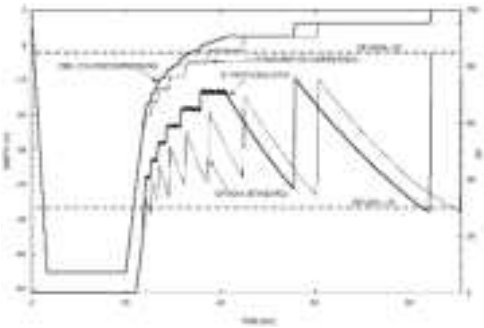
mares®

QUAD 2 Dive Computer

Instruction Manual

CEIL-CON



CEILING-CONTROLLED DECOMPRESSION READ BEFORE ACTIVATING FEATURE

Ceiling-controlled decompression (CEIL-CON) aims to maximize the inert gas pressure gradient in the leading tissue within the limit allowed by your choice of GF LOW and GF HIGH. This results in a slightly higher supersaturation compared to standard decompression, due to the decrease in inert gas tissue pressure during a stationary decompression stop. Figure 1 shows an example of the gradient factor in the leading tissue (GF NOW) for CEIL-CON and for standard decompression, using GF 30/85. As the mechanisms leading to decompression sickness are not yet fully understood, caution should be exercised when performing a ceiling-controlled decompression. If you are comfortable with a given set of GF low/high for standard decompression, we recommend decreasing both values by 10 when activating the CEIL-CON feature. Perform a sufficient number of dives and become comfortable with the procedure before gradually increasing GF low/high. For more information about ceiling controlled decompression, please check www.mares.com/downloads/articles.

If you have any doubts about CEIL-CON, do not activate it.

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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.

NOTE
Some images in the text contain red segments. These denote a blinking segment. There is no red color on the display. All segments are black. For ease of description, we depict blinking segments in red.

⚠ 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.

⚠ WARNING

In particular, unless you fully understand the implications of certain features, you should not use them. Examples of features not to be used unless fully understood are:

- alternate gradient factors
- ceiling-controlled deco
- high oxygen content decompression mixes
- trimix.

• PART I

• 1. INTRODUCTION

1.1. GLOSSARY

ABBREVIATIONS	DESCRIPTION
AIR:	Air dive.
ALT GF:	The gradient factor setting for the alternate/emergency decompression calculation.
AVG:	Average depth, calculated from the beginning of the dive.
BT:	(BOTTOM TIMER): the mode in which the dive computer displays depth, time and temperature but does not perform any decompression calculation.
CNS:	Central Nervous System. CNS% is used to quantify toxic effects of oxygen.
DECO:	Decompression obligation.
DTIME:	Dive time, the whole time spent below a depth of 1.2m/4ft.
DESAT:	Desaturation time. The time needed for the body to eliminate the nitrogen taken up during diving.
GF:	Gradient factor.
GF LOW:	The gradient factor value determining the first stop during ascent in decompression dives. This value is set by the diver.
GF HIGH:	The gradient factor determining the residual nitrogen at the end of the dive. This value is set by the diver.
GF NOW:	The gradient factor of the leading tissue during the dive evaluated at ambient pressure. This is calculated by the algorithm and represents inert gas pressure in the leading tissue.
GF @SURF:	The gradient factor of the leading tissue during the dive evaluated at surface pressure. This is calculated by the algorithm and represents inert gas pressure in the leading tissue.
GF @+3:	The prediction of GF @SURF 3 minutes ahead if the diver stays at current depth. This is calculated by the algorithm and represents inert gas pressure in the leading tissue.
MAX:	Maximum depth attained during the dive.
MAIN GF:	The gradient factor setting for the primary decompression calculation.
MOD:	Maximum Operating Depth. This is the depth at which the partial pressure of oxygen (ppO_2) reaches the maximum allowed level (ppO_2max). Diving deeper than the MOD will expose the diver to unsafe ppO_2 levels.
NO DECO:	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.
O_2:	Oxygen.
O_2%:	Oxygen concentration used by the computer in all calculations.
OTU:	Oxygen Toxicity Units.
ppO_2:	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.
S. I.:	Surface interval, the time that has elapsed since the end of the dive.
SLOW:	Ascent rate alarm.
SWITCH:	Depth at which a gas switch can be carried out.
TTS:	Time To Surface, the time it takes to perform the ascent from your current depth to the surface in a decompression dive, including all decompression stops.
TTS @+X:	The overall ascent time inclusive of all decompression stops if the dive is extended by X minutes at the current depth.

TERMINOLOGY	DESCRIPTION
Ceiling:	The depth at which you would exceed the permissible gradient factor. As you clear a stop and begin the next one, the ceiling is the same as or very close to the stop depth itself. As the duration of the stop decreases, so does the ceiling until it reaches the depth of the next stop. QUAD 2 shows the ceiling only if the value is greater than 6 m / 20 ft.
Gradient Factor:	Reduction of Bühlmann's original value of maximum tolerated inert gas pressure. The term is used for settings in the algorithm. It is also used for the calculated value of inert gas pressure in a tissue so that it can be referenced to the settings in the algorithm.
Heliox:	A breathing gas containing Oxygen and Helium.
Multigas:	Refers to a dive in which more than one breathing gas is used.
Nitrox:	A breathing mix made of oxygen and nitrogen, with the oxygen concentration being 22% or higher.
Nitrogen bar graph:	It represents nitrogen saturation (any amount in excess of the equilibrium state at the surface) in the leading tissue via ten segments along the left edge of the display. The segments light up gradually from from the bottom up during the dive. The more you see, the closer to the no deco limits you are. As you enter a situation of mandatory decompression stop, all ten segments will be lit
NO-FLY:	Minimum amount of time the diver should wait before taking a plane.
POST DIVE:	The computer on the surface at the end of a dive. This mode is available until there is remaining desaturation.
ppO_2max:	The maximum allowed value for ppO_2. Together with the oxygen concentration it defines the MOD.
PRE-DIVE:	The computer on the surface ready to dive.
Trimix:	A breathing gas containing oxygen, nitrogen and helium.

