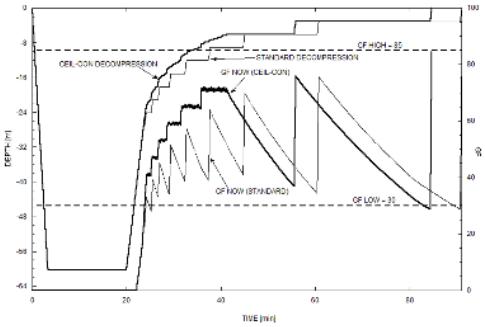
mares®

Color Dive Computer

Instruction Manual (FW 1.01.00 05/2022)

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 https://www.mares.com/en/ceiling-controlled-vs-staged-decompression-comparison-betweendecompression-duration-and-tissue-tensions-article-02. **If you have any doubts about CEIL-CON, do not activate it.**

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• IMPORTANT WARNINGS

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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.

⚠ 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:

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

• PART I

• 1. INTRODUCTION

1.1. GLOSSARY

AIR:	Air dive
AVG:	Average depth, calculated from the beginning of the dive.
CNS:	Central Nervous System. CNS% is used to quantify toxic effects of oxygen.
D-TIME:	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.
Gas integration:	The feature in Sirius to include tank pressure information in its calculations and to display it on the computer screen.
Gas switching:	The act of changing from one breathing gas to another.
GF:	Gradient factor
Gradient Factor:	Reduction of Bühlmann's original value of maximum tolerated inert gas pressure.
Heliox:	A breathing gas containing Oxygen and Helium.
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_2max). 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.
Nitrox:	A breathing mix made of oxygen and nitrogen, with the oxygen concentration being 22% or higher.
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.
NO-FLY:	Minimum amount of time the diver should wait before taking a plane.
O_2:	Oxygen.
O_2%:	Oxygen concentration used by the computer in all calculations.
Pairing:	The act of establishing a coded RF communication between Sirius and a dedicated device, such as a tank module.
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.
ppO_2max:	The maximum allowed value for ppO_2. Together with the oxygen concentration it defines the MOD.
S. I.:	Surface interval, the time that has elapsed since the end of the dive.
Switch depth:	The depth at which the diver plans to switch to a higher oxygen concentration mix while using the multigas option.
TOD:	Time Of Day
TTR:	Time To Reserve, it is the time that a diver can spend at the current depth before reaching the tank reserve.
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 and assuming an ascent rate of 10m/min or 33ft/min.
TTS @+X:	The overall ascent time inclusive of all decompression stops if the dive is extended by X minutes at the current depth.

1.2. OPERATING MODES

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

- **watch mode**: Sirius 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 smart phone and much more;
- **dive mode**: Sirius monitors depth, time, temperature and performs all decompression calculations; dive mode itself can be broken down into 4 sub categories:
  - **pre-dive** (Sirius 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** (Sirius 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, Sirius 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. RECHARGEABLE BATTERY

Sirius uses a rechargeable battery. A full charge allows you up to 30 hours of diving, depending on the usage of the backlight and the temperature of the water. If during a dive the battery level drops to 15%, Sirius will display a low battery warning. When this appears, you should start your final ascent to the surface.

⚠ **WARNING**

- Sirius will not enter in dive mode if the battery level is 20% or less.
- Leaving Sirius unattended for long periods of time such that the battery will be completely discharged does not harm neither the battery nor Sirius. Logbook data and all settings will be saved. After charging you must however set the time and date again.
- When the battery in Sirius is completely discharged, it may take up to 20 minutes from the moment it is connected to a power source before Sirius reacts.
- Temperature can noticeably affect battery performance. A low battery warning may appear when diving in cold waters even if you think that the battery should have sufficient charge.
- It is advised that you charge the battery if you intend to dive in cold water.

The rechargeable battery has a life time of approximately 500 charging cycles. Please contact your authorized Mares dealer if you need to replace it.

1.3.1. CHARGING THE BATTERY

Sirius charges the battery via the included induction charger. Simply lay Sirius face up on the pad and verify that the charging symbol appears on the display. The battery takes about 3 hours to charge from completely empty to completely full.

1.4. COMMUNICATING VIA BLUETOOTH

Sirius 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 AND WATCH FUNCTIONS

Sirius 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.

In **TOD** (Time Of Day display - watch mode):

BL:

- **SP** cycles through the three watch faces: **BIG**, **DETAIL** and **ANALOG**; In case of residual nitrogen from a dive, the **POST DIVE** display appears after **ANALOG**.
- **LP** calls up the **COMPASS**. While in compass, **TR-SP** sets a bearing, **TR-LP** erases a set bearing. **BL-SP** exits the compass.

TL:

- **SP** brings up the **STOPWATCH**. Once in stopwatch mode, **TR-SP** starts and stops, **BR-SP** takes a lap time and resets, **BL-SP** exits and returns to **TOD** display.
- **LP** brings up the **COUNTDOWN TIMER**. Once in timer mode, **TR-SP** starts and stops, **BR-SP** resets (also while the timer is running), **TR-LP** allows to set the time (when the timer is not running), **BL-LP** toggles between **REPEAT ON** and **REPEAT OFF**. **BL-SP** exits and returns to **TOD** display.

TR:

- **SP** puts Sirius into **PRE-DIVE** mode. From here, **TR-SP** brings up the **GF TABLE** (from which you can access the GF settings) and **BR-SP** brings up the gas setting menu. **BL-SP** returns to **TOD** display.
- **LP** brings up the **MENU**. Once inside the menu, **TR-SP** moves up in the list while **BR-SP** moves down. **TR-LP** enters the selected line while **BR-LP** goes back one level. **BL-SP** returns to **TOD** display.

BR:

- **SP** changes the color of the seconds, scrolling through all options.
- **LP** switches the background to white and the white foreground to black.

In **DIVE MODE**

BL:

- **SP** cycles through **E-Z**, **COMPLICATIONS**, **DIVE PROFILE**, **TISSUE SATURATION GRAPH** and **LIST OF STOPS** (for decompression dives).
- **LP** calls up the **COMPASS**, While in compass, **TR-SP** sets a bearing, **TR-LP** erases a set bearing. **BL-SP** exits the compass.

TL:

- **SP** resets the stopwatch even when it is not visible on the display.
- **LP** brings up the **UW MENU**.

TR:

- **SP** modifies the information field in the top row momentarily (**E-Z**) or in the top right corner (**COMPLICATIONS**)
- **LP** activates the backlight.

BR:

- **SP** modifies the information field in the bottom row momentarily (**E-Z**) or in the bottom right corner (**COMPLICATIONS**)
- **LP** brings up the **GAS SWITCH TABLE** (for multigas dives).

Figure 1 provides a schematic view of button function in watch mode and in dive mode.

1.5.1. WATCH FACES

Sirius offers you a choice of watch faces (Fig. 2):

- **BIG**: digital time in XXL size;
- **DETAIL**: digital time with seconds and battery information;
- **ANALOG**: analog watch face.

These are placed in a loop accessible with **BL-SP**. In case of a recent dive, the **POST DIVE** display is part of this loop as well.

1.5.2. DIGITAL COMPASS

Sirius has a tilt-compensated digital compass which can be used at almost any inclination. The compass can be called up at any moment on the surface or during a dive by **BL-LP** (Fig. 3). With **TR-SP** you can set a reference bearing. This is useful for instance if you are on a boat and there is a landmark on the shore that you can use for alignment to reach a specific spot on that dive site. A dot will appear to indicate the set bearing. Additional symbols will appear as well: squares at 90 degrees, triangles at 120 degrees and two parallel lines at 180 degrees, as an aid in navigation for square, triangular and reciprocal courses. Once underwater, align the dot with the arrow and start swimming in that direction.

The number underneath the ribbon represents the deviation of the direction you are pointing at with reference to the set bearing. In dive mode the stopwatch appears next to it, useful to time legs of a course.

Repeating **TR-SP** sets a new bearing, while **TR-LP** erases the set bearing.

BL-SP exits the compass and returns to **TOD** display or dive display.

1.5.3. STOPWATCH

TL-SP from any **TOD** display brings up the **STOPWATCH**. Once in stopwatch, **TR-SP** starts and stops, **BR-SP** takes a lap time while the stopwatch is running and resets it when it

isn't. The 4 more recent lap times are kept on the display (Fig. 4). **BL-SP** exits the stopwatch.

1.5.4. COUNTDOWN TIMER

TL-LP from any **TOD** display brings up the **COUNTDOWN TIMER** (Fig. 5). **TR-LP** allows you to set the duration. **TR-SP** starts and stops the timer, **BR-SP** resets it (also while running). **BL-LP** allows you to activate the automatic repetition of the timer upon reaching 0. **BL-SP** exits and returns to **TOD** display.

