

Manual: QA PV Forecast

Solar irradiance forecast from the PV Forecast service for planning photovoltaic production in the SHE system.

Introduction

QA PV Forecast loads an hourly forecast of solar irradiance (W/m^2) and outdoor temperature for the installation site from the PV Forecast service (pvforecast.cz) and passes it on to other applications of the SHE system. From the irradiance forecast, **QA Consumption Control** calculates the prediction of photovoltaic production and overproduction for the current and the following day – according to this prediction it controls appliances and battery charging and cooperates with spot control and energy sharing.

The application displays the forecast for today, tomorrow and the day after tomorrow by hours, the sunrise and sunset times and the address of the place for which the forecast is downloaded.

The basic version of the PV Forecast service is free for one location. An alternative to this application is QA Solcast (forecast from the Solcast service).

For clear visualisation and access to measurement history and graphs, we recommend connecting to Mervis SCADA.

IMPORTANT WARNING: The application reads data from a third-party service – PV Forecast (pvforecast.cz).

The transfer of values, their scope and update frequency depend on the PV Forecast service and its terms.

The functionality of the application and the support options of Smart Home and Energy depend on the availability, capabilities and terms of this service. If it is changed, restricted or discontinued, the application may stop working completely or partially.

Smart Home and Energy does not guarantee the availability, completeness or correctness of data provided by a third party. The customer sets up and manages the registration and account with the PV Forecast service on their own.

Upstream and downstream applications

Upstream applications

- **PV Forecast service** – registration of the location at <https://wp2.pvforecast.cz/regitrace/> and an assigned API key; source of the forecast read by the application.

Downstream applications

- **QA Consumption Control** – takes over the irradiance forecast as the source of the production and overproduction prediction for energy management. To calculate the production prediction, it also needs the **Inverter QA** (instantaneous production values and battery state).
- Other applications of the Energy Management family that work with the prediction (e.g. QA Spot Pro, QA Wallbox SPOT Planner, QA Energy Sharing) take over the prediction via **QA Consumption Control**.

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 application is installed into the unit automatically and allows future automatic updates. Requires the “superuser” credentials for the unit. See the separate “Installation Application” manual for details.
- **Standalone installation file (*.fqax)** — 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.

The application is typically installed together with **QA Consumption Control** and is displayed on the unit desktop in the same room (section) as the other energy management tiles.

After a successful installation, the **Irradiation Prediction** tile (main card, displays the current irradiance forecast in W/m²) and the value tiles **Irradiation** (W/m²) and **Temperature** (°C) appear on the unit desktop.

Operating prerequisites

- **Controller:** Fibaro HC3 or HC3L (or Yubii Home / Home Pro) with internet access.
- **Registration of the location with the PV Forecast service** and an assigned **API key** (basic version for one location free of charge).
- Geographic coordinates of the installation site (latitude and longitude), which you enter during the registration and into the application variables.
- To use the forecast in control, **QA Consumption Control** and the **Inverter QA** are installed; loading and displaying the forecast alone works without them.

Registration with the PV Forecast service

1. Open the page <https://wp2.pvforecast.cz/registrace/>.
2. Fill in your e-mail, first name and surname (the company name is optional) and the data of the power plant: **latitude**, **longitude** and **altitude** of the installation site.
3. After submitting the registration, you receive a confirmation e-mail with the assigned API key. If the e-mail does not arrive, check your spam folder, or contact the service operator.
4. Keep the message with the key and the coordinates — then enter the data into the application variables in the unit. The API key is an access code with which the application identifies itself to the service; do not disclose it to anyone.

Opening the application control card

To open the application card in a web browser, move the cursor over the **Irradiation Prediction** tile and click the eye icon in its top-right corner. The application card opens. The gear icon in the top-left corner of the tile opens the device settings with the variables.

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. Register the location with the PV Forecast service and obtain an API key (see above).
2. On the **Irradiation Prediction** tile, click the gear icon and go to the **Variables** tab.
3. Enter the latitude of the installation site into the **PV_Forecast_lat** variable and the longitude into **PV_Forecast_lon**.
 - Use a decimal number with a dot and the same coordinates as during the registration; the values 49.249 and 16.731 in the example are only an example — do not swap latitude and longitude.
 - Paste the whole assigned API key without spaces into the **PV_Forecast_key** variable.
 - Click the pencil icon at the end of the row, edit the value and save the change.
 - Edit the existing rows, do not add new variables.
 - Leave the **Period** variable unchanged.
4. Open the **Irradiation Prediction** card and load the forecast with the **Update** button.
 - Check that the table of values is displayed, that the **Address** value matches the installation site and that the **Update** time is current.
5. In **QA Consumption Control**, check that the application is listed among the irradiance prediction sources (**Installation** card, control configuration).
 - Displaying the forecast on the main card does not yet confirm its use in control.
 - If you cannot find the application among the sources, contact the system administrator.

Variables

The application uses these variables (gear icon on the tile → **Variables** tab):

- **PV_Forecast_lat** — latitude of the installation site (e.g. 49.249),
- **PV_Forecast_lon** — longitude of the installation site (e.g. 16.731),
- **PV_Forecast_key** — API key assigned by the PV Forecast service (secret variable, the value is not displayed),
- **Period** — period of loading the forecast from the service (default value 6; leave unchanged),
- **_savedValues** — internal saved values (address of the place, time of the last loading); do not edit this variable.

“Irradiation Prediction” card

The main card displays the forecast loaded from the PV Forecast service:

- **Forecast Now** — current hour, forecast irradiance (W/m²) and outdoor temperature (°C); the same irradiance value is shown in the card header and on the tile.
- **Irradiation Prediction** table — forecast irradiance (W/m²) for each hour (**Hour**) in the **Today**, **Tomorrow** and **In two days** columns.
 - The current hour is marked with an arrow.
 - Zero values during the night hours are correct.
 - An empty cell means that no value is displayed for the given hour, not a zero forecast.
- **Sunrise/Sunset** — sunrise and sunset time for the given day.
- **Address** — address of the place for which the service calculates the forecast (according to the entered coordinates).
- **Update** — date and time of the last loading of the forecast.

To load the forecast from the service immediately outside the regular period, click the **Update** button. The **PV FORECAST** link next to the **Support** label opens the website of the service operator.

Value tiles

The following tiles are displayed on the desktop:

- **Irradiation Prediction** (current forecast irradiance in W/m^2),
- **Irradiation** (W/m^2),
- **Temperature** ($^{\circ}\text{C}$).

These are forecast values for the current hour, not measurements of a local sensor; irradiance expresses the intensity of solar radiation, not the power of the power plant.

From the forecast, **QA Consumption Control** calculates an estimate of the produced energy in kWh (tiles **Pred.PV Today**, **Pred.PV Tomorrow**); these values cannot be compared directly with the irradiance.

Notes

- The basic version of the PV Forecast service provides a forecast 5 days ahead in hourly intervals for one registered location; the application displays three days.
- If the forecast is not updated (old **Update** time, empty table), check the unit's internet connection and the coordinates; paste the whole key from the registration message into **PV_Forecast_key** again without spaces. If the problem persists, check the registration status with the service operator.
- The coordinates entered into the variables must match the coordinates of the registered location (the basic version of the service is bound to one location).
- For clear visualisation and access to measurement history and graphs, we recommend connecting to Mervis SCADA.