Firmware versions and description of the serial interface of the iks aquastar industrial.

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1. iks aquastar industrial firmware: improvements and PC software-compatibility

The following firmware updates are available in 3 different languages: German (DE), English (GB) and French (FR).

			Firmware version is compatible with …	
aquastar industrial firmware versions	Improvements in the different firmware versions		PC software: iks aquasSoft /aquaPilot	Iks-aquastar-visual
2.27 v0 and v1	adjustable switching hysteresis (except level); no longer „aquarium“ related.	=>	Yes (iks aquasSoft)	not compatible *
2.27 v0 and v1	Adaptation of the oxygen measurement to the new ODOS sensor.	=>	Yes (iks aquasSoft)	not compatible *
2.27 v2	control type "Increase O2": at the lower alarm point control isn't switched off.	=>	Yes (iks aquasSoft)	not compatible *
2.27 v3	Output: „Date“ and „Time“	=>	iks aquasSoft/aquaPilot	not compatible *
2.27 v4	Output: „no control x“	=>	iks aquasSoft/aquaPilot	not compatible *
2.28 v1 and v2	Control of oxygen also in the unit mg/l;	=>	restricted compatible *	Yes
2.28 v1 and v2	automatic storage of measured values in the same unit => erase memory before!	=>	restricted compatible *	Yes
2.28 v3	New commands over serial interface: 'DI' and ‚DL' (please see chapter 6)	=>	restricted compatible *	Yes
2.28 v4	New command over serial interface: 'DC' (see chapter 6 in this document)	=>	restricted compatible *	Yes
2.28 v5	Some issues solved: pH Control: „Control in the pond“	=>	restricted compatible *	Yes
2.29 v1	New command over serial interface: 'DD' (see chapter 6 in this document)	=>	restricted compatible *	Yes

* not compatible with the software function „read program“ (Programm lesen) and „transfer program“ (Programm übertragen) ! ; „program“ = configuration data

2. How to do a firmware update

What do you need ?

- PC with a serial RS-232 interface (if your PC has no RS-232 interface, you need a USB-RS232 adapter).
- (USB-RS232 adapter; we recommend to use the iks USB-RS232 adapter, order no. 3031).
- Datacable to the PC or USB-RS232 adapter, 3 meters long (order no. 3000).
- UpdateVxx.exe PC software. (--> https://www.iks-aqua.com/html/engl/download.php#software)
- Firmware hex file. (--> https://www.iks-aqua.com/html/engl/download.php#industrial firmware)

How to do !

1. Installation: Download the update software (UpdateVxx.exe) and the firmware hex file and copy them into a directory of your choice.
2. Start of the programm: Open the Windows-Explorer, open the directory with the update software and the hex file, double-click the UpdateVxx.exe file.
3. Update aquastar: Connect the aquastar via the datacable to the PC; remove the powersupply from the aquastar; click on „SendFile“ at the PC-Software; select the *.hex firmware file in the next dialogue; select the serial interface (COM1 or COM2 or other; virtual COM port if using the USB-RS232 adapter) in the next dialogue; **Don't be worry about the message "The configured serial port is not valid. Please choose another port". In this special case, this message is unimportant!** Wait, until you see „Verbindungsaufnahme“; now connect the powersupply to the aquastar; then you will see how the several sectors are written to the aquastar; wait 1 til 2 minutes.
4. Update is complete and successful, if at the end of the dialoge the text „Prüfsumme OK“ appears.
5. Perform a reset: **After each software update the aquastar must be reseted. This erases all former programming and returns the system to its original condition.** Please proceed as follows:
   - Disconnect the aquastar from the power supply
   - Now press the key labelled F1 and keep it pressed.
   - Reconnect the power supply (continue to keep F1 pressed)
   - The following message appears on the display shortly afterwards: F1 to reset.
   - Press the F1 key again.
   - After a few seconds a successful Reset will be confirmed with the message „Memory OK“
   - You will be then returned to the main menu.