1.5.5. PRE-DIVE

TR-SP puts Sirius into **PRE-DIVE** mode, which means that Sirius is ready to start a dive (Fig. 6). From this mode you also have quick access to the **GF TABLE** (**TR-SP**) and the gas setting menu (**BR-SP**).

1.5.6. MENUS AND SETTINGS

From any **TOD** display, **TR-LP** calls up the menu of settings and functions (Fig. 7). Once inside this list, **TR-SP** advances in one direction, **BR-SP** advances in the other. **TR-LP** enters the highlighted line item, whereas **BR-LP** goes back one level. Some menus allow you to go deeper into another menu, some allow you to set a value, change a setting or perform an operation (such as pairing of a transmitter). **TR-SP** advances in a list or increases a value, **BR-SP** advances backwards in a list or decreases a value. **TR-LP** or **BR-LP** confirms a setting and goes back one level. **BL-SP** returns to **TOD** display.

The menu contains the following entries:

- **SET DIVE** - section 2
- **SET WATCH** - section 3
- **LOGBOOK** - section 4
- **PLANNER** - section 5
- **INFO** - section 6
- **BLUETOOTH** - section 7

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

Sirius can communicate with up to 5 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.

In order for Sirius to display tank pressure and gas consumption information, you must first establish a channel of communication between the tank module and Sirius. 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 (Fig. 8).

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 Sirius. For best transmission, we recommend positioning the tank module as described in Figure 9.

To pair the tank module with the Sirius, 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 DIVE/GAS INTEGR./PAIR DEVICES**
- Choose the channel that you wish to assign to the device (if this is your only tank module for single gas diving, choose **G1**. **G2** through **G5** are used for multigas dives. More information on this in section 11);
- Place Sirius against the tank module as shown in Figure 10.
- Push **SELECT** and wait until the progress bar advances to the end. You will either see the message **PAIRING SUCCESSFUL** or **PAIRING NOT SUCCESSFUL**. In the first case you have successfully established a connection, in the second you need to repeat the operation, **but you must turn off the valve and depressurize the first stage completely, then wait 1 minute before attempting again.**

NOTE
- When diving with more than one gas mixture, tanks **G1** through **G5** must be set to increasing oxygen levels. Refer to section 11 for more information on multigas diving.
- A tank module can only be paired to one channel on one Sirius. If you pair the same tank module to a second channel on the same Sirius or to a second Sirius, the first one will be erased.

After a successful pairing of **G1** to Sirius, the home and the pre-dive display will show the tank pressure in either **bar** or **psi**. If tank **G1** has not been paired, Sirius will show an empty field instead of a pressure value. If **G1** has been paired but Sirius 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.
- If a tank module battery is weak, Sirius alerts you with a screen message referencing the channel designation assigned to the tank module in question.
- During a dive, you can ask Sirius to display the battery status of the tank module. More information about this in section 8.3.6 and 9.

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 if the battery in Sirius is completely empty.
- You do NOT need to repeat the pairing procedure after upgrading the firmware in your Sirius.

1.6.1. INFORMATION PERTAINING TO THE PRESSURE GAUGE FUNCTION

The pressure gauge (tank module) described in this manual is manufactured by Mares SpA, Salita Bonsen 4, 16035 Rapallo, Italy.

The accuracy of the pressure measurement is:

at	50bar	±	5bar
at	100bar	±	10bar
at	200bar	±	10bar
at	300bar	±	15bar
at	750psi	±	75psi
at	1500psi	±	150psi
at	3000psi	±	150psi
at	4350psi	±	220psi

Connecting port airflow: <100 liters/min. at a pressure of 100 bar.

CE CERTIFICATION
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 EN250:2014 for use with air. It is compliant with the specifications set forth in the harmonized European Standard EN 13949:2003 for use with oxygen-rich mixtures (Nitrox).

The pressure gauge described in this instruction manual has been tested and CE certified to a maximum depth of 50m by Registered Test Center 0474 - RINA Via Corsica 12, 16128, Genova, Italy.

APPLICATION
The submersible pressure gauge is a safety device for monitoring residual pressure in the tank, designed to be used as part of a SCUBA set (open-circuit, self-contained underwater breathing apparatus).

The gauge can be used in cold water (below 10 °C / 50 °F). Maximum operating depth is 150 m / 492 ft.

The pressure gauge must not be used in conditions that preclude its use (e.g.: low or no visibility that makes it impossible to read the gauge) and under which it is necessary to use appropriate safety devices.

The pressure gauge is designed for use exclusively with Nitrox, up to 100% oxygen. The use of air (EN 12021) or any mixture other than Nitrox or oxygen would contaminate the equipment, requiring cleaning and servicing by a Qualified Technician at a Mares Lab Service Center before it can be used with nitrox or oxygen again.

It must be kept in mind that the depth and duration of the dive are strictly dependent on

the percentage of oxygen in the breathable mixture.

> ⚠ **WARNING**
>
> Training is compulsory before the device described in these instructions may be used.
>
> The user must have received adequate prior training on the use of SCUBA diving equipment, both for use with air and for use with Nitrox.

> ⚠ **WARNING**
>
> Gaskets and o-rings for the Nitrox pressure gauge must be lubricated exclusively with oxygen-compatible grease; in the presence of oxygen-rich mixtures, the use of other types of lubricants may spark an explosion.

> ⚠ **WARNING**
>
> In the event of use with mixtures contaminated with oil, the entire system must be cleaned and serviced by a Qualified Technician at a Mares Lab Service Center.

CHECKS PRIOR TO USE, PREPARING FOR THE DIVE AND USE
Slowly open the tank valve to avoid the "water hammer" effect resulting from the high pressure entering the tank module.

When using Nitrox or oxygen, always open the tank valve very slowly to reduce the risk of an explosion.

Once the tank valve is open and the system is pressurized, close the valve and make sure there are no leaks, checking that the pressure indicated by the dive computer is stable and does not drop. If a drop in pressure is detected, do not dive and double check the entire system.

During the dive, remember to check the residual pressure frequently.

In addition to a numeric value for the tank pressure, Sirius uses color coding for an immediate at-a-glance tank pressure visualization. The color is applied to the lower screen divider bar. When the tank pressure reaches 50 bar / 500 psi, the inside of the bar turns red, to alert the diver of a low tank pressure situation.

The tank module must only be used with CE-marked SCUBA components.

MARKING
The instrument markings are the following:

- EN250: tested and certified according to European Norm EN250;
- CE 0474: CE conformity and identification number of notified body controlling production in compliance with Module D of European Regulation 2016/425
- 300 bar (NITROX/O2 200 bar max)

CARE, STORAGE AND TRANSPORT
Rinse your regulator and tank module thoroughly in fresh water after every dive. Ensure that the dust cap is installed on the first stage prior to doing so. Store the regulator and tank module in a dry place away from direct sunlight. When travelling with your equipment, it is best to use a padded bag such as is commonly used to transport diving equipment.

• 2. SET DIVE

MENU	*Description*
SET DIVE	
MODE	Allows you to choose between air, nitrox, trimix and bottom timer mode.
ALGORITHM	Allows you to set gradient factors, personalization levels, and more.
GAS INTEGR.	Allows you to synchronize your Sirius with optional tank modules and to define all parameters concerning gas integration (tank volume, operating tank pressure, tank reserve and more).
WARNINGS	Allows you to define and activate certain warnings individually.
MULTIGAS	Allows you to define parameters relating to multigas dives.
FUTURE DECO	Allows you to set the parameters for the future deco prediction. Please refer to section 2.6 for more details on this.
WATER	Allows you to choose between salt and fresh water.
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 VIOL.	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 choose between **AUTO-OFF** (the backlight stays on for only 6 s) or **PUSH ON/PUSH OFF** (the light stays only until you turn it off manually).
COMPASS TIME	Allows you to set the duration of the compass display before it reverts back to the dive data. You can set this value to 5 seconds, 15 seconds or **PUSH ON/PUSH OFF**. If set to **PUSH ON/PUSH OFF**, you exit compass mode with **BL-SP**.

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 Sirius to **BOTTOM TIMER**, in which case Sirius 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 **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 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_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 **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. With **TR-LP** save and exit the menu. Note that you can press **BR-LP** after having set the O_2% to save and exit skipping the ppO_2max setting.

> ⚠ **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 Sirius 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 11 for

more information about diving with more than one gas or for dives with trimix.

With **BR-SP** from **PRE-DIVE** you have direct access to the last used gas setting menu.

2.2. ALGORITHM

Sirius 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 with respect to Bühlmann's original value at that depth.

For more information about gradient factors, please refer to www.mares.com/sports/diving/gradientfactor

TR-SP from **PRE-DIVE** displays a table listing all settings (Fig. 11). From here, **TR-LP** gives you direct access to the **ALGORITHM** menu.

