

User and installation manual



farbwerk

Firmware version 1001
aquasuite version 2015

Current as of January 2015

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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

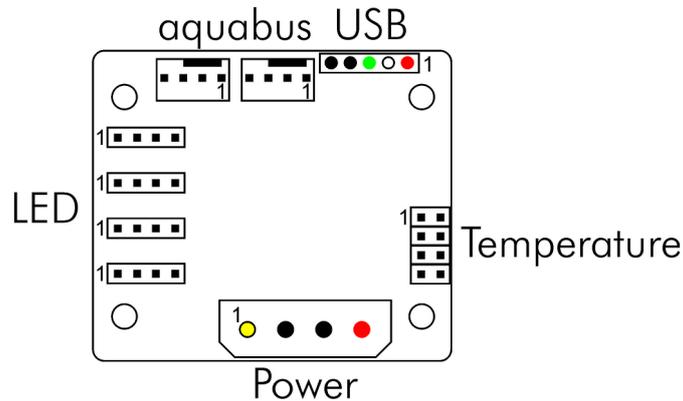
- One farbwerk controller
- One internal USB cable
- Mounting materials
- This manual

4. Assembly instructions

Use the supplied screws to install the farbwerk controller inside your PC case. Make sure that the PCB and electronic components 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!

Please refer to the following chapters for details on the individual connectors.

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 output are not short-circuit proof!

Pin assignment:

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

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!

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 (not available in Bluetooth version)

Connector for communication with other Aqua Computer devices. Use a compatible aquabus cable (not included in delivery, article no. 53122/53161/53162/93111) 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/PRO (art. 53146, 53145)
- aquaero 5 XT/PRO/LT (art. 53125, 53095, 53090, 53089)

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

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, so after initial configuration, LED color can for example be controlled depending on a temperature sensor reading independently from an USB or aquabus connection. 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 farbwerk units, the aquasuite software is available for download from our website www.aqua-computer.de. You will find the most up-to-date version in the support section of the website.

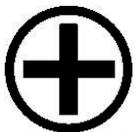
After downloading, install the aquasuite software. Depending on your selection during the installation process, the aquasuite software may start automatically upon restart or may be accessed through a symbol on your desktop or in the start menu.

6.2. Basic operation

The program window is divided into two main areas. On the left side, a list of "overview pages", data logger, device pages and the basic configuration page of the software 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



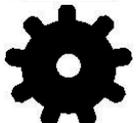
Click the plus symbol in the "Overview pages" headline to create a new overview page.



Clicking the monitor symbol will toggle desktop mode for this overview page. While desktop mode is active, the arrow in the symbol will have an orange color.



Clicking the padlock symbol will unlock or lock this overview page for editing.



Clicking the gear wheel 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.



Clicking this symbol in the lower left corner of the aquasuite window will display the news feed on aquasuite updates.

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 corresponding 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.

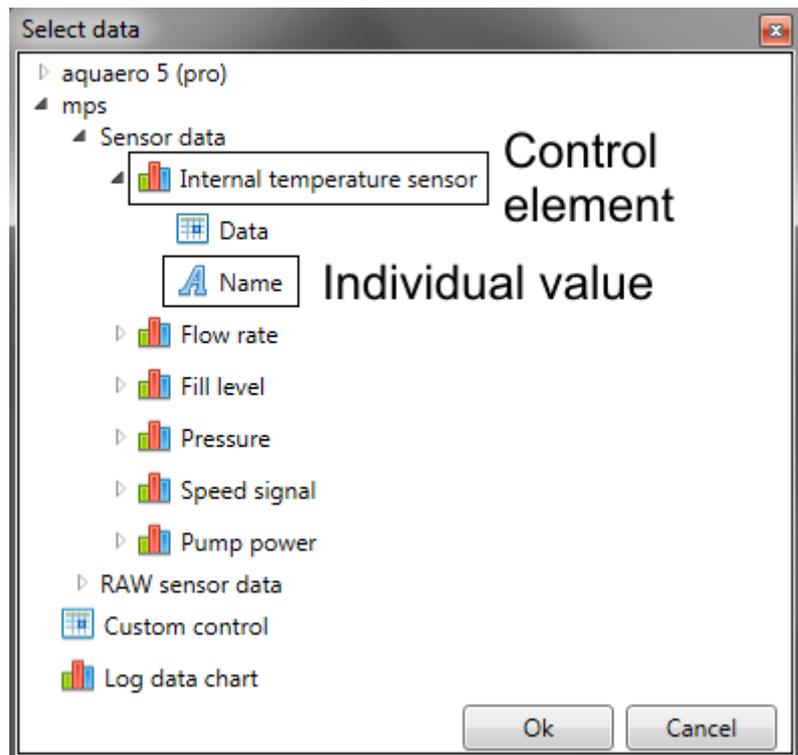
7.3. Adding new elements

If the currently selected overview page is unlocked for editing, a white plus symbol is displayed in the bottom 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 elements are displayed in a tree diagram, click the arrow or plus and minus symbols to access individual items. Please note that individual values can be selected as well as higher-ranking control elements. Custom controls can be selected for example to import image files.

