**mares**®

icon ◯ HD

DEPTH
17.9 m
MAX DEPTH
34.5

G1 32%
118
bar

NO DECO
38:

D-TIME
20:

TEMP
25°C

TTR
25:

**mares**

# icon ◯ HD Net Ready

# Color Dive Computer

**Instruction Manual**

• **TABLE OF CONTENTS**

*Congratulations on your purchase of an **Icon HD Net Ready**.*

**Icon HD Net Ready** represents the cutting edge in Mares technology, and was designed to ensure maximum safety, efficiency, reliability and durability over time. Simple and easy to use, it is ideal for all types of dives. For brevity, we will refer to it simply as Icon HD In the remainder of this manual.

In this manual you will find all the instructions needed to enjoy the product to its fullest.

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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.

## CHARACTERISTICS OF ICON HD

**ICON HD** is a color-display dive computer and much, much more.

With **ICON HD**, you can:

- display your information digitally or graphically during the dive;
- have a clear indication at all times of the stops you need to make;
- display a map of the seabed during the dive;
- keep the compass active at all times, or use it on demand;
- store and view .jpg format files;
- instantly review the logbook of your dives in both digital and graphic formats;
- recharge the **ICON HD** battery anywhere, even from your PC.

## IMPORTANT WARNINGS

Before diving, make sure you have read and understood all parts of this manual.

⚠ **WARNING**

As with all SCUBA equipment, Mares dive computers are designed to be used by trained, certified divers only. Failure to fully understand the risks of using such equipment may result in serious injury or death. DO NOT use this dive computer or any SCUBA equipment unless you are a trained, qualified SCUBA diver.

⚠ **WARNING**

**ICON HD** is intended strictly for recreational diving.

⚠ **WARNING**

In addition to the dive computer, also use a depth gauge, a submersible pressure gauge, a timer or watch, and dive tables.

⚠ **WARNING**

Never dive alone. **ICON HD** is not a replacement for a dive buddy.

⚠ **WARNING**

Do not dive if the display appears unusual or unclear.

⚠ **WARNING**

**ICON HD** 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. The dive computer cannot take into account the physical conditions of the individual diver, which may vary from one day to the next. For your safety, have a general medical check-up before undertaking a dive.

⚠ **WARNING**

Always check the battery power level before starting the dive. Do not dive if the display indicates that the battery is low. Recharge the battery. If this doesn't work, contact an authorized center to replace the battery.

⚠ **WARNING**

Do not fly within 24 hours of your last dive, and in any case wait until the **ICON HD** "no fly" warning disappears.

⚠ **WARNING**

Recreational divers should not dive deeper than 40 m (130 ft). Although this computer will continue to provide information for compressed-air dives deeper than 40 m (130 ft), the risk of nitrogen narcosis and decompression sickness (DCS) is greatly increased.

⚠ **WARNING**

Never dive to depths greater than 40 m (130 ft), and never take decompression dives with **ICON HD** unless you possess the specific certification (IANTD, NAUI, PADI, DSAT, PSA, SSI, TDI, etc.) for deep scuba diving to depths of more than 40 m (130 ft) and fully understand the risks and the skills that this type of dive requires. This type of dive can entail a greater risk of decompression sickness, even for the most qualified and expert divers, and regardless of the instrumentation or computer used. Divers attempting these types of dives must have completed a specialty course and gained the necessary experience. The safety of a dive can only be increased through adequate preparation and training. Mares therefore recommends using the dive computer only after having completed a specialty diver training course. Mares recommends scrupulous adherence to the simple rules of behavior listed in the next column.

## RESPONSIBLE DIVING PRACTICES

- Always plan your dives in advance.
- Never exceed the limits of your skill and experience.
- Check your computer frequently during the dive.
- Do not exceed a safe ascent rate as indicated by the dive computer.
- Always perform a safety stop between 6 and 3 meters (20 and 10 feet) for at least 3 minutes during your final ascent.
- After any decompression stops, don't exceed the recommended ascent speed, 10 m/min (30 ft/min).
- Avoid yo-yo dives (repeatedly ascending and descending).
- Avoid strenuous activity during and after the dive.
- Consider following a more conservative profile when diving in cold water or when exerting yourself heavily during the dive.
- In the case of a decompression dive, prolong the decompression stop nearest the surface for additional safety.
- Repetitive dives should be separated by a surface interval of at least 1 hour.
- Your deepest dive should be the first one of the day.
- When doing repetitive dives for several consecutive days, take at least one day a week off. In the case of decompression-stop diving, it is recommended to take one day off every three days.
- Avoid decompression-stop dives and do not dive deeper than 40 meters (130 feet) unless you have been specifically trained in this type of technical diving.
- Avoid repetitive "square profile" dives (dives to a constant depth) deeper than 18 meters (60 feet).
- After a single dive wait at least 12 hours, for multiple dives and/or multiple days wait at least 18 hours and preferably 24 hours before flying, in accordance with the recommendations of the Divers' Alert Network (DAN).
- Each member of a buddy team must have his or her own dive computer and the whole buddy team must follow whichever is the most conservative profile.

## 1.1. GLOSSARY

| | |
|---|---|
| AIR: | Air dive |
| ASC: | Total ascent time, the time it takes to perform the ascent from your current depth to the surface in a decompression dive, including all decompression stops and assuming an ascent rate of 10m/min or 33ft/min. |
| ASC + X: | The overall ascent time inclusive of all decompression stops if the dive is extended by X minutes at the current depth. |
| AVG: | Average depth, calculated from the beginning of the dive. |
| CNS: | Central Nervous System. CNS% is used to quantify toxic effects of oxygen. |
| DESAT: | Desaturation time. The time needed for the body to eliminate the nitrogen taken up during diving. |
| D-TIME: | Dive time, the whole time spent below a depth of 1.2m/4ft. |
| Gas integration: | The feature in Icon HD 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. |
| Max depth: | Maximum depth attained during the dive. |
| MOD: | Maximum Operating Depth. This is the depth at which the partial pressure of oxygen ($ppO_2$) reaches the maximum allowed level ($ppO_2$max). Diving deeper than the MOD will expose the diver to unsafe $ppO_2$ levels. |
| Multigas: | Refers to a dive in which more than one breathing gas is used (air and/or Nitrox). |
| Nitrox: | A breathing mix made of oxygen and nitrogen, with the oxygen concentration being 22% or higher. |
| NO-FLY: | Minimum amount of time the diver should wait before taking a plane. |
| No deco time: | This is the time that you can stay at the current depth and still make a direct ascent to the surface without having to perform mandatory decompression stops. |
| $O_2$: | Oxygen. |
| $O_2$%: | Oxygen concentration used by the computer in all calculations. |
| P Factor: | Personalization factors, which allow the user to select between the standard decompression algorithm (P0) and an increasingly more conservative one (P1, P2). |
| Pairing: | The act of establishing a coded RF communication between Icon HD 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. |
| $ppO_2$max: | The maximum allowed value for $ppO_2$. Together with the oxygen concentration it defines the MOD. |
| Switch depth: | The depth at which the diver plans to switch to a higher oxygen concentration mix while using the multigas option. |
| SURF INT: | Surface interval, the time that has elapsed since the end of the dive. |
| TTR: | Time To Reserve, it is the time that a diver can spend at the current depth before reaching the tank reserve. |

## 1.2. OPERATING MODES

The functions of the Icon HD computer can be grouped into three categories, each corresponding to a specific mode of operation:

- **surface** mode: the computer is dry on the surface. In this mode you can change settings, review your logbook, use the dive planner, see remaining desaturation after a dive, download to PC and much more;
- **dive** mode: the computer is at a depth of 1.2m/4ft or more. In this mode, Icon HD monitors depth, time, temperature and performs all decompression calculations; dive mode itself can be broken down into 4 sub categories:
  - **pre-dive** (Icon HD 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** (Icon HD 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; this for instance would allow a diver to surface momentarily to set a bearing towards the boat, then submerge again and swim towards the boat);
  - **post-dive** (after the three minutes of surfacing mode, Icon HD 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);
- **sleep** mode: the computer is on the surface after 1 minute without operation (10 minutes from **pre-dive** mode). Though the computer appears to be turned off completely, it is still active. Icon HD computes tissue desaturation and checks the ambient pressure once every 20 seconds for uninterrupted monitoring of the environment.

## 1.3. TURNING ON ICON HD AND MAIN MENU

To start the computer, press any button. The screen will show the main menu. Think of this as the home page of your new dive computer. This is where it all starts.
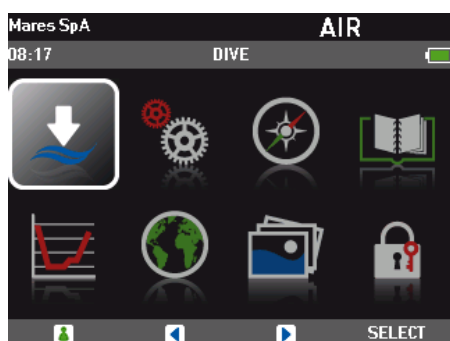
Once in the main menu, you will see the familiar look of an icon-based user interface. From the top left, in sequence, there are:

- **DIVE**: puts Icon HD into **pre-dive** mode;
- **SETTINGS**: in here you can set your Nitrox, choose your language and much more;

- **COMPASS**: from within this menu you can use the compass while on the surface, for instance to set a bearing which you will call up later on in the dive to navigate towards a wreck;
- **LOGBOOK**: review your dives in numeric and graphic format. Icon HD's memory is able to hold complete information for the last 100 hours of diving, at a 5s sampling rate;
- **PLANNER**: plan your next dive;
- **MAPS**: view all maps uploaded to your Icon HD;
- **PHOTOS**: view all images uploaded to your Icon HD;
- **BUTTON LOCK**: lock the buttons so that the battery is not accidentally drained during travel.

## 1.4. RECHARGEABLE BATTERY

Icon HD uses a lithium-ion rechargeable battery. A full charge allows you to do up to 5-7 hours of diving, depending on the usage of the high intensity on the backlight and the temperature of the water. The display alerts you of the status of the battery. The four possible situations are described as follows:

- A solid green battery symbol means Icon HD has between 70 and 100% charge;
- A partially filled green battery symbol means Icon HD has between 30 and 70% charge, still enough for safe diving
- A partially filled yellow battery symbol means Icon HD has between 20 and 30% charge. If Icon is between 20 and 30% charge upon being turned on, the following display appears, urging you to charge the battery.

You should recharge Icon HD at the earliest opportunity, but you can bypass this screen by pressing ⚏. You should be able to do one 1-hour dive in temperate waters with a "yellow" battery.

- A partially filled red battery symbol means Icon HD has between 0 and 20% charge. This is not sufficient to ensure a safe dive hence the computer is disabled from functioning. Upon turning on Icon HD, you see the following display.
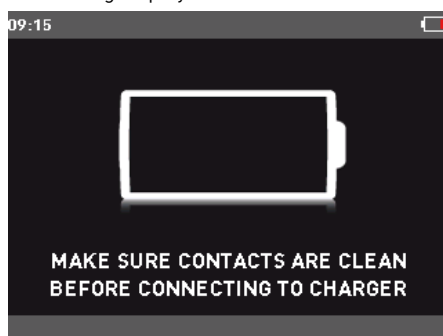
In the event that the charge drops below 30% during a dive, the message **LOW BATTERY** will appear on the display. When you see this message, you should consider starting the procedure for a safe ascent as there may not be enough charge to continue diving.
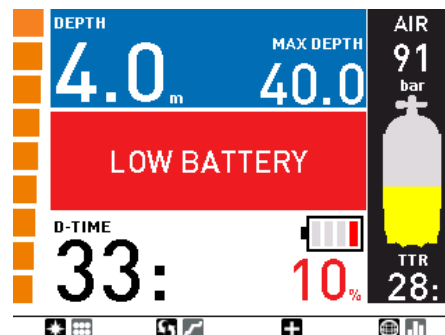
⚠ **WARNING**

- Starting a dive with less than 30% charge can cause the computer to fail during the dive. Recharge the battery as soon as you notice this message.
- In sleep mode Icon HD uses up the battery at a rate of approx 4-6% per day, so you must recharge it before diving if you have not used it for a few days.
- Leaving Icon HD unattended for long periods of time such that the battery will be completely empty does not harm neither the battery nor Icon HD. Logbook data and all settings will be saved. After charging you must however set the time and date again.
- When the battery in Icon HD is completely empty, it may take up to 20 minutes from the moment it is connected to a power source before Icon HD 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.

### 1.4.1. CHARGING THE BATTERY

The battery takes about 4 hours to charge from completely empty to completely full when using the adapter that came with the computer. It can take up to 8 hours when using a standard adapter as not all adapters feed the same current to the USB port. To charge the battery, use the special clip and the USB cable, connecting it either directly to a power supply or to the USB port of a PC.

