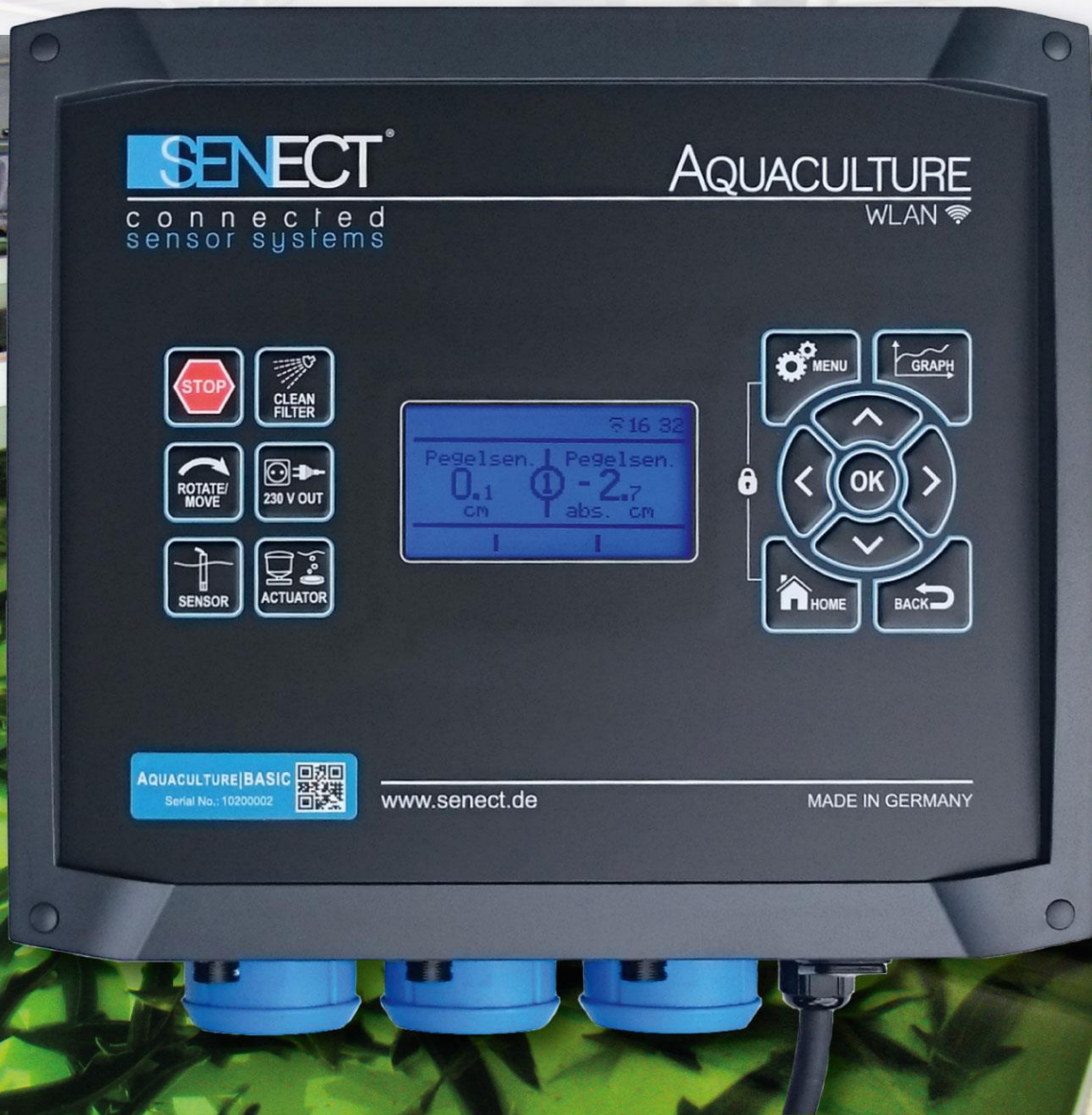




AQUACULTURE|CONTROL MANUAL



Product type

Product name:	SENECT® AQUACULTURE CONTROL 150 W / 300 W
Versions:	AQUACULTURE CONTROL – Basic (150 W) AQUACULTURE CONTROL – Basic (300 W) AQUACULTURE CONTROL – Pro (150 W) AQUACULTURE CONTROL – Pro (300 W)
Type:	AQC-A1-333-150 AQC-A1-333-300 AQC-A1-663-150 AQC-A1-663-300
Producer:	SENECT GmbH & Co. KG An 44 – No. 11 76829 Landau / Germany

Important note:

Please read this manual carefully and store it so that you can use it later. Read the warning and safety notes attentive.

More information and latest software releases or documents can be downloaded from:

www.senect.de

Further information, application descriptions and answers to frequently asked questions can be also found on the SENECT Forum:





<http://forum.senect.de>

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Used symbols and wording

	<p>DANGER! Warning of life threatening dangers.</p> <p>WARNING! Warning of possible life threatening and / or severe irreversible injuries.</p> <p>ATTENTION! Warning of possible medium or slight injury.</p>
	<p>ATTENTION! Follow the notes to avoid damage of equipment.</p>
	<p>NOTE! Further information for the use of the device.</p>
	<p>NOTE! Further information for the use of the device.</p>

General Security Notes

The SENECT® AQUACULTURE|CONTROL is an electronic control unit developed for measuring and controlling water quality parameters and actuator like fish feeders, valves or drum filters.



Since it is an electric product the common prerequisites for a safe instrument usage must be fulfilled. The device must be operated with 230 V AC (~50 Hz). Ensure that all cables are installed safely so that no obstacles for persons are built and all.



Mount all cables and electric devices protected against direct environmental impacts like overheating by direct sunlight and water. Even if the product is protected against spray water, the product's lifetime will be elongated, if it is mounted on a protected place.

For many applications a ground fault circuit interrupter (interrupting current ≤ 30 mA) is required by law. Inform yourself about the valid legislation. If the mains plug cable is damaged, only the producer or a qualified person designated by the producer is allowed to repair the damage.

The operating temperature of the device must be between 0°C and +40°C. It is not allowed to modify the SENECT® AQUACULTURE|CONTROL, to open the housing or to insert anything into the housing.

If the power cable is damaged, it must be replaced by the producer or a qualified person designated by the producer to avoid potential dangers.

The device is designed to be operated by professional users. It can be also operated by children over the age of 8 years and persons with limited physical, sensorial or cognitive ability, if they are supervised, trained in the operation of the device, able to operate the device safely and if they understand potential risks resulting from the operation. It is for children or persons with limited physical, sensorial or cognitive ability not allowed to perform any maintenance works.

Please store this manual. We suggest the storage a copy of the manual in the vicinity of the device.

Technical and optical changes of this manual are subject to alterations.



Warning: Before doing any maintenance work switch off all electric devices or unplug the mains plug.

Intended use

The AQUACULTURE|CONTROL is an electronic control and measurement unit developed to measure water quality parameters and control processes in professional industrial aquaculture facilities.

Performance specification

The SENECT AQUACULTURE|CONTROL is a versatile measurement and control unit designed for the use in aquaculture. There are four different versions available:

	AQUACULTURE CONTROL			
	Basic 150 W	Basic 300 W	Pro 150 W	Pro 300 W
Sensor input ports	3	3	6	6
Actuator output ports	2 (max. 1 A)	2 (max. 1 A)	5 (max. 1 A)	5 (max. 1 A)
	24 V DC PWM, 4-20 mA, 0-10 V	24 V DC PWM, 4-20 mA, 0-10 V	24 V DC PWM, 4-20 mA, 0-10 V	24 V DC PWM, 4-20 mA, 0-10 V
High-power-actuator output ports	1 (max. 5 A)	1 (max. 10 A)	1 (max. 5 A)	1 (max. 10 A)
	24 V DC PWM	24 V DC PWM	24 V DC PWM	24 V DC PWM
230 V AC mains plug	3 (max. 8 A, 2 A, 4 A)	3 (max. 8 A, 2 A, 4 A)	3 (max. 8 A, 2 A, 4 A)	3 (max. 8 A, 2 A, 4 A)

Every type of SENECT sensor can be connected to the universal sensor input ports (e.g. the oxygen sensor O2S, the pH sensor XR-1 or the water level probe PS). The AQUACULTURE|CONTROL measures then the signal of the connected sensors, saves the measurements internally (up to max. 3 months) and can control output ports depending on the sensor readings or send alarm message, if the control unit is connected to the internet.

At its actuator output ports, 24 V DC actuators like valves or fish feeders can be connected directly. Also actuators, which can be controlled via 4-20 mA or 0-10 V control signals can be controlled directly. Actuators with 230 V AC can be switched with the actuator ports by using the optional PowerSwitch SC24-230 or can be controlled directly, when they are connected to one of the three 230 V AC output ports at the bottom side of the device. Please consider always the max. allowed power consumption of actuators.

The AQUACULTURE|CONTROL can also be used to control drum or belt filters. Please consider here:



The direct control of drum or belt filters is only possible for filter with a 24 V DC filter motor with max. 5 A (AQC-A1-xx3-150) or 10 A (AQC-A1-xx3-300) or with a 230 V AC filter motor. The spray pump must be operated with 230 V AC with a maximal current of 8 A. For enabling all functions which need to adjust the motor speed of the filter (e.g. intensive cleaning), 230 V or 400 V filter motors must be controlled via a variable frequency drive connected to one of the actuator output ports (see Fig. 5).

The integrated WLAN module can be used to embed the SENECT AQUACULTURE|CONTROL into a WLAN network. With an established internet connection of the AQUACULTURE|CONTROL, the control unit can download software updates and send alarm messages. Additionally, with the SENECT Control App on an Android, Apple iOS or Windows device, the AQUACULTURE|CONTROL can be operated remotely (Internet connection with port forwarding and dynamic DNS necessary, for more details see chapter WLAN).

Please consider during the design of your control system that the sensors, cables and actuators are not within the scope of delivery of the AQUACULTURE|CONTROL and have to be ordered separately.

Getting started

Scope of delivery

- 1 x AQUACULTURE|CONTROL unit with 2.7 m power cable
- 1 x Wall mount set
- 1 x Set of exchange fuses with 2 AT, 4 AT and 8 AT
- 1 x Manual

Note



Please check directly after delivery, that the package is not destroyed or damaged or was opened before. Please check also, that all parts as listed above are included. If anything is missing or broken, please contact us as soon as possible within 14 days.

Unfortunately, we cannot accept later information of damage, which happened during the transport.

Installation and start-up



Choose a location for your AQUACULTURE|CONTROL which is clean, dry and protected from direct sunlight. Ensure that all cables are placed safely and all regulations are fulfilled.

To mount the AQUACULTURE|CONTROL, place the delivered wall mounting parts on the back of the device. Tight the parts with the delivered screws (3 x 10 mm, see Fig. 1). Afterwards, you can use the wall mounting parts of the AQUACULTURE|CONTROL to attach the device to its place, e.g. on a wall.

Plug the 230 V power plug of the AQUACULTURE |CONTROL in a spray water protected plug (IPx4 or higher) but do not switch the AQUACULTURE |CONTROL on yet. The next steps inform you how to connect the sensors and actuators.

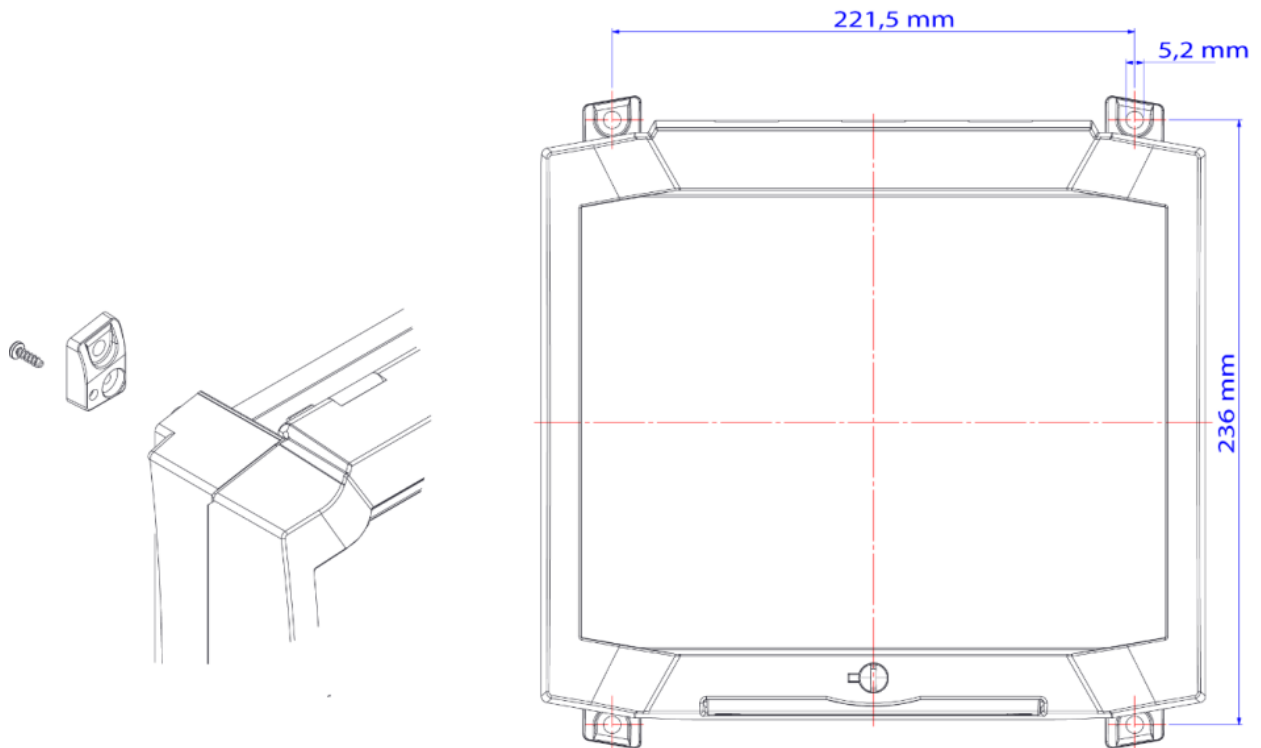


Fig. 1: Wall mounting parts and dimensions of the drill holes for the mounting of the AQUACULTURE|CONTROL.



Fig. 2: Sensor and actuator ports of the AQUACULTURE|CONTROL Pro. The AQUACULTURE|CONTROL Basic is equipped without the upper row (SENSOR 4-6 and OUT 4-6).

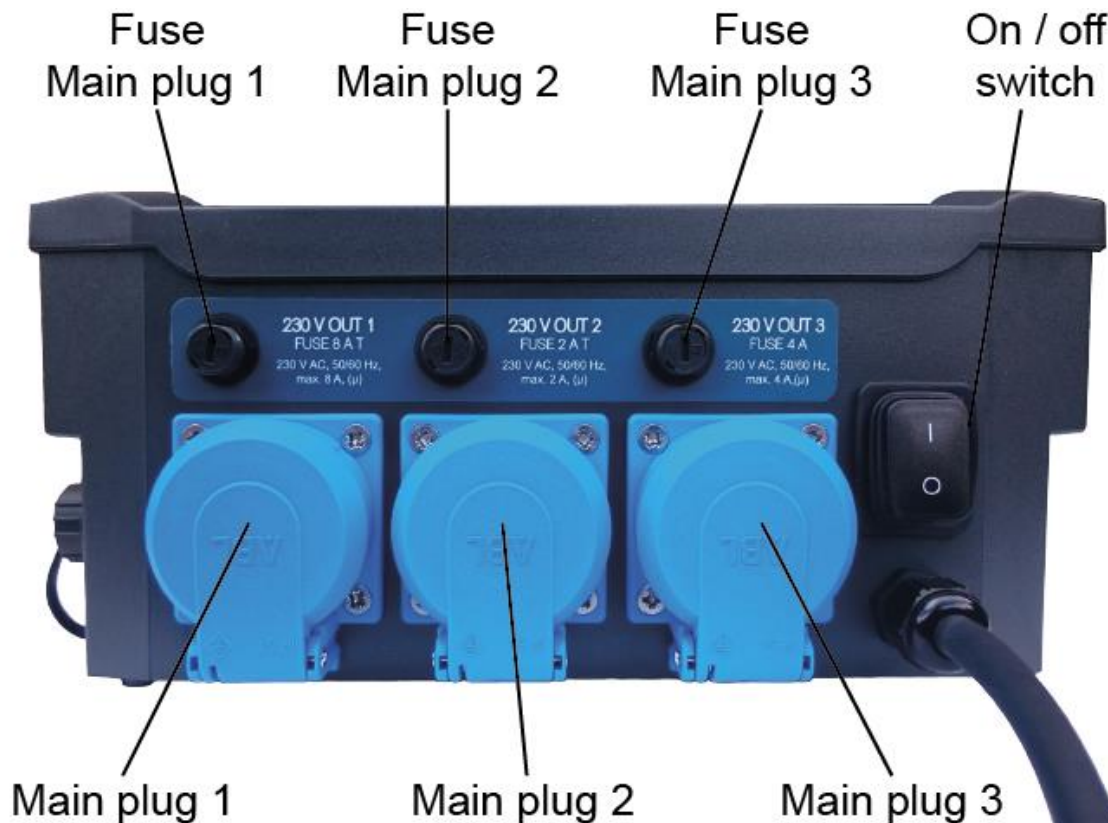


Fig. 3: View from the bottom side of the AQUACULTURE|CONTROL.

