ODYSSEY DIVE COMPUTER

USER MANUAL

This user manual applies to **ODYSSEY** dive computers running firmware of the **2.0.x series**



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Preamble

Within the ODC range of dive computers, the ODYSSEY model covered in this manual has been designed for open-circuit and closed-circuit (rebreather, CCR) scuba diving with all types of binary and ternary gases (Air/Nitrox/Heliox/Trimix).
ODYSSEY is a dive computer offering a wide range of settings and dive modes. It is essential to read this manual carefully and to have appropriate dive training in order to fully understand how it works and the dangers associated with incorrect settings.

WARNING

Although we make every effort to ensure that your computer functions correctly, your computer's firmware, like any software, may contain undetected bugs. Your computer may fail at any time and without warning, before or during a dive, due to a software or hardware failure.
Never risk your life based on a single source of information. Plan all your dives carefully, use a second computer or dive tables, and be prepared to execute your backup plan at any time.
You risk your life when scuba diving, and no dive computer can eliminate that risk.
A dive computer is not a substitute for proper training, knowledge and skills required for diving.
It is strongly advised not to dive if you are tired, taking medication, have consumed alcohol, are sleep deprived, or in any other circumstances that could impair your abilities.

DANGER

The ODYSSEY dive computer is designed to monitor your dive profile and calculate decompression stop requirements based on its internal model and the parameters you provide. These calculations are, at best, an estimate of actual physiological decompression requirements and never guarantee a safe ascent profile. Decompression sickness (DCS) is intrinsically linked to the amount of gas dissolved in the diver's body as a result of the dive, which must be eliminated by the body during the ascent and after returning to the surface.
In scuba diving, there is no such thing as zero risk.
ANY DIVE INVOLVES A RISK OF DECOMPRESSION SICKNESS (DCS)

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1. Main technical specifications

Maximum operating depth (technical capacity, excluding algorithm)	200 m
Display depth	> 30 cm. See also §9.
Start of dive recording	> 1.0 m, with retroactive integration of measurements taken below 60 cm. In micro-standby (within 6 h after the computer is switched off), automatic start above 1100 mbar, i.e. approximately 1 m at sea level. See also §9.
End of dive time	Ascent above 30 cm. See also §9.
Operating temperature (air)*	-10°C to +50°C
Operating temperature (water)*	-4°C to +35°C
Storage conditions	Rinse and dry the product, then store it in a clean, dry place away from light. Temperature: -20°C to +50°C.
Pressure sensor	Piezo-resistive sensor with 24-bit ADC. Ref. TE CONNECTIVITY: MS5849-30BA
Calibrated range*	600 mbar – 30 bar
Accuracy*	+/– 50 cm from 0 to 100 m (from 850 mbar to 11 bar abs.) +/– 1 m from 100 to 200 m
Surface pressure range	600 mbar – 1040 mbar (from sea level to approximately 4000 m altitude).
Maximum recommended interval for checking the product's accuracy	2 years or 200 dives, whichever comes first
Crush pressure	> 25 bar
Use above sea level **Altitude diving**	Automatic calibration of atmospheric pressure between 1040 and 600 mbar (approx. 4000 m altitude), see §9. Manual selection of fresh water or salt water (§4.)
Automatic start	Backup mode: by pressure measurement above 1100 mbar during the 6 h after the computer is switched off (micro-standby), then on contact with water via the wet contacts. See §9.
Power supply	AA/LR6 batteries: 1.5V lithium; 3.6V lithium; 1.5V alkaline; 1.2V NiMH
Minimum battery life	20 hours at 0°C with a 1.2V NiMH battery (vibration disabled, medium brightness)

**** PRODUCT ACCURACY: product calibrated at the factory.***

2. Other features

Trade name and reference code	ODYSSEY; ODC-R.01.582.25
Housing	Injection-molded polymer plastic.
Dimensions	H 81 mm x W 96 mm x D 37 mm
Operating weight	200 g
Mounting	With straps or bungee cords
Controls	3 piezoelectric buttons – activation force: 3 to 5 N
Wet contacts	Automatic start of the computer on contact with water when micro-standby is not active (see §9).
Lens	Polycarbonate
Screen type	2.4” 18-bit TFT-LCD color screen with variable brightness
Algorithm	Bühlmann ZHL-16C
Dive log sampling period	2 s
Repetitive dive planner and tables	Yes
Bluetooth Low Energy connection	Log export and firmware update
Logbook	More than 300 hours of dive time recording (128 MB memory card)
Compass function	Accelerometer and magnetometer. Accuracy +/– 5°
Programmable visual and vibration alarms	3V electric motor - 11,000 rpm. Vibration force: 1.55 Grms Note: vibration function can be disabled
Cylinder pressure measurement	Simultaneous monitoring of up to 4 cylinders via ODC SENSOR
Dive modes: open circuit (OC) and closed circuit (CC)	OC: Air / Nitrox / Trimix / Heliox / 100% Oxygen CC: Air / Nitrox / Trimix / Heliox / 100% Oxygen

3. Power supply

3.1. General

The ODYSSEY dive computer is designed to work with most commercially available AA/LR6 batteries.

- **Recommended batteries: 1.5V lithium** (and 3.6V lithium if applicable)
- Batteries that can be used provided the vibration function is disabled: 1.5V alkaline and 1.2V rechargeable NiMH.

The recommended battery type is 1.5V lithium, which offers the best battery life, particularly in very cold water.
SAFT 3.6V batteries offer similar performance and can be used without restriction.

Because lithium batteries need to be replaced less often than alkaline batteries, they reduce the waste caused by discarding, at each replacement, the minimum reserve the computer must have before any use.

1.5V alkaline and 1.2V NiMH batteries offer lower performance and cannot fully ensure operation of the vibration alert. These batteries are very sensitive to low temperatures, which reduce their battery life.

Using the vibration mode with alkaline or rechargeable NiMH batteries is strongly discouraged because of its high current consumption. With intensive use of the vibration function, the insufficient energy of these batteries may cause the computer to shut down unexpectedly.

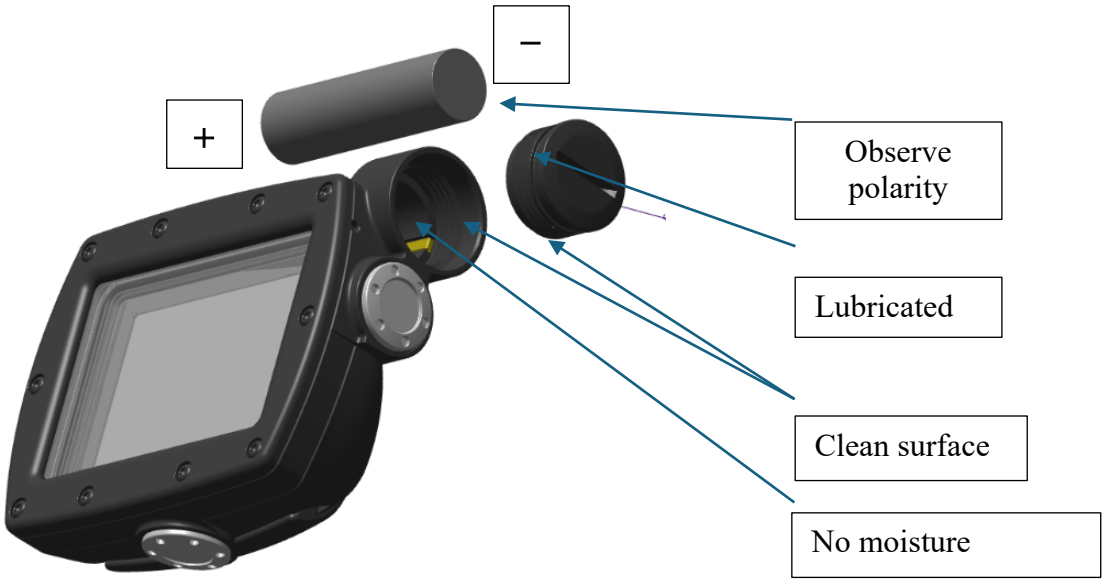
3.2. Replacing the battery in the battery compartment: operating procedure

Unscrew the battery cap using the battery compartment key or a coin. Observe the polarity: positive terminal towards the bottom of the compartment, negative terminal towards the spring side of the cap.



Make sure there are no foreign objects or dust on the inner sealing surface of the battery compartment or on the O-ring of the cap. It is recommended to lubricate this seal regularly with a suitable silicone grease.

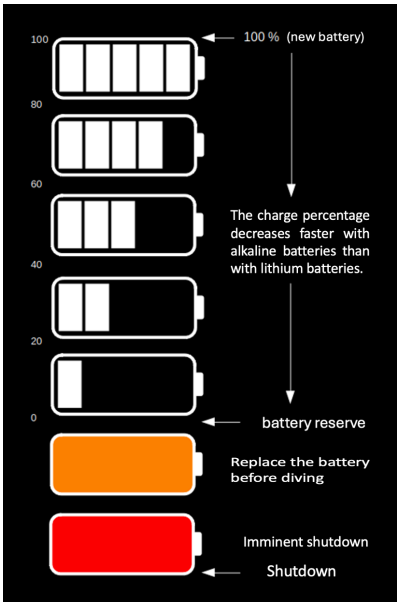
The battery and the inside of the battery compartment must be clean, dry and free of any trace of moisture.



Checks to be carried out when replacing the battery

3.3. Battery life

The average battery life of the ODYSSEY computer is approximately 30 hours of diving. It varies depending on the type of battery used, the water temperature, the screen brightness and how often the vibration function is used.



Residual battery charge display convention

Residual charge indicator:

The battery indicator shows the estimated residual charge of the battery. Each bar represents approximately 20% of the usable capacity, i.e. an indicative battery life of 5 to 8 hours depending on the conditions of use.

When the indicator turns orange, the computer enters its reserve zone. A residual battery life of more than 4 hours may remain under reference conditions, but this duration is not guaranteed, particularly in cold water or in case of high power consumption.

The battery must be replaced at the end of the first dive during which the indicator turned orange. Starting a new dive with a battery at this level is not recommended.

The charge indicator is an estimate of the remaining battery life and does not guarantee a minimum operating time.

Lithium batteries maintain a relatively stable voltage for most of their service life, followed by a marked drop at the end of discharge. Their behavior differs from that of alkaline and NiMH batteries, particularly at low temperatures.

To ensure the reliability of the indicator, the battery type selected in the settings must match the battery installed.

4. Getting started with the ODYSSEY computer

4.1. Packaging and delivery kit

The dive computer is delivered with a 1.5V lithium battery installed. To prevent unwanted power-up, the battery compartment cap is partially unscrewed, which prevents any simultaneous contact between the + and - terminals.
To power on your computer, screw the cap all the way down using the battery compartment key provided for this purpose.

ODYSSEY computers are delivered in individual packaging with the following accessories:

- A pair of elastic fabric straps;
- An elastic “bungee” cord;
- A spare O-ring for the battery cap;
- A battery compartment key for screwing and unscrewing the battery cap;
- A manufacturer’s warranty and certification card.

- **Attaching the elastic fabric straps and bungees**

ODYSSEY has mounting points for two elastic fabric straps or two bungees, as preferred by the user.
The removable bungee retention interfaces allow precise, non-slip attachment.
If you wish to use the elastic straps with clips, the two rubber interfaces must be removed.
To install the bungees, it is advisable to first remove the two interfaces before threading the cord through the holes. Then refit the two interfaces to limit the movement of the cord.



Rubber interfaces to be removed when using the fabric straps or fitted when using the bungees

4.2. Starting the computer and using the buttons



To switch on the computer, simply press the Left and Right buttons simultaneously.
The startup screen displays the firmware version number before automatically switching to the home screen.
At each startup, the computer checks its internal components. If a problem is detected on one of them, a dedicated page is displayed indicating the nature of the error. In this case, do not dive with the computer and contact Azoth Systems.

