

# User manual

EN



OSTC 2



OSTC plus



OSTC cr



OSTC sport

## OSTC Dive computer

with the Firmware hwOS sport and hwOS tech



# Your OSTC

Thank you for choosing a heinrichs weikamp dive computer!

Our dive computers can be operated either with the firmware hwOS sport with 5 gases and Nitrox up to 100% or the firmware hwOS tech with the full trimix program and many CCR functions. An upgrade to the tech version is possible at any time. In this manual you will find the necessary information for both versions.

Data like logbook information or updates can be transferred easily with Bluetooth. Take also notice of the large supply of logbook programs and other software.

The development of the heinrichs weikamp dive computers is permanently going on. Use the firmware updates to keep your OSTC always up to date. Get it for free at:

[www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)

You can use the OSTC intuitively. But to become familiar with its functions and to use it in the best way, we recommend you to read this manual carefully. Additionally you find some videos on our website and facebook page which offer some easy explanations (for example how to change the battery, calibrate the compass or change the bungees).

Please notice the additional user manuals for sensor readings with the OSTC cR and for gas integration in the OSTC 2 TR with transmitter. This manual also applies to older models such as the OSTC 3.

We hope you enjoy diving with your new OSTC dive computer!



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## Contact

For any questions relating to your OSTC, please contact us:

- Internet forum: [www.forum.heinrichsweikamp.com](http://www.forum.heinrichsweikamp.com)
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# 1. Common advices

## 1.1. Technical status

This manual corresponds to the technical status of the OSTC dive computers (OSTC 2, OSTC sport, OSTC plus, OSTC cR) and the firmware hwOS sport and hwOS tech as of January 2021.

Firmware hwOS sport 10.68

Firmware hwOS tech 3.13

OSTC, its firmware and the documentation are subject to technical changes without notice.

The OSTC firmware (integrated software) is an ongoing development. To make the best use of OSTC, we advise you to use the latest stable firmware available on our website: [www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)

## 1.2. About this manual

Read this manual carefully, so you can set up and use the dive computer in the right way. Keep this manual so you can consult it also at a later time. You also find the latest version for download as PDF on our homepage.

### Special markings

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#### ! Warning

indicates a situation that carries a significant risk or injury.

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#### Caution

indicates a situation that carries a risk of damage to the device.

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#### Note

indicates additional information.

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### Standard settings

Unless noted otherwise, the information in this manual refers to OSTC standard settings.

For important settings, the OSTC shows an asterisk \* behind the current setting, if the current setting is different from the default setting.

### Terms of use

Copying or reusing this manual or parts of this manual is not allowed without the written permission of heinrichs weikamp.

## 1.3. Functions overview

Your dive computer OSTC assists you with the following functions:

**Display:** Diving depth and duration according to EN 13319, maximum diving depth, ambient temperature, ambient pressure, bottom time, duration and depth of planned deco stops, time to desaturation based on diving depth and duration.

Additional informations: tilt-compensated compass, average depth, stopwatch, ppO<sub>2</sub>, CNS.

**Planning:** Configure and check gas mixtures as well as setpoints in CCR mode, calculate a deco plan in the simulator.

**Record:** Time, duration, depth profile, temperature, reference pressure and time of desaturation.



## 2. Safety advices

### 2.1. Requirements

The most important factor for safe diving is a competent and well trained diver.

This dive computer is intended for experienced divers. That implies:

A diving education including decompression diving is mandatory. Sufficient knowledge about the laws of physics in diving is required. It may harm your health if you rely on a wrong configured dive computer. Do not use this dive computer, if you do not know or understand the settings and displayed information of the OSTC.

If necessary, you must be able to finish your dive safely without a dive computer.

Do not adjust decompression parameters if you are not aware of their meanings.

### 2.2. Before every dive

Plan your dive.

Set up a dive plan independently from OSTC and take it with you when diving.

Make sure that your OSTC is ready for use and correctly configured.

Always confirm the following questions before diving:

#### **Stable firmware?**

Use only stable firmware provided by heinrichs weikamp. It has been tested and allows a proper and reliable performance of OSTC.

#### **Configured correctly?**

Check the settings of your OSTC. If neces-

sary, adjust the settings according to your dive plan and equipment.

#### **Battery full?**

Check the battery status using the battery indicator on the display. To ensure reliable performance throughout your dive, the status of the rechargeable battery must be sufficiently high. We recommend to recharge it at 20 percent of performance at the latest. If you use an AA battery for your OSTC plus you should also replace it at 20 percent of performance.

#### **Device waterproof?**

For OSTC plus and OSTC sport (battery compartment) and OSTC cR (S8 connector) and older models with USB port check if all openings are closed.

The models OSTC 2 and OSTC 2 TR are completely closed and have no openings that could cause leakages. But for safety check the housing for cracks or damages which might allow water to intrude.

#### **Safely attached?**

Make sure that your OSTC can be fastened safely using either the bungees or a suitable alternative.

#### **Display messages?**

Check the screen of the OSTC. Do not dive if your dive computer shows a warning. Check the cause of the warning.

## 2.3. While diving

### Take a backup system with you.

While diving, always carry a backup system to measure duration and depth of your dive independently from OSTC.

### Take a sufficiently long surface break before diving again.

The OSTC doesn't indicate how long to wait before the next dive. It just shows the duration time of the interval. Please follow the guidelines you were taught during your dive training.

### Take the OSTC with you on every repeat dive – do not lend it to anyone.

A correct calculation of tissue saturation requires that your OSTC is:

- configured correctly
- used on every dive
- only used during your own dive (and not shared with others)

---

### ! Warning

Saturation data is lost when updating the OSTC firmware or in the unlikely event of a failure. In these cases, do not dive any further until tissue saturation has returned to normal level.

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## 2.4. Safe use of the OSTC

Do not modify the hardware. Modifications to the hardware of OSTC can damage its proper function and the watertightness of its housing.

Only the bungee backplate, the cap of the battery compartment (OSTC plus, OSTC sport) and the cap of the S8 connector (OSTC cR) can be removed. There is no other way to open the housing without damaging the device.

Keep your OSTC out of children's reach. Small parts such as the battery cap (OSTC plus, OSTC sport) may represent a choking hazard.

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### Caution

Surpassing the maximum water depth of 120 meters may cause malfunction or permanent damage of the device.

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## 2.5. Environmental conditions

Store the OSTC in a cool, dry place. Permissible temperature range for use and storage: between -5 °C and 40 °C.

Maximum water depth for operation: 120 meters.

If you use an AA battery for the OSTC plus/sport: Make sure that the used battery is suitable for the ambient temperature to be expected in your dives. For cold water diving (under 10°C) we recommend the use of a Lithium battery.

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### Note

Decompression calculations and depth are always based on the actual surface pressure. So if you are diving in **mountain lakes**, no further settings are needed. OSTC automatically adapts to the actual surface pressure.

---

### 3. Before first use

heinrichs weikamp delivers the OSTC ready to use. But nevertheless check the battery status before using it the first time.

The OSTC is attached to the arm with bungee. The bungee is already installed (Bungees, page 42). To tighten the bungee, make a knot above the circular cavity. Cut remaining bungee and use a lighter to melt the small remains of nylon.



#### 3.1. Handling

The OSTC is operated with two buttons either on the left and right side of the housing, on the OSTC sport these are push buttons, on all other models piezo buttons. A short press is enough to trigger the piezo buttons. You can adjust individually how sensitive the buttons shall react (look for page 18).

To turn on the OSTC, press one of the two buttons. NEW: OSTC with mechanical push buttons: Press both buttons at the same time to switch on. If the OSTC does not wake up at once, it is in deep sleep mode (look for next page). To wake it up, press the button once more after 5 seconds. The deep sleep mode is only active on models with piezo buttons.

From start screen you can scroll the custom view in the middle with the right button (View) and enter the menu with the left button (Menu). Inside the menu you can scroll the items with the left button (NEXT) and confirm with the right button (ENTER). You only have to press one button at a time. From the last item on the bottom, the cursor jumps back to the top with the next press.

In some menus you will find the entry MORE. Select this entry to access the next menu page with more menu items. To quit the menu or submenu, choose EXIT.

To change the setting of a menu item, press ENTER repeatedly until the required value is displayed. For important settings that vary from the default values, the OSTC shows an asterisk \* behind the current setting.



MENU/NEXT

VIEW/ENTER

## 3.2. Modes of operation

The OSTC has three modes of operation and switches automatically between them: Surface mode, dive mode and sleep mode.

### Surface mode

In surface mode you can adjust the settings for the next dive, adjust the base settings of the OSTC and read recorded dive data.

To turn on the OSTC, press one of the two buttons. If it does not wake up at once and is in deep sleep mode (look for sleep mode), push the button once more after 5 seconds.

In surface mode the display shows general information as time, date, temperature, ambient pressure and battery status. After a dive the display also shows the elapsed time since last dive, tissue saturation and the no fly time.

### Dive mode

The OSTC automatically switches into dive mode when it is at 1,6 meter below the surface for five seconds (also when it is in sleep mode).

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#### Note

We recommend that you manually turn on your dive computer before the dive to check the settings.

---

In dive mode the display shows current diving depth, dive time, maximum depth, the currently selected gas (in CCR diving the setpoint and the current diluent gas), decompression information and additional information.

It is not possible to switch underwater from dive mode to surface mode. You cannot change the base settings while diving. Note that exceptions apply to the **apnea mode**.

### Sleep mode

When the OSTC isn't operated at the surface, it switches into sleep mode after two minutes to save energy.

In sleep mode the display is turned off. Ambient pressure is measured at regular intervals. After diving, decompression calculation continues.

After 15 minutes in sleep mode, OSTC switches to **deep sleep mode**. Deep sleep mode is only active on models with piezo buttons, not on the OSTC sport (with push buttons). In deep sleep no buttons are polled, which saves a lot of energy. Move the dive computer and wait 5 seconds until it wakes up. Now you can turn it on with the buttons.

