Owner's Manual

OSTC 2

Open Source Dive Computer

heinrichs weikamp

(D) CE Konformitätserklärung

Die Produkte der heinrichs weikamp GbR entsprechen den Anforderungen der Richtlinie des EU-Rates 89/336/EEC (EMV) und 2004/108/EC (EMV), ggf. ergänzt in der Angleichung der Rechtsvorschriften der Mitgliedstaaten in Bezug auf die elektromagnetische Verträglichkeit.

(GB) CE Declaration of conformity

Products by heinrichs weikamp comply with the requirements of the Council Directives 89/336/EEC (EMV) and 2004/108/EC (EMV), as amended where applicable on the approximation of the laws of the member states relating to Electromagnetic Compatibility.

heinrichs weikamp GbR, 79098 Freiburg
Freiburg, 2010

Christian Weikamp   Matthias Heinrichs

(D) RoHS Konformitätserklärung

Die heinrichs weikamp GbR erklärt hiermit, dass alle von uns ab Januar 2006 hergestellten Produkte RoHS-konform sind gemäss EU Richtlinie 2002/95/EG bezüglich folgender Substanzen:
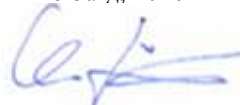
Blei (Pb)
Cadmium(Cd)
sechswertiges Chrom(Cr(VI))
Quecksilber(Hg)
Polybromierte Biphenyle (PBB)
Polybromierte Diphenylether (PBDE)

(GB) Declaration of RoHS Compliance

heinrichs weikamp GbR herewith declares that as of January 2006, all our products are manufactured RoHS conformal, fully complying with EU Directive 2002/95/EC with respect to the following substances:

Lead (Pb)
Cadmium(Cd)
Hexalvalent Chromium(Cr(VI))
Mercury(Hg)
Polybrominated biphenyls (PBB)
Polybrominated diphenylethers (PBDE)

heinrichs weikamp GbR, 79098 Freiburg
Freiburg, 2010

Christian Weikamp   Matthias Heinrichs

Your OSTC2

Thank you for choosing a heinrichs weikamp dive computer.

Using open source software for full transparency, combined with state-of-the-art hardware and robust design, OSTC2 is your instrument of choice for technical diving.

We hope you enjoy diving with your new OSTC2 dive computer.

To become familiar with the functions of OSTC2 and to use it correctly, it is recommended that you read this manual carefully.

Functions Overview

The Open Source Dive Computer OSTC2 assists you with the following functions:

Display
- Diving depth and duration according to EN 13119
- Maximum diving depth
- Ambient temperature
- Ambient pressure
- Bottom time
- Duration and depth of planned decostops
- Time to desaturation based on diving depth and duration

Planning
- Set and retrieve gas mixtures matching the scuba set
- Calculate a decoplan in the simulator

Record
- Time, duration, depth profile, temperature, reference pressure and time to desaturation

Contacting us

If you have any questions regarding the OSTC2, you can reach us
- on the Internet forum www.heinrichsweikamp.com
- via e-mail: info@heinrichsweikamp.com

Postal Address

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Adlerstraße 7
79098 Freiburg im Breisgau
Germany

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Device Overview

Left/Front/Top View
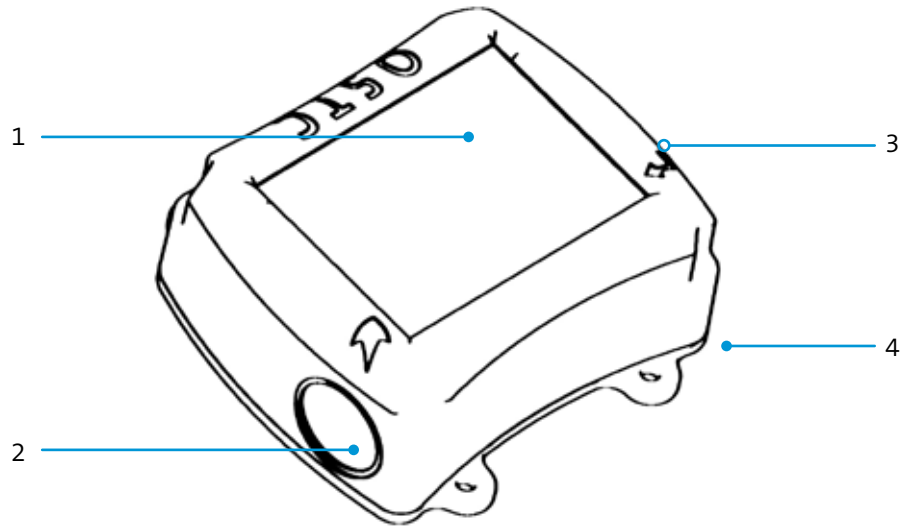
1   Display
2   SET/MENU button (contact switch))
3   ENTER button (contact switch)
4   Bungee mount

Device Overview

Bottom View
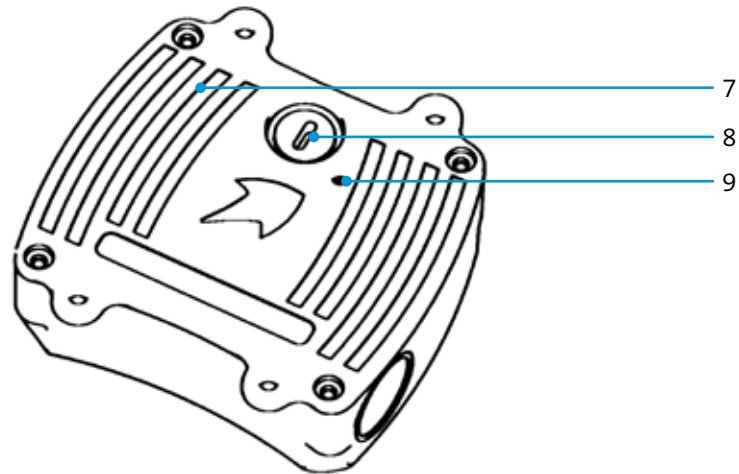
7   Pressure sensor
8   USB connector with protective cap
9   LED-Statusdisplay

General Notes

Technical Status

This manual corresponds to the technical status of OSTC2 and its firmware as of May, 2013.