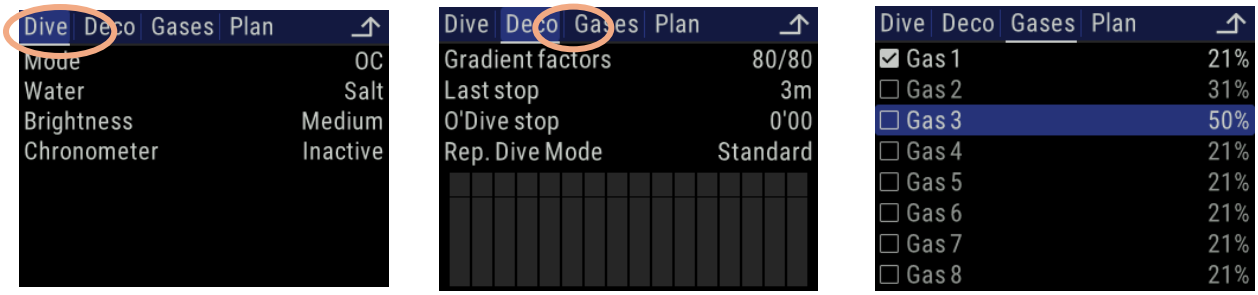


Firmware version display



Home screen

4.3. Navigating the computer menus

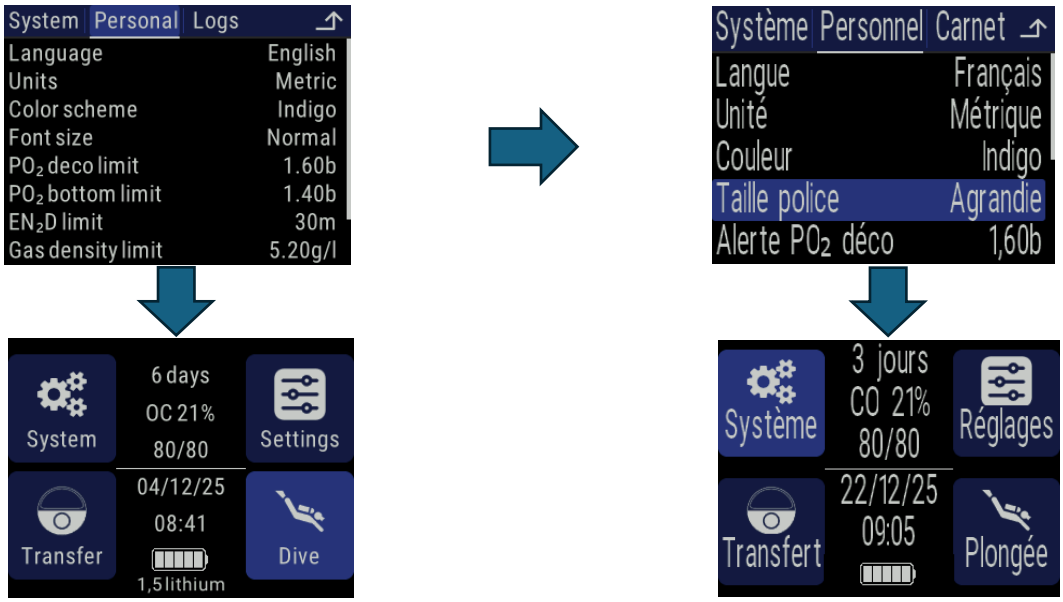


Moving through the "Settings" page menus by pressing the right button

Pressing the right button moves the highlighted field to the right, and pressing the center button enters the highlighted tab.
Above: moving from "Dive" to "Gases" via "Deco", then activating and scrolling through the "Gases" submenu.
In a vertical menu, the right button moves the highlighted selection down and the left button moves it up.

Choosing the display font size:

You can choose an enlarged or normal display mode according to the reading comfort you prefer.
Select Normal or Large in the "Personal" menu, "Font size" item.



4.4. Checks before diving

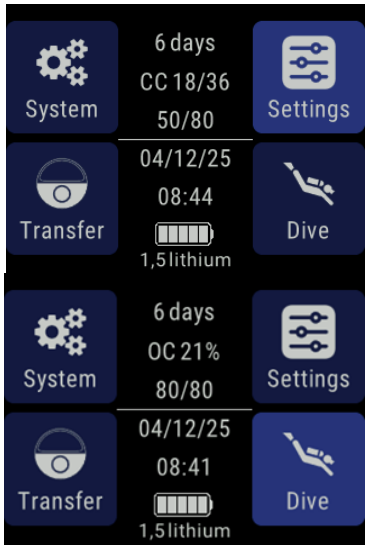


1. Start the computer and check the firmware version

2. On the home screen, check:
   - The dive mode: OC (open circuit) or CC (closed circuit)
   - The activated gases and their composition (% O2 / % He), consistent with the gas analysis
   - Any alerts currently in progress
   - The surface interval
   - The battery level
   - The declared battery type, which must match the battery installed
   - The Gradient Factor (GF) settings
   - The repetitive dive conservatism level
   - With ODC SENSOR sensors: reception of the pressure of each cylinder
   - In CC mode: the set point values and switching mode, as well as the remaining time of the soda lime timer

3. In the “Settings” - “Dive” menu, check:
   - The water type
   - The brightness level
   - The dive mode

Examples:



Dive mode: Closed Circuit (CC)
Gas: Trimix 18%O2/36%He
Conservatism: GF Low 50 and GF High 80
Surface interval: 6 days.
Battery level (100%).
Date and time

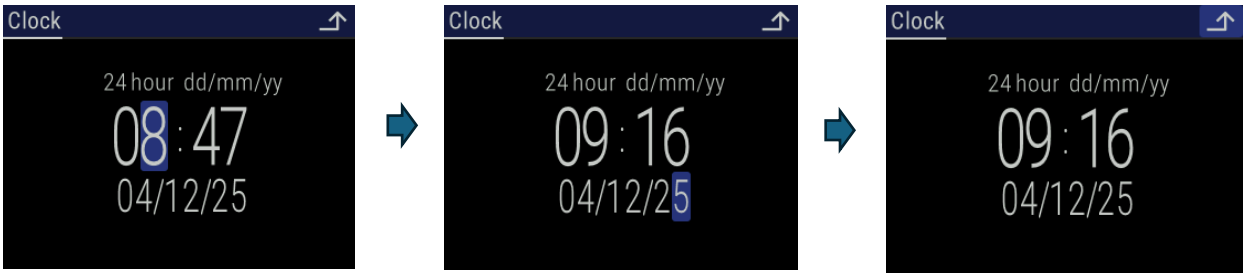
Dive mode: Open Circuit (OC)
Gas: Air
Conservatism: GF Low 80 and GF High 80
Surface interval: 6 days
Battery level: 100%
Date and time

5. Overview of the “System” menu

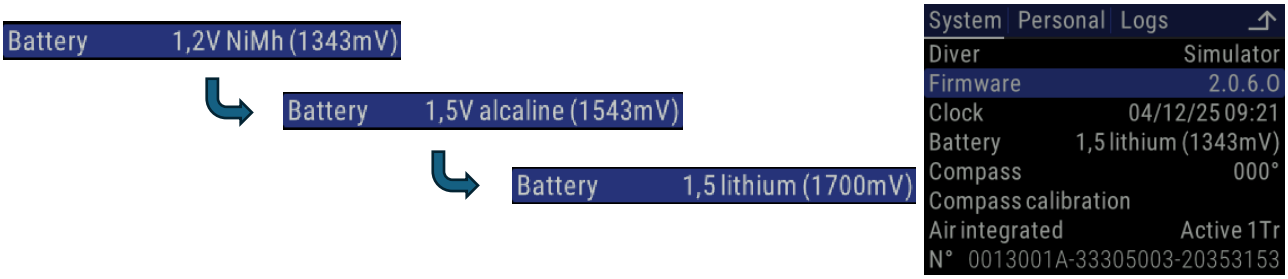


The System menu allows you to change the computer’s basic settings. Each line can be highlighted; you can enter the highlighted menu line by pressing the center “Enter/Confirm” button and scroll through the various options available:

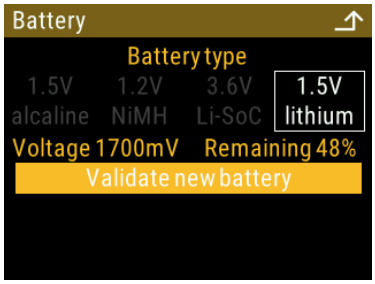
- Setting the date and clock:



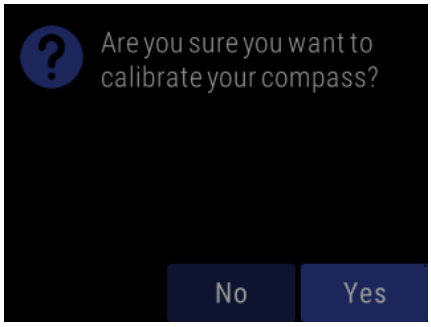
- Battery type information:

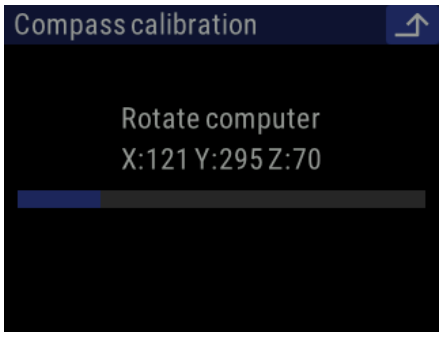


Safety notice: an incorrect battery type configuration may compromise the reliability of the charge indication (battery icon) and increase the risk of the computer shutting down during a dive. For the same reason, a used battery must only be replaced with a new battery before declaring it in the dedicated automatic menu.

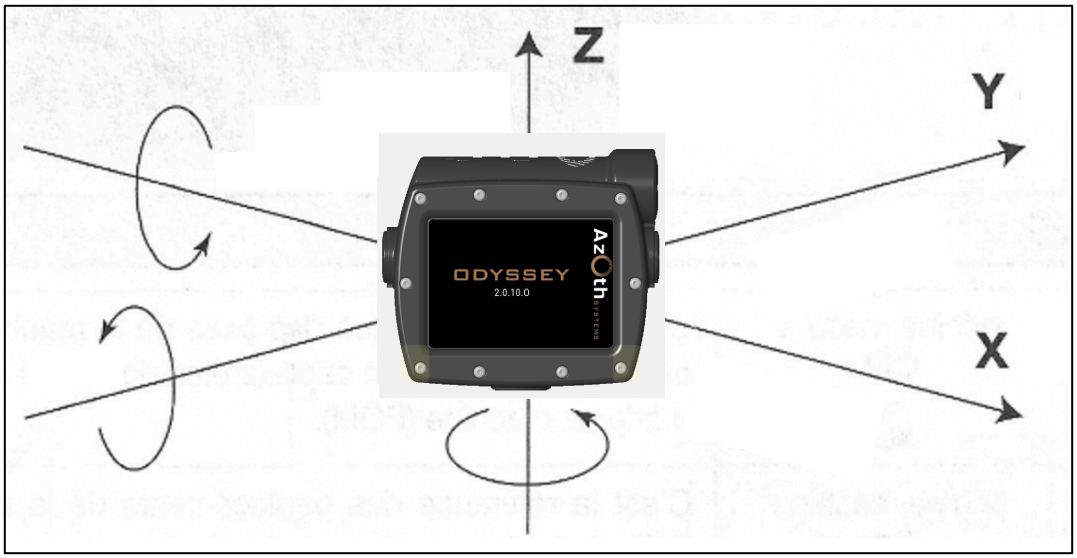


- Calibrating the compass:





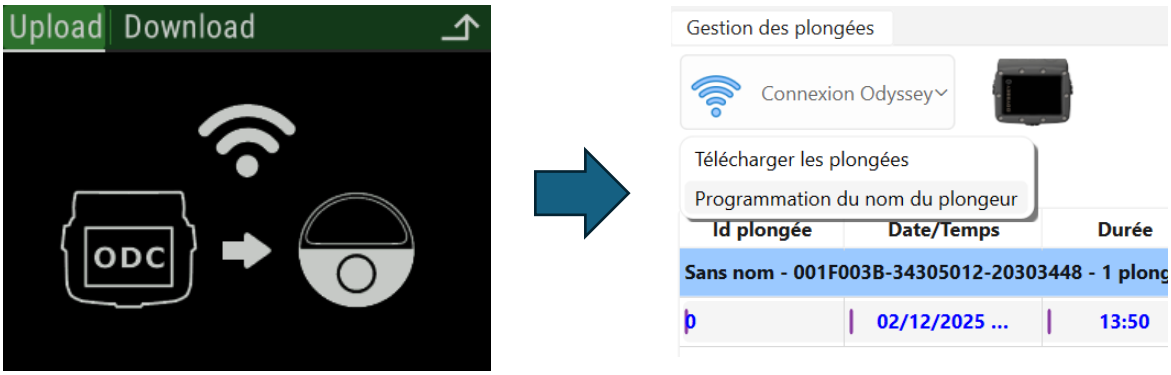
To calibrate the compass, perform rotational movements in both directions around each of the three axes of the computer. For optimal accuracy, this operation should be repeated each time the battery is replaced or the dive location changes.



