Manual

SENECT|ONE
SENECT|TWO
MONITOR|FOUR
FILTER|CONTROL
AQUACULTURE|CONTROL

For FW Version 1.90 - 26.04.2022

Manufacturer:

SENECT GmbH & Co. KG
An 44 – No. 11
76829 Landau / Germany

Important:

Please read this instruction manual carefully and keep it for future reference. Check your system daily.

For updates as well as information on expansion options and supplementary products for your SENECT product, please contact

www.senect.de

www.produkte.senect.de

You can find answers to frequently asked questions and suggestions for application and operation in our forum at

wiki.senect.de

EU Declaration of Conformity

according to the EU Low Voltage Directive 2014/35/EU as per Annex IV; dated 26 February 2014 (L 96/357)

We, the manufacturer, hereby declare that the product described below complies with the basic safety and health requirements of the EU Low Voltage Directive in its design and construction as well as in the version placed on the market by us. The manufacturer hereby assumes sole responsibility for issuing this declaration of conformity. In the event of a modification of the product not agreed with us, this declaration loses its validity.

Manufacturer: Senect GmbH & Co. KG
An 44 – No. 11
D-76829 Landau in der Pfalz / Germany
Email: info@senect.de

Description of the electrical operation:

Function: Control of aquaculture systems

Type / Model: SENECT AQUACULTURE|CONTROL, AQC-A1-xx3-xxx
SENECT FILTER|CONTROL, FC-A1-333-xxx
SENECT SENECT|ONE, ONE-A2-13-xxx
SENECT SENECT|TWO, TWO-A2-22-xxx
SENECT MONITOR|FOUR, FOUR-A2-40-xxx

Compliance with other directives/regulations also applicable to the product is declared:

- EMV 2014/30/EU
- RoHS 2011/65/EG
- WEEE 2012/19/EU

The following harmonised standards have been applied:

- DIN EN 61326-1: 2013
- DIN EN 50581: 2013
- DIN EN 61010-1: 2010 + A1: 2015/04

The SENECT controller contains a transmitter module which is certified according the following:

- FCC ID (VRA-SG9011203, Part 15
- IC ID (7420A-SG9011203), IC RSS-2010
- ETSI compliant
- CE (STSI EN 300 328 C1.8.1:2012 | EN 301 489-1 V1.9.2:2011 + EN 301 489-17 V2.2.1: 2009 | EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + A2: 2013 | EN 62479: 2010)

Year of CE-marking: 2016
Signed for and on behalf of: Senect GmbH & Co. KG
Place and date: Landau in der Pfalz, 1. Juni 2016

Signature:

B. Eng. Florian Maeck (CEO)

Type description

Type description

Name:	Variations:	Type code:
SENECT® FILTER|CONTROL	FILTER|CONTROL 150 W	FC-A1-333-150 Item no. 1200
	FILTER|CONTROL 150 W with alarm output	FC-A1-333-150-A Item no. 1201
	FILTER|CONTROL 300 W	FC-A1-333-300 Item no. 1210
	FILTER|CONTROL 300 W with alarm output	FC-A1-333-300-A Item no. 1211
SENECT® AQUACULTURE|CONTROL	AQUACULTURE|CONTROL – Basic 150 W	AQC-A1-333-150 Item no. 1400
	AQUACULTURE|CONTROL – Basic 150 W with alarm output	AQC-A1-333-150-A Item no. 1401
	AQUACULTURE|CONTROL – Basic 300 W	AQC-A1-333-300, Item no. 1410
	AQUACULTURE|CONTROL – Basic 300 W with alarm output	AQC-A1-333-300-A Item no. 1411
	AQUACULTURE|CONTROL – Pro 150 W	AQC-A1-663-150 Item no. 1500
	AQUACULTURE|CONTROL – Pro 150 W with alarm output	AQC-A1-663-150-A Item no. 1501
	AQUACULTURE|CONTROL – Pro 300 W	AQC-A1-663-300 Item no. 1510
	AQUACULTURE|CONTROL – Pro 300 W with alarm output	AQC-A1-663-300-A Item no. 1511
SENECT® ONE	ONE 230 VAC	ONE-A2-13 Item no. 1000
	ONE 24 VDC	ONE-A2-13 Item no. 1001
SENECT® TWO	TWO 230 VAC	TWO-A2-22 Item no. 1600
	TWO 24 VDC	TWO-A2-22 Item no. 1601
SENECT® MONITOR|4	MONITOR|4 230 VAC	M4-A2-40 Item no. 1100
	MONITOR|4 24 VDC	M4-A2-40 Item no. 1101

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Symbols and signal words

	DANGER! Warning of immediate danger to life. WARNING! Warning of possible danger to life and/or serious irreversible injuries. CAUTION! Warning of possible medium and/or minor injuries.
	CAUTION! Observe notes to avoid damage to property.
	NOTE! Further information for the use of the device.
	WARNING! Warning of danger of electric shock.

General safety instructions

SENECT® AQUACULTURE|CONTROL, FILTER|CONTROL, MONITOR|4, ONE, TWO (hereinafter referred to as SENECT® Control) are electronic measuring and control units to which sensors and actuators can be connected.

Since this is an electronic product with 230 V mains voltage, the requirements must be met, as is usual for all electrical appliances. The device may only be operated with 230 V AC (50 Hz) supply voltage. The device and all connected cables must be installed and operated protected from moisture and humidity. When laying all cables and lines, care must be taken to ensure that they do not cause safety-relevant impairments such as tripping hazards. For many applications, protection by a residual current circuit breaker with a trigger current < 30 mA is mandatory. Please inform yourself about this.

The device must be installed protected from overheating by direct sunlight and may only be operated at an ambient temperature between 0°C and 40°C. Only the intended connecting devices (e.g. sensors or actuators) may be connected. The SENECT® Control unit may not be modified, except for extensions or software updates of SENECT®. It is forbidden to open the device or in any way to penetrate into the interior of the housing, as there is mains voltage present. Use only original SENECT® or SENECT® supplied or approved expansion, replacement or accessory parts.

If the mains connection cable of the device is damaged, it must be replaced by the manufacturer, his customer service or a similarly qualified person in order to avoid hazards. This device can be used by children aged 8 years and older and persons with reduced physical, sensory or mental abilities or lack of experience, if they have been supervised or instructed in the safe use of the device and understand the resulting dangers. Children must not play with the device. Cleaning and user maintenance must not be performed by children without supervision.

Please keep this manual as a reference book. Subject to technical and optical changes and printing errors

CAUTION: Before carrying out maintenance work, switch off all devices in the water or pull the power plug.

Intended use

SENECT® AQUACULTURE|CONTROL, FILTER|CONTROL, MONITOR|4, ONE, TWO is a control, measurement and regulation unit for use in industrial fish breeding and farming systems.

The SENECT® Control unit can be used to switch or control the outputs (if available, control outputs: 24 V DC PWM, 0-10 V, 4-20 mA and power outputs: 230 V AC) according to different functions. The functions include, for example, control by time or by sensor measured values. In addition, the AQUACULTURE|CONTROL and FILTER|CONTROL are used to control drum and belt filter systems. The integrated WLAN module allows the integration of the SENECT® control into an existing WLAN network, so that the SENECT® control can also be operated with the available software (Senect Control App).

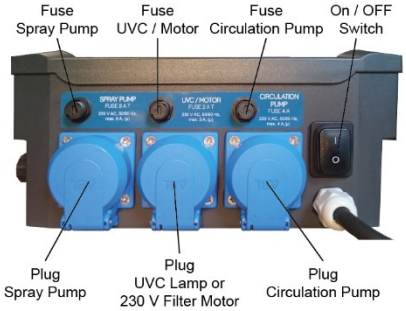
The direct control of drum filters is only possible if the drum motor is driven with 24 V DC and a current consumption of 5 A (at 300 W 10 A) is not exceeded or if it is a 230 V AC drum motor with max. 460 W. If a 230 V drum filter motor is connected directly, all functions using a speed reduction are not possible. This can be realized by connecting a frequency converter (not included in the scope of delivery).

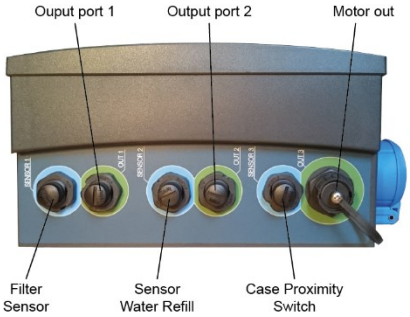
Service description

The SENECT® control system is available in different versions:

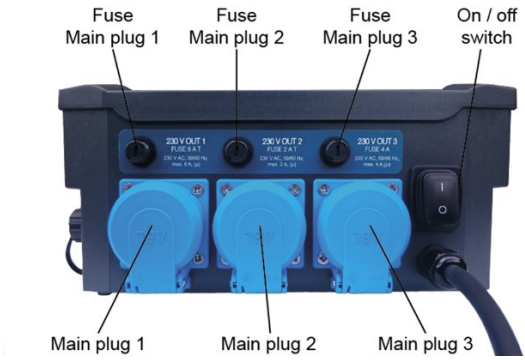
		Sensor plugs	Actuator plugs	High power outputs	230 V AC Sockets
AQUACULTURE|CONTROL	Basic 150W	3	2	1 5A	3
	Basic 300W	3	2	1 10A	3
	PRO 150W	6	5	1 5A	3
	PRO 300W	6	5	1 10A	3
FILTER|CONTROL	150W	3	2	1 5A	3
	300W	3	2	1 10A	3
ONE		1	3	0	0
TWO		2	2	0	0
FOUR		4	0	0	0

FILTER|CONTROL





AQUACULTURE|CONTROL



Sensors and actuators PRO

Sensors and actuators BASIC

SENECT|ONE

SENECT|TWO

MONITOR|4

Every SENECT® Control unit can switch and control its outputs depending on sensor readings. The outputs can also be activated by specifying fixed times or intervals. Further functions are, for example, activation depending on another output or activation in case of an alarm message.

The specification of alarm thresholds makes it possible to trigger an alarm if the measured values of the sensor fall below or exceed the threshold values. This activates alarm outputs or informs the user via the Senect Control app.

Furthermore, the AQUACULTURE|CONTROL or FILTER|CONTROL can be used as drum or belt filter control. Drum filter and belt filter (both terms are used synonymously from now on), remove suspended particles from liquids by flowing the liquid through a filter fabric (e.g. gauze) and particles adhering to the filter fabric (mechanical separation of solids). The main task of filter controls is to trigger the cleaning process, preferably depending on the degree of contamination of the filter fabric. The AQUACULTURE|CONTROL or FILTER|CONTROL detects the degree of contamination of the filter fabric by means of water level measurements (optional sensor EPS-250-MA, Art. No.: 2000 or PS-300-MA, Art. No.: 2001 required). If the water level falls below (gravity system, sensor in filter chamber) or exceeds (pumped system, sensor in prechamber) a threshold value, the rotation of the drum and the cleaning of the fabric is initiated by spray nozzles. Many parameters such as flush water level, emergency stop water level (dry run protection), etc. can be individually adjusted. Only by connecting a water level sensor is contamination-dependent cleaning possible. If the sensor is not connected, a time-controlled operating mode is possible. However, in this case, some functions such as the emergency shutdown of the pumps when the water level is too low are no longer possible. In the time controlled operating mode many individual cleaning parameters can be set and a cleaning interval can be defined.

The connection of a 230 V pressure pump for cleaning the filter fabric as well as a 230 V circulation pump is necessary for this. **Please make sure that the power consumption of the connected 230 V consumers is limited to 1800 W (socket OUT 1, 8A), 460 W (socket OUT 2, 2A) and 920 W (socket OUT 3, 4A). Each socket is individually fused against overcurrent**. If consumers such as pumps with a higher power consumption are to be connected, an adapter module (SENECT Power Switch, e.g. PWS-24230-SC, Art. No.: 3100) is required.

The control unit AQUACULTURE|CONTROL - 150 W or FILTER|CONTROL - 150 W is designed for control of 24 V DC drum motors with a maximum output of 120 W (5 A), while the AQUACULTURE|CONTROL - 300 W or FILTER|CONTROL - 300 W is also suitable for motors up to 240 W (10 A). The full performance can only be used in conjunction with the respective additional products such as sensors and actuators.

Initial operation

Scope of delivery

- 1 x SENECT® Control with 2.7 m power cable
- 1 x wall bracket set
- 1 x spare fuse set consisting of 3 microfuses 2 AT, 4 AT, 8 AT (not with ONE, TWO, MONITOR|4)
- 1 x instruction manual

Please make sure that the packaging was undamaged and not opened before commissioning and that all positions marked in the scope of delivery are present. If you notice any defects, damage or the absence of items included in the scope of delivery, please report this immediately within 14 days. Later complaints regarding defects that have already arisen before commissioning cannot be accepted.

Positioning and mounting

Choose a location for the SENECT® Control unit that is dry and protected from direct sunlight. Ensure that all cables are routed cleanly so that no safety hazards can arise, e.g. due to "tripping hazards" or water ingress into electrical components such as plugs.

Cabling, installation and commissioning

A wall bracket for mounting your SENECT® Control unit is included in the scope of delivery. Screw the wall brackets into the holes provided on the back of the control unit using the screws supplied. Then screw the SENECT® Control unit to the intended location (e.g. on a wall).

