

User and installation manual



farbwerk

Revision 2 / Revision 8

ENGLISH: PAGE 1

DEUTSCH: SEITE 28

Current as of February 2024

All information contained in this manual is subject to change without prior notice.
All rights reserved.

Table of contents

1. Preface.....	5
2. Safety precautions.....	5
3. Scope of delivery.....	5
4. Assembly instructions.....	5
5. Electrical connections.....	6
5.1. Connector overview.....	6
5.2. Power supply.....	6
5.3. LED output 1-4.....	6
5.4. USB.....	6
5.5. aquabus 1/2.....	7
5.6. Temperature sensors.....	7
5.7. Status LED.....	7
6. aquasuite software.....	8
6.1. Installation of the aquasuite software.....	8
6.2. Basic operation.....	8
6.3. Symbols in the headlines.....	9
7. Overview pages (aquasuite).....	9
7.1. Desktop mode.....	9
7.2. Creating new overview pages and activating edit mode.....	9
7.3. Adding new elements.....	10
7.4. Editing existing elements.....	10
7.5. Values and names.....	10
7.6. Detailed data elements.....	10
7.7. Log data chart.....	11
7.8. User defined: Images, text, drawing elements.....	11
7.9. Export and import of overview pages.....	11
8. Data quick view and data log (aquasuite).....	12
8.1. Log settings.....	12
8.2. Analyze data.....	12
8.3. Manual data export.....	14
8.4. Automatic data export.....	14
9. Sensor configuration.....	14
9.1. Sensor mode.....	14
9.2. Offset.....	14
9.3. Software sensors.....	15
10. RGB controller configuration.....	16
10.1. Output mode.....	17
10.2. LED type.....	17
10.3. Color settings.....	17
10.4. Temperature controlled mode.....	17

10.5. Refresh speed.....	17
10.6. Fading effect.....	17
10.7. Sound controlled effects.....	17
10.8. AMBIENTpx effect.....	18
11. Profiles.....	18
11.1. Manual profile selection.....	18
11.2. Automatic profile selection.....	18
11.3. Profile configuration.....	18
12. System settings farbwerk.....	19
12.1. Device information.....	19
12.2. Factory defaults.....	19
12.3. aquabus configuration.....	19
12.4. Bluetooth configuration (Bluetooth version only).....	19
13. Playground (aquasuite).....	19
13.1. Input values.....	20
13.2. Virtual Software Sensors.....	20
13.3. Output actions.....	21
13.4. Global profiles.....	21
13.5. Hotkeys.....	22
14. aquasuite web.....	22
14.1. Data export.....	22
14.2. Data access.....	22
14.3. Data import.....	23
15. Basic settings (aquasuite).....	23
15.1. Language.....	23
15.2. Create overview pages.....	23
15.3. Reorder menu items.....	23
15.4. Units.....	23
15.5. Event log.....	24
15.6. Application start-up.....	24
15.7. Service administration.....	24
15.8. Audio and video.....	24
15.9. Updates and update service.....	24
15.10. E-mail and MQTT accounts.....	25
16. Bluetooth demo app for Android.....	25
16.1. Download and installation.....	25
16.2. Bluetooth pairing.....	26
16.3. Using the Android demo app.....	26
17. Technical details and care instructions.....	26
17.1. Technical details.....	26
17.2. Care instructions.....	27
17.3. Waste disposal.....	27
17.4. Contact Aqua Computer.....	27

1. Preface

The farbwerk unit is a high power LED controller for PCs.

Considering the fast technical development, we reserve the right to perform alterations to the products at any time. It therefore is possible that your product does not correspond precisely to the descriptions or illustrations in this manual.

2. Safety precautions

The following safety precautions have to be observed at all times:

- Save your data onto suitable media before working on your hardware!
- The farbwerk unit may only be used inside a PC case!
- Never touch electronic components during operation! Do not connect or disconnect cables to/from the device while the device is powered! Components may get very hot during operation. After power off, let the device cool down for at least 30 minutes before touching it!
- Do not turn the PC on unless you are sure that all cable connections to/from the farbwerk unit are correctly attached!
- This product is not designed for use in life support appliances, devices, or systems where malfunction of this product can reasonably be expected to result in personal injury. Aqua Computer GmbH & Co. KG customers using or selling this product for use in such application do so at their own risk and agree to fully indemnify Aqua Computer GmbH & Co. KG for any damages resulting from such application!

3. Scope of delivery

- One farbwerk controller
- One internal USB cable (replacement part no. 53085)
- Mounting material
- This manual

4. Assembly instructions

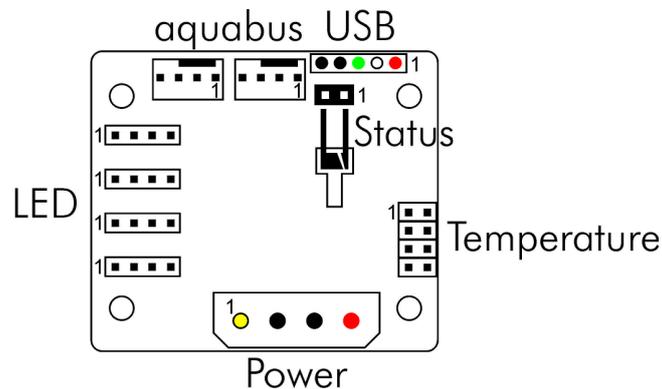
The farbwerk controller can be installed inside the PC case using the supplied screws and nuts. In order to access the mounting holes, bend the rubber insulation away from the top cover of the farbwerk controller and remove the top cover. Re-install the top cover afterwards.

Alternatively, double sided adhesive tape can be used to secure the farbwerk controller inside the PC case.

Make sure that the electric connectors do not have contact to metal parts or other electronic devices inside the PC case, otherwise malfunctions or destruction of the farbwerk unit or other devices may occur!

5. Electrical connections

5.1. Connector overview



ATTENTION: Completely turn off your power supply or disconnect the mains power cord from the wall outlet before connecting or disconnecting any cables to/from the device!

5.2. Power supply

Connect a power plug of your PC's power supply unit to this connector. Do not use excessive force but double check the polarity of the plug if you are having trouble to connect.