Also in deep sleep mode the OSTC switches automatically to dive mode after 5 seconds.



The OSTC starts the dive mode automatically when it is below 1,6 meters depth.

### 3.3. Modes of diving

In the main menu you can choose under **Dive/Deco Setup > Dive Setup > Dive Mode**, if you want to use the OSTC for scuba diving, rebreather diving with a CCR or pSCR, apnea diving or as depth gauge. The chosen dive mode is shown permanently on the main display (OC, CC, pSCR, apnea, gauge)

#### OC (Open Circuit)

Use this dive mode for scuba diving with an open circuit. This setting is preset on your OSTC.

#### CCR (Closed Circuit Rebreather)

Use this dive mode for diving with a CCR rebreather.

#### pSCR

Use this dive mode for diving with a pSCR rebreather.

The decompression calculation model for OC, CC and pSCR is Bühlmann ZH-L16 without gradient factors or Bühlmann ZH-L16+GF with gradient factors (read more on page 17). In the menu **Dive/Deco Setup > Deco Setup** you can switch from ZH-L16 to ZH-L16+GF adjust the saturation factors and gradient factors (page 20).

#### Apnea

Use this dive setting for apnea diving or snorkeling.

In apnea mode the OSTC serves as a depth gauge. It displays depth, dive time and temperature on the main screen, clock and compass in the custom view (right button). Additionally it offers information for the whole session: Maximum depth, surface time, depth of the last descent and the total time of underwater time. Decompression calculation is switched off.

In apnea mode the OSTC remains in dive mode even when diving at low depths. You can switch into surface mode at any time by pushing the left button. Push ENTER to confirm the QUIT? question.

The OSTC switches automatically from apnea mode into surface mode after a 15 minutes delay and above a depth of 1 meter.

By default, apnea dives are not saved in the logbook. In **Dive Setup > Store Apnea**, you can set the logbook to record apnea dives.

#### Gauge

With this dive setting, OSTC serves as a depth gauge. Decompression and saturation calculation are switched off.

It displays depth, maximum depth, dive time, temperature, clock, battery status, compass and average depth. In the menu you can set the stopwatch and calculate the average depth from new.



The dive mode of the dive computer is shown permanently on the display. In this case OC for Open Circuit (scuba diving) is active.

## 3.4. Compass calibration

OSTC has a tilt-compensated electronic compass. Like all other electronic compasses it must be calibrated before use. The calibration compensates aberration that can be caused by the battery.

Start the calibration with **Settings > System Settings > Compass**.

For an exact heading, the calibration of the compass is absolutely necessary.

After starting the calibration menu, move the dive computer slowly around each axis. Do this a number of times within 60 seconds. After this while the calibration ends automatically. During the calibration routine the OSTC shows X-, Y- and Z-axis.



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### Note

The order of the axis rotation is not important. Keep the dive computer away from any metallic object during the calibration process (at least 50 centimetres).

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## 4. Surface Mode

### 4.1. Main menu

In the main menu you can adjust the settings to prepare the next dive, adjust the base settings of the OSTC and review your dives in the logbook.

#### Logbook

Recorded data from recent dives.

#### OC Gas Setup

Set up your gas mix for scuba diving or your bailout gases for CCR and pSCR diving. You can configure up to five gases.

#### CCR/pSCR Setup

Settings for rebreather diving (CCR and pSCR). Configure setpoints and diluent gases for CCR diving as well as O<sub>2</sub> drop and lung ratio for pSCR diving.

#### Dive Setup

Settings for deco calculation and dive modes of the OSTC (open circuit, closed circuit, pSCR, gauge or apnea) and more.

#### Simulator

Calculate deco and simulate the dive mode.

#### Settings

Settings for time, language, display brightness, compass and more. Start Bluetooth and reset menu.

#### Exit

Exit the main menu.

These functions are described in the following chapters of this manual.

## 4.2. Display in surface mode

### Permanent items

On the start screen the OSTC shows the following items permanently:

- ambient pressure, clock, date
- temperature
- firmware
- battery: level, type and voltage
- dive mode: Open circuit (OC), Closed Circuit (CCR), pSCR, Gauge or Apnea
- first gas for diving
- after diving: time since last dive, no fly time, desaturation and surface interval. Warnings for missed deco and too high CNS.

### Selectable items

In the middle part of the display you can see extra information in the custom view. You can switch them with the right button (View).

- personal text (up to 60 characters)
- compass
- gaslist (OC) or setpoints, diluents and bailout in CC mode, diluents and bailout in pSCR mode
- current settings: deco type, gradient or saturation factors, time of future TTS, last deco, salinity
- elapsed time since last dive, duration and maximum depth of the last dive
- desaturation diagram (after the dive, you can see the approximate tissue saturation in the desaturation diagram. The 16 types of tissue according to the Bühlman model are arranged horizontally. The fastest tissue is on top, the slowest is below. The longer the line, the more saturated is the tissue.)



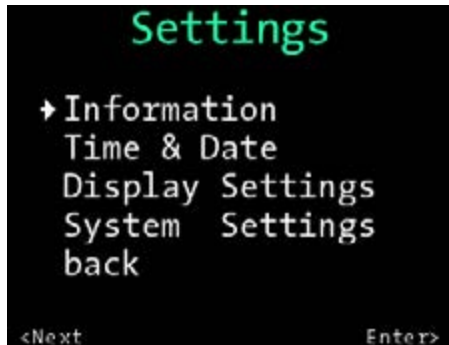
You can scroll a lot of information in the custom view, like details of the last dive (top) or the current deco settings (bottom). First gas and dive mode are shown permanently.



On the start screen you can scroll the custom view with the right button and enter the main menu with the left button.

## 4.3. Settings

In the settings menu you can set up basic configurations (like clock, language, display brightness, button sensitivity). You can activate Bluetooth and reset all settings and values.



Overview menu Settings

### 4.3.1. Information

Shows some device specific information like serial number, installed firmware version, number of total dives, type of battery and the total runtime.

### 4.3.2. Bluetooth mode

Activate the Bluetooth Mode in the Settings menu with ENTER. On the display appears »Starting ... done« and the Bluetooth is active. After activating you have four minutes to connect the OSTC with your personal computer or smartphone.

When there is no connection, the Bluetooth menu terminates automatically. You can also stop it with the right button ENTER.

When connecting your OSTC to a personal computer the first time, you need to »pair« your dive computer with the device.

This process depends on the operation system of the computer. In Windows: Click the Bluetooth symbol in the system tray and select the option »add device«. You don't need a PIN code.

When the connecting has been established, the PC creates a virtual COM port. The PC software communicates with the OSTC via the COM port. You do not need any special drivers, you only have to select the correct COM port (outgoing port, SPP).

### 4.3.3. Time and date

Menu to set time and date. With **Set time** you can set the time, with **Set date** you can set the date of the internal clock of the OSTC. You can change the values for time and date with the ENTER button.

Choose a date format:

YYMMDD: year, month, day

DDMMYY: day, month, year (default)

MMDDYY: month, day, year

---

#### Note

You can also set up time and date with your personal computer, as well as the personal text on the start screen.

---

### 4.3.4. Display settings

#### Brightness

The three settings Eco, Medium and High set different brightness levels for your display. Within these levels, the OSTC uses an ambient light sensor to adapt to the current light conditions (not OSTC cR). In most cases the default Eco is recommended. If the OSTC is often used in shallow depths and bright sunlight, a higher setting is recommended.

Default: Eco



## Layout

The display in dive mode can be selected in a smaller view with more detail or in a larger view with less detail. This setting can also be changed while diving (see p. 39).

## Units

Display of depth and temperature in metric (m/°C) or imperial (ft/°F) units.

Default: m/°C

## Language

The OSTC can be set up in English or German (standard). To use the languages Italian and French, download the suitable firmware from our homepage:

[www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)

## Rotate screen

The display can be also shown upside down.

Default: No

## Colour scheme

Choose the colour of the display in dive mode. You can choose the schemes red, green, blue and standard (white)

Default: Standard

## Speed graph

Shows the rate of ascent in a graph, otherwise only in numbers.

Default: No

## Speed adaptive

The warning for the rate of ascent is adjusting to the depth. It varies from 7 to 20 meters per minute. If you choose No, the value 10 m/min will be used during the whole dive as threshold value for an ascent warning.

Default: No

## ppO2 always

Setting whether the ppO2 value should always be displayed in the foreground. In the default setting it can be seen via the Custom View.

Default: no

## Depth blinking

Setting whether a warning should be displayed when the maximum dive depth is exceeded (depth flashes red).

Default: Yes

## 2nd depth

This value can be used to set whether the maximum depth or the average depth is permanently displayed on the main screen as second depth information. The other value can be called up in the Custom View (right button).

Setting range: max., medium

Default setting: Maximum depth

## Graphics

(Not available in the firmware hwOS sport)

In dive mode, the OSTC displays a saturation graph. Here you can select whether to display the saturation of all tissues in a graph (Pressure+Sat) or nitrogen and helium separated (N2+He)

Setting range: Pressure+Sat, N2+He

Default: Pressure+Sat

## 4.3.5. System settings

### Compass

How to calibrate the compass, page 14.

### Logbook offset

The dives in the logbook have sequential numbers. With the logbook offset you can adjust this number to your personal number of dives. So the last dive is not shown as dive number 1 but e.g. as number 349, if you have previously made 349 dives. This value will be increased automatically after every dive (not for simulated dives).

### Adjust buttons

You can adjust the sensitivity of the piezo buttons and how strong you have to press them. The higher the value, the harder you have to press. Press ENTER until the required value is displayed

Setting range: 20% – 80%

Default: 40%

### Reset menu

In the reset menu you can put the settings of the OSTC to its default values and start the dive computer from new. You can reset your decompression information and clear the logbook.

