

Manual: QA AMPERO SDM6RO

Integration of the AMPERO SDM6RO expansion module — 6 relay outputs via Modbus with the Watchdog function and definition of default states.

Introduction

QA AMPERO SDM6RO provides bidirectional communication (reading and writing) with the AMPERO SDM6RO expansion module and makes its 6 relay outputs available as separate devices in the unit. The application automatically creates child devices for each output, allows you to set the default states and includes the **Watchdog** safety function, which defines the behaviour of the module when communication with the controller is lost. It is used to extend the number of outputs in installations where the standard outputs of the controller are not sufficient — typically for switching valves, pumps, contactors, heating circuits, blinds or lighting circuits.

The application cooperates with Mervis SCADA for visualisation and long-term archiving and with other QA applications of the SHE ecosystem — the module outputs can be controlled by orchestrators such as energy management, thermostats or DHW control.

Upstream and downstream applications

Upstream applications

The application does not require any specific upstream QA application. The prerequisite for operation is a physically installed **AMPERO SDM6RO** module and a **Modbus TCP / Modbus RTU converter** through which the module is available in the unit network.

In an installation, the module outputs are typically controlled by these orchestrators:

- **Energy Management System (EMS)** — switching loads to use surplus energy according to the energy balance of the house.
- **QA thermostats and QA DHW control** — switching heating circuits, circulation pumps and domestic hot water heating.

Downstream applications

The relay outputs of the module can be used:

- directly on the hardware — switching contactors, valves, pumps, heating elements, lighting circuits, blinds and similar loads,
- as an input for other QA applications of the SHE ecosystem or for the user's own logic in the controller.

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 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.

A free **TRIAL** version for 2 days is available for verifying the functions before purchase — it can be downloaded from the product page in the e-shop.

After a successful installation, the **SDM-6RO** tile, the tiles of the individual relay outputs (**RO 1 to RO 6**) and the **Values, Settings** and **Installation** cards appear on the unit desktop.

Operating prerequisites

- A physically installed **AMPERO SDM6RO** module.
- A **Modbus TCP / Modbus RTU converter** through which the module is available in the unit network (not supplied with the application).
- A correctly designed network topology and carefully chosen reading periods so that no collisions occur on the Modbus RTU bus.
- A free slot for uploading the application in the controller.

Warning

The application does not manage the traffic on a single Modbus RTU bus. With a higher number of devices on the bus or with a reading interval that is too short, communication collisions will occur. Choose the reading periods carefully so that no collisions occur and the communication is stable.

Opening the application control card

To open the application cards in a web browser, move the cursor over the tile (**Values, Settings, 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 AMPERO SDM6RO, the following tiles and cards are displayed on the unit desktop:

- **SDM-6RO** — the main information tile of the application.
- **RO 1, RO 2, ..., RO 6** — child devices for the individual relay outputs of the module. The tiles display the **On / Off** state and allow you to switch the output on or off directly.
- **Values** — overview of the current states of all 6 digital outputs of the module.
- **Settings** — default states of the outputs after the Watchdog is activated and the Watchdog value.
- **Installation** — connection to the module, setting of the reading periods, selection of the child device type.

After the installation is complete, first set up the **"Installation" card** — connection to the module in the network and the reading periods. Then on the **"Settings" card** choose the default states of the outputs and the Watchdog value. The **Values** card provides information and requires no further configuration.

"Installation" card

The card is used to connect the application to the module, to choose how the relay outputs are displayed and to set the reading periods.

Warning

When saving settings, always wait until Run status changes to Running. Do not press SAVE before that. Repeated pressing before the restart is complete may cause configuration errors.

Module Settings

- **Module ID** — address of the module on the Modbus RTU bus.
- **DO STATUS CHILD** — selection of the relay outputs that are to be displayed in the unit as child devices. The value 2 Selected means that two tiles of the corresponding outputs will be created.

Reading periods Settings

- **READING PERIOD-DIGITAL INPUTS** — interval at which the application reads the current states of the relay outputs (e.g. 30 s).
- **READING PERIOD-SETTINGS** — interval at which the application loads the module configuration (default states, Watchdog, e.g. 10 min).

Choose the periods carefully with regard to the load on the Modbus RTU bus. The application does not manage the traffic on the bus — with a higher number of devices or intervals that are too short, communication collisions may occur.

IP Address Settings

- **Unit ID** — identifier of the Modbus unit on the converter.
- **IP Address** — IP address of the Modbus TCP / RTU converter.
- **MAC Address** — MAC address of the converter.
- **MAC ADDRESS** — selection of the converter from the list of devices found in the network.
- **SEARCH NETWORK** — starts a search for available Modbus TCP converters in the unit network. After the search is complete, the converter can be selected in the **MAC ADDRESS** field.

After completing the settings, save the configuration with the **SAVE** button and wait until **Run status** changes to **Running**.

"Values" card

The card displays the **Digital Output Status** section — the current state of all 6 relay outputs of the module (**Output 1 to Output 6**). For each output, the contact state is shown next to its name:

- **Connected** — the relay is switched on (contact closed).
- **Disconnected** — the relay is switched off (contact open).

The **OFF** and **ON** buttons next to each output allow you to switch the output state manually directly from the card.

"Settings" card

The card is used to set the **Output Default Values** — the states to which the module sets its relay outputs after the **Watchdog** function is activated (for example when communication with the controller is lost).

Output Default Values

For each relay output (**Output 1** to **Output 6**) two levels of settings are available:

- **Output n** — default state of the output after the Watchdog trips. Buttons **OFF** (open) and **ON** (closed).
- **Local default n** — local default state of the output stored directly in the module. Buttons **NONE** (no action — the module keeps the last state), **OFF** (open) and **ON** (closed).

The current state of the output is always shown next to the selection — **Connected** or **Disconnected**.

Warning

Set the default states so that the installation remains in a safe state in the event of a communication failure (e.g. closed valves, heating elements switched off, cooling circuit valves open). For critical systems, defining the default state is essential.

Watchdog

- **Watchdog** — time after which, without communication with the controller, the module automatically sets the outputs to the default states defined above. The value is displayed in the format minutes:seconds:milliseconds (e.g. 1m 5s 500ms).
- Buttons below the Watchdog value: --- and -- (fast decrease), - (step down), 0 (reset / Watchdog off), + (step up), ++ and +++ (fast increase).

Choose the Watchdog value according to the longest expected interval between valid reading cycles — a shorter value means a faster reaction to a failure, but also a risk of false activation during a short-term overload of the bus.

Relay output tiles (RO 1–RO 6)

For each relay output selected in the **DO STATUS CHILD** field on the **Installation** card, a separate tile is displayed on the unit desktop — **RO 1**, **RO 2**, ... up to **RO 6**. The tiles display the current state of the output (**On** / **Off**), allow manual switching and can be further used in the unit logic like any other device (scenes, blocking conditions, automations).

Notes

Typical use of the application includes:

- switching pumps, valves and contactors in the technical room,
- control of heating circuits via external contactors,
- control of lighting circuits and blinds,
- safe control of critical systems thanks to the Watchdog function (protection against overheating, spontaneous start of a load or flooding in the event of a system failure).

For long-term archiving of the output states, consumption charts of the switched loads and evaluation over time, we recommend connecting to **Mervis SCADA** (value export, charts, history).