DISPLAY	DESCRIPTION OF SETTING
ADD SURF INT	ADDITIONAL SURFACE INTERVAL IN DIVE PLANNER
AIR	AIR DIVE
ALGO	ALGORITHM
ALL SLNT	ALL SILENT
ALT GF	ALTERNATE GF
ASCNT VIOL	ASCENT VIOLATION
BACKLGHT	BACKLIGHT
BELOW MOD	ALLOW SWITCH BELOW MOD
BLE	BLUETOOTH
CEIL-CON DECO	CEIL-CON DECO OPTION
CLOCK	TIME AND DATE
DECO STOP	SHALLOWEST DECO STOP
DEEP STOP	DEEP STOP
DIVE TIME	DIVE TIME WARNING
EN13319	WATER DENSITY ACCORDING TO EN 13119
ENTER DECO	ENTERING A DECOMPRESSION OBLIGATION WARNING
ERASE DESAT	ERASING OF RESIDUAL INERT GAS
FRSH	FRESH WATER
FUTURE DECO	TTS@+X
GF	MAIN GF
LOW, HIGH	BACKLIGHT INTENSITY
MAX	MAX DEPTH
MODE	AIR, NITROX OR TRIMIX
MULTIDAY	MULTIDAY ALGORITHM OPTION
NO DECO 2:	NO DECO WARNING AT 2 MINUTES
NX	NITROX
PREDICT	PREDICTIVE MULTIGAS
REP	REPETITIVE DIVES ALGORITHM OPTION
SALT	SALT WATER
STAT	STATISTICS PAGE IN LOGBOOK
SURF	DURATION OF SURFACING MODE
TX	TRIMIX
UNITS	METRIC OR IMPERIAL UNITS
WARN	WARNINGS
WATR	WATER

1.2. OPERATING MODES

The functions of the Quad 2 computer can be grouped into two categories, each corresponding to a specific mode of operation:

- **surface mode**: Quad 2 is dry on the surface. You can change settings, review your logbook, use the dive planner, see remaining desaturation after a dive, download to smart phone and much more;
- **dive mode**: Quad 2 monitors depth, time, temperature and performs all decompression calculations; dive mode itself can be broken down into 4 sub categories:
  - **PRE-DIVE** (Quad 2 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** (Quad 2 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, Quad 2 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

Quad 2 uses a CR2450 user-replaceable battery. See section 12.2.1 for instructions on how to replace it. Good quality batteries should suffice for approx 200-300 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 in the pre-dive and dive display: the remaining battery charge is adequate for diving;
- partially-filled steady battery symbol on the display (dive and pre-dive): there is enough charge for a few more dives, but you should consider replacing the battery at the next opportunity;
- partially-filled blinking battery symbol on the display: the battery is too weak for diving. If this happens during a dive, you must not perform any more dives before replacing the battery. If you see the blinking battery symbol on the surface, be aware that Quad 2 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 5).

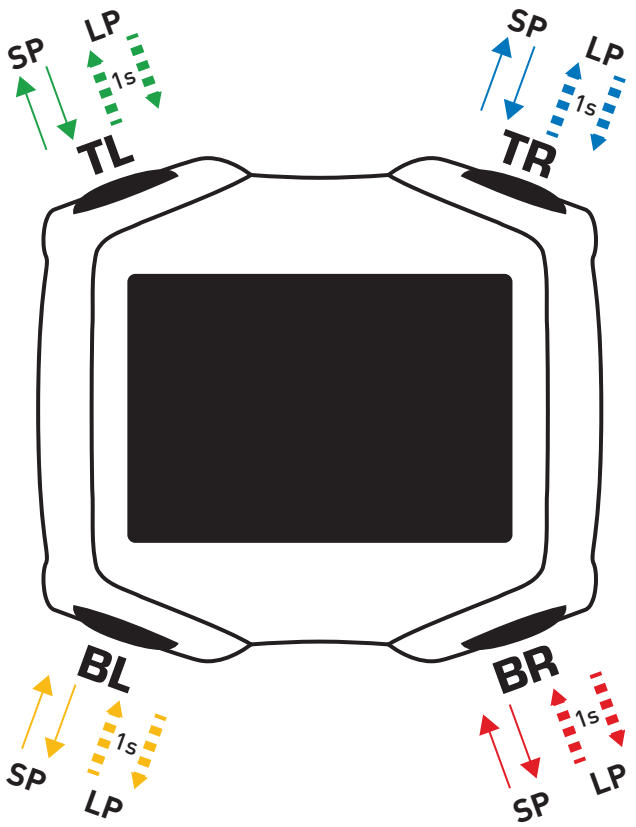
1.4. COMMUNICATING VIA BLUETOOTH

Quad 2 can communicate via low power bluetooth and the apps MARES or MySSI directly to a smartphone to transfer logbook information or to perform firmware upgrades.

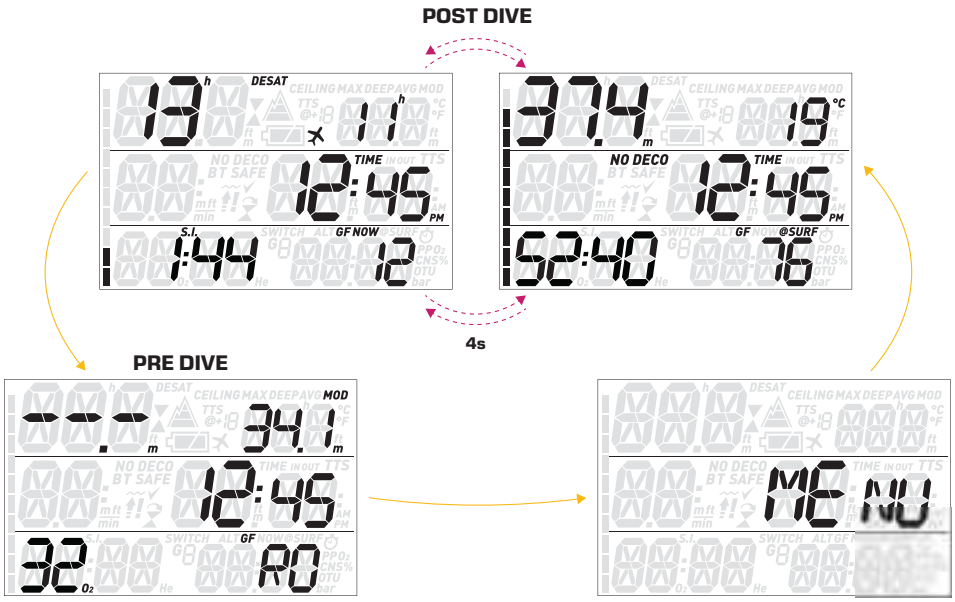
To initiate a bluetooth connection, select **BLUETOOTH** from the main menu, then start the Mares or MySSI app on your smartphone and follow the instructions.

1.5. BUTTON OPERATION, MAIN FUNCTIONS AND SHORTCUTS

Quad 2 has four buttons, which we refer to as **TL** (top left), **BL** (bottom left), **TR** (top right) and **BR** (bottom right). Each button can perform two operations, depending on whether it is pressed and released (short press - **SP**) or pressed and held for one second (long press - **LP**). A button operation is then defined, for instance, as **TL-SP**: top left, short press.

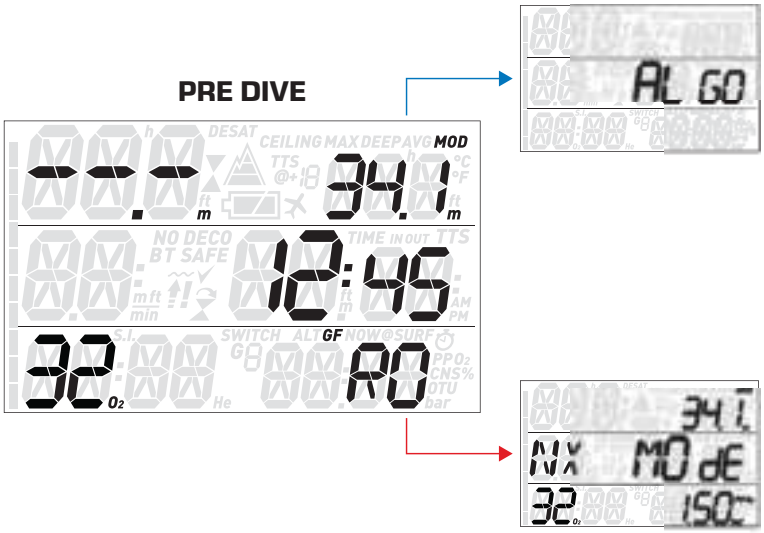


Quad 2 switches on in **PRE-DIVE** mode or, if DESAT > 0, in **POST DIVE** mode. **BL-SP** allows the user to toggle between **PRE-DIVE** and **MENU**. In presence of remaining desaturation, the **POST DIVE** screen is part of this loop.

