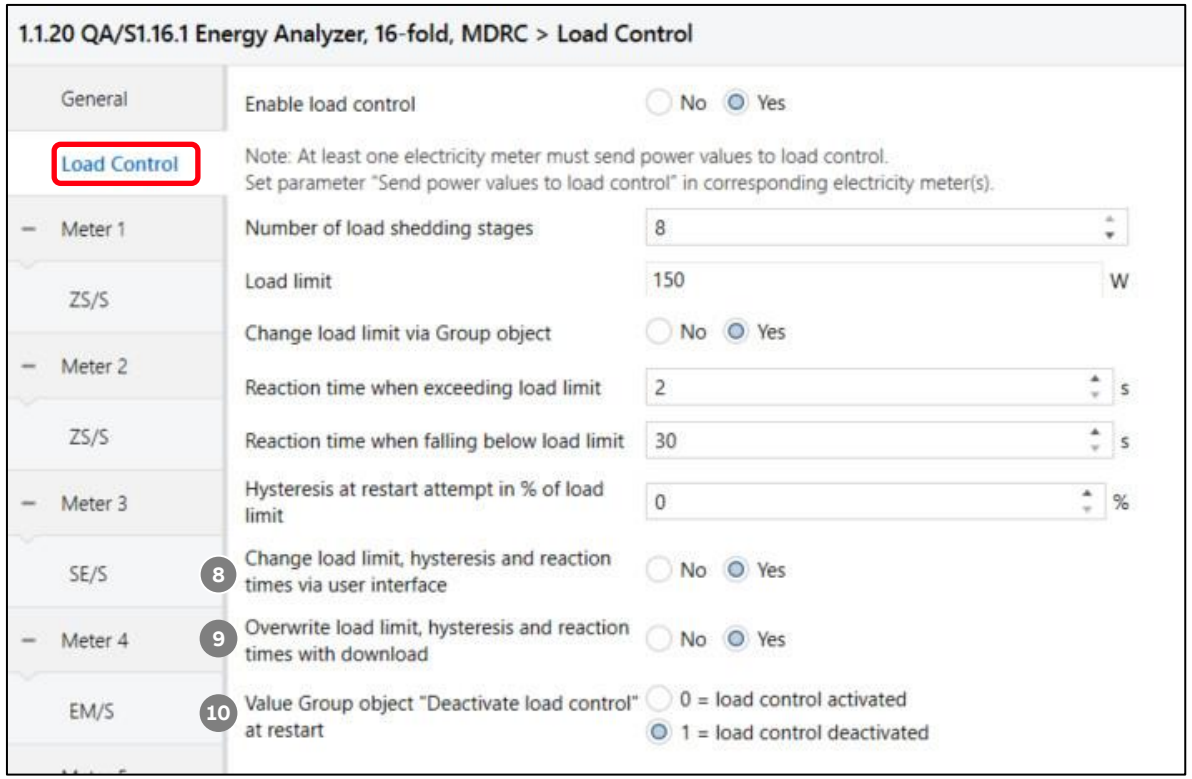


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Meter “ZS/S Meter Interface Module”

1	Device selection • None • ABB: ZS/S Meter Interface Module • ABB: SE/S Energy Actuator • ABB: EM/S Energy Module • Electricity (generic) • Gas (generic) • Water (generic) • Heat (generic) • Measurement This parameter determines which type of meter is read. It shows meter-specific parameter windows according to the option selected. These are explained in the sections that follow.
2	Name This field lets you enter a unique name for the meter interface module or the meter you wish to read. It is used for identification purposes, for example, if there are several identical meter interface modules in a single installation. The name you enter will appear in the UI in Management > Meter Management
3	Location Here you can enter the installation location for the meter interface module. It is used for location purposes, for example, if there are several identical meter interface modules in a single installation. The installation location you enter will appear in the UI in Management > Meter Management

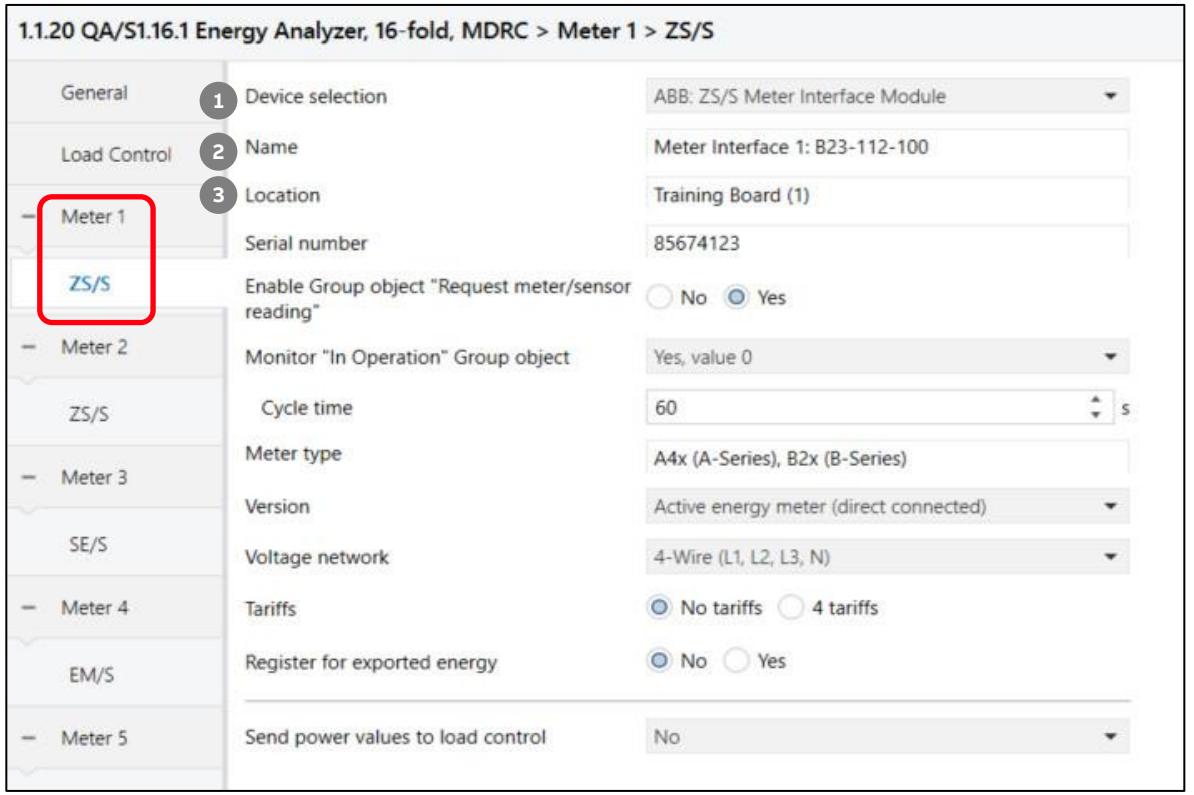


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Meter “ZS/S Meter Interface Module”

4	Serial number This field lets you enter a serial number or ID number for the meter interface module. This is another way to identify it if there are several identical meter interface modules in a single installation. The serial number you enter will appear in the UI in Management > Meter Management
5	Enable Group object "Request meter/sensor reading" This parameter determines whether meter readings are received via a separate group object. • No • Yes: Shows the Request meter reading group object, which enables active reading of the present meter readings. Readings from connected meters are requested one after the other roughly every 60 seconds.
6	Monitor "In Operation" Group object This parameter determines whether the In operation group object monitors the presence of the ZS/S on the bus. • No: No monitoring • Yes, value 0: Shows the In operation group object and the Cycle time parameter. The group object expects a value 0 telegram from the ZS/S within the cycle time. • Yes, value 1: Shows the In operation group object and the Cycle time parameter. The group object expects a value 1 telegram from the ZS/S within the cycle time. • Yes, both values: Shows the In operation group object and the Cycle time parameter. The group object expects a value 0 or 1 telegram from the ZS/S within the cycle time.

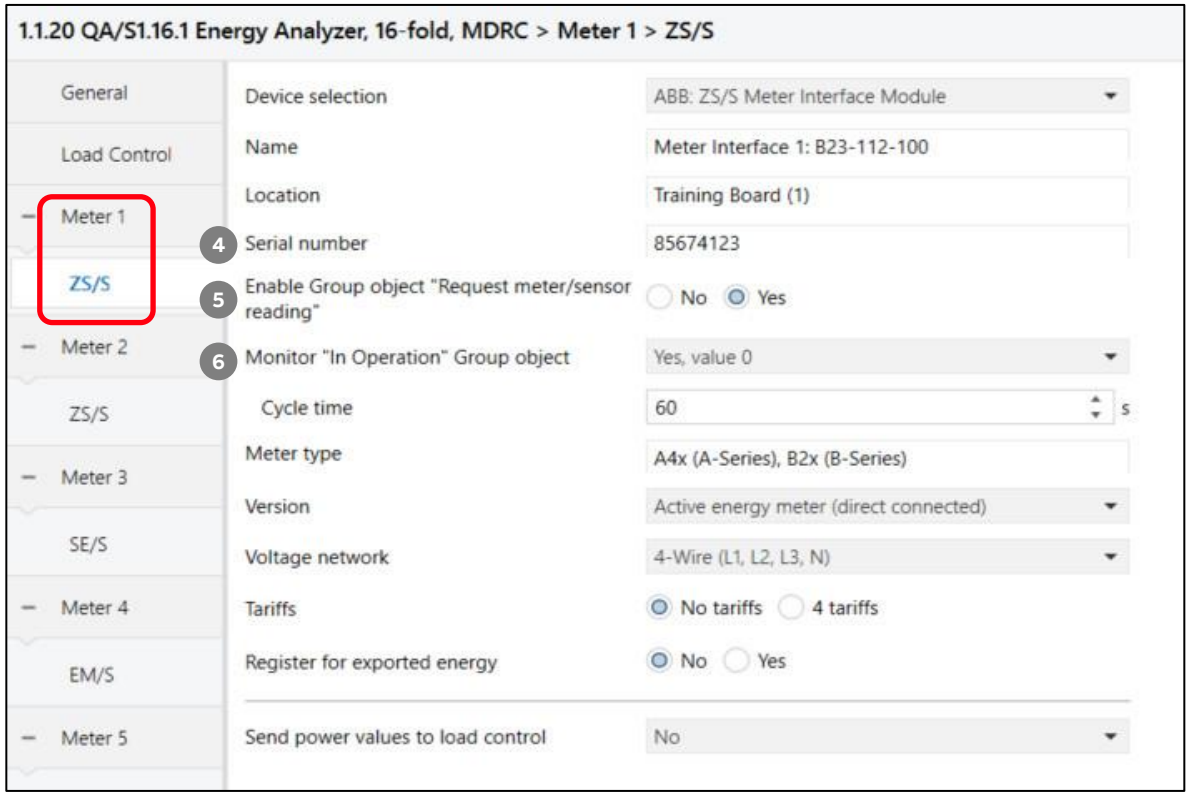


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Meter “ZS/S Meter Interface Module”

7	Meter type A4x (A-series), B2x (B-series) The Energy Analyzer QA/S can only be used in conjunction with type A4x (A-Series) and B2x (B-Series) meters. The meters must be parametrized in the ZS/S.
8	Version • Active energy meter (direct connected) • Active energy meter (transformer rated) • Combination meter (direct connected) • Combination meter (transformer rated)
9	Voltage network • 2-Wire (L, N) • 3-Wire (L1, L2, L3) • 4-Wire (L1, L2, L3, N)

Note: The parameter settings here must match those in the ZS/S.

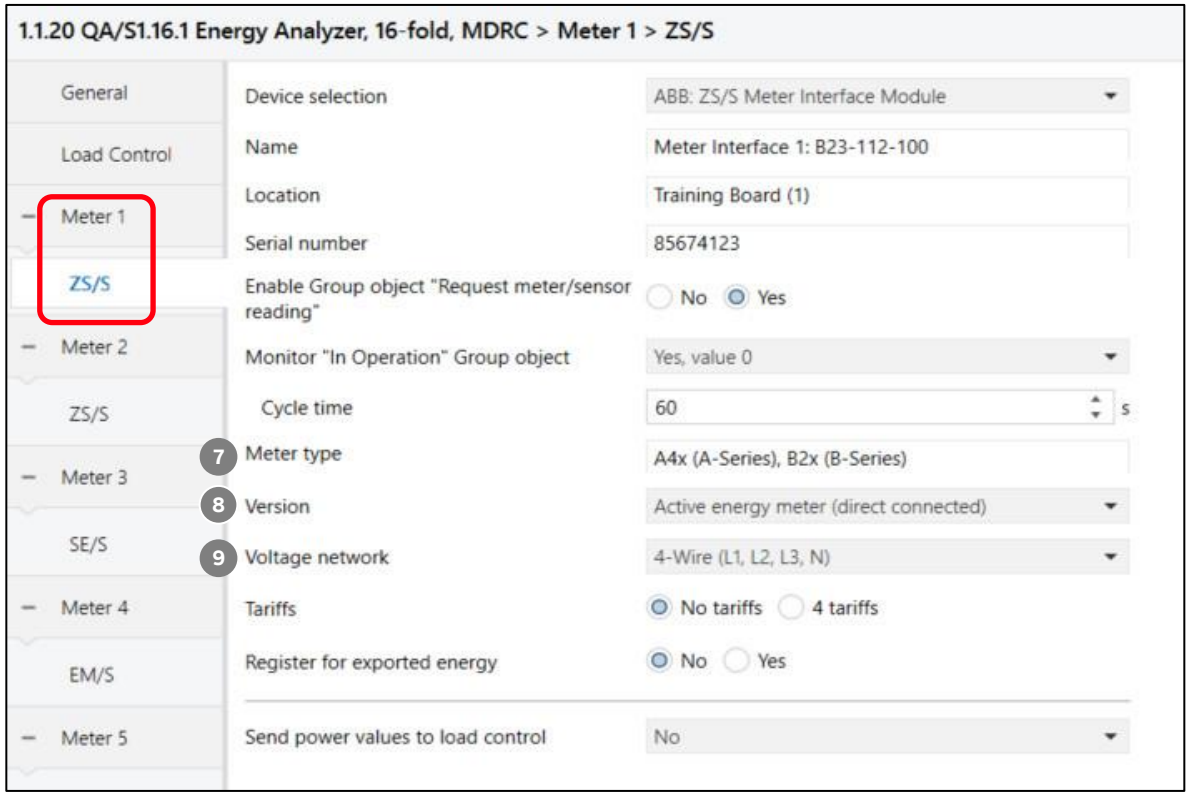


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Meter “ZS/S Meter Interface Module”

10	Tariffs • No tariffs • 4 tariffs
11	Register for exported energy • No • Yes
12	Send power values to load control This parameter determines which power value from the connected meter is sent to load control and taken into account in the calculation. • No • Sum of all phases • Phase 1 • Phase 2 • Phase 3 • Phase 1, 2 • Phase 1, 3 • Phase 2, 3

Note: The parameter settings here must match those in the ZS/S.

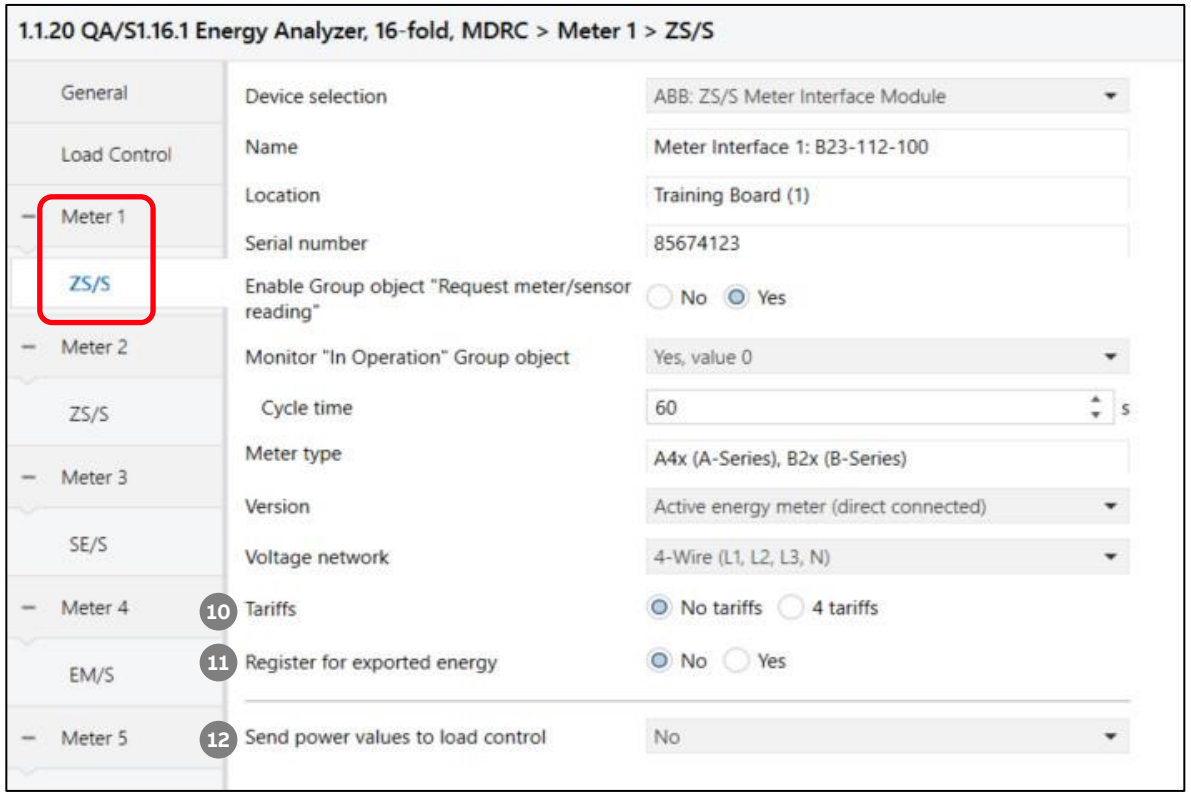
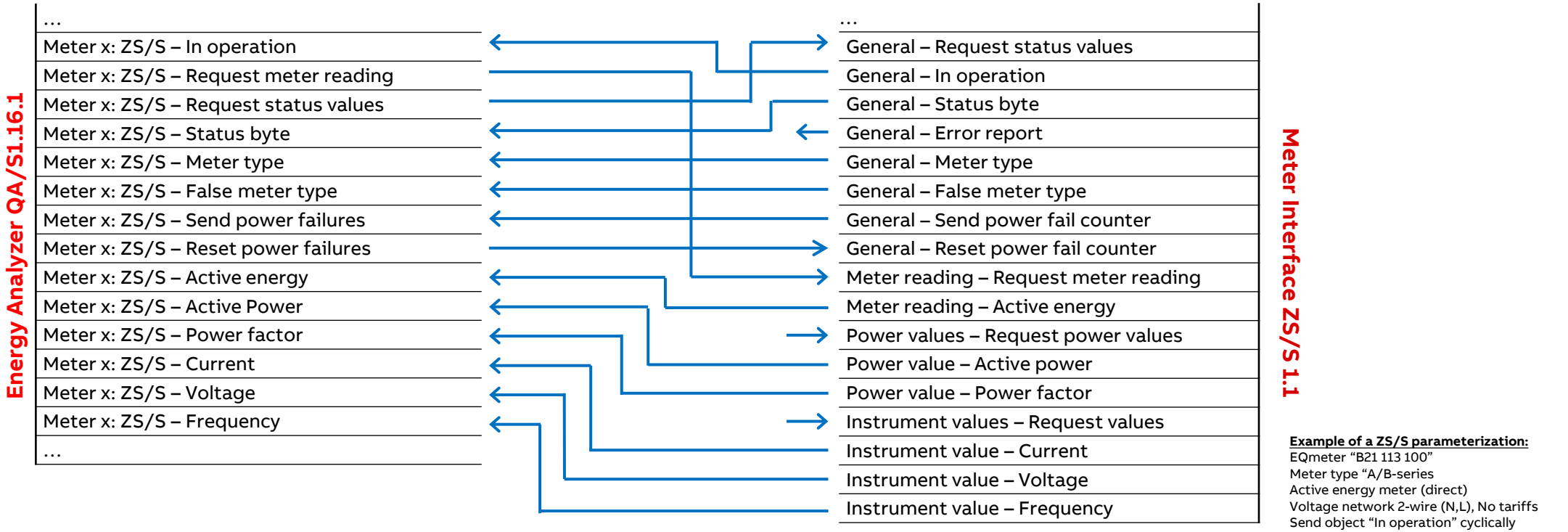


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX – Assignment of group addresses



Example of a ZS/S parameterization:
EQmeter “B21 113 100”
Meter type “A/B-series
Active energy meter (direct)
Voltage network 2-wire (N,L), No tariffs
Send object “In operation” cyclically
Send values (meter, power and instrument) on request

ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: SE/S Energy Act. – EM/S Energy Mod.

1	Name This field lets you enter a unique name for the SE/S Energy Actuator or EM/S Energy Module. It is used for identification purposes, for example, if there are several identical energy actuators or modules in a single installation. The name you enter will appear in the UI in Management > Meter Management
2	Location Here you can enter the installation location for the SE/S Energy Actuator or EM/S Energy Module. It is used for location purposes, for example, if there are several identical energy actuators or modules in a single installation. The installation location you enter will appear in the UI in Management > Meter Management
3	Serial number This field lets you enter a serial or ID number for the SE/S Energy Actuator or EM/S Energy Module. This is another way to identify it if there are several identical energy actuators or modules in a single installation. The serial number you enter will appear in the UI in Management > Meter Management
4	Enable Group object "Request meter/sensor reading" This parameter determines whether meter readings are received via a separate group object. • No • Yes: Shows the Request meter reading group object, which enables active reading of the present meter readings. Readings from connected meters are requested one after the other roughly every 60 seconds.

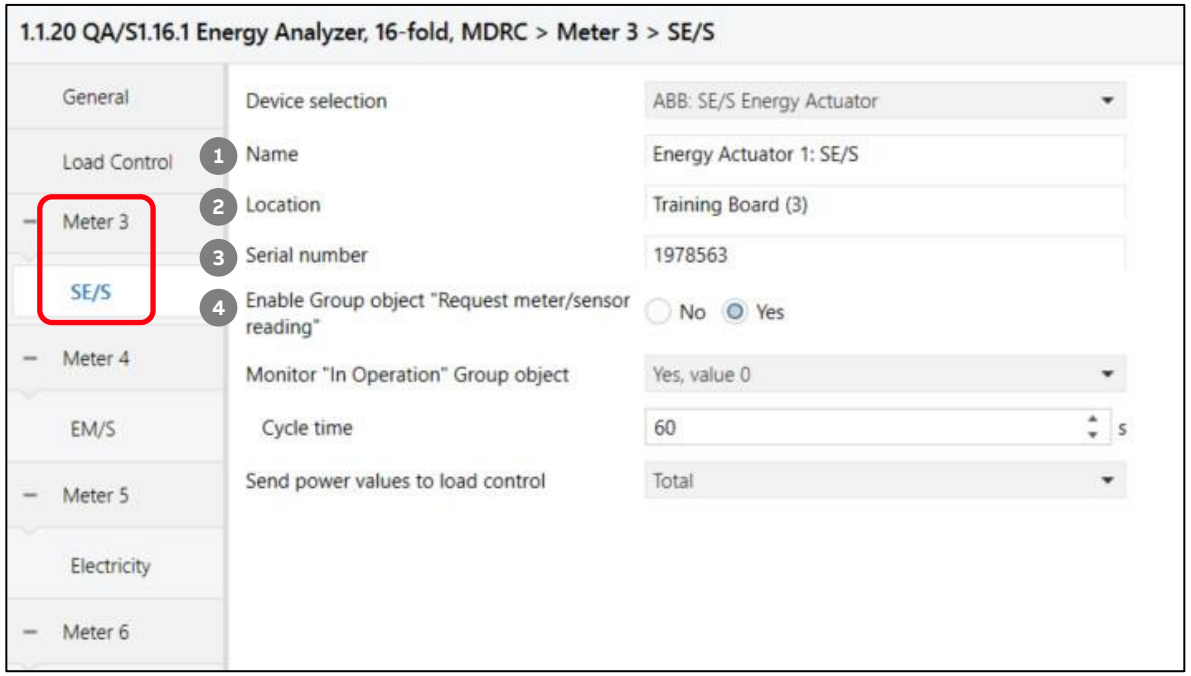


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: SE/S Energy Act. – EM/S Energy Mod.

5	Monitor "In Operation" Group object This parameter determines whether the In operation group object monitors the presence of the SE/S or EM/S on the bus. • No: No monitoring • Yes, value 0: Shows the In operation group object and the Cycle time parameter. The group object expects a value 0 telegram from the SE/S or EM/S within the cycle time. • Yes, value 1: Shows the In operation group object and the Cycle time parameter. The group object expects a value 1 telegram from the SE/S or EM/S within the cycle time. • Yes, both values: Shows the In operation group object and the Cycle time parameter. The group object expects a value 0 or 1 telegram from the SE/S or EM/S within the cycle time.
6	Send power values to load control This parameter determines which power value from the connected meter is sent to load control and taken into account in the calculation. • No: No power value is sent; the meter is not taken into account in the load control • Total: Sends the total power/sum of all channels • Channel A: Sends the channel A power value • Channel B: Sends the channel B power value • Channel C: Sends the channel C power value • Channel A, B: Sends the (sum of the) channel A and B power values • Channel A, C: Sends the (sum of the) channel A and C power values • Channel B, C: Sends the (sum of the) channel B and C power values

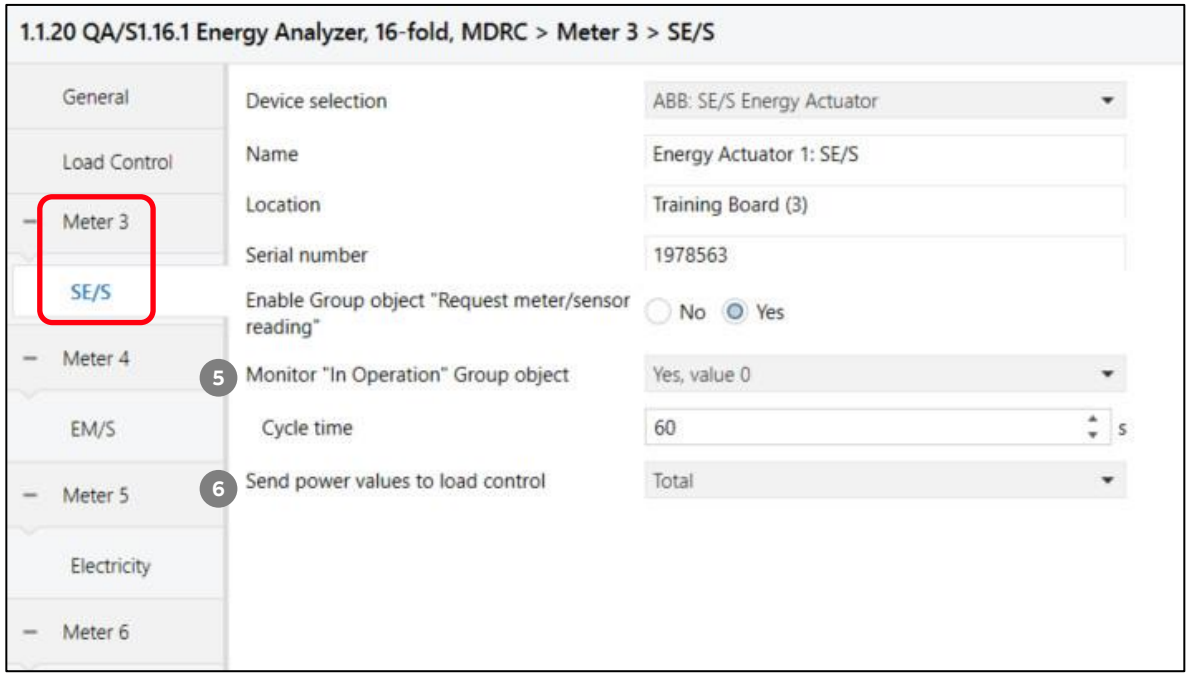


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX – Assignment of group addresses

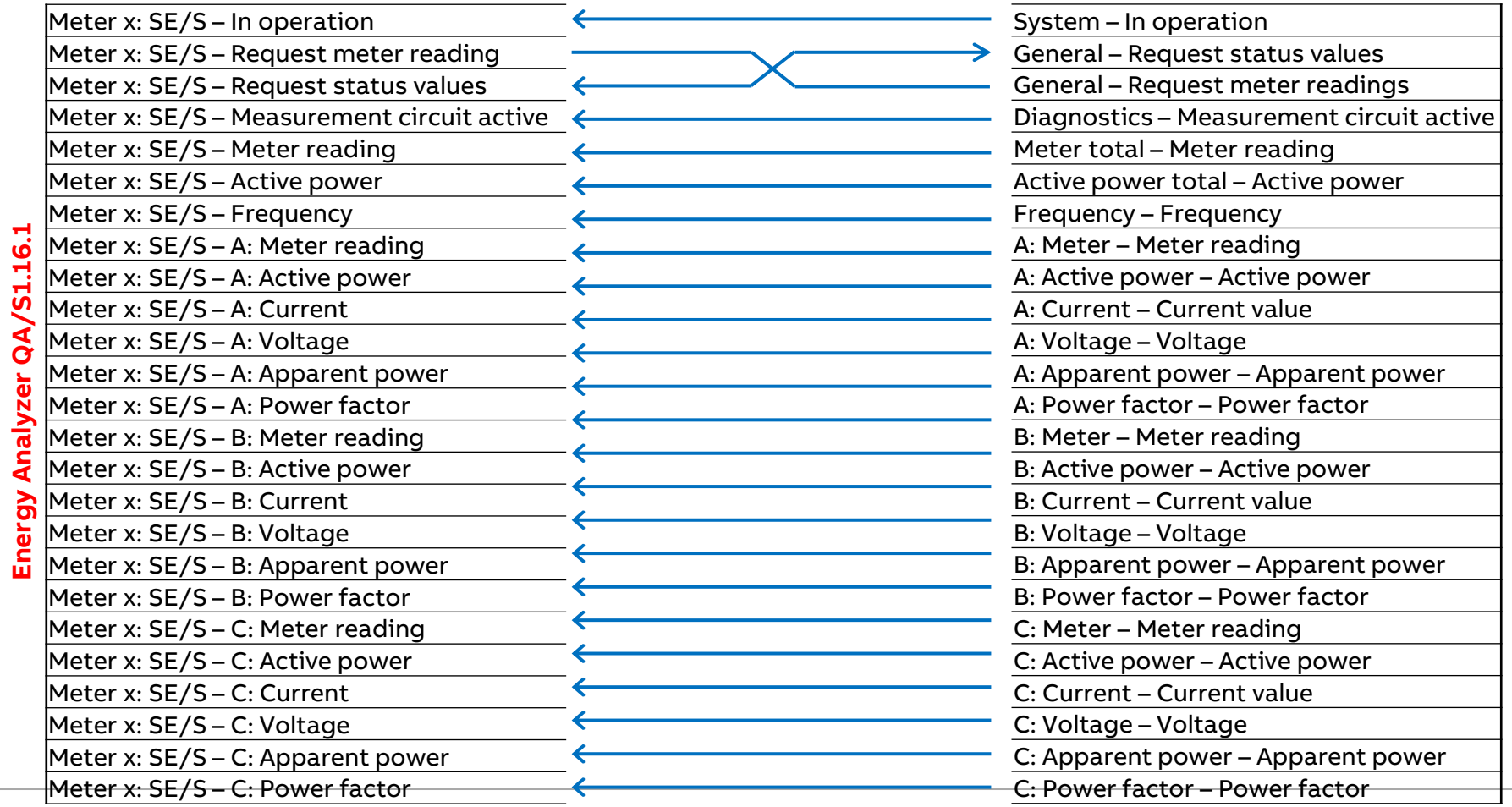


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ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Electricity (generic)

1	Name In this field, you can enter a unique name for the meter. It is used for identification purposes, for example, if there are several identical meters in a single installation. The name you enter will appear in the UI in Management > Meter Management
2	Location Here you can enter the installation location for the meter. It is used for location purposes, for example, if there are several identical meters in a single installation. The installation location you enter will appear in the UI in Management > Meter Management
3	Serial number This field lets you enter a serial number or ID number for the meter. This is another way to identify it if there are several identical meters in a single installation. The serial number you enter will appear in the UI in Management > Meter Management
4	Enable Group object "Request meter/sensor reading" This parameter determines whether meter readings are received via a separate group object. • No • Yes: Shows the Request meter reading group object, which enables active reading of the present meter readings. Readings from connected meters are requested one after the other roughly every 60 seconds.