Pin assignment:

- Pin 1: +12 V
- Pin 2: GND
- Pin 3: GND
- Pin 4: +5 V

5.3. LED output 1-4

Connect up to four RGB LED strips to these outputs. Maximum current rating for each separate color is 2.5 A at 12 V (corresponding to 30 Watts) and a total maximum combined current of 8 A at 12 V for all twelve color channels (corresponding to 96 Watts total).

The LED outputs are not short-circuit proof!

Pin assignment:

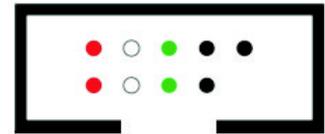
- Pin 1: +12 V
- Pin 2: GND blue (or green)
- Pin 3: GND red
- Pin 3: GND green (or blue)

5.4. USB

This connector is used for USB communication to the PC and for power supply. Connect to an internal USB header of your motherboard. Take special care to make sure the pin alignment matches your motherboard!

The corresponding connector on the motherboard is usually a 9 pin connector with two independent USB ports. Both rows of 4/5 pins can be used to connect an

USB device. The black wires (GND) are to be connected to the side of the missing pin, see picture with colored pin assignment.



Pin assignment:

- Pin 1: +5 V (red)
- Pin 2: D- (white)
- Pin 3: D+ (green)
- Pin 4: GND (black)
- Pin 5: not connected

5.5. aquabus 1/2

Connector for communication with other Aqua Computer devices. Use a compatible aquabus cable (not included in delivery, article no. 53122/53162) to connect the farbwerk controller board to a suitable connector of a compatible device, for example an aquaero. USB and aquabus interface can be used at the same time.

Pin assignment:

- Pin 1: GND
- Pin 2: SDA
- Pin 3: SCL

Compatible aquabus devices:

- aquaero 6 XT (53146, 53206, 53250, 53251, 53262, 53263)
- aquaero 6 PRO (53145, 53253)
- aquaero 6 LT (53234)
- aquaero 5 XT (53089, 53125, 53249)
- aquaero 5 PRO (53090, 53252)
- aquaero 5 LT (53095)

5.6. Temperature sensors

Connector for up to four temperature sensor.

Pin assignment:

- Pin 1/3/5/7: Signal 1-4
- Pin 2/4/6/8: GND

Compatible sensors:

- Temperature sensor inline G1/4 (53066)
- Temperature sensor inner/outer thread G1/4 (53067)
- Temperature sensor G1/4 (53147)
- Temperature sensor plug&cool (53025)
- Temperature sensor 70 cm (53026)

5.7. Status LED

The blue status LED should always be active if power is supplied. For revisions 1 and 2 (black circuit boards), the LED is soldered into the circuit board and can not be removed.

Revision 8 (white circuit boards) only: The status LED is removable and can be inserted from both sides. A red LED is also included in delivery and can be used in-

stead of the originally installed blue LED. The polarity of the LED can be determined by differently shaped metal areas inside the LED, see figure in chapter 5.1. Alternatively, the device can be used without any status LED.

Pin assignment: Pin 1: Supply voltage
Pin 2: GND

6. aquasuite software

The Windows software aquasuite is an extensive software suite and can be used for configuration and monitoring. The software is not required for operation though. All configuration parameters can be saved into the device's memory.

Please note: Depending on the type of product you are using, some features may not be available for your device.

6.1. Installation of the aquasuite software

For configuration and monitoring of our products with USB interface, the aquasuite software is available for download from our website www.aqua-computer.de. You will find the setup program in the support section of the website under Downloads/Software.

The setup program checks all connected USB devices for embedded update service periods and offers various aquasuite versions depending on detected devices. If no device with update service for the latest aquasuite version is found, a warning is displayed and older aquasuite versions that do not require an update service purchase can be selected for installation. For installation and update service validation, an internet connection is required.

The latest aquasuite version may also be installed if no suitable update service period has been found in a device. Subsequently, update service may be purchased or an existing key may be entered within the aquasuite. These functions can be accessed in the aquasuite/Updates tab.

6.2. Basic operation

The program window is divided into two main areas. On the left side, a list of "overview pages", data quick view, data logger, device pages, aquasuite web and aquasuite configuration is displayed, the right side shows the details of the currently selected list element. The list can be hidden or restored by clicking the arrow symbol in the upper left corner.

List elements may be minimized or maximized for easier access by clicking the title bar. The title bars may contain various symbols that will be explained in the following chapter.

6.3. Symbols in the headlines



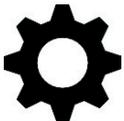
Click the plus symbol in the “Overview pages” headline to create a new overview page.



Clicking the monitor symbol will toggle desktop mode for this overview page. While desktop mode is active, the color of the symbol will change to orange.



Overview page: Clicking the padlock symbol will unlock or lock this overview page for editing. Device: Device can not be used due to update service problems, see “Updates and update service” for details.



Clicking the gear symbol will access the basic configuration page of the selected list element.



In order to save all settings into a device, click the disk symbol in the headline.



This symbol indicates that communication with this device is not possible at the moment. Check USB connection and power supply of the device if necessary.

7. Overview pages (aquasuite)

Current sensor readings and diagrams from all supported devices can be displayed in overview pages. For each device a pre-configured overview page is automatically generated the first time the device is connected to the PC. These pages can be individually modified and new pages can be created. Within one overview page, data from all connected devices can be accessed.

7.1. Desktop mode

Each overview page can be displayed directly on your desktop. You can enable desktop mode for an overview page by clicking the monitor symbol in the list of overview pages. Desktop mode can only be enabled for one overview page at a time. With desktop mode enabled, elements of the overview page may cover program symbols on your desktop, but mouse clicks are transmitted to underlying desktop symbols.

If a overview page is unlocked for editing while desktop mode is active, the page will be displayed in the aquasuite window for editing and the current desktop will be displayed as background for your convenience.

7.2. Creating new overview pages and activating edit mode

In order to create a new overview page, click the plus symbol in the headline “Overview pages”.

Existing overview pages can be unlocked for editing by clicking lock symbol in the page listing.

