

PERDIX·2



Technical Modes
Operating Instructions



Powerful • Simple • Reliable



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DANGER

This computer is capable of calculating deco stop requirements. These calculations are at best a guess of real physiological decompression requirements. Dives requiring staged decompression are substantially more risky than dives that stay well within no-stop limits.

Diving with rebreathers and/or diving mixed gases and/or performing staged decompression dives and/or diving in overhead environments greatly increases the risk associated with scuba diving.

**YOU REALLY ARE RISKING YOUR LIFE
WITH THIS ACTIVITY.**



WARNING

This computer has bugs. Although we haven't found them all yet, they are there. It is certain that there are things that this computer does that either we didn't think about, or planned for it to do something different. Never risk your life on only one source of information. Use a second computer or tables. If you choose to make riskier dives, obtain the proper training and work up to them slowly to gain experience.

This computer will fail. It is not whether it will fail but when it will fail. Do not depend on it. Always have a plan for how to handle failures. Automatic systems are no substitute for knowledge and training.

No technology will keep you alive. Knowledge, skill, and practiced procedures are your best defense (except for not doing the dive, of course).



Conventions Used in this Manual

These conventions are used to highlight important information:



INFORMATION

Information boxes contain useful tips for getting the most out of your Perdix 2.



CAUTION

Caution boxes contain important instructions for operating your dive computer.



WARNING

Warning boxes contain critical information that may affect your personal safety.



1. Introduction

The Shearwater Perdix 2 is an advanced dive computer for all types of diving.

Please take the time to read this manual. Your safety may depend on your ability to read and understand your dive computer's displays.

Diving involves risk and education is your best tool for managing this risk.

Do not use this manual as a substitute for proper dive training and never dive beyond your training. What you don't know can hurt you.

Features

- Full color 2.2" LCD display
- Rugged computer construction
- Titanium bezel
- User replaceable battery
- Customizable vibration alerts
- Programmable depth sampling rates
- Depth sensor calibrated to 130 msw
- Depth sensor function past 300 msw
- Crush pressure rating of 260 msw
- 6 independently configurable diving modes
- Simplified recreational modes (Air & Nitrox)
- 5 customizable gases in technical diving modes
- Any combination of Oxygen, Nitrogen and Helium (Air, Nitrox, Trimix)
- Full decompression and CCR Support
- Bühlmann ZHL-16C with gradient factors standard
- Optional VPM-B and DCIEM decompression models
- No lockout for violating deco stops
- CNS Tracking
- Gas Density Tracking
- Quick NDL and full decompression planner built in
- Simultaneous wireless pressure monitoring of up to 4 cylinders
- Sidemount diving features
- Tilt compensated digital compass with multiple display options
- Bluetooth Dive log uploading to Shearwater Cloud
- Free firmware updates

1.1. Notes on this manual

This manual provides operating instructions for the Perdix 2 dive computer in technical operating modes only.

This manual contains cross-references between sections to make it easier to navigate.

Underlined text indicates the presence of a link to another section.

Do not change any settings on your Perdix 2 without understanding the consequence of the change. If you are unsure, consult the appropriate section of the manual for reference.

This manual is not a substitute for proper training.



Firmware Version: V91

This manual corresponds to firmware version V91.

Feature changes may have been made since this release and might not be documented here.

Check the release notes on [Shearwater.com](https://www.shearwater.com) for a complete list of changes since the last release.



1.2. Modes Covered by this Manual

This manual provides operating instructions for the Perdix 2 in the following technical operating modes:

- Open Circuit Technical (OC Tec)
- Closed Circuit / Bail Out (CC/BO)
- Gauge

The Shearwater Perdix 2 also has 3 modes specifically designed for Open Circuit Recreational diving:

- Air
- Nitrox (up to 40% O₂)
- 3 GasNx (up to 100% O₂)

For detailed instructions on operation in recreational modes, please see the [Perdix 2 Recreational Modes Manual](#).

Some features of the Perdix 2 only apply to certain dive modes. If not otherwise indicated, features described are applicable in all dive modes.

[Read more about Mode Setup on page 63.](#)



2. Basic Operation

2.1. Turning On

To turn the Perdix 2 on, press both buttons together.



Auto-on

The Perdix 2 will automatically turn-on when submerged underwater. This is based on pressure increase and not on the presence of water. When auto-on is activated, the Perdix 2 will enter the last configured dive mode.



Do Not Rely On The Auto-On Feature

This feature is supplied as a backup for when you forget to turn on your Perdix 2.

Shearwater recommends turning your computer on manually before each dive to confirm proper operation and to double check battery status and setup.

Auto-on Details

The Perdix 2 turns on automatically and enters dive mode when the absolute pressure is greater than 1100 millibar (mbar).

For reference, normal sea level pressure is 1013 mbar and 1 mbar of pressure corresponds to approximately 1 cm (0.4") of water. So, when at sea level, the Perdix 2 will automatically turn-on and enter dive mode when about 0.9 m (3 ft) underwater.

If at higher altitude, then the Perdix 2 auto-on will occur at a deeper depth. For example, when at 2000 m (6500 ft) altitude the atmospheric pressure is only about 800 mbar. Therefore, at this altitude the Perdix 2 must be submerged underwater by 300 mbar to reach an absolute pressure of 1100 mbar. This means the auto-on occurs at about 3 m (10 ft) underwater when at an altitude of 2000 m.

2.2. Customizable Splash Screen

After turning on, the Perdix 2 Splash Screen is displayed for 2 seconds.

Customizable start up text can be added using the Shearwater Cloud Desktop app.

The image itself can also be customized using the Shearwater Cloud Desktop App.

Note that the computer will revert to the standard splash screen on a firmware update. The custom splash screen will then need to be reloaded.

See the section on [Firmware Update and Log Download](#) on page 74 for details.



2.3. Buttons

Two titanium piezo-electric buttons are used to change settings and view menus.

All Perdix 2 operations are simple single button presses.



Don't worry about remembering all the button rules below. Button hints make using the Perdix 2 easy.

MENU (Left) button

From main screen	Brings up menu
In a menu	Moves to the next menu item
Editing a setting	Changes the setting's value

SELECT (Left) button

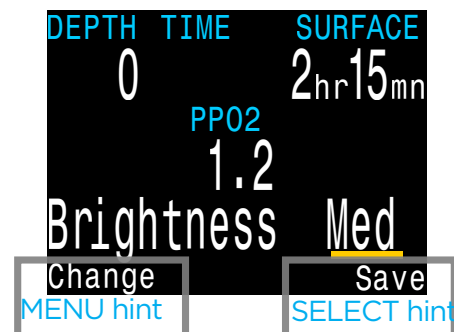
From main screen	Steps through info screens
In a menu	Performs command or starts editing
Editing a setting	Saves the setting's value

BOTH BUTTONS

When Perdix 2 is off pressing MENU and SELECT at the same time will turn the Perdix 2 on. No other operation requires pressing both buttons at the same time.

Button Hints

When in a menu, button hints indicate the function of each button:



In the example above, the hints tell us:

- Use MENU to change the brightness value
- Use SELECT to save the current value

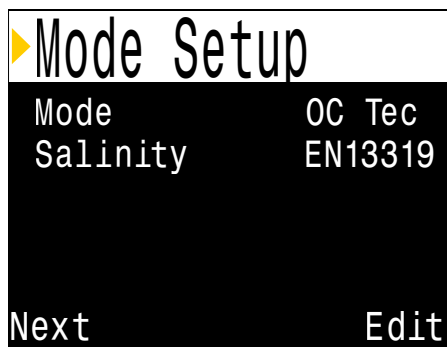


2.4. Changing between Modes

By default the Perdix 2 is set to 3 GasNx Mode.



3 GasNX Mode



Mode Setup Menu

Recreational focused modes can be distinguished by the large-font layout.

For directions on how to use the recreational focused modes on the Perdix 2, see the [Perdix 2 Recreational Modes Manual](#).

This manual covers operation in technical diving modes. Switch to one of these modes in the mode setup menu. See details on page 63.

Technical modes have a more dense layout and are capable of displaying more information on the screen.



OC Tec Mode



CC/BO Mode



Gauge Mode

The breathing mode indicator in the bottom left of the screen shows which mode the computer is currently in.

OC Tec mode is designed for decompression diving. This mode supports helium and contains a built in decompression planner. TTS cannot be removed from the display.

CC/BO is designed for use as an off-board computer for a closed circuit rebreather.

The current internal setpoint being used for decompression calculations is always displayed in the middle of the display in this mode.

Gauge mode converts the Perdix 2 into a basic bottom timer. Gauge mode has a unique layout.

Depth and dive time is larger in Gauge mode.

Decompression tissues are not tracked in this mode.

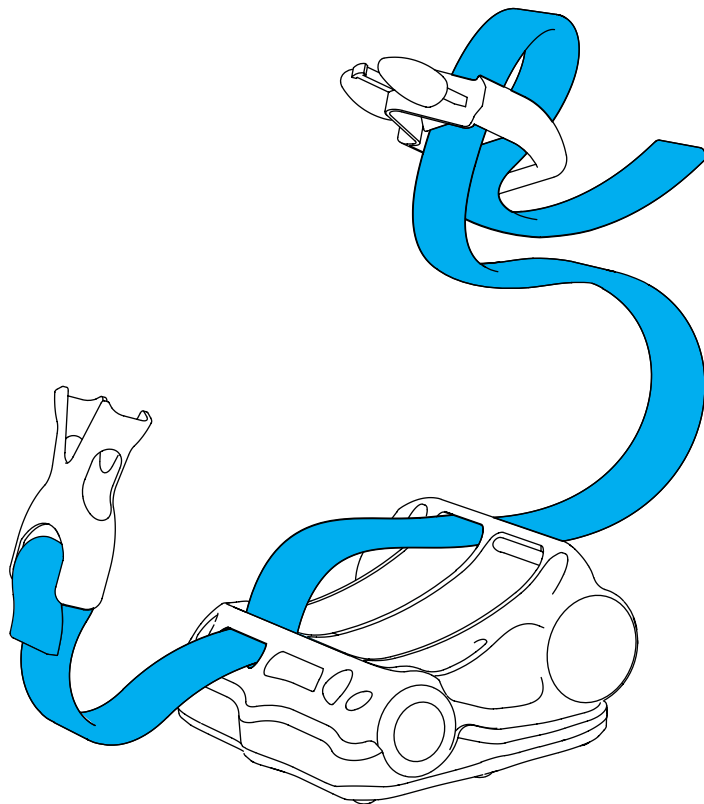


3. Mounting Options

The Perdix 2 includes mounting points for either two elastic straps or two bungee chords.

3.1. Elastic Straps

Install the elastic straps as shown in the image below. The buckles feature a locking mechanism to prevent them from inadvertently loosening. Press the tab to allow the buckle to slide freely on the straps. Strap width is 3/4" (19mm).

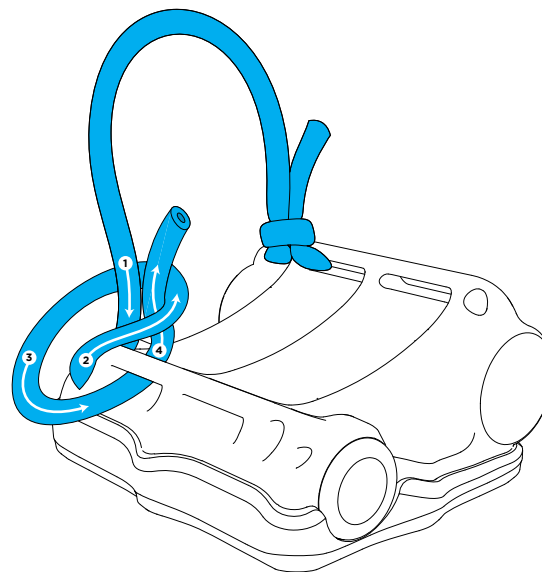


Install straps and buckles as shown

3.2. Shock Cord

Bungee or shock cord can be installed in many ways on the Perdix 2. The Perdix 2's holes are sized for 3/16" cord.

Shearwater recommends the knot shown below. This knot has the nice feature of creating loops that stay wide open while donning the Perdix 2 and the knots will not pull free under high load.



When using bungee or shock cord, always create two independent loops so that a single break will not result in a lost dive computer.

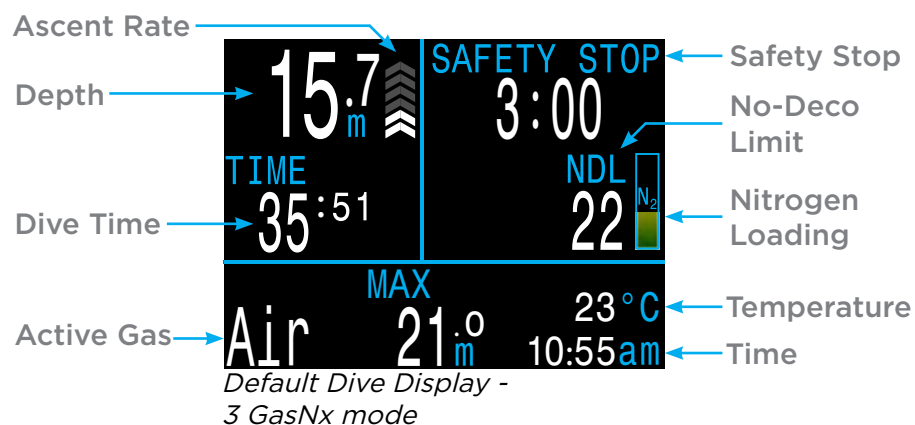


4. Dive Interface

4.1. Default Dive Setup

The Perdix 2 comes pre-configured for recreational diving. The default dive mode is 3 Gas Nitrox mode (3 GasNx).

As a quick reference, a diagram of the default diving display is shown below.



This manual is for technical dive modes only. Many features of the above default display are shared by the dive modes covered in this manual.

For directions on how to use Air, Nitrox or 3 GasNx modes, see the [Perdix 2 Recreational Modes Manual](#).

The next section lists all the dive modes available on the Perdix 2. Change the Dive Mode from the Mode Setup menu. [See details on page 63](#)

4.2. Dive Mode Differentiation

Each dive mode is designed to best suit a particular type of diving.

Air

Designed for use during recreational, air only, no-decompression diving activities.

- Air (21% oxygen) only, not switchable underwater

Nitrox (Single Gas)

Designed for use during recreational, Nitrox, no-decompression diving activities.

- Single Gas Nitrox up to 40% oxygen
- No gas switching underwater

3 GasNx (Three Gas Mode)

Designed for introductory technical diving activities including diving involving planned decompression.

- Three programmable gases
- Support for gas switching
- Nitrox up to 100%

OC Tec

Designed for open circuit technical diving activities including planned decompression.

- Full Trimix
- No Safety stops

CC/BO

Designed for use with a closed circuit rebreather.

- Fast switching from closed circuit to open circuit (BO) operating modes.

Gauge

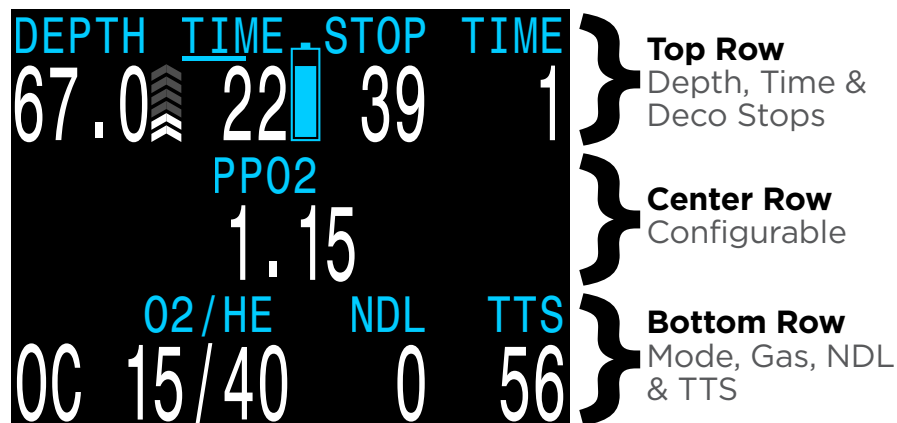
Gauge Mode turns the Perdix 2 into a simple depth and time display with a dedicated layout (bottom timer). [See details on page 37](#).

- No tissue tracking
- No decompression information



4.3. Main Screen Layout

In OC Tec and CC/BO modes, the main screen shows the most important information needed for technical diving.



The Top and Bottom row content are reserved for the most critical information required for technical diving. The information displayed in these rows is fixed.

The Centre row contents can be configured to display the data that the user feels is most important. In OC Tec mode, the entire row is configurable. In CC/BO mode, left and right positions can be configured, but the current setpoint is always displayed in the center position and cannot be removed.

See page 67 for [Center Row configuration options](#).

Pressing the Select (right) button scrolls through additional data in the bottom row, temporarily obscuring this information. [See the Info Screens section on page 16 for more information.](#)

The following section goes into detail about each screen element.

4.4. Detailed Descriptions

The Top Row

The top row shows depth, dive time, ascent rate, decompression information and battery status.



Depth

Displayed in feet or meters.




In feet, depth displays with no decimal places. In meters, depth displays with one decimal place up to 99.9m.


Note: If the depth shows a Flashing Red zero or shows a depth at the surface, then the depth sensor needs service.

Ascent Rate Display

Shows how fast you are currently ascending.

1 arrow per 3 meters per minute (mpm) or 10 feet per minute (fpm) of ascent rate.

 **WHITE** when less than 9 mpm / 30 fpm (1 to 3 arrows)

 **YELLOW** when greater than 9 mpm / 30 fpm and less than 18 mpm / 60 fpm (4 or 5 arrows)

 **FLASHING RED** when greater than 18 mpm / 60 fpm (6 arrows)

Decompression calculations assume 10mpm (33fpm) ascent rate.



Dive Time

TIME
22

The first “TIME” item, on the left of the top row, is the length of the current dive in minutes.

TIME
00

Seconds display as a bar drawn below the word “Time.” It takes 15 seconds to underline each character in the word. The seconds bar is not displayed when not diving.

Decompression Stop Depth and Time

DEPTH TIME STOP TIME
27.2 62 27 2

Stop at 27 meters for 2 minutes

The third item in the Top row, “Stop”, indicates the next decompression stop depth in the current units (feet or meters). This is the shallowest depth to which you can ascend. The last item on the right in the top row, “time”, is how long in minutes to hold the stop.

DEPTH TIME STOP TIME
25.2 62 27 2

Decompression Stop Violated

Decompression information will **Flash Red** if you ascend shallower than the current stop.

By default the Perdix 2 uses a 3m (10ft) last deco stop depth. You may perform your last deco stop deeper if you wish - deco calculations will remain accurate. If you choose to do this, depending on your breathing gas, the predicted time-to-surface may be shorter than the actual TTS since off-gassing may occur slower than the algorithm expects. There is also an option to set the last stop to 6m (20ft).

Surface Interval

When on the surface, decompression stop depth and time are replaced by a surface interval display showing the hours and minutes since the end of your last dive.

DEPTH TIME SURFACE
.0 [Battery Icon] 2h 15m

2 hour and 15 minute surface interval

Above 4 days, the surface interval is displayed in days.

The surface interval is reset when the decompression tissues are cleared. See the Decompression Tissue Loading section on page 78 for more information.

Deco Clear Counter

When deco clears the STOP DEPTH and TIME are replaced by a counter that begins counting up from 0.

DEPTH TIME CLEAR
.0 [Battery Icon] 2:14

Battery Icon

The default behavior is that the battery icon is shown on the surface but disappears when diving. If low or critical then the battery icon will appear while diving.



BLUE when battery charge is OK



YELLOW when battery needs to be replaced.



RED when battery must be replaced immediately.



The Center Row



All 3 locations configurable in OC Tec mode

In OC Tec mode, center row information is entirely customizable. There are three configurable locations, each of which can be populated independently.

A list of data options is given to the right. Center Row Setup instructions can be found on [page 67](#).

The middle location of the center row displays gas PPO2 by default. It has a smaller selection of data options because it is slightly narrower than the left and right slots.

For detailed descriptions of each screen element see [Info Screen Descriptions on page 17](#)

In CC/BO mode the center slot is not configurable. It always displays the currently selected rebreather setpoint with no title text. The right and left slots can still be customized.



Only 2 locations configurable in CC/BO mode



Default PPO2 Limits

In CC mode, PPO2 displays in **Flashing Red** when less than 0.40 or greater than 1.6.

In OC Tech mode, PPO2 displays in **Flashing Red** when less than 0.19 or greater than 1.65.

The above limits can be adjusted in the Adv. Config 2 menu. See details on [page 72](#)

Home Screen Configuration Options

Option	Info Display	Option	Info Display
PPO2	PPO2 1.15	CLOCK	CLOCK 12:58
CNS %	CNS 11	Timer	TIMER 0:58
MOD	MOD 57.3 m	Dive End Time	DET 1:31
Gas Density	DENSITY 1.3 g/L	RATE	RATE 43 ft/min
GF99	GF99 15%	Temperature	TEMP 18°C
Surface GF	SurGF 44%	Compass	319°
Ceiling	CEIL 17	Max Depth	MAX 57.0 m
@+5	@+5 20	Avg. Depth	AVG 21.3 m
Δ+5	Δ+5 +8	Tank Pressure	T1 175 BAR
Time To Surface	TTS 15	Surface Air Consumption	SAC T1 1.5 Bar/min
Dil. PPO2	DilPPO2 .99	Gas Time Remaining	GTR T1 37
FiO2	FiO2 .32	Redundant Time Remaining	RTR T1 16
Mini Display	Δ+5 -4 GF99 37% SfGF 180		



Mini Displays

Mini Displays for the left and right custom slots can each hold 3 data displays. See details on [page 23](#).





The Bottom Row

The bottom row of technical dive modes displays the current circuit mode, active gas, No Decompression Limit (NDL), and Time To Surface (TTS).