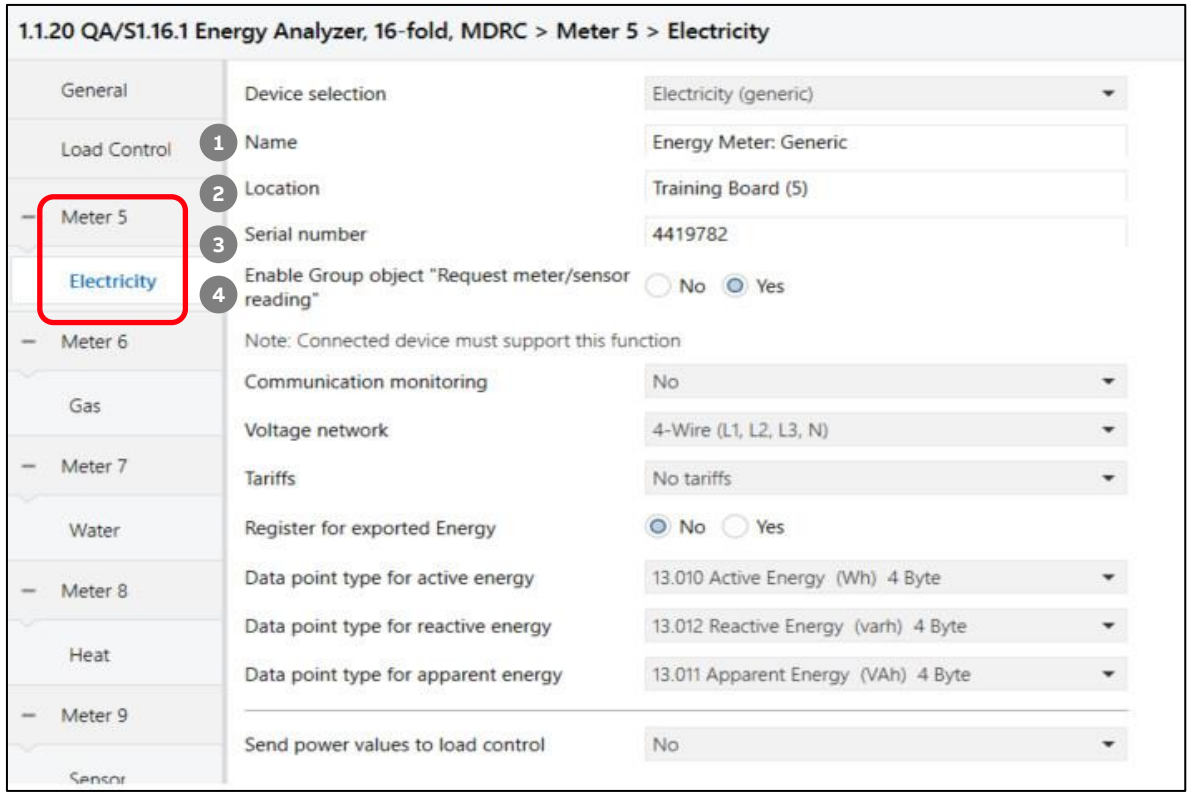


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Electricity (generic)

5	Communication monitoring This parameter determines whether the In operation group object monitors the presence of the meter on the bus. • No: No monitoring • Yes, value 0: Shows the In operation group object and the Cycle time parameter. The group object expects a value 0 telegram from the meter within the cycle time. • Yes, value 1: Shows the In operation group object and the Cycle time parameter. The group object expects a value 1 telegram from the meter within the cycle time. • Yes, both values: Shows the In operation group object and the Cycle time parameter. The group object expects a value 0 or 1 telegram from the meter within the cycle time. • General monitoring: If any telegram fails to reach an Energy Analyzer group object within the set cycle time, the meter will be flagged as "disconnected" in the meter management overview. • Therefore the meter's group object must be linked with the corresponding KNX Energy Analyzer group object.
6	Voltage network This parameter determines whether the meter has a 2-, 3- or 4-wire connection and provides a corresponding tab. To use the tab, select the relevant option. • 2-Wire (L, N): The meter is a 2-wire. The group objects for a 2-wire meter appear. • 3-Wire (L1, L2, L3): The meter is a 3-wire. The group objects for a 3-wire meter appear. • 4-Wire (L1, L2, L3, N): The meter is a 4-wire. The group objects for a 4-wire meter appear.

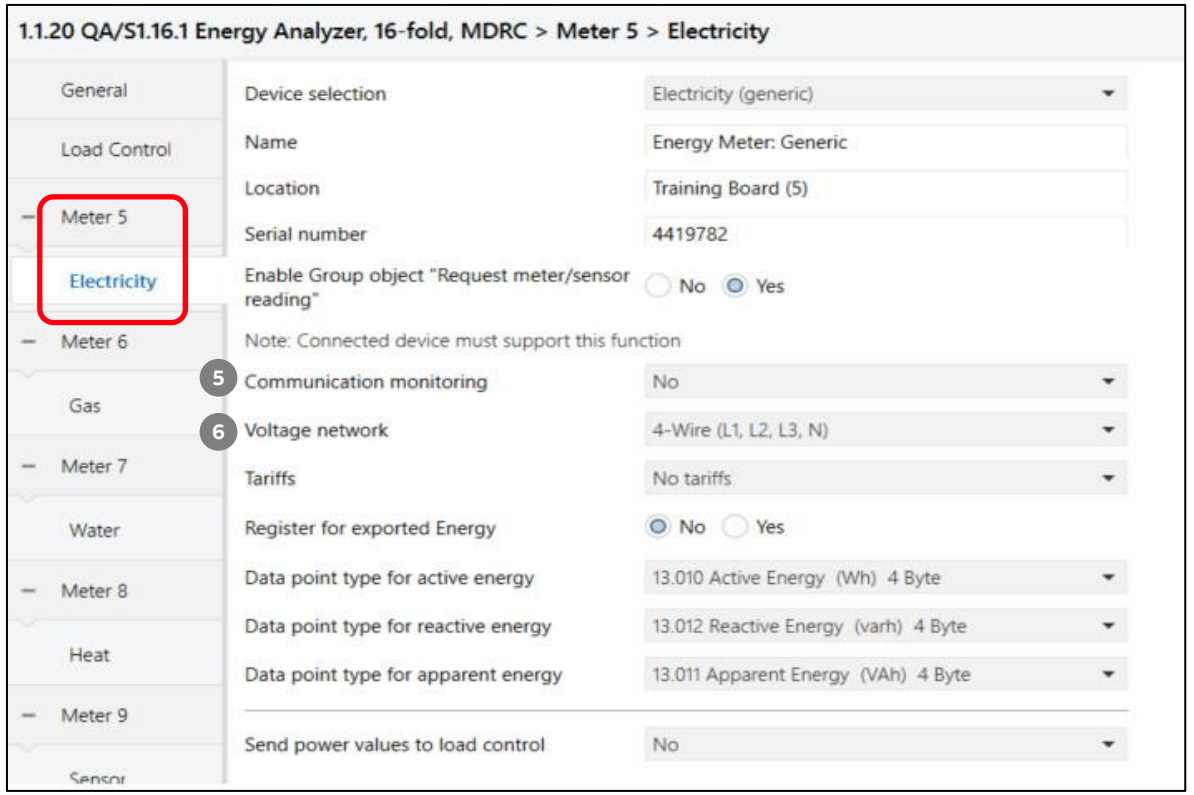


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Electricity (generic)

7	Tariffs This parameter determines whether the meter has a tariff tab. To use the tab, select the relevant option. • No tariffs: The meter has no tariffs. • 2 tariffs: The meter has 2 tariffs. The group objects for 2 tariffs appear. • 4 tariffs: The meter has 4 tariffs. The group objects for 4 tariffs appear.
8	Register for exported energy This parameter determines whether the meter has an exported energy tab. To use the tab, select Yes. • No • Yes: The group objects for exported energy appear.
9	Data point type for active energy This parameter determines the data type used to receive active energy. The corresponding group object appears when you make a selection. • 13.010 Active Energy (Wh) 4 Byte • 13.013 Active Energy (kWh) 4 Byte • 29.010 Active Energy (Wh) 8 Byte

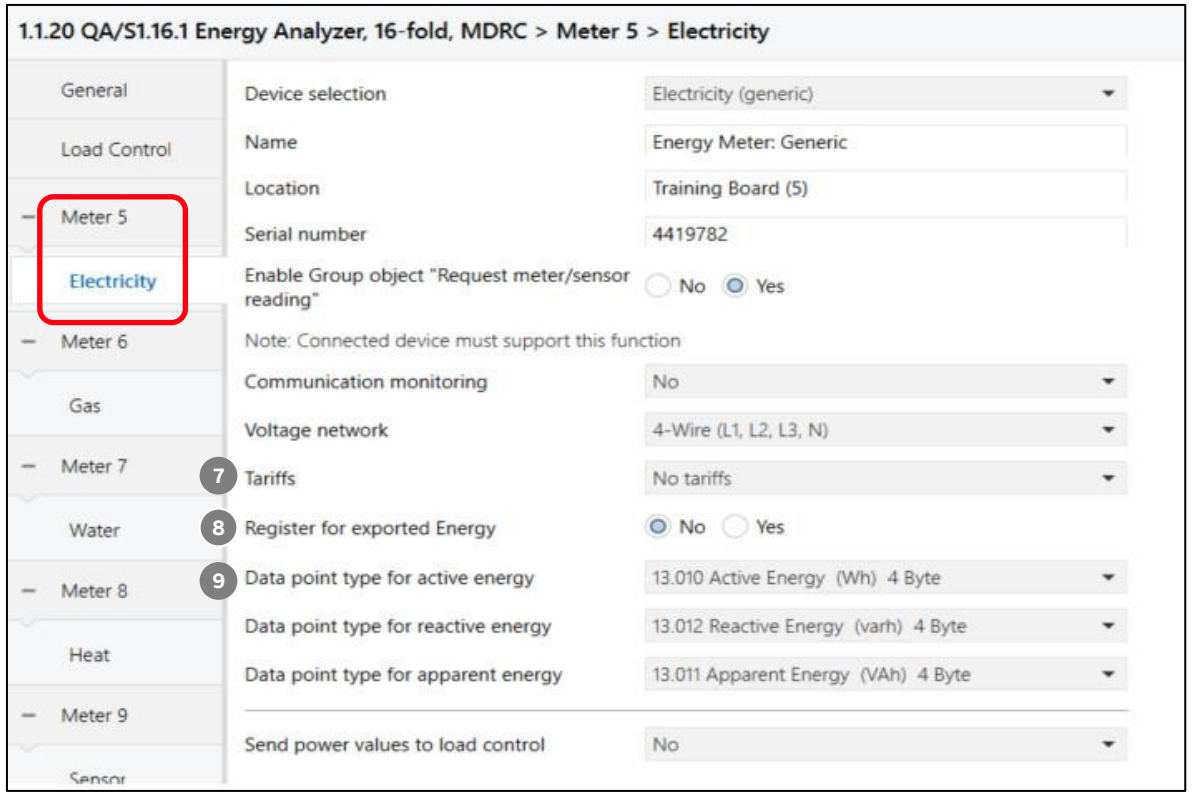


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Electricity (generic)

10	Data point type for reactive energy This parameter determines the data type used to receive reactive energy. The corresponding group object appears when you make a selection. • None • 13.012 Reactive Energy (varh) 4 Byte • 13.015 Reactive Energy (kvarh) 4 Byte • 29.012 Reactive Energy (varh) 8 Byte
11	Data point type for apparent energy This parameter determines the data type used to receive apparent energy. The corresponding group object appears when you make a selection. • None • 13.011 Apparent Energy (VAh) 4 Byte • 13.014 Apparent Energy (kVAh) 4 Byte • 29.011 Apparent Energy (VAh) 8 Byte
12	Send power values to load control This parameter determines which power value from the connected meter is sent to load control and taken into account in the calculation. • No: No power value is sent; the meter is not taken into account in the load control. • Sum of all phases: Sends the total power/sum of all phases • Phase 1: Sends the phase L1 power value • Phase 2: Sends the phase L2 power value • Phase 3: Sends the phase L3 power value • …

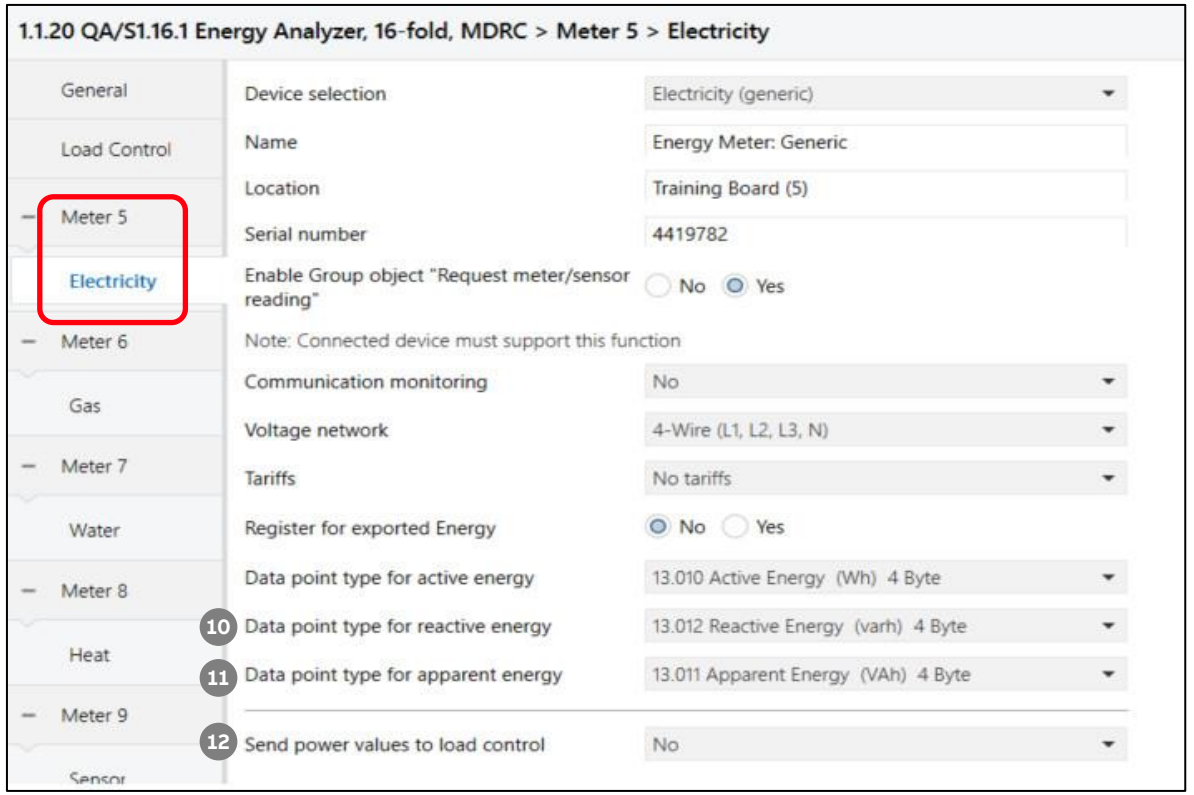


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Gas (generic)

1	Name In this field, you can enter a unique name for the meter. It is used for identification purposes, for example, if there are several identical meters in a single installation. The name you enter will appear in the UI in Management > Meter Management
2	Location Here you can enter the installation location for the meter. It is used for location purposes, for example, if there are several identical meters in a single installation. The installation location you enter will appear in the UI in Management > Meter Management
3	Serial number This field lets you enter a serial number or ID number for the meter. This is another way to identify it if there are several identical meters in a single installation. The serial number you enter will appear in the UI in Management > Meter Management
4	Enable Group object "Request meter/sensor reading" This parameter determines whether meter readings are received via a separate group object. • No • Yes: Shows the Request meter reading group object, which enables active reading of the present meter readings. Readings from connected meters are requested one after the other roughly every 60 seconds.

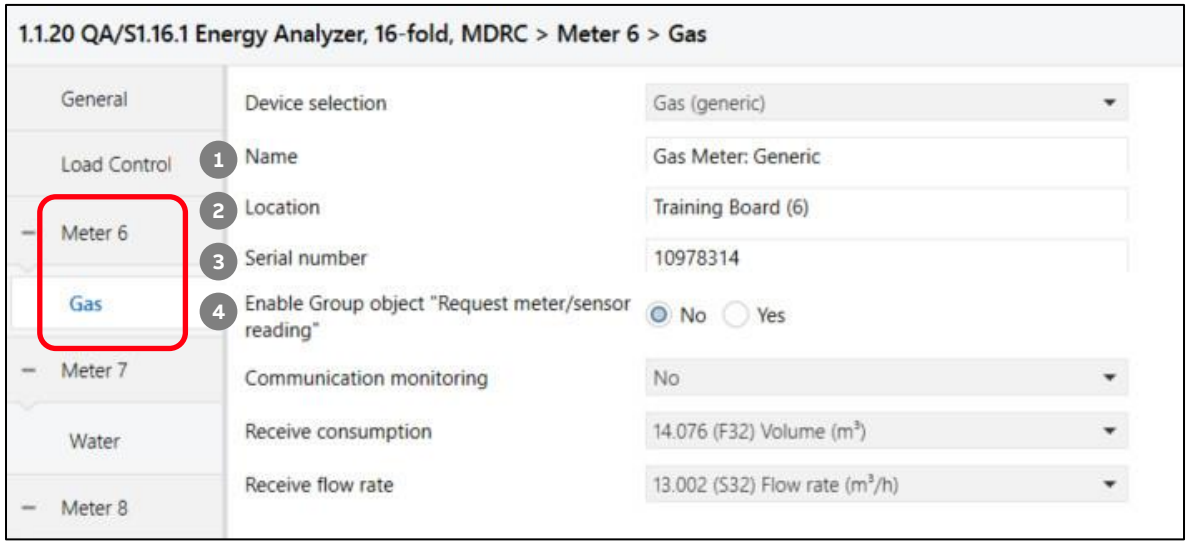


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Gas (generic)

5	Communication monitoring See parameter window “Electricity (generic)”
6	Receive consumption This parameter determines the data type used to receive gas consumption. The corresponding group object appears when you make a selection. • No • 14.076 (F32) Volume (m^3) • 12.xxx (U32) Volume (m^3) • 12.xxx (U32) Volume (l)
7	Receive flow rate This parameter determines the data type used to receive flow rate. The corresponding group object appears when you make a selection. • No • 14.077 (F32) Flow rate (m^3/s) • 12.xxx (U32) Flow rate (m^3/h) • 12.xxx (U32) Flow rate (l/h) • 13.002 (S32) Flow rate (m^3/h)

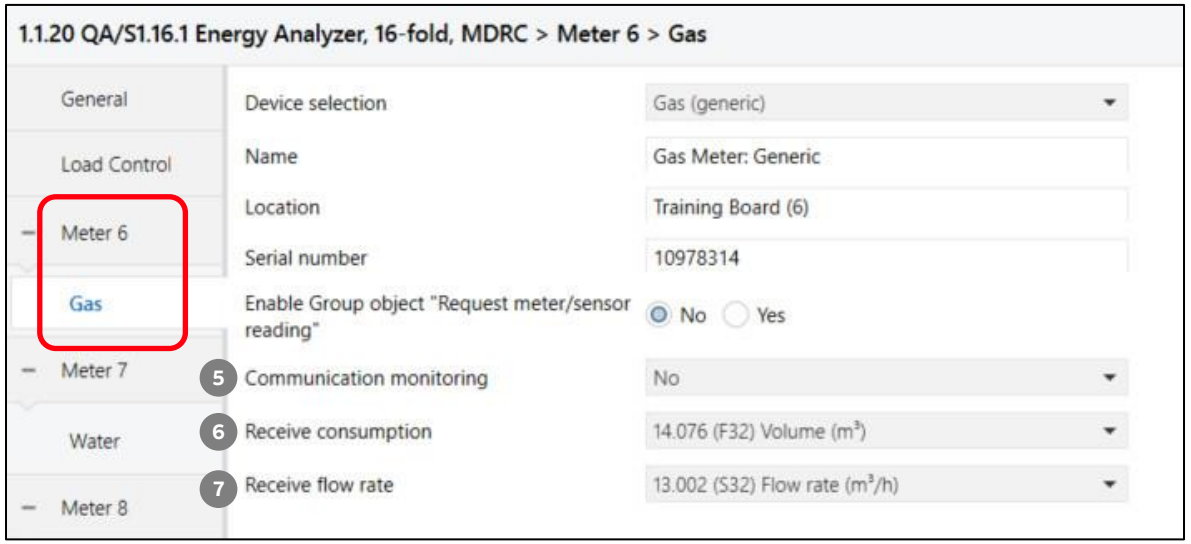


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Water (generic)

1	Name In this field, you can enter a unique name for the meter. It is used for identification purposes, for example, if there are several identical meters in a single installation. The name you enter will appear in the UI in Management > Meter Management
2	Location Here you can enter the installation location for the meter. It is used for location purposes, for example, if there are several identical meters in a single installation. The installation location you enter will appear in the UI in Management > Meter Management
3	Serial number This field lets you enter a serial number or ID number for the meter. This is another way to identify it if there are several identical meters in a single installation. The serial number you enter will appear in the UI in Management > Meter Management
4	Enable Group object "Request meter/sensor reading" This parameter determines whether meter readings are received via a separate group object. • No • Yes: Shows the Request meter reading group object, which enables active reading of the present meter readings. Readings from connected meters are requested one after the other roughly every 60 seconds.

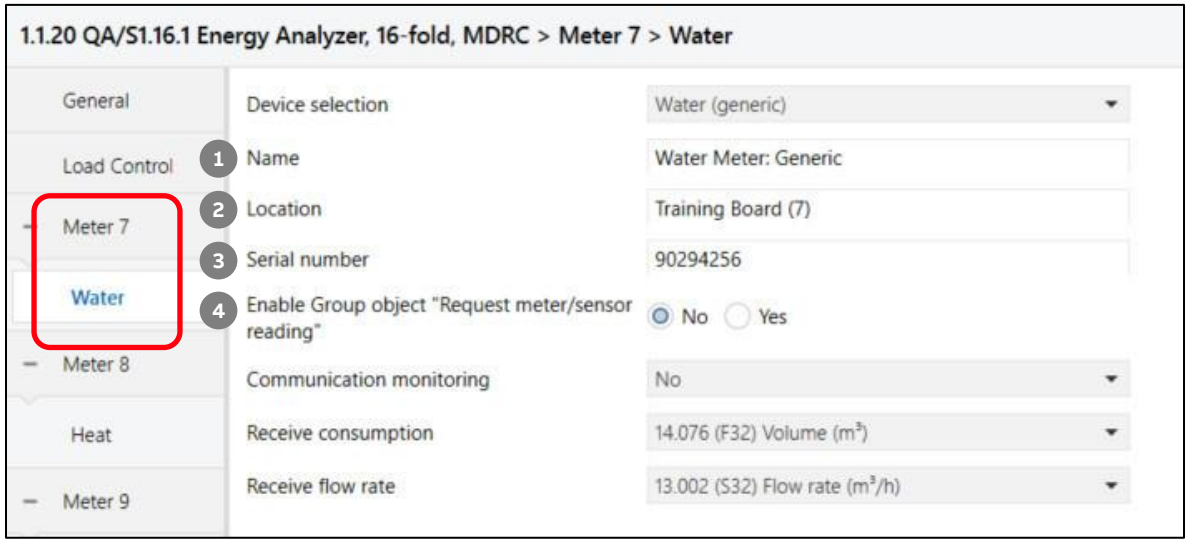


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Water (generic)

5	Communication monitoring See parameter window “Electricity (generic)”
6	Receive consumption This parameter determines the data type used to receive water consumption. The corresponding group object appears when you make a selection. • No • 14.076 (F32) Volume (m3) • 12.xxx (U32) Volume (m3) • 12.xxx (U32) Volume (l)
7	Receive flow rate This parameter determines the data type used to receive flow rate. The corresponding group object appears when you make a selection. • No • 14.077 (F32) Flow rate (m^3/s) • 12.xxx (U32) Flow rate (m^3/h) • 12.xxx (U32) Flow rate (l/h) • 13.002 (S32) Flow rate (m^3/h)

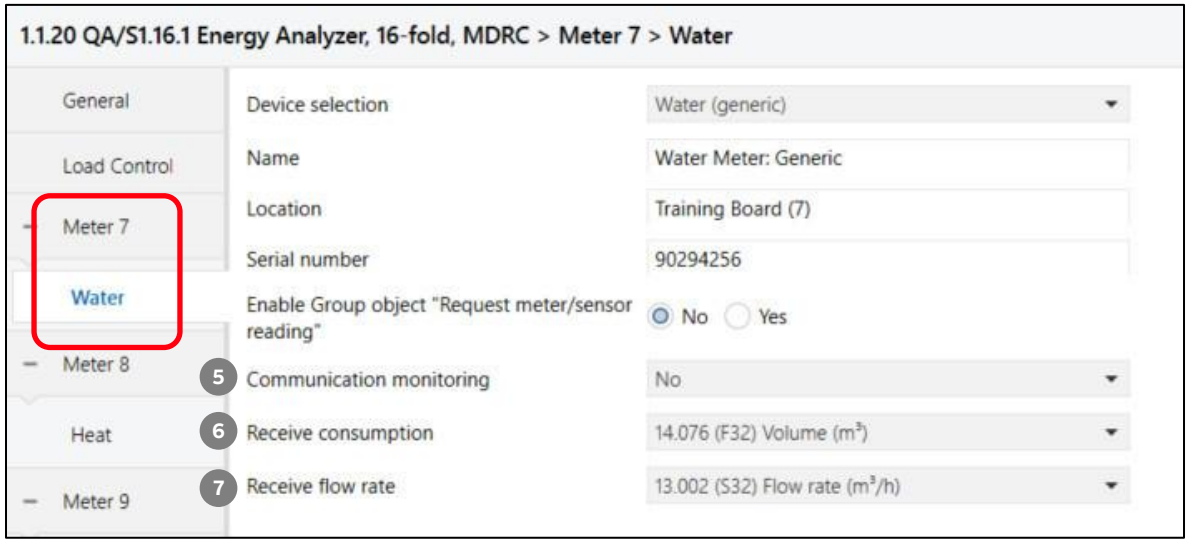


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Heat (generic)

1	Name In this field, you can enter a unique name for the meter. It is used for identification purposes, for example, if there are several identical meters in a single installation. The name you enter will appear in the UI in Management > Meter Management
2	Location Here you can enter the installation location for the meter. It is used for location purposes, for example, if there are several identical meters in a single installation. The installation location you enter will appear in the UI in Management > Meter Management
3	Serial number This field lets you enter a serial number or ID number for the meter. This is another way to identify it if there are several identical meters in a single installation. The serial number you enter will appear in the UI in Management > Meter Management
4	Enable Group object "Request meter/sensor reading" This parameter determines whether meter readings are received via a separate group object. • No • Yes: Shows the Request meter reading group object, which enables active reading of the present meter readings. Readings from connected meters are requested one after the other roughly every 60 seconds.

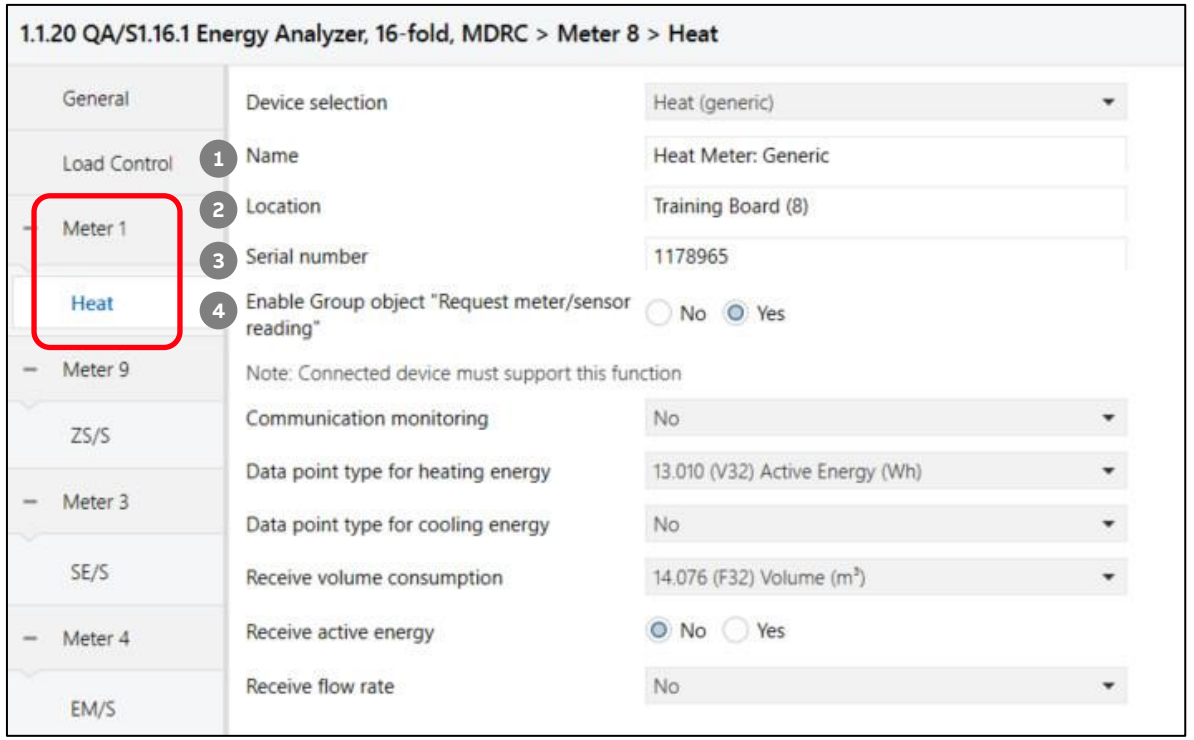


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Heat (generic)

5	Communication monitoring See parameter window “Electricity (generic)”
6	Data point type for heating energy This parameter determines the data type used to receive heating energy meter readings. The corresponding group object appears when you make a selection. • 13.010 (V32) Active Energy (Wh) • 13.013 (V32) Active Energy (kWh) • 112.xxx (U32) Active Energy (kWh) • 12.xxx (U32) Active Energy (MWh)
7	Data point type for cooling energy This parameter determines the data type used to receive cooling energy meter readings. The corresponding group object appears when you make a selection. No • 13.010 (V32) Active Energy (Wh) • 13.013 (V32) Active Energy (kWh) • 12.xxx (U32) Active Energy (kWh) • 12.xxx (U32) Active Energy (MWh)

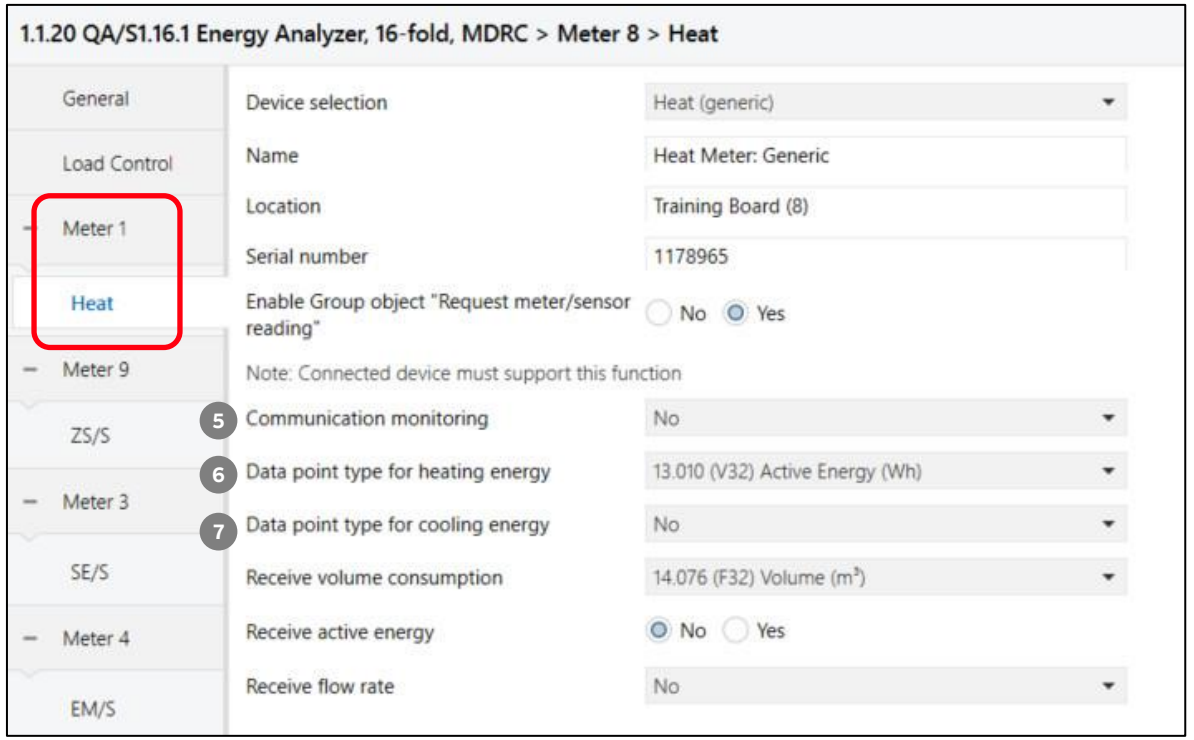


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Heat (generic)

8	Receive volume consumption This parameter determines the data type used to receive accumulated volume. The corresponding group object appears when you make a selection • No • 14.076 (F32) Volume (m^3) • 12.xxx (U32) Volume (m^3) • 12.xxx (U32) Volume (l)
9	Receive active energy This parameter determines the data type used to receive active energy. The corresponding group object appears when you make a selection. • No: No action • Yes: The group object for receiving heating energy appears.
10	Receive flow rate This parameter determines the data type used to receive flow rate. The corresponding group object appears when you make a selection. • No • 14.077 (F32) Flow rate (m^3/s) • 12.xxx (U32) Flow rate (m^3/h) • 12.xxx (U32) Flow rate (l/h) • 13.002 (S32) Flow rate (m^3/h)

