

# OSTC

Open Source Dive Computer

2N



## **(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:

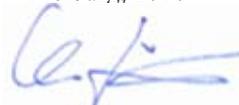
Blei (Pb)  
Cadmium(Cd)  
sechswertiges Chrom(Cr(VI))  
Quecksilber(Hg)  
Polybromierte Biphenyle (PBB)  
Polybromierte Diphenylether (PBDE)

## **(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)  
Hexavalent Chromium(Cr(VI))  
Mercury(Hg)  
Polybrominated biphenyls (PBB)  
Polybrominated diphenylethers (PBDE)

heinrichs weikamp GbR, 79098 Freiburg  
Freiburg, 2010



Christian Weikamp



Matthias Heinrichs

# Your OSTC 2N

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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, OSTC 2N is your instrument of choice for technical diving.

We hope you enjoy diving with your new OSTC 2N dive computer.

To become familiar with the functions of OSTC 2N and to use it correctly, it is recommended that you read this manual carefully.

## Functions Overview

The Open Source Dive Computer OSTC 2N 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 OSTC 2N, you can reach us

- on the Internet forum  
[www.heinrichsweikamp.net](http://www.heinrichsweikamp.net)
- via e-mail:  
[info@heinrichsweikamp.net](mailto:info@heinrichsweikamp.net)

## Postal Address

Heinrichs Weikamp GbR  
Adlerstraße 7  
79098 Freiburg im Breisgau  
Germany

# Contents

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<b>Your OSTC 2N</b> .....	<b>3</b>	<b>Basics</b> .....	<b>12</b>	<b>Menu Functions in Surface Mode</b> .....	<b>20</b>
Functions Overview.....	3	Preparations for first use .....	12	<b>Logbook – Recorded Dive Data</b> .....	<b>21</b>
Contacting us .....	3	Control Elements and Menus .....	12	<b>Gas Setup – Adapting Scuba Gas</b>	
<b>Contents</b> .....	<b>4</b>	Charging the Battery.....	13	<b>Mixes</b> .....	<b>22</b>
<b>Device Overview</b> .....	<b>6</b>	OSTC 2N Modes of Operation .....	14	<b>Reset Menu</b> .....	<b>24</b>
Left/Front/Top View .....	6	OSTC 2N Dive Settings.....	15	<b>Setup – Adjusting Base Settings</b> .....	<b>25</b>
Right/Bottom View.....	7	<b>Display in Surface Mode</b> .....	<b>17</b>	Custom Functions.....	25
<b>General Notes</b> .....	<b>8</b>	Startbildschirm .....	17	Salinity .....	26
Technical Status.....	8	Desaturation diagram .....	18	Decotype – OSTC 2N Dive Setting .	27
User Settings.....	8	Gaslist .....	18	Date Format .....	27
About this Manual.....	8	Setpoints .....	18	Debug.....	27
<b>Warnings and Safety Advice</b> .....	<b>9</b>	Dive Setting Display .....	19	Show License .....	27
Precautions.....	9			<b>Set Time and Date</b> .....	<b>28</b>
Before Every Dive.....	9			Set Time .....	28
While Diving .....	10				
Safe Use of OSTC 2N .....	11				
Environmental Conditions .....	11				

