

Owner's manual

# DR 5



heinrichs  weikamp

## **D** CE Konformitätserklärung

Die Produkte von heinrichs weikamp 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.

## **D** RoHS Konformitätserklärung

heinrichs weikamp erklärt hiermit, dass alle von uns ab Januar 2006 hergestellten Produkte RoHS-konform sind gemäss EU Richtlinie 2002/95/EG bezüglich folgender Substanzen:

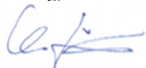
Blei (Pb)  
Cadmium(Cd)  
sechswertiges Chrom(Cr(VI))  
Quecksilber(Hg)  
Polybromierte Biphenyle (PBB)  
Polybromierte Diphenylether (PBDE)

## **GB** Declaration of RoHS Compliance

heinrichs weikamp 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, 79098 Freiburg  
Freiburg, 2012

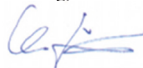


Christian Weikamp



Matthias Heinrichs

heinrichs weikamp, 79098 Freiburg  
Freiburg, 2012



Christian Weikamp



Matthias Heinrichs

# Your DR5

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Thank you for choosing a heinrichs weikamp dive computer.

Using the in-house designed software for full transparency, combined with state-of-the-art hardware and robust design, DR5 is your instrument of choice for extended technical diving.

We hope you enjoy diving with your new DR5 dive computer.

To become familiar with the functions of DR5 and to use it correctly, it is recommended that you read this manual carefully.

**For any questions or queries relating to your DR5 dive computer please contact your local heinrichs weikamp dealership or we can be contacted directly via the following...**

- ...internet forum:  
[www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)
- ...e-mail:  
[info@heinrichsweikamp.net](mailto:info@heinrichsweikamp.net)
- ...mail:  
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Germany

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# Functions Overview

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The DR5 diving computer for technical diving and professional diving supports you with:



**display:**

**decompression algorithm:**

**preparation:**

**data transfer:**

**logging:**

**others:**



depth and divetime according to EN 13119 up to 200 meters, maximum depth, water temperature, no stop time / NDL, decompression stops for rebreather, open circuit and bailout, residual times, partial oxygen pressure monitoring ( with optional hardware), custom views ( average depth, stop watch, CNS, time of day)

Varying Permeability Model / VPM-B with Bühlmann checks, Bühlmann with gradient factors, Personal dive tables

gas mixes and setpoints, deco planer

digital / analog electrical port for oxygen monitoring, USB port

UDDF compatible logbook with USB interface

lifetime free firmware updates

# Preparation

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**You receive your new DR5 with a complete stable firmware installed from heinrichs weikamp. If the DR5 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.**

**S8 and Fischer are used synonymous in the following manual**

The package should include the DR5, an USB to S8 cable, bungee for use as wristband and a transport box.

The S8 plug should be covered by a red closure. The S8 has to be covered with this closure all the time to prevent intrusion of water.

The battery compartment is on the right, opposite, side. Please keep the battery compartment closed to prevent damage of the sealings. The battery will be recharged via the S8 connector and the S8 to USB cable provided.

The pressure sensor can be found on the bottom of the diving computer. It is identified by a tiny hole in the centre.





Furthermore two slots on each side are visible next to the holes for the bungee. A wristband for those slots is not part of the package. We recommend the use of the bungee wristband.

Please lengthen the bungee to fit on your wrist with respect to your diving suit.

The DR5 is user operated by three red piezo buttons on the slanted front of the device. Those buttons are responsive to pressure impulse applied. Holding down the button has no effect.

# Technical Data

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<b>Processor</b>	High-performance, low-power 32-bit RISC-based
<b>Data storage</b>	2 GigaByte Flash-EEPROM
<b>Displays</b>	OLED display, diagonal 2.4" (6.1 cm) Field of view: 170° Resolution: 320 x 240 Pixel Status display: Two multicolor and one blue LED
<b>Connections</b>	USB + analog + digital via S8 for O2 Sensor (triple-sealed) Digital via optical Port (Wet connector)
<b>Sensor</b>	Pressure: 30bar guaranteed / $\pm 0.5$ mbar Temperature: resolution 0.01 °C / $\pm 0.5$ °C
<b>Power supply</b>	Replaceable Li-Ion battery, recharge via USB 20+ hours of operation, 1+ months standby
<b>Operating elements</b>	Three high-grade Piezo keys



