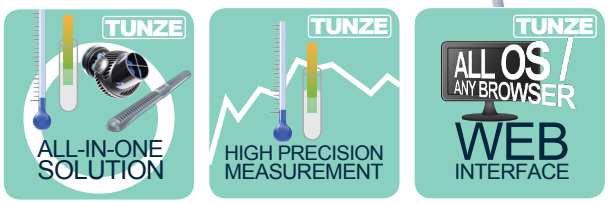
TUNZE

High Tech Aquarium Ecology



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Instructions for use

English

SmartController 7000

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High Tech Aquarium Ecology

SmartController 7000

General information

The TUNZE® SmartController 7000 (1) combines all important functions needed to create natural conditions within the aquarium. It is able to control all Turbelle® electronic (2). In addition, it also controls TUNZE® LEDs 8850 (3), CO_2 valves (4), as well as switching sockets (5), for example, for 230 V valves or ozone devices and power outlets for the timed on-switching of lights. The Moonlight Turbelle® 7097.050 (6) can also be controlled by the SmartController 7000 according to the cycle. In addition, it measures and regulates the temperature, the pH value and Redox values. The settings can be easily performed through a web interface with any WiFi-enabled device which uses a web browser. But even without WiFi it is possible to quickly and easily perform the basic settings via the touch panel.

Scope of delivery

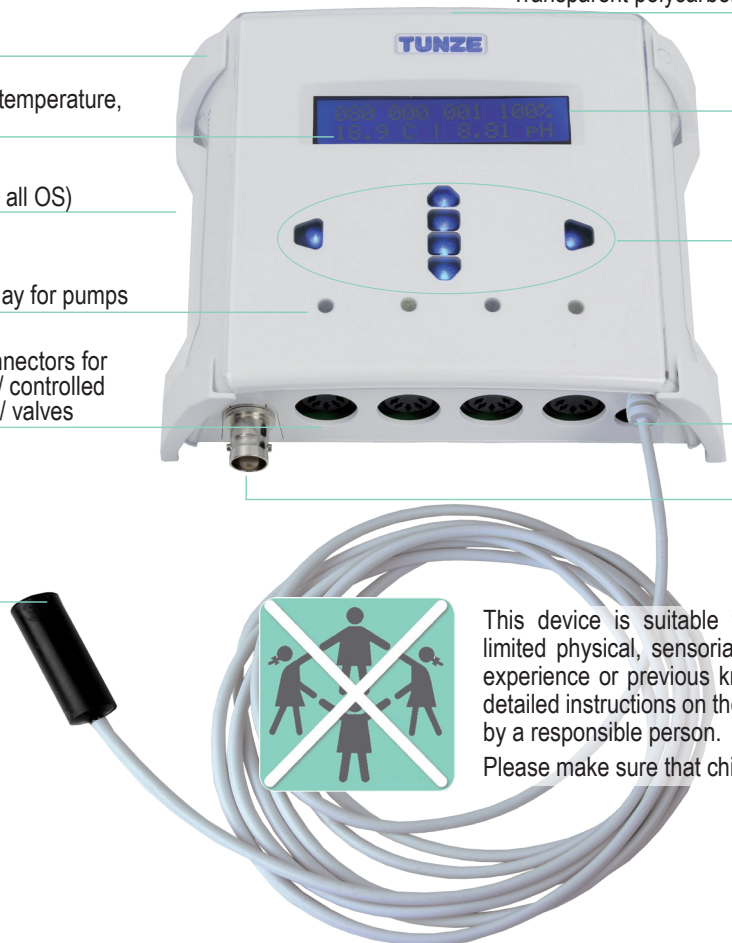
- SmartController 7000
- Temperature probe
- 4 control outputs with 4 connection cables each with a length of 1.2 m (47.2 in.)
- Mounting set

Suitable for devices with Wi-Fi and browser.

Dimensions without mount (L x W x H):
133 x 33 x 116 mm (5.2 x 1.2 x 4.5 in.)

Up to 8 pumps or 8 LED 8850 lights are controlled with the separately available Y-cable 7090.300 (7) (not included in the scope of delivery!).

Ambient temperature: 0°- 45°C (32° - 113°F)



This device is suitable for users (including children) with limited physical, sensorial or mental abilities or without any experience or previous knowledge, if suitable supervision or detailed instructions on the operation of the device is provided by a responsible person.

Please make sure that children do not play with the device.

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Technical data

Measurement and control range

pH

with Controlled Power Socket 7070.120, with CO_2 Valve Set 7070.200 and pH electrode 7070.110 or pH electrode 7070.100.
The measurement is temperature compensated.
Measurement and control range: pH 1.5 - 12
Hysteresis: pH +0.02 and -0.05 mV

mV

with Controlled Power Socket 7070.120,
with mV electrode 7055.100.
Measuring range: -700 - 700 mV
Control range: 0 - 500 mV
Hysteresis: 0 and 5 mV
Settings only possible via WiFi.

Temperature

with Controlled Power Socket 7070.120.
Temperature scale: °C or °F
Measurement and control range: 5 - 50°C (41 - 122°F)
Hysteresis: 0 to 0.3 °C (0.54°F)

Accessories

(1) 7040.120 Buffer solution for pH 7 and 9
(2) 7040.130 Buffer solution for pH 5 and 7
(3) 7075.150 Redox test solution +475 mV, 50 ml (1.7 oz.)
(4) 7040.200 Cleaning solution for electrodes
(5) 7070.300 pH / mV electrode holder
(6) 7070.100 pH electrode plastic
(7) 7070.110 pH electrode glass
(8) 7055.100 mV electrode glass
(9) 7070.200 CO_2 valve set
(10) 7070.120 Controlled Power Socket
(11) 7097.050 Moonlight Turbelle®
(12) 6105.500 Safety Connector

Spare parts

(13) 7000.400 Wall mount for SmartController 7000
(14) 5012.010 Power supply unit 12 V
(15) 7000.891 Protective cap Ø 12.6 x 9.6 mm (0.5 x 0.4 in.)

Delivery state

Before each connecting/disconnecting of the connecting cables to a Turbelle® pump or TUNZE® LED 8850, always first disconnect the power supply from the mains socket and switch it off (14)!

The SmartController 7000 is supplied with 4 cables 7092.300 (15). One CO_2 valve (9) from the Valve Set 7070.200, one switching socket outlet 7070.120 (10), one TUNZE® LED 8850 (16) or one Turbelle® pump (17) can be connected to each cable.

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Switching socket / CO_2 valve

The switching socket (Controlled Power Socket) 7070.120 (1) and the CO_2 valve (2) from the CO_2 valve set 7070.200 each have a connection (a) for the SmartController 7000 (3) and a socket (b) for connecting additional TUNZE® LED 8850 (4) or a Turbelle® pump (5).

Therefore, without an additional cable a switching socket (1) or a valve (2) can be operated on a single socket / channel (c) of the SmartController 7000 (3) together with a TUNZE® LED 8850 (4) or together with a Turbelle® pump (5).

It is, however, **NOT** possible to connect a switching socket and a valve to a single socket / channel (c)!

When connecting a CO_2 bottle (6), ensure that the CO_2 valve (7) and the non-return valve (8) are correctly connected in the direction of the arrow (9).

Y-cable

With the Y-cable 7090.300 (10), a further device can be connected to a socket. Through this, two different devices can be simultaneously controlled on a single socket (c), for example, a Turbelle® pump and a TUNZE® LED 8850 (11). Alternatively, two pumps (12) or two LEDs 8850 (13) can also be operated on a single socket. With 4 Y-cables it is thus possible to connect 8 Turbelle® pumps or 8 TUNZE® LEDs 8850 to the SmartController 7000 (5).

Caution! When using a Y-cable it is only possible to connect identical dimming LED lights with the same voltage, for example, 2 x 8850.000 with 24 V (13a), or 2x 8810.000 / 8820.000 / 8830.000 with 12 V (13b). A combination of these two lamps will destroy the 12 V lamp!

Combinations

A switching socket or a valve can also be combined with a Y-cable. Therefore it is possible to control 3 different devices through a single socket.

Combinations:

(A) switching socket + Y-cable + pump + LED 8850

(B) switching socket or valve + Y-cable + 2 pumps or 2 LEDs 8850

If a switching socket or valves are connected to a socket together with pumps or LEDs 8850, make sure that the switching socket or the valve is always connected first, and then the pump or LED 8850 light only connected afterwards to the supplied connector sockets of the switching socket / valve.

Additional power supply for SmartController 7000 – Safety Connector

In case of a power failure, the SmartController no longer controls any output. If flow pumps are connected to a safety connector 6105.500 (14), the SmartController 7000 must also be connected to a safety connector (possibly same battery with 12 V).