3. Specification of serial interface of the iks aquastar industrial

Interface:	RS-232
Connectors:	aquastar: Mini-DIN 6 female
Physical signal level:	RS-232 standard (between +3V til +15V and -3V til -15V, no logic TTL)
Data rate:	9600 bits per second (fix)
Data bits:	8
Parity:	none
Stop bits:	1
Signal lines:	TxD, RxD, GND
Flow control:	none

Connection to PC with 3 different types:

- "Data-Cable-PC" (iks order no.: 3000), connectors : Mini-DIN 6 male ------- D-Sub DE-9F female
- "Data-Cable-PC" plus USB-RS232 adapter (iks order no. 3031) with serial com port D-Sub DE-9M male.
- "Data-Cable-PC" plus RS232-ethernet-converter (iks order no. 1819), connectors: Ethernet RJ-45 jack – serial com port D-Sub DE-9M male.

4. Configuration of the serial interface RS232 of the personal computer :

Bits per seconds: 9600 Data bits: 8 Parity: None Stop bits: 1 Flow control : None

5. Data output of the iks aquastar industrial (serial interface ("PC"- plug socket))

The system reports back automatically all the values of the sensors, the actual date and the time in ASCII-format when the iks aquastar is in running mode. Results for various language versions EN, FR and DE are:

Result: (Example for aquastar industrial firmware v2.28GB (english)) :

...
E11:36 Fr, 20.01.
E1 (Lv) Air
E2 (pH-)07.01 pH => the "-" next to "pH" shows that an downward control is active.
E3 (Rx) +507 mV
E4 (Te+) 21.4 °C => the "+" next to "Te" shows that an upward control is active.
E5 (Ox)110.4 %
E6 (Co) 958 uS
E7 (AP) 1014 mB
E8 (Co) 78 mS
E11:37 Fr, 20.01.
..

Result: (Example for aquastar industrial firmware v2.28DE (german)) :

...
E11:36 Fr, 20.01.
E1 (Pe) Luft
E2 (pH-)07.01 pH => the "-" next to "pH" shows that an downward control is active.
E3 (Rx) +507 mV
E4 (Te+) 21.4 °C => the "+" next to "Te" shows that an upward control is active.
E5 (Ox)110.4 %
E6 (Le) 958 uS
E7 (Ld) 1014 mB
E8 (Le) 78 mS
E11:37 Fr, 20.01.
...

Result: (Example for aquastar industrial firmware v2.28FR (french)) :

...
E11:36 ve, 20.01.
E1 (ni) Luft
E2 (pH-)07.01 pH => the "-" next to "pH" shows that an downward control is active.
E3 (rx) +507 mV
E4 (te+) 21.4 °C **=>** the "+" next to "Te" shows that an upward control is active.
E5 (ox)110.4 %
E6 (co) 958 uS
E7 (pa) 1014 mB
E8 (co) 78 mS

Remark: the time-lag between one line to the next can be varied in the aquastar menu from 1 to 4 seconds:

aquastar industrial firmware v2.28GB
(iks aquastar: Main menu – SetMeasurement – Display – Ext. Display (in programming level professional)
aquastar industrial firmware v2.28DE
(iks aquastar: Hauptmenü – Messwerteinstellungen – Anzeige – Ext. Display (im Profimodus)

6. Commands for the iks aquastar industrial (send from PC over the serial interface)

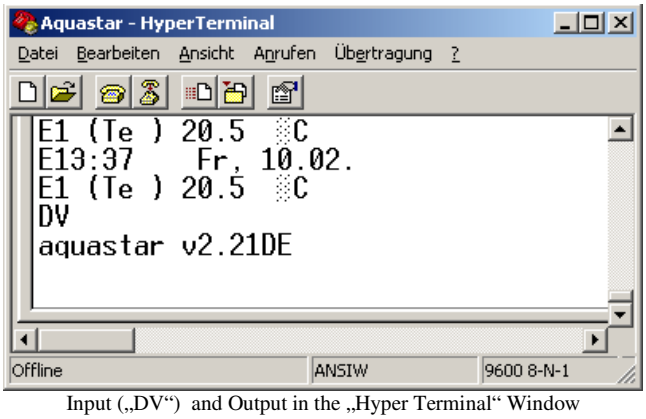
Commands in text format. (remark: ‚xx' stands for the different country versions GB, FR and DE)