<b>Case</b>	Milled from a single block of alloy Scratch resistant borosilicate glass window
<b>Dimension</b>	99 mm x 74 mm x 38 mm
<b>Weight</b>	450 gr.
<b>Operating depth</b>	300 meters
<b>PC software</b>	DivingLog, JdiveLog, Mac-Dive (UDDF), Subsurface and others
<b>Scope of delivery</b>	DR5 Computer Firmware by heinrichs weikamp S8-Charging cable Bungee EVA transport case Display protection film
<b>Accessories (optional)</b>	Multi Deco Firmware, S8 cable

# Environmental Conditions

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## Safe Use of DR5

This manual corresponds to the technical status of DR5 and its firmware as of March, 2014. DR5, its firmware and the documentation are subject to technical changes without notice. DR5 firmware (integrated software) is being continually enhanced. To make the best use of DR5, we advise you to use the latest stable firmware available on the heinrichs weikamp website: [www.heinrichsweikamp.com](http://www.heinrichsweikamp.com)

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 DR5.

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 DR5 diving computers.

Set up a dive plan independently from DR5, and take it with you when diving.

Make sure that your DR5 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 DR5.

**Configured Correctly?** Check the settings of your DR5. 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.

**Device waterproof?** Ensure that the S8 plug and battery compartment are properly closed and watertight. Check

# Environmental Conditions

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the housing for cracks or damages which might allow water to intrude.

**Safely attached?** Make sure DR5 can be fastened safely using either the bungee cord or a suitable alternative.

**Display messages?** Check the display of DR5 for warnings or other signals. Do not dive if the DR5 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 DR5.

Take DR5 with you on every repeat dive – don't lend it to anyone. A correct calculation of tissue saturation requires that DR5

- 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. DR5 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.

Saturation data might be lost when updating the DR5 firmware or in the unlikely event of a failure. In these cases, do not dive any further until tissue saturation has returned to normal.

Do not modify the hardware. Modifications to the hardware of DR5 can negatively impact its reliability and the leak tightness of its housing. Only the cap of the S8 connector and the cap of the optical port can be removed. There is no other way, except for the battery compartment, to open the

housing without damaging the device. It is imperative that the o-rings on the S8 plug are kept clean and free of hair, grit, dirt, lint etc.

Keep your DR5 out of children's reach. Small parts such as the caps may represent a choking hazard.

The ZH-L16 calculation model is valid only up to a depth of 120 m.

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

# Environmental Conditions

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## **Familiarize yourself with the DR5.**

It is recommended that you read this manual carefully and entirely.

## **Intended use**

The DR5 is a diving computer for personal use for manned scuba diving in natural waters up to a depth of 300 meter. Using the DR5 for diving in mountain lakes is possible. It shall not be used in environments with less than 600 mbar or industrial environments. The diving computer does not comply with military standards and is not antimagnetic.





## Warranty & Repair

The legal warranty is two years. Please contact your local dealer or the manufacturer heinrichs weikamp if necessary. It is recommended to write an email with name and serial number after buying the unit to register for warranty and repair issues. Please get into contact with your local dealer or the manufacturer before shipping the unit for repair or other issues to the manufacturer.

## Maintenance, replacing the battery, spare parts, disposal

Most of the DR5 is maintenance free. Please take care of O-rings that are prone to wear. Those should be the S8 plug o-rings only. The battery has to be charged entirely at least once a month and more often if the DR5 is used. The bungee should be controlled regularly and it can be detached and is hand washable and can be replaced, if necessary. The build in battery is rechargeable and can be replaced by some local dealers and the manufacturer if necessary. It is highly recommended not to replace the battery

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by the user to keep the unit watertight.  
Dispose DR5 as electronic waste. Do  
not throw it away with regular rubbish.  
You can also return DR5 to heinrichs  
weikamp for disposal..

# Usage



## Overview



Button left, middle and right

## The first dive: open circuit without gas changes

The DR5 is switched on with the right button the farthest to the S8 plug.

The serial number is shown during boot.

Date und time is shown as an analogue mechanical wristwatch on the left side of the surface screen. If date und time are not correct those can be adjusted in menu 003/050 and 003/051.