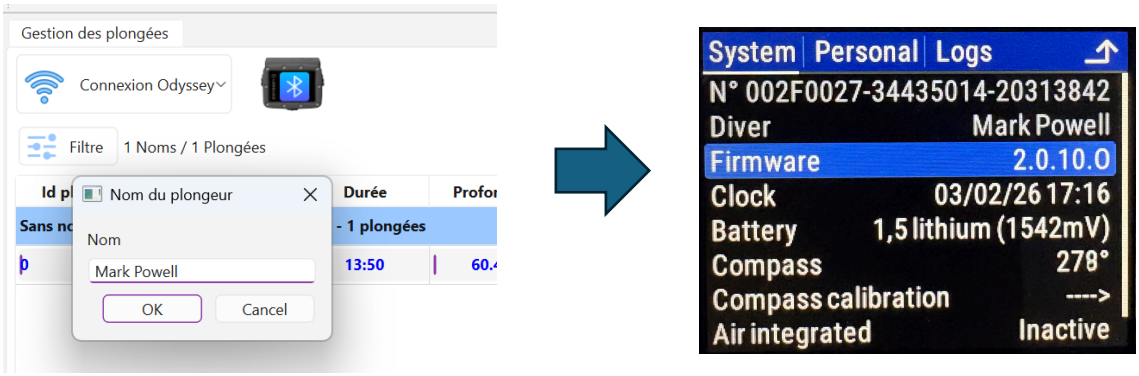
Rotational movements to calibrate the digital compass

- Personalizing the diver name:

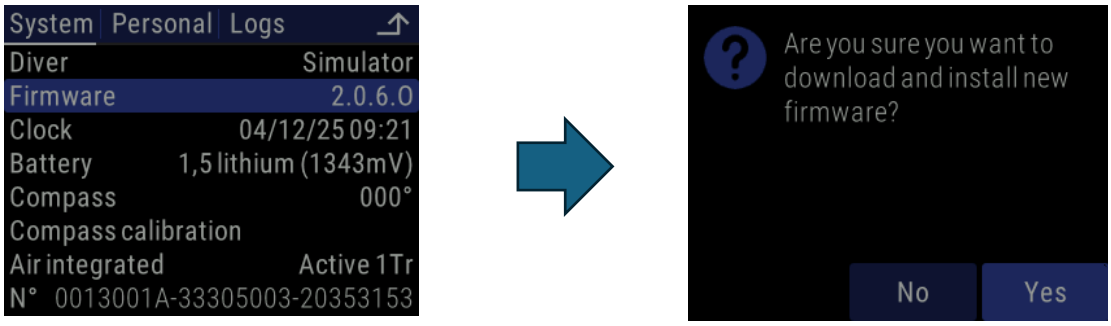
The computer user name can be personalized. To do so, switch on your ODYSSEY and go to the Transfer menu, then Upload. Then click “Odyssey Connection” in the upper-left corner of the *ODYSSEY Dive Log* and select “Program diver name”.



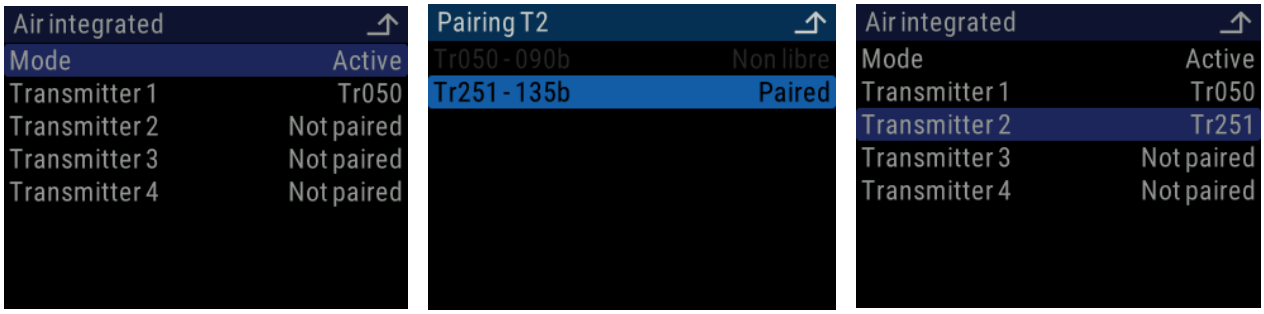
Enter the desired name in the dialog box, then confirm by clicking “OK”. You can then check in the ODYSSEY System menu that the new name has been applied:



- Firmware update – see §13:



- Pairing ODC SENSOR* cylinder pressure sensors (Tx transmitters) in the “Air integrated” menu:



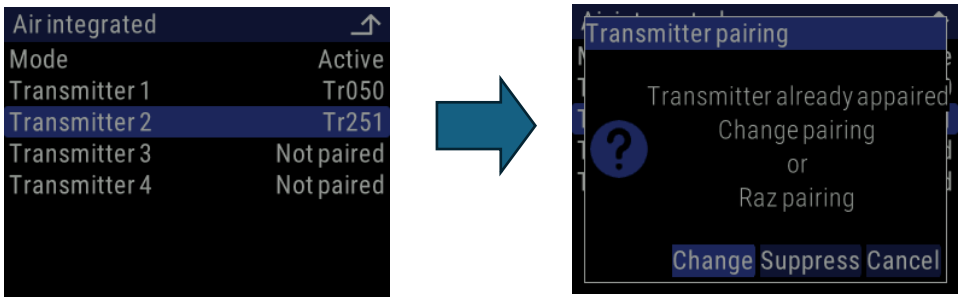
In “Active” mode, the “Air integrated” page automatically searches for cylinder pressure sensors within a 1.0 m radius of the computer.
In “Inactive” mode, the dive computer’s radio receiver is not operational. This corresponds to using the computer without a pressure sensor.

To avoid unnecessary battery consumption when no pressure sensor is used, make sure “Mode” is set to “Inactive”.

To pair a pressure sensor, select the number of the desired sensor when highlighted. Once paired, it will automatically appear on the dive page. This operation only needs to be performed once between the computer and the pressure sensor: the sensor number is then stored in the computer menu.

Up to 4 pressure sensors can be paired simultaneously with the same computer, and the pressures of each of the 4 cylinders can be viewed on the dive screen.

If necessary, paired sensors stored in memory can be changed or deleted by selecting them with the highlighted field and pressing the center button (here: “Delete”):



The active transmitter is detected automatically by the computer.
A paired transmitter can be deactivated when not in use. It is then no longer taken into account, but its pairing is retained: simply reactivate it to use it again, without repeating the pairing procedure.

**** See also: ODC SENSOR User Manual***

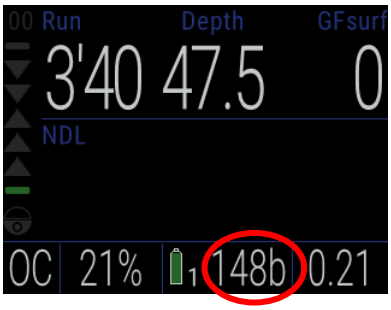


Illustration of the gas pressure available in cylinder no. 1 (pressure sensor no. 1): 148 bar

5.1. Flying after diving

Odyssey manages the waiting time required after a dive before flying. The gas load is analyzed with a limit of 0.8 bar of residual nitrogen tension in the compartments.
A crossed-out airplane icon on the home screen indicates this reminder, and the time before flying is displayed on the dive page.

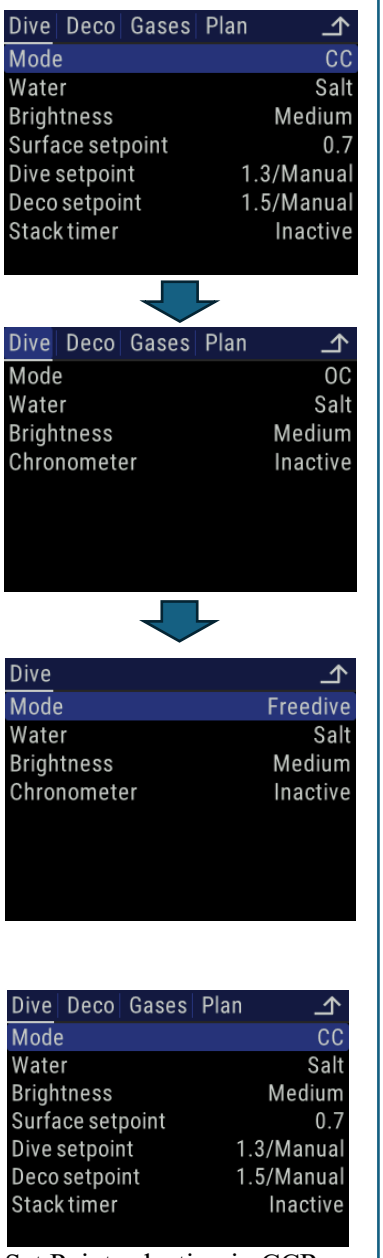


Illustration of the no-fly indicator after diving

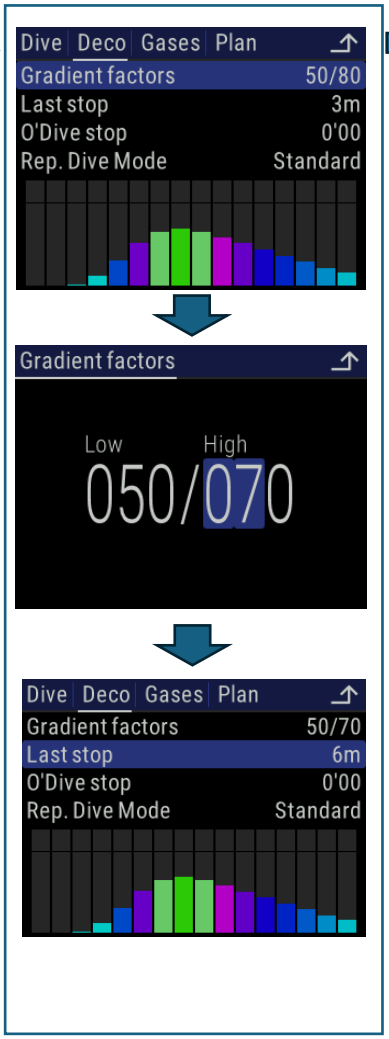
The no-fly time may be affected by the repetitive dive conservatism mode selected (Minimum – Standard – Increased) and by the dive parameters (i.e. tissue gas loading).