When connecting directly to a power outlet, you will see a screen indicating the current battery status and the symbol of a power plug indicating that it is under charge. When the battery is fully charged, the percentage indication is replaced by the symbol of a lightning bolt.
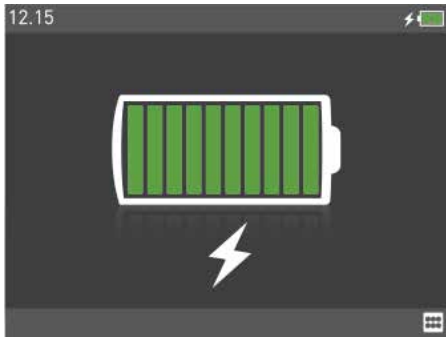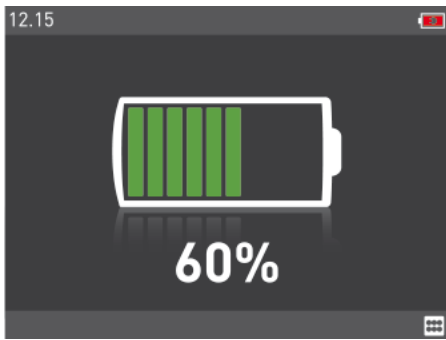
### 1.4.2. CONNECTING ICON HD TO A PC

To connect Icon HD to a PC or Macintosh computer, use the dedicated clip and the USB cable. Once connected, Icon HD will show the USB symbol on the display.
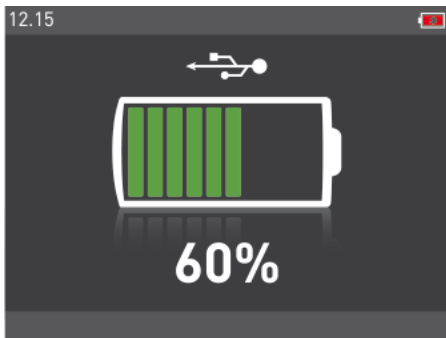


### 1.5. BUTTON OPERATION

Icon HD has four buttons. These buttons allow you to access menus and change settings while in surface mode. During the dive they switch displays, call up the compass or the map function, and allow to display further information on the computer screen. The function of each button is identified by an icon placed just above the button itself. In certain circumstances, for instance when erasing a set bearing in the digital compass or when calling up the gas switch function during a multigas dive, a button can perform two tasks, depending on whether it is pressed and released or pressed and held for one second.

In such case, there will be two icons above a button: the left one corresponds to the press-and-release action, the right one to the press-and-hold action.

The button icons that can appear during a dive and their meaning are:

: calls up the compass (PREDIVE and DIVE)

: calls up the underwater menu (PREDIVE and DIVE)

: calls up the dive profile (PREDIVE and DIVE)

: calls up the list of all stops (decompression dive only)

: scrolls through the information in the field to the right of the dive time (PREDIVE and DIVE)

: calls up the gas list table when diving with more than one gas mixture (PREDIVE and DIVE)

: calls up the linked map (DIVE)

: calls up the tissue saturation graph (PREDIVE and DIVE)

: allows to set a bearing (press) or erase a set bearing (press and hold) (COMPASS)

: makes stopwatch appear (COMPASS)

: makes stopwatch disappear (COMPASS)

: restarts stopwatch (COMPASS and DIVE, only if stopwatch on screen)

: exit from predive mode

: return to standard display (COMPASS, TISSUE GRAPH, MAP, GAS TABLE).

### 1.6. IN CASE OF EMERGENCY (ICE)

Icon HD allows you to enter information about yourself, such as name, contact information, emergency number, insurance policies and allergies. This information is entered via the PC software Dive Organizer. Alternatively, it can also be entered via the Divers' Diary Mac software. The first line of the ICE is displayed in the upper left corner of the main menu.
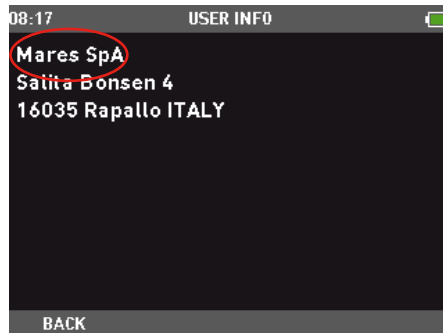




### 1.7. MOUNTING AND PAIRING OF THE TANK MODULE (OPTIONAL)

Icon HD features an exclusive two-way communication technology through which it can communicate with up to 3 tank modules regarding tank pressure and gas consumption information via patented interference-free communication. Each tank module needs to be mounted on a high pressure port of a first stage regulator.

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

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

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

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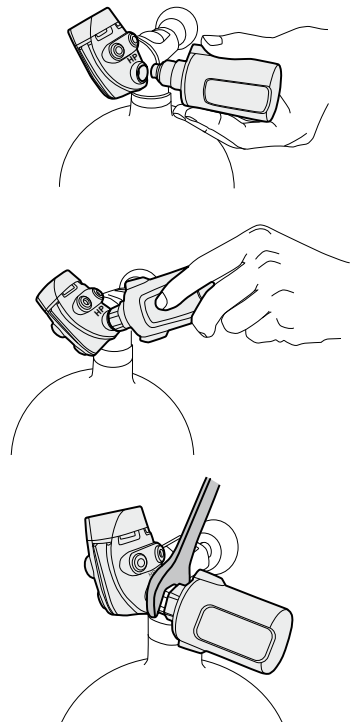


The Mares tank module communicates via radio frequency with Icon HD. For best transmission, we recommend positioning the tank module as described in the pictures below.
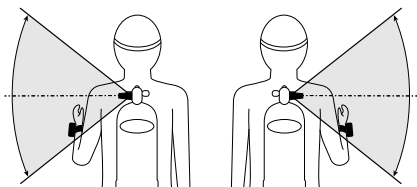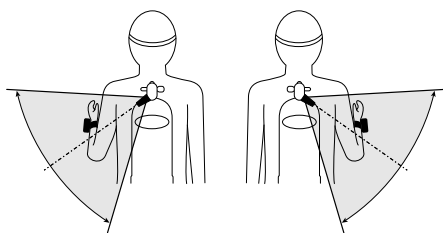
To pair the tank module with the Icon HD, proceed as follows:
- Open the tank valve to pressurize the tank module. **You now have two minutes to perform all steps listed below;**
- Go into SETTINGS/SET DIVE/GAS INTEGRATION/PAIR DEVICES
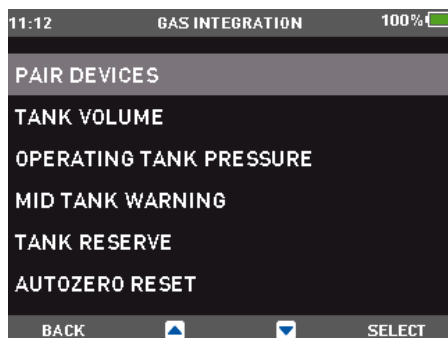


- Choose the channel that you wish to assign to the device (if this is your only tank module for single gas diving, choose **G1**. **G2** and **G3** are used for multigas dives. More information on this in section 3.5);
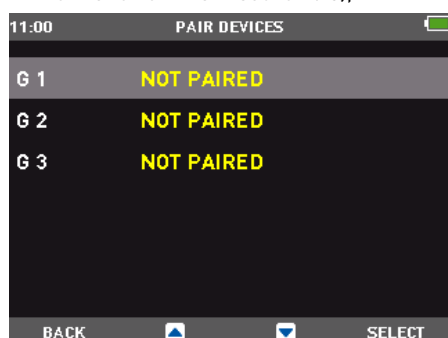


- Place Icon HD at about 15 cm / 6 inches from the tank module as shown below.
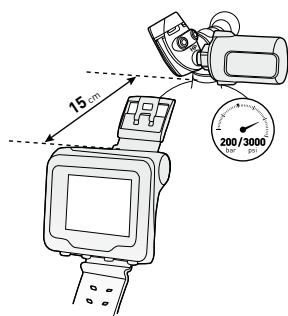


- Push **SELECT** and wait until the progress bar advances to the end. You will either see the message **PAIRING SUCCESSFUL** or **PAIRING NOT SUCCESSFUL**. In the first case you have successfully established a connection, in the second you need to repeat the operation, **but you must turn off the valve and depressurize the first stage completely, then wait 5 minutes before attempting again.**
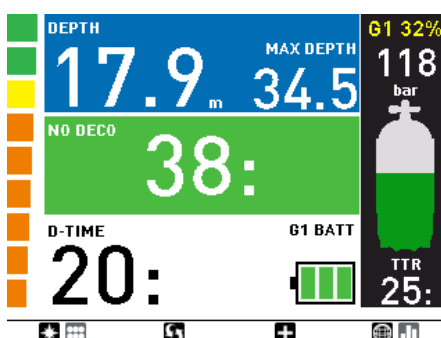
> **NOTE**
> - When diving with more than one gas mixture, tanks **G1**, **G2** and **G3** must be set to increasing oxygen levels. Refer to section 3.5 for more information on multigas diving.
> - A tank module can only be paired to one channel on one Icon HD. If you pair the same tank module to a second channel on the same Icon HD or to a second Icon HD, the first one will be erased.

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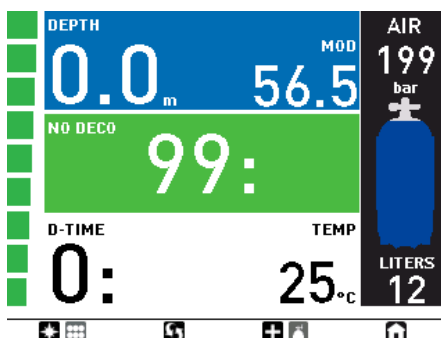


> **NOTE**
> - The Mares tank module has a range of approximately 1.5m/5ft.
> - The tank module remains on whenever it senses a pressure above 10bar/145psi. In order to maximize the life of the battery, after a dive close the tank valve and purge the second stage completely.
> - If a tank module battery is weak, Icon HD alerts you with a screen message referencing the channel designation assigned to the tank module in question.
> - During a dive, you can ask Icon HD to display the battery status of the tank module. More information about this in section 3.2.6 and 3.3.1.



See Chapter 4 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 Icon HD is completely empty.
> - You do NOT need to repeat the pairing procedure after upgrading the firmware in your Icon HD.

## 1.8. TURNING OFF ICON HD

Icon HD turns off automatically after 1 minute without operation when in surface mode and after 3 minutes without operation when in pre-dive mode. From the main menu, you can also turn it off manually by selecting the **BUTTON LOCK** icon.

## • 2. MENUS, SETTINGS AND FUNCTIONS

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

## 2.1. PRE-DIVE

Use this menu to put Icon HD into the ready-to-dive mode. This will ensure that Icon HD starts to monitor the dive as soon as a depth of 1.2m/4ft is reached. If you start the dive without putting Icon HD into pre-dive mode, Icon HD will switch into dive mode automatically but with a delay of up to 20 seconds from immersion.
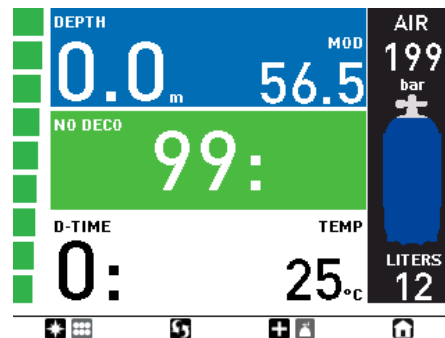


> **NOTE**
> - If you remain in pre-dive for longer than 3 minutes without pressing any button, Icon HD will switch off.
> - It is recommended to put Icon HD into pre-dive before submerging. Not doing so can lead to a delay of up to 20s in Icon HD monitoring the dive.

## 2.2. SETTINGS
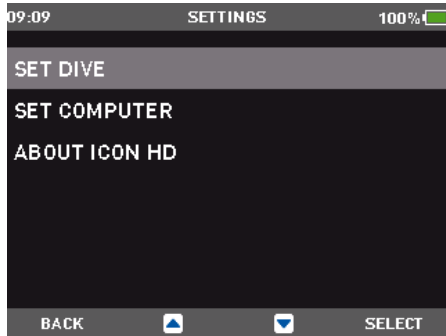


Icon HD's **SETTINGS** menu allows you to access functions or to change settings. Once inside this menu, you will see three submenus: **SET DIVE**, where you can set parameters pertaining to the dive, **SET COMPUTER**, where you can set parameters pertaining to the computer, and **ABOUT ICON HD**, where you can find information about your particular Icon HD and also statistics about the dives carried out with the computer.

Here below is a brief description of each menu.

| MENU | Description |
|---|---|
| **SET DIVE** | |
| MODE | Allows you to choose between air, nitrox and bottom timer mode. In case of nitrox, here is where you set the $O_2$% and $ppO_2$max. |
| MAX DEPTH | Allows you to set a max depth alarm independent of the MOD. |
| DIVE TIME | Allows you to set an alarm that will trigger at the defined time limit and also at half of the set limit. |
| P FACTOR | Allows you to choose between the standard algorithm (P0) and an increasingly more conservative one (P1, P2). |
| ALTITUDE | Allows you to set the algorithm into altitude mode when diving in mountain lakes. |
| GAS INTEGRATION | Allows you to synchronize your Icon HD with optional tank modules and to define all parameters concerning gas integration (tank volume, operating tank pressure, tank reserve and more). |
| WATER | Allows you to choose between salt and fresh water. |
| LINKED MAP | Allows you to select a map which you can call up on the display during the dive. |
| NIGHT MODE | Allows you to choose the night mode display (white numbers on black background) as default display. |
| AUDIBLE ALARMS | Allows you to turn on or off all audible alarms of Icon HD. |
| UNCONTROLLED ASCENT | 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. |
| ERASE DESAT | Allows you to reset the nitrogen saturation to zero, thereby erasing the effects of a previous dive. This is only for people who plan to lend their computer to another diver who has not performed a dive within the last 24 hours. |
| FUTURE DECO | Allows you to set the parameters for the future deco prediction. Please refer to section 3.3.1.3 for more details on this. |

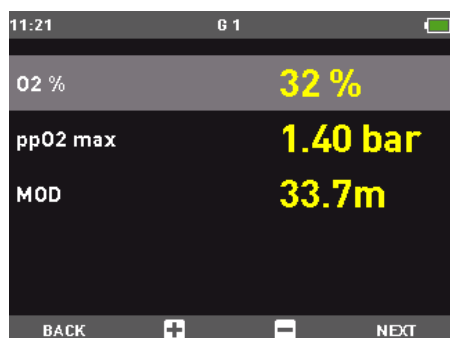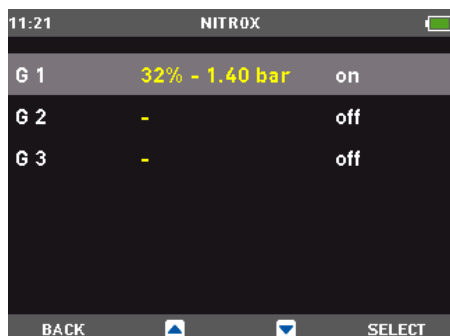| MENU | Description |
|---|---|
| **SET COMPUTER** | |
| LANGUAGE | Allows you to set the language for the user interface, all menus and warning messages during the dive. |
| TIME | Allows you to set the date, time, time zone shift when travelling, and a wake-up alarm. |
| UNITS | Allows you to choose between metric (m, °C, bar) and imperial (ft, °F, psi) units |
| BRIGHTNESS | Allows you to set the maximum brightness of the backlight. |
| LCD ADJUSTMENT | Allows you to compensate in case of display distortion. |
| BACKLIGHT TIMER | Allows you to set the time interval after which the display goes from maximum backlight to low power backlight. |
| DECLINATION | Allows you to compensate between magnetic north and geographic north in the digital compass. |
| COMPASS CALIBRATION | Allows you to recalibrate the compass. |