### Reboot/Backup

During the installation of a new firmware, it may be necessary to reboot the OSTC. You can select whether to reboot the current firmware (Reboot Current FW) or save the current firmware (Backup Current FW). So you can test a beta version at any time and easily go back to the previous firmware version.

### Reboot deco

To delete the current decompression data choose reset deco and push ENTER. You'll be prompted to confirm the action. For the next dive the OSTC starts decompression

calculation from new, without any data of former tissue load.

---

### ! Warning

Use reboot and reboot deco only, if you do not plan a repetitive dive within the next 48 hours. Both actions erase the current decompression data

---

### Reset settings

Resets all settings (not time and date) to factory defaults. You'll be prompted to confirm the action. Dives in the logbook and the dive counter will not be reset.

Desaturation and no fly time will remain.

### Reset logbook

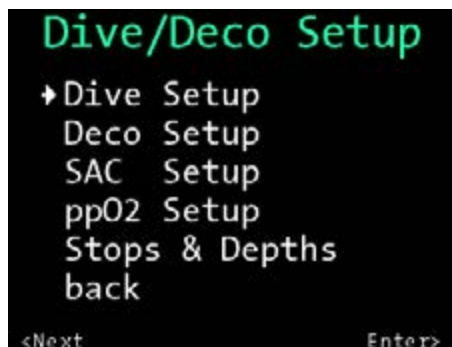
Deletes all data in the logbook. The counter starts again with zero. If you want your personal number of dives to be shown in the logbook, you have to set up (again) the number via logbook offset.

### Reset battery

When replacing the battery you have to choose the battery type (OSTC plus/sport). If you were wrong, you can correct your information in this menu (how to change the battery, page 38).

## 4.4. Dive/Deco Setup

In the menu Dive/Deco setup you can configure the dive mode of your OSTC and select important settings for the decompression calculation.



Menu overview »Deco Setup«.

### 4.4.1. Dive Setup

Under Dive Setup, you can set the operating mode, the deco forecast (fTTS) and values that are important for the logbook.

#### Dive mode

You can switch between the dive modes for open circuit (OC), closed circuit rebreather (CCR), pSCR, gauge mode or apnea diving. The current dive mode is shown permanently on the main screen both in surface mode and dive mode.

Default: OC

#### Future TTS (fTTS)/Delay

If you set a value greater than zero at fTTS, there will be a deco forecast in dive mode. In OC mode the future TTS (fTTS) shows the TTS (total time to surface) that you will have if you stay for xx minutes (the set value) on the current depth.

For example: »fTTS @5« shows the TTS that

you will have in five minutes if you stay on the current depth.

The future TTS is displayed as soon as a future TTS with a decostop is available. In case of a bailout there will be no fTTS calculation.

Additionally the future value of the CNS (CNS fTTS) that results from future TTS will be calculated. In dive mode it is displayed in the custom view. If the future CNS value exceeds 100%, there will be a warning.

In CCR mode the fTTS is either applied to the values of the rebreather (Calculation Gas B/O: No) or as future bailout to the bailout gases (Calculation Gas B/O: Yes). See page 24.

Setting range: 0 – 9 minutes

(0 = disabled)

Default: 0 minutes



Future TTS in dive mode: If the diver stays another 5 minutes (@+5) on the current depth, then he will have a TTS of 12 minutes.

## Dive timeout

After diving the OSTC shows a countdown of five minutes (pre-set). When you descend again within this period, the whole time of diving will be saved in the logbook as only one dive. You can adjust the period individually. Upon a depth of 1 meter, the dive can also be stopped manually.

Setting range: 1 – 20 minutes

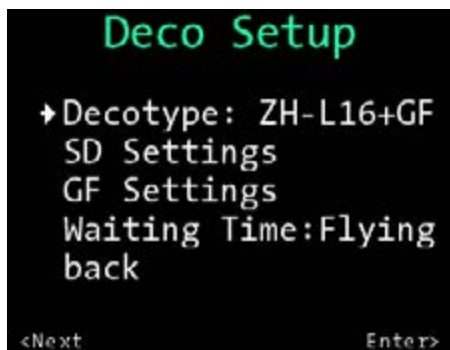
Default: 5 minutes

## Store apnea

Under this item you can set whether apnea dives should be saved in the logbook or not.  
Default: no

## 4.2.5. Deco Setup

In this menu item you can select the algorithm and make settings for gradient and saturation factors. This allows you to change the conservatism of the deco model and adapt it to your own needs.



Menu overview Deco setup.

## Decotype

Toggles between decompression calculation using the Bühlmann ZH-L16 algorithm or the Bühlmann ZH-L16+GF with gradient factors.

Default: ZH-L16+GF

## ZH-L16

The classical algorithm Bühlmann ZH-L16 calculates with maximum values (M-values) which should not be exceeded. As safety margin to the M-values (100 percent) this deco model uses saturation factors. The OSTC is preset to a value for saturation of 110 percent and a value for desaturation of 90 percent. Thereby there is a safety margin of 10 percent to the M-value.

Default: Saturation: 110%,

Desaturation: 90%

## ZH-L16+GF

The more modern algorithm Bühlmann ZH-L16+GF with gradient factors calculates with deeper decostops and a much bigger safety margin to the M-value. So you have less micro bubbles in your tissues. The GF low controls the allowed saturation for the deepest decostop, the GF high does it with the highest decostop.

The OSTC is preset to a GF low of 30 percent and a GF high of 85 percent (GF 30/85). With a GF low of 30 percent, you start your decompression with a safety margin of 70 percent to the M-value. The GF high comes closer with 85 percent, until you can finish your dive.

Default: GF 30/85, Saturation: 100%, Desaturation 100%

The model ZH-L16+GF can be set additionally to a more conservative level with the saturation factors (next page).

We suggest using the algorithm ZH-L16+GF with gradient factors.

The display for a single decostop is limited to 99 minutes. If a stop is longer than 99 minutes, another stop is generated at the same depth.

## Gradient factors

In the deco model ZH-L16+GF the gradient factors (GF) regulate the safety margin to the maximum values of the Bühlmann model that should not be exceeded during deco.

The GF are indicated like this: First the GF low, then the GF high is specified, for example GF 30/85

### GF low

The GF low regulates the allowed saturation for the first deepest decostop. The smaller the value of the GF low, the deeper starts the first deco stop.

Setting range: 10 – 100%

Default: 30%

### GF high

The GF high regulates the allowed saturation for the last shallowest decostop. The smaller the value of the GF high, the longer is the last deco stop.

Setting range: 45 – 110%

Default: 85%

## Alternative GF (aGF)

Settings for an alternative GF pair which can be toggled while diving. With »aGF selectable: No/Yes« you can set up if the alternative GF pair can be toggled while diving or not. When you select »Yes«, the aGF can be toggled in the menu in dive mode.

Default: No

### aGF low

Alternative value for the GF low in percent.

Setting range: 10 – 100%

Default: 60%

### aGF high

Alternative value for the GF high in percent.

Setting range: 45 – 110%

Default: 85%

---

## ! Warning

Only change values for decompression calculation if you are aware of their meanings. The pre-settings of the deco parameters are well established and proven. Changes have direct influence on the decompression calculation and modify the conservatism of the Bühlmann model.

---

## Saturation factors

The classical Bühlmann model ZH-L16 does not use GF, but saturation factors to create a safety margin to the maximum values of the deco model.

### Saturation

Multiplier for saturation process. A value of 100% corresponds to the pure Bühlmann model without any safety margin (in ZH-L16). The higher the value, the more an increased saturation will be considered.

Setting range: 100 – 140%

Default: 110% (ZH-L16),  
100% (ZH-L16+GF)

### Desaturation

Multiplier for desaturation process. A value of 100% corresponds to the pure Bühlmann model without any safety margin (in ZH-L16). The lower the value, the more a slower desaturation will be considered. Setting range: 60 – 100%

Default: 90% (ZH-L16),  
100% (ZH-L16+GF)

## GF + saturation factors

Using the ZH-L16+GF with gradient factors you can additionally adjust the decompression to the diving conditions with the saturation factors. A faster saturation because of increased work can be considered by a higher value of the saturation factor, a slower desaturation can be considered by a lower value of the desaturation factor. If you don't want to use the saturation fac-

tors additionally, choose the value 100% for both factors.

### Waiting time

Besides the no fly time, that indicates how long you should not fly after diving, the OSTC can also indicate the time you should wait to do an ascent up to 1000, 2000 or 3000 meters after diving.

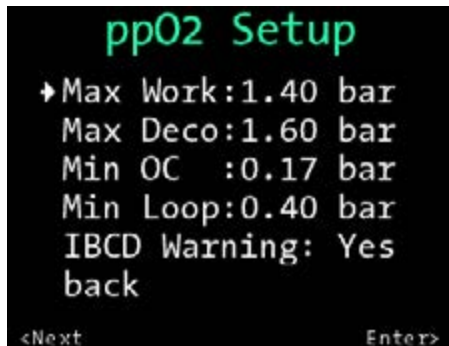
For the no fly time, a cabin pressure of 0.6 bar is used; the current ambient pressure is continuously included in the calculation.

Setting range: Flying, 1000 m, 2000 m, 3000 m

Default: Flying

### 4.5.3. ppO2 setup

Settings for maximum and minimum value of oxygen partial pressure (ppO2). This value has an impact on the MOD (maximum operating depth) during setup gases and using them.



You can set up a different ppO2 value for the deco and for the maximum depth of the dive.

The minimum threshold **Min** warns of a too low oxygen level.

Setting range: 0,16 – 0,21 bar

Default: 0,19 bar

The maximum threshold **Max Work** warns of a too high oxygen level during the deep part of the dive. With **Max Deco** you can define a different value for the deco phase of a dive.

Setting range: 1,20 – 1,60 bar

Default: 1,40 bar (Max), 1,60 bar (Max Deco)

With **Min Loop** rebreather divers can set up a threshold for a minimum ppO2 level in their loop.