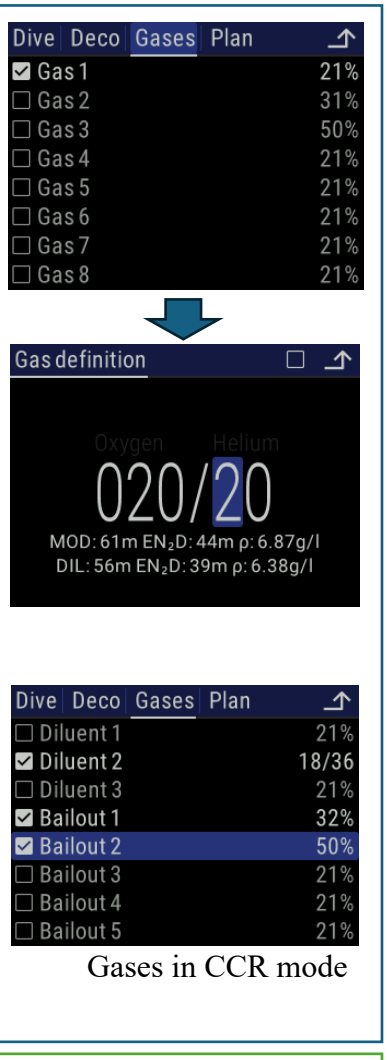
6. Overview of the “Settings” menu and the “Dive”, “Deco”, “Gases” and “Plan” submenus

The “Plan” menu allows you to plan a new dive taking the previous dive into account. The submenus give access to the dive mode settings and to the water type, screen brightness, conservatism, gas settings, etc.:



Set Point selection in CCR

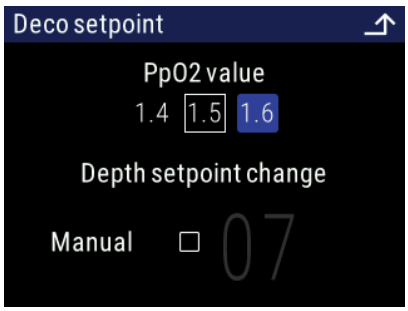


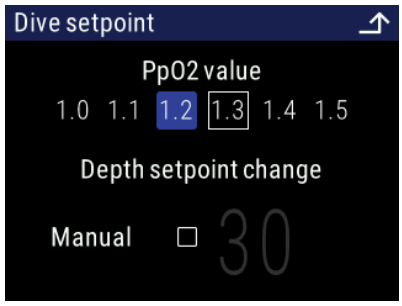


Gases in CCR mode

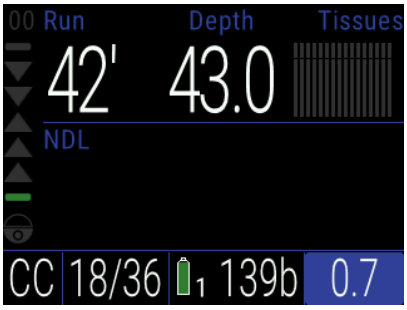
Gradient Factors are decompression conservatism coefficients. The closer the GF values are to 100%, the lower the level of conservatism and the shorter the decompression stops.
The GF Low value, between 20 and 100%, determines the depth of the first stop. The lower this GF, the deeper the stops proposed by the algorithm, and vice versa.
The GF High value, between 40 and 100%, determines the duration of the stops: the lower this value, the longer the stops.
For more information and a better understanding of the GF concept, see the document:
Clearing Up The Confusion About “Deep Stops” By Erik C. Baker, P.E

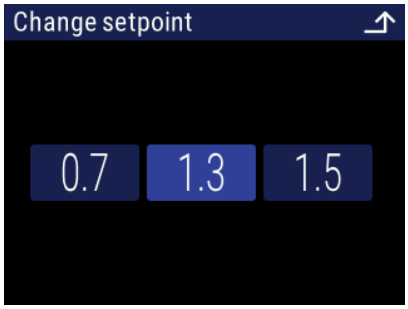
Specific setting of Set Point values with automatic or manual switching:



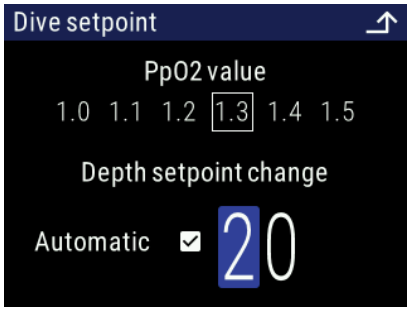


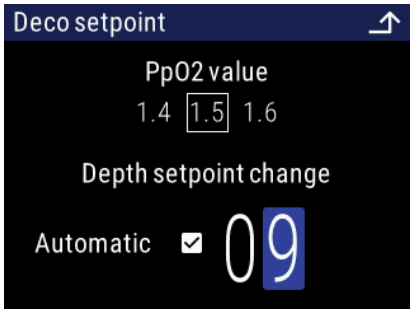
- The PpO_2 values of the Surface / Bottom / Decompression Set Points can each be configured.





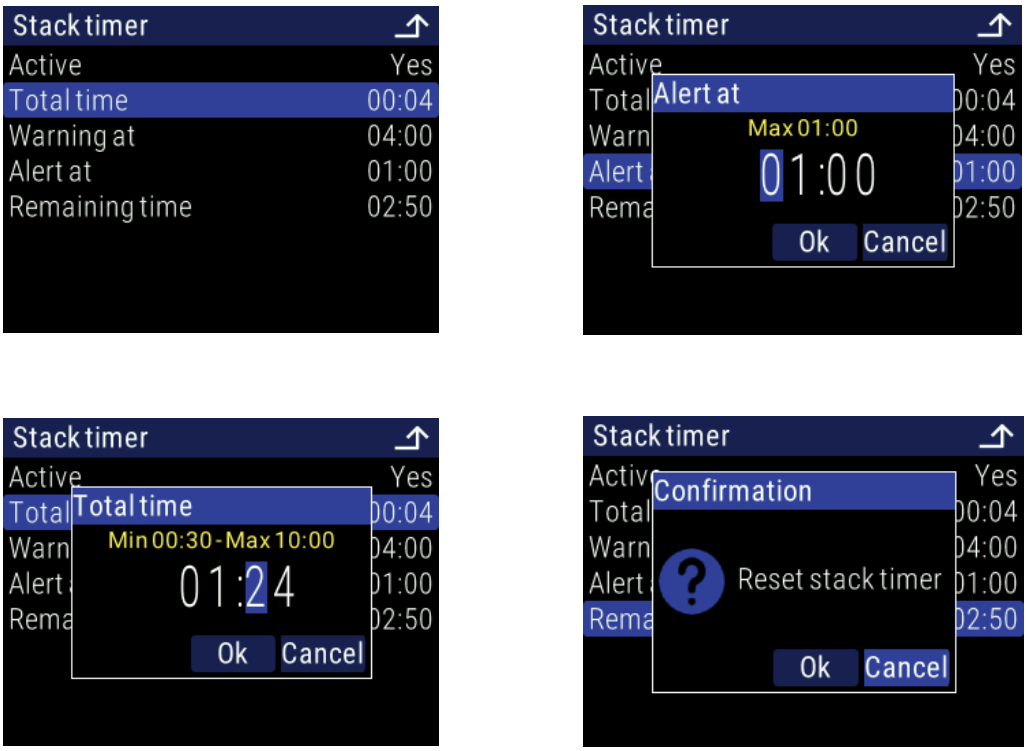
- In manual mode, it is up to the diver to switch from one Set Point to another during the dive.





- In automatic mode, the diver sets the Set Point switching depths for the descent and the ascent. If the Set Point is changed manually during the dive, automatic switching is then disabled for the rest of the dive.

Programming the soda lime usage timer – CCR mode

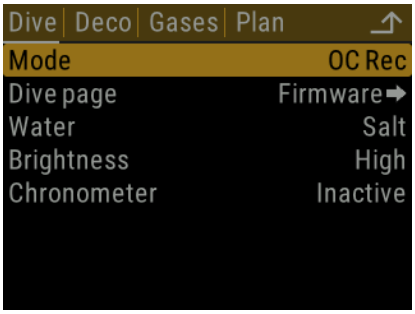


The total time can be programmed according to the type of canister, in accordance with the rebreather manufacturer's instructions.
A reminder warning can also be programmed, as well as an alert before the soda lime must be changed.
The timer must be reset after each soda lime change.

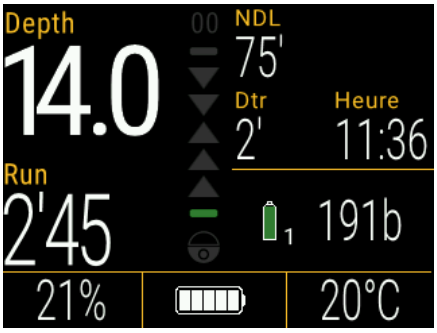
The soda lime usage timer is only active during the dive; when breathing from the loop at the surface, time is not counted.

***Recreational diving* mode in open circuit (OC Rec)**

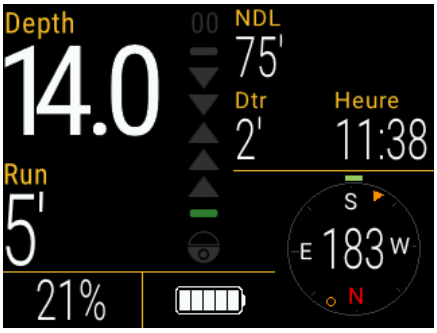
This mode is available in the "Dive mode" menu. The dive interface is simplified for dives with one or two gases, with enlarged depth and time display.



“OC Rec” mode selectable in “Dive” / “Mode”



Recreational display



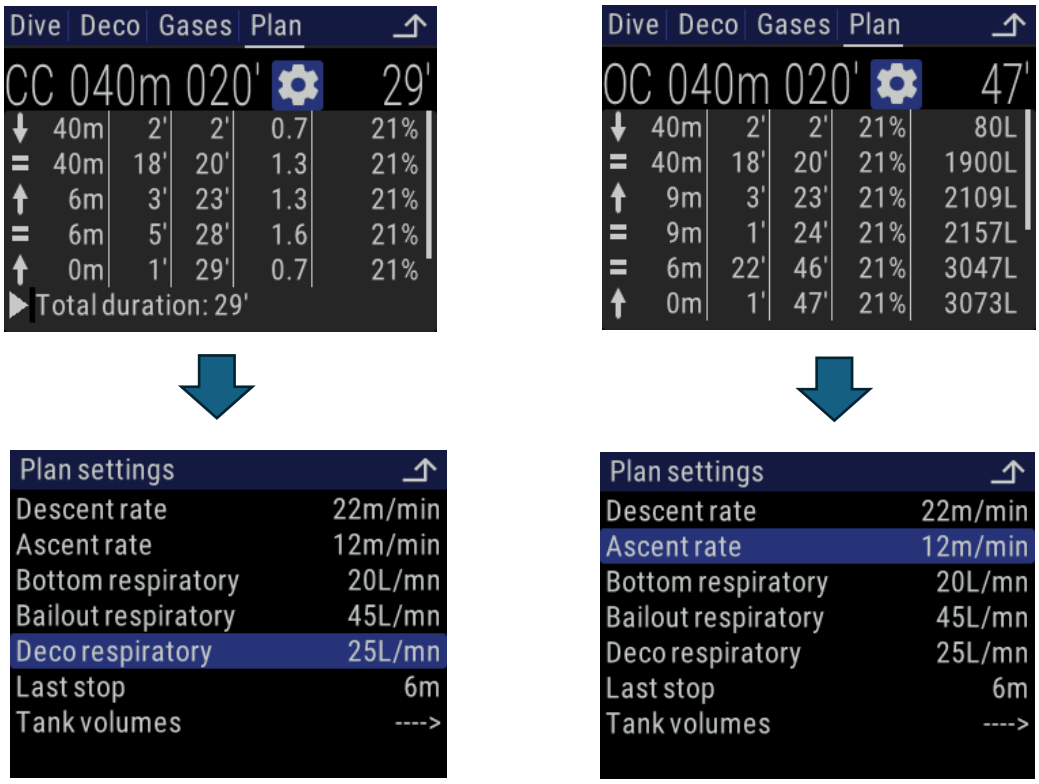
Recreational compass

The compass display is selected in the same way as in TEC mode, by pressing the Right and Center buttons simultaneously (or Left and Center depending on the “Position” setting in the Personal menu), see Chapter 12.