OSTC2, its firmware and the documentation are subject to technical changes without notice.

OSTC2 firmware (integrated software) is being continually enhanced. To make the best use of OSTC2, we advise you to use the latest stable firmware available on the heinrichs weikamp website:

http://www.heinrichsweikamp.com/ostc2

When updating the firmware, please refer to section USB Interface: Updating the Firmware.

User Settings

Unless noted differently, the information in this manual refers to OSTC2 standard settings.

Values, formats, units and display settings which can be adjusted by the user are marked with an asterisk * in this manual.

About this Manual

Special Markings

WARNING:indicates a situation that carries a significant risk of injury.

CAUTION: Indicates a situation that carries a risk of damage to the device.

Terms of Use

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Warnings and Safety Advice

⚠ WARNING

For your own safety, follow the safety advice given below.

Precautions

The most important factor in diving safely is a competent and well trained diver, diving within their abilities.

This dive computer is intended for experienced divers. That implies:
- Sufficient knowledge about the laws of physics in diving is required.
- Relying on a wrongly configured dive computer might damage your health.
- Do not use this dive computer if you are not familiar with or don't understand the settings and displayed information of OSTC2.
- If necessary, you must be able to finish your dive safely without the aid of a dive computer.

- It is mandatory to hold a decompression scuba dive qualification for use of OSTC2 diving computers.

Before Every Dive

Plan your dive.

Set up a dive plan independently from OSTC2, and take it with you when diving.

Make sure that your OSTC2 is ready for use and correctly configured.

Always confirm the following questions before diving:

Stable Firmware? Use only firmware provided by heinrichs weikamp which is marked as "stable". It has been tested and allows for a reliable performance of OSTC2.

Configured Correctly? Check the settings of your OSTC2. If necessary, adjust the settings according to your dive plan and equipment.

Battery charged? Check the battery status using the battery charge indicator on the display. To ensure reliable performance throughout your dive, the battery must be charged sufficiently. With the display at full brightness, a fully charged battery lasts more than 40 hours in dive mode. In the course of its lifecycle, battery life may decrease.

Device waterproof? Ensure that the USB connector cap is properly closed and watertight. Check the housing for cracks or damages which might allow water to intrude.

Warnings and Safety Advice

Functioning pressure sensor? Ensure that the opening of the pressure sensor is neither clogged nor soiled

Safely attached? Make sure OSTC2 can be fastened safely using either the bungee cord or a suitable alternative.

Display messages? Check the display of OSTC2 for warnings or other signals. Do not dive if the OSTC displays a warning, e.g. the warning symbol. Check the cause for the warning.

While Diving

Take a backup system with you.

While diving, always carry a backup system to measure duration and diving depth independently from OSTC2

Take OSTC2 with you on every repeat dive – don't lend it to anyone.

A correct calculation of tissue saturation requires that OSTC2
- is configured correctly
- is used on every dive
- is only used to record data during your own dives (and not shared with other divers)

Take a sufficiently long surface break before diving again.

OSTC2 does not explicitly indicate how long to wait before the next dive. Please adhere to the guidelines you were taught during your diver's training.

CAUTION Saturation data is lost when updating the OSTC2 firmware or in the unlikely event of a failure. In these cases, do not dive any further until tissue saturation has returned to normal.

Warnings and Safety Advice

Safe Use of OSTC2

Do not modify the hardware.

Modifications to the hardware of OSTC2 can negatively impact its reliability and the leak tightness of its housing.

Only the cap of the USB connector can be removed. There is no other way to open the housing without damaging the device.

It is imperative that the o-rings on the USB cap are kept clean and free of hair, grit, dirt, lint etc.

Keep your OSTC2 out of children's reach

Small parts such as the USB connector cap may represent a choking hazard and configuration may be indadvertedly altered without the divers knowledge.

Environmental Conditions

Store the OSTC2 in a cool, dry place.

Permissible temperature range for use and storage: 0 °C to 40 °C

Maximum water depth: 120 m

CAUTION
- Surpassing the maximum water depth may cause malfunctioning or permanent damage of the device.
- The ZH-L16 calculation model is valid only up to a depth of 120 m.

Basics

Preparations for first use

You receive your new OSTC2 ready-for-use from heinrichs weikamp. If the OSTC2 has not been used for a prolonged period of time, it may be necessary to recharge the battery first.

Before diving, you need to adjust some settings as described in this manual.

Familiarize yourself with the OSTC2. It is recommended that you read this manual carefully and entirely.

Control Elements and Menus

Buttons   Operate the OSTC2 using the two red buttons SET/MENU and ENTER on the left and right side, respectively. The buttons are contact switches which respond to short finger pressure. You don't need to hold the buttons down.

Menus   The basic principles of operation that are described below apply to most functions of the OSTC2. If necessary, the documentation indicates when to use these buttons differently.

To display the menu, press SET/MENU. The display shows the pre-menu **Menu?**. Press ENTER to confirm.

To select a menu entry, press SET/MENU repeatedly until the cursor marks the required menu item. From the item on the bottom, the cursor jumps back to the top.

In some menus, you will find a **More** entry. Select this entry to access the next menu page with more menu items.

To change the setting of a menu item, press ENTER repeatedly until the required value is displayed. Note that for some numerical settings, you have to adjust the direction and increment of change separately.