Current Circuit Mode

The active breathing mode configuration is displayed on the far left of the bottom row. The options are:

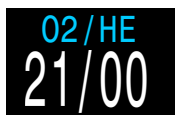
00 OC = Open circuit

CC CC = Closed circuit

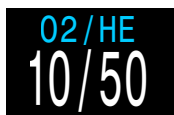
BO BO = Bailout
(displays in **Yellow** to indicate bailout condition)

Active Gas

The current active gas shown as a percentage of Oxygen and Helium. The remainder is assumed to be Nitrogen.



Air:
21% O₂
79% N₂



Trimix:
10% O₂
50% He
79% N₂



*A better
deco gas is
available*

In open circuit mode, this is the breathing gas fraction.
In closed circuit mode, this is the active diluent gas.

The active gas displays in yellow when there is a better gas available. Only turn on gases you plan to use on your dive.

No Decompression Limit (NDL)

NDL
20

NDL
5

The time remaining, in minutes, at the current depth until decompression stops will be necessary. Displays in **Yellow** when the NDL is less than the low NDL limit (Default 5 minutes).

NDL Replacement Options

Once NDL reaches 0 (i.e. deco stops needed), the NDL display can be replaced by a small selection of custom options to best utilize this space. See details on page 69. The Mini option is described in more detail on page 15.

The NDL replacement options are:

- **Ceiling**
- **@+5**
- **Delta+5**
- **GF99**
- **SurGF**
- **Mini**

Time To Surface (TTS)

TTS
35

The time-to-surface in minutes. This is the current time to ascend to the surface including the ascent plus all required deco stops.



Important!

All decompression information including Deco Stops, NDL, and Time to surface are predictions that assume:

- Ascent rate of 10mpm / 33fpm
- Decompression stops will be followed
- All programmed gases will be used as appropriate

See the Decompression Information Accuracy section on page 29 for more information.



Additional Information

The bottom row is also used to show additional information.

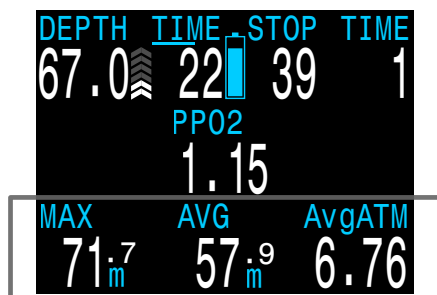
Only the bottom row changes during a dive, so critical information contained on the Top and Center Rows is always available.

Additional information that can be displayed on the bottom row includes:

Info Screens:

Shows additional dive information.

Press SELECT (right button) to step through info screens.

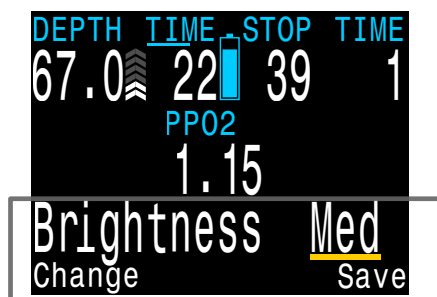


Sample Info Screen

Menus:

Allows changing settings.

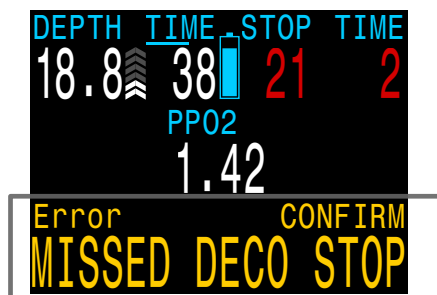
Press MENU (left button) to enter menus.



Sample Menu

Warnings:

Provide important alerts. Press any button to clear a warning.



Sample Warning

Mini NDL Replacement Display

The Mini NDL replacement display option reconfigures the right side of the bottom row to allow two additional pieces of custom information to be displayed.

The Mini NDL replacement display can be configured from System Setup > Deco Setup described on page 64.

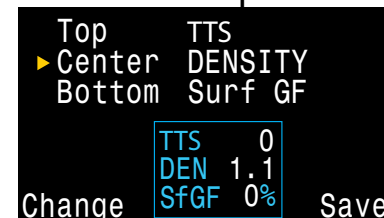
When the mini option is selected the chosen custom information is displayed at all times. This is unlike the other NDL replacement display options which only appear while the NDL is zero.

When in use, TTS is always the first row option of this mini display and cannot be changed. The NDL is relocated to the deco stop and time information section of the top row while there is no decompression obligation.



NDL Replacement Mini appearance

Mini Setup



NDL Replacement Mini setup menu.



4.5. Info Screens

Info screens provide more information than is available on the main screen.

From the main screen, the SELECT (right) button steps through info screens.

When all info screens have been viewed, pressing SELECT again will return to the main screen.

Info screens also automatically time-out after 10 seconds, returning to the home screen. This prevents active gas information from being hidden for an extended period.

Note that the Compass, Tissues and AI Info screens do not automatically time out when active.

Pressing the MENU (left) button will return to the home screen at any time.

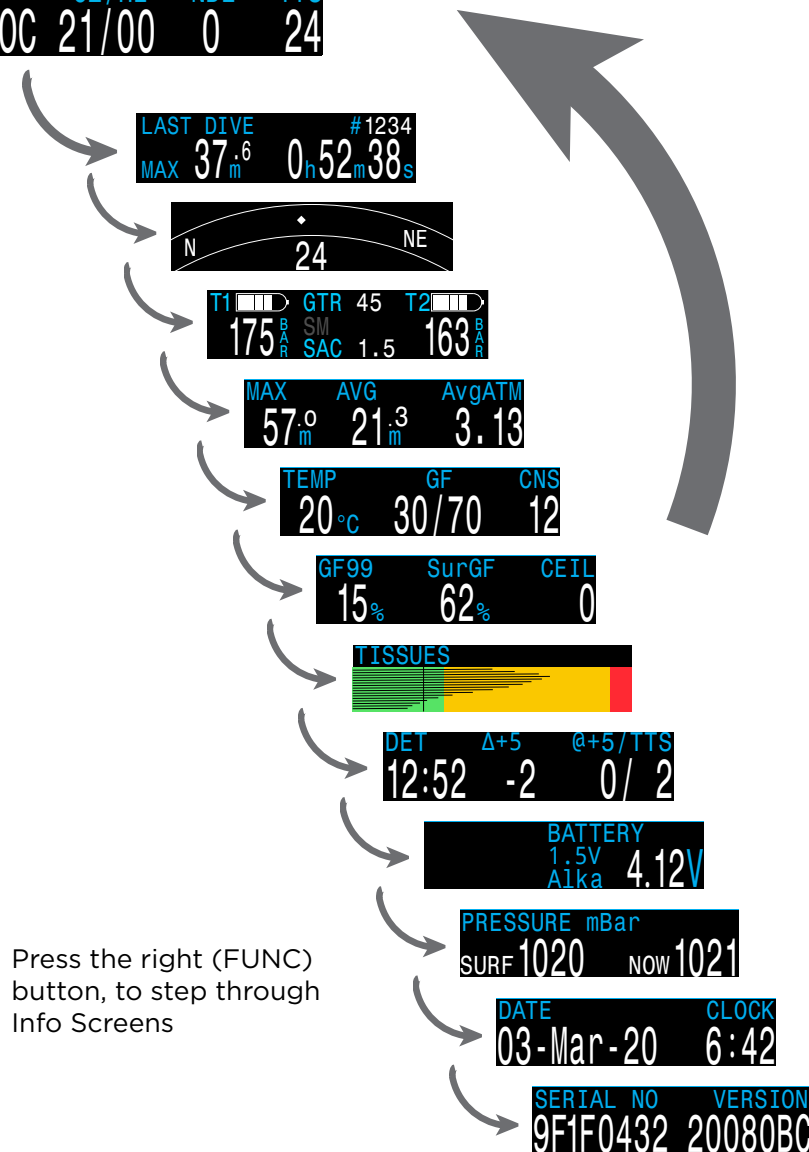
Although these screens are generally representative of the Perdix 2 display, info screen content varies for each mode. For example, decompression related info screens are not available in gauge mode.

The next section gives detailed descriptions of the data elements shown on the info screens.



Return to Main Screen by:

- Pressing the left (MENU) button
- Stepping past last screen
- Waiting 10 Seconds (most screens)



Press the right (FUNC) button, to step through Info Screens



4.6. Info Screen Descriptions

This section contains detailed descriptions of all info screen and custom screen elements.

Last Dive Info

LAST DIVE #1234
MAX 37.6m 0h52m38s

Maximum depth and dive time from the last dive. Only available at the surface.

Air Integration

Only available if AI feature is turned on. The contents of the AI info line will automatically adapt to the current setup. Some examples include:

T1 175 BAR

T1 Only

T1 GTR T1 SAC T1
175 BAR 37 1.5 Bar min

T1 & GTR/SAC

T1 T2
175 BAR 163 BAR

T1 & T2

T1 GTR 45 T2
175 BAR SM 1.5 163 BAR
SAC

T1, T2 &
GTR/SAC

T1 T2 T3 197
175 BAR 163 BAR T4 203

T1, T2, T3,
& T4

More information on AI features, limitations, and displays can be found in [the Air Integration \(AI\) section on page 39](#).

Compass



Marked headings appear in green while reciprocal headings are shown in red. Green arrows point in the direction of your mark when off course by 5° or more.

Compass info row will not time out and is only available when compass feature is turned on.

[See the Compass section on page 38 for more information.](#)

Maximum Depth

MAX
57.0m

The maximum depth of the current dive. When not diving, displays the maximum depth of the last dive

Average Depth

AVG
21.3m

Displays the average depth of the current dive, updated once per second. When not diving, displays the average depth of the last dive.

Average Atmospheres

AvgATM
3.13

The average depth of the current dive, measured in absolute atmospheres (i.e. a value of 1.0 at sea level). When not diving, shows the average of the last dive.

Temperature

TEMP
18°C

The current temperature in degrees Fahrenheit or degrees Celsius as configured in Display Setup)



Maximum Operating Depth (MOD)

MOD
57.0
m

Only available as a custom display.
In OC mode MOD is the maximum allowable depth of the current breathing gas as determined by PPO2 limits.

In CC mode, MOD is the maximum depth of the diluent.

Displays in **Flashing Red** when exceeded.

[Read more about PPO2 Limits on page 72](#)

Partial Pressure of Oxygen (PPO2)

PPO2
.36

In CC mode, displays in Flashing Red when less than 0.40 or greater than 1.6 by default.

PPO2
.16

In OC mode, displays in Flashing Red when less than 0.19 or greater than 1.65 by default.

Diluent PPO2

DilPPO2
.99

Only displayed in CC mode.
Displays in **Flashing Red** when the partial pressure of the diluent is less than 0.19 or greater than 1.65.

DilPPO2
1.77

When performing a manual diluent flush, you can check this value to see what the expected PPO2 will be at the current depth.

Fraction of Inspired O2 (FiO2)

FiO2
.42

Only displayed in CC mode.
The fraction of the breathing gas composed of O2.
This value is independent of pressure.

CNS Toxicity Percentage

CNS
11

Central Nervous System oxygen toxicity loading percentage. Turns **Yellow** when greater than 90%. Turns **Red** when greater than 150%.

CNS
100

The CNS percentage is calculated continuously, even when on the surface and turned off. When deco tissues are reset, the CNS will also be reset.

The CNS value (short for Central Nervous System Oxygen Toxicity) is a measure of how long you have been exposed to elevated partial pressures of oxygen (PPO2) as a percentage of a maximum allowable exposure. As PPO2 goes up, the maximum allowable exposure time goes down. The table we use is from the NOAA Diving Manual (Fourth Edition). The computer linearly interpolates between these points and extrapolates beyond them when necessary. Above a PPO2 of 1.65 ATA, the CNS rate increases at a fixed rate of 1% every 4 seconds.

During a dive the CNS never decreases. When back at the surface, a half-life of elimination of 90 minutes is used. So for example, if at the end of the dive the CNS was 80%, then 90 minutes later it will be 40%. In 90 more minutes it will be 20%, etc. Typically after about 6 half-life times (9 hours), everything is back close to equilibrium (0%).

Rate

RATE
↓ 43 $\frac{\text{ft}}{\text{min}}$

Numerical rate of ascent or descent. Same colour rules as ascent indicator. Available as a custom display only.

Mini Compass



A small compass that can be displayed at all times. The red arrow always points toward north. Only available as a custom display.

Gradient Factor

GF
30/70

The deco conservatism value when the deco model is set to GF. The low and high gradient factors control the conservatism of the Bühlmann GF algorithm. See “Clearing up the Confusion About Deep Stops” by Erik Baker for more information.

VPM-B (and VPM-BG)

VPM-B
+3

The deco conservatism value when the deco model is set to VPM-B.

VPM-BG
+3/90

If the deco model is VPM-B/GFS, also displays the gradient factor for surfacing.

GF99

GF99
15%

The current gradient factor as a percentage (i.e. super-saturation percent gradient)

0% means the leading tissue super-saturation is equal to ambient pressure. Displays “On Gas” when tissue tension is less than the inspired inert gas pressure.

100% means the leading tissue super-saturation is equal to the original M-Value limit in the Bühlmann ZHL-16C model.

GF99 is displayed in **Yellow** when the current gradient factor modified M-Value (GF High) is exceeded.

GF99 is displayed in **Red** when 100% (un-modified M-Value) is exceeded.



SurfGF

SurGF
62%

The surfacing gradient factor expected if the diver instantaneously surfaced.

SurfGF colour is based on the current GF (GF99). If the current GF is greater than GF High, SurfGF will be displayed in **Yellow**. If the current gradient factor is greater than 100%, SurfGF will be displayed in **Red**.

Ceiling

CEIL
8

The current decompression ceiling not rounded to the next deeper stop increment. (i.e. not a multiple of 10ft or 3m)

@+5

@+5
20

“At plus 5” is the TTS if remaining at the current depth for 5 more minutes. This can be used as a measure of how fast you are on-gassing or off-gassing.

Δ+5

Δ+5
+8

The predicted change in TTS if you were to stay at the current depth for 5 more minutes.

A positive “Delta plus 5” indicates that you are on-gassing the leading tissue while a negative number indicates that you are off-gassing the leading tissue.

Battery

BATTERY
3.7V
LiIon 3.99V

The Perdix 2's battery voltage. Displays in **Yellow** when the battery is low and needs replacement. Displays in **Flashing Red** when the battery is critically low and must be replaced as soon as possible. Also shows battery type.



Gas Density Display

DENSITY
1.3 $\frac{g}{L}$

The Gas Density display is only available as a customizable display and is not available in the info row.

DENSITY
5.3 $\frac{g}{L}$

For open circuit diving, the gas density display turns yellow at 6.3 grams per liter. No other warnings are generated.

DENSITY
6.4 $\frac{g}{L}$

For closed circuit diving, the gas density display turns yellow at 5.2 grams per liter and red at 6.3 grams per liter. No other warnings are generated.

Gas density is an approximation based on the diluent gas and loop PPO2.

You may be surprised at how shallow gas density warning colors appear.

Read more about why we chose these levels starting on page 66 here (recommendations on page 73):

[Anthony, T.G and Mitchell, S.J. Respiratory physiology of rebreatherdiving. In: Pollock NW, Sellers SH, Godfrey JM, eds. Rebreathers and Scientific Diving. Proceedings of NPS/NOAA/DAN/AAUS June 16-19, 2015 Workshop. Durham, NC; 2016.](#)

Dive End Time (DET)

DET
6:42

This is similar to TTS but is expressed as a time of day.

The time of day at which you can expect to surface if you depart immediately, ascend at 10mpm or 33fpm, change gases when prompted, and perform all decompression stops as directed.

Pressure

PRESSURE mBar
SURF 1013 NOW 1011

The pressure in millibars. Two values are shown, the surface (surf) pressure and the current (now) pressure.

Note that typical pressure at sea level is 1013 millibar, although it may vary with the weather (barometric pressure). For example, surface pressure may be as low as 980 millibar in a low pressure system, or as high as 1040 millibar in a high pressure system.

For this reason, the PPO2 displayed on the surface may not exactly match the FO2 (fraction of O2), although the displayed PPO2 is still correct.

The surface pressure is set based on the lowest pressure the dive computer sees in the 10 minutes prior to the start of a dive. Therefore, altitude is automatically accounted for and no special altitude setting is required.

Date and Time

In a 12 or 24 hour format. Time format can be changed in the watch settings menu.

DATE TIME DATE TIME
28-Jun-15 16:31 28-Jun-15 4:31pm

Timer

TIMER
5:42

A simple stopwatch. The timer is only available as a customizable display. It is not available in the info row.



Stack Timer

STACK USED REMAINING
0:00 3:00

In CC mode a stack timer can be enabled to help keep track of CO2 Scrubber usage. When enabled in the Advanced Config 4 menu, this timer will display how much time has elapsed either diving or while the unit is turned on, and how much time is remaining.

For more stack timer configuration options and setup instructions, see [page 82](#).

When the stack time has less than 60 minutes remaining, the remaining stack time will show in inverted yellow and the STACK TIME WARN notification will be triggered.

STACK USED REMAINING
2:05 0:55

When the stack time remaining is less than 30 minutes, the remaining stack time will flash red and the STACK TIME ALARM notification will be triggered. A persistent red **Stack Time** notification will remain on the screen to indicate that stack time requires immediate attention.

STACK USED REMAINING
2:45 0:15

If stack time remaining drops below zero, it will continue counting down into the negative and flash red. Note the mini display stack time will not count down negative due to space constraints.

STACK USED REMAINING
3:05 -0:05

Tissues bar Graph



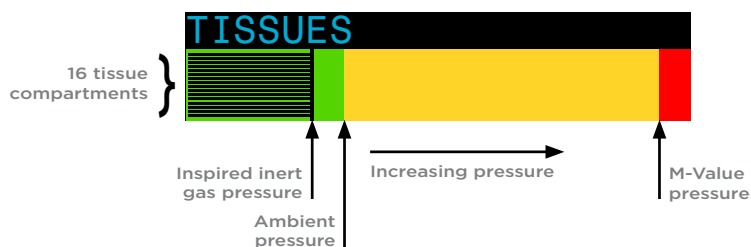
The tissues bar graph shows the tissue compartment inert gas tissue tensions based on the Bühlmann ZHL-16C model.

The fastest tissue compartment is shown on the top, and the slowest on the bottom. Each bar is the combined sum of the nitrogen and helium inert gas tensions. Pressure increases to the right.

The vertical cyan line shows the inert gas inspired pressure. The yellow line is the ambient pressure. The red line is the ZHL-16C M-Value pressure.

Tissues that are supersaturated above ambient pressure are shown in yellow, and tissues that are supersaturated above the M-Value are shown in red.

Note that the scale for each tissue compartment is different. The reason the bars are scaled in this way is so that the tissues tensions can be visualized in terms of risk (i.e. how close they are as a percentage to Bühlmann's original super-saturation limits). Also, this scale changes with depth, since the M-Value line also changes with depth.



Sample Tissue bar Graphs



On surface (sat. with air)

Note: Gas is 79% N₂ (21% O₂, or Air)



After descent



On-gassing



Deep stop



Last deco stop

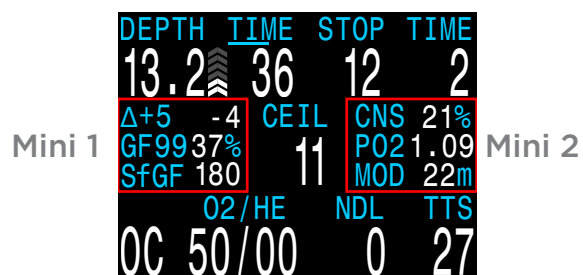
Note: Gas is now 50% O₂ and 50% N₂



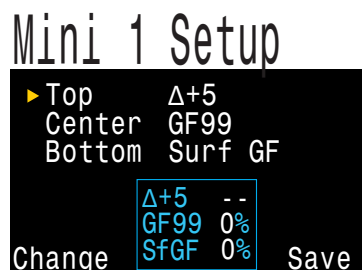
4.7. Mini Displays

Mini displays provide more options for data customization at the expense of font size.

There 2 separately configurable mini displays that are shared by both OC Tec and CC/BO mode. Mini displays are only available in the left and right custom positions.



Details about how to customize the mini displays can be found on [page 67](#)



Up to 9 customizable fields can be displayed simultaneously with fully populated Mini Displays, a customized center position and using the mini NDL replacement option. Managed improperly, this can be an overwhelming amount of information.

Care should be taken not to distract from the information that is most important to the type of diving you're doing.

4.8. Notifications

This section describes the different types of notifications the computer may present the diver.

See the List of primary notifications on [page 25](#) that a diver may encounter.

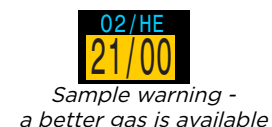
Color Coding

Color coding of text draws attention to problems or unsafe situations.

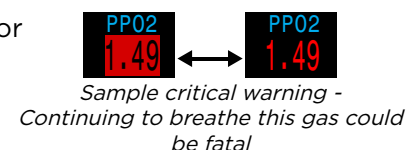
WHITE text indicates normal conditions by default.

Note that this normal condition color can be selected in the advanced configuration menu, described on [page 71](#)

YELLOW is used for warnings that are not immediately dangerous but should be addressed.



FLASHING RED is used for critical warnings that could be life threatening if not immediately addressed.



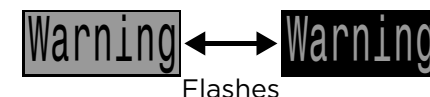
Color blind users

The warning or critical warning states can be determined without the use of color.

Warnings display on a solid inverted background.



Critical Warnings flash between inverted and normal text.





Types of Notifications

There are two types of notifications displayed by this dive computer. Primary notifications and persistent notifications.

Primary Notifications

Each primary notification displays as a message in **yellow** across the bottom row until dismissed.