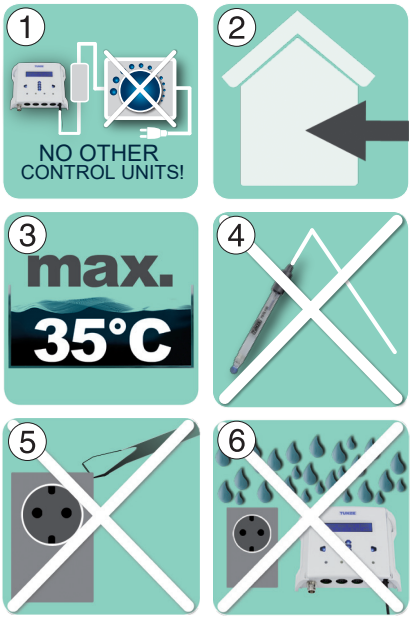
The Safety Connector enables a normal operation with the TUNZE® power supply unit (15), but in case of a power failure it will automatically switch over to a battery (16) or a DC power source. It should always be ensured that the battery is in an optimal condition, by using a commercially available battery charger.

Indoor use of lead starter batteries for cars is inadmissible!

Never connect the SmartController 7000 directly to a battery or other DC power source or without a fuse!

The maximum DC voltage is 18 volts (switch-off limit) - if exceeded, the electronics will be destroyed!

SmartController 7000



Safety instructions

Thee connection to third-party devices, for example, to a different power supply or switch is not allowed (1)!

Only use the SmartController 7000 in aquariums whose operation is also permitted outdoors (2).

Before putting the power supply into operation, please check whether the operating voltage of the appliance corresponds with the mains voltage.

Aquarium water temperature max. +35°C (95°F) (3).

Do not bend the probe cable and also do not use it to attach the probe (4).

Absolutely observe the chapter “Care and cleaning of the electrode”.

For the pH/CO_2 SmartController Set 7070.000: Water is constantly absorbs CO_2 and moves it into the hose in the direction of the valve. Therefore, unscrew the hose from the metering valve, if the CO_2 bottle is depleted or the control system is switched off.

The switching socket 7070.120 may only be opened only by an electrician (5).

The SmartController 7000 and power supply must be protected from moisture (6).

Keep the instruction manual in a safe place.

Safety instructions for the magnet holder of the pH / mV electrode holder

Very strong magnet! (7)

Keep the magnet holder out of reach of children!

Caution! Risk of injury! (8)

Do not bring the magnet halves together! The magnet halves cling together with a force of approx. 30 to 200 kg (66 to 441 lbs.), depending on the type of direct contact.

Only touch the magnetic parts on the sides with your hand. Never place the hand or the fingers between the contact surfaces (9)!

The magnets attracts metal parts and other magnets which are less than 10 cm (3.94 in.) away with great force! When handling the magnet, no metal parts, other magnets, blades or knives should be within a vicinity of 10 cm (3.94 in.) in order to avoid injuries.

Beware of magnetically sensitive items such as pacemakers, data carriers, credit cards and keys. Maintain a minimum distance of at least 30 cm (10.92 in.)!

When transporting the Magnet Holder, always use the supplied spacer adapter.

Heating above 50°C (122°F) will lead to the destruction of the magnet, or loss of the magnetic effect (10).

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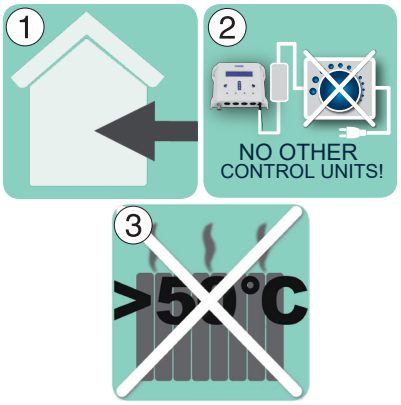

Safety instructions for TUNZE® power supply units

TUNZE® power supply units have not been designed for outdoor operation (1).

In order to prevent water damage, the power supply unit should be placed as far away from the aquarium as possible.

Operation is permitted only with a residual-current-operated circuit-breaker fitted, max. 30 mA.

Before working in the aquarium, please make sure that all electric units in use have been disconnected from the mains.

Do not repair a damaged mains cable – replace the unit completely.

The connection to devices, such as electronic switches or speed controllers, of other makes is not permissible (2)!

The SmartController 7000 on the pump cable is susceptible to water and may be destroyed in case of water damage!

The operation of the SmartController 7000 is permissible only with the original TUNZE® power supply unit.

Mount the power supply unit in a dry and well-ventilated position only.

Do not mount in the vicinity of heat sources (3).

Ambient temperature during operation: 0°C to +35°C (32°C to 95° F)

Ambient humidity during operation: 30% - 90%

Storage temperature: -25°C to +80° Celsius (-13°F to 176°F)

Storage humidity: 30% - 95%

Wall mounting of the SmartController

The SmartController 7000 can be mounted to smooth walls with the supplied adhesive strips, or be screwed to the wall. (Screws not included in the scope of delivery!)

A suitable wall must be dry and protected from splash water and moisture.

The SmartController 7000 may under no circumstances be attached above the Aquarium (4)!

Water from a pump connected to the SmartController 7000 could follow the cable and damage the device. To avoid this, we recommend forming a loop with the cable or placing the SmartController 7000 higher than the pump.

Observe the cable length of the devices because connecting cables may not be extended.

Several TUNZE® controllers can be placed densely side by side, and all cable outlets positioned at the bottom (5).

Route the cables in such a manner that no water can travel along them and penetrate into the controller!

SmartController 7000

Care and cleaning of the electrode

The accuracy of the pH or mV measurement depends on the cleaning condition of the electrode. For this reason, it should be treated with special care.

Never stick the electrode into the sand to test the pH or mV value in the ground. The sensitive glass sphere could be destroyed as a result, whereas the damage would be irreparable and the warranty would become void. (1).

During the operation, the electrode should be half immersed in water. Cable and screw connections must not come into contact with water.

The cable of the electrode should not be pinched or mechanically stressed.

A strong algae growth on the electrode will falsify the measured value. Please mount in position which is as dark as possible.

A dirty or algae-covered electrode may not be cleaned mechanically: the delicate glass membrane would be destroyed (2).

Cleaning in intervals of 1 - 3 months

The electrode should be cleaned to avoid faulty measurements. Please clean using the TUNZE® cleaning solution 7040.200 in intervals of 1 to 3 months.

Let the electrode soak in the cleaning solution for about 10 minutes (3).

Then rinse with very clean water (aqua dest.) and dry with very soft paper (4).

Service life of the electrode

If a clean electrode is properly stored, the self discharge (consumption) is lower than when it is used in measuring media. Therefore, the electrode tip should always be kept moist between the measurements, and preferably stored in a KCl solution. The electrode has a salt reservoir made of KCl (5) on the inside. This salt reservoir will be gradually consumed. If it is exhausted, there could be severe incorrect measurements and the electrode must be replaced.

If the electrode is exposed to the open for several hours, the membrane at the tip can dry out, resulting in a defect of the electrode.

The service life of the electrodes during continuous operation is approx. one to two years, whereas this time can usually be extended with good care and occasional measurements. A storage time of the mV or pH electrode for several months before first use only slightly shortens the service life, if the tip of the electrode remains in the protective cap with KCl solution and is kept moist. Exact specifications are thereby not possible here, because the lifetime depends on the respective usage.

The date of manufacture of the electrode is located on the outer side of the electrode packaging.

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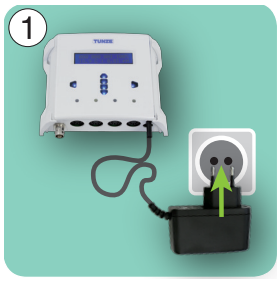
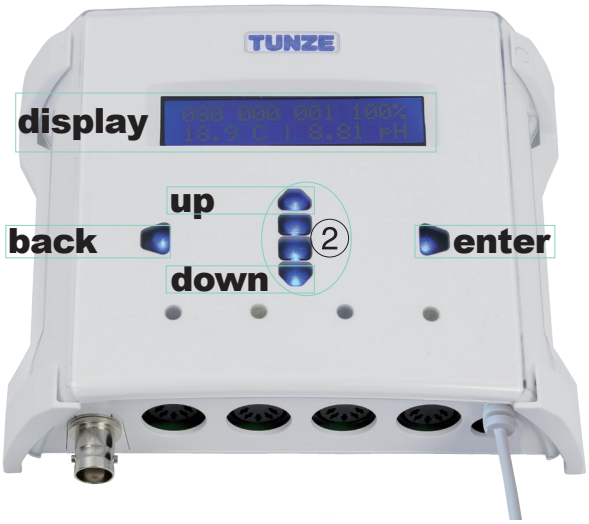


Basic settings with the touch panel — initial start-up

Connect the SmartController 7000 to the mains adapter 5012.010 as the power supply, and then connect to the power grid (1).