NOTE   The pre-menu **Menu?** avoids that the menu is displayed by mistake. Confirm the pre-menu by pressing ENTER within 5 seconds, otherwise the OSTC2 will return to the normal display.

.

Basics

Charging the Battery

The battery of the OSTC2 is charged using the USB connector. The delivery includes a USB cable.

Your OSTC2 must be charged in a dry environment to avoid damages caused by corrosion or a short circuit..

1. Unscrew and remove the protective lid from the USB connector.

2. Connect the USB connector to a computer or a standard USB charger.

3. The OSTC2 is being charged while the connected computer or USB charger is in operation.

4. While the battery is being charged, the battery symbol is yellow.

When the battery symbol is green, charging is complete (i.e. the battery is charged at least 95%).

Once charging is completed, disconnect the USB cable and screw the lid on the USB connector to make it watertight.

The USB plug of the cable can be used as 'screwdriver' for the cap.

If you do not use the OSTC2 for an extended period of time, you can leave it connected to the USB charger until next use.

Charging an empty battery might take up to eight hours.

NOTE The OSTC2 comes with an integrated magnetic reset switch. When charging, do not place the OSTC2 near a magnet that might trigger the magnetic switch.

Basics

OSTC2 Modes of Operation

OSTC2 has three modes of operation and switches automatically between them:

Surface Mode

To wake up the OSTC2, press SET/MENU or ENTER.

When in surface mode, the display shows general information – current time, date, temperature, ambient pressure and battery charging status. After a dive, the display also shows tissue saturation and remaining time in the no-fly period.

In surface mode, you can adjust the settings in preparation for the next dive, read recorded dive data and adjust the base settings of the OSTC2.

Dive Mode

The OSTC2 automatically switches into dive mode when it is at least 1.6 m* below the surface for five seconds.

In dive mode, the display shows current diving depth, elapsed time since starting the dive, maximum depth since starting the dive, the currently selected breathing gas and decompression information including Future TTS if configured.*

Pressing ENTER toggles additional information provided as Custom View like EAD/END, Average Depth, Time or Stopwatch.

NOTE It is not possible to switch underwater from dive mode to surface mode; hence you cannot change the base settings while diving. Note that exceptions apply to the Apnoe setting.

TIP The integrated simulator allows you to get acquainted with the functions of the dive mode.

Sleep Mode

When the OSTC2 is not operated at the surface, it switches into sleep mode after 2 minutes* to save battery.

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

Basics

OSTC2 Dive Settings

You can configure the OSTC2 to match your equipment and how you intend to use it. Furthermore, you can select a model for decompression calculation.

To select a dive setting, select **Setup** > **Decotype**, then choose one of the dive settings described below.

NOTE The displayed information is adapted according to the chosen dive setting. In dive mode, menu items are adapted as well.

Dive settings with decompression calculation

ZH-L16 OC, L16-GF OC   Use these dive settings with regular (open circuit) dive equipment.

The decompression calculation model is Bühlmann ZH-L16 for open circuit with or without gradient factors.

ZH-L16 CC, L16-GF CC Use these dive settings with a closed circuit rebreather.

The decompression calculation model is Bühlmann ZH-L16 for closed circuit with or without gradient factors.

pSCR-GF   With pSCR O2 Drop and lung ratio modify the calculation of ppO2. The basic values can be configured in CF61, CF62 and CF63.

Dive settings without decompression calculation

Gauge   Use this dive setting if you do not use the OSTC2 for decompression calculation.

With this dive setting, OSTC2 serves as a depth gauge. Additionally displayed and recorded are ambient temperature and elapsed time since starting the dive. Decompression and saturation calculation are switched off.

Apnoe   Use this setting for apnea diving or snorkeling.

With this dive setting, the OSTC2 serves as a depth gauge. Additionally displayed and recorded are ambient temperature and elapsed time since starting the dive. Decompression and saturation calculation are switched off. Dive time is displayed in minutes*.

Basics

▲▲▲

With the Apnoe setting, the OSTC2 re-mains in dive mode even when diving at low depths. You can switch into sur-face mode at any time by pressing SET/MENU?. Press ENTER to confirm the **Quit?** alert.

Above a defined depth* and after a de-fined delay*, the OSTC2 switches auto-matically into surface mode.

Display in Surface Mode

Surface screen

1   Dive setting: OC, CC, CF, pSCR, Gauge or Apnea

2   Ambient pressure

3   Time

4   Date

5   Ambient temperature

6   Remaining no-fly time (hours:minutes).

7   Remaining desaturation time (hours:minutes).

8   Battery charge indicator / battery voltage*

9   Custom text (up to 23 characters)

10   Installed firmware version

11   CustomView: Desaturation diagram, gas list (OC), setpoints (CC), Surface Intervall, Desaturation in %. Display toogled with right button.

12   First gas mix (OC) or oxygen partial pressure at setpoint 1 (CC), depending on the dive setting.

13   Gas overview, additional active gases

Display in Surface Mode

Desaturation diagram

When using a dive setting with decompression calculation, a desaturation diagram is available.

Press ENTER to switch between desaturation diagram and gas list (OC) or setpoints (CC).

```
N2  �
 80% ├──┼──┼──┤
He  ana
```
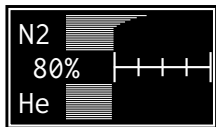
After a dive, you can see the approximate tissue saturation in the desaturation diagram.

The lines in the upper section represent nitrogen saturation, the lines in the lower section helium saturation of the 16 types of tissue according the Bühlmann model.

The numeric value is the lead tissue saturation percentage.

The first scale division marks a saturation of 80%. Each following division corresponds approximately to the decrease over the half-life for the respective type of tissue.

TIP The same desaturation diagram is also available in the dive mode (**More** > **Graphs**).

