Owner's Manual

HUD

heinrichs weikamp

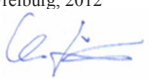
(D) CE Konformitätserklärung

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.

heinrichs weikamp, 79098 Freiburg
Freiburg, 2012



Christian Weikamp

Matthias Heinrichs

(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)
Hexalvalent Chromium(Cr(VI))
Mercury(Hg)
Polybrominated biphenyls (PBB)
Polybrominated diphenylethers (PBDE)

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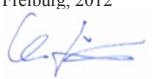

Christian Weikamp

Matthias Heinrichs

Your HUD

Hello and welcome!

Thank you for choosing a heinrichs weikamp HUD.

Contact
If you have any questions regarding the HUD, you can reach us...

- on the Internet-Forum:
  www.heinrichsweikamp.com

- by e-mail:
  info@heinrichsweikamp.com

- by mail:
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  79098 Freiburg im Breisgau
  Germany

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General Notes

Technical Status

This manual corresponds to the technical status of hw HUD and its firmware as of May, 2012.

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

General Notes

About this Manual

Methods to identify

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

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

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Description

Description

The hw HUD (Head-Up Display) is a monitoring device for the O2 partial pressure in Closed-Circuit Rebreathers. Up to three sensors can be hardwired to the unit. As long as they have a common GND, all sensors normally used in CCR devices are compatible.

The monitoring device consists of two components: The very compact HUD itself and the electronics box with the battery compartment. The HUD will be attached to the mouthpiece with a specially designed mount. The electronics box can be attached to your setup where you want it.

The hw HUD is available in two versions:

1. As stand-alone unit with integrated optical digital output for additional connection via optical fibre cable
2. As S8 version with additional cable for connecting the hw HUD to our DR5 diving computer

Usage

Usage

IMPORTANT: The hw HUD is actived by pressing the piezo button.

The button has to pressed twice within one second to turn on the hw HUD. To turn off the device press the button again twice.

The system will go to standby after a delay of five seconds.

IMPORTANT: The battery has to be changed prior to the next dive if all three red LEDs light up for three seconds on power on.

Display

Display

The partial oxygen pressure is displayed via three dual color LEDs after successful calibration of the oxygen sensors. The LEDs are installed in an ultra compact device that can be mounted at every known CCR mouth piece without screws nor the necessity of glue.

Blink codes

< 0.25bar:	8 x red
0.25-0.35bar:	7 x red
0.35-0.45bar:	6 x red
0.45-0.55bar:	5 x red
0.55-0.65bar:	4 x red
0.65-0.75bar:	3 x red
0.75-0.85bar:	2 x red
0.85-0.95bar:	1 x red
0.95–1.05bar:	1 x yellow
1.05-1.15bar:	1 x green
1.15-1.25bar:	2 x green
1.25-1.35bar:	3 x green
1.35-1.45bar:	4 x green
1.45-1.55bar:	5 x green
1.55-1.65bar:	6 x green
> 1.65bar:	continuous red

Battery low: continuous blue

Look at dive computer: blue LED blinking*

Functionality of blue LED:

If a diving computer is connected (S8 version only): „Look at dive computer!“ oder „battery low!“

Stand-alone version with optical port “battery low.!”

* S8 version only

Overview

The ppO2 value is shown with a simple blink code. The code is repeated with updated values every five seconds.

The display has a resolution of 0.1bar. All values above 1.0 bar up to 1.6 bar are green, all values below 1.0 bar are red blink codes. 1.0 bar itself is displayed as 1x yellow. Every sensor has its seperate display. No mean values are shown but pure measurement data. If any sensor fails its display does not interfere with the display of the remaining sensors.

Scenarios:

0.4bar ppO2: red – red – red - red – red – red

0.7bar ppO2: red – red - red

1.0bar ppO2: yellow

1.3bar ppO2: green – green – green

1.4bar ppO2: green – green – green – green

Calibration

IMPORTANT:
Calibration prior to each dive / each power on is not obligatory (the hw HUD stores the latest calibration values) but recommened to check for broken sensors. Please follow the recommodations of your instructior / CCR school about this.

IMPORTANT:

Do not dive if cables are not in mint Condition

Usage for diving is prohibited if any cable is not in mint conditon!

The usage of at least two independent monitoring devices for ppO2 is obligatory!

Calibration

IMPORTANT: The hw HUD has to be calibrated with 100% oxygen.