### 2.2.1. SET DIVE
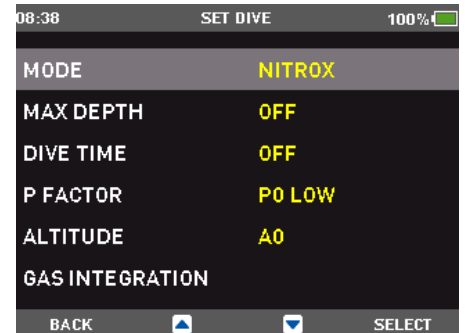


#### 2.2.1.1. MODE

In this menu you define the type of gas you will be breathing during the dive (**AIR** or **NITROX**, including **MULTIGAS**). You can also set Icon HD to **BOTTOM TIMER**, in which case Icon HD will show only time, depth and temperature: it will not carry out any decompression calculation and it will not show any warnings and alarms.
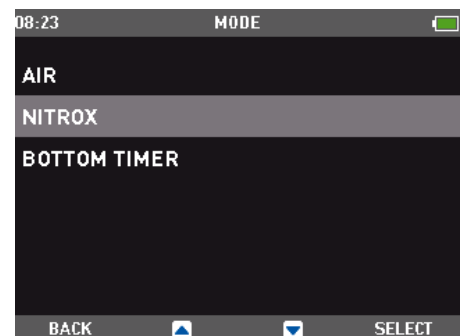
Use ▲ and ▼ to highlight your choice, then press **SELECT** to activate it. **AIR** is the equivalent of setting **NITROX** to 21% and a ppO₂max of 1.4bar.

When selecting **NITROX**, you are taken to a submenu in which you can define the percentage of oxygen in the mixture (O₂%) and the maximum value of oxygen partial pressure (ppO₂max) for up to three breathing mixes. The maximum possible value for the ppO₂max is 1.6bar. Most training agencies recommend not to exceed a value of 1.4bar.

| 11:21 | NITROX | |
|---|---|---|
| G 1 | 32% - 1.40 bar | on |
| G 2 | - | off |
| G 3 | - | off |
| BACK | ▲ ▼ | SELECT |

| 11:21 | G 1 | |
|---|---|
| O2 % | 32 % |
| ppO2 max | 1.40 bar |
| MOD | 33.7m |
| BACK | ➕ ➖ NEXT |

Once inside this menu, use ➕ and ➖ to change the O₂%, and watch how this affects the maximum operating depth (MOD). Then press **NEXT** to move on to the ppO₂max and use ➕ and ➖ to change the value, again noticing how this affects the MOD. Press **SET** to save and exit the menu. Note that you can press **BACK** after having set the O₂% to save and exit skipping the ppO₂max setting.
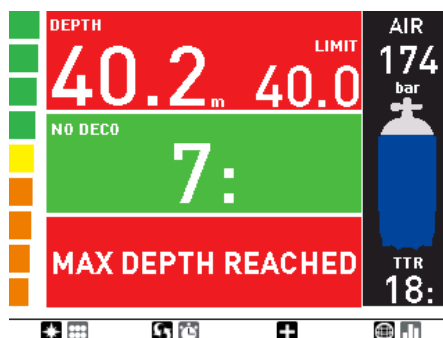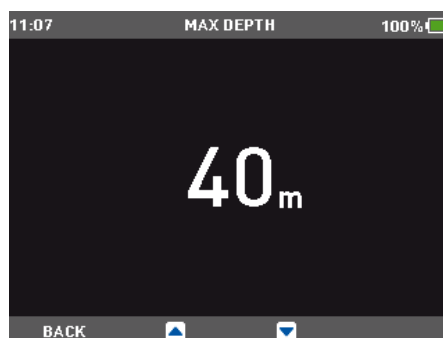
> ⚠ **WARNING**
>
> - Diving with Nitrox may only be attempted by experienced divers after proper training from an internationally recognized agency.
> - Before every dive and after changing the tank, you must make sure that the set oxygen concentration in Icon HD corresponds to the oxygen concentration 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 3.5 for more information about diving with more than one gas.
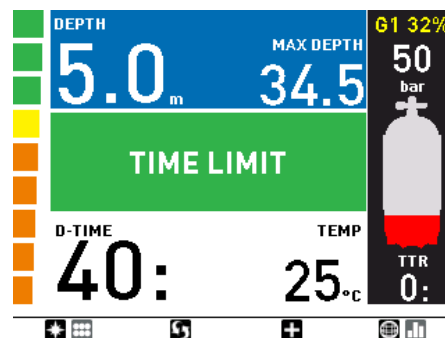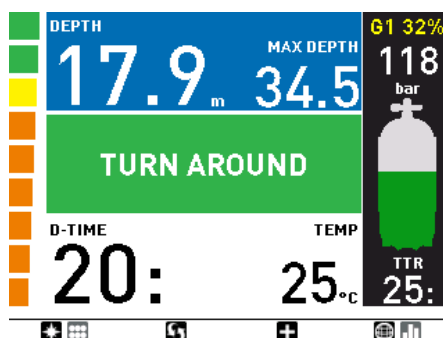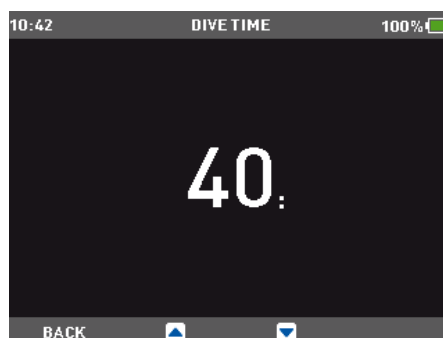
### 2.2.1.2. MAX DEPTH

Icon HD allows you to set an alarm at a depth independent of the MOD. The default value is **OFF**. Using the ➕ and ➖ buttons you can set it between 10m / 30ft and up to just shy of the MOD, in 1m / 5ft increments. Upon reaching the

depth defined in this alarm, the message **MAX DEPTH REACHED** appears on the screen and stays there until you ascend above the set limit.

| 11:07 | MAX DEPTH | 100% |
|---|---|---|

40m

| BACK | ▲ ▼ |

| DEPTH | | AIR |
|---|---|---|
| 40.2 m | 40.0 LIMIT | 174 bar |
| NO DECO | | |
| 7: | | |
| MAX DEPTH REACHED | | TTR 18: |

### 2.2.1.3. DIVE TIME

Icon HD 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 ➕ and ➖ 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.

| 10:42 | DIVE TIME | 100% |
|---|---|---|

40:

| BACK | ▲ ▼ |

| DEPTH | | G1 32% |
|---|---|---|
| 17.9 m | MAX DEPTH 34.5 | 118 bar |
| TURN AROUND | | |
| D-TIME 20: | | TEMP 25°C TTR 25: |

### 2.2.1.4. P FACTOR

Icon HD allows you to set an additional personal safety factor for those circumstances in which you want to be especially cautious, such as after a long period of inactivity or when planning a strenuous dive. In this menu you can choose between the standard algorithm (**P0**), a more conservative version (**P2**) or an intermediate one (**P1**).

> **NOTE**
> The choice of **P FACTOR** will be reflected in the dive planner.

### 2.2.1.5. ALTITUDE

Atmospheric pressure is a function of altitude and of weather conditions. This is an important aspect to consider for diving, because the atmospheric pressure surrounding you has an influence on uptake and subsequent release of nitrogen. Above a certain altitude, the decompression algorithm has to change in order to account for the effect of the change in atmospheric pressure. When diving in a mountain lake, find out what the altitude is and choose the altitude range in Icon HD within the four available options:
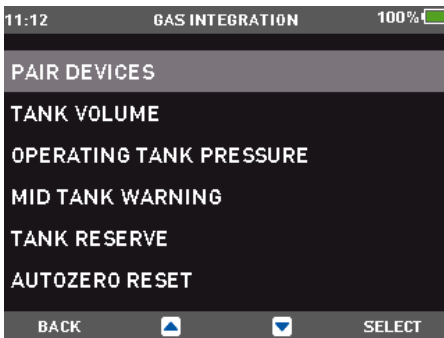
- **A0**: from sea level to approximately 700m/3300ft;
- **A1**: from approximately 700m/2300ft to approximately 1500m/4900ft ;
- **A2**: from approximately 1500m/4900ft to approximately 2400m/7900ft;
- **A3**: from approximately 2400m/7900ft to approximately 3700m/12100ft;
- We do not recommend diving at altitudes above 3700m / 12100ft. If you do, set Icon HD to **BOTTOM TIMER** and find appropriate altitude dive tables.

> ⚠ **WARNING**
> Diving in mountain lakes without first setting Icon HD to the proper altitude setting can cause severe injury or death.

### 2.2.1.6. GAS INTEGRATION

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

| DEPTH | | G1 32% |
|---|---|---|
| 5.0 m | MAX DEPTH 34.5 | 50 bar |
| TIME LIMIT | | |
| D-TIME 40: | | TEMP 25°C TTR 0: |

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

The third menu, **OPERATING TANK PRESSURE**, is where you define the nominal fill pressure of your tanks. This can be set individually for each tank (**G1**, **G2** or **G3**). This value is used to scale the graphic tank representation but also to define the pressure ranges for color coding (described in section 2.2.1.6.1). When the units are set to ft/°F/psi, this value is important because together with the tank volume it allows Icon HD to correctly evaluate your gas consumption in cu ft/min. Default values are **200bar** and **3000psi.**

The fourth menu, **MID TANK WARNING**, is the value at which Icon HD triggers a half tank warning. This can be set individually for each tank (**G1**, **G2** or **G3**). 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 3.2.5 and 3.3.1). This can be set individually for each tank (**G1**, **G2** or **G3**). Default values are **50bar** and **750psi**.

The sixth and last menu is called **AUTOZERO RESET** and it allows you to set the ambient pressure reading on the tank module in the unlikely event of a drift of the zero value. You would perform this operation if you noticed a significant difference between the read-out of Icon HD and a calibrated pressure gauge also connected to the same first stage.

Due to the potential of introducing an error in the tank module measurement, please contact your Mares Authorized Service Center before performing this operation.

### 2.2.1.6.1. COLOR CODING FOR PRESSURE RANGES

In addition to a numeric value for the tank pressure, Icon HD uses color coding for an immediate at-a-glance tank pressure visualization. The color is applied to the inside of the tank pictogram. The pressure range from operating tank pressure to empty tank is split into 5 ranges, from **BLUE** to **GREEN** to

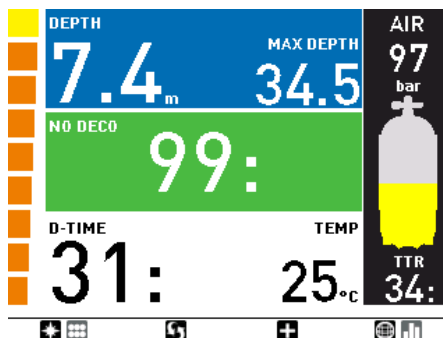**YELLOW** to **ORANGE** to **RED**. The ranges are so defined:

**BLUE**: the upper half between **OPERATING TANK PRESSURE** and **MID TANK WARNING**
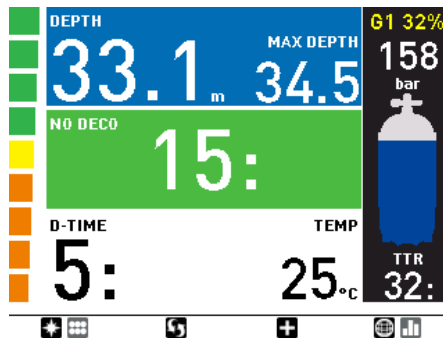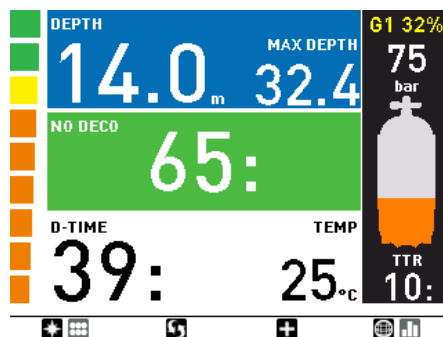


**GREEN**: lower half between **OPERATING TANK PRESSURE** and **MID TANK WARNING**
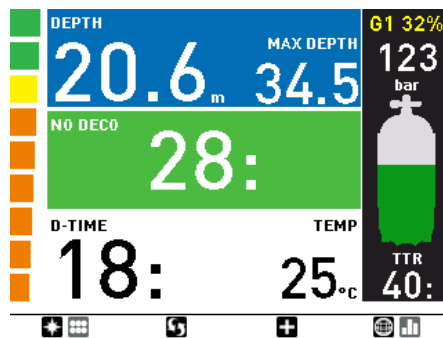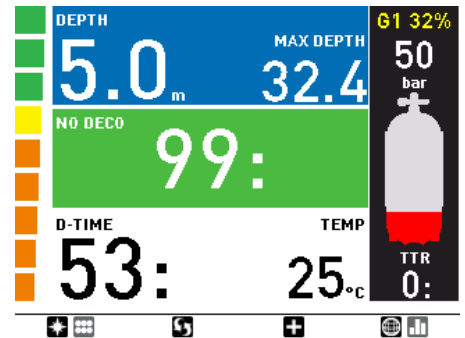


**YELLOW**: upper half between **MID TANK WARNING** and 50bar/750psi.



**ORANGE**: lower half between **MID TANK WARNING** and 50bar/750psi.



**RED**: below 50bar / 750psi



### 2.2.1.7. WATER

You can set the computer for **fresh** water or **salt** water calibration, depending on where you intend to dive. Setting the wrong water type entails an error in depth measurement of approx 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.

