

Manual: QA DHW Mode

Automatic setting of domestic hot water (DHW) heating modes according to a time schedule, for multiple heating sources, with smart source selection based on the annual climate mode.

Introduction

QA DHW Mode is an intelligent application for controlling domestic hot water heating from multiple heat sources – solar collectors, photovoltaics, grid electricity, a gas boiler or a heat pump. The application automatically selects the most economical available source according to the time schedule, the annual heating mode, the weather forecast and the expected daily irradiance.

In the time schedule, the user only sets the required heating priority (the comfort mode and the type of cheap/required energy); the specific source and its output are selected by the application itself. The application also supports Vacation mode, manual mode, one-time comfort heating and cooperation with the global control of profiles and climate.

A single controller can run several independent DHW heating groups. One group can also control several physical appliances (e.g. two DHW boilers with the same group number set in their QA).

The application cooperates with Mervis SCADA for visualisation and with other QA applications of the Energy Management series – for spot prices, energy sharing, controlled wallboxes, DHW heating and more.

Upstream and downstream applications

Upstream applications

Optional (they extend the functionality):

- **QA Global Climate Mode** – provides the annual heating mode (winter / transitional period / summer), according to which the application changes the active sources.
- **QA Profile Control** – shares the Vacation mode setting (number of days, return to normal operation).
- **QA Weather Forecast YR** – provides the irradiance and outdoor temperature forecast for the automatic selection of the Solar / PV priority.
- **QA Presence Detection** – provides the presence state for the behaviour in the "User at home" mode.

The application also works without these upstream QA applications, but the related automatic functions are unavailable without them.

Downstream applications

The outputs of QA DHW Mode (Solar, PV, Electro, Boiler, Heat pump) serve as inputs for the following QA applications, which perform the actual physical control of the appliances. The link is made by the **same group number** – one QA DHW Mode in "Group 1" can control all downstream QA applications that also have Group 1 set.

- QA DHW Boiler
- QA Two-Stage Boiler Control
- QA Heat Pump

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. It 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.

After a successful installation, the gateway desktop shows, in the **Hot water** → **Hotwater Mode** section, the set of tiles belonging to the application: the quick actions **Once**, **Auto** and **Off**, followed by **TÜV**, **Hotwater Mode**, **Control**, **Schedule**, **Setting Properties** and **Installation**.

Operating prerequisites

- Hardware for switching the selected sources is installed in the unit – an EX01PV module, a Shelly Dimmer or another supported device, and a DHW temperature sensor.
- For the automatic selection of the Solar / PV priority according to the weather, QA Weather Forecast YR (or QA PV Forecast) is installed in the unit.
- For cooperation with the annual heating modes, QA Global Climate Mode is installed.
- For Vacation mode synchronised with the other applications, QA Profile Control is installed.
- For the “User at home” mode, QA Presence Detection is installed.
- Users who should receive alarm notifications have valid access to the unit, so that they appear in the recipient list.

Opening the application control card

To open the application card with all controls, hover the mouse cursor over the relevant tile on the desktop (e.g. **Hotwater Mode** or **Control**) and click the eye icon in the top-right corner of the tile. The application detail with the current state and settings 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

The application is operated from the tiles available in the **Hot water** → **Hotwater Mode** section:

- **Once / Auto / Off** – quick actions for switching the operating mode directly from the desktop. The text below each tile shows the state of the action (e.g. Off).
- **TÜV** – overview indicator with the current DHW temperature.
- **Hotwater Mode** – overview tile with the current state and buttons for controlling the operating mode.
- **Control** – the main control card (operating mode, priority, outputs, Vacation and User at home modes).
- **Schedule** – setting of the required priority for the individual periods of each day of the week.
- **Setting Properties** – setting of the irradiance prediction, the Solar / PV coefficients, alarms and notifications.
- **Installation** – configuration of the heating group, source selection and hardware connection.

