aquaero 5

Fan controller and monitoring system.
The perfect solution for watercooled PCs and HTPCs.

www.aqua-computer.de

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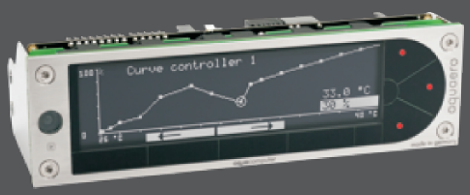
aquaero 5 - The perfect device

Functional description

The concept



The aquaero 5 is a completly new developed controller for virtually any PC, but especially for silent and watercooled PCs. A new application which has been noted due development are HTPCs and multimedia applications.
A powerful 32-bit CPU with Watchdog functions executes all functions in realtime. The aquaero device can be configured directly at the device or through the aquasuite software by attaching the device to USB 2.0. The aquaero operates fully autonomous and doesn't need a PC or running software in the background.

Fan controller

One of the key-features of the new aquaero 5 is the fan control. The aquaero provides 4 fan channels and it can be expanded with 6 external connected poweradjusts to a 10 channel fan controller. The rpm of all fans is monitored and the fans can be fully controlled in the voltage range from 0 to 12V by free defined controllers. The aquaero 5 provides fantastic controlling possibilities beginning with two point controllers up to intelligent PID controllers. All output channels are short circuit protected and providing current and voltage measurement. Also the temperature of the output stage is monitored.
The fan channels are supplying PWM free analog DC voltage to prevent noise generation. Any fan channel can deliver a current of 1,65A and the maximum combined current of all channels is 5A. Depending on the used heatsink the maximum power dissipation is dynamic limited.
A integrated realtime electronic fuse can be set for any channel in 100mA steps.

Operating the device

The aquaero 5 is setting new standards, especially in the ease of use. The PRO and XT version can be configured completely at the device. We have build a very easy to use tree menu and input dialogs with assistant functions which are very easy to understand. Of course the aquaero supports several languages and can work with metric and imperial units. Symbols and animated icons are improving the usage as well as the big graphic display. Important messages are displayed by Pop-Up windows.

With the aquaero XT you have 4 softkeys that can be freely named and assigned to actions. Dimmable illuminated buttons on the capacitive touch front allow an easy operation even at night. Brightness, dimming and behavior of the screen and buttons can be adjusted. You also can select different button-clicks or turn them off.

The aquaero XT and PRO can be also fully operated through the IR remote control aquaremote and allows fast changes of names since you can type them directly on the full featured keyboard.

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USB 2.0 interface for 5 devices

In comparison to similar products of our competitors the aquaero 5 has a native USB 2.0 interface. You won't need any drivers for the installation as the aquaero has been developed under the HID specification, so the required drivers are already included in your OS. You will have complete support for all 32/64 bit Windows versions. But don't be surprised, you will find 5 new devices in your device manager:
USB mouse, Keyboard, Multimedia device, IR receiver and of course the aquaero.
All this just gives you a very small overview of the possibilities of this device.

Included Windows software: aquasuite 2012

The aquasuite software has been redesigned. Now it has a complete new graphical interface for device management. You can analyze all data in real time or transfer the internal aquaero cache into the aquasuite database.

You also have full remote access to the aquaero, which means that you can control the aquaero display through the aquasuite software.

The aquasuite 2012 will be extended during the next months. After that you can control all actual Aqua Computer devices in just one suite. This software fully supports DirectX and will be used for all new Aqua Computer products in the next years. The software also supports remote control through a intranet or the internet.

Power management functions

The aquaero 5 is an all-in-one solution for multimedia and HTPC users. It connects itself as a USB keyboard and in connection with your BIOS it can boot up or shut down your PC. The start-up event can be raised by a timer, a key or a IR command given to the aquaero. An emergency shutdown via relay is also possible. The aquaero can take its stand-by power from the USB connection or an extra cable and it only needs approx. 0,35 W (display off) while waiting for the next task. Of course you can enable the display during stand-by if you need it.

aquaremote: The aquaero controls your PC

The so called aquaremote, a IR remote with a small keyboard, a mouse-pad and multimedia keys, gives you the opportunity to control your PC. The current key level (shift, control, etc.) will be displayed in the aquaero through a pop-up window. The mouse can be controlled by a pad with 8 integrated buttons. Mouse strikes with pressed mouse buttons are possible and the keyboard is also usable in the BIOS Setup.

