AQUATROL V.1.0 – USER MANUALS

CONTROLLER OVERVIEW

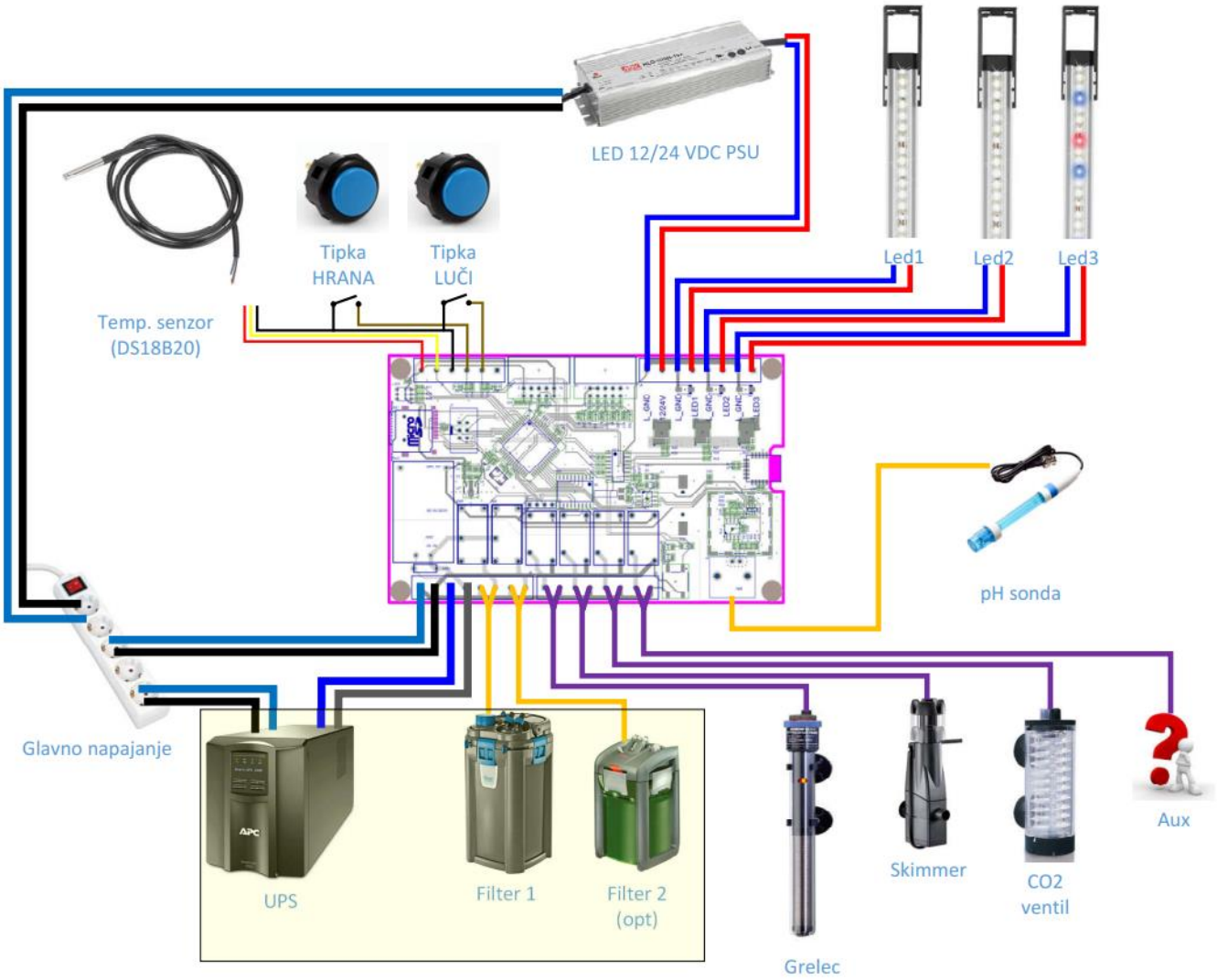
aquaTROL is a dedicated controller for controlling aquarium equipment. Using bluetooth connection it is possible to view status and adjust parameters. Using internal microSD card it is possible also to log data on SD card, adjust settings as well as update firmware.

MAIN FUNCTIONS

- LED lights controlling (3 independent channels)
  - Adjustable LED power (255 steps)
  - Sunset and sunrise with adjustable parameters
  - Programmed on/off time, based on internal clock
  - Possible to turn on/off lights using button (night cleaning etc.)
  - Internal clock with backup battery
  - Galvanically seperated outputs, which support 12/24 VDC power supply (external)
  - Max. 4 A / each channel (100 W per channel, 300 W total)
- Heater controlling
  - 230 VAC output to control heater using DS18B20 temperature probe
  - In case of using heater with internal thermostat, we suggest using Aquatrol as main heater controller and adjusting heater's thermostat to 2-3 degrees higher temperature to use it as backup turn-off mechanism.
  - Max. 10 A/230 VAC
- Skimmer controlling
  - 230 VAC output to control turn on skimmer twice per day (adjustable intervals)
  - Max. 10A/230VAC
- CO2 valve controlling using pH probe
  - 230 VAC output for CO2 valve
  - Max. 10A/230VAC
- Filter pumps controlling (2)
  - 2 independent NC channels
  - Max. 6A/230 VAC
  - »FEED« function: when feeding, pump(s) is disabled for a certain period of time (0-999 s)
  - »UPS BACKUP« function: when running on UPS, pumps are switched on alternately in 15 min intervals, so both filters are active and bacterias survive, but power consumption is low.
- 1 auxilary output (10A/230VAC), function will be defined
- Data logging to SD card
  - Data logging on each action; i.e. lights on, CO2 valva off … (/LOG/DATA.TXT)
  - Periodically logging of all parameters to CSV file (/LOG/LOG.TXT), which can be later processed in Excel
- Parameters setup using file on SD card
  - /CONFIG/CONFIG.TXT
- Firmware update using SD card
  - Copy »AquaTrol.hex« file to root folder on SD card
  - Insert card to controller, power on the system and wait 20 s
  - Turn off the controller
  - Remove card and delete file after upgrade

CONNECTING THE CONTROLLER

Warning! There is a mains voltage on the controller! Be careful and first disconnect the power supply cable before doing anything on the controller itself!