Initial setup procedure

After installing the application, we recommend the following configuration order:

1. **"Installation" card** – select the heating group, the physical sources, the hardware modules and the temperature sensor. This step must be completed first, because the set of sections and buttons on the other cards (**Control**, **Schedule**, **Setting Properties**) changes according to the choices in **Installation**.
2. **"Setting Properties" card** – check the preset coefficients for Solar / PV and set the temperature limits and notifications.
3. **"Schedule" card** – set the heating priorities for the individual periods of each day of the week.
4. **"Control" card** – select the operating mode (**AUTO / MANUAL / VACATION**) and, if needed, the behaviour for the Vacation and User at home modes.

This manual describes all options that can appear in the UI – a specific installation only shows the subset that matches the selected sources and hardware.

Note: If you do not see a button or section described in this manual on your screen, it is not an application error. The application only shows the elements that make sense for your specific installation – for example, the **ONCE** button appears only after one of the basic (required) heating sources (Basic electro, Gas boiler Basic or Heat pump Basic) is selected in **Installation**; the **SOLAR / PV** buttons in **Priority Settings** are shown according to the selected type of cheap heating; the **Solar settings / PV settings** sections in **Setting Properties** are shown only when the corresponding source is ticked in **Installation**.

Quick action tiles (Once / Auto / Off)

The three tiles at the start of the section serve as a shortcut for switching the operating mode directly from the desktop, without opening the **Control** card:

- **Once** – starts one-time heating to the comfort temperature.
- **Auto** – switches the application to automatic mode.
- **Off** – switches the heating off (equivalent to **MANUAL OFF**).

The text below each tile shows the state of the action (Off = action inactive).

"TÜV" tile

Overview indicator with the current DHW temperature from the selected sensor (e.g. 57.7 °C). It provides a quick visual indication of the tank state directly on the desktop.

“Hotwater Mode” tile

The tile provides a quick overview of the heating group state and contains:

- **Mode** – icon of the current operating mode. In an error state (e.g. unavailable temperature sensor) a red cross is shown.
- **Priority** – icons of the currently used priority (e.g. COMF on the solar panel / grid icon). In case of an error or with the heating off, --- is shown.
- **Current DHW temperature** – temperature measured by the selected sensor (e.g. 59.1 °C); in case of a sensor error --- °C.
- **Output** – state of the individual heating sources on separate lines (e.g. OFF for all four sources).

Below the overview are the control buttons for changing the operating mode: **ONCE**, **AUTO**, **MANUAL OFF**, **VACATION**. The **Vacation midnights** field with the number of days (and the - / + buttons) is located above the **VACATION** button.

“Control” card

The card brings together all controls for the normal operation of the group.

Control Mode

The current states are shown at the top of the card:

- **Mode** – the current operating mode of the application, e.g. AUTO-ON. In an error state (e.g. unavailable temperature sensor) ERROR|Measured temperature error is shown.
- **Priority** – the currently evaluated heating priority, e.g. AUTO-OFF or AUTO-PV~COMFORT. In automatic mode it has the AUTO- prefix and contains the mode selected according to the time schedule, the annual mode and the weather forecast.

Outputs

For each source selected in **Installation**, one row with three values is shown – the source name, the activity and the current output state:

- **Source name** – Solar, PV, Electro, Boiler, Heat pump.
- **Activity** – information on when the source is active (e.g. Year round:Active); if the source has no valid configuration, -- is shown.
- **Output state** – OFF, ECO, NORMAL, COMFORT or MAX.

Example: Solar Year round:Active OFF.

Status fields

Below the Outputs section there is a row of information fields that provide context for the application's decisions:

- **Temperature output** – the current DHW temperature from the selected sensor.
- **Presence** – state from QA Presence Detection (e.g. At home).
- **Annual climate mode** – from QA Global Climate Mode (Winter / Transient / Summer).
- **Sunrise/Sunset** – the times of sunrise and sunset and the current part of the day (e.g. 05:36 | 20:05 | Day).
- **Weather** – data from QA Weather Forecast YR (irradiance in W/m² and outdoor temperature).

Operating mode buttons

- **ONCE** – one-time heating to the comfort temperature using the best available source; after the comfort temperature is reached, the application returns to the previous mode. The button is shown if at least one basic (required) heating source (**Basic electro**, **Gas boiler Basic** or **Heat pump Basic**) is selected in **Installation**.
- **AUTO** – the application selects the priority and the source itself according to the time schedule, the annual mode and the weather forecast. The recommended normal mode.
- **MANUAL OFF** – switches the heating off permanently.