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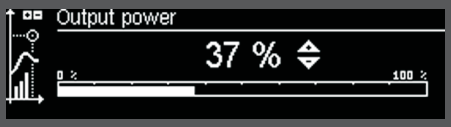
The controller – intelligence in the background



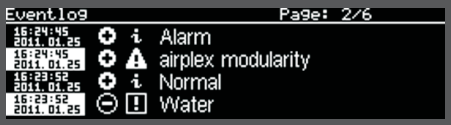
The better the controller works the less noisy is your PC – this is the basic function of the new aquaero 5.
In comparison to the aquaero 4 we changed the structure of the controller circuit. The new structure is shown below:

Sensor -> controller -> actors (e.g. air fans)

You can choose between the following controllers („Two point“, “Curve”, „Ideal Value“, “RGB” and “manual”). Now you can allocate as many actors to a controller as you like. Besides that virtual and software sensors can be used as the input for a controller.

With the aquaero 5 all switching outputs can be used as actor, so the controller can handle the relay or the multiswitch. Through the curve controller you can configure the output power in relation to the temperature on your own wishes in a graphical way. By using the manual regulators you can allocate one value to many actors which helps you controlling a group of fans by just changing one parameter.

Database included: Log-data and event memory

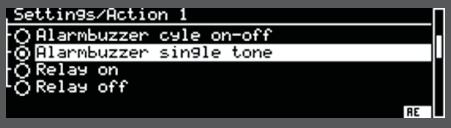


Creating graphical charts and logging data wasn't possible with the old aquaero. The new aquaero 5 has an internal flash data cache so you can save up to 140.000 values in the device memory. You decide which data you need to store or not. The saved data can be analyzed directly in the aquasuite.

If you connect the aquaero to the mainboard via USB the saved data will be transferred to the aquasuite automatically.

All events, alarms and warnings, will be logged to the database together with the date and time. Based on this data you will have a complete overview of your system. Also it's possible to raise events based on the data which initiate actions like a „power-on“ IR command.

Actions



Based on the event memory the aquaero 5 provides the possibility to raise actions when an event occurs. These actions can perform the following jobs:

Switching RPM generator signal, buzzer on, buzzer interval, buzzer single tone, relay on, 15 or 2 seconds switching time, load profile 1-4, sending IR-Command 1-8. Also keyboard functions can be send to the PC: Key power on, key sleep, key wake up.

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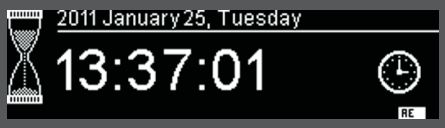
USB-Display: Watching external supplied data on the aquaero screen

The display of the aquaero can be used for external data like media player information. You can display information with up to 20 fps. These screens with external data can be shown alternately to the screens of the aquaero. At the moment we are developing a driver for the popular LCD-Hype software. While displaying animations the aquaero still works in the background and all menus can be used.

Transmit/Receive infrared commands

You can control other devices in your house with the optional IR transmitter of the aquaero. The aquaero 5 can handle all important IR-protocols so you are able to manage your home theater components. You won't need the aquasuite software for this management. The aquaero is able to turn on/off your amplifier or you TV after the PC gets started. Furthermore through the aquasuite software the aquaero can analyze, learn and reproduce the signals of other IR-remotes.

aquaero 5 – the control centre



The aquaero 5 has an integrated realtime clock with an perpetual calendar. You will be able to choose different time zones. Summertime will be changed automatically. Additionally to these features you can configure 32 timers, that can control many functions e.g. automatic PC start-up.

Temperature sensors – digital, real, virtual or by software ?

Eight analog temperature sensors and a digital temperature/humidity (LS aquabus channel) sensor can be connected to the aquaero. Moreover external sensors of other Aqua Computer devices (aquastream, poweradjust) can be connected to the aquaero 5. Altogether up to 40 temperature sensors can be used.

But there's more to come, you will be able to configure virtual sensors by binding real sensors to one virtual. By combining information, this virtual sensor can display an average, maximum or difference value of the connected sensors. Also software sensors can be used, which are getting the current sensor value from a windows software. Software sensors can be proved by using Watchdog and Fail-Safe functions.