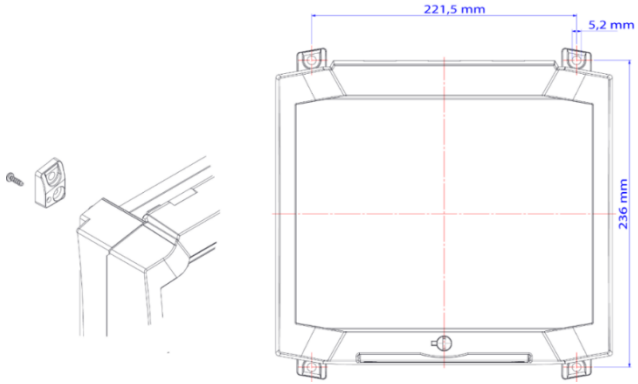


Figure 2 Dimensions of the hole for fastening AQUACULTURE|CONTROL and FILTER|CONTROL.

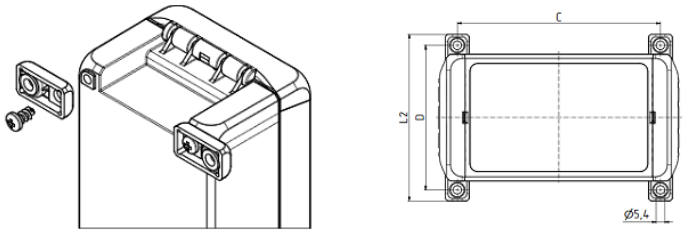


Figure 1 Dimensions of the hole SENECT|ONE, SENECT|TWO, MONITOR|FOUR, D=91 mm, C = 168 mm

Keep a distance of at least 15 cm around the device.

If the SENECT® Control unit is properly fastened, then take the plug of the power cable of the SENECT® Control unit and plug it into a suitable (IPx4), individually fused power socket. **DO NOT switch on** the SENECT® Control unit at first. The next steps are the wiring of your control and the commissioning

The SENECT® Control as sensor control

The cabling is different depending on the intended use. Basically, you should proceed as follows:

1. Attach sensors and actuators at the place of use.
2. Lay the cables from the sensors to the SENECT® Control unit and connect the plugs at the respective sockets "**SENSOR**" by screwing them in (remove protective cap before).
3. Turn on the SENECT® Control and make the desired settings.
4. Optional: Connect the SENECT® Control to the existing WLAN (see chapter: WLAN Configuration).
5. Now plug the desired 24V actuators and 230 V consumers one after the other into the respective sockets and check the function of each output.

Now your system is ready for use.

Application example: oxygen control

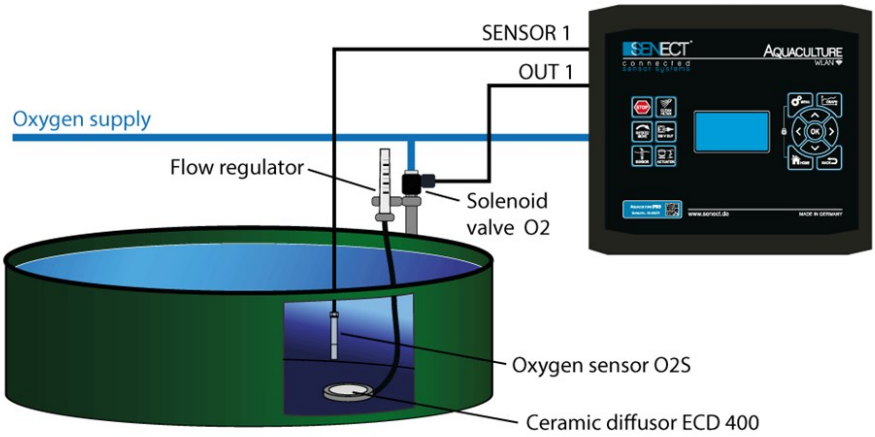


Figure 3 Connection example oxygen control

In this example, the oxygen sensor O2S is plugged into plug **SENSOR 1**. A normally open solenoid valve (e.g., type: MVO-M7-SC, Art. No.: 3020-24-NO) is plugged to actuator plug **OUT 1** ("normally open" was deliberately selected so that in the event of a power failure the valve is open and thus the oxygen supply is guaranteed).

The desired oxygen concentration is above 95% and when 100% saturation is reached, the oxygen supply should be stopped. Now select the actuator output in the menu (**MENU / Output ports / Plug 1**) and set the following points:

- **Function: Sensor control** - a new submenu appears when you go back one level in the menu with BACK.
- In the submenu "**Sensor Control**" you must now set the following items:
    - Mode: Break time active
    - Control parameters: O2 % a.s.
    - Sensor plug: 1
    - Start value: 95%
    - Stop value: 100%
    - Max. Duration: 00:05:00 (the valve is open for max. 5 min)
    - Break time: 00:06:00 (after the max. duration the valve is closed for 1 min)
- In the submenu "**Output Signal**" please select the following:
    - Polarity: Low Active (the output is switched off when oxygen saturation falls below 95%. This opens the solenoid valve).

Now all necessary settings are set and the function is ready for use. Test the function, e.g. by immersing the O2S oxygen sensor in 0% oxygen solution.

AQUACULTURE|CONTROL or FILTER|CONTROL as filter control

If the AQUACULTURE|CONTROL is to be used as **filter control**, proceed as follows:

1. Mount water level probe

If you do not have a water level probe, continue with point 2).

The optimal location for the water level probe PS (PS-300-MA) for filter control is where it is possible to control the function of the circulation pump. In **gravity systems** this is usually after the filter or in the filter chamber, whereas in **pumped systems** this is before the drum filter or in the prechamber of the filter. Please note that the water level probe must be mounted submerged and must not be placed deeper than 2.5 m under water. Also make sure that there is no direct flow to the level probe. Please follow the instructions in the operating manual of the respective sensor.

Connect the water level probe PS for filter control to the **SENSOR 1 plug** (see Figure 4).

If your filter is equipped with screw-in level sensors (EPS-250-MA), connect the sensor in the filter chamber to the **SENSOR 1 plug** and the sensor in the prechamber to the **SENSOR 2 plug** (for water refilling or differential cleaning).

2. Connection of the cover switch

If your filter has a cover switch, connect it to **plug SENSOR 3**. To use the cover switch function, select the item "**Cover switch EBF**" or "**Cover switch DF**" in the **Menu / Filter settings / Extras**. The differences are explained in chapter “Filter Settings”.

SENECT offers the suitable cable for cover switches (normally open) (Type: DSK-5M-SC, Art.-No.: 3460) Please note that the cover switch is not an emergency stop according to EN ISO 13850:2015-10.

3. Connection of the filter motor

Make sure that the motor is correctly installed on your filter. Check in the technical documentation of your filter manufacturer whether the motor is operated with 24 V DC and does not exceed a maximum permissible current consumption of 5 A (150 W variant) or 10 A (300 W variant). Connect the (optionally available) motor cable to your motor (polarity: red = +, black = -). Connect the plug of the motor cable to the high power **output plug OUT 3 (MOTOR)**.

If your filter is equipped with a 230 V AC motor, connect the motor to the socket "**230 V OUT 2**". Make sure that only motors with an output of less than 460 W (max. 2A) can be connected directly. If your motor has a higher output, it can be connected and operated via the optionally available Power Switch 230-230 or 24-230.

If a 230 V AC or 400 V AC filter motor is used, its speed can be controlled by the SENECT® Control unit via a **frequency converter**.

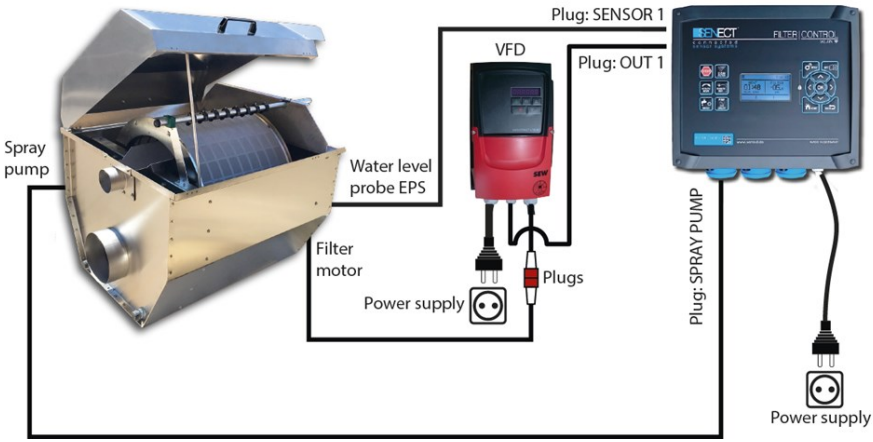


Figure 4: Connection example for controlling the drum filter motor with frequency converter

To do this, connect the frequency converter to one of the actuator outputs and select "**Filter Motor**", additional function "**frequency converter**" as function. SENECT offers suitable frequency converters for different motor models.

4. Connection of the spray and circulation pump

If the pumps are correctly installed in your system, then lay the cables to your SENECT® control unit. Before connecting to the control unit, check the technical data of the pumps to see if they are suitable for connection to the control unit. Connect the plug for the rinse or spray pump (to clean its filter, max. 1800 W) to the 230 V AC socket "**230 V OUT 1**". Connect the plug for the circulation pumps to the 230 V AC socket "**230 V OUT 3**" (see Figure 4).

5. System start in operating mode: Filter control

Make sure that the power plug of the SENECT® Control unit is connected to a power outlet and switch on the SENECT® control unit with the on/off switch.

If your system is a pumped system and the filter sensor is located in front of the drum, please select "**Pumped system**" as **filter type** in the **filter settings**. If the filter sensor is in the filter chamber or your filter is a gravity system, please select "**Gravity system**" in the filter settings.

If you have a 230 V AC filter motor, select "Filter Motor" under **Menu / 230 V plug / S 2 / Functions.**

Also select the correct type of water level sensor. If you have a level sensor PS, select under ***Sensors / Filter sensor*** e.g.. ***S1 / Sensor Type*** the measuring range "**Level Sensor 3 m**" while when using the screw-in level sensors EPS "**Level Sensor 2.5 m**" must be selected. Enter the location of the sensor (prechamber or filter) in the ***Menu / Sensors / Plug 1 / Position***. Repeat this if you use a second sensor for filter control.

Perform a cleaning cycle manually by pressing the "**CLEAN FILTER**" button. When the cleaning is complete, check the water levels in your system.

If all water levels are correct, the level probe must still be referenced. To do this, select in the menu under ***Sensors / e.g. S1 / Reference Sensor*** and confirm that the "**Sensor Reference Point**" is set (sensor measured value = zero).

Now your system is configured and operational.

In order to achieve the best cleaning results and an efficient and resource-saving operation, you need to adjust even further settings to your filter. You will find more information in the chapter "Operation".

To operate the drum filter properly, the drum motor and the spray pump must be connected. The connection of the level probe as well as the circulation pump are necessary to use the full performance range of the SENECT® control as filter control. If the connection of the level sensor is omitted, the drum filter **can be operated via a time control**. If the circulation pump is not connected to the designated plug on the SENECT® Control unit, the emergency shutdown function of the pump is not possible. When attaching all sensors (e.g. the level probe), make sure that the sensor and the cable cannot interfere with other components (e.g. the drum).

In a gravity system it also can be useful to place the level probe in the prechamber. This is the case, if the level in the prechamber increases faster than the level in the filter chamber decreases.

Since every drum filter uses water during cleaning, it is absolutely necessary for the smooth operation that sufficient water is added again! Either manually or automatically, always add enough water so that the water level in your system (basin, pond, etc.) is constant!

For an automatic refilling of your system, we recommend to install a second level probe in the basin / pond or in the prechamber in combination with the SENECT magnetic valve M12 (Art.-Nr.: 3010).