# Contents

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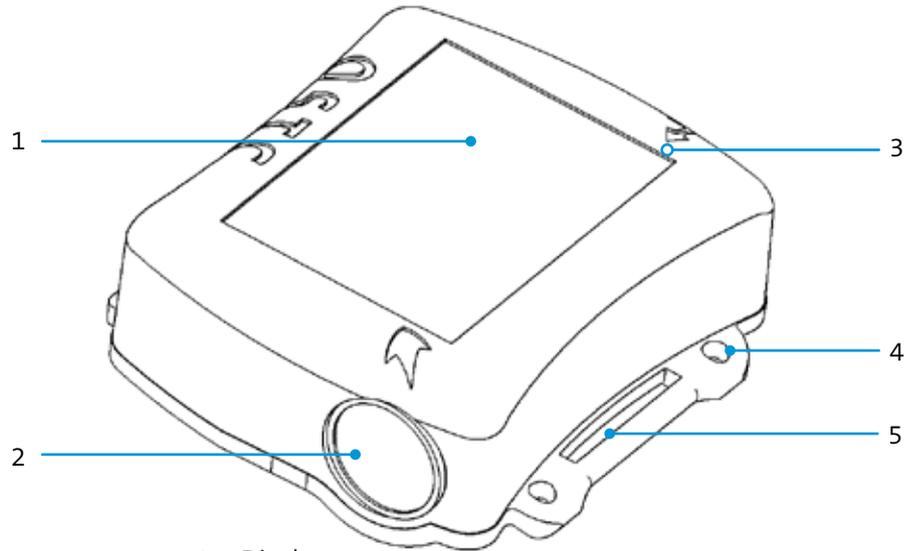
<b>CCR SetPoint Menu – Closed Circuit Rebreather Settings</b> .....	29	Markter.....	38	<b>Technical Specifications</b> .....	42
<b>Battery Information</b> .....	30	Time.....	38	<b>Inside View</b> .....	43
<b>Simulator</b> .....	31	<b>CustomViews in DiveMode</b> .....	38		
<b>Display in Dive Mode</b> .....	33	Lead Tiss.....	39		
Main display in dive mode/Closed Circuit.....	33	Avr.Depth.....	39		
Main display in dive mode/Open Circuit.....	34	Average depth since the start of the dive.....	39		
Main display in dive mode/ Gauge, Apnoe.....	35	Graph.....	39		
<b>Menu Functions in Dive Mode</b> .....	36	EAD / END.....	39		
Set Gas.....	36	FutureTTS.....	39		
SetPoint.....	37	<b>Cleaning and Care</b> .....	40		
Bailout.....	37	<b>USB Interface</b> .....	41		
Display.....	37	Installing the Driver.....	41		
Gas List.....	37	Transferring data and settings.....	41		
SetMarker.....	38	Updating the firmware.....	41		
ResetAvr.....	38				
Stopwatch.....	38				



# Device Overview

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## Left/Front/Top View

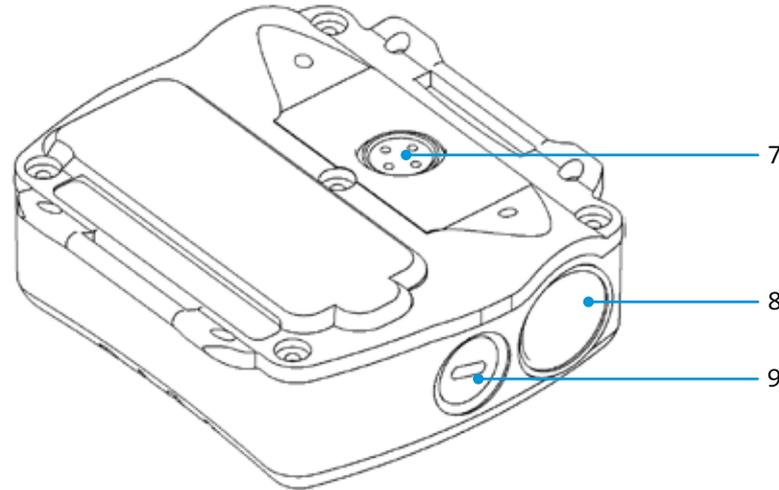


- 1 Display
- 2 SET/MENU button (contact switch)
- 3 ENTER button (contact switch )
- 4 Bungee mount
- 5 Velcro wristband mount (wristband optional)

# Device Overview

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## Right/Bottom View



- 7 Pressure sensor
- 8 ENTER button (contact switch)
- 9 USB connector with protective cap

# General Notes

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## Technical Status

This manual corresponds to the technical status of OSTC 2N and its firmware as of May, 2011.

OSTC 2N, its firmware and the documentation are subject to technical changes without notice.

OSTC 2N firmware (integrated software) is being continually enhanced. To make the best use of OSTC 2N, we advise you to use the latest stable firmware available on the heinrichs weikamp website:

<http://www.heinrichsweikamp.net/ostc>

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 OSTC 2N 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

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## WARNING

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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 OSTC 2N.
- If necessary, you must be able to finish your dive safely without the aid of a dive computer.

### Before Every Dive

#### Plan your dive.

Set up a dive plan independently from OSTC 2N, and take it with you when diving.

#### Make sure that your OSTC 2N 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 OSTC 2N.

**Configured Correctly?** Check the settings of your OSTC 2N. If necessary, ad-

just 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 both the USB connector cap and the battery compartment are firmly closed and watertight. Check the housing for cracks or damages which might allow water to intrude.



