



Smart Air Dive Computer

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• IMPORTANT WARNINGS

No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form without the written permission of Mares S.p.A.

Mares adopts a policy of continuing improvement, and therefore reserves the right to make changes and enhancements to any of the products described in this manual without notice.

Under no circumstances shall Mares be held responsible for any loss or damage sustained by third parties deriving from the use of this instrument.

WARNING

A dive computer is an electronic instrument and as such it is not immune to failure. To protect yourself against the unlikely event of a failure, in addition to the dive computer, also use a depth gauge, a submersible pressure gauge, a timer or watch, and dive tables.

WARNING

Do not dive if the display appears unusual or unclear.

WARNING

The dive computer must not be used in conditions that preclude its use (e.g.: low or no visibility, making it impossible to read the gauge).

WARNING

The dive computer cannot ensure against possible decompression sickness.

DISCLAIMER

This manual describes how to operate an instrument and it describes the information provided by the instrument during a dive. Neither this manual nor the instrument are a substitute for dive training, common sense and good diving practices.

How the information provided by the instrument is interpreted and put to use by the diver is not the responsibility of Mares. Read the manual carefully and make sure you understand completely how the instrument works and the information it provides during a dive, including information on depth, time, decompression obligations and all warnings and alarms. Unless you fully understand how the instrument works and the information it displays and unless you accept full responsibility for using this instrument, do not dive with it.

• 1. INTRODUCTION

1.1. GLOSSARY

AIR:	Air dive
	Symbolizes decompression stop violation.
	Symbolizes uncontrolled ascent and uncontrolled ascent violation.
ASC:	Total ascent time, the time it takes to perform the ascent from your current depth to the surface in a decompression dive, including all decompression stops and assuming an ascent rate of 10m/min or 33ft/min.
AVG:	Average depth, calculated from the beginning of the dive.
CNS:	Central Nervous System. CNS% is used to quantify toxic effects of oxygen.
DESAT:	Desaturation time. The time needed for the body to eliminate the nitrogen taken up during diving.
Gas switching:	The act of changing from one breathing gas to another.
Max depth:	Maximum depth attained during the dive.
MOD:	Maximum Operating Depth. This is the depth at which the partial pressure of oxygen (ppO ₂) reaches the maximum allowed level (ppO ₂ max). Diving deeper than the MOD will expose the diver to unsafe ppO ₂ levels.
Multigas:	Refers to a dive in which more than one breathing gas is used (air and/or Nitrox).
Nitrox:	A breathing mix made of oxygen and nitrogen, with the oxygen concentration being 22% or higher.
NO FLY:	Minimum amount of time the diver should wait before taking a plane.
No deco time:	This is the time that you can stay at the current depth and still make a direct ascent to the surface without having to perform mandatory decompression stops.
O₂:	Oxygen.
O₂%:	Oxygen concentration used by the computer in all calculations.
P Factor:	Personalization factors, which allow the user to select between the standard decompression algorithm (P0) and an increasingly more conservative one (P1, P2).
ppO₂:	Partial pressure of oxygen. This is the pressure of the oxygen in the breathing mix. It is a function of depth and oxygen concentration. A ppO ₂ higher than 1.6bar is considered dangerous.
ppO₂max:	The maximum allowed value for ppO ₂ . Together with the oxygen concentration it defines the MOD.
Switch depth:	The depth at which the diver plans to switch to a higher oxygen concentration mix while using the multigas option.
S.I.:	Surface interval.

1.2. OPERATING MODES

The functions of the Smart Air computer can be grouped into two categories, each corresponding to a specific mode of operation:

- watch mode: Smart Air is dry on the surface. In this mode you can use it as a normal watch. You can also change settings, review your logbook, use the dive planner, see remaining desaturation after a dive, download to PC and much more;
- dive mode: Smart Air monitors depth, time, temperature and performs all decompression calculations; dive mode itself can be broken down into 4 sub categories:
 - pre-dive (Smart Air is on the surface but actively monitoring ambient pressure, so that it can begin to calculate a dive the instant it is submerged below 1.2m/4ft);
 - dive;
 - surfacing (Smart Air is on the surface at the end of a dive; dive time calculation is halted but if the diver submerges within three minutes the dive is resumed including the time spent on the surface);
 - post-dive (after the three minutes of surfacing mode, Smart Air closes the logbook and reverts to a display showing desaturation time, no-fly time and surface interval; this lasts until the desaturation and the no-fly time both have been reduced to zero).

1.3. USER-REPLACEABLE BATTERY

Smart Air uses a CR2450 user-replaceable battery. See section 4.2.1 for instructions on how to replace it. Good quality batteries should suffice for approx 100-150 dives, depending on the usage of the backlight and the temperature of the water. Diving in cold water, usage of the backlight and of the beeper increases battery consumption.

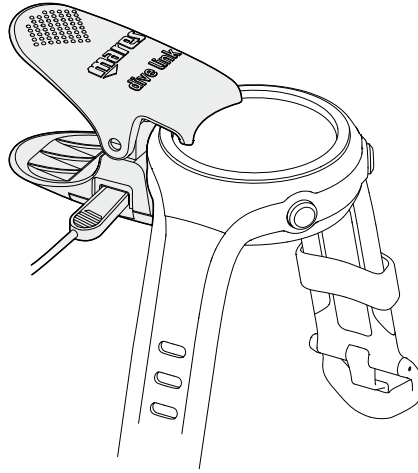
The display alerts you of the status of the battery. The three possible situations are described as follows:

- battery symbol not visible: the remaining battery charge is adequate for diving;
- steady battery symbol on the display: there is enough charge for a few more dives, but you should consider replacing the battery at the next opportunity;
- blinking battery symbol on the display (surface only): the battery is too weak for diving. Smart Air will not function as a dive computer and will not turn on if submerged.

The level of the battery charge can also be found on the "INFO" page (see section 2.8).

1.4. CONNECTING SMART AIR TO A PC OR MAC

To connect Smart Air to a PC or Macintosh computer, use the optional clip and the USB cable and Dive Organizer to download your dives to a PC or Divers' Diary to download your dives to a Mac. Both software programs can be downloaded from www.mares.com.



1.5. BUTTON OPERATION

Smart Air has 2 buttons, labelled **UP/ENTER** and **DOWN/ESC**. Each button can be pressed and released to perform one function (**up** and **down**) and pressed and held for one second to perform a different function (**enter** and **esc**). We'll refer to them as **UP** and **DOWN** button in the remainder of this manual.

On the surface pressing and releasing either button allows to scroll through menus, settings and values. Pressing and holding the **UP** button enters into a menu or confirms a setting, while pressing and holding the **DOWN** button exits from a menu and goes up one level.

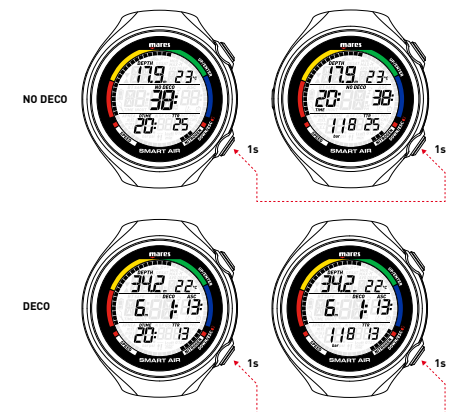
During the dive, the **UP** button modifies the top row (depth information) whereas the **DOWN** button modifies the lower right corner of the display. From the main watch display and in dive mode, press and hold the **UP** button (⬆) to activate the backlight.

The function of the **DOWN** button during the dive deserves a particular mention already at this stage of the manual (it is described in more detail in section 3.3).

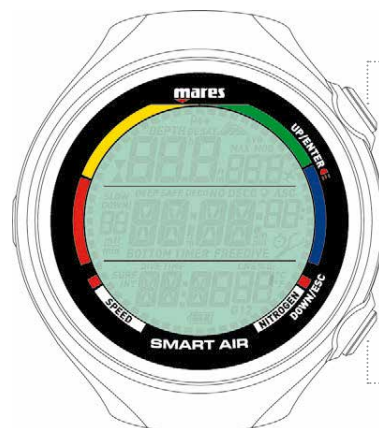
Smart Air shows the tank pressure as an arc spanning the upper half of the display perimeter, in a fashion similar to an analog gauge with a needle pointing to a position along the arc. The arc is composed of 36 of the 60 dots representing the seconds in normal watch operation. A 200bar/3200psi tank is represented with all 36 dots lit, which gradually turn off as the tank is breathed down during the dive, mimicking the movement of a needle in the analog gauge.

In addition to this graphic representation, Smart Air can show the tank pressure also as a numeric value. In **NO DECO** mode, this forces the dive time and no deco time to share the center row, with a slight reduction in size for the no deco time. In **DECO** mode the dive time cannot be moved to the center row, so that the numeric value of the tank pressure on the display **replaces** the dive time.

To switch between the two options, whether in **NO DECO** or in **DECO**, press and hold the **DOWN** button.



An overview of the button function both in surface mode and during a dive is presented here below.