The SmartController 7000 can be quickly adjusted without a WiFi-capable device using the touch panel. This option is especially interesting for the SmartController 7000 as a pH/CO_2 controller (7070.000) or temperature controller (7028.000). Not all settings can be performed the touch panel. Some functions can only be performed through the web interface. The settings of the redox value are possible over WiFi.



Touch panel interface:

Press **enter** to get into the menu.

Press on **up**ward or **down**ward until “System” appears in the display.

Setting the time:
Press on **enter** again → “time” will appear in the display. Confirm with **enter**. Use the **up** / **down** keys to set the time. Save with **enter**.

Enabling the food timer:
Press **back** for 5 seconds. It also works if the parental lock is activated.

Select temperature scale:
Back to the menu, then **up**, then press **enter** again and choose between °Celsius and °Fahrenheit. Save with **enter**.

Select language:
Back to the menu, then **up**, then press **enter** again and choose between German and English. Save with **enter**.

Note: The language setting in the touch panel is independent from the language setting in the browser (WiFi).

Setting the date:
Back to the menu, then **up**ward → “date” will appear in the display. Confirm with **enter**. Set the date with the buttons **up** / **down**. Save with **enter**.

Parental lock:
Press **enter** and **back** simultaneously. After blinking twice, the middle LEDs (2) will extinguish and a simple touch protection will be enabled. Press **enter** and **back** simultaneously again to deactivate.

In case of a possible failure of the touch panel / display:
Activate the food-timer, then disable it again. Should obscure characters appear on the display, exit the menu by pressing the **back** button or wait for some time.

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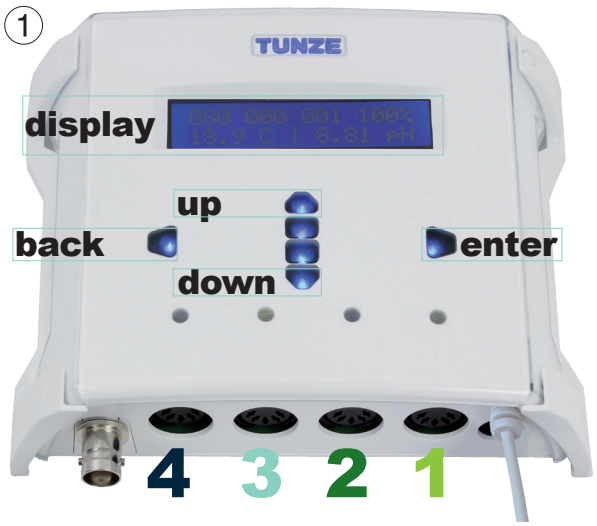

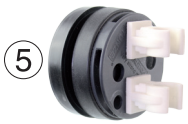

pH/CO_2 SmartController 7070.000

(setting using the touch panel)

Scope of delivery pH/CO_2-SmartController

(1) SmartController 7000

(2) pH electrode made of glass 7070.110

(3) CO_2 valve set 7070.200

(4) Buffer solution for pH 5 / 7 7040.130

(5) pH / mV electrode holder 7070.300

Adjust pH:

Press **enter** to get into the menu.

Press on **up**ward or **down**ward until “pH value” appears in the display.

Press on **enter** again → “pH control” will appear in the display.

When you activate the pH control, the CO_2 valve 7070.200 (3) or the switching socket (6) 7070.120 can be connected to **channel 4** (leftmost socket), and through this the pH value can be regulated.

pH set-point value:

Press on **up**ward or **down**ward until “pH set-point value” appears in the display. The set-point can be set as “Maximum pH”. Save with **enter**.

Adjust pH 5 / 7 calibration:

With **back**, the previous program step can be reached.

Press on **up**ward or **down**ward until “5 / 7 calibration” appears in the display.

When pressing **enter**, an automatic calibration will be performed with the pH buffer for pH 7 and pH 5. The second row of the display will then show “pH 5 + enter”.

First clean the electrode with a cleaning solution and wipe down, or let it drip off thoroughly.

Immerse the electrode in calibration solution 5 dive and then press **enter**.

The second row of the display will then show “please wait”. The calibration for the buffer solution 5 is completed, when the second line of the display shows “pH7 + enter”.

Initially rinse the electrode with as pure as possible water and wipe down.

Afterwards, immerse the electrode in calibration solution 7 and press **enter**.

The display will again show “please wait”. The calibration for both buffer solutions is completed, when the display reads “completed”!

Perform the same procedure with the “7 / 9 calibration” for the pH buffer 7 and 9.

When the SmartController 7000 is connected to a smart phone or a PC, the history of the pH value of the last 22 hours will be depicted in a graphic.

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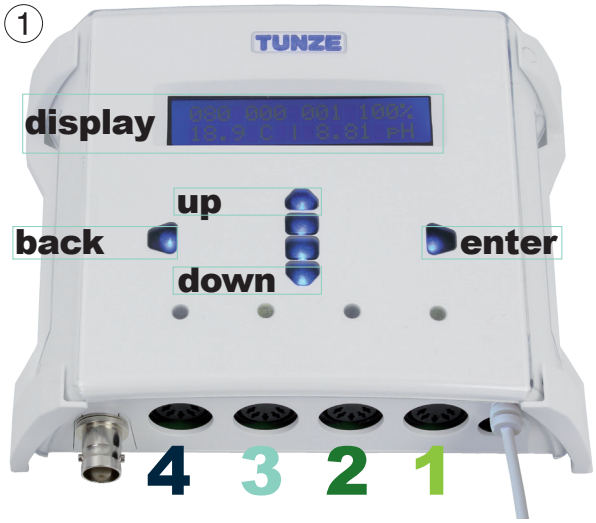

Temperature SmartController 7028.000

(setting using the touch panel)

For this you need:

(1) SmartController 7000

(2) Controlled Power Socket 7070.120

Adjust temperature control:

Press **enter** to get into the menu.

Press on **up**ward or **down**ward until "Temperature" appears in the display.

Press on **enter** again → "Temp. control" will appear in the display.

Press **enter** again, press on **up**ward or **down**ward and then **enter** press again to turn the temperature control on or off again.

With a renewed pressure on **up**ward "Cooling temp." to cool or "Heating temp." for heating will be selected.

By pressing on **enter**, it is now possible to directly specify the respective set-point temperature. It can be set with **up** or **down**, and stored with **enter**.

Devices for cooling, e.g. fans or refrigeration units, must be connected to a switching socket 7070.120 (2) on **channel 3** (second socket from the left).

Devices for heating must be connected to an (additional) switching socket 7070.120 (2) on **channel 2** (second socket from the right). However, please observe: Do not exceed the maximum power rating of the switching sockets!

When the SmartController 7000 is connected to a smart phone or a PC, the history of the temperature of the last 22 hours will be depicted in a graphic.

Pumps, lights

(setting using the touch panel)

The settings for the Turbelle® pumps and TUNZE® lights can also be set with the touch panel in a similar manner as the temperature control. However, we recommend conducting the settings through a WiFi connection.

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Settings for smart phone, tablet or PC with WiFi

Integration of an existing WiFi network in the Access Point Mode

Connect the SmartController 7000 to the mains adapter 5012.010 as the power supply, and then connect to the power grid (1).