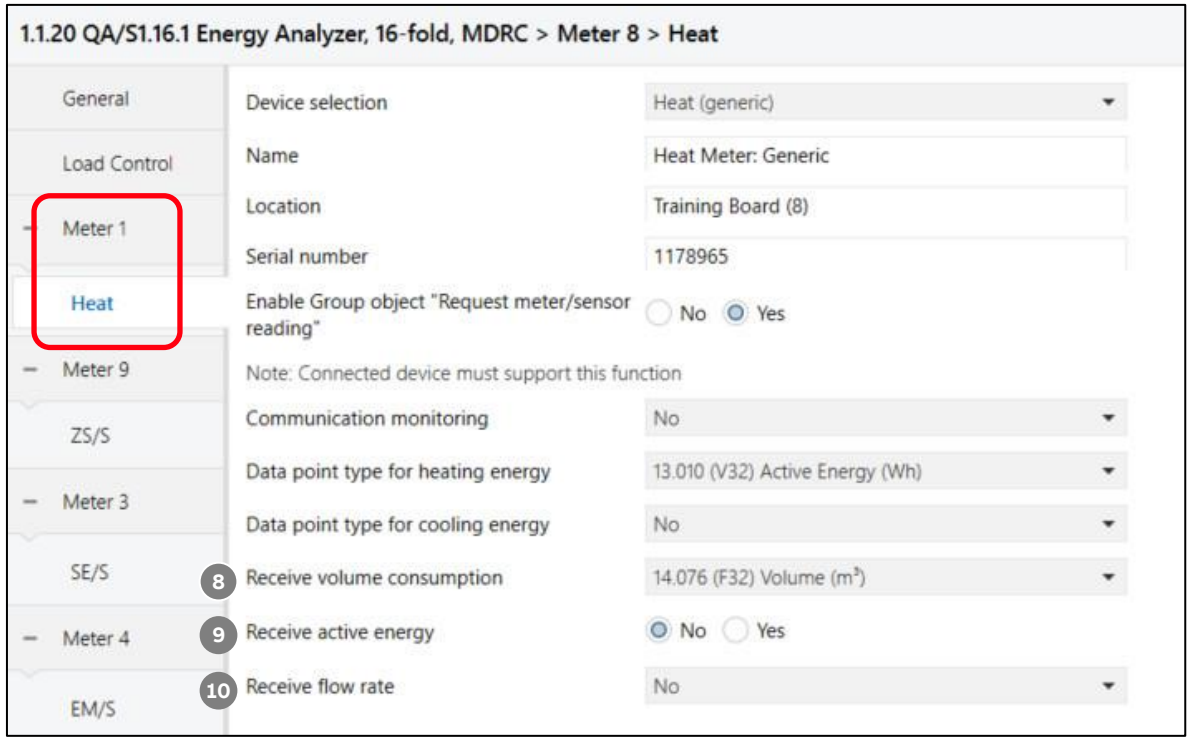
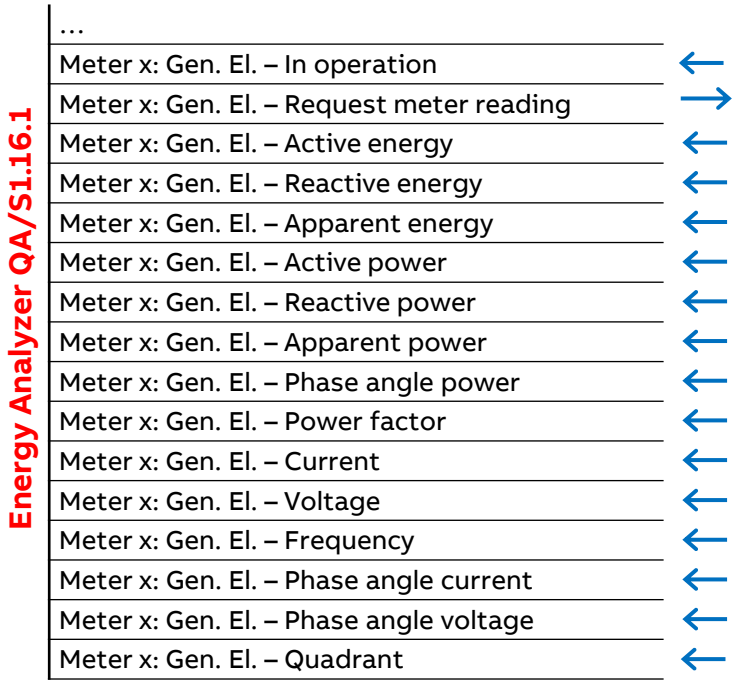


ABB EQmatic Energy Analyzer QA/S x.yy.1

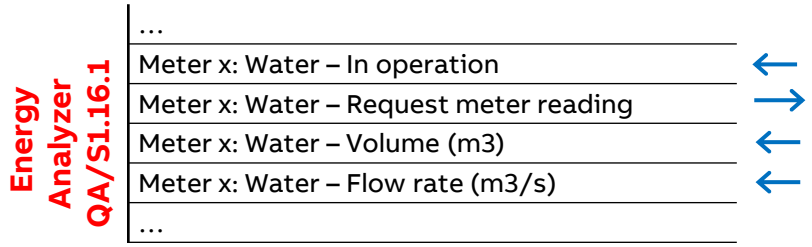
ETS Parameter Energy Analyzer QA/S 1.16.1 KNX – Assignment of group addresses



Example of a QA/S parameterization:

Meter type “Electricity” (generic)

- Voltage network 2-wire (N,L)
- No tariffs
- Communication monitoring via object “In operation” cyclically



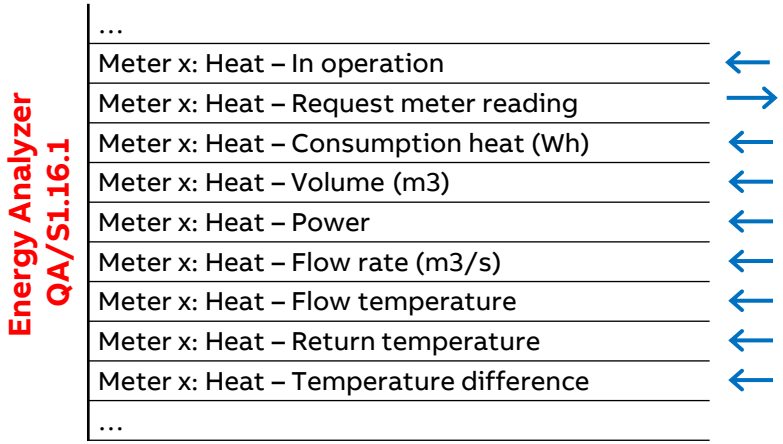
Example of a QA/S parameterization:

Meter type “Water” (generic)

- Receive consumption m^3 (DPT 14.076)
- Receive flow rate m^3/s (DPT 14.077)
- Communication monitoring via object “In operation” cyclically

ABB EQmatic Energy Analyzer QA/S x.yy.1

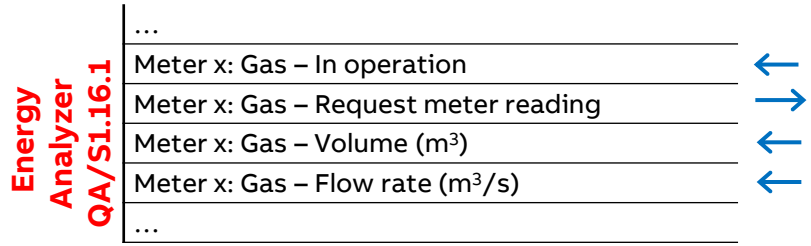
ETS Parameter Energy Analyzer QA/S 1.16.1 KNX – Assignment of group addresses



Example of a QA/S parameterization:

Meter type “Heat” (generic)

- Receive energy consumption heating “Active energy” (DPT 13.010)
- Receive volume consumption “Volume” m^3 (DPT 14.076)
- Receive volume flow rate “Flow rate” m^3/s (DPT 14.0767)
- Communication monitoring via object “In operation” cyclically



Example of a QA/S parameterization:

Meter type “Gas” (generic)

- Receive consumption “Volume” m^3 (DPT 14.076)
- Receive flow rate m^3/s (DPT 14.077)
- Communication monitoring via object “In operation” cyclically

ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Measurement

The Energy Analyzer lets you capture up to ten different measured values and/or environmental parameters per configured sensor and display them on the UI (dashboard or instantaneous values)

When combined with the alarm function, it can send an email notification whenever a threshold is exceeded

- Temperature (°C/°F)
- Rel. Humidity % (1-byte/2-bytes-value)
- CO_2/Air Quality ppm
- PM2.5: particulate matter
- PM10: particulate matter
- Wind Speed m/s
- Brightness lux

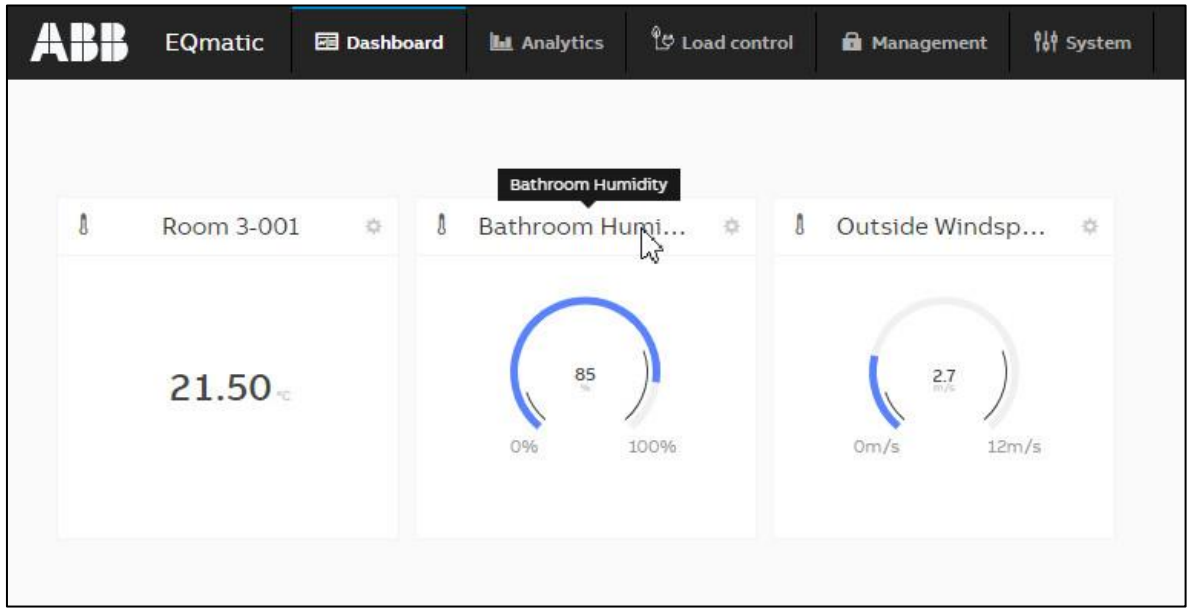


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ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Measurement

1	Name In this field, you can enter a unique name for the sensor. It is used for identification purposes, for example, if there are several identical sensors in a single installation. The name you enter will appear in the UI in Management > Meter Management
2	Location Here you can enter the installation location for the sensor. It is used for location purposes, for example, if there are several identical sensors in a single installation. The installation location you enter will appear in the UI in Management > Meter Management
3	Serial number This field lets you enter a serial number or ID number for the sensor. This is another way to identify it if there are several identical sensors in a single installation. The serial number you enter will appear in the UI in Management > Meter Management
4	Enable Group object "Request meter/sensor reading" This parameter determines whether meter readings/measured values are received via a separate group object. • No • Yes: Shows the Request meter/sensor reading group object. This group object enables active reading of the present meter readings/measured values. Readings/measured values from connected meters/sensors are requested one after the other roughly every 60 seconds.

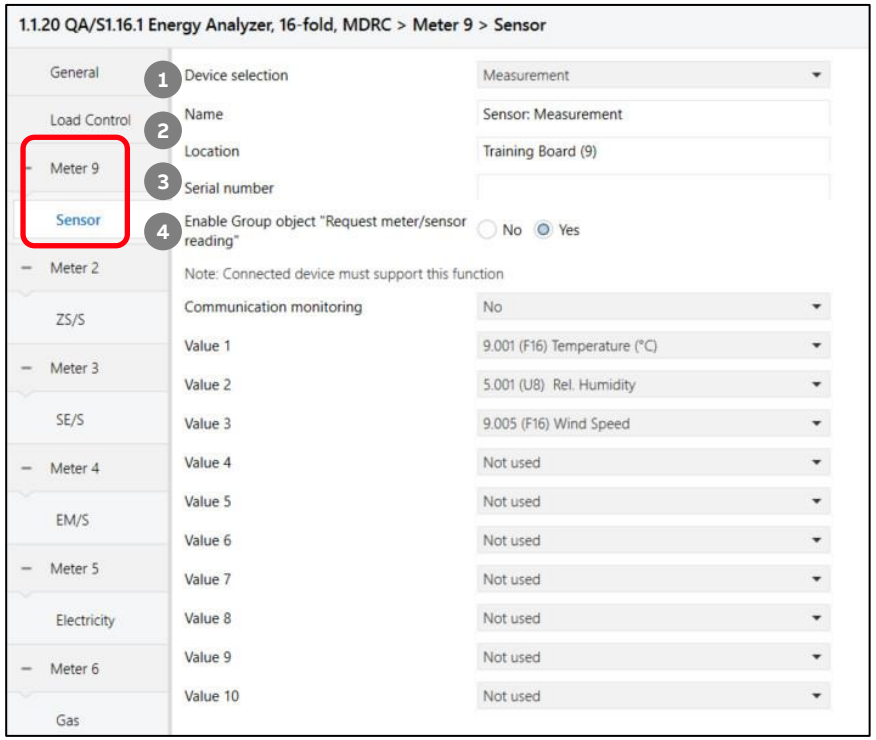
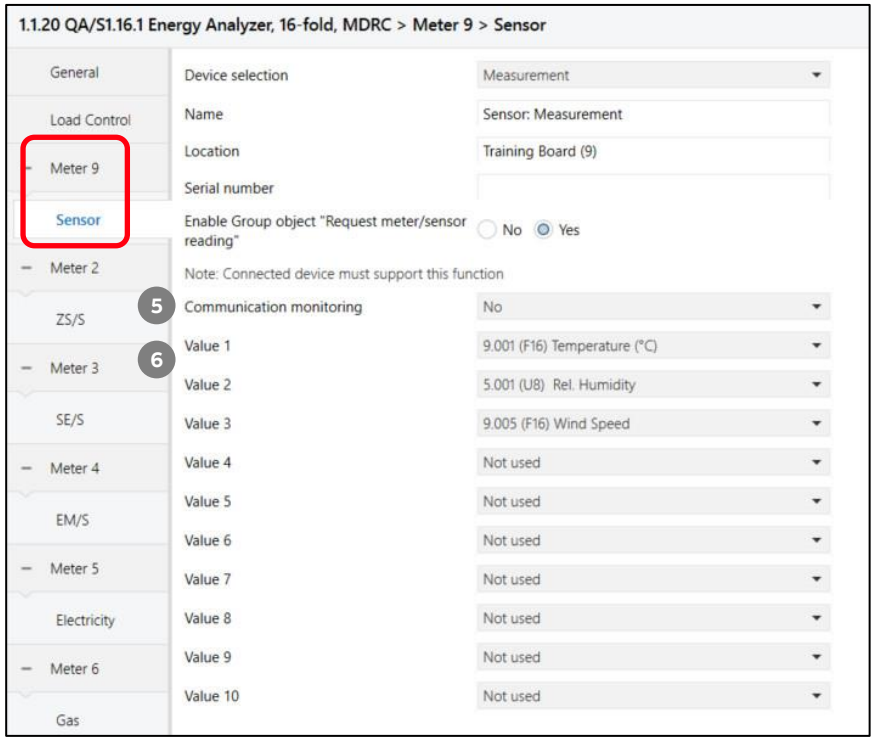


ABB EQmatic Energy Analyzer QA/S x.yy.1

ETS Parameter Energy Analyzer QA/S 1.16.1 KNX

Parameter window: Measurement

5	Communication monitoring See parameter window “Electricity (generic)”
6	Value 1…Value 10 This parameter defines which measured value is received. The corresponding group object appears based on your selection. • Not used: No measured values are received. • 9.001 (F16) Temperature (°C): The group object for receiving temperature in °C appears. • 9.027 (F16) Temperature (°F): The group object for receiving temperature in °F appears. • 5.001 (U8) Rel. Humidity: The group object for receiving relative humidity in % (1-byte-value)appears. • 9.007 (U8) Rel. Humidity: The group object for receiving relative humidity in % (2-bytes-value) appears. • 9.008 (F16) C CO2/Air Quality: The group object for receiving air quality in ppm appears. • 7.001 (U16) PM2.5: The group object for receiving PM2.5 particulate matter appears. • 7.001 (U16) PM10: The group object for receiving PM10 particulate matter appears. • 9.005 (F16) Wind Speed: The group object for receiving wind speed in m/s appears. • 9.004 (F16) Brightness: The group object for receiving brightness in lux appears.



Provide measured values

Data sharing via Modbus TCP and REST API

ABB EQmatic Energy Analyzer QA/S x.yy.1

Provide measured values

Data sharing via Modbus TCP & REST API – QA/S as a Gateway between field devices and super ordinate system

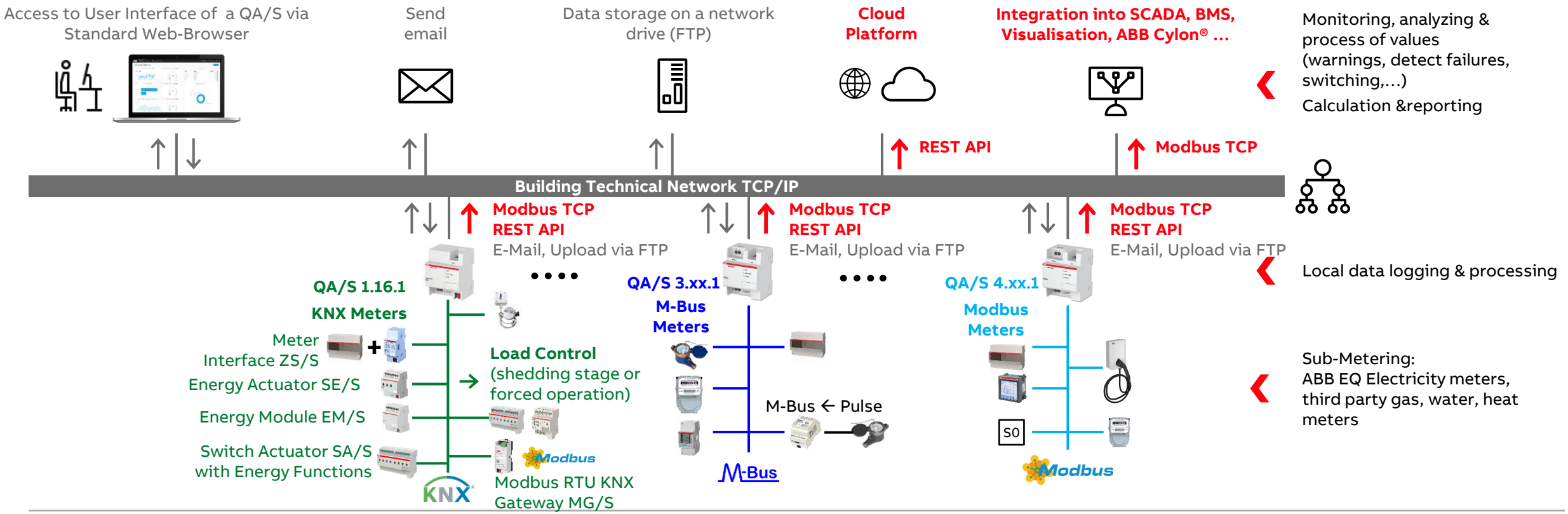
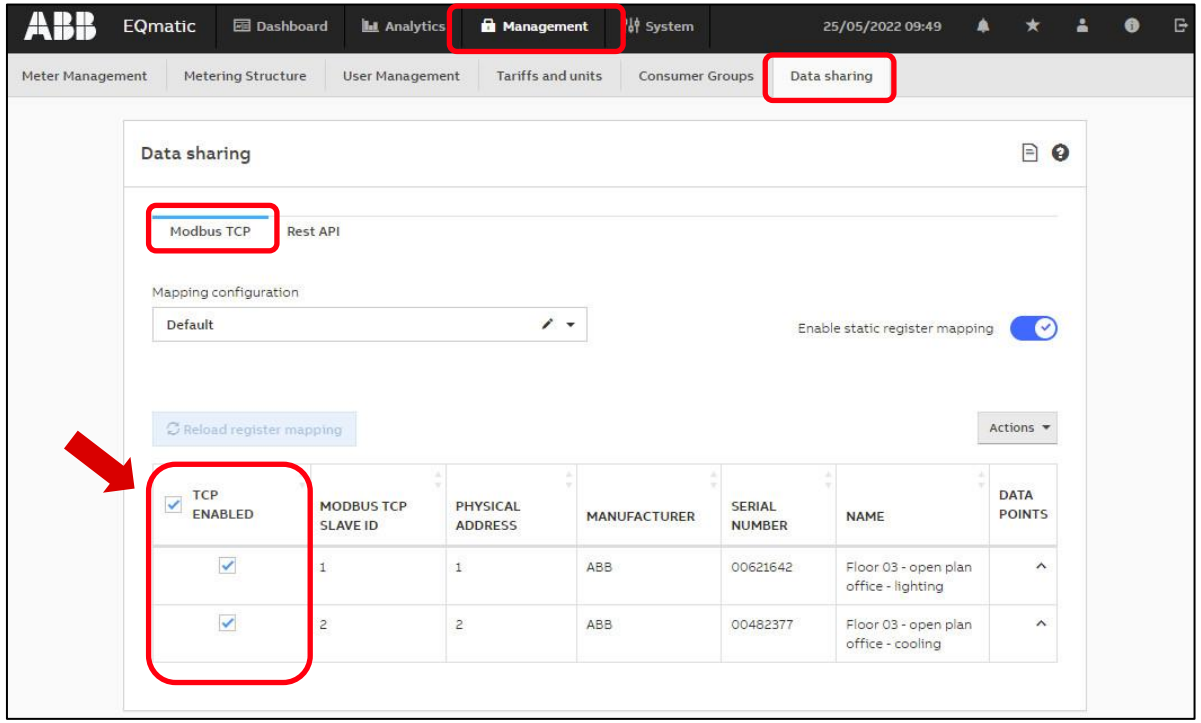


ABB EQmatic Energy Analyzer QA/S x.yy.1

Provide measured values

Data sharing via Modbus TCP

- The data transfer via Modbus TCP function is available for forwarding and using measured data in higher-level systems (e.g. building management systems, SCADA etc.)
- A Client-server communication is established via Modbus TCP
- This communication requires a TCP connection to be set up between a client (e.g. a PC) and the server (e.g. the Energy Analyzer QA/S x.yy.1)
- The TCP port 502 reserved for Modbus is used for communication
- If there is a firewall between the server and client, it must be ensured the TCP port configured is opened
- Example: Voltage L1 of meter 1
  - IP address of QA/S: 192.168.1.170
  - Modbus TCP slave ID: 1
  - TCP register address: 523dec



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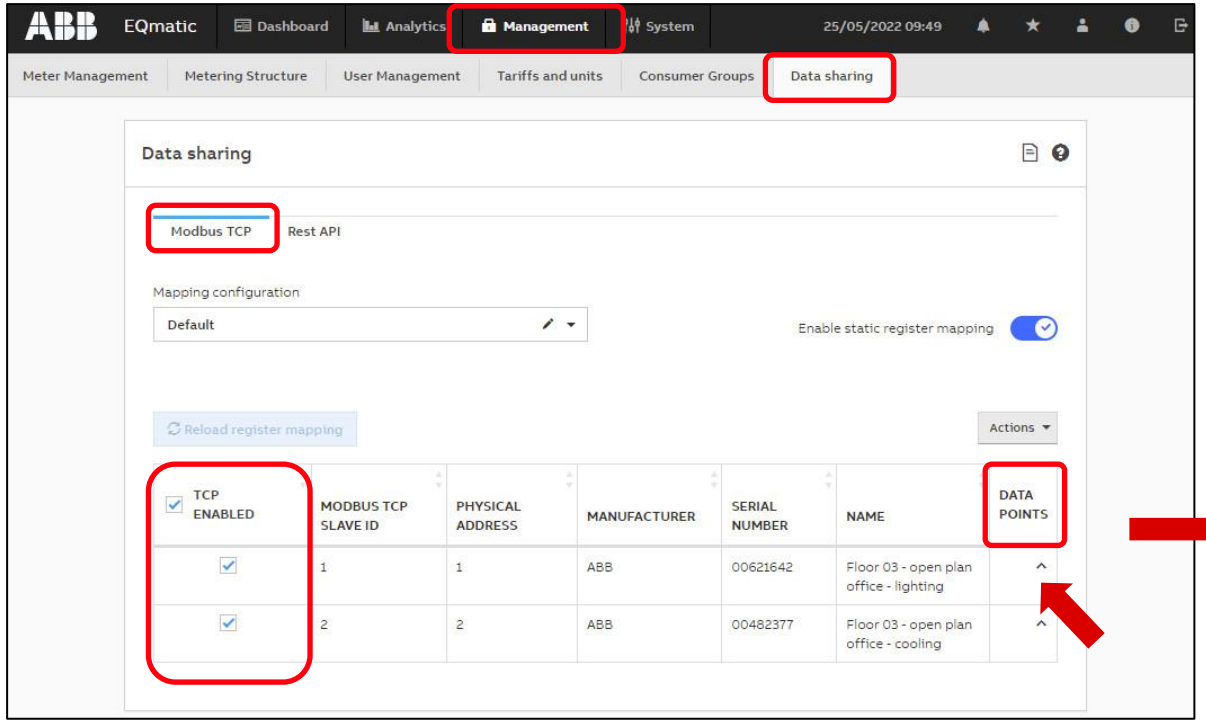
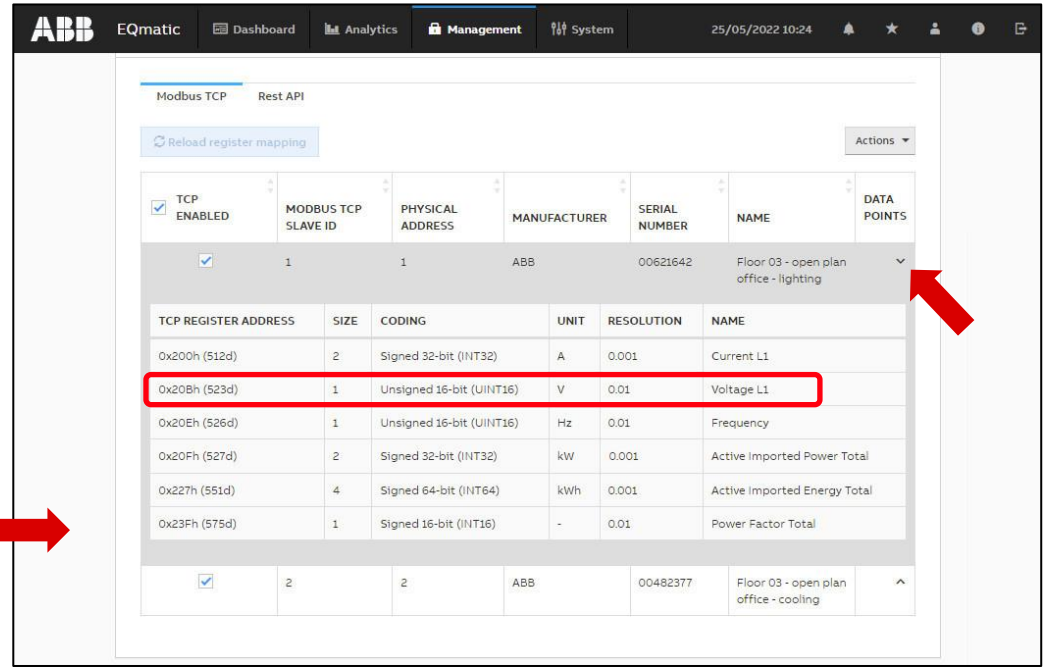
Provide measured values

Data sharing via Modbus TCP – data points: Register address (dec.), size, coding, unit, multiplier and name



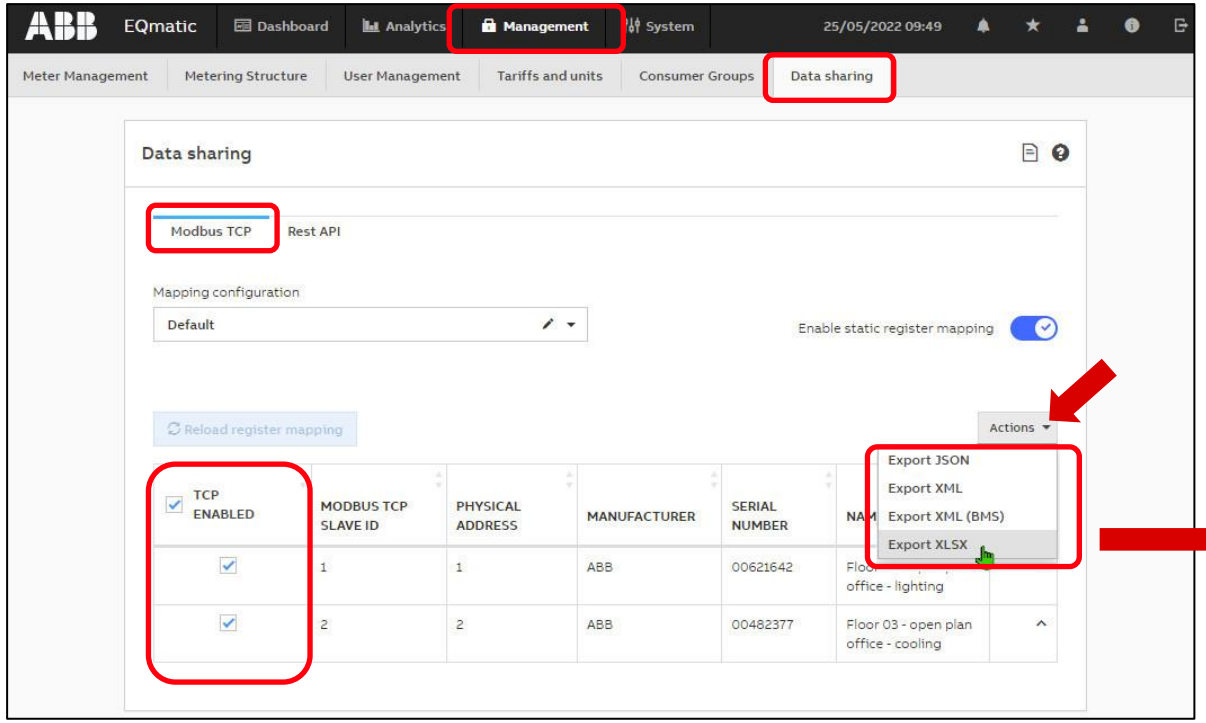


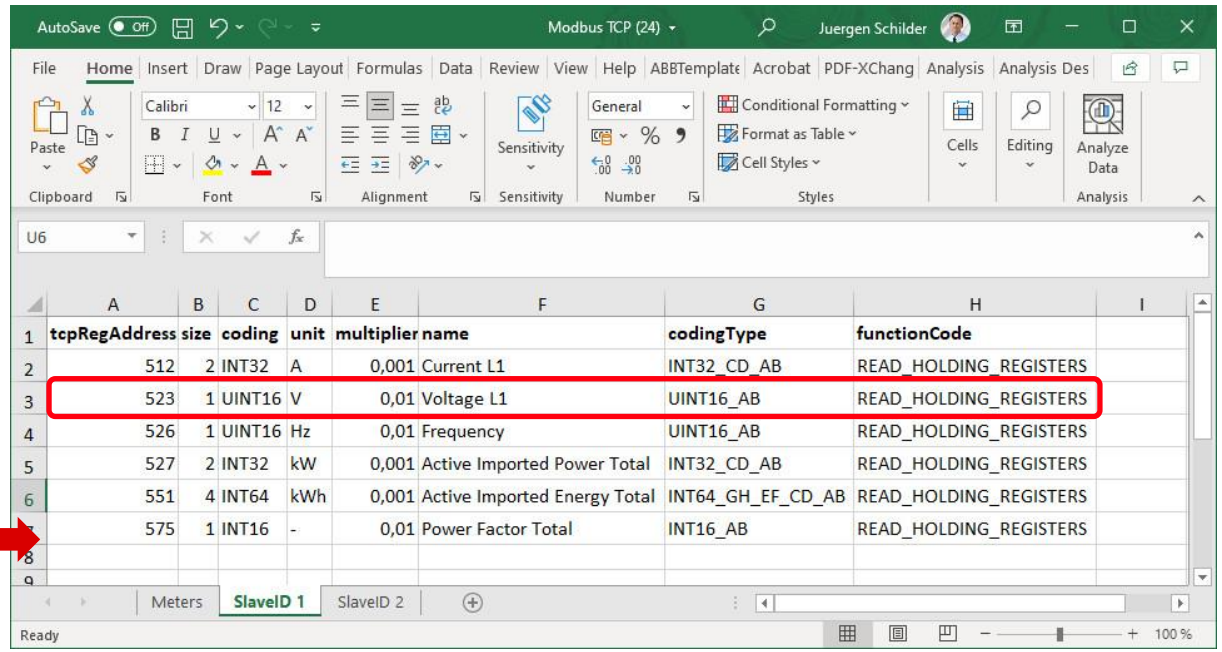
Voltage L1:
Register address 523dec, unsigned 16-bit (UNIT16), unit "V", multiplier/factor 0.01

ABB EQmatic Energy Analyzer QA/S x.yy.1

Provide measured values

Data sharing via Modbus TCP – data points: Register address (dec.), size, coding, unit, multiplier and name





	A	B	C	D	E	F	G	H
1	tcpRegAddress	size	coding	unit	multiplier	name	codingType	functionCode
2	512	2	INT32	A	0,001	Current L1	INT32_CD_AB	READ_HOLDING_REGISTERS
3	523	1	UINT16	V	0,01	Voltage L1	UINT16_AB	READ_HOLDING_REGISTERS
4	526	1	UINT16	Hz	0,01	Frequency	UINT16_AB	READ_HOLDING_REGISTERS
5	527	2	INT32	kW	0,001	Active Imported Power Total	INT32_CD_AB	READ_HOLDING_REGISTERS
6	551	4	INT64	kWh	0,001	Active Imported Energy Total	INT64_GH_EF_CD_AB	READ_HOLDING_REGISTERS
7	575	1	INT16	-	0,01	Power Factor Total	INT16_AB	READ_HOLDING_REGISTERS

Voltage L1:
Register address 523dec, unsigned 16-bit (UNIT16), unit "V", multiplier/factor 0.01

Export XML (BMS) : The data is exported in a special XML format for import into a BMS (e.g. Eisbaer) and can be imported directly there.