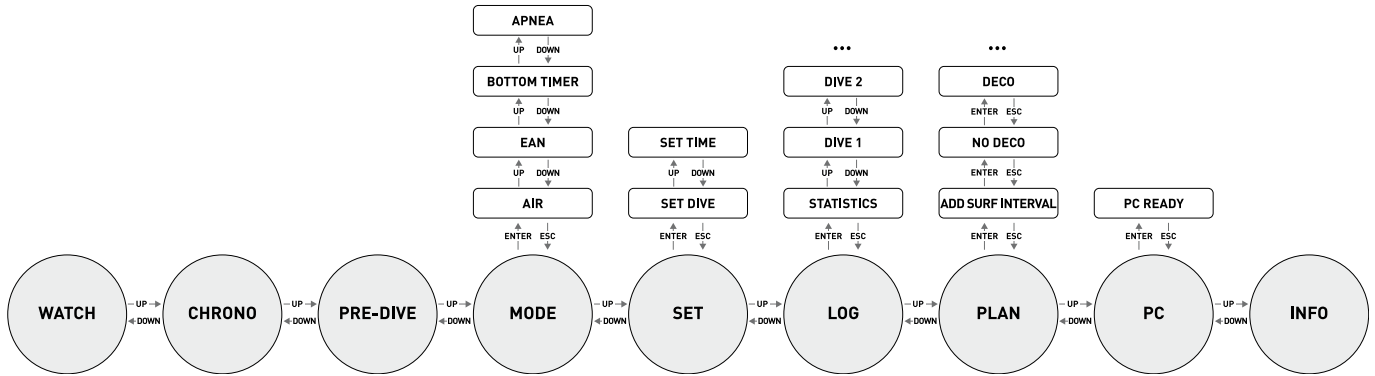


	PRESS	PRESS AND HOLD
WATCH	Scroll up or increase by 1	From time of day display: backlight From all others: enter a submenu or confirm a setting
DIVE	Modify top row	Backlight

	PRESS	PRESS AND HOLD
WATCH	Scroll down or decrease by 1	Go back one level
DIVE	Modify bottom row	Switch between dive time and tank pressure in lower left corner. (Multigas only: - Activate gas switch process - Confirm gas switch)

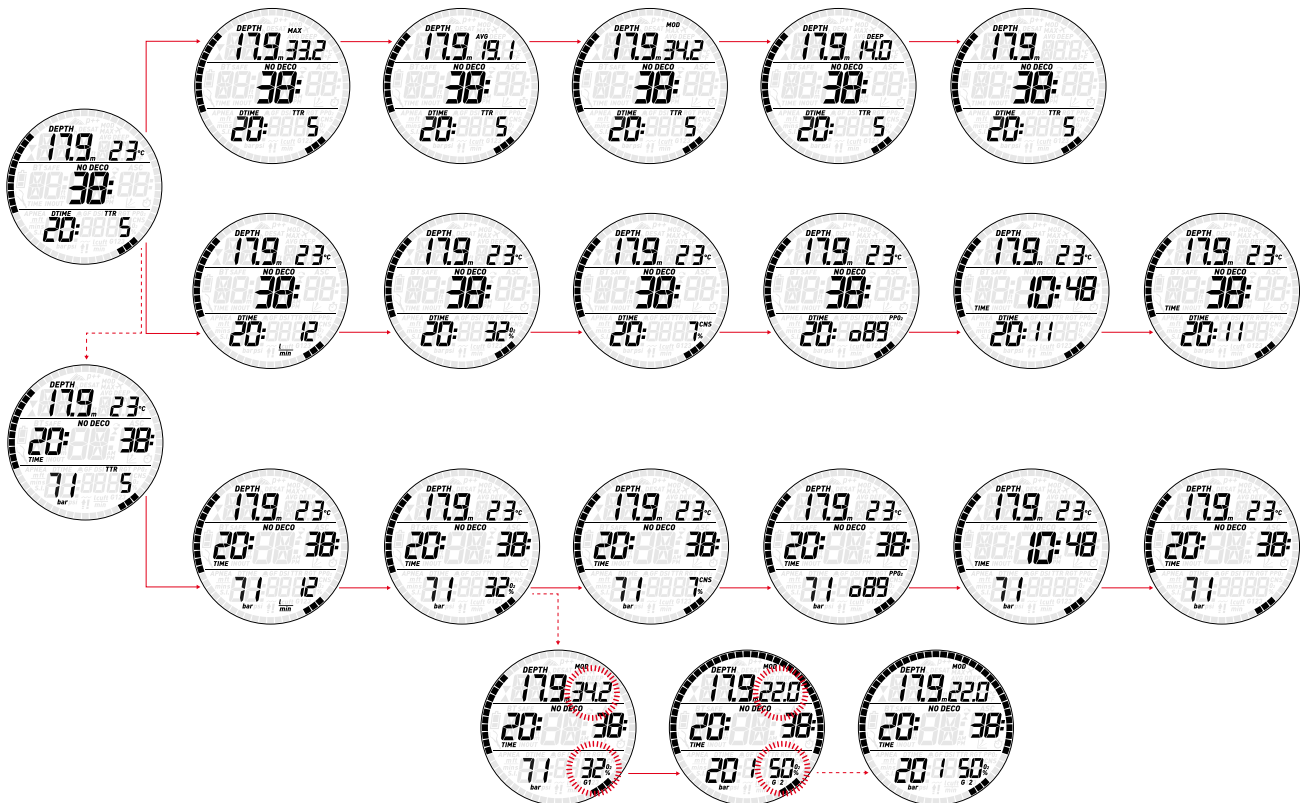
SURFACE MODE

- press
- > press and hold



DIVE MODE

- press
- > press and hold



1.6. WATCH DISPLAY

The watch display is the “home” display of Smart Air. In this mode, the time of day is shown in the middle row of the display while date, temperature, seconds, wake-up time and second time can be displayed by pressing the **DOWN** button. Note that the temperature reading will be affected by your body heat while you are wearing the watch. A growing or diminishing ring of 60 dots around the perimeter of the display represents the seconds.

When the wake-up time is displayed, pressing and holding the **DOWN** button turns the wake-up alarm on or off.

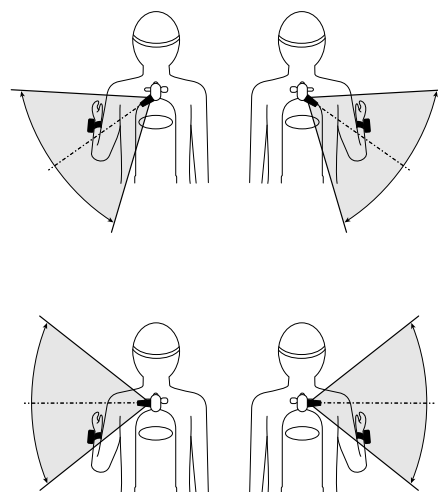
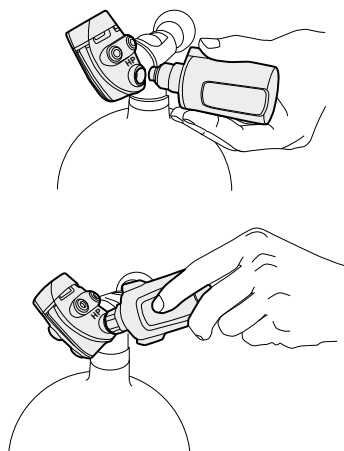


When the second time is displayed, pressing and holding the **DOWN** button switches main time and second time.



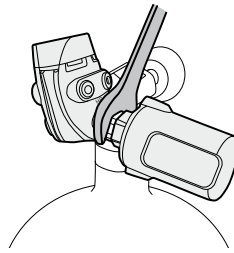
1.7. MOUNTING AND PAIRING OF THE TANK MODULE (OPTIONAL)

Smart Air can communicate with up to 3 tank modules regarding tank pressure and gas consumption information. Each tank module needs to be mounted on a high pressure port of a first stage regulator.



To pair the tank module with the Smart Air, proceed as follows:

- Open the tank valve to pressurize the tank module. **You now have two minutes to perform all steps listed below;**
- Go into SET/SET DIVE/GAS INTEGR/PAIR.



In order for Smart Air to display tank pressure and gas consumption information, you must first establish a channel of communication between the tank module and Smart Air. This is called **pairing**. This operation needs to be performed only once and ensures a permanent and interference-free link between the two devices.

NOTE

To perform the pairing operation, the tank module must be pressurized to at least 15bar/220psi. Hence it must be mounted on a first stage regulator, which is itself mounted on a full scuba tank and the valve opened.

To mount the tank module on the first stage regulator, first remove the high pressure port plug, then screw in the tank module gently by hand until you feel a minimum of resistance, then use a 19mm wrench to tighten it.

NOTE

- Do not force the tank module while holding it by the plastic cap.
- Do not overtorque while using the wrench: the o-ring seal is assured as soon as you feel the first resistance. The only reason for using a wrench to tighten a bit more is to prevent the tank module from unscrewing itself over time.

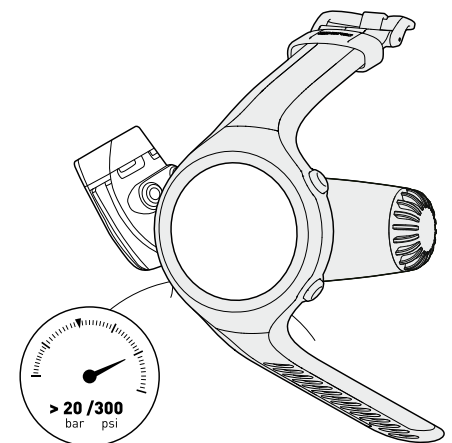
The Mares tank module communicates via radio frequency with Smart Air. For best transmission, we recommend positioning the tank module as described in the next figures.



- The display will show **G1** in the lower right corner and the word **PAIR** in the middle. The lower left corner shows the letters **nP** (Not Paired) or **P** (Paired) to indicate the current status of that channel. Use the **UP** and **DOWN** buttons in case you are trying to pair channel **G2** or **G3**.



- Place Smart Air onto the tank module so that there is contact between tank module and Smart Air as shown below.



- Press **ENTER** and wait until **OK** appears on the display, in which case you have successfully established a connection. If **OK** does not appear on the display you need to repeat the operation, **but you must turn off the valve and depressurize the first stage completely, then wait 20 seconds before attempting again.**



NOTE

- When diving with more than one gas mixture, tanks **G1**, **G2** and **G3** must be set to increasing oxygen levels. Refer to section 3.5 for more information on multigas diving.
- A tank module can only be paired to one channel on one Smart Air. If you pair the same tank module to a second channel on the same Smart Air or to a second Smart Air, the first one will be erased.

