

Owner's Manual



multiswitch™ 1.41

Firmware-Version 1.06

OS- Version 1.02

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Current as of: Juli 19th 2012

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1. Contents of package

1x multiswitch™ (assembled)
1x internal USB-cable (5-pin), length approx. 70 cm
Mounting material

1x this manual

2. Preface

Dear customer,

We congratulate you on the purchase of a multiswitch from Aqua Computer. We are one of the oldest manufacturers in Germany of PC water-cooling systems. Our products are made from materials of the highest quality. We hope you enjoy your new cooling system. Should you have any questions, we would like to ask you to first look at the "FAQ" area and "forum" on our homepage www.aqua-computer.de. If you should not find an answer to your question there, please email to support@aquacomputer.de. Considering the fast technical development, we reserve the right to be able to perform alterations to the products at any time. It therefore is possible that your product does not correspond precisely to the descriptions or especially the illustrations in this manual.

Your Aqua Computer Team

3. Safety precautions

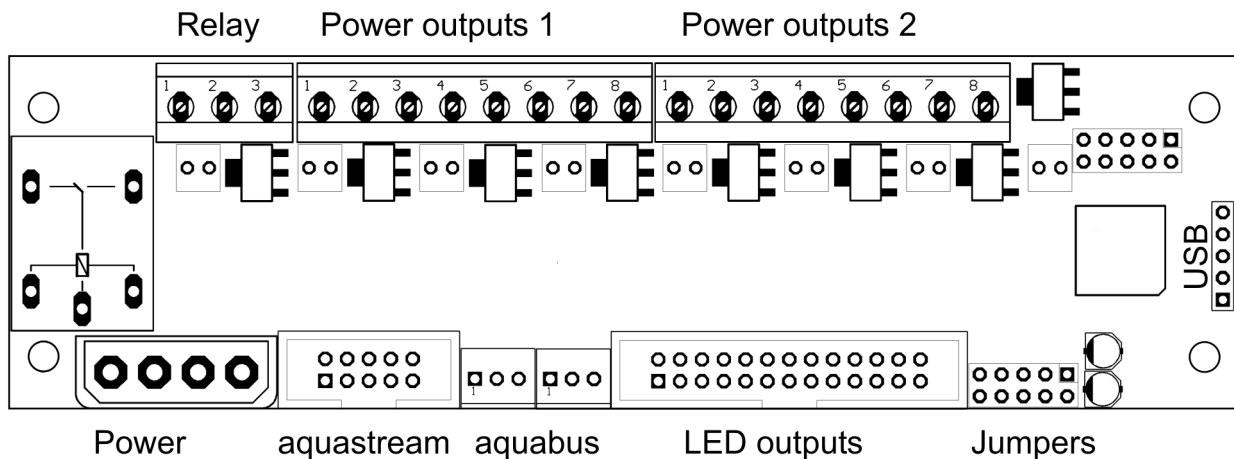
Before we get into the specifics of the system, we would like you to follow these basic precautions which should be obeyed at all times.

- ! 1. Read this manual thoroughly and completely!
- 2. Backup your data before working on the hardware!
- ! 3. The aquaero may only be used completely assembled in a computer case!
- 4. Never touch, connect or separate cables or electronic components while in use!
- ! 5. Do not turn on your computer unless you are absolutely certain that all cables are securely and correctly connected to the aquaero!
- ! 6. Maintenance notes: Use only soft, damp cloths to wipe the device. Do not use benzene, paint thinner, detergents, or chemically treated wiped cloths, and do not place vinyl, plastic, or rubber objects on the device to avoid the risk of malfunction or damage to surface of the device!
- 7. The relay-output may be powered at max. 12 V! The current must not exceed 1 Ampere!
- 8. All statements in this manual are subject to the fast technological development. Our products are constantly enhanced. Technical changes, misprints and errors are reserved!
- ! 9. 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 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.
- ! 10. Do not rest your weight on or place heavy objects on the device, and do not apply excessive force to the buttons, switches, or connectors to avoid the risk of damage to the device or personal injury.

4. Connecting external components

4.1. Overview

The following schematic shows the multitude of connection possibilities of the multiswitch™:



4.2. Power connector

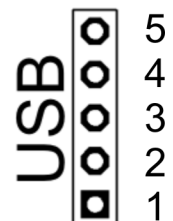
Attach a vacant power connector of your PSU. Due to the form of the plug the polarity can not be misinterpreted. Do not use force when connecting the plug but double check if the plug is lined-up correctly (i.e. not upside down)

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

4.3. USB

Connection possibility for an internal USB-connector on the mainboard. Use the included USB-cable and pay close attention to the polarity (colored wires) of the cable. **Incorrect use may result in the destruction of the aquaero and/or the mainboard and further components!** Therefore pay close attention to the pin assignment of the connectors on the mainboard. Please consult the manual of your mainboard for help.