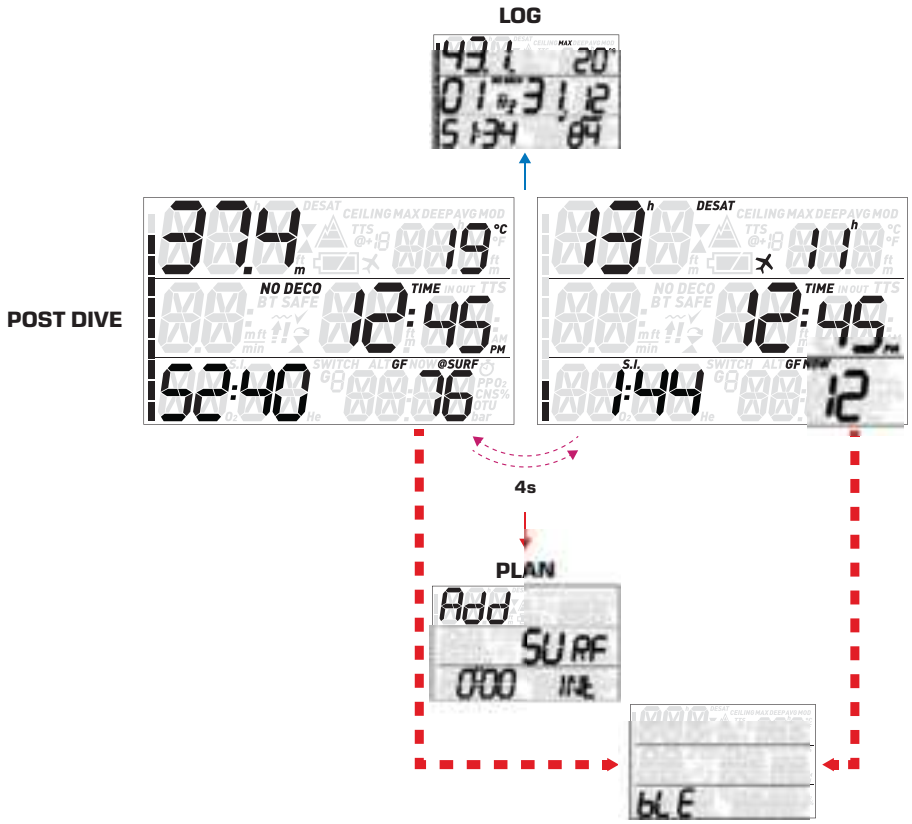


Both **PRE-DIVE** and **POST DIVE** offer shortcuts to often used functions.

From **PRE-DIVE**, **TR-SP** allows you to go straight into the gradient factor setting menu. **BR-SP** allows you go to directly into the gas setting menu (**AIR**, single gas nitrox, multigas nitrox or multigas trimix).



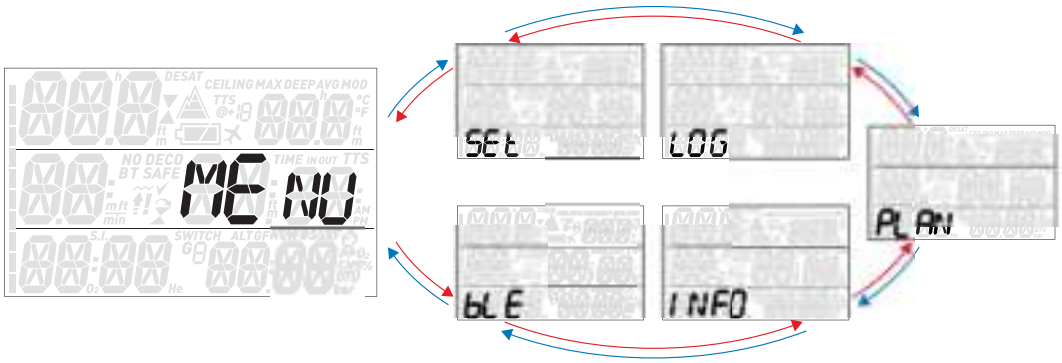
From **POST DIVE**, **TR-SP** allows you to access the log of your most recent dive. **BR-SP** gives you direct access to the planner function. **BR-LP** starts a bluetooth connection.



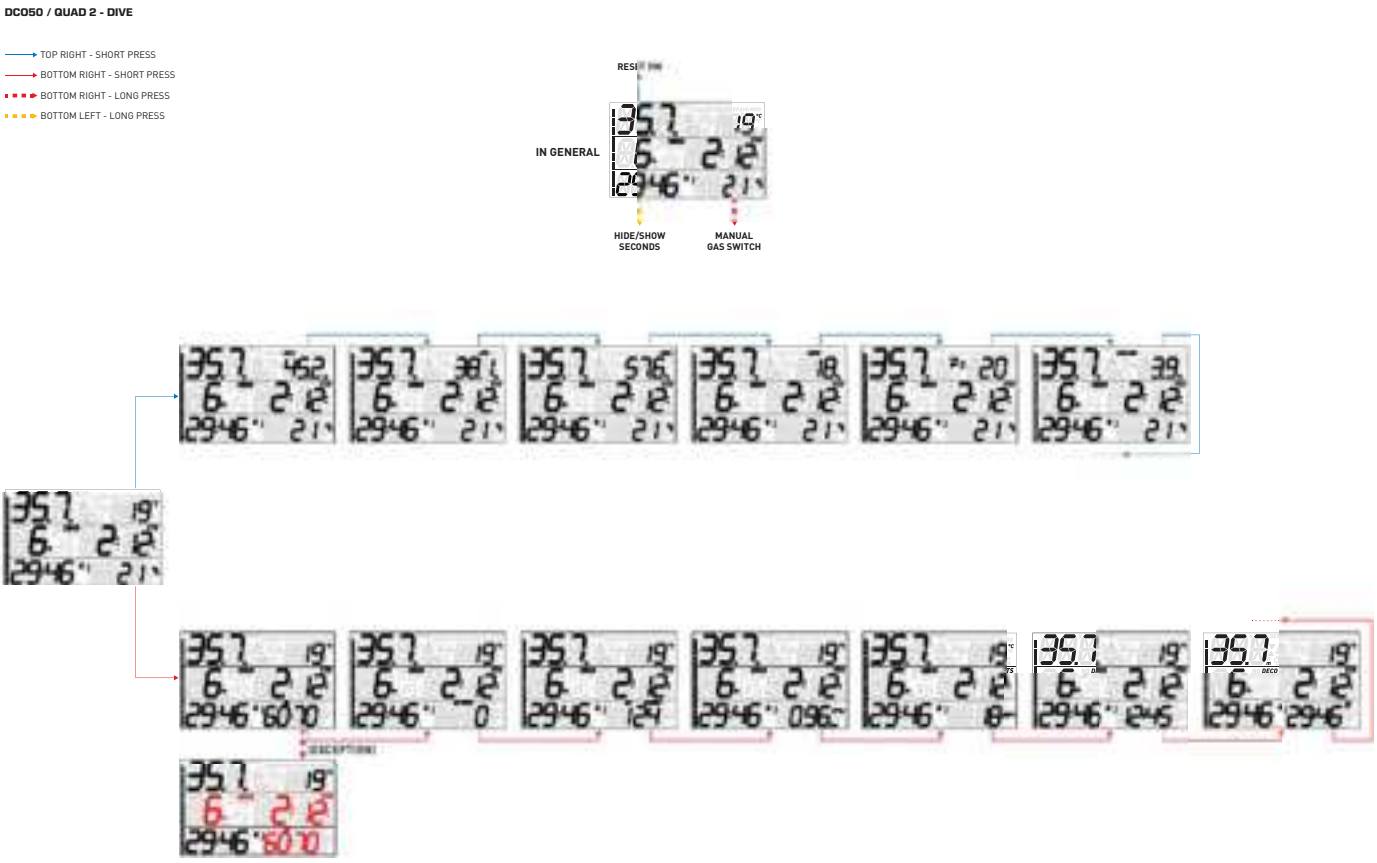
From **MENU**, **TR-SP** and **BR-SP** allow you to cycle through the following sequence of menus:

- SET - section 2
- LOG - section 3
- PLAN - section 4
- INFO - section 5
- BLE - section 6

As a general rule, once inside a menu, **TR-SP** and **BR-SP** scroll through the options or change a value, **TL-SP**, **TR-LP** and **BR-LP** confirm and either jump to the next option or go back one level, **BL-SP** goes back one level without saving.



During a dive, **TR-SP** and **BR-SP** modify information fields in the top and bottom row respectively, **TL-SP** resets the stopwatch, and **TR-LP** activates the backlight. Gas switching and alternate gradient factors are described later in the manual.



• 2. SET

MENU	*Description*
SET	
MODE	Allows you to choose between air, nitrox, trimix and bottom timer mode.
ALGORITHM	Allows you to set gradient factors, personalization levels, and more.
WARNINGS	Allows you to define and activate certain warnings individually.
MULTIGAS	Allows you to define parameters relating to multigas dives.
WATER	Allows you to choose between salt and fresh water.
FUTURE DECO	Allows you to set the parameters for the future deco prediction. Please refer to section 2.5 for more details on this.
DEEP STOP	Allows you to activate or deactivate the visualization of deep stops.
DECO STOP	Allows you to choose the depth of the shallowest stop among 3m/10ft, 4.5m/15ft, 6m/20ft.
ERASE DESAT	Allows you to reset the inert gas 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.
ALL SILENT	Allows you to silence the dive computer.
ASCENT VIOLATION	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.
SURFACING MODE	Allows you to set the time interval after surfacing before the dive is closed.
CEIL-CON DECO	Allows you to switch between staged decompression and continuous ascent (CEILing CONtrolled).
BACKLIGHT	Allows you to set the duration of the backlight between 2 and 12 seconds. The default setting is 6 seconds. You can also change the intensity from **LOW** to **HIGH**. In **HIGH** the energy consumption is higher and the battery will last less.
UNITS	Allows you to choose between metric (m, °C) and imperial (ft, °F) units.
CLOCK	Allows you to set the date and time.

2.1. MODE

In this menu you define the type of gas you will be breathing during the dive (**AIR** as **SINGLE GAS**, **NITROX** as **SINGLE GAS**, **NITROX** as **MULTIGAS**, **TRIMIX** as **MULTIGAS**). You can also set Quad 2 to **BOTTOM TIMER**, in which case Quad 2 will show only time, depth and temperature: it will not carry out any decompression calculation and it will not show any warnings and alarms.

Use **TR-SP** or **BR-SP** to highlight your choice, then press **TL-SP** or **TR-LP** to activate it. **AIR** is the equivalent of setting Nitrox to 21% and a ppO_2max of 1.4bar.

When selecting Nitrox, you can define the percentage of oxygen in the mixture (O_2%) and the maximum value of oxygen partial pressure (ppO_2max) for up to three breathing mixes. The maximum possible value for the ppO_2max is 1.6bar. Most training agencies recommend not to exceed a value of 1.4bar.

Once inside this menu, use **TR-SP** or **BR-SP** to change the O_2%, and watch how this affects the maximum operating depth (MOD). Then with **TL-SP** or **TR-LP** move on to the ppO_2max and use **TR-SP** or **BR-SP** to change the value, again noticing how this affects the MOD. **TL-SP** or **TR-LP** saves the set values and returns to **PRE-DIVE**. Note that if you press **BR-LP** after setting the O_2% value, you skip the ppO_2max setting and return directly to **PRE-DIVE**.

> ⚠ **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 Quad 2 corresponds to the oxygen concentration in the tank. Setting the wrong oxygen concentration can lead to serious injury or death.

This is also the menu where you would be setting your decompression gases if you dived with more than one gas. See chapter 10 for more information about diving with more than one gas or for dives with trimix.

2.2. ALGORITHM

Quad 2 employs the unmodified Bühlmann ZH-L16C algorithm with gradient factors. Gradient factors are used to lower the maximum tolerated inert gas pressure in the tissues with respect to Bühlmann's original values. This results in less nitrogen in the body at the end of the dive, which under normal circumstances makes the dive safer. Gradient factors are expressed in pairs: the first value, also called **GF low**, represents the reduction of the original Bühlmann value that defines the beginning of the final ascent (relevant only in decompression dives); the second value, also called **GF high**, represents the reduction of the original Bühlmann value that defines the residual nitrogen at the surface at the end of a dive. As an example GF 50/85 will get you to the surface with a 15% lower gradient factor with respect to Bühlmann's original maximum tolerated inert gas pressure and, if this was a decompression dive, your first decompression stop would have been at a depth such that you would not have exceeded 50% of the gradient factor with respect to Bühlmann's original value at that depth.

For more information about gradient factors, please refer to www.mares.com/downloads/articles

2.2.1. MAIN GF

This is where you set the conservatism level of the ZH-L16C algorithm via gradient factors. We use Bühlmann's original values reduced by 15% as a starting point, and you can make the algorithm more conservative from there. There are four predefined sets of gradient factors with increasing conservatism from **R0 (85/85)** to **R3 (50/60)** for recreational dives and from **T0 (30/85)** to **T3 (25/40)** for tech dives. You can also enter the GF low and GF high values directly via the **CUSTOM** setting. The default value is **R0 (85/85).**

2.2.2. ALTERNATE GF

Quad 2 allows you to define an alternate set of gradient factors, to use when you need to cut your decompression short in case of an emergency. The set of alternate gradient factors cannot be more conservative (i.e. lower) than the main set of GF values. The default value is R0 (85/85).