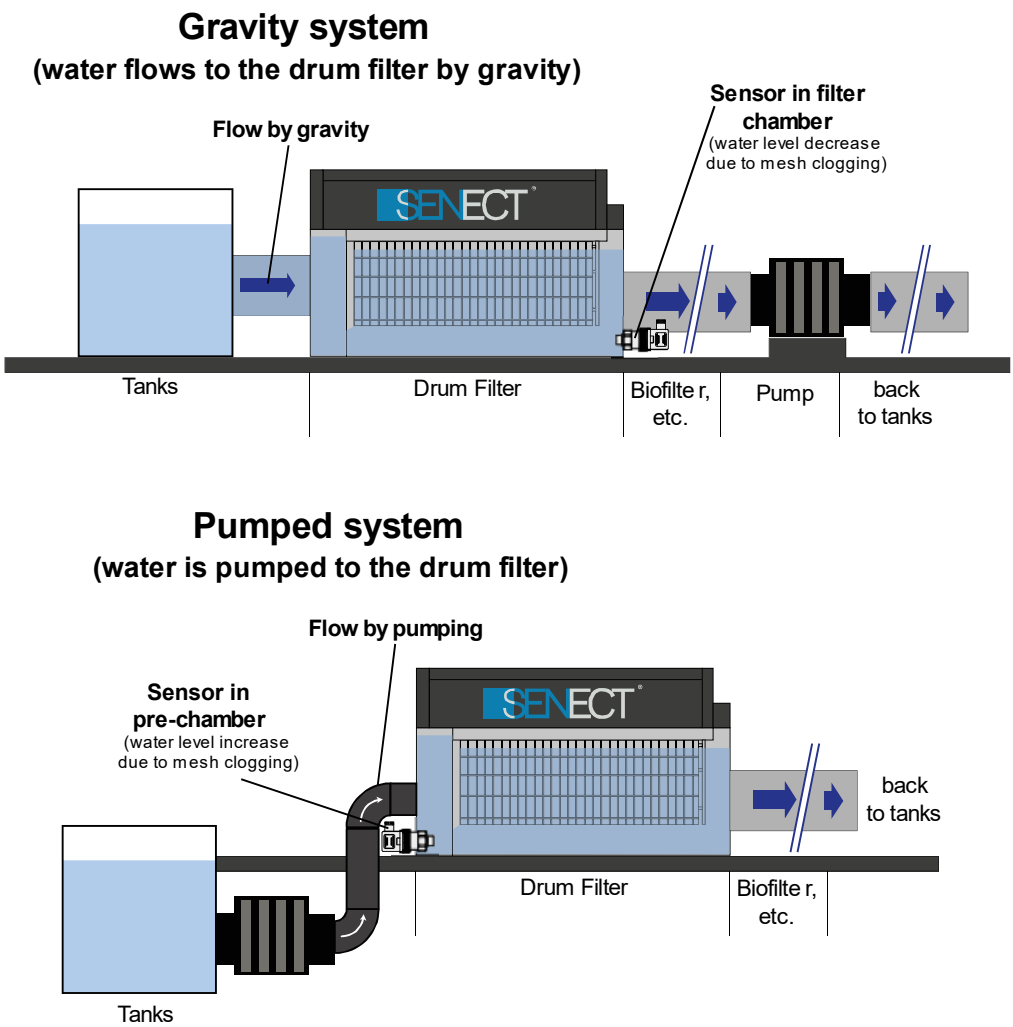
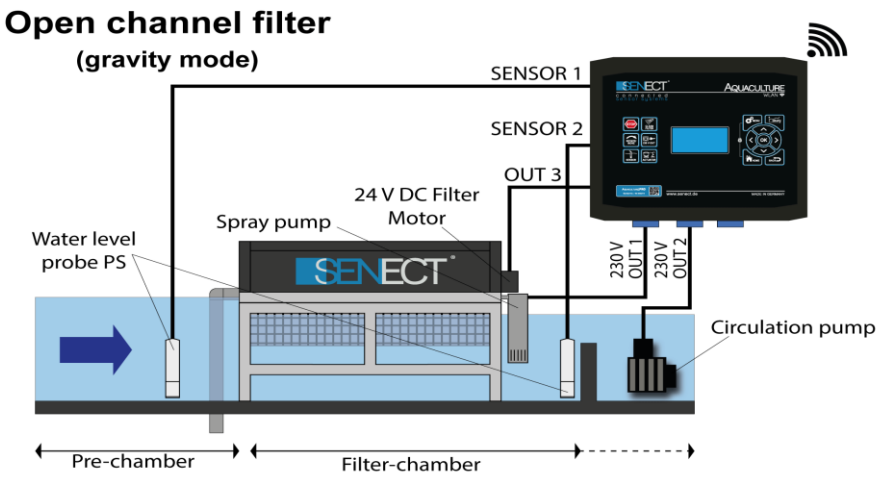


Figure 5 Schematic structure of a gravity-driven and a pumped system. In the case of the gravity driven system, the water is transported by gravity into the drum filter, whereas in the pumped system a pump actively pumps the water into the drum filter.



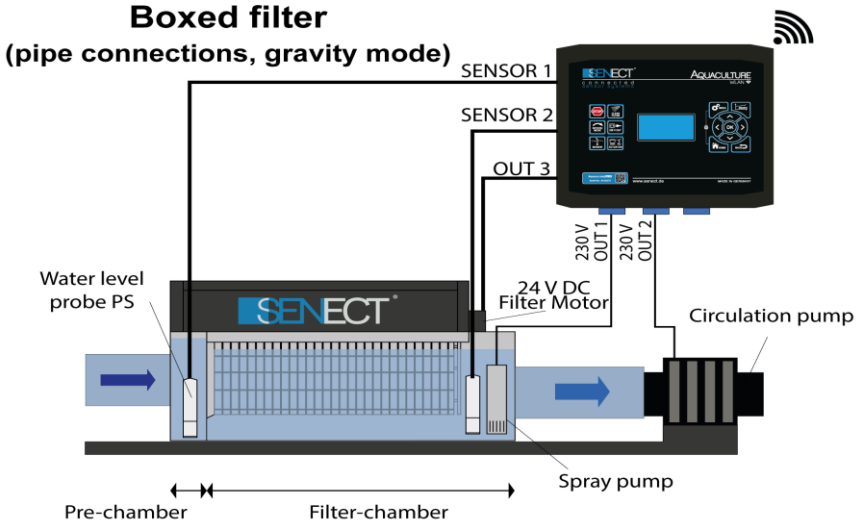


Figure 6 Explanation of the positions for the level probe. When controlled via the probe in the prechamber, cleaning is triggered by a water level rise, when the probe in the filter chamber is controlled via a fall. In differential operation with two level probe

Quick Start Guide Sensor Control

1. Mount the SENECT® Control unit in a protected location.
2. Fix the desired sensor in its place and connect the cable to one of the **SENSOR** plugs.
3. Switch on the SENECT® Control.
4. Select the output to which the actuator will be connected in the ***menu / output ports*** or ***menu / 230 V plug*** and choose the appropriate function. To control according to sensor measured values, this is **"Sensor Control"**.
5. Set desired parameters and test the output by plugging the cable of the actuator into the desired output.

Tip: The function "**Constant on**" can be used to check whether the actuator is working.

Quick Start Guide Filter Control

1. Mount the SENECT® Control unit in a protected location.
2. Mount the level probe submerged in the rear filter chamber (gravity operated mode) or prechamber of the filter (pumped mode) and connect the cable to plug **SENSOR 1**.
3. Connect the motor cable to your filter motor and **OUT 3**. Plug the spray pump (=filter pump) into the **230 V plug / S1**, the circulation pump into the socket **230 V plug / S3**. Also connect the cover switch of your filter to **SENSOR 3**.
4. Switch on the SENECT® Control.
5. Set the appropriate settings for your filter in the **MENU** under the item ***Filter Settings***.
6. Select the position and type of the sensor in the ***Menu / Sensors / S1***.
7. Select the correct functions for the sockets under ***Menu / 230 V plug*** (socket 1 = **filter pump**, socket 3 = **circulation pump**). Use the **STOP button** to interrupt all functions immediately.
8. Perform a drum cleaning (**CLEAN FILTER** button).

9. Check the water level in your pond system If the water level is OK, reference the level probe in the menu under **Sensors / S1 / Reference sensor**. Then the applied level is the reference water level (= 0).

Please note that in filter mode the water level always refers to the **referenced / relative** (i.e. set to zero) water level, while the alarm settings use the **absolute** water level.

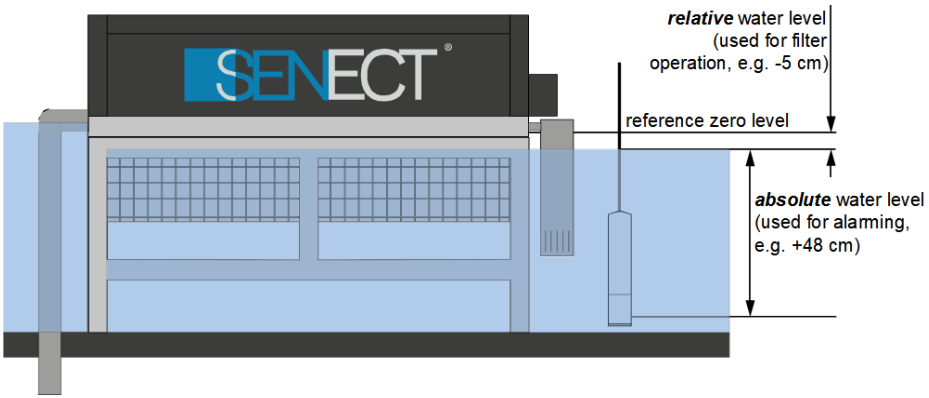


Figure 7 Difference between absolute and relative water level.

Alerts

For each sensor measured value, alarm thresholds can be specified in the sensor menu. If these thresholds are exceeded or not reached, an alarm is triggered. In the filter mode an alarm is triggered if the dry run 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 measured value below upper alarm threshold again) or 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/Alarm Pause***; App: In Control, click on top field with Serial-No. → 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***.

With the help of the **temporary alarm thresholds**, the alarm thresholds can be temporarily changed so that the sensor only reports an alarm if the temporary alarm thresholds are undershot / exceeded.

The alarm is shown in the top line of the display as a flashing exclamation mark, the SENECT® Control unit 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 contact / normally open contact) for control units with Extra Alarm output.

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

Registration for push messages

In order for warnings, notes and alarms to be received as push messages, **the respective terminal device** (smartphone) must be registered with the control unit. This requires an existing WLAN connection, the installed SENECT Control App and the integration of the control into the SENECT Control App (see chapter WLAN). Registration can be performed in the app in the menu (gearwheel symbol in the top right-hand corner) under "**Alarm Settings**". To do this, enter a freely selectable name for "**Mobile X**" (e.g. User 1) and confirm this with +. With the button "**Test Mobile**" you can check the registration.

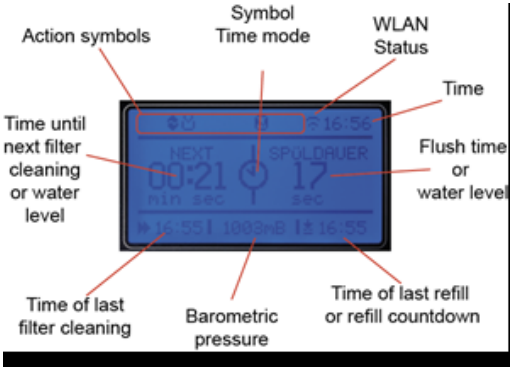
The same applies to the email addresses that should receive an alarm message.

The registration must always be done directly with the respective end device. Entering the phone number of the respective device does not work.

Operation

Display and symbols

The display unit (display) shows the user important information about settings, the current operating status and the parameters measured in real time.



In the top first row of the display you will find various action icons, which give the user a

Figure 8 Description of the display

quick overview of currently executed work processes and/or selected modes of the filter system.

The action symbols indicate the following functions or states:

!	Alarm active
‖	Pause – can be cancelled with STOP
	Key lock active
	Circulation pump switched on
	Filter cleaning
	WLAN: no connection
	WLAN: available but no internet access
	WLAN: connected to the network
	WLAN: configuration mode active
	WLAN: update available

Key descriptions

The SENECT® control is operated using the buttons on the front panel. By pressing the MENU key, you can now make the necessary settings. Use the arrow keys 🡅 and 🡇 to select the corresponding menu item and confirm your selection with **OK**. The **BACK** button always takes you back one menu level, while **HOME** takes you back to the start screen.

The HOME view displays information about the operating status of the filter, sensor readings or states of the outputs. Use the arrow keys 🡄 and 🡆 switch the display from filter status to the respective sensors of the plugs. With the keys 🡇 and 🡅 switch between the display of the sensors and the outputs.

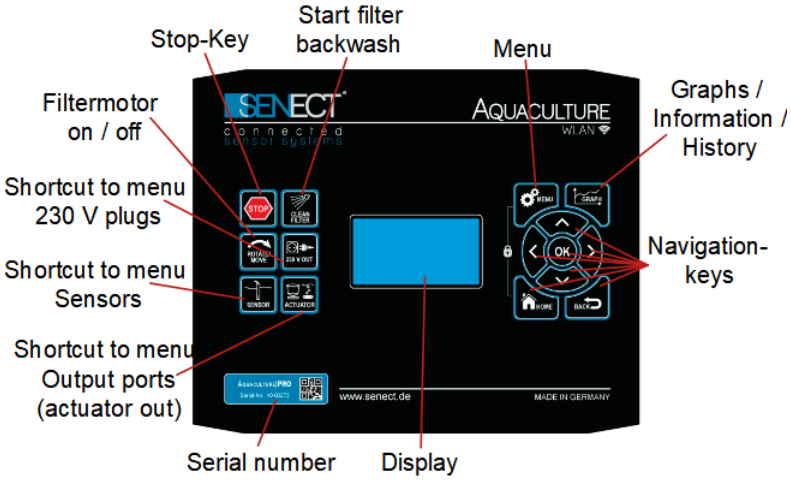


Figure 9 Description of the buttons of the FILTER|CONTROL

Arrow keys: Use the arrow keys to move around the menu. To open a menu selection, press the **OK** button.

If you are outside the menus you can use the arrow keys 🡄 and 🡆 to switch between the individual sensor plugs and display the different measured values.

OK: Press OK to confirm your selection.

Key descriptions

BACK: Use the BACK key to go back one level within the menu.

HOME: Pressing the HOME button takes you from the menu to the normal view.