After a successful pairing of **G1** to Smart Air, the pre-dive display will show the tank pressure in either **bar** or **psi**. If tank **G1** has not been paired, Smart Air will show **nP** instead of a pressure value. If **G1** has been paired but Smart Air is not receiving any signal, it will show - - - instead of a pressure value.



NOTE

- The Mares tank module has a range of approximately 1.5m/5ft.
- The tank module turns on automatically upon pressurization to at least 10 bar / 145 psi. It turns off automatically when the pressure drops below 10 bar / 145 psi.
- In order to save battery power, the tank module turns itself off also when the pressure does not change over more than 4 minutes. The tank module turns itself on again when a difference of pressure of more than 1 bar / 14.5 psi is sensed.
- If a tank module battery is weak, Smart Air alerts you by blinking the battery symbol together with **G1** (or **G2** or **G3**) in the upper right corner.

Refer to the dedicated tank module manual for information on how to replace the battery in the tank module.

NOTE

- You do NOT need to repeat the pairing procedure after a battery replacement in the tank module.
- You do NOT need to repeat the pairing procedure after a battery replacement in Smart Air.
- You do NOT need to repeat the pairing procedure after upgrading the firmware in your Smart Air.

• 2. MENUS, SETTINGS AND FUNCTIONS

This chapter describes in detail all menus, setting and functions of the Smart Air dive computer.

From the time of day display, pressing the **UP** button allows you to scroll through the following sequence of menus (note that once inside the menu loop, pressing the **DOWN** button scrolls through the menus in reverse sequence):

- **CHrOnO**: allows you to operate Smart Air like a normal stopwatch;
- **PRE dIVE**: places Smart Air in the ready-to-dive mode;
- **MOdE**: allows you to set the computer to air, nitrox or bottom timer mode;
- **SEt**: allows you to view and change all settings relative to the dive computer;
- **LOG**: allows you to access the detailed history of the dives performed;
- **PLAN**: allows you to plan dives as a function of depth based on your current nitrogen load;
- **PC**: allows you to download dives to a PC or Mac
- **InFO**: allows you to view information about software and hardware of your Smart Air.

The **pre-dive** mode puts the computer in a ready-to-dive mode and ensures that Smart Air starts to monitor the dive as soon as a depth of 1.2m/4ft is reached. If you start the dive without putting Smart Air into **pre-dive** mode, it will start to monitor the dive automatically but with a delay of up to 20 seconds from immersion.

The pre-dive display shows p factor and altitude settings, time of day and tank pressure (if a tank module is paired, active and Smart Air is within 1.5m/5ft of the tank module). If Nitrox is set, it will show the O₂ percentage and the corresponding MOD.



NOTE

- If you remain in pre-dive for longer than 3 minutes without pressing any button, Smart Air will revert to normal watch operation.
- It is recommended to put Smart Air into pre-dive before submerging. Not doing so can lead to a delay of up to 20s in Smart Air monitoring the dive.

2.1. CHrOnO



Press and hold the **UP** button to enter this menu. The middle row now features a stopwatch while the time of day has moved to the bottom row. Press the **UP** button to start and stop the time, then press the **DOWN** button to reset the time to zero. Press and hold the **DOWN** button to exit from the stopwatch function (this stops and resets the stopwatch if it was running or stopped at a non-zero value upon exiting).



The stopwatch features also a split-time function: by pressing the **DOWN** button while the stopwatch is running, the time itself will freeze while **SPL** blinks in the top row and the stopwatch continues in the background. Every time you press the **DOWN** button the split time will refresh with the new value. Press and hold the **DOWN** button to exit the split-time mode. Note that while in split-time mode, the **UP** button has no function.

2.2. PRE dIVE



Press and hold the **UP** button to enter this menu and put Smart Air into the ready-to-dive mode.

2.3. MOdE



Here you can define the type of gas you will be breathing during the dive (air or enriched

Smart Air Dive Computer

air nitrox, including multigas). You can also set Smart Air to bottom timer (**BT**), in which case Smart Air will show only time, depth, tank pressure and temperature: it will not carry out any decompression calculation and it will not show any warnings and alarms. You can set Smart Air also to **APNEA**, which in essence is a bottom timer with special features dedicated to apneists.

Press the **UP** or **DOWN** button to scroll through the four possible options (**AIR**, **EAN**, **BT** or **APNEA**), then press and hold the **UP** button to select it.



AIR is the equivalent of setting **EAN** to 21% and a ppO_2 max of 1.4bar, but simplifies the display a bit by not showing the CNS (its value however is calculated in the background and if needed the 75% warning and the 100% alarm are triggered).

When selecting **EAN**, you are taken to a submenu in which you can define the percentage of oxygen in the mixture (% O_2) and the maximum value of oxygen partial pressure (ppO_2 max) for up to three breathing mixes. The maximum possible value for the ppO_2 max is 1.6bar. Most training agencies recommend not to exceed a value of 1.4bar.



Once inside this menu, press the **UP** or **DOWN** button to change the O_2 % and observe how this affects the maximum operating depth (MOD). Then press and hold the **UP** button to move on to the ppO_2 max and use the **UP** or **DOWN** button to change the value, again noticing how this affects the MOD. Press and hold the **UP** button again to save the setting.



This leads you to the **G2 OFF** screen. Press and hold the **DOWN** button to exit the menu or go to section 3.5 to read about diving with more than one gas.



⚠ WARNING

- Diving with Nitrox may only be attempted by experienced divers after proper training from an internationally recognized agency.
- Before every dive and after changing the tank, you must make sure that the set oxygen concentration in Smart Air corresponds to the oxygen concentration in the tank. Setting the wrong oxygen concentration can lead to serious injury or death.

2.4. SET



Smart Air's **SET** menu allows you to change settings. Once inside this menu, press the **UP** or **DOWN** button to scroll between two submenus: **SET DIVE**, where you can set parameters pertaining to the dive, and **SET TIME**, where you can set parameters pertaining to time and date.

Press and hold the **UP** button to enter a menu, press the **UP** or **DOWN** button to scroll up and down between available options or to increase or decrease the value of a setting. Then press and hold the **UP** button to confirm the change in setting. Press and hold the **DOWN** button to go up one level in the menu tree.

MENU	Description
SET DIVE	
- LGHT	Allows you to set the duration after which the backlight turns off automatically. You can set this between 1 and 10 seconds.
- P FACT	Allows you to choose between the standard algorithm (P0) and an increasingly more conservative one (P1 , P2).
- ALt	Allows you to set the algorithm into altitude mode when diving in mountain lakes.
- WAtR	Allows you to choose between salt (1.025kg/l) and fresh (1.000kg/l) water or EN-319 (1.0197kg/l), corresponding to the water density used in European Norm 13319.
- GAS IntEGr	Allows you to pair your Smart Air with optional tank modules and to define all parameters concerning gas integration (tank volume, half tank pressure and tank reserve).
- UnitS	Allows you to choose between metric (m , °C , bar) and imperial (ft , °F , psi) units.
- FAST	Allows you to turn off the dive violation due to uncontrolled ascent. This is for dive instructors only, who may find themselves in such a situation because of their teaching requirements.
- dEEP	Allows you to activate or deactivate the visualization of deep stops.
- ALAR	Allows you to turn on or off all audible alarms of Smart Air.
- ERASE	Allows you to reset the nitrogen saturation to zero, thereby erasing the effects of a previous dive. This is only for people who plan to lend their computer to another diver who has not performed a dive within the last 24 hours.
SET TIME	Allows you to set the time format, time and date, wake-up alarm and second time.

2.4.1. SET dIVE



2.4.1.1. LIGHT (BACKLIGHT)



Smart Air has a backlight which can be activated in case of low ambient light. The backlight is activated by pressing and holding the **UP** button. During a dive, the backlight will stay on for the duration defined in this menu. You can choose between 1 and 10 seconds.

NOTE

- The backlight consumes battery energy: the longer the backlight stays on, the less your battery will last.
- If the **low battery** warning is activated, the backlight will be disabled.

In surface mode, the backlight can be activated by pressing and holding the **UP** button. The backlight will stay on for 6 seconds, unless you go into any menu, in which case it will stay on until you return to the pre-dive display or after one minute of no button operation.

2.4.1.2. P FACT (P FACTOR)



Smart Air allows you to set an additional personal safety factor for those circumstances in which you want to be especially cautious, such as after a long period of inactivity or when planning a strenuous dive. In this menu you can choose between the standard algorithm (**P0**), a more conservative version (**P2**) or an intermediate one (**P1**). On the pre-dive, post-dive, logbook and planner displays, P1 is displayed with p+, P2 with p++ and P0 is indicated by the absence of symbols.

NOTE

The choice of **p factor** will be reflected in the dive planner.

2.4.1.3. ALT (ALTITUDE)



Atmospheric pressure is a function of altitude and of weather conditions. This is an important aspect to consider for diving, because the atmospheric pressure surrounding you has an influence on uptake and subsequent release of nitrogen. Above a certain altitude, the decompression algorithm has to change in order to account for the effect of the change in atmospheric pressure. When diving in a mountain lake, find out what the altitude is and choose the altitude range in Smart Air within the four available options:

- **A0**: from sea level to approximately 700m/2300ft;
- **A1**: from approximately 700m/2300ft to approximately 1500m/4900ft ;
- **A2**: from approximately 1500m/4900ft to approximately 2400m/7900ft;
- **A3**: from approximately 2400m/7900ft to approximately 3700m/12100ft;
- We do not recommend diving at altitudes above 3700m / 12100ft. If you do, set Smart Air to **bottom timer** and find appropriate altitude dive tables.