Setting range: 0,20 – 0,60 bar

Default: 0,40 bar

### IBCD warning

Activate the warning of isobaric counter-diffusion during a gas change. This warning is shown, if you do a gas change with two inert gases (nitrogen N2/helium He) and the leading tissue saturates due to an isobaric counter diffusion (IBCD). An isobaric counter diffusion occurs when the nitrogen content in a tissue increases while the helium content decreases (or vice versa) and a saturation occurs (in sum more gas is entering the tissues than leaving).

Default: No

## 4.5.4. Stops and depths

### Safety stop

The safety stop can be switched on or off. After a dive within the no deco limit (NDL) the OSTC shows a safety stop of 3 minutes in 5 meters. It is displayed as a countdown split to the second. It will not be displayed after a deco dive.

Default: No

### Extended stop

If the extended stops are activated with »Yes«, the gas changes are always suggested and executed at the depth set under »Change depth«.

If »No« is activated here, the gas change is only suggested and executed at the first deco stage. This leads to a better decompression. For example: The gas change at Nx50 is set to 21 metres. When ascending, the first decompression stop is at 15 metres, then the gas change is only suggested at this depth and not at 21 metres.

Default: Yes

### Last deco

Setting for the depth of the last decompression stop. Choose here if the OSTC shall calculate its last stop at 3, 4, 5 or 6 meter. When you have heavy waves, a deeper last decostop can be better.

Setting range: 3 – 6 meters

Default: 3 meters

### Depth warning

If you want to set a warning for a certain depth, you can set it here. When the set depth is reached, the depth number turns red and flashes.

The OSTC dive computers (except the OSTC 4) are approved for a maximum depth of 120 metres.

### Salinity

This setting allows you to adjust if you dive in salt water or in fresh water. This value has a slight effect on the display of the actual and maximum depth. To increase this value, push ENTER repeatedly until the required value is displayed.

For most seas the setting is 3%, for the Mediterranean and Red Seas 4% and for the Baltic Sea 1-2%.

Setting range: 0% – 4%

Default: 0%

---

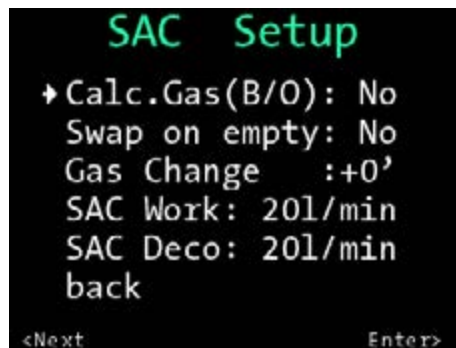
### Note

Decompression information is based on absolute pressure and not on relative pressure. Therefore salinity does not effect this calculation.

---

## 4.5.5. SAC Setup

The OSTC can calculate in real time the amount of gas you need to finish your dive including all decostops and the ascent rates. You can make the necessary settings in the SAC Setup (SAC = standard air consumption rate)



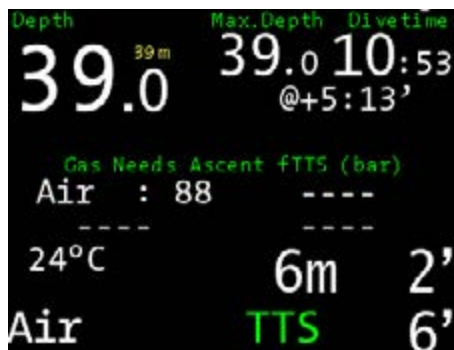
Menu overview SAC Setup.

## Calculation gas (B/O)

If this option is selected, the dive computer calculates the gas needs that you need to finish your dive including all decostops and the ascent rates. B/O means bailout.

### OC mode:

If the Future TTS is deactivated (set to zero), the dive computer will show you how much gas you would need if you started the ascent immediately. If the future TTS is activated (value greater than zero) and set to 2 minutes, for example, the dive computer shows your future gas need that you will have when you start with your ascent in 2 minutes.



When everything is set, the required gas needs are displayed in the custom view. For limited space, only four gases can be displayed, but warnings are generated for all five gases.

In **CCR** or **pSCR** mode there are two variants.

If the option »Calculation gas (B/O)« is turned off, the future TTS and the future CNS are calculated assuming that you use the rebreather until the end of the dive.

If the option »Calculation gas (B/O)« is turned on, the fTTS becomes the fB/O (future bailout). The fB/O as well as the future CNS and the future gas demand are applied to the bailout gases. In this case, the fB/O is displayed as B/O time (bailout time). The

future bailout time is calculated assuming that you spend the time set at fTTS/fB/O with the start bailout gas at the current depth and then start the bailout ascent.



If the fB/O is set to 2 minutes, for example, B/O 2:19' means that the diver will have a TTS of 19 minutes when he will start his bailout ascent in 2 minutes.

## Setup SAC rate

To display the gas needs, the values for your own respiratory minute volume (SAC) must be entered first. At the items **Work SAC** and **Deco SAC**, the gas demand (breathing minute volume) is set in litres per minute for the relevant part of the dive (work or deco).  
Setting range: 5 – 50 l/min  
Default: 20 l/min

The corresponding tank sizes are set in the **OC Gas Setup** for the respective gas.

These settings are also used by the deco calculator, which can be accessed via the simulation menu.

## Gas change

If you want the time required for a gas change to be taken into account in advance when indicating the total ascent time (TTS), you can set the time for the gas change in minutes in this menu.



Setting range: 0 – 3 minutes  
Default: 0 minutes (deactivated)

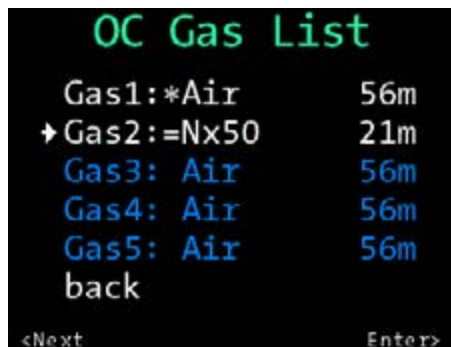
### Swap on empty

This function is particularly useful for side-mount diving: If you activate it with »Yes«, 2 identical active gases can be combined in their gas content.

Default: No

## 4.6. OC Gas setup

Use **OC gas setup** to configure presets for up to five gases for scuba diving as well as bailout gases for rebreather diving. You can use these presets when you change your gases during the dive.



The first gas is marked with an asterisk. Disabled gases are blue, but you can select them anyway during the dive.

The presets are marked like this: **Air** for compressed air (21% oxygen) and **Nx** for Nitrox (e.g. a mix of Nitrox 31 is shown as Nx31) and **Tx** for Trimix (e.g. Tx 15/50). 100% oxygen is shown as **O2**. In the firmware hwOS sport trimix is not available

### Note

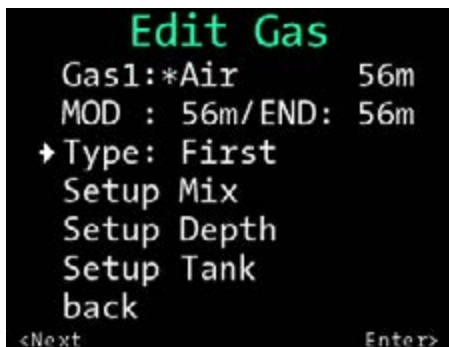
The first gas is used when starting the dive. All gases (even disabled ones) can be chosen underwater.

The OSTC always computes the tissue load and the decompression scheme using the selected gas. It takes all deco gases in account for the decompression phase.

The change of deco gases with configured change depth will be advised underwater.

### 4.6.1. Edit gas

Select a gas in the OC gas list and press ENTER to see details or to change values. For each gas you can set the type, the gas mix and the change depth as well as the tank size for the gas demand calculation.



For each gas you see the maximum operating depth (MOD) and the equivalent narcotic depth (END).

### Select gas type

Choose for which purpose you want to use the gas, as first gas, work gas or deco gas. You can scroll the gas type with ENTER.

#### First

The first gas that you use to start your dive. If there is only one gas active, it will be au-

tomatically the first gas. Additionally the first gas is marked with a \*. Each of the five gases can be marked as first gas.

### Work

Gases that you use for descending or as bottom gas.

### Deco

Gases that you use for decompression.

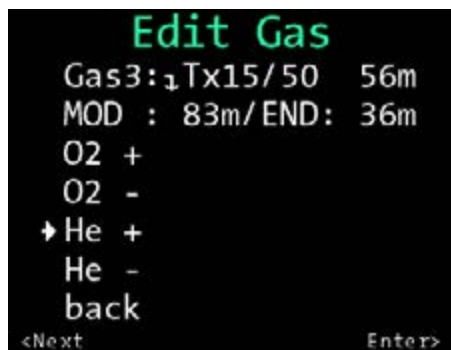
### Disabled

Gas is disabled and is not taken into account for the decompression prognosis. During the dive you can select them anyway, then the calculation starts from new.

Disabled gases are shown in blue letters.

### Setup mix

For every gas you can set the percentage of oxygen and helium. Select **O2 +** or **O2 -** to change the percentage of oxygen (increase or decrease) or **He +** or **He -** to change the percentage of helium. Repeatedly push ENTER until the required value is shown. (In the firmware hwOS sport trimix is not available.)



With + you can increase the values for oxygen and helium, with - you can decrease them.

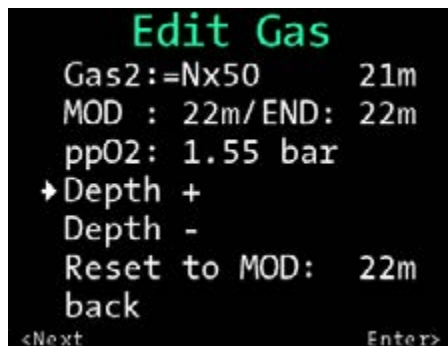
If the oxygen value is lower than 21% and no helium is added, the warning Err (error) appears.