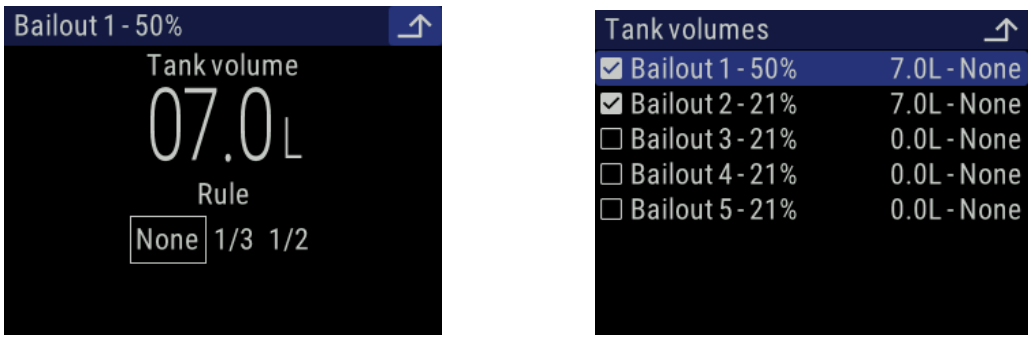
- **Dive planning:**

The ODYSSEY computer is equipped with a dive planner that simulates square-profile dives. The planner takes into account the gas load from the previous dive and all activated gases to calculate the decompression stops.
Planning can be carried out in both OC and CC modes with the associated gases and conservatism.

CC dive planning **OC dive planning**

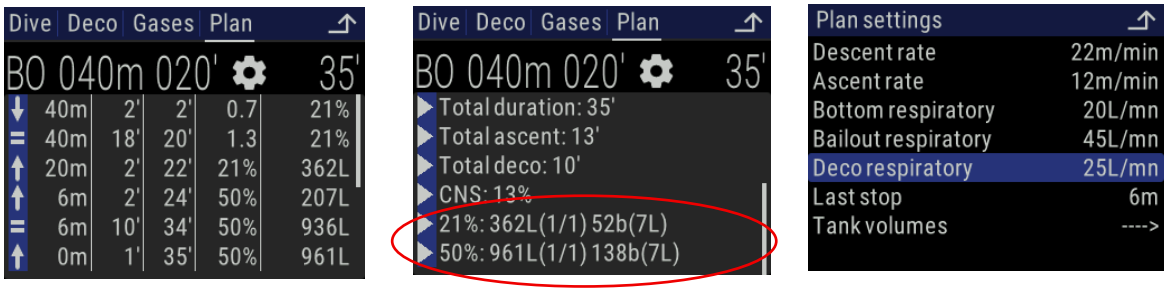


Possible planner parameter settings



Cylinder volume settings and available gas management rules

Once configured, the planner provides an accurate calculation of the gas volumes required and of the filling pressures.



Example of a CCR dive plan with a Bail Out (BO) ascent: the volumes and pressures of the gases consumed are displayed in liters (L) and bars (b)
(BO Air 7L: 362 L / 52 b and BO 50% 7L: 961 L / 138 b)

As a result, the planner provides the depths and durations of the stops, the dive time and the Total Dive Time, based on the Pmax and Bottom Time values.
The “Planning settings” menu allows you to set the descent rate, ascent rate, gas consumption and cylinder volumes used for the planning calculation.

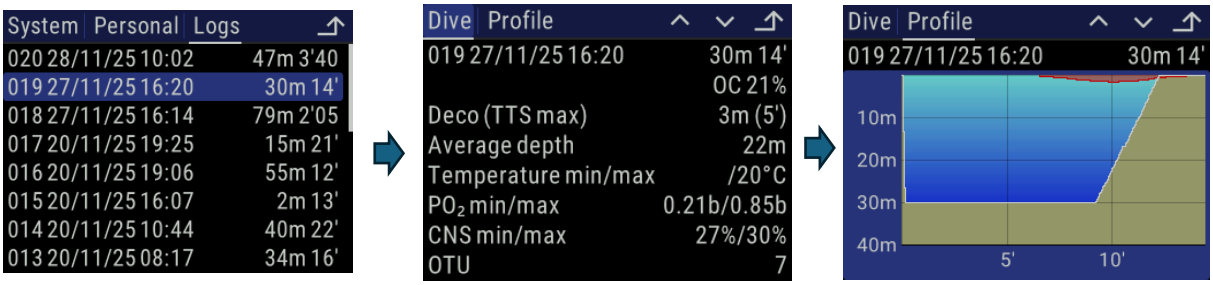
Planner durations are calculated according to the following rules:
- The ascent to the first stop is made at the ascent rate defined in the planning settings, and its duration is rounded up to the next minute;
- Transits between stops are not counted: only the duration of the stops is taken into account;
- The final ascent from the last stop to the surface is counted as 1 minute;
- Without stops, the entire ascent is made at the defined rate, without the 6 m/min phase.

This plan remains an approximation based on a theoretical square profile, using several assumptions regarding descent and ascent rates. The ODYSSEY dive planner is designed for simple dives.

Multilevel dives are not supported.

7. Overview of the “Logbook” menu

The “Logbook” menu contains all the information related to recorded dives:

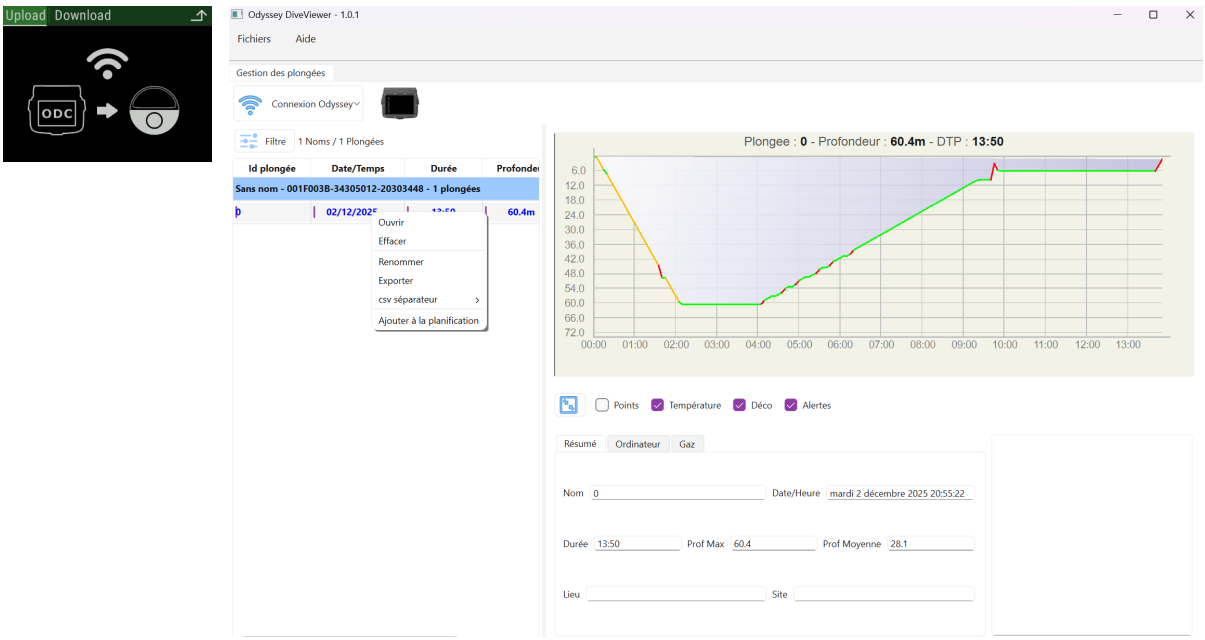


By selecting a dive, you can access its graphical profile and detailed data:

- Date, maximum depth and total dive time;
- Dive mode;
- Gases used;
- Average depth;
- Deepest calculated stop and maximum calculated ASC;
- Minimum and maximum oxygen partial pressure;
- O_2 load, CNS and OTU;
- Cylinder pressure recorded by the ODC SENSOR;
- Minimum and maximum temperatures.

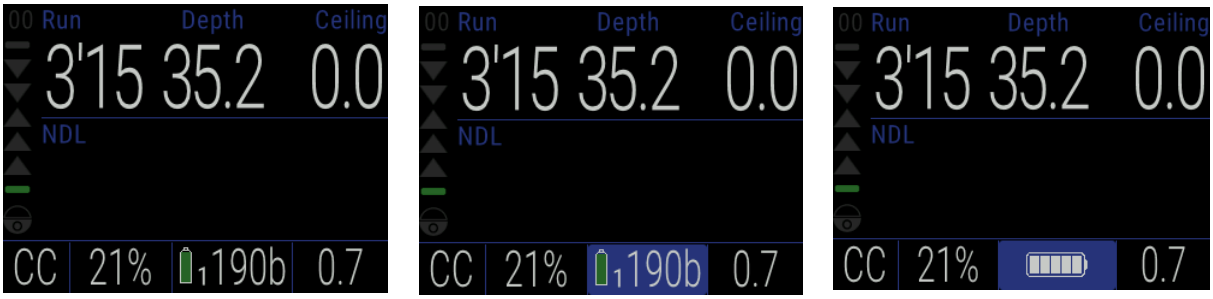
The computer’s memory can store more than 300 dives of 1 hour each. An automatic overwrite loop is activated when the memory is full; the oldest dive stored in memory is then deleted to free up space for a new dive. It is recommended to export and save your dives at least once a year using the *ODYSSEY Dive Log software.*

ODYSSEY Dive Log software for PC or Mac



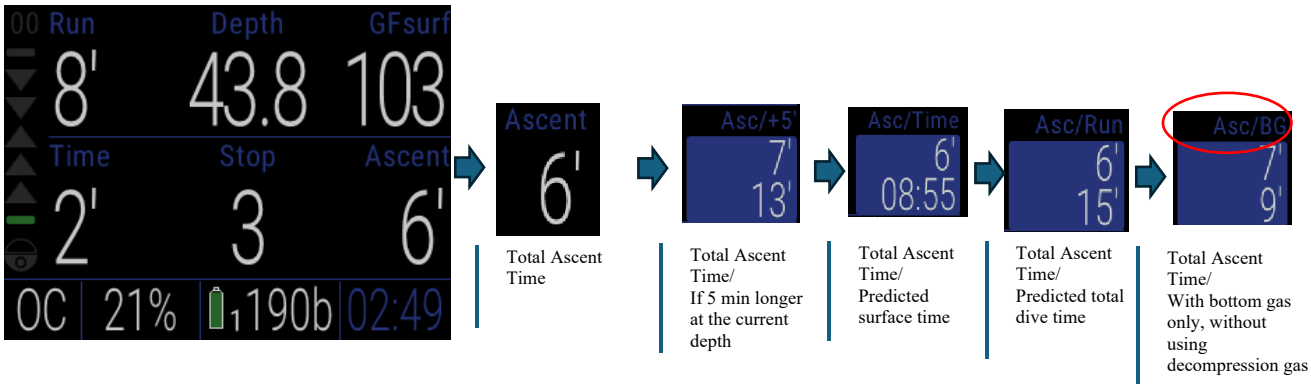
The ODYSSEY Dive Log software, available for PC and Mac at https://o-dive.com/doc-odyssey/, allows you to transfer dives via Bluetooth (Transfer > Upload menu), view detailed profiles and program the diver name (see §5).

8. Overview of the “Dive” menu



By selecting the highlighted fields, you can change the displays.
Use the “Left” and “Right” buttons to move the highlighted field and “Confirm/Enter” with the center button.