7.3. Adding new elements

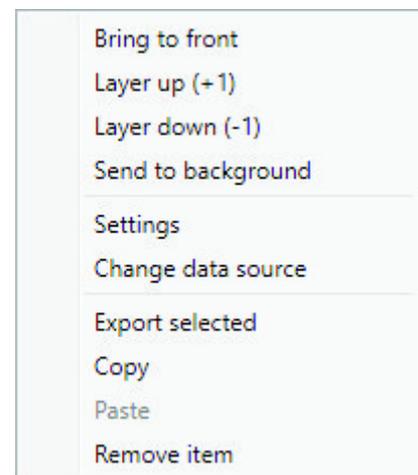
If the currently selected overview page is unlocked for editing, a plus symbol is displayed in the top right corner of the screen. Click the symbol to add a new element to the page and select the desired element from the following list. All available data is displayed in a tree diagram, click the arrow symbols to access individual items.

Confirm your selection by clicking the check symbol in the bottom right corner. The new element will be displayed in the upper left corner and the configuration window is displayed. Configure the element as described in the next chapters.

7.4. Editing existing elements

If the currently selected overview page is unlocked for editing, right-clicking an element will access a context menu.

To access the settings of an element, select "Settings" in the context menu or simply double click the element. If you want to move an element, "drag" this element while holding down the mouse button. Release the mouse button when the element is at the desired position.



7.5. Values and names

If the currently selected overview page is unlocked for editing, right-click an element and select "Settings". You may also double click the element.

Font face, size and color as well as position, decimal places and unit can be configured for individual values.

7.6. Detailed data elements

If the currently selected overview page is unlocked for editing, right-click an element and select "Settings". You may also double click the element. Apart from position, size and color, the style of the element can be selected and configured. The following styles are available:

- **Headline only:** Compact display as a headline.
- **Text:** Displays the numerical value in a box with a headline.
- **Bar graph:** Displays numerical value as well as bar graph.
- **Chart:** Displays the value in chronological sequence as a chart.
- **Gauge:** Displays the value as an analog gauge.

All display styles offer extensive configuration options, additionally statistical data such as minimum, maximum and average can be displayed.

7.7. Log data chart

This element can be used to display charts on overview pages. The charts have to be created using the data log functionality of the aquasuite before they become available for overview pages. Please refer to the next chapter for details. Once a chart has been configured, it can be selected from the “Chart selection” list on the “Display” tab of the settings dialog.

7.8. User defined: Images, text, drawing elements

By using user defined controls, simple drawing elements such as circles, rectangles and texts as well as images and more sophisticated elements can be added to an overview page. To do so, add an “User defined” element to an overview page. Switch to the “Display” tab in following dialog box, select the type of element to be created from the drop down menu and confirm your selection by clicking the “Load preset” button. Depending on the type of element, an additional dialog may appear before the code (XAML, Extensible Application Markup Language) of the new element is displayed in the lower part of the dialog window. You may want to customize the code. By clicking the “Ok” Button, the new control is saved to the overview page.

Step-by-step example to add an image: Select “Image” from the drop down menu and click the “Load preset” button. Select an image file using the following file selection dialog. The code is then displayed in the lower part of the dialog window and can be modified. Save the new control by clicking the “Ok” button. The picture will be displayed on the overview page.

More complex controls such as data bindings and animations are also available but will require some programming experience for configuration.

7.9. Export and import of overview pages

Elements and complete overview pages can be exported from the aquasuite and can then be imported either on the same PC or on other PCs. For export as well as import, the overview page must be in edit mode.

To export a complete page, right click a free spot of the page and select “Export page” from the context menu. To export individual elements, select the element or elements, perform a right click and select “Export selected” from the context menu. For import, right click a free spot of the page and select “Import page” or “Import items” from the context menu. Using “Import page”, the current page will be deleted and only the imported page items will be displayed, using “Import items” will add the items from file to the current page without altering the existing items. During import, the elements will be assigned to devices using the following scheme:

If a device with identical serial number is found on the computer, no changes are made.

If no device with identical serial number is found on the computer, the element will be assigned to the first device found of identical type.

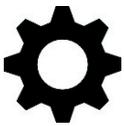
When importing complex pages with elements referring to more than one device, it is recommended to edit the device assignment in the file using a text editor prior to importing.

8. Data quick view and data log (aquasuite)

All data currently monitored by the aquasuite can be accessed in the “Data quick view” section. This includes data from connected USB devices as well as hardware data supplied by the Aqua Computer background service. Displayed data may be filtered using the text box next to the magnifier icon, a chart shows the development over a maximum of ten minutes. All data shown here is not stored permanently.

In contrast, the “Data log” may be used to selectively and permanently store data from all connected Aqua Computer devices and hardware data supplied by the background service. Logged data can then be analyzed by creating charts or be exported to files. Data is only logged while the aquasuite software is being executed.

8.1. Log settings



The log settings can be accessed by clicking the “Log settings” element below the “Data log” headline in the listing. To log data, create a new log data set by clicking the plus symbol in the upper right corner of the settings window. Enter name, time interval and configure automatic deletion of old data to meet your requirements. You may then add the data sources to log by clicking the plus symbol in the “Data sources” window section. You may add an unlimited number of data sources to each log data set, the total number of log data sets is also unlimited.

8.2. Analyze data



Logged data can be visually evaluated as charts. To do so, select “Analyze data” below the “Data log” headline in the listing. The chart will initially be empty, directly below the chart are eight buttons to modify the chart. In the lower section of the window, the chart data can be configured.

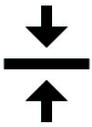
To add data to the chart, first select the “Data sources” tab in the chart configuration and select a data set to be displayed. If no data sources are available, you will have to configure the log settings as described in the chapter “Log settings” of this manual. Select the time period to be displayed on the right side of the window and add the data to the chart by clicking the “Add data to chart” button. Repeat this procedure if you want to display more than one data set in the chart.

You may modify the chart using the “Chart setup” and “Data series setup” tabs. Finally, you can use the “Chart manager” tab to save the current chart configura-

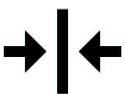
tion and to load or delete previously saved configurations. All saved chart configurations will be available on overview pages for the “Log data chart” element. The currently displayed chart can be edited by using the buttons directly below the chart and may also be saved as an image file. The button corresponding to the currently selected function is highlighted by an orange frame. Please refer to the following list for details on each function:



To save the currently displayed chart as an image file, click the floppy disk symbol and select a name and location in the following dialog.



This function can be used to add horizontal lines to the chart. While this function is activated, simply click into the chart to add a line at the current cursor position.