For your reference, the OSTC shows the maximum operating depth (MOD) and the equivalent narcotic depth (END) of your mix.

### Setup change depth

The change depth must be set for each gas so that the recommended gas change (better gas) works. For each gas, enter the maximum operating depth or change depth.

To set the change depth for your gases, select **Depth +** or **Depth -**. The chosen change depth will be shown in the first line of the display. It will turn red if the change depth is deeper than the maximum operation depth (MOD). Use **Reset to MOD** to reset the value to the MOD. The MOD depends on the ppO2 value in the settings.



You can set the change depth freely or you can reset it to MOD.

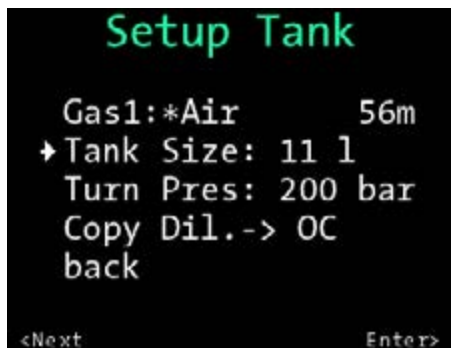
During the dive, the gases with set change depth will be suggested at that depth. This allows a quick gas change without entering the menu (better gas).

Of course you can also change the gas manually at any time via the menu in dive mode

(left button MENU) under gas list.  
See page 36 for more information

## Setup Tank

For real-time calculation of the gas demand (see SAC setup, p. 23), the size in litres can be set for each diving tank. Also a return pressure can be set.



Overview menu Setup Tank

### Tank size

Here you can specify the tank size in litres for your gas (OC gas/bailout gas).

Setting range: 1 – 40 l

Default: 11 l

### Turn pressure

Here you can set how much gas from the tank may be used for the dive. If the calculated gas needs reach 70% of the tank press budget, a warning appears in yellow. At 100% the warning appears in red.

Setting range: 50 – 290 bar

Default: 200 bar

### Select transmitter

Users of an OSTC 2 TR with transmitter can select their transmitter here.

## Examples for gas setup

The OSTC is delivered with the following default setting: Gas 1 with air as start gas, all other gases are deactivated (blue).

### Dive with one gas (e.g. Nx32):

Configure any gas (e.g. gas 1) as first gas and set the mix of the gas under »Setup mix«. Press O2 + until the value is on 32 for an Nx32. Deactivate the other gases (type: deactivated)

### Dive with one additional decompression gas (e.g. Air + Nitrox 50):

Set a gas (e.g. Gas 1) as first gas and set it to air (O2 content at 21%). Enter the maximum operating depth under »Setup depth« (or reset to MOD). Set a second gas (e.g. gas 2) to »Deco« and set the O2 content to 50%. Enter 21m under »Setup depth« or press »Reset on MOD«. Deactivate the remaining gases.

### Dive with two decompression gases (e.g. Tx 21/35 + Nitrox 50 + 100% O):

Set a gas (e.g. Gas 1) as first gas and under »Setup Mix« set the value for O2 to 21% and the value for helium to 35%. Under »Setup depth« enter the maximum operating depth (e.g. 45m or reset to MOD = 57m for ppO2 at 1.4). Set a second gas (e.g. Gas 2) to »Deco« and set the O2 content to 50%. Enter 21m under »Setup depth« or press »Reset on MOD«. Proceed in the same way for the third gas (e.g. gas 3): Set the gas type to deco, the mix to 100% O2 and the change depth to 6m (or MOD). Deactivate the remaining gases.

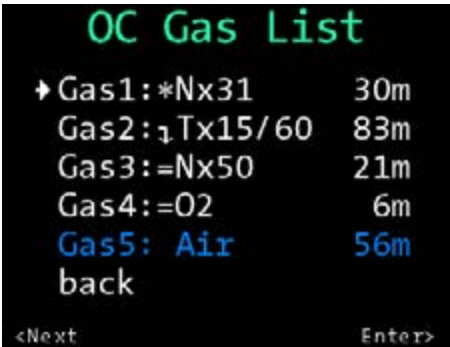
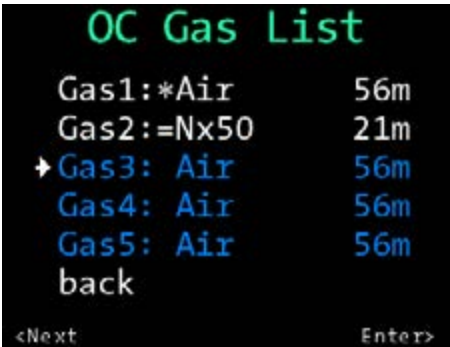
### Dive with a travel gas, bottom gas and two decompression gases (e.g. Nx32, Tx 15/60, Nx50 and 100% O2):

Set a gas (e.g. Gas 1) as start gas, set the value for O2 to 32% under »Setup Mix« and set the change depth to e.g. 30m. Set a second gas (e.g. Gas 2) to »Work« and set the O2

content to 15% and the helium content to 60% (TX 15/60). Enter the maximum operating depth under »Setup depth« (e.g. 75m or press »Reset to MOD« = 83m for ppO2 at 1.4). Set a third gas (e.g. gas 3) to deco, the O2 content to 50% and the change depth to 21m (or MOD). Proceed in the same way with the fourth gas (e.g. Gas 4): Set the gas type to deco, the mix to 100% O2 and the change depth to 6m (or MOD). Disable the remaining gas.

**Note**

The current gas list is shown in surface mode and in dive mode in the menu (left button). Gases with a too high or too low ppO2 are marked red. In dive mode you can easily see which gas fits to the current depth.



Gas list in surface mode: Above with two gases, below with four gases.



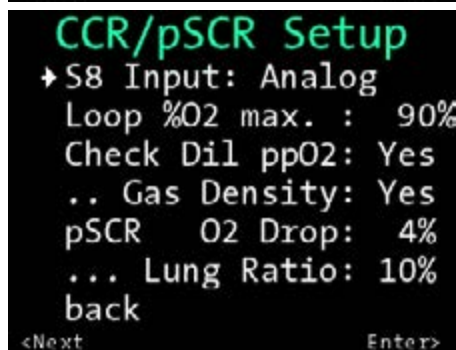
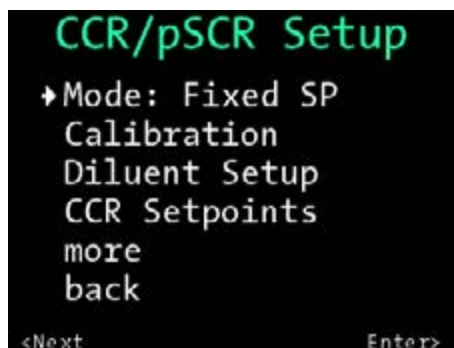
Gas list in dive mode: The Nx 50 has a too high ppO2 for the current depth.

## 4.7. CCR/pSCR setup

(only available in the firmware hwOS tech)

In this menu you can make the settings that are necessary for diving with a CCR and a pSCR. With all OSTC models you can use fixed setpoints and auto setpoints for decompression calculation.

The OSTC cR can also read oxygen sensors. Please refer to the additional operating instructions for the OSTC cR.



Overview CCR/pSCR Setup. The submenu »S8 Input« is only available in the OSTC cR with sensor operation.

### 4.7.1. Mode

Select if you want to perform the calculation with fixed setpoints, auto setpoints or with sensor.

### Fixed setpoint (SP)

You have to do the setpoint change by yourself.

### Auto setpoint

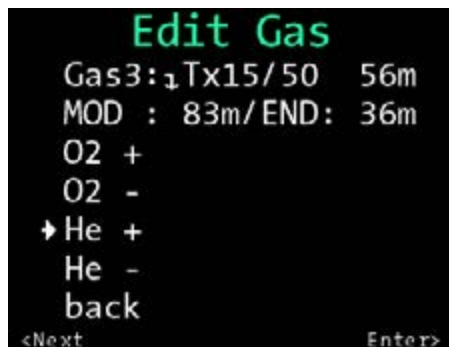
If you set a change depth for the setpoint, the setpoint change is made automatically at the respective change depth.

### Sensor

Deco calculation via connected oxygen sensors (only possible in the OSTC cR and in the old model OSTC 3).

## 4.7.2. Diluent setup

In the Diluent menu you can configure your diluent gases. They are designated as Dil 1 to Dil 5. The setup of the gases is the same as for the OC gases. Only the gas types are different.



To configure the mix and the change depth of the diluents is the same as for OC gases.

### Diluent type

Each diluent can be of the following type:

#### First

The first diluent that you use when you start the dive. Only one diluent can be marked as First. If you use only one diluent, it is marked automatically as First.

## Work

Additional diluents which can be chosen underwater.

## Disabled

The diluent is disabled and is not taken into account by the better diluent function. But it can be chosen underwater anyway. Disabled diluents are shown dimmed (in blue colour).

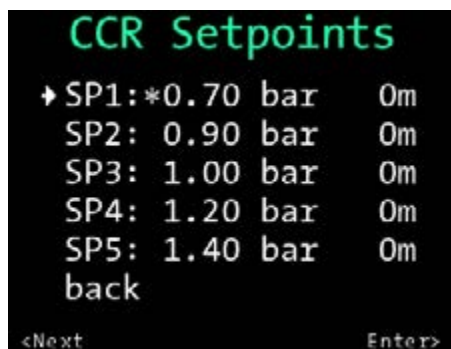
The setup of the diluents is the same as for OC gas setup (page 25).

## Better diluent

In dive mode you can make a quick gas change (better diluent). Close to the configured change depth the OSTC shows the better diluent.

### 4.7.3. CCR setpoints

You can configure up to 5 fixed setpoints for the decompression calculation. For each setpoint you can configure the ppO2 value and the change depth. But in dive mode the OSTC will not indicate the change depth.