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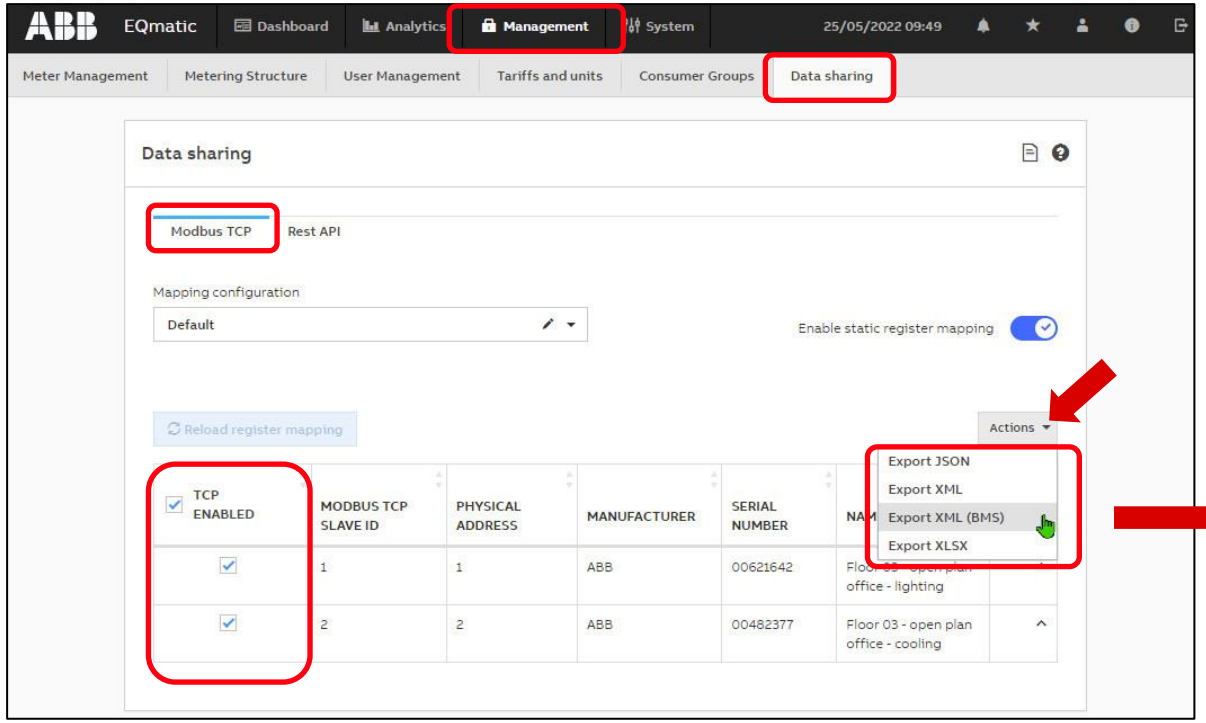
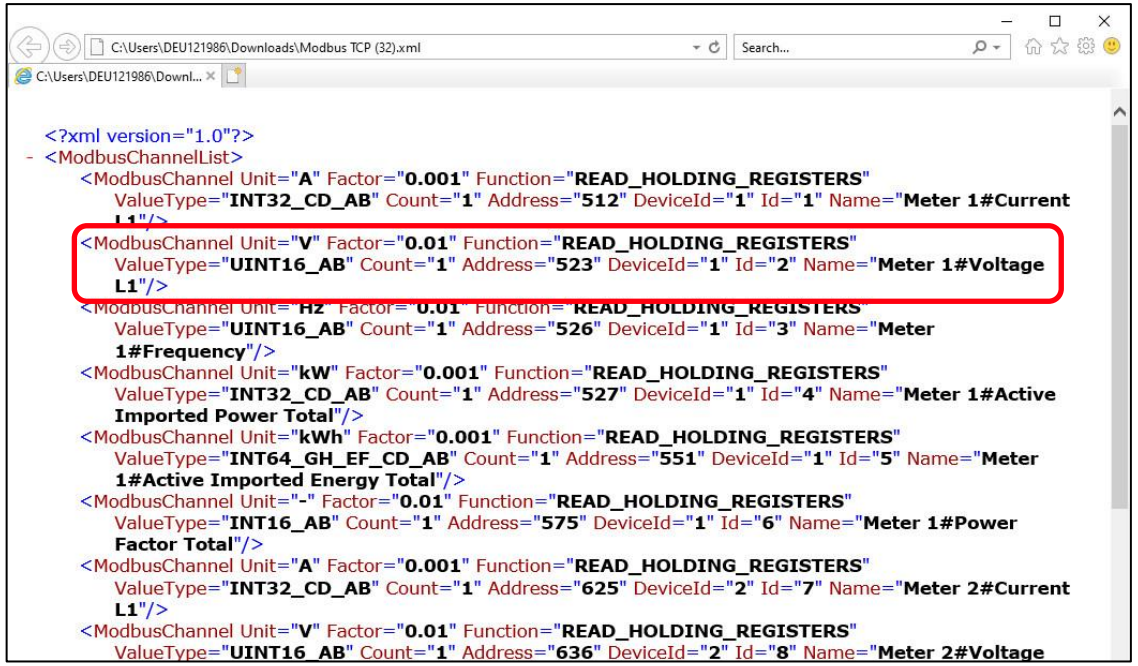
Provide measured values

Data sharing via Modbus TCP – data points: Register address (dec.), size, coding, unit, multiplier and name





Export XML (BMS) : The data is exported in a special XML format for import into a BMS (e.g. Eisbaer) and can be imported directly there.

Voltage L1:
Register address 523dec, unsigned 16-bit (UNIT16), unit "V", multiplier/factor 0.01

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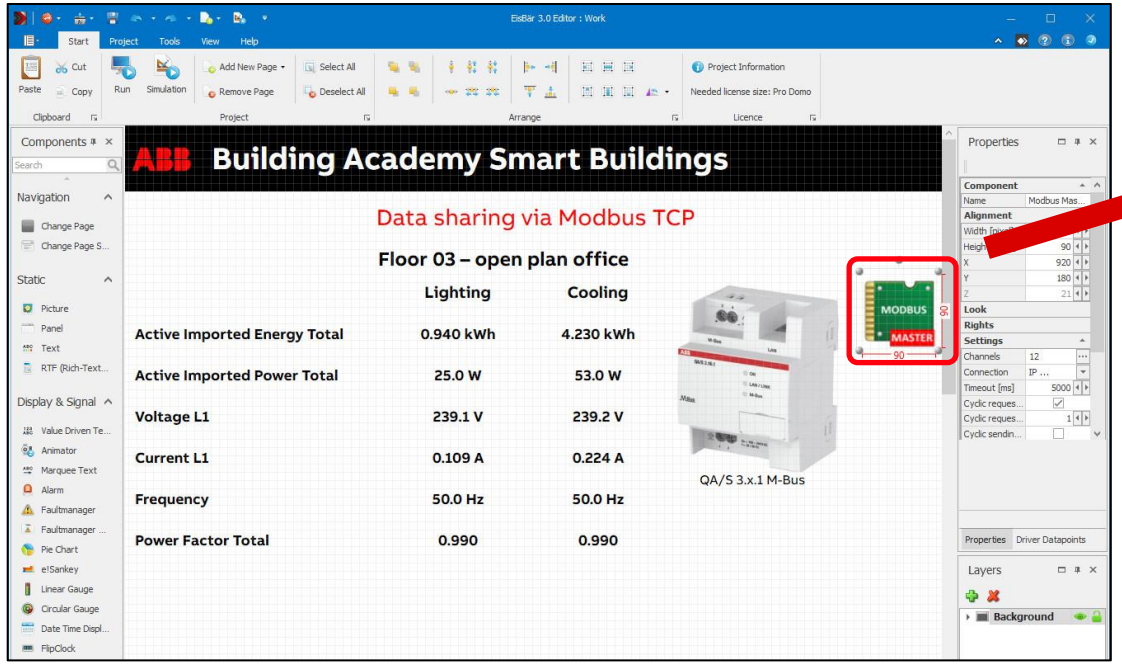
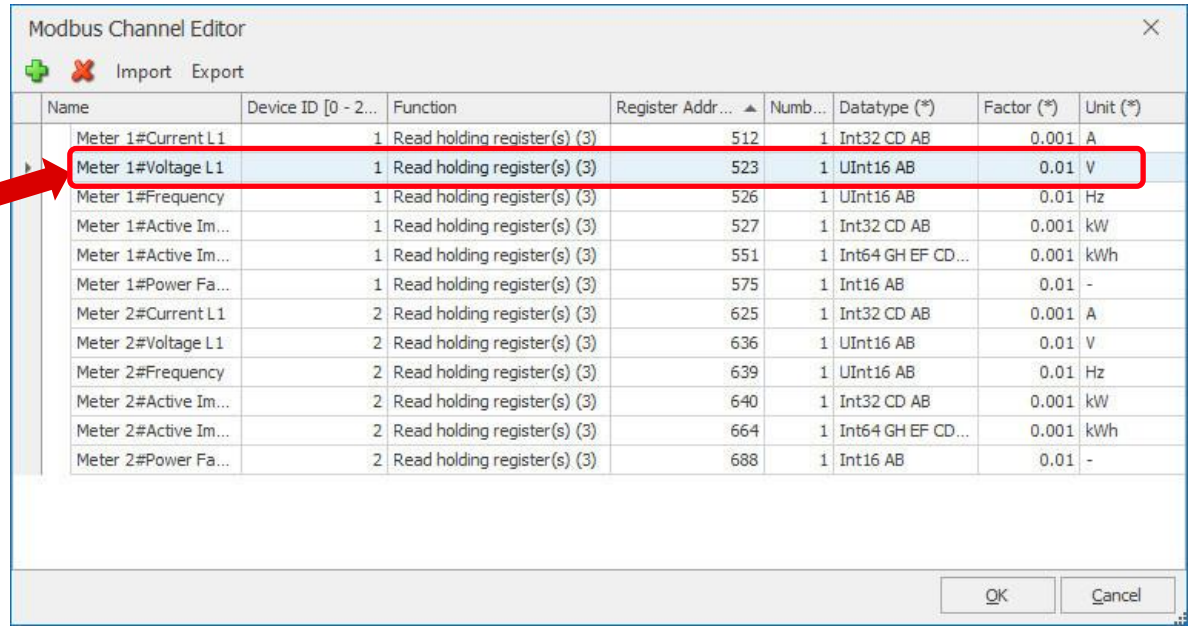
Provide measured values

Data sharing via Modbus TCP – data points: Register address (dec.), size, coding, unit, multiplier and name



Modbus Driver – Import:
The data exported from the Energy Analyzer can be imported directly.



Name	Device ID [0 - 2...	Function	Register Addr...	Numb...	Datatype (*)	Factor (*)	Unit (*)
Meter 1#Current L1	1	Read holding register(s) (3)	512	1	Int32 CD AB	0.001	A
Meter 1#Voltage L1	1	Read holding register(s) (3)	523	1	UInt16 AB	0.01	V
Meter 1#Frequency	1	Read holding register(s) (3)	526	1	UInt16 AB	0.01	Hz
Meter 1#Active Im...	1	Read holding register(s) (3)	527	1	Int32 CD AB	0.001	kW
Meter 1#Active Im...	1	Read holding register(s) (3)	551	1	Int64 GH EF CD...	0.001	kWh
Meter 1#Power Fa...	1	Read holding register(s) (3)	575	1	Int16 AB	0.01	-
Meter 2#Current L1	2	Read holding register(s) (3)	625	1	Int32 CD AB	0.001	A
Meter 2#Voltage L1	2	Read holding register(s) (3)	636	1	UInt16 AB	0.01	V
Meter 2#Frequency	2	Read holding register(s) (3)	639	1	UInt16 AB	0.01	Hz
Meter 2#Active Im...	2	Read holding register(s) (3)	640	1	Int32 CD AB	0.001	kW
Meter 2#Active Im...	2	Read holding register(s) (3)	664	1	Int64 GH EF CD...	0.001	kWh
Meter 2#Power Fa...	2	Read holding register(s) (3)	688	1	Int16 AB	0.01	-

Voltage L1:
Register address 523dec, unsigned 16-bit (UNIT16), unit "V", multiplier/factor 0.01

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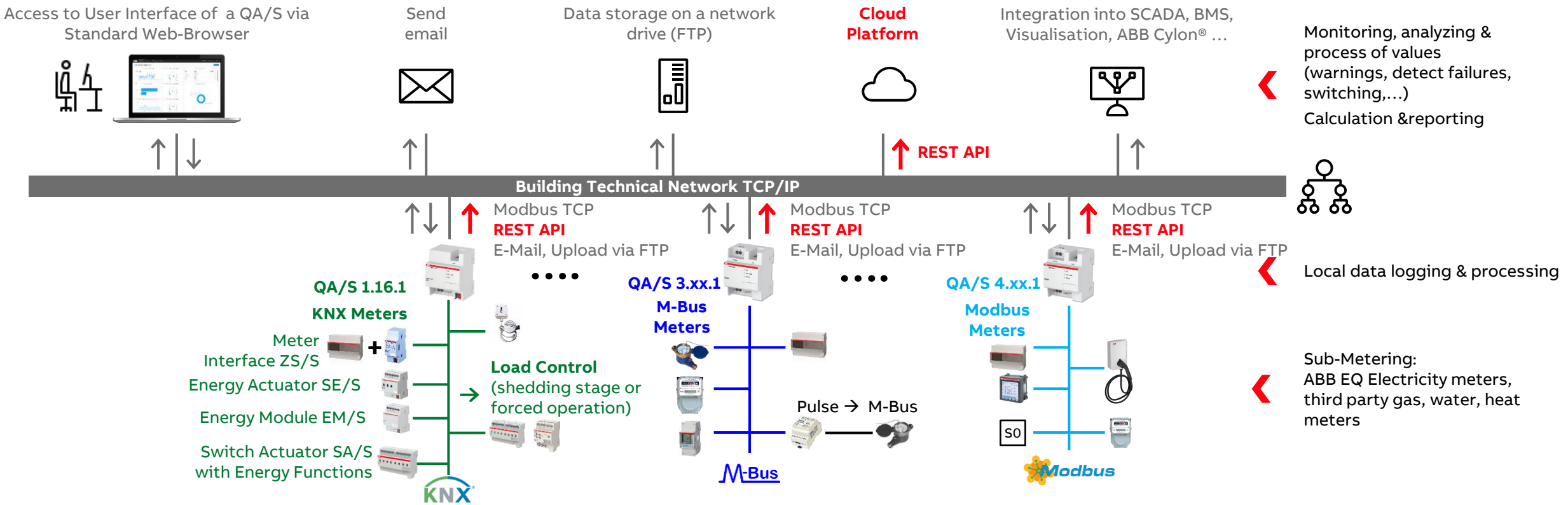
Provide measured values

Data sharing via REST API



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Provide measured values

Data sharing via REST API

Representational state transfer (REST) is a software architectural style that defines a set of constraints to be used for creating Web services

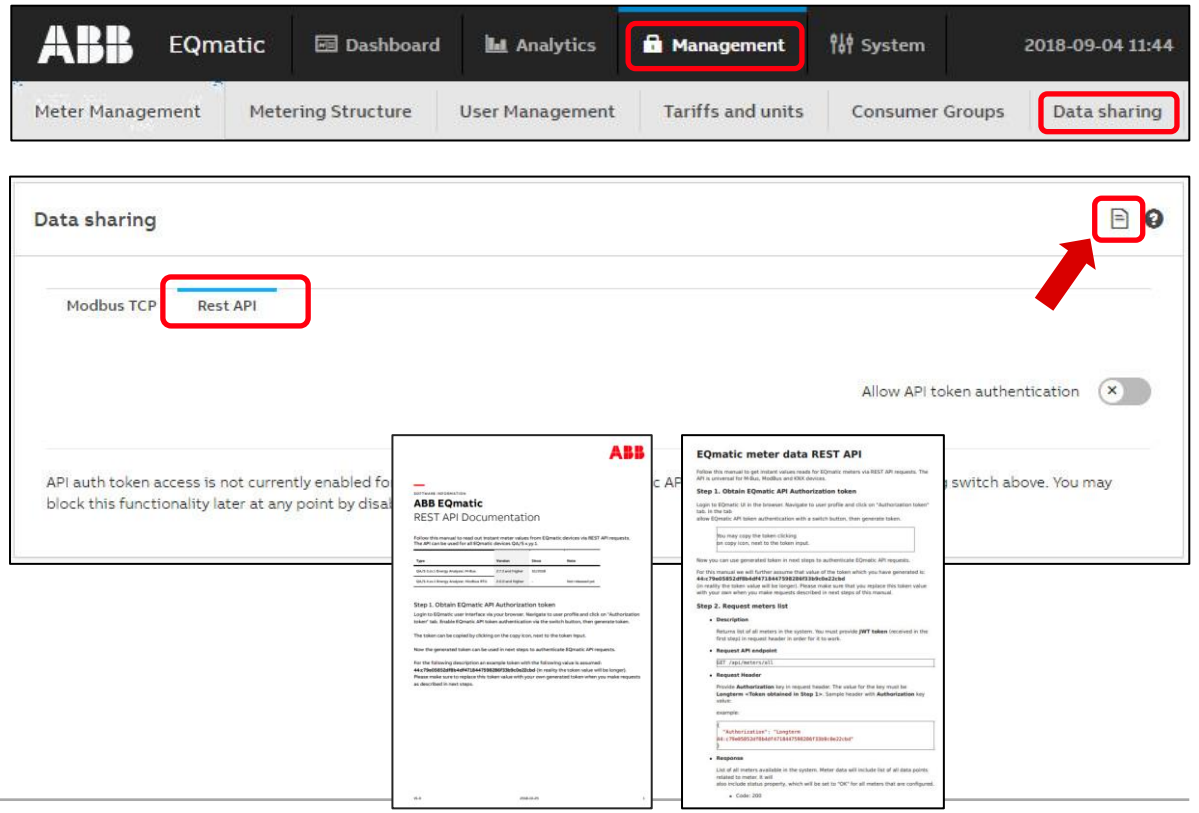
→ provide interoperability between computer systems on the Internet

An application programming interface (API) is an interface or communication protocol between a client and a server intended to simplify the building of client-side software

Software information:

– Description of the “REST API”

– Documentation “ABB EQmatic REST API”



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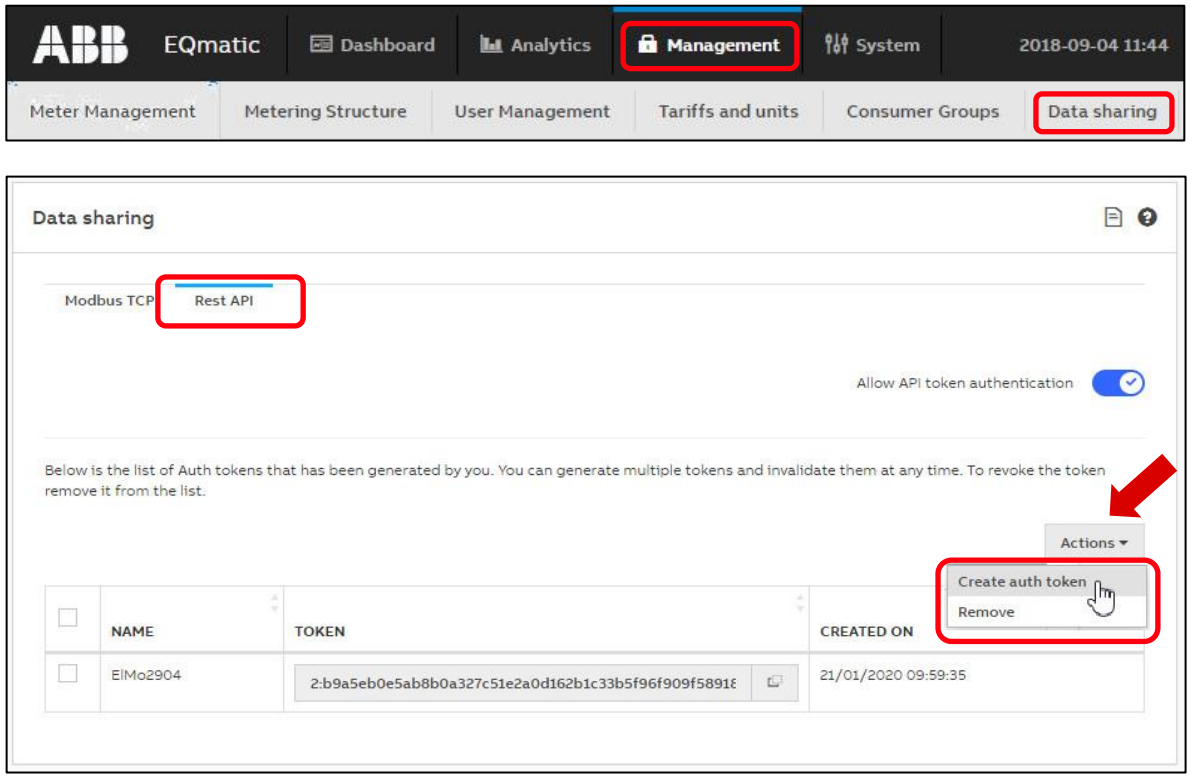
Provide measured values

Data sharing via REST API

Authentication tokens allow usage of EQmatic API

Click “Action” dropdown to generate an API authentication token



Collection, management and storage of meter data from QA/S via Modbus TCP in a BMS, Visualisation, ...

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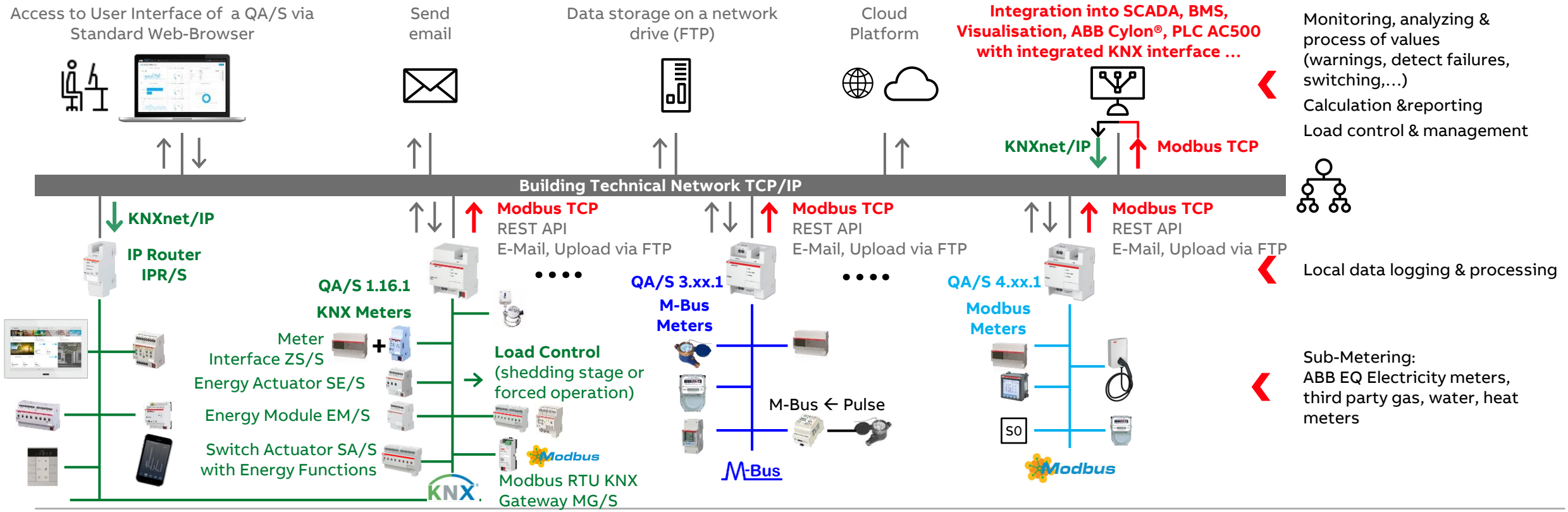
Collection, management and storage of meter data from QA/S via Modbus TCP

System overview – Data sharing via Modbus TCP, conversion via a KNX interface and forwarding to KNX



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Collection, management and storage of meter data from QA/S via Modbus TCP

Building management software “NETxAutomation”

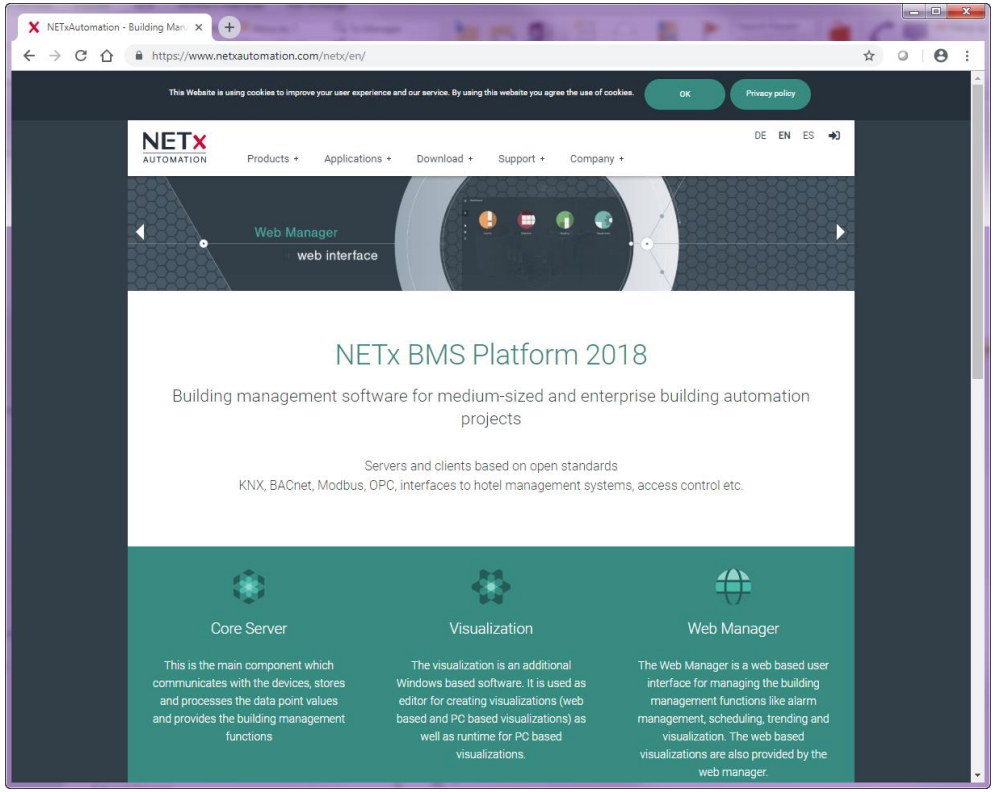
Building management software for medium-sized and enterprise building automation projects

Servers and clients based on open standards

KNX, BACnet, Modbus, OPC, interfaces to hotel management systems, access control etc.

Through the connection of hotel management software like MICROS Fidelio/Opera or Protel with the building management system, data of the guest can be integrated

https://www.netxautomation.com



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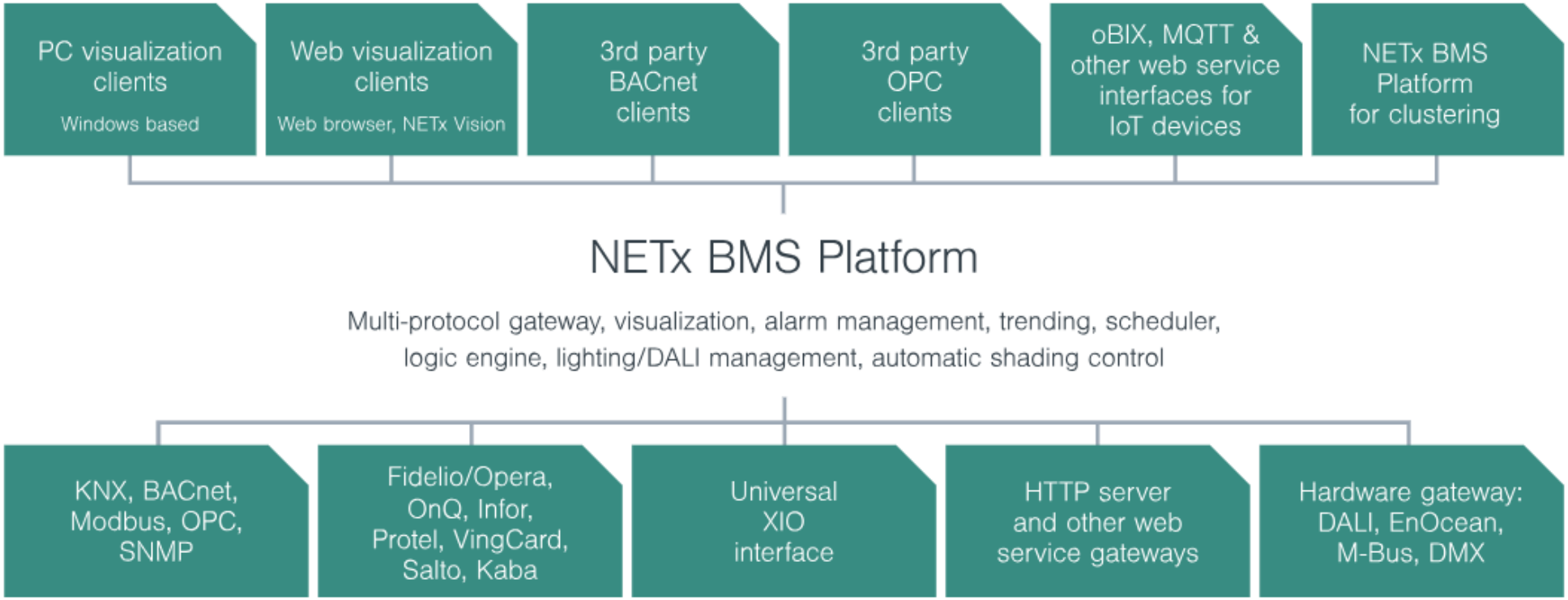
Collection, management and storage of meter data from QA/S via Modbus TCP

Building management software



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Collection, management and storage of meter data from QA/S via Modbus TCP

Visualisation software “EisBaer SCADA”

EisBaer SCADA is an innovative and cost-efficient software for the visualisation and automation of building and machine intelligence

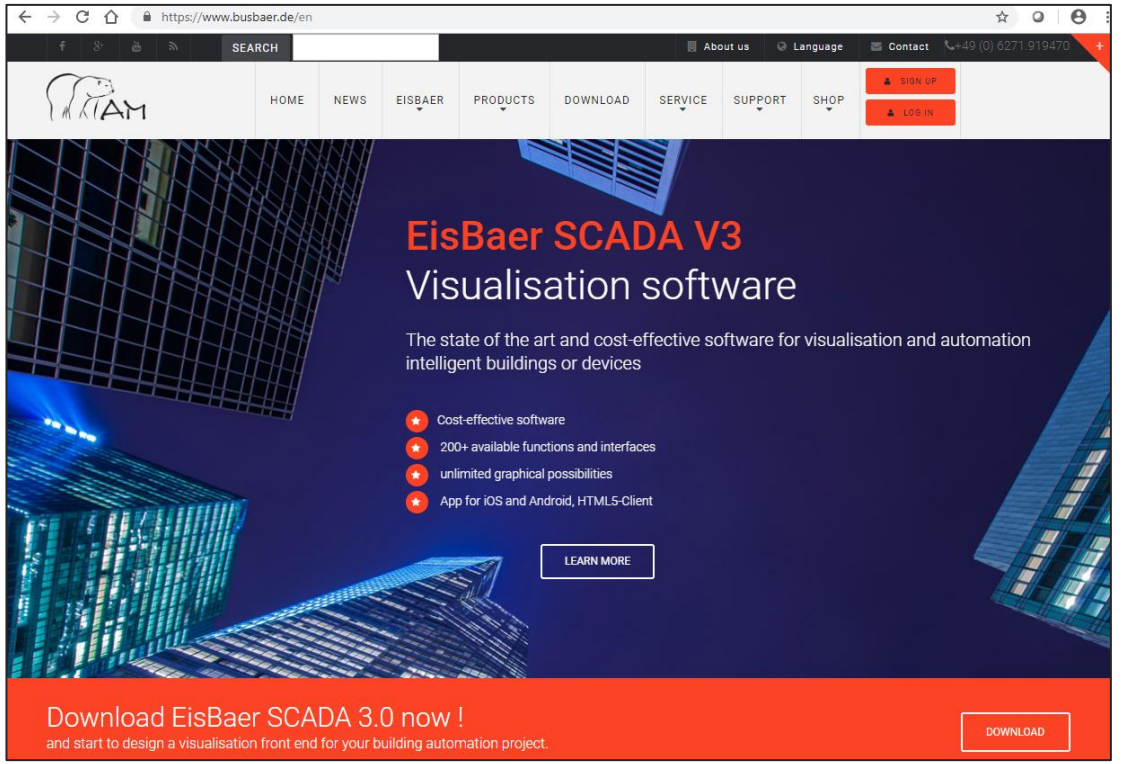
EisBaer SCADA offers a large range of potential applications, from the control of single rooms or machines, apartments or houses through to largescale buildings or whole building complexes

An intuitive graphical editor with flexible menus, convenient layout tools and customizable function templates facilitates the creation of user interfaces for your applications

The software provides interfaces for a wide variety of control and IT systems and is therefore a universal platform

Multiple interfaces to KNX, OPC, BACNet, Modbus, MBus, DMX, CAN Bus, ESPA 4.4.4, Sonos, Fidelio, Z-Wave, Tesla, Siemens Logo!, Profibus, BOSE, Revox Voxnet, ekey, Philips Hue, WAGO PFC, ZigBee, SNMP, ABB CMS, RAPIX, IRTrans, and many more

https://www.busbaer.de/en



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Collection, management and storage of meter data from QA/S via Modbus TCP

Visualisation software “EisBaer SCADA”

- Free editor incl. simulation mode
- Server is running as a Windows service
- Unlimited number of clients – no cost
- Free software updates
- Free Smart Clients for iOS, Android, Windows Phone and Windows RT
- Alarm Manager for unlimited messages according to DIN 19235 and data logging in SQL-based database
- Drivers and interfaces to KNX, OPC DA / UA /XML, DMX, MODBUS TCP / RTU / UDP, SONOS, IrTrans, ABB CMS, ABB M2M, Rapix, C-Bus, BACnet (server and / or client)
- Generation of templates with complete Modbus registers