The right side of the surface screen should be have blank. The top shows

# Usage

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the last dive if the surface interval is less than nine days. If there was a test dive at the manufacturer's place within those days the tissues values might have a saturation left. The proper setup for the first dive is Open Circuit, Air, no gas changes, VPM +3, last stop at 3 meter. All this information should be shown in the right side of the surface screen. No gas change is shown as blank behind the information about the first gas. The computer is ready for a first simple dive if the battery status in the upper right corner is at least 20 percent. Please charge the DR5 if the battery status is below 20 percent. Please configure the dive computer as mentioned if there

are differences to the description. The tissues can be reset if there is still information about the last dive shown. Information about the Reset can be found in Advanced usage: System.

Alternatively a dive can be simulated with the build in simulator mode to get in contact with the DR5 functionality.

Please use the DR5 dive computer, together with a well known backup dive computer, with Open Circuit on Air only first prior to using the more advanced features.



The divemode starts as soon as the ambient pressure is 1160 mbar or more. The computer will start from standby if necessary.

The main information on the dive screen is the depth in meter. The standard setting is that 10 bar is equivalent to 100 meter. The two available ranges for this are 98 to 102 for metrical and 320 to 334 for imperial translation. The configuration does affect the actual depth and max depth only, all the other information is always shown as 10 bar equals 100 meter.

Maximum depth is shown on the bottom of the left side underneath the actual depth. Between those values the ascend and descent rate is shown if applicable.

The total divetime is shown centered on the bottom line. The regular display is minutes:seconds.

The remaining No stop time is shown on the right top corner. This information is replaced by time to surface as soon as there are stops necessary.

The next stop is shown left to the TTS information in the center of the top line. The decompression algorithm uses 12

# Usage

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meter / minute to predict stops and TTS. Deviations by the user are covered as the deco stops are calculated anew every few seconds.

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## HINT

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Recalculation continues even if standard rules are broken as for example, a stop is skipped by the diver, or the ascent is interrupted and followed by a descent (Jo-Jo). In that case the decompression algorithm does not protect against decompression sickness. There is no blocking behavior or similar if warnings and rules are broken or ignored. The DR5

is an add-on to help for a diving but does never replace personal decisions based on a proper scuba dive qualification.

The actual gas setting is written on the top left corner, and therefore should be Air at this first dive. Next to it is the current oxygen pressure in mbar.

The left button toggles between several custom information that is shown on right main part of the dive screen.

Some custom views, like average depth and stop tables offer functionality on the middle button. The average depth and stop watch can be reset as well as



the next page of a longer sto list can be shown.

CNS is shown between actual gas and actual depth if applicable.

The battery warning symbol is shown if the battery status drops to a certain level.

Hints, warnings and errors are shown as a symbol between maximum depth and total divetime. Details will be displayed by pressing the right button.

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## HINT

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Almost all warnings and trigger levels can be configured. Therefore warnings and hints can differ from dive computer to dive computer as well as between firmware versions.

Dive menu is accessible through the red button too. Nevertheless, without gas changes and with VPM, there is nothing to be configured for this first dive.

Reaching the water surface at least within on meter and not descending again will start the count down to end dive mode. Ending the dive mode will

# Usage

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write a log, save the changing tissue parameter and switch to surface mode.

Surface mode will display information about the last dive as maximum depth and duration as well as the surface break. The end of the dive will be shown as a red finger in the clock for twelve hours too.

The left button toggles the display and more information, like tissue saturation, are available.

The right button starts the menu with logbook as first entry. Dives are sorted in descending order with month/day tags.

Four pages of information are available for each dive. Starting with global information and continuing with three fullscreen graphs.

The logbook can be copied to a personal computer or laptop via USB. All logbook data is stored in the logbook on the DR5. The data format is UDDF.

Firmware updates can be executed using the USB connection without any additional software on the personal computer or laptop.

The battery will be charged while connected with a USB. The charge





duration depends partly on the type of USB connection. A USB power supply, like the ones for mobile phones, with USB plug to connect the USB-S8 cable is recommend for charging the battery.

# Usage

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## Modes

Four different modes are implemented. Starting with Open Circuit for all gas mixes with Nitrogen and Helium and continuing with rebreather modes with evaluation of external oxygen sensors or without and manual setpoint control for the decompression algorithm.

Unique is the dive table mode that can be loaded with deco tables, like DECO 2000 or similar, to be used for decompression calculations. Using tables is almost identical to using build-in realtime decompression algorithms. The maximum depth and

maximum duration as well as the gas mixes available are limited through the data of the dive table.