The notification is dismissed by pressing either button.



Sample Primary notification -
High PPO2 Warning

For example, this “HIGH PPO2” message will appear if the average PPO2 goes above the high PPO2 limit for more than 30 seconds.

The highest priority notification is listed first. If multiple errors occur simultaneously, the notification with the highest priority will be displayed. Clear the first notification by pressing a button to see the next one.

If vibration alerts are on, the unit will vibrate when the alert first occurs and every 10 seconds until it is acknowledged.

A list of primary notifications a diver may see is given on [page 25](#).

Persistent Notifications

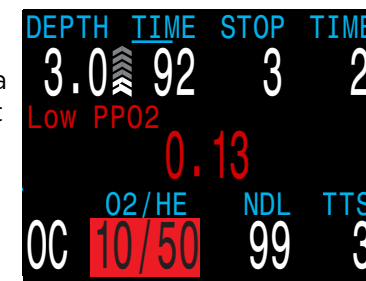
Persistent notifications complement primary notifications, displaying while a dangerous condition is present until the condition is resolved.

Persistent notifications cannot be cleared while the condition that caused them persists.

Example: when PPO2 is in an unsafe range,

- Center row text that shows a “Low PPO2” or “High PPO2” message.
- PPO2 and gas values are highlighted and flash.

These persistent notifications will clear automatically once a safe PPO2 is restored.



Sample “Low PPO2”
Persistent Notification



Sample “High PPO2”
Persistent Notification



Limitations Of Alarms

All alarm systems share common weaknesses.

They can alarm when no error condition exists (false positive). Or they can fail to alarm when a real error condition occurs (false negative).

Respond to alarms if you see them, but NEVER depend on them. Your judgment, education, and experience are your best defenses. Have a plan for failures, build experience slowly, and dive within your experience.



Vibration Alerts

In addition to visual notifications, the Perdix 2 has vibration alerts to help quickly notify the diver of warnings, errors and dive events.

If turned on, attention vibration alerts occur when a safety stop starts, pauses, or is completed. Vibration alerts also occur any time a primary notification is triggered and every 10 seconds until it is acknowledged.

There are some persistent conditions, such as low PPO2 that will cause vibration to continue until the condition is resolved.

The vibration alert can be toggled on or off in the System Setup menu as described in [Alerts Setup described on page 68](#), or in the [Dive Setup described on page 55](#).

A Test Vibration tool is also available in the Dive Setup menu and should be used regularly before diving to ensure the vibrator is functioning properly.



Vibration is Battery Dependant

Vibration Alerts are only available when using a 1.5V Lithium or 3.7V Rechargeable Li-ion battery.



Caution

Although vibration alerts are very useful, never rely on them for your safety. Electromechanical devices can and will eventually fail.

Always be proactively aware of your depth, no-decompression limit, gas supply, and other critical dive data. You are ultimately responsible for your own safety.

4.9. List of primary notifications

The following table lists primary notifications you may see, their meaning, and steps to take to solve any problems.

If multiple warnings are triggered simultaneously, the notification with the highest priority will be displayed. Clear that notification by pressing any button to see the next notification.



Contact Shearwater

The subsequent list of notifications is not exhaustive. Please contact Shearwater if you experience any unexpected errors: info@shearwater.com

Display	Meaning	Action to take
Warning Confirm LOW PPO2	The PPO2 is below the limit set in the PPO2 limits menu.	Change your breathing gas to one safe for the current depth.
Warning Confirm HIGH PPO2	The PPO2 is above the limit set in the PPO2 limits menu.	Change your breathing gas to one safe for the current depth.
Warning Confirm MISSED DECO STOP	A required decompression stop was violated.	Descend deeper than the currently displayed stop depth. Monitor for symptoms of DCS. Use extra conservatism for future repetitive dives.
Warning Confirm FAST ASCENT	The ascent was sustained as faster than 10m/min (33ft/min)	Use a slow ascent rate. Monitor for symptoms of DCS. Use extra conservatism for future repetitive dives.



Display	Meaning	Action to take
	The internal battery is low.	Replace the battery.
	The decompression tissue inert gas loading has been set to default levels.	Plan repetitive dives accordingly.
	Central Nervous System (CNS) toxicity clock exceeded 150%	Switch to a gas with a lower PPO2 or ascend shallower (decompression ceiling allowing)
	Central Nervous System (CNS) toxicity clock exceeded 90%	Switch to a gas with a lower PPO2 or ascend shallower (decompression ceiling allowing)
	NDL is less than low NDL alert value. (Only if alert active)	Ascend soon to avoid decompression obligation.
	Depth is deeper than depth alert value. (Only if alert active)	Ascend above depth limit.
	Dive time has surpassed time alert value. (Only if alert active)	End dive safely.
	No communications for 30 to 90 seconds.	See the Transmitter Connection Issues section on page 49 for more information.
	No communications for 90+ seconds.	See the Transmitter Connection Issues section on page 49 for more information.

Display	Meaning	Action to take
	Low transmitter battery.	Replace the transmitter battery.
	Tank pressure exceeds rated pressure by more than 10%	Properly set the rated pressure in the AI Setup menu. page 65 .
	Tank pressure has fallen below the critical pressure.	Be aware that gas is running low. Begin to end your dive and perform a controlled ascent to the surface.
	GTR is not available when on the surface.	None. GTR will display during a dive.
	GTR is not available when on the surface.	None. After a few minutes, enough data has been collected for display.
	The computer has reset to recover from an unexpected software condition.	If this occurs more than once over a long period, please report to Shearwater Research Inc.
	This reset shows up after a software update. This is the normal event that shows the computer has been rebooted after the software update.	N/A
	Firmware update failed, possibly due to a communications error or corrupted file.	Try the firmware upgrade again. Contact Shearwater if problem persists.



4.10. Decompression Stops

There are no Safety Stops in technical diving modes. Decompression stops are mandatory stops that must be followed in order to reduce the risk of decompression illness (DCI)



Do not dive beyond your training

Only perform decompression diving if you have received proper training to do so.

Diving with any type of overhead ceiling, whether in a cave or shipwreck, or from a decompression requirement, adds significant risk. Have a plan to handle failures and never rely solely on a single source of information.

Decompression stops occur at fixed 10ft (3m) intervals.

Decompression stops display as follows:

Decompression Stop Display

Once the NDL reaches zero, deco stop information will begin to populate the right side of the Top Row

DEPTH	TIME	STOP	TIME
27.2	62	27	2

Deco Stop Violation

If you ascend shallower than your current stop, the decompression information will **flash red**.

DEPTH	TIME	STOP	TIME
25.2	62	27	2

Significant decompression stop violations will result in a “MISSED STOP” notification. Press any button to clear this notification.

Warning	Confirm
MISSED	DECO STOP

Deco Stops Complete

By default, the deco clear counter is enabled. Once all decompression stops are complete, the Deco Clear counter will begin counting up from zero.

If the Deco Clear Counter is turned off, the display will say “Clear”.



No Lockout for violating deco stops

There is no lock-out or other penalty for violating decompression stops.

Shearwater’s policy is to provide clear warnings that the decompression scheduled was violated, to allow you to make decisions based on your training.

This may include contacting your dive insurance provider, contacting the nearest recompression chamber, or performing first aid based on your training.



5. Decompression and Gradient Factors

The basic decompression algorithm used by this computer is Bühlmann ZHL-16C. It has been modified by the use of Gradient Factors that were developed by Erik Baker. We have used his ideas to create our own code to implement it. We would like to give credit to Erik for his work in education about decompression algorithms, but he is in no way responsible for the code we have written.

The computer implements Gradient Factors creating varied levels of conservatism. The levels of conservatism are pairs of number like 30/70. For a more detailed explanation of their meaning, please refer to Erik Baker's excellent articles: "Clearing Up The Confusion About Deep Stops" and "Understanding M-values". The articles are readily available on the web. You might also want to search for "Gradient Factors" on the web.

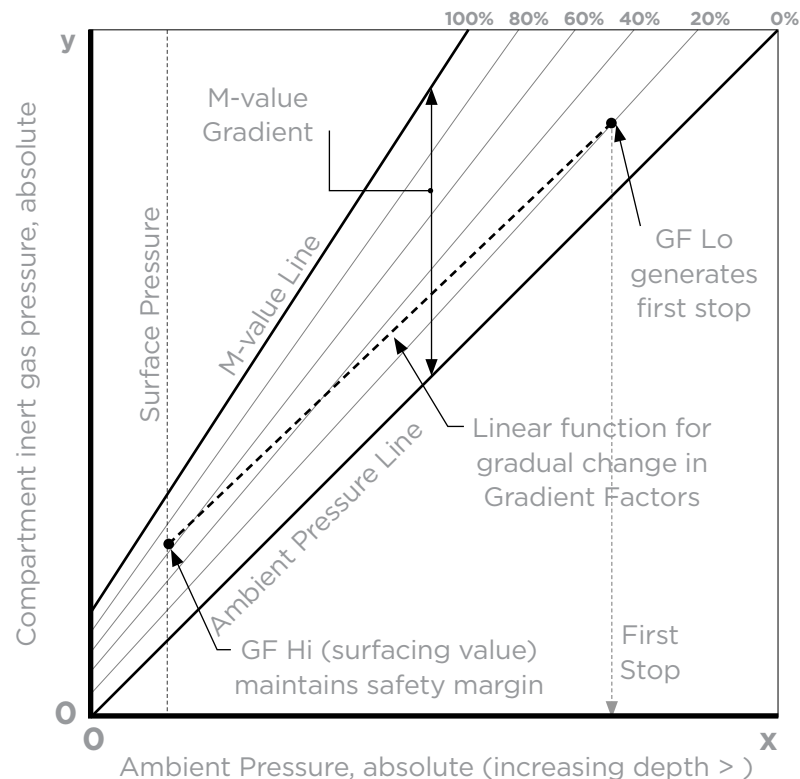
The default conservatism of the system depends on the dive mode.

For OC Rec mode the default conservatism setting is medium (40/85).

For OC Tec and CC/BO modes where some decompression is presumed, the default is a more conservative 30/70. The system provides several settings that are more aggressive than the default.

Do not edit GF values until you understand the effects.

Graph from Erik Baker's "Clearing Up The Confusion About Deep Stops"
Pressure Graph: Gradient Factors



- A Gradient Factor is simply a decimal fraction (or percentage) of the M-value Gradient.
- Gradient Factors (GF) are defined from 0% to 100%.
- A Gradient Factor of 0% represents the ambient pressure line.
- A Gradient Factor of 100% represents the M-value line.
- Gradient Factors modify the original M-value equations for conservatism within the decompression zone.
- The lower Gradient Factor value (GF Lo) determines the depth of the first stop. Used to generate deep stops to the depth of the "deepest possible deco stop"
- The higher Gradient Factor value (GF Hi) determines the surfacing tissue supersaturation.



5.1. Decompression Information Accuracy

Decompression information displayed by this computer, including NDL, stop depth, stop time, and TTS are predictions. These values are continuously recalculated and will change with changing conditions. The accuracy of these predictions is dependent on several assumptions made by the decompression algorithm. It is important to understand these assumptions to ensure accurate decompression predictions.

It is assumed that the diver's ascent rate is 10m/min (33ft/min). Ascending significantly faster or slower than this will impact decompression obligations. It is also assumed that the diver is carrying and plans to use every gas that is currently turned on. Leaving gases that are not expected to be used turned on will result in inaccurate time to surface, decompression stop and decompression time information being displayed.

On ascent, it is assumed that the diver will perform decompression stops using the gas with the highest PPO2 below the OC Deco PPO2 value (default 1.61). If there is a better gas available, the current gas will be displayed in yellow, indicating that a gas change is expected. The decompression prediction displayed always assumes that the best gas will be used. Even if the switch to a better gas has not been completed yet, decompression predictions will be displayed as if the switch is about to occur in the next 5 seconds.

Divers can encounter longer than expected decompression stops as well as inaccurate time to surface predictions if they fail to switch to a better gas when prompted by the computer.

Example: A diver on a decompression dive to 40m/131ft for 40 minutes with GF settings of 45/85 has two gases programmed into their computer and turned on: 21/00 & 99/00. The diver's decompression schedule will be calculated based on breathing 21% oxygen for the descent, bottom and ascent phases of the dive until the diver ascends to 6m/20ft. At 6m/20ft the PPO2 of the 99/00 mix is 1.606 (less than 1.61), so it is the best decompression gas available.

Decompression information for the remaining stops will be calculated and displayed assuming the diver is going to switch to this better gas. This dive profile indicates these stops would be 8 minutes at 6m/20ft and 12 minutes at 3m/10ft. If the diver never makes the switch to 99/00, the computer will not allow them to surface until adequate off-gassing has occurred, but it will continue to assume the diver is about to make the gas switch and the decompression times given will be grossly inaccurate. The 6m/20ft stop will take 19 minutes to clear and the 3m/10ft stop will take 38 minutes to clear. That is a total time to surface difference of 37 minutes.

In a lost gas scenario or in the event a diver forgets to turn off a gas they are not carrying before a dive, gases can be turned off during the dive in Main menu -> Edit Gases.



6. Example Dives

6.1. Simple OC Tec Example Dive

This is an example of displays that might be seen on a simple decompression dive in OC Tec Mode.

1. Set Up Gases - Best practices include checking your gas lists before each dive. This screen is available in the System Setup menu. This dive only involves air. Turn off all gases you do not plan to use on the dive.

2. Verify Settings - It is also prudent to ensure all other settings are correct before starting the dive. Not all settings can be modified underwater.

3. Plan Dive - Use a deco planner to check the total runtime, decompression schedule and gas quantity needed.

The on-board deco planner is limited in functionality. For complex dives we recommend planning using desktop or smartphone dive planning software.

4. Pre-Dive - This is the surface screen immediately before descending. It shows the computer is in OC mode and that 21% O₂ is selected.

5. Descent - As we pass through 10 meters, the time-to-surface (TTS) shows one minute. This shows that the computer is expecting the diver to ascend at approximately 10 meters per minute or 33 feet per minute. Decompression predictions are based on this ascent rate.

6. NDL Decreasing - The no-decompression limit (NDL) starts off showing 99, but then starts to show a smaller number as the depth increases. This screen shows that we will go into deco in 12 minutes.

(Continued on next page)

OC Gases

A1	OC	On	21/00
2	OC	Off	00/00
3	OC	Off	00/00
4	OC	Off	00/00
5	OC	Off	00/00
Next		Edit	

1. Set Up Gases

Deco Setup

Deco Model	GF
Conserv (GF)	30/70
Last Stop	6m
NDL Display	NDL
Clear Cntr	On
Next	Edit

2. Verify Settings

OC	Depth	Time	RMV
	030	030	14
Stp	Time	Run	Gas Qnt
30	bot	30	21/00 1640
12	asc	32	21/00 78
12	1	33	21/00 31
9	4	37	21/00 106
6	7	44	21/00 156
Quit		Next	

3. Plan Dive

DEPTH	TIME	SURFACE
.0		10h58m
	PP02	
	.21	
02/HE	NDL	TTS
OC 21/00	0	0

4. Pre-Dive

DEPTH	TIME	STOP	TIME
10.0	1		
	PP02		
	.42		
02/HE	NDL	TTS	
OC 21/00	99	1	

5. Descent

DEPTH	TIME	STOP	TIME
28.0	4		
	PP02		
	.80		
02/HE	NDL	TTS	
OC 21/00	12	3	

6. NDL Decreasing



7. Max Depth - We now have a decompression requirement. Our first stop is at 12 meters and we will need to remain there for up to one minute. Although stops are shown in minutes, the computer will calculate and change the ceiling in real time and the stop may be less than a minute.

Time to surface (TTS) now indicates it will take 26 minutes to ascend to the surface following the currently calculated decompression schedule.

8. Ascent - As we ascend, the ascent rate indicator shows two chevrons, or about 6 mpm / 20 fpm. This is slower than the 10 mpm / 33 fpm that decompression calculations assume. As a result of this slow ascent, early decompression stops may clear before we arrive.

9. Missed Stop - When we go shallower than our 6 meter stop, the deco stop information starts to flash red. Significant stop violations will result in a missed deco stop notification.

10. Deco Clear - When we clear the last stop, the stop depth and time is replaced by the Deco clear counter that begins counting up from zero. We also see an NDL of 99 minutes again. Once we surface, the depth will return to 0 and a minute later when the computer comes out of dive mode, the NDL goes to 0 as well.



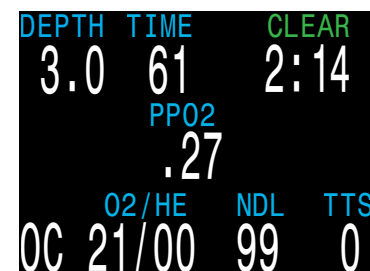
7. Max Depth



8. Ascent



9. Missed Stop



10. Deco Clear



No safety stop countdown in technical dive modes

It is widely believed that additional time spent at the last decompression stop reduces the overall risk of decompression sickness.

The decision not to include a safety stop countdown in technical dive modes is an acknowledgment that technical divers plan decompression ahead of their dives to manage decompression risk with this in mind.

The deco clear counter is a useful tool to aid divers in padding their final decompression stop for additional conservatism.



6.2. Complex OC Tec Example Dive

This is an example of displays that might be seen on a multi-gas trimix decompression dive in OC Tec Mode.

Max Depth: 60 meters	Bottom Gas: Trimix (18/45)
Bottom Time: 20 minutes	Deco Gases: 50% & 99% O2

1. OC Gas Setup - Best practices include checking your gas list before each dive. This screen is available in the System Setup menu. All gases that are turned on will be used to calculate the decompression schedule. Make sure to turn off gases you are not carrying or planning to use.

2. Verify Settings - It is also prudent to ensure all other settings are correct before starting every dive. In addition to checking gases, we recommend verifying the settings on all system setup pages.

3. Plan Dive - Use the Deco Planner found in Dive Setup to check the total runtime, decompression scheduled and gas requirements for the dive.

We recommend using desktop or smart phone dive planning software for complex dives. The on-board deco planner is an effective tool for confirming computer settings produce a plan that meet your expectations.

4. Pre-Dive - Prior to beginning the dive we can see our active gas is currently 18/45, and our battery is in a good state of charge. The decimal in the depth display indicates that meters are the selected units.

5. Descent - s we descend our dive time begins counting up, PPO2 increases, and the displayed NDL falls.

OC Gases

1 OC	On	99/00
2 OC	On	50/00
A3 OC	On	18/45
4 OC	Off	00/00
5 OC	Off	00/00
Next		Edit

1. OC Gas Setup

OC	Depth	Time	RMV
	060	020	15
Stp	Tme	Run	Gas
60	bot	20	18/45
30	asc	23	18/45
30	1	24	18/45
27	1	25	18/45
24	1	27	18/45
Quit		Next	

3. Plan Dive -
Deco Scheduled

DEPTH	TIME	SURFACE
.0		10h58m
	PP02	
	.18	
	O2/HE	NDL
OC	18/45	TTS
	0	0

4. Pre-Dive

Deco Setup

Deco Model	GF
Conserv (GF)	30/70
Last Stop	6m
NDL Display	NDL
Clear Cntr	On
Next	Edit

2. Verify Deco
Settings

OC	Depth	Time	RMV
	060	020	15
Gas Usage, in Liters			
	99/00:	461	
	50/00:	518	
	18/45:	2411	
Quit		Next	

3. Plan Dive -
Gas Requirement

DEPTH	TIME	STOP TIME
33.0	3	
	PP02	
	.73	
	O2/HE	NDL
OC	18/45	TTS
	5	4

5. Descent

(Continued on next page)



6. Max depth - Once NDL hits 0, deco stops are needed. Stop requirements are now display in the top right of the screen. TTS has increased to include deco stop time.

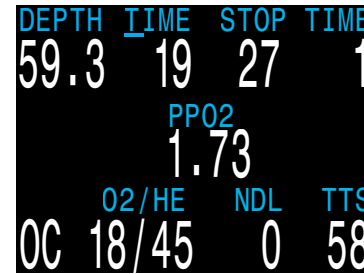
7. Ascent - It is safe to ascend to 24 meters. 2 minutes must be spent at that deco stop. The bar graph to the right of the depth shows the ascent rate (10 mpm). All decompression predictions are made assuming an ascent rate of 10 meters per minute.

8. Gas Change - All decompression predictions are made assuming you will switch to the best available gas on ascent. At the 21m stop, the breathing gas turns yellow indicating that a better breathing gas is available. If the switch is not made, tissue loading will be calculated using the active gas, but predicted deco stop and time calculations assume the switch will occur within the next 5 seconds. Available gases can be added or subtracted during the dive in the Dive Setup > Define Gas menu.

9. High PPO2 - After the switch to 50% O2, the diver has descended a couple meters, their inspired PPO2 has risen above the default warning value, and the high PPO2 warning has been triggered. Any button press will clear the primary notification, but for PPO2 warnings, the computer will continue to vibrate to get the divers attention until the PPO2 warning condition has been resolved.

10. Missed Deco Stop - The diver has ascended shallower than the decompression ceiling. Deco information flashes red and after a short time a missed deco stop warning is triggered. Clear the warning and stop the vibration alert by pressing any button. Re-descend deeper than the stop depth to clear the flashing text.

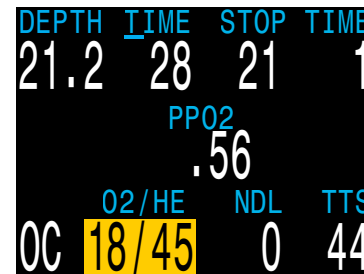
11. Deco Clear - Once all decompression obligation has been cleared, the deco clear counter begins counting up from zero.