MENU: Press the MENU button to open the menu. Here you can make your settings.

GRAPH / INFO: By pressing the Graph / Info button, the past actions (history) including the time are displayed. By using the arrow keys 🡐 and 🡒 you can switch to different views (graphical display of the recorded measured values, WLAN info, system info). With the keys 🡓 and 🡑 you can change the time scale of the X-axis (e.g. 1 hour, 1 day).

LOCK: Pressing the **MENU and HOME** keys simultaneously locks the keys. Unlocking occurs when both keys are pressed and the set Pin Code is entered. In the original state it is 0000.

Additional keys of AQUACULTURE|CONTROL & FILTER|CONTROL:

STOP: With the **STOP** button you can cancel all actions immediately and the control unit is in pause mode. Pressing the **STOP** button again will cancel the pause. With the **STOP** key you can also switch on and off outputs defined as "circulation pump".

CLEAN FILTER: By briefly pressing the CLEAN FILTER button, the filter is cleaned for one cycle. If the button is held down for longer than 3 seconds, an intensive cleaning cycle is started.

ROTATE/MOVE: Press this key to activate the filter motor. When the key is released again, the movement stops.

Additional keys of **AQUACULTURE|CONTROL**:

230 V OUT: Shortcut to the 230 V Plug menu and its settings.

SENSOR: Press the **SENSOR** key to open the Sensors menu.

ACTUATOR: Use this key to make the settings of the actuator plugs **OUT**.

Additional keys of **FILTER|CONTROL:**

SENSOR REF: If this key is pressed, a user query appears whether the level probes should be referenced, i.e. set to zero. If you select "Yes" and confirm this with OK, the water levels of the level probes in the filter and in the prechamber (not the pond sensor) are defined as zero value (0 cm) and all further measurements refer to this value as starting point (initialization). A correct initialization is essential for the smooth functioning of your drum filter.

WATER: If a SENECT solenoid valve (Type MVW-M12-SC, Art.-Nr. 3010) is connected to plug OUT 2, pressing this key will take you directly to the menu for water refill settings (see menu description). If this button is pressed for longer than 3 s, the manual water refill is activated.

PUMP ON/OFF: With this key you can switch the connected circulation pump on and off.

Table 1: Explanations to the entries of the history.

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 measurable
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
Timer refill	Start of time-controlled refilling (timer table or interval)
Sensor refill	Start of sensor-controlled refilling (sensor controlled)
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
Log	Log entry for changed setting

The Menu

All settings and parameters can be adjusted via the menu. The menu is structured as shown on the following page. Please note that some items in the menu are dynamic and can only be changed when certain preferences are visible.

Filter Menu

The menu item **Filter Settings** is only available for AQUACULTURE|CONTROL and FILTER|CONTROL. In this menu you can make all settings necessary for filter operation.

Filter settings

- **Filter Mode**
- **Operating Mode**
- **Extras**
- **Water Level**
- **Backwash Parameters**
- **Eco|Mode**
- **Alarm**
- **Pause cleaning p.**

Submenu Filter Mode

- **Filter Mode**
  - **Gravity System**
  - **Pumped System**

Select whether the filter is in gravity mode (filter sensor installed behind the filter fabric) or a pumped system (filter sensor installed in front of the filter fabric).

Submenu Operating Mode

If you do not want to use the AQUACULTURE|CONTROL as filter control, select "Deactivate" here.

- **Operating Mode**
  - **Deactivate**
  - **Automatic Mode**
  - **Time-controlled**
  - **High-Press. Cleaner**

However, if you use the AQUACULTURE|CONTROL to control a self-cleaning filter such as a drum or belt filter, you can select here whether the cleaning is triggered by sensor measured values (**automatic mode**) or by a time control (**time-controlled**).

In addition, you can start a manual program here with the item "**High-Press. Cleaner**", in which the filter motor (only with a motor at the High-Power output or with a frequency converter) runs at reduced speed to clean the filter fabric with a high-pressure cleaner. No "normal" cleaning will then take place. With the **Stop button**, the high-pressure cleaner mode can be stopped and returned to normal mode.

Submenu Extras

This menu item contains various extra functions whose sub-menu only appears if they are selected here.

- **Extras**
  - **Deactivate**
  - **Dynamic|Mode**
  - **Eco|Mode**
  - **Cover Sw. DF**
  - **Cover Sw. EBF**
  - **Dry run Prot. OFF**
  - **Dry run pro. pumps**

Dynamic|Mode: The Dynamic|Mode is used in systems with fluctuating water levels to clean the drum filter only according to the degree of pollution. For this purpose, a dynamic flushing level is determined. You can activate and deactivate this function here. We recommend activating the Dynamic|Mode in systems with fluctuating water levels.

Eco|Mode: Eco|Mode is used for water-saving cleaning of your filter. In this case, 1cm before the flush level is reached, a partial rotation of the drum rotation is performed so that the entire filter fabric is used before cleaning is carried out. In this menu item you can activate or deactivate the Eco|Mode.

Cover Switch DF: If your filter has a cover switch (normally open contact), you can plug it directly into the **SENSOR 3** plug. A suitable connection cable (cable cover switch DKS 5m, art. no.: 3460) can be obtained from SENECT.

If the cover is opened and the switch opens its contact, any cleaning that is taking place is immediately interrupted and a connected UVC lamp (this must be defined as a UVC lamp in the **sockets menu**) goes out.

Please note that the "**cover switch**" function is **not a safety device** but a comfort function. When opening the filter and working inside the filter, all electrical appliances must be switched off.

Cover Switch EBF: The cover switch EBF function differs from cover switch DF in that **only** the UVC lamp is switched off, but filter operation continues.

Dry-running protection OFF: The dry run protection - i.e. switching off the "**circulation pump**" plug if the measured water level is too low - can be deactivated here.

Dry-running protection - pumped: If the filter is defined as pumped system, the dry run protection is activated when the measured water level in the filter falls below a defined value. In addition, the overflow protection water level can now be set in the submenu "**Water levels / Overflow protection**" (see below). For this purpose, a second level sensor in the pure water area is necessary.

Submenu Water Level

All adjustable water level-related parameters are system-specific. This means that individual settings are optimal for each filter version or pond system. In this menu item you can change the various values and thus find the optimum settings for your system.

- **Water Level**
  - **Flush Level**
  - **Overflow Protection**
  - **Dry run Protection**

Flush level: The flush level is the water level above (pumped system) or below (gravity system) which triggers the cleaning process (depending on the position of the water level sensor). The flush water level is always a difference from the sensor zero point (see referencing the sensor). **Exception:** when using 2 water level sensors, which are defined as prechamber and filter sensor, the difference between the two measured values is used as the flush level**.**

Overflow Protection (only in pumped mode): A maximum value can be specified here, if this value is exceeded the circulation pump is switched off and an alarm is triggered. This

can, for example, prevent the filter from overflowing in the event of a fault (such as a failure of the spray pump and a consequent reduction in the flow rate of the filter).

Dry run Protection: At the point Dry run protection, you can set the water level at which the circulation pump switches off and cleaning is no longer carried out. If the water level reaches this level, it can be assumed that there is a fault in the circulation system (e.g. too little water, parts of the filter are defective) and the pumps are switched off for their own protection. The system is automatically restarted several times and the water level and its changes are precisely evaluated. When the water levels are back in the normal range, the SENECT® Control unit automatically switches back to normal operation.

Submenu Backwash Parameters

In this menu item, all parameters relevant for cleaning can be set.

- **Backwash Parameters**
  - **Backwash Duration**
  - **Pre-flushing time**
  - **Post-flushing time**
  - **Cleaning Pause**
  - **Forced Clean. Cycle**
  - **Intensive Cleaning**
    - **Interval**
    - **Duration**
    - **Motor Speed**
  - **Motor Speed**
  - **Flume Cleaning**

Backwash duration: The backwash duration refers to the duration of a cleaning cycle or how long the filter motor is turned. Set the cleaning time so that the drum completes at least one complete rotation per cleaning cycle or the belt runs through once.

Pre-flushing time: With the pre-flushing function, a time window is defined which ensures that the spray pump is activated before the drum rotation starts. This serves to create a water film in the drain channel so that dirt particles do not stick there and are removed cleanly. Negative entries here mean that the spray pump only becomes active after the filter motor has been started.

Post-flushing time: In order to wash the dirt off the flume after drum rotation, a post-flushing time can be specified. The spray pump is then active for the specified time after the drum rotation has ended.

Cleaning pause: The cleaning pause defines the minimum time interval between two rinses. This ensures that even in sluggish systems where the water levels in the system

change only slowly, cleaning is only active when it is actually needed. In addition, this prevents too frequent cleaning, which can be particularly important when the water level in the system is low. However, if the water level falls significantly below the cleaning water level (forced flush level - this lies between the flush level and the dry-running protection level), the cleaning pause is bypassed and rinsing is carried out to prevent the water level from falling below the emergency stop level.

Forced cleaning: The time at which the filter should clean regularly, even if no contamination has been detected by the sensor, can be set with the forced cleaning function. Enter the time after which the filter should clean at the latest. This can serve as frost protection in winter or to remove particles from the filter before they decompose

Intensive cleaning: Since the filter fabric can become persistent clogged over time due to biological growth but also due to lime deposits, intensive cleaning is carried out at regular intervals. This involves turning the drum more slowly and extending the cleaning time.

Intensive cleaning - Interval: By entering the interval, you can determine after how many normal cleanings an intensive cleaning should take place.

Intensive cleaning - Duration: The duration determines how long the intensive cleaning should last. Please note that due to a reduced rotation speed of the drum, the duration should be longer than for normal cleaning. The drum should rotate at least twice.

Intensive cleaning – Motor speed (only for 24V Motors or with frequency converter): To achieve a better cleaning effect, the motor speed is reduced during intensive cleaning. In this menu item you can set the speed from 20% (slow) to 100% (fast).

Motor speed (only for 24V Motors or with frequency converter): In this menu item you can set the speed of rotation for **normal cleaning and forced cleaning** of your filter. You can select the speed between 20% (slow) and 100% (fast). The slower your drum rotates, the longer the filter fabric is cleaned. If you make changes here, please make sure that you also adjust the backwash duration. It is recommended that the drum can rotate at least one full rotation at the selected speed level.

Flume cleaning: If an output is configured as spray pump with the additional function flume cleaning, this menu item appears. Here you can now set after how many cleanings the flume cleaning is to be activated. The output with the additional function **flume cleaning** is switched on for the duration of the post-cleaning time. Example: Filters in which the flume cleaning is carried out via a solenoid valve and the spray pump.

Submenu Eco|Mode

If the Eco|Mode is activated, you can set the duration of the partial rotation here.

- **Eco|Mode**
  - **Duration Eco|Mode**

Submenu Alarm

In the Alarm menu, you can specify which notifications you want to receive regarding filter operation. The following modes are available:

- **Alarm**
  - **Mode**
    - **Deactivate**
    - **Forced Clean. Cycl**
    - **Service Intervall**
    - **Low Cleaning int.**
    - **High Cleaning int.**
  - **Service Interval**
  - **Low Cleaning int.**
  - **High Cleaning int.**

Deactivate: Disable all additional notifications.

Forced Cleaning Cycle: Normally an alarm is only sent in case of dry run protection. However, you can also receive an alarm message in the event of forced cleaning (if the water level falls below the flush water level despite cleaning but does not yet reach the dry-run protection water level, forced cleaning takes place).

Service Interval: Receive an alarm message when a specified number of cleanings is reached (menu item Service interval):

Select "Service Interval" and enter a number of cleanings for which you want an alarm message. For example, you can have the system notify you every 20,000 cleanings to carry out an inspection of the filter.

Low / High cleaning interval: You can specify whether you want to receive a notification when the filter has a low or increased cleaning interval. In the menu items "**Low cleaning int.**" and "**High cleaning int.**" you can set when the notification is to be sent:

Low cleaning int.: Send a notification if there have been less than 10 cleanings, e.g., in the last 300 minutes.

High cleaning int.: Send a notification if more than 10 cleanings have been carried out, e.g., in the last 30 minutes

Example: The filter cleans approximately every 5 minutes, so in 50 minutes 10 cleanings are triggered. There should be a notification when cleaning takes less than 4 minutes or more than 7 minutes. Set 40 minutes for increased cleaning and 70 minutes for less cleaning.

For example, increased cleaning can detect clogged filter fabric. Due to the few cleanings e.g. a failure of a pump can be detected.

Submenu Pause cleaning pause

In this menu item you can deactivate the cleaning pause for a certain period of time. During this time the cleaning pause is ignored and the filter can be cleaned more often. This is necessary, for example, for cleaning work.

Sensor menu

The menu for the sensors depends on the type of sensor. Please observe the instructions in the operating manual of the respective sensor.

The Sensors menu consists of the following submenus:

Sensors

- **Sensor Referencing**
- **Sensor Calibration**
- **Position**
- **Alarm Threshold**
- **Sensor Type**
- **Plug Name**
- **Change zero-point**
- **Salinity correction**
- **CO2 Calculation**

To change the settings of the connected sensors or to calibrate / reference the sensors, select the respective sensor in this menu item.

The sensor plug, sensor type and, if applicable, the sensor name assigned by the user are displayed here per line.