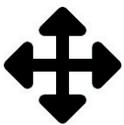
This function can be used to add vertical lines to the chart. While this function is activated, simply click into the chart to add a line at the current cursor position.



This function can be used to add annotations to the chart. While this function is activated, simply click into the chart to add an annotation at the current cursor position. By clicking into the text box, you may edit the text. You may also drag the little circle beside the text box to move the connecting line to the desired position. Use drag and drop to move existing annotations.



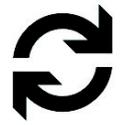
This function can be used to remove horizontal/vertical lines or annotations from the chart. While this function is activated, simply click the element to be removed.



This function can be used to move the visible portion of the chart. Press and hold the mouse button while moving the cursor in the chart to select the position to be displayed, then release the button.



This function can be used to zoom in and out. Use the mouse wheel or select the area to be displayed. You can reset the zoom settings by double-clicking in the chart area.



This function can be used to reload and update the chart.



This function will completely remove the chart.

8.3. Manual data export

Saved data can be exported from the data log into a XML file. To do so, select “Analyze data” below the “Data log” headline in the listing. Select the “Data sources” tab in the chart configuration and select a data set to be exported. If no data sources are available, you will have to configure the log settings as described in the chapter “Log settings” of this manual. Select the time period to be exported on the right side of the window and start the export process by clicking the “Export data” button. Enter a file name and path in the following dialog window.

8.4. Automatic data export



The automatic data export feature can be used to save data from the aquasuite into an XML file on the hard disk or in the RAM (“memory mapped file”) in a regular time interval. The automatic data export will always overwrite the previously saved data, so the file always contains only the most recent data set. Select “Automatic data export” below the “Data log” headline in the listing to access the settings screen. Create a new export data set by clicking the plus symbol in the upper right corner of the screen. Enter name, path and time interval to meet your requirements. You may then add the data sources to log by clicking the plus symbol in the “Data sources” window section. You may add an unlimited number of data sources to each export data set, the total number of export data sets is also unlimited.

9. Sensor configuration



Select “Sensors” from the device list below the “farbwerk” entry.

9.1. Sensor mode

Select the desired mode of operation for the sensor input. If “Temperature” mode is selected, temperature will be calculated from the sensor data. Alternatively, each input can be configured to “Resistance” or “Voltage 0-3.3 V” mode, resulting in sensor readings being interpreted as resistance or voltage values.

9.2. Offset

If you detect inaccuracies in the temperature sensor readings, you can make corrections here. In general, this should not be necessary. This setting is available in sensor mode “Temperature” only.

9.3. Software sensors

Four available software temperature sensors can be used to transfer temperature sensor readings to the farberwerk controller from the computer by USB connection or from an aquaero 5/6 by aquabus connection.

For each software sensor, a scale factor and an offset may be configured for manipulation of the displayed sensor value. Data from third party software regularly requires the scale factor to be adjusted.

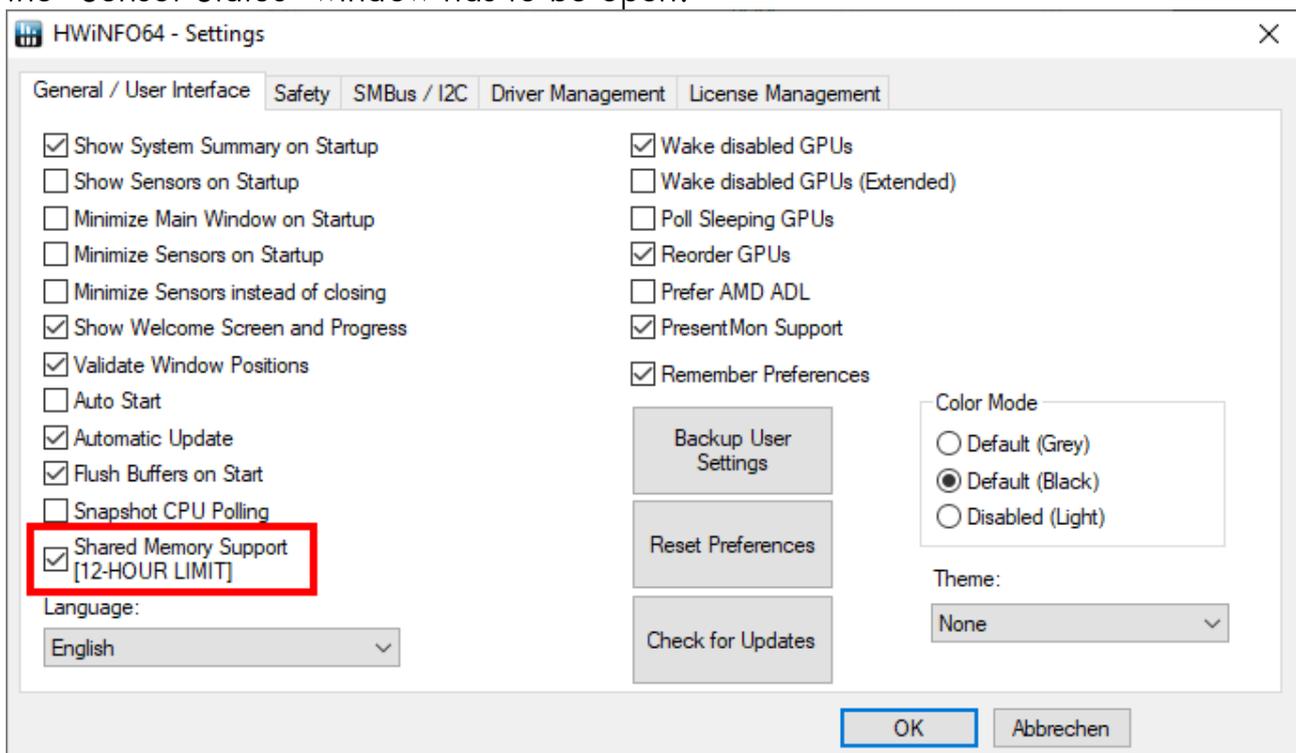
Software sensor values will only be available while all involved programs are running, so no data will be available while the operation system is starting up or shutting down or if an involved program is closed. If no data is available or the data has not been updated within the time interval defined as "Timeout in s", the device will use the "Fallback temperature" instead. As soon as data is available again, normal operation of the software sensor will resume automatically.