# Warnings and Safety Advice

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

**Safely attached?** Make sure OSTC 2N can be fastened safely using either the wristband or a suitable alternative.

**Display messages?** Check the display of OSTC 2N 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 OSTC 2N

**Take OSTC 2N with you on every repeat dive – don't lend it to anyone.**

A correct calculation of tissue saturation requires that OSTC 2N

- 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.**

OSTC 2N 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 OSTC 2N 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 OSTC 2N

### Do not modify the hardware.

Modifications to the hardware of OSTC 2N can negatively impact its reliability and the leak tightness of its housing.

Only the caps of the battery compartment and 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.

Open the battery compartment only when the battery has to be replaced.

### Keep your OSTC 2N out of children's reach

Small parts such as the USB connector cap may represent a choking hazard and

configuration may be inadvertently altered without the divers knowledge.

## Environmental Conditions

Store the OSTC 2N 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

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## Preparations for first use

You receive your new OSTC 2N ready-for-use from heinrichs weikamp. If the OSTC 2N 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 OSTC 2N. It is recommended that you read this manual carefully and entirely.

## Control Elements and Menu

**Buttons** Operate the OSTC 2N 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 OSTC 2N. 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 OSTC 2N will return to the normal display.

# Basics

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## Charging the Battery

The battery of the OSTC 2N is charged using the USB connector. The delivery includes a USB cable.

Your OSTC 2N 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 OSTC 2N 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.

If you do not use the OSTC 2N for an extended period of time, you can leave it connected to the USB charger until next use. The USB plug of the cable can be used as ‘screwdriver’ for the cap.

**NOTE** The OSTC 2N comes with an integrated magnetic reset switch. When charging, do not place the OSTC 2N near a magnet that might trigger the magnetic switch.

# Basics

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## OSTC 2N Modes of Operation

OSTC 2N has three modes of operation and switches automatically between them:

### Surface Mode

To wake up the OSTC 2N, 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 OSTC 2N.

### Dive Mode

The OSTC 2N 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.

**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 OSTC 2N 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

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## OSTC 2N Dive Settings

You can configure the OSTC 2N 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.

### Dive settings without decompression calculation

**Gauge** Use this dive setting if you do not use the OSTC 2N for decompression calculation.

With this dive setting, OSTC 2N 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 OSTC 2N 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

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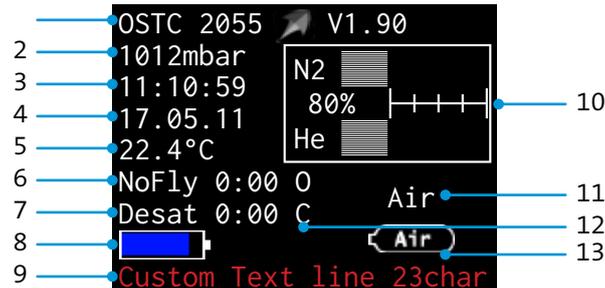
With the Apnoe setting, the OSTC 2N remains in dive mode even when diving at low depths. You can switch into surface mode at any time by pressing SET/MENU?. Press ENTER to confirm the **Quit?** alert.

Above a defined depth\* and after a defined delay\*, the OSTC 2N switches automatically into surface mode.

# Display in Surface Mode



## Startbildschirm



- 1 Installed firmware version (Serial number, version number)
- 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 CustomView: Desaturation diagram, gas list (OC), setpoints (CC), Surface Intervall, Desaturation in %. Display toggled with right button.

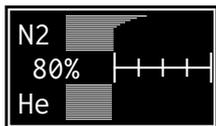
- 11 First gas mix (OC) or oxygen partial pressure at setpoint 1 (CC), depending on the dive setting.
- 12 Dive setting: OC, CC, CF, Gauge or Apnoe
- 13 Additional active gas

# 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).



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 10.

Press ENTER to switch between gas list and desaturation diagram.

The first gas mix used when starting your dive is displayed at position 11. 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 10.