Select the setpoint with ENTER and adjust ppO2 and depth with +/-.

The decompression calculation uses always the current setpoint. If the setpoint is phys-

ically not possible (e.g. 1,6 bar in 3 meters), the setpoint will be adjusted accordingly (in this example to 1,3 bar).

The dive always starts with SP1, only in the deco calculator in the simulator the values can be different (see p. 27). The SP1 is additionally marked with an asterisk \*.

Setting range ppO2: 0,5 – 1,6 bar

Default: SP1: 0,7 bar, SP2: 0,9 bar, SP3: 1,0 bar, SP4: 1,2 bar, SP5: 1,4 bar

Setting range change depth: 0–99 m

Default: 0 m

### 4.7.4. Maximum O2 content in the loop

The setting »Loop %O2 max« is based on the assumption that the set percentage of oxygen is the maximum value of oxygen that can be present in the loop, even if you flush it with 100% O2. The calculation will be adjusted accordingly.

Setting range: 80 – 100%

Default: 90%

### 4.7.5. Check diluent ppO2

This setting is used to permanently check the ppO2 value in the diluent. If it is too high or too low, a warning is displayed.

Default: Yes

### 4.7.6. Check gas density

If this item is activated, the gas density is continuously calculated and displayed in the custom view. If it is too high, a warning is displayed (also available in OC mode).

Yellow pre warning at >6,0 g/litre

Red warning at >6,5 g/litre

### 4.7.7. pSCR setup

Settings for diving with a pSCR.

#### O2 drop

Drop of O2 value in the pSCR compared to the diluent per breath.

Setting range: 0 – 15 %

Default: 4 %

#### Lung ratio

Ratio of the diameter of the inner and outer counterlung.

Setting range: 5 – 20 %

Default: 10 %

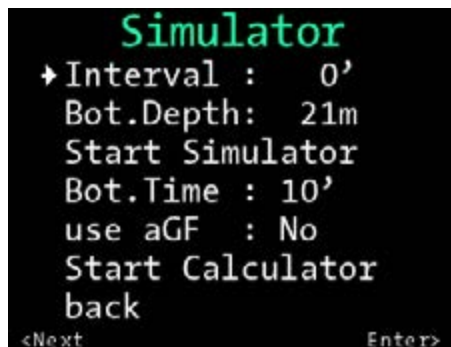
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#### Note

The gas mixture and the resulting decompression calculation of a pSCR deviate considerably from the calculation of OC or CCR diving. This manual can not go into details here.

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## 4.8. Simulator



Menu overview »Simulator«.

Use the simulator to simulate the dive mode of the OSTC or to calculate the decoplan for your next dive. With the simulator you can get familiar with your dive computer even before the first dive.

### 4.8.1. Calculate a decoplan

As a planning tool, the OSTC can calculate decompression stops in advance to planned dives. Hereby all settings of the OSTC and the tissue load of previous real dives are taken into account.

#### Start calculator

To start the calculation, select **Start Calculator** and press ENTER. First set the values for interval, depth and bottom time. If you want a gas calculation, enter the values in the **SAC Setup**.

#### Interval

If you are planning a repetitive dive, set up the surface interval. It can be increased in steps of 10 minutes.

Setting range: 0 – 240 minutes

Default: 0 minutes

#### Bottom depth

Enter a value for the maximum depth. It can be increased in steps of 3 meters.

Setting range: 12 – 120 meters

Default: 21 meters

#### Bottom time

Enter a value for the bottom time (the time you want to stay on the maximum depth). It can be increased in steps of 2 minutes.

Setting range: 1 – 59 minutes

Default: 5 minutes

#### Use aGF

With **Use aGF** you can choose if the alternative gradient factor (aGF) shall be used for the calculation or not (No/Yes).

#### Set up the gas needs

In the main menu > **Dive/Deco Setup** > **SAC setup** you can enter your respiratory minute volume (in litres per minute) for the travel gas and the deco gas. The deco calculator then shows you your gas needs (in litres) for the planned dive.

### Calculator Setup

(this item appears only, when CCR is selected as dive mode)

With **Setpoint** you can select a different setpoint than SP1 for the calculation. This selection can only be made in the deco calculator, in dive mode the CCR dive always starts with SP1.

In the **Gas contingency** mode, identical gases are grouped together in the calculation (sidemount or bottom stages with identical gas content).

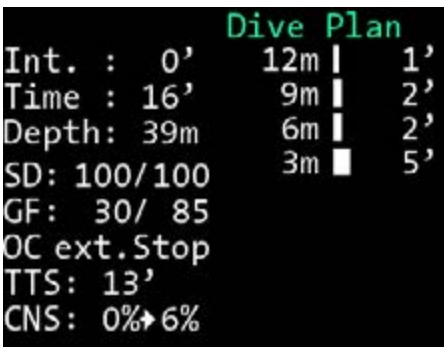
Default: No

### Display of the calculation

When the calculation is finished, the display shows the decoplan with the planned decostops. Depth is displayed in meters, duration in minutes. The duration is additionally represented graphically.

To show the gas needs and further stops (if there are more than 8) press ENTER.

The deco calculator uses the current surface pressure for the calculation. In the simulator, the pressure is set to 1 bar. This can result in slight deviations in the deco calculation, also in comparison to other deco calculation programs.



Dive plan for a dive with air for 16 minutes on a depth of 39 meters. Switch to the calculated gas needs with the right button ENTER.

## 4.8.2. Start simulator

Simulated dives can be maximum 90 minutes long and are not stored in your logbook. The simulation uses all set values in the OSTC and the current saturation (if available).

Simulated dives do not affect any values of the OSTC. Any saturation from real dives remains unchanged.

Select the **Bottom Depth** and select **Start Simulator** to start the simulation of the dive mode.

The simulator follows a speed of 10 metres per minute during ascent and descent.

### Change dive time and depth

During the simulation you can change the depth and the dive time. Press the left button repeatedly to display the menu items. Select the desired item with ENTER (right):

**Menu:** Open menu in dive mode

**Quit?:** Quit dive mode simulation. The simulation will stop after a short delay.

**Sim: -1m:** descend 1 meter

**Sim: +1m:** ascend 1 meter

**Sim: +5':** longer the divetime for 5 minutes

**Layout:** dive mode in large view

All other functions are similar to the dive mode and are described there.

---

### Note

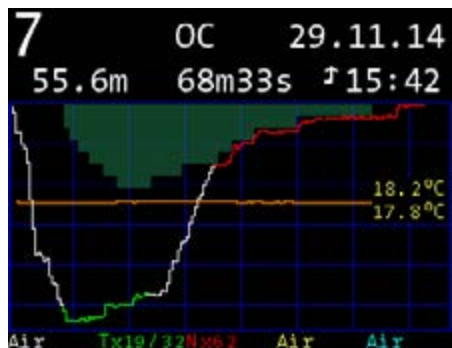
The OSTC stays 90 minutes in the simulation mode until it switches to sleep mode. Stop the simulation mode manually to save energy.

---



## 4.9. Logbook

The OSTC records data during every dive. It can be retrieved from the logbook. The OSTC stores data of up to 255 dives with a total duration of 500 to 1000 hours. The exact number of records depends on the overall size of data. If the memory is full, existing records will be overwritten, starting with the eldest.



Depth profile in logbook. Switch to more information with the right button.

---

### Note

If you want to save your recorded dive data, you can connect the OSTC via Bluetooth to a personal computer or smartphone and readout the data (page 16).

---

Logbook entries are sorted in chronological order, starting with the most recent entry. Every entry shows position index, date, maximum depth and dive time.

To see details of a dive, press ENTER to select it. The first detailed view appears with a depth profile and an overview of the most important data (depth, dive time, date, clock, temperature, deco, gases used).

With the right button ENTER you can call up further information such as charging sta-

tus, deco settings, average depth and gas list.

Use the left button to exit the view.

Markers are shown with a yellow M.

---

### Note

Via Settings > System Settings > Logbook Offset you can put in your own number of dives. It will be shown instead of the numbers of dives which are stored in the dive computer (page 18).

---

## 5. Dive mode

### 5.1. Displays in dive mode

#### Permanent information

In dive mode the OSTC shows the following items permanently on the display:

- Depth in meters or feet
- Maximum depth or average depth, depends on settings, page 17
- Divetime in minutes and seconds
- NDL (No Deco Limit) or TTS (Time To Surface including all decostops) and the next deco stop in minutes.
- Currently used gas (in CCR mode the current setpoint)
- Water temperature in °C or °F
- Deco forecast by the Future TTS (fTTS) (if activated, see page 19), in CCR mode as Future Bailout (fB/O)

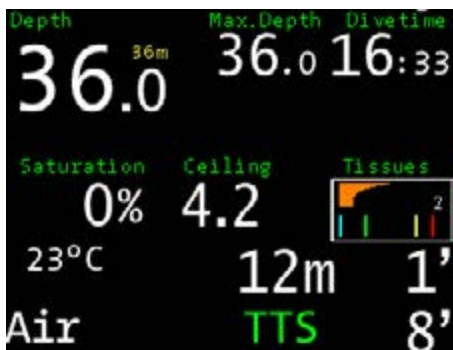
#### Selectable information

Selectable items can be shown in the custom view in the middle of the display. You can scroll through these items with the right button.

- Maximum depth or average depth, depends on settings, page 17
- Stopwatch with average depth and stopped depth (more on page 37)
- Next stops: Display of all decompression stops. If there are no decostops necessary, there will be displayed ---. If there are decostops, the next decostop is permanently shown on the main display.
- Saturation  
Shows the current supersaturation in the leading tissue (100% corresponds to the M-value, maximum value)
- Ceiling  
The Ceiling indicates the uppermost depth value up to which you can only just

ascend without damaging the deco model. It corresponds to the M-value in the Bühlmann model. If you dive beyond this upper limit, the risk of a deco incident is increased.