Gaslist

When using an open circuit dive setting, the list of available gas mixes can be shown on the display at position 11.

Press ENTER to switch between gas list and desaturation diagram.

The first gas mix used when starting your dive is displayed at position 12. Air means compressed air (21% oxygen,

no helium). For any other gas mix, the respective percentages of oxygen and helium fractions are displayed.

Gaslist contains the other four preset gas mixes with their respective percentages of oxygen and helium fractions.

If the sum of oxygen and helium fractions is less than 21%, the gas list shows **ERR** indicating an unusual gas mix.

Setpoints

When using a closed circuit dive setting, the list of available setpoints can be shown on the display at position 11.

Press ENTER to switch between setpoints list and desaturation diagram.

The setpoints list shows the oxygen partial pressure for the three setpoints (**SP**) and the oxygen and helium frac-

Display in Surface Mode

tions of the diluent. The first setpoint is permanently displayed at position 11.

Surface Interval

Time passed since last recorded dive.

BSat/BDes/Last

Last Decostop depth is shown .* BSat (Bühlmann Saturation) as well as BDes (Bühlmann Desaturation) are shown. Those two parameters are relevant conservatism parameters for non-gradient factor dive setups.

Dive Setting Display

In surface mode, the dive setting is displayed on top of the left side.

Menu Functions in Surface Mode

You can adjust the settings to prepare the next dive, read recorded dive data and adjust the base settings of OSTC2.

Press SET/MENU in order to access the menu in surface mode. The display shows the pre-menu **Menu?**. Press ENTER to confirm.

```
            Menu:
 ⇗ Logbook
   Gas Setup
   Reset Menu
   Setup
   More
   Exit
```

Logbook   Look up recorded data from recent dives

Gas Setup   Set gas mixes matching the scuba set

Reset Menu   Reset the OSTC2 settings to their default values; stop decompression calculation; delete recorded data; restart the OSTC2

Setup   Inspect and modify base settings for OSTC2 functions

Choose **More** for the following entries:

Set Time   Set date and time

CCR SetPoint Menu   Inspect and modify closed circuit rebreather settings

Battery Info   Display Battery charge status

Simulator   Simulate dive mode; calculate decostops

See the following sections for more details.

Logbook – Recorded Dive Data

The OSTC2 records data during every dive. It can be retrieved from the Logbook.

Memory

Logbook entries are sorted in chronological order, starting with the most recent entry. Every entry shows:
- 1st row - Position index
  (**01** = most recent),
- 2nd row - Date (month/day),
- 3rd row - Maximum dive depth
- 4th row - Dive duration (minutes)

OSTC2 stores data of approximately 20 to 30 typical dives. The actual number of records depends on the overall size of data. If the memory is full, existing records will be overwritten, starting with the oldest.

TIP   If you want to secure your recorded dive data, you can connect the OSTC2 to a computer and read out the data.

Displaying details

The details page also shows:
- 1st line - position index, date, time
- 2nd line - maximum diving depth, duration, minimum ambient temperature
- 3rd line – ambient pressure above water (used as reference for depth measurement), desaturation time (hours:minutes)

TIP   To display the actual number of dives instead of the position index, you can configure Custom Function 28.

TIP   More information including Gaslist, Salinity, CNS and Average Depth can be found on page 2 and 3 (toogled with left button).

Gas Setup – Adapting Scuba Gas Mixes

Use Gas Setup to configure presets for up to five gas mixes. You can switch between these presets while diving, whenever you exchange gases.

```
Gas Setup - Gaslist
   G1:*AIR 21    at 0m
   G2: TX 23/2   at 14m
 ▸ G3: NX 99     at 6m
   G4: AIR 21    at 0m
   G5: AIR 21    at 0m
   Exit
```

The presets are marked like this: **AIR** for compressed air (21% oxygen, no helium), **NX** for nitrox and **TX** for trimix.

To inspect and modify a preset, go to the **Gas Setup** menu, select the desired preset and press ENTER.

```
Gas# 1:AIR 21 at 0m
 ▸ More
   O2: 21%    MOD:66m
   He: 0%     END:66m
   +/-: +
   Default:21/0
   Exit
```

Setting the composition

Specify the composition of a gas mix by setting the percentage of the oxygen and helium fraction, respectively.

First, choose whether to increase or decrease the fraction. Select the +/− entry. Press ENTER to switch between increasing (**+**) and decreasing (**–**) the value.

Next, select the **O2** entry for the oxygen fraction or the **He** entry for the helium fraction. Press ENTER repeatedly until the required value is displayed. For ref-

erence, the OSTC2 displays the calculated maximum diving depth (**MOD**) next to the O2 entry.

Reverting to default values

To revert a gas mix preset to standard values, select the **Default** entry and press ENTER.

```
Gas# 1:AIR 21 at 0m
 ▸ Active Gas? Yes
   First Gas? Yes
   Depth +/-: +
   Change:0m    0.21bar
   Default:0m
   Exit
```

Setting the operation depth

To set the operation depth for a preset gas mix, select **More**, then select **Depth +** or **Depth –**. The current operation depth is shown in the first line of

Gas Setup – Adapting Scuba Gas Mixes

the display, the calculated corresponding oxygen partial pressure (**ppO2**) in the fourth line, next to the **Change** entry.

Configure usage

To use a gas mix right at the start, set **First Gas?** to **Yes**. On the **Gas List**, the first gas mix is marked with an asterisk (**Gn:***), all other gas mixes are marked **Gn::**.

NOTE A gas mix with an operation depth of 0 m is used only when **First Gas?** is set to **Yes**.

If a certain gas mix is not available, you can disable the respective entry on the gas list. To do this, set **Active Gas?** to No. Deactivated entries are dimmed out on the display (text turns dark blue).