- **VACATION** – activates Vacation mode. The **Vacation midnights** field sets the number of vacation days (shown e.g. as 7); it is changed with the - / + buttons. If QA Profile Control is installed in the unit, the application shares the number of vacation days with it.

Priority Settings

The section controls where the application takes the priority from:

- **Time schedule** – information field with the currently valid priority from the time schedule (e.g. SOLAR+PV).
- **AUTO** – the application uses the priority from the time schedule.
- **MANUAL** – the application uses the manually selected priority from the following section.

Priority Settings MANUAL

Selection of the priority for manual mode. The buttons combine the cheap heating mode (Solar / PV) and the required heating mode:

- **SOLAR** – heating by solar collectors. Shown when **Solar collectors** are selected in **Installation**.
- **PV~COMFORT** – PV surplus up to the comfort temperature. Shown when **Photovoltaics surplus** is selected in **Installation**.
- **PV~MAX** – maximum available PV output. Shown when **Photovoltaics surplus** is selected **and** at the same time the **PV-Max** button in the **Modes Configuration** section of the **Installation** card is active.
- **ECO / NORMAL / COMFORT** – required (paid) heating mode. Shown when at least one basic source (**Basic electro / Gas boiler Basic / Heat pump Basic**) is selected in **Installation**.

The buttons can be combined; active choices are highlighted with a blue border.

Vacation Mode Settings

The **VACATION MODE** drop-down field sets the priority for the vacation period. The list contains the same combinations as the **Schedule** (e.g. OFF, SOLAR, ECO, PV~COMFORT, ECO+SOLAR+PV~COMFORT etc.).

At Home Mode Settings

The **AT HOME MODE** drop-down field sets the behaviour when QA Presence Detection reports the At home state. Values: NO CHANGE, ECO, NORMAL, COMFORT. The NO CHANGE option keeps the normal time schedule logic.

“Schedule” card

The schedule sets, for each day of the week, the required heating priority for up to four periods of the day. In automatic mode, the application follows the current time, and the priority of the current period serves as the input for selecting the most suitable source.

Day structure

- **Preceding** – informative display of the last period of the previous day.
- **Period 1 – Period 4** – always a pair of “start time” + “priority”. Between two periods, the priority of the earlier one applies.

Setup procedure

- Select the day with the < and > arrows at the top of the card.
- For each period, set the start hour and the required priority (the left / right arrows scroll through the list of available priorities).
- Save the changes for the selected day with the **Save Day** button.
- To quickly copy the day to other days, use **Copy to Working days**, **Copy to Weekend** or **Copy to Full Week**.

The **Saving** field indicates the save state (Not saved / Saved). The **Status** field at the bottom shows the current communication state of the schedule.

The **Refresh** button at the bottom of the card is used for checking only — whenever you want to verify which values are actually saved for the selected day, click it and the currently saved values are reloaded from the unit.

Priority overview

The priority selection combines the **required heating mode** (paid source: OFF / ECO / NORMAL / COMFORT) and the **cheap heating mode** (Solar, PV~COMFORT, PV~MAX). In the drop-down list they are shown as combinations, e.g. SOLAR, PV~COMFORT, ECO+SOLAR, NORMAL+SOLAR+PV~COMFORT, ECO+PV~MAX etc. The set of available combinations matches the sources selected in **Installation**.

In the **Schedule**, the priorities are shown abbreviated on the card (e.g. NORM+SOL+PV for NORMAL+SOLAR+PV~COMFORT).

The schedule applies only in the automatic mode of the application (the **AUTO** switch in the **Priority Settings** section on the **Control** card); in manual mode, the priority set in the **Priority Settings MANUAL** section is used.

“Setting Properties” card

Used for advanced settings of the prediction, the source coefficients and alarms. The values are preset from the factory and normally do not need to be changed. The set of displayed sections depends on the sources selected in **Installation** (e.g. **Solar settings** and the **Solar** column in the prediction are shown only if **Solar collectors** are ticked in **Installation**).