DA: Current measured value chain (all aquastar industrial firmware versions)
Result (example): **0 07.01 +507 21.5 110.9 1169 xxxx xxxx**

DE: sensor slot configuration (all aquastar industrial firmware versions)

	description: sensor slot – sensor type
Result: **PepHRxTeOxLe----END**	1-Level, 2-pH, 3-Rx,4-Temp, 5-Oxygen,6-Conductivity (example for aquastar industrial firmware v2.28DE german)
Result: **LvpHRxTeOxCo----END**	(example for aquastar industrial firmware v2.28GB english)
Result: **nipHrxteoxco----END**	(example for aquastar industrial firmware v2.28FR french)

DV: output of the iks aquastar industrial version: „aquastarI v2.28D" (industrial, german, version 2.28) (all aquastar industrial firmware versions)



Input („DV") and Output in the „Hyper Terminal" Window

DF: output of the dimming points of the configured lighting sequences (only available in test version)

LichtVerlauf-Nr 1 Taeglich DoseNr 5
Dimm-Zeitpunkte:
Ein DZP-Nr. 1 DZP-Zeit 28800s R-folge 1 H-Wert 20%
Ein DZP-Nr. 2 DZP-Zeit 32400s R-folge 2 H-Wert 80%
Ein DZP-Nr. 3 DZP-Zeit 68400s R-folge 3 H-Wert 80%
Ein DZP-Nr. 4 DZP-Zeit 72000s R-folge 4 H-Wert 20%

LichtVerlauf-Nr 2 TagDerWoche Mi DoseNr 5
Dimm-Zeitpunkte:
Ein DZP-Nr. 1 DZP-Zeit 25200s R-folge 1 H-Wert 10%
Ein DZP-Nr. 2 DZP-Zeit 36000s R-folge 2 H-Wert 90%
Ein DZP-Nr. 3 DZP-Zeit 57600s R-folge 3 H-Wert 90%
Ein DZP-Nr. 4 DZP-Zeit 68400s R-folge 4 H-Wert 10%

DS: Output of the stored measured value data; up to 2000 measured value chains. (all aquastar industrial firmware versions)
Result (example) :

Datum Uhrzeit Pe pH Rx Te Ox Le -- --

20.01. 11:52:50 0 07.01 +508 21.5 111.6 1169 xxxx xxxx
20.01. 11:53:00 0 07.01 +508 21.5 111.6 1169 xxxx xxxx
20.01. 11:53:10 0 07.01 +508 21.5 111.6 1169 xxxx xxxx
END

DI: information about stored measurement values in memory (since firmware version aquastarI2.28xx3)
Result (example) : „**1994 2000 END**“
(C-code: printf("%4u %4u ",SPEICHER_PLATZ, MAX_STORAGE_NUMBER - 1); printf("END\n"))
Description: „remaining storage space total storage space END“

DL: delete the memory of the stored measurement values (since firmware version aquastarI2.28xx3)
Result: „END“ Description: reply, that the command was executed

D : Timeout after 2 seconds, if there is no subsequent second character! (since firmware version aquastarI2.28xx3)

Result: „**Timeout**“

DC: Output of stored measured value data in csv format (comma-separated values (or semicolon)). The output can be redirected to a csv formatted text file within a terminal program. (Examples for terminal programs: Hyper-Terminal, Realterm, Docklight Scripting) (since firmware version aquastarI2.28xx4)
Result (example):

"Datum - Uhrzeit";"Te";"Te";"Ld";"Ld";"--";"--";"--";"--"
"21.08. 09:45:12";“26,8“;“26,9“;“994“;“994“;"xxxx";"xxxx";"xxxx";"xxxx"
"21.08. 09:45:15";“26,8“;“26,9“;“994“;“994“;"xxxx";"xxxx";"xxxx";"xxxx"
"21.08. 09:45:18";“26,8“;“26,9“;“994“;“994“;"xxxx";"xxxx";"xxxx";"xxxx"
"21.08. 09:45:21";“26,8“;“26,9“;“994“;“994“;"xxxx";"xxxx";"xxxx";"xxxx"
"21.08. 09:45:24";“26,8“;“26,9“;“994“;“994“;"xxxx";"xxxx";"xxxx";"xxxx"

DD: Output of the currently active switch positions of the sockets on panel 1 (L1) til panel 4 (L4).
(since version 2.29 v1).