### 2.2.1.8. LINKED MAP

In this menu, you can select a map which you can later on call up during the dive.

> **NOTE**
> If you do not select any map, the corresponding button will be disabled during the dive.

### 2.2.1.9. NIGHT MODE

In this menu you can select the **NIGHT MODE** as the default display. You can always switch between the two display modes using the Underwater Menu described in section 3.3.6.
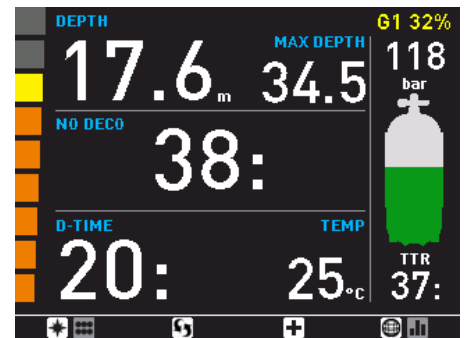


### 2.2.1.10. AUDIBLE ALARMS

In this menu you can disable audible alarms.

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

### 2.2.1.11. UNCONTROLLED ASCENT

An uncontrolled ascent is defined as one in which a speed of 12 m/min / 40ft/min or higher was maintained over more than two thirds of the way up. This applies to dives deeper than 12m/40ft only. In such an event, due to the potential of harmful bubble formation, Icon HD

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.

### 2.2.1.12. ERASE DESATURATION

Icon HD 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.
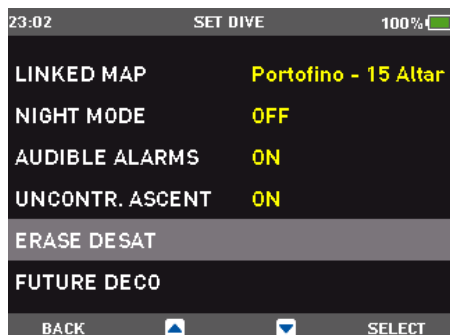


> ⚠ **WARNING**
> Diving after having reset the desaturation is extremely dangerous and is very likely to cause serious injury or death. Do not reset the desaturation unless you have a valid reason to do so.

Once inside the menu, you will see a graphic representation of the loading in all tissues of the decompression calculation. To prevent accidental desaturation reset, you must enter the security code once you decide to proceed with the reset. The security code is **1234**.
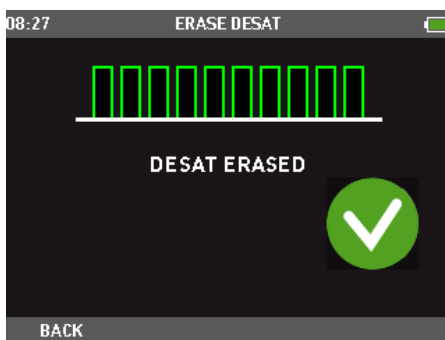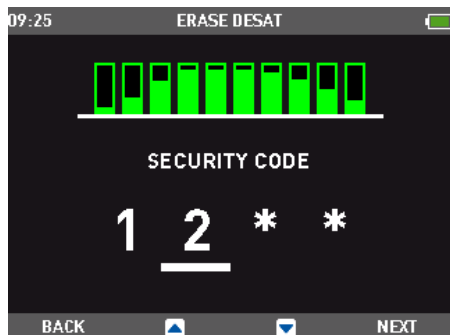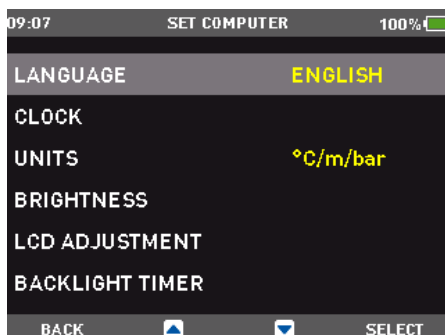




After entering the security code you will get a confirmation of the successful completion of the operation.

### 2.2.1.13. FUTURE DECO

In this menu you can define the parameters of the future deco prediction and of the runaway deco alarm. Refer to section 3.3.1.3 for more information.
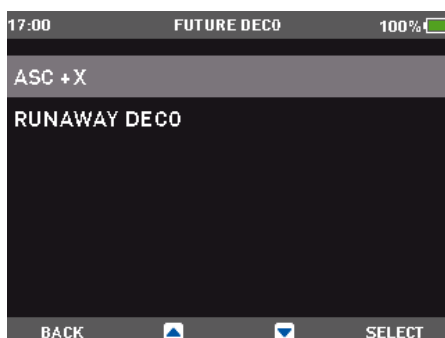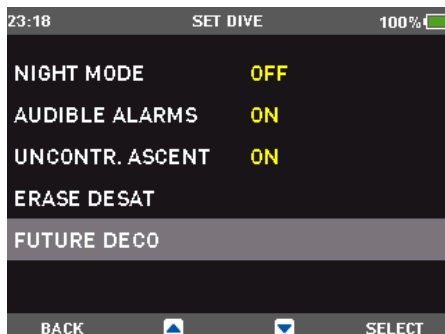




### 2.2.2. SET COMPUTER



### 2.2.2.1. LANGUAGE

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

### 2.2.2.2. TIME

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

### 2.2.2.3. 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).

### 2.2.2.4. BRIGHTNESS

This menu allows you to change the brightness of the display in the high power mode (see section 2.2.2.6) to adapt to various levels of light conditions. Upon entering this menu, a sliding bar appears across the display. Use ◀ and ▶ to set the brightness level.

### 2.2.2.5. LCD ADJUSTMENT

This menu allows you to optimize the display. Use ◀ and ▶ and observe how the test display is affected.

### 2.2.2.6. BACKLIGHT TIMER

Icon HD has a permanently backlit color display. In order to optimize the life of the battery, there are two levels of light intensity in dive mode: a low power mode, in which the display is still readable but the intensity is dimmed, and a high power, the intensity of which is defined with the **BRIGHTNESS** setting at 2.2.2.4. Whenever you push a button, Icon HD switches from low power to high power intensity. In this menu, you can choose the duration of the high intensity interval between 10 seconds and 1 minute in 10-second intervals. You can also set it to **ON** in which case the backlight in Icon HD is permanently set to high intensity. This is the default setting.

> **NOTE**
> - The backlight consumes battery energy: the longer the backlight stays on high intensity, the less your battery charge will last.
> - If the **LOW BATTERY** warning is activated, high intensity backlight will be disabled and the display will remain on low power.

### 2.2.2.7. 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.

### 2.2.2.8. COMPASS CALIBRATION

The digital compass in Icon HD 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 following image will appear on the display.
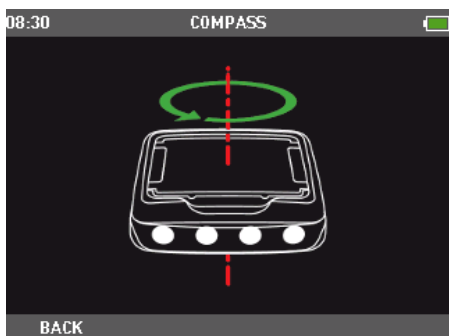


Now hold Icon HD horizontal to the surface and perform one slow counter clockwise circle. Once you have finished the circle, the calibration is completed.

### 2.2.3. ABOUT ICON HD

This submenu provides various information about the hardware and software of your Icon HD . It also lists information about the use of the dive computer, such as longest dive, deepest dive, total number of dives and total dive time. These can be individually reset to 0 by pressing the right button (**RESET**). In addition, you can revert to the original settings configuration via the **FACTORY RESET** option (this option is not available while there is remaining desaturation in the computer). The option **FACTORY MAINTENANCE** is for use by authorized personnel only.
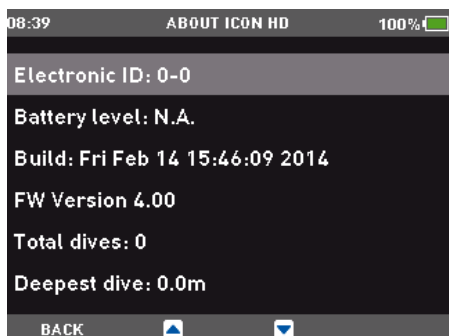


### 2.3. DIGITAL COMPASS

Icon HD has a tilt-compensated digital compass which can be used at almost any inclination. The compass can be called up at any moment during the dive and it can also be used on the surface. This menu allows you to use the compass on the surface and also to set a bearing for reference during your next dive.
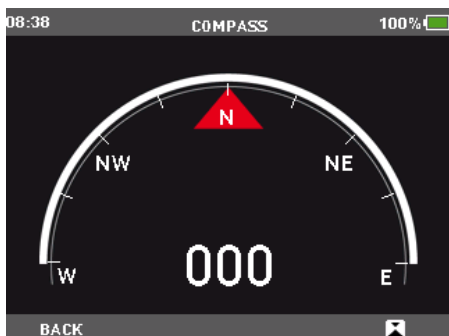


The number shown in the middle of the compass rose represents the bearing, between 0 (North) and 359.

### 2.3.1. SETTING A BEARING

With ✕ 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. Press ✕ and 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.

Once underwater, align the dot with the arrow and start swimming in that direction. If you press ✕ again, the new bearing will override the one in memory. If you press and hold ✕ you erase the bearing.
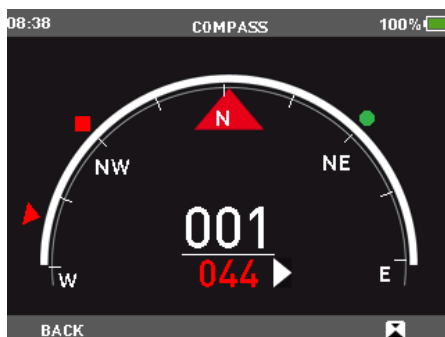


### 2.4. LOGBOOK

Icon HD can record the profiles of approximately 100 hours of diving, at a sampling rate of 5 seconds. The information can be transferred to PC via the Dive Organizer software or to a Mac via the Divers' Diary software. In addition, Icon HD 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.



By pressing **SELECT** you will access the details of the dive, and from here you can view the depth profile with either the temperature or tank pressure data by pressing **PROFILE**.
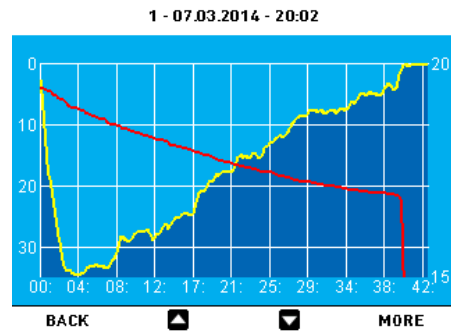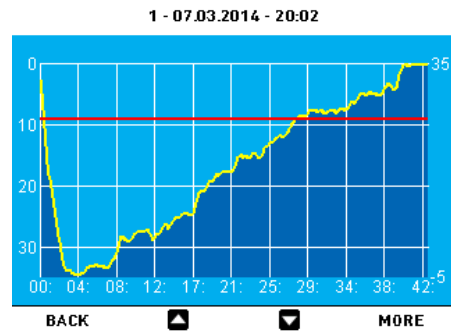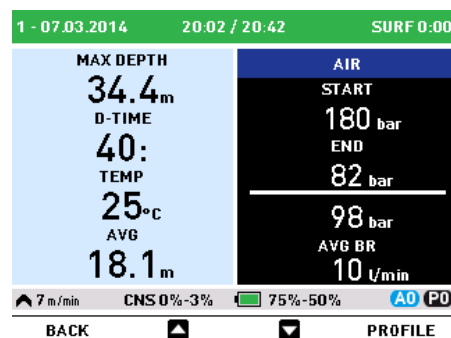






### 2.5. DIVE PLANNER

This function allows you to plan your next dive. At the top of the display you will see the settings used for the calculations: $O_2$%, water type, P Factor and Altitude selections. In case you dived recently, you can enter an additional surface interval between now and when you intend to dive: the residual nitrogen load will be adapted accordingly. Hit the **SELECT** button then use the ➕ and ➖ buttons to define the additional surface interval in 15-minute increments. Next hit **BACK** and use the 🔼 and 🔽 buttons to scroll through the no decompression limits for all depths, in 3m / 10ft increments, up to the MOD for the gas in use. If you wish to see what would happen if for a given depth you extended your dive time beyond the no decompression limit, press the right button, labelled **DECO**. Use the ➕ to increase your dive time and see what your corresponding decompression obligation would be. Press **BACK** to return to the no decompression limits.
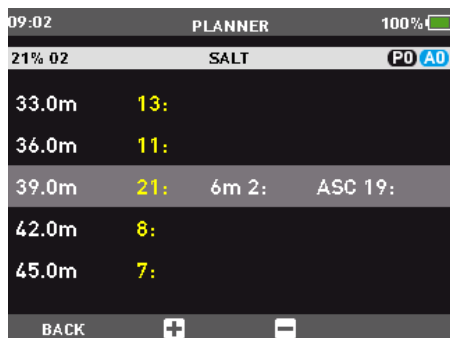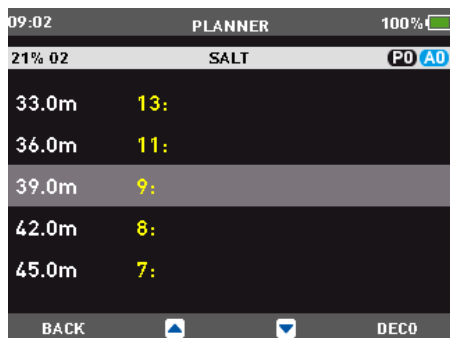
## 2.6. MAPS AND PHOTOS

These menus allow you to view all the maps and pictures that have been uploaded via Dive Organizer to your Icon HD. Any file in JPEG format can be uploaded to Icon. Note that only the files listed as maps can be selected for the **LINKED MAP** function described in section 2.2.1.8.