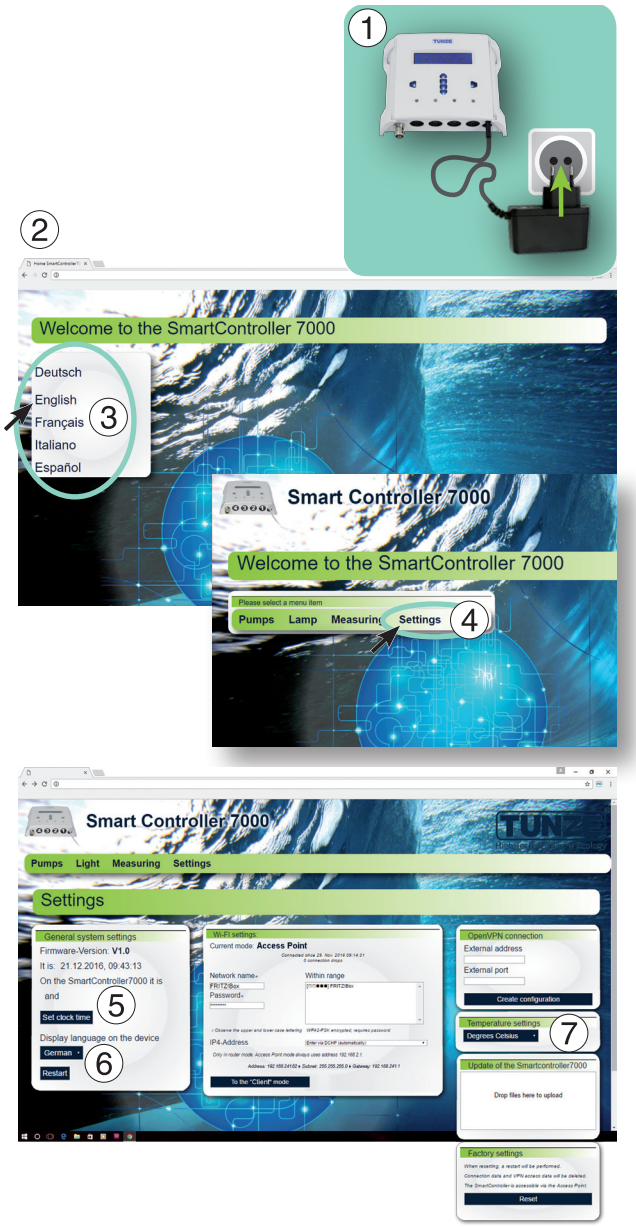
After inserting the mains plug, a hotspot connection with the network name **#smartcontroller_7000** will automatically be created in the SmartController 7000, to which a smart phone, tablet or computer with WiFi can easily connect to. The password for the WiFi connection is **smartcontroller7000**.

After the successful connection has been established, open the browser of the smart phone, tablet or PC, and enter the address **192.168.2.1**.

The website of the SmartController 7000 (2) will now open and allow the performance of settings (4).

The first connection can take several minutes!

First, select one of the available languages (3), then click on the “Settings” menu item (4).



“Settings” menu

Time and date (5), as well as the language are shown on the display of the SmartController 7000 (6), and the unit of temperature in °C or °F (7) can be set with the dark blue buttons in this menu.

Should a depiction in the browser present a problem, it might be wise to enter the address as trustworthy in the anti-virus software of the PC, because some anti-virus programs block JavaScript applications. This is also necessary if after opening the page, the window “Connection interrupted” is displayed.

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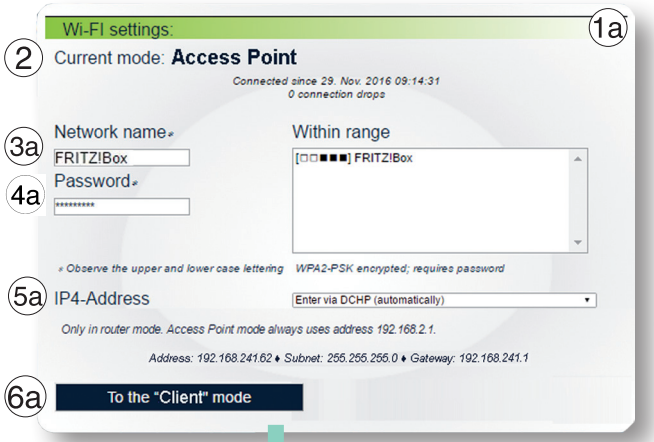
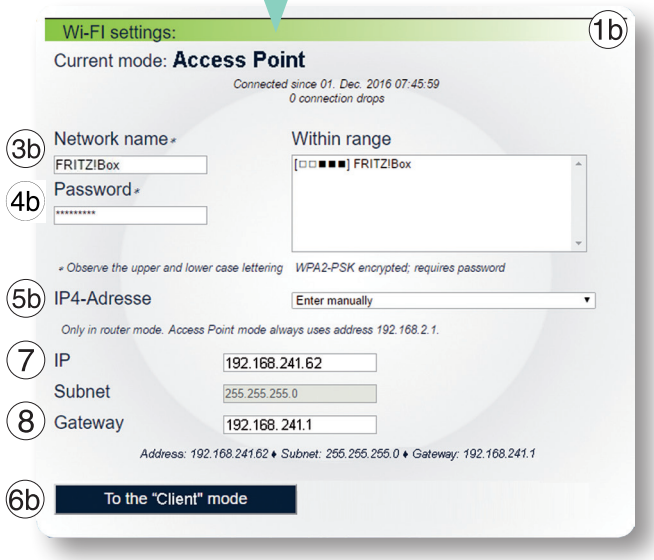




Integration into an existing WiFi network in the Client Mode

In order to create a connection to an existing network, the SmartController 7000 must first be connected as described in the chapter “Settings with smart phone, tablet, or PC with WiFi” as described on page 11. Select the menu item “Settings” (1). The default setting in the window “WiFi settings” (1a) is initially set to “Current mode: Access Point (2)”.

There are two ways to connect:

A. Make no changes in the field “Obtain IP4 address via DHCP (automatically)” (5a). Here, an IP address is automatically assigned to the SmartController 7000 from the external router. Subsequently, it can be queried from the existing router and, if necessary, permanently assigned to the SmartController 7000 in the router.

→ Enter the “network name” (SSID) (3a), and “Password” (4a) of your WiFi network, and click on “Client Mode” (6a). Now, the smart controller will be connected to your network. If necessary, make a bookmark entry for this address after the language selection.

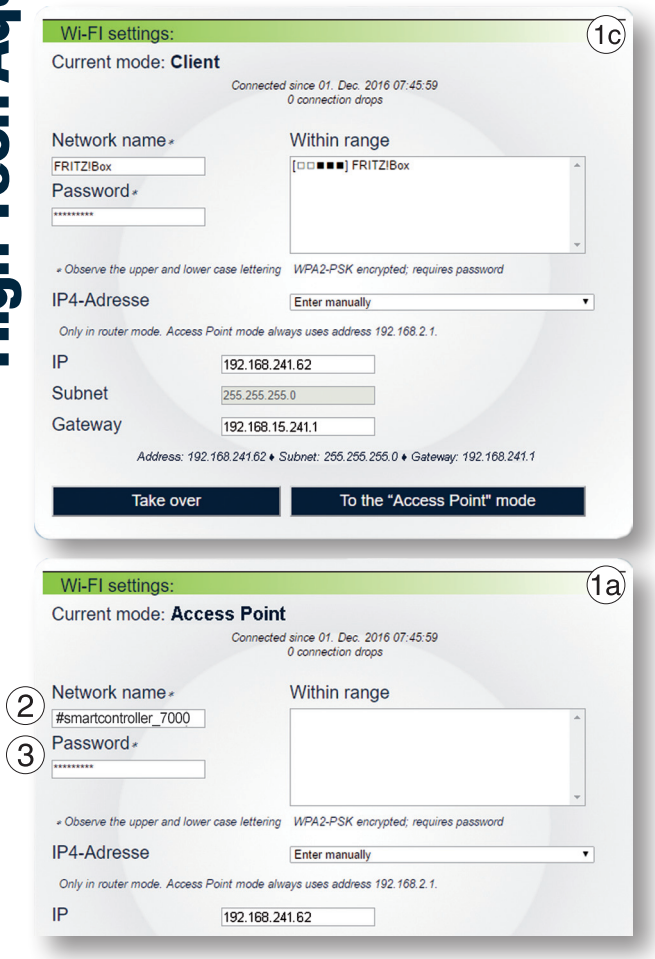
Should it not be possible to find the assigned IP address in the router of the network, the SmartController 7000 can be found on the network with the help of a utility software. If the Bonjour® service from Apple® is installed, the SmartController 7000 can be found by entering **smartcontroller.local/** in the browser. With Windows® and Apple® devices, this utility software can be downloaded from Apple® (for example, from https://support.apple.com/) on the Internet. The Bonjou® service will already be installed after the programs iTunes, QuickTime or the Safari browser has been installed.

With Android devices, a Bonjour® service (Bonjour® browser) must be installed as an App from the Playstore. With this application, the SmartController 7000 and the assigned IP address can possibly be found in a subdirectory (e.g. Workgroup). This address must be entered in your browser, in order to access the SmartController 7000.

B. Prerequisite: There is a known IP address from the router available on the network. In the field “IP4-Adresse” make changes in the field “Obtain via DHCP (automatically)” (5a) to “manual input” (5b) (1a → 1b).

→ enter the “network name” (SSID) (3b) and “Password” (4b) of the WiFi network. In the window, IP (7), enter the known free IP address and in the field “Gateway” (8) the address of the router (gateway). Afterwards click on “Client Mode” (6B). Now, the SmartController 7000 will be connected to your network.