- Each configurable field has submenus that provide access to additional information:



The dynamic ascent field displays various ascent times calculated according to the bottom time and the gases breathed. The predicted total dive time and surface time take into account the ascent time at the rate set in the “Personal” menu (see below), plus the stops calculated at that moment with the available gases and the transitions between stops (6 m/min).

Predicted ascent times are calculated continuously, taking into account the bottom gas used and the decompression gas available according to the programmed dive mode.

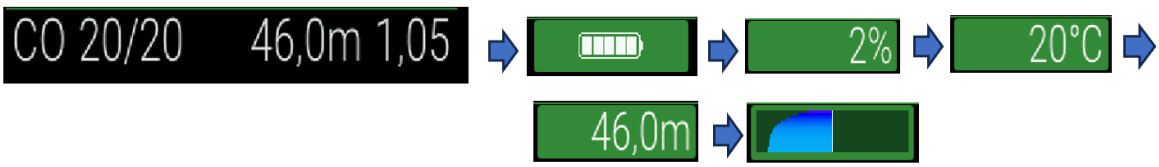
ASC calculation rules:
- Ascent to the first stop at the rate set in the “Personal” / “Ascent rate” menu: 8, 10, 11, 12 or 15 m/min. The same setting is used for the VR ascent rate indicator (§10.4) and the ascent rate alarm (§10.1).

- After the first stop, between stops and then up to the surface: fixed rate of 6 m/min.
- Without stops: ascent at the set rate to the depth of the “Last stop” parameter (“Deco” menu), then at 6 m/min to the surface.
- The safety stop (“O’Dive stop”) is included in the ASC when it is programmed.
- Rounding: the duration is rounded up to the next multiple of 5 seconds. Above 60 seconds, it is rounded up to the next minute.
- These rules also apply to the ASC+5, ASC/ST, ASC/RUN and ASC/BG fields, as well as to the TGR calculation (§10.3).

Examples of a no-stop dive, with the last stop set to 3 m, no O’Dive stop and an ascent rate set to 10 m/min:
- From 10 m: 7 m at 10 m/min (0.7 min), then 3 m at 6 m/min (0.5 min), i.e. 1.2 min = 72 s. Rounded to 75 s, then up to the next minute: 2’ displayed.
- From 40 m: 37 m at 10 m/min (3.7 min), then 3 m at 6 m/min (0.5 min), i.e. 4.2 min = 252 s. Rounded to 255 s, then up to the next minute: 5’ displayed.

For comparison, from 10 m with an ascent rate set to 12 m/min: 7 m at 12 m/min (35 s), then 3 m at 6 m/min (30 s), i.e. 65 s: 2’ displayed.

The ASC/BG information field displays the predicted total ascent time:
- ASC - taking into account the available decompression gas;
- BG (Back Gas) - considering only the bottom gas for the decompression calculation,
- Changing the dynamic field displays at the bottom of the screen: battery; % CNS; temperature in °C; max. depth.
- Tissue desaturation graph: it shows the calculated gas loading state at the present moment.



- Digital pressure gauge function*, air pressure display:



Pressure transmitter no. 1 Change to transmitter no. 2 3rd transmitter displayed

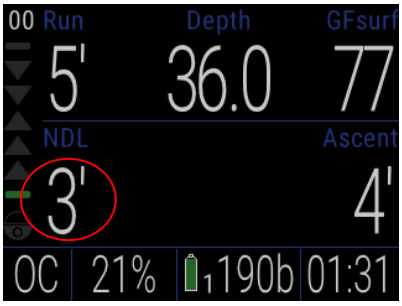
- Pressure alarm colors are displayed according to the following rule:
  - **Green** above 100 bar
  - **Orange** from 100 to 50 bar
  - **Red** below 50 bar

These color thresholds are fixed and independent of the reserve pressure set for the TGR function.

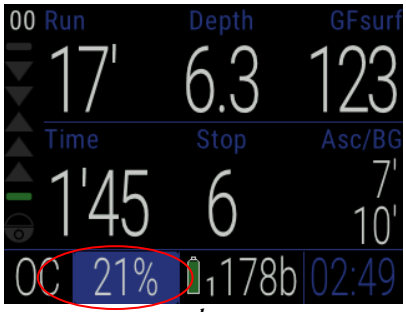
** See also: ODC SENSOR User Manual*

- **Display of decompression dives**

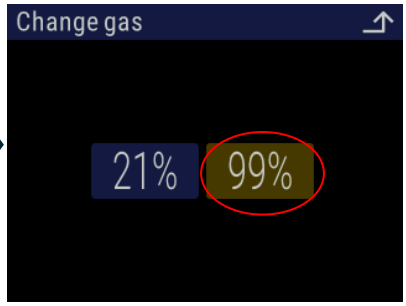
- Example of an Air dive with Oxygen decompression:



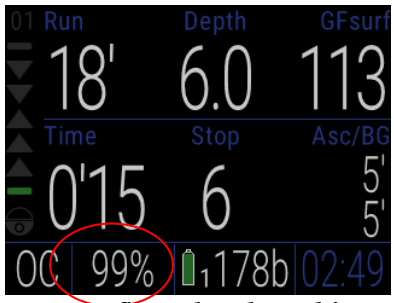
NDL: 3' left without stops



Selecting the 2nd available gas



Gas switch



Oxygen confirmed as breathing gas

Gradient Factor (GF) indications on the dive page. There are two types:

- **The Gradient Factor (GF)** expresses the supersaturation of a compartment as a percentage of the maximum supersaturation tolerated by the Bühlmann model (M-value) at the pressure considered: GF = (tissue tension – ambient pressure) / (M-value – ambient pressure) × 100. A GF of 0% corresponds to a tissue whose tension equals the ambient pressure; a GF of 100% corresponds to the Bühlmann limit without any conservatism factor.

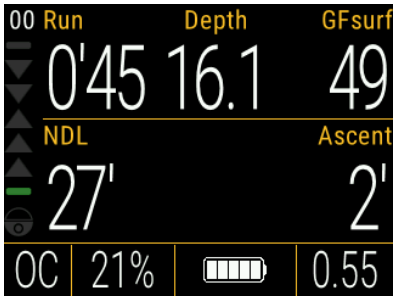
Both displayed values are those of the most loaded compartment (leading compartment) among the 16 compartments of the model. When no compartment is supersaturated, in particular during the on-gassing phase at the beginning of the dive, the displayed value is 0.

- **Instantaneous surface GF: anticipates the supersaturation level in the event of an instantaneous return to the surface**

Maximum Gradient Factor calculated assuming an instantaneous return to the surface, without any change in tissue tensions. It allows you to evaluate the theoretical supersaturation level at the surface and to compare it with the selected GF High value.

The calculation uses as surface pressure the reference atmospheric pressure measured when the computer is started (see §9).

This indicator allows you to monitor the inert gas loading during the dive and to assess how close you are to the limit set by the GF High. A value above the GF High indicates that an instantaneous return to the surface would exceed this limit. It is not a simulation of an actual ascent.



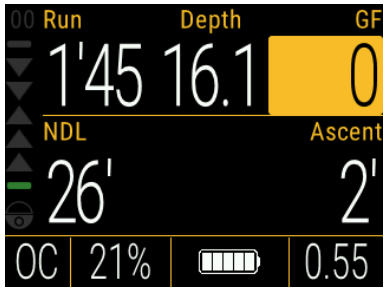
Surface GF in instantaneous projection
State of the 16 tissues at the present moment

- **GF at the current depth: indicates the supersaturation level at the current depth**

Maximum Gradient Factor calculated at the ambient pressure corresponding to the diver's current depth. It represents the instantaneous supersaturation level of the tissues and shows how close they are to the supersaturation limit allowed by the algorithm at this depth.

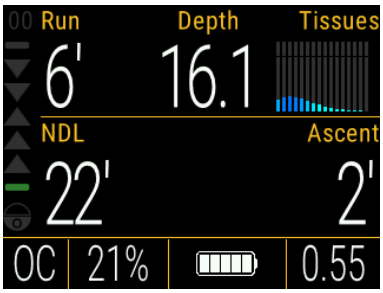
The applicable limit GF varies linearly between the GF Low value, at the depth of the first stop, and the GF High value, at the surface. The depth of the first stop used as a reference is recalculated continuously during the dive. As long as the GF at the current depth remains below this limit GF, the algorithm allows the ascent to the next stop.

This indicator reflects the supersaturation state of the tissues at the depth considered. It changes mainly with depth and inert gas loading. It can be compared with the limit GF applicable at this depth, determined by the algorithm from the GF Low and GF High parameters.



GF calculated at the current depth

- Tissue display:



Saturation state of the 16 tissues (Bühlmann compartments) at the present moment

Reading the tissue graph:

- Each bar represents a compartment, from compartment 1 on the left to compartment 16 on the right.
- The height of a bar indicates the compartment's inert gas loading (nitrogen and helium) relative to what it can tolerate at the current depth. The bottom of the scale corresponds to the partial pressure of nitrogen in air at the surface.
- The horizontal line, placed at 80% of the height, corresponds to the maximum pressure tolerated by the compartment, calculated with the GF applicable at the current depth. The area above this line represents an exceedance of this limit.
- The color of a bar depends on its value (cyan, then increasingly dark blue below 40%; purple from 40 to 60%; very pale pink, then yellow-green from 66 to 80%; yellow, then orange from 80 to 90%; dark orange from 100%, then red at 114%).
- The graph is recalculated every 2 seconds. At the surface, it shows the state of the tissues at the end of the dive.

Note: these indicators supplement the decompression information displayed by the computer. They help anticipate and monitor the evolution of supersaturation, but are no substitute for complying with the calculated ceilings and stops.

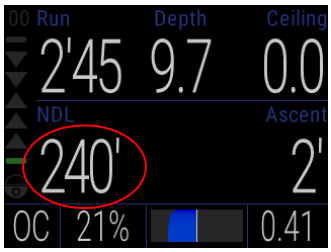
- **Display, activation mode and countdown of decompression stops:**

Dives are "no-stop", i.e. within the no-decompression limits, when the NDL (No Decompression Limit) field is displayed as a positive value.
E.g.: +240' means that more than 240 minutes of diving can be carried out without decompression stops at the current depth.
A display of 3' means that 3 minutes of diving remain without a decompression stop while staying at the current depth. When the no-decompression limit is close ("< 3'"), the computer highlights the NDL field in gray and emits two series of vibration warnings. Beyond this point, the NDL display is replaced by STOP, indicating the depth of the first stop and its duration calculated at the time of display.

Decompression stops are counted down optimally at the exact target depth given by the ODYSSEY, calculated in relation to the theoretical ceiling not to be exceeded.

If the stop is performed deeper than the target depth (e.g. 4 m instead of 3 m), its duration is extended.
If the diver is more than 10 cm above the stop target depth, the stop display field is highlighted in brown.
If the diver is more than 10 cm above the theoretical decompression ceiling, the stop display field is highlighted in red.

