

## Short user instruction of the Aquacolor Pump Controller and Datalogger

### Application

The control-unit is connected to the biofilm sensor and gives an alarm when the water quality changes:

0 - 1.8 Volt: the LED lights green

1.8 - 3.6 Volt: the LED blinks red

3.6 - 5 Volt: the LED lights red continuously

### Connecting the sensor to the control-unit

A sticker inside of the control-unit indicates how to connect the sensor wires to the control unit. Also the relay output is connector is indicated in the control-unit. **Warning: Never attempt to switch equipment with the relay if the relay is in contact with the mains voltage. This is very dangerous!**

De control-unit is equipped with a datalogger, real time clock and a pulse train generator to control the dosing rate of standard industrial dosing pumps. For connecting a dosing pump, an extra connector is present on the right hand side of the relay connector, see also the sticker in the control-unit. The plus of the pump dosing input is connected to the red wire and the zero (ground) of the input to the other connector.

### Connecting the control-unit to a smartphone

After powering the control-unit, it can be connected to a smartphone through wifi. For this purpose, the smartphone is connected to the network named Control\_unit\_Biofilm\_Sensor with password Biofilm007.

Now open a browser and type the following address: 192.168.4.1 or

<http://www.aquacolor.start>. Adding this address to your favorites, facilitates quick future connections. After connecting, you'll see the sensor menu and the sensor output.

### Changing the network name (ssid)

In case you use several control-units installed close to each other, it can be convenient to change the network name of the control-units so that you can recognize them easily.

Example:

Control\_unit\_location\_1 and Control\_unit\_location\_2.

Example: In case you want to change the default network name into Control\_unit\_location\_1 you type in the input field: newssidControl\_unit\_location\_1 and press send. If you now disconnect the power from the control-unit and switch it on again, the new setting will be activated.

### Settings for the dosing pump

In case you want the dosing pump to start as soon as the sensor signal becomes larger than zero, you can type 0 in the input field and press send. The dosing pump will now operate at a

dosing rate linearly increasing from zero pulses per minute at a sensor output value of 0 Volt to  $p_{max}$  pulses per minute at a sensor output of 5 Volt.

You can also program the dosing pump to start when the output signal of the sensor exceeds a predefined output voltage. Example: If you want the dosing pump to start when the sensor output voltage exceeds 2.5 Volt, you type 2.5 in the input field and press the send button. The control unit will now start dosing at  $V = 2.5$  Volt and the dosing rate will increase linearly from zero pulses per minute at 2.5 Volt to  $p_{max}$  pulses per minute at  $V = 5$  Volt.

The relay in the control-unit always switches at the same sensor output voltage at which the dosing pump is activated. So in the previous example, this is at  $V = 2.5$  Volt.

#### Setting the maximum pulse frequency $p_{max}$

You can adjust the maximum pulse frequency for steering the dosing pump, i.e., the pulse frequency at  $V = 5$  Volt, by typing  $p_{max}$  in the input field followed directly by the desired frequency [1/min]. Example: typing  $p_{max}200$  and pressing the send button results in a maximum pulse frequency of 200 pulses per minute at a sensor output voltage of 5 Volt.

#### Use of the datalogger

The control-unit is equipped with a datalogger and a real time clock. The battery in the real time clock has a life-time of 4+ years and should not be removed in order to prevent the need for maintenance of the control-unit.

In the control-unit, a 16 GB micro SD card is placed (FAT formatted, named EasyMeasure) with a file name datalog.txt on it. This micro SD card must always be present in the control-unit before it is powered.

On the SD card, the following data are stored automatically: time stamp (date and time), sensor value [Volt], pulse frequency [1/min]. These data are stored automatically in .csv format at a frequency of about 2 times per minute.

In order to retrieve the data, the control-unit must be switched off. The SD card can be removed from its holder (click system) and placed in the SD to USB dongle that is delivered together with the control-unit. Subsequently, the USB dongle is placed in a computer so that the .csv file can be copied.