Icon HD's memory can hold approximately 50 between maps and pictures.

## 2.7. BUTTON LOCK

This function allows you to lock the buttons so that the computer is not turned on inadvertently. This is very useful for instance while travelling to a dive site, since otherwise Icon HD might unintentionally drain the battery before the dive.

To lock the buttons, press and hold **SELECT** for one second from the main menu, or press it normally when the **BUTTON LOCK** icon is highlighted. This will blacken the display.

NOTE
Even when turned off, Icon HD uses up the battery at a rate of approx 4-6% per day, so you must recharge it before diving if you have not used it for a few days.

NOTE
Leaving Icon HD unattended for long periods of time such that the battery will be completely empty does not harm neither the battery nor Icon HD. Logbook data and all settings will be saved. After charging you must however set the time and date again.

NOTE
When the battery in Icon HD is completely empty, it may take up to 20 minutes from the moment it is connected to a power source before Icon HD reacts.
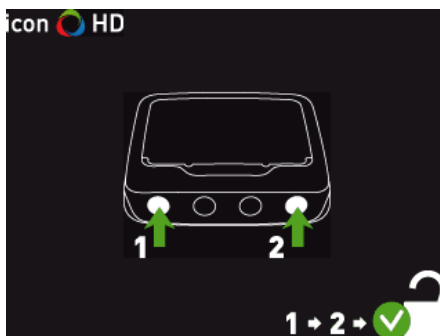


To unlock the buttons, press the left button followed by pressing the right button. The main display now reappears.

## • 3. DIVING WITH ICON HD

## 3.1. A FEW WORDS ABOUT NITROX

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

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

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

Icon HD 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: Icon HD has an MOD alarm set for a user-defined $ppO_2max$. As you enter the oxygen concentration for the dive, Icon HD 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 2.2.1.1 for more information on how to change this setting. If Icon HD is set to **AIR**, the $ppO_2max$ is set to **1.4bar** by default.
- Against long exposure effects: Icon HD "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 Icon HD will activate an alarm when this level of CNS% is reached. Icon HD 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.

## 3.2. ALARMS

Icon HD 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 gauge 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, map viewing 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.
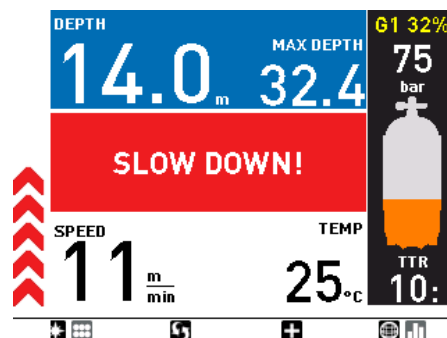
### 3.2.1. ASCENT RATE
As soon as depth decreases Icon HD activates the ascent rate control algorithm and displays the calculated value both numerically and graphically.
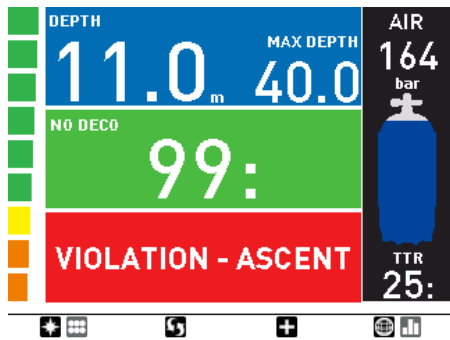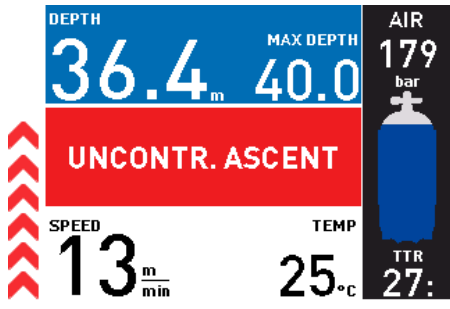
⚠ WARNING
A rapid ascent increases the risk of decompression sickness.

If Icon HD determines an ascent rate of 10m/min / 30ft/min or higher, the fast ascent alarm is triggered: an audible alarm goes off, the arrows on the left side bar turn red and the message **SLOW DOWN** is displayed in the middle of the screen of the screen. This persists until the ascent rate is reduced to 10m/min / 30ft/min or less.
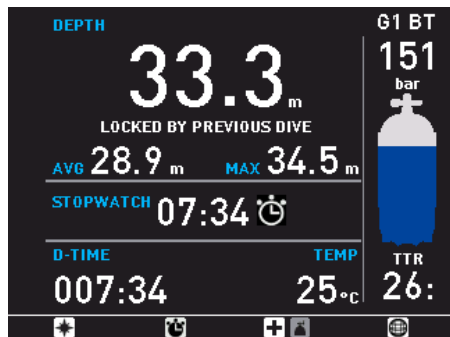


If the ascent rate exceeds 12m/min / 40ft/min at a depth below 12m / 40ft, the message on the screen changes to **UNCONTR. ASCENT** . If a speed in excess of 12m/min / 40ft/min is

maintained for two thirds or more of the depth at which the alarm was first triggered, Icon HD considers it a dive violation and the display will show **VIOLATION - ASCENT.** This message will remain on the screen until you hit any button to acknowledge having seen it.



If the diver attempts a dive after an ascent violation, Icon HD will only function as a depth gauge and timer (bottom timer mode), and it will display the message **LOCKED BY PREVIOUS DIVE**.

### 3.2.2. MOD/ppO$_2$

When the diver reaches a depth at which the ppO$_2$ of the inspired gas exceeds the maximum

limit entered in the corresponding setting (from 1.2 to 1.6bar), an audible alarm goes off, the depth is shown in red and the message **MOD EXCEEDED** is shown at the bottom of the display.
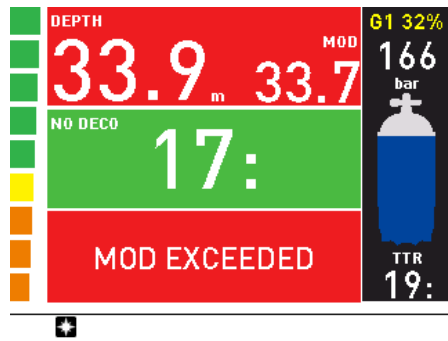


The alarm persists until the diver has ascended enough for the ppO$_2$ to return within the set limit. While the alarm is active, the map function is disabled and the compass can only be called up for 10 seconds, after which the default display with the alarm message is shown again. The gas switch menu can be called up for 20s before the display switches back to the alarm message.

### 3.2.3. CNS = 75%

Oxygen toxicity exposure is tracked on Icon HD 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%, it turns red and the warning message **CNS > 75%** appears on the display until you hit any button to acknowledge having seen it. Furthermore, the field which can be selected via the ✚ button shows the CNS value in red. If you push the ✚ button to view any other value, it will remain for 4s only, and then return to the CNS value.

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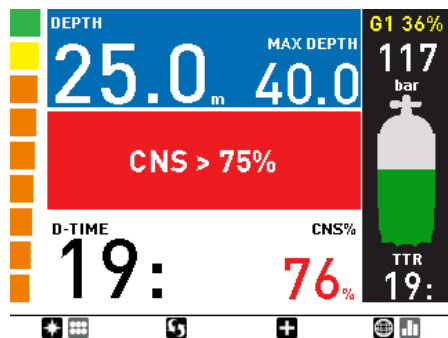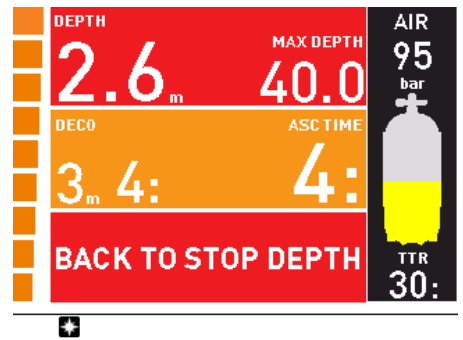
### 3.2.4. MISSED DECOMPRESSION STOP

If you ascend above the decompression stop depth by more than 0.3m (1ft), an audible alarm goes off and the message **BACK TO STOP DEPTH** is displayed at the bottom of the screen. This alarm remains active until you return to the correct depth. Note that while the alarm is active, it is not possible to consult the map, and the compass can be viewed only for 10 seconds before the screen returns to the default display.

### 3.2.4.1. MISSED DECO STOP MODE

If the stop depth is exceeded by more than 1m (3ft) for more than three minutes, Icon HD considers it a dive violation and the display will show **VIOLATION - DECO·**
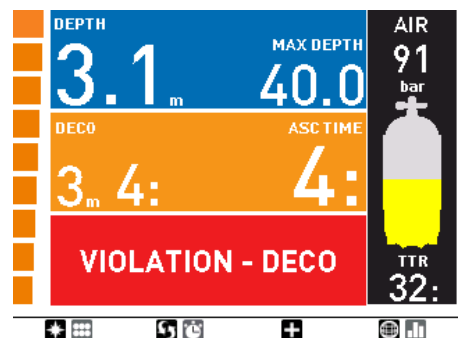


In this case, if the diver attempts a repetitive dive after surfacing, Icon HD will function only as a depth gauge and timer (bottom timer mode), and it will display the message **LOCKED BY PREVIOUS DIVE**.

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

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

When during a decompression dive Icon HD calculates a **TTR** which is inferior to the total ascent time, the message **LOW TANK PRESSURE** appears on the bottom of the display and remains there until you hit any button to acknowledge having seen it. We strongly suggest initiating an ascent when this situation arises, in order to avoid running out of breathing gas during the decompression stop.
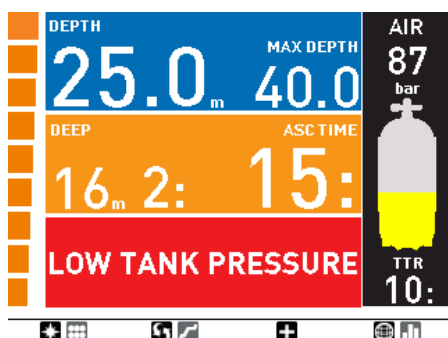
Additionally, when the tank pressure reaches the value specified under **TANK RESERVE**, the message **TANK RESERVE REACHED** is displayed until you hit any button to acknowledge having seen it.
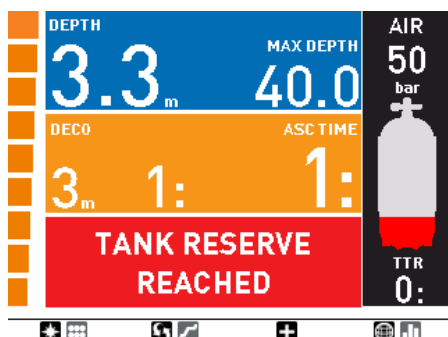
### 3.2.6. LOW BATTERY

⚠ **WARNING**

Do not start a dive if the **LOW BATTERY** message is displayed on the screen on the surface. The computer may fail to function during the dive and this could lead to serious injury or death.

If Icon HD detects that the battery power level is getting low, it will show the message **LOW BATTERY** on the display until you hit any button to acknowledge having seen it. Furthermore, the field which can be selected via the ✚ button shows the battery information in red. If you push the ✚ button to view any other value, it will remain for 4s only, and then return to the battery value. In a **LOW BATTERY** situation, the map function is disabled, as well as audible signals, and the backlight is reduced to a low - power safety level (readability of the display is ensured). You

can still access the compass, but after 30s the screen will revert to the standard display and the battery displayed in red.
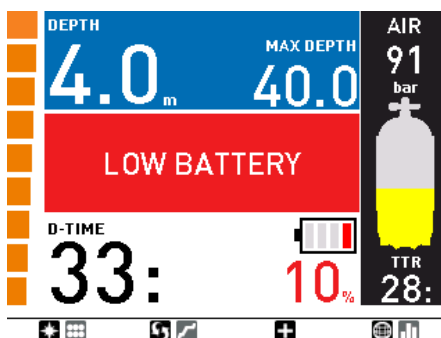
⚠ **WARNING**

When this warning appears, you should stop the dive, safely, without delay.

If the battery is completely drained during or right after a dive, Icon HD 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, Icon HD 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 **G1** (or **G2** or **G3**) **LOW BATTERY** is displayed until you hit any button to acknowledge having seen it. Furthermore, the field which can be selected via the ✚ button shows the tank module battery information in red. If you push the ✚ button to view any other value, it will remain for 4s only, and then return to the tank module battery information.
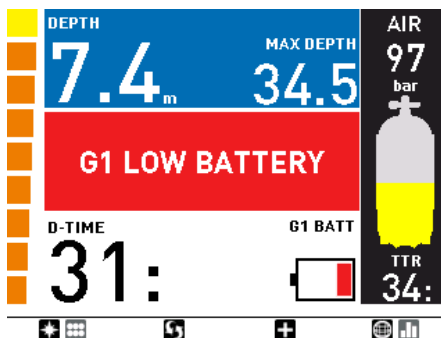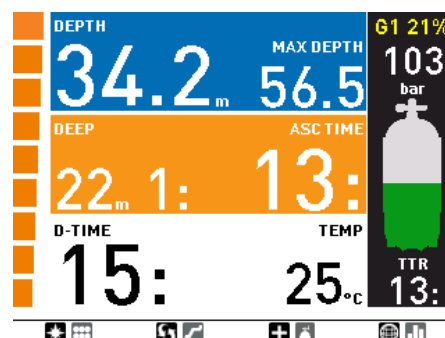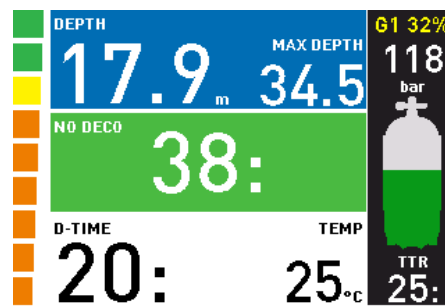
## 3.3. DISPLAY INFORMATION

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

With Icon HD you have a choice of how the information is presented on the display. This is described in the next sections.