Using the AQUACULTURE|CONTROL to switch outputs as a function of sensor measurements

Which sensors, which actuators and how the cables are connected depend strongly on your application. In general, you can follow these steps:

1. Mount sensors and actuator at their location.
2. Place and lay the cables safely to the AQUACULTURE|CONTROL, remove the protection cap from the sensor input port and connect the sensor plug to the blue marked „SENSOR“ input.
3. Switch on the AQUACULTURE|CONTROL and set the desired settings. To switch the output ports, you have to assign a function to the selected output port.



Note: Changing languages can be easily done in the menu. Press the button MENU and select under „System Einstellungen / Sprache“ the language „English“.

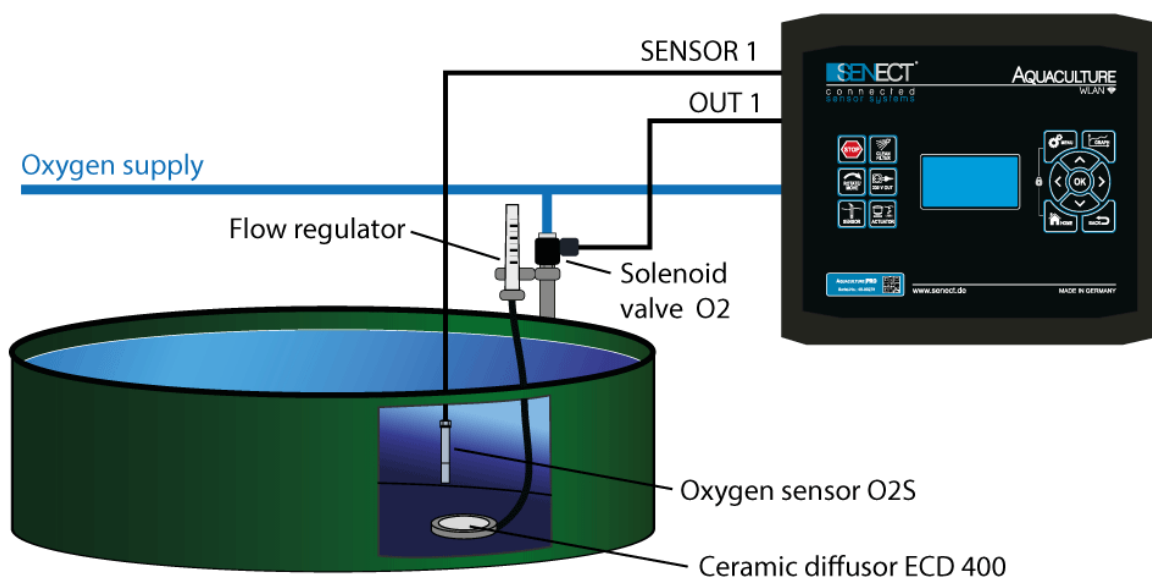
Application example: Oxygen control

In this example, the oxygen sensor O2S is connected to **SENSOR 1** and the „normally opened“ solenoid valve (Type: MVO-M7-SC, Art. No.: 3020) is plugged into actuator plug **OUT 1**. („Normally open“ is selected here, that in case of a power shutdown the valve opens automatically and the fish still get oxygen.)

The desired oxygen level should be over 95% and if 100% are reached, the addition of oxygen shall be stopped. Go to the menu (**MENU / Output Ports / Plug 1**) and set:

- **Function: Sensor Control** – a new submenu appears (when you go back in the menu)
- In the submenu „**Sensor Control**“ set:
 - Mode: Break time active
 - Control Parameter: O2 % a.s.
 - Sensor Plug: 1
 - Start value: 95%
 - Stop value: 100%
 - Max. Duration: 00:05:00 (the valve opens for max. 5 min)
 - Break Time: 00:01:00 (after the 5 min, the valve keeps inactive for 1 min)
- In the submenu „**Output signal**“ set:
 - Polarity: Low Active (the output is switched off, when the O₂ concentration falls below 95% so that the [normally open] valve opens)

Now, all the settings are done and you can test the system, e.g. dipping the O2S sensor in 0%-oxygen solution.



4. *Optional:* Connect the AQUACULTURE|CONTROL with your WLAN network (see chapter: WLAN).
5. Check the function of your control settings. Hint: You can easily check the actuator by selecting the function „Constant on“.

Now, your system is ready for useage.

Controlling the drum filter with the AQUACULTURE|CONTROL

When you want to control a drum or belt filter with the AQUACULTURE|CONTROL follow the steps below:

1.) Water level sensor installation

If you do not have a water level sensor, please continue with 2.).



Mount the water level probe or sensor at its optimal location. The optimal location of the water level sensor (PS-300-MA or EPS-250-MA) is where the water level responds to the clogging of the filter and a control over the proper functioning of the circulation pump is. In a **gravity system**, this location is usually behind the filter while in **pumped systems**, this is typically before the filter or in the pre-chamber of the filter.

Please do not insert the water level sensor deeper than 2.5 m and ensure that it is well fixed and at a location with low direct currents. Read also the instructions of the water level sensor manual.

Connect the water level sensor cable to the AQUACULTURE|CONTROL (e.g.) with **SENSOR 1** (see Fig. 2). If you are using a second water level sensor, connect the 2nd probe with **SENSOR 2**.

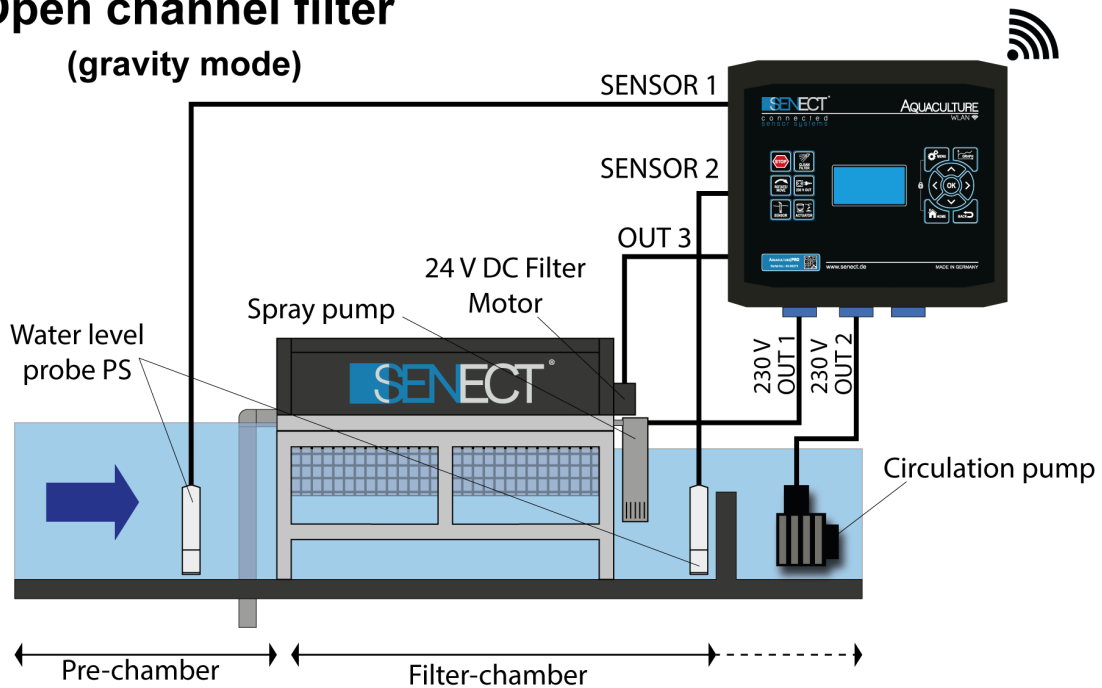
2.) Case switch

If your filter is equipped with a case or cover proximity switch, you can connect it to **SENSOR 3**. If you do not have a suitable plug at your switch, you can order the proper plug from SENECT or your dealer.

The function of the case switch is to switch off the drum motor and a connected UVC lamp (which are often located inside the drum filter), when the cover is opened (mode: drum filter). In the mode “belt filter” is selected, then only the UVC lamp is switched off.

Please consider that the case or cover switch does not fulfil all requirements to be an emergency stop switch according to EN ISO 13850:2015-10.

Open channel filter (gravity mode)



Boxed filter (pipe connections, gravity mode)

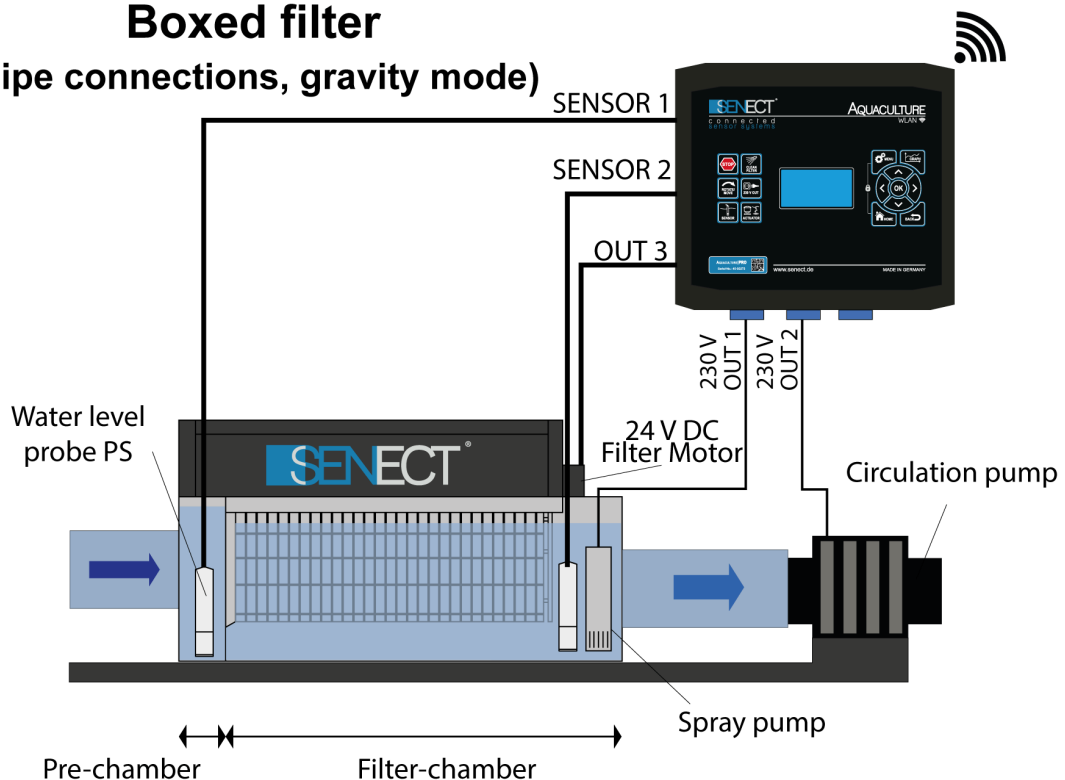


Fig. 4: Connecting an open channel drum filter and a boxed drum filter. Please note that the filter motors here are controlled by the high-power actuator output port OUT 3.

3.) Filter motor

24 V DC Filter motors:

Ensure that the filter motor is correctly installed at your filter and check in the technical documentation, if the motor can be operated with 24 V DC (max. current 5 or 10 A). If yes, you can connect the motor with the optional available motor cable (Art. No.: 3400, polarity: red = +, black = -). Connect the motor cable plug to the high-power actuator output port **OUT 3**.

230 V AC Filter motors:

If your filter is equipped with a 230 V AC motor, connect its plug with the main plug 2 (**230 V OUT 2**). Please consider that only motors with a power of max. 500 W can be connected directly here. Motors with a higher power consumption can be connected to the other two **230 V PLUG 1** or **230 V PLUG 3**, in case these are not needed for other consumers like a spray pump or can be connected to actuator output ports via the optional Power Switch 24-230 (Art. No.: 3100).

Note here, that all functions where the motor speed is controlled by the AQUACULTURE|CONTROL do not work, because there is just an on / off switching of the filter motor possible. These functions are:

- Intensive cleaning programme
- Soft motor start
- High-pressure cleaning mode

If you want to use these functions with AC motors, you need a variable frequency drive to control the motor speed.

230 V / 400 V AC Filter motors connected via variable frequency drive (VFD):

For changing the rotation speed of AC filter motors, which allows to use all functions which change the motor speed, a variable frequency drive between the AQUACULTURE |CONTROL and the filter motor is necessary.

SENECT offers fully parametrized and wired VFDs. The green labelled actuator cable from the VFD must be connected to one the actuator output ports, e.g. **OUT 1**.

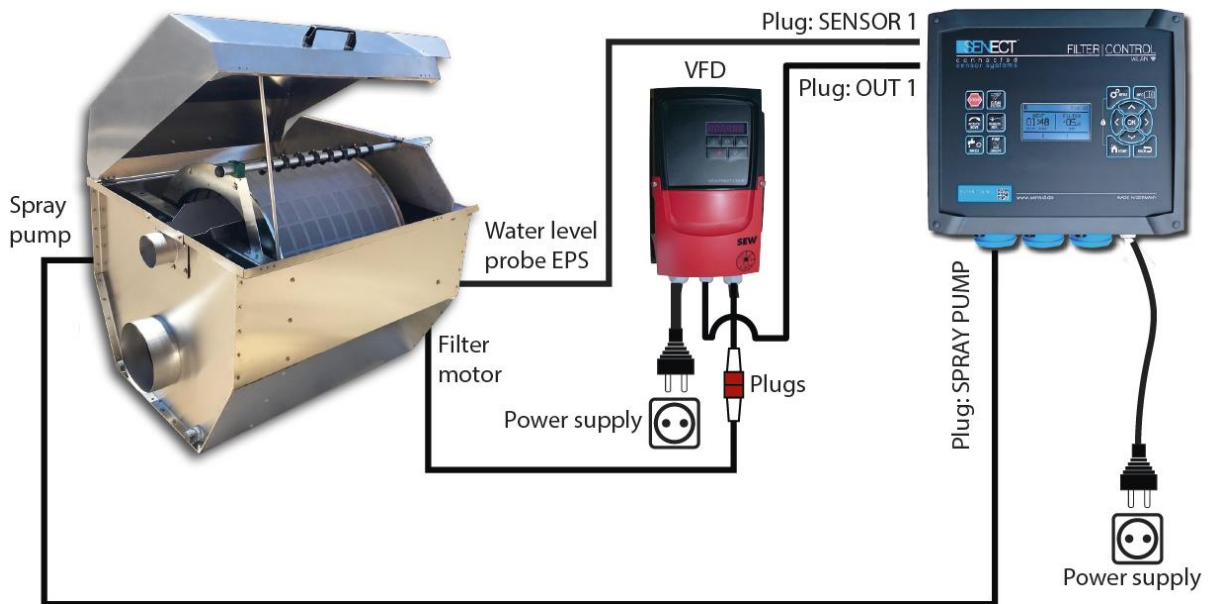


Fig. 5: Connecting a drum filter via a variable frequency drive.



Note: Select the function “filter motor” for the corresponding actuator output port (here **OUT 1**) and select the additional function “variable frequency drive”.