Both versions (S8 cable und stand-alone with optical out) are calibrated via the piezo button. For calibration the system must be flushed with 100% oxygen on land and, while turned on, the piezo button has to be pushed three times within one second. The HUD will display the sensor calibraton results for each sensor in the next five seconds (continuous green: sensors ok, continuous red: sensors malfunctioning / not connected).

NOTE: Sensors with less than 38mV output @ 100% oxygen are rejected

Channels without sensors will be deactivted until the next calibration. In other words those channels will not permanently blink red during operation

If no sensor is found, all channels continuously blink red

It is necessary to calibrate the system after any battery replacement / disconnection of battery

Installation

IMPORTANT: Proper installation of the system into the rebreather head and/or sensor housing is obligatory.

The setup has to be accomplished by person that is licenced to handle electronic installations.

The hw HUD electronic box is equipped with an 1m 8-wire cable for combined connection of HUD and sensors to achieve the most reliable wiring. Four wires connect the HUD with the electronic box and the remaining four wires are reserved for up to three sensors with common ground.

Wiring Overview

wire	Sensor/HUD	Function
blue	HUD	data
brown	HUD	data
white	HUD	power
black	HUD	GND/ground
grey	Sensors	GND/ground
yellow	Sensors	Sensor 1 positive terminal
red	Sensors	Sensor 2 positive terminal
green	Sensors	Sensor 3 positive terminal

The HUD is digitally controlled by the four wires of the electronic box mentioned in the overview. The high flex cable out of the HUD has four wires only. The colors of the wire are identical to those of the cable from the electronic box.

Wiring HUD

Wire @ electronics box	Wire @ HUB
blue	blue
brown	brown
white	white
black	black

Wiring sensors

Wire @ electronics box	Wire @ sensor
grey	GND/ground (–)
yellow	Sensor 1 positive terminal (+)
red	Sensor 2 positive terminal (+)
green	Sensor 3 positive terminal (+)

Sensors will be connected using a common ground. The negative terminal of all sensors will be connected to the single grey cable of the electronic box.

Installation sequence

1. Remove battery from electronic box

2. Plan wiring, position and length of cables to and from HUD as well as electronic box.

   NOTE: The whole hw HUD system will become an incorporated part of the rebreather head.

3. Install the HUD cable in your rebreather head or sensor compartment using the cable clamp provided with the hw HUD set. (the clamp provided is fitted with a M12x1 metric thread)

4. Install the electronic box cable with similar care

5. Remove 5 to 10 cm of length of the outer isolation of both cables

6. Connect the four wires from the HUD with the electronic box properly (soldering or crimping). Heat shrink tubing (provided) has to be used for each wire!

7. Install battery again. Check: the HUD has to show battery status for five seconds and afterwards blink red on all three channels. Turn off HUD by pressing the piezo button twice.

Installation sequence

8. Connect up to three ppO2 sensors to the remaining four cables (most likely special connectors are necessary). Please keep in mind that all pins marked minus (–) are connected to the single grey cable from the electonic box.

Battery replacement

NOTE:
hw HUD runs on 3.6V AA batteries.

IMPORTANT:
1,5V AA batteries can not be used.

For battery replacement use a coin to open the lid. The lid closes easily. Do not tilt the lid while closing the battery compartment. It is recommended to search for the beginning of the thread by softly turning anti-clockwise.

Battery replacement

A SAFT LS14500 AA 3,6Volt Battery is part of the hw HUD package and it should be replaced with the same battery by SAFT with AA dimensions and 3,6V. Only 'Saft' batteries of this type ensure proper operation. Low voltage 1,5 V AA batteries can not be used. Replace the battery if the HUD shows battery low warning on power up or during dive.

The battery has to be oriented that way that the positive terminal of the battery points into the compartment, hence goes in first into the battery compartment. The battery lid connects the negative terminal of the battery.

Battery life depends on several factors i.e. Temperature, blink codes. As benchmark consider 200 hours with S8 version and 150 hours with stand-alone.

Maintenance

Maintenance

The hw HUD is build as a low maintenance unit with safety features like perfect sealed electronics.
Rinse the complete setup of HUD and electronic box after dive with fresh water. Be careful to avoid any water drops to enter the system. Inspection of O-rings is necessary with every battery replacement. Replace O-rings if necessary. O-ring used is NBR 14 x 2 70A.

NOTE: O-rings, battery lids, HUD mounts and replacement batteries are available from heinrichs weikamp as spare parts.


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