2.2.3. REPETITIVE DIVES

The original Bühlmann algorithm assumes normal offgassing of inert gas via diffusion after a dive. This seems to work well for most people and indeed most dive computers available today compute repetitive dives like this. There is evidence however that some people produce bubbles after a dive, or produce more bubbles than others, and these bubbles though harmless slow down the offgassing process. Surface intervals of three hours or longer are known to dissipate most if not all bubbles. Quad 2 allows you to account for this by applying an additional conservatism to repetitive dives, reducing both gradient factor values by 8 upon surfacing from a dive and then increasing it again by 1 every 15 minutes of surface interval. When setting **REP** to **ON** you will have recovered the full gradient factor values after a two-hour surface interval. Any dive started before such surface interval will carry an automatic additional gradient factor reduction. If you set the value to **OFF**, the GF values are not modified during a surface interval.

2.2.4. MULTIDAY

Increasing inert gas load on your tissues over several days of diving has effects that are not fully understood and are different from person to person. Most dive computers available today do not account for this and compute simple inert gas offgassing by diffusion. Quad 2 allows you to increase the conservatism automatically for each day of diving with less than 24-hours of surface interval by reducing both gradient factor values by 2 on the second day, an additional 2 on the third day and an additional 2 on the fourth day up to a maximum of 6.

2.3. WARNINGS

2.3.1. MAX DEPTH

Quad 2 allows you to set an alarm at a depth independent of the MOD. The default value is **OFF**. Using **TR-SP** or **BR-SP** you can set it between 10m / 30ft and up to just shy of the MOD, in 1m / 5ft increments. Upon reaching the defined depth an alarm similar in behaviour to the **MOD** alarm (section 7.3.2) is triggered. Press any button to acknowledge having seen it.

2.3.2. DIVE TIME

Quad 2 allows you to set a time alarm, triggering also a warning at half of the set time limit. The default value is **OFF**. Using the button, you can set the value between 20 and 90 minutes in 2-minute increments. Upon reaching half of the set limit, the dive time will blink until you hit any button to acknowledge it. Upon reaching the set time limit, the dive time again blinks until you hit any button to acknowledge it.

2.3.3. NO DECO

When this is set to **ON**, a warning will alert you when the NO STOP time reaches 2 minutes.

2.3.4. ENTERING DECO

When this is set to **ON**, a warning will alert you when a mandatory decompression stop has been calculated by Quad 2.

2.4. MULTIGAS

2.4.1. PREDICTIVE

When set to **ON**, Quad 2 will consider all gases in the decompression calculation, with switches carried out at the MOD of each gas. When set to **OFF**, the decompression calculation will consider the currently breathed gas only. See Section 10 for more information about the **PREDICTIVE** feature.

The default value is **ON**.

2.4.2. SWITCH BELOW MOD

When set to **ON**, Quad 2 will allow a switch to a gas at a depth deeper than the MOD of the gas (resulting in an immediate MOD alarm).

The default value is **ON**.

2.5. FUTURE DECO

In this menu you can define the parameter of the future deco prediction. Refer to section 8.2 for more information.

2.6. WATER

You can set the computer to fresh water, salt water or **EN13319** calibration, depending on where you intend to dive. Setting the wrong water type entails an error in depth measurement of maximum 3% (i.e. 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. **EN13319** corresponds to a water density of 1.0197kg/l and it is used in European Norm 13319.

2.7. DEEP STOP

Quad 2 calculates a deep stop for air and nitrox dives only. The depth is defined as that at which the 5th compartment (27-minute half time) switches from ongassing to offgassing. Stopping at this depth during an ascent allows the first four tissues to offgas at a relatively high ambient pressure (theoretically preventing microbubble formation) without causing excessive nitrogen uptake in the other tissues. The deep stop, when calculated, is shown in the top right corner of the display, next to the current depth. The deep stop is optional, not carrying it out does not introduce any penalties and its duration is NOT included in the total ascent time.

This menu allows you turn off the calculation and display of the deep stop. The default setting is **OFF**.

2.8. DECO STOP

This menu allows you to choose the depth of the shallowest stop among 3m/10ft, 4.5m/15ft and 6m/20ft. Decompression times increase when the shallowest stop is deeper.

For the setting to be active the following conditions have to be met:

- predictive multigas is **ON**;
- at least one gas is set to an oxygen percentage of at least 36%;
- when prompted to do so, the gas switch is carried out.

If these conditions are not met, Quad 2 will recalculate the decompression with a 3 m / 10 ft shallowest stop.

2.9. ERASE DESAT

Quad 2 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.

Once inside the menu, 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.

2.10. ALL SILENT

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.

2.11. ASCENT VIOLATION

If the ascent rate exceeds 120% of the allowed value over a depth change of more than 20m/66ft, due to the potential of harmful bubble formation, Quad 2 locks the computer for 48 hours in order to prevent 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.

2.12. SURFACING MODE

In this menu you can set the duration of the interval from the moment you reach the surface to when the dive computer closes the dive. During this interval you can submerge again and resume the dive. This menu allows you to change the default 3-minute interval to any value between 1 minute and 45 minutes.

2.13. CEIL-CON DECO

This feature allows you to decompress following the ceiling (0.1 m / 1 ft decrements) instead of the common 3 m / 10 ft steps. This is particularly advantageous when the difference between GF low and GF high is considerable. Turning this option **ON** makes the **CEILING** become the default indication in the upper right corner of the display once you are within 3 m / 10 ft of the deepest stop, and allows you to ascend to the ceiling without incurring into a deco stop violation. The decompression schedule itself is still displayed in the usual 3 m / 10 ft steps. Once the ceiling has reached the value of 6.0 m / 20 ft, the remainder of the decompression has to be carried out in the standard way at 6.0 m / 20 ft and, if applicable, at 4.5 / 15 ft m or 3.0 m / 10 ft. For this reason QUAD 2 shows the ceiling only if the value is greater than 6.0 m / 20 ft.

2.14. BACKLIGHT

This menu allows you to set the duration of the backlight between 2 and 12 seconds. Default setting is 6 seconds.

You can also change the intensity from **LOW** to **HIGH**. In **HIGH** the energy consumption is higher and the battery will last less.

2.15. UNITS

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

2.16. CLOCK

This menu allows you to set the time and date.

• 3. LOGBOOK

Quad 2 can record the profiles of over 100 hours of diving, at a sampling rate of 5 seconds. The information can be transferred to a Smartphone (Mares or MySSI app, via bluetooth). In addition, Quad 2 can show most of the information directly on the display. Upon entering the logbook you will see **StAt**. Entering this menu will show the deepest depth, longest dive time and lowest temperature recorded, in addition to the total number of dives and total number of dive hours.

TR-SP from **StAt** will scroll through a summary of all dives in memory, starting with the most recent. For each dive with **TR-LP** you can access additional information.