6. Max Depth



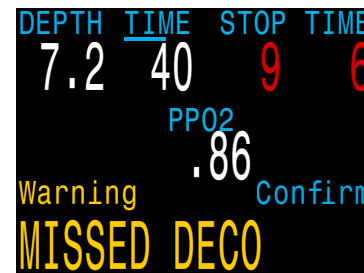
7. Ascent



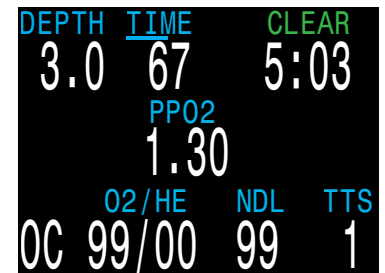
8. Gas Change



9. High PPO2



10. Missed Stop



11. Deco Clear



6.3.CC Example Dive

This is an example of displays that might be seen on a multi-gas decompression dive in CC/BO Mode.

Max Depth: 90 meters	Diluent Gas: Trimix (10/50)
Bottom Time: 20 minutes	Bailout Gases: 14/55, 21%, 50%

1. CC Gas Setup - Best practices include checking your gas lists before each dive. Gas setup screens are available in the System Setup in CC mode. For this dive the only diluent gas is Trimix 10/50. (10% O2, 50% He, 40% N2)

2. BO Gas Setup - Several bail out gases are required for this dive. If we switch to BO mode, we can also use the Dive Setup > Define Gas menu to edit, turn on, or turn off the bailout gases.

We will verify we are carrying sufficient bailout gas when we plan the dive.

3. Verify Settings - It is prudent to ensure all other settings are correct before starting every dive. For advanced technical dives, it is especially important to double check the values on every screen of the system set up menu.

4. Plan Dive - Use the dive planner found in Dive Tools to check the total runtime, decompression schedules and bailout gas requirements for the dive.

For closed circuit dives, two decompression schedules will be generated. A primary schedule for closed circuit deco, and a bailout decompression schedule.

The on-board deco planner is limited in functionality, so for complex dives we recommend using desktop or smart phone dive planning software. Using the on-board planner to double check your dive plan is an effective way of confirming decompression settings.

(Continued on next page)

CC Gases

A1 CC	On	10/50
2 CC	Off	00/00
3 CC	Off	00/00
4 CC	Off	00/00
5 CC	Off	00/00
Next	Edit	

1. CC Gas Setup

BO Gases

1 OC	On	99/00
2 OC	On	50/00
3 OC	On	14/55
4 OC	Off	00/00
5 OC	Off	00/00
Next	Edit	

2. OC Gas Setup

Deco Setup

Deco Model	GF
Conserv (GF)	30/70
Last Stop	6m
NDL Display	GF99
Clear Cntr	On
Next	Edit

3. Verify Deco Settings

CC	Depth	Time	RMV	P02
	090	020	15	1.3
Stp	Tme	Run	Gas	
90	bot	20	10/50	
48	asc	25	10/50	
48	1	26	10/50	
45	1	27	10/50	
42	1	28	10/50	
Quit	Next			

4. Plan Dive - CC Scheduled

BO	Depth	Time	RMV	P02
	090	020	15	1.3
Stp	Tme	Run	Gas	Qty
66	bot	23	14/55	316
42	asc	25	21/00	230
42	1	26	21/00	78
39	1	27	21/00	74
36	1	28	21/00	69
Quit	Next			

4. Plan Dive - BO Scheduled

BO	Depth	Time	RMV
	090	020	15
Gas Usage, in Liters			
50/00:2300			
21/00: 840			
14/55: 316			
Quit	Next		

4. Plan Dive - Bailout Gas Requirement



CC Example Dive (cont.)



Note on Hypoxic Diluents

Hypoxic diluents such as 10/50 in this example require special training since they can be deadly near the surface.

5. Pre-Dive - Prior to beginning the dive we can see from the mode indicator that we are in CC mode. Our active diluent gas is set to 10/50, our set point is 0.7, and the Perdix 2's battery is sufficiently charged.

6. Diluent Check - Pressing the right button a few times brings up the diluent PPO2. The red indicates the diluent is unsafe to breath directly.

This information can be viewed at any time to verify the diluent is safe or to check what the expected PPO2 will be when flushing with diluent at depth.

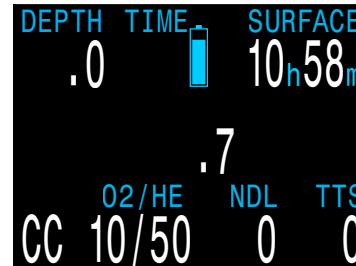
7. Automatic Set point Switch - The optional auto set point switch was enabled with a depth setting of 15m. So as we descend past 15m, the set point automatically switches from 0.7 to 1.3.

8. Decreasing NDL - As we descend deeper, the NDL decreases. The TTS shows it will take 5 minutes to ascend to the surface at 10m/min (33ft/min).

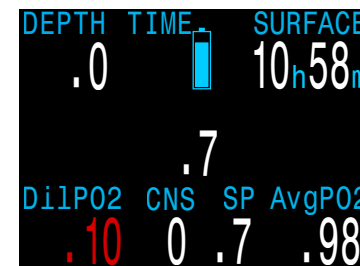
9. Bottom Time - We have completed the bottom time. The TTS indicates we have about 1.5 hours of decompression to do. The first stop will be at 48m for 1 minute. We have GF99 set to replace NDL while we have a decompression obligation.

10. Ascending to the First Stop - Here we are ascending at 3m/min. This is slower than the expected 10m/min ascent rate. This slow ascent has caused the TTS to rise, as most tissues are still on-gassing.

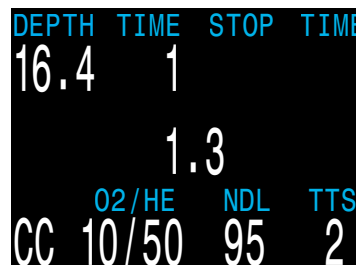
(Continued on next page)



5. Pre-Dive



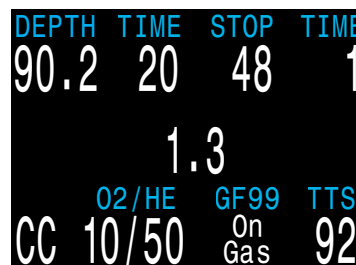
6. Diluent Check



7. Automatic Set point Switch



8. Decreasing NDL



9. Bottom Time



10. Ascending to First Stop



CC Example Dive (cont.)

11. First Deco Stop - The slow ascent has caused the first stop to clear before we reached it. This often happens with slow ascents.

12. A Problem Has developed - There is a problem with the O2 readings on the rebreather controller and the decision has been made to bail out. After physically switching the BOV or mouthpiece, the computer needs to be set to BO mode for proper deco calculations.

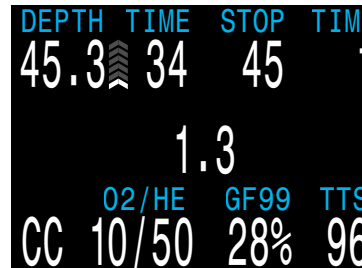
13. Bailout - Press the left (MENU) button until it brings up "SWITCH CC -> BO". Pressing the right (SELECT) button makes the change.

Note the Dive Mode indicator has changed to BO to indicate the bailout condition and the set point has disappeared from the info row. The best BO gas was automatically selected, and the deco schedule has been adjusted based on all of the available BO gases.

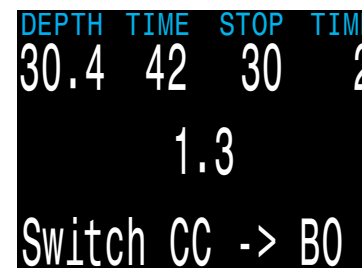
14. Gas Switch Required - We are now at 21m, having completed a few more deco stops. The gas is now displaying in yellow, indicating a better gas is available.

15. Gas Switch - Pressing left (MENU) button brings up the "SELECT GAS" option in the main menu. This example uses the "New" gas select menu. (page 54). The best available gas will be the initial selection when entering the gas select menu, just press SELECT one more time to make it the active gas.

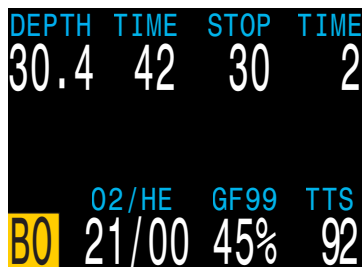
16. Deco Clear - Follow the deco stops until they have all cleared and the Deco Clear Counter begins counting up from zero.



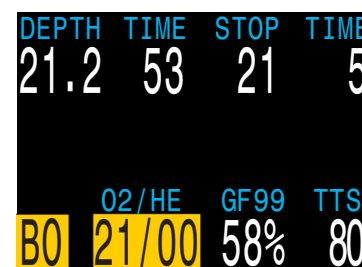
11. First Deco Stop



12. A problem has developed



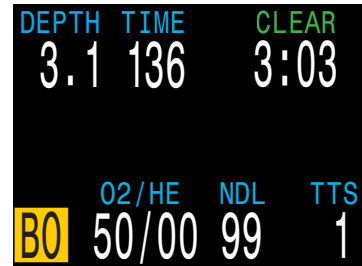
13. Bailout



14. Gas Switch Required



15. Gas Switch



16. Deco Clear

End of example.



7. Gauge Mode

Gauge Mode turns the Perdix 2 into a simple depth and time display (a.k.a. a bottom timer).



Gauge Mode

Since decompression tissues are not tracked in Gauge Mode, changing to or from Gauge Mode resets the deco tissues.

Change to Gauge Mode in the System Setup > Mode Setup menu. [page 51](#).

Gauge Mode Features:

- Extra-large depth display (meters or feet)
- Extra-large time display (in minutes:seconds)
- Maximum and average depth on main screen.
- Resettable average depth
- Stopwatch

The Gauge Display is organized by:

- Depths along the left.
- Times along the right.
- Depth and Dive Time in the top row.

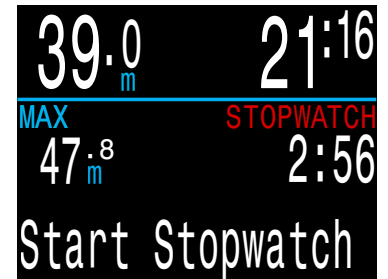
Stopwatch

When diving, starting or stopping the Stopwatch is the first menu option.

When stopped, the word “Stopwatch” displays in red.

When non-zero, the stopwatch can be reset. Reset behavior depends on state:

- If running when reset, it continues running, counting up again from 0.
- If stopped when reset, then it is set 0 and remains stopped.



Resettable Average Depth

During a dive, the average depth can be reset.

While on the surface, the MAX and AVG values display the maximum and average depth of the last dive. The AVG depth displayed on the surface is for the entire dive, regardless of whether the reset average depth option was used. The dive log also records the average depth for the entire dive.



8. Compass

The Perdix 2 contains a tilt-compensated digital compass.

Compass Features

- 1° resolution
- $\pm 5^\circ$ accuracy
- High-speed refresh rate
- User set heading marker with reciprocal
- True North (declination) adjustment
- Tilt compensation $\pm 45^\circ$



Viewing the Compass

When enabled, the compass is viewed by pressing the SELECT (right) button once. Press SELECT again to continue on to view the regular info screens.

Unlike the regular info screens, the compass never times out back to the main screen. Press MENU (left) button to return to the main screen.

Marking a Heading

To mark a heading, when viewing the compass press the MENU (left) button. This brings up the "Exit/Mark" menu. Press the SELECT (right) button to mark the heading.



The marked heading is shown with a green arrow. When within $\pm 5^\circ$ of the heading, the degrees display turns green.



The reciprocal heading (180° from marked heading) is shown with a red arrow. When within $\pm 5^\circ$ of the reciprocal heading, the degrees display turns red.



When more than 5° off the marked heading, a green arrow shows the direction back to the marked heading.



Also, the offset degrees to the heading are displayed (16° in the example image). This offset is useful when navigating patterns. For example, a box pattern requires turns at 90° intervals, while a triangle pattern requires 120° turns.

Compass Limitations

Calibration - The digital compass needs occasional calibration. This can be done in the **System Setup** ➔ **Compass** menu. [See details on page 69.](#)

Battery Changes - When the battery is changed, the compass requires calibration.

Interference - Since a compass operates by reading the Earth's magnetic field, the compass heading is affected by anything that distorts that field or creates its own. Steel objects and electric motors or cabling (e.g. from dive lights) should be kept at a distance. Being close to or inside a shipwreck may also affect the compass.

Magnetic declination (also called magnetic variation) is the difference between magnetic and True North. This can be compensated in the Compass Setup menu using the True North setting. The magnetic declination varies around the world, so will need to be readjusted when traveling.

Magnetic inclination (or magnetic dip) is how much the Earth's magnetic field points up or down. The compass automatically compensates for this angle. However, near the poles, the inclination angle can exceed 80° (i.e. the magnetic field points almost directly up or down), in which case the specified accuracy may not be met.



9. Air Integration (AI)

The Perdix 2 is equipped with 4-transmitter air integration capability.

This section covers operation of the AI feature.

AI Features

- Simultaneous wireless pressure monitoring of up to 4 tanks.
- Units in psi or bar.
- Gas Time Remaining (GTR) and Surface Air Consumption (SAC) rate based on one tank.
- Sidemount support for SAC, GTR, and Redundant Time Remaining (RTR)
- Sidemount Tank Switch Notifications
- Logging of pressure, GTR and SAC
- Reserve and critical gas pressure warnings.

9.1. What is AI?

AI stands for Air Integration. On the Perdix 2, this refers to a system that uses wireless transmitters to measure the gas pressure in a SCUBA tank and transmit this information to the Perdix 2 dive computer for display and logging.

Data is transmitted using low-frequency (38kHz) radio frequency communications. A receiver in the Perdix 2 accepts this data and formats it for display.

The communication is one-way. The transmitter sends data to the Perdix 2, but the dive computer does not send any data to the transmitter.

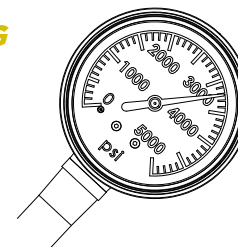


Shearwater Swift Wireless Transmitter



Use a backup analog SPG

Always use a backup analog submersible pressure gauge as a redundant source of gas pressure information.





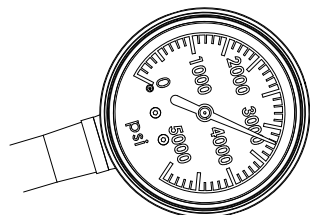
9.2. Basic AI Setup

This section will get you started with the basics of AI on the Perdix 2. Advanced setup and detailed descriptions will be covered in later sections.

Install the Transmitter

Before using the AI system, you will need to install one or more transmitters on a scuba tank first stage regulator.

The transmitter must be installed on a first stage port labeled “HP” (high pressure). Use a first stage regulator with at least two HP ports, so that a backup analog submersible pressure gauge (SPG) can be used.



A backup SPG is recommended

Position the transmitter such that it is on the same side of your body as you wear your Perdix 2 handset. Range is limited to approximately 1 m (3 ft).

A high-pressure hose may be used to relocate the transmitter for better reception or convenience. Use hoses rated for a working pressure of 300 bar (4500 psi) or higher.

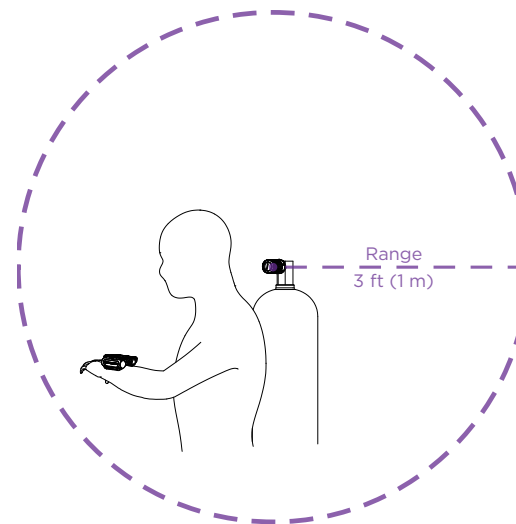
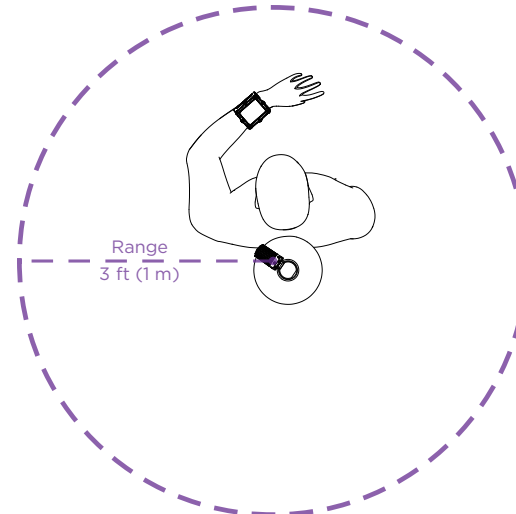


Some transmitters require a wrench (11/16” or 17mm) to tighten or loosen

Avoid hand tightening or loosening unless otherwise specified by the transmitter manufacturer, as this may damage the transmitter.



The Shearwater Swift transmitter can be installed without tools.



Install transmitter on 1st stage HP port

Install transmitter on the same side of your body as the handset. Range is approximately 3 feet (1 m).



Turn on the Transmitter

Turn on the transmitter by opening the tank valve. The transmitter will automatically wake up when it detects pressure.

Pressure data is transmitted approximately every 5 seconds.

Turn off the Transmitter

To turn off the transmitter, close the tank valve and purge the second stage regulator to drain pressure from the hoses. The transmitter will automatically power down after 2 minutes of no applied pressure.

Enable AI on the Perdix 2

On the Perdix 2, navigate to the **System Setup** > **AI Setup**. Change the **AI Mode** setting to **On**.

```

AI Setup
▶ AI Mode      On
Units         Bar
Tx Setup      T1
GTR Mode      Off
Next          Edit
    
```

When **AI Mode** is set to **Off**, the AI sub-system is completely powered down and does not consume any power. When on, the AI system increases power consumption by approximately 10%.

Note that AI is never on when the Perdix 2 is turned off.

More information about can be found in the [AI Setup](#) section on page 65.

Pair the Transmitter

Each transmitter has a unique serial number etched on its body. All communications are coded with this number so that the source of each pressure reading can be identified.



Pair the transmitter by going to the **Tx Setup** menu option, and selecting T1. Turn on T1, then enter the 6-digit transmitter serial number into the **T1 Serial #** setting. You only need to set this once, as it will be permanently saved in the settings memory.

Transmitters

```

#      On      Serial
▶ T1    On      285817
T2      Off      000000
T3      Off      000000
T4      Off      000000
Next    Setup    Edit
    
```

Tank Setup

```

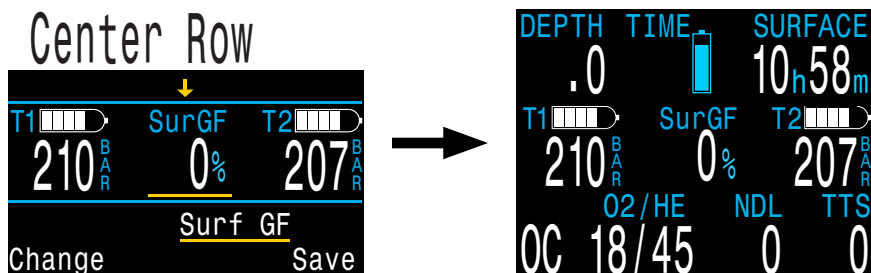
▶ T1 Serial#  285817
Rated         207Bar
Reserve       048Bar
Rename        T1
Unpair
Next          Edit
    
```



Add an AI display to the home screen

AI information is automatically displayed as an info screen when the AI feature is enabled, however, the main screen will not show AI information until manually added.

In technical diving modes, add AI to the home screen in the System Setup > Center Row menu.



The center row can be customized extensively to show a wide variety of information.

Find more information about how to do this up in [the Center Row section on page 67](#).



Check that your tank valve is open

Always take a few breaths from your regulator or purge your regulator's second stage while monitoring your tank pressure for a full 10-15 seconds prior to entering the water to ensure your tank valve is turned on.

If the first stage regulator is charged but the tank valve has been closed, the breathing gas available to the diver will decrease rapidly and within a few breaths the diver will face an "out of air" situation. Unlike an analog gauge, the air pressure reported on the Perdix 2 will only update every 5 seconds, so the pressure reported by the Perdix 2 must be monitored for longer than that (we suggest 10-15 seconds) to ensure the tank valve is open.

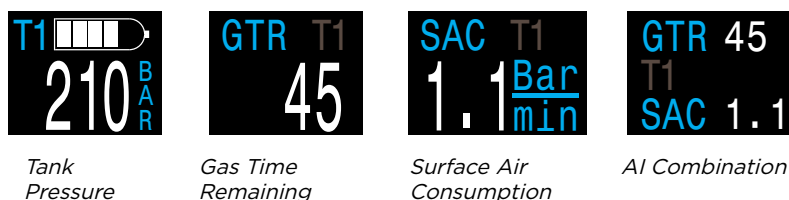
Including a regulator purge test followed by 10-15 seconds of air pressure monitoring before entering the water as part of your pre-dive safety check is a good way to mitigate this risk.



9.3. AI Displays

This section describes the display field types that are used to display AI information. The display types are:

- 1) Tank Pressure
- 2) SAC
- 3) GTR
- 4) RTR (sidemount only)
- 5) AI combination display



These displays can be viewed in two ways:

- 1) Added to a customizable zone on the home screen
- 2) Most can be viewed on the AI info screen.

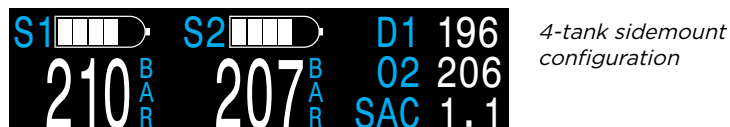
Renaming Transmitters

Transmitter titles can be customized in the transmitter setup menu. This makes it easier to keep track of which transmitter is reporting which cylinder pressure.