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Collection, management and storage of meter data from QA/S via Modbus TCP

Visualisation software “EisBaer SCADA”

Available MODBUS interfaces:

- Generic MODBUS RTU
- Generic MODBUS TCP
- Generic MODBUS UDP
- ABB CMS 600
- ABB M2M
- Templates for A4x payer, XT 4 ACB and Emax2MCB
- Templates for QA/S x.64.1
- ABB EV AC-charger
- … and more

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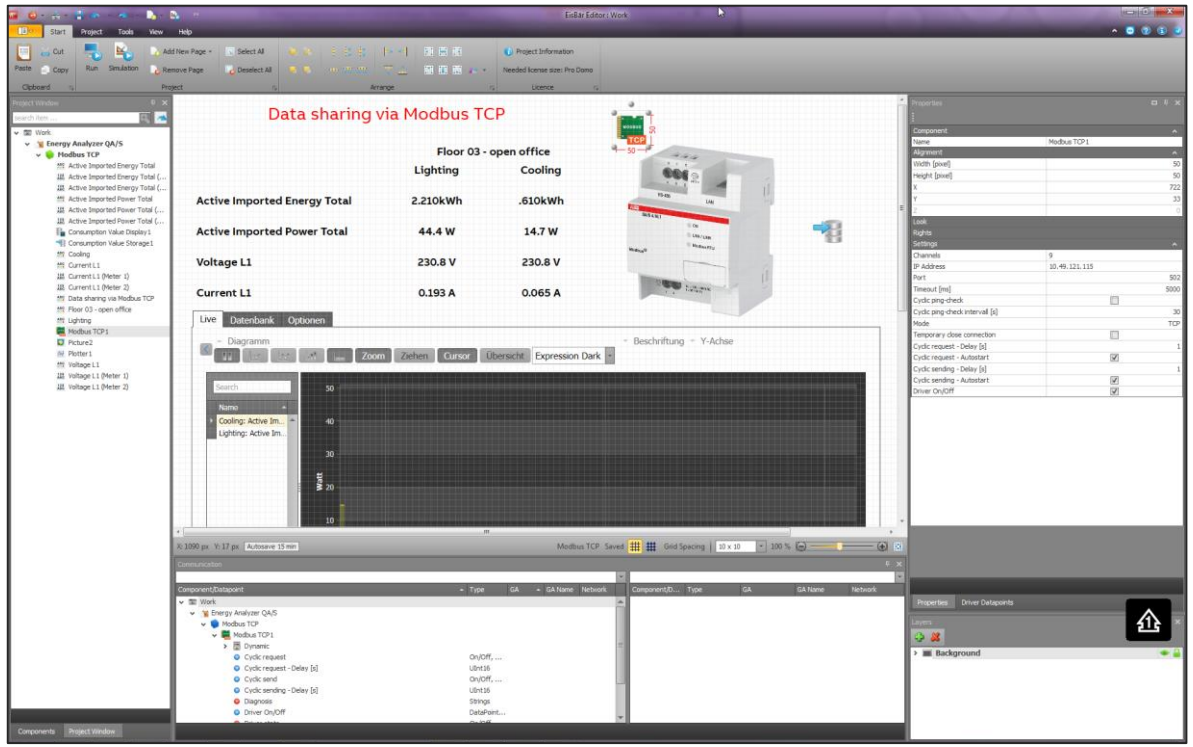
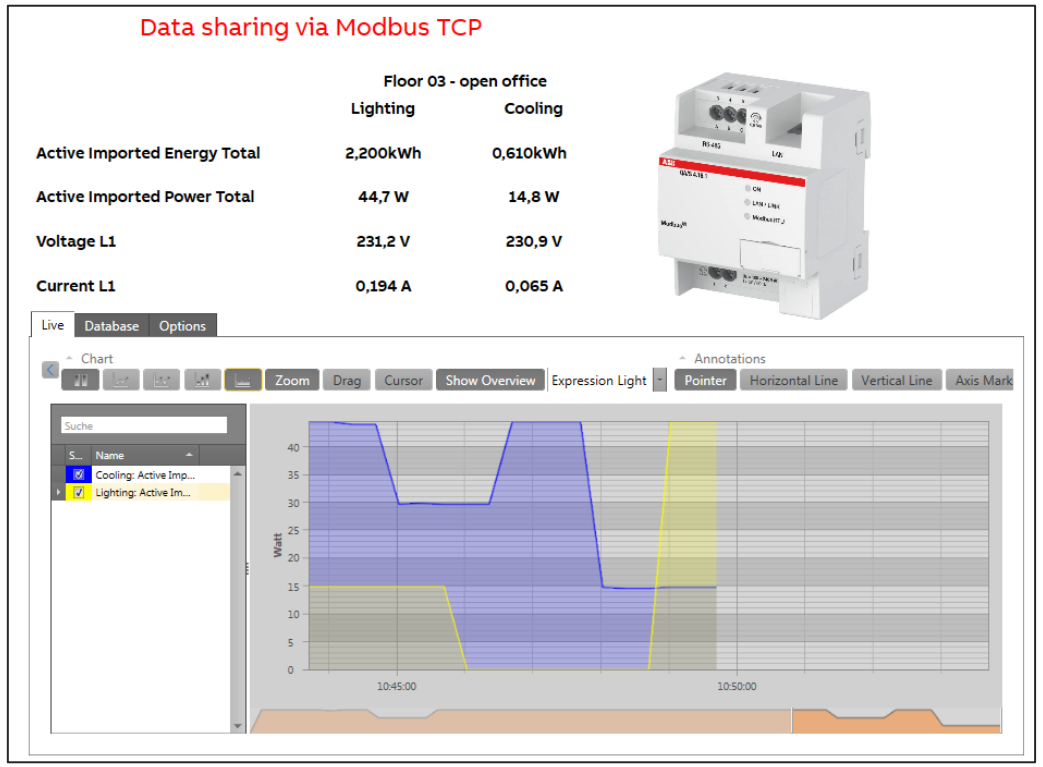
Collection, management and storage of meter data from QA/S via Modbus TCP

Visualisation software “EisBaer SCADA”: Editor



Run time



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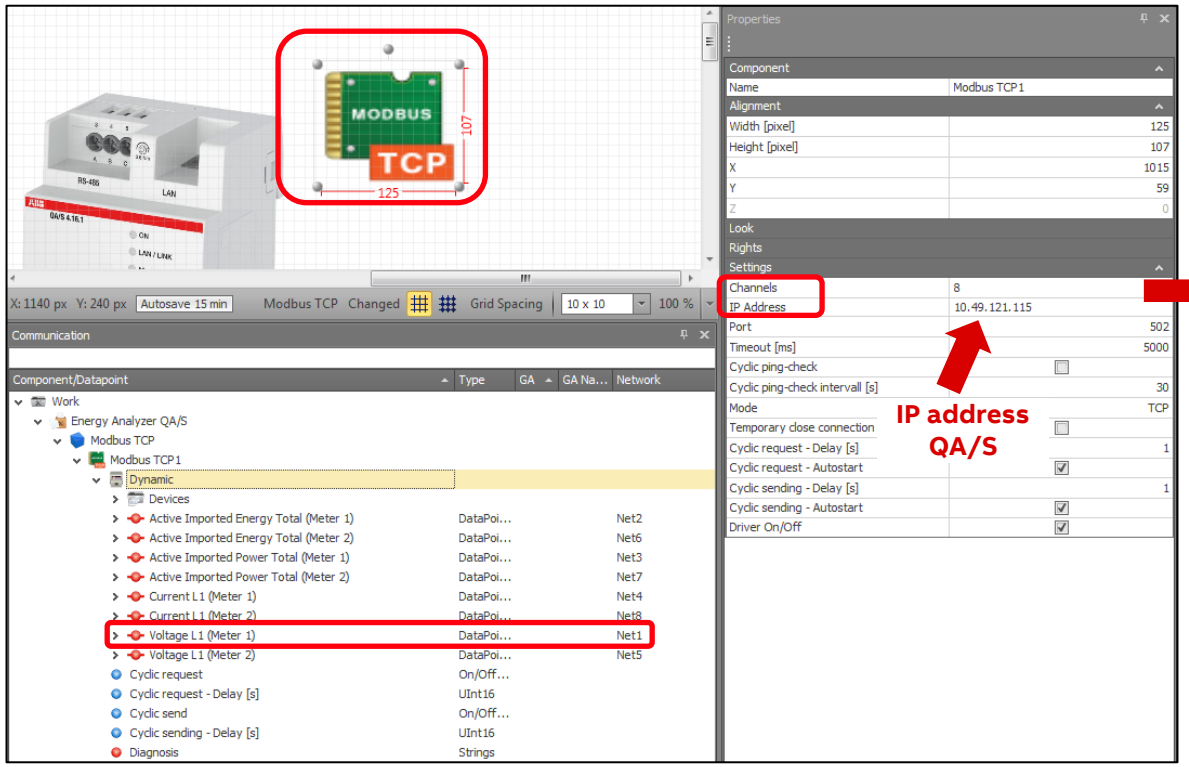
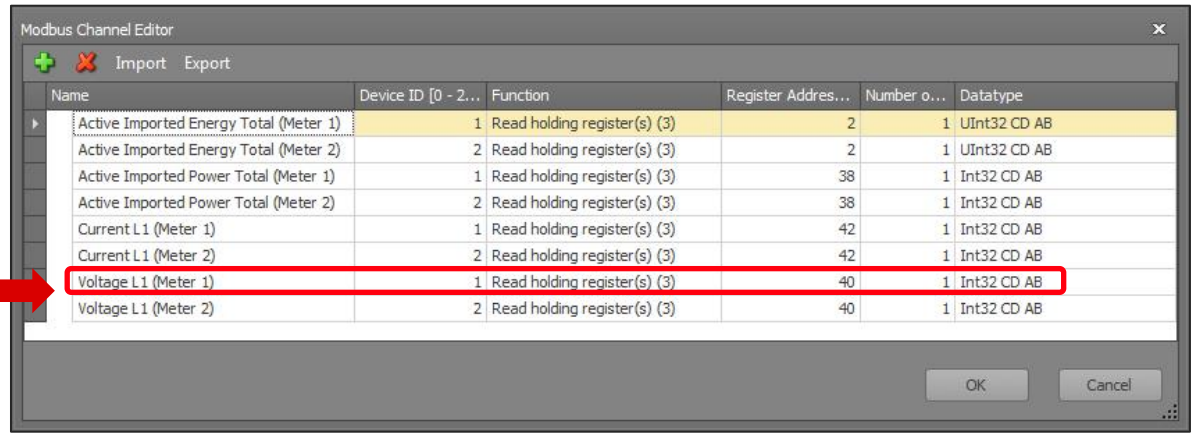
Collection, management and storage of meter data from QA/S via Modbus TCP

Settings of “Modus TCP driver”



Modus TCP driver: Modbus Channel Editor



tcpRegAddress	size	coding	unit	multiplier	name
...	...	...	...	...	...
2	2	Unsigned 32-bit (UINT32)	Wh	10	Active Imported Energy Total
32	6	ASCII string	-	1	Product name
38	2	Signed 32-bit (INT32)	W	0,01	Active Imported Power Total
40	2	Signed 32-bit (INT32)	V	0,1	Voltage L1
42	2	Signed 32-bit (INT32)	A	0,001	Current L1
44	1	Unsigned 8-bit (UINT8)	Hz	0,01	Frequency
45	1	Signed 16-bit (INT16)	-	0,001	Power Factor Total
...	...	...	...	...	...

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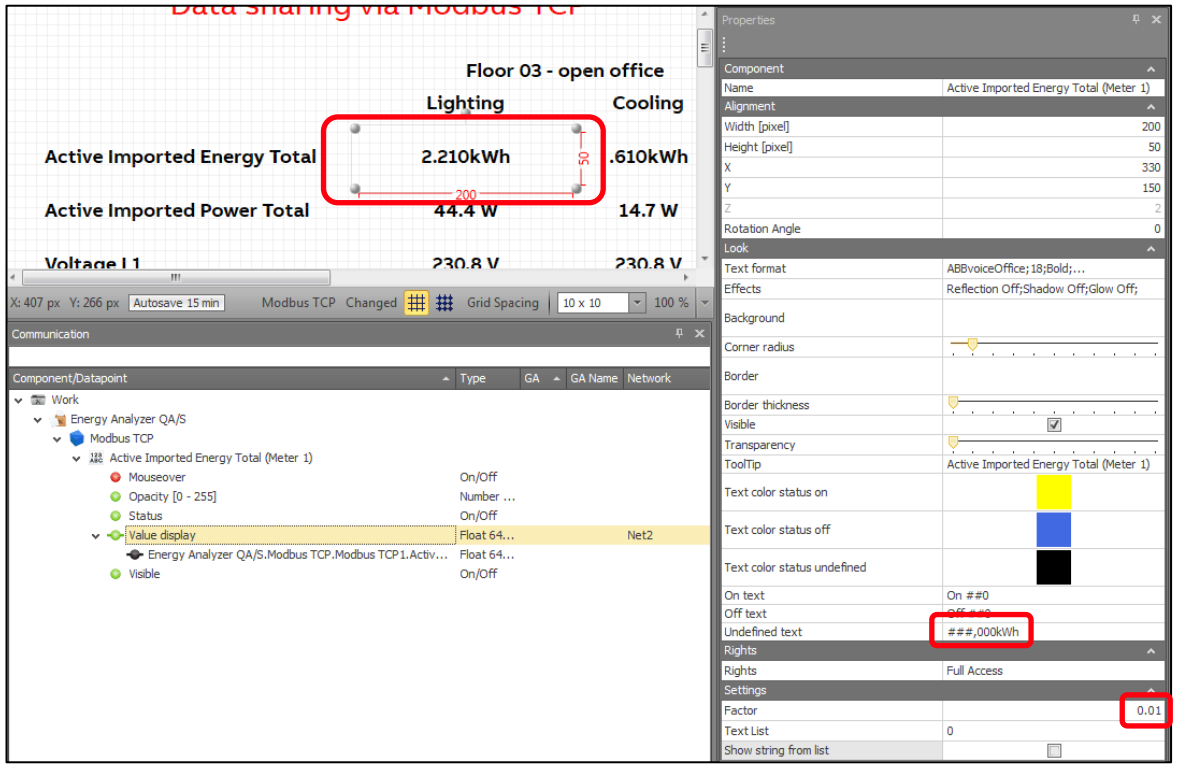
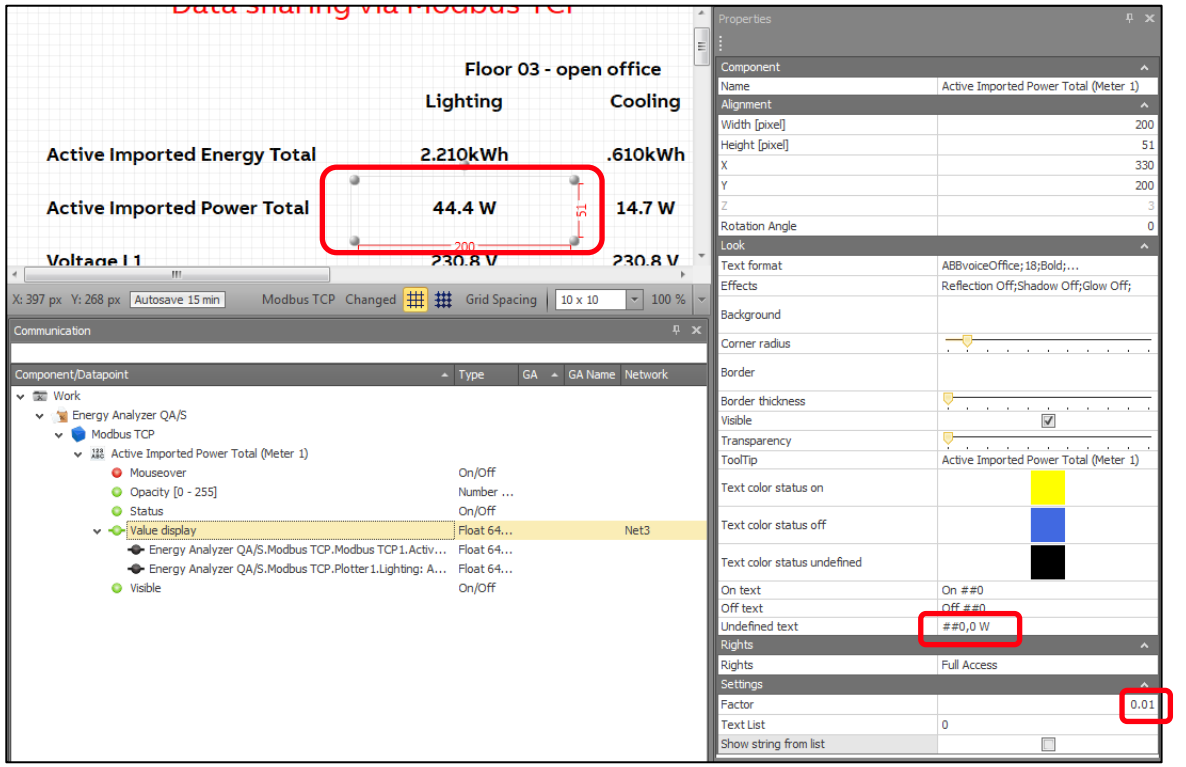
Collection, management and storage of meter data from QA/S via Modbus TCP

Settings of component “Value driven text”: Energy



Settings of component “Value driven text”: Power



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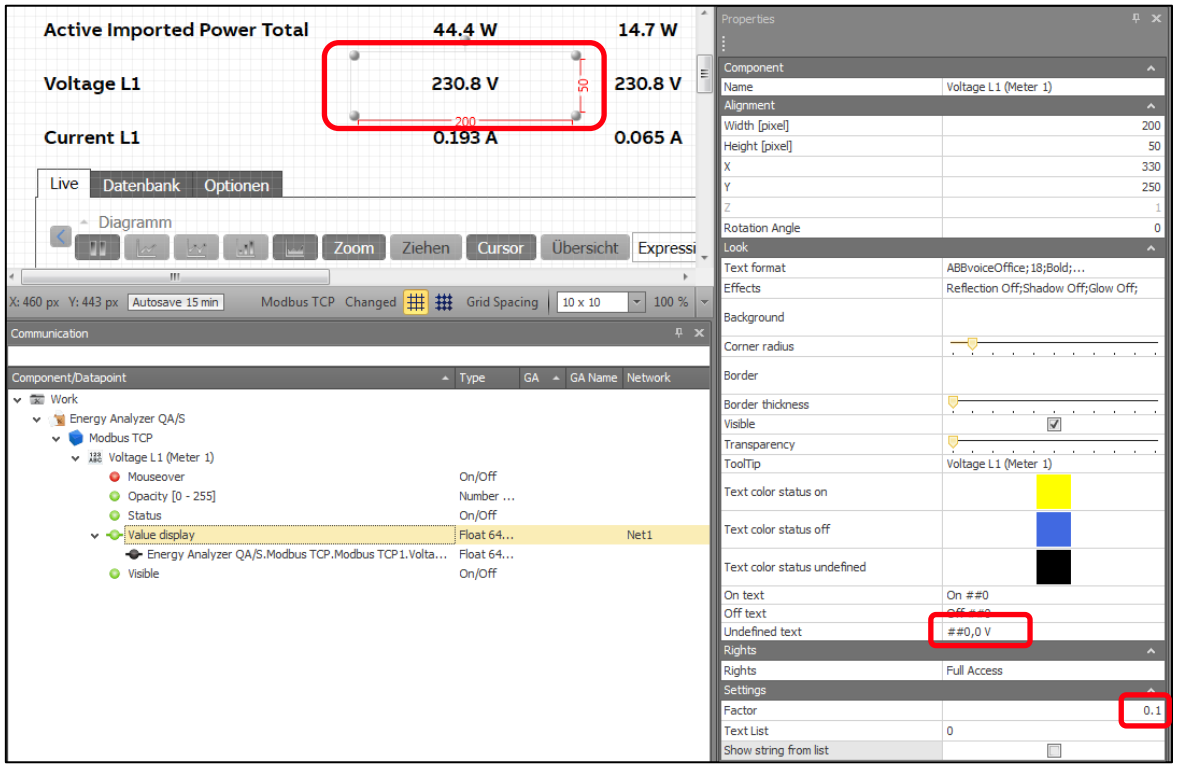
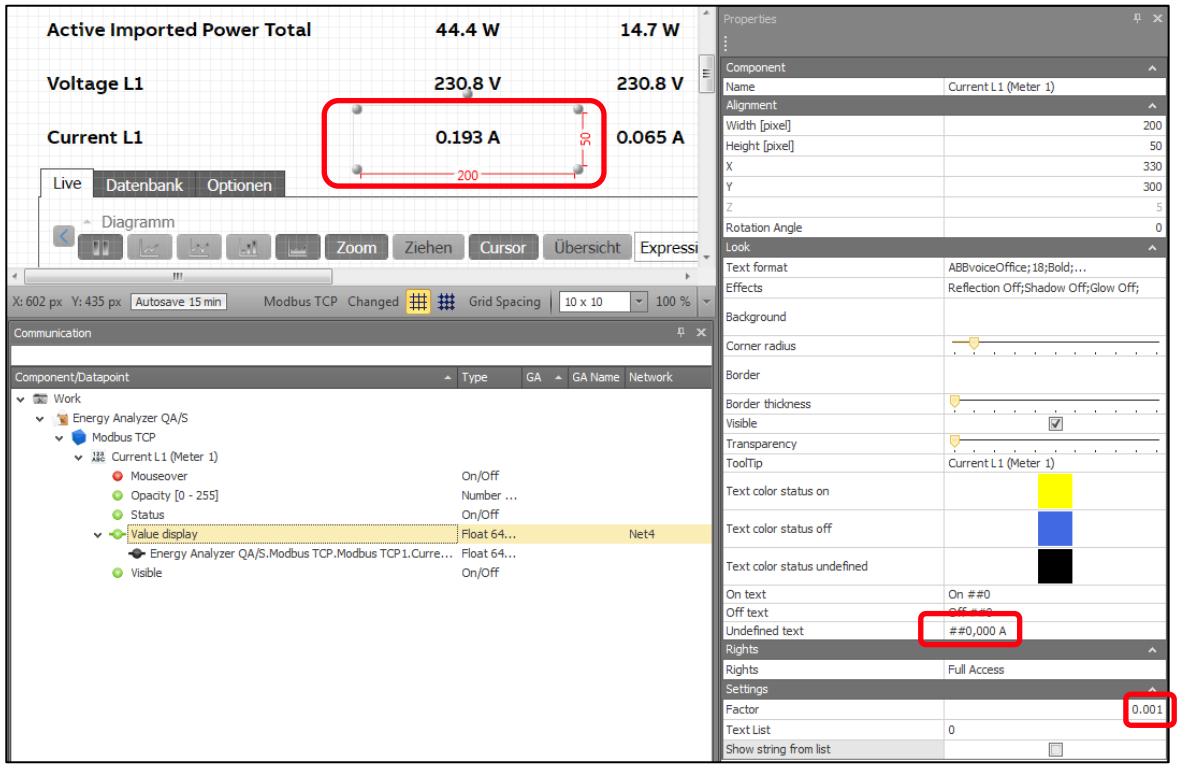
Collection, management and storage of meter data from QA/S via Modbus TCP

Settings of component “Value driven text”: Voltage



Settings of component “Value driven text”: Current



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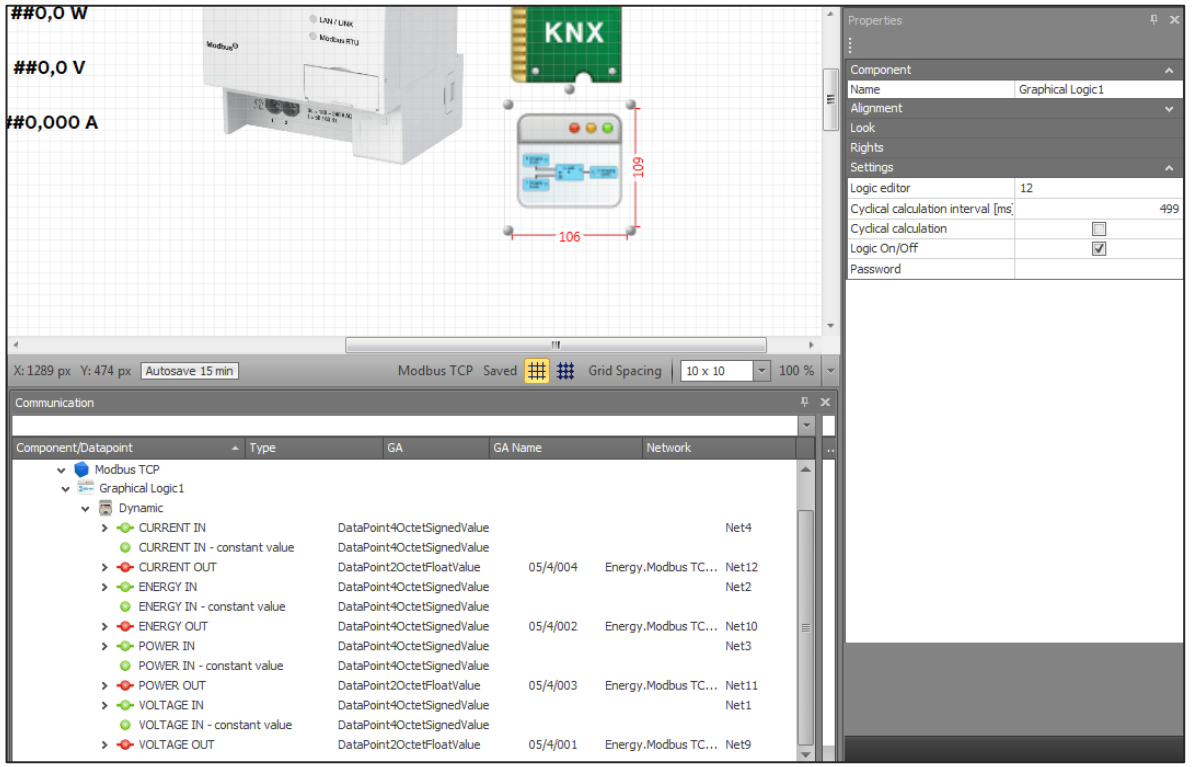
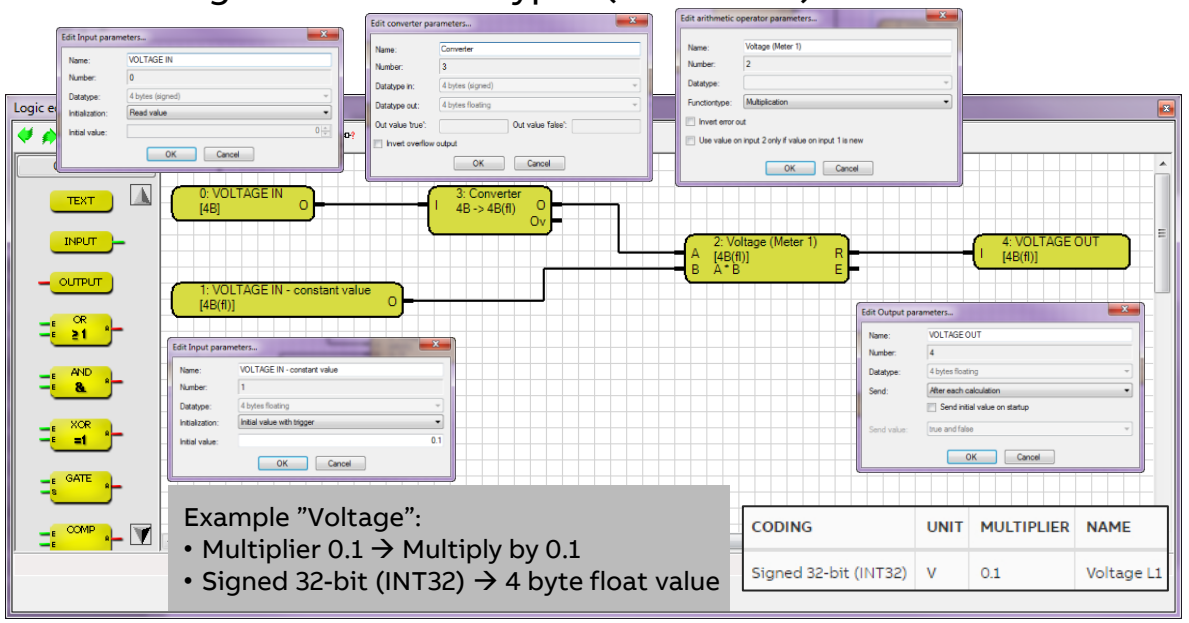
Collection, management and storage of meter data from QA/S via Modbus TCP

Settings of component “Graphical Logic”: Multiplier



Divide by multiplier and convert integer to floating point

- The QA/S sends the values with a factor (multiplier)
- These values must be multiplied by the multiplier and converted from integer to KNX data types (float value)



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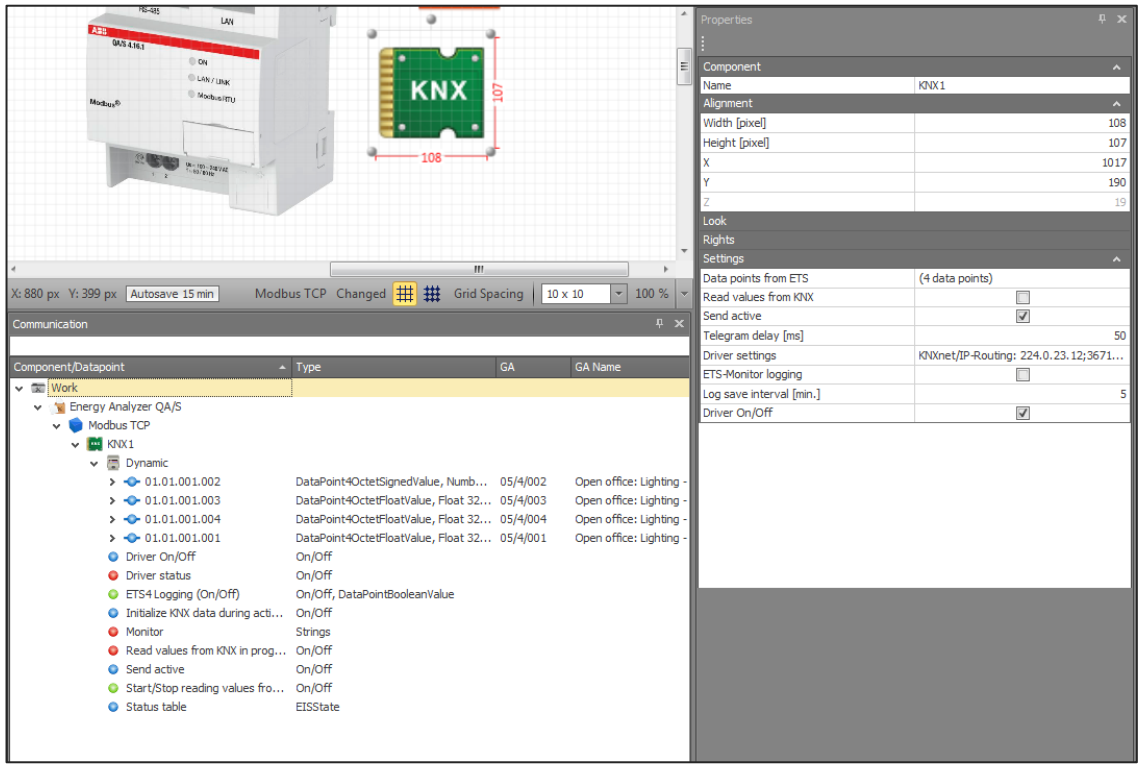
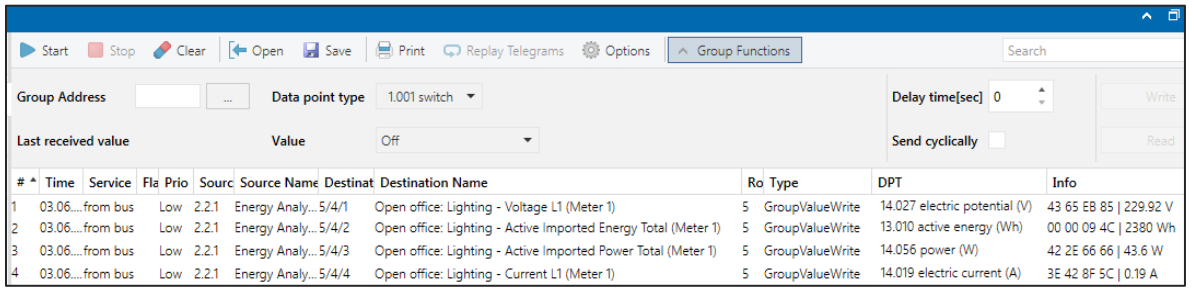
Collection, management and storage of meter data from QA/S via Modbus TCP

Settings of “KNX driver”



ETS: Group monitor



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Collection, management and storage of meter data from QA/S via Modbus TCP