SmartController 7000



By entering the assigned IP address in the browser, the SmartController 7000 will now be found from now on (1c). If necessary, make a bookmark entry for this address after the language selection. At the end, press “Take over”.

Reset of the Client Mode

If a connection to the specified network in Client Mode has not been found through the browser, then the assigned network should be switched off or SmartController 7000 switched on outside of this network.

If the SmartController 7000 is unable to successfully connect with the existing network in the Client Mode (1c), it will automatically attempt to connect after 60 seconds in the Access Point Mode (1a) with the network name **#smartcontroller_7000** (2) and the IP address **192.168.2.1** (3). A connection to the SmartController 7000 then be possible again as described in the chapter “Integration into an existing WiFi network in the Access Point Mode (see page 11).

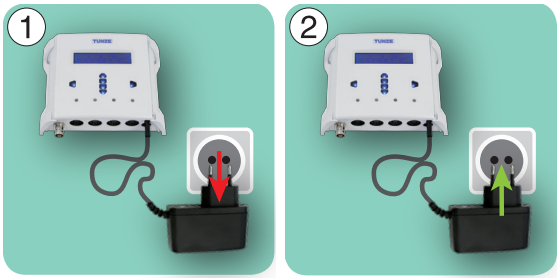
Note: If your access point is out of operation for a prolonged time due to maintenance work (max. 24 hours), your SmartController 7000 will automatically reconnect afterwards.

Important note in case of a faulty display

If the WiFi connection to the SmartController 7000 is interrupted and only partial information is visible in the browser, a reboot via the control button “New start” (4) in the menu “Settings” will usually be sufficient. If this page is no longer reachable, you can force a restart by pulling the mains plug of the SmartController 7000.
Older browsers on a tablet or PC don’t fully support the display of the browser window of the SmartController 7000. In this case, please install a current browser.

SmartController 7000

Connecting multiple SmartControllers in the Access Point Mode

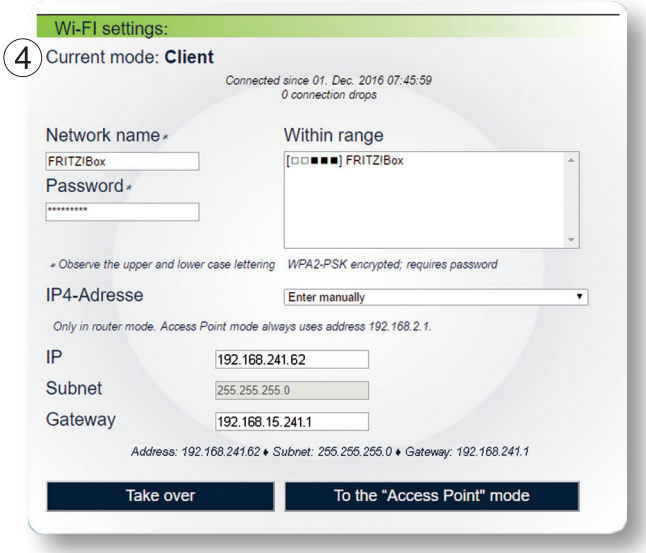


The first SmartController 7000 remains unplugged from the mains power grid (1) and only the second is put into operation by inserting the power plug (2). Now create a connection to the second SmartController 7000 as described in the chapter “Integration into an existing WiFi network in the Access Point Mode (see page 11), meaning a connection of your PC with the network name **#smartcontroller_7000** and with the password **smartcontroller7000**.

In the menu item “Settings” (3) the second device must then be switched to the Client Mode (4). Thereby, a different IP address is used, e.g. the IP address **192.168.2.2** can be used for the second device.

Before you confirm the setting for the Client Mode, the first SmartController 7000 must now also be switched on (2). It will then work as master.

For additional SmartControllers which are to be operated simultaneously in the Access Point Mode, the procedure is the same as with the second SmartController 7000. The last number in the IP address is then counted up by one. For the third device you can also select the IP address **192.168.2.3**.

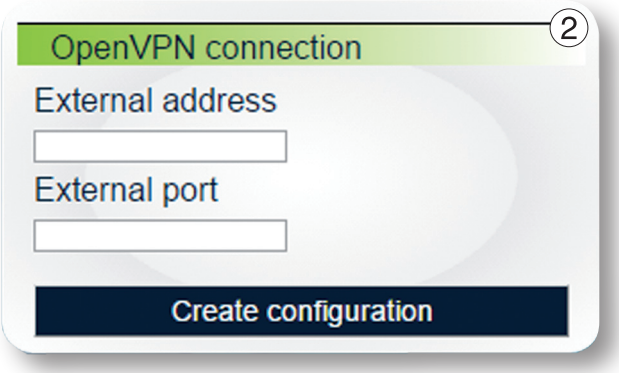


Connecting multiple SmartControllers in the Client Mode

The connection of additional devices is carried out exactly as described in the chapter “Integration into an existing WiFi network in the Client Mode (see page 12), but other devices are only recognized if the respective IP address was assigned in the local area network as described in point 1 and 2. The Bonjour® service will always only let you find a single SmartController 7000.

SmartController 7000

Access to the SmartController via the Internet (web interface)



The connection is made possible through the built-in OpenVPN server (2). To do this, the data of the port or a DynDNS must be entered on the page “Settings” (1). From this, a configuration file will be created which is then loaded onto the device, and imported into the OpenVPN program.

Afterwards, the incoming UDP traffic will be forwarded in the router to port 1194 of the SmartController 7000.

An example of such a VPN connection will be shown in a video which is available on our website www.tunze.com in the article SmartController 7000 (7000.000).

Caution!

Only turn on the control for temperature, pH or mV (see chapter “Measurement menu”, page 21), if a switching socket (Controlled Power Socket) (3) or a valve (4) is plugged in to the corresponding connector socket.

When directly connecting a pump to a socket (**channel 1-4**) (5) of the SmartController 7000 with the controller for a switching socket or a valve switched on, the pump will stop running.

If the pump was connected to the switching socket or the valve, the control of both devices will be possible.

TUNZE High Tech Aquarium Ecology

SmartController 7000

Menu “Pumps”

Pulse mode — wave motion simulation

The pulse operation generates biologically active current flow pulses (= wave motion). This simulates a natural wave motion just like in the ocean. The greater the difference between the specified pump performances, the greater the wave character of the current flow and the effect on the animals will be.

Up to four pumps can be connected directly to the SmartController 7000 (1). With Y-adapter cables 7090.300 (2) an expansion up to 8 pumps will be possible.

Connect the SmartController 7000 to the mains adapter 5012.010 as the power supply, and then connect to the power grid (3).

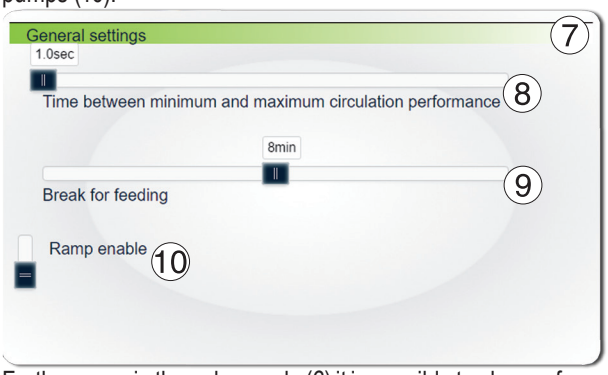
Open the SmartController 7000 page in the browser and select a language (4).

When you click on the menu item “Pumps” (5), the black button “Pulse mode” (6) will be displayed during the first opening.

Field “General settings” (7):

With the “Pulse mode” (6) button activated, the time between minimum and maximum circulation performance of the pumps (8) can be set here simultaneously for all 4 channels / pumps with the top regulator. This will generate an efficient wave motion simulation.