Reset Menu

This menu allows you to reset all settings of the OSTC2 to their default values, stop decompression calculation prematurely, delete recorded data, or restart the OSTC2.

To leave the Reset Menu, select **Cancel Reset** or **Exit**.

Reverting settings to default

To reset all user settings from the Gas Setup, Setup menu and decompression data to their default values, select the **Reset CF, Gas & Deco** entry, then press ENTER. You will be prompted to confirm the reset (**Confirm?**). Select **OK** to confirm the reset or **Cancel** to perform no reset.

Deleting Logbook data

To delete all recorded dive data, select the **Reset Logbook** entry and press ENTER. You will be prompted to confirm the reset (**Confirm?**). Select **OK** to delete all recorded dive data or **Cancel** to keep the data.

NOTE Deleted dive data cannot be restored.

Rebooting the OSTC2

The OSTC2 needs to be rebooted during the installation of a new firmware.

To reboot, select the **Reboot OSTC** entry and press ENTER. You will be prompted to confirm the reboot (**Confirm?**). Select **OK** to confirm the reboot or **Cancel** to perform no reboot.

CAUTION Rebooting deletes the current decompression data.

Deleting decompression data

To delete current decompression data, select the **Reset decodata** entry and press ENTER. When you start the next dive, the OSTC2 will use normal tissue saturation (fully desaturated) for its calculations.

CAUTION Use **Reboot OSTC** and **Reset** only if you do not plan a repeat dive within the next 48 hours.

Setup – Adjusting Base Settings

Select **Setup** on the main menu to display the **Setup menu**, where you can inspect and adjust the base settings of your OSTC2.

```
       Setup Menu:
➤  Custom FunctionsI
   Custom FunctionsII
   Custom FunctionsIII
   Decotype: ZH-L16 OC
   More
   Exit
```

```
      Setup Menu 2:
➤  Date format:DDMMYY
   Debug: OFF
   Show License
   Salinity: 1.00kg/l
   Brightness: Eco
   Exit
```

Custom Functions

Custom functions are parameters that control the functions of the OSTC2.

For a current list of all available Custom Functions, see the OSTC wiki at http://www.heinrichsweikamp.com.

Configuring Custom Functions

Custom Functions are divided by their ordinal number into three menus, **Custom Functions I** (parameters 0 to 31), **Custom Functions II** (parameters 32 to 63) and **Custom Functions III** (parameters 64 to 95).

TIP You can also configure Custom Functions and other settings from a PC using SubSurface, Diving Log or JDiveLog software.

Select **Setup** and then **Custom Functions I, Custom Functions II** or **Custom Functions III**.

```
    Custom Functions I
➤  00:Start Dive  [m]
   +/-: +       > 0.50
   Step:0.01   < 2.50
   Default:1.00
   Current:1.00
   Exit
```

On the display, the second line shows the ordinal number, the parameter name as well as the unit of the parameter value in square brackets.

To increase or decrease the parameter value, select the **+/–** entry. Press ENTER to switch between increasing (**+**) and decreasing (**–**) the value.

To set the increment by which the value is increased or decreased, select the **1/10** entry. Press ENTER to switch between an increment of **1** or **10**.

Setup – Adjusting Base Settings

Next, select the **Current** entry and press ENTER repeatedly until the required value is displayed. You can change the direction and increment at any time.

NOTE For technical reasons, the possible numeric range for parameter values is

- 0 to 255, for entries with 8 bit word size
- 0 bis 32767, for entries with 15 bit word size

Note that the possible numeric range includes unsuitable or even dangerous values.

⚠ WARNING

Keep to the value range that is recommended for the respective Custom Function. Some Custom Functions impact critical safety-related functions and displays.

To reset a particular parameter to its default value, select the **Default** entry and press ENTER.

NOTE All Custom Functions are adjusted to a tested value suitable for this application.

Salinity

This setting allows you to adjust salinity, used for calculating both current and maximum depths.

The default salinity is based on a density of water of 1.00 kg/l. To increase this value, select the **Salinity** entry and press ENTER repeatedly until the required value is displayed. The value range is 1.00 kg/l to 1.04 kg/l.

NOTE Decompression information is based upon absolute pressure and not relative pressure and therefore salinity does not effect this calculation.

Setup – Adjusting Base Settings

Decotype – OSTC2 Dive Setting

Select the required dive setting and the type of decompression calculation.

ZH-L16 OC   Decompression calculation for open circuit (normal scuba gear) using the Bühlmann ZH-L16 model

ZH-L16 CC   Decompression calculation for closed circuit rebreather using the Bühlmann ZH-L16 model

Gauge   Disables decompression/saturation calculation and no-fly warning. The OSTC2 records diving depth, time and temperature.

Apnoe   Disables decompression/saturation calculation and no-fly warning. The OSTC2 records diving depth, time and temperature.

L16-GF OC   Decompression calculation for open circuit (normal scuba gear) using the Bühlmann ZH-L16 model with gradient factors

L16-GF CC   Decompression calculation for closed circuit rebreather using the Bühlmann ZH-L16 model with gradient factors

pSCR-GF   Decompression calculation for passive semi closed circuit rebreather using the Bühlmann ZH-L16 model with gradient factors and O2 drop as well as lung ratio.

Choose **More** to access the following entries:

Date Format

Set the displayed date format:
- **YYMMDD**: year, month, day
- **DDMMYY**: day, month, year
- **MMDDYY**: month, day, year

Debug

To display additional information for the analysis of errors, set **Debug** to **ON**. This setting is intended to assist programmers and developers and is not required for normal operation.

Show License

Select this entry to display the terms of license for the firmware.

Set Time and Date

Set Time

To set date and time for the OSTC2, select **More** from the main menu, then **Set Time**.