4.) Connecting the spray and circulation pump

If the pumps are correctly installed, arrange all cables safely to your AQUACULTURE|CONTROL. Check on the data sheets of your pumps, if they fit to the specifications of the AQUACULTURE|CONTROL (**230 V OUT 1**: 230 V AC, max. 1800 W, **230 V OUT 3**: 230 V AC, max. 900 W). Plug the spray pump connector into the plug „**230 V OUT 1**“ and the connector of the circulation pump to the plug „**230 V OUT 3**“ (see).



To operate a drum or belt filter correctly, it is necessary to connect the filter motor and spray pump according to the specifications of the filter producer.



Every drum or belt filter consumes water. Therefore, it is absolutely necessary that the lost water is refilled. Ensure that either the water is replenished automatically or if manually, that the water level in your tanks or ponds is constant.

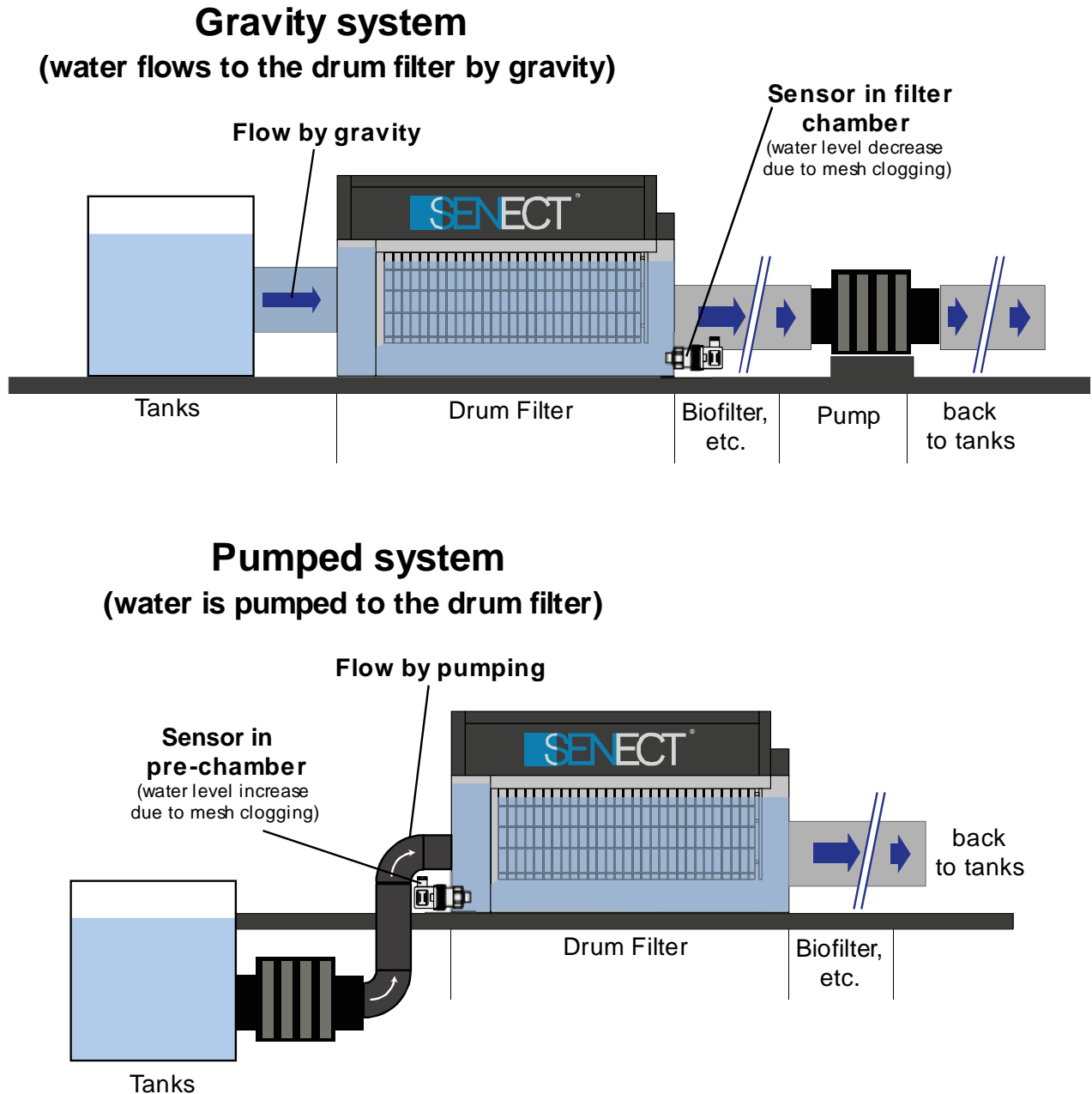


Fig. 6 Sketch showing the general two hydraulic systems in which drum filter are operated.

STARTING THE SYSTEM

Switch the AQUACULTURE|CONTROL on with the **ON/OFF Switch** at the bottom (Fig. 3).

By pressing the button **MENU**, you can configure all necessary settings. With the cursor buttons **↑** and **↓**, you can choose the desired menu item and to confirm your selection, press **OK**. The button **BACK** brings you always one hierarchical level down, while **HOME** displays the normal screen and exits the menu.

If your filter is used in a pumped system, select in the **Filter Settings** as **Filter Mode „Pumped System“**. If you are operating the filter in gravity mode, select **“Gravity System”**.

If you are using a 230 V AC filter motor connected to a 230 V main plug, select in the menu at **230 V Plug / 230 V Plu X** the function **„Filter Motor“**. If you are using a 230 V AC filter motor connected via a variable frequency drive to an actuator output port, select in the menu at **Output ports / Plug X** the function **„Filter Motor“** and the additional function **“Var. Frequency Dri”**.

To assign a function to the water level sensor(s), select in the menu **Sensors / S X / Position** to the location where the sensor is mounted. Is it in front of the drum, select **“Pre-chamber”**, and is it mounted behind the drum, select **“Filter-chamber”**. The Pre-chamber defined sensor starts flushing when the water level rises above the flush level, while the definition Filter-chamber initiates the cleaning, when the water level falls below the flush level.

Check and eventually select the proper type of water level sensor connected to your AQUACULTURE|CONTROL. If you are using the water level probe PS, select **Sensors / S X / Sensor Type** the type: **„PS-300-MA“** while if you use the water level sensor EPS, select **„EPS-250-MA“**.

If you have connected your circulation pump to the AQUACULTURE|CONTROL, assign the function **“Circulation pump”** to the corresponding 230 V plug. You can now switch off (and on) your circulation pump by pressing the button **„STOP“**.

After connecting your spray / jet / backwash pump to the AQUACULTURE|CONTROL, assign the function **“Spray pump”** to the corresponding 230 V plug. If you have it connected via an PowerSwitch or VFD at one of the actuator output ports, assign the function **“Spray pump”** to this port.

Clean the filter by pressing the button **„CLEAN FILTER“**. After the cleaning process, check the water level in your system. If the water level is correct, you have to set the water level sensor(s) to zero (referencing). Go therefore in the menu to **Sensors / S X / Sensor Referencing** and confirm with yes. This sets the *relative* water level to 0 cm (the absolute water level is always the actual water level measured by the probe, while the relative water level refers to this set zero condition).

Now, your system is ready for operation.

To achieve the most efficient operation, you have to configure all other filter-related settings so that they fit to your filter, for example the cleaning duration, etc. You'll find more information in the chapter **“Operation”**.

Using the AQUACULTURE|CONTROL to switch outputs as a function of sensor measurements – Short version

1. Mount the AQUACULTURE|CONTROL at a protected location.
2. Mount the sensor at its position and connect the cable to one of the **SENSOR** plugs.
3. Turn the AQUACULTURE|CONTROL on.
4. Select in the **Menu / Output ports** or **Menu / 230 V Plug** the output, at which the corresponding actuator (e.g. aerator, valve) will be plugged and select the desired function. If you want to switch the output in relation to sensor readings, select „**Sensor Control**“.
5. Set all the necessary parameters and plug in the actuator.

Note: Do always doublecheck your setted parameters and afterwards the correct operation of the function.

Hint: By using the function „Constant on“ you can check the function of the actuator.

Controlling the drum filter with the AQUACULTURE|CONTROL – Short version

1. Mount the AQUACULTURE|CONTROL at a protected location.
2. Mount the water level probe PS submerged in the filter chamber (gravity system) or in the pre chamber (pumped system). If you are using the water level sensor EPS, install it at its correct location analogue to the probe PS.
 - a. In case you are using 2 water level sensors to control your filter backwash by the difference in water level, install both sensors (one in the pre-chamber, one in the filter chamber, see Fig. 4).
3. Connect the filter motor cable, the spray pump, the cover switch and the circulation pump with your AQUACULTURE |CONTROL.
 - a. If you are using a VFD, connect the motor to the VFD, connect the green marked actuator cable of the VFD to the AQUACULTURE |CONTROL to OUT 1 and plug the VFD power plug into a power supply mains plug.
4. Switch the AQUACULTURE |CONTROL on.
5. Assign the correct functions to the connected SENSOR input and OUTPUT ports
 - a. Sensor in the filter chamber: **S X / Position: Filter-chamber**
 - b. Sensor in the pre-chamber: **S X / Position: Pre-chamber**
 - c. Spray pump: **230 V Plug / Plug 1 / Function: Spray pump**

d. Circulation pump: **230 V Plug / Plug 3 / Function: Circulation pump**

If you are using a VFD, select in the **MENU** the function “filter motor” for the corresponding actuator **output port** (e.g. Plug 1) and the **additional function** “variable frequency drive”.

6. Set the correct backwash settings in the **MENU** under **Filter Settings**.
7. Switch on the circulation pump (button **PUMP ON/OFF**) and clean the filter (button **CLEAN FILTER**).
8. Check the water level. If the water level is correct, set it to “0 cm” in the **menu / Sensors Sx: PS 3m / Sensor referencing**.

Now, your system is ready for operation.



Please note that the filter backwash water levels refer to the **referenced** water level while the alarm settings of the sensor refer to the **absolute** water level.

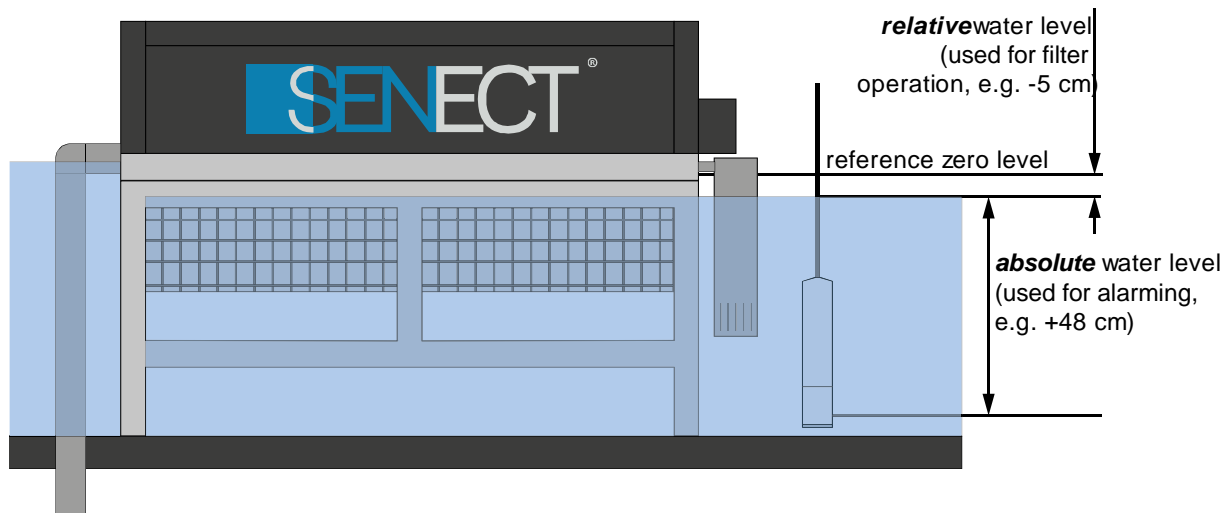


Fig. 7: Relative water level vs. absolute water level.

Alarms

Alarm thresholds can be specified in the sensor menu for each sensor measured value, and an alarm is triggered if they are exceeded or not reached. During filter operation, an alarm is triggered if the dry-running or overflow protection becomes active (e.g. too little water in the filter chamber).

An alarm is active until its cause is eliminated (e.g. sensor reading again below upper alarm threshold) or until it is switched off manually.

The alarm can also be paused for a certain time, e.g. to carry out work on the system (Control: Menu/System Settings/Alarm pause; App: In Control on top field with Serial-No. Click button:

"Pause alarm for..."). To be reminded of the alarm at regular intervals (e.g. every 30 min), this can also be set in the menu/system settings/alarm/alarm recall.

The alarm is shown in the top line of the display as a flashing exclamation mark, sends a push message to the registered mobile devices (e.g. smartphone, tablet), an email to all registered email addresses, switches all outputs with the function "Alarm" or the additional function "Alarm coupling" and switches this output (potential-free normally closed / normally open contact) for controllers with extra alarm output.

In order to forward the alarm externally, the signal can also be forwarded to a GSM module (e.g. for a telephone call or SMS) or a building surveillance system. For this purpose, the electrical signal of an output must be used.

Registration for push message:

So that warnings, notes and alarms can be received as push messages, the respective terminal (smartphone) must be registered with the controller. This requires an existing WLAN connection, the installed SENECT Control App and the integration of the controller into the SENECT Control App (see chapter WLAN). The registration can be made in the menu (gearwheel symbol at the top right) under "Alarm settings". To do this, enter a freely selectable name for "Mobile X" (e.g. User 1) and confirm with +. With the button "Test Mobile" you can check the registration.

The same applies to the details of the email addresses which should receive an alarm message.

Operation

Display and symbols

On the display, you'll find information about filter operation, current measurements and the status of the instrument.

The upper row shows you action symbols, which display the current running actions or modes of operation.

The action symbols are:

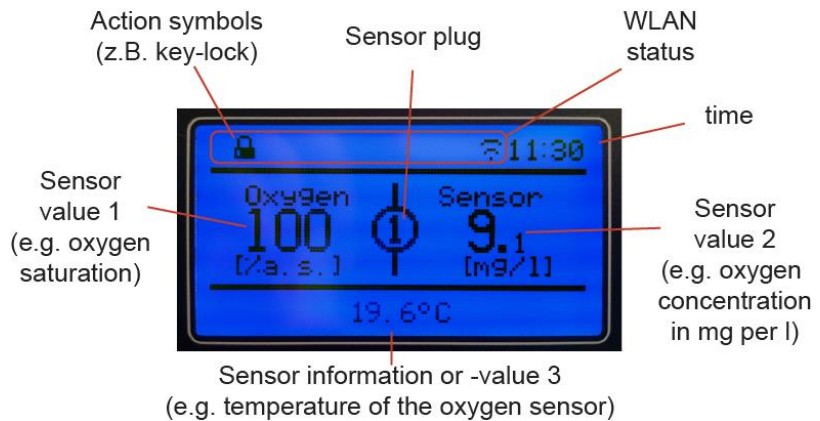


Fig. 8: The display of the AQUACULTURE|CONTROL.

!	Alarm active
	Pause, release with "STOP"
🔒	Pin code active, unit blocked
⚙️	Circulation pump on
🧼	Filter cleaning
.	WLAN: Not connected
—	WLAN connected, but not internet access
🌐	WLAN: Connected with network
⚙️	WLAN: Configuration mode active
🔄	WLAN: Update available

Buttons and menu

The AQUACULTURE|CONTROL is operated by the user via the buttons on the front. With the navigation buttons (↓, ↑, ←, →, **BACK** and **HOME**) you can navigate through the menu.

To change the displayed view from the filter status to the sensor values (the number in the center circle show the SENSOR plug number) press ← or →. To view the status of an output port, select the corresponding sensor plug, e.g. plug 1 and press ↑. You can then also change to the other output ports with ← or →.

