

Manual: QA Modbus Master

Central control of communication on the RS485 Modbus RTU bus for several Slave devices in the SHE system.

Introduction

QA Modbus Master controls communication on the **RS485 Modbus RTU** bus in Master–Slave mode. Via the **Modbus TCP / Modbus RTU converter**, it addresses the individual subordinate (Slave) applications one after another — for example QA EASTRON SDM230 / SDM630 Modbus Slave or Sharing (ESG) — and passes the read values to them. In this way, only one device communicates on the line at any one time, which prevents collisions and ensures stable data reading even with a larger number of meters on one line; in case of a short communication failure, the application repeats the query.

The application allows several metering points (e.g. the meters of individual apartments) to be connected to one converter without increasing the number of converters. Each **Modbus Master** application serves one converter (one line) and is identified by the **Modbus Group** number; the subordinate applications are assigned to it with the same group number. For several lines, several **Modbus Master** applications are installed, each with its own group number.

The application itself does not display any measured values — the data are provided by the subordinate Slave applications, which make them available to other applications (energy sharing, consumption control) and to SCADA Mervis.

Upstream and downstream applications

Upstream applications

The application does not require any upstream QA application. The prerequisite for operation is a **Modbus TCP / Modbus RTU converter** in the local network of the unit and a correctly wired RS485 bus (cabling, termination, unique device addresses).

Downstream applications

Slave applications that communicate via **Modbus Master**:

- **QA EASTRON SDM230 Modbus Slave**, **QA EASTRON SDM630 Modbus Slave** — reading of meters on the line.
- **QA EASTRON SDM230 Sharing (ESG)**, **QA EASTRON SDM630 Sharing (ESG)** — metering of consumption points for energy sharing.
- Other devices on the line (e.g. temperature sensors, inverters) for which a corresponding Slave application exists.

Without an installed Slave application, **Modbus Master** has nothing to serve.

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 downloads and installs the purchased licences. It provides automatic updates of all 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.

You can try out the functions of the application before purchase in the trial version — TRIAL unlocks full functionality for 2 days.

After a successful installation, one **Modbus Master** tile (main card) appears on the unit desktop in the **Modbus Master** room (section). With several lines, there is one tile here for each installed application; we recommend naming the tiles according to the line or the building (e.g. **ModbusMaster Korejska 11**).

Operating prerequisites

- **Control unit:** Fibaro HC3 or HC3L (or Yubii Home / Home Pro).
- A **Modbus TCP / Modbus RTU converter** in the same local network as the control unit (not included with the application).
- A correctly wired RS485 bus: suitable cabling, termination and a unique Modbus address (**Unit ID**) of each device on the line.
- Installed Slave applications for the connected devices with the same **Modbus Group** number.
- Reading periods set with regard to the number of devices — with a larger number (e.g. 10 or more meters), the Master must manage to serve all requests, otherwise reading is delayed.

Opening the application control card

To open the card in a web browser, move the cursor over the **Modbus Master** tile and click the **eye** icon in its top-right corner. The application card 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

Initial setup procedure

1. Connect the converter and the devices on the RS485 bus; on each device, set a unique Modbus address and communication parameters identical to those of the converter.
2. On the **Modbus Master** card, use the **SEARCH NETWORK** button to search for the converter and select it in the **MAC ADDRESS** field.
 - If several devices are found, select the one whose IP or MAC address corresponds to your converter.
 - Check the **IP Address** and **MAC Address** items.
 - If no converter is found, check its power supply and connection to the local network.
3. Set the **Modbus Group** value (a different number for each line, not used by another line; the number in the screenshot belongs to a sample installation).
 - Save with the **SAVE** button and wait until **Run status** changes to Running.
 - Running means that the application is running — communication with the meters is confirmed only by the tables on the card.
4. Install the Slave applications and in each of them set the same **Modbus Group** number and the **Unit ID** address of the given device on the **Installation** card (see the manual of the respective Slave application).
5. On the **Modbus Master** card, press **INIT DEVICES**.
 - All registered devices are displayed in the **Overview of Modbus devices** table, and the last reading times start to update in the **Communication overview** table.
 - If a device is missing from the list, check the installation of its Slave application and that the **Modbus Group** number matches.
 - If it is in the list but the time does not update, check its address and wiring on the line.

"Modbus Master" card

The only card of the application — it displays an overview of communication on the line and contains its settings. The ID in the card header is the number of this application in the control unit; the **DeviceID** values in the tables are the numbers of the subordinate Slave applications.

Communication overview

Table with data on the last reading for each device and each period:

- **UnitID** (address of the device on the line),
- **DeviceID** (ID of the Slave application in the unit),
- **Period** (reading period in seconds),
- **Time** (date and time of the last reading).

The **Time** column shows whether the Master manages to serve all devices — the times should be updated in the set periods.

Overview of Modbus devices

List of the devices registered with this Master: **UnitID**, **DeviceID** and **Periods** (reading periods requested by the Slave application, e.g. 20,30 or 30,60). The **Initialization** line shows the date and time of the last loading of the device list.

- **INIT DEVICES** — reloads the list of registered Slave applications. Use it after installing or changing the settings of a Slave application if the device is not displayed in the list.

Modbus Settings

- **Modbus Group** — group number of this line; set the same number in the Slave applications connected to this line. Change the value with the -- / - / + / ++ buttons.

IP Address Settings

- **IP Address** and **MAC Address** — network identification of the converter.
- **MAC ADDRESS** — selection of the converter from the list of devices found in the network.
- **SEARCH NETWORK** — searches for available converters in the local network; after it finishes, select the converter in the **MAC ADDRESS** field.

The **Run status** line shows the running state of the application. Save the settings with the **SAVE** button. The application version is shown at the bottom of the card (e.g. sheModbusMaster 1.02.01).

 **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.**

Notes

- The reading periods of the individual quantities are set in the Slave applications; the Master only executes them one after another.
 - With a larger number of devices, extend the periods so that the times in the **Communication overview** table are updated regularly.
 - A longer period means slower updating of the measured values.
- Each **Modbus Master** application serves one converter. For another line, install another **Modbus Master** application with a different **Modbus Group** number.
- For clear visualisation, measurement history and charts, we recommend connecting to SCADA Mervis.