Example:

S1: PS 3m Basin2: Level probe PS-300-MA at plug 1 (S1) with the plug name "Basin 2".

Submenu Sensor Reference (only with level sensors)

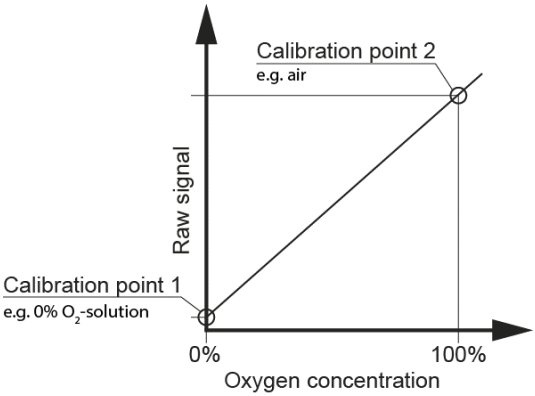
If all water levels in your system are correct, you can set the water level measurement of the selected sensor to "zero" in this menu item.

Submenu Sensor Calibration

pH and ORP sensors should be calibrated regularly to obtain correct readings. In this menu item you can calibrate the sensors (including other sensors such as the oxygen sensor O2S).

- **Sensor Calibration**
  - **Measuring channel 1 (e.g. “pH”or “ORP”)**
    - **Calibration Point 1**
    - **Calibration Point 2**
    - **Factory settings**
    - **Save Calibration**
    - **Load Calibration**
  - **Measuring channel 2 (Temperature)**
    - **Calibration Point 1**
    - **Calibration Point 2**
    - **Save Calibration**
    - **Load Calibration**
  - **Information**
  - **Infos to Senect**

To do this, select which parameter you want to calibrate: Measuring channel 1 is the actual sensor, measuring channel 2 is for the integrated temperature measurement of the sensor (e.g. oxygen or conductivity sensor). Now you can carry out a two-point calibration, e.g. at pH 4 (calibration point 1) and pH 10 (calibration point 2) for the pH sensor. In the editor you can adjust the value of the calibration point, e.g. if you calibrate with a pH 7 solution instead of a pH 4 solution.



Saving the calibration: After a successful calibration, the calibration must be saved so that it is also available after a restart.

Load the calibration: Old calibrations can be loaded here in case a calibration cannot be completed successfully (e.g. because the calibration solution was spilled).

Factory settings (only with O2 Sensor): Calibration points for 0 and 100% can be entered here to restore the calibration points.

Info (only with O2 Sensor): In the menu under **Info** you can see the serial number of the sensor (SN), the measurement signal at the lower calibration point (C0), the signal at the upper calibration point (C1) and the operating mode used (e.g. the control unit used).

Info to Senect (only with O2 Sensor): If your sensor has an error, you can send the error data directly from the control unit to SENECT to solve the problem. To do this, select **Info to SENECT** in the calibration menu.

For more information on the calibration of the sensors, please refer to the respective operating instructions.

Submenu Position (only with water level sensors)

The position of the sensor determines its function. Select "**Filter-chamber**" if you want to use the water level sensor to clean the filter behind the filter (or in the filter chamber). Select "**Pre-chamber**" if the sensor is positioned in the prechamber and should also be used to control the filter. Select "**Refill Sensor**" if the sensor is to be used for water level control (refilling). Or select "**Other**" if none of these functions should be linked to the sensor.

Submenu Alarm Thresholds

In this menu, the desired values for a sensor alarm are set:

- **Alarm Threshold**
  - **Lower Threshold**
  - **Upper Threshold**
  - **Hysteresis**
  - **Lower Threshold °C**
  - **Upper Threshold °C**
  - **Hysteresis °C**
  - **Alarm On/Off**
  - **Unit**
  - **Temp. Threshold**

If you want an alarm to be triggered when the measured value falls below or exceeds a sensor value, you can enter the thresholds in this menu item. The **hysteresis** indicates the tolerance value within which no new alarm is to be sent if the measured value fluctuates.

If a sensor also has a temperature signal, the parameters for this can be entered in the menu items with °C.

Example:

You want to receive an alarm when the temperature exceeds 25°C or falls below 10°C. Set the **Lower Threshold** to 10°C and the **Upper Threshold** to 25°C. As hysteresis e.g. 0.5°C. You will then receive an all-clear signal when the temperature is above 10.5°C again.

If you want to switch off the alarm, you can set this under "**Alarm On / Off**".

In the "**Unit**" menu you can select the unit to be considered for the alarm, e.g. referenced or absolute level for level sensors or e.g. % a.s. or mg/l for oxygen sensors.

In the "**Temp. Thresholds**" menu, you can set temporary alarm thresholds for a specific time. The actual alarm threshold then becomes effective again after this time. This is useful if an alarm is present but for a certain period of time the alarm should only be activated if the temperature falls below / exceeds another threshold, e.g. during maintenance work.

Submenu Sensor Type

Select the type of your sensor here, e.g. the level sensor PS-300-MA or the screw-in level sensor EPS-250-MA.

- **Sensor type**
  - **EPS-250-MA (Level probe 2.5m)**
  - **PS-300-MA (Level probe 3.0m)**
  - **EDS**
  - **Flow**
  - **CO2**
  - **PS (level sensor with custom range)**

If a pressure sensor EDS or a flow sensor is connected, select it here. The measuring range of the sensor must then be stored in the Measuring range menu, e.g. 6000 mbar for an EDS with a measuring range up to 6 bar.

Submenu Plug Name

You can also assign the sensor a name with a maximum of 8 characters, which appears in the SENECT Control App, for example.

Submenu Change zero-point (for level sensors)

If, for example, the sensor is used for refilling, but the basin or pond is not yet full and therefore the reference water level (zero) has not yet been reached, you can change it manually here.

Submenu Salinity Correction (only with O2 Sensors)

As the oxygen saturation concentration is dependent on the salt content, the SENECT control offer the possibility of correction.

- **Salinity correction**
  - **Mode**
    - **From fix Value cor.**
    - **From Sensor cor.**
  - **Correction Value**
  - **with Plug**

If a conductivity sensor (CON2, CON10 or CON50) is also connected to the control unit, the measured value of this sensor can be used for correction (Mode: **corrected by the sensor.**) In the menu "**With plug**" the sensor plug of the CONxx is specified which is to be used for correction. Alternatively, a fixed correction value for salinity can be entered (Mode: **corrected by the fixed value**). This value is entered as electrical conductivity (µS / cm) under **Correction Value**.

Submenu CO2 calculation (only for pH sensor)

Based on the pH value, temperature and alkalinity, the CO2 content can be calculated.

- **CO2 calculation**
  - **Mode**
    - **From fix Value cor.**
    - **From Sensor cor.**
  - **Correction Value**
  - **with Plug**
  - **Alkalinity**

Since the CO2 calculation is dependent on temperature, the SENECT Control units offer the possibility of calculation with temperature. If a sensor with temperature measurement (e.g. TMP, CON, O2S) is connected to the control unit, the measured value of this sensor can be used for calculation (Mode: **from sensor cor.**). In the menu "**With plug**" the sensor plug of the sensor with temperature signal which is to be used for calculation is specified.

Alternatively, a fixed temperature value can be entered (Mode: **from fix value cor.**). This value is entered as temperature in °C under **Correction Value**. Under alkalinity the alkalinity must be entered in mg/l. The display shows a conversion to °dH.

Measuring Range Submenu (for pressure sensor, div. level sensor)

In this menu the measuring range of pressure sensors can be set, e.g. 2500 mbar for an EDS2.5 or 6000 mbar for an EDS6.0 with 6 bar pressure range. Do so with other sensors with custom range.

Menu outputs and sockets

This section does not apply to the **MONITOR|FOUR** and is dependent on the existing and connected actuators.

With the **AQUACULTURE|CONTROL** you can freely assign a function to the actuator outputs (OUT 1 to OUT3 or OUT 6) and the three sockets (230 V OUT 1 to 230 V OUT 3), with the **SENECT|ONE** (OUT 1 to OUT 3) and with the **SENECT|TWO** (OUT 1 & 2). With the **FILTER|CONTROL**, only the outputs OUT1 and OUT2 and socket 2 can be assigned a function (the remaining outputs are fixed). The actuator outputs **OUT** are intended for the connection of low-voltage consumers with max. 24 V DC or for the output of control signals (4-20 mA or 0-10 V (but not for the high-power output)).

At the end of each line a symbol is shown, which represents the current state of the output:

Output switched on 

Output switched off 

The menu is structured as follows:

- **Output Ports**
  - **Function**
  - **Additional Function**
  - **Operating Time**
  - **Alarm Handling**
  - **Output Signals**
  - **Feeder**
  - **Sensor Control**
  - **Time-controlled**
  - **Output Signal**
  - **Switch on for**
  - **Switch off for**
  - **Plug Name**
  - **Hour Meter**

First select one of the functions. Depending on the selected function, the corresponding submenus are then activated.

Submenu Functions

Select the function of the plug depending on the connected actuator. Available for selection:

- **Function**
  - **Off**
  - **Filter Motor**
  - **Spray Pump**
  - **Circulation Pump**
  - **Sensor Control**
  - **Feeder**
  - **Time-controlled**
  - **Constant on**
  - **UVC Lamp**
  - **Alarm**
  - **Sensor Forwarding**

Description of the main actuator functions

- Filter Motor

If the Filter motor function is selected, the actuator is active when the filter motor is controlled. The output signal corresponds to the value set in the motor speed. Using the Additional Function "**frequency converter**", the signal is output via 0-10 V and 4-20 mA, while the 24 V DC output line switches the frequency drive on and off.

- Spray Pump

If the actuator is defined as a spray pump, the actuator is active if the filter spray pump is to be controlled.

- Circulation Pump

In the case of the circulation pump function, the control takes place after the circulation pump has been regulated. This means that the output can be switched on and off with the **STOP** key and is integrated in the emergency shutdown mechanism.

If the circulation pump function is selected, the input pin on this output is automatically activated, which can pick up a signal from the pump (e.g. fault message).

In this function, control via 0-10V / 0-20mA is also available. The minimum level in the output signal menu can be used to set an offset so that, for example, 1V is still output when

the pump is switched off. This is necessary for pumps with 0-10V input which require more than 0V to switch off.

- Sensor Control

The sensor control is used to control the output according to a sensor signal.

- Feeder

If you have selected the "Feeder" function for an output, you can make the appropriate settings here.

- Time-controlled

The time-controlled operation function allows the output to be switched on and off at intervals.

- Constant on

If you want the output to be constantly switched on, select **Constant on** as the function. You can also use the other settings such as **additional function**.

- UVC Lamp

If "UVC lamp" is selected as the function, the "continuously on" mode works in the same way as the additional function that the UVC lamp is switched off when the filter cover is opened (cover switch required). Furthermore, the app displays the operating hours for this plug.

This function can also register fault messages from UVC lamps and trigger an alarm. To do this, the UVC lamp must transmit the fault signal to the control system via a potential-free normally open contact (actuator cable AK-OE-5M-SC required). Please refer to the operating instructions of the actuator cable for details of connection.

- Alarm Handling

With the "Alarm Handling" function, a warning lamp (e.g. SENECT warning lamp VIS-LED) can be connected to the actuator plug or the fault message can be forwarded to a telecommunications system or a consumer can be switched on, e.g. a ventilation pump. The function is visible in the menu when you select “Alarm Coupling” in “Additional Functions”.

- Sensor Forwarding

With the function "Sensor Forwarding", the measured value of a sensor can be output as an analogue signal at the actuator plug. This allows the measured value to be transferred to another control system, for example.

Description of the additional functions

With this menu item you can provide the plug with an additional function. Depending on the selected function, **a different sub-menu appears**. Possible items are:

- **Additional Function**
  - **Off**
  - **Alarm Coupling**
  - **Output Coupling**
  - **Time-controlled**
  - **VFD (variable frequency drive, for the main function Filter Motor)**
  - **Flume Cleaning (for the main function Spray Pump)**

If you select "**Alarm Coupling**", this plug is switched off, for example, if an alarm is triggered by a water level falling below a certain level. In the dynamic menu item "**Alarm Handling**" you can use "**Switch on output**" or "**Switch off output**" to select whether the actuator should be switched on or off in the event of an alarm. Press "**Off**" to deactivate the alarm coupling.

By selecting "**Output Coupling**", the output is activated depending on another output, see sub-menu **Output Coupling**. Please note that the menu item "**Output Coupling**" now appears, in which you can make the other settings.

A "**time control**" can be added to the normal function of the output as an additional function, see description of **Operating Time**.

If the plug is defined as "**Filter Motor**", the additional function "**Frequency Converter**" can be used to switch on the control via the 4-20 mA as well as the activation via +24 V DC. In this case the frequency converter is used to achieve the full range of functions with AC motors (e.g. 230 V AC or 400 V AC) by controlling the motor speed. Please contact SENECT for suitable frequency converters for your motor.

The additional function "**Flume Cleaning**" enables the control of the flume cleaning of your filter via a magnetic valve which is connected to the spray pump, see description cleaning parameters.

Description of the further settings of the outputs

Submenu Operating Time

With the operation time you specify when the control is active.