Data sharing via Modbus TCP: PLC Controller AC500 with integrated KNX interface

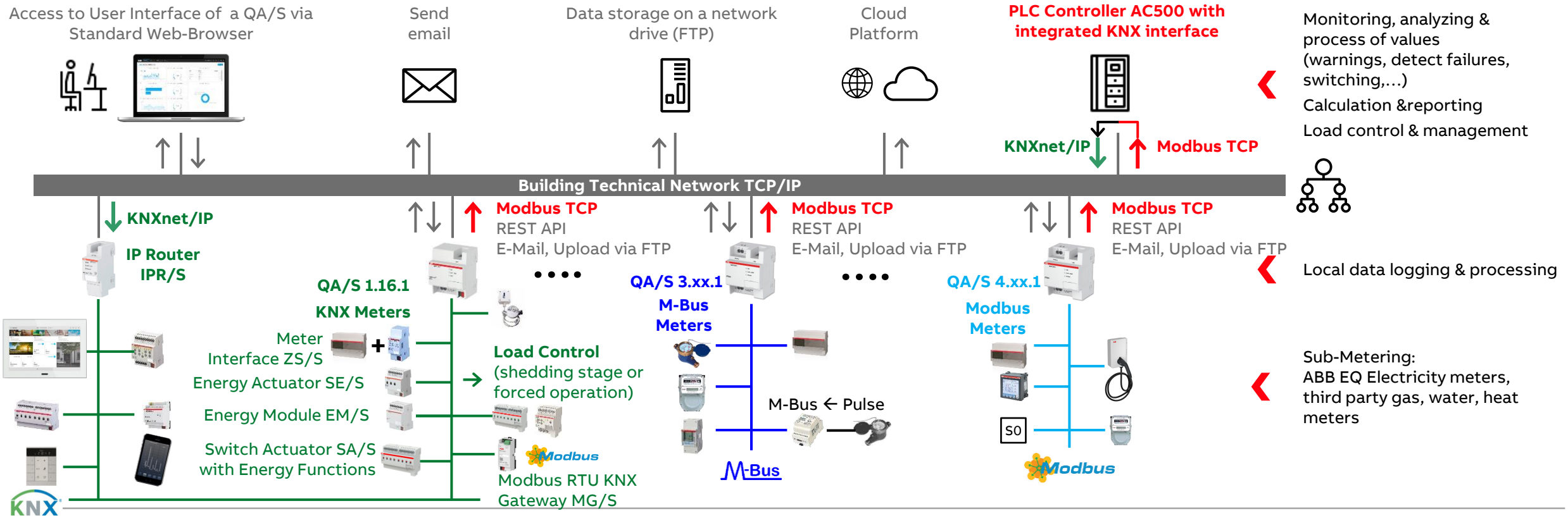


ABB EQmatic Energy Analyzer QA/S x.yy.1

Collection, management and storage of meter data from QA/S via Modbus TCP

Data sharing via Modbus TCP to KNX: PLC Controller AC500 with integrated KNX interface

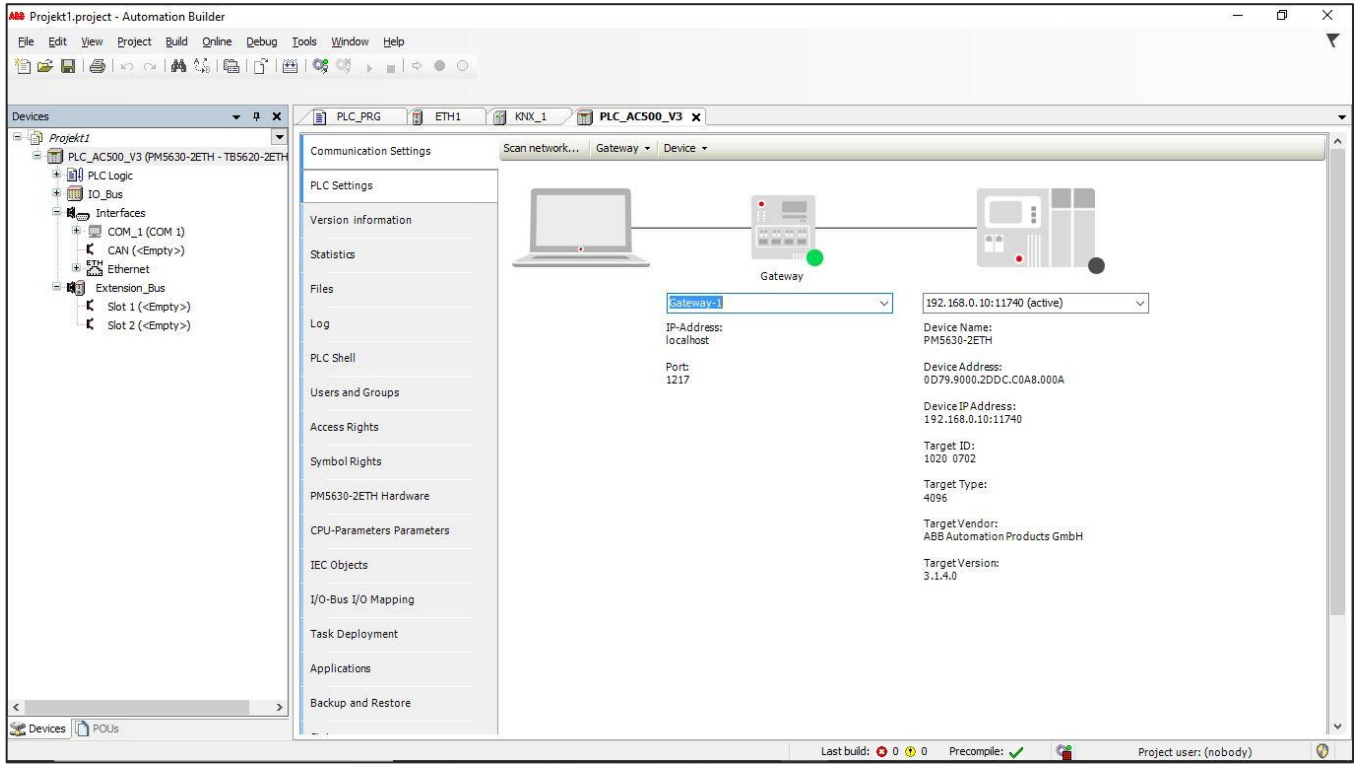


ABB EQmatic Energy Analyzer QA/S x.yy.1

Collection, management and storage of meter data from QA/S via Modbus TCP

Data sharing via Modbus TCP to KNX: PLC Controller AC500 with integrated KNX interface

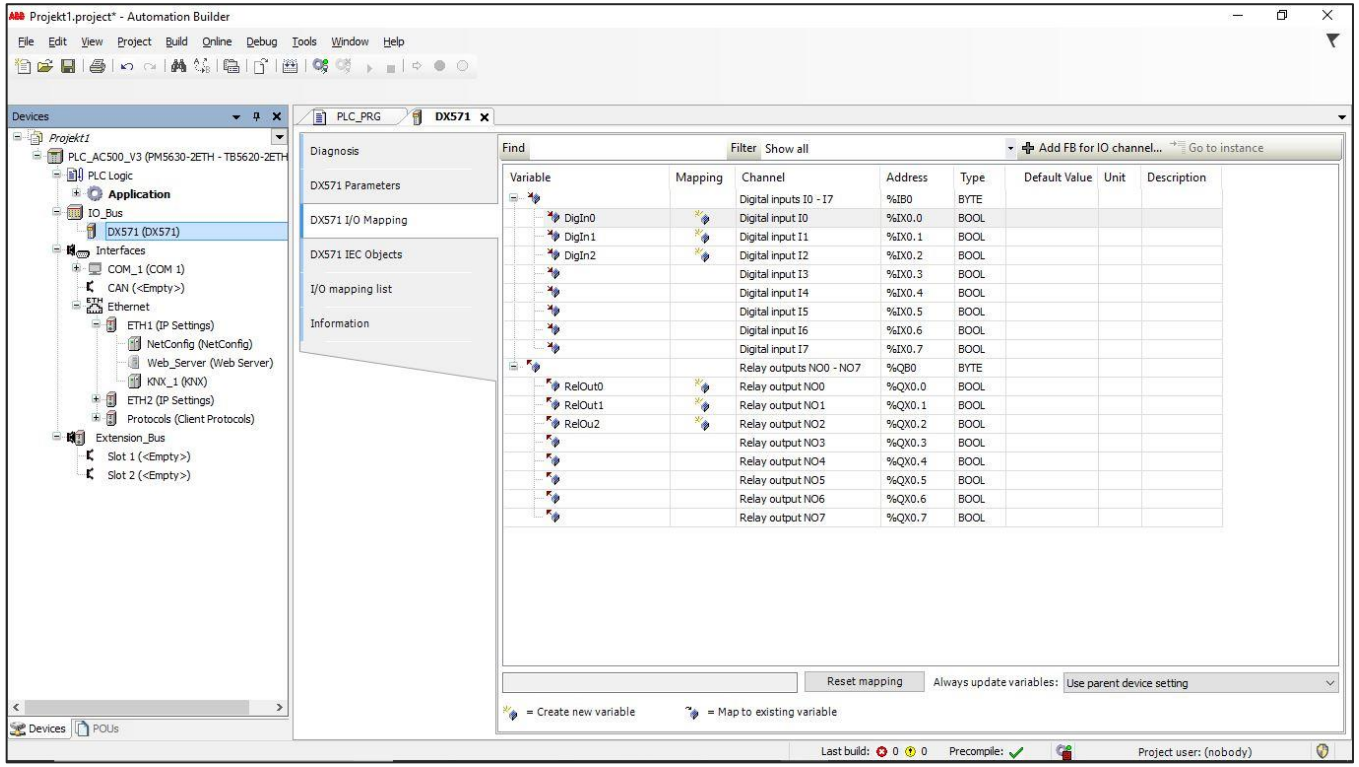


ABB EQmatic Energy Analyzer QA/S x.yy.1

Collection, management and storage of meter data from QA/S via Modbus TCP

Data sharing via Modbus TCP to KNX: PLC Controller AC500 with integrated KNX interface

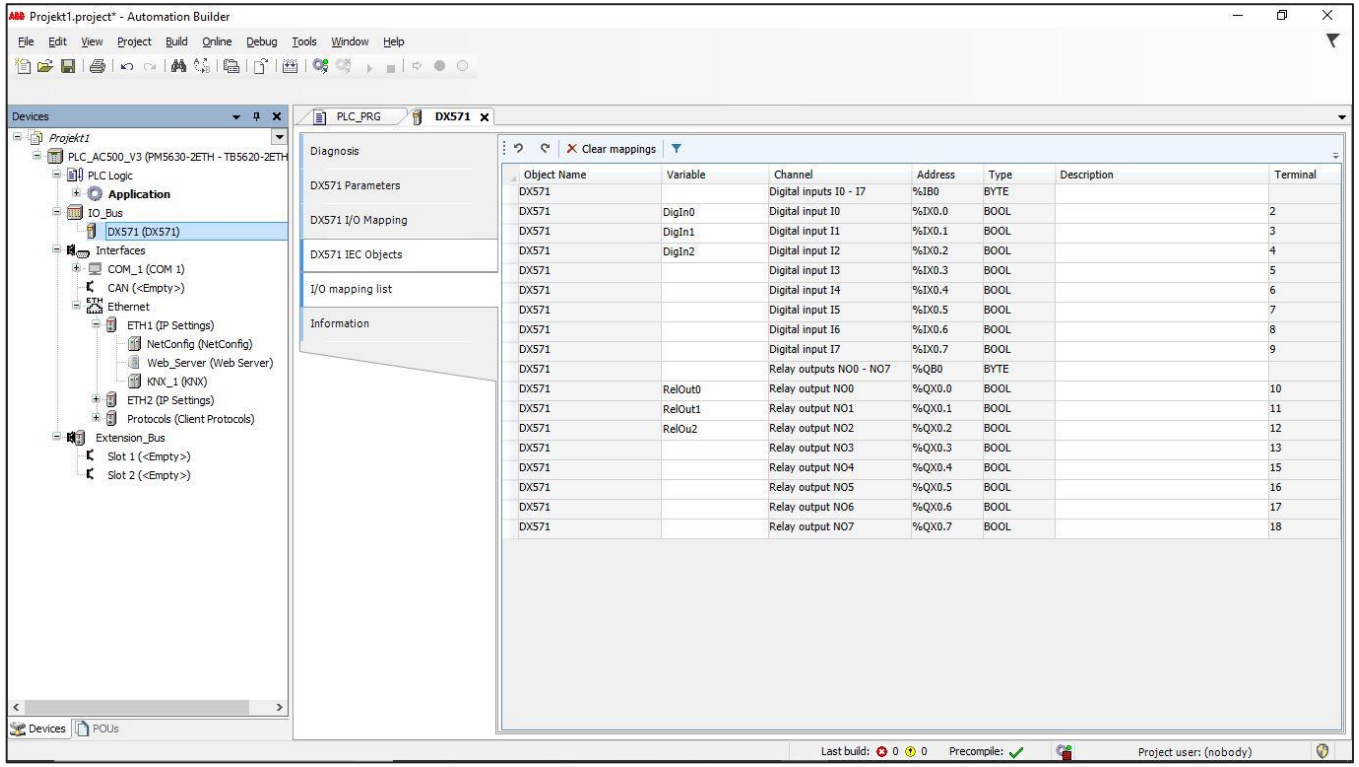


ABB EQmatic Energy Analyzer QA/S x.yy.1

Collection, management and storage of meter data from QA/S via Modbus TCP

Data sharing via Modbus TCP to KNX: PLC Controller AC500 with integrated KNX interface

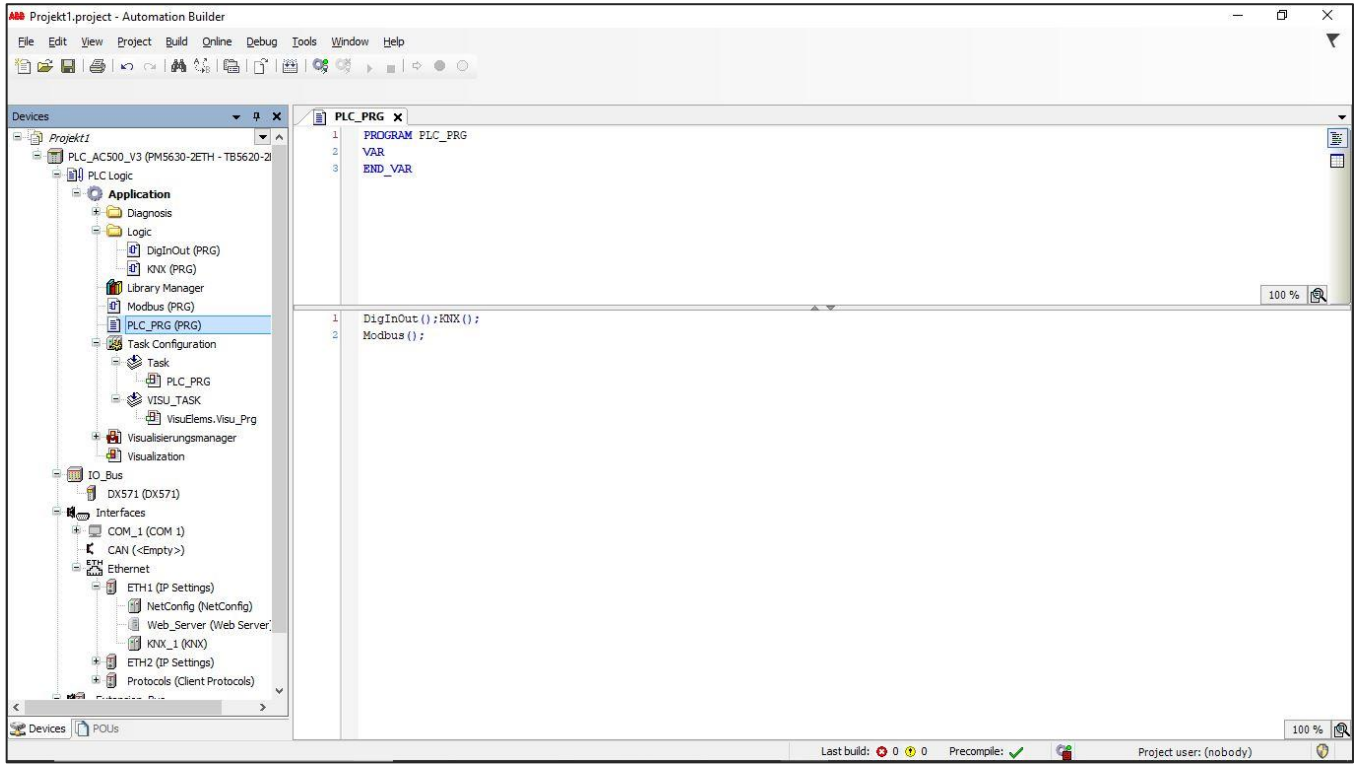
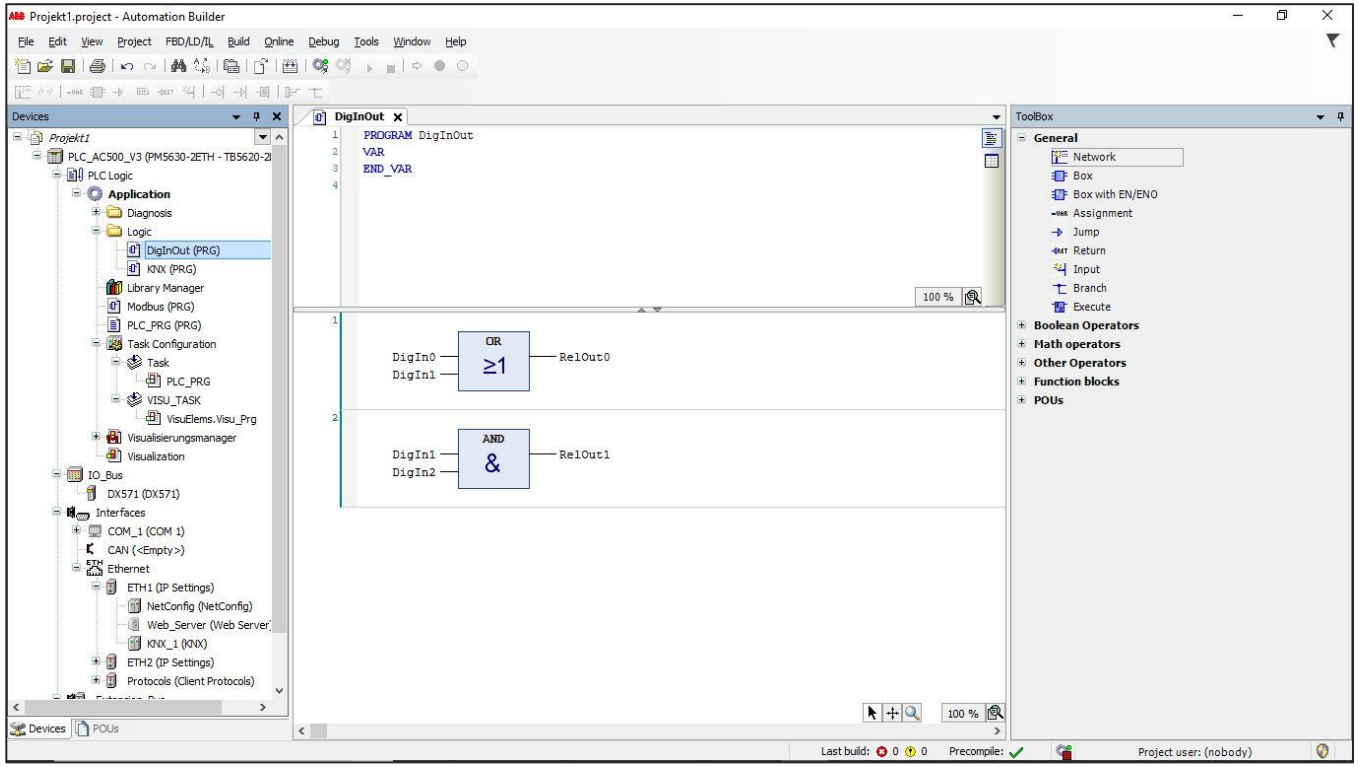


ABB EQmatic Energy Analyzer QA/S x.yy.1

Collection, management and storage of meter data from QA/S via Modbus TCP

Data sharing via Modbus TCP to KNX: PLC Controller AC500 with integrated KNX interface



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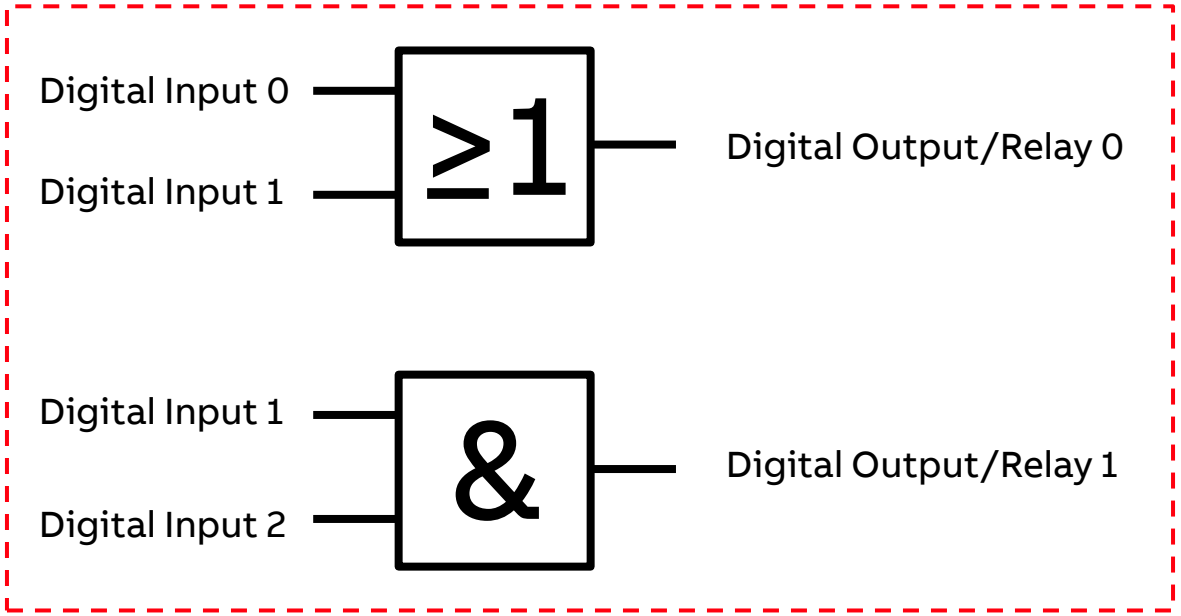
Collection, management and storage of meter data from QA/S via Modbus TCP

Data sharing via Modbus TCP to KNX: PLC Controller AC500 with integrated KNX interface



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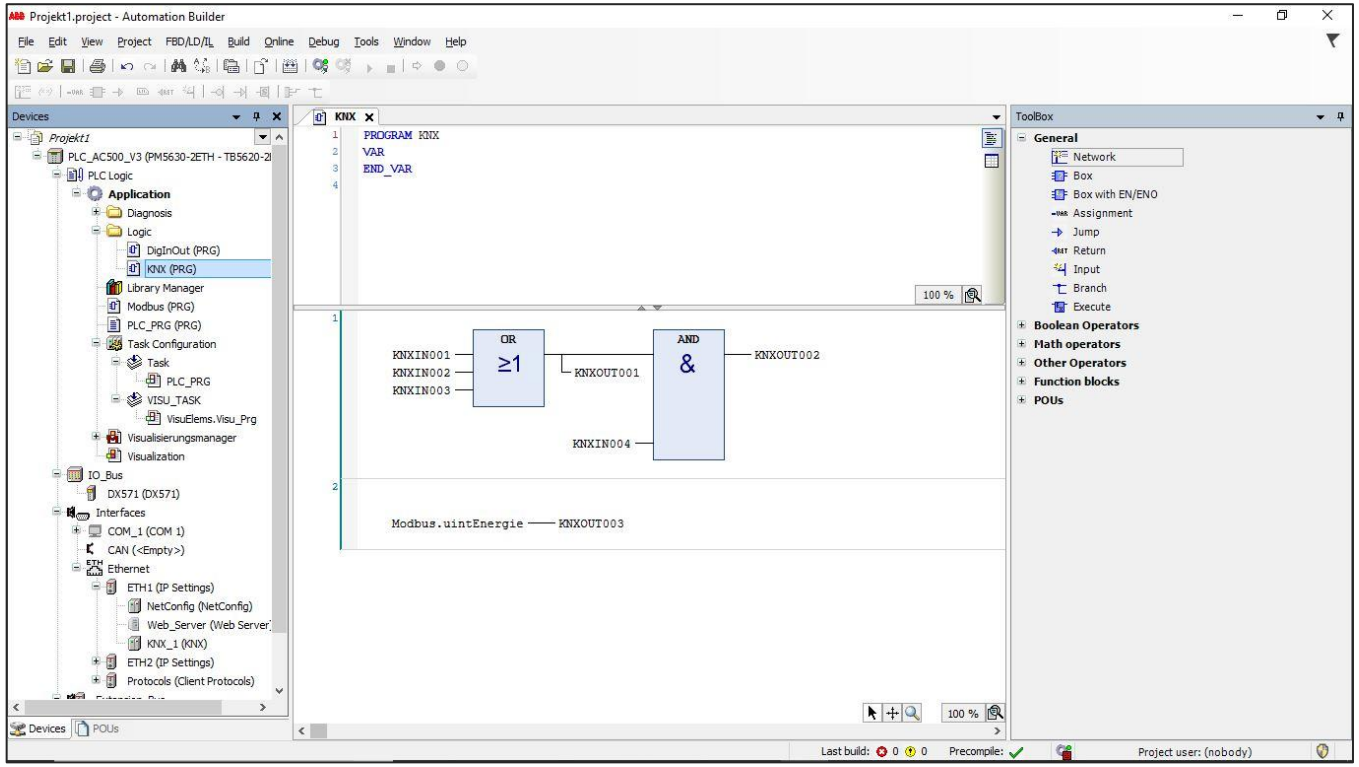

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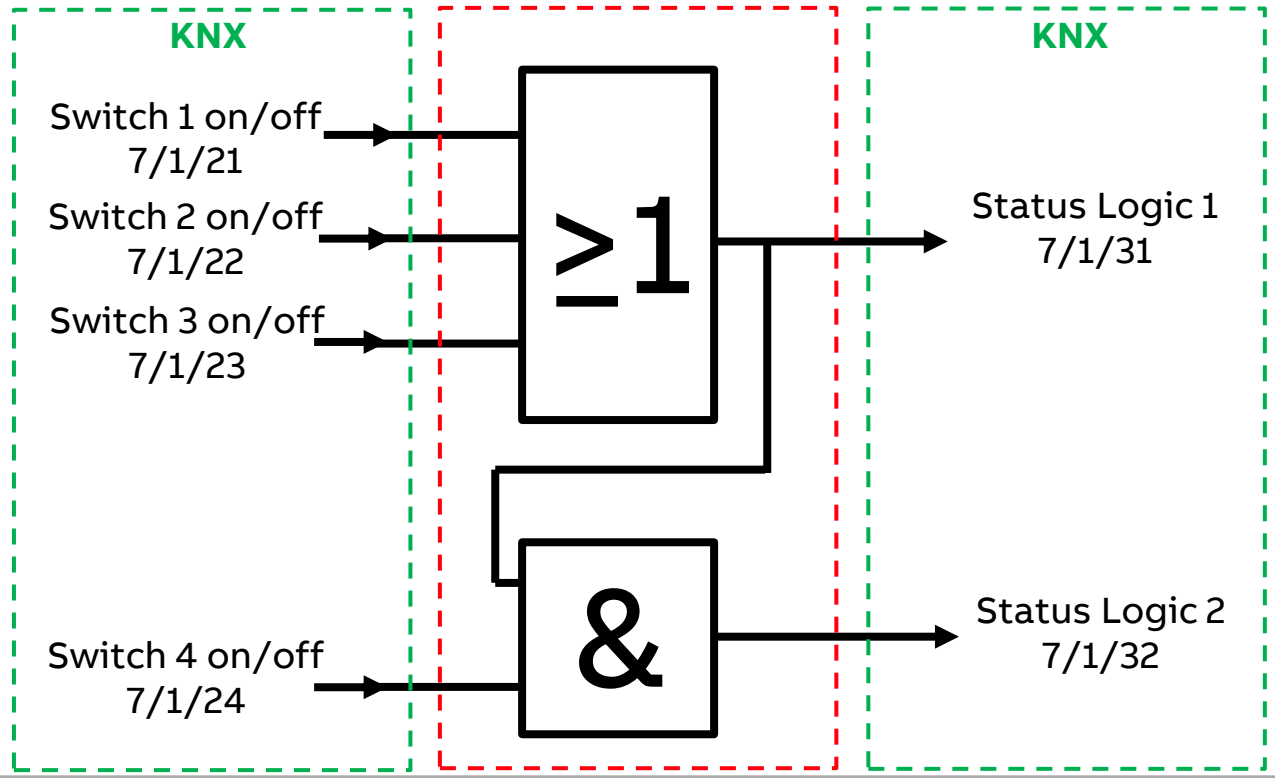

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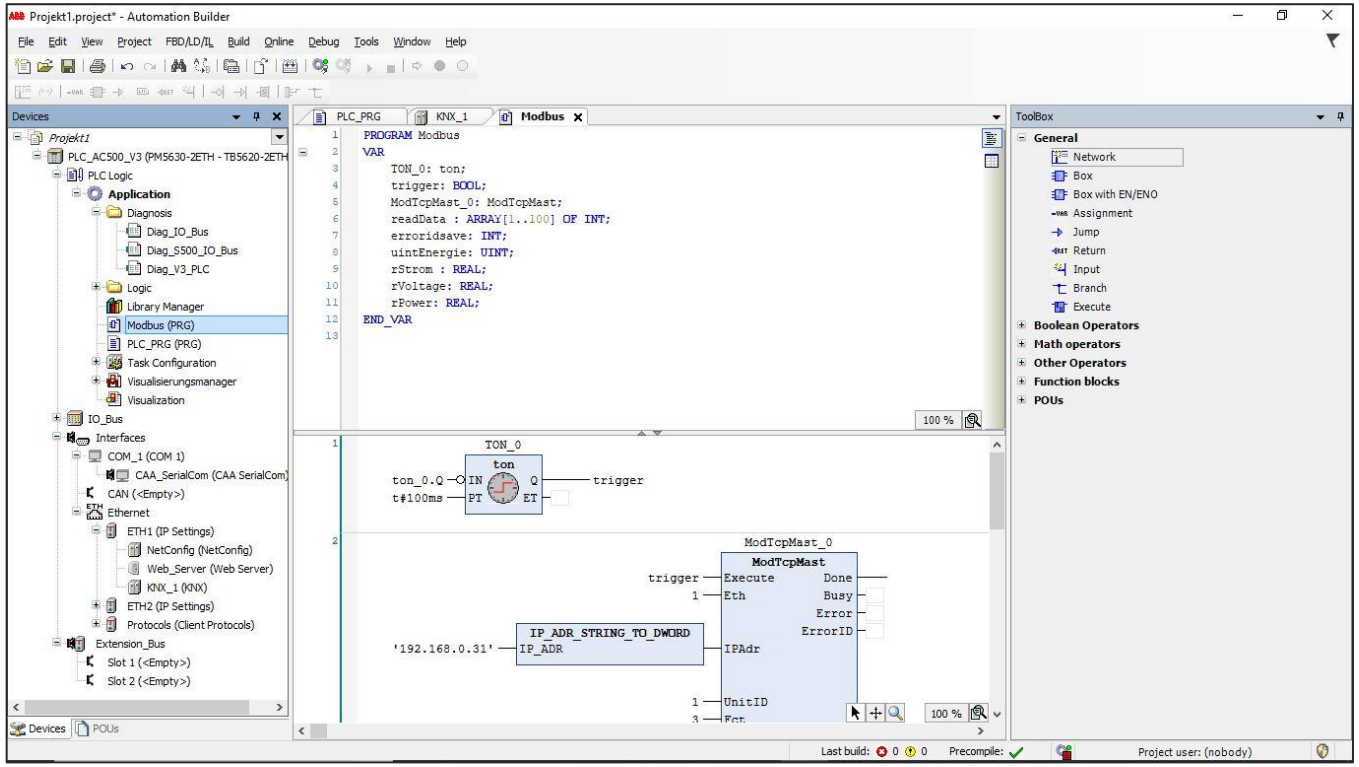

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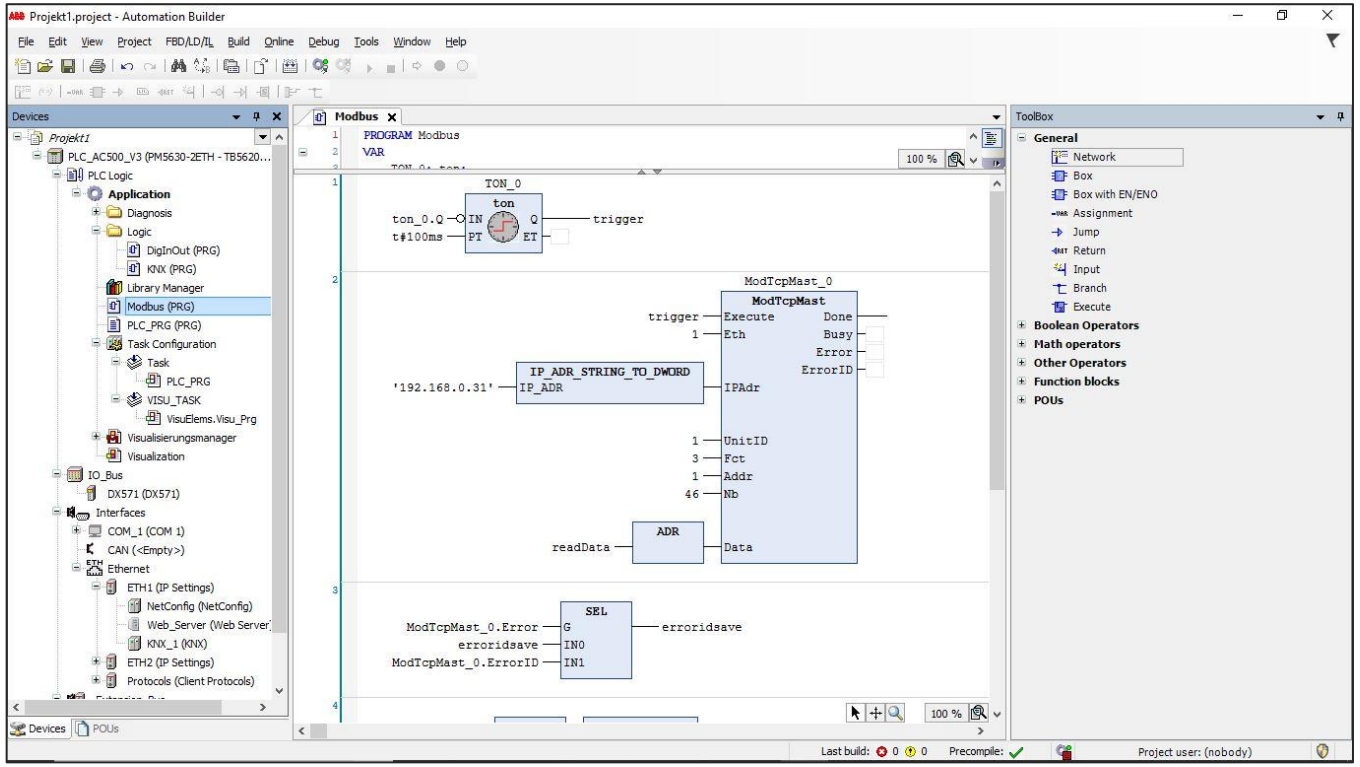