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 fractions of

# Display in Surface Mode



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

Example: Dive setting is ZH-L16 OC

```
NoFly 0:00 G      Air
Desat 0:00 F
```

Example: Dive setting is Gauge

```
Gauge
```

## Dive Setting Display

In surface mode, the dive setting (pos. 11) is displayed like this:

- **O/C:** ZH-L16 OC
- **C/C:** ZH-L16 CC
- **G/F** and first gas: L16-GF OC
- **G/F** and oxygen partial pressure: L16-GF CC
- **Gauge:** Gauge dive setting
- **Apnoe:** Apnoe dive setting

Example: Dive setting is ZH-L16 CC

```
NoFly 0:00 C      1.00Bar
Desat 0:00 C
```

Example: Dive setting is Apnoe

```
Apnoe
```

Example: Dive setting is L16-GF OC

```
NoFly 0:00 G      22|0
Desat 0:00 F
```

Example: Dive setting is L16-GF CC

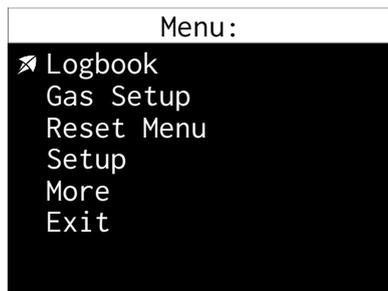
```
NoFly 0:00 G      1.00Bar
Desat 0:00 F
```

# 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 OSTC 2N.

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



**Logbook** Look up recorded data from recent dives

**Gas Setup** Set gas mixes matching the scuba set

**Reset Menu** Reset the OSTC 2N settings to their default values; stop decompression calculation; delete recorded data; restart the OSTC 2N

**Setup** Inspect and modify base settings for OSTC 2N 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 OSTC 2N records data during every dive. It can be retrieved from the Logbook.

Logbook				
✈	01	10/11	15.5m	34'
	02	10/05	25.2m	18'
	03	10/04	23.0m	22'
	04	10/04	16.2m	24'
Exit				

## Memory

Logbook entries are sorted in chronological order, starting with the most recent entry. Every entry shows:

- Position index  
(01 = most recent),
- Date (month/day),
- Maximum dive depth
- Dive duration (minutes)

OSTC 2N 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 OSTC 2N to a computer and read out the data.

## Displaying details

The details page also shows:

- 1st line – position index, date
- 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 in 0m
G2: TX 23/2 in 14m
G3: AIR 21 in 0m
G4: AIR 21 in 0m
G5: AIR 21 in 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 in 6m
✦ More
O2: 21% (MOD:66m)
He: 0% (MOD: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 OSTC 2N 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 in 6m
✦ Back (ppO2:0.21Bar)
Active Gas? Yes
First Gas? Yes
Depth +
Depth -
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 second line, next to the **Back** 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 0m 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 OSTC 2N to their default values, stop decompression calculation prematurely, delete recorded data, or restart the OSTC 2N.

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

## Reverting settings to default

To reset all user settings from the Gas Setup and Setup menu 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 OSTC 2N

The OSTC 2N 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 OSTC 2N will use normal tis-

sue saturation (fully desaturated) for its calculations.

**CAUTION** Use **Reboot OSTC** and **Reset Decodata** 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 OSTC 2N.

```
Setup Menu:
✦ Custom FunctionsI
  Custom FunctionsII
  Salinity:1.00kg/l
  Decotype:ZH-L160C
  More
  Exit
```

```
Setup Menu 2:
✦ Date Format:MMDDYY
  Debug: OFF
  Salinity:1.00kg/l
  Show License

  Exit
```

## Custom Functions

Custom functions are parameters that control the functions of the OSTC 2N.

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 two menus, **Custom Functions I** (parameters 0 to 31) and **Custom Functions II** (parameters 31 to 63).

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

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

```
Custom Functions I
✦ 00: Start Dive [cm]
  +/-: +      > 0.50
  1/10: 1     < 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

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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 marked with **8B** (8 bit word size)
- 0 bis 32767, for entries marked with **15B** (15 bit word size)

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

---

### **WARNING**

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

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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 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

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## Decotype – OSTC 2N 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 OSTC 2N records diving depth, time and temperature.

**Apnoe** Disables decompression/saturation calculation and no-fly warning.

The OSTC 2N 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

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.

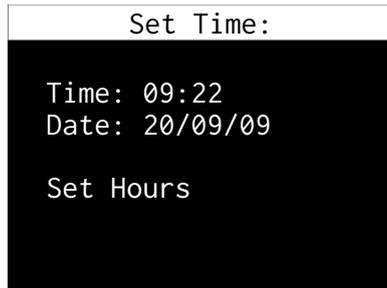
# Set Time and Date

---

## Set Time

To set date and time for the OSTC 2N, 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.



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 OSTC 2N to the corresponding CCR setpoint. You can specify setpoints in the **CCR SetPoint Menu**.

**NOTE** The OSTC MKII does not display the PPO<sub>2</sub> of the breathing loop and therefore you cannot use it as a PPO<sub>2</sub> display. In the context of CCR diving the OSTC MKII can only serve a constant PPO<sub>2</sub> decompression computer and not as PPO<sub>2</sub> display or a setpoint controller.