- **Operating Time**
    - **Start time**
    - **Stop time**
    - **Days**

For example, by selecting a time from 7:00 start time to 19:00 stop time, you can prevent activation at night. If both times are set to 0:00 the control is continuously active.

The time function can be used to change the control time continuously by an adjustable value per day (see daylight mode).

The submenu days offers the possibility to do the function only on specific weekdays.

Submenu Alarm Handling

In this sub-menu, you define whether the output should be switched off or on in case of an alarm.

- **Alarm Handling**
    - **Switch off output**
    - **Switch on output**

This function allows countermeasures to be taken in the event of an alarm, such as switching on additional ventilation or forwarding the alarm to a telecommunications system.

Submenu Output Coupling

By means of the output coupling you can switch this output depending on another output.

- **Output Coupling**
  - **Plug**
  - **Mode**
    - **Off**
    - **Off when on**
    - **Off when off**
    - **On when off**
    - **On when on**

Under "**Plug**" you can select to which other actuator you want to link this output, while under "**Mode**" you can decide how the output should behave:

Off when on: This plug is turned off when the paired plug is on.
Off when off: This plug is turned off when the paired plug is off.
On when off: This plug is turned on when the paired plug is off.
On when on: This plug is turned on when the paired plug is on.

Submenu Feeder

In addition to time-based feeding, the automatic feeder function offers various additional functions to ensure ideal feeding.

- **Feeder**
  - **Function**
  - **Daily feed amount**
  - **Daily increase**
  - **Environmentally Dependent Feeding**
  - **Light Stimulation**
  - **Calibration**

Brief instructions: Setting the automatic feeder

To use a feeder with SENECT Control units, proceed as follows:

1. Menu / Output port: **Feeder / Operating time**
2. Set **Start and stop time:** e.g. from 7:00 to 20:00
3. Set **Feeding time**:
    a. **Interval mode**: enter here at what interval and for how long you want to feed (example: duration: 20 s, interval period: 30 min).
    b. Alternatively: at specific times (use the timer table, for example: 10 am, 20 s duration, 12 am, 30 s duration, etc.)

In the newly published sub-menu **Feeder** you can use further additional functions and calibrate the automatic feeder. Calibration is necessary to use additional functions that relate to the feed quantity (daily feed quantity, daily rate of increase, temperature correction).

For more information on each of the additional functions, refer to this chapter.

Submenu Function

In the menu item "**Feeder**", you can expect the following **functions**:

- **Function**
    - **Off**
    - **Daily feed amount**
    - **Daily increase**
    - **Low O2 protection**
    - **Air pressure**
    - **Temperature Protection**
    - **Temperature Correction**
    - **Alarm = no feeding**
    - **Light Stimulation**

By selecting the additional functions, the respective menu sub-menu items appear. Please note that for many of these functions the feeder must first be calibrated. The menu item "**Calibration**" appears dynamically when the appropriate functions are selected.

The additional functions of the feeder control are:

1. Daily feed amount

Enter the maximum daily feed amount in g at a reference temperature of 16°C and the feeder will divide the total amount equally between the selected feeding times. A medium temperature is deliberately chosen to meet the requirements of as many species as possible.

Depending on the mode selected in the feeding times menu, the feeding duration (portion size, "**Interval duration**" mode) or the interval between feedings (“**Interval period**" mode) is calculated from the daily feed quantity.

2. Daily increase

The daily rate of increase in % indicates by how much the daily feed quantity increases per day. This allows you to automatically adjust the amount of feed to the growth of the fish. This means that the daily feed amount changes daily and so does the feeding duration or interval period (“**Interval Period**” mode).

3. O2 Protection

If the oxygen content is too low, the feed is often not eaten by the fish. Therefore, in this menu item it is possible to enter the oxygen content below which feeding should not take place.

If this is selected, the settings can be adjusted in the menu item "**Environment-based feeding**". Here please also select the appropriate sensor plug of the O2 sensor from whose values this link is to be made.

4. Air pressure

Analogous to stopping feeding when the oxygen content is too low, air pressure can also be used. The actual value can be set under "**Environment-based feeding**".

5. Temperature protection

The situation is similar with temperature. Here you can select whether no feeding should take place above and below two temperature values ("**Environment-based feeding**").

6. Temperature correction

If you want to adjust the feed quantity to the water temperature, you can switch on the automatic adjustment with the temperature correction.

As a data basis, you must enter the feeding amount in kg per 100 kg fish weight (or %) for the different temperatures under ***Environment-based feeding / temperature correction***. Normally you will get exactly this information from your feed supplier in the respective data sheets.

7. Alarm = no feeding

If you want the system to stop feeding in the event of an alarm (e.g. low water level), activate this item.

8. Light stimulation

If you use the SENECT hatchery fry feeder, you can switch on the integrated LED lamp before feeding (**turn on time**) and switch it off again a certain time after feeding (**turn off time**). If the light is to be dimmed slowly, you can specify this with the **start-up duration**.

This function is used to improve the condition of the fish, so that the fish are attracted to feed with the help of the light and less food is lost.

9. Calibration

To calibrate the automatic feeder, select the menu item "**Calibration / Calibration point 1**". Collect the feed dispensed in 5 s, weigh it and enter the weighed feed quantity. Repeat this for the second calibration point (10 s). Afterwards the calculated feed mass appears when entering the feeding time.

Submenu Environment-based feeding

The settings for the respective additional functions are made in the sub-menu "**Environment-based feeding**":

- **Environment-based feeding**
  - **Sensor Plug**
  - **Low O2 protection**
  - **Air pressure**
  - **Min. Temperature**
  - **Max. Temperature**
  - **Temperature Correction**

A sensor value is required for various additional functions (e.g. O2 protection). In the Sensor plug menu, specify the sensor from which the sensor values are to be taken into account for the function.

Under "**Low O2 protection**" enter the oxygen saturation, under "**Air pressure**" the minimum air pressure under which no more feeding should take place. With the help of "**Min. Temperature**" and "**Max. Temperature**" you can define the temperature window in which feeding should take place. In the menu "**Temperature Correction**" you can store the temperature dependent feeding recommendations of the feed manufacturer.

Tip:

If you want to add oxygen before each feeding, select the output of the sensor control (i.e. the output of the solenoid valve or aerator) and select "timed operation" as an additional function. Under "timed operation" set the mode "output coupling", so that you can set the output port to be controlled (i.e. the feeder plug), the pre and post time.

First of all, the **regulation period** should determine the (day) time window in which feeding should take place. For this purpose, enter the start and stop time.

Submenu Feeding Time

Determine the respective **feeding times**:

- **Feeding time**
  - **Modes**
    - **Off**
    - **Timer Table**
    - **Interval Duration**
    - **Multi Interval**
    - **Interval Period**

Here you can either feed at a fixed interval ("**Interval Duration**", e.g. every hour for 15 s each, "**Multi Interval**", e.g. between 8 a.m. and 12 p.m. every 30 minutes for 15 s and between 1 p.m. and 6 p.m. every 45 minutes for 10 s)), at fixed times ("**Timer Table**", e.g. at 10 a.m., 11 a.m. and 3 p.m. for 5 s each). This control is similar to the function of the timer control function and is described in more detail there.

If the additional function "**Daily Feed Amount**" is activated, there are two different modes for the interval feeding function. If the mode "**Interval duration**" is activated, the "Interval period" is set. The "duration" of a feeding is then calculated from the stored calibration, the daily feeding quantity and the number of feedings (resulting from the control time and the interval period). If the mode "**Interval Period**" is activated, the "duration" of the feeding is set. Then the interval between feedings is calculated, see also under additional function "Daily Feed Amount" and "Daily Increase"..

The other menu items (Control Time, Output Signal, switch-on for, switch-off for, Plug Name, Hour meter) are identical to those for the other output functions.

Submenu Output Signal

In the sub-menu "Output signal", you can make settings for each output..

- **Output signal**
  - **Output strength**
  - **Start-up duration**
  - **Polarity**
  - **24 V Output**
  - **Min. level**
  - **Max. level**
  - **Alarm in**
  - **Sensor forwarding**

In the selection point "**Output strength**" you can specify for many functions which signal strength should be present when activated. This does not apply to functions which automatically control the signal strength, such as the Filter Motor function.

With the % value you can set the relative value of the output signal, which appears on all electrical outputs (24 V DC PWM, 0-10 V DC, 0-20 mA). Here, 100% corresponds to e.g. 24 V DC, 10 V and 20 mA, while 50% means a 50% reduction in power via pulse width modulation (PWM) on the 24 V DC output, 5 V on the signal output and 10 mA on the current output.

If you connect a 24 V DC consumer, find out whether this consumer (e.g. motor) is designed for PWM dimming.

By controlling the output signal, you can also use actuators such as pumps with **4-20mA** or **0-10V** input. A wiring diagram is included with each actuator cable ordered (type: AK-EI-5M-SC, art. no.: 3410).

The **Start-up duration** determines the time of the linear rise, i.e. the time the output needs to reach the maximum output signal. This can be used for example to control light.

The **polarity** determines whether voltage should be present in the activated state (Active high), as is usual, for example, with a normally closed solenoid valve for water replenishment, or whether voltage should always be present and the voltage should be interrupted in the active state (*Active low*), as is the case with normally open solenoid valves for oxygen supply.

The **24 V output** sets the mode of the 24V of the acutator. It can be **PWM Signal**, **On / Off** or **Power Supply**. In the mode PWM Signal, the output will be pwm dimmed according to the value of output strength. If you choose the mode On / Off, there will be 24V or 0V at

the the output. This could be use to switch an 0-10V actuator off. In the mode **Power Supply** the output will provide power for an actuator that is controlled via 0-10V.

If the output is switched off, the factory setting is for a level of 0 V PWM (PWM output), 0 V (0-10 V output) or 0 mA (0-20 mA output) at the output.

If you want to set a higher level here, you can do so under the menu item "**Min. level**". An example of an application for this would be pump control, since with some pumps the preset speed is switched at a signal of 0 V. If you set the minimum level to 10%, for example, the pump will not run at the preset speed when it is switched off.

With the "**Max. level**" (not availabe for every function) an upper limit can be set so that the full level (24V, 10V, 20mA) is not present when the output is switched on.

The actuator outputs OUT 1, OUT 2, OUT 4, OUT 5 and OUT 6 each have an input pin which can accept a signal. This can be e.g. a disturbance signal from a pump, which then triggers the alarm in the control unit. Under **Alarm in** you can select whether the alarm is high-active or low-active. For connection information please refer to the data sheet of the actuator cable.

Submenu Sensor Forwarding

The sensor forwarding function is used to transfer a sensor signal via 0-10V / 4-20mA signal to another system.

- **Sensor forwarding**
  - **Sensor plug**
  - **Min. sensor value**
  - **Max. sensor value**
  - **Standard signal**
    - **0-20mA , 0-10V**
    - **4-20mA, 2-10V**
    - **Individual**

To transmit the sensor signal, the sensor plug must first be selected. Then the "**Min. sensor value**" and the "**Max. sensor value**" can be set. 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). In the sub-menu standard signal you can select which voltage or which current should be output for "Min. sensor value" and "Max. sensor value".

0-20mA / 0-10V: For the "Min. sensor value" 0mA / 0V are output, for the "Max. sensor value" 20mA / 10V.

4-20mA / 2-10V: With "Min. sensor value" 4mA / 2V are output, with "Max. sensor value" 20mA / 10V.

Individual: Here the values for "Min. level" and "Max. level" apply.

The sensor transfer also works in the opposite way, i.e. that the "Max. sensor value" is greater than the "Min. sensor value". This can be used to control an oxygen proportional valve. The lower the sensor value, the higher the output signal and the valve will open further.

Submenu Switch on for

Even if the output is currently not turned on, you can activate the plug for a specified time. To do this, select "Switch on for" and specify the time for which the plug is to be activated.

Submenu Switch off for

If you want to deactivate the output for a certain time, enter the time for which the plug is to be deactivated here. This can be useful, for example, if feeding is to be paused while working on the system.

Submenu Plug name

You can also give the plug a name of up to 8 characters, which then appears in the SENECT Control App.

Submenu Hour meter

The display of the respective output shows the operating hours, i.e. the time during which the output is activated. You can set this value to 0 in the menu item "Hour meter".

Submenu sensor control

After selecting the "Sensor control" function, the sub-menu item of the same name appears:

- **Mode**
- **Control Parameters**
- **Sensor plug**
- **Start value**
- **Stop value**
- **Max. Duration**
- **Break time**
- **If error**
- **GroThermal**
- **Daily change**

Here you can set the desired **control parameter** (e.g. oxygen saturation, temperature, etc.) and the associated settings (**sensor plug**, **start and stop limits**, **max. control duration**, **break time** and the behaviour "**if error**").

If the start value is set lower than the stop value, e.g. if the water level falls below the start value, the control is activated. If the water level rises above the stop value again, the control stops. If both values are exchanged, the control is also in the opposite direction, as may be necessary, for example, to pump out a pump sump.

It is possible to add different, special modes to the sensor control:

- **Modus**
  - **Deactivate**
  - **Break time active**
  - **Break at System Start**
  - **Daily change**
  - **Setpoint control**

"**Max. duration**" and the "**Break time**" serve as protective measures. The "Max. duration" indicates how long the output may be switched on, the break time determines the interval. If a pause time of 1 hour and a max. duration of 30 minutes is set, the output is switched on every hour for max. 30 minutes. This can be useful, for example, to detect leaks while adding water.