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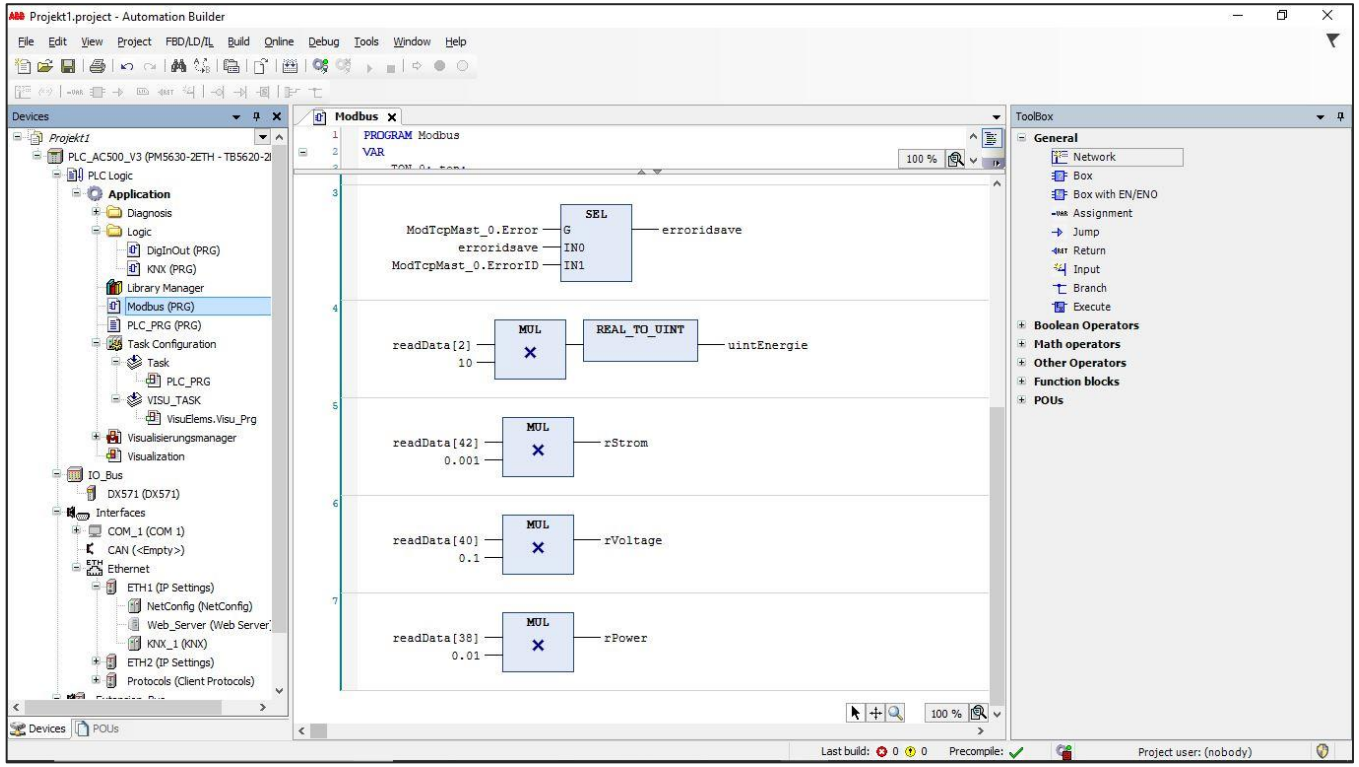

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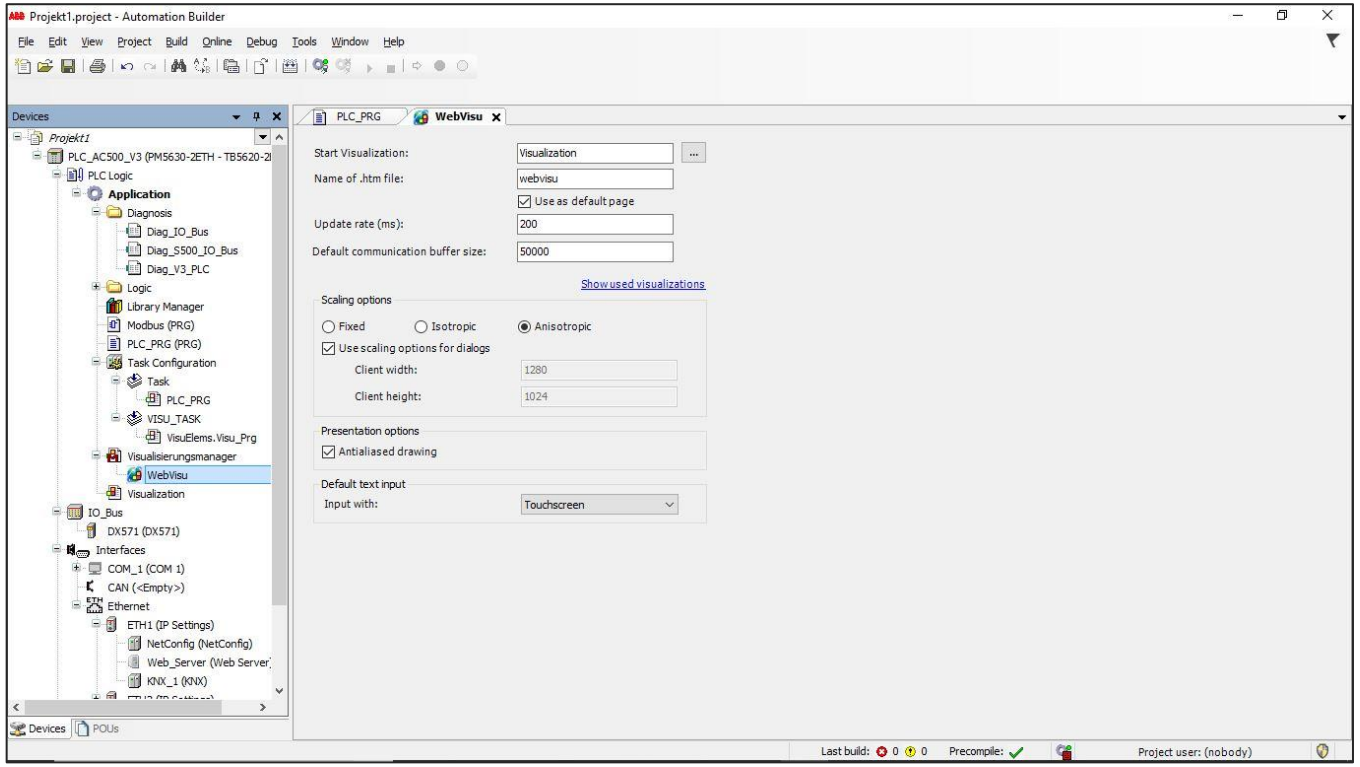

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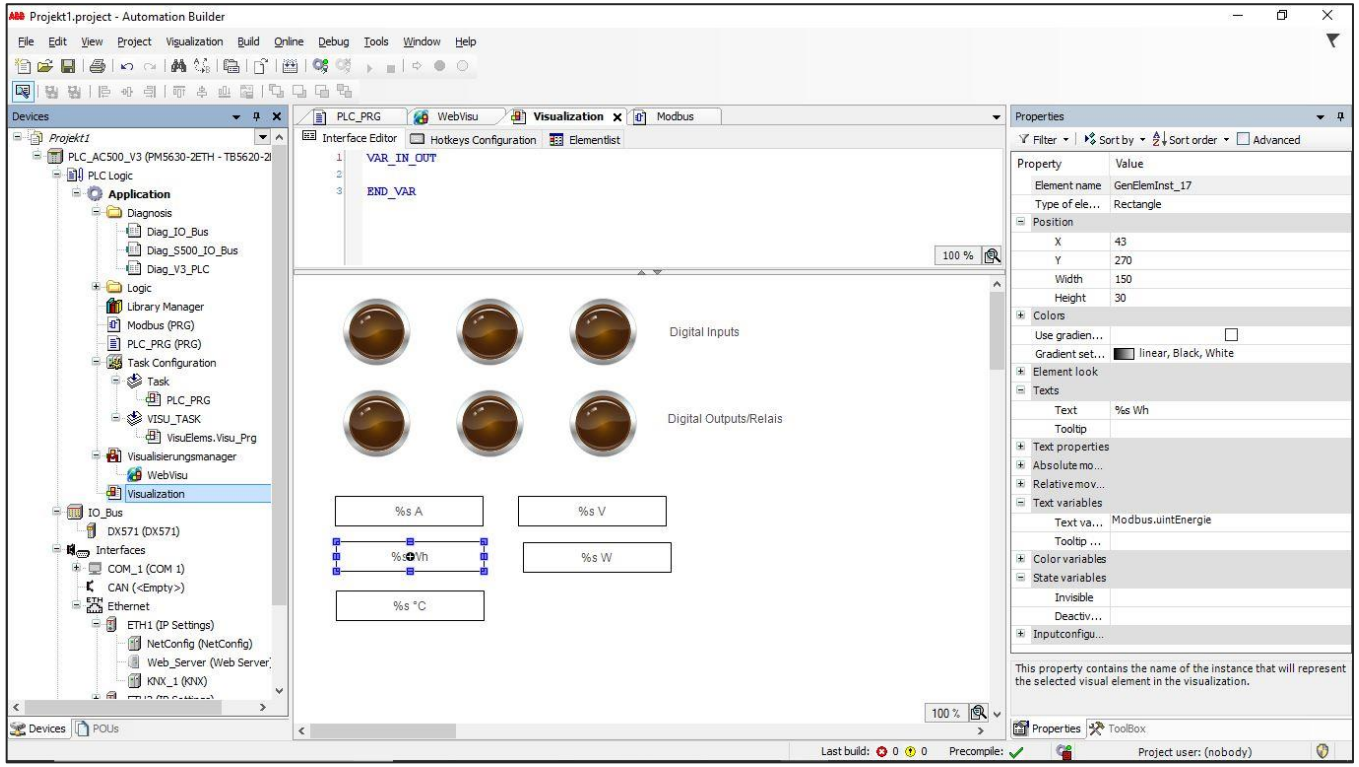

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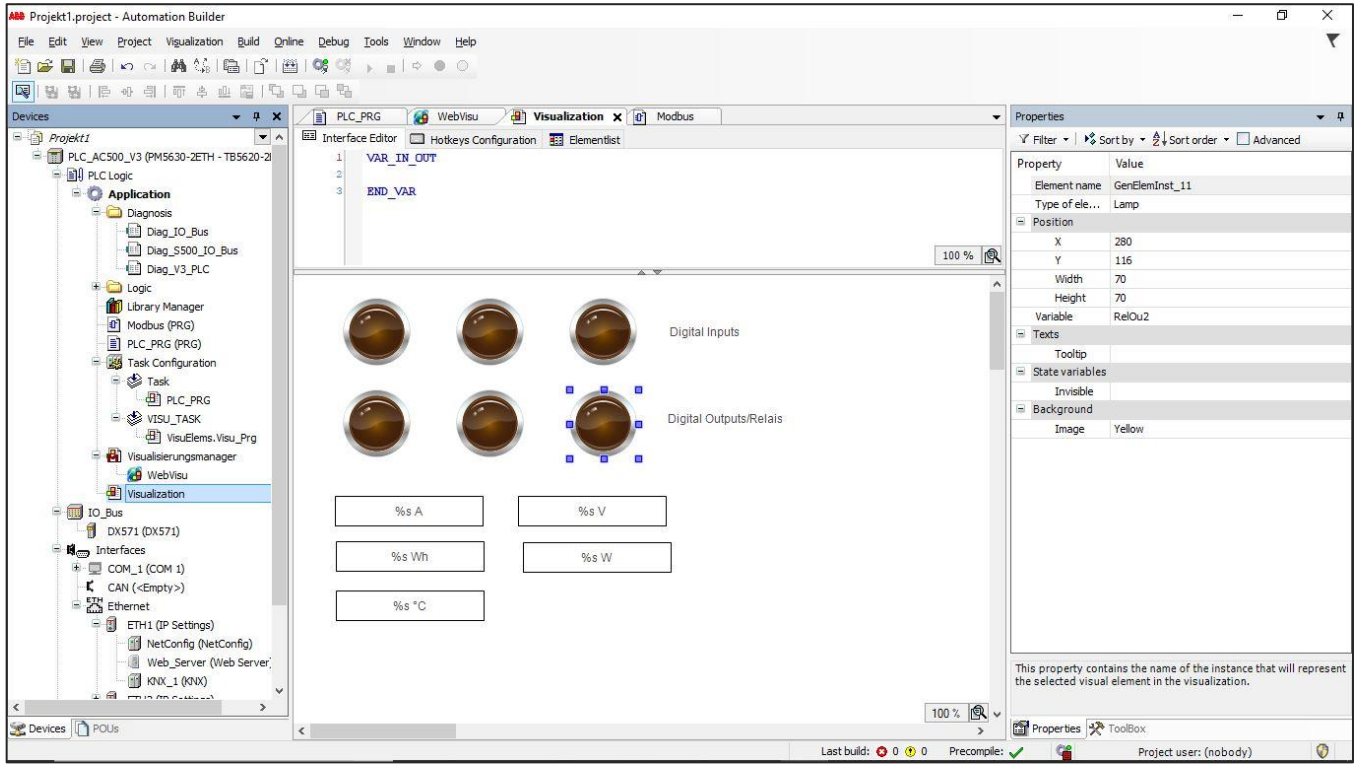

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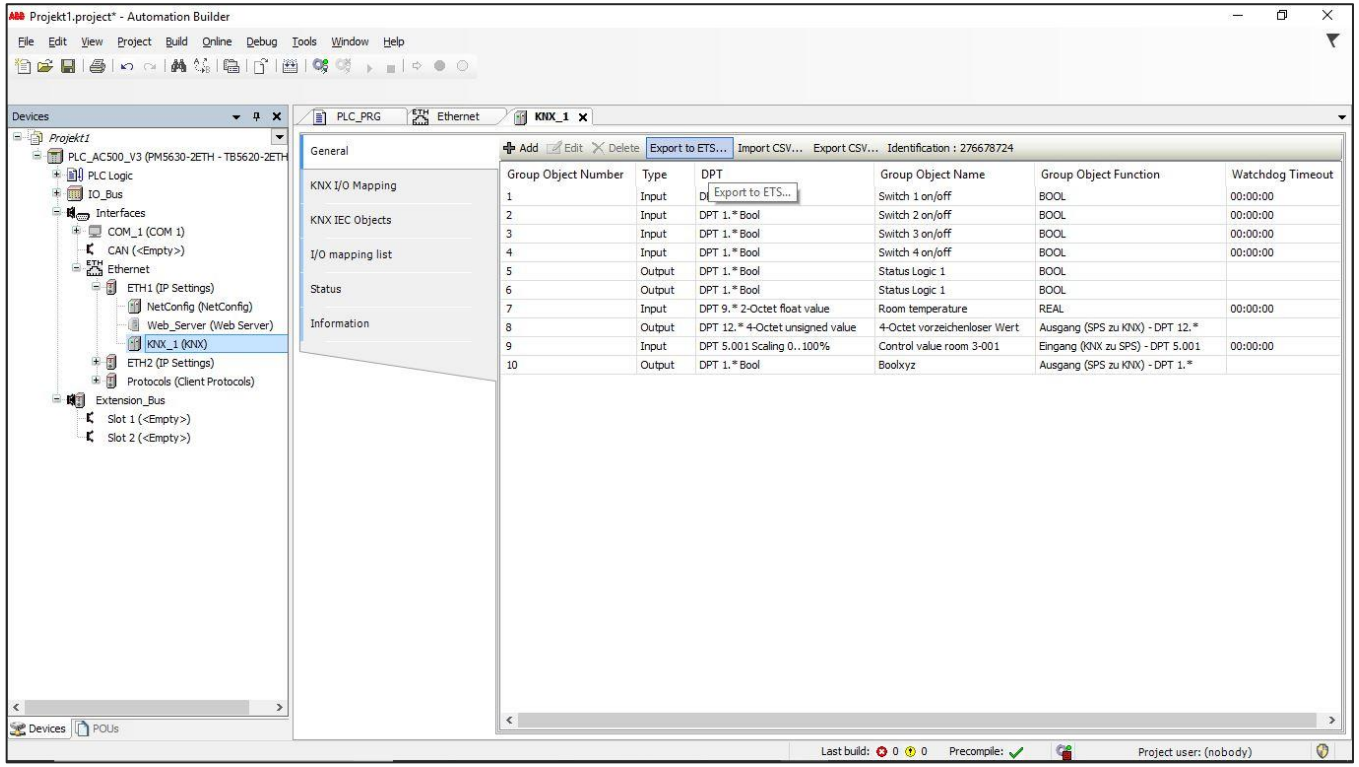

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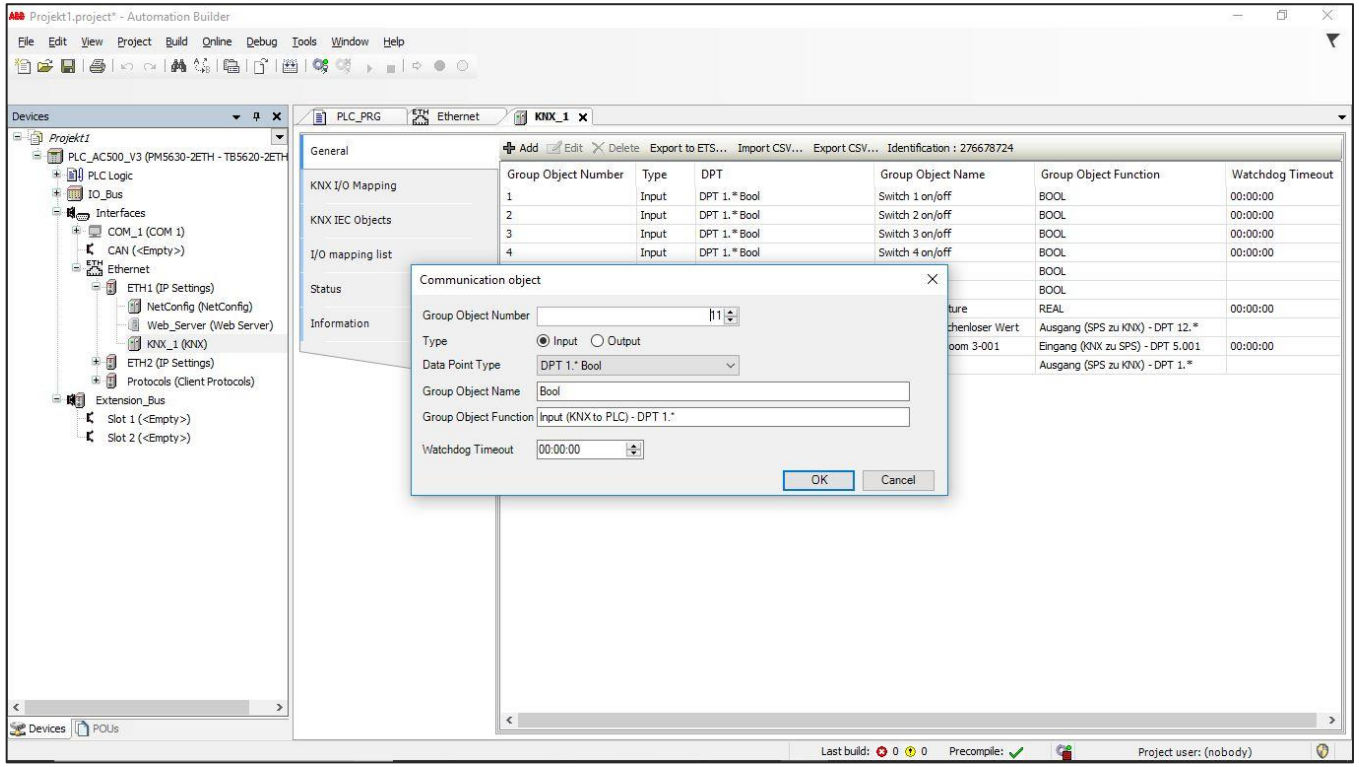

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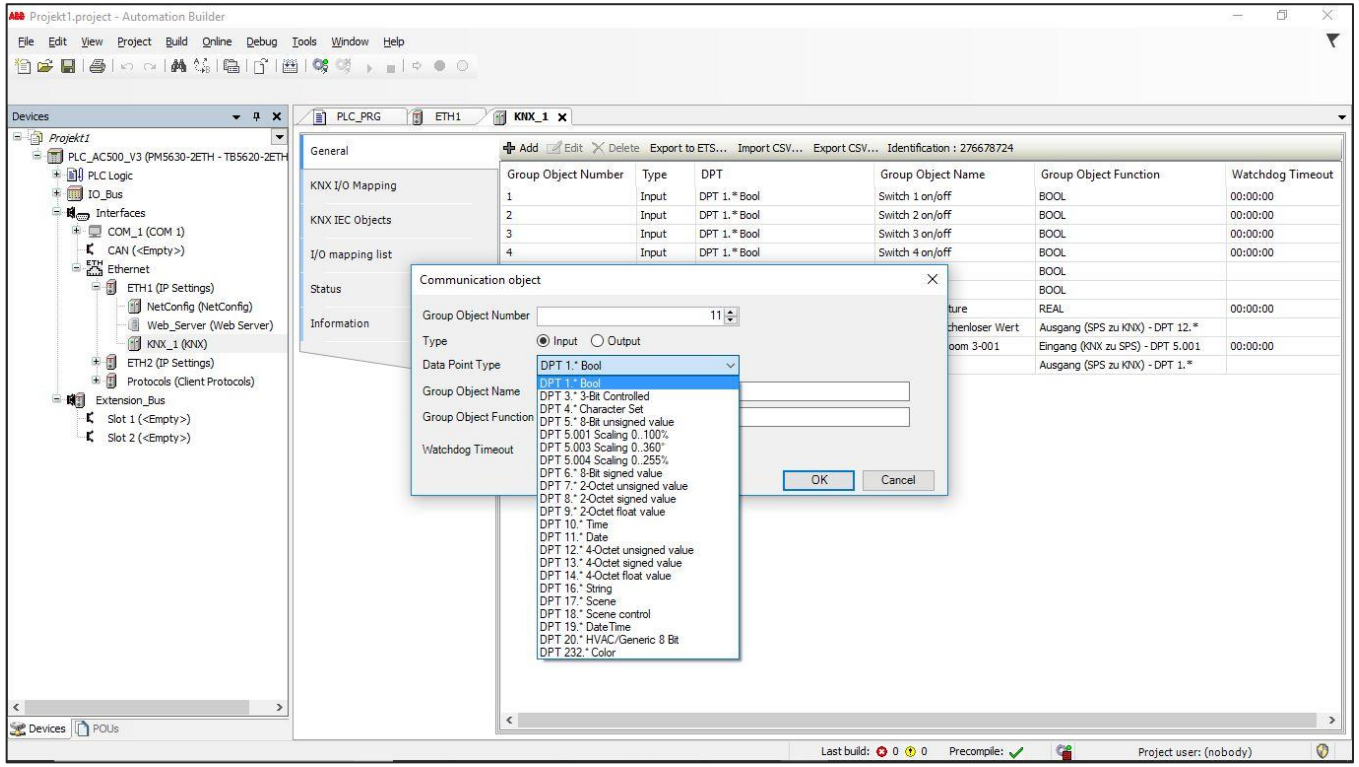

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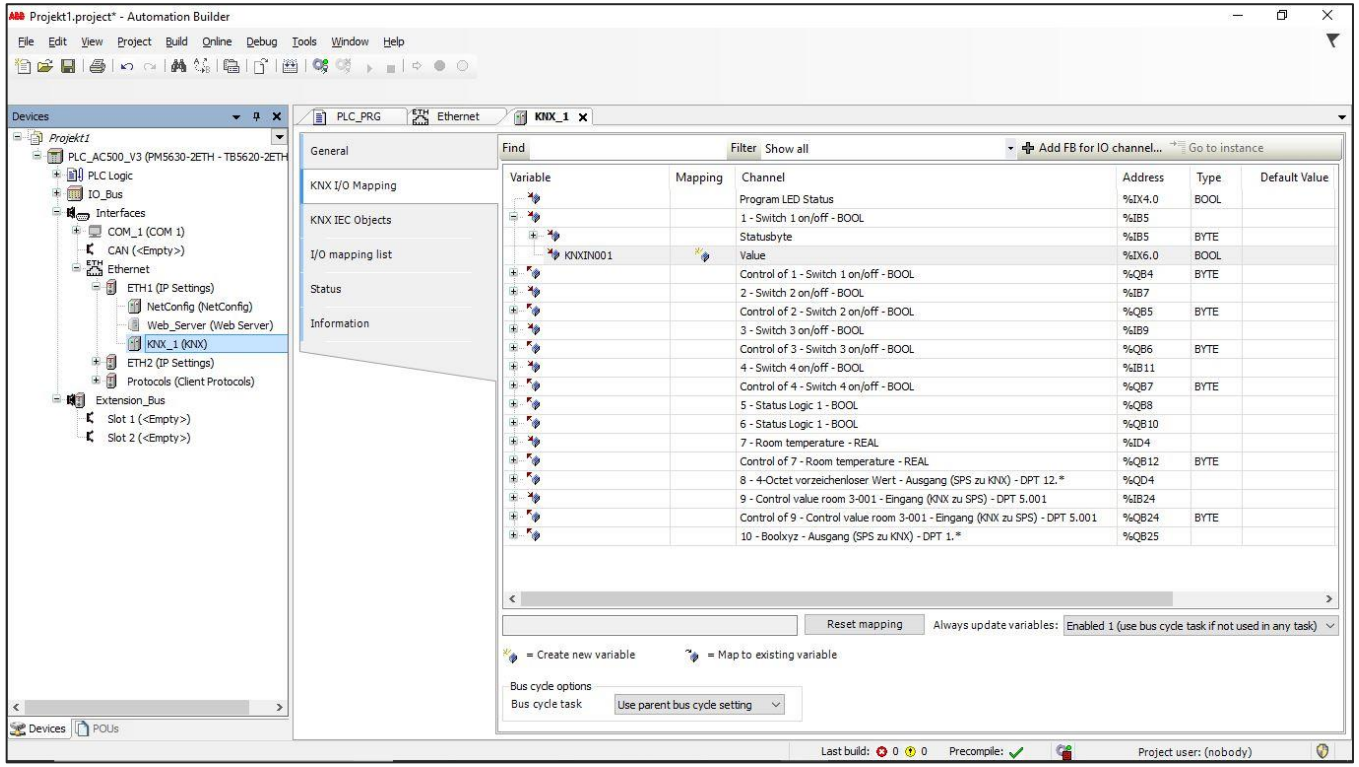

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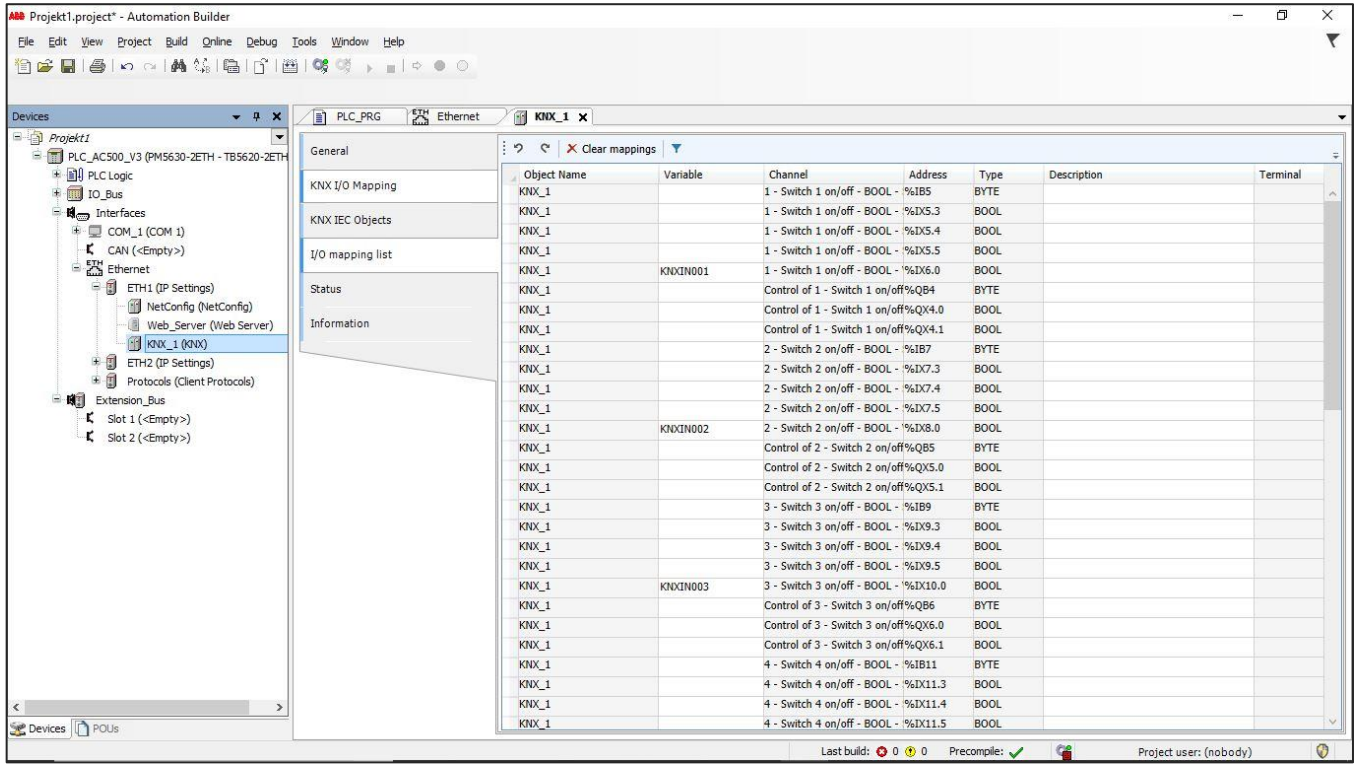

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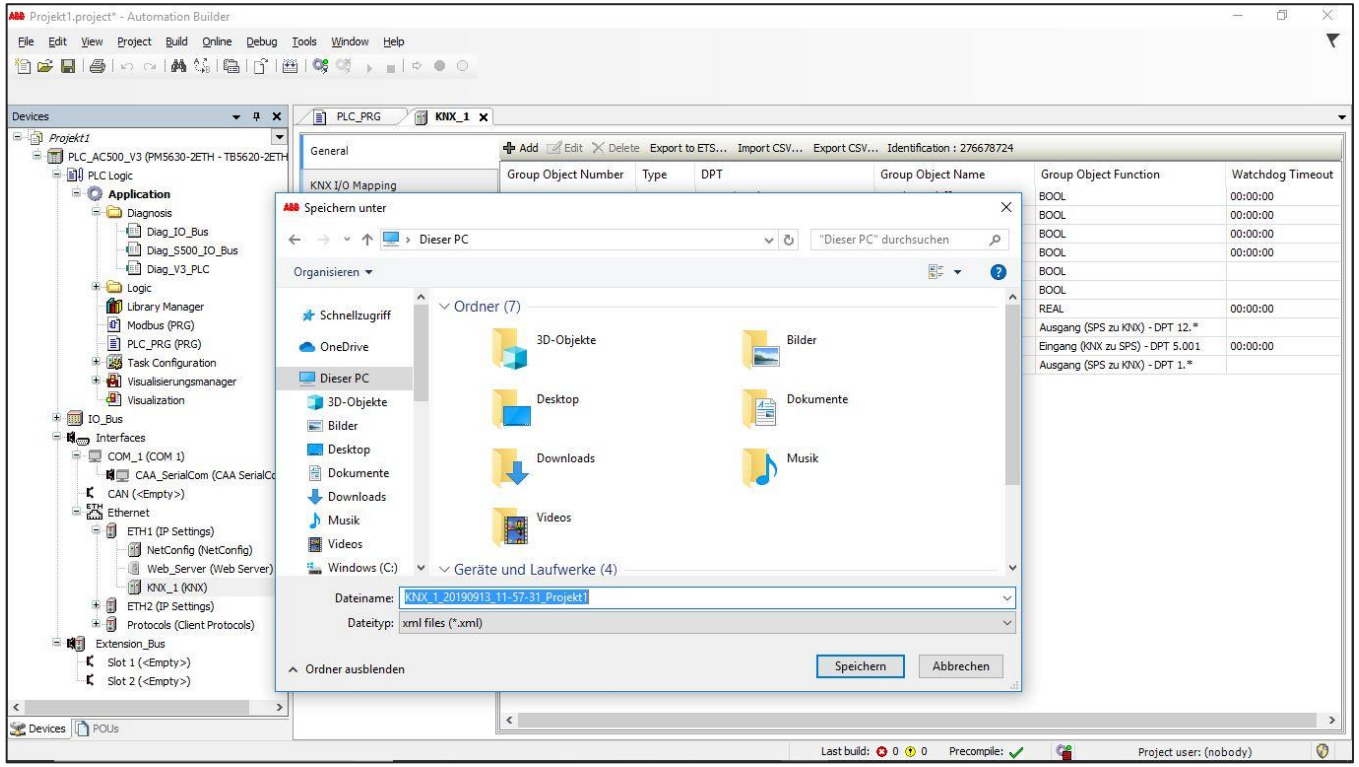