On the pre-dive, post-dive, logbook and planner displays, A1 through A3 are indicated with the mountain symbol filled with 1, 2 or 3 segments while A0 is indicated by the absence of symbols.

⚠ WARNING

Diving in mountain lakes without first setting Smart Air to the proper altitude setting can cause severe injury or death.

2.4.1.4. WAtR (WATER)



You can set the computer for **FRESH** water, **SALt** water or **EN-319** calibration, depending on where you intend to dive. Setting the wrong water type entails an error in depth measurement of 1-3% (e.g. at a depth of 30m/100ft, a computer set to salt water will show 29m/97ft in fresh water whereas a computer set to fresh water will show 31m/103ft in salt water). Note that this does not affect the proper functioning of the computer, since the computer performs all of the calculations based purely on pressure measurements.

2.4.1.5. GAS IntEGr (GAS INTEGRATION)

This menu contains five submenus. The first one allows you to pair the tank modules to Smart Air. Please refer to section 1.7 for the description of the pairing process.

The second menu, **tANK VOLM**, allows you to set the size of the volume of the tank, individually for **G1**, **G2** and **G3**. This parameter is important for a correct evaluation of your gas consumption in l/min or cu ft/min. Default setting is **12l** for metric system and **80 cubic feet** in imperial. For the imperial setting it is paramount that you also set the correct operating tank pressure, since the size of the tank is referenced to this pressure.



The third menu, **tANK OPERAt PrESS**, is where you define the nominal fill pressure of your tanks. This can be set individually for each tank (**G1**, **G2** or **G3**). When the units are set to ft/°F/psi, this value is important because together with the tank volume it allows Smart Air to correctly evaluate your gas consumption in cu ft/min. Default values are **200bar** and **3000psi**.



The fourth menu, **tANK WARN**, is the value at which Smart Air triggers a half tank warning. This can be set individually for each tank (**G1**, **G2** or **G3**). Default values are **100bar** and **1500psi**.



The fifth menu, **tANK RSRV**, is the value at which an alarm is triggered because you should always be at the surface before reaching this level. Furthermore, this value is used to calculate the **TTR** value (see section 3.2.5 and 3.3). This can be set individually for each tank (**G1**, **G2** or **G3**). Default values are **50bar** and **500psi**.



2.4.1.6. UnitS



You can choose between metric (depth in meters, temperature in °C) and imperial units. (depth in feet, temperature in °F).

2.4.1.7. Fast (FAST ASCENT)



A fast (uncontrolled) ascent is defined as one in which a speed of 12 m/min / 40ft/min or higher was maintained over more than two thirds of the way up. This applies to dives deeper than 12m/40ft only. In such an event, due to the potential of harmful bubble formation, Smart Air locks the computer for 24 hours in order to discourage you from diving again. In this menu, you have the option to disable the locking up of the computer in the event of an uncontrolled ascent.

⚠ WARNING

- An uncontrolled ascent increases your risk of decompression sickness (DCS)
- This feature is intended for very experienced divers only, such as dive instructors, who take full responsibility for the consequences of turning off this function.

2.4.1.8. ALAR (ALARMS)



In this menu you can disable audible alarms.

⚠ WARNING

Disabling audible alarms can lead you into potentially dangerous situation and could result in serious injury or death.

2.4.1.9. ERASE (ERASE DESATURATION)



Smart Air allows you to reset the desaturation in the computer. Any tissue saturation information from a recent dive will be reset to zero and the computer treats the next dive as a non-repetitive dive. This is useful when the computer is loaned to another diver who has not dived in the last 24 hours.

⚠ WARNING

Diving after having reset the desaturation is extremely dangerous and is very likely to cause serious injury or death. Do not reset the desaturation unless you have a valid reason to do so.

In order to prevent accidental desaturation reset, you must enter the security code once you decide to proceed with the reset. The security code is 1234.

After entering the security code you will get a confirmation of the successful completion of the operation.

2.4.2. Set TIME

This menu allows you to set the time format, time, date, wake-up alarm and second time (t2). Scroll through the options by pressing either button. Press and hold the UP button to edit an option, then press either button to modify the blinking value, then press and hold the UP button to confirm the new setting.



Smart Air features a "sleep" mode: in case you don't wear it other than on a dive trip, you can put Smart Air in sleep mode to reduce battery consumption. This turns off the display while

the watch is still active in the background. When in sleep mode, Smart Air consumes about half as much energy as when awake. To put Smart Air in sleep mode, press and hold the UP button when you see "Go to sleep" on the display. To wake up from sleep mode, press either button.



2.5. LOG (LOGBOOK)

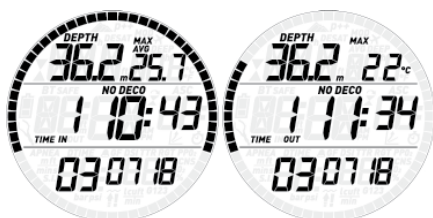


Smart Air can record the profiles of approximately 95 hours of diving, at a sampling rate of 5 seconds. The information can be transferred using the optional USB clip to PC via the Dive Organizer software or to a Mac via the Divers' Diary software. In addition, Smart Air can show most of the information directly on the display.

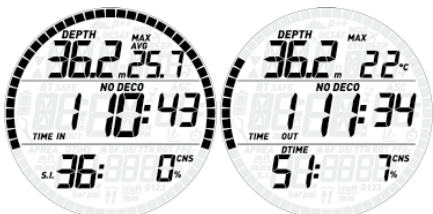
When you first enter the logbook menu, you will see a summary of all dives performed to date. In particular, the maximum depth ever reached, the total number of dives, the total number of hours spent underwater and the coldest water temperature recorded.



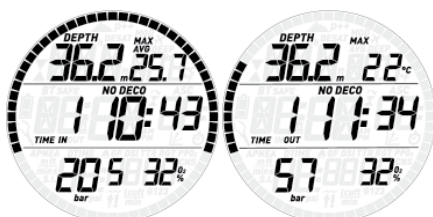
From here, press the UP button to scroll through all dives in the memory of the computer. Each dive has three or more pages of data. Page 1 has maximum depth of the dive in the upper left corner while minimum temperature and average depth alternate every 2s in the upper right corner. In the center row time in and time out alternate on the right side of the screen while a sequential dive counter (1 being the most recent dive) is shown to the left. The bottom row shows the date of the dive.



Press and hold the **UP** button to view the next page of the dive log, which shows the surface interval prior to the dive alternating with the dive time and **CNS** (alternating between start and end value) in the bottom row.



Press **UP** again to view beginning and ending tank pressure alternating in the bottom left corner while the $O_2\%$ of the gas is shown to the right.



In case more than one gas was used in the dive, pressing **UP** shows pressure and O_2 information for G2 and, if applicable, pressing **UP** again shows the information for G3.

Press and hold the **DOWN** button to return to the list of the main logbook menu.

2.6. PLAN (DIVE PLANNER)



This function allows you to plan your next dive. Upon entering this menu, the display lists the settings used for the calculation: P Factor and Altitude selections. The bottom row shows a surface interval of 0:00: in case you dived recently, you can enter an additional surface interval between now and when you intend to dive by pressing the **UP** button: the residual nitrogen load will be adapted accordingly. Next press and hold the **DOWN** button to enter the actual dive plan: Smart Air displays a depth and the corresponding no deco time. In the bottom row it lists the oxygen concentration of G1.



Use the **UP** and **DOWN** buttons to increase/decrease the depth in 3m / 10ft increments (limited to the MOD of G1) and view the related no deco time. Press and hold the **UP** button to enter deco planning: Smart Air will add one minute to the no deco time and show the corresponding deco obligation. Now use the **UP** and **DOWN** buttons to modify the dive time and view how this affects the deco calculation. Press and hold the **DOWN** button to return to the no deco dive planner. From here either choose a different depth and repeat a deco plan or press and hold the **DOWN** button to exit the dive planner.



NOTE

The dive planner is enabled only if either air or nitrox mode is set

2.7. PC



This submenu allows you to download your dive data to a PC or Mac. Press the **ENTER** button and the display will show **PC ready**, symbolizing that Smart Air is ready to communicate.



2.8. INFO



This submenu provides information about the hardware and software of your Smart Air and about the status of the battery: **OK** means the battery is good, **LO** means the battery is weak but you can still do a few more dives, and **KO** means the battery is very low and Smart Air won't function as a dive computer.



3. DIVING WITH SMART AIR

3.1. A FEW WORDS ABOUT NITROX

Nitrox is the term used to describe breathing gases made of oxygen-nitrogen mixes with an oxygen percentage higher than 21% [air]. Because Nitrox contains less nitrogen than air, there is less nitrogen loading on the diver's body at the same depth as compared to breathing air.

However, the increase in oxygen concentration in Nitrox implies an increase in oxygen partial pressure in the breathing mix at the same depth. At higher than atmospheric partial pressures, oxygen can have toxic effects on the human body. These can be lumped into two categories:

- Sudden effects due to oxygen partial pressure over 1.4bar. These are not related to the length of the exposure to high partial pressure oxygen, and can vary in terms of the exact level of partial pressure they happen at. It is commonly accepted that partial pressures up to 1.4bar are tolerable, and several training agencies advocate maximum oxygen partial pressures up to 1.6bar.
- Long exposure effects to oxygen partial pressures over 0.5bar due to repeated and/or long dives. These can affect the central nervous system, cause damage to lungs or to other vital organs.