• 4. DIVE PLANNER

This function allows you to plan your next dive. In case you dived recently, with **TR-SP** you can enter an additional surface interval in 15-minute increments between now and when you intend to dive: the residual nitrogen load will be adapted accordingly. Quad 2 will consider all active gases and set gradient factors, displaying them at the bottom of the

screen. Then enter the planner with **TL-SP** or **TR-LP**; with **TR-SP** and **BR-SP** you can scroll through the no decompression limits for all depths, in 3m / 10ft increments, up to the MOD for the gas in use. With **TL-SP** or **TR-LP** you can see what would happen if for a given depth you extended your dive time beyond the no decompression limit. Use **TR-SP** to increase your dive time and see what your corresponding decompression obligation would be. Use **BL-SP** to return to the no decompression limits. From here **BL-SP** exits the dive planner.

• 5. INFO

This submenu provides various information about the hardware and software of your Quad 2.

• 6. BLUETOOTH

This menu starts the bluetooth connection to a smart device via the MARES or MySSI app. It can be reached also as a shortcut with **BR-LP** from **POST DIVE**.

• PART II

• 7. DIVING WITH QUAD 2

7.1. 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.

Quad 2 warns you with respect to these two effects in the following ways (as long as it is set to either **AIR** or **NITROX**):

- Against sudden effects: Quad 2 has an MOD alarm set for a user-defined ppO_2max. As you enter the oxygen concentration for the dive, Quad 2 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 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 Quad 2 is set to **AIR**, the ppO_2max is set to **1.4bar** by default.
- Against long exposure effects: Quad 2 "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 Quad 2 will activate an alarm when this level of CNS% is reached. Quad 2 also warns you when the CNS level reaches 75%. Note that the CNS% is independent of the value of ppO_2max set by the user.

7.2. 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. Quad 2 automatically adapts the algorithm by sensing the ambient pressure every 20 seconds even when it is turned off.

NOTE
We do not recommend diving at altitudes above 3700m / 12100ft. If you do, set Quad 2 to **BOTTOM TIMER (BT)** and find appropriate altitude dive tables.

7.3. ALARMS

Quad 2 can alert you of potentially dangerous situations. There are five different alarms:

- Ascent rate alarm;
- Exceeding a safe ppO_2/MOD;
- CNS =75%;
- Missed decompression stop;
- Low battery during the dive.

⚠ WARNING
When in bottom timer mode, all warnings and all alarms are **OFF** aside for the low battery 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.

7.3.1. ASCENT RATE

As soon as depth decreases Quad 2 activates the ascent rate control algorithm and displays the calculated value both numerically and graphically.

⚠ WARNING

A rapid ascent increases the risk of decompression sickness.

If Quad 2 determines an ascent rate higher than set limits, the fast ascent alarm is triggered: an audible alarm goes off, and the message SLOW is displayed on the screen.

This persists until the ascent rate is reduced to below the pertinent limit. The limits are dependent on the current depth as follows:

Depth in m	Speed in m/min	Depth in feet	Speed in ft/min
> 50 m	20	> 165 ft	60
30 – 50 m	15	100 – 165 ft	45
10 – 30 m	10	30 – 100 ft	30
< 10m	5	< 30ft	15

⚠ WARNING

If the ascent rate exceeds 120% of the allowed value over a depth change of more than 20m/66ft, Quad 2 locks the computer for 48 hours in order to prevent you from diving again. You can disable this function in the menu **ASCENT VIOLATION** This should only be done by highly experienced divers, who take full responsibility for the consequences of this action.

7.3.2. 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 depth starts blinking and the MOD is shown next to it.

This persists until the situation has been corrected.

While the alarm is active you can call up a gas switch, but the top row will continue showing the blinking depth and MOD until the situation has been corrected.

⚠ WARNING

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

7.3.3. CNS = 75%

⚠ WARNING

When the CNS reaches 100% there is danger of oxygen toxicity. Quad 2 starts alerting you when you reach 75%.

Oxygen toxicity exposure is tracked on Quad 2 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 exceeds 75%, the CNS value starts blinking and becomes the default field in the lower right corner. With **BR-SP** you can view any other value, but it will remain for 4s only, and then return to the CNS value.

If the oxygen toxicity level reaches 75%, ascend to shallower depth to decrease oxygen loading and consider terminating the dive.

⚠ 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.

7.3.4. 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), an audible alarm goes off and the depth starts blinking together with the depth of the missed deco stop. This alarm remains active until you return to the correct depth.

⚠ WARNING

Never ascend above the displayed decompression stop depth.

7.3.4.1. CEILING-CONTROLLED DECO OPTION

If **CEIL-CON DECO** is set to **ON**, the ceiling starts blinking in the top right corner as soon as you exceed the **CEILING.**

7.3.4.2. ALTERNATE GRADIENT FACTORS AND MISSED DECO STOP MODE

If the stop depth is exceeded by less than 1m (3ft) for more than three minutes or by more than 1m (3ft) for more than 1 minute, Quad 2 will automatically switch to the **ALTERNATE** gradient factors, display **ALT** blinking in the top right corner and, if compatible with the current depth, keep you out of a dive violation. **ALT** is displayed until you press any button to acknowledge having seen it.

If the alternate gradient factors are not compatible with the current depth, Quad 2 considers this a dive violation and the deco violation symbol will appear, blinking, until you press any button to acknowledge having seen it.

In this case, if the diver attempts a repetitive dive after surfacing, Quad 2 will function only as a depth gauge and timer (bottom timer mode) and it will display the missed deco stop violation symbol ( ).

7.3.4.2.1. CEILING-CONTROLLED DECO OPTION

If **CEIL-CON DECO** is set to **ON**, and you exceed the **CEILING** by up to 0.3m /1 ft for 1 minute or more, Quad 2 will automatically switch to the alternate gradient factors, display **ALT** and, if compatible with the current depth, keep you out of a dive violation. **ALT** is displayed until you press any button to acknowledge having seen it. If you exceed the **CEILING** by more than 0.3 m / 1 ft the switch to the alternate gradient factors is instantaneous.

If the alternate gradient factors are not compatible with the current depth, Quad 2 considers this a dive violation and the display will show the missed deco stop violation symbol ( ).

In this case, if the diver attempts a repetitive dive after surfacing, Quad 2 will function only as a depth gauge and timer (bottom timer mode), and it will display the missed deco stop violation symbol ( ).

NOTE
The purpose of this is to provide you, when the circumstances allow it, with the means to perform an alternative decompression and to prevent a computer lockdown after surfacing. To perform an alternative decompression, observe the values of **GF NOW/GF @SURF** and ascend so as to keep both values as close as possible to the original **MAIN GF** values within the limits of your gas supply.

7.3.5. LOW BATTERY

If Quad 2 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.

If the symbol starts blinking during a dive you must replace the battery before diving again.

• 8. DISPLAY INFORMATION

Turning on Quad 2 puts it in **PRE-DIVE** to ensure that monitoring of the dive starts as soon as a depth of 1.2m/4ft is reached. If you start the dive without putting Quad 2 into pre-dive mode, Quad 2 will switch into dive mode automatically but with a delay of up to 20 seconds from immersion.