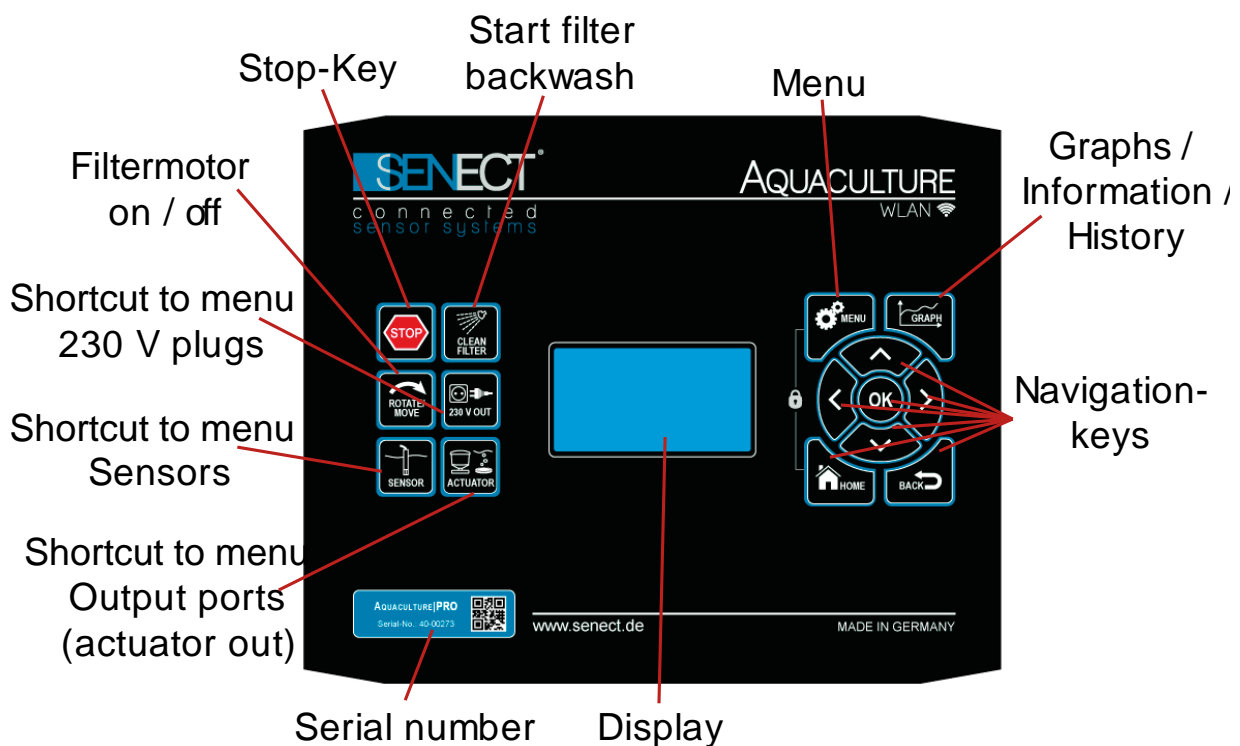


Fig. 9: Keypad of the AQUACULTURE|CONTROL.

- Cursors:** With the cursor buttons you can move through the menu and change settings..
- OK:** With OK you confirm your selection.
- BACK:** The button BACK brings you one level back in the menu.
- HOME:** By pressing home, the home screen will be displayed and you exit the menu.
- MENU:** The menu is opened by pressing MENU.
- GRAPH:** With the GRAPH-button, the stored sensor readings are visualized as a xy plot.
With the cursor buttons ← and → you can switch between the measured data

while with pressing ↓ and ↑ you can change the temporal scale of the x axis (e.g. 1 hour, 1 day). Here you can also find the history recordings or device or WLAN information.

Lock: By pressing the buttons **MENU** and **HOME** simulatanously, the lock is active. To unlock the keypad, you have to enter the Pin Code. The Pin Code is 0000 unless you have changed it in the menu.

STOP: By pressing **STOP** all actions are stopped immedeately and the device is in the break mode. By pressing **STOP** again, the device starts again.

CLEAN FILTER: By pressing **CLEAN FILTER** you start a cleaning process. If you press longer than 3 s, the intensive cleaning mode is started.

ROTATE/MOVE: To move the belt or rotate the drum manually, press ROTATE/MOVE. If you release the button, the motor stopps.

230 V OUT: Shortcut to the 230 V Plug menu.

SENSOR: Shortcut to the sensor menu.

ACTUATOR: Shortcut to the actuator output menu.

Tab. 1: Description of the history entries.

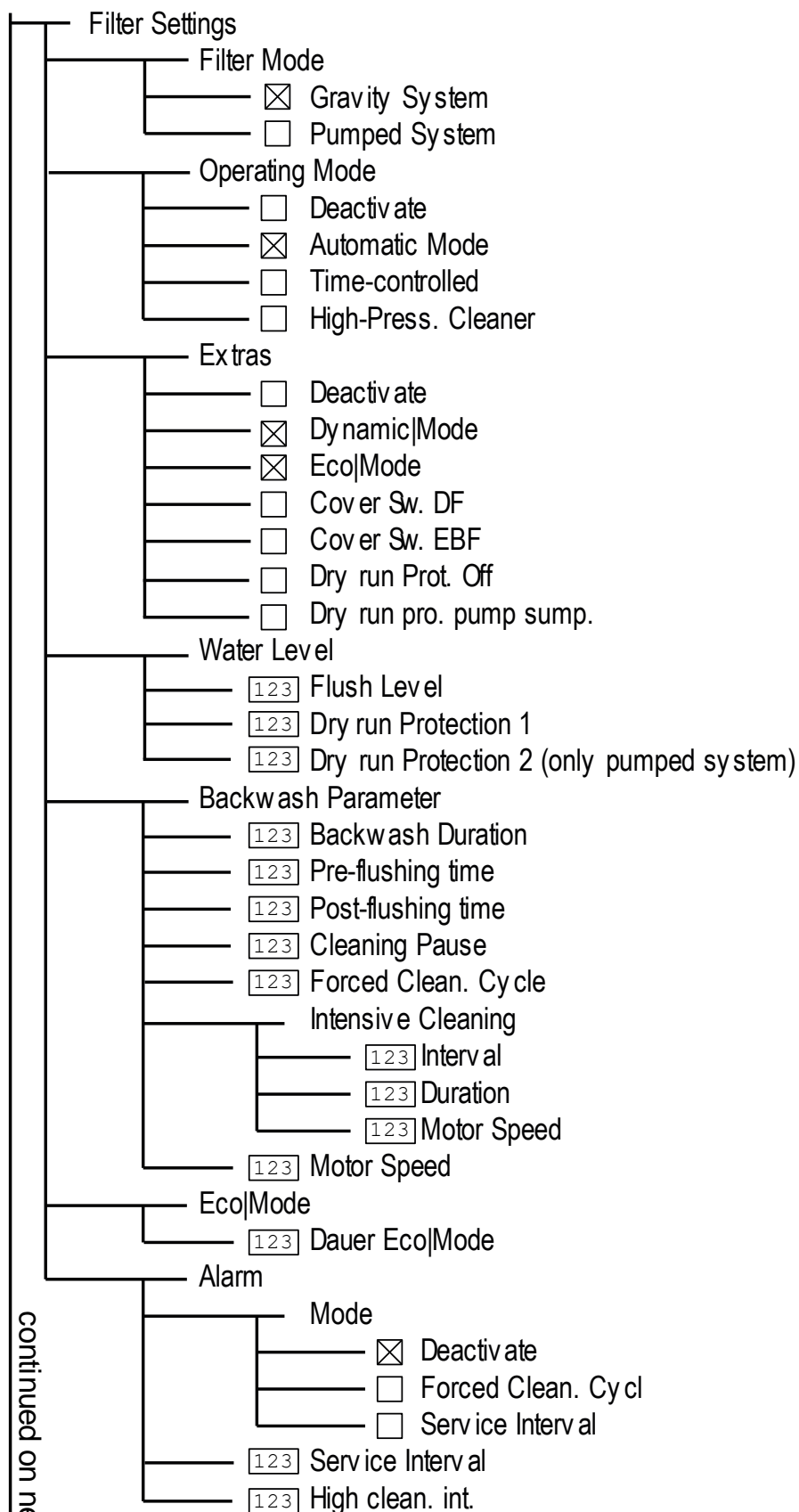
Entry	Description
System Start	Start of the control unit
Man. Backwash	Backwashing started manually (by pressing the button)
Sens. Backwash	Backwashing started by sensor measurements
Sens. Forced B.	Forced backwashing started by sensor
Time contr. Bw.	Time-controlled backwashing
Abort backwash	Manual interruption of backwashing
Modus changed	Operating mode of filter settings changed (automatic vs. time-contr.)
Intensive cleaning	Intensive backwash
Drive error 1	Error on high-power OUT 3: no current measureable
Drive error 2	Error on high-power OUT 3: overload
Drive error 3	Error on high-power OUT 3: short circuit
Break active	Break mode is active (e.g. by pressing STOP)
Break deact.	Break mode was deactivated
Dry run prot.	Dry run protection mode was started
Reset dry run.	Dry run protection mode was manually stopped
Man. Pump off	Pump was switched off manually
Man. Pump on	Pump was switched on manually
Power fail	Power failure or control unit switched off
Factory setting	Factory settings loaded
Man. Refill.	Water refill was started manually
End of refill	End of water refilling

Entry	Description
Timer refill	Start of time-controlled refilling
Sensor refill	Start of sensor-controlled refilling (time table)
Interv. refill	Start of time-controlled refilling (interval)
Abort sensorc.	Abort of sensor-controlled water refill (exceeding max. time)
Timer on	Timer controlled output was switched on
Timer off	Timer controlled output was switched off
Sen.Reg.on	Sensor controlled output was switched on
Sen.Reg.off	Sensor controlled output was switched off
Feeding	Feeder active
No Feeding	Feeding cancelled due to environmental parameters e.g. O ₂ , temp.
Cover opened	Cover switch recognizes open cover
Cover closed	Cover switch detects closing of cover
Output Alarm	Alarm on output
Output Ok	Alarm on output cleared
Sensor Error	Error at sensor
Sensor Alarm	Sensor measurements above or below alarm thresholds
Sensor Ok	Sensor values again in normal range

The Menu

All settings and parameters can be changed in the menu. Please note that the menu is dynamically changing. This means that parts of the menu appear only if certain settings are selected (e.g. a new submenu appears) or if the corresponding sensors are connected.

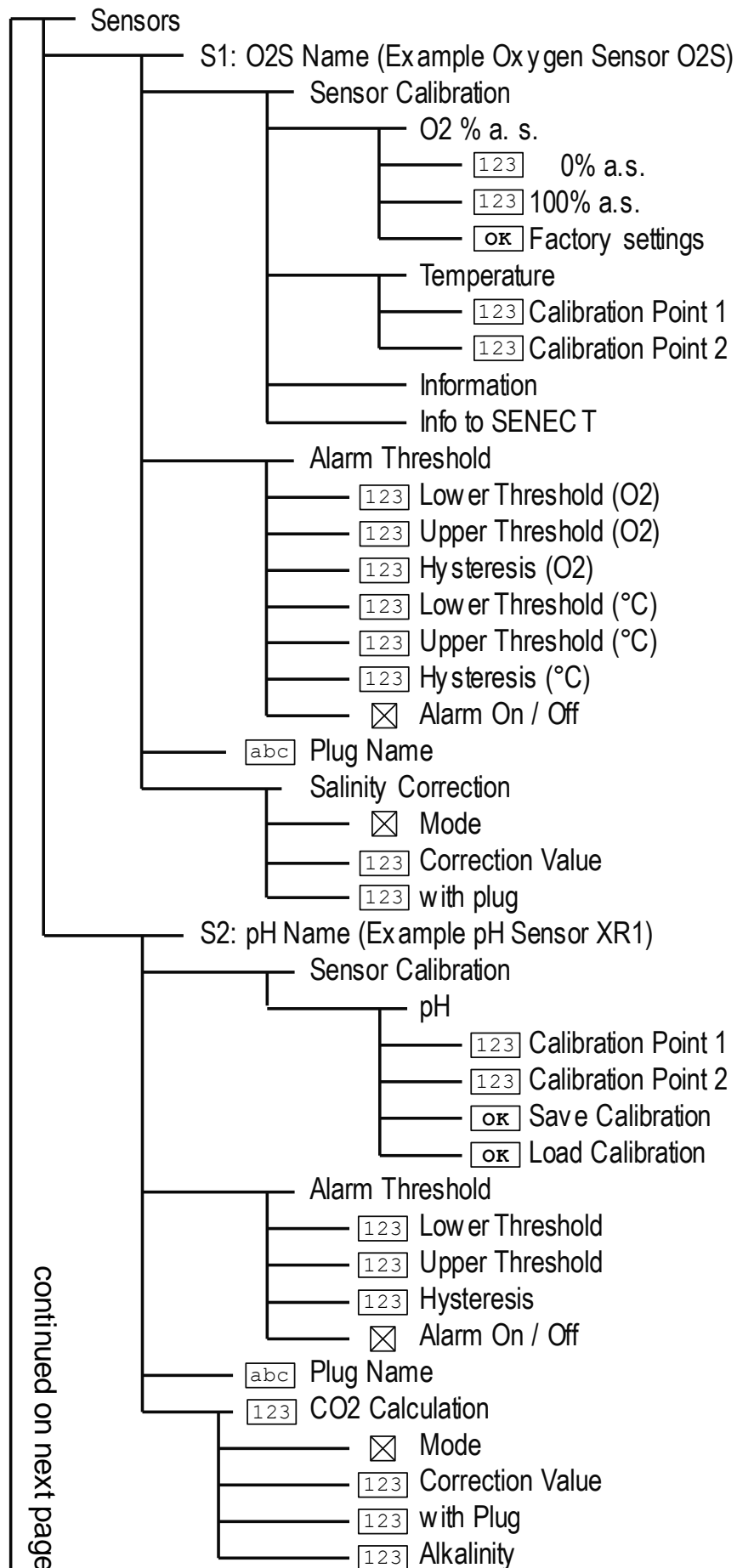
Filter Menu



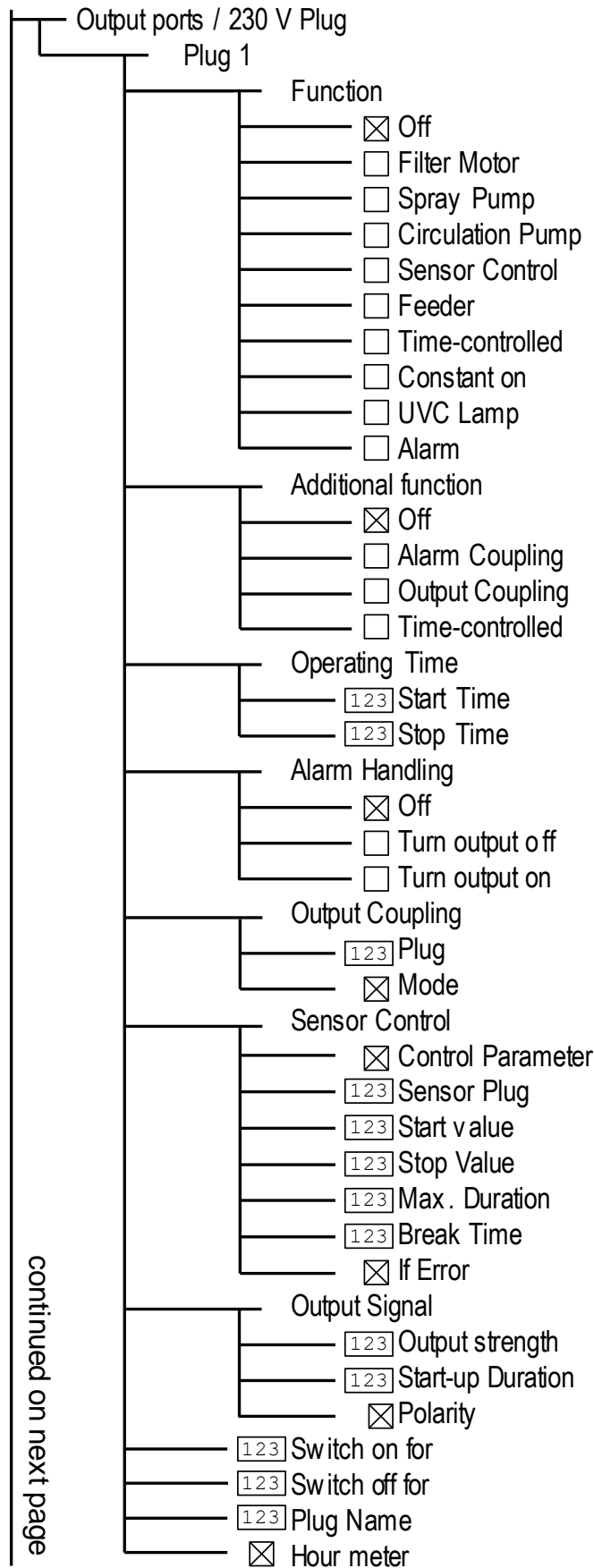
continued on next page

Input value:	Selection:
123 Numerical	<input checked="" type="checkbox"/> selected (factory settings)
	<input type="checkbox"/> not selected