Each transmitter title has 2 characters that apply to all AI displays. The following options are available.

First Character: T, S, B, O, or D

Second Character: 1, 2, 3, or 4

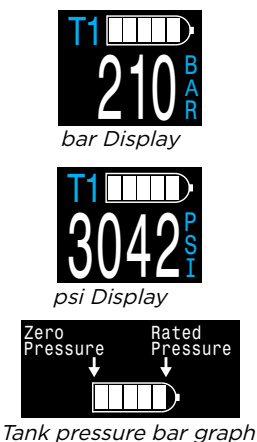


Renaming is for display purposes only. There is no relationship between a transmitter title and gas fraction for decompression calculation purposes.

Tank Pressure Display

The pressure displays are the most fundamental AI displays, showing pressure in the current units (psi or bar).

At the top of each pressure display, a bar graph represents the pressure graphically. This bar graph is scaled from zero pressure up to the **rated pressure** setting. This is NOT a battery level indicator.

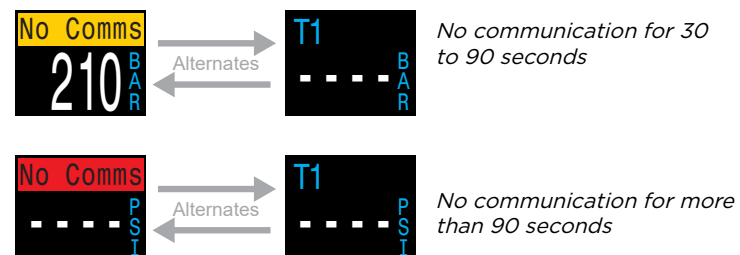


Low Pressure warnings:

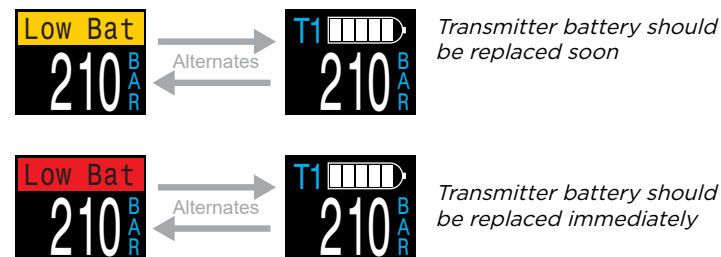


Reserve Pressure thresholds can be managed in the AI Setup Menu. [See details on page 65.](#)

No Communication Warnings:



Low Transmitter Battery Warnings:





SAC Display

The Surface Air Consumption (SAC) display shows the average rate of pressure change over the last two minutes, normalized to as if at 1 ATA pressure. Depending on the current units setting, SAC is either displayed in psi/minute or bar/minute.

SAC T1
1.1 Bar/min

SAC SM
0.8 PSI/min

SAC can be displayed for a single tank, or for a sidemount configuration of two tanks of identical volume.



Note that SAC in pressure per minute is NOT transferable between tanks of different sizes.

The title indicates which transmitter is being used for the SAC calculations in a dark gray font. "SM" indicates that Sidemount SAC is selected.

The tank(s) included in the SAC calculation are selected in the AI Setup menu ([page 65](#)).

During the first few minutes of a dive the SAC value is not available, while the initial data is being collected for averaging calculations. The SAC display will show "wait" during this time.

SAC T1
wait



On surface, SAC is average from last dive

The average SAC from your last dive is shown when on the surface. When a dive ends, you may notice the SAC value suddenly changes. This is because the SAC display changes from showing the SAC over the last two minutes (when in dive mode) to showing the average SAC for the whole dive.

GTR Display

The Gas Time Remaining display shows the time, in minutes, that you could stay at the current depth until a direct ascent to the surface at a speed of 33 feet/min (10 m/min) would result in surfacing with the reserve gas pressure remaining.

GTR T1
45

GTR T1
5

GTR T1
2

The Value is displayed in yellow when less than or equal to 5 minutes. The value is displayed in red when less than or equal to 2 minutes.

GTR can only be based on a single tank or when sidemount is selected, with 2 tanks of identical volume.

The title indicates which transmitter is being used for the GTR calculations in a dark gray font. "SM" indicates that Sidemount GTR is selected.

When on the surface, the GTR displays "---". **GTR is not shown when decompression stops are needed, and will display "deco"**.

SAC data from the first 30 seconds of each dive is discarded. It then takes an additional few minutes to calculate the average SAC. Therefore, for the first few minutes of each dive, the GTR will display "wait", until enough data has been collected to begin making GTR predictions.

More information on how GTR is calculated can be found in [the GTR calculations section on page 48](#).

No GTR
on surface

GTR T1

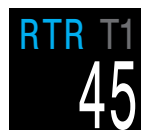
GTR T1
wait

At start of dive,
wait for data to
stabilize



RTR Display (Sidemount Only)

The Redundant Time Remaining (RTR) display indicates how much gas time remains if calculated only using the pressure of the sidemount tank with less pressure (i.e. all gas in the higher pressure tank was lost).



All of the same rules apply to RTR as they do to GTR and it is calculated in exactly the same way.

The title indicates the tank that is currently being used for the RTR calculation in dark grey.

AI Combination Displays

AI combination displays automatically populate the AI info row to pack more information into the limited available space. The format of the AI combinations is based on AI settings. Some examples are given below. This is not an exhaustive list of the possible displays.

See the center row menu section on [page 67](#) to learn how to place AI displays on your home screen.

GTR, RTR, and SAC may not have information available about what tank they are referencing due to space constraint.

AI Setting	Display
Tx Setup T1 GTR Mode T1	
Tx Setup T1 T2 GTR Mode SM:T1+T2	
Tx Setup T1 T2 T3 T4 GTR Mode SM:T1+T2	

9.4. Sidemount AI

The Perdix 2 offers some features that make gas tracking more convenient while sidemount diving. These include:

- Sidemount tank switch notifications
- Sidemount SAC calculations
- Sidemount GTR and RTR

All sidemount features are enabled in the AI setup menu by setting the GTR Mode option to the desired SM combination.

AI Setup

AI Mode	On
Units	Bar
Tx Setup	T1 T2
GTR Mode	SM:T1+T2
SM Switch	21Bar
Next	Edit



Use Identical Tanks For Sidemount

Sidemount features were designed assuming the sidemount tanks are of identical volume. This removes the need to enter tank volumes into the computer, simplifying the user interface and reducing the chances of input errors.

Do not use sidemount AI features with tanks of differing volumes.

Sidemount Tank Switch Notifications

When the sidemount feature is enabled switch notifications will appear as a green box highlighting the label of the tank you should be breathing from. This provides a subtle reminder to switch tanks when the difference between tank pressures rises above the SM Switch setting.



The switch notification setting has a range of 7 bar - 69 bar or 100 psi - 999 psi.



Sidemount SAC and GTR

Sidemount SAC and GTR are calculated the same way as single tank SAC and GTR except the tank pressures are pooled prior to each calculation. Essentially the two tanks are treated as one large tank.

Sidemount SAC and GTR calculations are dependent on the assumption that both sidemount tanks are of identical volume.

Note that SAC rate is not transferable between tanks of differing volumes. You must convert SAC to RMV for comparing gas consumption across different tank configurations.

For the purposes of RMV calculations using sidemount SAC, follow the same procedure outlined for a single tank in [the SAC calculations section on page 47](#), but add all of the relevant tank attributes together as if you were using a single large tank.

Total volume = Volume_{Tank 1} + Volume_{Tank 2}

Total rated pressure = Rated pressure_{Tank 1} + Rated pressure_{Tank 2}

9.5. Using Multiple Transmitters

When using multiple transmitters, best reception reliability will be attained by using transmitters with different transmission intervals or by using transmitters with active collision avoidance such as the Shearwater Swift Transmitter.

When two transmitters of the same transmission interval are used, the potential exists for their communication timing to become synchronized. When this occurs, data dropouts may result and could last up to 20 minutes or more.

Legacy Shearwater transmitters of different colors have different transmit timing. This reduces communication collisions that could potentially cause a loss of connection.

When using more than two transmitters, Shearwater recommends using the Swift transmitter which actively 'listens' for other transmitters in the vicinity and dynamically alters transmit timing to avoid interference.

There is no defined upper limit to the number of Swift transmitters that can be run concurrently. For more details, see the Swift Operating Instructions Manual.



Using Multiple Transmitters With The Same Transmission Interval May Result in Lost Comms

When using more than one transmitter, use transmitters with adaptive collision avoidance or legacy transmitters of different colors to prevent interference (see above).



9.6. SAC calculations

Surface Air Consumption (SAC) is the **rate of change of tank pressure**, normalized as if at 1 atmosphere of pressure. The units are either psi/minute or bar/minute.

The Perdix 2 calculates SAC averaged over the last two minutes. The data from the first 30 seconds of a dive are discarded to ignore the extra gas that is typically used during this time (inflating BCD, wing, or dry suit).

SAC vs RMV

Since SAC is simply based on rate of tank pressure change, the calculations do not need to know the tank size. However, this means that the SAC is NOT transferable to tanks of a different size.

Contrast this to respiratory minute volume (RMV) which is the volume of gas your lungs experience per minute, measured in Cuft/min or L/min. The RMV describes your personal breathing rate, and is therefore independent of tank size.

Why SAC instead of RMV?

Since RMV has the desirable property of being transferable between tanks of different sizes, it seems to be the better choice on which to base GTR calculations. However, the main drawback of using RMV is that it requires setting up tank size correctly for each tank. Such setup is easy to forget and is also easy to setup incorrectly.

SAC has the great property of not requiring any setup, making it the simplest and most reliable choice. The drawback is that it is not transferable between tanks of different sizes.

SAC Formula

The SAC is calculated as follows:

$$SAC = \frac{P_{tank}(t_1) - P_{tank}(t_2)}{t_2 - t_1} \div P_{amb,ATA}$$

$P_{tank}(t)$ = Tank pressure at time t [PSI] or [Bar]
 t = Time [minutes]
 $P_{amb,ATA}$ = Ambient pressure [ATA]

The time samples are taken 2 minutes apart, and $P_{amb,ATA}$ is the average ambient pressure (i.e. depth) over this time frame.

Since the Perdix 2 displays and logs SAC, the formula for calculating RMV from SAC is useful. Knowing your RMV can help with planning dives using tanks of various sizes.

Calculating RMV from SAC - Imperial units

In the imperial system, tank sizes are described using two values; capacity in Cuft at a rated pressure in psi.

For example, a common tank size is 80 Cuft at 3000 psi.

To convert SAC in [psi/minute] to RMV in [Cuft/minute], calculate how many Cuft are stored per psi, then multiply this by the SAC to get RMV.

For example, a SAC of 23 psi/min with an 80 Cuft 3000 psi tank would be an RMV of $(23 \times (80/3000)) = 0.61$ Cuft/min.

Calculating RMV from SAC - Metric units

In the metric system, tank sizes are described using a single number, the tank's physical size in liters [L]. This is how much gas could be stored at a pressure of 1 bar, so effectively the units of tank size are [L/bar].

This makes converting SAC to RMV easy. When using metric units, simply multiply the SAC by tank size.

For example, a SAC of 2.1 bar/min with a 10 L tank would be an RMV of $(2.1 \times 10) = 21$ L/min.



9.7. GTR calculations

Gas Time Remaining (GTR) is the time in minutes that can be spent at the current depth until a direct ascent to the surface at a rate of 10 m/min (33 feet/min) would result in surfacing with the reserve pressure. This is calculated using the current SAC value.

Safety stops and decompression stops are not considered by the GTR calculations.

To calculate GTR, start with the known tank pressure, P_{tank} . The remaining gas pressure, $P_{\text{remaining}}$, is determined by subtracting off the reserve pressure and the pressure used for the ascent.

$$P_{\text{remaining}} = P_{\text{tank}} - P_{\text{reserve}} - P_{\text{ascent}}, \text{ all tank pressures in [psi] or [bar]}$$

Knowing $P_{\text{remaining}}$, divide this by the SAC adjusted to the current ambient pressure to get GTR in minutes.

$$GTR = P_{\text{remaining}} / (SAC \times P_{\text{amb,ATA}})$$

Why aren't safety stops included?

Safety stops aren't included to simplify the meaning of GTR, and make it consistent across operating modes that do not include safety stops.

Managing enough gas for a safety stop is quite simple, especially since they require a relatively small amount of gas. For example, consider if your SAC was 1.4 bar/min (20 psi/min). At a depth of 4.5m/15ft, the pressure is 1.45 ATA. So a 3 minute safety stop would use $1.4 \times 1.45 \times 3 = 6.1$ bar (87 psi) of gas. This small amount of gas is easy to factor into the reserve pressure setting.

Why is GTR limited to no deco?

Currently, Shearwater does not believe that GTR is the proper tool for decompression dives, especially those involving multiple gases. This isn't to say AI in general

is not a good fit for all technical diving, but the GTR function becomes increasingly complex to manage and understand when multiple gases are used.

Overall, the required complexity of menus and setup burden on the user would result in a system prone to mistakes and accidental misuse, and not fitting with Shearwater's design philosophies.

Gas management is an incredibly important and also complex activity, especially for technical diving. Education, training, and planning are critical for proper gas management for technical dives. Shearwater feels that a convenience feature such as GTR is not a good application of technology in this case, as its complexity and potential for misuse would outweigh its utility.

No compensation for ideal gas law deviations

Note that all SAC and GTR calculations assume that the ideal gas law is valid. This is a good approximation up to about 207 bar (3000 psi). Above this pressure, the change in gas compressibility as pressure increases becomes a noticeable factor. This is mainly an issue for European divers using 300 bar cylinders. The end result is early in the dive, when pressures are above 207 bar/3000 psi, the SAC is over-estimated, resulting in under-estimation of GTR (although this is the good way to err, as it is more conservative). As the dive progresses and pressure drops, this problem rectifies itself and the numbers become more accurate.



9.8. Transmitter Connection Issues

If you are seeing “No Comms” errors, follow these steps:

If the “No Comms” is persistent:

- Check that the proper serial number is entered into the AI Setup Transmitter Setup menu.
- Ensure the Transmitter battery is not dead.
- Ensure the transmitter is turned on, by connecting it to a first stage and turning on the tank valve. Applying high pressure > 3.5 bar (50 psi) is the only way to turn on the transmitter.

The indicator light on a Swift transmitter will flash to indicate it is transmitting.

All compatible transmitters will power off after 2 minutes of no pressure.

- Bring the handset within range (1m / 3ft) of the transmitter. Having the transmitter too close (less than 5 cm / 2 inches) can also cause communication loss.

If the “No Comms” is intermittent:

- Search for sources of radio frequency (RF) interference, such as HID lights, scooters, suit heaters, or photo flashes. Try eliminating such sources to see if this solves the connection problem.
- Check the distance from transmitter to handset. If range related dropouts are occurring during diving, locating the transmitter on short length of high pressure hose is possible to decrease the transmitter to handset distance.
- If more than one legacy or compatible third party transmitter is in range of the computer, ensure that they have different transmit timings (grey vs. yellow coloured transmitters), to minimize interference. This is not usually a source of problems with Shearwater Swift transmitters.



10. Menus

Menus perform actions and allow settings to be changed.

If no buttons are pushed for 10 seconds, the menu system will time-out, returning to the main screen. Anything that had been previously saved will be retained. Anything that was in the middle of editing will be discarded.

The main Perdix menu can be accessed using the left (Menu) button from the main screen.

Main menu items differ by mode, as well as at the surface versus on a dive. The most commonly used menu items are placed first in the main menu to reduce button presses.

In the following section each item will be covered in detail.



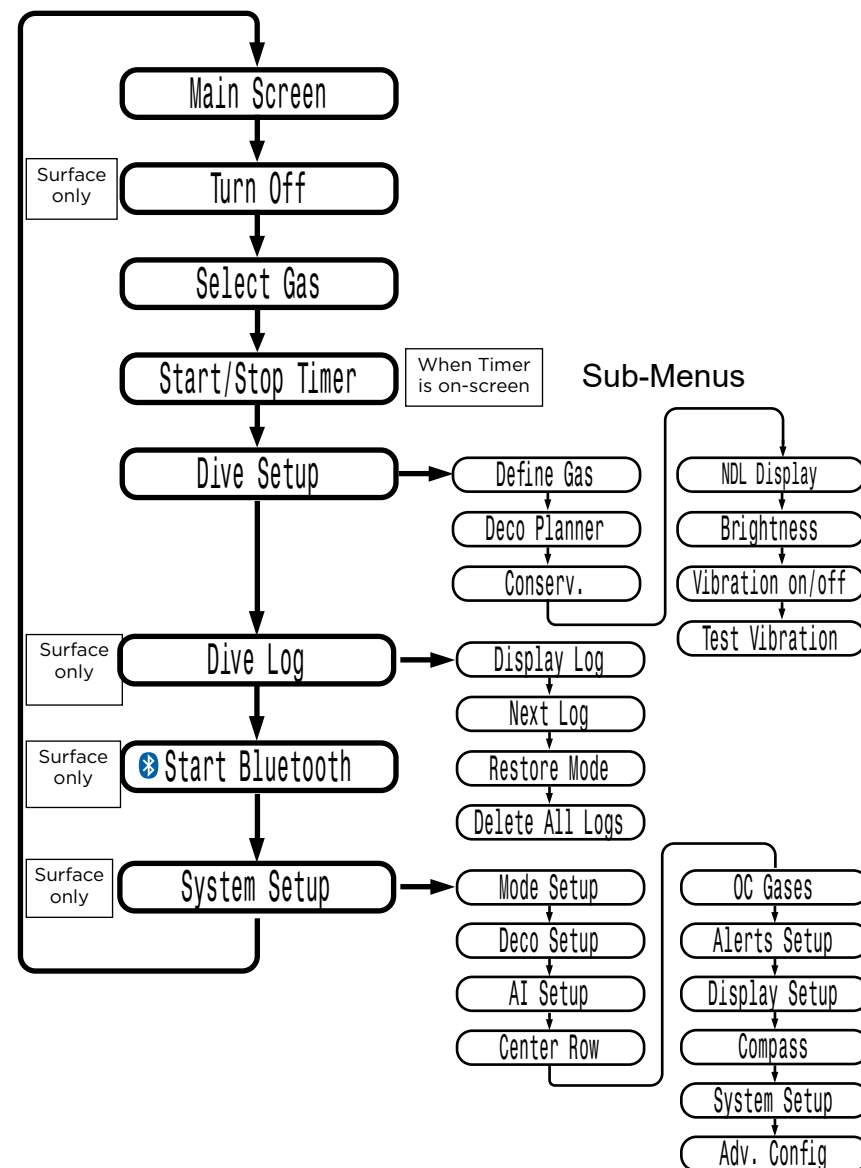
Adaptive Menus

Only menus necessary for the current mode are shown. This keeps operation simple, prevents mistakes, and reduces button presses.