### 3.3.1. STANDARD (DEFAULT) DISPLAY

The standard display presents dive information in a prevalently numerical format. More specifically, the following information is displayed:

- current depth and max depth in top row
- no deco time in middle row (depth of deepest stop, time at deepest stop and total ascent time in case of decompression dives)
- dive time and temperature in bottom row
- description of gas in use, tank pressure in bar / psi, graphic representation of tank pressure using the 5 color ranges described in section 2.2.1.6.1, time to reserve (**TTR**) along the right edge of the display
- nitrogen bar graph along the left edge of the display
- ascent speed: in case of an ascent, the value in m/min or ft/min is displayed in lieu of the dive time, while graphically it is shown in lieu of the nitrogen bar graph (each arrow representing 2m/min / 6ft/min).

Upon pressing ✚, the field to the right of the dive time is modified in the following sequence:

- water temperature
- stopwatch
- $O_2$/MOD (Nitrox only)
- CNS (Nitrox only)
- $ppO_2$ (Nitrox only)
- time of day
- battery status of Icon HD
- battery status of tank module in use
- average depth
- gas consumption in l/min or cuft/min.

**NOTE**

if you set Icon HD to AIR, the information on $O_2$/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 $O_2$/MOD, CNS and $ppO_2$, set Icon HD 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.

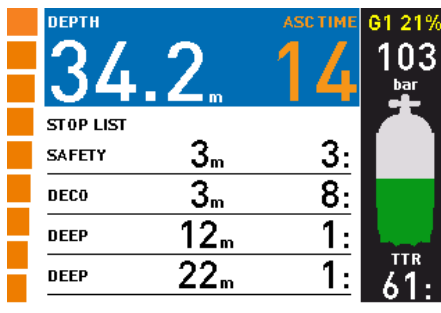| DEPTH | | MAX DEPTH | G1 32% |
|---|---|---|---|
| 17.9 m | | 34.5 | 118 bar |
| NO DECO | 38: | | |
| D-TIME | | G1 BATT | |
| 20: | | | TTR 25: |
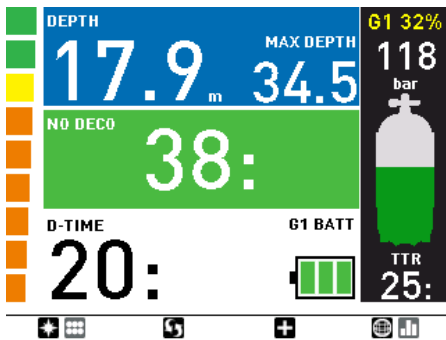
### 3.3.1.1. DETAILED DESCRIPTION OF DISPLAYED DATA

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 Icon HD 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** (**ASC**), which includes each decompression stop and the time required to travel the vertical distance to the surface at a rate of 10m/min / 33ft/min. **ASC** includes the duration of deep stops as well. Note that in presence of a deep stop during a decompression dive, the deep stop itself is shown as the first (deepest) stop in the middle row. 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, the second button from the left features a new label: ▤. Pressing and holding it will display the details of all stops computed by Icon HD, up to a maximum of 4, starting from the deepest.

| DEPTH | | ASC TIME | G1 21% |
|---|---|---|---|
| 34.2 m | | 14 | 103 bar |
| STOP LIST | | | |
| SAFETY | 3m | 3: | |
| DECO | 3m | 8: | |
| DEEP | 12m | 1: | |
| DEEP | 22m | 1: | TTR 61: |

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, Icon HD employs color coding to identify a range in tank pressure, as described in section 2.2.1.6.1.

> ⚠ **WARNING**
>
> - If Icon HD receives no signal from the tank module for 45 seconds, the pressure value is replaced by ---. Check the position of Icon HD 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 15bar/220psi, the tank module will turn off and Icon HD will not show tank pressure any longer.

The **TTR** (**time to reserve**) is the time you can spend at the current depth breathing at the current rate before reaching the user defined tank reserve.
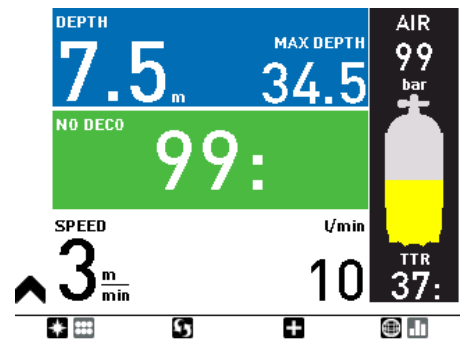
> **NOTE**
> Icon HD needs approximately 2 minutes to analyze your breathing pattern, thus the **TTR** is not displayed at the very beginning of the dive.

The **nitrogen bar graph** is on the left side of the display. It represents nitrogen supersaturation (any amount in excess of the equilibrium state at the surface) in the leading tissue compartment. The bar graph is made of ten segments, which gradually switch from green to red during the dive. The more red segments you see, the closer to the no deco limits you are. As you enter a situation of mandatory decompression stop, all segments will be red.

During a surface interval, the segments will gradually turn from red to green as Icon HD tracks the offgassing of your tissues.
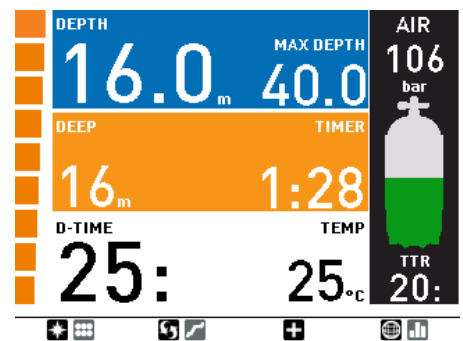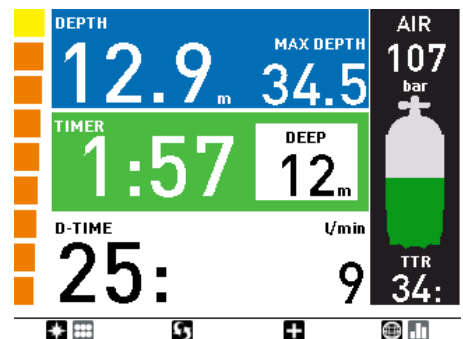
**Ascent rate**: in presence of a depth change in excess of 80cm / 3ft, Icon HD calculates the corresponding ascent speed and displays both numerically (in lieu of the dive time) and via an arrow bar which, for the duration of the ascent, replaces the nitrogen bar graph. Each arrow in the arrow bar represents approximately 2m/min / 6ft/min speed. These arrows turn red for speeds in excess of 10m/min / 33ft/min.

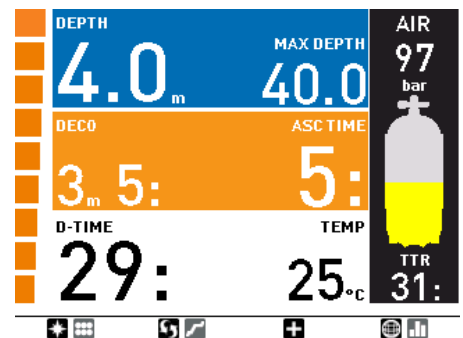| DEPTH | | MAX DEPTH | AIR |
|---|---|---|---|
| 7.5 m | | 34.5 | 99 bar |
| NO DECO | 99: | | |
| SPEED | | l/min | |
| ▲ 3 m/min | | 10 | TTR 37: |

### 3.3.1.2. DEEP, DECO AND SAFETY STOPS

**DEEP** stops are generated as you approach the no deco limit. You can either have one 2-minute stop or two 1-minute stops. **DEEP** stops are **NOT** mandatory but rather suggestions which attempt to minimize bubble production by offgassing some nitrogen at high ambient pressure. Deep stops are shown as a 1 or 2 minute countdown.

| DEPTH | | MAX DEPTH | AIR |
|---|---|---|---|
| 12.9 m | | 34.5 | 107 bar |
| TIMER | 1:57 | DEEP 12 m | |
| D-TIME | | l/min | |
| 25: | | 9 | TTR 34: |

| DEPTH | | MAX DEPTH | AIR |
|---|---|---|---|
| 16.0 m | | 40.0 | 106 bar |
| DEEP | 16m | TIMER 1:28 | |
| D-TIME | | TEMP | |
| 25: | | 25.°c | TTR 20: |

**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.

| DEPTH | | MAX DEPTH | AIR |
|---|---|---|---|
| 4.0 m | | 40.0 | 97 bar |
| DECO | 3m 5: | ASC TIME 5: | |
| D-TIME | | TEMP | |
| 29: | | 25.°c | TTR 31: |

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.
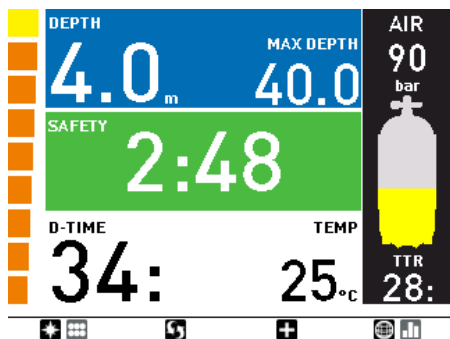


> ⚠ WARNING
>
> During all dives, perform a safety stop between 3 and 5 meters/10 and 15 feet for 3 minutes, even if no decompression stop is required.

### 3.3.1.3. FUTURE DECOMPRESSION

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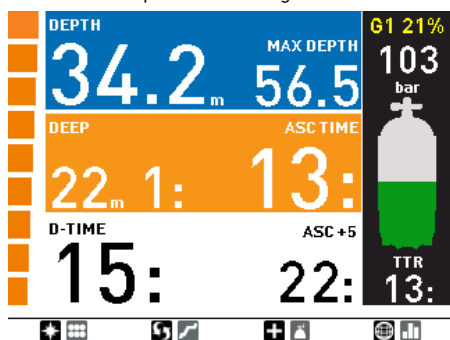


It is also very useful because, as the slower tissues start accumulating nitrogen, you could find yourself in a situation in which the decompression time grows very quickly, so much so that you may find yourself with insufficient gas to finish the dive.

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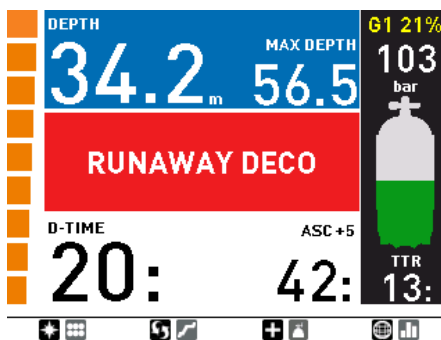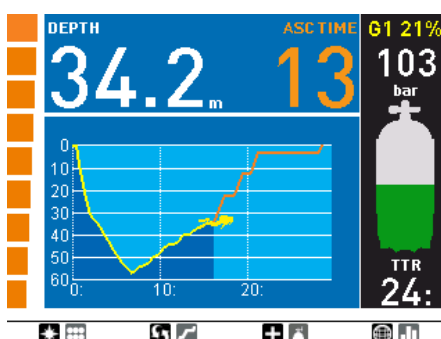


> NOTE
>
> The prediction of **ASC** can be set between 3 and 10 minutes in advance via the **ASC+X** menu within **FUTURE DECO** in **SET DIVE**. The value of **X** can be set between 3 and 10 minutes.
>
> Likewise, the trigger point of the **RUNAWAY DECO** alarm can be set between 2 and 4 times the value of **X**. As an example, if you set the prediction of **ASC** 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 **ASC** and the predicted one 6 minutes later is **6*3=18** minutes or greater.

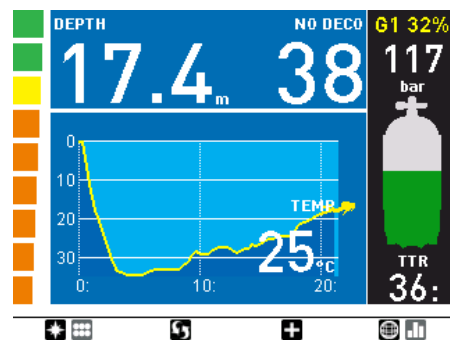### 3.3.2. DIVE PROFILE
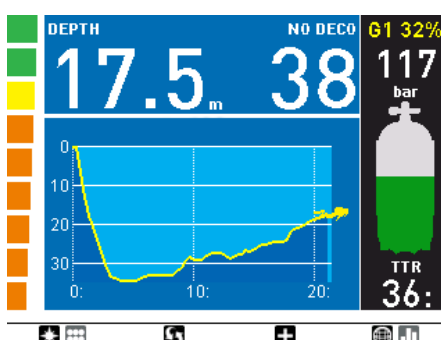


During the dive you can view the depth profile performed so far by clicking on 🔄. The profile is updated every 20 seconds. The top row now shows current depth and no deco time (or total ascent time in case of decompression dives) so that you can keep the profile on the display and still have all the major information about the dive.



With the ➕ button you can call up one additional piece of information but, unlike in the standard display, you can also remove it (by clicking through the whole sequence) in case it overlaps with the dive profile.



> NOTE
>
> The display remains in dive profile mode until you press 🔄 or until an alarm is triggered, in which case the display reverts to the standard display.

