

Manual: QA EASTRON SDM630 Modbus Slave

Integration of the EASTRON SDM630 three-phase electricity meter via Modbus RTU — measurement of voltage, current, power, frequency and energy with optional child devices.

Introduction

QA EASTRON SDM630 provides communication with the **EASTRON SDM630 Modbus RTU** three-phase electricity meter and makes its measured values available in the controller. The application reads voltage, current, active / reactive / apparent power, power factor, frequency and active and reactive energy. According to the user's selection, it automatically creates child devices for the selected quantities so that the data are available to other QA applications, scenes and the unit's logic.

The application is the **Modbus Slave** version, intended for operating several devices on one RS485 Modbus RTU communication line. It does not communicate with the bus directly — communication via the Modbus TCP / Modbus RTU converter is provided by the master application **QA Modbus Master**, which serves all Slave applications on the line one after another and thus prevents collisions. You assign the Slave application to the Master by the **Modbus Group** number; with the **Unit ID** address you identify the meter on the given line.

The advantage of this variant is collision-free operation of several meters (e.g. of individual apartments or machines) on one converter. The data reading frequency must be adapted to the number of devices on the line so that the Master manages to serve all requests.

The application cooperates with **Mervis SCADA** for visualisation and with other QA applications of the Energy Management family — for consumption and PV surplus control, sub-metering of major appliances, metering of rental units and more.

Upstream and downstream applications

Upstream applications

- **QA Modbus Master** — mandatory; provides communication on the Modbus RTU line via the Modbus TCP / Modbus RTU converter. The Slave application and Modbus Master must have the same **Modbus Group** number.

The prerequisite for operation is a physically installed **EASTRON SDM630 Modbus RTU** meter connected to the RS485 bus of the converter served by **QA Modbus Master**.

Downstream applications

Optional:

- **QA Consumption Control** — use of the measured values for energy management (PV surplus, load control, appliance priorities).
- Sub-metering of individual major appliances (heat pump, wallbox, air conditioning, other equipment) or rental units — the measured data serve as a basis for control and evaluation in other QA applications.

The measured values can also be used by other QA applications of the SHE ecosystem or by the user's own logic in the unit.

Installation and initial setup of the QA

Installation

Purchase the application in the Smart Home and Energy e-shop (<https://eshop.smarthomeenergy.cz>). After the purchase you receive an e-mail with a link to the activation form, in which you choose one of the two installation methods:

- **Installation via the SHE Installation Application (recommended)** — the activation form provides a link to download the Installation Application.
 - Install it into the unit; it then automatically installs the purchased licences.
 - It provides automatic updates of all SHE applications and easy licence management (requires the “superuser” credentials for the unit).
 - See the separate “Installation Application” manual for details.
- **Standalone installation file** — the activation form provides links to download an encrypted *.fqax file bound to the entered unit S/N.
 - Install the file manually into the unit according to the unit manufacturer’s instructions (logged in as “superuser”).
 - This option does not allow automatic updates.

To verify the function before purchase, a free **TRIAL** version for 2 days is available — download it from the product page in the e-shop.

After a successful installation, the **Meter** tile, the **Values overview** and **Installation** cards and the tiles of the selected child devices (**Power Active, Current, Energy, Voltage, Frequency**) appear on the unit desktop.

Operating prerequisites

- A physically installed **EASTRON SDM630 Modbus RTU** three-phase electricity meter.
- A **Modbus TCP / Modbus RTU converter** in the same local network as the controller (not included with the application) and an installed **QA Modbus Master** application that serves this converter.
- A Modbus address (**Unit ID**) set on the meter that is unique within the line, and communication parameters matching those of the converter.
- Reading periods chosen with regard to the number of devices on the line.
- For the Modbus RTU bus, a correctly designed topology and carefully chosen reading periods so that no collisions occur.
- A free slot for uploading the application in the controller.

Opening the application control card

To open the application card in a web browser, move the cursor over the tile (**Meter, Values overview, Installation**) and click the **eye** icon in its top-right corner. The card detail opens.