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. PERSONALIZATION

This menu allows you to define additional conservatism in a way similar to going from R0 to R1, R2 or R3 but in a more personal way. It has three submenus, called **PHYSIO, DIVE, I TODAY**. The values set in each menu are subtracted from the **MAIN GF** values yielding the values used by Sirius for the decompression calculations.

PHYSIO allows you to define an additional conservatism based on how you feel about yourself and diving overall. Each step from **LOW** to **MEDIUM** to **HIGH** incrementally reduces both gradient factor values by 10. There is also a setting called **ADVANCED (ADV)**, which increases the gradient factor by 5 so that a maximum of 90/90 can be achieved. This is only for experienced divers who have accumulated enough experience to know they can tolerate such levels of inert gas. We do not recommend doing this since it increases the risk of decompression sickness thus Sirius requires that you insert a code (**1234**) to allow the setting.

The value set in **PHYSIO** remains stored until you manually change it. The default value is **OFF**.

DIVE allows you to define an additional conservatism based on how you feel about the dive conditions. Each step from **LOW** to **MEDIUM** to **HIGH** incrementally reduces both gradient factor values by 3. If you think there will be much current or the water will be very cold, pick one of these settings. Since conditions can actually be different from what you expected, this parameter can be edited also DURING the dive (via the underwater menu). The default value is **OFF**.

The value set in **DIVE** resets automatically to **OFF** at midnight.

I TODAY allows you to define an additional conservatism based on how you feel about yourself today, for instance to account for a restless night or not having hydrated sufficiently. Each step from **LOW** to **MEDIUM** to **HIGH** incrementally reduces both gradient factor values by 5.

The default value is **OFF**. Also the value set in **I TODAY** resets automatically to **OFF** at midnight.

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. Sirius 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 DIVE** 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. Sirius 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. GAS INTEGRATION

This menu contains five submenus. The first one allows you to pair the tank modules to Sirius. Please refer to section 1.6 for the description of the pairing process.

The second menu, **TANK VOLUME**, allows you to set the size of the volume of the tank, individually for **G1** through **G5**. 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, **MAX PRESSURE**, is where you define the nominal fill pressure of your tanks. This can be set individually for each tank (**G1** through **G5**). This value is used to scale the graphic tank representation but also to define the pressure ranges for color coding (described in section 2.3.1). When the units are set to ft/°F/psi, this value is important because together with the tank volume it allows Sirius to correctly evaluate your gas consumption in cu ft/min. Default values are **200bar** and **3000psi.**

The fourth menu, **HALF TANK**, is the value at which Sirius triggers a half tank warning. This can be set individually for each tank (**G1** through **G5**). This value is also used in the definition of the pressure ranges for color coding as described below. Default values are **100bar** and **1500 psi**.

The fifth menu, **TANK RESERVE**, 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 8.3.5 and 9.1). This can be set individually for each tank (**G1** through **G5**). Default values are **50bar** and **500psi**.

2.3.1. COLOR CODING FOR PRESSURE RANGES

In addition to a numeric value for the tank pressure, Sirius uses color coding for an immediate at-a-glance tank pressure visualization. The color is applied to the lower screen divider. The pressure range from operating tank pressure to empty tank is split into 4 ranges, from **BLUE** to **GREEN** to **YELLOW** to **RED**. The ranges are so defined:

BLUE: the upper half between **MAX PRESSURE** and **HALF TANK**

GREEN: lower half between **MAX PRESSURE** and **HALF TANK**

YELLOW: between **HALF TANK** and 50bar/500psi.

RED: below 50bar / 500psi

2.4. WARNINGS

2.4.1. MAX DEPTH

Sirius 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 8.3.2) is triggered, albeit with the message **MAX DEPTH REACHED**.

2.4.2. DIVE TIME

Sirius 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 **TR-SP** or **BR-SP** buttons, you can set the value between 20 and 90 minutes in 2-minute increments. Upon reaching half of the set limit, the message **TURN AROUND** appears and stays on the display until you hit any button to acknowledge it. Upon reaching the set time limit, the message **TIME LIMIT** appears and stays on the display until you hit any button to acknowledge it.

2.4.3. NO DECO

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

2.4.4. ENTERING DECO

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

2.5. MULTIGAS

2.5.1. PREDICTIVE

When set to **ON**, Sirius 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 11 for more information about the **PREDICTIVE** feature.

The default value is **ON**.

2.5.2. SWITCH BELOW MOD

When set to **ON**, Sirius 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**.

2.6. FUTURE DECO

In this menu you can define the parameters of the future deco prediction and of the runaway deco alarm. Refer to section 9.3 for more information.

2.7. 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.

2.8. DEEP STOP

Sirius 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**.

2.9. 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 50%;
- when prompted to do so, the gas switch is carried out.

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

2.10. ERASE DESAT.

Sirius 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.

2.11. 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.

2.12. ASCENT VIOL.

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, Sirius locks the computer for 24 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.

2.13. 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.

2.14. 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. In order to remind the diver of this, the upper right field will show **STOP** followed by depth of the stop. The actual ceiling can still be called up but within 4 seconds **STOP** and the depth of the stop are shown again.

> **NOTE**
>
> When CEIL-CON is turned on and you have a decompression obligation, the display defaults to COMPLICATIONS. E-Z is not available anymore due to the fact that near the decompression stop the CEILING has to be displayed next to the current depth.

2.15. BACKLIGHT

This menu allows you to choose between **AUTO-OFF** (the backlight stays on for only 6 s) or **PUSH ON/PUSH OFF** (the light stays only until you turn it off manually). This setting applies to the duration of the backlight in dive mode only.

2.16. COMPASS TIME

This menu allows you to set the duration of the compass display before it reverts back to the dive data. You can set this value to 5 seconds, 15 seconds or **PUSH ON/PUSH OFF**. If set to **PUSH ON/PUSH OFF**, you exit compass mode with **BL-SP**. This setting applies to dive mode only.

• 3. SET WATCH

MENU	*Description*
SET WATCH	
LANGUAGE	Allows you to set the language for the user interface, all menus and warning messages during the dive.
UNITS	Allows you to choose between metric (m, °C, bar) and imperial (ft, °F, psi) units.
CLOCK	Allows you to set the date, time, time zone shift when travelling, and a wake-up alarm.
BRIGHTNESS	Allows you to set the maximum brightness of the backlight.
COMPASS DECL.	Allows you to compensate between magnetic north and geographic north in the digital compass.
COMPASS CLBR	Allows you to recalibrate the compass.

3.1. LANGUAGE

In this menu you can set the language for the user interface and for alarm messages during the dive.

3.2. UNITS

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

3.3. CLOCK

This menu allows you to set the time format, time, date, time zone shift and wake-up alarm.

3.4. BRIGHTNESS

This menu allows you to change the brightness of the display between three levels, **LOW**, **MED** and **HIGH**. This applies to the backlight in watch mode only. The intensity of the backlight in dive mode is always **HIGH**.

3.5. COMPASS DECLINATION

Depending on the exact location on the planet, there can be a deviation between true North and magnetic North. Any compass will always show magnetic North, so via this menu you can set a value for the so-called declination that will make the compass show true North instead.

3.6. COMPASS CALIBRATION

The digital compass in Sirius is calibrated from the factory and does not require, under normal circumstances, any further maintenance.
In certain instances, however, such as after exposure to extremely intense magnetic fields, it may be necessary to recalibrate the compass to ensure its accuracy. If you notice an obvious deviation in the indication of the compass, access this menu and perform the calibration as described below.

First you must enter the security code, **1234**. Then the image shown in Figure 12 appears on the display.

Perform repeated revolutions of the device around its own axis while rotating the axis itself.

Visit https://www.mares.com/en/download for a link to a video describing the process.

• 4. LOGBOOK

Sirius 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, Sirius can show most of the information directly on the display. On the main page of the logbook you will see a listing of all dives, including date, time the dive started, depth and dive time. Scroll up and down using **TR-SP** and **BR-SP**, then press **TR-LP** to access the details of the dive. **BR-SP** exits the logbook and **BL-SP** returns to **TOD**.

• 5. 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. Sirius will consider all active gases and set gradient factors, listed for reference at the top of the screen. Then enter the planner with **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 **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 **BR-LP** to return to the no decompression limits. From here **BR-SP** exits the dive planner and **BL-SP** returns to **TOD**.

• 6. INFO

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

• 7. BLUETOOTH

This menu starts the bluetooth connection to a smart device via the MARES or MySSI app.

• PART II

• 8. DIVING WITH SIRIUS

8.1. 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.