10.1. Menu Structure

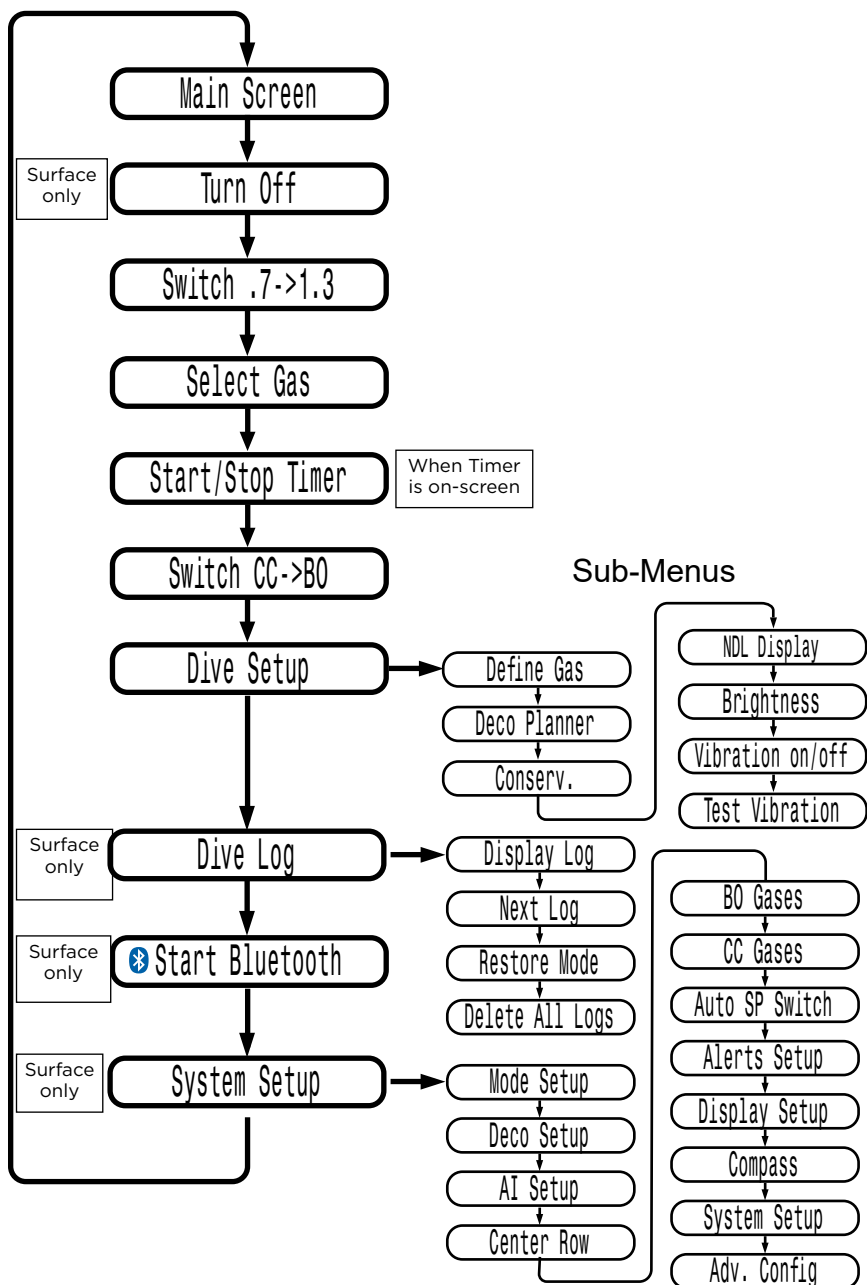
Open Circuit Menu Structure

Main Menu



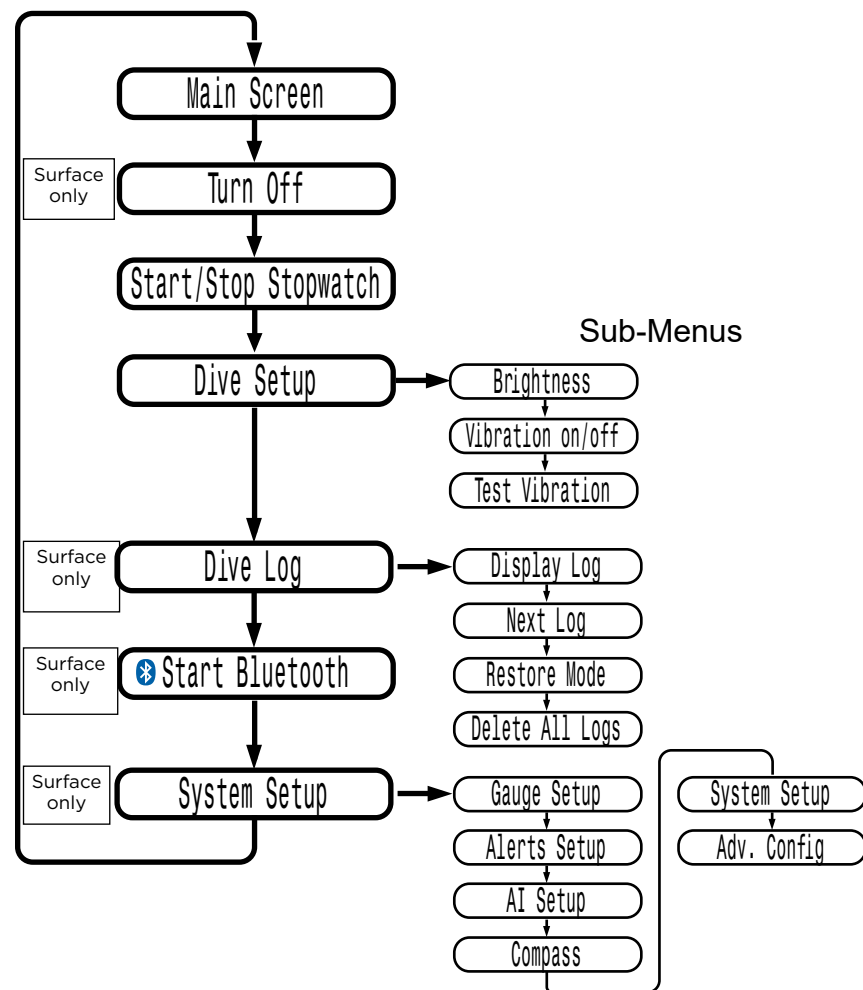
Closed Circuit (int PPO2) Menu Structure

Main Menu



Gauge Menu Structure

Main Menu





10.2. Main Menu Descriptions

Turn Off

The “Turn Off” item puts the computer to sleep. While sleeping, the screen is blank, but the tissue contents are maintained for repetitive diving. The “Turn Off” menu item will not appear during a dive. It will also not appear after a dive until the end dive delay time (60s) has expired to allow for a continuation dive.

Turn Off

End Dive

This menu item will replace Turn Off when on the surface and still in dive mode.

The Perdix 2 will automatically exit dive mode once 1 minute has been spent at the surface. Use this menu command to exit dive mode sooner.

End Dive

Start Timer / Stop Timer (Stopwatch)

This menu item only appears when the timer has been added to the main screen. It is always available in gauge mode.

Start Timer

Stop Timer

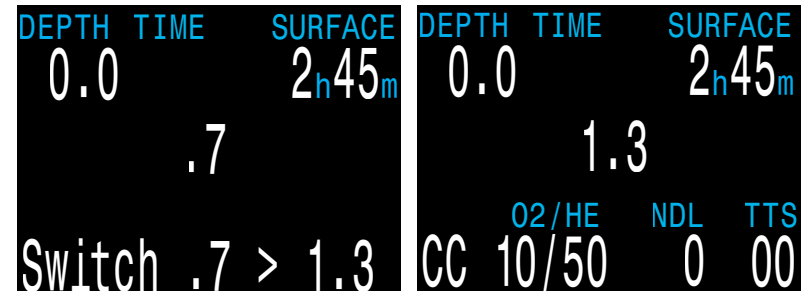
Reset Timer

This menu item only appears when the timer is not zero. If the timer is running, it will reset to zero and keep running.

Reset Timer

Setpoint Switch CC ONLY

This menu is only available in CC mode.



For closed circuit diving the Perdix 2 operates in internal PPO2 mode. This mode is used to calculate decompression for an unconnected rebreather.

The setpoint switch menu is used to switch between the low (default 0.7) and high (default 1.3) setpoints. These setpoints can be changed in the mode setup menu to approximate the rebreather setpoint.

During a dive the “Switch Setpoint” menu item will be the first item displayed, since the “Turn Off” displays are disabled when diving.

Pressing SELECT when this menu is displayed changes the PPO2 setpoint from the low setpoint to the high setpoint or vice-versa. To redefine the PPO2 value of a setpoint during a dive, use the Dive Setup menu.

This menu item performs a manual switching of PPO2 setpoint. The Perdix 2 can be setup to automatically perform setpoint switches at programmable depths in the System Setup > Auto SP Switch menu. When auto setpoint switches are enabled, this menu item is still available to provide manual control.



Select Gas

This menu item allows you to pick a gas from the gases you have created. The selected gas will be used either as the breathing gas in open circuit and bailout modes, or the diluent in closed circuit mode.

By default, the Classic gas select menu is enabled.

From left to right, each gas shows gas number, circuit mode (OC or CC), on or off, the fraction of oxygen then the fraction of helium.

Gases are always sorted from most to least oxygen content.

Use the left (Next) button to increment to the desired diluent/gas, then press the right (Select) button to select that diluent/gas.

An 'A' will appear next to the currently active gas. This is the gas being used for tissue compartment updating.

A gas that is off will be shown in **Magenta**, but can still be selected. It will be turned on automatically if it is selected.

Gases that are turned off are not used in decompression calculations. All gases that are turned on will be used in decompression calculations as appropriate. See the Decompression Information Accuracy section on page 29 for more information.

If you increment past the number of gases available, the display will fall back out of the "Select Gas".

```
DEPTH TIME SURFACE
0.0 PP02 2h45m
.21
Select Gas
```

Select Gas main menu

```
A1 OC On 21/00
Next Select
```

Gas 1, Active Gas, 21% O2

```
2 OC On 50/00
Next Select
```

Gas 2, Turned on, 50% O2

```
3 OC Off 18/50
Next Select
```

Gas 3, Turned Off, 18% O2, 50% He

Radio Station Gases



For closed circuit mode, the system maintains two sets of gases - one for open circuit (bail out), and one for closed circuit.

The way they operate is very similar to the way car radios work with AM and FM stations.

When you are listening to an FM station and you push a station selection button, it will take you to another FM station. If you add a new station, it will be an FM station.

Similarly, if you are in the AM mode, adding or deleting a station would add or delete an AM station.

With radio station gases, when you are in open circuit, adding, deleting or selecting a gas will refer to an open circuit gas. Just like the FM stations are selected when your radio is in FM mode, the closed circuit gases are available in the closed circuit mode. When you switch to open circuit, the gases available will be open circuit gases.



Gases will not turn off automatically

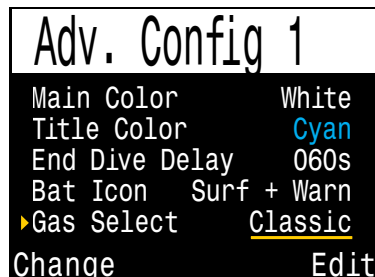
Selecting a new gas will turn that gas on if it is off, but gases will never turn off automatically.

It is important to turn off all gases you are not carrying and or do not plan to use on the dive in the Define Gas menu to ensure you receive accurate decompression information.

Select Gas Menu Style Options

Two styles of Select Gas menus are available, Classic (default) and New.

Change between the two styles in the Adv. Config 1 menu. See details on [page 71](#).



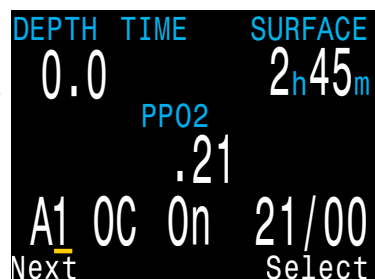
Gas select menu style changed in Adv. Config 1

Classic Style Select Gas

The classic Select Gas style described on the previous page is the default.

Summary:

- One gas is shown at a time.
- Press Next to step through gases, and Select to select the shown gas.
- Gases are sorted from highest O2% to lowest O2%.
- Stepping past the last gas will exit the menu without changing the active gas.
- Upon entering the Select Gas menu, the first gas shown is always the highest O2% gas.



Classic style gas select menu

New Style Select Gas

The new style makes visualizing the gas list easier. It also reduces button presses for deco gas switches.

Summary:

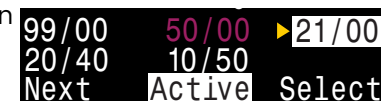
- Shows all gases on the screen at once.
- Press Next to step through gases, and Select to choose the pointed to gas.
- A gas must be selected to exit the menu (scrolling past last gas wraps back to first gas).
- The active gas is shown with a white background.
- Turned off gases are shown in Magenta (purple).
- Gases are sorted from highest O2% to lowest O2%.
- When diving and there is a deco stop, the first gas pointed to will be the most appropriate gas (highest PPO2 less than 1.61). This reduces button presses in most cases.
- On the surface or when no deco stops are needed, the first gas pointed to will be the active gas.



New style gas select menu layout. 5 gases currently programmed and on



50% O2 turned off. Select to change to 50% and turn gas on



21% O2 is currently active gas, Select to exit menu making no changes.

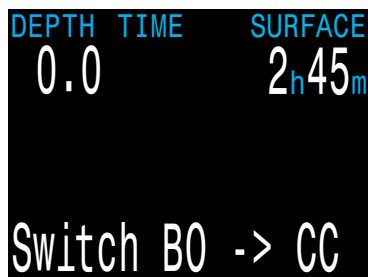


Switch to CC/BO CC ONLY

This menu item is only available in CC/BO mode.



Menu appearance in CC mode



Menu appearance in BO mode

Depending on the current computer setting, this selection will show as either “Switch CC > BO” or “Switch BO > CC”.

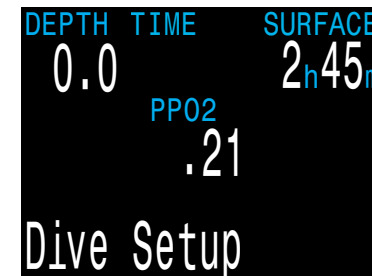
Pressing the right (SELECT) button will change the mode for decompression calculations. When switching to Bail Out while diving, the most appropriate Bail Out gas will become the breathing gas for calculations.

At this point, the diver may want to switch to a different gas, but since the diver may have other things to deal with, the computer will make a “best guess” of which gas the diver would choose.

10.3.Dive Setup

All of the Dive Setup menus are available both on the surface and when diving.

The values in Dive Setup can also be accessed in the Systems Setup menu, but the System Setup menu is not available when diving.



Menu appearance in BO mode

Pressing the right (SELECT) button will enter the Dive Setup sub-menu.

Edit Low Setpoint CC ONLY

This item allows you to edit the low setpoint value. Initially it will display the currently selected value.



Edit Low Setpoint option shows current setpoint

Press the right (Edit) button to open the edit display. Press the left (Change) button to increment the setpoint.



Press the Change button to increment the setpoint

Values from 0.4 to 1.5 are allowed. Incrementing past 1.5 returns the value to 0.4. Press the right (Save) button to lock in new low setpoint.

Edit High Setpoint

Works in exactly the same way as the Edit Low Setpoint function above. Edit Low Setpoint

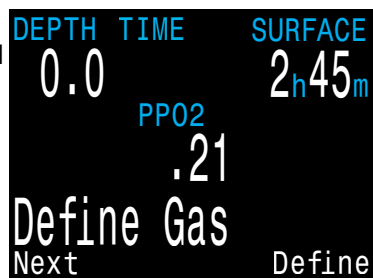


Edit High Setpoint menu



Define Gas

The define gas function allows you to set up 5 gases in Closed Circuit and 5 gases in Open Circuit. You must be in Open Circuit mode to edit open circuit gases, and you must be in Closed Circuit to edit closed circuit diluents. For each gas, you can select the percentage of oxygen and helium in the gas. The remainder is assumed to be nitrogen.



Define Gas Menu

Pushing the right (Define) button presents the function to define gas number 1.



Press Next to increment to next gas

The left (Next) button increments to the next gas.



Press Edit to modify this gas

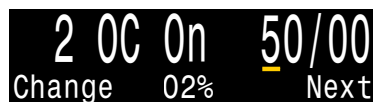
Press the right (Edit) button to edit a gas.

The first option is to toggle the gas on or off as indicated by the underline. Use the left (Change) button to toggle the gas on.



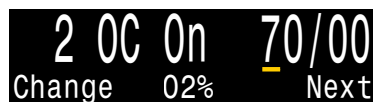
Press Change to toggle gas on

Continuing along, the gas contents are edited one digit at a time. The underline shows the digit being edited.



Press Next to move on to edit gas contents

Each push of the left (Change) button increments the digit being edited. When the digit reaches 9, it will roll over to 0.



Press Change to increment underlined digit

Pushing the right button (Next) will lock in the current digit, and move on to the next digit.



The "He%" indicator shows we are editing the fraction of helium

A helpful indicator of what is being edited is included in the center at the bottom.



Press Save after editing the last digit

Pushing the right (Save) button on the last digit will finish editing that gas, and bring you back to the gas number. You can continue to increment through the gases pressing the left (Next) button.



The "A" denotes the currently active gas

The "A" denotes the active gas. You cannot turn off the active gas in the Define Gas menu. If you try, it will generate an error. You can edit it, but cannot set both the O2 and HE to 00.

Setting any gas to 00/00 will automatically turn it off.

The computer will display all 5 gas entries available to allow you to enter new gases.

Pressing MENU one more time when the fifth gas is displayed will return you to the "Define Gas" menu item.



OC Tec and Bailout modes share gases

The OC Tec and Bailout gas lists are one and the same. It's important to review the gases you have turned on before every dive, especially if you often use your dive computer for both open and closed circuit diving.



New Style Define Gas

Similar to the New Style Select Gas menu, the New Style Define Gas menu shows all gases on the screen at once at the expense of font size.

If the Gas Select style is set to New, the computer will also display the New Style Define Gas Menu.

When the Define Gas menu is opened, all of the gases will be displayed. Turned on gases will be in white, turned off gases will be magenta, and the currently active gas will be highlighted.

Press the left (Next) button until the arrow points to the gas you would like the edit, then press the right (Edit) button.

Similar to the Classic Style Define Gas menu, the attribute being toggled is displayed at the bottom of the display.

Gases can be toggled on or off, and the gas fractions of oxygen and helium can be changed one digit at a time.

When you are finished editing move the arrow to the Exit option and press the right (Exit) button to leave the define gas menu. New Style

Adv. Config 1

Main Color	White
Title Color	Cyan
End Dive Delay	060s
Bat Icon	Surf + Warn
Gas Select	New
Change	Edit

Set Gas Select to "New" in Adv.1
to use New Style Define Gas menu

99/00	▶ 50/00	21/00
20/40	10/50	Exit
Next		Edit

Press Next to increment to next gas

99/00	50/00	21/00
20/40	10/50	Exit
Change	On/Off	Next

Press Change to toggle the gas on

99/00	50/00	21/00
20/40	10/50	Exit
Change	02%	Next

Press Change increment gas fraction one digit at a time

99/00	50/00	21/00
20/40	10/50	Exit
Change	He%	Save

Press Save when finished editing the last digit

99/00	50/00	21/00
20/40	10/50	▶ Exit
Next		Exit

Select the Exit item to leave the Define Gas Menu when finished



Turn off gases you are not carrying

Only turn on the gases you are actually carrying and plan to use on the dive. Failure to abide by this warning may result in inaccurate decompression information being displayed.

With radio station gases, the computer has a full picture of the OC and CC gases you are carrying and can make informed predictions about decompression times. There is no need to turn gases off and on when you switch from CC to OC, because the computer already knows what the gas sets are. You should only have the CC and OC gases you are actually carrying turned on.

If you often use other gases, you can enter the gas and turn it off. You can turn gases on and off during a dive and you can also add or remove a gas during the dive if needed.



Deco Planner

Introduction

- Calculates decompression profiles for simple dives.
- Calculates gas consumption based on RMV
- Can be used both on the surface and during a dive.



Deco Planner Menu

The Perdix 2 also contains a separate quick NDL Planner that can be found in the Dive Setup menu of recreational modes. See the Perdix 2 Recreational Modes Manual for details.

Setup

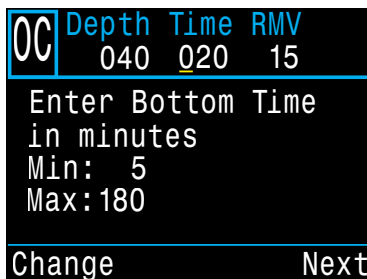
The planner uses the current gases programmed in the current dive mode, as well as the current conservatism (GF low/high) settings. VPM-B dive planning is available on units with the optional VPM-B unlock.

When used at the Surface

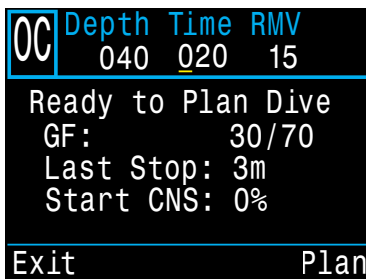
Enter the dive bottom depth, bottom time, respiratory minute volume (RMV) and PPO2 (closed-circuit only).

Note: Residual tissue loading (and CNS%) from recent dives will be used in calculating the profile

When the correct values are entered, confirm decompression settings and starting CNS, then select "Plan".



Enter dive details



Press Plan when ready

When used during a dive

Computes the decompression profile assuming the ascent will begin immediately. There are no settings to enter. (RMV is last used value).



Deco Planner Limitations

The Perdix 2's Deco Planner is intended for simple dives.

Multi-level dives are not supported.

The Deco Planner does not provide thorough validation of the profile. For example, it does not check for nitrogen narcosis limitations, gas usage limitations, or CNS percentage violations.

The user is responsible for ensuring a safe profile is followed.



Important!

The Perdix 2's Deco Planner makes the following assumptions:

- Descent rate is 18m/min (60ft/min) and the ascent rate is 10m/min (33ft/min).
- The gas in use at any time will be the gas with the highest PPO2 within the PPO2 limits.
- The planner will use the configured last stop depth.
- The RMV is the same during the bottom phase of the dive as it is while traveling and during deco

Read more about PPO2 Limits on [page 72](#).



Result Screens

The results are given in tables showing:

Stp:	Stop Depth	In meters or feet
Tme	Stop Time	In minutes
Run	Run Time	In minutes
Gas	Gas Used	%O2
Qty	Quantity Used	In liters or Cuft

The first few rows will show the bottom time (bot) and the ascent time (asc) to ascend to the first stop. Multiple initial ascent legs may be shown if gas switches are needed.

CC	Depth	Time	RMV	
	040	020	15	
Stp	Tme	Run	Gas	Qty
40	bot	20	28%	1419
21	asc	22	28%	115
12	asc	23	50%	36
12	1	24	50%	33
9	1	25	50%	29
Quit				Next

Open circuit deco plan page 1

CC	Depth	Time	RMV	
	040	020	15	
Stp	Tme	Run	Gas	Qty
6	3	28	50%	73
3	6	34	50%	118
Quit				Next

Open circuit deco plan page 2

If more than 2 stops are needed, the results will be split onto several screens.

After the last page of the deco schedule, gas usage and deco summary screens show the expected quantity of each gas used for the dive, the total dive time, the time spent on deco and final CNS%.

CC	Depth	Time	RMV	
	040	020	15	
Gas Usage, in Liters				
50%: 287				
28%: 1534				
Quit				Next

Open circuit gas usage summary

CC	Depth	Time	RMV	
	040	020	15	
OC Summary				
Run: 34 minutes				
Deco: 14 minutes				
CNS: 16 %				
Quit				Next

Open circuit deco summary

For closed circuit plans, a bailout plan based on the programmed bailout gases will automatically be generated after the closed circuit deco summary.

CC	Depth	Time	RMV	P02
	045	030	15	1.3
Stp	Tme	Run	Gas	
45	bot	30	10/50	
21	asc	33	10/50	
21	1	34	10/50	
18	2	36	10/50	
15	2	38	10/50	
Quit				Next

Closed circuit deco plan page 1

BO	Depth	Time	RMV	P02
	045	030	15	1.3
Stp	Tme	Run	Gas	Qty
6	6	53	99/00	242
3	11	64	99/00	212
Quit				Next

Bailout deco plan page 2

A bailout gas usage and deco summary will also be generated.