Smart Air keeps you safe with respect to these two effects in the following ways (as long as it is set to either **air** or **nitrox**):

- Against sudden effects: Smart Air has an MOD alarm set for a user-defined ppO_2max . As you enter the oxygen concentration for the dive, Smart Air shows you the corresponding MOD for the defined ppO_2max . The default value of ppO_2max from the factory is 1.4bar. This can be

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adjusted to your preference between 1.2 and 1.6bar. Please refer to section 2.1 for more information on how to change this setting. If Smart Air is set to air, the ppO_2 max is set to 1.4bar by default.

- Against long exposure effects: Smart Air "tracks" the exposure by means of the CNS% (Central Nervous System). At levels of 100% and higher there is risk of long exposure effects, and consequently Smart Air will activate an alarm when this level of CNS% is reached. Smart Air also warns you when the CNS level reaches 75%. Note that the CNS% is independent of the value of ppO_2 max set by the user.

3.2. ALARMS

Smart Air can alert you of potentially dangerous situations. There are six different alarms:

- Ascent rate alarm;
- Exceeding a safe ppO_2 /MOD;
- CNS =100%;
- Missed decompression stop;
- Low tank pressure;
- Low battery during the dive.

⚠ WARNING

When in bottom timer mode, all warnings and all alarms are OFF aside for the low battery alarm and tank reserve alarm.

NOTE

- Alarms are both visual and audible, as described in detail below.
- Ascent rate alarm has priority over other alarms if they are triggered simultaneously.

3.2.1. ASCENT RATE

As soon as depth decreases by more than 80cm / 3ft Smart Air activates the ascent rate control algorithm and displays the calculated value. This is shown in the lower left corner.

⚠ WARNING

A rapid ascent increases the risk of decompression sickness.

If Smart Air determines an ascent rate of 10m/min / 30ft/min or higher, the fast ascent alarm is triggered: an audible alarm goes off and **SLOW** appears blinking on the display. This persists until the ascent rate is reduced to 10m/min / 30ft/min or less.



If the ascent rate exceeds 12m/min / 40ft/min at a depth below 12m / 40ft, **!!** blinks as well. If a speed in excess of 12m/min / 40ft/min is maintained for two thirds or more of the depth at which the alarm was first triggered, Smart

Air considers it a dive violation and the display will show the steady **!!**.



In this case, if the diver attempts a repetitive dive after surfacing, Smart Air will only function as a depth gauge and timer (bottom timer mode), and will display **!!** on the screen throughout the dive.

3.2.2. MOD/ ppO_2

⚠ WARNING

- The MOD should not be exceeded. Disregarding the alarm can lead to serious injury or death.
- Exceeding a ppO_2 of 1.6bar can lead to sudden convulsions resulting in serious injury or death.

When the diver reaches a depth at which the ppO_2 of the inspired gas exceeds the maximum limit entered in the corresponding setting (from 1.2 to 1.6bar), an audible alarm goes off, the current depth starts to blink and the value of the MOD is shown to the right of the current depth, also blinking.

The alarm persists until the diver has ascended enough for the ppO_2 to return within the set limit.



⚠ WARNING

When the MOD alarm is triggered, ascend immediately until the alarm stops. Failure to do so could result in serious injury or death.

3.2.3. CNS = 100%

⚠ WARNING

When the CNS reaches 100% there is danger of oxygen toxicity. Start procedure to terminate the dive.

Oxygen toxicity exposure is tracked on Smart Air by means of the CNS% based on currently accepted recommendations for exposure limits. This toxicity is expressed as a percentage value which ranges from 0% to 100%. When the value reaches 75%, an alarm goes off and the CNS value blinks on the screen. Additionally the CNS becomes the default item in the lower right corner: if you call up other information after 8 seconds the CNS appears again. Ascend to shallower depth to decrease oxygen loading and consider terminating the dive.



When the oxygen toxicity level reaches 100% the alarm is repeated for 5 seconds in one-minute intervals after the first occurrence and for as long as the value of CNS stays at or above 100%. Consider terminating the dive immediately!

⚠ WARNING

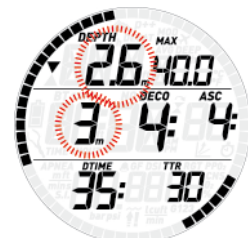
Diving with oxygen toxicity at levels of 75% or greater may put you into a potentially hazardous situation, which could result in serious injury or death.

3.2.4. MISSED DECOMPRESSION STOP

⚠ WARNING

Violating a mandatory decompression obligation may result in serious injury or death.


If you ascend above the decompression stop depth by more than 0.3m (1ft), a downward pointing triangle appears, an audible alarm goes off and both the current depth and the depth of the deco stop start blinking. This alarm remains active until you return to the correct depth.




⚠ WARNING

- When the missed deco stop alarm is triggered, desaturation of the simulated tissue compartments is halted and resumes only when the diver returns to the correct stop depth.
- Never ascend above the displayed decompression stop depth.

3.2.4.1. MISSED DECO STOP MODE

If the stop depth is exceeded by more than 1m (3ft) for more than three minutes, Smart Air considers it a dive violation and the display will show .

In this case, if the diver attempts a repetitive dive after surfacing, Smart Air will function only as a depth gauge and timer (bottom timer mode), and it will display  on the screen.



3.2.5. LOW TANK PRESSURE (IF OPTIONAL TANK MODULE IS USED)

When Smart Air is used in conjunction with a tank module, you will not only have tank pressure information clearly visible on the display, but also an estimate of the time you can still spend at the depth you are at, based on the current gas consumption, before reaching the tank reserve. This is called **TTR** – Time To Reserve.

When during a decompression dive Smart Air calculates a **TTR** which is inferior to the total ascent time, the **TTR** value starts to blink and an audible alarm goes off. Press any button to acknowledge the alarm and it will turn off. We strongly suggest initiating an ascent when this situation arises, in order to avoid running out of breathing gas during the decompression stop.

NOTE

When set to imperial units and with a tank pressure higher than 999psi, when the alarm is triggered only the flashing TTR will be displayed on the bottom row until you acknowledge the alarm by pressing any button.



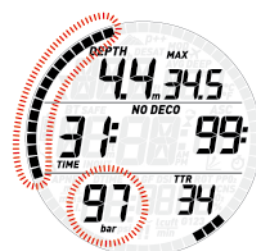
Additionally, when the tank pressure reaches the value specified under **tANK RSRV**, the dots in the arc representing the tank pressure and the value of the tank pressure start to blink and an audible alarm goes off. Press any button to acknowledge the alarm and silence it, though the dots representing the tank pressure will continue to blink. If the value of the tank pressure was not shown on the display before the alarm, the display reverts back to the dive time after the alarm has been acknowledged.



NOTE

For metric setting only: if the tank reserve is set to a value below 50bar, the alarm will go off at 50bar and the value defined as tank reserve will be used for **TTR** calculation only.

Smart Air features also a half tank alarm, which goes off when the pressure defined in the **tANK WARN** menu is reached. The dots in the arc representing the tank pressure and the value of the tank pressure start to blink, and an audible alarm goes off. Press either button to acknowledge the alarm and silence it. If the value of the tank pressure was not shown on the display before the alarm, the display reverts back to the dive time after the alarm has been acknowledged.

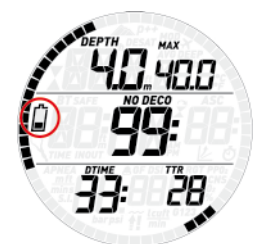


NOTE

If you set the **tANK WARN** value to the same value as **tANK RSRV**, you will eliminate the half tank alarm.

3.2.6. LOW BATTERY

If Smart Air detects that the battery power level is safe for diving but without much reserve left, it will show the steady battery symbol on the display.



3.3. DISPLAY INFORMATION

Upon immersion, if Smart Air was set to pre-dive, it will immediately start monitoring the dive. Otherwise, it will turn on automatically within 20 seconds of having reached a depth of 1.2m/4ft.

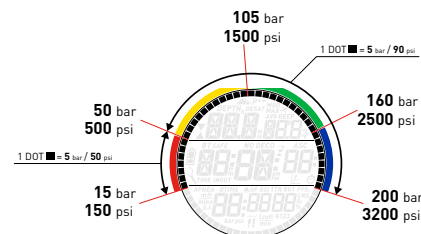
The following information is shown:

- current depth
- temperature
- no deco time (or depth and duration of

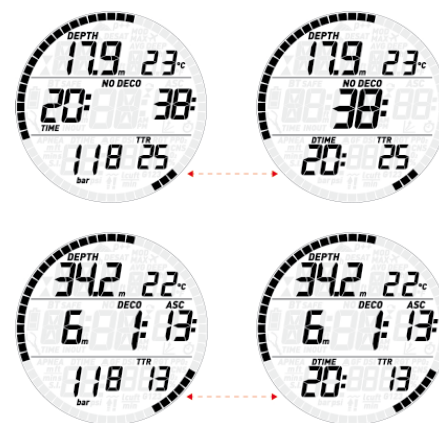
deepest stop and total ascent time in case of decompression dives)

- dive time
- tank pressure
- TTR
- nitrogen saturation bar graph

Smart Air shows tank pressure as an arc of dots spanning across the upper half of the display, corresponding to the red, yellow, green and blue areas on the outer mask. This mimics the look of an analog pressure gauge for an at-a-glance interpretation of the tank pressure. The full arc spans from 15bar to 200bar in metric and from 150psi to 3200psi in imperial, with each dot corresponding to 5bar in metric while in imperial units each dot corresponds to 90psi from 3200psi to 500psi and changes to 50psi from 500psi to 150psi. For lower starting tank pressures the arc will start at a lower position, just like the needle on an analog gauge, while for higher starting tank pressures the arc will remain in the full position until the tank is breathed down to a pressure below 200bar or 3200psi is reached.