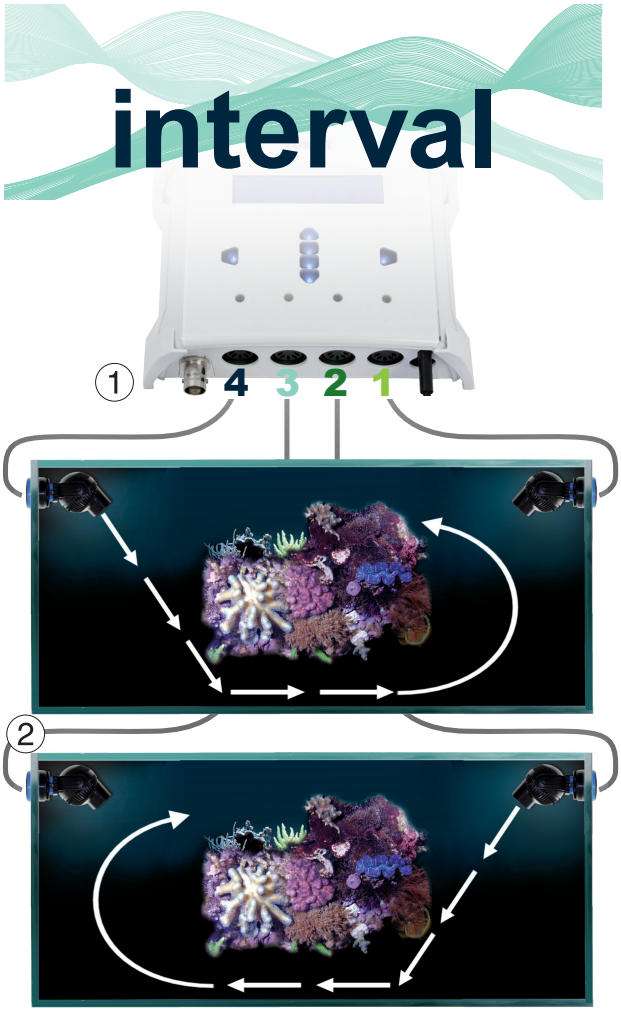
Additionally, it is possible to easily set the time frame of the feeding break (9) and the ramp for the smooth running of all pumps (10).



Furthermore, in the pulse mode (6) it is possible to also perform settings for the “Storm mode” (11), “Night mode” (12) and the setting of the pumps as “Wave generators” (13), as well as the separate adjustment of the circulation performance of the four pumps channels (14) (for this, see the chapter “Interval mode — high and low tide simulation”, page 17).

TUNZE High Tech Aquarium Ecology

SmartController 7000



Menu “Pumps”

Interval mode — high and low tide simulation

The interval operation between low tide (**channels 1-2**) and high tide (**channels 3-4**) (1) enables the creation of two circulation currents in the aquarium (2) The reef rock is regularly flooded from both sides, the sediments are washed away and the invertebrates exposed to current from all directions. We recommend setting the pump performances as equally as possible, in order to achieve the same circulation performance from both sides.

Connect the SmartController 7000 to the mains adapter 5012.010 as the power supply, and then connect to the power grid (3).

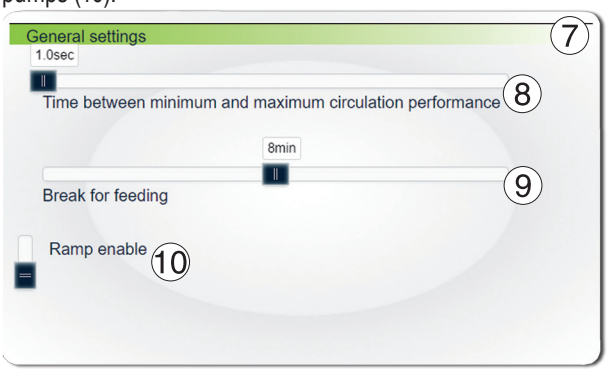
Open the SmartController 7000 page in the browser and select a language (4).

When you click on the menu item “Pumps” (5), the black button “Pulse mode” (6) will be displayed initially during the first opening. Click this black button and select “Interval Mode” (6b). The pumps will now be controlled alternately, for example, the right pump in the aquarium once and then the left pump once. On the SmartController 7000, the **channels 1-2** and **channels 3-4** will be controlled in an alternating cycle (1).

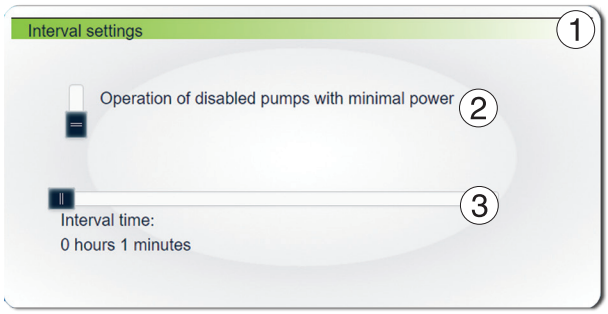
Field “General settings” (7):

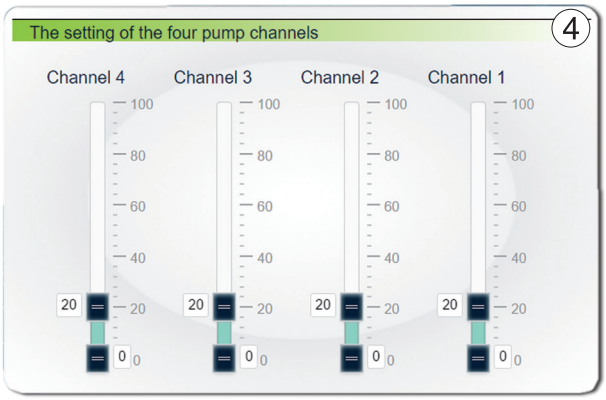
With the “Interval mode” (6) button activated, the time between minimum and maximum circulation performance of the pumps (8) can be set here simultaneously for all 4 channels / pumps with the top regulator. This will generate an efficient wave motion simulation.

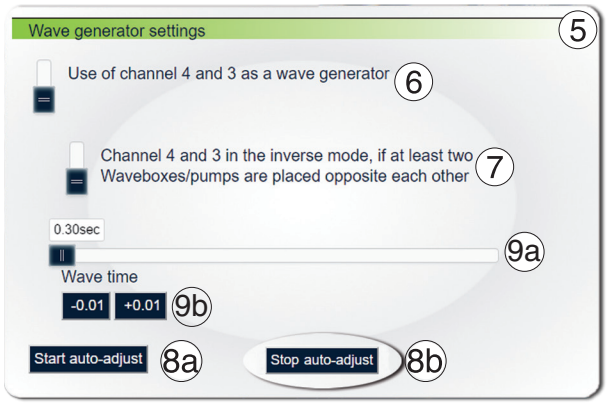
Additionally, it is possible to easily set the time frame of the feeding break (9) and the ramp for the smooth running of all pumps (10).



SmartController 7000







Field “Interval settings” (1):

Here, it is possible to continue the operation of the other non-controlled pumps with a minimum circulation performance with the help of the top regulator “Operation of deactivated pumps with minimal capacity” (2).

With the lower regulator “Interval time” (3) the time can be selected for the pump alternation from one minute up to 10 hours.

Field “Setting of the four pump channels” (4):

Here, the pump output can be individually adjusted with the regulator precisely as needed on each channel.

Field “Wave generator settings” (5):

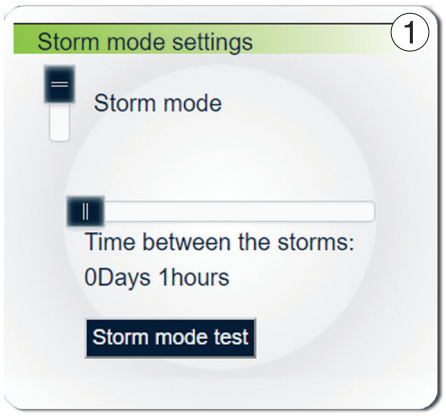
By moving the “Use of channel 3 and 4 as a wave generator” regulator (6) upwards, the function as wave generators (wave box principle) is assigned to the pumps or wave boxes on the **channels 3** and **4**.

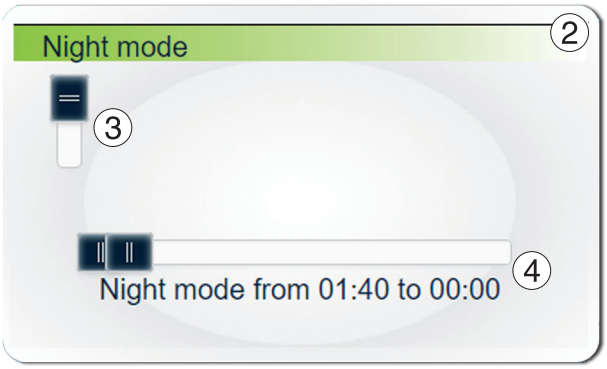
The **channels 3** and **4** can simultaneously be set to synchronous or alternating (asynchronously).
If the pumps / waveboxes are adjacent and they should be switched asynchronously, the function “Channel 4 and 3 in the inverse operation, if...” will be activated - the regulator is pushed upwards (7). Otherwise leave the regulator down.
Clicking on the “Auto-adjust start” (8a) button will enable an automatic search for detecting the optimal resonance frequency for the pumps / waveboxes in the aquarium. The pulsing will initially start with a cycle time of 0.3 seconds. Every 3 seconds it will then increase by a time of 0.01 up to a max. of 2.5 seconds. During this time, the aquarium should be closely observed. A water movement can be observed, once the resonant frequency is reached. Now press the function “Auto adjust stop” (8b).
The “wave time” can additionally be manually fine adjusted in ±0,01 second steps with a regulator (9a) or with two buttons (9b).