### 3.3.3. COMPASS
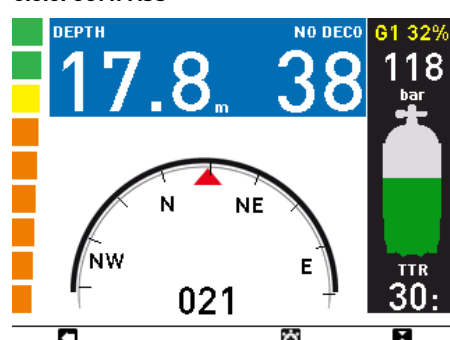


During the dive you can access the compass by pressing ➕. In **COMPASS** mode, the top row of the display shows current depth and no deco time (or total ascent time in the case of decompression dives), so that you can keep the compass on the display and still have all the major information about the dive.
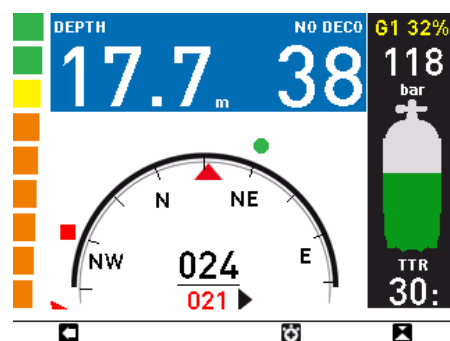


With ❎, you can set a reference bearing. A dot will appear to indicate the set bearing. Additional symbols will appear as well: squares at 90 degrees, triangles at 120 degrees and two parallel lines at 180 degrees, as an aid in navigation for square, triangular and reciprocal courses. The number at the bottom represents the deviation of the direction you are pointing at with reference to the set bearing. If you press ❎ again, the new bearing will override the one in memory. If you press and hold ❎ you erase the bearing.
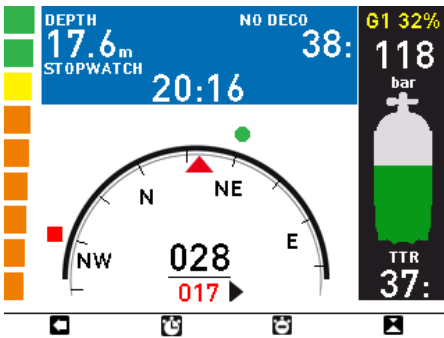
By pressing ⊡, the top row is split in two and a stop watch appears in the lower row. Use ⏱ to activate the stop watch. Every time you press ⏱, the stop watch restarts from 00:00. By pressing ⊡, the top row goes back to full size but the stop watch keeps running in the background.

> **NOTE**
> The display remains in compass mode until you press ◀ or until an alarm is triggered, in which case the display reverts to the standard display.

### 3.3.4. VIEWING MAPS DURING A DIVE

To call up the map selected under **SET DIVE/ LINKED MAP**, press 🌐. The map will remain on the display for 10 seconds, after which the screen reverts to dive information. You can press ◀ to return to the main screen before the 10 seconds have elapsed.



Portofino - 15 Altare
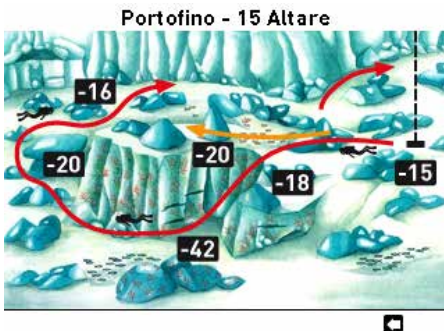
> **NOTE**
> - In the event of an alarm, Icon HD automatically switches back to the standard display.
> - The map is static, and does not change as you swim during the dive.

### 3.3.5. TISSUE SATURATION GRAPH



By pressing and holding the right button (⊡) a complete description of the current tissue

saturation fills the space underneath the top row. The top row itself shows current depth and no deco time (or total ascent time in case of decompression dives) so that you can keep the tissue saturation graph on the display and still have all the major information about the dive. The graph itself is updated continuously.
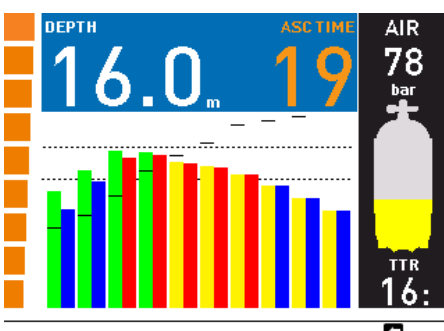
The graph shows the tissue tension in each of the ten compartments simulated by the algorithm, both the instantaneous value (left bar, green or yellow) and the projected value at the surface after an ascent at 10m/ min (right bar, blue or red). The vertical axis represents pressure, normalized so that the safe ascent criterion for each tissue is at the same height, and this is represented by the lower dotted line. As long as the right bar (projected value at the surface) remains below the dotted bar, that particular tissue does not require decompression. When one of the right tissues pushes past the lower dotted line, a decompression stop will be required (failure to meet the safe ascent criterion) and the bar itself changes from blue to red. If a right bar were to push past the second dotted line, there would be a 6m / 20ft stop required in addition to a 3m / 10ft stop.

On the graph one also sees small horizontal black segments: these are representative, on the same pressure scale, of the partial pressure of nitrogen in the inhaled gas. The distance between the small segment and the left 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 segment is above the left bar, the tissue in question is taking on gas and the bar is depicted in yellow. Once the small segment descends into the left bar, the tissue in question is offgassing and the bar becomes green. More information about this can be found in the download section of www.mares.com.

### 3.3.6. UNDERWATER MENU
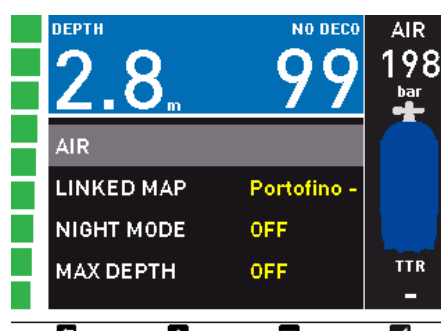


By pressing and holding the left button (⊞) you can call up a menu which allows you to change certain settings during the dive. These are described in detail in section 2.2 although some names have changed a bit due to the limited length available in the UW menu.

AIR (or G1) - corresponds to MODE in 2.2.1.1. This is meant for those occasions when you forgot to update the oxygen percentage setting in the computer after a change of nitrox, a switch from air to nitrox or viceversa, which would force you to abort the dive or at least go to the surface, wait three minutes to exit the dive and then perform the change. This menu is active only during the first minute of the dive and only if the depth has not exceeded 6m / 20ft.

> **NOTE**
> This menu is not meant for switching to a high oxygen content decompression gas.

LINKED MAP - as described in 2.2.1.8

NIGHT MODE - as described in 2.2.1.9

MAX DEPTH - as described in 2.2.1.2

DIVE TIME - as described in 2.2.1.3

BRIGHTNESS - as described in 2.2.2.4

TANK VOLUME - as described in 2.2.1.6

MAX PRESSURE - corresponds to OPERATING TANK PRESSURE in 2.2.1.6

HALF TANK - corresponds to MID TANK WARNING in 2.2.1.6

TANK RESERVE - as described in 2.2.1.6

WATER - as described in 2.2.1.7.

### 3.4. AFTER THE DIVE

Upon returning to the surface, Icon HD first goes into the so-called **surfacing** mode. This mode allows you to resume your dive after a brief period of orientation. The screen shows a 3-minute countdown, a profile of the dive, your maximum depth, dive time, average depth and, for nitrox dives, the CNS% at the end of the dive. When used with the optional tank module, the screen shows the tank pressure as well.
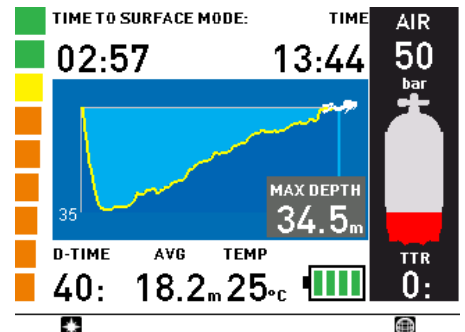


If you submerge again before the 3-minute countdown is over, the dive time will resume from where it left off, including the time spent on the surface. If you do not submerge before the end of the countdown, Icon HD considers the dive finished, records the data to the logbook and reverts to the so-called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

The post-dive screen shows the following information:
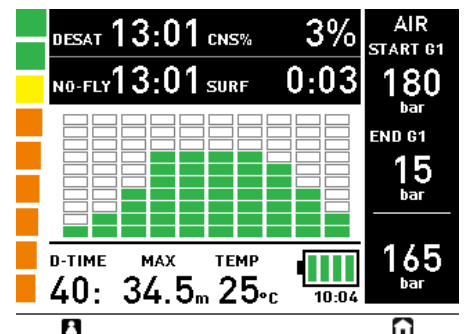


- The remaining desaturation time **(DESAT TIME)**: this is calculated by the decompression model in the computer. Any dive started while there is remaining desaturation on your computer is considered a repetitive dive, meaning that Icon HD

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. Icon HD 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. There are two special cases:
  - if the DESAT TIME is longer than the NO-FLY TIME, Icon HD automatically sets the NO-FLY TIME to be equal to the DESAT TIME;
  - 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 Icon HD displays **NO-FLY** can result in serious injury or death.

- The surface interval **(SURF. INT.)**: this is displayed from the moment the dive is closed (3 minutes after surfacing) for as long as there is remaining desaturation or no-fly time on the computer.

The screen also shows the main data of the last dive: max depth, temperature, dive time, CNS%, initial, final and differential tank pressure.

In addition, the supersaturation with respect to ambient pressure at the surface in all ten compartments of the algorithm is shown discretized in ten segments. The tallest bar is also reproduced along the left edge in the same fashion as it is also during the dive. You can use this to gauge your progress in getting rid of nitrogen as the surface interval grows. Icon HD continues to perform decompression-related calculations (nitrogen release), for as long as there is desaturation or no-fly time left.

## 3.5. DIVING WITH MORE THAN ONE GAS MIXTURE

⚠ **WARNING**

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

Icon HD 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**.

Icon HD 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 1.7. Note that Icon HD 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.

⚠ **WARNING**

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

### 3.5.1. SETTING MORE THAN ONE GAS
The characteristics of the gases must be entered in the computer before the dive. It will then be your responsibility to tell Icon HD 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 Icon HD 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 $ppO_2$max for each one, as described in the picture sequence below. Keep in mind that the MOD for **G2** and **G3** is the depth at which Icon HD will prompt you to perform the gas switch (see section 3.5.2 below).
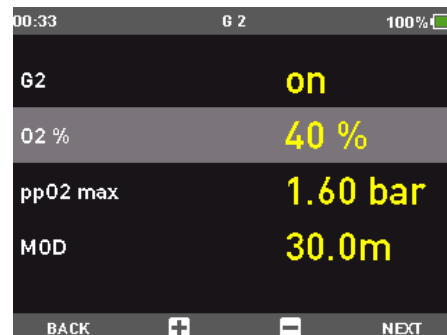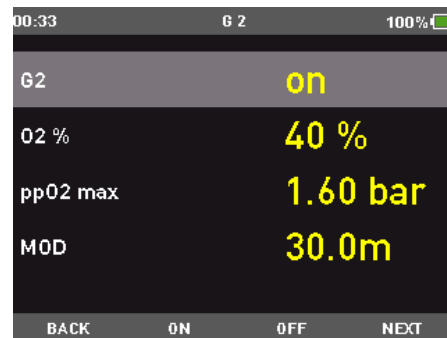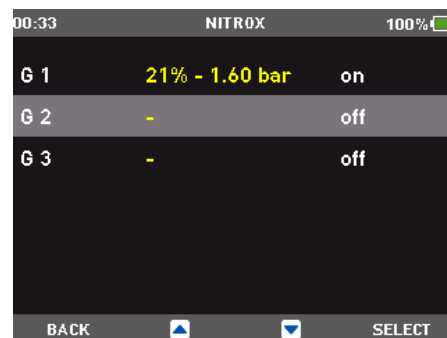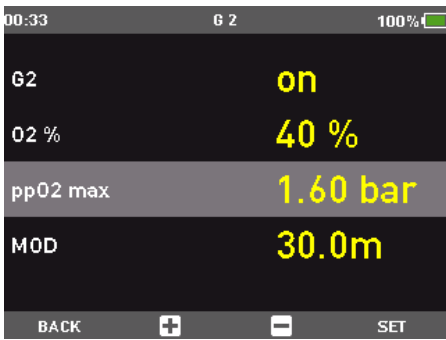
## 3.5.2. SWITCHING GAS

During Nitrox dives with the gas switching function enabled, the third button from the left has two functions, indicated by a double icon:

- Brief pressure: scrolls through the sequence of information to the right of the dive time [icon].
- Prolonged pressure (1 second): displays the gas switch screen [icon].

Icon HD 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**, Icon HD sounds an audible signal and displays the message **GAS 1 -> GAS 2** at the bottom of the screen.
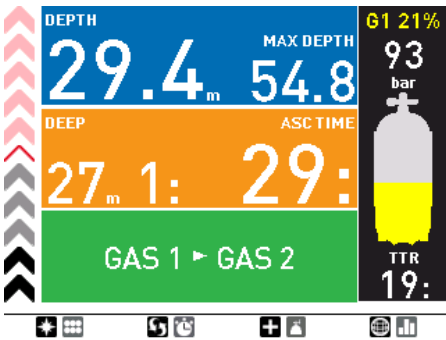


**NOTE**
- Icon HD will allow the change only if the depth is shallower than the MOD corresponding to the set ppO$_2$max.
- Icon HD will not allow the gas switch if you are deeper.
- The message at the bottom of the screen remains only for 20 seconds. You can however call up the gas switch screen at any time, and switch to another gas as long as your depth allows the gas to be activated.
- The same process is repeated when you approach the MOD for **G3** with the message **GAS 2 -> GAS 3**.
- If you have set **G1**, **G2** and **G3** and have not switched from **G1** to **G2**, once you reach the MOD for **G3** the display will prompt the message **GAS 1 -> GAS 3**

At this point, by holding down for 1 second [icon], the gas switch screen will appear: this shows the set gases, with the currently active one indicated by a yellow arrow.
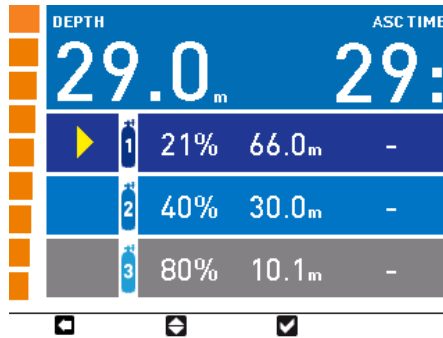


**NOTE**
You can reach this screen at any time during the dive, for instance to check on the tank pressure and the planned switch point of **G2** and **G3**.