Example for the output: L1:*-*- L2:6**- L3:---- L4:----
Explanation: On panel 1 (L1) the sockets 1 and 3 at 100 % (non-variable output socket panels are obviously either 100% active or off). On panel 2 (L2) the first socket (equivalent to socket number 5) is at around 60% (and therefore a variable-output socket). The sockets 6 and 7 are switched at full power. Unfortunately it's not possible to show exact level of variable output as only one figure is available on the (internal) display for each one.

See also aquastar manual chapter „7.2 The menu “Run”„

7. Tipps for software developers and programmers

Time performance for the particulars commands

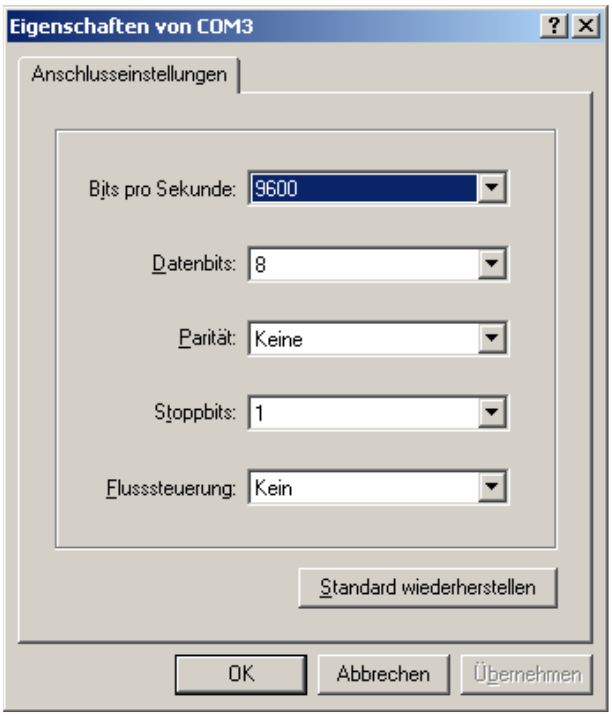
Example for the command „DS“ (send measured data storage):

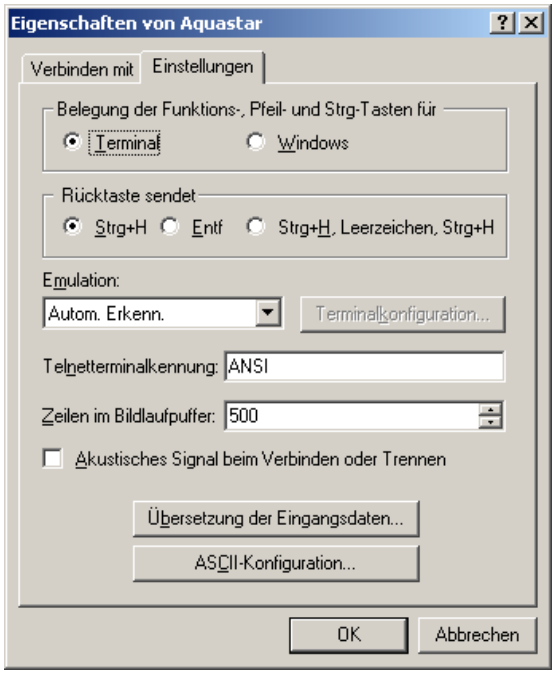
a) Between „D“ und S“ must be a time span of 50 milliseconds.