The tank pressure can be displayed also numerically by pressing and holding the **DOWN** button. In **NO DECO** this moves the dive time to the left of the center row while the no deco time is shifted to the right. In **DECO** this replaces the dive time with the tank pressure. By pressing and holding the **DOWN** button again, the displays revert back to the previous lay-out.



By pressing the **UP** button, you can modify the information displayed in the upper row. At each button press, the screen cycles through temperature, max depth, average depth, MOD (nitrox only), deep stop (if activated and if calculated to be present), and an empty field.

By pressing the **DOWN** button, you can modify the information displayed in the bottom row. At each button press, the screen cycles through time to reserve, gas consumption, oxygen percentage, CNS, ppO₂, time of day (in lieu of the dive time; the time of the day has a 4-second time out after which the dive

Smart Air Dive Computer

time is displayed again), and an empty field, in which case the dive time is shown inclusive of seconds.

NOTE

In imperial units, when in decompression and with the bottom row set to show tank pressure, when the tank pressure is higher than 999psi no other information is shown to the right of it due to the need to show tank pressure with 4 digits. Pressing the **DOWN** button scrolls through the same fields but hiding the tank pressure, which is anyway always shown as the arc of dots. Each field other than the tank pressure has a 4-second time out.

NOTE

The ppO_2 is indicated in bar without the decimal point and, in order to differentiate it better from the information field to the immediate left, when it is displayed, it uses a small 0 or small 1 respectively,



In case of an ascent, the **speed** in m/min or ft/min is displayed in the bottom left corner.

The **depth** is given in 10cm resolution until 99.9 meters, after which it is given in 1m resolution. When the depth is displayed in feet, the resolution is always 1 foot. At a depth shallower than 1.2m/4ft, the display shows ---. Maximum possible depth is 150m/492ft.

The **dive time** is displayed in minutes. If during the dive you ascend to the surface, the time spent on the surface will only be counted if you descend again below 1.2m/4ft within 3 minutes. This allows for brief periods of orientation. While on the surface, the time will not show as progressing but it is running in the background. As soon as you submerge, the time will resume, including the time spent on the surface.

The **no deco time** is calculated in real time and updated continuously. Maximum displayed no deco time is 99 minutes. If you remain at depth beyond a no deco time of zero minutes, you will enter into decompression: you can no longer make a direct ascent to the surface and Smart Air displays a **MANDATORY** decompression stop. Instead of a no deco time, it shows you the depth and duration of the deepest stop and the total ascent time (**ASC**), which includes each decompression stop and the time required to travel the vertical distance to the surface at a rate of 10m/min / 33ft/min. **ASC** does not include the duration of deep stops.

DEEP, DECO and **SAFETY** stops:

- **DEEP** stops are generated as you approach the no deco limit. You can either have one 2-minute stop or two 1-minute stops. **DEEP** stops are **NOT** mandatory. Deep stops are displayed to the right of the current depth.



Upon reaching the optimum range for carrying out a deep stop (+/- 1m /3ft of the displayed depth), the deep stop itself will be shown in the top right corner with the label **DEEP** blinking, and a countdown timer appears to indicate the progress of the stop. Deep stops can be deactivated in a dedicated settings menu.



- **DECO** stops are generated progressively as you stay down beyond the no deco time. **DECO** stops are **MANDATORY**. For **DECO** stops, since the duration is a function of the exact depth, only the minutes are shown. During a decompression stop, the following symbols may appear:

- ▼ : optimal range for the decompression stop;
- ▲ : above decompression stop depth, descend immediately!



- A **SAFETY** stop is generated as soon as the depth of the dive exceeds 10m / 33ft. It has a duration of 3 minutes and it is carried out between depths of 6m / 20ft and 3m / 10ft at the end of a dive prior to surfacing. Such stop is **NOT** mandatory but **HIGHLY RECOMMENDED**.



WARNING

During all dives, perform a safety stop between 3 and 6 meters/10 and 20 feet for 3 minutes, even if no decompression stop is required.

The **tank pressure** is based on the signal from the tank module. The tank module has a range of 1.5m/5ft.

WARNING

- If Smart Air receives no signal from the tank module for 45 seconds, the pressure value is replaced by ---. Check the position of Smart Air with respect to the tank module. Start ascending if you don't get a tank pressure reading unless you have a spare pressure gauge.
- If the tank pressure reaches 10bar/145psi, the tank module will turn off and Smart Air will not show tank pressure any longer.

The **TTR** (time to reserve) is the time you can spend at the current depth breathing at the current rate before reaching the user defined tank reserve.

NOTE

Smart Air needs approximately 2 minutes to analyze your breathing pattern, thus the TTR is not displayed at the very beginning of the dive.

The **nitrogen bar graph** is on the right side of the display. It represents nitrogen saturation in the leading tissue compartment. The bar graph is made of five segments, which gradually fill during the dive. The more black segments you see, the closer to the no deco limits you are. As you enter a situation of mandatory decompression stop, all segments will be black.

During a surface interval, the segments will gradually turn off as Smart Air tracks the offgassing of your tissues.

Ascent rate: in presence of a depth change in excess of 80cm / 3ft, Smart Air calculates the corresponding ascent speed and displays in place of the dive time, for the duration of the ascent.

3.4. AFTER THE DIVE

Upon returning to the surface, Smart Air first goes into the so-called surfacing mode. This mode allows you to resume your dive after a brief period of orientation. The screen shows a 3-minute countdown.



If you submerge again before the 3-minute countdown is over, the dive time will resume from where it left off, including the time spent on the surface. If you do not submerge before the end of the countdown, Smart Air considers the dive finished, records the data to the logbook and reverts to the so-called post-dive mode.

The post-dive screen contains:

- The remaining desaturation time (**DESAT**): this is calculated by the decompression

model in the computer. Any dive started while there is remaining desaturation on your computer is considered a repetitive dive, meaning that Smart Air accounts for the pre-existing nitrogen load in your body. The bar graph shows the calculated nitrogen load in the leading tissue. You can use this to gauge your progress in getting rid of nitrogen as the surface interval grows. Smart Air continues to perform decompression-related calculations (nitrogen release), for as long as there is desaturation time left.

- The no-fly time (**NO FLY**): this is the time during which an exposure to the reduced pressure inside the cabin of an airplane could cause decompression sickness. Smart Air employs, as recommended by NOAA, DAN and other agencies, a standard 12-hour (no-deco non-repetitive dives) or 24-hour (deco and/or repetitive dives) countdown. Hence you may find a situation in which the desaturation time is shorter than the no-fly time. This is simply the consequence of the desaturation time being calculated by the algorithm based on the actual dive profile, while the no-fly time is an accepted standard in the diving industry. Since the real effect of flying after diving has never been fully investigated, this approach fits with our philosophy.

WARNING

Flying while Smart Air displays **NO FLY** can result in serious injury or death.

- The surface interval (**S.I.**): this is displayed from the moment the dive is closed (3 minutes after surfacing) for as long as there is remaining desaturation or no-fly time on the computer.
- In case of a dive violation, the corresponding symbol (⚠, ⌚) is shown.



The post-dive display is the default display for as long as either the no-fly or the desaturation is greater than 0 minutes. By pressing the **DOWN** button you can go to all other screens but Smart Air will revert automatically to the post-dive display after an 8-second time out. For as long as there is desaturation, Smart Air also features a condensed log of the last dive: maximum and average depth in the top row, dive time and set O₂% in the bottom row.



3.5. DIVING WITH MORE THAN ONE GAS MIXTURE

WARNING

- Diving with more than one gas mixture represents a much higher risk than diving with a single gas mixture, and mistakes by the diver may lead to serious injury or death.
- During dives with more than one gas mixture, always make sure you are breathing from the tank that you intend to breathe from. Breathing from a high oxygen concentration mix at the wrong depth can kill you instantly.
- Mark all your regulators and tanks so that you cannot confuse them under any circumstance.
- Before each dive and after changing a tank, ensure that each gas mixture is set to the correct value for the corresponding tank.

Smart Air enables you to use up to three gas mixtures during the dive (air and Nitrox only). The three mixtures are labeled G1, G2 and G3 and must be in ascending order of oxygen content, i.e. G1 has the lowest oxygen concentration, G2 an intermediate value, and G3 has the highest oxygen concentration of the three. If you are diving with only two mixtures, you will be utilizing tanks G1 and G2.

WARNING

It is not possible to switch to a gas at a depth at which the oxygen partial pressure for that gas is greater than the set maximum value.

NOTE

- If you dive using just one gas, select G1 and deselect the other two.
- For dives with two gases, select G1 and G2 and deselect the third.
- When enabling G2 and G3, you must first define G2 and then G3.
- You cannot activate G3 without first having activated G2.
- G2 cannot have an oxygen percentage higher than G3.
- If you set G2 to OFF, G3 will automatically be set to OFF also.
- The MOD for G2 and G3 is the switch depth for the corresponding gas. This is what Smart Air uses for its calculation, alarms and suggested switch points.

3.5.1. SETTING MORE THAN ONE GAS

The characteristics of the gases must be entered in the computer before the dive. It will then be your responsibility to tell Smart Air which gas is currently being used during the various phases of the dive.

To use multiple gases, you will need to enable the gases and set the oxygen percentage and the ppO₂max for each one. This is done in the same way as for G1, with the difference that for G2 and G3 you can turn a gas **ON** or **OFF**. Keep in mind that the MOD for G2 and G3 is the depth at which Smart Air will prompt you to perform the gas switch (see section 3.5.2 below). To enable G2 press the **UP** button from

the **G2 OFF** display. You will now see **G2 ON**, a value of oxygen concentration, ppO₂ and MOD. Proceed as you would for G1 until you get to the **G3 OFF** screen. Either press and hold the **DOWN** button if you have finished setting gases, or press the **UP** button to advance to the **G3 ON** display and setting of G3.