Sirius 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: Sirius has an MOD alarm set for a user-defined ppO_2max. As you enter the oxygen concentration for the dive, Sirius 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 Sirius is set to **AIR**, the ppO_2max is set to **1.4bar** by default.
- Against long exposure effects: Sirius "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 Sirius will activate an alarm when this level of CNS% is reached. Sirius 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.

8.2. 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. Sirius 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 Sirius to **BOTTOM TIMER** and find appropriate altitude dive tables.

8.3. ALARMS

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

- Ascent rate alarm;
- Exceeding a safe ppO_2/MOD;
- CNS =75%;
- 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**.**

NOTE
- Alarms are both visual and audible, as described in detail below.
- If you are in any graphic display mode (compass, dive profile, or tissue graph) when an alarm is triggered, you will be kicked out of that mode and back to the standard numeric display.
- Ascent rate alarm has priority over other alarms if they are triggered simultaneously.

8.3.1. ASCENT RATE

As soon as depth decreases Sirius 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 Sirius determines an ascent rate higher than set limits, the fast ascent alarm is triggered: an audible alarm goes off, the screen dividers start blinking in red and the message **SLOW!** is displayed on the screen (Fig. 13). This persists until the ascent rate is reduced to below the pertinent limit. The limits are dependent on the current depth as follow:

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, Sirius locks the computer for 24 hours in order to prevent you from diving again. You can disable this function in the menu **ASCENT VIOL**. This should only be done by highly experienced divers, who take full responsibility for the consequences of this action.

8.3.2. 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), the display temporarily switches to the **COMPLICATIONS** lay-out, an audible alarm goes off, the depth is shown in red and the message **MOD!** is shown at the bottom of the display (Fig. 14). The message is displayed until you press any button to acknowledge having seen it, but the depth and the MOD remain in red until the situation has been corrected.

While the alarm is active you can call up the compass or the gas switch table, but the top row will continue showing the depth and MOD in red 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.

8.3.3. CNS = 75%

⚠ WARNING
When the CNS reaches 100% there is danger of oxygen toxicity. Sirius starts alerting you when you reach 75%.

Oxygen toxicity exposure is tracked on Sirius 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%, Sirius switches automatically to the **COMPLICATIONS** display in order to show the CNS value, which is shown in red, together with the message CNS > 75% until you hit any button to acknowledge having seen it. Furthermore, the field which can be selected via the **BR-SP** button shows the CNS value in red. If you push the **BR-SP** button to view any other value, it will remain for 4s only, and then return to the CNS value (Fig. 15).

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.

8.3.4. 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 message **DECO STOP!** is displayed at the bottom of the screen (Fig. 16). This alarm remains active until you return to the correct depth.

⚠ WARNING
Never ascend above the displayed decompression stop depth.

8.3.4.1. CEILING-CONTROLLED DECO OPTION

If **CEIL-CON DECO** is set to **ON**, the message **CEILING!** will be triggered as soon as you exceed the **CEILING** (Fig. 17).

8.3.4.2. EMERGENCY 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, Sirius will automatically switch to the **EMERGENCY** gradient factors (95/95), display the messagge **MAIN GF > GF 95/95** (Fig. 18), and, if compatible with the current depth, keep you out of a dive violation. The message **MAIN GF > GF 95/95** is displayed until you press any button to acknowledge having seen it.

If the **EMERGENCY** gradient factors are not compatible with the current depth, Sirius considers this a dive violation and the display will show **DECO ERROR!** (Fig. 19).

In this case, if the diver attempts a repetitive dive after surfacing, Sirius will function only as a depth gauge and timer (bottom timer mode), and it will display the message **LOCKED BY PREVIOUS DIVE**.

8.3.4.2.1. 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, Sirius will automatically switch to the **EMERGENCY** gradient factors (95/95), display the messagge **MAIN GF > GF 95/95** (Fig. 18), and, if compatible with the current depth, keep you out of a dive violation. The message **MAIN GF > GF 95/95** 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 **EMERGENCY** gradient factors (95/95) is instantaneous.

If the **EMERGENCY** gradient factors are not compatible with the current depth, Sirius considers this a dive violation and the display will show **DECO ERROR!** (Fig. 19).

In this case, if the diver attempts a repetitive dive after surfacing, Sirius will function only as a depth gauge and timer (bottom timer mode), and it will display the message **LOCKED BY PREVIOUS DIVE.**

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.

⚠ WARNING
The combination GF 95/95 is more conservative than the standard unmodified Bühlmann (which corresponds to GF 100/100) but it carries an increased risk of decompression sickness with respect to the standard settings in Sirius. Avoid violating the decompression obligations dictated by **MAIN GF** but if it happens anyway ascend trying to keep **GF NOW/GF @SURF** as low as possible.

8.3.5. LOW TANK PRESSURE

When during a decompression dive Sirius calculates a **TTR** which is inferior to the total ascent time, the message **LOW TANK PRESSURE** appears on the display and remains there until you hit any button to acknowledge having seen it (Fig 20). We strongly suggest initiating an ascent when this situation arises, in order to avoid running out of breathing gas during the decompression stop.

Additionally, when the tank pressure reaches the value specified under **HALF TANK** and **TANK RESERVE**, the message **HALF TANK** and **TANK RESERVE**, respectively, is displayed until you hit any button to acknowledge having seen it (Fig. 21 and 22).

8.3.6. LOW BATTERY

⚠ WARNING
If before a dive the battery power level is 20% or less, the message **NO DIVE** appears on the display. Sirius will not function as a dive computer.

When the battery power level reaches 15%, Sirius will show the message **BATTERY LOW** on the display until you hit any button to acknowledge having seen it. Furthermore the display switches to **COMPLICATIONS** and the lower right corner shows the battery information in red (Fig. 23). If you push the **BR-SP** button to view any other value, it will remain for 4s only, and then return to the battery value.

⚠ WARNING
When the **BATTERY LOW** warning appears, you should start your final ascent to the surface.

⚠ WARNING
If the battery is completely drained during or right after a dive, Sirius will lose the nitrogen loading information in the tissues, and hence it will calculate the next dive wrongly. Do not dive for 24 hours following a dive during or after which the battery was completely drained.

In addition to monitoring the status of its own battery, Sirius also monitors the status of the battery in all tank modules paired to it, and alerts you when a battery is low and should be replaced. The message **BATTERY LOW G1** (or **G2** through **G5**) is displayed until you hit any button to acknoweldge having seen it. Furthermore the display switches to **COMPLICATIONS** and the lower right corner shows the tank module battery information in red (Fig. 24). If you push **BR-SP** to view any other value, it will remain for 4s only, and then return to the tank module battery information.

• 9. DISPLAY INFORMATION

TR-SP from the home menu puts Sirius 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 Sirius into pre-dive mode, Sirius 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, Sirius will return to **TOD**.
- It is recommended to put Sirius into pre-dive before submerging. Not doing so can lead to a delay of up to 20s in Sirius monitoring the dive.

The **PRE-DIVE** display shows the active GF values in the top row, the active gases in the middle row and the tank pressure of G1 in the bottom row (if a tank module is paired and connected).

From the **PRE-DIVE** display you have a few options of quick access to settings. With **TR-SP** you can see the **GF TABLE**, and from here with **TR-SP** you can access the **ALGORITHM** menu, in case you want to change your GF values. With **BR-LP** you can access the gas settings menu.

With Sirius you have a choice of how the information is presented on the display.

The **E-Z** display presents the bare minimum of dive information (Fig. 25):

- current depth in top row
- dive time and no deco time in middle row (depth of deepest stop, time at deepest stop and total ascent time in case of decompression dives)
- tank pressure in bar / psi in bottom row
- nitrogen bar graph between the top and the middle row
- graphic representation of tank pressure between the middle and the bottom row
- ascent speed: in case of an ascent, the value in m/min or ft/min is displayed in lieu of the dive time, while graphically it is shown in lieu of both horizontal bar graphs, in green up to 80% of the allowed limit, in yellow from 80 to 100% and in red beyond that.

With **TR-SP**, the current depth is momentarily replaced by the temperature. **TR-SP** within two seconds and the temperature is replaced by the maximum depth reached so far. After two seconds without button operation, the current depth is shown again. With **BR-SP** the tank pressure is momentarily replaced by **TTR** (Time To Reserve). **BR-SP** within two seconds brings up gas consumption in l/min or cuft/min, O_2%, time of day and battery status. After two seconds without button operation, the tank pressure is shown again.

With **BL-SP** you can switch to the **COMPLICATIONS** display, which presents more data fields (Fig. 26):

- current depth, temperature and max depth in top row
- dive time, no deco time in middle row (depth of deepest stop, time at deepest stop and total ascent time in case of decompression dives)
- tank pressure, TTR and stopwatch in bottom row
- nitrogen bar graph between the top and the middle row
- graphic representation of tank pressure between the middle and the bottom row
- ascent speed: in case of an ascent, the value in m/min or ft/min is displayed in lieu of the dive time, while graphically it is shown with both bar graphs in green up to 100% of the allowed limit and in red beyond that.