Pin assignment: Pin 1: GND black wire
 Pin 2: GND black wire



Pin 3: D+	green wire
Pin 4: D-	white wire
Pin 5: VCC	red wire

4.4. aquabus (I²C-Bus)

3-pin add-on connector for optional add-on components by aqua-computer. Only use cables specified by aqua-computer (not included in delivery)!

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

4.5. Jumpers

The five positions configure the different functions of the multiswitch™. Appropriate short-circuit-bridges, so-called „Jumpers“, are included in the delivery.

The individual functions may be derived from chapter 5. Configuration.

4.6. Power outputs 1/2

Screw clamps that allow the connection of up to eight consumer loads to the power outputs of the multiswitch™. The outputs supply a maximum of 12 V at a maximal 1 amp per channel. **The total load must not be higher than 40 Watts. Incorrect use may result in the destruction of the multiswitch™ and/or the mainboard and further components!**

Pin assignment:	Terminal strip 1 contact 1:	Output 8 +12 V enabled
	Terminal strip 1 contact 2:	Output 8 GND
	Terminal strip 1 contact 3:	Output 7 +12 V enabled
	Terminal strip 1 contact 4:	Output 7 GND
	Terminal strip 1 contact 5:	Output 6 +12 V enabled
	Terminal strip 1 contact 6:	Output 6 GND
	Terminal strip 1 contact 7:	Output 5 +12 V enabled
	Terminal strip 1 contact 8:	Output 5 GND
	Terminal strip 2 contact 1:	Output 4 +12 V enabled
	Terminal strip 2 contact 2:	Output 4 GND
	Terminal strip 2 contact 3:	Output 3 +12 V enabled

Terminal strip 2 contact 4:	Output 3 GND
Terminal strip 2 contact 5:	Output 2 +12 V enabled
Terminal strip 2 contact 6:	Output 2 GND
Terminal strip 2 contact 7:	Output 1 +12 V enabled
Terminal strip 2 contact 8:	Output 1 GND

NOTICE:

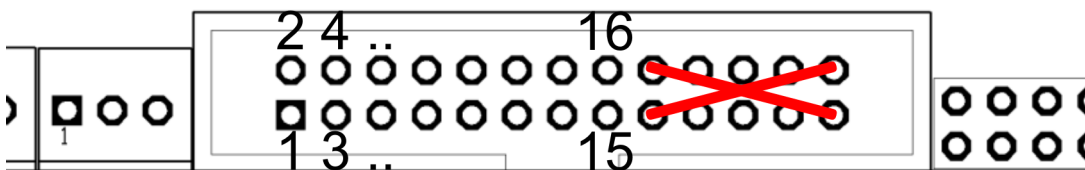
- When disabled the output voltage lies below 0,5 V
- When connecting inductive loads (e.g. motors), a self-induction recuperation diode (Schottky) and a 100 nF capacitor need to be connected to the consumer to prevent interferences with the multiswitch™ and other connected devices. In isolated cases further measures may be required.
- The outputs are **not** protected against overvoltage or short-circuits! When connecting capacitive and inductive loads appropriate precaution measures must be taken.

4.7. LED-outputs

Connection possibilities for up to eight LEDs. The LEDs are operated via an into the multiswitch™ integrated series resistance of 100 Ω with 5 V. Ultra-bright LEDs (I_{\max} 20 mA, U 3 V) may be connected without any series resistance directly to the outputs, for LEDs with a low forward voltage the additional series resistance is calculated as follows:

Additional series resistance = $((5 \text{ V} - \text{forward voltage}) / I_{\max}) - 100 \Omega$

Pin assignment:



abus

LED outputs

Jump

Pin 1: VCC LED 1	Pin 2: GND LED 1
Pin 3: VCC LED 2	Pin 4: GND LED 2
Pin 5: VCC LED 3	Pin 6: GND LED 3
Pin 7: VCC LED 4	Pin 8: GND LED 4
Pin 9: VCC LED 5	Pin 10: GND LED 5
Pin 11: VCC LED 6	Pin 12: GND LED 6
Pin 13: VCC LED 7	Pin 14: GND LED 7

Pin 15: VCC LED 8 Pin 16: GND LED 8

All other pins (17-26) **must not** be short circuited!

4.8. Relay

Floating output. Freely usable, maximum breaking capacity 4 A at max. 12 V.