1) Prepare mains cable 230 VAC. **Do not connect cable to the power outlet yet!**
2) Prepare mains cable for UPS (if used). UPS is used to power controller logic and both filters. All other devices are powered through mains power and in case that mains is disconnected are shut off.
    a. If UPS is not used, short pins 1+3 and 2+4!
    Do not connect cable to the UPS yet!
3) Prepare connectors to all equipment used.
    a. If only one filter is used, connect it to left output (1).
4) Connect LED power supply. Mind the correct polarity! **Do not connect cable to the power outlet yet!**
5) Connect LED diodes to outputs 1-3. Mind the correct polarity!
6) Connect temperature sensor (if used).
7) Connect buttons (if used).
8) Connect pH probe (if used).
9) Insert microSD card (FAT32).

10) Activate UPS power supply. Controller should turn on (see LED diode on it above SD card).
11) Activate mains power supply (230 VAC).
12) Activate LED power supply.

PARAMETERS SETUP

Parameters are stored in internal EEPROM memory as well as on SD card. If SD card is inserted, data from SD will always be used and copied to EEPROM as well. If no SD card is present, data from EEPROM will be used.

Disconnect UPS 230 VAC power supply. Remove microSD card and insert it into computer. There is a file CONFIG.TXT in the CONFIG folder with following content:

AquaTROL BASIC SETTINGS	
/Edit only values, keep formatting!!!/	
_____LED 1:_____	**LED channel 1 settings (left)**
255 - power on (000-255)	Day power (000-255, 255=100%)
000 - power off (000-255)	Night power (000-255, 0=off)
11:00:00 - on time	Sunrise time (time, when sunrise starts)
19:00:00 - off time	Sunset time (time, when sunset starts)
1000 - Dimming Step 1(0100-9999)	Sunset and sunrise speed (1000 approx 15 min)
_____LED 2:_____	**LED channel 2 settings (middle)**
254 - power on (000-255)	
001 - power off (000-255)	
11:15:00 - on time	
18:50:00 - off time	
1000 - Dimming Step 2(0100-9999)	
_____LED 3:_____	**LED channel 3 settings (right)**
255 - power on (000-255)	
002 - power off (000-255)	
09:00:00 - on time	
20:00:00 - off time	
1000 - Dimming Step 3(0100-9999)	
_____TEMPERATURE_____	**Heater target temperature**
251 - target temperature (x.xx)	(hysteresis set to 0,2 degrees Celsius)
_____SKIMMER_____	
10:00:05 - on time 1	Skimmer on time 1
10:15:05 - off time 1	Skimmer off time 1
16:00:06 - on time 2	Skimmer on time 2
16:15:06 - off time 2	Skimmer off time 2
_____CO2 VALVE_____	**CO2 valve pH setting**
6.51 - target pH (x.xx)	(hysteresis set to 0,1 pH)
_____FEED TIME_____	**Filter disable when feeding**
300 - feed time in s (xxx)	Feeding time – filter disabling in seconds
1 - pumps affected (0,1,2)	0-disabled, 1-filter 1 only, 2-both filters

You may change all values, but keep in mind, that you must not change formatting (i.e. write 100 instead of 0100 or insert/delete some line(s).

TIME AND DATE CHANGING (RTC)

Create file TIME.TXT using notepad. Its content should be exactly in following format:

12:32:00	Time
04/06/20	Date

When system will startup, file will be read and RTC time will be updated. File will be deleted automatically.

PH PROBE CALIBRATION

As pH probes are different and they also degenerate with time, it is reccomended to do a periodical calibration each 3-6 months. However at first use pH probe calibration is neccessary for proper readings!

REQUIREMENTS

- Aquatrol & pH probe with BNC connector (obviously 😉)
- A glass of tap water (to clean the probe)
- A pH buffer solution with pH=7,0
- A pH buffer solution with pH=4,0
- Smartphone with terminal (Microchip Bluetooth Data or BLT), that works (shows logs each few seconds)

A STEP BY STEP GUIDE

1. Connect the pH probe to BNC
2. Put BNC probe to tap water
3. Connect to Aquatrol using terminal
    - Start the app
    - Select BM 70
    - Scan devices and click Aquatrol_xxxx, when found
    - Wait few seconds and click »Transfer data to device«
    - You shall receive periodical readings from the Aquatrol now into top window
    - Click » Send CR/LF« checkbox
    - Write »c« (small letter!) into send window and click »Send«
    - Follow the onscreen manuals for calibration!
4. Put probe into pH=7,0 buffer solution and wait as requested
5. Put probe into tap water to clean it as requested
6. Put probe into pH=4,0 buffer solution and wait as requested
7. Calibrating is finished, clean probe with tap water before putting it to aquarium!