Sensor menu

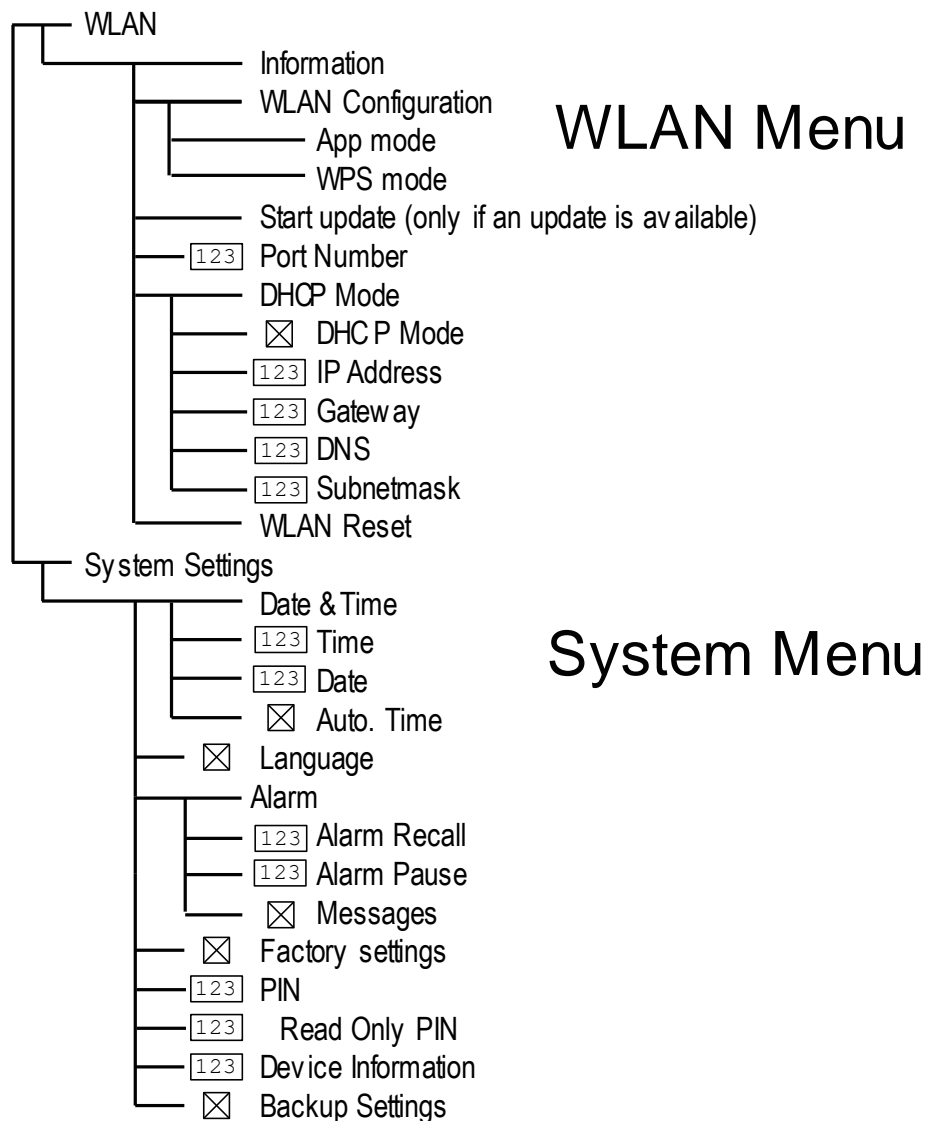


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Menu output ports



Filter settings

Here you can configure all relevant settings for the filter operation.

- **Filter Mode**

Select here, if you are using your filter in a gravity or pumped system. The selection here means that the filters backwashing is triggered by an decrease of the water level (typically for gravity mode, where the sensor is installed behind the filter) or by an increase (when the sensor is installed before the filter).

- **Operating Mode**

Without a water level sensor, the filter is operated time-controlled. In this menu point, you can choose the operation mode. „**Automatic mode**“ means that based on the clogging of the filter mesh, indicated by the measurements of the water level sensor, the cleaning is

initiated. In the „**Time-controlled mode**“, the filter is cleaned in regular time intervals. The „**High-Press. Cleaner**“ mode lets the filter motor run continuously, but slow without activating the spray pump. This mode is handy, when the filter mesh is cleaned manually with a high-pressure cleaner. **Extras**

Here you can select the activation of extra functions.

1. **Dynamic|Mode:**

The Dynamic|Mode is a special algorithm which leads to a more stable clogging-induced control of the backwashing. With this mode, the backwash water level is continuously corrected for changes in the water level. Please note, that the backwashing is then not at exactly the specified backwash water level. Instead it starts when the “corrected” backwash level is reached.

2. **Eco|Mode**

With the Eco-Mode you can decrease the water consumption of your filter. When the water level sensor initiates the cleaning, only the filter motor is activated for a short time to bring the until then unused filter mesh into the water. By monitoring the water level, the AQUACULTURE|CONTROL will decide when the next full cleaning is necessary.

3. **Cover Sw. DF**

If the cover switch is defined as “Cover Sw. DF” where DF stands for drum filter, the backwashing will be stopped, if the cover is opened. Additionally, when the 230 V plug 2 is defined as “UVC lamp”, it will be also switched off immediately.

4. **Cover Sw. EBF**

In case the cover switch is set to EBF, which means “Endlosbandfilter” or continuous belt filter, a backwashing will **not** be interrupted when the cover is opened. The UVC on 230 V plug 2 however will be switched off.

• **Water level**

All water level related parameters are system-specific. In this menu item, you can configure the cleaning-related water level settings.

• **Flush Level**

The flush level is the water level threshold, under (gravity system) or over (pumped system) which the cleaning is initiated. It is always displayed positive as a difference.

• **Dry run Protection**

The Dry run Protection level is the water level at which the circulation pump is deactivated and the system stopped. If the water level is below this level, the AQUACULTURE|CONTROL

tries several times to reactivate the filter. Only if the operation can be safely continued, the AQUACULTURE|CONTROL goes back into the normal operation mode.

You will see this as a message in the display. The symbol “Pause” will also appear. To restart the operation manually, press “STOP”.

- **Backwash Parameter**

Here you can set all relevant parameters for the filter cleaning.

- **Backwash Duration**

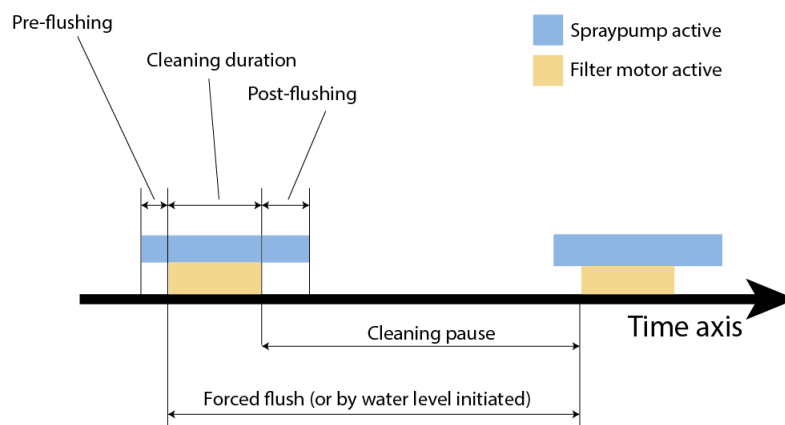
The backwash duration defines the time of one cleaning cycle. Choose the flush time so that the drum is rotated at least one time completely.

- **Pre-flushing time**

With the pre-flushing time, you can define how long the spray pump is activated before the filter motor starts.

- **Post-flushing time**

To discharge also the last rest of particles from the flush tray, you can set with the post-flushing time the duration, how long the spray pump should stay activated after the filter motor stops.



- **Cleaning pause**

The cleaning pause defines the minimal temporal distance between two filter cleaning events. This break prevents from water loss associated from too man cleaning events. But in case the water level drops further towards the emergency level, the filter flushes despite there is a cleaning pause. This function disables the cleaning pause in situations, when urgent cleaning is necessary.

▪ **Forced Clean. Cycle**

Here, you can specify how often the filter should be backwashed even when the sensor does not detect the necessity of backwashing. This means that you can set here the maximum time where the filter is not flushed.

▪ **Intensive cleaning**

Since the filter mesh can clog regularly by biofouling or calcareous crusts, the FITLER|CONTROL initiates in regular intervals an intensive cleaning mode where by a reduction of the motor speed the filter mesh is cleaned more intensively.

- **Interval**

The interval defines, how often the intensive cleaning programme should be run.

- **Duration**

With the duration, you can choose how long the intensive cleaning programme should activate the filter. The drum should be rotated at least one time full.

- **Motor speed**

To intensify the cleaning, the motor speed is reduced. Here you can choose the speed from 20% (slow) to 100% (max. speed).

- **Motor speed**

This menu item is the same as mentioned above, but valid for the normal flushing.

- **Eco-Mode**

With the Eco-Mode you can decrease the water consumption of your filter. When the water level sensor initiates the cleaning, only the filter motor is activated for a short time to bring the until then unused filter mesh into the water. By monitoring the water level, the AQUACULTURE|CONTROL will decide when the next full cleaning is necessary.

In this menu item, you can set how long every partial rotation of the drum should last.

- **Alarm**

The alarm mode specifies, when you will be alarmed. Several events can cause alarms:

- Dry run protection (can't be switched off)
- Forced Clean. Cycle (when the filter is backwashed, but the water level still decreases and the filter is forced to be cleaned again)

- Service interval (here you can select to be alarmed regularly e.g. when the filter has been backwashed 10.000 times. This function is intended to be a reminder for any maintenance work)
- High clean int.: If the filter has an increased flushing frequency, you can receive an alarm message. Set therefore the time of 10 cleaning cycles. If the filter flushes more than 10 times in the specified time, you will receive an alarm message.

Sensor Menu



To change the settings of the connected sensors, please select here the sensor. ***Please refer to the manuals of each sensor.*** The entire menu is dynamic and may change depending on the sensor connected.

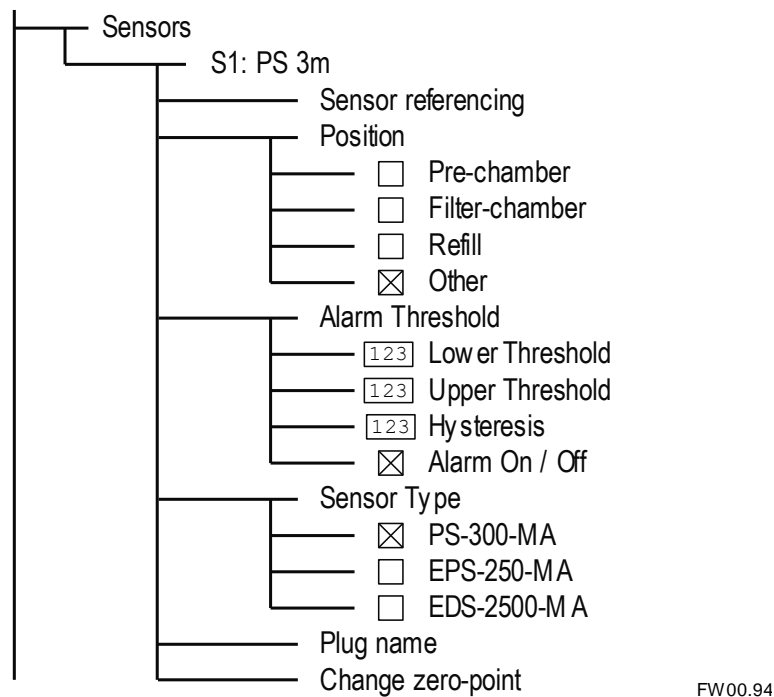
- **Sensors (Shortcut: Button SENSOR)**

To change the sensor settings or to calibrate the sensors, select in the menu under Sensors the desired sensor (plug). In every row, the sensor plug, sensor type and if set, the sensor name is displayed.

Example: **S1: PS 3m Tank2** [Plug SENSOR 1, Water level Probe PS with 3 m range, Name: Tank2]

The following manual refers to the examples of the water level probe and the oxygen sensor O2S. The menu items for other sensors are described in the manuals of the according sensors.

- **S1: PS 3m**



▪ Sensor referencing

Are all water levels in your system correct, you can set the sensor measurement to zero (0 cm). This is important since all regulation mechanisms like filter flushing or water refill use this zero point in their control function.

▪ Position

To select the function of the water level probe, the position must be selected (see also Fig. 4). Select „**Filter**“ if the filter backwashing is induced by a **decrease** of the water level. Select „**Pre-chamber**“, when the cleaning should be started by a water level **increase**.

If you are using two water level sensors and you have set both positions for the two sensors, the flushing is induced by the difference in water level between both sensors.

To refill a tank or pond, you have to place the probe in the according location (e.g. in the pond) and select „**Refill Sensor**“ as position. If you want to use other functions, select here „**other**“.

▪ Alarm threshold

In case there should be an alarm sent, when the sensor gives readings above or below a certain threshold, you can define these thresholds in this menu item. The hysteresis defines the tolerance of alarming. For example, if the lower threshold of -15 cm defines the alarm level and the water level fluctuates between -14.5 and -15.2 cm, the hysteresis of 1 cm eliminates several warnings always when the sensor reaches -15.0 cm.

In this menu item, you can also activate or deactivate the alarming of this sensor.



Please note, that the alarm is always referred to the ***absolute*** water level (see Fig. 7, p. 18).

- **Sensor Type**

Select here the type of water level sensor you have connected. The water level probe PS has a range of 3.0 m (Type: PS-300-MA) while the EPS exhibits a range of 2.5 m (Type: EPS-250-MA or EPS-250-MAK).

- **Plug name**

With plug name you can give the sensor a name of max. 8 characters, which will be displayed in the SENECT Control App.

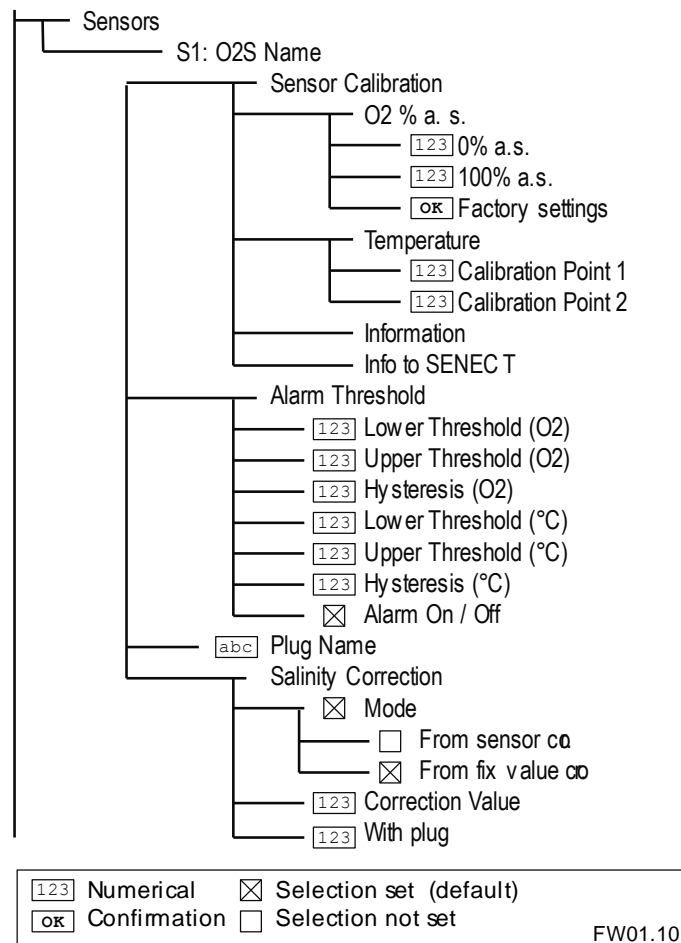
- **Change zero-point**

If the sensor is used for refilling, you can change the zero-point (reference level) so that it is shifted by the manually set level.