Press [icon] to scroll through the available gases, then press [icon] to activate it. The decompression calculation will reflect the switch in breathing gas. In addition, the display will now show the symbol of the new gas and its oxygen concentration. In profile view, the area below the MOD of the deco gas is depicted in red.
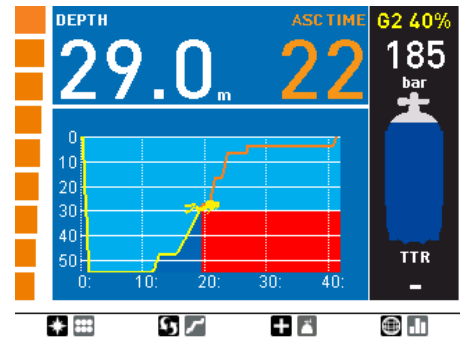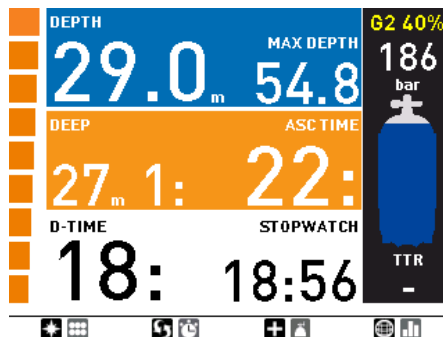




**NOTE**
- You can select another gas using [icon], if permitted at that depth.
- You can exit this mode without changing the gas by pressing [icon].
- If there is only one gas set, the computer will not enter this menu.

## 3.5.3. SPECIAL SITUATIONS

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

There may be situations in which you have to switch back to a gas with lower oxygen concentration than what you are currently breathing. This can happen for instance if you want to descend deeper than the MOD for the current gas, or if for instance you have run out of gas in G3 during the decompression. To do so, simply press and hold [icon] to call up the gas switch screen. Use [icon] to choose another gas, then press [icon] to activate it.

### 3.5.3.2. SUBMERGING BELOW THE MOD AFTER A GAS SWITCH

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

### 3.5.4. TTR WHEN DIVING WITH MORE THAN ONE GAS MIXTURE

Icon HD determines the **TTR** based on your breathing pattern, the tank pressure for the gas you are currently breathing, and the decompression time calculated for that gas only. It does not account for tanks other than what you are currently breathing, hence your actual autonomy may be higher. For this reason when diving with more than one gas mixture the **LOW TANK PRESSURE** warning does not exist.

### 3.5.5. LOGBOOK FOR DIVES WITH MORE THAN ONE GAS MIXTURE

For dives carried out with more than one gas mixture, Icon HD 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.
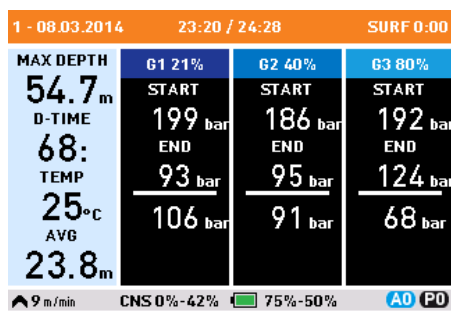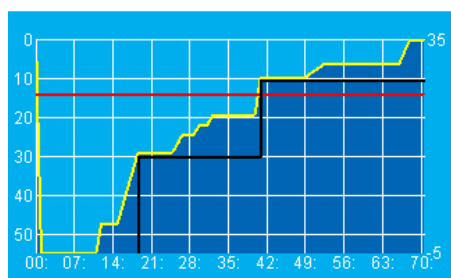
1 - 08.03.2014 - 23:20



1 - 08.03.2014 - 23:20

## 3.6. BOTTOM TIMER MODE

When Icon HD is set to **BOTTOM TIMER** mode, it will only monitor depth, time, tank pressure and temperature, and will not carry out any decompression calculation. You can only switch to bottom timer mode if the computer is completely desaturated. All audible and visual alarms, other than the low battery alarm, are turned off.

> ⚠ **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.



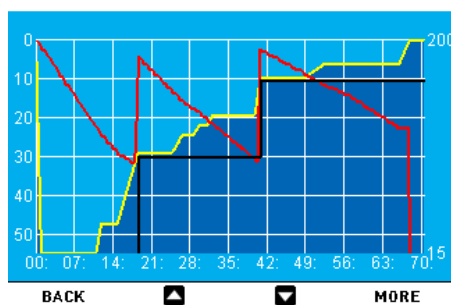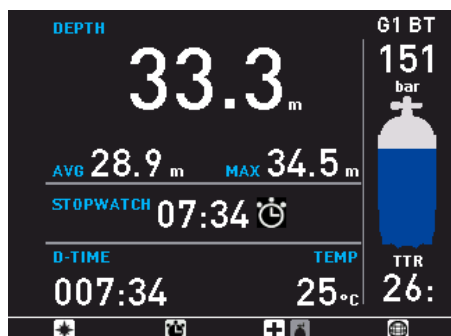During a dive in gauge mode, the following information is displayed:

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

The stop watch is reset by means of ⏱. Upon pressing and holding the same button, the gas switch display is called up. The only result of switching gas mixtures in bottom timer mode is that the pressure of the newly chosen tank is displayed instead of the current one.

### 3.6.1. DIVE VIOLATION INDUCED BOTTOM TIMER MODE

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

- Uncontrolled ascent.
- Missed deco stop.

In case of a violation, Icon HD will restrict the use of Air and Nitrox mode for 24 hours, and will only allow operation in Bottom Timer mode, continuously displaying the message **LOCKED BY PREVIOUS DIVE**.
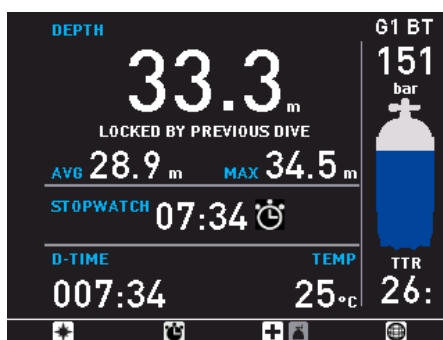


## • 4. TAKING CARE OF ICON HD

## 4.1. TECHNICAL INFORMATION

### Pressure gauge function

The pressure gauge integrated with the ICON HD net ready dive computer has been tested and CE certified by Registered Test Center #0426 - ITALCERT, V.le Sarca, 336 - 20126 Milan.
The pressure gauge is a Category III device as defined under European Directive 89/686/CEE, and complies with the specifications set out in the harmonized European Standard EN 250/2000 for use with air compliant with Standard EN 12021 (oxygen content of 21%). The EC certification process and verification of the operating performance of the pressure gauge in the ICON HD net ready dive computer under standards EN 250:2000 and EN 13949: 2003 are understood to be applicable to a maximum depth of 50 m below the surface. The ICON HD net ready dive computer can be used in cold water (water at temperatures below 10°C).

### Marking

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

- working pressure rating: 300 bar / 4,350 psi;
- reference standard: EN 250/2000;
- reference marking: CE 0426.

The conformity marking indicates compliance with the essential health and safety requirements as per attachment II D. and 89/686/EEC. The number alongside the EC identifies the Notified Body #0426 – ITALCERT V.le Sarca, 336 – 20126 Milan - Italy, authorized to inspect the finished product under art. 11 B D.e. 89/686/CEE.

### Characteristics

Maximum operating pressure: 360 bar (5150 psi). Accuracy: The guaranteed accuracy of the pressure measurement is:

- at 50 bar ± 5 bar
- at 100 bar ± 10 bar
- at 200 bar ± 10 bar
- at 300 bar ± 15 bar
- at 750 psi ± 72 psi
- at 1450 psi ± 145 psi
- at 2900 psi ± 145 psi
- at 4350 psi ± 217 psi

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

### Measurement resolution

Metric: 1 bar
Imperial : 10 psi.

### Measurement of high pressure

- every 10 seconds.

### Operating altitude:

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

**Decompression model:** RGBM Mares-Wienke (10 tissues)

### Depth measurement:

- Max displayed depth: 150m/492ft
- Resolution: 0.1m until 99.9m and 1m at depth deeper than 100m. Resolution in ft is always 1ft
- Temperature compensation of the measurement between -10 °C to +50 °C / 14 °F to 122 °F
- Accuracy from 0 to 80m/262ft: 1% ±0.2m/1ft

### Temperature measurement:

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

### 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$_2$max range between 1.2 and 1.6bar

**Logbook memory**: over 100 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**:
- Icon HD:
  - 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 5-7 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
- Tank module:
  - CR123
  - Battery life: 150-200 dives. Actual battery life depends on the number of dives per year, the length of each dive and the water temperature.

## 4.2. MAINTENANCE

The tank pressure gauge and the parts of this product used to measure tank pressure should be serviced by an authorized Mares dealer every other year of after 200 dives (whichever comes first). In addition, the depth accuracy should be verified every two years. Aside from that, Icon HD 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 Icon HD, the following recommendations will help assure years of trouble free service:

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

### 4.2.1. REPLACING THE BATTERY IN ICON HD

Icon HD uses a rechargeable battery, so 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.

### 4.2.2. REPLACING THE BATTERY IN THE TANK MODULE

> ⚠ **WARNING**
> We recommend having the battery of the tank module replaced by an authorized Mares dealer. The change must be made with particular care in order to prevent water from seeping in. The warranty does not cover damages due to an improper placement of the battery.

> ⚠ **WARNING**
> - Never touch the metal surface of the battery with bare fingers. The two battery poles must never be short circuited.
> - A leaking tank module cap may lead to the destruction of the tank module by water seeping in or cause the tank module to switch off without prior notice.
> - Always open the tank module in a dry and clean environment.
> - Only open the tank module to replace the battery.

> **NOTE**
> You do NOT have to repeat the pairing procedure after replacing the battery in the tank module.
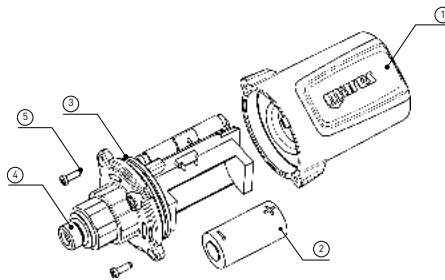


1. Remove the tank module from the HP port of the first stage regulator.
2. Dry the tank module with a soft towel.
3. Remove the 2 screws (5) with a Phillips screwdriver.
4. Carefully remove the tank module cap (1).
5. Carefully remove the tank module cap o-ring (3) Be careful not to damage the sealing surfaces.
6. Remove the battery (2) by holding it on both sides. Do not touch the contacts or the electronic parts.

> ⚠ **WARNING**
> If you notice traces of seeping water, damages or other defects on the o-ring, do not use the tank module for further dives. Take it to an authorized Mares dealer to be checked.

7. Always insert a new o-ring when you replace the battery and dispose the old o-ring. Make sure that the new, lubricated o-ring is in perfect condition, and that o-ring, o-ring groove and the sealing surface of the tank module and tank module cap are free of dust and dirt. If necessary, clean the parts with a soft cloth. Fit the o-ring in the o-ring groove.
8. Wait for 30 seconds, then insert the new battery. Ensure that the ➕ side is facing away from the base of the tank module. The tank module can be damaged if you do not insert the battery correctly.
9. The tank module will now perform an automatic test and switch into ready mode after 60 seconds.

## 4.3. WARRANTY

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

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

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

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

Any products returned for overhaul or repairs under warranty, or for any other reason, must be forwarded exclusively via the vendor and accompanied with a proof of purchase slip. Products travel at the risk of the sender.

## 4.4. WARRANTY EXCLUSIONS

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

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

Damage resulting from excessive exposure to elevated or low temperatures.
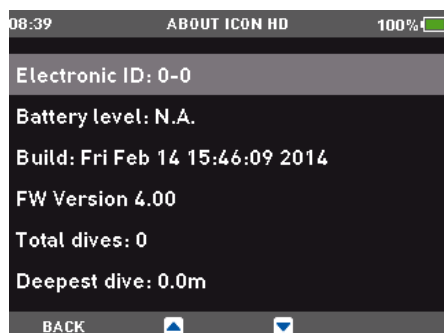
Damage caused by the use of compressed air to clean the dive computer.

## 4.5. HOW TO FIND THE PRODUCT SERIAL NUMBER AND ELECTRONIC ID

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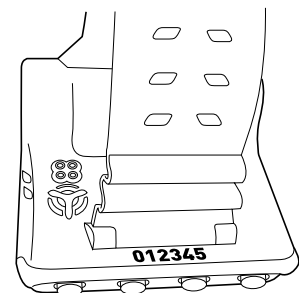


To see the electronic ID, enter the **SETTINGS** submenu, go to **ABOUT ICON HD** using the central buttons, and press **SELECT**.

```
08:39          ABOUT ICON HD        100%

Electronic ID: 0-0

Battery level: N.A.

Build: Fri Feb 14 15:46:09 2014

FW Version 4.00

Total dives: 0

Deepest dive: 0.0m

   BACK         ▲          ▼
```

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

• **5. DISPOSAL OF THE DEVICE**

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

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

**rgbm**®

Algorithm

Deep Stops

$C\,E$

**mares**®