Caution!

If the “wave generator” mode is activated, the **channels 1** and **2** will remain in the “Interval” mode.

SmartController 7000





Field "Storm mode settings" (1):

Here, you can select a de-sedimentation of the reef structure in the aquarium. The storm-like current flow is not constantly in operation, but can be programmed for several times a day or week (3 hours to 5 days). The "Storm mode" is based on a fixed and precise pump cycle, which controls all four pump outputs for five minutes according to the following program:

Pump 1 -> 20 seconds
Pump 2 -> 20 seconds
Pump 3 -> 20 seconds
Pump 4 -> 20 seconds
Pumps 1+2 → 20 seconds.
Pumps 3+4 → 20 seconds.
Pump 1 -> 20 seconds
Pumps 1+2 → 20 seconds
Pumps 1+2+3 → 20 seconds
Pumps 1+2+3+4 → 20 seconds

Position the pumps in the aquarium in such a manner, that the "Storm mode" is not able to cause any water damages!

Field "Night mode" (2):

In the night mode, a night mode of the pump output can be selected using a regulator (3). If the regulator has been pushed upwards, a time window for the night mode will also be adjustable (4). The internal real time clock will interrupt the pulse operation of the connected pumps during this time. The pumps will then continue to run with minimal performance. In the morning, after the time has expired, the selected pulse operation of the pump will start again in the "Pulse mode" (see page 16).

Effect of Interval mode in the aquarium:

The interval operation between low tide (**channels 1** and **2**) and high tide (**channels 3** and **4**) enables the creation of two annular flows in the aquarium. The reef rock is regularly flooded from both sides, the sediments are washed away and the invertebrates exposed to current from all directions.

Example:

Channels 1 and **2** to 20% and 80%.
Channels 3 and **4** to 40% and 100%.
Interval time to about 6 hours.
Pulse frequency to 1.5 sec.
Connect a pump to each socket of the SmartController 7000 outputs.

Result:

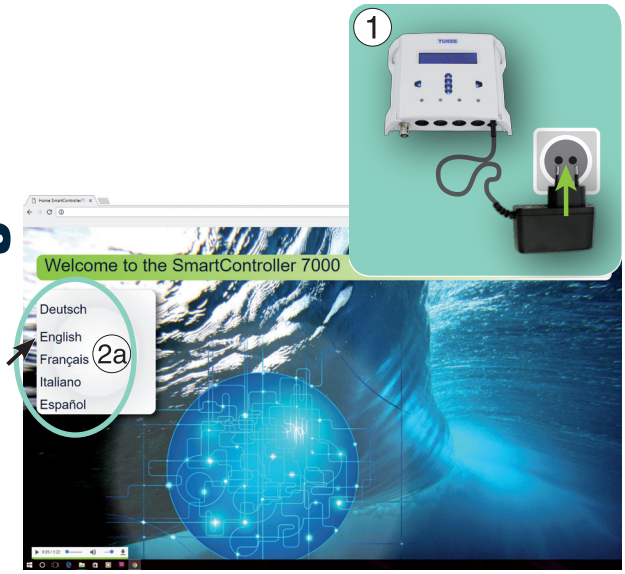
The pumps at the outputs 1 and 2 will operate for 6 hours, and vary their output between 20% and 80%.

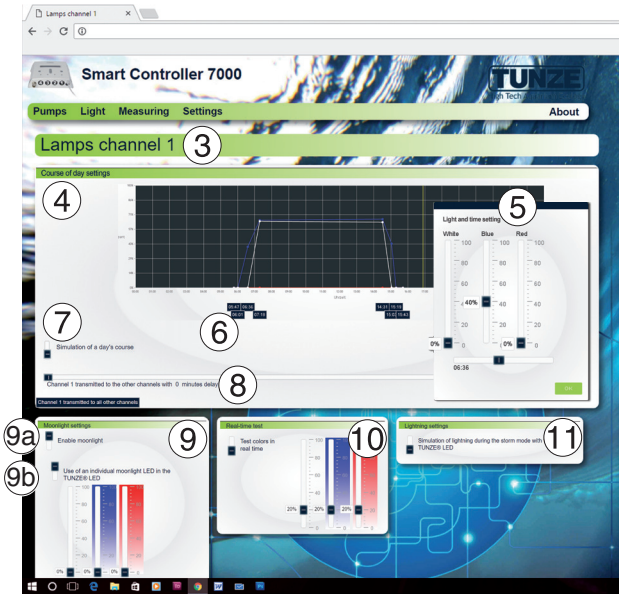
After 6 hours the pumps 1 and 2 will be switched off, and the pumps 3 and 4 will continue to operate and vary their performance between 40% and 100%.

After 6 further hours, the pumps 1 and 2 will switch on again, etc.

If the night mode function "night mode" is enabled, this will interrupt the pulse operation for the programmed time interval, for example, from 9:00 p.m. to 9:00 a.m., during which all pumps will remain in the minimal performance setting, but the high and low tide simulation "Interval mode" will continue to function. In the morning after 9 a.m., the selected pulse operation of the pump will start.

SmartController 7000





Menu “Lamps” — Lamp 1

Connect the SmartController 7000 to the mains adapter 5012.010 as the power supply, and then connect to the power grid (1).

Open the SmartController 7000 page in the browser and select a language (2a).

After clicking on the menu item “Lights” and “Light1” (2b) the menu “Lamps channel 1” will be displayed (3).

Field “Course of day settings” (4):

Here, the light curve throughout a day can be set either by directly dragging the points on the graph (5), or by pressing the dark blue buttons with the appropriate times below them (6).

Function “Course of the day simulation” (7):
Here, the actuated light (here lamp 1) can simulate the light curve of an entire day course within about a minute in fast forward.

Bar “Transfer channel 1 with a ... minutes time delay to the other channels” (8):

With this function the light curve of the course of a day can be transferred from Lamp 1 to other light channels (2 - 4) with a time delay.
This approach should be conducted with preference in practice, instead of a separate setting for each individual lamp / each individual light channel!
Any changes to the course of the day for the other lights/light channels, separate adjustments can still be performed individually, after the setting of lamp 1 and the subsequent transfer to the other lights.

Field “Moonlight settings” (9):

Regulator “Enable moonlight” (9a):

By switching on the “Enable moonlight” function, the desired moonlight LED (in this case light 1) will be used as moonlight. The moonlight LED in lamp 1 will assume its function as the moonlight at the time of the last time setting for the course of the day setting, and will switch off during the first time setting for the course of the day.

Regulator “Use of individual moonlight LEDs in the TUNZE® LED” (9b):

Through this, it is possible to use various LEDs of a lamp as moonlight. This enables a color adjustment of the moonlight.

Field “Real-time test” (10):

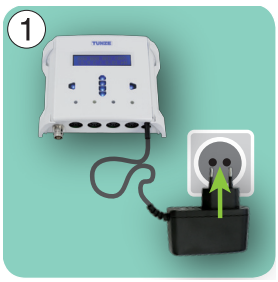
The different LEDs of a lamp can be tried out and tested for performance with this function.

Field “Lightning settings” (11):

In the “Storm mode” (see chapter “Interval mode - high and low tide simulation, S. 17) the actuated light can also simulate lightning flashes, while the pumps are in “Storm mode”.

SmartController 7000

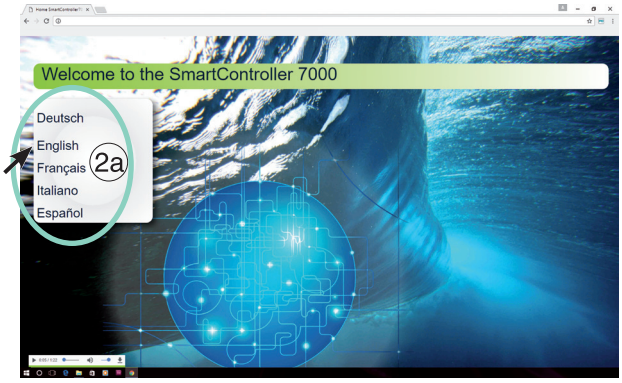
Menu “Lamps” — Season

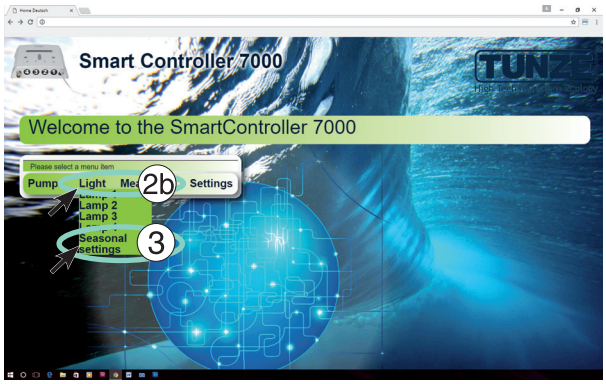


Connect the SmartController 7000 to the mains adapter 5012.010 as the power supply, and then connect to the power grid (1).