- **S2: O2S Name (Example Oxygen Sensor O2S)**

- **Sensor Calibration**

Every sensor should be calibrated regularly to achieve best accuracy. In this menu item, you can calibrate either the oxygen sensor signal or the temperature signal of the O2S.



Please choose, which parameter should be calibrated: e.g. **O2 % a.s.** for calibrating the oxygen signal.

All calibrations are programmed as 2-point calibrations, but there can be also only one point be changed. This is for example important if you want to calibrate your oxygen sensor only in air.

To do so, please hold the sensor in air or 100% oxygen saturated water and select in the calibration menu **100% a.s.** If the measurement value is stable, press ok or wait 120 s.

For the 2-point calibration, you have also to change the calibration point 1 (0%-oxygen). Insert the sensor in 0%-oxygen solution, select **0% a.s.** and wait

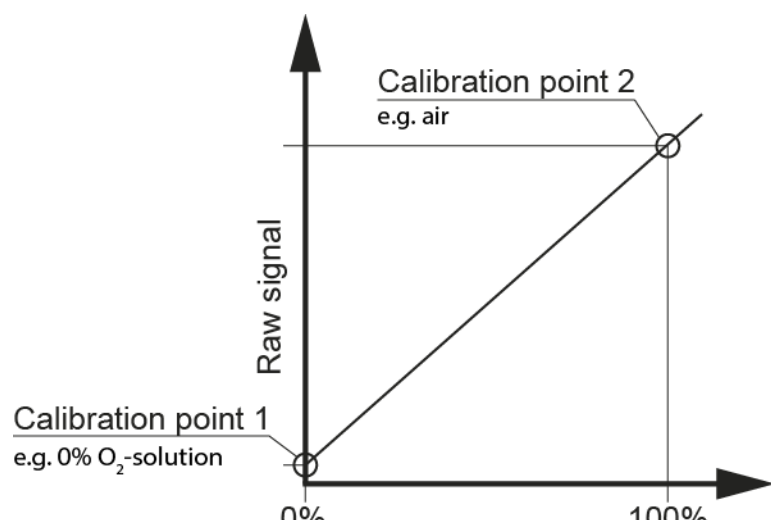


Fig. 10: 2-point calibration of the oxygen sensor.

until the value is stable. Confirm the calibration point with ok.

The calibration of the temperature channel is equivalent to the oxygen calibration.

Under the item **Information** you can see serial number of the sensor (SN) the signal at the lower calibration point (C0) and upper calibration point (C1) as well as the sensor mode.

By selecting **factory settings**, you can insert calibration values manually.

Under the menu item **Info to SENECT** error codes can be directly send via email to SENECT for further troubleshooting.

- **Alarm threshold**

In case there should be an alarm sent, when the sensor gives readings above or below a certain threshold, you can define these thresholds in this menu item. The **hysteresis** defines the tolerance of alarming. For example, if the lower threshold of 70% defines the alarm level and the concentration fluctuates between 69 and 71%, the hysteresis of 3% eliminates several warnings always when the sensor reaches 70%. With **alarm on / off** you can also deactivate the alarming for this sensor.

- **Plug name**

With plug name you can give the sensor a name of max. 8 characters, which will be displayed in the SENECT Control App.

- **Salinity correction**

Since the oxygen saturation concentration depends on the salinity of the water, the SENECT control can correct for the effect of salinity. Therefore, you can either enter a specific salinity (**Mode: Correction value**) or connect a conductivity sensor (**Mode: Sensor corrected**), which calculates the salinity and the correction based on conductivity measurements.

Menu output ports and 230 V AC plugs

- **Output / 230 V plugs**

With the AQUACULTURE|CONTROL up to 6 actuator output ports (OUT 1 to OUT 3 / OUT 6) and three mains plugs (230 V OUT 1 to 230 V OUT 3) can be individually configured to fulfill specific functions.

The actuator output ports are designed for the use of low-voltage consumer with up to 24 V DC or to control actuators with control signals (4-20 mA or 0-10 V).

At the end of each line, the current state is displayed:



Output port switched on

Output port switched off

- **Plug 1 to 6 / 230 V Plug 1 to 3**

Please note that 230 V plugs can only be switched on and off while the actuator output ports can also control the output strength (e.g. only 75% of the output signal strength).

- **Functions**

Select here the function of the plug. You can choose between:

1. Deactivate
2. Filter Motor
3. Filter Pump
4. Circulation Pump
5. Sensor Control
6. Feeder
7. Time Control
8. Constant on
9. UVC Lamp
10. Alarm

Description of the major output functions

▪ **Filter Motor**

If the function „Filter motor“ is selected, the output is active when the filter motor is activated. By using output signals like 4-20 mA, you can for example also control variable frequency drives for using 380 V motors.

To control the motor speed via 4-20 mA and switching it on and off with 24 V DC, please select as “Additional function “ “Var. Frequency Drive” (see also page 13).

▪ **Spray pump**

Defined as „Spray pump“, the output is activated, as defined in the filter settings.

▪ **Circulation pump**

When defined as „circulation pump“, the output is switched on in normal mode, but will be switched off in case of alarming (e.g. water level below dry-run protection). Additionally, the circulation pump can be switched on and off with the STOP button (break symbol in the display). Additional functions can be added.

If the function circulation pump is selected, the input pin at this output is automatically activated, which can receive a signal from the pump (e.g. fault message) (see page 45).

▪ **Sensor Control**

To switch output ports in relation to the signal of a connected sensor, you have to select the “sensor control” function.

Select under “**Control Parameter**” the signal to which the output shall respond, e.g. % a.s. for the oxygen saturation.

Choose also from which sensor the signal comes with “**Sensor Plug**”. E.g. should the output be controlled by the oxygen sensor in plug *SENSOR 1*, select here *plug 1*.

By defining the “**Start-**” and “**Stop value**” you can set the thresholds of operation.



Is the start value below the stop value, the output is activated, when the signal sinks below the start value. If it rises up to over the stop value, the output is deactivated. This function can also be used vice-versa.

Application example (Start < Stopp): The output is used to control the oxygen level. The desired concentration is between 90% and 100% a.s. Therefore, the start value is set to 90% and the stop value to 100%. When the oxygen saturation drops below 90%, the output is activated and the water oxygenated. Following this oxygenation, the saturation increases and if 100% are reached, the output is switched off again.

Application example (Stopp < Start): The opposite example of this is the control of a pump, which empties a pump sump. Here, the water level is the sensing parameter and to output, a

pump is connected. The pump should be switched on, when the water exceeds a threshold, let's say 30 cm and switched off, when there is only 10 cm water left. Then, the start value with 30 cm is larger than the stop value with 10 cm.

For the sensor control, you can also use protection parameters like "**Max. duration**" or "**break time**".

▪ Feeder

For controlling fish feeders, you have to select the function „Feeder“. Then, the new submenu "**Feeder**" and "**Time-controlled**" appear.

The "Time-controlled" submenu is equivalent as described on page 42 and describes the times, when the feeder is active.

The submenu „Feeder“ allows you to use many specially designed **feeder functions** to better control your feeder, also in relation to environmental parameters. Please consider that for some of the extra functions, the feeder must be calibrated. This menu item will be displayed dynamically, when the corresponding extra functions are selected.

As **feeder functions** can be selected:

1. Daily feed amount
2. Daily increase
3. Low O2 protection
4. Air pressure
5. Temp. Protection
6. Temp. Correction
7. Alarm = No feeding
8. Light stimulation

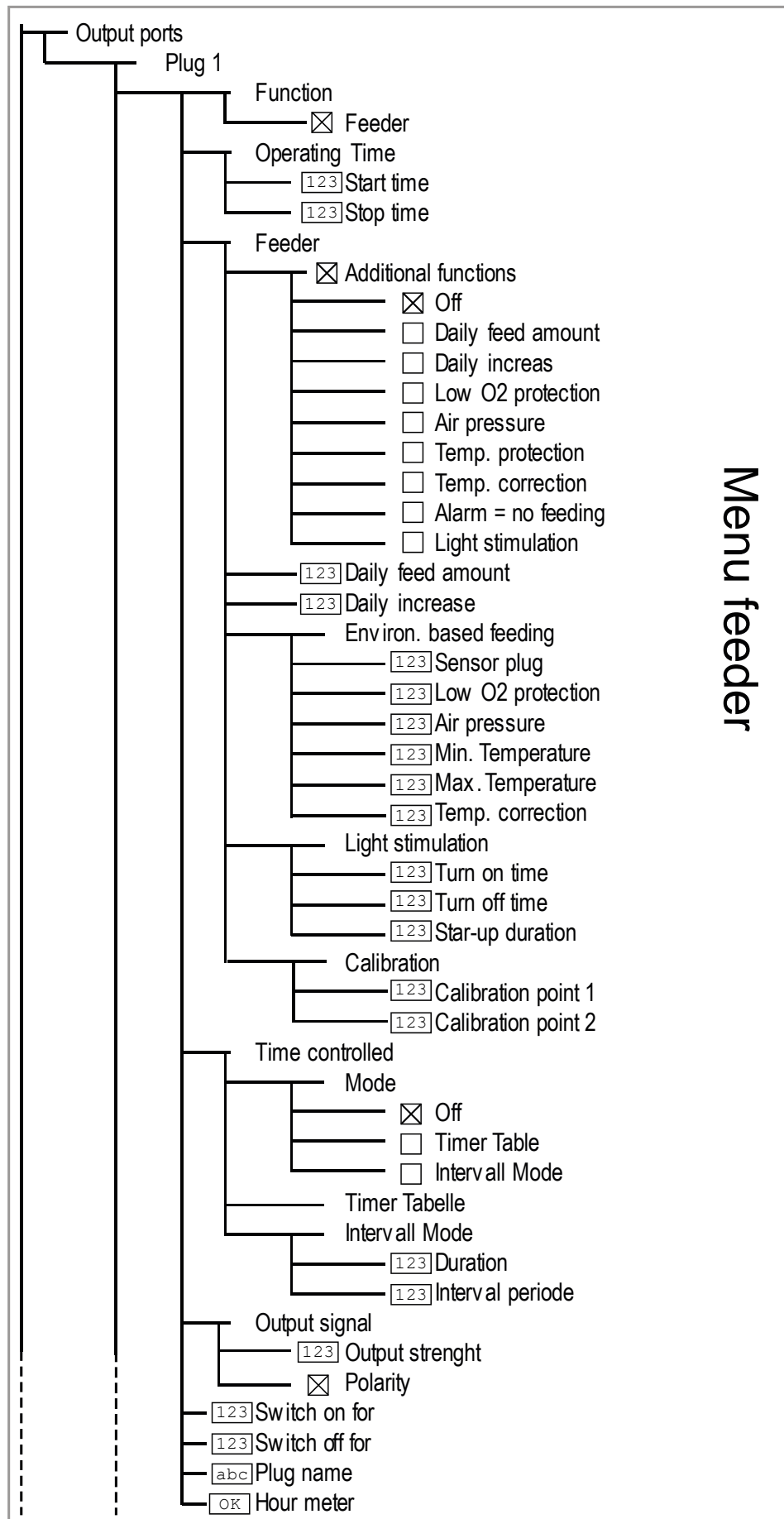
Depending on the selected **feeder functions** the displayed dynamic submenu can be:

Daily feed amount

When the feeder is calibrated, you can set here the total amount of feed (weight). Then, the feeder will automatically set the duration of the feed events (times must be selected in the time-controlled feeder menu) so, that the defined weight of feed is fed per day. In case you want to change the feed amount depending on the temperature (temperature correction), please note that daily feed amount corresponds to the temperature of 16°C.

For example, select **Plug 1 / Function: Feeder** and under **Plug 1 / Time-controlled / Mode: Interval**. Set the interval period to 1 h and the daily feed amount to 100 g. Now, the control

unit calculates, how long the feeder must be activated in each interval. If you set the duration manually, you can see the feed amount per event below the duration time.



Daily increase

Since fish grow with time and need therefore more feed per day, the feed control can automatically increase the daily amount of feed. Insert here the increase rate in %.

Environ. based feed.

Under this menu item, several environmental parameter based functions are included:

- **Low O₂ Protection:** In case the oxygen concentration is too low, ongoing feeding can deteriorate conditions. Therefore, the user can use this function to cancel the feeding, if the oxygen concentration is below a threshold. Enter in this menu item the concentration of oxygen below which the feeding is cancelled. Note, that it is necessary that a SENECT oxygen sensor O2S needs to be connected and that this sensor is selected under “plug”.
- **Air pressure:** Since the barometric pressure can have an effect on feeding, you can select here under which barometric pressure (measured by the AQUACULTURE|CONTROL internally) the feeding should be cancelled.
- **Min. / Max. Temperature:** You can also set limits in the temperature, above which (min. temperature) or below which (max. temperature) feeding is allowed.
- **Temperature correction:** To feed more efficiently, the daily amount of feed can be adjusted by the sensor temperature. You can enter here directly the values of the data sheets of the feed producer in % or **kg feed per 100 kg fish biomass**. These values are used to automatically correct the daily feed amount (which refers to 16°C) according to the measured temperature.
- **Light stimulation:** Some fish feeders from SENECT are equipped with LEDs to attract the fish to the location of the feeder prior to the feeding. You can select in this menu item, how long before the feeding (**turn on time**) and how long after feeding (**turn off time**) the LEDs should be switched on. Additionally, start-up and end ramps can be defined by the **start-up duration** to enable a soft light start.
- **Calibration:** The calibration of the feeder is a necessary step to use all feed-weight related functions. Catch therefore the feed which comes out of the feeder for 5 and 10 s and weight it. Type in the weight respectively. Now, you can use the function “Daily feed amount” and when you adjust the duration of the feeding, you can see directly the feed weight which corresponds to the duration.

The function “feeder” creates a dynamic submenu where additional features (Time-control – which are here the feeding times, Output signal, etc.) like previously described can be set.

Hint: If you want to increase the oxygen level prior to feeding, select the output port of the sensor-control (oxygen dosing valve, etc.) and select the additional function „Time-controlled“. Use the mode „Output coupling“ with the oxygen dosing plug and set the „turn on time“.

- **Time-controlled**

You can select under “time-controlled” different methods to control the output temporally:

- **Timer Table**

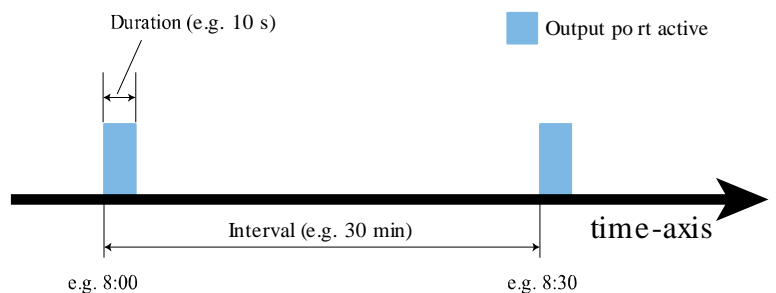
In the timer table, you can define specific times when the output should be activated.

Choose “+ New Entry” to create a new activation time. Enter therefore the starting time and duration and press OK to save this entry.

By pressing ➡, you can delete entries from the list.

- **Interval**

With the interval function, you can define time intervals on which the output should be activated. Enter here the **duration** of each event, e.g. always switch on for 5 minutes and the **interval** between the events, e.g. every 2 hours.



- **Multi-Intervall**

If you want to set different intervals at different times, you can do this under the respective phases with the Multi Interval setting. This is an interval control in a defined time window, e.g. feeding every 10 min for 25 s each from 7 to 9 o'clock.

- **Output coupling**

The output can be also switched depending on another output (see also below under “additional functions”) but with a positive or negative shift in time. With the **Turn on time** and **Turn off time**, you can select how long this output shall be active before the other (time-controlled) output is activated.

- **Daylight mode**

To simulate the seasons in terms of daylight, it is necessary to change the start and stop of the time-controlled function each day so that the light duration will be elongated or shortened. With this time function you can set a duration which will be change per day, e.g. + 1 min means that the time, when the output is switched on, will be increased 1 min per day.