While setting the date and time, the clock is paused (whereas desaturation calculation continues). When you have set the new date and time, you can restart the clock to the second.

```
        Set Time:

    Time:11:21
    Date:17.05.13




Set Hours
```
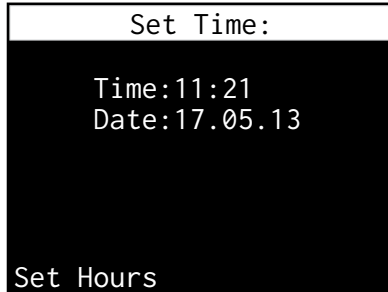
1. Press ENTER repeatedly until the required value is displayed.
2. Press SET/MENU to select the next setting – from hour to minute, to month, to day and to year.

3. After **Set Year**, press SET/MENU to restart the clock at second :01 after the set time.

CCR SetPoint Menu – Closed Circuit Rebreather Settings

When using a closed circuit rebreather, you can set the OSTC2 to the corresponding CCR setpoint. You can specify setpoints in the **CCR SetPoint Menu**.

NOTE   OST2 does not display the PPo2 of the breathing loop and therefore you cannot use it as a PPo2 display. In the context of CCR diving the OSTC2 can only serve as a constant PPo2 decompression computer and not as PPo2 display or a setpoint controller..

```
    CCR Setup Menu
▸  SP#1 (Dil. 21/0)
   Current:0.80bar
   ppO2 +
   ppO2 -
   Default:1.00
   Exit
```

Select the first menu entry and press ENTER to select setpoint 1, 2 or 3 (**SP#1**, **SP#2**, **SP#3**).

To increase oxygen partial pressure for the selected setpoint, select **ppO2 +** and press ENTER repeatedly. The value increases in steps of 0.01 bar.

To decrease oxygen partial pressure for the selected setpoint, select **ppO2 –** and press ENTER repeatedly. The value decreases in steps of 0.01 bar.

To revert to the default value for oxygen partial pressure, select **Default:1.00** and press ENTER.

If required, repeat these steps for the other setpoints.

Battery Information

Select **Battery Informtion** to display detailed information about the battery.

```
Battery Information
Cycles:0 (0)
Last Complete:00.00.00
Lowest Vbatt:4.200V
Lowest at:15.05.13
Tmin:25.4° (15.05.13)
Tmax:25.4° (15.05.13)
Total Dives: 9
```

- **Cycles**: Number of complete charge cycles (battery charged up to at least 95% of its capacity)
- **Last Complete**: Date of the last complete charge
- **Lowest Vbatt**: Minimum battery voltage
- **Lowest at**: Date of minimum battery voltage
- **Tmin**: Minimum ambient temperature with date

- **Tmax**: Maximum ambient temperature with date
- **Total Dives**: Counter of all real dives done with this computer

Press ENTER to exit Battery Information and return to the menu.

Simulator

Use the simulator to
- simulate the dive mode of the OSTC2
- calculate the decoplan for the specified maximum depth and retention period at the bottom.

```
      OSTC Simulator
 ➤  Interval:Now
    Start Dive
    Bottom Time:3min
    Max. Depth:15m
    Calculate Deco
    Exit
```

Calculate Decoplan

As a planning aid, the OSTC2 can calculate decompression stops previous to a planned dive.

First, set the desired values for bottom time and maximum depth. Select the respective menu entry and press ENTER until the required value is displayed.

- **Bottom Time** can be increased in steps of 2 minutes up to a maximum of 199 minutes.
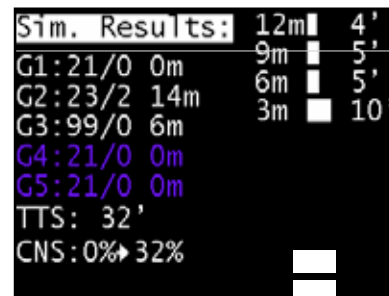- **Max. Depth** can be increased in steps of 3 meters up to maximum of 99 meters

If you accidentally exceed the desired value, select **Exit** to leave the simulator menu. Select the simulator again and set the correct values.

To start calculation, select **Calculate Deco** and press ENTER.

Please wait for the calculation of the decompression plan. Calculation may take some time, depending on the specified bottom time.

TIP During calculation, the **Bottom Time** value counts down, indicating the remaining minutes of bottom time to be calculated.

When the calculation is done, select **Show Decoplan** to display the calculated decompression plan with duration and depth of the planned decompression stops.

```
Sim. Results:  12m▮  4'
                9m▮   5'
G1:21/0  0m     6m▮   5'
G2:23/2 14m     3m▮  10"
G3:99/0  6m
G4:21/0  0m
G5:21/0  0m
TTS: 32'
CNS:0%➤32%
```

Depth is displayed in meters, duration is displayed in minutes. Duration is additionally represented by the width of the respective bar.

NOTE Only the six deepest decompression stop are displayed.

Simulator

Simulating Dive Mode

The simulator allows you to simulate the diving mode in order to become familiar with its functions above the surface.

Start Dive Select **Start Dive** to start the simulator. The value specified for **Max. Depth** is adapted as current diving depth.

Changing diving depth Unlike the dive mode, the simulator has an additional menu for diving depth, where you can set the simulated diving depth. Press ENTER to display the depth menu. Use SET/MENU to select the desired change in depth, then press ENTER to confirm:
• **+1m**, **+10m**: descend 1 m or 10 m
• **-1m**, **-10m**: descend 1 m or 10 m

Quitting dive mode To quit the dive mode, simulate an ascent. In the depth menu, select **-10m** and press ENTER repeatedly until the displayed diving depth has reached 0 m. The dive mode simulation will stop after a short delay.

NOTE Both in dive mode and during a simulation, the OSTC2 cannot switch to sleep mode. Remember to quit the dive mode simulation when you're done, otherwise you might exhaust the capacity of both battery and logbook memory.

