

# HUD USER MANUAL



## FATHOM Heads Up Display

The Heads Up Display (HUD) is a visual display that provides the diver with essential PO2 information. The FATHOM HUD utilizes a modified Smithers Code, which is a system of flashing lights that communicates PO2 information to the diver. The HUD monitors each of the three sensors and displays the PO2 on three LEDs. Each of the LEDs corresponds to a sensor. Each LED can flash red, green, or orange. The brightness of the LEDs is adjusted automatically based on ambient light.

The HUD flash pattern is:

- A single orange flash is 1.0 bar/ata.
- The number of green flashes is the number of tenths above 1.0, so three green flashes is 1.3 bar/ata.
- The number of red flashes is the number of tenths below 1.0, so two red flashes is 0.8 bar/ata.

The built-in piezo button controls the HUD. One (1) push turns it on or off and three (3) pushes calibrates (see below). To count as multiple pushes, each push of the piezo button must happen within one-third (1/3) of a second of the preceding push. When the unit is first switched on, all three LEDs will flash green at full brightness for one second (to load the battery), then the center LED (cell 2) will indicate the battery voltage, using one green flash for each 0.1 V above 3.0 V, and one red flash for each 0.1 V below (e.g. 3.4 V = 4 green flashes, 2.8 V = 2 redflashes). One orange flash indicates 3.0 V. It is worth replacing the battery when it gets to 3.0 V or below, indicated by orange or red flashes at startup. Battery life during use will depend somewhat on LED brightness and how often they flash (i.e. how close to a PO2 of 1.0 you are diving). A SAFT 14250 primary cell should provide 200+ hours of diving. The HUD has an auto-off feature. If the PO2 does not change for an hour, and the button is not pressed, the HUD switches itself off.

PO <sub>2</sub>	Display
2.0 +	******
1.9	* * * * * * * * * * * * * * * * * * * *
1.8	******
1.7	*****
1.6	****
1.5	****
1.4	***
1.3	***
1.2	**
1.1	*
1.0	*
0.9	*
0.8	**
0.7	***
0.6	***
0.5	****
0.4	****
0.3	*****
0.2	******
0.1	******
0	******

The FATHOM HUD has a visual alarm feature, a distinctive high-visibility warning alternates with the flash pattern if the average PO2 of enabled cells is below 0.4 PO2 or above 1.6 PO2. The visual alarm rapidly flashes alternating red and green LEDs at full brightness to get the diver's attention.

HUD USER MANUAL 2

### Calibration

Calibration is the process on the rebreather's monitoring devices (handset or HUD) used to align the oxygen sensors' output in millivolts to a known partial pressure of oxygen.

To calibrate the FATHOM HUD, flush the loop with oxygen and push the piezo button three times within 1.5 seconds. It might take a little practice to get this, but it is intended to prevent accidental calibrations. If you successfully complete the calibrate sequence, all three lights will come on bright red for 1 second. If you don't see that, it didn't get the calibration command. Cells that calibrate correctly flash green for 1 second, and if there is a problem with an individual cell, that cell's LED will flash red for 1 second. Each cell calibrates independently of the others. Calibration failure may occur because the cell voltage is out of range (e.g. below 35 mV in 100% oxygen) or the cell voltage is unstable. Calibration data (and other settings) are retained even if power is disconnected (e.g. when changing the battery). After you calibrate, each of the sensors should be flashing one orange. That means the PO2 is between 0.95 and 1.05. The actual value that's used for calibration is 0.98.

### Installation

The External HUD with unterminated cable needs to be installed in your CCR head by a trained technician. An appropriate sized cable gland should be used to seal the 6.2 mm cable. After trimming the cable to length, it should be waterblocked to prevent moisture from traveling up the cable. The following table indicates which wires correspond to which cells.

Cell 1	Red
Cell 2	Brown
Cell 3	Purple
Ground	Black

HUD USER MANUAL 3



#### FATHOM DIVE SYSTEMS LLC

4113 NW 6th St, Suite A, Gainesville, FL 32609 +1 352 213 8486

> info@fathomdive.com www.fathomdive.com