Transmission of sensor data via USB interface

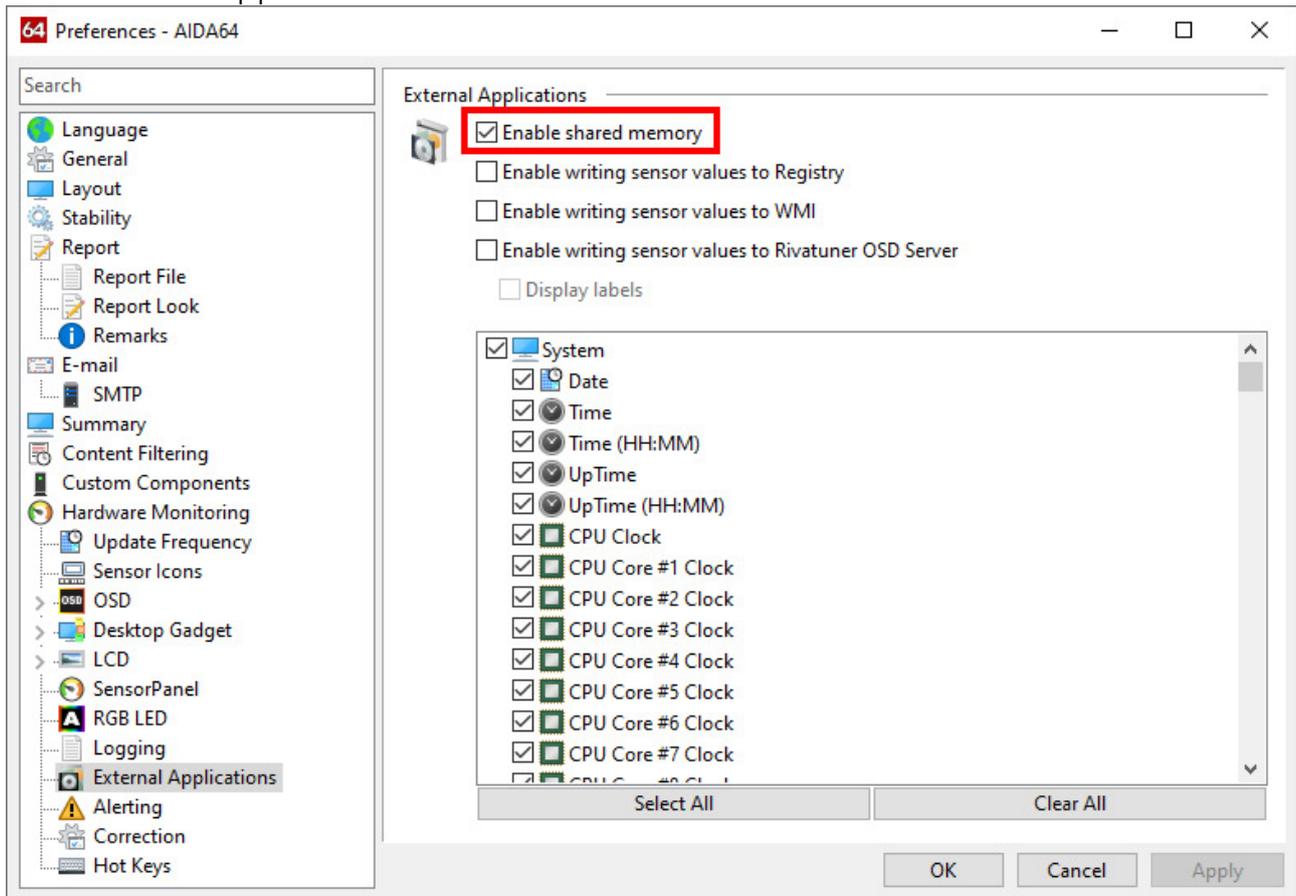
During installation of the aquasuite, the background service "Aqua Computer Service" is also installed. This service supplies various data from PC components and imported data from aquasuite web, additionally sensor data provided by third party software can be accessed. In order to access third party software data, the third party software has to be correctly installed, configured and running.

Currently, the "Aqua Computer Service" supports data transfer from "HWiNFO" (REALiX, Freeware, www.hwinfo.com) and "AIDA64" (FinalWire Ltd., subject to license fees, www.aida64.com).

In the HWiNFO settings menu, "Shared Memory Support" must be activated and the "Sensor Status" window has to be open:



In the AIDA64 preferences menu, “Enable shared memory” must be activated in the “External Applications” sub-menu:



By clicking the plus symbol labeled “Data source”, one of the provided sensors can be assigned to the selected software sensor.

Transmission of sensor data via aquabus interface

Sensor data to be transmitted via aquabus is determined solely by the connected aquaero 5/6 controller. For configuration, the aquaero has to be connected to the PC (at least temporarily) via USB.

Select “Outputs” from the device list below the “aquaero” entry. From the “aquabus: farbwerk x, output y” section, select the appropriate farbwerk to receive sensor data. Select the “Transmit sensor data to farbwerk” mode and the data source to be transmitted. The assignment to the four software sensors of the farbwerk is predetermined.

10. RGB controller configuration



Select “RGB” from the device list below the “farbwerk” entry to configure the four LED outputs. In the upper section, the four outputs can be disabled entirely. For disabled outputs, all further configuration options are removed from the lower section.

10.1. Output mode

Each RGB output can be controlled by a temperature sensor input or software temperature sensor, by an external controller (for instance from an aquaero 5/6 connected via aquabus, via Bluetooth connection or third party software), set to a fixed color or a color gradient. A copy function can be used to transfer all settings from another previously configured controller.

10.2. LED type

The color sequence of the electrical contacts of LED strips may vary. Select the correct type corresponding to markings on the LED strip.

10.3. Color settings

Depending on the current controller mode, one or two colors can be defined. Colors can conveniently be set using the graphical color and brightness selectors, alternatively corresponding values can be set manually. The “Optimized colors for Aqua Computer LED strip” function enables color optimization for the LED strips available from Aqua Computer.

10.4. Temperature controlled mode

In temperature controlled mode, two colors can be defined corresponding to two temperature readings. The farbwerk controller generates a color gradient for temperature sensor values between these limits. The “Controller source low pass filter” setting influences sensor reading smoothing for a steady color gradient.