BO	Depth	Time	RMV	P02
	045	030	15	1.3
Gas Usage, in Liters				
99/00: 354				
36/00: 619				
Quit				Next

Bailout gas usage summary

BO	Depth	Time	RMV	P02
	045	030	15	1.3
OC Summary				
Run: 64 minutes				
Deco: 34 minutes				
CNS: 34 %				
Quit				Next

Bailout deco summary

If no decompression is required, no table will be shown. Instead, the total No-Decompression-Limit (NDL) time in minutes, at the given bottom depth will be reported. Also, the gas quantity required to surface (bailout in CC) will be reported.

CC	Depth	Time	RMV	P02
	024	030	14	1.3
No Deco Stops.				
Total NDL at 24m is 30 minutes				
Bailout gas quantity is 73 Liters.				
Quit				Done

No decompression required



Conservatism

The conservatism settings (GF High and GF Low) can be edited in the Dive Setup menu. While diving, only the GF High value can be edited. This allows changing the surfacing conservatism during a dive. For example, if you worked much harder on the bottom segment than expected, you may wish to add conservatism by reducing the GF High setting

Conserv. 30/70
Next Edit

NDL Replacement Display

While in decompression, NDL is 0. This makes the NDL area wasted space until decompression is cleared.

NDL Display CEIL
Change Save

The NDL Display option allows you to replace the NDL with different information once decompression is required and the NDL has gone to 0.

Unlike other custom displays, the NDL display option can be changed during the dive through the dive setup menu.

There are 6 options for NDL Display:

1. NDL
2. CEIL
3. GF99
4. SurfGF
5. @+5
6. Δ +5
7. Mini

Note that the Mini NDL replacement display can be selected, but not configured in this Menu and has a special appearance. Read more about Mini NDL Replacement Display on page 15.

Brightness

The display brightness has four fixed brightness settings plus an Auto mode.

The fixed options are:

- Cave: Longest battery life.
- Low: Second longest battery life.
- Med: Best mix of battery life and readability.
- High: Easiest readability, especially in bright sunlight.

Auto will use the light sensor to determine the brightness of the display. The more ambient light there is, the brighter the display will get. At depth, or in dark water, very little brightness is needed to see the display.

The Auto setting works well in most situations.

The brightness of the display is the major determinant of battery life. Up to 80% of the power consumption is to power the display. When a low battery alert occurs, the display brightness is automatically reduced to extend battery life.

Vibration On/Off

Shows current state of vibration function. Press the right (Edit) button to toggle the vibration function on or off.

Vibration On
Next Edit

Test Vibration

Press the right (Ok) button to quickly test the vibration function to ensure it's working correctly.

Test Vibration
Next Ok



Regularly test vibration alerts with the Test Vibration tool to ensure they are working and you can hear/feel them through your exposure suit.

10.4.Dive Log

Use the Dive Log menu to review logs stored on the Perdix 2. Up to 1000 hours of detailed logs can be stored at the default sampling rate of 10 seconds.

The Dive Log menu is only available when on the surface.

Dive Log



Display Log

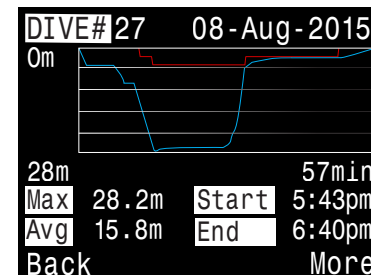
Use this menu to display a list of logged dives and view details.

Display Log
Next Display

Dive Log

1	22m	43min	01-Jan
2	18m	50min	01-Jan

Next View



Select a dive to view from the Dive log list.

The profile of the dive is plotted in blue, with decompression stops plotted in red. The following information is displayed by scrolling through the dive log screens:

- Maximum and Average depth
- Dive number
- Date (dd-mon-yyyy)
- Start - Time of day dive started
- End - Time of day dive ended
- Length of dive in minutes
- Minimum, maximum, and average temperature
- Dive mode (Air, Nitrox, etc.)
- Surface interval preceding the dive
- Recorded Surface Pressure at the beginning of the dive
- Gradient factor settings used
- Start and end CNS
- Start and end pressure for up to 4 AI transmitters
- Average surface air consumption rate

Edit Log

Scrolling past all screens of an individual log brings up the Edit Log page where Dive number, Date, and Time can be changed, or the dive log can be deleted.

Next Log

The dive log number can be edited. This is useful if you want the dive computer log numbers to match your lifetime dive count.

Next Log = 0004
Next Exit

This number will be applied to the next dive.

Restore Mode

Restore mode can be toggled on and off. When toggled on, it shows deleted logs, grayed out in the “Display Log” sub-menu. These dives can be restored to the Dive Log.

Restore Mode On
Next Edit

The Delete All Logs option is also changed to Restore All Logs when Restore mode is enabled.

Delete All Logs

Deletes All of the Logs.

Deleted Logs can be restored by toggling Restore Mode to on.

Delete All Logs
Next Delete

Start Bluetooth

Bluetooth is used for both firmware uploading and dive log downloading.

 Start Bluetooth

Use this option to initialize Bluetooth on your dive computer.



11. System Setup Reference

System Setup contains configuration settings together in a convenient format for updating the configuration before a dive.

System Setup

The sub-menus, pages, and configuration options differ considerably in each dive mode. This manual only covers technical dive modes. See the Perdix 2 recreational modes manual for a comprehensive description of the menus in recreational modes.

System setup cannot be accessed during a dive.



11.1. Mode Setup

The first sub-menu of System Setup is Mode Setup.

The appearance of this page changes depending on the selected mode.

Mode

There are 6 available dive modes:

- Air
- Nitrox
- 3 GasNx (default)
- OC Tec
- CC/BO
- Gauge
(E.g. bottom timer mode)

Mode Setup	
Mode	CC/BO
Salinity	EN13319
PPO2 Mode	Int.
Low SP	0.7
High SP	1.3
Next	Edit

This manual only covers OC Tec, CC/BO, and Gauge mode. For the other modes, please see the Perdix 2 recreational diving manual.

When changing to or from Gauge Mode, the decompression tissues are cleared. This is because the Perdix 2 does not know what gas you are breathing in this mode, and therefore cannot track inert gas loading. Plan repetitive dives accordingly.

For more information on which mode to choose, see [Dive Mode Differentiation on page 10](#).

Salinity

Water type (salinity) affects how the measured pressure is converted to depth.

Settings:

- Fresh
- EN13319 (default)
- Salt

Density of freshwater and saltwater differ by about 3%. Saltwater, being denser, will display a shallower depth for the same measured pressure versus the Fresh setting.

The EN13319 value is between Fresh and Salt. It is from the European CE standard for dive computers, and is the Perdix 2's default value.

Note that this setting only affects the depth displayed on the computer and has no impact on decompression calculations which rely on absolute pressure.

PPO2 Mode **CC ONLY**

PPO2 mode only appears in CC/BO mode.

On the Perdix 2 this value is always "Int." (Internal fixed PPO2). On other models of Shearwater computer, this value can be changed to "ext." when external O2 cells are used for decompression calculations.

Low and High Setpoints **CC ONLY**

The Low and High PPO2 Setpoints are only available when CC is enabled.

Each setpoint can be set from 0.4 to 1.5.

The setpoints can also be edited during a dive, in the Dive Setup menu.



11.2. Deco Setup

Deco Model

By default this will show
“Buhlmann ZHL16C GF”
indicating that the Bühlmann
ZHL-16C with gradient factors
model is being used.

Optional VPM-B and DCIEM decompression algorithm
unlocks are available at an additional cost. If applied,
the deco model item allows the user to change
between the available algorithms.

Conservatism

In technical dive modes conservatism can be adjusted
in either the GF or VPM model.

For a more detailed explanation of their meaning for
the GF algorithm, please refer to Erik Baker’s excellent
articles: Clearing Up The Confusion About “Deep
Stops” and Understanding M-values. The articles are
readily available on the web.

VPM-B has conservatism settings from 0 to +5, with
higher numbers being more conservative.

Also see Decompression and Gradient Factors on
page 28.

Deco Setup	
Deco Model	GF
Conserv (GF)	30/70
Last Stop	6m
NDL Display	NDL
Clear Cntr	On
Next	Edit

Last Stop

Allows you to choose where to do your last
mandatory decompression stop.

The choices are 3m/10ft and 6m/20ft.

NDL Display

These options were previously covered in the Dive
Setup section. See [NDL Replacement Display on page
60 for details.](#)

Clear Cntr

This option allows you to toggle the deco clear
counter on or off.

When turned on, the counter will count up from
zero in the deco area starting when decompression
obligations are cleared.

Read more about Decompression Stops on page
27.



11.3. AI Setup

All AI settings must be configured on the surface before a dive, since the System Setup menu is not accessible during a dive.

AI Setup

AI Mode	On
Units	Bar
Tx Setup	T1 T2
GTR Mode	SM:T1+T2
SM Switch	21Bar
Next	Edit

AI Mode

AI Mode is used to easily enable or disable AI.

AI Mode Setting	Description
Off	AI sub-system is completely powered down and consumes no power.
On	AI is enabled. When on, AI increases power consumption by about 10%.

Units

Choices are bar or psi.

TX Setup

The Transmitter setup (TX Setup) menu is used to set up transmitters. Currently active transmitters are shown next to TX Setup in the top level AI menu.

Up to 4 transmitters can be configured in this menu. Select a transmitter to modify its attributes.

Transmitter On/ Off

Turn off transmitters that are not currently in use to save battery power.

Transmitters

#	On	Serial
T1	On	285817
T2	On	005752
T3	Off	000000
T4	Off	000000
Next	Setup	Edit

Transmitters

#	On	Serial
T1	On	285817
T2	On	005752
T3	Off	000000
T4	Off	000000
Change		Next



Set AI Mode to OFF when AI not in use

Leaving AI enabled when not in use will negatively impact battery life when the computer is turned on. When a paired transmitter is not communicating, the Perdix 2 goes into a higher power scan state. This increases power consumption to about 25% higher than with AI off. Once communications are established, power drops to about 10% higher than with AI off.

Note, AI is never active when the computer is off. There is no need to turn AI off when the computer is turned off.

Tank Setup

Navigate over to and select a transmitter's serial number in the transmitter setup menu to enter the tank set up menu for that transmitter.

Serial Number Setup

Every transmitter has a unique 6-digit serial number. This number is etched onto the side of the transmitter.

Enter the serial number to pair the transmitter to T1. This number only needs to be entered once. Like all settings, it is stored in permanent memory. Transmitter settings are saved across all dive modes.

Tank Setup

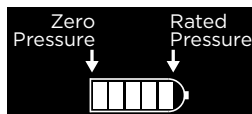
T1 Serial#	285817
Rated	207Bar
Reserve	048Bar
Rename	T1
Unpair	
Next	Edit





Rated Pressure

Enter the rated pressure of the tank on which the transmitter is installed.



The valid range is 69 to 300 bar (1000 to 4350 psi).

The only use of this setting is to scale the full-scale range of the gas pressure bar graph that appears over the numerical tank pressure number.

Reserve Pressure

Enter the reserve pressure.

The valid range is 28 to 137 bar (400 to 2000 psi).

The reserve pressure setting is used for:

1. Low pressure warnings
2. Gas Time Remaining (GTR) calculations

A “**Reserve Pressure**” warning will be generated when the tank pressure falls below this setting.

A “**Critical Pressure**” warning will be generated when the tank pressure falls below the larger of 21 bar (300 psi) or half the reserve pressure.

For example, if reserve pressure is set to 48 bar, the critical warning will occur at 24 bar (48/2). If the reserve pressure is set to 27 bar, the critical warning will occur at 21 bar.

Rename

Allows the changing of the transmitters title as it appears on menus and screens throughout the dive computer. Two characters can be customized per tank. The options are:

First Character: T,S,B,O, or D.

Second Character: 1,2,3, or 4.

Unpair

The unpair option is simply a shortcut to reset the serial number to 000000.

When not using T1 or T2, for lowest power consumption, disable receiving completely by setting the AI Mode setting to Off.

GTR Mode

Gas Time Remaining (GTR) is the time in minutes that can be spent at the current depth and SAC rate until a direct ascent to the surface at a rate of 10 m/min (33 feet/min) would result in surfacing with the reserve pressure. The SAC rate is averaged over the last two minutes of diving for calculating GTR.

AI Setup

AI Mode	On
Units	Bar
Tx Setup	T1 T2
► GTR Mode	SM:T1+T2
SM Switch	21Bar
Next	Edit

GTR and SAC are only based on one tank, or on two tanks in sidemount configuration. Note that for sidemount the tanks must be of identical volume for SAC to be accurate.

The GTR/SAC setting is also used for identifying sidemount mode. Selecting a SM option here will enable tank switch notifications.

GTR Mode Setting	Description
Off	GTR is disabled. SAC is also disabled.
T1, T2, T3, or T4	Selected Transmitter is used for GTR and SAC calculations.
SM:T1+T2 (Or similar)	Combined SAC for selected transmitters will be calculated and used for GTR. Sidemount switch notifications will be enabled.



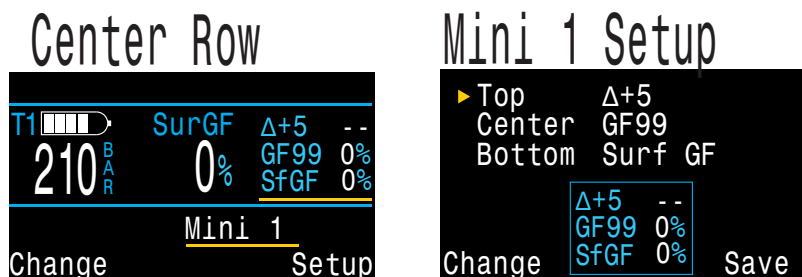
11.4. Center Row

Configure and preview the Center row in this menu.

All three center row positions are user configurable in OC Tec mode. Only the left and right positions are configurable in CC/BO mode as the middle position is reserved for PPO2 Setpoint.

For a complete list of configuration options, see the [Home Screen Configuration Options](#) section on page 13.

Mini Display Setup

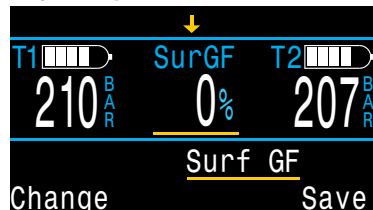


The Perdix 2 has a mini display function that allows it to show 3 pieces of information in each of the left and right custom slots at the expense of font size.

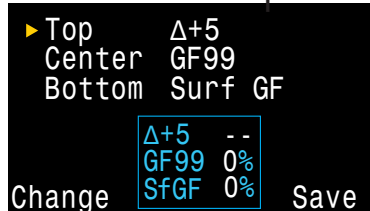
Selecting one of the two mini display items in the Center row setup menu will bring you to the Mini Display Setup Menu for that mini display.

Note that not all mini-displays will show units due to space constraints.

Center Row



Mini 1 Setup



11.5. OC Gases (BO Gases)

This menu allows the user to edit the open circuit gas list. The options contained here are the same as those in the “Define Gases” subsection of the “Dive Setup” section on page 55. This menu page conveniently displays all five gases simultaneously.

OC Gases		
1 OC	On	99/00
2 OC	On	50/00
A3 OC	On	14/55
4 OC	Off	00/00
5 OC	Off	00/00
Next		Edit

Each gas can be turned on or off and set to any concentration of O2 and helium. The remaining percentage is assumed to be nitrogen.

The active gas is shown with a leading ‘A’. All gases that are turned off are drawn in magenta (purple).

In CC/BO mode, this menu is titled “BO Gases”. Note that the gas list is shared between OC Tec and Bailout modes.

11.6. CC Gases CC ONLY

This menu allows the user to edit the closed circuit diluent gas list. The options contained here are the same as those in the OC Gas list setup menu.

CC Gases		
A1 CC	On	10/00
2 CC	Off	00/00
3 CC	Off	00/00
4 CC	Off	00/00
5 CC	Off	00/00
Next		Edit



11.7. Auto Setpoint Switch CC ONLY

This menu page is only available in CC mode.

This page sets up automatic setpoint switching. The dive computer can be set up to auto switch the setpoint up only, down only, both, or neither.

First, you set whether the “Up” switch occurs automatically or manually. If “Up” is set to “Auto”, then you can set the depth at which the auto switch occurs.

The menu options are the same for the down setpoint switch.

When a switch is set to “Auto”, you can always manually override the setting at any time during the dive.

The automatic switches only occur when crossing the specified depth. Say for example, the switch up depth is set to 15m. You start the dive on the low setpoint, then as you descend past 15m, the setpoint automatically switches up to high. If at say 24m you then manually switch back to the low setpoint, the setpoint will remain low. If you ascend shallower than 24m then re-descend deeper than 24m again, the automatic setpoint switch will occur again. The Perdix 2 enforces a 6m (20ft) gap between switch up and switch down depths to prevent rapid automatic switching between setpoints for small depth changes. The values 0.7 and 1.3 are shown as examples only. Other values for the low and high setpoint can be adjusted in the Dive Setup or Mode Setup menu.

Auto SP Switch		
Up:	0.7>1.3	Auto
Up Depth		021m
Down:	1.3>0.7	Auto
Down Depth		012m
Next		Edit

Auto setpoint switch example:

The settings displayed to the left would cause the computer to behave as follows.

The low to high auto setpoint switch is enabled at a depth of 21 meters.

Up:	0.7>1.3	Auto
Up Depth		021m

The dive starts at the 0.7 setpoint. As you descend past 21m, the setpoint switches “up” to 1.3.

You finish your bottom time, then begin ascending.

The high to low auto setpoint switch is enabled at a depth of 12 meters.

Down:	1.3>0.7	Auto
Down Depth		012m

When you ascend above 12, the setpoint switches “down” to 0.7.

11.8. Alerts Setup

This page is used to set up custom dive alerts for Maximum Depth, Time, and Low NDL. Notifications will be triggered when these values are exceeded.

You can also toggle the vibration function from this page.

See [Notifications on page 23](#) for more information on how these alerts are displayed.

Alerts Setup		
Depth	On	m
Time	On	min
Low NDL	On	min
Vibration	On	
Next		Edit



11.9. Display Setup

Depth and Temperature

Depth: Feet or Meters
Temperature: °F or °C

Brightness

See brightness options on [page 69](#).

Altitude

The altitude setting on the Perdix 2 is set to Auto by default. In this mode the computer will automatically compensate for pressure changes when diving at altitude. There is no reason to set the computer to SeaLvl except at the direction of technical support.

Flip Screen

Displays the contents of the screen upside down.

Display Setup	
▶Depth Units	Meters
Temp Units	°C
Brightness	Med
Altitude	Auto
Flip Screen	
Next	Edit

11.10. Compass

Compass View

The Compass View setting can be set to the following options:

Off: The compass is disabled.

60°, 90°, or 120°: Sets the range of the compass dial that is visible on the main screen. The actual amount of arc that there is room for on the screen is 60°, so this may feel the most natural. The 90° or 120° settings allow a wider range to be seen at once. The default is 90°.

True North (declination)

Enter the declination of current position to correct compass to true north.

This setting can be set from -99° to +99°.

If matching an uncompensated compass, or navigation is based on relative directions, then this setting can be left at 0°.

Compass	
▶Compass View	90°
Calibrate	
True North	+0°
188°	
Next	Edit



Determination of Surface Pressure

Accurate depth measurements and decompression calculations require knowing the ambient atmospheric pressure at the surface. Regardless of the turn on method, the surface pressure is determined the same way. While in the off state the surface pressure is measured and saved every 15 seconds. A 10 minute history of these pressure samples is kept. Immediately after turn on this history is examined and the minimum pressure is used as the surface pressure. The surface pressure is then remembered, and not updated again until the next turn on.

Calibrate

Calibration of the compass may be needed if the accuracy drifts over time or if a permanent magnet or ferromagnetic metal (e.g. iron or nickel) object is mounted very close to the Perdix 2. To be calibrated out, such an object must be mounted with the Perdix 2 such that it moves along with the Perdix 2.

Calibrate the Compass Each Battery Change

Each battery has its own magnetic signature, mostly due to its steel case. Therefore, recalibrating the compass when changing batteries is recommended.

Compare the Perdix 2 with a known good compass or fixed references to determine if calibration is needed. If comparing against fixed references, remember to consider the local deviation between Magnetic North and True North (declination). Calibration is typically not needed when traveling to different locations. The adjustment needed then is the True North (declination).

When calibrating, rotate the Perdix 2 smoothly through as many 3D twists and turns as possible in 15 seconds.

Compass Calibration Tips

The following tips will help ensure a good calibration:

- Stay away from metal (especially steel or iron) objects. For example, wrist watches, metal desks, boat decks, desktop computers, etc. These can all interfere with the Earth's magnetic field.
- Rotate to as many 3D positions as possible. Upside down, sideways, on edge, etc.
- Compare with an analog compass to check calibration.



11.11. System Setup

Date

Allows the user to set the current date.

Clock

Allows the user to set the current time. The format can be set to AM, PM or 24 hour time.

Unlock

Only to be used at the direction of Shearwater technical support.

Log Rate

Sets how often dive samples are added to the computer's log. More samples will give a higher resolution dive log at the expense of log memory. Default is 10 seconds. Maximum resolution is 2 seconds.

Reset to Defaults

The final 'System Setup' option is 'Reset to Defaults'. This will reset all user changed options to factory settings and/or clear the tissues on the dive computer. 'Reset to Defaults' cannot be reversed.

Note: This will not delete dive logs, or reset dive log numbers.

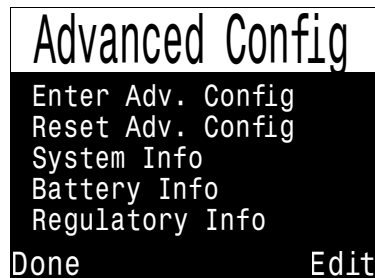
System Setup	
Date	8-Aug-2015
Clock	08:08AM
Unlock	
Log Rate	10 Sec
Reset to Defaults	
Next	Edit



11.12. Advanced Config

Advanced configuration contains items that will be used infrequently and can be ignored by most users. They provide more detailed configurations.