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

Altimeter

Enables the use of the pressure sensor for (not so perfect) barometric measurements in surface mode. The sensor build in the OSTC2 is specified for a large pressure range of several bars and not barometric range specific. It does not replace an altimeter.
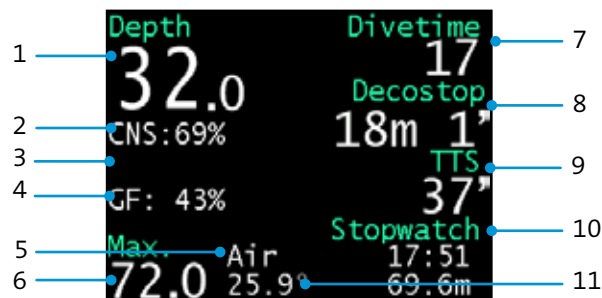
Display in Dive Mode

Main display in dive mode/Closed Circuit
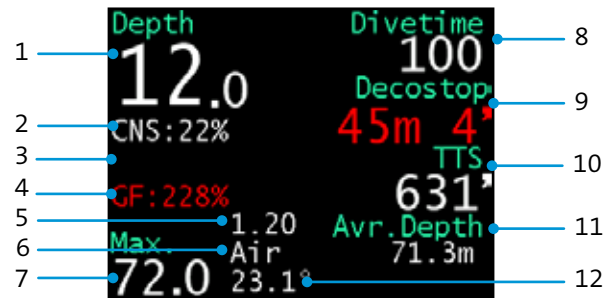
1 Diving depth in meters

2 **CNS**: oxygen toxicity percentage (displayed when required) or rate of descent in m/min

3 **ppO2**: oxygen partial pressure in bar (displayed when required)

4 **GF**: present gradient factor

5 Oxygen partial pressure for the selected setpoint; **Bail** for bailout

6 Composition of the selected diluent or bailout gas (oxygen/helium)

7 **Max** Maximum diving depth

8 **Divetime:** Dive time in minutes*

9 **Decostop:** Depth and duration of the next decostop (if available)

10 **TTS**: total duration of decostops; **No Stop**: no decostop planned, remaining dive time until the first decostop

11 **CustomView:** Stopwatch, Marker, Time, LeadTiss., Avr.Depth, Tissue-Graph, EAD/END, FutureTTS

12 Ambient temperature

Display in Dive Mode

Main display in dive mode/Open Circuit

1. Diving depth in meters
2. **CNS**: oxygen toxicity percentage (displayed when required) or rate of descent in m/min
3. **ppO2**: oxygen partial pressure in bar (displayed when required)
4. **GF**: present gradient factor
6. Composition of the selected diluent or bailout gas (oxygen/helium)

7. **Max** Maximum diving depth
8. **Divetime:** Dive time in minutes*
9. **Decostop:** Depth and duration of the next decostop (if available)
10. **TTS**: total duration of decostops; **No Stop**: no decostop planned, remaining dive time until the first decostop

11. **CustomView:** Stopwatch, Marker, Time, LeadTiss., Avr.Depth, Tissue-Graph, EAD/END, FutureTTS
12. Ambient temperature

Display in Dive Mode

Main display in dive mode/Gauge, Apnoe

1	Diving depth in meters
2	**CNS**: oxygen toxicity percentage (displayed when required) or rate of descent in m/min
3	**Max** Maximum diving depth
4	Ambient temperature
5	**Divetime:** Total dive time (minutes:seconds)
6	**Surface:** Surface time (minutes:seconds)
7	**Descent:** Elapsed time since last descent (minutes:seconds)

Menu Functions in Dive Mode

When the computer is in dive mode and set to OC, CC, pSCR or Gauge, you may use the menu to
• select a preset gas mix (OC, Gauge) or setpoints and bailout gases (CC)
• show decoplan
• reset Average Depth / toogle gradient factors / ...
• toggle display brightness

NOTE   The Apnoe dive mode does not have a menu.

To display the menu in dive mode, press SET/MENU. The display shows the pre-menu **Menu?**. Press ENTER to confirm.

The third menu entry depends on the CustomView in the right low part of the dive mode screen.

Decompression data

Decoplan (OC, CC) shows the decompression plan as a list of decompression stages. The current decompression stage is also shown on the main display.

Selecting a breathing gas

Gas List (OC, Gauge) allows you to switch between the five preset gas mixes.

Set Gas (OC, Gauge) allows you to modify the current composition of the gas mix during the dive.

SetPoint (CC) allows you to switch between the three preset setpoints.

Bailout (CC) allows you to select one of the three preset bailout gases.

Set Gas

For Open Circuit, Gauge

This setting allows you to select the currently used gas mix. You may choose between the presets made in **Gas Setup** (in surface mode). Oxygen and helium fractions of the current gas mix are displayed on the main display.

Select **O2 +** or **O2 −**, to increase or decrease the oxygen fraction.

Select **He +** oder **He −** to increase or decrease the helium fraction.

Press ENTER repeatedly until the required value is displayed.

The new value is displayed in the first line, next to **Sel**.

In order to apply the new setting select the first entry **Sel** and press ENTER.

Menu Functions in Dive Mode

In order to revert to the preset gas mix, select it again from the **Gas List**.

SetPoint

For Closed Circuit

Choose between the three setpoints that have been configured in Gas Setup (surface mode). Oxygen and helium fraction of the current gas mix are displayed on the main screen.

Bailout

For Closed Circuit

Select the current bailout gas mix. You can choose between five preset gas mixes already configured in **Gas Setup** (surface mode). Oxygen and helium fraction of the current gas mix are displayed on the main screen.

Display

Select **Display** to switch between full (default) and reduced brightness of the display. At full brightness, text appears in white; at reduced brightness, it appears in a yellowish shade.