10.5. Refresh speed

The “Refresh speed” setting determines how often the controller is updated.

10.6. Fading effect

For some controller modes, a fading effect can be activated. By defining the eight points of the effect curve, a pulsating brightness of the corresponding LED output can be set.

10.7. Sound controlled effects

Sound controlled effects can be used to visualize the current audio output of the computer. A warning in the LED configuration area will notify you if audio analysis has been disabled in the aquasuite. In this case, please enable the feature in the general aquasuite configuration. The general aquasuite configuration can also be used to modify existing audio filters and define custom audio filters.

10.8. AMBIENTpx effect

The AMBIENTpx effect replicates the border area of the current monitor content on the configured LEDs. This effect is meant to be used with LED strips installed to the rear of the monitor for background lighting. A warning in the LED configuration area will notify you if video analysis has been disabled in the aquasuite. In this case, please enable the feature in the general aquasuite configuration.

For each configured AMBIENTpx effect, please select the correct monitor, edge and desktop range to evaluate for the effect.

Prerequisites and limitations:

- The AMBIENTpx effect requires Microsoft Windows operating system version 8.1 or newer.
- Screen content preventing analysis by DRM or similar methods cannot be analyzed.
- Multi monitor setups must be configured using standard procedures of the operating system. Special features of the graphics card driver like "NVIDIA Surround" or "AMD Eyefinity" must be disabled.
- AMBIENTpx is not available while "NVIDIA G-Sync" is active.

11. Profiles



Select "Profiles" from the device list below the "farbwerk" entry.

The profile management can be used to save four configurations as profiles and activate them manually or automatically. Profile management is a software feature of the aquasuite and requires a USB connection to the farbwerk.

11.1. Manual profile selection

Select the profile to be activated by clicking the corresponding button.

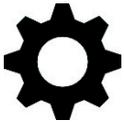
11.2. Automatic profile selection

Profiles can be activated automatically using the global profiles feature of the aquasuite, see chapter 13.4. for details.

11.3. Profile configuration

All configuration changes are automatically stored in the currently active profile. The current configuration can also be stored in any other profile by clicking the corresponding button.

12. System settings farbwerk



Select "System" from the device list below the "farbwerk" entry.

12.1. Device information

The details displayed here might be required when you contact our service for support. You may enter a "Device description" for easier identification, this text will be displayed in the device list and in the data quick view.

12.2. Factory defaults

Click the button "Reset device to factory defaults" for a complete reset of all settings. You will have to completely reconfigure the device after resetting it to factory defaults!

12.3. aquabus configuration

Before connecting farbwerk devices to an aquaero 5/6 controller, each farbwerk device has to be configured to an individual aquabus address. You may skip this step if only one farbwerk device is connected. Addresses 20 and 21 are available for farbwerk devices.

Beginning with firmware version 1004 included in aquasuite version 2017-3, data received by aquabus from an aquaero 5/6 is always processed with higher priority than the configuration stored in the farbwerk itself. Manual configuration of data prioritization is no longer necessary in this case.

12.4. Bluetooth configuration (Bluetooth version only)

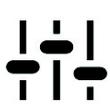
For initializing a Bluetooth connection, a pairing key is required. The factory preset of "1234" can be changed to another four-digit pairing key.

Please note: After changing the pairing key, you will have to power down the farbwerk device for changes to take effect.

13. Playground (aquasuite)

Click the entry "Playground" to configure Virtual Software Sensors, global profile management and hotkeys.

13.1. Input values



Input values defined in this section can be manipulated by individually configured control elements, for example sliders or buttons.

Create a new input value by clicking the plus symbol in the upper right corner of the “Input values” window and configure the properties as desired. A name, an icon, a unit, a range of values as well as a initial value can be assigned to each input value. This new input value will then be available to be displayed on overview pages and in the quick view section and can be used as a data source for software sensors and virtual software sensors.

In the lower area of the window, control elements can be created and configured to manipulate the input value. These preconfigured control elements can then be used for overview pages or in the system tray.

13.2. Virtual Software Sensors

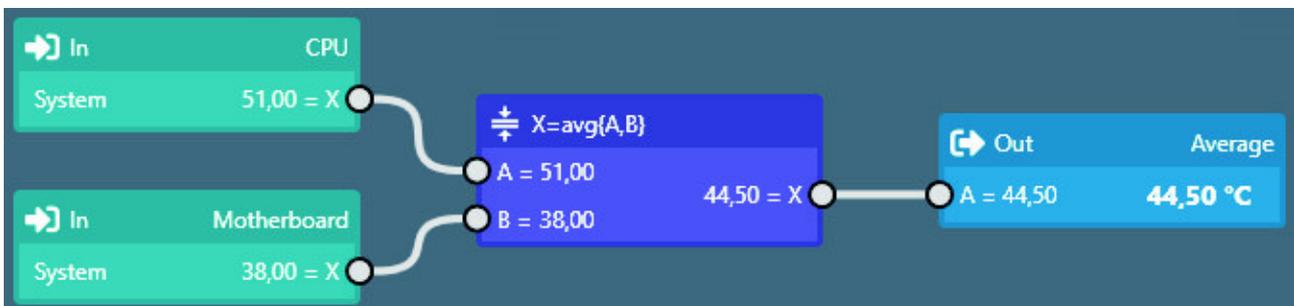


Virtual Software Sensors can be used for extensive yet easy to use adaptation and calculation of sensor values using mathematical and logical functions as well as filters.

Create a new Virtual Software Sensor by clicking the plus symbol in the upper right corner of the “Virtual Software Sensors” window. Each Virtual Software Sensor always has an “Out” element which will provide the resulting sensor value. In the settings dialog of this element, the name and unit of the sensor can be configured. You can now add data sources and function blocks to the lower area of the sensor window and connect inputs and outputs of the blocks with lines. Connect the output of the last function block with the “Out” element.

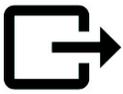
The resulting virtual sensor can be used within the aquasuite software, for example for overview pages, additionally it may be transmitted via USB connection to connected devices that feature software sensors.

The following (very simple) example calculates the average out of two temperatures:



Virtual software sensors are updated once per second and re-calculated with the numbers valid in that particular moment. When using fast changing input values, extreme values can therefore either be used or ignored for the calculation. No smoothing or averaging is taking place.