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

- 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 tank pressure is modified in the following sequence:

- main GF
- current gradient factor/gradient factor at the surface if the diver ascends now
- O_2% (Nitrox only)
- CNS (Nitrox only)
- ppO_2 (Nitrox only)
- time of day
- battery status of Sirius
- battery status of tank module in use
- gas consumption in l/min or cuft/min

NOTE
if you set Sirius 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 Sirius to Nitrox 21%.

The battery in the tank module is shown as a battery outline with either 3 (battery ok), 2 (battery ok for now but you should consider replacing it) or 1 (battery could fail any time) segments inside of it. The 3-segment situation is green, the 2-segment situation is yellow, and the 1-segment situation is red.

If no tank module is paired with G1 Sirius changes the layout of the displayed information as follows:

- the dive time replaces the tank pressure;
- the lower colored screen divider replicates the behaviour of the upper colored screen divider;
- in the lower right corner sequence TTR and l/min do not appear.

9.1. DETAILED DESCRIPTION OF DISPLAYED DATA

The **depth** is given in 10cm resolution until 99.9meters, 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 Sirius displays a **MANDATORY** decompression stop. Instead of a no deco time, it shows you the depth of the deepest stop, the time at the deepest stop, and the **total ascent time** (**TTS - Time To Surface**), which includes each decompression stop and the time required to travel the vertical distance to the surface at the allowed rate (Fig. 27). **TTS** does **NOT** include the duration of deep stops.

Deep stops are **NOT** mandatory so you can skip them without incurring any penalty in the decompression calculation.

Once there is a mandatory decompression stop, **BL-SP** from the tissue saturation graph will display the **LIST OF STOPS** computed by Sirius, up to a maximum of 4, starting from the deepest (Fig. 28).

The **tank pressure** is based on the signal from the tank module. The tank module has a range of 1.5m/5ft. In addition to showing the numeric value, Sirius employs color coding to identify a range in tank pressure, as described in section 2.3.1

⚠ WARNING

- If Sirius receives no signal from the tank module for 45 seconds, the pressure value is replaced by ---. Check the position of Sirius 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 Sirius will not show tank pressure any longer.

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

Nitrogen saturation in the leading tissue is represented graphically in the upper ribbon, dividing the top field from the middle field. It represents nitrogen supersaturation (any amount in excess of the equilibrium state at the surface) in the leading tissue. The ribbon changes gradually from green to purple during the dive.

The more purple you see, the closer to the no deco limits you are. As you enter a situation of mandatory decompression stop, the entire ribbon will be purple.

During a surface interval, the ribbon will gradually return to green as Sirius tracks the offgassing of your tissues.

Ascent rate: in presence of a depth change in excess of 80cm / 3ft, Sirius calculates the corresponding ascent speed and displays it both numerically (in lieu of the dive time) and via the screen divider bars which, for the duration of the ascent, replaces the nitrogen saturation and tank pressure bars. The bars are green for speeds up to 80% of the allowed limit, yellow for speeds between 80% and 100%, and red for speeds in excess of the allowed limit described in section 8.3.1.

The **current gradient factor (GF NOW)** is the highest value of inert gas pressure, expressed as a gradient factor, among all 16 tissues of the algorithm at the present moment. The **gradient factor at the surface if the diver ascends now (GF @ SURF)** is the value of **GF NOW** calculated at surface pressure (Fig. 29).

The **ceiling** is the depth at which you would exceed the 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 (Fig. 30).

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.

9.2. 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 (Fig. 31).

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 (Fig. 32).

⚠ 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.

9.3. 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 (Fig. 33).

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
Associated to a large difference between the current **TTS** and the **TTS @+5** value, Sirius will alert you with the **RUNAWAY DECO** warning: since the **TTS @+5** calculation runs in the background and is permanently updated, Sirius monitors this value and, if it is calculated to be greater than 10 minutes beyond the current **TTS**, Sirius will trigger the alarm **RUNAWAY DECO**. This remains on the display until you press any button to acknowledge having seen it (Fig. 34).

NOTE
The prediction of **TTS** can be set between 3 and 10 minutes in advance via the **TTS @+X** menu within **FUTURE DECO** in **SET DIVE**. The value of **X** can be set between 3 and 10 minutes.

Likewise, the trigger point of the **RUNAWAY DECO** alarm can be set between 2 and 4 times the value of **X**. As an example, if you set the prediction of **TTS** to a value of +6 and the **RUNAWAY DECO** to a value of 3, the alarm will be triggered when the difference between the current **TTS** and the predicted one 6 minutes later is **6*3=18** minutes or greater.

9.4. DIVE PROFILE

During the dive you can view the depth profile performed so far by pressing **BL-SP** from the **COMPLICATIONS** display (Fig. 35). This is a static image and it automatically reverts to the **E-Z** display within 5 seconds unless you press **BL-SP** to access the **TISSUE SATURATION GRAPH**.

9.5. TISSUE SATURATION GRAPH

With **BL-SP** from the profile view a complete description of the current tissue saturation fills the space underneath the top row (Fig. 36). It remains on the display for a maximum of 5 seconds before reverting to the **E-Z** dive display. **BL-SP** within 5 seconds brings up the **LIST OF STOPS** (9.1).

The graph shows the tissue tension in each of the 16 compartments simulated by the algorithm, together with red segments representing the maximum tolerated inert gas pressure values at the surface and, in presence of decompression stops, at the depth of all calculated stops. The vertical axis represents pressure. As long as a tissue remains below the red segments, that particular tissue does not require decompression. When a tissue pushes past the lower red segment, a decompression stop will be required (failure to meet the safe ascent criterion). If a tissue were to push past the second red segment, there would be a 6m / 20ft stop required in addition to a 3m / 10ft stop.

For air and nitrox dives, on the graph there is also a horizontal black line: this represents, on the same pressure scale, the partial pressure of nitrogen in the inhaled gas. The distance between the line and top of a bar represents the pressure difference driving gas in or out of a tissue and is thus indicative of the speed of on or offgassing. As long as the line is above the bar, the tissue in question is taking on gas and the bar is depicted in yellow.

Once the line descends into the bar, the tissue in question is offgassing and the bar becomes green.

9.6. COMPASS

During the dive you can access the compass by pressing **BL-LP**. In **COMPASS** mode, the top row of the display shows current depth (Fig. 35).

The compass will remain on the screen for the duration defined in **COMPASS AUTO-OFF** or until an alarm is triggered.

With **TR-SP** you can set a reference bearing. A dot will appear to indicate the set bearing. Additional symbols will appear as well: squares at 90 degrees, triangles at 120 degrees and two parallel lines at 180 degrees, as an aid in navigation for square, triangular and reciprocal courses. The number at the bottom represents the deviation of the direction you are pointing at with reference to the set bearing. With **TR-SP** a new bearing will override the one in memory. With **TR-LP** you erase the bearing. **TL-SP** resets the stopwatch.

9.7. UNDERWATER MENU

With **TL-LP** you can call up a menu which allows you to change certain settings during the dive. These are described in detail in section 2 although some names have changed a bit due to the limited length available in the UW menu (Fig. 37).

BOOKMARK - allows you to set a bookmark which you can later review in the downloaded dive profile

DIVE - as described in 2.2.2

FUTURE DECO - as described in 2.6

MAX DEPTH - as described in 2.4.1

DIVE TIME - as described in 2.4.2

BACKLIGHT - as described in 2.15

TANK VOLUME - as described in 2.3

MAX PRESSURE - as described in 2.3

HALF TANK - as described in 2.3

TANK RESERVE - as described in 2.3

WATER - as described in 2.7

COMPASS TIME - as described in 2.16

• 10. AFTER THE DIVE

Upon returning to the surface, Sirius 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 time to surfacing mode countdown timer, dive time, and tank pressure (Fig. 39).

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, Sirius considers the dive finished, records the data to the logbook and reverts to the so-called **post-dive** mode.

The post-dive screen shows the following information (Fig. 40):

- 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 Sirius 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. Sirius 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 Sirius 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.
- CNS: this allows you to track how the CNS load from the previous dive is gradually reduced during the surface interval.
- GF NOW: this helps you track your inert gas in excess of ambient pressure.

The screen also shows the main data of the last dive: max depth, temperature, dive time, and final tank pressure (graphically).

The **POST DIVE** display is part of the **BL-SP** loop.

• 11. 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.

Sirius 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**.

Sirius 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 2.5.1), when you switch gas when prompted to do so during an ascent, you will not see a change in the decompression calculation: Sirius 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 2.5.1) you will see a reduction in the total ascent time as you switch to a gas with higher oxygen content and Sirius considers this for the decompression calculation.