The first screen allows you to enter the advanced configuration area, or to set the advanced configurations settings to their default.



Reset Adv. Config

This will reset all advanced config values to their default settings.

Note: This will not affect other computer settings, delete dive logs, or reset dive log numbers.

System Info

The System Info section lists the computer's serial number as well as other technical information you may be asked to provide to tech support for troubleshooting purposes.

Battery Info

This section gives additional information on the type of battery being used and battery performance.

Regulatory Info

This section is where a user can find the specific model number of their computer as well as additional regulatory information.

Advanced Config 1

Main Colour

Main colours can also be changed for added contrast. Default is white but can be changed to green or red.

Title Colour

The title colors can be changed for added contrast or visual appeal. Default is Cyan, with gray, white, green, red, pink, and blue also available.

End Dive Delay

Sets the time in seconds to wait after surfacing before ending the current dive.

This value can be set from 20 seconds to 600 seconds (10 minutes). Default is 60s.

This value can be set to a longer time if you want brief surface intervals connected together into one dive. Alternatively, a shorter time can be used to exit dive mode more quickly upon surfacing.

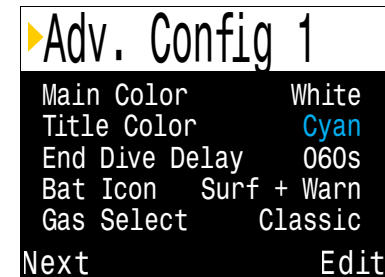
Battery Icon

The behavior of the battery icon can be changed here. Options are:

- **Surf+Warn:** The battery icon always displays when on the surface. During dive it displays only if there is a low battery warning.
- **Always:** The battery icon always displays.
- **Warn Only:** The battery icon only appears when there is a low battery warning.

Gas Select

The feature is described in the Select Gas Menu Style Options section on page 54.





Advanced Config 2

PPO2 Limits

This section allows changing of PPO2 limits.



WARNING

Do not change these values unless you fully understand the effect.

All values are in absolute atmospheres [ATA] of pressure. (1 ATA = 1.013 bar)

OC Low PPO2

PPO2 of all gases display in flashing red when less than this value. (Default 0.18)

OC MOD PPO2

This is the maximum allowable PPO2 during the bottom phase of the dive - **Maximum Operating Depth**. (Default 1.4)

OC Deco PPO2

All decompression predictions (Deco schedule and TTS) assume that the gas used for decompression at a given depth will be the gas with the highest PPO2 that is less than or equal to this value. (Default 1.61)

Suggested gas switches (when the current gas is displayed in yellow) are determined by this value. If you change this value, please be sure you understand its effect.

For example, if lowered to 1.50, then a switch to oxygen (99/00) will not be assumed at 6m/20ft.

Adv. Config 2

OC Min.	PP02	0.18
OC Mod.	PP02	1.40
OC Deco	PP02	1.61
CC Min.	PP02	0.40
CC Max.	PP02	1.60
Next		Edit

CC Min PPO2

PPO2 displays in flashing red when less than this value. (Default 0.40)

CC Max PPO2

PPO2 displays in flashing red when greater than this value. (Default 1.60)

Note: In both OC and CC modes, "Low PPO2" or "High PPO2" alerts are displayed when the limits are violated for more than 30 seconds.

Bottom Gases Vs. Deco Gases

In OC Tec, and 3 GasNx modes, the least oxygen rich mix is considered a bottom gas and obeys the OC MOD PPO2 limit. Other gases are considered deco gases and obey Deco PPO2 limit.

This is another reason it is important to turn off all gases that you are not carrying.

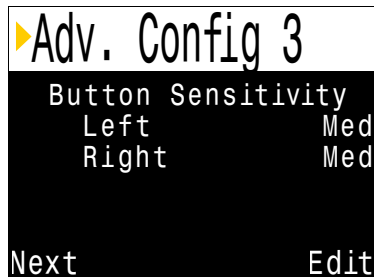
In Air only and Nitrox modes - not described in this manual - all gases are considered bottom gases and obey OC MOD PPO2 limit, even in decompression.



Advanced Config 3

Button Sensitivity

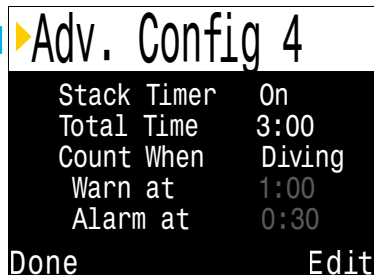
This menu allows some fine tuning of button sensitivity. This can be useful to adjust downward if you often experience accidental button presses.



Advanced Config 4 CC ONLY

Stack Timer

A stack timer is available for tracking the amount of time spent diving with a CO2 absorbent canister.



It can be toggled on and off in the Advanced Config. 3 menu. The total time can be set anywhere between and 1h and 9h 59m. The stack timer can be set to count down either when diving, or when the computer is ON. A warning will alert the diver when the stack timer has 1h remaining and an alarm will be displayed when the stack timer has 30 minutes remaining.

The current stack timer count used and remaining will be available as an info screen when the stack timer is enabled. The stack timer can also be reset from the main level menu. The stack timer cannot be reset during a dive.



Note: Stack Timer information will reset in the event of a firmware update.



12. Firmware Update and Log Download

It is important to keep the firmware on your dive computer up to date. In addition to new features and improvements, firmware updates address important bug fixes.

There are two ways to update the firmware on your Perdix 2:

- 1) With Shearwater Cloud Desktop
- 2) With Shearwater Cloud Mobile



Upgrading the firmware resets decompression tissue loading. Plan repetitive dives accordingly.



During the update process, the screen may flicker or go blank for a few seconds

12.1. Shearwater Cloud Desktop

Ensure you have the most recent version of Shearwater Cloud Desktop. [You can get it here.](#)

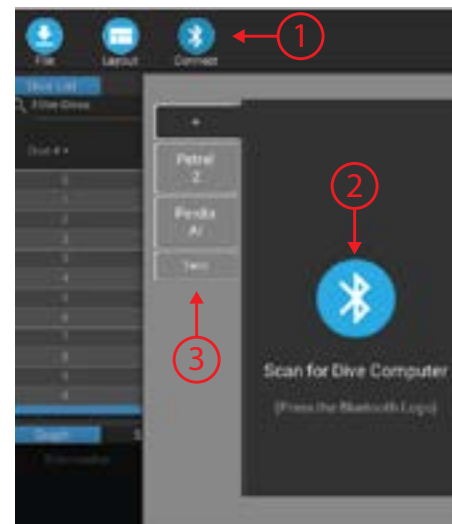
Connect to Shearwater Cloud Desktop

On your Perdix 2, start Bluetooth by selecting the Bluetooth menu item from the main menu.



In Shearwater Cloud Desktop:

1. Click the connect icon to open the connect tab.
2. Scan for Dive Computer
3. Once you've connected the computer once, use the Perdix 2 tab to connect faster next time



Shearwater Cloud Desktop Connect Tab

Once the Perdix 2 is connected, the connect tab will show a picture of the dive computer.

Download Dives

Select “Download Dives” from the connect tab.

A list of dives will be generated. You can un-select any dive logs you don’t want to download, then press OK.

Shearwater Cloud Desktop will transfer the dives to your computer.

From the connect tab, you can give the Perdix 2 a name. If you have multiple Shearwater dive computers, you will be able to easily tell which dive was downloaded from which dive computer.



Select the dives you wish to download and press OK



Shearwater Cloud Desktop Connect Tab



Update Firmware

Select “Update Firmware” from the connect tab.

Shearwater Cloud Desktop will automatically select the latest available firmware.

When prompted, select your language and confirm the update.

The Perdix 2 screen will give percentile updates of receiving the firmware, and then the Personal Computer will read “Firmware successfully sent to the computer” on completion.



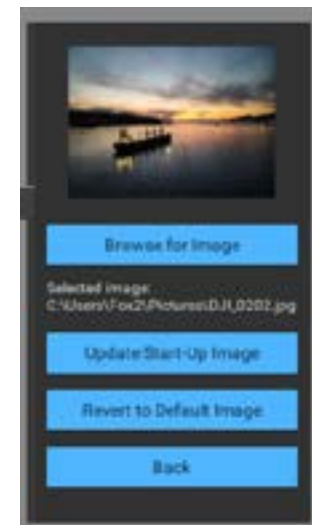
Firmware updates can take up to 15 minutes.

Update Start-up Text

Start-Up text appears at the top of the start up splash screen when the Perdix 2 is turned on. It’s a great place to put your name and phone number so your computer can be more easily returned if mis-placed.

Update Start-up Image

Here you can also change the startup image that appears when the Perdix 2 turns on to help better differentiate your dive computer.



Update Start-up Image



12.2. Shearwater Cloud Mobile

Ensure you have the most recent version of Shearwater Cloud Mobile.

Download it from [Google Play](#) or the [Apple App Store](#).

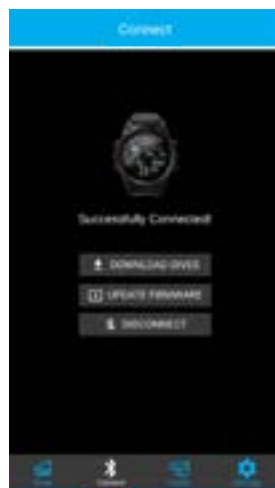
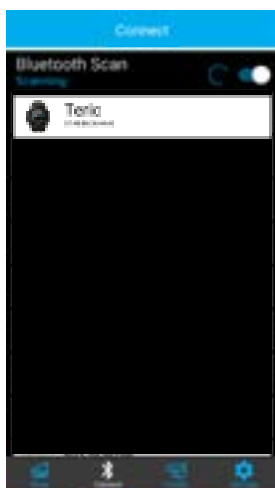
Connect to Shearwater Cloud Mobile

On your Perdix 2, start Bluetooth by selecting the Bluetooth menu item from the main menu.



On Shearwater cloud mobile:

1. Press the connect icon at the bottom of the screen
2. Select your Perdix 2 from the list of Bluetooth devices

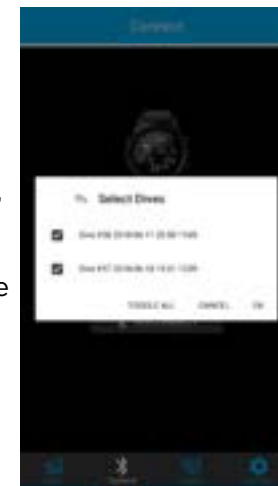


Download Dives

Select "Download Dives"

A list of dives will be generated and you can un-select any dive logs you don't want to download, then press OK.

Shearwater Cloud will transfer the dives to your smart phone.



Update Firmware

Once the Perdix 2 is connected to Shearwater cloud mobile, select "Update Firmware" from the connect tab.

Shearwater Cloud mobile will automatically select the latest available firmware.

When prompted, select your language and confirm the update.

The Perdix 2 screen will give percentile updates of receiving the firmware, and then the mobile app will read "Firmware successfully sent to the computer" on completion.



Firmware updates can take up to 15 minutes.



13.Changing the Battery

A large coin or washer is required to change the battery

Remove the battery cap

Insert the coin or washer into the battery cap slot. Unscrew by turning counter clockwise until the battery cap is free. Be sure to store the battery cap in a clean dry space.

Exchange the battery

Remove the existing battery by tilting the Perdix 2 and letting the old battery slide out. Insert a new battery positive contact first. A small diagram on the bottom of the Perdix 2 shows the proper orientation.

Reinstalling the battery cap

It is **very important that the battery cap O-rings are clear of dust or debris**. Carefully inspect the O-rings for any debris or damage and gently clean. It is recommended that the battery cap's O-ring is lubricated on a regular basis with an O-ring lubricant compatible with Buna-N (Nitrile) O-rings. Lubricating helps ensure that the O-ring seats properly and does not twist or bunch.

Insert the battery cap into the Perdix 2 and compress the battery contact springs. While the springs are compressed rotate the battery cap clockwise to engage the threads. Be sure not to cross thread the battery cap's threads. Tighten the battery cap until snug and the Perdix 2 powers on. Do not over tighten the battery cap.

NOTE: Battery cap O-rings are Type 112 Buna-N 70 durometer.

Battery Type Selection

After changing the battery, select the battery type used.

The Perdix 2 attempts to guess what type of battery is being used. If the battery type is incorrect, it should be manually edited.

Battery Changed
Check Battery Type
Voltage: 1.53V
Battery Type:
1.5V Lithium
Edit Confirm

The Perdix 2 can accept most AA sized (14500 size) batteries that output a voltage between 0.9V and 4.3V. However, some batteries are better than others.

- Not all batteries support vibration.
- Battery types that support the fuel gauge feature will give more warning before the computer dies.
- Some battery types perform better in cold water.

Shearwater recommends using Energizer Ultimate Lithium batteries for best performance.

Supported battery types:

Battery Type	Approx. Battery Life	Vibration Support	Fuel Gauge	Cold water Performance
1.5V Lithium Recommended	60 hours	Yes	Yes	Very Good
1.5V Alkaline	45 hours	No	Yes	Ok
1.2V NiMh Rechargeable	30 hours	No	No	Poor
3.6V Saft LS14500	100 hours	No	No	Poor
3.7V Li-Ion Rechargeable	35 hours	Yes	Yes	Good

Battery life is based on medium brightness.



Alkaline batteries are especially prone to leaking. This is a leading cause of dive computer failure.
Alkaline batteries are not recommended.



13.1. Behavior on Battery Change

Settings

All settings are retained permanently. No loss of settings occurs when changing the battery.

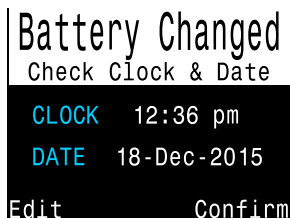
Clock

The clock (time and date) is saved to permanent memory every 16 seconds when the dive computer is on, and every 5 minutes when off. When the battery is removed, the clock stops running. Once the battery is replaced, the clock is restored to the last saved value (so it is best to remove the battery while the dive computer is on for lowest error).

Quick battery changes will not require any adjustment, but the time should be corrected if the battery is removed for more than a few minutes.

Expected clock drift is about 4 minutes per month. If there is higher drift, it is likely due to clock stoppage during battery changes, and is easily corrected at the time of a battery change.

The clock is also updated every time the dive computer is connected to Shearwater Desktop or Shearwater Mobile.



After replacing the battery a screen appears for quick adjustments to the time

Decompression Tissue Loading

The battery may be safely changed between repetitive dives.

Like the clock, the decompression tissue loading is saved every 16 seconds to permanent memory when on, and every 5 minutes when off.

When the battery is removed the tissues remain stored in the permanent memory and are restored once the battery is replaced, allowing for battery changes between repetitive dives. However, the dive computer does not know for how long the battery was removed, so no surface interval adjustment is applied for the time that the battery is removed.

For quick battery changes, the un-powered time interval is not significant. However, if the battery is removed shortly after a dive and then remains out for a long period, residual tissue loading will remain when the battery is replaced.

If at the time of battery replacement any tissue is below saturated with air at the current pressure, then that tissue is brought up to being saturated with air. This might happen after a decompression dive that used 100% O₂, where the faster tissues are often completely depleted of inert gas loading. Bringing such tissues back up to saturated with air after a battery change is the most conservative approach.

When deco tissues are reset:

- Inert gas tissue loadings are set to saturated with air at current atmospheric pressure
- CNS Oxygen Toxicity set to 0%
- Surface Interval time set to 0
- All VPM-B values set to default levels



14. Storage and Maintenance

The Perdix 2 dive computer should be stored dry and clean.

Do not allow salt deposits to build up on the dive computer. Rinse the computer with fresh water to remove salt and other contaminants.

Do not wash under high pressure jets of water as it may cause damage to the depth sensor.

Do not use detergents or other cleaning chemicals as they may damage the dive computer. Allow to dry naturally before storing.

Store the dive computer **out of direct sunlight** in a cool, dry and dust free environment. Avoid exposure to direct ultra-violet radiation and radiant heat.

15. Servicing

There are no user serviceable parts inside the Perdix 2. Do not tighten or remove any faceplate screws.

Clean with water ONLY. Any solvents may damage the Perdix 2 dive computer.

Service of the Shearwater Perdix 2 may only be done at Shearwater Research, or by any of our authorized service centers.

Contact Info@shearwater.com for service requests.

Shearwater recommends service of all dive computers every 2 years by an authorized service center.

Evidence of tampering will void your warranty.

16. Glossary

CC - Closed circuit. Scuba diving using a rebreather where exhaled gas is recirculated with carbon dioxide removed.

GTR - Gas Time Remaining. The time, in minutes, that can be spent at the current depth and SAC rate until a direct ascent to the surface would result in surfacing with the reserve tank pressure.

NDL - No Decompression Limit. The time, in minutes, that can be spent at the current depth until mandatory decompression stops will be required.

O₂ - Oxygen gas.

OC - Open circuit. Scuba diving where gas is exhaled into the water (i.e. most diving).

PPO₂ - Partial Pressure of Oxygen, sometimes PPO2.

RMV - Respiratory Minute Volume. Gas usage rate measured as the volume of gas consumed, adjusted as if at a pressure of one atmosphere. Units of Cuft/minute or L/minute.

SAC - Surface Air Consumption. Gas usage rate measured as the rate of tank pressure change, adjusted as if at a pressure of one atmosphere (i.e. surface pressure). Units of psi/minute or bar/minute.



17. Perdix 2 Specifications

Specification	Perdix 2 Model
Operating Modes	Air Nitrox 3 GasNx (3 Gas Nitrox) OC Tec CC/BO Gauge
Display	Full color 2.2" QVGA LCD with always on LED back light
Pressure (depth) sensor	Piezo-resistive
Accuracy	+/-20 mbar (at surface) +/-100 mbar (at 14bar)
Calibrated Depth Sensor Range (Maximum Rated Depth)	0 bar to 14 bar (130 msw, 426 fsw)
Crush Depth Limit	27 bar (-260msw) Note: this exceeds the calibrated depth sensor range.
Surface Pressure Range	500 mbar to 1040 mbar
Depth of dive start	1.6 m of sea water
Depth of dive end	0.9 m of sea water
Operating Temperature Range	+4°C to +32°C
Short-Term (hours) Temperature Range	-10°C to +50°C
Long-Term Storage Temperature Range	+5°C to +20°C
Battery	User Replaceable AA Size, 0.9V to 4.3V
Battery Operating Life (Display Medium Brightness)	45 Hours (AA 1.5V Alkaline) 60 Hours (1.5V Lithium) 100 Hours (SAFT LS14500)
Communications	Bluetooth Low Energy (4.0)
Compass Resolution	1°
Compass Accuracy	±5°
Compass Tilt Compensation	Yes, over ±45° pitch and roll
Dive Log Capacity	Approximately 1000 hours
Battery cap o-ring	Dual o-rings. Size: AS568-112 Material: Nitrile Durometer: 70A
Wrist Attachment	2 x 3/4" Elastic Straps with Buckles, or 2 x Bungee Cord (3/16" diameter cord)
Weight	190 g
Size (W X L X H)	81mm X 71mm X 38mm

18. Regulatory Information

A) USA-Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and the receiver.
- Connect the equipment to outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Caution: Exposure to Radio Frequency Radiation.

This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Perdix 2 Dive Computer Contains TX FCC ID: 2AA9B04

**B) Canada - Industry Canada (IC)**

This device complies with RSS 210 of Industry Canada.

Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of this device.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes :

- (1) il ne doit pas produire d'interférence, et
- (2) l'utilisateur du dispositif doit être prêt à accepter toute interférence radioélectrique reçue, même si celle-ci est susceptible de compromettre le fonctionnement du dispositif.

Caution: Exposure to Radio Frequency Radiation.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's [website](#).

Perdix 2 Dive Computer Contains TX IC: I2208A-04

C) EU and UK Conformance Statements

- EU EC Type examination conducted by: SGS Fimko Oy Ltd, Takomatie 8, FI-00380 Helsinki, Finland. Notified Body No. 0598.
- UK EC Type examination conducted by: SGS United Kingdom Ltd, Rossmore Business Park, Ellesmere Port, South Wirral, Cheshire, CH65 3EN, United Kingdom. Approved Body No. 0120.
- This device is in conforms with REGULATION (EU) 2016/425 on personal protective equipment.
- High pressure gas sensing components are in conformity with EN 250:2014 - respiratory equipment -open circuit self-contained compressed air diving apparatus - requirements, testing and marking - clause 6.11.1 Pressure Indicator. Pressure indication is designed to protect a trained diver from the risk of drowning.
- EN 250:2014 is the standard describing certain minimum performance requirements for SCUBA regulators to be used with air only sold in EU. EN 250:2014 testing is performed to a maximum depth of 50 M (165 FSW). A component of self-contained breathing apparatus as defined by EN 250:2014 is: Pressure Indicator, for use with air only. Products marked EN250 are intended for air use only. Products marked EN 13949 are intended for use with gases containing more than 22% oxygen and must not be used for air.
- Depth and time measurements conform with EN 13359:2000 - Diving Accessories - depth gauges and combined depth and time monitoring devices
- Electronic instruments are in compliance with:
 - ETSI EN 301 489-1, v2.2.3: 2019 Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.
 - ETSI 301 489-17 V3.2.4:2020 ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems.

- EN 55035:2017/A11:2020 Electromagnetic compatibility of multimedia equipment. Immunity requirements.
- CISRP32/EN 55032, 2015. A11:2020 Electromagnetic compatibility of multimedia equipment. Emission requirements.
- DIRECTIVE 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS)
- Declarations of Conformity are available at: <https://www.shearwater.com/iso-9001-2015-certified/>

WARNING: Transmitters marked EN 250 are certified for use with air only. Transmitters marked EN 13949 are certified for use with Nitrox only.





19. Contact

www.shearwater.com/contact

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