13.3. Output actions



While the virtual software sensors are used as a value within the aquasuite, output actions configured in this section are used to trigger events. Various notification events including emails and MQTT messages are available. Additionally, external programs can be started.

Create a new output action by clicking the plus symbol in the upper right corner of the “Output actions” window and configure the properties as desired. Each output action always has an “Output” element which represents the event itself. In the settings dialog of this element, the event to be executed can be selected and configured.

You can now add data sources and function blocks to the lower area of the window and connect inputs and outputs of the blocks with lines. Connect the output of the last function block with the “Output” element. The event will be executed when the input of the “Output” element reaches a value greater than zero.

Output actions are updated once per second and re-calculated with the numbers valid in that particular moment. When using fast changing input values, extreme values can therefore either be used or ignored for the calculation. No smoothing or averaging is taking place. Example: If thresholds are exceeded for very short periods of time lasting less than one second, the action can be executed or not be executed seemingly at random, depending on whether the thresholds is exceeded in the exact moment the calculation is performed.

13.4. Global profiles



The global profile management can be used to conveniently change settings in multiple devices simultaneously and activate desktop pages. Individual actions can be defined for each of the four profiles, switching between profiles can either be done manually or automatically depending on configurable rules.

In order to use this feature, set up profiles within the individual device configurations first. These profiles can then be activated using the global profile management. Not every type of device supports profiles.

Buttons in the upper window area can be used to switch between global profiles. Alternatively, the profile icon in the title bar of the aquasuite window or a profile icon in the system tray may be used.

Example use cases: Switching of LED illumination settings depending on current time of day or modification of fan settings when a graphics application is launched.

Notice for profile activation depending on running applications: During configuration of the respective rule in the aquasuite, the application to be configured must already be running. The application selection within the aquasuite will always show currently running applications and processes only.

13.5. Hotkeys



Hotkeys are key combinations that will be processed system-wide and can activate global profiles or desktop pages. The configured key combinations will be registered in the operating system and be processed by the background service. If the configured actions only use the profile management, the aquasuite does not have to be running for hotkeys to be operational; if desktop pages are used, the aquasuite must be running. Do not use key combinations for this function that are required by other applications.

14. aquasuite web

Click the entry “aquasuite web” to publish data on the internet or import data from the internet. The server for this service is operated by Aqua Computer and provided for use with the aquasuite, without warranty for error free operation or permanent availability. Aqua Computer reserves the right to limit or cancel this service at any time.

14.1. Data export



To publish data, create a new export data set by clicking the plus symbol in the upper right corner of the “Data export” window. The name of the data set may be modified to meet your requirements. You may then add the data sources to export by clicking the plus symbol in the “Data sources” window section. By clicking the gear symbol, the name of the corresponding value can be changed. Up to 30 data sources can be added to each export data set, the total number of export data sets is limited to 10. All selected values will be transmitted to the Aqua Computer server by the Aqua Computer background service approximately every 15 seconds, even after closing the aquasuite.

Notice regarding data security: All data contained in the configured export data sets is transmitted to the Aqua Computer server with transport security. The server stores the data set in volatile memory until a new data set is received or until 10 minutes have passed. Data received is not permanently stored, data is also not correlated to IP addresses or other personal data. Data on the server may be accessed by anyone without restrictions, furthermore automatic data collection and recording through third parties is possible. Use the data export feature for data that you want to publish publicly and are allowed to do so only.

14.2. Data access



Published data can be obtained from the Aqua Computer server in various formats. Generally, the “access key” is required to access data.

In addition to access through any internet browser and importing data into the aquasuite, data is also available in JSON format and compatible to Circonus.

Furthermore, the server generates banner images in two different sizes from the transmitted data, suitable to be included in forums signatures. The code required for the Aqua Computer forums is provided for your convenience.

14.3. Data import

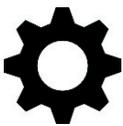


To import a data set from the Aqua Computer server, the “access key” of the data set is required. The access key can be found in the aquasuite on the computer providing the data in the “Data access” section.

Create a new import entry by clicking the plus symbol in the upper right corner of the “Data import” window. Enter the access key of the data set to be imported. Up to 10 data sets (each containing up to 30 values) can be configured.

In order to verify that data is being imported, use the “Data quick view” feature in the aquasuite. Navigate to “Data from Aqua Computer service”, then “aquasuite web”. For each imported data set, you should find an entry with the name of the data set containing the individual values. It may take a few seconds before imported data is displayed.

15. Basic settings (aquasuite)



Click the entry “Settings” below the headline “aquasuite” to access basic settings for language, units and start-up of the software.

15.1. Language

Select a language from the drop down menu. After changing the language setting, the software will have to be restarted.

15.2. Create overview pages

After activating the “Generate device overview pages”, new overview pages with default settings will be created for all devices.

15.3. Reorder menu items

The order in which overview pages and devices are displayed in the list can be adjusted to your preference. Activate the reorder mode by clicking the “Edit menu order” button or by clicking and holding one of the elements for a few seconds. Sort the list items by clicking the arrow symbols and exit the reorder mode by clicking the check symbol on the right side of the window when done.

15.4. Units

Select the units to be used for temperature and flow values from the drop down menus. After changing these settings, the software will have to be restarted.

15.5. Event log

Events from various parts of the aquasuite can be saved to text files. Use the buttons to view the files either internally in the aquasuite or with an external program.

15.6. Application start-up

You may customize start-up behavior to suit your preferences. You may also select to hide the task bar symbol of the software when minimized.

15.7. Service administration



The background service configures special USB settings for all connected Aqua Computer devices, provides hardware data, software sensors, profile management, aquasuite web and Playground and should therefore always be active.

The hardware monitoring features of the background service can be disabled for specific categories if errors occur. Especially when using hardware monitoring software of different manufacturers at the same time, conflicts can occur when accessing data. Deactivate the hardware monitoring feature of the aquasuite or parts of it in this case.

When maintenance mode is activated, all optional modules of the background service are deactivated. This is useful in case of erroneous settings in the Playground, in particular if a system shutdown is configured and triggers too often. Therefore, in default configuration maintenance mode is automatically enabled if the computer is shut down three times by this feature (recommended setting).

15.8. Audio and video



The background service can analyze audio and video data and provide it to connected devices. Both functions can be enabled and disabled separately.