Mode selection can be found in 001/006. Each mode has an unique Dive Setup.

## Gas Mixes

Ten gas mixes can be preconfigured and will be used for all modes except dive table mode. Each mode has a separate gas change setup as well as specific first gas or diluent settings.



First of all 001/005 is the gas mixes configuration for all modes using percentage oxygen plus percentage helium as input. Nitrogen is the remainder. Maximum operating depth (MOD) and equivalent nitrox depth (END) are shown immediately for each gas in the rows on the right. The first row show the usage of the gas mixes in several modes. All gas mixes can be used during a dive – even if not preconfigured as gas change in advance.

The gas mixes are shown in typical notation. Complex gas mixes in percentage oxygen and helium. The menu has two pages. The second page

follows the first by scrolling down with the right button. Please enter all gases used regularly. The most often used first if possible.

Menu 001/008 as well as 001/007/016 and 001/007/018 offer options to select the first gas or diluent and gas changes for both directions. Travel gases trigger warnings at the specific depth on the descent. Deco gases trigger warnings on the ascent and are used by the decompression algorithm to predict oncoming gas changes.

Depth for gas changes are entered in meter. Off resets the gas change depth.

# Usage

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Each gas mix of the ten gas mixes can be used during a dive (except for dive table mode). Furthermore most modes offer a freely configurable gas mix.

## Conservatism

Two different models can be selected via 001/009/040. One is VPM-B the other is Bühlmann ZH-L16 with gradient factors.

VPM-B has six levels of conservatism starting with zero. 0 and 1 are very progressive therefore the standard setting is 3. Decompression stops will be

evaluated against Bühlmann by the DR5 to not violate ZH-L16.

Bühlmann as standalone decompression algorithm is configured via gradient factors. The gradient factors for lower depth is stated first. The gradient factor at the surface is stated second. Diver without deeper knowledge about gradient factor can use the three examples given in the diving computer to start with.



## Starting dive mode

The dive mode starts automatically if the ambient pressure exceeds 1160 mbar. The boot screen and surface screen will be shown while booting.

## Leaving dive mode

The timeout starts as soon as the surface is only one meter away or closer. The timeout will continue to its end (about 4 minutes) if no ascent interrupts it. A logbook entry is written and the surface mode will be started after leaving dive mode.

Simulating a dive is ended by menu entry surface or after ten minutes without user interaction.

# Usage

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## Information about the last dive

All dives will be logged as UDDF files if the divetime is at least one minute.

All logs can be accessed directly in the dive computer via 001. The first page of each dive offers time and date as year-month-day as well as details about the dive mode, conservatism, maximum depth, average depth, lowest temperature and duration in hours:minutes:seconds. Furthermore CNS information and maximum oxygen pressure at the bottom line.

The second page graphs output is depth and temperature. The third page graph offers details about gas changes and the last page about oxygen pressure in mbar.

More information about the last dive can be found on the start page in surface mode on the right side. On top about maximum depth and duration. The actual surface interval below. Custom views with information about current tissue saturation, CNS and OTU is available with the left button.



## USB interface – data transfer

USB mode starts as soon as the diving computer is connected to an USB interface. The battery will be recharged in this mode and the DR5 is similar to a simple USB memory stick. The mounted DR5 partition gives access to all important files including background pictures, fonts and VPM dumps. No changes should be done to the file system of the DR5 for that reason. The advantage of this is easy access for updates.

Logbook is the user accessible folder with all logs as UDDF files. Date, time,

maximum depth and duration is represented in the filename of those logs. Those files can be copied to the PC by hand or with a dedicated dive log software like DivingLog.

Logs not longer needed can be deleted but there is no way to rebuild this data after deletion.

All other folders and files must not, except for updates, be modified in any way.

Most of the time checking and repairing the file system of the DR5 with PC

# Usage

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build-in tools helps to keep the DR5 file system healthy.

Using the DR5 as USB device and handling data is slow in comparison to modern USB memory sticks as the diving computer is not an optimized specific memory stick. Please use with abundance of patience especially before disconnecting.

Exit on the middle button is introduced with firmware V 2.10 to contribute to safe disconnecting with Mac OS as eject does not work properly.