- Graphical display of the tissue saturation Tissue graph for nitrogen (N<sub>2</sub>) and helium (He): The 16 tissue types are arranged horizontally. The fastest is at the top, the slowest at the bottom. In real time, it shows whether the tissue is saturated (orange) or desaturated (blue).
- Compass
- CNS  
O<sub>2</sub> load for the central nervous system: »CNS now« shows the current value, »CNS surface« shows the value you will have when you surface now (including all deco stops and ascent speeds) and »CNS fTTS« shows the future CNS for the set minutes in the Future TTS (if activated)
- ppO<sub>2</sub> (oxygen partial pressure)
- EAD  
The equivalent air depth is the depth at which the nitrogen partial pressure of compressed air corresponds to that of the Nitrox mixture
- END  
The equivalent narcotic depth is the depth at which the oxygen and nitrogen partial pressure corresponds to the nitrogen partial pressure of normal compressed air.
- Gas density  
Info on the increasing gas density with rising pressure. Air has a density of 1.29 g/l at the surface (1bar). A value of 6.5 g/l should not be exceeded, a warning appears.
- Time, battery status, surface pressure
- in CCR mode also: ppO<sub>2</sub> (O<sub>2</sub>), sensor check, ppO<sub>2</sub> (diluent)
- in pSCR mode also: ppO<sub>2</sub>, O<sub>2</sub> drop, Lung ratio
- No information



Tissues (here setting »Pres+Sat«): Upper graphic: Total pressure (He+N<sub>2</sub>), lower graph: relative supersaturation (He+N<sub>2</sub>), green: GF low, yellow: GF high, red: M-value.



In the Custom View in the centre, you can access a lot of information by pressing the right button. Whether the maximum depth or average depth is permanently visible in the foreground can be set in the menu.

The gas density is for information only and displays a warning if the value is too high.



The Future TTS shows the future deco time, e.g. in 5 minutes the TTS will be 12 minutes (display: @+5:12').

The safety stop is displayed as a countdown in minutes and seconds. It must first be activated in the menu.

# 5.2. Menu in dive mode

In dive mode (OC) you can select your pre-set gases (gaslist), reset the calculation of your average depth (reset avr./stopwatch), use the alternative GF-pair (aGF) for decompression calculation, set a marker in the logbook and a lot more.



Call the menu with the left button, open it with the right button.

In CCR mode you can also choose setpoints and diluents (in pSCR mode no setpoints) and activate your bailout gases.

To enter the menu, press the left button. On the display appears »Menu?«. Press ENTER to confirm. The pre-menu »Menu?« avoids that you press the button by accident. Confirm within five seconds or the OSTC returns to normal display.

## Note

In the dive mode apnea there are no menu functions available. In gauge mode you can only reset the calculation of the average depth.

### 5.2.1. Gas change (OC)

#### Manual gas change

Open the menu and select **Gas list** to do a gas change. You can choose between the gas mixes that you have prepared in **OC Gas setup** in the surface mode. Select the gas. The selected gas then appears on the main screen.



If you select »Gas list» in the menu, you can select the individual gases. The Nx50 currently has too high ppO2 and appears in red.

If you forgot to configure a gas on the surface you can catch this up while diving. Go to **Gaslist** and **Lost Gas > Extra Gas** to configure an additional gas. This new gas will be used as current gas in the decompression calculation. If you loose a gas, go to **Lost gas** and delete it from the list. It will no more be part of the deco calculation.



Gases can be removed under »Lost Gas« or a forgotten gas can be set up under »Extra Gas«.

### Note

Gases in **red** have a too high or low ppO<sub>2</sub> to be used in the current depth (they can be selected anyway).

Gases in **blue** are disabled. They can be selected anyway, but they have not been part of the decompression calculation. If you select one of them, the calculation starts from new.

## Better gas change

Once you have set the change depth of your deco gas, you can carry out a quick gas change without entering the menu. The OSTC automatically suggests the appropriate gas.

A gas turns yellow, when you get close to the configured change depth of the gas during your ascent. Then press the left button NEXT and the dive computer suggests you the better gas (e.g. Nx50?). So you see at once which gas you shall use. Just confirm with ENTER and the gas is active.



Better gas change: Close to the configured change depth, the current gas gets yellow and the dive computer suggests you a better gas.

## 5.2.2. Stopwatch

In dive mode you can select the average depth and stopwatch in the custom view (right button). **Total avr** indicates the average depth since the start of the dive. **Stopped avr** indicates the average depth for a period of time that you choose.

The stopwatch starts with the beginning of the dive. While diving you can restart it in the menu function **Reset avr**. The stopwatch starts from new and shows the average depth since the start of the stopwatch (stopped avr).



Stopwatch: »Total avr.« shows the average depth for the whole dive, »Stopped avr.« shows the average depth since the reset of the stopwatch.

### 5.2.3. Toggle GF

With this option you can select the alternative gradient factor aGF for the deco calculation. To be available, the aGF must be activated before diving in the surface mode. If the aGF is selected, a message appears permanently on the display.



The current GF (30/85) and the alternative aGF (50/80) are displayed under »Toggle GF«. Pressing again activates the aGF, which is permanently shown on the display.

### 5.2.4. Set marker

If you push Marker there will be a small marker (M) in your logbook from that point.

### 5.2.5. Bearing

The options »Bearing« and »Layout« are not inside of the menu. They are on the same level as the menu call (left button). Press the button several times to get to Bearing and Layout.



When »Bearing« is active, take your bearing and confirm with the right button. It will be marked green, the opposite heading will be marked red.

To make a bearing with the compass at first go to the compass view with the right button. Then push the left button twice until **Bearing** is displayed. With the right button you confirm the compass course you want to use. It will be marked green. The opposite heading will be marked red.

You can also make a bearing in the surface mode, just before diving. Put the custom view to compass and push the left button. It appears **Bearing**. Push the button another time to store the actual bearing.

### 5.2.6. Layout

With »Layout« you can activate an enlarged view of the dive mode. Here only the most important values are shown (duration, depth, current gas and no-stop time or the TTS with the next stop), further information can be switched on via the Custom View (right button).

The large view can be closed at any time by pressing the left button > Layout > confirm.

The large view can also be set before the dive in surface mode (see p. 17).



Also in the large view, additional information can be displayed in the custom view in the middle. With »Layout« (left button) you can return to the normal view.

### 5.2.7. CCR functions

(only available in the firmware hwOS tech)



Menu in CCR mode. You can change setpoints and diluents and activate your bailout.

#### Setpoint change

While diving in CCR mode you can choose between the five setpoints that have been configured in surface mode. Choose **Setpoint** in the dive menu and confirm the selected value with ENTER.



If you go to »Setpoint« you see the five configured setpoints and can select them.

If **Auto SP** is activated, the setpoint is automatically changed when you reach the configured change depth. With **Fixed SP**, you

must change manually; the change depth is not indicated.

### 5.2.8. Bailout

If you have to switch from closed circuit to open circuit, you can select your bailout gases in the menu. You can choose between the five gases that were configured in **OC gas setup** in surface mode. The selected gas is immediately displayed on the main screen and the deco calculation is restarted. With **Lost Gas** you can configure a new (forgotten) gas or delete a lost gas.

The gas change is the same as for OC gases, see page 36.

### 5.2.9. Diluent

In CCR and pSCR mode the diluent gases are shown in the »Gas list«. The gas change is the same as for OC gases (page 36). Also here you can configure a new gas and delete a lost gas.

## 5.3. Warnings

Warnings appear in yellow and red on the display. Depending on your custom view the warnings appear in the custom view or in the upper part of the display (not double). If there are critical warnings, a warning sign is displayed additionally.

**Yellow warning:** Important notes and pre-warnings (threshold 70%)

**Red warning:** The final warning is displayed in red (threshold 100%). You have to react immediately.

Warnings are shown in the dive mode for the following items (some warnings also appear in the surface mode):

- Low battery level
- ppO2 too high or too low
- CNS warning (danger of oxygen poisoning)
- Too high gradient factors and missed decostop (the missed decostop is marked red)
- Too fast ascent
- When the decompression calculation is based on the alternative GF-pair
- Micro bubbles warning
- Deco model validity limits exceeded (no longer valid)
- Diluent warning
- MOD warning (if activated)
- IBCD warning (isobaric counter diffusion, if activated)

### Deactivate warnings

The last warning in each case can be deactivated if required. To do this, press the left button until **Ackn?** (Acknowledge?) appears and confirm with the right button. You can deactivate all warnings step by step.



The last warning that appears can be removed.



### Rate of ascent

The rate of ascent is displayed when it is more than six meters per minute (e.g. +7/min). When the rate of ascent is faster than 10 m/min it is displayed in red as warning.

The rate of descent is displayed when it is more than 6 m/min (e.g. -15m/min).

Settings for the display of the rate of ascent can be done in Settings > Display settings (page 17).



If you see the ascent rate in numbers or as graph depends on the display settings.

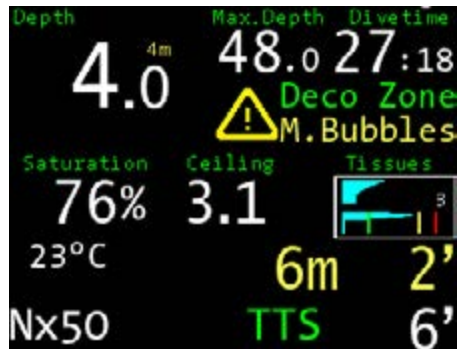
### Warnings in the view



ppO2 warning: The O2 content of the current gas NX 32 is too high for the depth (max. ppO2 1.4 bar)



If »depth blinking« is active, the depth will be marked red when you exceed the MOD.



Missed deco stop on 6 metres. Additionally there is a pre-warning for micro bubbles (the tissues are so saturated that micro bubbles could occur).