Notices for video analysis: Screen content preventing analysis by DRM or similar methods cannot be analyzed. If a graphics card is configured for variable refresh rate or a modified refresh rate, video analysis may fail; please deactivate this function in the graphics settings of the operating system if necessary.

15.9. Updates and update service



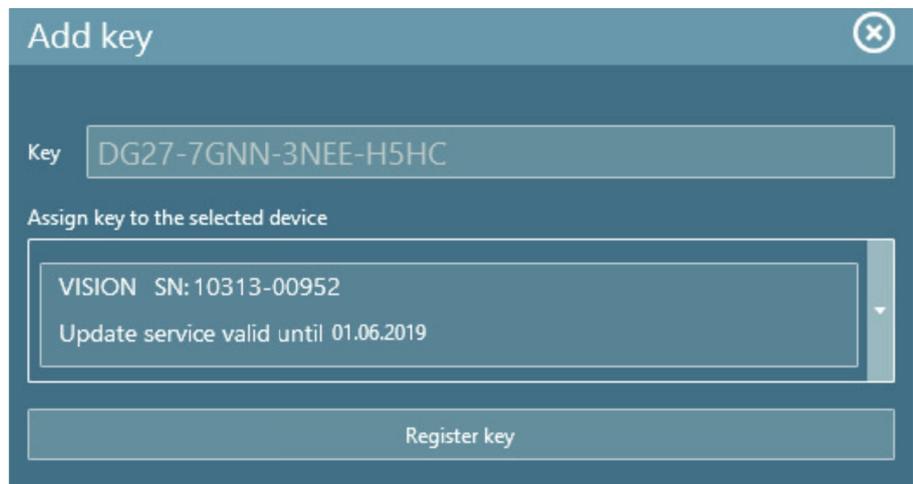
For software activation, all aquasuite versions starting with version 2017 require an active update service for the initial release date of the respective version. Update service periods are generally assigned to individual devices, brand-new devices automatically contain update service for a specific period depending on the type of the device. For software activation, at least one device in the computer must contain a corresponding update service period that includes the release date of this software version. If a valid update service period is detected for at least one device, all devices connected to the computer can be

used with this version. It is not mandatory that each device has a corresponding update service period. For update service validation, the aquasuite requires an internet connection.

After successful validation, a file containing current data is stored on the computer. A re-validation is performed only if a new software version (update) is installed or upon connection of new devices. New devices can not be used prior to re-validation, even if other devices with corresponding update service periods are connected at the same time.

To purchase update service, please use the “Buy” button, which will open a website with current prices and payment options.

If you have received a key for update service with a device or bought one separately, you may enter the key after clicking the “Register” button. Select a currently connected USB device from the list for update service assignment. After click-



ing the “Register key” button, the update service period is permanently assigned to the selected device and stored on the Aqua Computer update server. The key will not have to be re-entered after re-installation of the software or transfer of the device to another computer, but transferring the update service period to another device is not possible.

During update service validation and software activation, device serial numbers and a calculated computer ID are transmitted to and stored on the update server. No further personal information such as IP addresses are stored.

15.10. E-mail and MQTT accounts



Accounts for sending e-mail or MQTT messages can be configured. These accounts can then be used to send messages in the “Outputs” section of the Playground.

16. Bluetooth demo app for Android

16.1. Download and installation

A free demo app is available for download. In order to install the app, you will have to enable installation from unknown sources. Open the app drawer and go

to “Settings”. In the settings screen, select “Security” and enable “Unknown sources” from the “Device Administration” section.

Use the internet browser on your mobile Android device to download the app. You will find the app on the Aqua Computer website www.aqua-computer.de by navigating to “Support” → “Downloads” → “Software” and selecting the farbwerk Bluetooth app for Android.

Open the app drawer and go to “Downloads”. Start the installation by tapping on the downloaded farbwerk APK file.

We recommend to disable the “Unknown sources” setting after installation for security reasons.

16.2. Bluetooth pairing

Before the farbwerk demo app can access farbwerk devices via Bluetooth, each farbwerk device must be paired with your mobile device. Open the app drawer and go to “Settings”. In the settings screen, select “Bluetooth”. The farbwerk Bluetooth devices will show as “farbwerk xxxxx-xxxxx”, where xxxxx-xxxxx will be replaced by the individual serial number of each farbwerk device. See chapter 12.1. for reference.

Tap the farbwerk device you want to pair to your mobile phone and enter the pairing key for the farbwerk device. Factory default key is “1234”, see chapter 12.4. for individual configuration.

16.3. Using the Android demo app

Open the app drawer and go to “farbwerk”. The farbwerk demo app will display a list of all paired farbwerk devices. Tap any device to access the settings for this device.

Please note: Each output has to be configured to use an “External controller source” to accept configuration via Bluetooth. Please see chapter 10.1. for reference.

Please note: Only one mobile device can be connected to a farbwerk device via Bluetooth at any given time. After leaving the settings screen in the farbwerk demo app, other devices can connect to this controller via Bluetooth again.

17. Technical details and care instructions

17.1. Technical details

Dimensions W x H x D:	47 mm x 41 mm x 20 mm
Power supply voltage:	12 V DC $\pm 5\%$, 5 V DC $\pm 5\%$
Power supply current:	max 8.1 A
LED output voltage:	12 V
Output current per channel:	max. 2.5 A at 12 V
Combined output current:	max. 8 A at 12 V

Ambient temperature range:	10 to 40 °C (noncondensing)
Bluetooth interface	Bluetooth class 1, max. 10 m, SPP protocol (Bluetooth version only)

17.2. Care instructions

Use a dry and soft cloth for cleaning. All electronic components and headers must not get in contact with coolant or water!

17.3. Waste disposal

This device has to be disposed of as electronic waste. Please check your local regulations for disposal of electronic waste.



17.4. Contact Aqua Computer

We are always happy to answer questions regarding our products and to receive feedback. For answers on frequently asked questions, please also check our website www.aqua-computer.de. You might also want to visit our forums and discuss our products with experienced moderators and thousands of members – available 24/7. To get in direct contact with our customer support team, we offer several options:

Email: support@aqua-computer.de

Postal address: Aqua Computer GmbH & Co. KG
Gelliehäuser Str. 1
37130 Gleichen
Germany

Tel: +49 (0) 5508 9749290 (9-16 h CET, German and English language)