NOTE The display brightness setting applies only to dive mode; the setting is retained for the next dive.

Decoplan

Select **Decoplan** to display the list of currently planned decompression stops.

For each planned decompression stop, depth in meters and duration in minutes are displayed. Duration is additionally represented by the width of the respective bar.

If no decompression stops are required, **No Deco** is displayed.
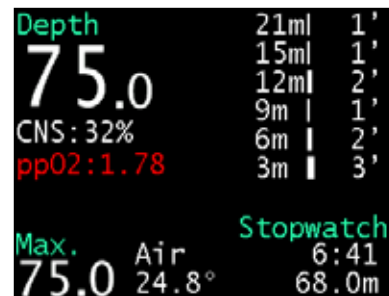
Press ENTER to hide the list.

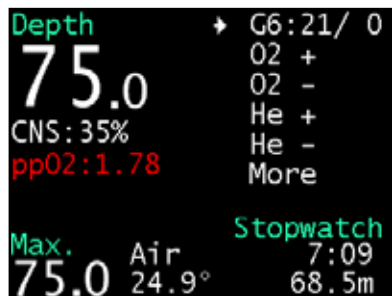If required, the next decompression stop is permanently shown on the main display.

Gas List

For Open Circuit, Gauge

This setting allows you to select the currently used gas mix. You may choose between the presets made in Gas Setup (in surface mode). Oxygen and helium

CustomViews in DiveMode

fractions of the current gas mix are displayed on the main display.

SetMarker

Sets a marker at the current position in the profil

ResetAvr

Sets Stopwatch to zero and reset the average depth of the stopwatch.

ToogleGF

Use either the standard or the alternative gradient factor pair. This is available only if CF 67, CF68 and CF69 is configured in surface mode.

CustomViews in DiveMode

Stopwatch

The stopwatch counts seconds and minutes. The value left of the stopwatch is the average depth since starting the stopwatch.

The stopwatch is resetted via **Menu > ResetAvr.**

Marker

Allows to set a marker via **Menu > Set-Marker**

Time

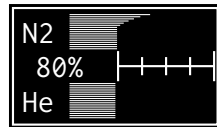Actual time of the day.

Lead Tiss.

Displays the type of tissue with the most significant saturation.

Avr.Depth

Average depth since the start of the dive.

Graph

Displays a desaturation diagram showing the calculated nitrogen and helium saturation.

The diagram visualises the approximate saturation values during the dive.

The lines in the upper section represent nitrogen saturation, the lines in the lower section show the helium saturation of the 16 types of tissue according the Bühlmann model.

The numeric value is the saturation percentage of the lead tissue.

The first scale division marks a saturation of 80%. Each following division corresponds approximately to the decrease over the half-life for the respective type of tissue.

EAD / END

Equivalent Air Depth as well as Equivalent Narcotic Depth is shown.

FutureTTS

TTS time for ascent after additional xx minutes on the current depth

GF Values

Overview of both gradient factor pairs. The active one is colored white.

Cleaning and Care

Housing

Use freshwater to rinse OSTC2 after every dive, particularly after diving in seawater.

If necessary, dissolve dirt by immersing OSTC2 into freshwater for some hours. Do not use cleaning agents or solvents.

CAUTION Never insert pointed objects into the opening of the pressure sensor.

Wristband / Bungee

The OSTC2 ships with bungee. The bungee can be detached and is hand washable and can be replaced, if necessary.

Power supply

The Li-Ion rechargeable battery is sealed in gel for safety reasons.

USB Interface

The USB interface can be used for charging the battery, for data exchange between the OSTC2 and a connected computer, and for installing new firmware for the OSTC2.

While the OSTC2 is connected to a suitable USB port or a standard USB charger, the battery charges. For details see the section Basics: Charging the Battery.

NOTE Links to all mentioned software resources can be found at http://www. heinrichsweikamp.com

Installing the Driver

When connecting a computer to your OSTC2 for the first time, you will need to install a device driver, which is available for Windows, Mac OS X and Linux.

1. Download the FT232R interface driver.
2. Unpack the zip archive to a directory.

3. Connect the USB interface of the OSTC2 to your computer. Windows will automatically recognize the OSTC2 as a new device.
4. When Windows asks for a driver medium, point to the directory containing the unpacked driver software.

After installation has completed, the OSTC2 interface becomes part of the "Ports" branch in the Windows Device Manager; it is listed as "USB Serial Port (COM x)".

Transferring data and settings

Data transfer with the OSTC2 is supported by two software applications – DivingLog and JDiveLog. Both applications provide easy-to-operate functions for transferring recorded dive data, and for configuring and remotely controlling your OSTC2.

Updating the firmware

The OSTC2 firmware (integrated software) is in the constant process of improvement. To make the most of your OSTC2, it is advisable to use the latest stable firmware that is available at the heinrichs weikamp website:

http://www.heinrichsweikamp.com/ostc

NOTE Linux and Macintosh users can install firmware updates using the JDiveLog application or SubSurface.

Technical Specifications

Processor	Low Power Microchip PIC18LF4685
Data storage	128kB Memory for data and logbook
Display	2,4" TFT-Display (6,1 cm), Resolution 320×240 Pixel, 65 000 Colors, Angle of view 170°
Connector	Micro-USB 2.0 Interface for data download and battery recharging
Sensor	Intersema MS5541C
Battery	18650 LiIon battery with protective circuit, nonstop usage > 40 hours
Controls	Two Piezo-electric switches, usable even with extra thick gloves
Housing	Housing made of ABS plastic Display window made of scratch-resistant borosilicate glass
Dimensions	80 mm x 68 mm x 34 mm
Weight	about 260g
Maximum diving depth	120m
Allowed temperature range	0-40°C

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