Confirm your selection by clicking "OK". 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. Settings of individual values

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. Settings of control 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. Custom controls: Images, text, drawing elements

By using custom 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 a "Custom control" 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. Example process 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.

7.8. 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.

7.9. 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 log (aquasuite)

Data from all connected Aqua Computer devices can be logged by the aquasuite. Logged data can then be analyzed by creating charts or be exported to files.

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.

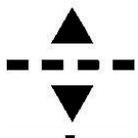
To add data to the chart, first select the “Data sources” tab in the chart configuration and select a data set to be displayed. If no data sources are available, you will have to configure the log settings as described in the corresponding chapter of this manual. Select the time period to be displayed 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 configuration and to load or delete previously saved configurations. All saved chart configurations will be available on overview pages for the “Log data chart” element.

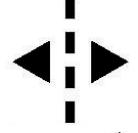
The currently displayed chart can be edited by using the buttons directly below the chart and may also be saved as an image file. The button corresponding to the currently selected function is highlighted by an orange frame. Please refer to the following list for details on each function:



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.



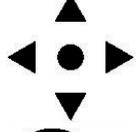
This function can be used to add vertical lines to the chart. While this function is activated, simply click into the chart to add a line at the current cursor position.



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 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 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 corresponding chapter 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 (aquasuite)

Select “Sensors” from the device list for the device to be configured.

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

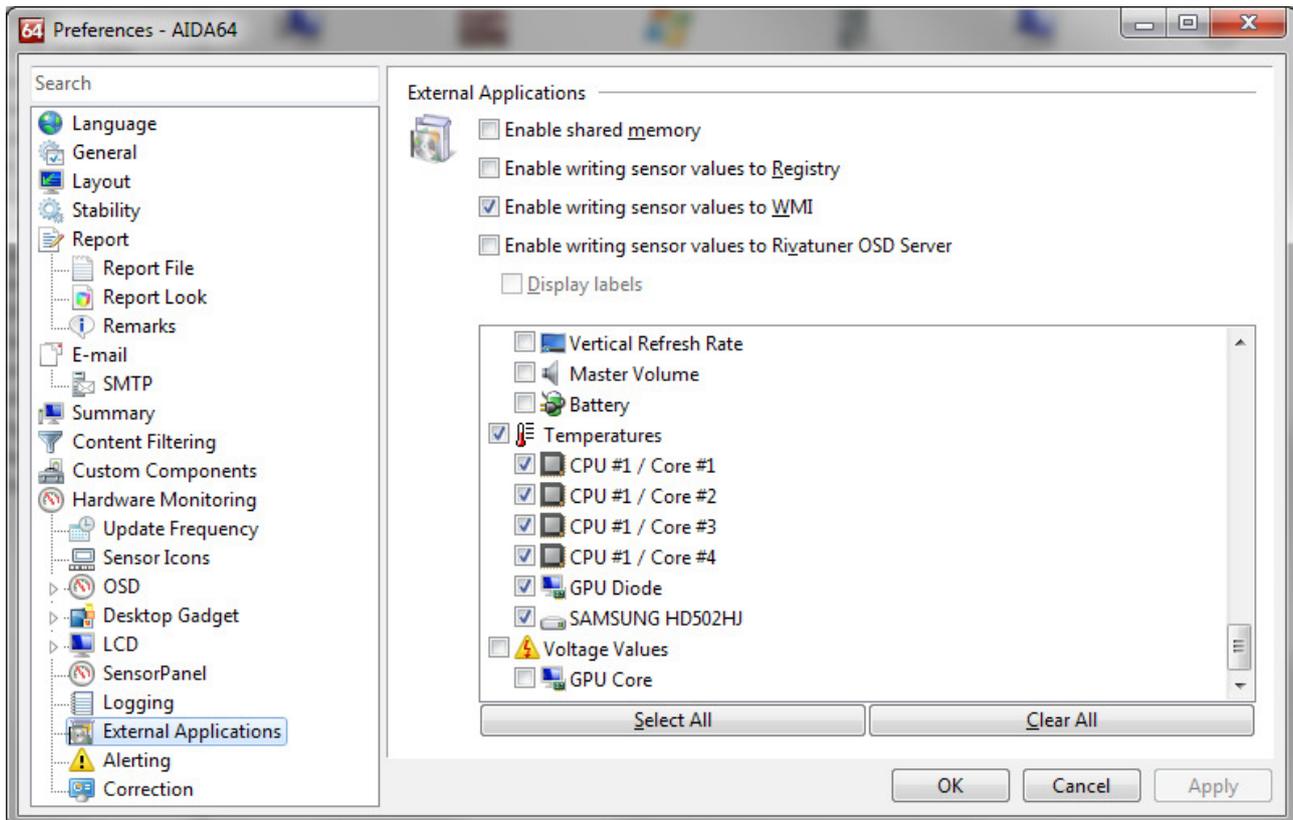
Four available software temperature sensors can be used to transfer temperature sensor readings from third party software into the farbwerk. Three procedures are implemented:

1. Sensor data is transmitted from an aquaero 5/6 connected to the farbwerk via aquabus.
2. A third party software provides data, the “Aqua Computer Service” reads this data and transmits it to the farbwerk via USB connection. This requires the third party software to be installed, configured and running as well as the “Aqua Computer Service” to be installed and active.
3. A third party software directly transmits data to the farbwerk via USB connection. This requires the third party software to be installed, configured and running.

Currently, the “Aqua Computer Service” supports data transfer from „HWiNFO“ (REALiX, Freeware, www.hwinfo.com), „Open Hardware Monitor“ (Open Hardware Monitor Project, Open Source/MPL 2.0, www.openhardwaremonitor.org) and „AIDA64“ (FinalWire Ltd., subject to license fees, www.aida64.com).

HWiNFO and Open Hardware Monitor automatically export all temperature sensor values and do not need to be configured.

In the AIDA64 preferences menu, writing to WMI must be activated in the „external applications“ sub-menu:



After activating “Use sensor with Aqua Computer Service” in the aquasuite, click the “Select data source” button to assign the currently selected software sensor to a temperature sensor provided by third party software.

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 aquaero will use the “Fallback temperature” instead. As soon as data is available again, normal operation of the software sensor will resume automatically.

10. Controller configuration(aquasuite)

Select “Controller” from the device list to configure the four LED outputs.

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. 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.

10.3. 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.

10.4. Refresh speed

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

10.5. 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.

11. System settings farbwerk (aquasuite)

Select “System” from the device list for the device to be configured.

11.1. Device information

The details displayed here might be required when you contact our service for support.

11.2. 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!

11.3. aquabus configuration (aquabus version only)

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.

11.4. 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.

12. Basic settings (aquasuite)

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

12.1. Language

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

12.2. 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.

12.3. 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.

12.4. Service administration

The service (background service) configures special USB settings for all connected Aqua Computer devices and should therefore always be active.

13. Bluetooth demo app for Android

13.1. 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 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 farberwerk APK file.

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

13.2. Bluetooth pairing

Before the farberwerk demo app can access farberwerk devices via Bluetooth, each farberwerk device must be paired with your mobile device. Open the app drawer and go to “Settings”. In the settings screen, select “Bluetooth”. The farberwerk Bluetooth devices will show as “farberwerk xxxxx-xxxxx”, where xxxxx-xxxxx will be replaced by the individual serial number of each farberwerk device. See chapter 11.1. for reference.

Tap the farberwerk device you want to pair to your mobile phone and enter the pairing key for the farberwerk device. Factory default key is “1234”, see chapter 11.4. for individual configuration.

13.3. Using the Android demo app

Open the app drawer and go to “farberwerk”. The farberwerk demo app will display a list of all paired farberwerk 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 farberwerk device via Bluetooth at any given time. After leaving the settings screen in the farberwerk demo app, other devices can connect to this controller via Bluetooth again.

14. Technical details and care instructions

14.1. 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)

14.2. Care instructions

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

14.3. Waste disposal

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



14.4. 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

Address: Aqua Computer GmbH & Co. KG

Gelliehäuser Str. 1

37130 Gleichen, Germany

Tel: +49 (0) 5508 9749290 (9-16 h Central European Time)

Fax: +49 (0) 5508 9749291