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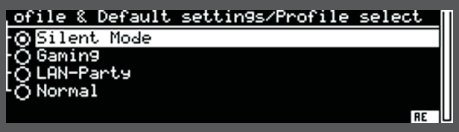
Power outputs and RGB-LED

In addition to the 4 analog fan channels the new aquaero has two more voltage regulators. These are using a 16kHz PWM and can be used the same way as the 4 analog channels with the restriction that they are not providing an rpm input. The power outputs are regulated through a 16bit interface and can be adjusted in 0.01 % steps. These outputs can be set by the controllers like the air fans. They can be perfectly used control big fans or powerful LEDs.

Additionally the LED output was extended to an RGB output. A LED connected to this output is able to change its color based on the temperature sensors.

Profiles: Always the right setup



Silence, LAN or night: The right ambient for whatever you are up to do can be set with one keypress. With its 4 integrated profiles you can choose the requested parameterset to the current situation. The profiles can be selected, created or deleted in the device or the aquasuite. The profiles can also be selected by the internal timer.

Flow measurement - the right strategy for a exact value

The aquaero has got an input for a flow meter. Besides that the 1st channel, configured as a sensor, can be used for the flow measuring. You can also use 6 external inputs by adding poweradjust units to the aquaero. The aquaero uses an intelligent algorithm to calculate the flow level. Depending on the impulse numbers the aquaero automatically uses different algorithms to produce precise measuring. This way you can use flow sensors with less or more impulses/l.

Alert ! Alert !

The aquaero 5 is the guardian of your PC. Different problems need different actions, so the aquaero has 8 different alarm and warning levels to classify problems. To every alert you can adjust a warning level by yourself. You can also name those levels like „warning“, „alert“ or „emergency shutdown“ and you can decide what happens when an alarm occurs. Right now the following alert types are existing:
Temperature alert, fan rpm alert, flow alert, fill-level, pump and overvoltage alert.

Beep, beep, beep

In case of an alert the aquaero has a beeper that warns you.

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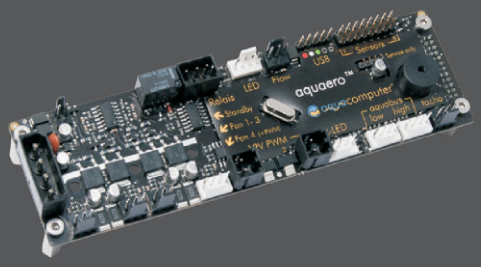
aquabus



Besides all the other functions of the aquaero it has 2 aquabus interfaces. Through the aquabus connection you will be able to link other Aqua Computer devices to the aquaero. All the other linked devices will be identified and integrated as a part of the aquaero. There are no separate device menus in the aquaero anymore.

Next to the aquabus input there is a high speed input as well. You can use it to connect the aquastream or the poweradjust. Older Aqua Computer devices can be connected to the LS connector.

Current aquabus periphery

poweradjust 2: the poweradjust 2 device was developed simultaneously to the new aquaero and fits to it perfectly. By connecting the poweradjust 2 to the aquaero it will have another powerful amplifier incl. voltage regulation and temperature measuring. There will be another temperature sensor and a flow meter integrated to the aquaero sensor structure.

aquastream XT: by connecting this pump to the aquaero you will have total control over it. You can affect the pump power or change every parameter. If an error occurs it will be shown as an alert in the aquaero. You are also able to use the aquastream internal temperature sensor through the aquaero.

multiswitch: If you connect a multiswitch you will have 17 more switching outputs connected to your aquaero. They can be configured and managed through regulators.

tubemeter: this device can show you the fill level in your aquatube.

There will be more to come...

All this is only the beginning. It will take years until the aquaero 5 reaches its function capacity limit. We will continue developing and extending the software possibilities through permanent firmware updates. The whole concept has been designed for a long product life and new periphery will be announced soon.

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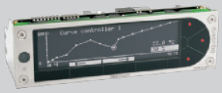
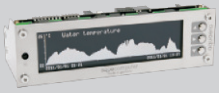
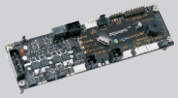
Technical specifications - part 1