```
CCR SetPoint Menu
✈ SP#1 (Dil. 21/0)
Current:1.00Bar
ppO2 +
ppO2 -
Default:1.00
Exit
```

To increase oxygen partial pressure for the selected setpoint, select **ppO<sub>2</sub> +** and press ENTER repeatedly. The value increases in steps of 0.01 bar.

To decrease oxygen partial pressure for the selected setpoint, select **ppO<sub>2</sub> -** 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.

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

# Battery Information

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

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

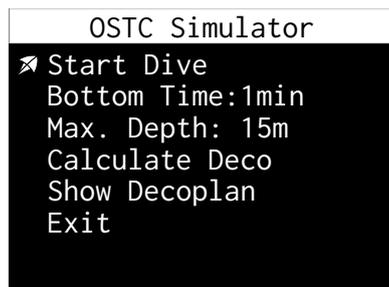
```
Battery Information
Cycles:11(2)
Last Complete:09/03/03
Lowest Vbatt:3.130V
Lowest at:08/05/09
Tmin:15.1° (08/23/09)
Tmax:28.9° (09/05/09)
```

- **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

# Simulator

Use the simulator to

- simulate the dive mode of the OSTC 2N
- calculate the decoplan for the specified maximum depth and retention period at the bottom.



## Calculate Decoplan

As a planning aid, the OSTC 2N 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. While calculating, the right status indicator is flickering in red. 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.

The image shows a screenshot of the "Sim. Results" screen. It displays a list of decompression stops with their depths and durations, along with a progress bar for each. The results are as follows:

Stop	Depth (m)	Duration (min)
Sim. Results:	27m	4'
	24m	8'
G1: 21/0	21m	13'
G2: 21/0	18m	16'
G3: 21/0	15m	27'
G4: 21/0	12m	39'
G5: 21/0	9m	61'
TTS:	6m	116'
CNS: 0% > 71%		More

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



# Simulator

---

**NOTE** Only the six deepest decompression stop are displayed.

## Simulating Dive Mode

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

**Tauchmodus starten** 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**: ascend 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.

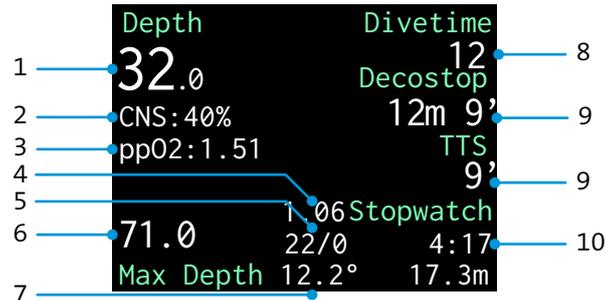
**NOTE** Both in dive mode and during a simulation, the OSTC 2N cannot switch to sleep mode. Remember to quit the dive mode simulation when you're done, otherwise you might exhaust the capacity of both battery and logbook memory.

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

# Display in Dive Mode



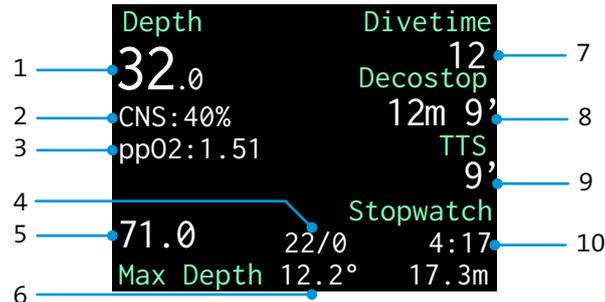
## Main display in dive mode/Closed Circuit



- 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 Oxygen partial pressure for the selected setpoint; **Bail** for bailout
- 5 Composition of the selected diluent or bailout gas (oxygen/helium)
- 6 Maximum diving depth
- 7 Ambient temperature
- 8 Dive time in minutes\*
- 9 Depth and duration of the next decostop (if available)
- 10 **Stopwatch**: Stopwatch, Marker, Time, LeadTiss., Avr.Depth, Tissue-Graph, EAD/END, FutureTTS
- 11 **TTS**: total duration of decostops; **No Stop**: no decostop planned, remaining dive time until the first decostop

# 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 Composition of the selected gas mix (oxygen/helium) or “Air”
- 5 Maximum diving depth
- 6 Ambient temperature
- 7 Dive time in minutes\*
- 8 Depth and duration of the next decostop (if available)
- 9 **TTS**: total duration of decostops; **No Stop**: no decostop planned, remaining dive time until the first decostop.
- 10 **CustomView**: as in ClosedCircuit

# Display in Dive Mode



## Main display in dive mode/Gauge, Apnoe



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

# Menu Functions in Dive Mode

When the computer is in dive mode and set to OC, CC or Gauge, you may use the menu to

- select a preset gas mix (OC, Gauge) or setpoints and bailout gases (CC)
- display additional information

**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.

## 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.

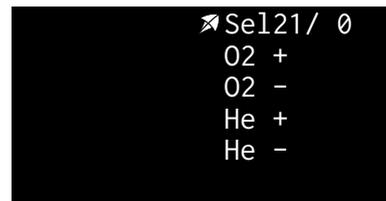
**SetPoint** (CC) allows you to switch between the three preset setpoints.

**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 +** or **He -** to increase or decrease the helium fraction.

# Menu Functions in Dive Mode

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.