## Charging the battery

Battery recharges automatically if the diving computer is connected to any proper USB power supply or USB interface with sufficient supply of current. Most PC will turn off the power supply if the PC is in standby or shutdown. It is recommend to use a dedicated USB charger for mobile phones or tablets. The USB charger has to have a USB port to plug in the S8-USB cable.





## Firmware update

The most recent firmware is available free of charge at [www.heinrichs-weikamp.com/DR5/firmware](http://www.heinrichs-weikamp.com/DR5/firmware)

The update is a zip package with further instructions in README.txt The standard procedure is to copy the entire content of the zip package to the DR5 root folder using the USB interface for data transfer. Executing the batch file included will copy the new system files to the proper places.

As a result only fwupdate.dr5 is left.

The file fwupdate.dr5 contains the main code the will be reprogram your DR5 after leaving the USB mode.

For that reason it is important to have sufficient, at least fifty percentage, battery capacity left before the update starts. The update itself takes about one minute.

# Usage

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## Wristband

The diving computer is fastened to your arm with a 6mm bungee wristband. The bungee wristband can be set to your arm diameter individually. To tighten the bungee make a knot at the ends (Tighten knots very strong). Cut remaining bungee after about 1cm and use a lighter to gently melt the small remains of nylon.

Replacing the bungee should be done before wear gets too strong. Best care and attention should be exercised with the replacement bungee wristband. Especially about quality, proper length and proper knots.

The housing of the diving computer has four holes to be used to fasten the bungee. The slots can be used for an optional attachment..



## Oxygen monitoring

Two ways can be used to connect oxygen monitoring cells to the DR5 diving computers.

First the common way of connecting them directly, without any additional electronics, to the S8 connector. The DR5 does the analog to digital conversation. The four pins used for analog connection of up to three oxygen cells are shown later in this manual.

Configure the DR5 to O2 in direct analog in 001/020/back/022 or 001/007/015/022 before connecting the cells. Otherwise

the cells could be damaged by voltage output from the DR5 set to digital I/O mode. The Calibration menu 001/020 is available only in CCR modes.

The other options for input in 022 is “O2 In+Out S8 HUD”. It requires additional hardware between the cells and the DR5. The hardware required is a specific hwHUD with S8. Details about connecting the hwHUD can be found in the manual that comes with your hwHUD. The ports are described later in this manual.

Calibration follows proper installation of the oxygen monitoring hardware.

## Advanced usage

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**The two point calibration uses gases selected in 001/020/back/021 or 001/007/015/021. Hundred percent is translated to 98 percent internally.**

The calibration itself is executed in 001/020. The actual millivolt output is shown for all three sensors in the lower left corner. 028 turns off individual sensor inputs. 025 calibrates with reference to gas mix one. The millivolt measurements are shown next to it after calibration step one. 026 calibrates the cells with reference to gas mix two. The millivolt measurements are shown next to it after calibration with the second gas mix. Furthermore the result of the

second measurement will be compared with the new two point calibration curve. The level of compliance will be shown underneath. If the results differ very much from 100% the linearity of the cell or the measurement itself is in question.

Now after both measurements the actual oxygen partial pressure is shown in mbar and 020 Calibration is written in green. Re-calibrate the sensors as often as necessary. The calibration will be stored even if the sensors are disconnected. After connecting the sensors, the partial pressure of oxygen will be shown again. There is no testing circuit to verify the



validity of the calibration data and no life period for it. Please re-calibrate if applicable.

The oxygen sensor data can be used after calibration as gas input for the decompression algorithm and to show warnings if any low or high limit is exceeded.

Using setting HILO in 023 Logic will use the sensor with lowest mbar value to calculate nitrogen and helium level in diver's gas mix. With Normal as setting in 023 Logic all sensors will be used to calculate an average if the values differ less than 200 mbar. Otherwise, and if

three sensors are used, the two sensors with the least difference will be used only.

The DR5 switches automatically from CCR with HUD to CCR manual if sensor values exceed the fallback limit. The fallback limit is configured in 024. Limits for showing values in green are set with 105 Green.

Individual sensors can be turned off during the dive as well as the mode switched to fixed setpoints or bailout.

# Advanced usage

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## Fixed setpoint

Fixed setpoints replace the input of the oxygen monitoring with cells for the decompression algorithm.

Six setpoint slots are available in 001/007/017. The first slot will be used at the beginning of the dive.

Setpoints can not be adjusted during the dive. Therefore all necessary setpoints have to be entered before in 001/007/017. The unit is bar.