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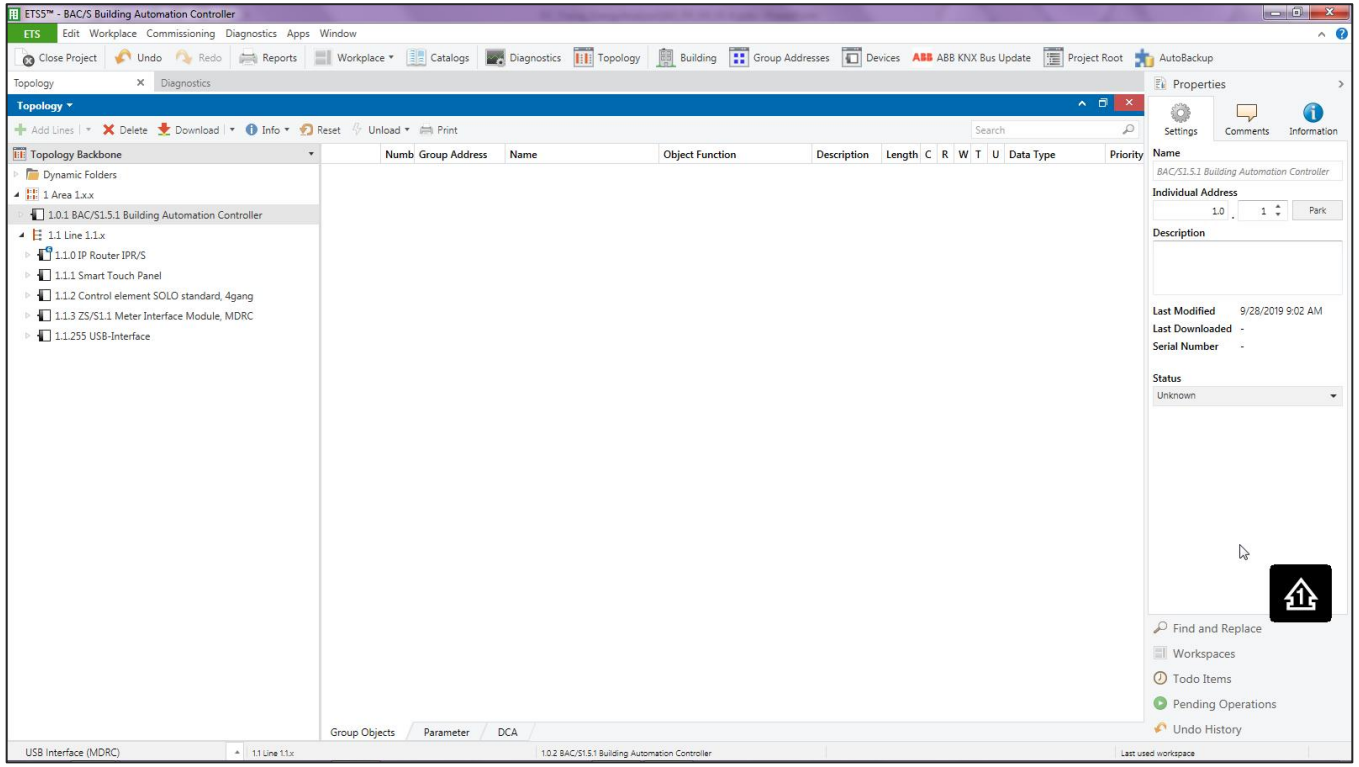

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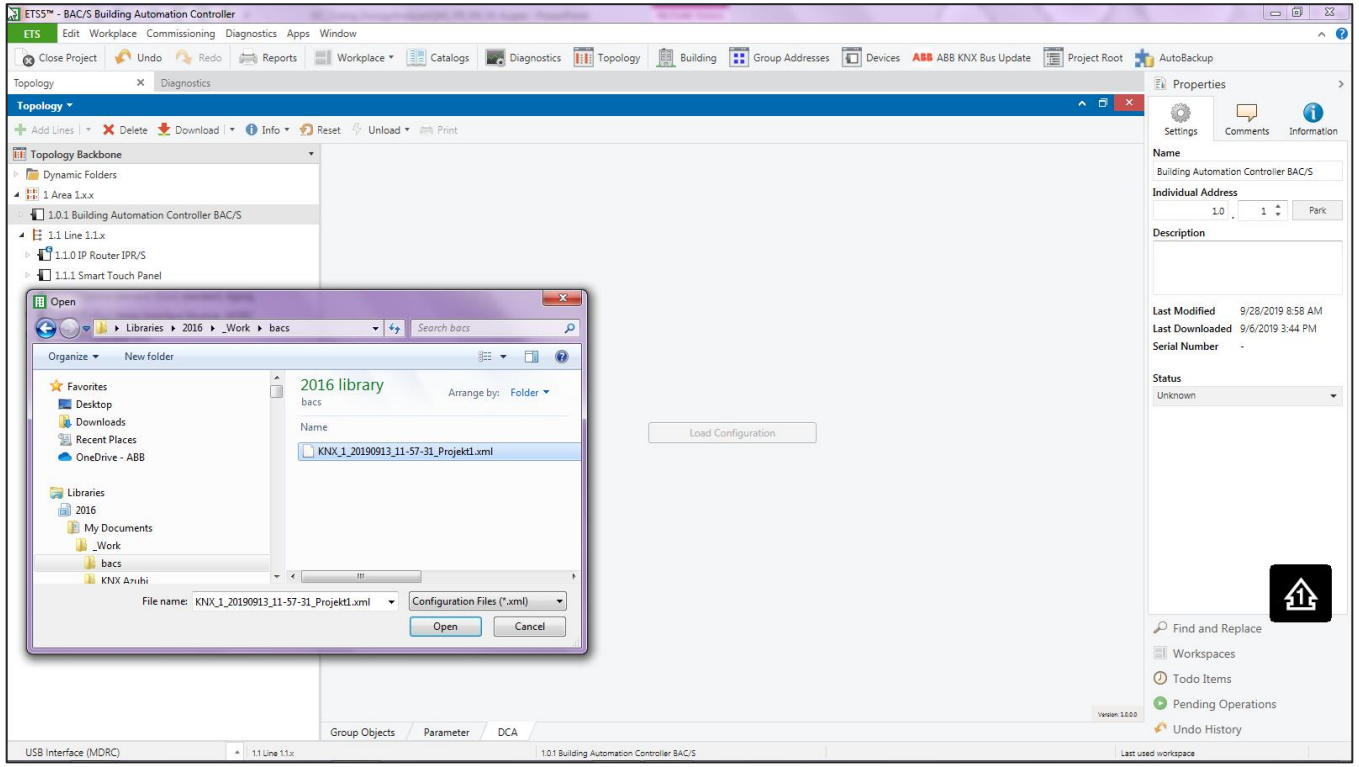

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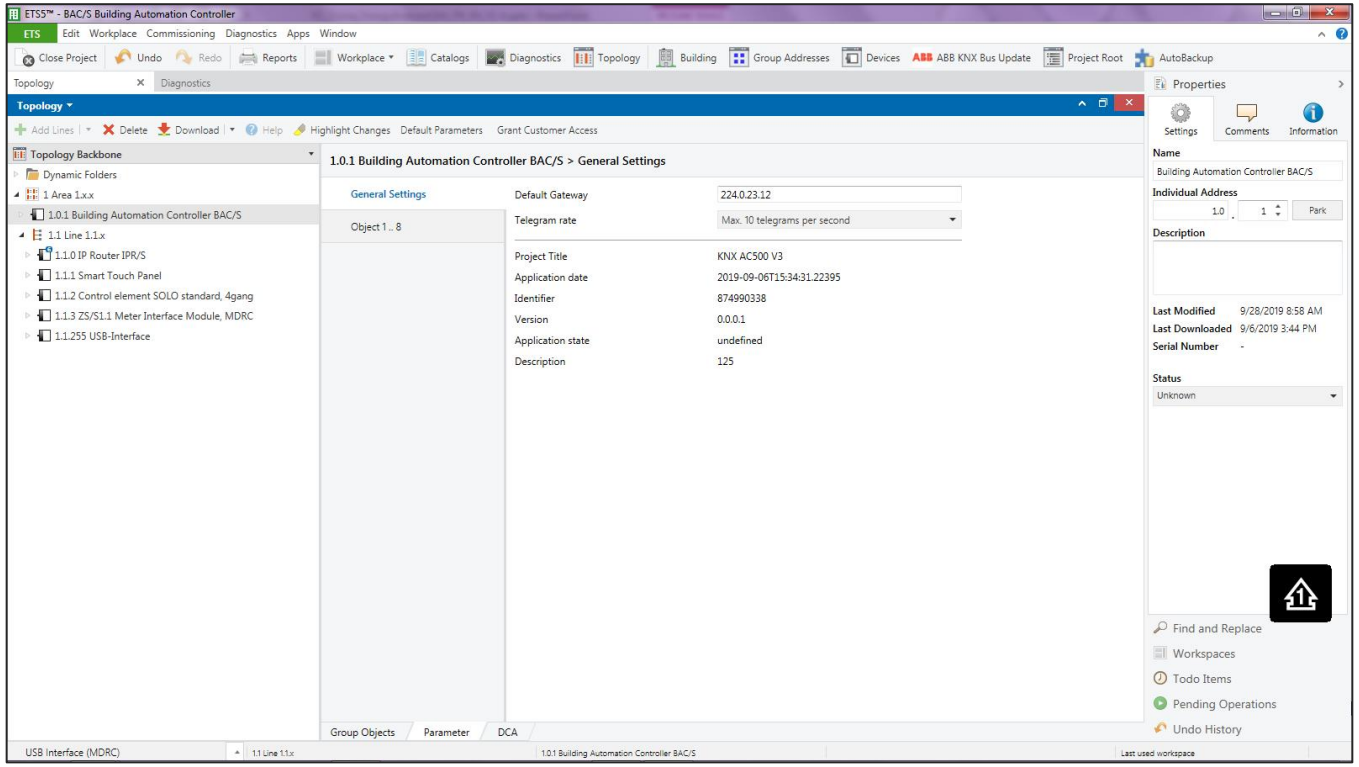

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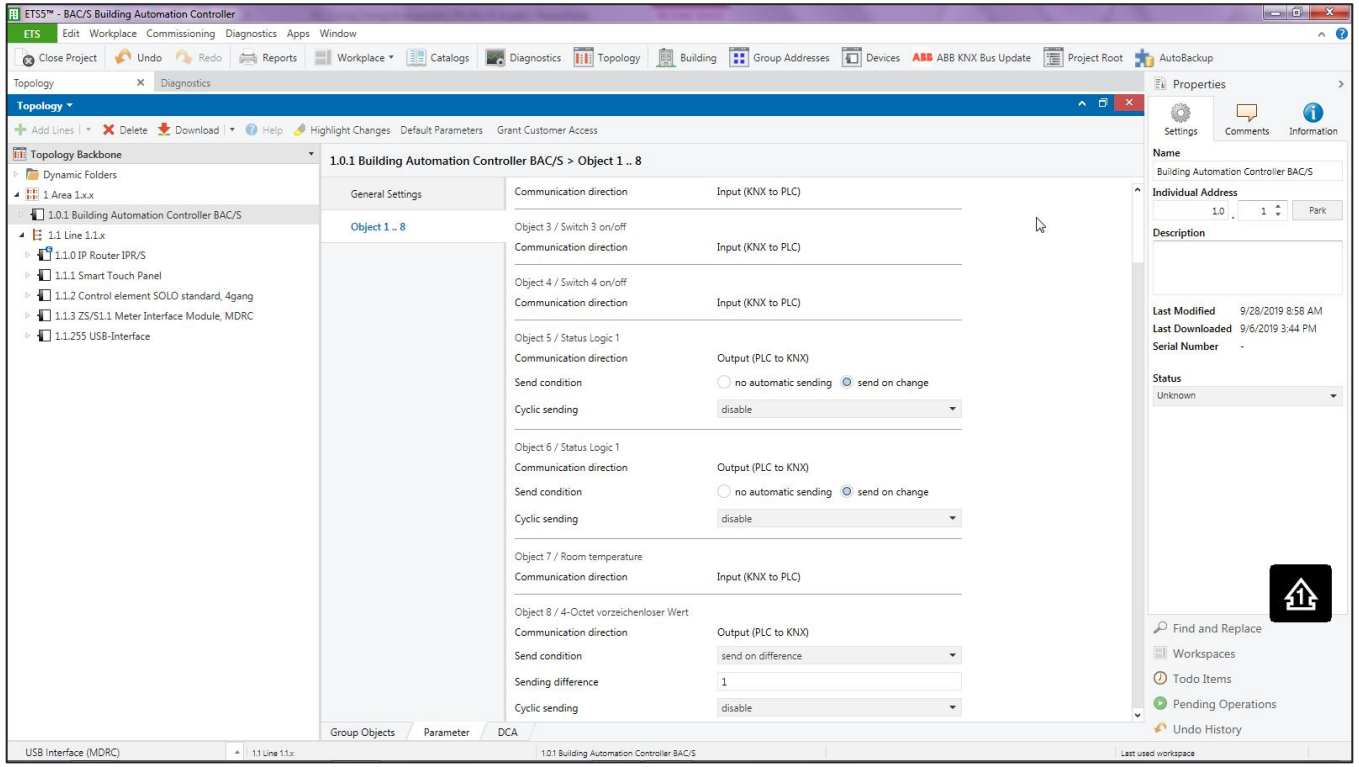

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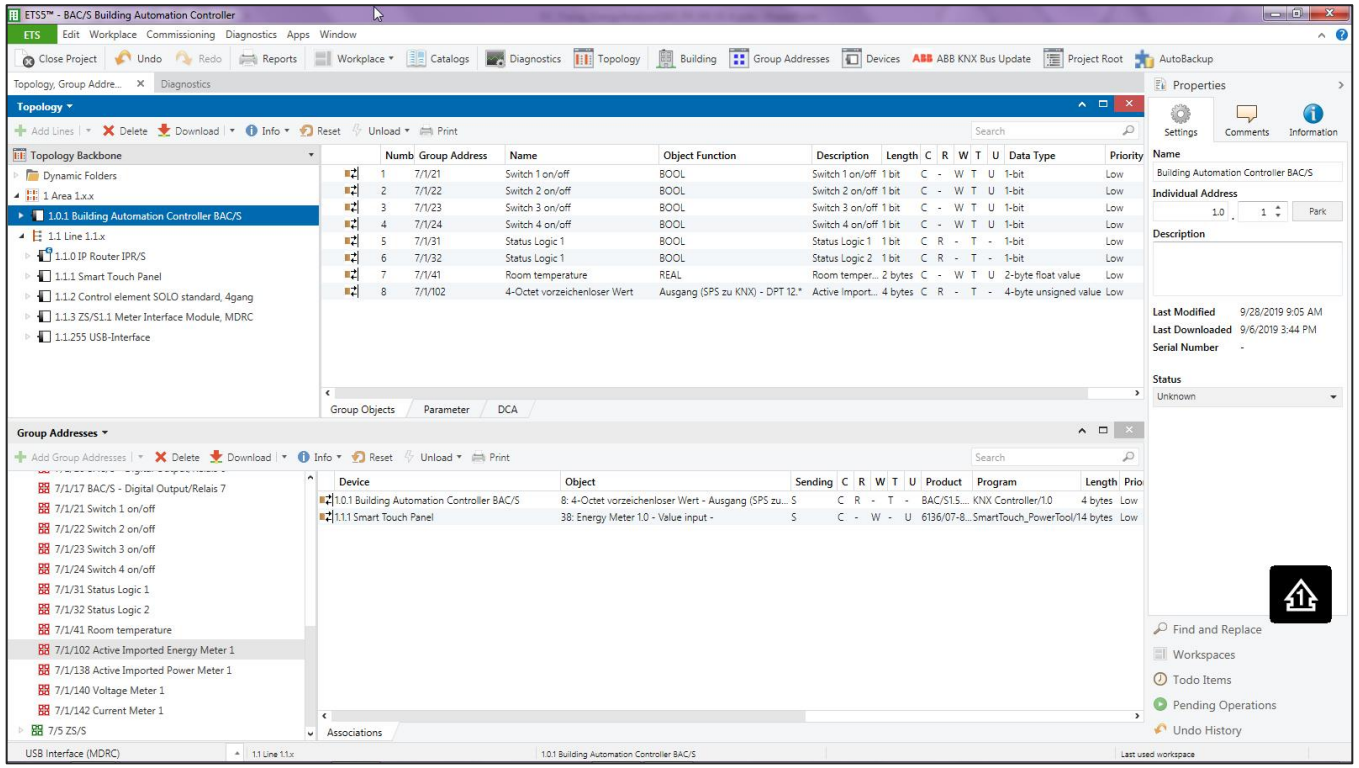

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Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox

Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox

Smarter mobility – charging infrastructure for electric vehicles

- ABB offers a total EV charging solution from compact, high-quality AC Wallboxes, reliable DC fast charging stations with robust connectivity, to innovative on-demand electric bus charging systems, we deploy infrastructure that meet the needs of the next generation of smarter mobility
- The Terra AC Wallbox is a powerful yet cost-effective charging solution for electric vehicles, which is characterized by its range of functions, in particular through digital integration in the apps and portals or energy management systems supplied
- Whether in a single/multi-family house, functional building or in the parking garage

Terra AC-Wallbox

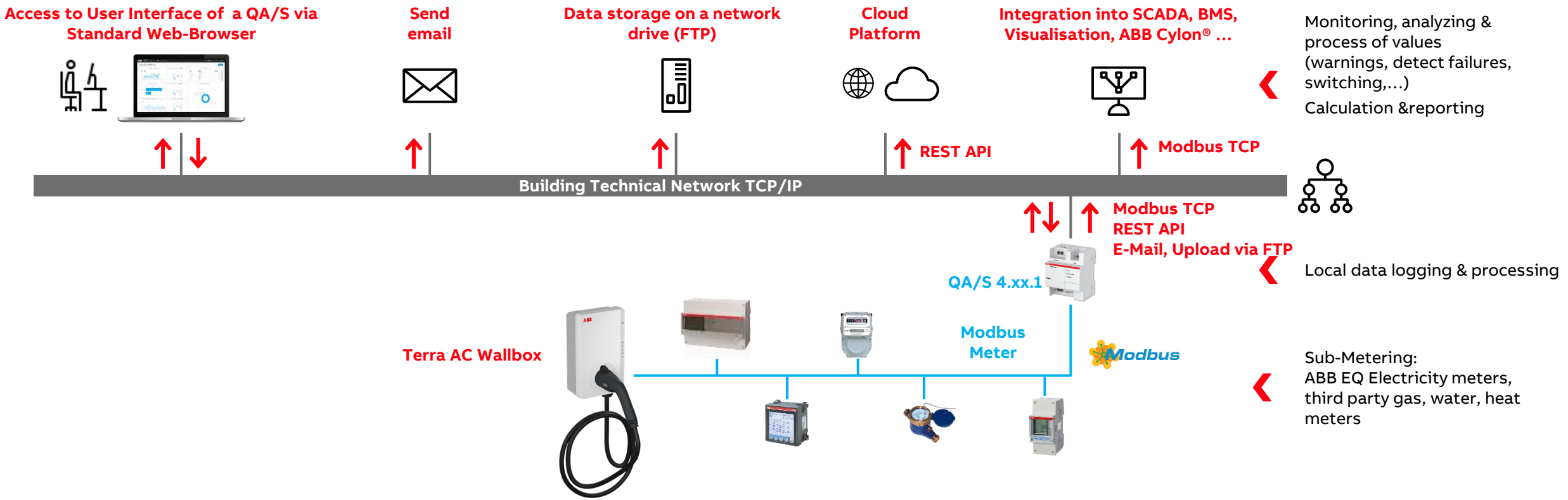
DC Wallbox – 24kW

Terra fast charging stations

High Power fast charging stations

Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox

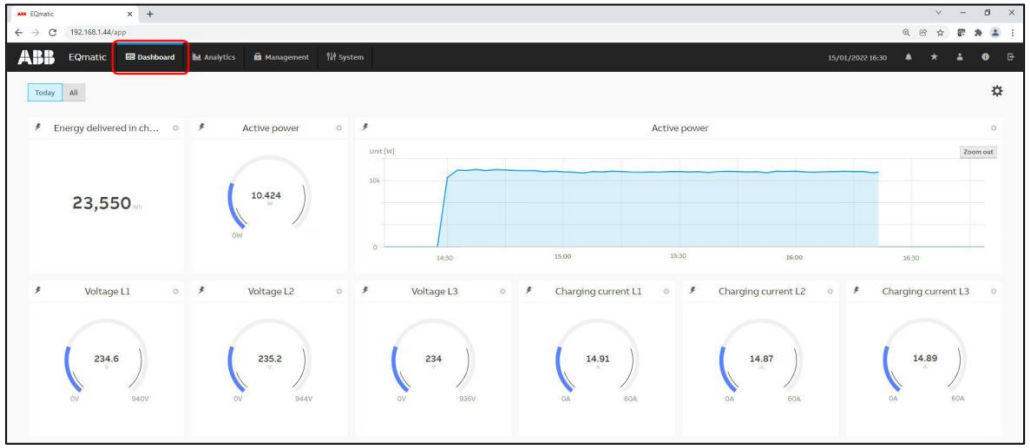
System Overview

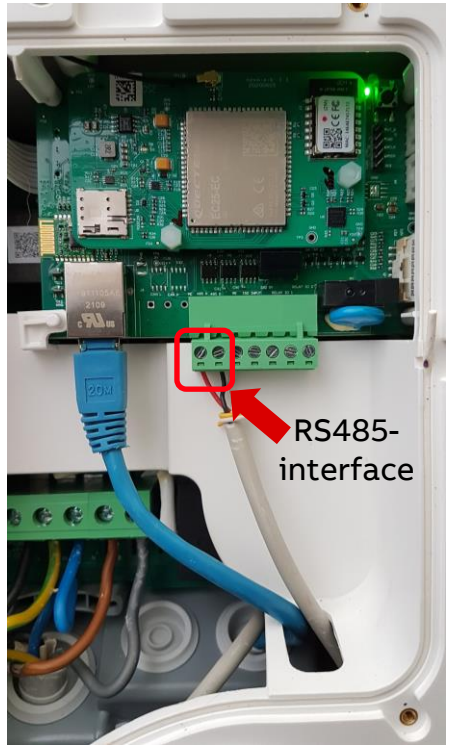


Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox

Terra AC Wallbox

- A Terra AC Wallbox can communicate with the ABB EQmatic Energy Analyzer QA/S 4.xx.1 Modbus via the integrated RS485 interface using the Modbus RTU protocol
- The meter data measured by the wallbox can thus be displayed and further processed in the Energy Analyzer QA/S





Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox

Step-by-Step Guide

It shows step by step how the Energy Analyzer QA/S and the Terra AC Wallbox are configured

- Setting the wallbox as a “Secondary device” and setting the Modbus parameters (baud rate, parity, …) with the “TerraConfig” app
- Configuration of the Energy Analyzer QA/S Modbus with addition of a “Meter model” and the “data points for register mapping”
- The Wallbox can then be configured like a meter

- Link to PDF (Englisch)

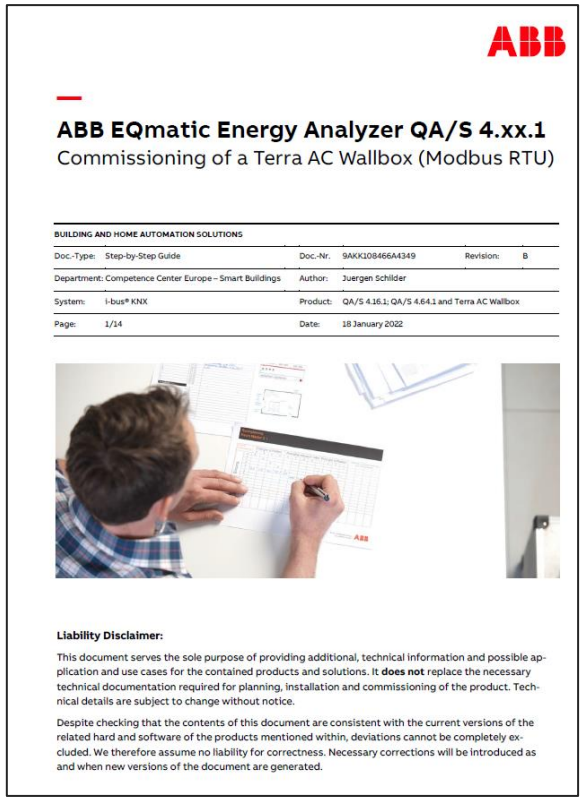


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ABB EQmatic Energy Analyzer QA/S 4.xx.1

Commissioning of a Terra AC Wallbox (Modbus RTU)

BUILDING AND HOME AUTOMATION SOLUTIONS

Doc.-Type:	Step-by-Step Guide	Doc.-Nr.	9AKK108466A4349 Revision: B
Department:	Competence Center Europe – Smart Buildings	Author:	Juergen Schilder
System:	i-bus® KNX	Product:	QA/S 4.16.1; QA/S 4.64.1 and Terra AC Wallbox
Page:	1/14	Date:	18 January 2022

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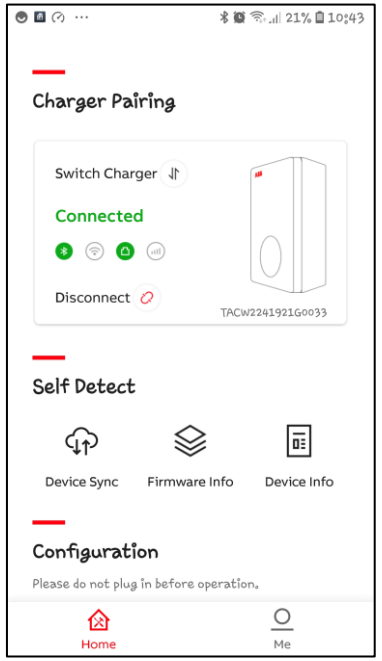
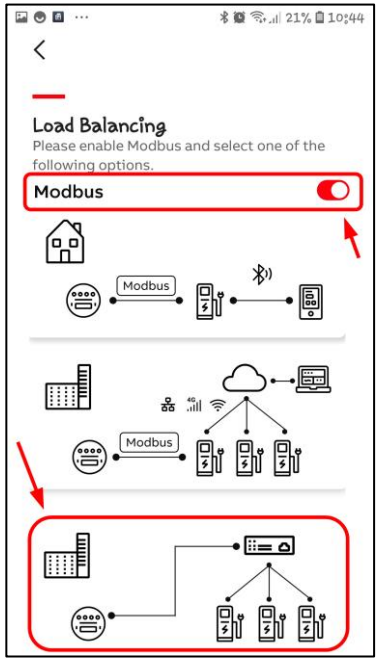
Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox

Configuration of the Terra AC Wallbox

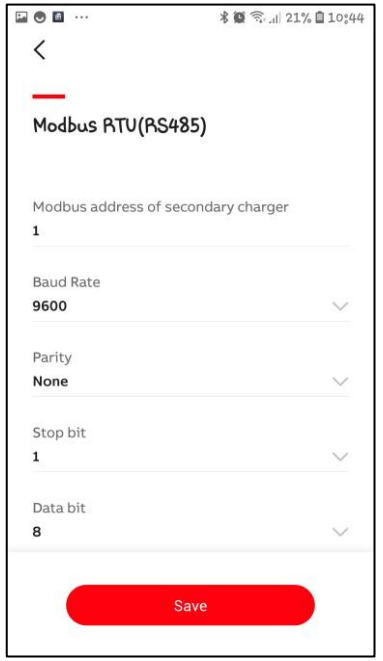
- The Energy Analyzer is the only “Primary Device” and all meters - including the Terra Wallbox – are ”Secondary Devices”
- A secondary Modbus device reads and writes from the primary device of the local Modbus controller (Energy Analyzer QA/S)
- When delivered, the Terra Wallbox acts as a “Primary device”
- When operating on an Energy Analyzer QA/S, however, this must be operated as a “Secondary device”
- These and other settings (Modbus RTU baud rate, parity, ...) are made with the “TerraConfig” app



TerraConfig App



Load Balance
“Secondary device“

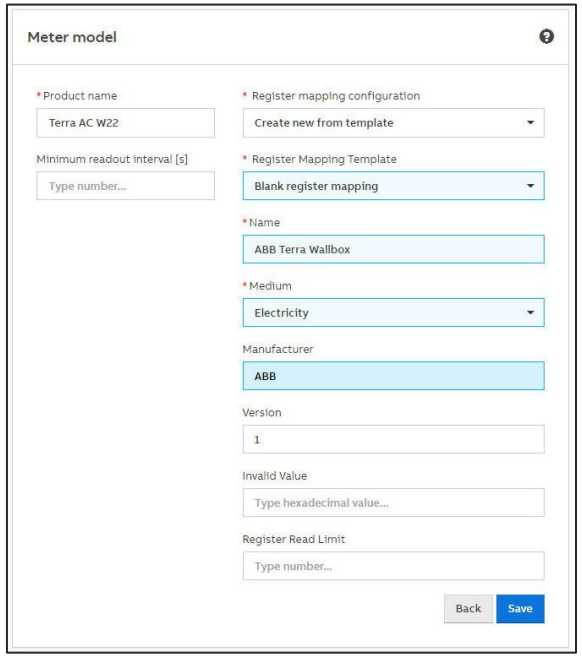


Modbus RTU
parameter

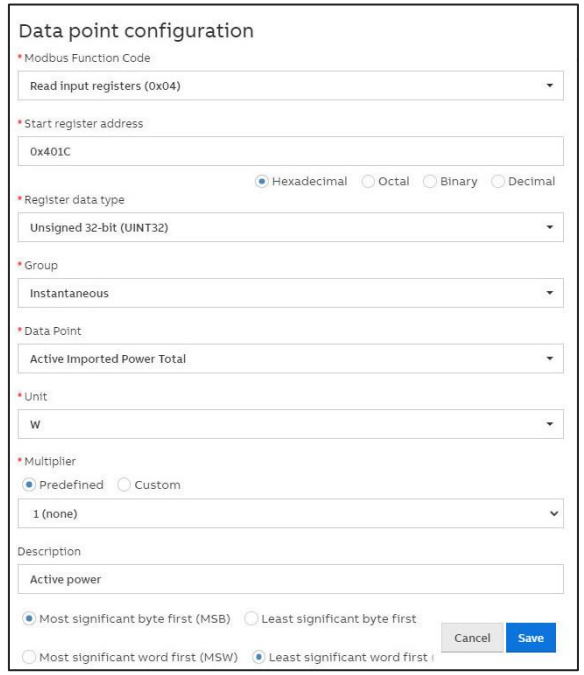
Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox

Konfiguration des Energy Analyzer QA/S Modbus

- The wallbox must be added and configured as a new meter in the Energy Analyzer QA/S
- All settings for the connected Modbus devices are made in the “Meter Management Menu”
- The wallbox is not available in the Energy Analyzer QA/S library by default (firmware version V 2.0.5)
- Therefore, a “Meter model” must be added manually and then the “Data points for register mapping” must be configured
- After that, the wallbox can be added and configured as a meter

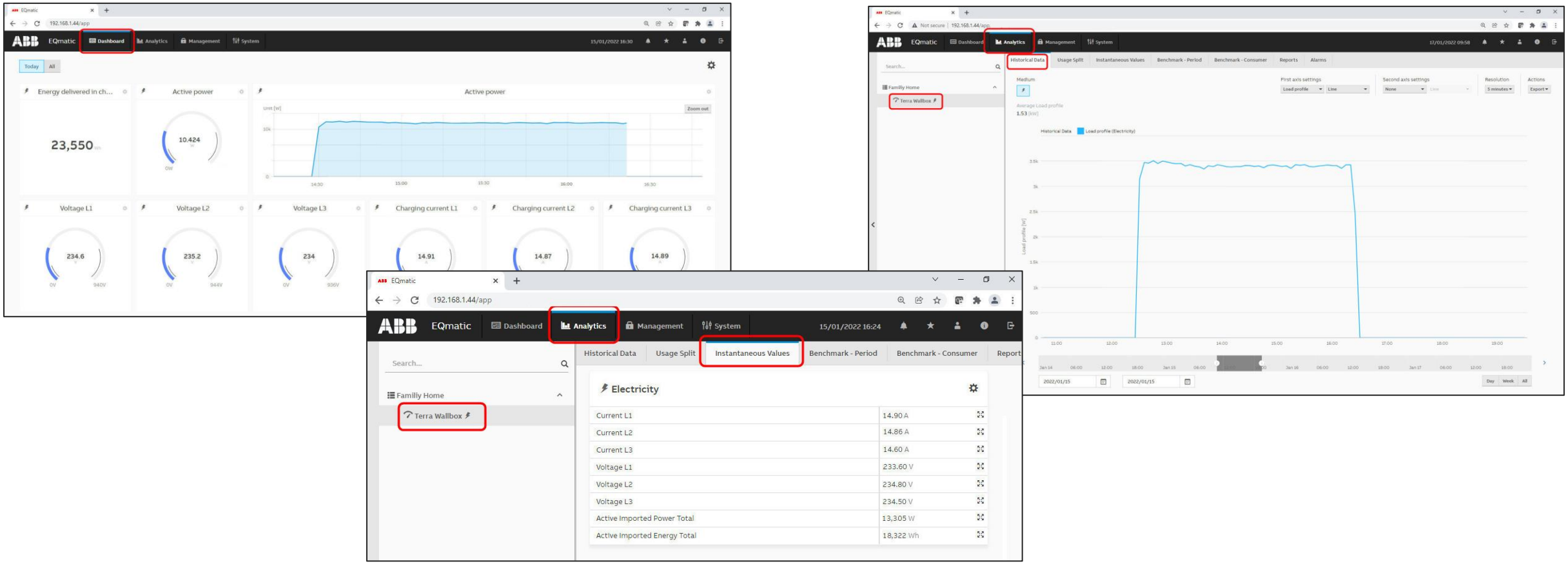


Add a Meter model



Configuration of data points for register mapping

Configuration of the Energy Analyzer QA/S 4.xx.1 Modbus with a Terra AC Wallbox



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