Sirius can show the tank pressure of each tank if the corresponding first stage regulator is equipped with a Mares tank module, paired as described in section 1.6. Note that Sirius can be programmed and used for diving with more than one gas mixture whether you use tank modules for each or not.

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

11.1. 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 Sirius which gas is currently being used during the various phases of the dive.

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 Sirius uses for its calculation, alarms and suggested switch points.
- Setting a tank to **OFF** does not affect the pairing of the corresponding tank module.

To use multiple gases, you will need to enable the gases and set the oxygen percentage and the ppO_2max for each one, as described in Figure 41. Keep in mind that the MOD for **G2** and **G3** is the depth at which Sirius will prompt you to perform the gas switch (see section 11.2 below).

NOTE
- When setting an oxygen concentration of 80% or higher, Sirius 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.

11.2. SWITCHING GAS

Sirius 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**, Sirius sounds an audible signal and displays the message **SWITCH GAS G2** below the top row (Fig. 42). With **TR-SP** or **BR-SP** you perform the switch, at which point Sirius shortly displays the message **GAS SWITCH OK**; with **TL-SP** or **BL-SP** you stay on the current gas, at which point Sirius shortly displays the message **GAS NOT SWITCHED**. If you don't perform any action within 30 seconds, Sirius shows **GAS NOT SWITCHED** and returns to the normal display. If set to **PREDICTIVE = ON** and the gas was not switched, Sirius will show the message **EXCLUDING G2** prior to changing the decompression calculation to reflect the exclusion of G2.

If you drop again below the MOD for G2, Sirius will show the message **INCLUDING G2 AGAIN** and changes the decompression calculation accordingly.

NOTE
The same process is repeated when you approach the MOD for G3 with the message SWITCH TO GAS G3

You can always perform a manual switch with **BR-LP.** This will make the gas switch screen appear, which shows all active gases (Fig. 43).

NOTE
You can reach this screen at any time during the dive, for instance to check on the planned switch point of **G2** and **G3**.

Scroll through the available gases with **TR-SP** and **BR-SP**, then with **TR-LP** or **BR-LP** you activate it. With **BL-LP** you can exit without making changes. The decompression calculation will reflect the switch in breathing gas.

11.3. SPECIAL SITUATIONS

11.3.1. 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, call up the gas switch screen with **BR-LP**. Choose another gas with **TR-SP** or **BR-SP**, then with either **TR-LP** or **BR-LP** you activate it. The decompression calculation will reflect the switch in breathing gas.

11.3.2. 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.

11.3.3. LOGBOOK FOR DIVES WITH MORE THAN ONE GAS MIXTURE

For dives carried out with more than one gas mixture, Sirius adds information on oxygen concentration, initial, final and differential pressure for all gases used. On the dive profile, switch points are shown on the time line.

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

Sirius allows you to set up to 5 gases in which in addition to the oxygen percentage you can also set the helium percentage. In the tissue saturation graph you will see bars for the nitrogen partial pressure and for the helium partial pressure. Everything else 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!

• 12. BOTTOM TIMER MODE

When Sirius is set to **BOTTOM TIMER** 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 gauge 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 gauge mode, the following information is displayed (Fig. 44):

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

With **TR-SP** and **BR-SP** you can change the values in the center left and right field respectively, choosing among:

- max depth

- avg depth
- temperature
- stopwatch
- time of day
- battery status

The stopwatch is reset by means of **TL-SP**. The average depth is reset by means of **BR-LP**.

12.1. 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, Sirius will restrict the use for 24 hours, and will only allow operation in Bottom Timer mode, continuously displaying the message **LOCKED BY PREVIOUS DIVE**.

• 13. TAKING CARE OF SIRIUS

13.1. 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

Digital compass:

- **resolution:** 1°
- **accuracy:** ± 1° + 5% of tilt angle (example: at 50° tilt, accuracy is ±3.5°)
- **tilt angle:** up to 80°
- **refresh rate:** 1s

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

Oxygen concentration: adjustable between 21% and 99%, ppO_2max range between 1.2 and 1.6bar up to 79% O_2, then 1.6 - 1.8 bar.

Logbook memory: over 1000 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: 2.7"
- Technology: TFT
- Resolution: QVGA 320*240
- Colors: 256000
- Brightness 420cd/m²
- Mineral glass

Power supply:

- Sirius:
  - lithium-ion rechargeable battery, with battery charge indicator
  - operating temperature:
    - discharging: from -10 to +50 °C / 14 to 122 °F
    - charging: from 0 to 45 °C / 32 to 113 °F
  - battery duration from one charge: approx 40 hours of diving. Actual battery duration depends on the usage of the high intensity backlight and the water temperature
  - lifetime of the battery: approx 500 charging cycles

Bluetooth:

EU

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

FCC Warnings/ISED (Canada) Warnings

- Model: SIRIUS FCC ID: 2AIKSSIRIUS IC:21499-SIRIUS
- 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: MARES USA, Congress Corporate Plaza II 902 Clint Moore Road Suite 208, 33487 Boca Raton, Florida. www.mares.com
- This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'emetteur/recepteur exempt de licence contenu dans le present appareil est conforme aux CNR d'Innovation, Sciences et Developpement economique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes : (1) L'appareil ne doit pas produire de brouillage; (2) L'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

ICES-003 Class B Notice -Avis NMB-003 Classe B:

This Class B digital device complies with Canadian ICES-003

Cet appareil numerique classe B est conforme à la norme Canadien NMB-003.

CAN ICES-3(B) /NMB-3(B)

- Responsible party's contact located in the Canada: Head Canada Inc, 935A Southgate Dr, Guelph on N1L 0B9 Ontario, Canada, www.head.com.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Others

This product uses a module which obtained a certification of construction type issued by Japan Radio Act.

13.2. 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 every two years. Aside from that, Sirius is virtually maintenance free. All you need to do is rinse it carefully with fresh water after each dive (avoid any chemical products) and charge the battery when needed. To avoid possible problems with your Sirius, the following recommendations will help assure years of trouble free service:

- avoid dropping or jarring your Sirius;
- do not expose Sirius to intense, direct sunlight;
- do not store Sirius 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 Sirius 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 Sirius, because it could damage the pressure sensor area.

13.2.1. REPLACING THE BATTERY IN SIRIUS

Sirius uses a rechargeable battery, and it may be necessary to replace it after approximately 500 charging cycles. The battery should only be replaced in a center authorized by Mares. Mares declines all responsibility for any damage caused by replacing the battery.

NOTE
Dispose of the old battery properly. Mares adopts a policy of respect for the environment, and urges use of the appropriate separated waste collection services.

• 14. 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.

14.1. 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.

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

The serial number is laser-engraved on the back side of Sirius, 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.

• 15. 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.

• FIGURE

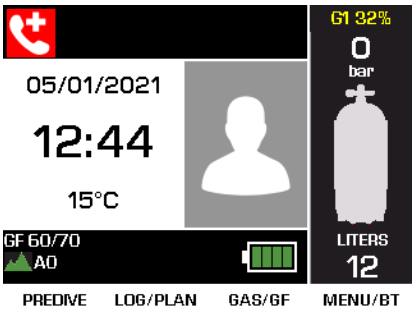


Fig. 1

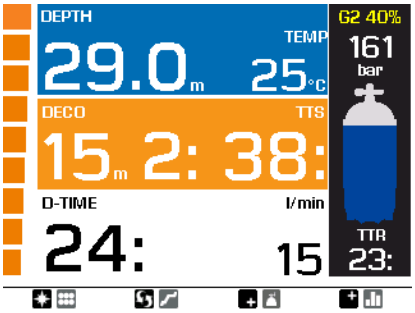
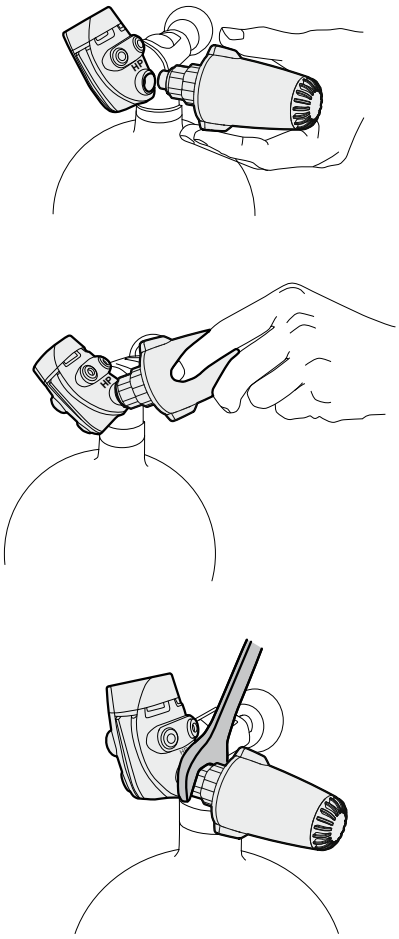