Display examples:



Over 240' without stop



195' without stop left



NDL limit, 1'35 left



1'45 stop at 6 m



-10 cm from the stop



-10 cm / ceiling



Normal stop resumed

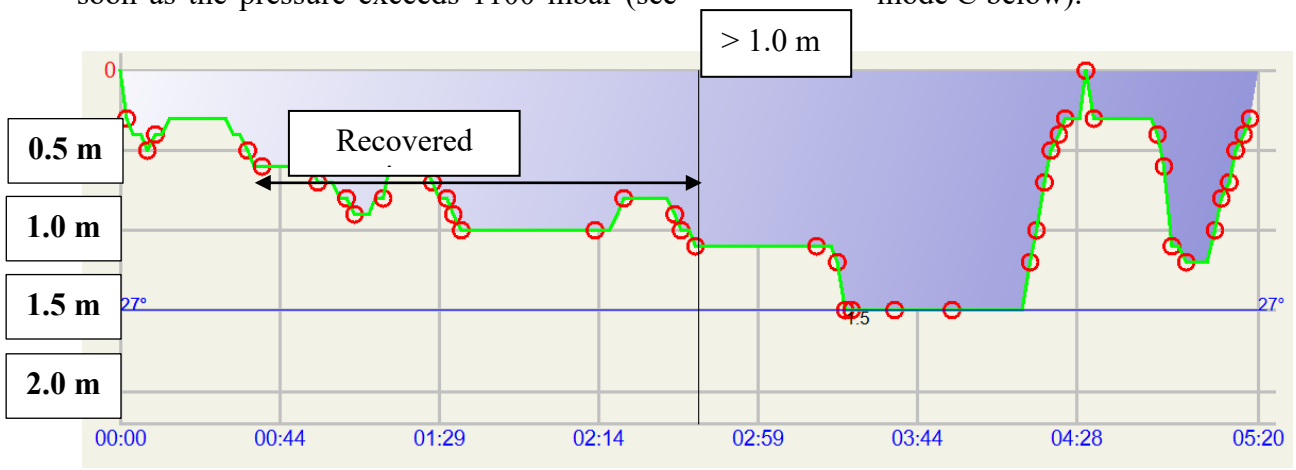


End of stops – surface OK

Note: the theoretical decompression ceiling is always shallower than the stop target depth!

9. Managing the start and recording of the dive

When the computer is switched on, the depth is displayed on the screen as soon as it exceeds 30 cm. At this stage, dive time is not yet counted.
Actual dive recording only begins when the depth exceeds 1.0 m. From this threshold onward, the computer retroactively integrates into the dive profile all measurements taken at depths greater than 60 cm before this point.
These thresholds apply when the computer has been switched on manually. In micro-standby, within 6 hours after the computer is switched off, it automatically switches to dive mode as soon as the pressure exceeds 1100 mbar (see mode C below).



Atmospheric pressure calibration function:

A. Normal mode (manual start using the piezoelectric buttons)

After the computer has been started by pressing the 2 side buttons simultaneously, a first measurement of the ambient pressure is taken.
- This value is accepted as the reference atmospheric pressure if it is within the range of 600 to 1040 mbar, corresponding to an altitude from sea level up to approximately 4000 m.
- If the measured pressure is outside this range, it is considered invalid. The computer then uses as reference atmospheric pressure the last valid atmospheric pressure value recorded during a previous start-up.

B. Start by wet contacts

The wet contacts detect the presence of water under the housing. When micro-standby is not active, i.e. more than 6 hours after the computer has been switched off, the switched-off computer starts automatically as soon as it is immersed. Like the micro-standby start, this is a backup mode which does not replace switching on at the surface. Keep these contacts clean by rinsing with fresh water after each dive (see §14).

C. Micro-standby mode (automatic start)

Micro-standby is activated automatically when the computer is switched off, for a period of 6 hours. During this period, the microprocessor measures the ambient pressure every 10 seconds, including when the computer is switched off.
This mode enables the computer to start automatically (“backup” mode), in particular if the diver forgets to switch it on at the surface.
- As soon as an absolute pressure greater than 1100 mbar is detected, the computer automatically switches to dive mode.
This pressure value corresponds to approximately 1 m depth at sea level under normal weather conditions (atmospheric pressure of approximately 1013 mbar).

Important note:

STARTING THE COMPUTER IS MANDATORY BEFORE ANY IMMERSION IN ORDER TO CHECK ITS SETTINGS AND BATTERY LEVEL AND TO ALLOW AN ACCURATE CALIBRATION OF THE REFERENCE ATMOSPHERIC PRESSURE.

USING AN INCORRECT ATMOSPHERIC PRESSURE MAY SIGNIFICANTLY AFFECT THE DECOMPRESSION CALCULATION, PARTICULARLY WHEN DIVING AT ALTITUDE.

AUTOMATIC UNDERWATER START IS ONLY AN EXCEPTIONAL BACKUP MEANS AND MUST UNDER NO CIRCUMSTANCES BE CONSIDERED A NORMAL OPERATING MODE.

Altitude diving:

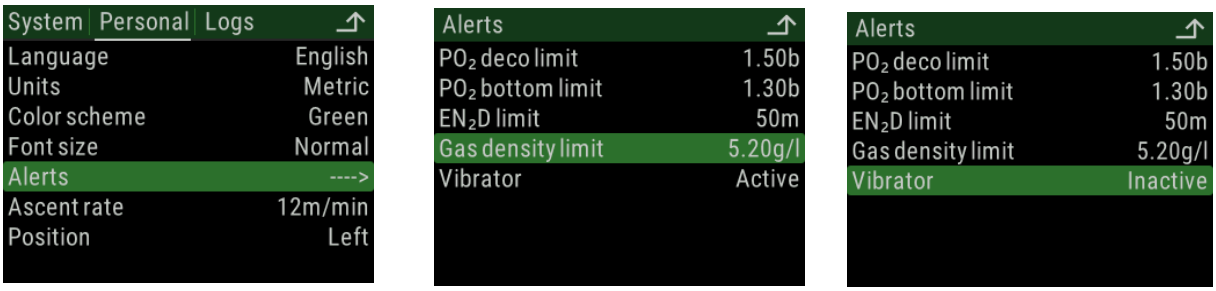
The ODYSSEY computer automatically calibrates itself to the atmospheric pressure at each startup. As a result, no action is required to take altitude into account.
Due to the lower atmospheric pressure at the surface, altitude diving may lead to significant variations in decompression parameters, in particular the no-decompression limit (NDL) and the total ascent time with stops (ASC).

Example:
A “square” air dive to 30 m with a GF setting of 80/80 has an NDL of approximately 12 minutes at sea level. This NDL drops to approximately 7 minutes in a lake located at an altitude of 3200 m.

When diving at altitude, the automatic dive mode start depth changes due to the lower atmospheric pressure at the surface.
For example, at an altitude of 2000 m, where atmospheric pressure is approximately 800 mbar, the computer will automatically start in dive mode at a depth of approximately 3 m, corresponding to a pressure differential of 300 mbar between the surface pressure and the automatic start value of 1100 mbar.

10. Alarm management

ODYSSEY alarms are indicated by visual signals and, where applicable, by vibrations. Visual alarms are shown either by highlighting a display field or by a dialog box overlaid on the main screen.
Depending on the nature of the alarm, these visual indications may be accompanied by vibration sequences.
The vibration alarm function can be disabled by the user in the “Alerts” menu.



Examples of alarms with thresholds programmable in the “Personal - Alerts” menu



Alarm display examples: Density, N_2 partial pressure and ppO_2



Examples of visual alarms by highlighting of a display field: low cylinder pressure with vibration, ascent rate alert without vibration.

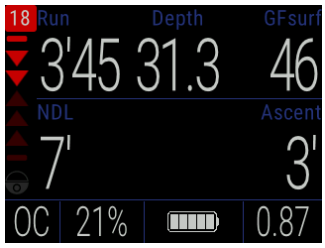
10.1. List of ODYSSEY alarms

- Maximum depth per gas used:
    - Oxygen partial pressure of the bottom gas;
    - Oxygen partial pressure of the decompression gas;
    - Depth related to nitrogen partial pressure;
    - Depth related to the density of the breathing gas.

- Gas reserve pressure:
    - 35 bar if the maximum depth reached (Pmax) is less than or equal to 10 m;
    - 50 bar if the maximum depth reached (Pmax) is greater than 10 m.

- Loss of connection with the ODC SENSOR pressure transmitter (see §10.2)
    - After 1’45’’ of interrupted reception (visual and vibration alarm).

- Fast ascent rate:
    - Instantaneous if the rate in m/min exceeds the recorded setting.



- Decompression stops
    - Stop depth compliance relative to the target depth;
    - Stop depth compliance relative to the decompression ceiling;
    - Total interruption, non-compliance with decompression stops.

10.2. Alarm / Loss of ODC SENSOR connection

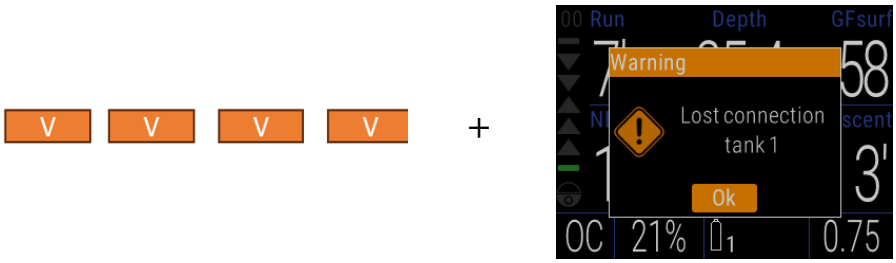
The computer may temporarily move out of the optimal reception range and no longer receive signals (see: ODC SENSOR User Manual). If the connection is lost for more than 45 seconds, dashes are displayed on the computer screen:



Dashes displayed instead of the pressure value if the connection with the ODC SENSOR is lost for more than 45 seconds

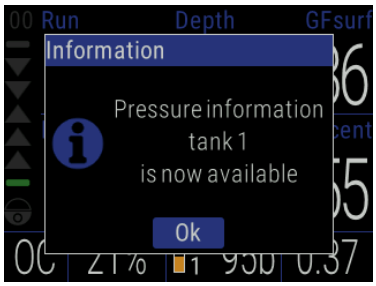
Moving the computer closer to the pressure sensor, **with antennas parallel**, within the optimal range will restore the connection, with data updated in approximately 3 seconds.

If the loss of connection lasts longer than a total of 1'45'', a series of 4 vibrations and a message alert the diver to the loss of connection:



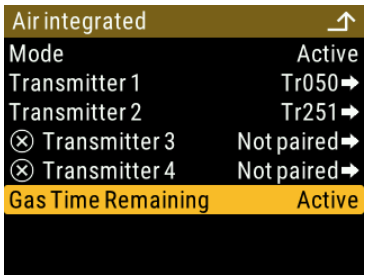
The alert message can be acknowledged ("OK") and cleared by simply pressing any of the 3 piezoelectric buttons.

When the connection is restored, a temporary message informs the diver that the situation has returned to normal:

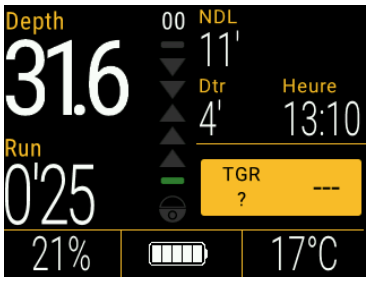


Temporary message indicating a return to normal when the ODC SENSOR connection is restored and after acknowledgment of the first alert message.

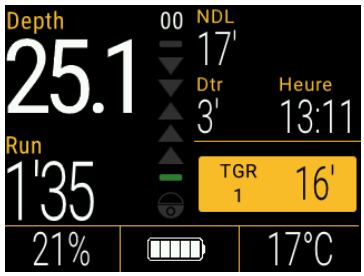
10.3. Specific alarms for the Gas Time Remaining option – gas consumption monitoring with ODC Sensor



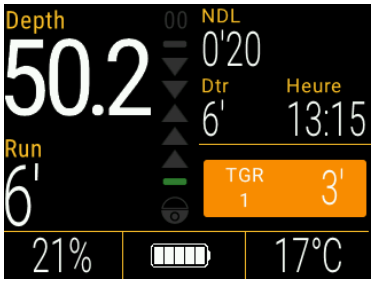
TGR mode activated



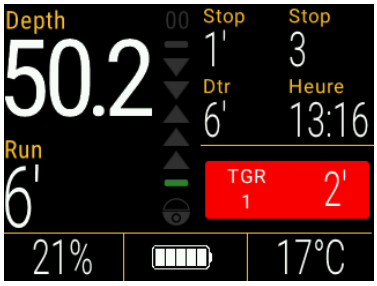
Consumption calculation



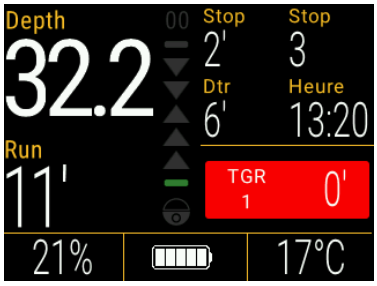
TGR displayed



3' of gas before reserve



2' before reserve



Reserve exceeded

The TGR (Gas Time Remaining) function requires the desired minimum reserve pressure and the cylinder volume to be entered. It calculates the remaining dive time taking into account the total ascent time (ASC), including decompression stops, so that the diver can reach the surface while keeping the defined reserve pressure.