- **Constant on**

The function „Constant on“ switches the output port on. You can add an additional function to the „constant on“-function and adjust the output signal.

- **UVC Lamp**

When a UVC lamp is connected to a drum filter, it is permanently switched on, except the case is opened. Then the UVC should be switched off. Therefore, one connected sensor must be defined as a case switch.

- **Alarm**

Does one sensor value exceeds the upper threshold or falls below the lower threshold, a alarm state is activated and all outputs with alarm coupling or outputs with the function „alarm“ react. Here, you can for example connect an alarm lamp directly to the output (e.g. the SENECT Alarm lamp VIS-LED).

- **Sensor Forwarding**

With the function "**SensorForwarding**", the measured value of a sensor can be output as an analog signal at the actuator slot. This allows the measured value to be transferred to another control system, for example.

First select the **pluf of the sensor** from which you want to transfer the signal. With **Min.** and **Max. Sensor value** you can specify the value range which corresponds to the smallest and largest signal (e.g. 0% oxygen saturation at 4 mA, 200% saturation at 20 mA). You can select either 0-20 mA/0-10 V or 4-20 mA / 2-10 V under **Standard signal**.

Depending on the selected function, the submenu will be different. Possible submenus are:

Additional functions

You can add an additional function to the selected original function. There are three different types of additional functions:

Alarm coupling defines that the output will react, if a sensor recognizes an alarm situation, e.g. when a threshold is exceeded. In the new submenu "**Alarm handling**" you can select if the output should be turned off or switched on in case of an alarm – independent from the original function. This function can be used for example, when the feeders should be switched off, when the oxygen sensor recognizes low oxygen levels.

The **output coupling** switched the selected output port also in relation in to the other output port. This means, that it will be for example switched on, when the other output is activated.

At first, you have to select the output port, to which the additional function is related under the item "plug". This one is the output, which gives the information.

In the next step, you can select the logic mode, how the output should respond to the “information giving output”.

Off	Function is switched off
Off if on	Output port is switched off, when the other output is on
Off if off	Output port is switched off, when the other output is off
On if on	Output port is switched on, when the other output is on
On if off	Output port is switched on, when the other output is off

One example here: to the OUT 1, an aeration device is connected which controls oxygen via the **sensor control** function. On OUT 2, a fish feeder is connected with the function “**feeder**”. The desired functionality is now, that the aeration should be activated always, when the fish feeder is feeding. Select at the OUT 1 the additional function “**Output coupling**” and refer in “**plug**” to OUT 2. Select “On if on” and the aeration is switched on (independent of the sensor control) when the feeder is activated.

The third possible additional function is “**Time-controlled**”. It can be used, when a function is selected and the output port should additionally be switched in a temporal pattern. For example, on OUT 1 a solenoid valve which controls the oxygen input in tanks with a ceramic diffuser is connected. The selected function for OUT 1 is sensor control and only if there is not enough oxygen, the output is activated and the water oxygenated. The additional function “Time-controlled” can now be used to switch OUT 1 on regularly, e.g. every 12 hours for 2 minutes to avoid biofouling on the ceramic diffuser.

Application example: Using the actuator output to control lights

In fish farming, it is often useful to simulate the daylight. With the function „time control“ you can use for example 24 V DC LED lights which can be controlled in their luminescence. Let's assume that the LEDs are connected to the 24 V DC output port OUT 1 and that the lights should start at 7 a.m. in the morning, increase their luminescence in 30 min to the maximum of 80%. The decrease starts at 6:30 pm and the day length should be increased by 2 min per day. Set the following menu items:

- Function: Time-controlled
- Operating time:
 - Start time: 7:00
 - Stop time: 19:00
- Output signal:
 - Output strength: 80%
 - Start-Up Duration: 30:00 [mm:ss]
- Time-controlled
 - Mode: Daylight Mode
 - Daily change: 2 min

By setting the operation time in the daylight mode, you define when the lights start and end at the first day. At the second day, it starts 1 min earlier and stops 1 min later.

Special additional functions:

If the plug is defined as “**Filter Motor**” the special additional function “Var. freq. drive” can be used to control variable frequency drive (VFD) with a 4-20 mA signal and the activation with the 24 V DC signal. This function is designed to control 230 V AC and 380 V AC filter motors. SENECT offers VFDs.

▪ Output signal

The output signal can be configured in three different ways:

1. The **strength** of the signal: The output signal of OUT 1 and two are 0-24 V DC as pulse width modulation, 4 – 20 mA and 0 – 10 V DC signal. With the strength you can set in % how strong the output signal is, e.g. 100% means 24 V DC, 20 mA and 10 V, while 50% are 12 V DC, 12 mA and 5 V respectively.
2. **Start-up duration**: To increase and decrease the output signal slowly (ramp), the time of the start-up ramp can be set here. E.g. when you choose here 10 s, then the output strength will be linearly increased over 10 s to reach its maximum value (set by “Output strength”)

3. Polarity

The output polarity defines how the actor is activated. If the actor should be switched on by a voltage on the port, it is „active high“. This is the case for a normally closed solenoid valve for the water refilling. “Active low” would mean that if the output is activated, the voltage is reduced from 24 V to 0 V so that the actor can be activated (for example a normally opened solenoid valve).

If the output is switched off, a level of 0 V PWM (PWM output), 0 V (0-10 V output) or 4 mA (4-20 mA output) is applied to the output with factory settings. If you want to set a higher level here, this is possible under the menu item **Off Level**. An application example for this would be a pump control, since with some pumps the preset speed is switched at a signal of 0 V. The output level can be set to a higher level by means of the menu item level. If the level is set to e.g. 1%, the pump is prevented from running at the preset speed when it is switched off.

The actuator outputs OUT 1, OUT 2, OUT 4, OUT 5 and OUT 6 each have an input pin which can receive a signal. This can, for example, be an interference signal from a pump, which then triggers the alarm in the controller. Under **Alarm in**, you can select whether the alarm should be triggered when the actuator is switched on (high-active) or off (low-active). Connection information can be found in the data sheet of the actuator cable.

- **Switch on for**

To switch the output port on manually, you can select here the duration. Confirm with OK.



- **Switch off for**

To switch the output port off manually, you can select here the duration. Confirm with OK.

Plug name

With plug name you can give the output a name of max. 8 characters, which will be displayed in the SENECT Control App.

- **Hour meter**

To see how long an output was activated, you can use the “hour meter” menu item. Here you can set it to zero and from then on, there will be displayed in the screen of the corresponding output in the bottom line the hours of activation (press in the home screen  to switch to the output screens and then  until you are the selected output port).

This function can be for instance be used to estimate exchange intervals of actuators, e.g. UVC lamps.

Menu WLAN

Additional information and help with respect to the wifi connectivity can be found on the SENECT forum under:

<http://forum.senect.de>



Fig. 11: QR-Code to the link of the SENECT Forum.

- **Info**

Info shows information about the current WLAN connection of your AQUACULTURE|CONTROL.

SSID: WLAN network name

Signal: Signal strength of the connection (should be between -20 dB (strong) and -70 dB (weaker))

IP: IP-address of the control unit

MAC: Mac-address of the control unit

- **WLAN configuration**



Note: The remote access to the AQUACULTURE|CONTROL requires dynamic DNS, port forwarding of the router and internet access with IPv4. If you have only a DS-Lite internet connection, additional devices (e.g. FIP-Box from feste-ip.de) may be required.

If you want to integrate your AQUACULTURE|CONTROL in an existing WLAN-network, you need a Windows (Version 7 or higher), Android or iOS-based device on which the SENECT Control App is installed. The SENECT Control App is available in the Google Playstore or the Apple App Store.

The Windows- and MacOS versions of the app can be downloaded on www.senect.de/app.

You can change the language of the app under the “Settings” button.

Please have the name of the WLAN-network (SSID Name) and the WLAN-password ready.



Fig. 13: QR code for the link to the SENECT Control App in the Google Play Store



Fig. 12: QR code for the link to the SENECT Control App in the Apple App Store.

You need to proceed through the following steps to **connect the AQUACULTURE|CONTROL to the internet:**

- Set the AQUACULTURE|CONTROL in WLAN configuration mode (Menu/WLAN/WLAN Configuration)
- With the **App Mode:**
- Connect your smartphone or PC to the network SENECT_AP (this is the AQUACULTURE|CONTROL)
- Start the SENECT Control App, press the button “Settings”.
- Press “Send WLAN settings”.
- Enter the WLAN network name (SSID) and password. Set the Encryption and DNS/DHCP (typically “WPA / WPA2” and “on”)
- Press “Send settings to device ”



Hint: Here you can hide or show the password.

Settings

Send WLAN information to controller

Now, the network information is transmitted from your smartphone to the AQUACULTURE|CONTROL which starts to establish the connection to your WLAN network. If this is successful, the WLAN symbol appears on the left side of the clock in the AQUACULTURE|CONTROL's display.

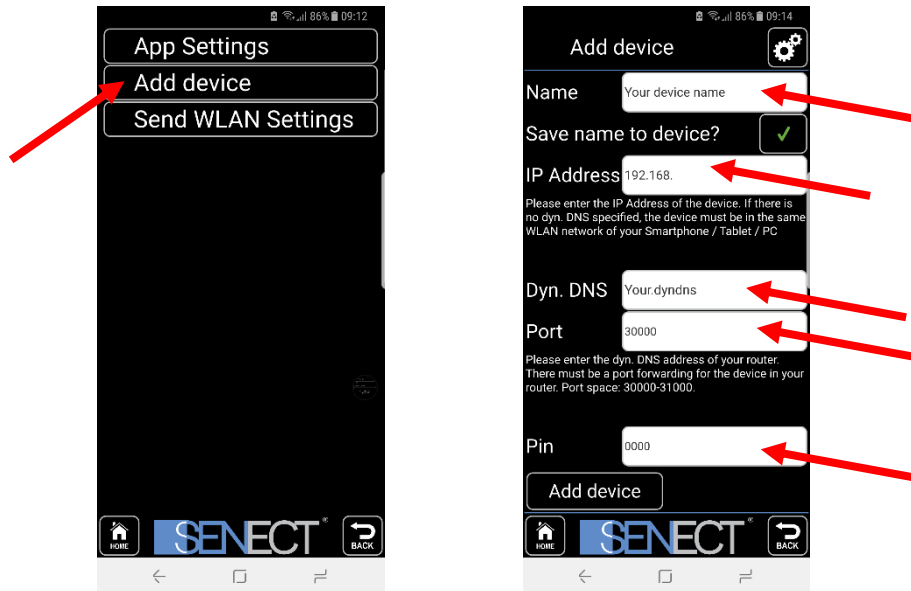
WPS Mode: If your router supports WPS, you can connect the AQUACULTURE|CONTROL directly with the router WLAN by pressing the WPS button (typically longer than 3 s) on the

router and then selecting **Menu/WLAN/WLAN Configuration/WPS Mode**. Please note that the WPS Mode of the router is only for 2 minutes active.

Your router will now send the required SSID, password and connection settings directly to the AQUACULTURE|CONTROL.

Embedding the AQUACULTURE|CONTROL unit in your SENECT Control App:

1. Open the SENECT Control App and press the button “Add device”



2. Choose an individual name for the control unit and enter its IP address (you'll find it under Menu/WLAN/Information).
3. Enter the corresponding dynamic DNS address (next chapter), port number (at delivery 30000) and PIN (at delivery 0000)



There are 2 levels of operation possible: Full access for the entire menu or “read-only”-access, where only reading is allowed. To provide the “read-only” access, you need to set the “read-only PIN” in the system settings (must be different to the normal PIN) and enter this read-only PIN into the SENECT Control App here.

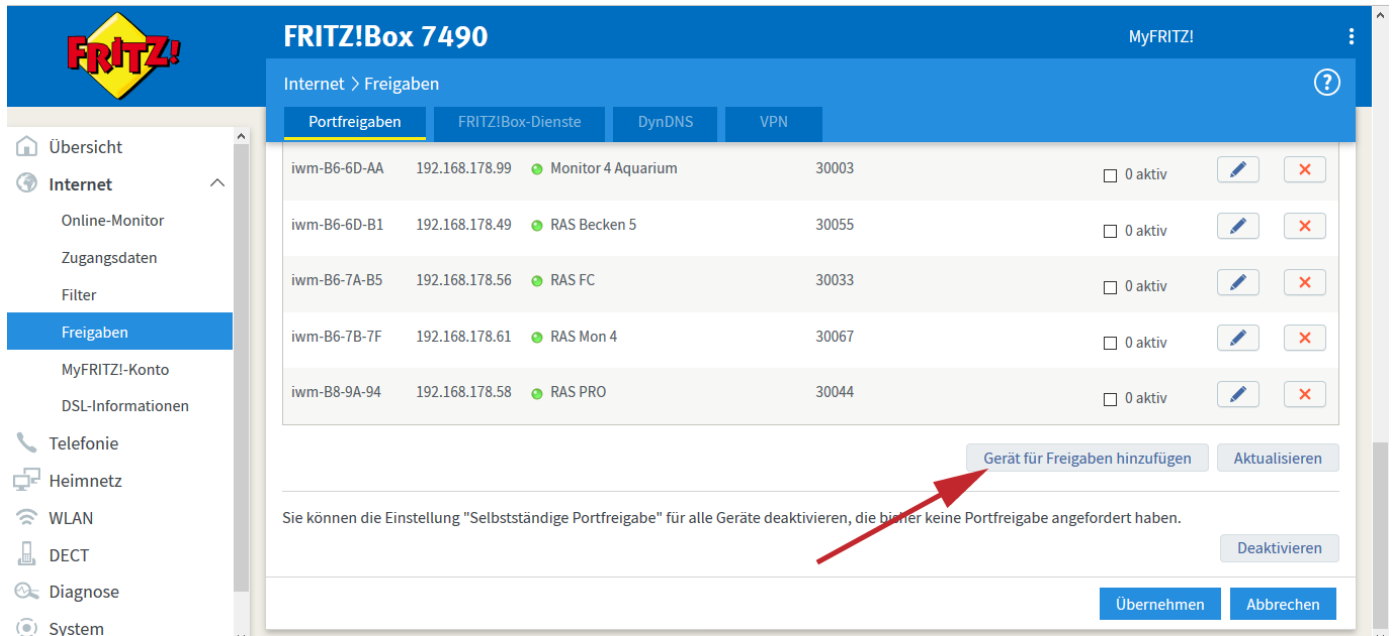
4. Press the button “Add device”

The AQUACULTURE|CONTROL can now be operated with your SENECT Control App when your smartphone / PC is within the same WLAN network. To **enable the remote access**, you need to establish a dynamic DNS connection:

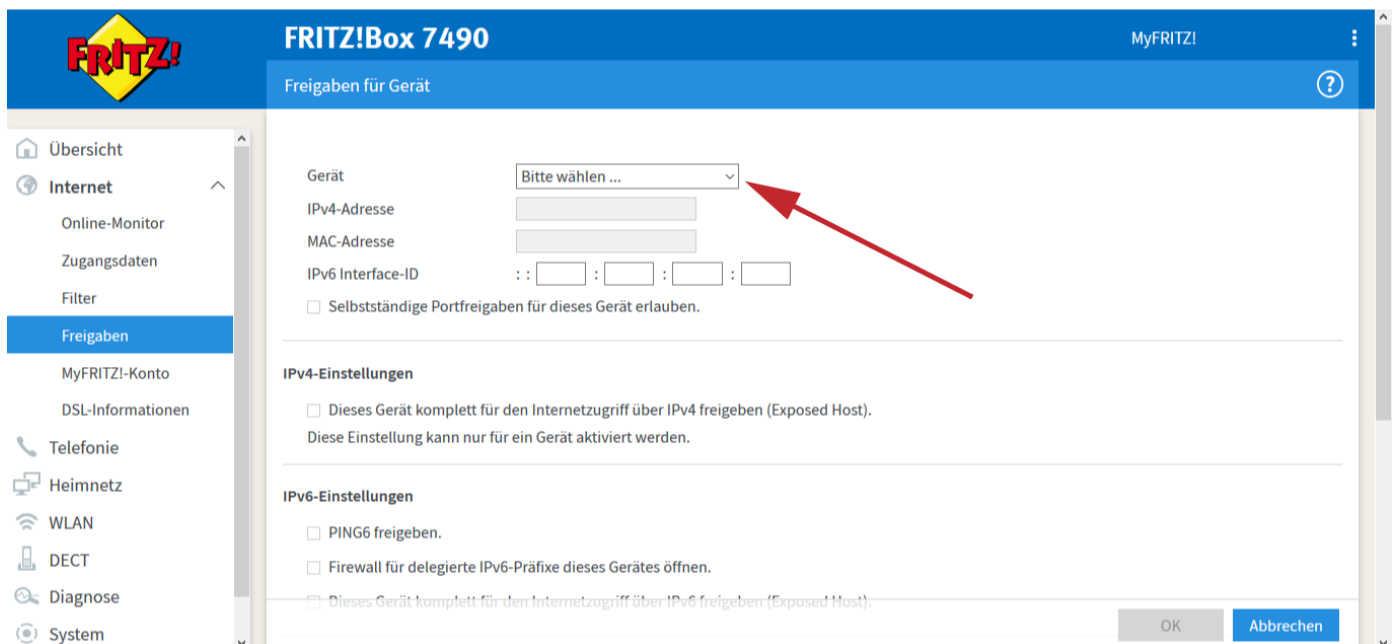
1. Activate a DynDNS account (e.g. a MyFritz! account or register at dynDNS.org)
2. Open your internet router settings and allow the port forwarding
3. Send the dynamic DNS address to the control unit (via the app)