Fig. 2



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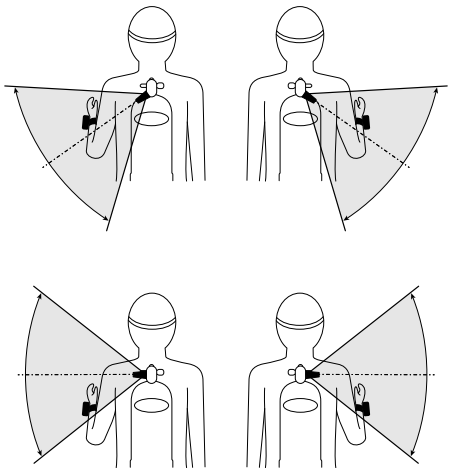

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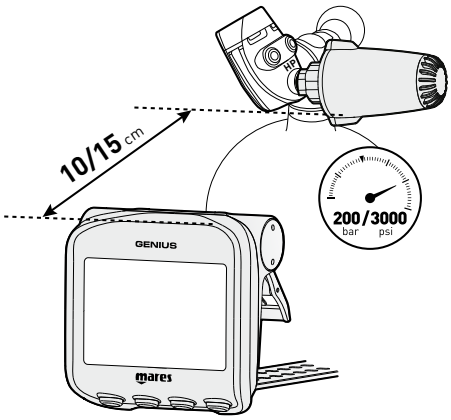
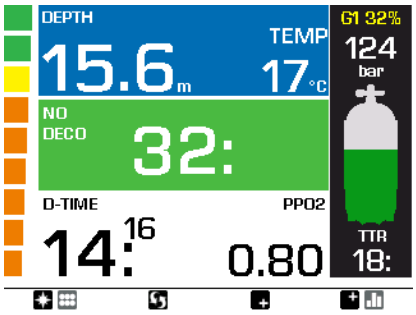


Fig. 5

10:23	GRADIENT FACTORS			83%
PARAMETERS	MAIN		ALTERNATE	
BASE	R3	50/60	R0	85/85
PHYSIO	LOW	-10		-
I TODAY	OFF	0		-
DIVE	OFF	0		-
REP DIVES	ON	0	ON	0
MULTIDAY	ON	0	OFF	0
CURRENT	40/50		85/85	
BACK				SET

Fig. 6



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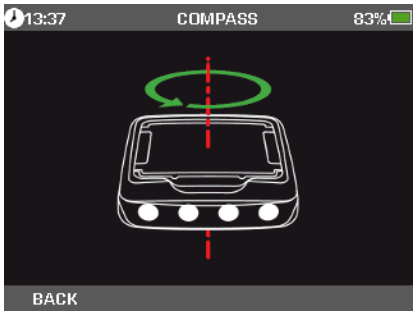

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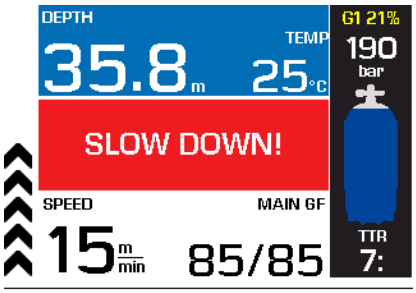

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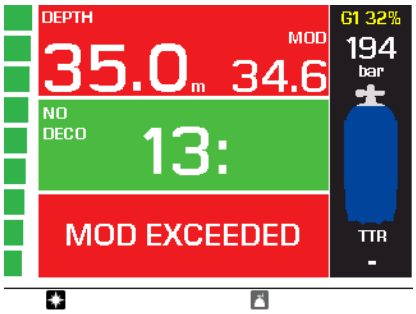

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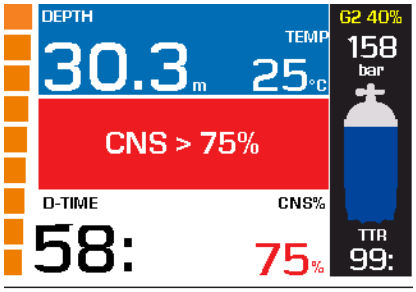
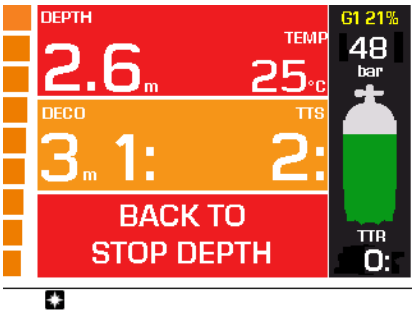


Fig. 11

- FIGURE



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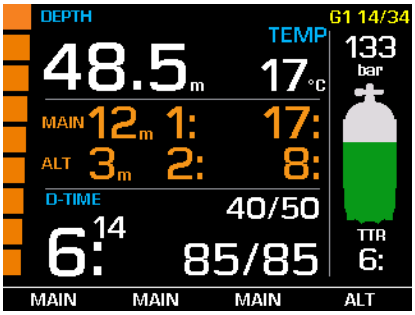

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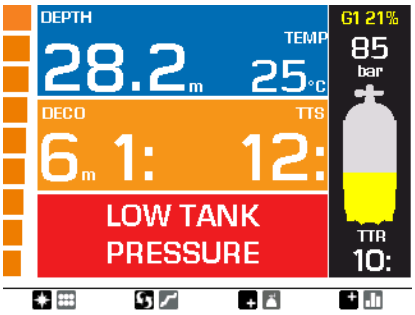

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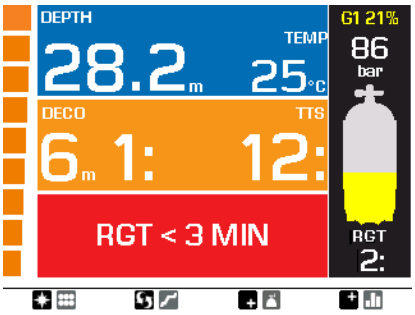

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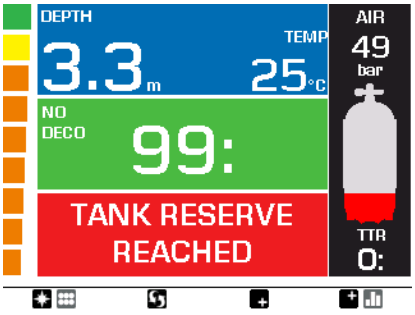

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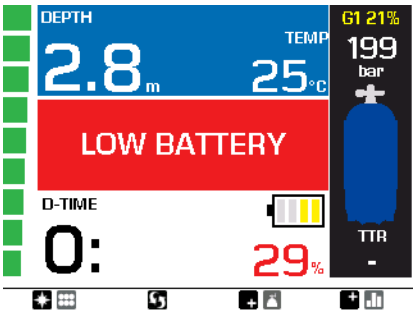

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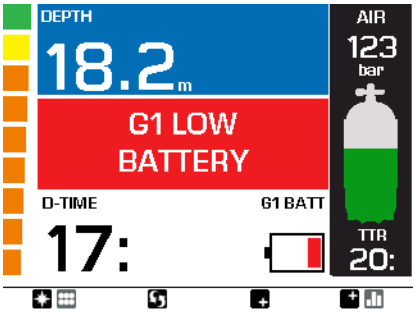

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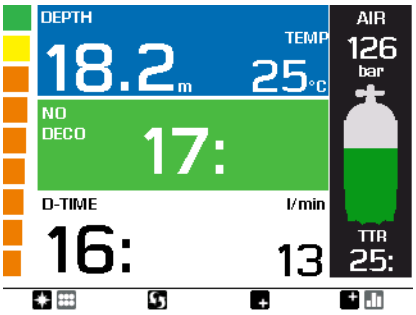

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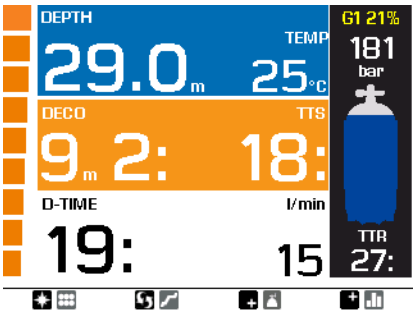

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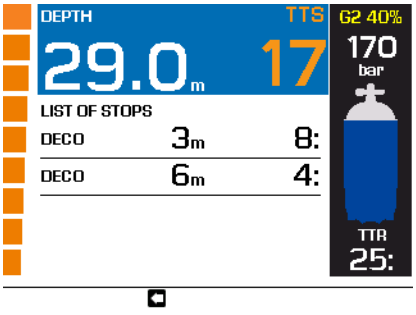