Pin assignment: Pin 1: Opening contact (NC)
Pin 2: Common connector
Pin 3: Breaking contact (NO)

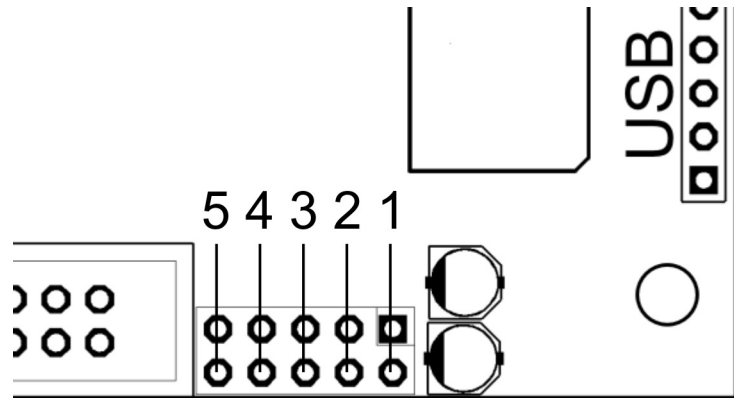
4.9. aquastream

Connection possibility to the controller of the aquastream. A maximum of two aquastream-controller may be connected. The following chart shows the connection possibilities depending on the hardware revision of the controller:

Revision Controller 1	Revision Controller 2
1.0 or higher	not possible
1.5 or higher	3.0 or higher

5. Configuration

Via the five configuration-jumpers (see chapter 4.5. Jumper) you can permanently configure single functions of the multiswitch™. For this purpose the included short-circuit-bridges („jumper“) are either removed from the contact pins (position „open“) or set on the contact pins (position „closed“).



je Jumper

The individual positions have the following functions:

Jumper position 1: aquabus-address

This jumper configures the aquabus-adress of the multiswitch™ when connected as a aquabus-device e.g. to the aquaero. When connected as a USB-device this function is ignored.

Jumper open: Address multiswitch™ 1

Jumper closed: Address multiswitch™ 2

Jumper position 2: Save configuration

When this jumper is set, the current condition of the outputs are saved with each keypress (supported only in devices with buttons) and automatically loaded after a reset of the system. Additionally a save via the PC-software aquasuite is possible. If this function is deactivated, so is the function in the aquasuite software!

Jumper open: Saving deactivated

Jumper closed: Speichern activated

Jumper position 3: Deactivate PWM function

This jumper configures the output of PWM signals at the outputs of the multiswitch™. In the default setting (jumper open) PWM signals are generated at the outputs which allow for instance LEDs to be controlled in brightness. You **must** check if **all** connected devices are able to

handle PWM signals **before** you activate this function. **Failure to do so may result in the destruction of the connected devices!**

If the multiswitch™ is used as an aquabus-device on the aquaero, the PWM function is always deactivated and the jumper setting is ignored.

Jumper open: PWM activated

Jumper closed: PWM deactivated

Jumper position 4: Button function

This jumper configures the functions of the buttons on the front of the device (supported only in devices with buttons).

When the jumper is set, the condition (on/off) of the corresponding power output is switched. Additionally the outputs may be switched via the PC-software if the multiswitch™ is connected via USB (not possible if connected as an aquabus-device).

With an open jumper setting the buttons have no direct influence on the outputs of the multiswitch™ and are only interpreted via the PC-software when connected as an USB-device.

If the power outputs of the multiswitch™, when connected as an aquabus-device to the aquaero, should be switched, the jumper must be open!

Jumper open: Interpret buttons only via the PC-software

Jumper closed: Buttons switch power outputs directly

Jumper position 5: USB/aquabus

This jumper configures which interface of the multiswitch is active.

Jumper open: USB enabled, aquabus disabled

Jumper closed: aquabus enabled, USB disabled

6. Initial operation

Depending on the hardware version either install the multiswitch™ in an available 5 ¼"-bay of your PC-case (version with buttons and LEDs) or in an available place in the interior of your case (version multiswitch™ LT without buttons and LEDs). Place close attention that the circuit board is securely fixed and has no conductive contact to parts of the PC-case! Now configure the functions of the multiswitch™ as described in chapter 5. Configuration.

Make all desired connections to the multiswitch™ as described in chapter 4. Connecting external components and make sure that no short-circuits are present at the outputs of the multiswitch™.

The device may now be operated by starting the computer.

To conveniently operate the device the aquasuite software can be used. Software and updates may be found in the internet at <http://www.aqua-computer.de> in the section „Support“.

7. Further details

7.1. Changing the front plate

The front plate of the multiswitch™ (not multiswitch LT™ version) can be exchanged for different colored plates (not included in delivery). To do this, simply unscrew the four mounting screws in the corners, change the front plate and carefully retighten the screws.

8. Technical Data

Dimensions (WxHxD):	approx. 148x42x64 mm
Current consumption 5V:	typ. 5 mA
Current consumption 12 V (plus power output):	typ. 10/150 mA (LT/non LT)
Load capacity per power output:	max. 10 W
Total load capacity for all outputs:	max. 40 W
Load capacity of the relay output:	max. 12 V, max. 4 A