3.5.2. SWITCHING GAS

Smart Air always begins the dive with G1, which has the lowest percentage of oxygen. When during the ascent you reach the depth corresponding to the MOD of G2, Smart Air sounds an audible signal and the oxygen concentration of G1 starts to blink in the lower right corner.



Press the **DOWN** button while this indication is blinking to initiate the gas switch: the oxygen percentage of G2 starts to blink in lieu of that of G1, and in the top right corner the MOD of G2 is displayed, also blinking.



Press and hold the **DOWN** button to confirm the switch to G2: the set oxygen concentration will be displayed steadily in the lower right corner of the screen, and within 20 seconds the ascent time is updated to reflect the higher oxygen concentration in the breathing gas.



If you press the **DOWN** button while G2 is blinking, the next available gas in the list will be displayed instead. This will be G1 if only two gases are set or if you are deeper than the MOD of G3, or G3 if you have set three gases and are shallower than the MOD of G3.

NOTE

- Smart Air will allow the change only if the depth is shallower than the MOD corresponding to the set ppO₂max.
- Smart Air will not allow the gas switch if you are deeper.
- The automatic blinking of the oxygen concentration of G1 lasts only for 20 seconds. You can however initiate the gas switch at any time by pressing and holding the **DOWN** button when the oxygen concentration is displayed in the lower right corner, then switch to G2 as long as your depth allows the gas to be activated.
- The same process is repeated when you approach the MOD for G3 with G2 blinking instead of G1
- If you have set G1, G2 and G3 and have not switched from G1 to G2, once you reach the MOD for G3 the oxygen concentration of G1 will again blink to alert you of the possibility of switching gas.

3.5.3. SPECIAL SITUATIONS

3.5.3.1. SWITCHING BACK TO A GAS MIXTURE WITH LOWER OXYGEN CONCENTRATION

There may be situations in which you have to switch back to a gas with lower oxygen concentration than what you are currently breathing. This can happen for instance if you want to descend deeper than the MOD for the current gas, or if for instance you have run out of gas in G2 during the decompression. To do so, simply press the **DOWN** button until the oxygen concentration is displayed in the lower right corner, then press and hold the **DOWN** button to initiate the gas switch. From here on the procedure is the same as described in 3.5.2.

3.5.3.2. SUBMERGING BELOW THE MOD AFTER A GAS SWITCH

If after having switched to a gas mixture with a higher oxygen concentration you inadvertently drop again below the MOD for that mixture, the MOD alarm will immediately go off. Either switch back to a gas mixture suited for that depth, or ascend above the MOD for the gas mixture you are breathing from.

3.6. BOTTOM TIMER MODE (BT)

When Smart Air is set to **BT** mode, it will only monitor depth, time and temperature, tank pressure and will not carry out any

decompression calculation. Maximum displayed dive time in gauge mode is 999 minutes. You can only switch to bottom timer mode if the computer is completely desaturated. All audible and visual alarms, other than the low battery alarm and low tank pressure, are turned off.

WARNING

Dives in bottom timer mode are performed at your own risk. After a dive in bottom timer mode you must wait at least 24 hours before diving using a decompression computer.

During a dive in bottom timer mode, the following information is displayed:

- current depth
- temperature
- stopwatch
- dive time
- tank pressure
- TTR
- in case of an ascent: ascent speed (in m/min or ft/min).

Press the **UP** button to toggle between temperature, max depth, average depth, and an empty field. Press the **DOWN** button to scroll through time to reserve, gas consumption, gas identifier (G1, G2 or G3), time of day in lieu of the dive time (the display reverts back to dive time after 4 seconds) or an empty field.

NOTE

In bottom timer mode the tank pressure is visible **ONLY** as dots in the arc along the outer perimeter.

Pressing and holding the **DOWN** button restarts the stopwatch unless:

- the average depth is displayed in the upper right corner, in which case in addition to resetting the stopwatch it also resets the average depth;
- the gas identifier is displayed in the lower right corner, in which case the gas switch is initiated. This happens even if the average depth is visible in the upper right corner.



3.6.1. DIVE VIOLATION INDUCED BOTTOM TIMER MODE

The following violations can occur during an Air or Nitrox dive:

- Uncontrolled ascent.
- Missed deco stop.

In case of a violation, Smart Air will restrict the use of Air and Nitrox mode for 24 hours, and will only allow operation in bottom timer mode.

3.7. APNEA MODE

Smart Air features an apnea mode with dedicated features specifically for breath hold divers. In apnea, we differentiate between immersion and dive session. An immersion is the individual trip below the water surface. The dive session is a group of immersions performed in sequence without exiting the apnea mode.

WARNING

The practice of apnea exposes divers to different hazards from those associated with scuba diving. The diver should be aware of these hazards and understand how to avoid them.

WARNING

Do not practice apnea within 24 hours of having performed a scuba dive.

3.7.1. SETTINGS

Go into the **MODE** menu and from here select **APNEA** then press and hold the **UP** button to confirm your choice. This will automatically lead you into the settings menu for apnea diving. Press and hold the **DOWN** button to exit if you don't need to change any of the settings. Else scroll through the available settings pressing either button. To edit a setting, press and hold the **UP** button, then press either button to modify the setting, then press and hold the **UP** button again to confirm the change. The available settings are:

AL.beep

This allows you activate or deactivate all warnings at once.



Dive time

If active, when the dive time reaches the set limit an audible alarm will go off and the dive time will blink on the display.



Surf int

If active, when the surface interval reaches the set limit an audible alarm will go off and the surface interval will blink on the display.



Max

If active, upon reaching the depth defined in the setting an audible alarm will go off and the depth will blink on the display.



Int

This allows you to set a depth interval at which a short audible sequence is activated. For instance, if you set a depth interval of 5m/15ft, the audible sequence will go off at 5m/15ft, 10m/30ft, 15m/45ft etc.



3.7.2. USING SMART AIR ON AN APNEA DIVE

Put Smart Air into **PRE DIVE** so that as soon as you submerge past 1.2m/4ft it will start monitoring your dive. Smart Air will show the current depth and temperature in the top row, the dive time in minutes and seconds in the middle row. Press the **DOWN** button and the time of day will appear for a few seconds in the bottom row. Press and hold the **UP** button to activate the backlight.



3.7.2.1. SURFACING BETWEEN IMMERSIONS

When returning to a depth of less than 0.8m/3ft, Smart Air switches to surface mode. The display will show the maximum depth of the dive that just ended and minimum temperature in the top row, its duration in the middle row, and the surface time in minutes and seconds in the bottom row. The number to the left of the duration is the sequential counter of the immersions in the dive sequence.



By pressing the **UP** button the display switches to maximum depth and minimum temperature of the dive session in the top row, maximum dive time of the session in the middle row and time of day in the bottom row. In order to differentiate this "session" summary from the individual immersion summary, the dots in the upper half of the display are lit.



Press and hold the **UP** button to exit apnea mode. Do this only at the end of your dive session so that your immersions are all logged together (see section 3.7.3 for information about the logbook in apnea mode). Note that Smart Air will exit the apnea mode automatically after 30 minutes without immersion.

After exiting an apnea session, the default display will show the time of day in the center row and the count down defined in section 3.7.4 in the bottom row, until the count down clears.



3.7.3. LOGBOOK IN APNEA MODE

Smart Air separates scuba dive logs from apnea logs, hence there is a dedicated summary page for each. As you enter the logbook function, the two alternate every 4 seconds. The apnea summary shows max depth and minimum temperature in the top row, number of sessions in the middle row, longest dive time in the bottom row.



Upon pressing the **UP** button, individual logs will be shown in chronological sequence. Scuba dives are described in section 2.5. Apnea dives are grouped in sessions, and for each session there are two summary pages: the first shows the maximum depth and minimum temperature of the session, the time the session started and the date, in addition to a sequential counter;



Press and hold the **UP** button to reach the second summary page, which shows the maximum depth and minimum temperature of the session in the top row, the time the session started and the number of immersions in the session in the middle row, the longest dive time of the session in the bottom row.



Press and hold the **UP** button to enter the session and see max depth and minimum temperature of the immersion at the top, dive time and sequential counter of the immersion in the middle surface interval prior to immersion at the bottom.



Press either button to view the details of other immersions within the same session or press and hold the **DOWN** button to exit the session log.

3.7.4. SWITCHING FROM APNEA TO SCUBA

It is commonly accepted that scuba diving after apnea diving is safe, but we take a slightly more conservative approach. Smart Air evaluates your apnea activity and imposes a restriction before you can switch the dive computer from apnea to scuba based on your max depth in apnea in the preceding 24 hours:

- up to 5m/15ft: no restriction
- up to 10m/33ft: 2-hour restriction since the last apnea dive
- up to 20m/66ft: 4-hour restriction since the last apnea dive
- up to 30m/100ft: 6-hour restriction since the last apnea dive
- over 30m/100ft: 8-hour restriction

• 4. TAKING CARE OF SMART AIR

4.1. TECHNICAL INFORMATION

Pressure gauge function

The pressure gauge integrated in the Smart Air dive computer has been tested and CE certified by RINA, notified body 0474, located in Genova, Italy.

The pressure gauge is a Category III device as defined under European Regulation 2016/425, and complies with the specifications set out in the harmonized European Standard EN250 for use with air compliant with Standard EN 12021 (oxygen content of 21%).

The EC certification process and verification of the operating performance of the pressure gauge in the Smart Air dive computer under standards EN250 are understood to be applicable to a maximum depth of 50 m below the surface.

The Smart Air dive computer can be used in cold water (water at temperatures below 10°C).

Marking

The instrument markings are located on the tank module, and consist of the following:

- working pressure rating: 300 bar / 4,350 psi;
- reference standard: EN250;
- reference marking: CE 0474.

