

# Introduction

The Shearwater Petrel is an advanced technical diving computer for open and closed circuit divers.

Although we strive to make the Petrel easy enough to use without reading the manual, please take some time to read this manual to get the best performance from your new computer. Diving involves risk and education is your best tool for managing this risk.

## Models Covered by this Manual

This manual provides operating instructions for the Petrel **Standalone (SA)** and Petrel **External (EXT)** models. Both the Petrel 1 and Petrel 2 hardware versions are covered by this manual.

### Nitrox Recreational (OC Rec) Mode

Operation of the Petrel when set to the "OC Rec" mode is covered by a separate manual, see the [Shearwater Petrel Nitrox Recreational Mode Manual](#). Although the model of Petrel is the same when using this mode, a separate manual was written to keep the instructions simple.

### DiveCAN® (Rebreather Controller) Models

For instructions on the Petrel *rebreather controller models* using DiveCAN® communications, see the [Shearwater DiveCAN® Petrel Manual](#).

### Petrel 1 vs. Petrel 2

This manual covers both the Petrel 1 and Petrel 2 models. The difference between the models is that the Petrel 2 has a digital compass and also supports Bluetooth Smart Ready (i.e. dual mode Bluetooth supporting both Bluetooth Classic v2.1 and Bluetooth Smart v4.0). Bluetooth Smart is used for connecting to iOS devices.

All other features are the same between the Petrel 1 and Petrel 2. Both models use the same firmware file and firmware version number.

## Compass (Petrel 2 only)

The Petrel 2 model contains a tilt-compensated digital compass.

### Compass features:

- 1° resolution
- ±5° accuracy
- Smooth, high-speed refresh rate
- User set heading marker with reciprocal
- True North (declination) adjustment
- Tilt compensation ±45°



### 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.



### Compass Limitations

It is important to understand some compass limitations before use.

**Calibration** - The digital compass needs occasional calibration. This can be done in the System Setup → Compass menu and takes only one minute.

**Battery Changes** - When the battery is changed, the compass should be calibrated. This is because each battery has its own magnetic signature that interacts with the compass. Fortunately this effect can be removed with proper 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.

- Ferromagnetic materials (such as iron, steel, or nickel) should be kept away from the Petrel 2 when using the compass.
- A traditional compass should also not be placed too close, as it contains a permanent magnet.
- Electric motors and high current cabling (such as from dive lights) can also cause interference and should be kept at a distance.
- Being inside or near a shipwreck may also affect the compass heading.

## Marking a Heading

To mark a heading, press MENU (left) button until "Mark Compass" is displayed, then press SELECT (right) button to mark the current direction. The display will then jump back to the compass display. The heading is shown as a pair of green triangles.



Mark the heading to remember the current direction



This feature makes it easy to determine if you are off course



When the marked heading is off screen, an arrow points the shortest way back



When facing the opposite direction, the reciprocal heading is shown as a pair of red triangles

Only one heading can be marked at a time, it can however be changed. Once a heading has been marked, there is no way to clear the heading arrows from the display.

## Compass Setup (Petrel 2 only)

### Compass View

The Compass View setting can be set to:

- **Off:** The compass is disabled and the Mark Compass option is removed from the menus.
- **60°, 90°, or 120°:** Sets the range of the compass dial that is visible on the main screen. The actual amount of arc that is shown on the screen is 60°, so this may seem the most natural. The 90° or 120° setting can be used to see a wider range.

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

### True North

In most places, a compass does not point towards True North, but rather to Magnetic North. The difference in angle between these two directions is called the magnetic declination (also called magnetic variation), and varies around the world. The declination in your location can be found on maps or by searching online.

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

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

If you only need to match an uncompensated compass, or your navigation is all based on relative directions, then this setting is not necessary and can be left at 0°.

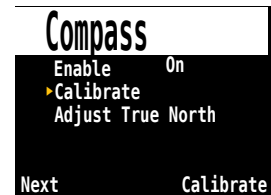
## Calibrate

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 Petrel. To be calibrated out, such an object must be mounted with the Petrel so that it moves along with the Petrel.



### Battery Affects the Compass Calibration

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



Compare the Petrel 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 travelling to different locations. The adjustment needed then is the True North (declination).

When calibrating, rotate the Petrel smoothly through as many 3D twists and turns as possible in 15 seconds. Keep metal and magnetic objects away during calibration. The calibration can also be reset back to the factory values. After calibration, it is recommended to compare the compass accuracy with a known good compass or fixed references



### Tips For a Good Compass Calibration

The following tips will help ensure a good calibration.

- Stay away from metal objects. For example, wrist watches, metal desks, boat decks, desktop computers, etc. 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 another compass (not a smartphone, those are terrible) to check your calibration.