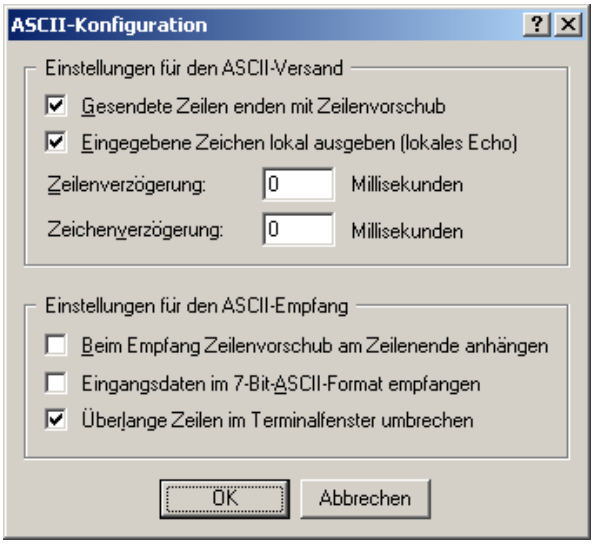
b) If the iks aquastar does not respond immediately to the commands, then the commands must be sent several times successively. Meanwhile you have to vary the time interval between the individual commands.

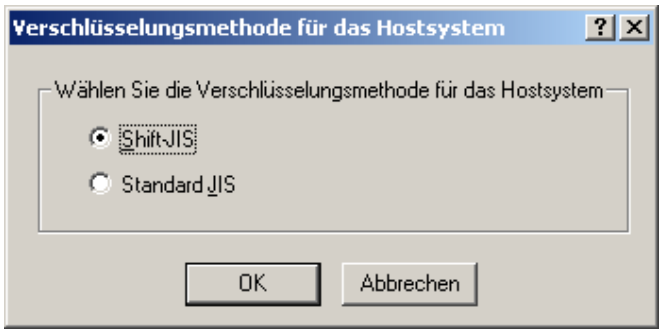
Example:
“DS” - 500 ms time span - “DS” - 510 ms time span - “DS” - 520 ms time span - “DS” .... and so on.

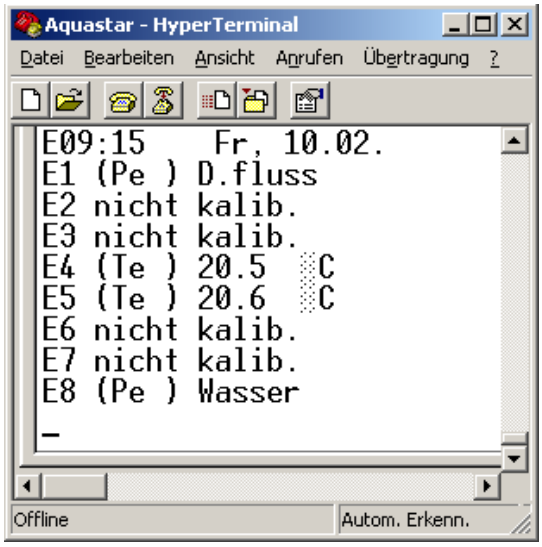
8. Configuration of the PC programm Windows „HyperTerminal“











Output in the “Hyper Terminal” window. (in ASCII-format when the iks aquastar industrial is in running mode)

9. FAQ

1. How do the iks aquastar industrial turn on a pump?

Pumps can be turned on or off with switch sockets. Up to 16 switch sockets (=> 4 switch socket panels) can be connected to the iks aquastar.
a) Various control processes (Temperature, pH, Redox, Oxygen, Level and so on) can be allocated to the switch sockets.
b) With several time functions (timers, intervall function etc.) you can also switch on or off the sockets.
To do this, the iks aquastar must be configurated. You can do this with the PC program Iks Aquastar Visual.

! Switch sockets cannot be turned on or off directly through the PC's program !

2. Is there a way to get the alarms through serial interface ? (Alarm messages)
If not, how do you get the upper and lower alarm limits of each sensor?

Yes, an active (current) alarm of a sensor is indicated via a star "*" in the values of the sensor, which are automatically reported back to PC over the RS-232 serial interface:

E1 (Te*) 25.3 °C => Alarm on the temp. sensor
E3 (pH*)07.97 pH => Alarm on the pH sensor

The upper and lower alarm limits of each sensor are parameters in the structure of the iks aquastar industrial configuration data.

10. Contact

If you have further questions, please contact:

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