How this procedure works in detail, depends on the type of router. Here, we show this exemplarily for a **FRITZ!Box Router**:

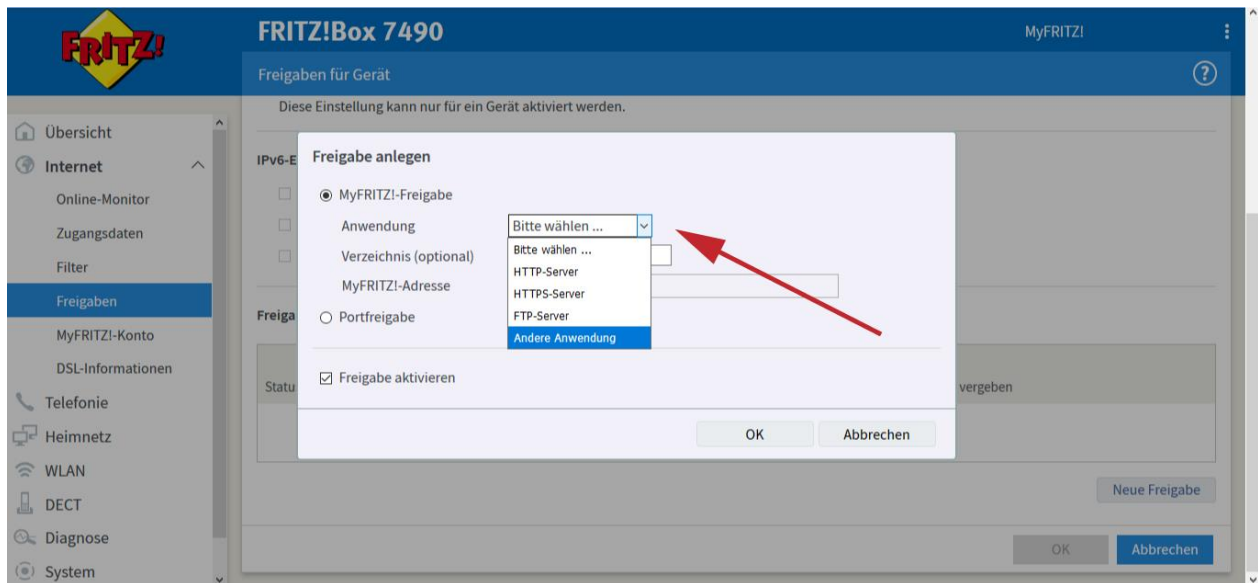
1. Log in to your router (e.g. fritz.box)
2. Click on “Internet” to “Freigaben” and select to add a new device (“Gerät für Freigabe hinzufügen”)



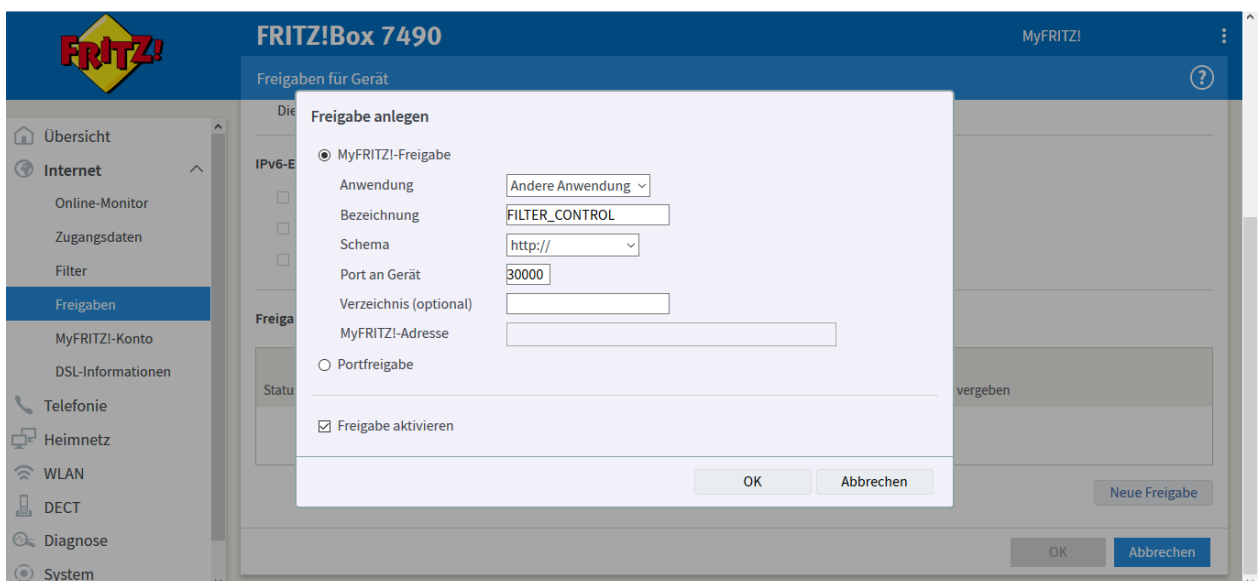
3. Select at “Gerät” the AQUACULTURE|CONTROL. It will be labelled with “Senect-101xxxxx”, where the x denote the serial number of your AQUACULTURE|CONTROL.



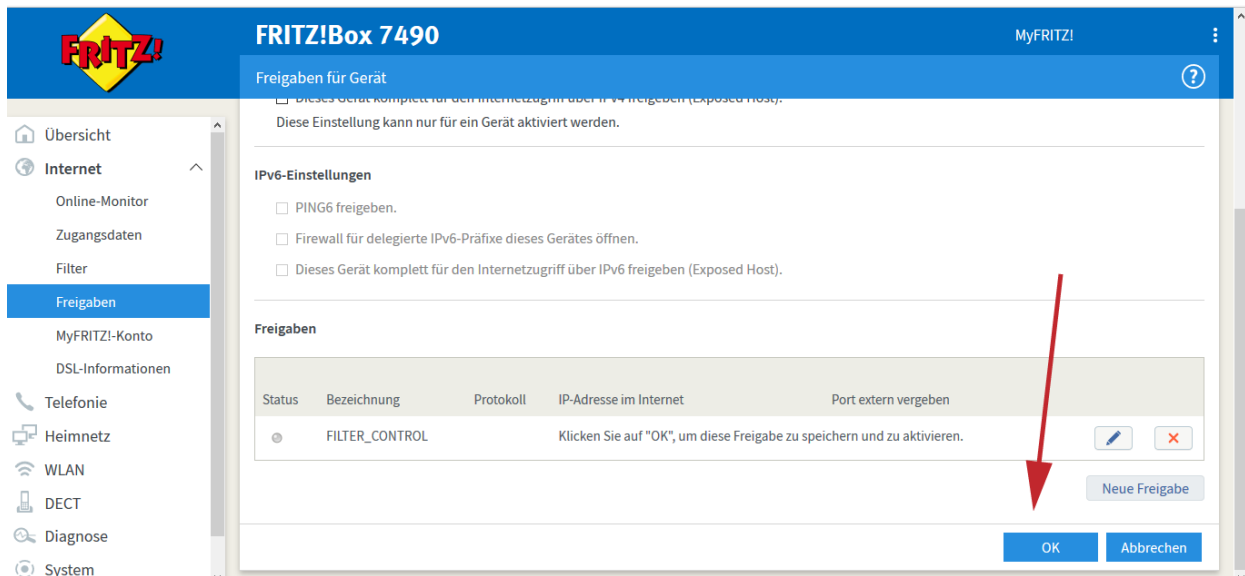
4. Click on “Neue Freigabe” and the Anwendung is “Andere Anwendung”



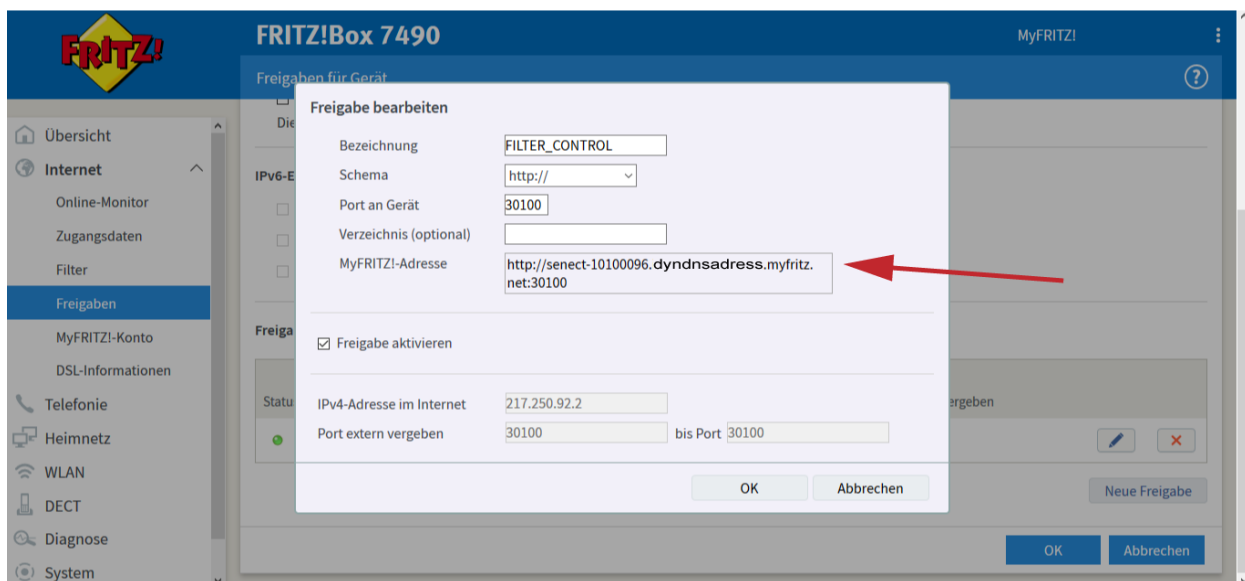
5. Select as „Schema“: „http://“ and type in the port number of the AQUACULTURE|CONTROL (30000 as factory setting, if you use several SENECT control units, each single one must have its own port number. You can change it in the menu/WLAN/Port number)



- Klick "OK" to save your settings. The AQUACULTURE|CONTROL appears now in the overview and the status should turn to green (which may take some minutes).



- If you again click on the pen (Bearbeiten), a window will open where you can see the dynamic DNS address of the control unit. You need this address in the SENECT Control App to establish the remote access.



To enable the remote access with the SENECT Control App, you need to go to the WLAN settings of the control unit in your App. Press therefore the button "settings".



Enter the dynamic DNS address without the "http://" and without the port number, e.g. here the ":30100" in the field Dyn DNS. Confirm with "Add device".

Now, the remote access is enabled. You can test it, for example by switching off your WLAN in your smartphone (please ensure that you have then activated the use of mobile data”).

- **Start update**

If the update symbol appears in the display, a new update for your AQUACULTURE|CONTROL is available. Select „Start update“ to update your AQUACULTURE|CONTROL.

Do not switch the AQUACULTURE|CONTROL off during the update process!



- **Port number**

Under factory settings, the port number of your control unit is 30000. If you are using several SENECT control units, every unit needs its own port number. Here you can change it e.g. to 30001.

- **DHCP**

For some routers, it is necessary to switch DHCP off. Here you do this and then set the corresponding network settings manually.

- IP address
 - Gateway
 - DNS
 - Subnetmask
-

- **WLAN reset**

If you want to delete the WLAN settings, select „reset WLAN“ and confirm with yes. Please note that only the network settings and information is cleared.

Menu System Settings

- **Date & Time**

Set the date and time in this menu item. The AQUACULTURE|CONTROL is equipped with an internal rechargeable battery so that even without a power connection, the clock continues and all relevant settings are saved.

If you select “Auto. Time”, then the time signal of an internet time server will be used and the clock is continuously synchronized.

- **Language**

As language, „German“ and „English“ can be selected.

- **Factory settings**

If you want to reset the AQUACULTURE|CONTROL, choose „Factory settings” and confirm with yes. Warning: All settings and saved parameters are deleted!

- **Alarm**

- **Alarm recall**

In case of an alarming, the warning by the push service and email can be repeated, if the condition of the alarm remains. Here you can select, in which time steps you want to be reminded, e.g. every 15 min.

- **Alarm pause**

To suppress the alarm for a define time period, you can select in this menu item the time for this. This feature is for example useful if maintenance works are made.

- **Alarm messages**

In Alarm messages, you can select if you want to be alarmed on every alarm or if some messages, e.g. „feeding skipped” should be omitted.

- **PIN**

Here you can enter a 4-number pin code to protect the AQUACULTURE|CONTROL from unauthorized usage. Note the pin code so that you unlock the AQUACULTURE|CONTROL again and store it at a safe place.

- **Read Only PIN**

Here you can enter a 4-number pin code which is used for the limited access with the SENECT Control App, where only reading is allowed. This “Read Only PIN” must be different to the normal PIN.

- **Device Infos**

Here you find information about the current device like the version of the firmware or the serial number of you AQUACULTURE|CONTROL.

- **Backup settings**

If you want to save all your settings, you can do this in the Backup Settings. Up to 3 settings can be stored and reloaded.

Technical data

Dimensions	260 x 228 x 127 mm
Cable length	2,7 m
Voltage	230 V AC / 50 Hz
Output power 24 V DC	Total max. 120 W (AQC-A1-xx3-150) or 280 W (AQC-A1-xx3-300)
Output power 230 V AC	230 V OUT 1 max. 1800 W (fused with 8 AT) 230 V OUT 2 max. 450 W (fused with 2 AT) 230 V OUT 3 max. 900 W (fused with 4 AT)
Power consumption*	< 8 W (AQC-A1-xx3-150) < 18 W (AQC-A1-xx3-300)
Temperature range	0°C to +40°C
Ingress protection	IP 54, if no 230 V devices are connected
Data connectivity	2.5 GHz WLAN, remote access via dynamic DNS, port forwarding and IPv4

* The power consumption is defined as the power of the AQUACULTURE|CONTROL without connected consumers..

Information about the correct disposal



Your device is well packed at delivery. Please dispose the packaging material accordingly to the regulations in your country.

Do not throw the product in the casual litter bin. Make sure you are informed about the local disposal regulations and dispose your product accordingly. Alternatively, you can also send the product back to the producer.

The SENECT GmbH & Co. KG is member of the Stiftung Elektro-Altgeräte Register and the products are registered (WEEE-Reg.-Nr.: DE37193510).

Warranty



Please check at delivery of your AQUACULTURE|CONTROL, that all parts are delivered completely and that they function correctly. In case of any claims, contact us immediately per email or phone (info@senect.de or +49-6341 - 95 95 210). Please describe your claim as detailed as possible so that we can provide a solution as fast as possible. The following details must be given to guarantee a fast support:

- Detailed error or claim description
- Information about the use of the AQUACULTURE|CONTROL (e.g. system type, filter)
- Your contact information

The AQUACULTURE|CONTROL has a guarantee of 1 year and a warranty of 2 years. Furthermore, the § 377 HBG (German law) is valid.