NOTE
- If you remain in pre-dive for longer than 10 minutes without pressing any button, Quad 2 will turn off.
- It is recommended to put Quad 2 into pre-dive before submerging. Not doing so can lead to a delay of up to 20s in Quad 2 monitoring the dive.

The **PRE-DIVE** display shows the active GF values, the active gas and its **MOD.**

During a dive the following information is shown:

- current depth and temperature in top row
- no deco time in middle row (depth of deepest stop, time at deepest stop and total ascent time in case of decompression dives)
- dive time and O_2% in bottom row
- nitrogen bar graph along the left edge of the display
- ascent speed: in case of an ascent, the value in m/min or ft/min is displayed to the left in the center row. Graphically it is displayed via the segments at the left edge of the display.

With **TR-SP** , the field to the right of the current depth is modified in the following sequence:

- max depth
- average depth
- MOD of gas in use
- deep stop if active and calculated
- TTS @+5
- ceiling.

With **BR-SP** , the field to the right of the dive time is modified in the following sequence:

- main GF
- GF NOW
- GF @SURF
- CNS
- OTU
- ppO_2
- time of day
- stopwatch

With **BL-LP** you can hide/show the seconds in the dive time.

The stopwatch can be reset by **TL-SP** even when the stopwatch is not displayed. This will also set a bookmark in the dive profile memory.

NOTE
if you set Quad 2 to **AIR**, the information on MOD, CNS and ppO_2 are not displayed in order to simplify the display. The CNS value is however calculated in the background and both the CNS alarm and MOD alarm are triggered if the circumstances require it. If you are diving air but would anyway like to see the MOD, CNS and ppO_2, set Quad 2 to Nitrox 21%.

8.1. DEEP, DECO AND SAFETY STOPS

DEEP stops are generated as you approach the no deco limit. **DEEP** stops are **NOT** mandatory but rather suggestions which attempt to minimize bubble production by offgassing some nitrogen at high ambient pressure. Deep stops are shown to the right of the current depth.

DECO stops are generated progressively as you stay at depth beyond the no deco time. **DECO** stops are **MANDATORY.** As you approach the depth of a stop, the duration of the stop is gradually reduced. The duration itself is always shown in minutes, and is calculated as a function of the pressure gradient achieved at the stop depth itself. Hence the farther you are from the exact depth of the stop, the longer it will take for each minute to tick off.

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**. A safety stop is always shown as a 3-minute countdown in minutes and seconds.

8.1.1. GF @+3

As you approach the surface towards the end of the dive, at a depth shallower than 10 m / 30 ft and if there is no decompression obligation, **GF @+3** appears next to **GF @SURF** in the lower right corner. **GF @+3** represents the prediction of **GF @SURF** 3 minutes ahead. This is a tool that allows you to appreciate the effect of spending time at shallow depth at the end of the dive, especially the effect of carrying out the safety stop and possibly extending it past three minutes.

When the safety stop has elapsed, a check mark appears and a countup timer starts as long as you stay shallower than 6 m / 20 ft.

⚠ WARNING

During all dives, perform a safety stop between 3 and 5 meters/10 and 15 feet for 3 minutes, even if no decompression stop is required.

8.2. FUTURE DECOMPRESSION

In case of a decompression dive, the **TR-SP** sequence also features **TTS @+5**. The value shown represents the total ascent time if you were to remain at the current depth for an additional 5 minutes. This is very useful since it allows you to estimate how your decompression will be affected by remaining at the current depth a while longer.

It is also very useful because, as the slower tissues start accumulating nitrogen, you could find yourself in a situation in which the decompression time grows very quickly, so much so that you may find yourself with insufficient gas to finish the dive.

NOTE

The prediction of **TTS** can be set between 3 and 10 minutes in advance in **FUTURE DECO** (2.5).

8.3. ALTERNATE GRADIENT FACTORS

To switch from the main gradient factors to alternate gradient factors, press **BR-SP** until **MAIN GF** appears on the display. Now with **BR-LP** the **GF** values and the decompression information will start blinking and alternating with the **ALT GF** information. The two sets of decompression calculations will continue alternating for 10 seconds after which the display will revert to normal unless you do one of the following:

- **TR-LP** will activate the alternate gradient factors: the display returns to normal, the decompression calculation shown in the center row is that pertaining to the alternate gradient factors, and **ALT GF** and its values replace **MAIN GF** and its values in the bottom right corner data field.
- Any other button operation will revert to the normal display while maintaining the **MAIN GF** values and the corresponding calculation.

NOTE

- The two decompression calculations can be called up as often as you wish before making a switch to the alternate gradient factors.
- The switch to alternate gradient factors can be made only once.
- Once the alternate gradient factors are active, it is not possible to return to the MAIN GF or see the two decompression calculations together on the display.

• 9. AFTER THE DIVE

Upon returning to the surface, Quad 2 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 the surfacing mode countdown timer.

If you submerge again before the 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, Quad 2 considers the dive finished, records the data to the logbook and reverts to the so-called **POST DIVE** mode.

The **POST DIVE** screen shows two sets of information, alternating in 4s intervals. One 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 Quad 2 accounts for the pre-existing nitrogen load in your body.
- The no-fly time **(NO-FLY TIME)**: this is the time during which an exposure to the reduced pressure inside the cabin of an airplane could cause decompression sickness. Quad 2 employs, as recommended by NOAA, DAN and other agencies, a standard 12-hour (no-deco non-repetitive dives) or 24-hour (deco and repetitive dives) countdown.

The DESAT TIME could be shorter than the NO-FLY TIME, which would imply that you cannot fly although you are desaturated. 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 Quad 2 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 for as long as there is remaining desaturation or no-fly time on the computer.
- GF NOW: this helps you track your inert gas in excess of ambient pressure.

The other contains a condensed log of the last dive: maximum depth, lowest temperature, dive time and **GF @SURF** at the end of the dive.

• 10. 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.

Quad 2 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. Two or more tanks can also be set to the same oxygen concentration. If you are diving with only two mixtures, you will be utilizing tanks **G1** and **G2**.

Quad 2 can be set to consider all active gases in the decompression calculation, or it can be set to consider only the gas currently in use. In the first case (**PREDICTIVE = ON** in 2.4.1), when you switch gas when prompted to do so during an ascent, you will not see a change in the decompression calculation: Quad 2 considered that you were going to switch gas and already considered the effect of this on the decompression. In the second case (**PREDICTIVE = OFF** in 2.4.1) you will see a reduction in the total ascent time as you switch to a gas with higher oxygen content and Quad 2 considers this for the decompression calculation.

NOTE

You can set all the gases to the same oxygen percentage.

10.1. 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 Quad 2 which gas is currently being used during the various phases of the dive.

The menu after single gas nitrox is multigas nitrox, identified by the G1 symbol appearing between the O_2 and the PPO_2 setting. Upon entering this menu, G1 starts to blink, allowing you to go directly to editing G2 or G3 via **TR-SP**. **TL-SP** or **TR-LP** enters the setting mode for the chosen gas, after which it is the same as in single gas nitrox. By default G2 is turned off. Upon entering G2, **TR-SP** will turn it on, and **TL-SP** or **TR-LP** will proceed to the setting mode for G2.