	aquaero 4 (no more available)	aquaero 5 XT 	aquaero 5 PRO 	aquaero 5 LT 
Display	character-LCD	graphic	graphic	not available
Resolution	2x20 Chracters	256x64	256x64	
Color	blue/white	black/white	black/white	
Max. Speed	low	~20 pages/s	~20 pages/s	
Cover	optional	standard	optional	
Units	metric	metric & imp.	metric & imp.	
PC Control and Screenshot	no	complete	complete	
Controlling the aquaero				
Type of key	mechanical	capacitive	mechanical	not available
Number of keys	3	3 + 4 softkeys	3	
Tone	without	adjustable	adjustable	
Key LED	without	adjustable, red	without	
IR Remote	without	HTPC keyboard	optional	
CPU and RAM				
	8-Bit	32-Bit	32-Bit	32-Bit
Frequency	6 MHz	48 MHz	48 MHz	48 MHz
Log-Data Flash Memory	without	~ 140.000	~ 140.000	~ 140.000
USB-Devices				
aquaero	yes, USB 1.1	yes, USB 2.0	yes, USB 2.0	yes, USB 2.0
HID-Keyboard with Wake Up	no	yes, IR keyb.	yes, option IR	yes, but no IR
HID-Mouse	no	yes, IR mouse	yes, option IR	no
Media Device	no	yes	yes	yes
USB IR Receiver	no	Yes	Yes	no

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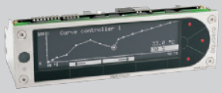
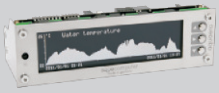
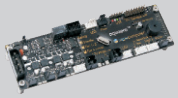
Technical specifications - part 2

	aquaero 4 (no more available)	aquaero 5 XT 	aquaero 5 PRO 	aquaero 5 LT 
Fan channels	4	4 internal	4 internal	4 internal
Maximum current	0,8 A	1,65A	1,65A	1,65A
Maximum power cosumption	10W	dynamic	dynamic	dynamic
Output for PWM-fan	no	channel 4	channel 4	channel 4
RPM measurement	yes	yes	yes	yes
Voltage range	full range	full range	full range	full range
Resolution	256 Steps	0.01% (16-Bit)	0.01% (16-Bit)	0.01% (16-Bit)
Heatsink	optional	ir (water opt.)	optional	optional
Expansion	no	6 external	6 external	6 external
Current measurement	no	yes	yes	yes
Shortage detection	no	yes	yes	yes
Programmable fuse	no	100mA steps	100mA steps	100mA steps
Temperature control	no	yes	yes	yes
PWM Channels	no	2x 16kHz PWM	2x 16kHz PWM	2x 16kHz PWM
Maximum current		1A	1A	1A
Resolution		0,01%	0,01%	0,01%
Relay output	N/O	changer	changer	changer
Maximum current	0,5A	1A	1A	1A
aquabus	Low Speed	LS+High Speed	LS+High Speed	LS+High Speed
Integration	as peripheral	complete	complete	complete
Real Time Clock (unbuffered)	time/day	perpetual cal.	perpetual cal.	perpetual cal.
Autom. Summer/Wintertime	no	yes	yes	yes
Timezone	no	yes	yes	yes

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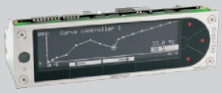
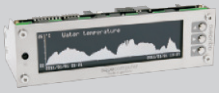
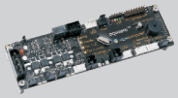
Technical specifications - part 3

	aquaero 4 (no more available)	aquaero 5 XT 	aquaero 5 PRO 	aquaero 5 LT 
Temperature sensors	6	8	8	8
External analog sensors	2x aquastream	>20	>20	>20
External digital sensors	no	temp/humidity	temp/humidity	temp/humidity
aquaero hardware monitor	no	3	3	3
Temperature range analog	0/100°C	-40/120°C	-40/120°C	-40/120°C
Display accuracy analog	0.1K	0.05K	0.05K	0.05K
Virtual temperature sensors	no	4 due software	4 due software	4 due software
LED Output	two colors	RGB	RGB	RGB
Timer	2	32	32	32
Action	relay	free definable	free definable	free definable
Weekday function	yes	yes	yes	yes
Eventlog	4 (Alarm)	2000 events	2000 events	2000 events
Profile storage in device	2	4	4	4
Language storage in device	1	2	2	2
Controller	4	61	61	61
Ideal value (PID)	yes	8	8	8
Two point	yes	16	16	16
Curve	no	4	4	4
RGB	no	1	1	1
Multiple targets	no	yes	yes	yes
Switching outputs useable	no	yes	yes	yes
IR transmitter	no	yes (optional)	yes (optional)	yes (optional)
RPM signal generator	no	yes	yes	yes

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