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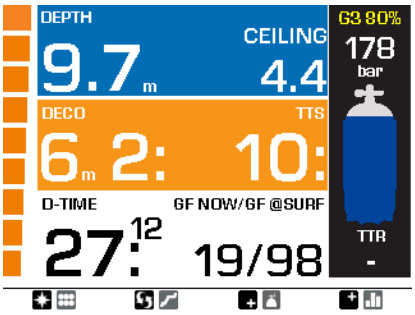

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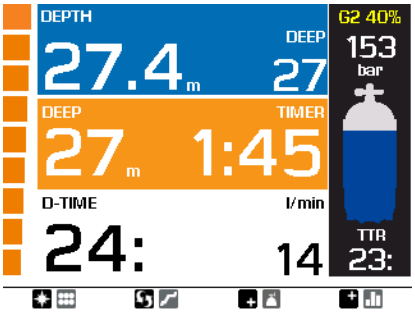

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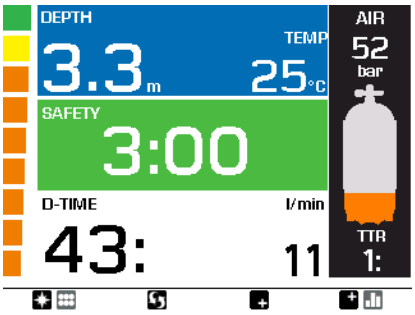

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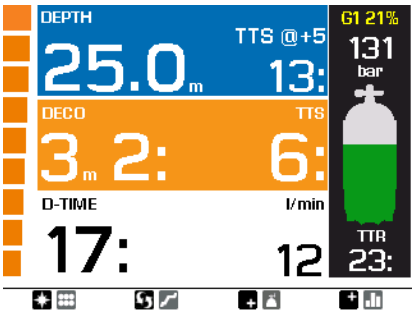

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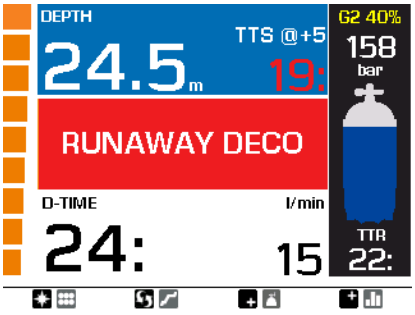
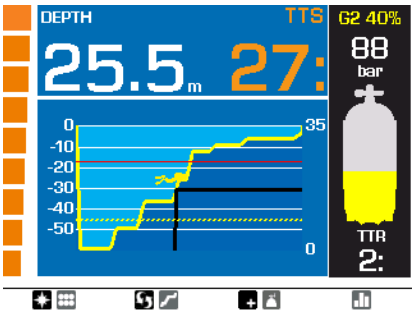


Fig. 26

- **FIGURE**



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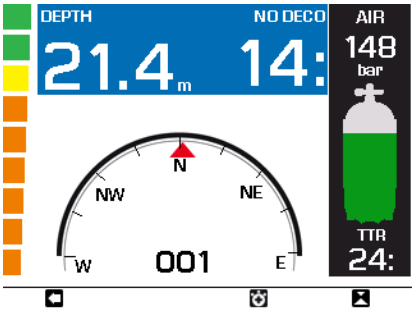

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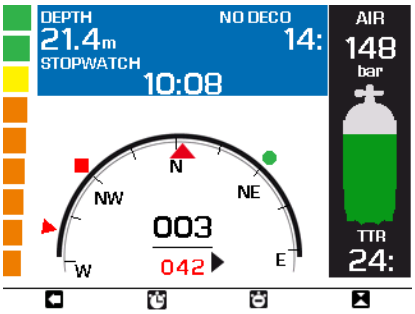

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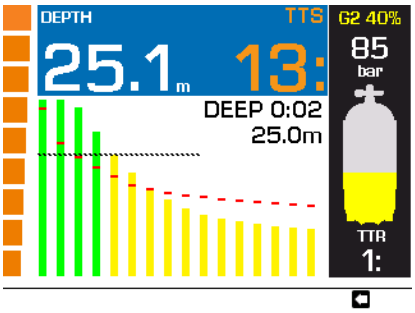

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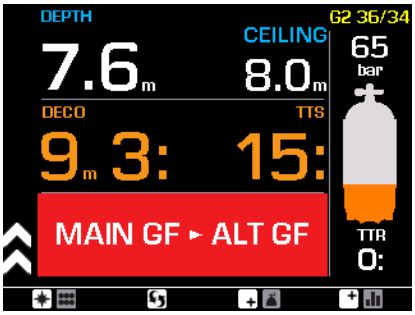

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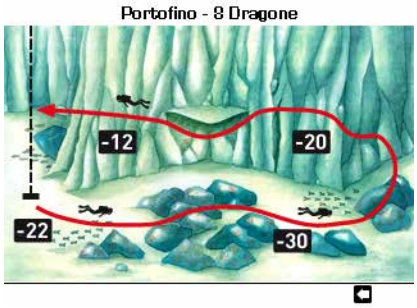

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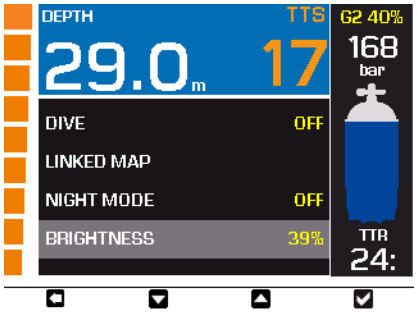

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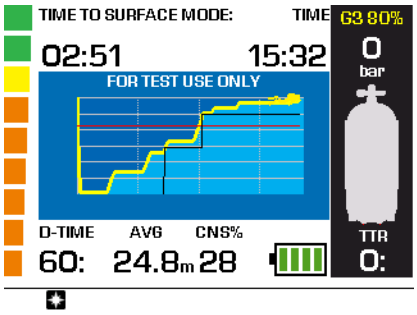

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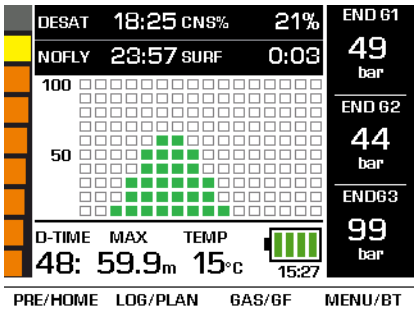

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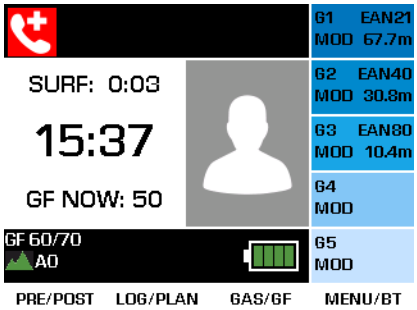

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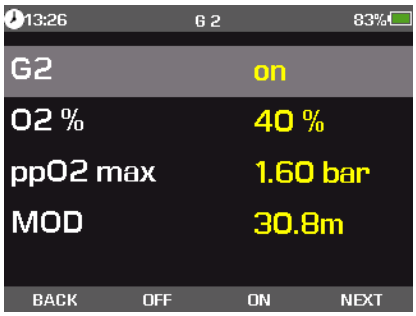

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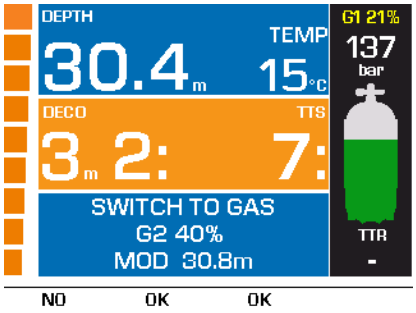

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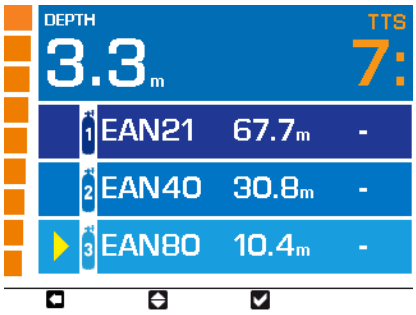

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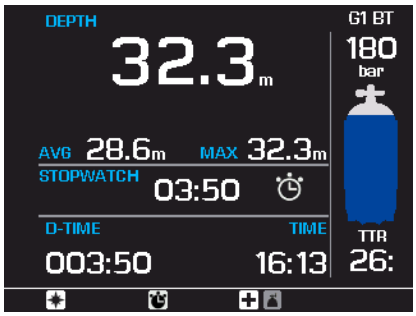

Fig. 40

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