During the dive the dive menu gives access to all six slots to select the proper one.



## Bailout

Entering first gas and gas changes in 001/007/018 is similar to open circuit. First gas will be used for decompression calculation during a CCR dive to predict the deco schedule for bailout.

The deco schedule for bailout is calculated all the time during the CCR dive and available even while in CCR mode. Bailout schedule is the custom view with the emergency exit symbol. Bailout can be selected directly from dive menu. The gas mix has to be selected before the mode is changed from CCR to bailout.

Returning to CCR is possible all the time with the dive menu.

Lost gas as well as gas lists are available for bailout like the same way they are available for open circuit in dive mode.

# Advanced usage

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## Dive mode extras

### Custom views::

- stop watch with average depth; Reset is available via the middle button
- oxygen cell monitoring
- CNS/OTU/EAD/oxygen fraction in diver's gas
- Future TTS; TTS if the preconfigured time in 001/009/044 has passed at the current depth
- Deco stops; page through with middle button
- Bailout stops;page through with middle button
- Ambient temperature;
- Scrubber timer; count down from the selected remaining minutes in 001/007/019 while CCR mode is active





## Menü:

- Sensors or Setpoint; Switching from cell monitoring to fix setpoints and vice versa;
- Gaslist; Changing the actual diver's gas using on of the ten preconfigured mixes or entering a new mix with the option XX/XX
- Lost gas; Toggle gas changes
- Alternative (Bühlmann ZH-16 only); Toggle gradient factors
- Bailout or Rebreather; Toggle from Bailout to CCR and vice versa

# Advanced usage

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## Table mode

Dive Setup Mode menu 001/006 has the option Dive Tables.

Selecting this and returning to the main page of the surface screen gives access to the tables via the left button. To select the proper table, if there are several, answers have to be given on the equipment, first gas and gas change to select the proper table. Last not least the name of the table will be shown if still ambiguous.

After selecting the table, the table can be used. The deco schedule will be

taken from the table instead of being calculated from diving computer.

Warnings appears if the diver leaves the range covered by the table. This is true for depth as well as for the divetime. Repetitive dives are supported too if the information is included in the table.

Exceeding the maximum depth of the table by more than one meter will trigger a warning and exceeding it by 2 meters will start a timeout of two minutes. The table mode will abort if the timeout is reached and not stopped by ascending to a depth within the limit of the table.



After abortion the DR5 can be used as gauge only for the actual dive. No decompression is available after abortion.

Each maximum depth has a maximum bottom time set in the table. The remaining bottom time is shown on the right lower corner. A warning will be shown five minutes to the end. The first stop has to be reached within this time plus the time give by the ascend rate in the table. If the deco stop is not reached within this time window plus five extra minutes then the table mode aborts with ‘table exceeded time’.

Consider that extra time is not reflected by changes in the deco schedule. Hence being deeper than allowed or exceeding the bottom time might add risk to the dive.

The third abort condition “table exceeded below deco” occurs if the next deco stop is not reached within seven minutes. To be within the deco stop the DR5 checks whether the diver is less than 1.2 meters below the target depth.

Included with the DR5 are two examples to test the table mode. If own dive tables should be implemented contact [support@heinrichsweikamp.com](mailto:support@heinrichsweikamp.com).

# Advanced usage

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## System

### Date and time:

Input in the following order: day, month, year. Confirm the new date with “=”. The time has 24h format.

### Display:

Brightness is automatically adjusted with soft dimming and brightening. The range can be chosen from dark (0) to high brightness (4).

The change of orientation of the displays allows the usage on both arms and

flexibility with the direction of the connectors. The right and left button change their functionality if the display is flipped within this menu.

Standby of the diving computer while in surface mode is configurable in 003/052/057. The minimum time is 30 seconds.

The top line of the main screen in surface mode left of the battery symbol can be used to display personal data. The text of the first line of About will be shown if activated in 003/052/058. Otherwise firmware specific information will be shown.



### **About:**

Four text lines to identify you as owner or for any personal information. The first line can be shown on the main page of the surface screen. The text can be secured with a pin to prevent unauthorized modification of it. The pin is not set first and therefore 0000.

### **Maintenance:**

The same pin as in About is used to protect this menu with options to reset tissue saturation, delete all logbook entries, the entire configuration or the

About data. Please secure this menu by setting a personal pin in About.