The mode "Break at System Start" mode ensures that after a system start, the break time is waited for before the output is switched on for the first time. If there is a frequent power failure, this mode can ensure that not too much water is added, for example.

If GroThermal is selected as control parameter, a Temperature Sensor Duo (Art. 2501) is required. In the menu item GroThermal the heat pump control can be configured:

- **GroThermal**
  - **Max. Temperature Difference**
  - **Duration Average**

The "**Max. temperature difference**" indicates by how many °C above the average temperature heating is allowed. "**Duration Average**" sets the number of days over which the air temperature should be averaged, e.g. 14 days → the average air temperature of the last 14 days is calculated. With the help of this function, a slow increase (in spring) and decrease (in autumn) of the pond temperature can be achieved.

With the "**Daily change**" mode, the start and stop value can be automatically changed daily. This allows, for example, the temperature to be lowered or raised automatically, e.g. by 0.1°C every day.

The mode **setpoint control** offers the possibility to do a header tank control (see AppNote 22002). The controller will try to keep the water level set in **Setpoint** by controlling a 0-10V pump. The parameter **Tolerance/Direction** defines the direction (positive value = increasing the 0-10V to reach the setpoint, negative value = decreasing the 0-10V signal to reach the setpoint) and the tolerance. If the sensor value is in the range of **Setpoint** + **Tolerance**, the output signal will be not changed. Use a positive value of **Tolerance/Direction** if you want to fill a tank and a negative value if you want to empty the tank. The parameter **Break Time** allows to set a delay until the output signal will be changed. The output signal will be changed in steps by 0,1%, so with a delay of 1 second, the output signal will increase / decrease every 10 seconds by 1 %.

Example: Regulation of the oxygen level

In this example, the aim is to control the oxygen content to a value of over 90% with a solenoid valve that is opened when no current is applied. First of all, in "**Output signal**", set "**Polarity**" to "**Low active**" as this is a solenoid valve that is open when no current is applied. The second step is to activate the "**sensor control**" function on the output to which the solenoid valve is connected. In the "Sensor control" menu, select "**O2 % a.s.**" as the control parameter. Select the sensor which is to be used for the control as the "plug". The **start value** is 90% and the **stop value** is 95%. Please set a plausible value for the protective measures "**break time**" and "**maximum duration**". These depend on the system used.

Submenu Time Controlled

The settings for time control can be made using various methods - either using fixed times (timer table), selected time intervals between activation (interval mode, multi-interval) or depending on another time-controlled output (e.g. add O2 before feeding). In addition, it is possible to change the start and stop time (control time of the output) daily (daylight mode) in order to simulate an annual cycle, for example, when controlling LEDs.

- **Mode**
  - **Timer Table**
  - **Interval Duration**
  - **Output Coupling**
  - **Daylight Mode**
  - **Multi Interval**
- **Timer Table**
- **Interval Mode**
- **Output Coupling**
- **Daylight Mode**
- **Multi Interval**

- Timer Table

In the timer table you can set the start time and the duration of each activation. By confirming the menu item "New entry", new entries can be created. Your entries are automatically sorted in chronological order. You can delete an entry by pressing the arrow keys ↑ and ↓. Select the desired entry and then press the arrow key ➔ remove from the list.

- Interval

The activation can also be controlled in intervals. In this case, the **duration** of the individual active phases (e.g. switch on for 5 min) is first specified. The interval time determines the time interval between the start times of the intervals (e.g. at 1 hour the water replenishment is started at 0:00, 1:00 2:00 etc.).

Note: If the seconds of the interval time are used, the maximum interval time is 2 hours.

- Multi-Interval

If you want to set different intervals at different times, this can be done under the respective phases with the Multi-interval setting. This is an interval control in a defined time window, e.g. from 7 to 9 o'clock every 10 min for 25 s each. There are 4 phases available.

- Output Coupling

If the output is to be switched as a function of the time of another plug, select "Output coupling" as the mode and select the plug under the newly appearing sub-menu according to which the timing of this output is to be controlled. With the turn time you determine how long before the other plug is switched on, this output should be activated. The turn-off time works in the same way. With the help of this function you can, for example, trigger an action before feeding.

Note: Output coupling only works with coupled outputs that have a time function.

- Daylight Mode

If the output is to be activated for a certain period of time longer or shorter every day, you can set in daylight mode by how long the control time (start and stop time) is to be extended (positive value, e.g. + 1 minute per day) or shortened (negative value, e.g. -2 minutes per day) per day. The daylight mode refers **only** to the control time of the output.

Menu WLAN

Further tips and assistance on the subject of WLAN networking of SENECT Control units can be found in our wiki at wiki.senect.de

- **WLAN**
  - **Info**
  - **WLAN Configuration**
  - **Start Update**
  - **Modules Update**
  - **Port number**
  - **DHCP**
  - **WLAN Reset**

Submenu Info

Here you can view information about the WLAN connection of your SENECT Control unit.

SSID: WLAN network names

Signal: Strength of the connection (the strength of the connection should generally be between -20 dB (strong) and -70 dB (weaker)). Less than -80dB is weak, below -90dB is very bad.

IP: IP address of the control unit

MAC: Mac address of the control unit

Submenu WLAN Configuration

Note: Remote access via dynamic DNS and port sharing is only possible with an Internet connection with IPv4 address. With DS-Lite connections, additional devices (e.g. FIP-Box from feste-ip.net) are required to implement remote access.

If you want to integrate your SENECT control into an existing WLAN network, you need a Windows (7 and higher), Android or iOS-compatible terminal device on which the **SENECT Control App** is installed.

The SENECT App is available from the Google Playstore® or the Apple App Store®. You can also find a link to download the App at www.senect.de/app.

Figure 3: QR code for the link to the SENECT Control App in the Apple Store.

Figure 2: QR code for the link to the SENECT Control App in the Google Playstore.

Have the name of your WLAN network (SSID name) and the WLAN password ready.

Establishing the WLAN connection of the control unit (App mode)

To configure the WLAN, the app must be given location authorisation. This is necessary so that the app can check whether the smartphone etc. is connected to the Senect_AP network. Furthermore, the location functionality must be activated.

1. Select "WLAN" / "WLAN configuration" in the menu and confirm the start of the configuration mode with "Yes" or select App mode and confirm with "Yes" The SENECT control unit now functions as an access point for conveniently configuring the WLAN settings via smartphone / tablet or PC. The display of the control unit shows "Control unit ready for configuration".
2. Select the network "SENECT_AP" in the WLAN settings on your smartphone or tablet. This will connect you directly to the control unit. The display of the control unit now shows "Device connected to control unit".
3. Open the SENECT Control App and select the "**Settings**" button. Select "Transfer WLAN settings" here.
4. Select the WLAN network (field SSID Name) to which you want to connect your control unit and enter the corresponding WLAN password. Also select the authentication type (usually WEP2) and the DNS/DHCP settings (usually ON) and press "Transfer settings to control unit". The display of the control unit now shows "Receive data. Connect to network". The WLAN settings are now transferred to the control unit.

5. Check the connection of the SENECT® controller with the WLAN network and the connection strength at the WLAN symbol to the left of the time display.

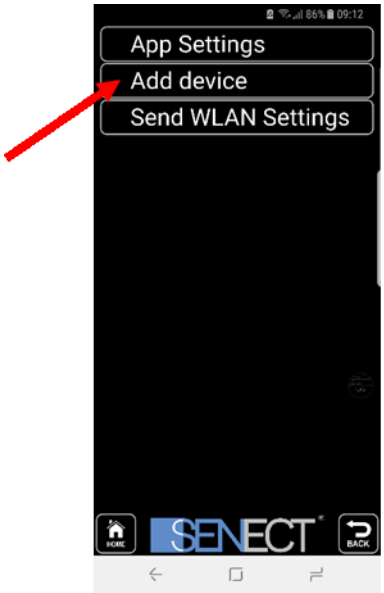
Tip: Have a look at our How-To #1: Connecting the Senect Control unit with a wifi network

Establishing the WLAN connection of the control unit (WPS mode)

If your router has a WPS function, pressing the WPS key (typically longer than 3 s) on the router and selecting **Menu / WLAN/ WLAN Configuration / WPS Mode** will establish a direct connection between the router and your control unit, in which the necessary WLAN settings are transmitted directly. Please note that the router only remains in WPS mode for 2 min.

How to add a control unit in the App

1. Select "Add device" in the settings to add a new device (control unit) to the list of your app
2. Now give the control unit a freely selectable name. If you check the box "Save name to device?", this **name** will be used as the device name.
3. Next, enter the **IP address** of your control unit. You can find this in the WLAN-Infos (Shortcut: GRAPH, 🡐, 🡐).



4. If you want to access the control unit from outside (Dynamic DNS required), enter the DynDNS address of your router here. This can usually only be done after successful setup in your router (see below).
5. Also enter the correct PIN code (0000 at delivery). If you want to give this device (Smartphone, Tablet, PC) read-only access, enter the read-only PIN here (Menu/System Settings/Read-only PIN).
6. With **Add device**, the app establishes the connection to the control unit and you can now also view the values via the terminal device.

If you also want **access outside your own WLAN network** (full Internet capability) with the SENECT Control App, you must set up a DynDNS connection. This varies from router to router, but basically the following 3 steps are necessary:

1. Activate DynDNS account (e.g. register with MyFritz! or register and activate DynDNS.org)
2. Enable control with port in router (Port forwarding)
3. Communicate port number and DynDNS address to the control via the SENECT Control App.

Instead of port sharing, access can also be via VPN. As this differs depending on the router used, this is described here as an example for a Fritz! box:

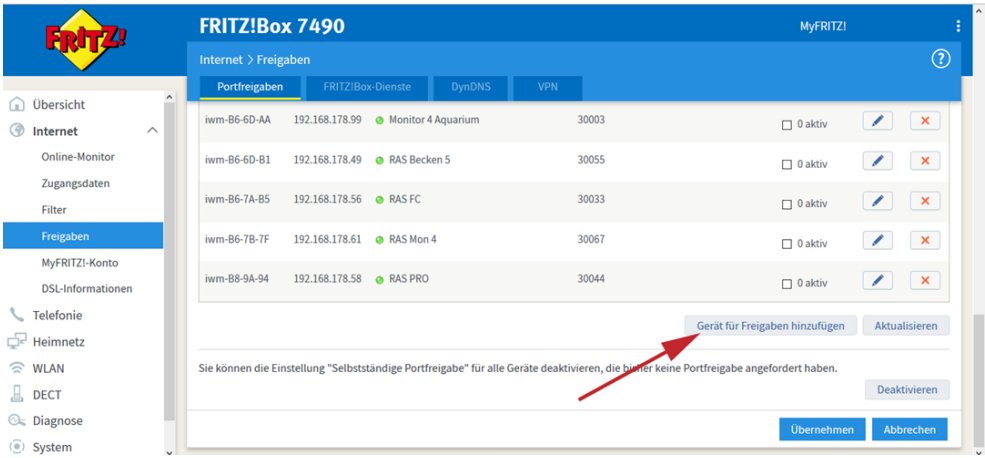
<u>Activate and unlock DynDNS accounts:</u>

1. Enter "fritz.box" in the address bar of your browser to access the settings of your router. Log in with your password.
2. If you have not yet created a "MyFritz! account" with your Fritz! Box, set it up first (Menu option →"MyFritz! account") and activate the account.

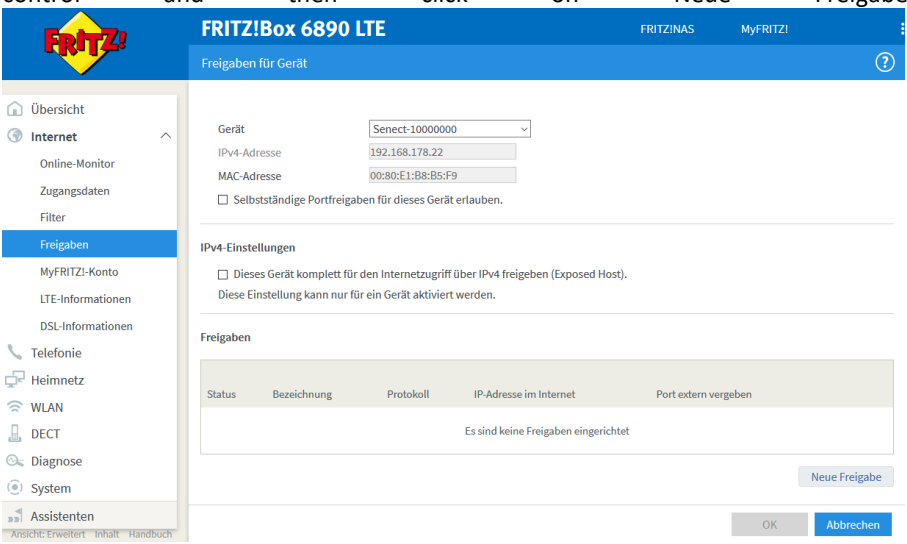
Alternatively, another DynDNS service can be activated (in the DynDNS tab).