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.



30m	02'
21m	03'
18m	04'
15m	02'
12m	04'
More	

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



# CustomViews in DiveMode

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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.

## SetMarker

Sets a marker at the current position in the profil

## ResetAvr

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

## 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.

# CustomViews in DiveMode

## Lead Tiss.

Displays the type of tissue with the most significant saturation.



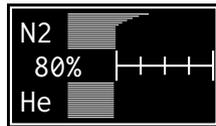
After a few seconds, the additional diagram disappears automatically. To hide it immediately, press SET/MENU or ENTER.

## 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 to 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



# Cleaning and Care

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## Housing

Use freshwater to rinse OSTC 2N after every dive, particularly after diving in seawater.

If necessary, dissolve dirt by immersing OSTC 2N 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

The OSTC 2N ships with bungee. Velcro strap wristband is available as optional accessory. The bungee and the wristband can be detached, are hand washable and can be replaced, if necessary.

## Changing the battery

The Li-Ion rechargeable battery is sealed in gel for safety reasons. Do not open the diving computer. If the OSTC 2N is opened the bottom plate has to be replaced and the battery has to be sealed anew. Cost for battery replacement are 29 Euro excluding shipping cost (status May 2011).

## Spares

Replacement wristbands and batteries can be ordered from heinrichs weikamp or your local dealer.

# USB Interface



The USB interface can be used for charging the battery, for data exchange between the OSTC 2N and a connected computer, and for installing new firmware for the OSTC 2N.

While the OSTC 2N is connected to a suitable USB port or a standard USB charger, the battery charges. For details see the section Basics: Charging the Battery.

Once charging is completed, disconnect the USB cable and firmly replace the lid on the USB connector to make it watertight. To allow the air behind the cap to escape, firmly twist the USB cap back into position.

**NOTE** Links to all mentioned software resources can be found at <http://www.heinrichsweikamp.net>

## Installing the Driver

When connecting a computer to your OSTC 2N 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 OSTC 2N to your computer. Windows will automatically recognize the OSTC 2N 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 OSTC 2N 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 OSTC 2N 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 OSTC Mk2.

## Updating the firmware

The OSTC 2N firmware (integrated software) is in the constant process of improvement. To make the most of your OSTC 2N, it is advisable to use the latest stable firmware that is available at the heinrichsweikamp website:

<http://www.heinrichsweikamp.net/ostc>

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

# Technical Specifications

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<b>Processor</b>	Low Power Microchip PIC18LF4685
<b>Data storage</b>	128kB Memory for Data and Logbook
<b>Display</b>	2,4" OLED-Display (6,1 cm), Resolution 320×240 Pixel, 65 000 Colors, Angle of view 170°
<b>Connector</b>	Micro-USB 2.0 Interface for data download and battery recharging
<b>Sensor</b>	Intersema MS5541C
<b>Battery</b>	18500 Lilon battery with protective circuit
<b>Controls</b>	Two Piezo-electric Switches, usable even with extra thick gloves
<b>Housing</b>	Housing made of ABS plastic Display window made of scratch-resistant borosilicate glass
<b>Dimensions</b>	80 mm x 68 mm x 32 mm
<b>Weight</b>	200g
<b>Maximum diving depth</b>	120m
<b>Allowed temperature range</b>	0-40°C



