

Quimbi

Monitoring and control of heat pumps and other devices via Modbus TCP/IP

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Instructions for use

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Note:

The program has been programmed with the greatest effort for care and error avoidance. Nevertheless, any warranty is excluded for errors in the program as well as for incorrect operation.

1. The most important thing: Preparation

The most practical way to use **Quimbi** is to monitor and control the device (heat pump) if the program runs on a PC that is permanently connected via a data cable - e.g. via an internet router and a central switch - is connected to the device to be monitored. The use on a permanently running, economical micro-PC, which can be accessed in the in-house network via a remote control app (e.g. AnyDesk, Teamviewer or similar), has proven to be effective. This means that **Quimbi** can be operated via PC as well as via mobile phone or tablet.

In everyday life, all values of the heat pump can be monitored in real time. This provides an overview at any time: All current measured values at a glance, e.g.

- the temperatures in the hot water boiler, in the buffer and in the supply and return pipes,
- the opening of the mixer
- the status values (buffer loading, shutdown and de-icing phases, etc.) etc.

In this way, **Quimbi** can monitor the heat pump or the device in question 24 hours a day, and in the event of malfunctions, irregularities or specific questions about the operation of the device, the data can be transmitted to the customer service, provided that they only have access to the current measured values of the device, for example.

A file "Modbus Register - Heat Pump .xls" is also included.

This Excel file(*) is the control file for a virtual heat pump (device). It is only used to look at the functions of the program. In demo mode, no real connection to a device is established via Modbus communication. All measured values displayed in demo mode are fictitious (for the sake of simplicity: repeated switching between two values). However, an .csv file is loaded under the menu item or on the 'Diagram' page, which shows a 24-hour diagram of real measured value recordings (see below).

The control file can then be copied into a copy (e.g. "My Steuerdatei-WP.xls").

Then - with the help of the device documentation (for Modbus communication) - the two tables in the file must be rewritten in such a way that the register numbers and all other information fit precisely on the device in question (read register and read/write register).

When rewriting the tax file, it is essential to follow the rules laid down at the bottom of the page of the first sheet. Otherwise, error messages may occur at the start of the pro-

gram and the program may be aborted.

2. Page/ Menu item: Connection

Reading the Excel file:

After clicking on the button, the Excel file is loaded and the information in the tables is checked for accuracy.

Connecting to the device (e.g. heat pump) via Modbus protocol:

After entering the necessary Modbus connection data to the device (IP address and port; see user manual), a connection is established with the "Connect" button.

Starting Data Retrieval:

The button starts the data retrieval and from this point on, the measured values of the device are retrieved at intervals of approx. 5s.

Automatic reading, connection and start at program start:

By ticking the checkbox, this initial part of the program will be skipped in the future.

Once the steps of reading, connecting and retrieving have been successfully completed, the display of the current measured values can be switched to either by pointing the mouse pointer to the far left on the light blue color stripe, or by clicking on the menu item "Measured and Control Values".

3. Page/ Menu item: Measured and control values

The following options arise here:

- Overview of all currently retrieved measured values
- Overview of the currently available target values with the possibility of changing them
- Determination of the measured values that are to be recorded in the diagram in their change over time
- Storage or restoration of the diagram configuration (measurement series to be recorded)
- Input and sending of desired setpoints

4. Page/ Menu item: Diagram

Here, the measured values are displayed in their temporal change.

Metrics that can only take two values (dual values) are plotted as color bars below the line chart, while all others whose values vary between their minimum and maximum values are plotted on the line chart.

Highlighted representation (drawn in bold) of individual function graphs (diagram curve):

- by touching the curve in question with the mouse pointer (sweep over the curve slightly to the right with the mouse pointer) with automatic indication of the time and measured value of the respective measuring point and display in the status window above (name of the measurement series, measured value and average value)
- by touching or clicking on the measured value labels in the legend window

- by hovering over the corresponding color field on the right edge of the screen with the possibility to switch individual (or all) curves visible or hidden

If a function graph is touched and then clicked with the mouse, the curve in question remains thickly drawn until the mouse pointer strokes over the field of the color selection. In this case, instantaneous readings can be displayed at the top of the status window at any point in time without necessarily having to touch the curve.

There are three direct buttons available:

- Data storage of the recorded measurement series in a .csv file
- Loading a .csv file with old, previously stored data, and
- Restarting the measured value recording (with loss of the data recorded until then)

The legend window with the labels can be hidden or shown via the Legend button (bottom right) or with the key combination <Ctrl> key and <Shift> key.

By default, the diagram always starts in such a way that the last 12 hours are visible on the screen, in medium zoom mode. The zoom mode can be changed

- by turning the mouse wheel while holding down the <Alt> key
- by pressing the arrow keys (right, left) holding down the <Alt> key or
- by clicking on the small zoom buttons (bottom right): W, M and E (wide, medium, narrow)

In addition, the visible area of the chart can be moved

- by moving the scroll bar below (with the left mouse button) or
- by pressing the arrow keys (right, left).

At the bottom of the graph window, there is an event counter for 3 different individually definable changes in measured values, e.g. to determine how often shutdowns or de-icing have occurred in the past 24 hours.

5. Direct control

On this page there are 30 one-click buttons, which can be labeled by the user as desired and programmed in their function (button: editing). By simply clicking on it (button: Status/Display), the transmission of the setpoint value to the device can then be triggered. The assignment of the control buttons can be saved or loaded from a corresponding file.

In Edit mode, the buttons can be cut, copied, pasted or deleted by right-clicking with the mouse. It is also possible to move the button position. To do this, grab the button with the left mouse button. After a short time, the button appears as a red sliding window. If this is moved to a different button position, the buttons change positions.

6. Orders

Here, any number of control or alarm orders can be placed, which are only then executed if certain time or measured value conditions are met. The orders can also be or loaded from former determinations.

As soon as all given conditions are met, the shipments are executed. Date and time conditions must be activated with the checkbox.

If the "Alarm" checkbox is activated, the program will issue both an audible and a visual alarm in a small warning window. In addition, during the time of a certain alarm, an indicator file is written to the program folder for the device in question. This can then be detected by other programs to trigger further processes.

If the 'SMS' checkbox is selected, an SMS will be sent to the recipient in the event of an alarm, provided that:

- the user has an account with the SMS provider Twilio(*) and
- all necessary information has been entered in the program settings.

7. Menu item: Extras/Settings

Here you can specify:

- whether the control file should be loaded and the connection to the device established automatically when the program starts;
- whether, and if so, when and how often the recorded measurement data (in .csv format) should be saved automatically; and
- which login credentials should be used for any existing Twilio account.

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Twilio is a registered trademark of Twilio.