Set up port sharing:

1. In the Fritz! Box under the menu item “Internet”, call up the “Freigeben” submenu and click on “Gerät für Freigaben hinzufügen”



2. Select the SENECT control for device or manually enter the IPv4 address of the SENECT control and then click on "Neue Freigabe":



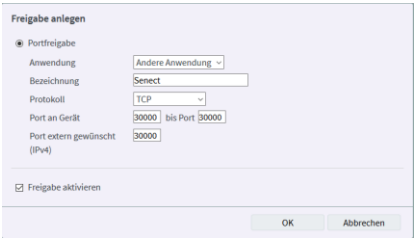
3. Make the following settings:

   a. Application: Select "Andere Anwendung"

   b. Bezeichnung: Choose your own name

   c. Protocol: "TCP"

   d. Port on device, port externally required: Port of the control unit. The port can be changed in the control unit in the menu item "WLAN"→ "Port Number"



If all settings are correct, save the settings with OK. Then confirm again with OK and save the port release with "Apply".

<u>Transmitting the DynDNS address to the control unit</u>

If you have already connected the control unit to the app, you can interrupt the connection by clicking on the check mark (left) and the "Settings" icon will reappear. If you have not yet connected the control unit to the app, click on the "+" in the top right corner.

Now enter the address of your account as already described in "DynDNS Address of your account". You will find this address in the settings of your Fritz!Box. Confirm this with "Add control unit".

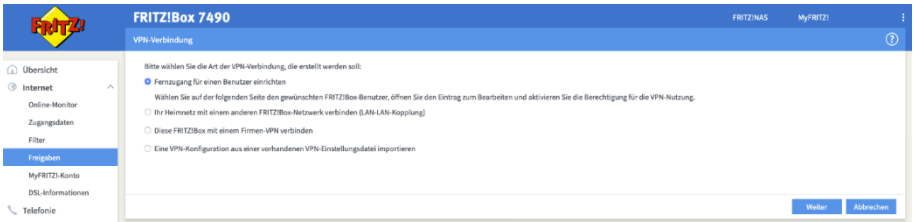
Now check the connection in your SENECT Control App - even if you are not connected to your WLAN (e.g. via mobile data)

For security reasons you should change the default PIN and port number of the control unit!

VPN access via Fritz!Box

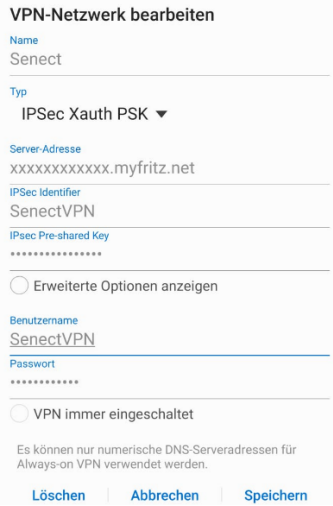
You can also access your Senect device via a VPN (Virtual Private Network):

1. In the Fritz!Box, open the sub-menu "VPN" under the menu item "Internet" and click on "Add VPN connection"
2. Select the item "Set up remote access for a user" and click on next



3. Add a new user ("Add User") or edit an existing user
4. Select "VPN" for permissions and create / update the user
5. In the menu item "Internet", open the submenu "VPN" and the user is listed. With a click on VPN settings you will get the settings for your Android or iOS device

6. Enter "VPN" in the search in the settings of your Android or iOS device and add a VPN profile



7. Activate VPN outside your network to access your Senect device

Submenu Start update

If the update icon appears in the action bar, a new update is available for your control unit. The update is automatically downloaded when an Internet connection is available, but not yet installed. With "Start update" you install the new firmware. Do **not** switch off the control unit!

This menu item is only available if an update is available.

Submenu Port Number

Especially if you manage several SENECT Control units in a WLAN network, you need different ports. Here you can set the port number of the control unit.

Submenu DHCP Mode

In this menu item you can switch the use of DHCP on and off and make the necessary settings if necessary. You can make the following settings here:

- IP Adress

- Gateway

- DNS

- Subnetmask

Note: If the DHCP mode is activated / deactivated, the WLAN connection is reset and the control unit tries to connect to the WLAN again. Therefore, first enter the addresses (IP, gateway, DNS and subnet mask) and then select the appropriate mode.

Submenu WLAN Reset

If you want to delete the saved WLAN settings, select "WLAN Reset" and confirm the prompt with "Yes". Please note that the saved WLAN settings can only be deleted here and are not deleted when you select "Reset to factory settings" in the System Settings menu.

System Settings menu

Submenu Date & Time

In this menu item you can select the time and date.

If an Internet connection is available, your control unit can synchronise with an internet time server. You can do this under "Auto. Time" or set a time zone other than CET using UTC. To do this, enter the offset to GMT in the UTC submenu.

Submenu Language

English, French or German can be selected as language.

Alarm submenu

The following alarm settings are centrally available here:

- **Alarm**
  - **Alarm Recall**
  - **Alarm pause**
  - **Messages**
    - **Deactivate**
    - **Feeding skipped**
    - **Sensor cleaning**
    - **Daily test alarm**
    - **Abort sensor control**
    - **Sensor freezing**
  - **Sensor cleaning**
  - **Daily test alarm**

- Alarm Recall:

In the event of an alarm, you can be notified by push message and email. To resend this notification regularly - as long as the alarm case still exists - select the repetition period here, e.g. every 15 minutes.

- Alarm pause

If you want to suspend the alarm for a certain time, e.g. when maintenance work is being carried out, you can select the time for which the alarm is to be paused in this menu item.

- Messages

There are events that can trigger a notification. Here you can select the events for which you want a notification to be sent, e.g. feeding skipped.

  - Feeding skipped

A feeding has been skipped due to an emergency, e.g. low oxygen.

  - Abort sensor control

If the a sensor control is interrupted due to the break time, the controller will send a message if this mode is activated.

  - Sensor freezing

The controller watches the sensor values. If a sensor value is a long time unusal stable, the controller can send a push notification. A possible failure could be a sensor at air.

- Sensor cleaning

The controller can remind you to clean or calibrate the sensors. You can specify the interval in the submenu sensor cleaning.

- Daily test alarm

This message is used to check the alarm function daily. If this alarm is activated, a time can be set at which a test alarm is to be sent. This is used to check the functionality of the alarm function daily.

Submenu Factory settings

If the factory settings are to overwrite the changes made, you can do this in this menu item.

Submenu PIN

In this menu item you can enter the 4-digit numerical code required to unlock the SENECT control. Write down your PIN code and keep it safe.

This PIN also gives **full access to the settings and actions** via the SENECT Control App.

Submenu Read Only PIN

If you want to set up an access with the SENECT Control App that allows the user to **see only the data and receive alerts**, but not to change any settings, please select a number sequence here that differs from the "normal" PIN and connect the device to the App with it.

Submenu Device Information

The version number of the software and the serial number can be displayed with this menu item.

Submenu Backup Settings

To quickly switch between different settings or to save settings, you can save them as a backup. This saves all the parameters made in the control unit. You can save up to 3 different entries here and also assign names to them.

To save settings, first select the memory location (e.g. Backup 1). Under " **Backup Name**", you can give these settings an individual name (e.g. "Factory", "Summer"). Confirm "**Save Backup**" with "**Yes**". To reload the saved settings, select "**Load Backup**" and confirm this with "**Yes**".

Extension options for your SENECT control

All the expansion options listed here are not included in the scope of delivery of your SENECT Control unit. For a detailed list and more information about expansion options, please visit www.senect.de or www.produkte.senect.de . Some examples of extensions are presented here. Please refer to the respective instructions for use of the extensions.

Connection of sensors

Your SENECT Control unit can measure many water quality parameters by connecting SENECT sensors. If an actuator is switched in addition to the respective sensor, the respective parameter can be controlled. A typical application is the control of dissolved oxygen. For this purpose, the oxygen sensor O2S (Art. No.: 2100) is used, for example with a solenoid valve O2 M7, to introduce gaseous oxygen into the fish breeding tanks through outflow valves. Please note that only level sensors and a temperature sensor can be connected to the FILTER|CONTROL.

Connection of a magnetic valve for water replenishment

In order to keep the water level in the pond or basin constant and thus also to operate filters hydraulically in an optimal way, the SENECT control unit can be used in combination with a level probe (PS-300-MA or EPS-250-MA) in the pond / basin / prechamber and a SENECT solenoid valve M12 (MVW-M12-SC). To do this, connect the level probe to plug SENSOR 2 and the magnetic valve to plug OUT 2.

Connection of further level probes

In order to increase the reliability of the drum filter system and to take into account water level changes in the system, we recommend the use of a second level probe / screw-in level sensor in the filter.

If the first level sensor is located in the rear filter chamber, the second level sensor must be installed in the prechamber. If the first sensor is in the prechamber, the second level sensor must be installed in the rear chamber. By using two level sensors, the **water level difference** between the two sensors is used to detect the degree of contamination of the filter fabric. This makes the system less susceptible to water level fluctuations of the pond system and reduces the water consumption of the system.

Troubleshooting: What to do if...

… the message "Cover switch open" appears

In this case either the cover is really open or the cable is not connected. If no cover switch is integrated on your filter, you can deactivate this function in the menu (Filter settings / Extras / Cover switch).

... the measured values of the level probe fluctuate greatly:

If this is the case, it is usually due to the fact that the water level sensor is exposed to the flow and thus not only measures the water level but also the flow. Please select an area with as little flow as possible (e.g. in the corners of the filter chamber) for the location of your level probe.

...there are long-term changes in the measured values of the level probe:

If the water level measurement changes over several days in the range of 5 to 15 cm, it is likely that the capillary of the level probe has been squeezed. In this case, there can no longer be a pressure equalisation with the atmosphere and the fluctuations in air pressure are transferred to the measurement of the water level. If the level changes depending on the air pressure, please check if the cable of the level probe is squeezed and loosen the pressure points if necessary.

...the cleaning stops after a short time:

If this is the case, it is probable that the overcurrent fuse has tripped and therefore cleaning is interrupted. This can be seen in the history (GRAPH key) by the entry "Drive Error". The SENECT® Control unit measures the current required to operate the filter motor during each cleaning process. If this current is too high, the SENECT® Control unit interrupts the cleaning process and thus protects against damage. Check the filter motor and also the drum or filter belt to determine the possible cause of this fault.

...you do not find the right help here:

Visit our wiki at http://wiki.senect.de . If you cannot find help here either, your dealer or our technical support will be happy to answer your questions. You can find the contact details on our homepage www.senect.de under Contact

Technical data

AQUACULTURE|CONTROL and FILTER|CONTROL

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, FC-A1-333-150) or 280 W (AQC-A1-xx3-300, FC-A1-333-300)
Output Power **230 V AC**	230 V Output 1 / Spraypump max. 1800 W 230 V Output 2 / UVC / Motor max. 450 W 230 V Output 3 / Circulation pump max. 900 W
Additional alarm-output	1x potential-free normally open contact (brown (pin 1) to white (pin 2)), max. 230 V/1 A 1x potential-free normally closed contact (black (pin 4) to blue (pin 3)), max. 230 V/1 A
Power consumption*	< 8 W (AQC-A1-xx3-150, FC-A1-333-150) < 18 W (AQC-A1-xx3-300, FC-A1-333-300)
Temperature range	0°C to +40°C
Ingress protection	IP 54
Data connectivity	2,4 GHz WLAN, remote access via dynamic DNS, port forwarding and IPv4

SENECT|ONE, SENECT|TWO, MONITOR|FOUR

Dimensions	**191x 140x 92mm**
Cable length	2,7 m
Voltage	230 V AC / 50 Hz bzw. 24VDC
Output power	Max. 12 W für OUT 1 und OUT 2, max. 36 W für OUT 3
Power consumption*	< 8 W
Temperature range	0°C bis +40°C
Ingress protection	IP 54
Data connectivity	2,4 GHz WLAN, Fernzugriff via Dynamic DNS, Portweiterleitung und IPv4

* The power consumption refers to the energy consumption of the SENECT® control unit without connected consumers

Information on correct disposal

Your device is packaged upon delivery. Please dispose of it properly.

Do not dispose of the product in normal household waste at the end of its life. Ask about the possibilities of professional disposal. Alternatively, SENECT GmbH & Co. KG will also take care of the disposal. You can send your product to us by post or bring it directly to us (SENECT GmbH & Co. KG, An 44 – Nr. 11, D-76829 Landau).

The SENECT GmbH & Co. KG is a member of the Stiftung Elektro-Altgeräte Register and for the SENECT® products a disposal agreement was made (WEEE-Reg.-Nr.: DE37193510).

Warranty

When you receive your SENECT Control unit, please check that all parts supplied are complete and in working order. If you have any complaints, please contact us immediately, preferably by email (info@senect.de). Please fill out the RMA form (https://senect.de/kontakt/RMA-Formular.pdf) and describe your request as precisely as possible so that we can offer you a solution as soon as possible.

The following information is essential for proper processing:

1. date of purchase and dealer
2. exact description of the error or defect
3. information on the operation of the installation (type of application (e.g. pond, indoor pool, etc.), operating principle (gravity or pumped system), type of filter
4. your contact details

The General Terms and Conditions apply, which can be viewed on the website www.senect.de/AGBs . The SENECT products have a 1 year manufacturer's warranty and a 2 year warranty.

Notes

Notes