Dependency Settings

- **After vacation Once** – after Vacation mode ends, the application performs one-time heating to the comfort temperature. The active state is highlighted with a blue border.

SOLAR intensity forecast

A table with the current irradiance prediction from QA Weather Forecast YR. The columns match the selected sources – the **Solar** column is shown when **Solar collectors** are selected, the **PV** column when **Photovoltaics surplus** is selected. The rows contain:

- **Today Rest** – prediction for the rest of today.
- **Today** – prediction for the whole of today.
- **Tomorrow** – prediction for tomorrow.
- **Day after tomorrow** – prediction for the day after tomorrow.

The application compares these values with the limits from the following sections and decides whether to prefer cheap heating or to postpone required heating to the next day.

Solar settings

The section is shown if **Solar collectors** are selected in **Installation**:

- **SOLAR Int.Today Min.** – minimum prediction at which solar is still considered sufficient (partially).
- **SOLAR int.Today Full** – prediction at which solar is fully sufficient.
- **SOLAR temperature Ext.Min / SOLAR Temperature Ext.Max** – range of outdoor temperatures in which the collectors are efficient. Outside this range the application does not use solar.
- **Solar heats** – time window (in hours) from / until during which the application considers solar heating available (this handles shading outside this window).

PV settings

The section is shown if **Photovoltaics surplus** is selected in **Installation**:

- **PV Int.Today Min.** – minimum irradiance prediction for today at which the application considers PV available for today's heating.

- **PV Int.Tomorrow Min.** – the equivalent for tomorrow; used to postpone required heating if the prediction for tomorrow is good.

Alarms Setting

- **Temperature Max** – upper DHW temperature limit; when it is exceeded, the application stops heating.
- **Temperature Alarm** – temperature above which a notification is sent to users.
- **LIST OF NOTIFICATION USERS** – drop-down list of users to whom notifications are sent (e.g. ID:2 SupportSHE). Only users with valid access to the unit are shown.
- **Notification period** – minimum interval between repeated notifications for the same state (e.g. 1hour).

“Installation” card

This card is used for the initial configuration of one DHW heating group and is the **first step** of the initial setup – the set of sections and buttons shown on the other cards depends on the sources and hardware selected here. Several independent groups can be installed in one controller; the downstream QA applications (QA DHW Boiler, QA Two-Stage Boiler Control, QA Heat Pump) are paired with QA DHW Mode by the same group number.

⚠ Warning: When saving the settings, always wait until Run status changes to Running. Do not use the SAVE button before that.

HOT WATER HEATING GROUP

Selection of the group (Group 1, Group 2, ...) you are currently configuring. Each group has its own sources, temperature sensor and settings.

Source configuration

The **SELECTING OF SOURCES** field opens a list of five check boxes:

- Solar collectors
- Photovoltaics surplus
- Basic electro
- Gas boiler Basic
- Heat pump Basic

The header shows the number of selected sources (e.g. 5 Selected).

Modes Configuration

- **PV-Max** – enables the **PV~MAX** mode, which uses the maximum available PV output (up to the **Temperature Max** safety limit). The active state is highlighted with a blue border. The button is shown when **Photovoltaics surplus** is selected.

Shelly Configuration

The section is shown when **Photovoltaics surplus** is selected (the Shelly Dimmer controls the power of the heating element from PV surplus). The **QA SHE SHELLYDIMMER0110VPMG3** field is used to select the specific device; the **Update** button checks its availability.

Input/output configuration

- **TEMPERATURE SOURCE TYPE** – selection of the DHW temperature measurement source: Disabled, EX01PV or Device.
- **TEMPERATURE SOURCE** – the specific input of the selected device (e.g. AI01 to AI04 for EX01PV; for Device, a drop-down list of the specific devices in the unit).

Installation procedure

- Tick the sources you want to use in the given group.

- Press **SAVE** and wait for the application to restart.
- Close the card and open it again – after the restart, the newly available configuration sections are shown.
- In **Input/output configuration**, select the type and the input of the DHW temperature sensor; save with the **SAVE** button.

The **Run status** field shows the run state (e.g. Running). The bottom part of the card shows the version information (e.g. Version: sheHotwaterControl 1.06.04).