Warning: Not all cards and tiles are displayed to all users. Each user selects which cards and tiles are displayed on the Display Settings card (sheViewControl application) – levels **SHORT, ADVANCED** and **ADMIN**. If you cannot see a described card, check the settings on this card.

User settings

For QA EASTRON SDM630, the following tiles and cards are displayed on the unit desktop:

- **Meter** — the main tile of the application (it may be named after the metered point, e.g. **Meter Main**, **Meter Apartment 1**); it displays the total consumed (imported) active energy (kWh).
- **Values overview** — information card with a clear table of all measured quantities.
- **Installation** — selection of child devices, setting of the reading periods and assignment to the **QA Modbus Master** application (Modbus Group, **Unit ID**).
- Child tiles — displayed according to the selection in the **CHILDREN CHOOSING** field on the **Installation** card, e.g. **Total** (total active power, W), **Active L1 / Active L2 / Active L3** (W), **Import** and **Export** (kWh).

Initial setup procedure

1. According to the meter and converter manuals, set a unique Modbus address (within the line) on the meter and communication parameters matching those of the converter. Note down the address.

2. First, put the converter and the **QA Modbus Master** application into operation according to the separate manual and note down the **Modbus Group** number of the line to which the meter is connected.

3. "Installation" card

- In the **CHILDREN CHOOSING** field, select the quantities you want to have as separate tiles.
- For the child devices, choose the type (**Consumption / Production**).
- Set the reading periods.

4. In the **Modbus Settings** section, set **Modbus Group** to the same number as in **QA Modbus Master** and **Unit ID** to the meter address (the values in the screenshots belong to a sample installation, do not copy them).

5. Press **SAVE** and wait until **Run status** changes to Running.

6. On the **ModbusMaster** card, press **INIT DEVICES** and check that the meter has appeared in the overview of Modbus devices. Compare the values read on the **Values overview** card with the meter display.

The **Meter** tile and the **Values overview** card are for information only and require no further configuration.

With several meters in one room, each has its own pair of **Values overview** and **Installation** cards.

- The cards with the nearest higher device IDs belong to the meter (the ID is shown in the card header).
- Before changing the settings, verify that the open card belongs to the required meter.
- For clarity, we recommend placing each application in its own room.

"Installation" card

The card is used to select the child devices, set the reading periods and assign the meter to the **QA Modbus Master** application.

 **Warning:** When saving settings, always wait until Run status changes to Running. Do not press SAVE before that. Pressing it repeatedly before the restart is complete may cause configuration errors.

Meter

- **CHILDREN CHOOSING** — selection of the quantities to be displayed in the unit as separate child tiles:
 - **Voltage Phase, Current Phase, Current Total, Power Active Phase, Power Active Total, Frequency, Energy Import Active Phase, Energy import Active Total, Energy Export Active Phase, Energy Export Active Total, Energy Total Active Total and Energy Total Active.**
 - A "phase" option creates three tiles for **L1, L2** and **L3**.
 - Several items can be ticked in the menu at the same time; the figure above the list (e.g. 1 Selected) shows their number.

- A child device is a separate subordinate device with its own tile.
- Select e.g. **Power Active Total** if you want to monitor the power directly on the desktop or use it in scenes and other applications.
- Select only the quantities you really need.
- **CHILD TYPE IMPORT**, **CHILD TYPE EXPORT**, **CHILD TYPE ENERGY TOTAL** and **CHILD TYPE POWER** — determine whether the energy and power child devices are registered in the unit as **Consumption** or **Production** (typically **Import** = **Consumption**, **Export** = **Production**; set a meter on the photovoltaic feed as **Production**).

Reading periods setting

A separate reading interval from the meter can be selected for each group of values (**Disabled**, 5s, 10s, 15s, 20s, 30s, 60s, 120s, 5m or 10m; 30s means reading once every 30 seconds, 10m once every 10 minutes):

- **READING PERIOD-POWER** — interval for reading the active, reactive and apparent power (e.g. 30s).
- **READING PERIOD-CURRENT** — interval for reading the current values (e.g. 60s).
- **READING PERIOD-VOLTAGE** — interval for reading the voltage, power factor and frequency (e.g. 60s).
- **READING PERIOD-ENERGY** — interval for reading the energy values (e.g. 10m).