NOTE

- When enabling **G2** and **G3**, you must first define **G2** and then **G3.**
- **G2** cannot have an oxygen percentage higher than **G3.**
- The MOD for **G2** and **G3** is the switch depth for the corresponding gas. This is what Quad 2 uses for its calculation, alarms and suggested switch points.

NOTE

- When setting an oxygen concentration of 80% or higher, Quad 2 automatically sets the ppO_2max to 1.6 bar.
- For gases with oxygen concentration 80% or higher, the ppO_2 can be set between 1.6 bar and 1.8 bar.

⚠ WARNING

A ppO_2 higher than 1.6 bar is dangerous and can result in injury or death.

10.2. SWITCHING GAS

Quad 2 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**, Quad 2 sounds an audible signal and the oxygen concentration of G1 together with the label ***SWITCH*** start to blink in the lower right corner.

Use **BR-SP** 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.

Use **BR-LP** to confirm the switch to G2: the set oxygen concentration will be displayed steadily in the lower right corner of the screen: if **PREDICTIVE** is set to **ON**, the decompression calculation will not change; if **PREDICTIVE** is set to **OFF**, within 20 seconds of having switched gas, the decompression calculation will be updated to reflect the change in gas.

NOTE
If **PREDICTIVE** is set to **ON** and you don't switch gas when prompted to do so,

- the decompression calculation will change to reflect the exclusion of G2 from its calculation;
- if you then drop below the MOD of G2, the decompression calculation will change again to reflect the reinclusion of G2.

Using **BR-SP** while G2 is blinking, the next available gas in the list will be displayed instead. This will be G1 or G3 (if set), depending on the depth and whether you allowed the switch below MOD.

NOTE

- The automatic blinking of the oxygen concentration of G1 lasts only for 20 seconds. You can however initiate the gas switch at any time with **BR-LP**.
- 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.

NOTE
The gas switch sequence can be initiated also manually, at any time, with **BR-LP** while the bottom right corner shows any field other than MAIN GF. When MAIN GF is on the screen, **BR-LP** initiates the ALT GF visualization (chapter 8.3).

10.3. SPECIAL SITUATIONS

10.3.1. 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 G3 during the decompression. To do so, use **BR-LP** to initiate the gas switch. From here on the procedure is the same as described in 10.2.

10.3.2. 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.

10.4. DIVING WITH MORE THAN ONE GAS MIXTURE - TRIMIX OR HELIOX

Quad 2 allows you to set up to 5 gases in which in addition to the oxygen percentage you can also set the helium percentage. Everything is the same as with multigas nitrox diving with the addition of OTUs (Oxygen Toxicity Units) in the sequence of data fields in the bottom right corner.

⚠ WARNING

Diving with trimix requires extensive dedicated training. This manual does not provide such training!

Failure to acquire appropriate training prior to diving with trimix is very likely to result in injury or death!

• 11. BOTTOM TIMER MODE

When Quad 2 is set to **BOTTOM TIMER (BT)** mode, it will only monitor depth, time, and temperature, and will not carry out any decompression calculation. You can only switch to bottom timer mode if the computer is completely desaturated. Alarms are limited to ascent rate, low battery and, if set by the user, max depth and dive time.

⚠ 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
- stopwatch
- time of day
- dive time
- temperature
- in case of an ascent: ascent speed (in m/min or ft/min).

With **TR-SP** you can change the values in the top right field, choosing among:

- max depth
- avg depth

- temperature

The stopwatch is reset by means of **TL-SP**. The average depth is reset by means of **TL-LP** when the average depth is shown.

11.1. DIVE VIOLATION INDUCED BOTTOM TIMER MODE

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

- Ascent violation.
- Missed deco stop violation.

In case of a violation, Quad 2 will restrict the use for 48 hours, and will only allow operation in Bottom Timer mode, continuously displaying the violation symbols.

• 12. TAKING CARE OF QUAD 2

12.1. TECHNICAL INFORMATION

Operating altitude:

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

Decompression model: Bühlmann ZH-L16C with gradient factors (16 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 9999 minutes

Oxygen concentration: adjustable between 21% and 99%, ppO_2 max range between 1.2 and 1.6bar up to 79% O_2, then 1.6 - 1.8 bar.

Logbook memory: over 200 hours of dive profile at 5-second sampling rate. Maximum dive time for download: 5400 minutes.

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

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

Display:

- Diagonal: 70 mm - 2 3/4"
- Technology: LCD segment display
- Mineral Glass

Power supply:

- CR2450
- battery duration: approx 200-300 hours of diving. Actual battery duration depends on the usage of the high intensity backlight and the water temperature

Bluetooth:

EU

This device is in compliance with the essential requirements and other relevant provisions of RED Directive (2014/53/EU).

FCC Warnings

- Model: Quad 2 FCC ID: 2AIKSQUAD2
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.
- Responsible party's contact located in the United States: Head USA - dba as Mares Diving a division of Head USA, Congress Corporate Plaza II 902 Clint Moore Road Suite 208, 33487 Boca Raton, Florida. www.mares.com

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

12.2. MAINTENANCE

The depth accuracy should be verified every two years. Aside from that, Quad 2 is virtually maintenance free. All you need to do is rinse it carefully with fresh water after each dive (avoid any chemical products). To avoid possible problems with your Quad 2, the following recommendations will help assure years of trouble free service:

- avoid dropping or jarring your Quad 2;
- do not expose Quad 2 to intense, direct sunlight;
- do not store Quad 2 in a sealed container, always ensure free ventilation.

NOTE
If you notice signs of moisture on the inner wall of the glass, take your Quad 2 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 Quad 2, because it could damage the pressure sensor area.

12.2.1. REPLACING THE BATTERY IN QUAD 2

Replacing the battery is a delicate operation, and requires close attention. We suggest 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
Inspect the O-ring carefully, checking for any signs of damage, tearing or warping. If necessary, replace it with a new O-ring. Unscrew the cover of the battery vane by using a coin that best fits into the slot. Remove the cover, remove the battery and insert the new battery paying close attention to the polarity. Check the o-ring and if needed replace it. Put the cover back in place and turn clockwise while pressing down until it's tight, without forcing too much.

NOTE
The battery compartment is sealed from the electronics, so that in case of a flooding of the battery compartment the dive computer is unharmed. In such event, you will need to rinse the compartment with fresh water, dry it thoroughly, replace the o-ring and put in a new battery.

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

• 13. 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.

13.1. 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.

13.2. HOW TO FIND THE PRODUCT SERIAL NUMBER AND ELECTRONIC ID

The serial number is laser-engraved on the back side of Quad 2, in front of the front attachment point of the strap.

To see the electronic ID, enter the **INFO** menu.

Both serial number and electronic ID can be found on the warranty card inside the box and also on the label outside the box.

• 14. 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.

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Mares S.p.A. - Salita Bonsen, 4 - 16035 RAPALLO - ITALY - Tel. +39 01852011 - Fax +39 0185201470
www.mares.com

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