The TGR is an estimate based on the calculated gas consumption.
Any increase in actual consumption may reduce the time available and compromise the planned reserve pressure. The diver must keep an appropriate safety margin.

10.4. Visual ascent rate indicator VR



Slow rate



Normal rate



Fast rate



Fast, non-compliant



Rate too high



Excessive rate – danger!

Example with a VR setting* of 12 m/min
(*see Personal menu / Ascent rate)

11. Repetitive dives

When several dives are performed within the same period, the amount of residual dissolved gas remaining in the body after a dive must be taken into account to ensure appropriate decompression during subsequent dives.
The ODYSSEY computer incorporates a patented repetitive dive management system specifically designed to improve diver safety during repetitive dives.

Limitations of Haldanian models for repetitive dives:
Bühlmann-type algorithms, like all Haldanian models, were historically designed to manage a single dive. In the case of repetitive dives, the decompression calculation must therefore be adapted to take into account the residual gas load from previous dives.

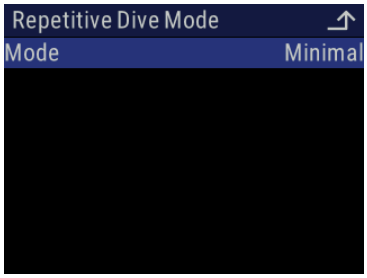
To meet this requirement, ODYSSEY offers **three levels of conservatism specific to repetitive dives**, without modifying the Gradient Factor setting selected by the user:

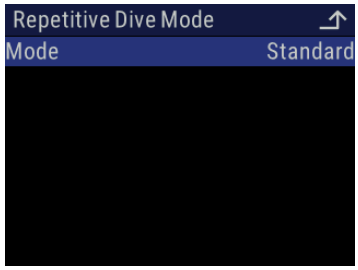
- Standard level (default setting): this level is designed to approximate the repetitive dive management of the Canadian DRDC tables. It offers a balanced compromise between safety and decompression time.

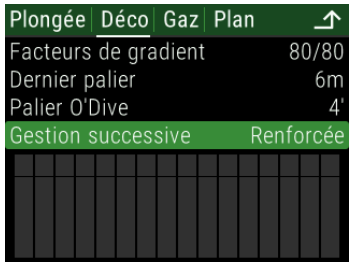
- **Minimum level**, below the standard level: this setting applies a reduced penalty, resulting in shorter decompression times for the same sequence of dives.

- Increased level, above the standard level: this setting introduces increased conservatism, extending decompression times to strengthen the safety margin during repetitive dives.

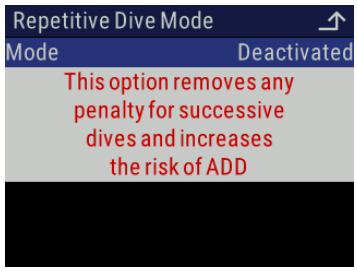
Disabling the safety mechanism:
The repetitive dive safety mechanism can be disabled.
In this case, the Bühlmann algorithm operates without any specific decompression penalty for repetitive dives. This configuration reduces safety margins and increases the risk of decompression sickness (DCS) in several situations.







Default setting



Mechanism disabled

For more information on repetitive dive management and the conditions under which the absence of a specific penalty may reduce the safety margin, refer to:

Alain Foret, Éric Frasquet
Ordinateurs de plongée et absence de surpénalisation des plongées successives (Dive computers and the absence of over-penalization of repetitive dives)
Worldivers Research & Reports, Montpellier, France
December 23, 2023

12. ODYSSEY navigation compass

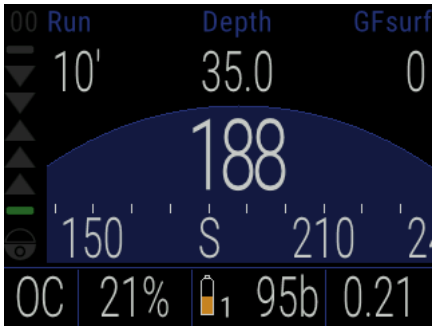
The ODYSSEY computer has a digital compass allowing underwater navigation with a stored heading. The compass display reduces the digital information fields in favor of the compass. This display change can be made during the dive by pressing the Center and Right buttons simultaneously, or Center and Left, depending on the “Position” setting in the Personal menu (see below).



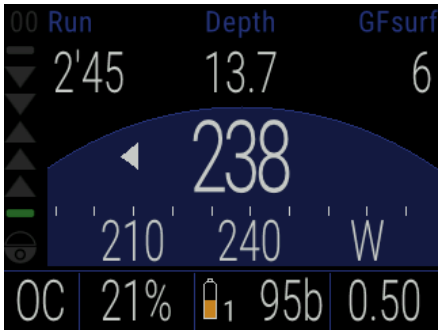
When the compass screen is displayed, pressing the Left and Right buttons simultaneously stores the heading to follow.
The arrow indicator shows left or right drift beyond a 5° deviation from the selected heading:



Heading tracked at 231°



No heading selected



Drifting right – go left



Drifting left – go right

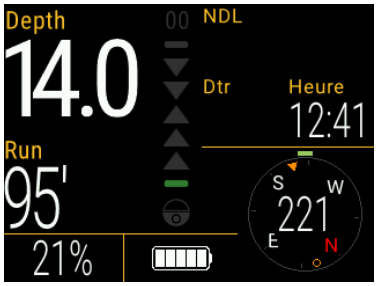
Selecting the Left or Right compass control setting:

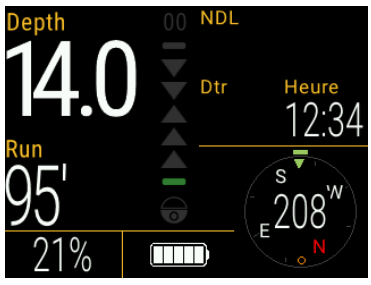
- In the “Personal” menu, set “Position” to Left or Right according to the wrist on which the computer is worn. In the Left position, the compass is displayed by pressing Center + Right; in the Right position, by pressing Center + Left.

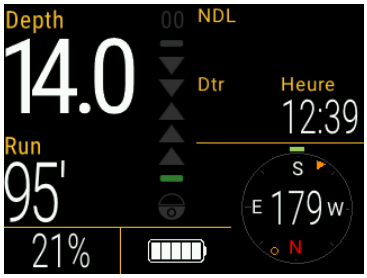




- Compass display in recreational mode with the same functions:







13. Firmware update and Bootloader mode features

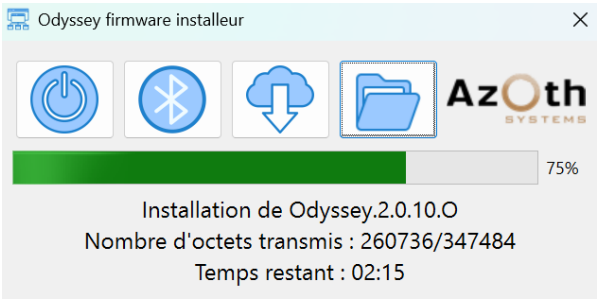
Since version 2.0.11, the firmware is updated from the “Transfer” menu, without restarting in Bootloader mode.

Update procedure:
1. Download the latest firmware and the ODYSSEY Update Tool software (version 1.3.0 or later), available for PC and Mac at https://o-dive.com/doc-odyssey/.
2. Check that the battery indicator shows at least 1 bar.
3. On the ODYSSEY, open the “Transfer” menu. Restarting in Bootloader mode is no longer necessary.
4. From the software, establish the Bluetooth connection and start the transfer.
5. The new firmware is only installed once it has been fully received: if the connection is interrupted, the existing firmware is retained. Since version 2.0.13, the transfer can be resumed from where it stopped.
6. After the restart, check the version number (“System” menu, “Firmware” item), then check the settings: gases, Gradient Factors and dive mode.

Up to version 2.0.10, the firmware was updated from the “System” menu, via the Bootloader mode described below. Since version 2.0.14, the “Firmware” item of this menu opens a dialog box showing the bootloader and firmware versions and identifiers. The following paragraphs and screenshots describe the operation of earlier versions.

The Bootloader is used to update the firmware and to view the computer’s self-test. In the Bootloader, Bluetooth is enabled in “update” mode and the following information is available:





Each indicator light shows the operating status of the components listed and tested by a self-test program.
They should all be green, except for the flash memory, which is on standby in this mode, and the wet contacts, which are dry.
The battery voltage in millivolts, the atmospheric pressure in mbar and the temperature in °C (instantaneous reading) can also be viewed in this mode.

14. Care

The computer must be thoroughly rinsed with fresh water after each use, dried and stored in a dry, well-ventilated place away from light.
Check the condition of the O-ring at each battery replacement (see §3.2) and replace it if damaged.

15. Maintenance

It is recommended to have the product's accuracy (depth measurement) checked within 2 years of its first use or after 200 dives (whichever comes first), after any significant impact, or in case of doubt.
This check can be carried out by a technical center (equipped with the appropriate facilities and measuring instruments) that is a member of, or approved by, Azoth Systems.

16. Warranty

The ODYSSEY dive computer is covered by a two-year warranty against manufacturing and operating defects.
The warranty does not cover defects or failures resulting from:

- excessive impacts or shocks;
- any disassembly of the computer by a person not authorized by Azoth Systems;
- pressure tests not performed in water.

17. Compliance

The ODYSSEY dive computer complies with the European standard EN 13319:2000 (NF EN 13319) – Depth gauges and combined depth and time measuring devices – Functional and safety requirements, test methods.
When used with the ODC SENSOR pressure sensor, the ODYSSEY dive computer complies with the European standard EN 250:2014 – Respiratory equipment – Open-circuit self-contained compressed air diving apparatus – Requirements, testing and marking.
Hereby, AZOTH SYSTEMS declares that the radio equipment type ODYSSEY is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://o-dive.com/declaration-de-conformite/.

18. Manufacturer

AZOTH SYSTEMS SAS
Place Georges Pompidou
Maison du Numérique et de l'Innovation
83000 Toulon
France
www.azoth-systems.com
contact@azoth-systems.com



This device must be disposed of as electronic waste through an appropriate collection channel. Do not dispose of it with household waste.

Glossary

- Bootloader: System menu for updating the firmware
- CC: Closed Circuit (CCR)
- CNS: Central Nervous System Oxygen Toxicity
- OC: Open Circuit
- RUN: Total Dive Time
- ASC: Total Ascent Time
- ASC+5: Predicted ASC if staying 5 more minutes at the current depth
- ASC BG: Predicted ASC “Back Gas”, i.e. remaining on the bottom gas used without switching to a decompression gas
- Firmware: Computer software
- Air integrated: Menu for managing the cylinder pressure transmitter(s)
- ST: Surface Time
- Logs: Data files of the dives stored in the computer
- NDL (No Decompression Limit): Time remaining without decompression stop
- ODC: O’Dive Computer – Azoth Systems range of dive computers
- ODYSSEY: Model of the ODC range designed for technical open-circuit and closed-circuit (rebreather) diving, with a simplified mode for recreational diving.
- ODC-M: ODC range of dive computers marketed to the military
- ODC-R: ODC range of dive computers marketed to the general public
- ODC SENSOR: Pressure sensor for dive cylinders, connectable to AZOTH SYSTEMS computers
- OTU: Oxygen Time Unit
- Oxy: 100% oxygen
- Pmax: Maximum depth reached during the dive
- VR: Ascent rate

End of document