Choose the periods carefully with regard to the load on the Modbus RTU bus.

- Fast-changing quantities (power, current) are typically read more often than slow-changing quantities (energy, frequency).
- Traffic on the bus is controlled by the **QA Modbus Master** application, which serves the requests of all Slave applications one after another — with more devices or intervals that are too short, it does not manage to serve all of them and reading is delayed.
- The **Disabled** option switches off reading of the given group — do not use it for a group whose values you need in scenes or other applications.
- If communication is unstable, extend the intervals.

Modbus Settings

- **Modbus Group** — group number that assigns the meter to the **QA Modbus Master** application (and its converter). All Slave applications on one line have the same group number as their Modbus Master. Change the value with the -- / - / + / ++ buttons.
- **Unit ID** — meter address on the Modbus bus; set it identical to the address set in the meter. It must be unique within the line. (The ID number in the card header is the device identifier in the unit and is not related to the Modbus address.)

The **Run status** field shows the application run state (e.g. Running). After completing the settings, save the configuration with the **SAVE** button and wait until **Run status** changes to Running. The application version is shown at the bottom of the card (e.g. sheEastronSDM630ModbusSlave 1.03.06).

"Meter" tile

The main tile of the application displays the total consumed (imported) active energy of the meter (kWh). After opening the card, the following is displayed:

- **Value** (imported active energy),
- current active power in total and per phase (W),
- current in total and per phase (A),
- phase voltages (V),
- frequency (Hz),
- balance active energy in total (import + export, kWh) and per phase,
- **Update** (date and time of the last reading).

Negative power on a phase means supply (export) in the given meter connection direction. Without a connected meter, the rows show dashes.

Child tiles

For each quantity selected in the **CHILDREN CHOOSING** field, a separate tile with the current value is displayed on the desktop; for a per-phase option, three tiles are displayed. For example:

- **Total** for the total active power,
- **Active L1 / L2 / L3** for the power per phase,
- **Import** and **Export** for the active energy.

The tiles serve as a quick overview on the unit desktop and for use in the logic of other QA applications and scenes. Without a connected meter, the tiles show zeros and the **Values overview** card shows dashes — a zero alone does not confirm working measurement.

“Values overview” card

Information card with a clear table of all quantities read from the meter for phases **L1 / L2 / L3** and **Total**. The card is divided into four sections:

- **Powers** — **Active** (W), **Reactive** (VAr) and **Apparent** (VA) power.
- **Values** — **Voltage** (V), **Current** (A), **Power factor** and **Frequency** (Hz).
- **Active Energy** — **Import**, **Export** and **Total** (kWh).
- **Reactive Energy** — **Import**, **Export** and **Total** (kVArh).

Dashes for the summary voltage (**Total**) and for the frequency of the individual phases are normal in the overview — these values are not given and the dashes do not indicate a communication failure.

The **Total** item for energy values is the sum of import and export. The overview of measured values is for information only and contains no controls for setting up the measurement.

Notes

Typical uses of the application include:

- metering of the main feed and sub-metering of the consumption of individual apartments, rental units or major appliances (heat pump, wallbox, air conditioning, other equipment) on one RS485 line,
- monitoring of the phase balance, power factor and grid frequency as input data for energy management.

If the values are not updated, verify that the **Modbus Group** value matches the **QA Modbus Master** setting and the **Unit ID** value matches the address set in the meter (each meter on the line must have a different address), and check the **Communication overview** table on the **ModbusMaster** card.

The basic variant of the QA EASTRON SDM630 application (with its own converter settings, without Modbus Master) is described in a separate manual.

For long-term archiving of measurements, consumption and production charts and evaluation over time, we recommend connecting to **Mervis SCADA** (value export, charts, history).