The conformity marking indicates compliance with the essential health and safety requirements as per European Regulation 2016/425. The number alongside CE identifies RINA, notified body 0474, located in Genova, Italy, authorized to inspect the finished product under Module D of European Regulation 2016/425.

Operating altitude:

- with decompression – sea level to approximately 3700m/12100ft
- without decompression (gauge mode) – at any altitude

Decompression model: RGBM Mares-Wienke (10 tissues)

Depth measurement:

- Max displayed depth: 150m/492ft
- Resolution: 0.1m until 99.9m and 1m at depth deeper than 100m. Resolution in ft is always 1ft
- Temperature compensation of the measurement between -10 °C to +50 °C / 14 °F to 122 °F

- Accuracy from 0 to 80m/262ft: 1% ±0.2m/1ft

Temperature measurement:

- Measurement range: -10 °C to +50 °C / 14 °F to 122 °F
- Resolution: 1 °C / 1 °F
- Accuracy: ± 2 °C / ± 4 °F

Clock: quartz clock, time, date, dive time display up to 999 minutes

Oxygen concentration: adjustable between 21% and 99%, ppO₂max range between 1.2 and 1.6bar

Logbook memory: 95 hours of dive profile at 5-second sampling rate

Operating temperature: -10 °C to +50 °C / 14 °F to 122 °F

Storage temperature: -20 to 70 °C / -4 to 158 °F

Display:

- Diagonal: 31 mm / 1 1/4"
- Mineral glass

Power supply:

- CR2450 user-replaceable battery
- battery life: 100-150 dives. Actual battery duration depends on the usage of the backlight and the water temperature.

4.2. MAINTENANCE

The tank pressure gauge and the parts of this product used to measure tank pressure should be serviced by an authorized Mares dealer every other year or after 200 dives (whichever comes first). In addition, the depth accuracy should be verified by an authorized Mares dealer every two years. Aside from that, Smart Air is virtually maintenance free. All you need to do is rinse it carefully with fresh water after each dive (avoid any chemical products) and replace the battery when needed. To avoid possible problems with your Smart Air, the following recommendations will help assure years of trouble free service:

- avoid dropping or jarring your Smart Air;
- do not expose Smart Air to intense, direct sunlight;
- do not store Smart Air in a sealed container, always ensure free ventilation.

NOTE

If you notice signs of moisture on the inner wall of the mineral glass, take your Smart Air immediately to an authorized Mares service center.

WARNING

The mineral glass is not exempt from scratches resulting from improper use.

WARNING

Do not blow compressed air onto Smart Air, because it could damage the pressure sensor area.

4.2.1. REPLACING THE BATTERY IN SMART AIR

WARNING

REPLACING THE BATTERY IS A VERY DELICATE OPERATION, AND WHEN PERFORMED BY AN INEXPERIENCED PERSON MOST LIKELY WILL LEAD TO A FLOODED COMPUTER. WE STRONGLY RECOMMEND THAT YOU VISIT AN AUTHORIZED MARES CENTER. MARES DECLINES ALL RESPONSIBILITY FOR ANY DAMAGE CAUSED BY REPLACING THE BATTERY.

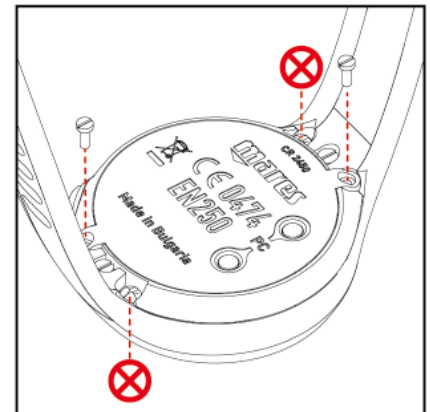
NOTE

Do not discard the old battery in the environment. Mares adopts a policy of respect for the environment, and urges use of the appropriate separated waste collection service.


WARNING

When changing the battery, the o-ring must be replaced. The Smart Air battery kit contains a high quality CR2450 battery and a new o-ring. All computer o-rings are inspected individually for integrity.

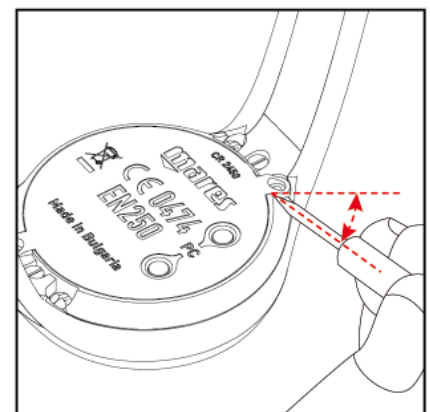
Follow these steps and refer to the pictures:
a) Remove the two screws as indicated in the picture below. These hold the battery cover in place.



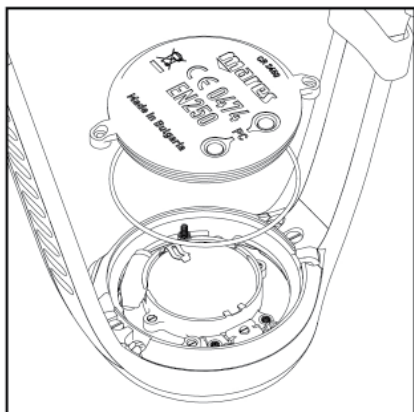
NOTE

Do not remove the screws denoted with !

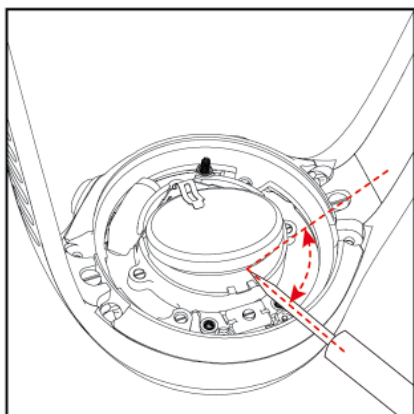
b) Use a small flat-head screwdriver to pry open and lift the cover as indicated in the picture below.



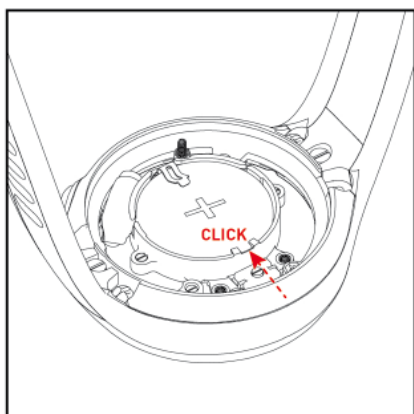
c) Remove the cover then remove the o-ring. Discard the o-ring.



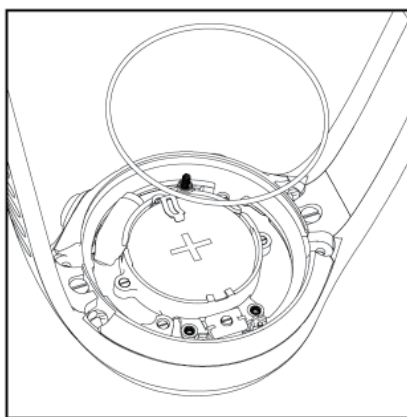
d) Remove the battery by prying it loose with a small flat-head screwdriver.



e) Replace the battery with the new one from the kit. The battery should click in place. Make sure to respect the correct polarity of the battery: the "+" has to be facing outwards.



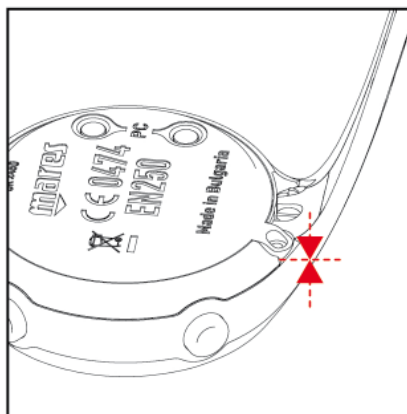
f) Position the new o-ring from the kit in the groove around the battery, ensuring that it sits towards the outer edge of the groove.



g) Position the cover onto the watch case and press it down evenly. Ensure that in the area of the screws the cover touches the watch case.

NOTE

Do not lubricate the o-ring! Lubrication causes the o-ring to twist when the cover is put over it, causing the watch to flood.



h) Keep the cover pressed onto the watch case while hand tightening the two screws. Don't use excessive force while tightening. Ideal torque is 12 N cm / 17 oz-in.

WARNING

Mares reserves the right to refuse to provide service under the warranty if the maintenance instructions are not followed.

4.3. WARRANTY

Mares products are guaranteed for a period of two years subject to the following limitations and conditions:

The warranty is non-transferable and applies strictly to the original purchaser.

Mares products are warranted free from defects in materials and workmanship: components that, upon technical inspection, are found to be defective, will be replaced free of charge.

Mares S.p.A. declines all responsibility for accidents of any kind that result from tampering or incorrect use of its products.

Any products returned for overhaul or repairs under warranty, or for any other reason, must be forwarded exclusively via the vendor and

accompanied with a proof of purchase slip. Products travel at the risk of the sender.

4.4. WARRANTY EXCLUSIONS

Damage caused by water seepage resulting from improper use (e.g. dirty seal, battery compartment closed incorrectly, etc.).

Rupture or scratching of the case, glass or strap as a result of violent impact or blows.

Damage resulting from excessive exposure to elevated or low temperatures.

Damage caused by the use of compressed air to clean the dive computer.

4.5. HOW TO FIND THE PRODUCT SERIAL NUMBER

To see the product serial number, enter the INFO submenu.

5. DISPOSAL OF THE DEVICE



Dispose of this device as electronic waste. Do not throw it away with regular rubbish.

If you prefer, you can return the device to your local Mares dealer.



Algorithm