ZH-L16 violated: The deco is missed and the model is violated. Whilst the model may be extrapolated to indicate potential deco stops, there is no guarantee it is correct. There is an acute danger for an incident.

## 6. Maintenance

### 6.1. Housing

Wash your OSTC after every dive with fresh water, especially after diving in seawater. If the housing is very dirty, put your OSTC over night in fresh water. Do not use any cleaning agents or solvents.

### 6.2. Bungee

The OSTC is delivered with bungees. The bungee wristband can be set to your arm diameter individually. To tighten the bungee, make a reef knot or a simple double knot above the circular cavity (tighten knot very strong). You can also use two bungees and fix them at the ends with figure eight knots. Cut the remaining bungee after about one centimetre and use a lighter to melt the small remains of nylon.

The bungees are hand washable and can be replaced if necessary. To mount the bungee on the backplate, we recommend you to wrap the ends with tape. On our facebook page you find a detailed video instruction about how to install the bungee.

### 6.3. Charging the battery

In the OSTC 2, TR and cR, a lithium-ion battery is permanently installed. The OSTC plus comes with a removable battery. These models are charged wirelessly via inductive charging (Qi standard).

Connect the delivered charging pad to the power supply and put it on the table with the charging coil upwards (rose coloured). It flashes once in red and then it flashes in green every four seconds. Put your dive computer with the backside on it.

For your orientation: On the backside of the dive computer is a round cavity where the pad should be placed.

As soon as it charges the computer, the charging pad is **permanently green or flashes green** every second. Start the OSTC and watch the battery indicator on the display. When the battery sign is permanently marked yellow the dive computer is charging optimally.

To protect the battery, the pad already stops charging at a small warming and flashes in red. Just leave the dive computer on the charger. The charging will be continued automatically.



To recharge your dive computer it has to be placed onto the charging pad. Put your dive computer with the backside on the charging coil (rose) .

---

### Note

When the battery is totally empty, the desaturation time and no fly time are still remaining. But check time and date after re-starting the dive computer.

---

## 6.4. Changing the battery

The rechargeable battery of the OSTC 2, OSTC 2 TR and OSTC cR is sealed and can only be removed by heinrichs weikamp. The rechargeable battery of the OSTC plus can be changed by the user and replaced by a normal AA battery. Nevertheless we advice you to use the rechargeable battery.

Recharging is not possible in the OSTC sport (here the model OSTC sport is meant, not the firmware hwOS sport!). Nevertheless, you can also use rechargeable lithium batteries with 3.7 V and at least 0.8 Ah

### Insert a new battery in your OSTC plus/sport

Open the battery compartment with a screw driver and remove the old battery. Insert a new battery of the size AA with the plus pole ahead.

Check the battery compartment o-ring. From time to time apply a very small amount of o-ring grease to it.

Close the battery cap until it is inserted in the housing. Do not close it with force.

It is possible to use a high-quality 1.5 V battery in the OSTC plus, but due to the short runtime, it is recommended to use the 3.7 V lithium battery.

---

### ! Warning !

Due to the possible risk of confusion with rechargeable batteries, the use of 3.6 V disposable batteries is not permitted in the OSTC plus and cannot be selected in the menu!

---

The use of a 1.2V NiMH battery is not recommended.

After replacing the battery the menu **New battery** appears on the display. Select if you have inserted the old battery again, a new 1,5V battery or a 3,7V lithium ion battery or a dive computer with permanently installed battery.

The correct indication of the battery is important. This allows the OSTC to measure and calculate the remaining battery status more accurately.

### Overview menu »New battery«:

- Keep old
- 1.5V disposable (T0)
- 3.6V disposable (T1)
- 3.7V chargeable (T2)
- OSTC 2(2015), cR (T3)
- OSTC 2(2017), TR (T4)

To use a rechargeable battery in the OSTC plus (like the delivered one), select **3,7V chargeable (T2)**. The selection »OSTC 2 or TR« only refers to the permanently installed battery in the OSTC 2 and OSTC 2 TR.

**T0 deactivates the charging function of the OSTC plus.** With these settings, the OSTC plus cannot be charged. If the charger flashes red immediately, check whether the wrong battery type has been selected. In order to recharge the dive computer OSTC plus, you have to select T2.

When you insert and select a rechargeable battery (3.7V AA Lilon battery), the OSTC initially displays 0% battery capacity even when the battery is full. This is normal, because the battery display needs one cycle of charging to calibrate itself (which, of course, is much faster if the battery is already charged). Put your OSTC plus on the charging pad until it indicates 100% charging capacity. After this operation, the battery status is displayed correctly.

We recommend using a USB power supply unit with at least 1.5 A at 5 V.

---

### Note

If you put in a wrong value for your battery, you can change it in the menu »Reset« with »Reset battery«.

---

## Calculating the capacity of the battery

The percentage indication for 1.5 V batteries is based only on the measured cell voltage (whereas for 3.6 V batteries or rechargeable batteries it is calculated in a complex way). Fluctuations in cell voltage due to temperature effects, fluctuating current consumption (backlighting that adapts to the environment) or even contact problems lead directly to changed percentage values in the display. The reference battery is the Energizer E2 Lithium 1.5 V. The use of alkaline batteries is not recommended.

With a 3.7 V battery/rechargeable battery, the capacity is calculated because the voltage is very constant over the life of the battery and a (high-impedance) measurement does not have much significance. For this, it is necessary to specify the battery type correctly when inserting a new battery. If an empty battery is inserted but is declared as full (in the OSTC sport model), the percentage is not correct. In order to catch such cas-

es, there are also 3 very rough voltage values for 3.6 V batteries, which are compared against the calculated percentage figure: 75 % (3.0 V), 50 % (2.9 V), 25 % (2.6 V) and 10 % (2.5 V). In such a case, there may be significant jumps in the percentage figure.

For all OSTCs with rechargeable batteries (OSTC2, cR and OSTC plus when using the recommended 3.7 V Lilon battery), the OSTC must be fully charged after each reset/reboot, restart after an empty battery or insertion of a new battery (OSTC plus only). The displayed battery capacity (in percent) is only correct when the OSTC has been charged until the battery indicator was highlighted in green during charging. Depending on the model, this can take several hours.

---

### Note

If the battery of the OSTC was discharged, the OSTC should be charged overnight (at least 6 hours), regardless of the percentage value displayed. It is important to set the correct battery type in such a case, even for OSTCs with a permanently installed battery.

---

## 6.5. Spare parts

Spare parts like bungees, backplates, rechargeable batteries, AA batteries (Saft LS14500 3.6V), caps for the battery compartment, Bluetooth adapter and screen protectors are available in our online shop or at your dealer.

[www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)

## 7. Software and updates

You can easily connect the OSTC to your PC, notebook or smartphone via Bluetooth to install software or read out your dives.

How to activate Bluetooth, see page 16.

### 7.1. Firmware updates

The firmware hwOS is in a constant process of improvement. To make the best of your OSTC, use the latest stable firmware that is available at the heinrichs weikamp website: [www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)

There are several ways to update the firmware:

#### OSTC Companion

Use the OSTC Companion, which you can download from our homepage. Download and unzip the firmware. Connect your OSTC to your computer and select the correct COM port and model in the OSTC Companion. Click on »Update Firmware«. With the Companion you can also set date and time and enter a personal text.

#### Subsurface

It is also possible to install the firmware with the free logbook software Subsurface. If your OSTC is connected to Subsurface, the

program will automatically ask you if you want to update (if an update is available).

#### App (free of charge)

Using the apps HWOS Config (Android) or OSTConf (iOS) is the easiest way to install the firmware on your dive computer. Turn on the Bluetooth in the OSTC and connect it to your smartphone. Open the app, select the device and connect it. Now you can update the firmware, set the date and time, set the personal text and reset the buttons to default values.

---

#### Note

We recommend you to upgrade the firmware regularly – at least once a year. Updates for the OSTC are free of charge, of course.

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### 7.2. Software for the OSTC

Data transfer with the OSTC is supported by many software applications for all common platforms. The applications provide easy-to-operate functions for transferring recorded dive data, for planning dives and for configuring and remotely controlling your OSTC.

On our website you'll find a list of all OSTC supporting programs and applications. Go to Service > Software:

[www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)

## 8. Technical data

<b>Display</b>	High resolution IPS LCD monitor with ambient light sensor, field of view: 170°, Resolution: 320 x 240 pixel
<b>Connections</b>	Bluetooth, (OSTC cR: S8 connector)
<b>Sensor</b>	Combined depth/temperature sensor 3D compass (fully tilt-compensated)
<b>Power supply</b>	Integrated Lithium Battery (OSTC 2, TR, CR, plus), OSTC plus: additionally possible AA battery with 1,5V, OSTC sport: AA battery of any type
<b>Operating elements</b>	Two piezo buttons, OSTC sport: two push buttons
<b>Housing</b>	Milled from a single block of alloy (OSTC plus and OSTC sport), ABS-PC (OSTC 2, OSTC 2 TR, OSTC cR), scratch resistant borosilicate-glass panel
<b>Dimensions</b>	66 mm x 65 mm x 20 mm (OSTCplus) 76 mm x 78 mm x 30 mm (OSTC 2 and OSTC 2 TR) 80 mm x 68 mm x 34 mm (OSTC cR) 69 mm x 66 mm x 21 mm (OSTC sport)
<b>Weight</b>	150 gr. (OSTC plus), 170gr. (OSTC 2 and OSTC 2 TR), 240 gr. (OSTC cR), 180g (OSTC sport)
<b>Max. operation depth</b>	120 m

## 9. Disposal

According to the European WEEE directive, electrical and electronic devices must not be disposed with consumer waste. It's components must be recycled or disposed apart from each other. Otherwise contaminative and hazardous substances can pollute our environment. You as the consumer are committed by law to dispose electrical and electronic devices to the producer, the dealer or public collecting points at the end of the lifetime for free. Particulars are regulated in national right.







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