Open the SmartController 7000 page in the browser and select a language (2a).

After clicking on the menu item “Lights” (2b) and “Season” (3) the menu “Seasonal settings” will be displayed (4).





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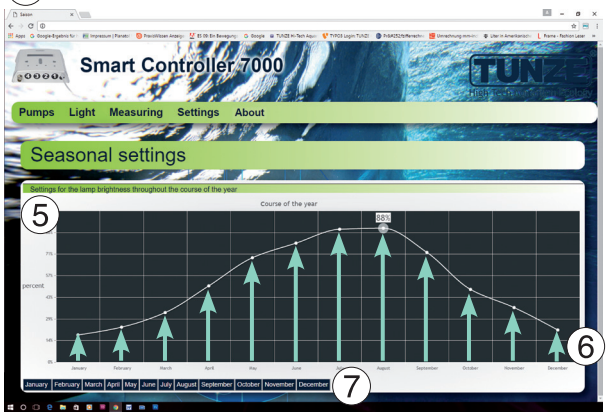


Field “Settings for the lamp brightness throughout the course of the year” (5):

In this field, it is possible to control the entire light intensity throughout the year. For this purpose there is a cursor (6) for each month or a dark blue button (7).

Here, the course of the year can be set either by directly dragging the points on the graph (6), or by pressing the dark blue buttons (7).

The function is particularly interesting for aquariums with a direct light intensity, and can thus be used to reduce the light intensity in the summer time, or increase the light intensity during the summer for native habitats (see example graph).

SmartController 7000

Menu “Measurement”

Connect the SmartController 7000 to the mains adapter 5012.010 as the power supply, and then connect to the power grid (1).

Open the SmartController 7000 page in the browser and select a language (2a).

After clicking on the menu item “Measurement” (2b) the menu “Measuring and switching sockets” (3) will be displayed.

In this menu, the left field is for the pH or mV settings (4), the right field for the temperature settings (5).

Field “pH / mV settings” (4):

Function “mV” (6a):

The current redox value will be displayed (7). By activating this function, the **channel 4** of the SmartController 7000 (8) will be activated as mV controller, and controlled according to a specified value.

The mV electrode 7055.100 (9) can be corrected / adjusted with the Redox Test Solution +475 mV, 50 ml (1.7 oz.) 7075.150 (10) and the displayed mV value with the lowest function of the field (11).

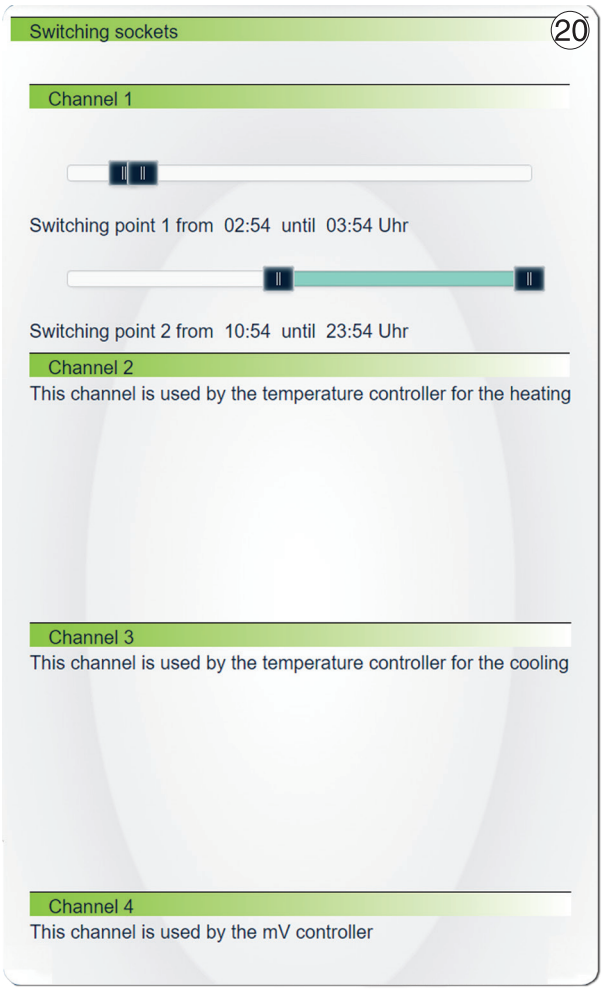
Function “pH” (6b):

The current pH value will be shown (12). By activating this function, the **channel 4** of the SmartController 7000 (8) will be activated as pH controller, and controlled according to a specified value.

In this field it is also possible to perform the calibration pH 5 / 7 or 7 / 9 (13) or resp. to test the electrode (14).

At the bottom in this field (15) the pH value for a measured KH value (carbonate hardness of water) can be calculated automatically in the freshwater aquarium and for an optimum CO_2 level. In an average freshwater aquarium, the CO_2 levels should between 10-25 mg/l, and 25-40 mg/l CO_2 in case of a strong lighting (at least 0.5 W/l (W/USgal.)).

SmartController 7000



Field “Temperature settings” (5):

The current temperature will be shown (5a). By activating the function (16), **channel 2** of the SmartController 7000 (8) will be activated as an output for the switching socket 7070.120 (17) for heating, whereas The function of each channel is shown here with the option to adjust the switching point. **Channel 3** can be activated as a switching socket for the cooling and controlled according to a specified value. The lights can dim even at high temperatures, or even be switched off (18).

Heat defence (19):

The activation of this function will cause that from an aquarium water temperature of 30°C (86°F) only the moonlight will be active, and only the night mode will continue to work for the Turbelle® pumps, in order to only heat the aquarium water as little as possible.

Field “Switching socket” (20):

The function of each channel is shown here with the option to adjust the switching point.

Thank you very much, that you have opted to purchase a high-quality product from TUNZE® Aquarientechnik GmbH. As the manufacturer, we regard it as our obligation to deliver a flawless product to you which will provide you with many years of enjoyment, in order to fulfill the trust you have placed in us. The passion for what we do is already applied during the design stages and continued throughout the production, the quality control, and all the way up to the packaging. Should you still detect any defects, we kindly ask you not to hesitate and directly contact your dealer or us.

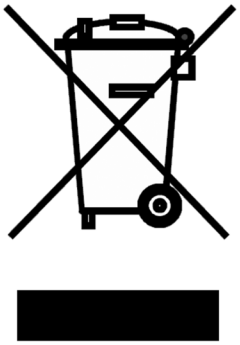
Warranty

The unit manufactured by TUNZE® Aquarientechnik GmbH carries a limited guarantee for a period of twenty-four (24) months after the date of purchase covering all defects in material and workmanship. Within the framework of the corresponding laws, your remedies in case of a violation of the guarantee obligation shall be limited to returning the unit manufactured by TUNZE® Aquarientechnik GmbH for repair or replacement at the discretion of the manufacturer. Within the framework of the corresponding laws, the said shall be the only remedies. Consequential damage and/or other damage shall be excluded therefrom explicitly. Defect units shall have to be shipped to the dealer or the manufacturer in the original packaging together with the sales slip in a pre-paid consignment. Unpaid consignments will not be accepted by the manufacturer.
Exclusion from guarantee shall exist also in case of damage caused by inexpert handling (such as water damage), technical modification carried out by the buyer or by connection to devices which have not been recommended.
Subject to technical modifications, especially those which further safety and technical progress.
Customers in USA, please refer to seperate Limited Warranty for United States brochure.

The service life of the electrodes during continuous operation is approx. one to two years, whereas this time can usually be extended with good care and occasional measurements. A storage time of the mV or pH electrode for several months before first use only slightly shortens the service life, if the tip of the electrode remains in the protective cap with KCl solution and is kept moist. Exact specifications are thereby not possible here, because the lifetime depends on the respective usage. All electrodes have been tested and are ready for measurement. If used properly, the warranty of the electrode is twelve (12) months from the date printed on the electrode packaging. TUNZE® Aquarientechnik GmbH shall not assume any guarantee for improper handling (electrode breakage, drying out).

Disposal

(in keeping with RL2002/96/EU)
The device and the battery may not be disposed of in normal domestic waste; it has to be disposed of in an expert manner.
Important for Europe: Devices can be disposed of through your community's disposal area.



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