Bitte sichern Sie dieses Menü durch die Vergabe einer PIN im Menü 003/053/995.

### **Pressure - depth relation:**

Diving computers as decompression algorithms as well as your physical body are aware of ambient pressure not meters of water with varying density. Therefore translating the pressure in bar to meters is just for the diver's convenience. All internal calculations are done with the formula 100 mbar

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equals 1 meter. Only the display of the actual depth and maximum depth can be modified with 003/054/065 to suit your needs. Starting with average depth and continuing with deco stops it is obvious the the 100 mbar equals 1 meter formula is kept. The range for actual depth and maximum depth can be adjusted from 10 bar = 98 to 102 and 320 to 332. The later to cover translation to feet.

### **Warnings/Views/General:**

066 and 067 are special custom menu residual from older firmware versions, which should not be modified if

possible. Those parameter include limits, warnings, as well as deactivating some custom views.

Menu 068 General has options to deactivate button sounds as wells as the option to reconfigure the reaction on pressing the right button. This might be of interest if Dive Setup is the primary menu used as it can be set to be the first page of the menu in surface menu.

# Simulator mode

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## Simulator

The simulator is almost identical to the real dive mode. The target depth can be adjusted with a menu preceding the regular dive menu. The target depth will be shown in the top right corner of this menu. The descent rate is 25 meters/minute, the ascend rate is 12 meters/minute. The option Surface will end the simulator mode as does a timer that is triggered after ten minutes without user interaction.

Using the simulator does not modify data like tissue saturation or surface

interval and will not create a logbook entry.

Oxygen monitoring is naturally limited in simulator mode as the real ambient pressure does not change.

One of the most important reasons for the existence of the simulator is the possibility to get used to the displays and the menu structure in dive mode. It does not replace to get acquainted with the diving computer by using it step by step for real dives.

# Simulator mode

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## Deco Planner

Deco Planner is useful for getting an idea of some of the actual parameters and the resulting deco stops of the next dive. Deco Planner is a mini tool and not comparable with dedicated dive planners for the PC.

The surface interval can be entered to modify the tissue saturation and VPM parameters.

The dive profile can be set with up to three entries. All of them using an ascent rate of 25 meter/minute that is subtracted from the entered time and the difference


is used as bottom time. Ascends are simulated with 12 meter/minute. The same decompression algorithm is used as for real dives but there is no adjustment to unpredicted gas changes, differences in descent and ascent rates or additional stops.

After the deco schedule is calculated, the left and right button can flip through the results and the middle button exits the deco planner.

Gas changes will be used as far as configured in Dive Setup and would be valid for a real dive. The setpoint is fixed and



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can be changed for the entire simulation  
with the deco planner.

Entering 0 meter will delete the related  
dive profil entry.

# Extended operational functions

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## **Bidirektionaler S8 port**

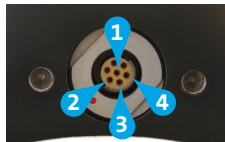
The S8 port combines USB, analog input and digital I/O. The oxygen monitoring pins can be configured to be analog or digital. The digital signal transport can be used in conjunction with the hwHUD with S8 plug. The advantage of the S8 connection to the hwHUD is the option to calibrate the hwHUD via the DR5 as the connection is bidirectional. The drawback of the S8 in comparison to the optical port is the lack of wet connection. Details can be found in the manual included in the optional hwHUD.

Analog input is available without additional electronics. Just oxygen sensor cells and the proper wiring is necessary. Those cells should be used for the DR5 only and not be split used with other CCR electronics.

Before connecting sensors directly to the DR5 make sure that the correct input is selected in the DR5. Otherwise the cells could be damaged by the digital data transfer.



Check the wiring prior to using the sensor module. This is the pin configuration:



- Pin 1 Ground of sensors 1, 2 and 3
- Pin 2 Hot/Positive terminal of sensor 1
- Pin 3 Hot sensor 2
- Pin 4 Hot sensor 3

External sensor modules for use with certain other dive computer, such as Shearwater GF, Shearwater Pursuit or VR3 can be used without modification. Note that some competitor models have less than three sensors.

During calibration you will specify which sensors are present and to be used.

Sensors with an output voltage of less than 2 mV or more than 160 mV will not be used and shown as Error or No Sensor.

Check the cell manufacturer recommendations for replacing sensors.

