RATIO
COMPUTERS

iX3M 2

User Manual
ver. 6.03

Warning!

This manual is valid only for iX3M 2 updated
to OS 5.1.5.6/016 or above.

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Contains Transmitter Module FCC ID: QOQWT12
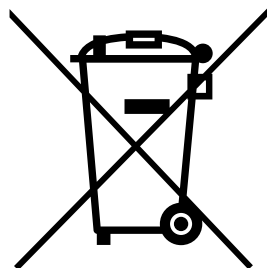
Made in Italy

Warning!

To receive all updates of this manual and notice of future updates of the iX3M 2 by e-mail send a message writing "iX3M 2"

to the following address: update@ratio-computers.com
This service is highly recommended
and it is completely free of charge.

For further support, have a look at the tutorial video available on www.ratio-computers.com

For assistance by mail write to support@ratio-computers.com

Warning!

This Manual **DOES NOT** replace an adequate diving training and should be used only by those divers who have been appropriately trained by a certified diver training organization.

The dive computer is an auxiliary instrument to the dive, it is compulsory having always an appropriate training and backup in order to carry out the decompression phase in case the device is malfunctioning for any reason.

To completely understand the terminology used in this manual and the functions of the dive computer a proper diving training is required.

Think Green

If possible do not print this manual.
Use your tablet or your PC to consult it .

THINK BEFORE YOU PRINT

CONTENTS

CONTENTS

iX3M 2 during the dive

X3M 2 in GAUGE mode

The iX3M 2 after a dive

Important Warnings

General Warnings

It is necessary to read this manual carefully before using the computer RATIO®. Wrongful use of this computer or its accessories will nullify the warranty and could cause permanent damages to the device and/or its accessories.

• The diving computer DOES NOT replace an adequate diving training and should be used only by those divers who have been opportunely trained.

• The RATIO® computer is an auxiliary instrument to the dive, so it is compulsory having always an appropriate backup (diving chart) in order to carry out the decompression phase in case the device is malfunctioning.

• Diving involves risks relating to decompression sickness, Oxygen toxicity and other risks relating to the diving itself. Even a careful reading of this manual and the use of this device won't prevent possible dangers. Anyone who doesn't know or doesn't accept consciously these risks, must not dive with iX3M 2 computer.

• Diving has intrinsic risks which cannot be completely eliminated.
No computer or diving chart can remove the risk of Decompression Sickness (DCS) or Oxygen toxicity to the cSELECTl nervous system, even if the diver meticulously and accurately follows the computer or the diving chart.

• The computer cannot take into consideration the individual physiological variations which might change day by day. For this reason it is good practice to use the device in a conservative and preventive way, remaining within the limits indicated by the computer, to minimize the risks of DD and Oxygen toxicity to the cSELECTl nervous system.

• The computer doesn't replace the learning of the diving decompression charts which we recommend to have always as backup along with a depth gauge and a watch.

• Never share a unique computer for two divers while diving; every diver must have his/her device at his/her wrist, which can give information to him/her only.

• Never dive with a computer which has not taken into consideration the previous dives a diver made; the computer calculation CANNOT use unknown data or take into consideration dives which it has not done.

Danger Warning

The computer IS NOT meant for a PROFESSIONAL use.
The computer is meant exclusively for a sport, recreational or technical use.

• A use which is not compliant to what has been said above, could expose the diver to an increasing risk of incurring in the Decompression Sickness (DCS). For this reason we discourage its use in case of professional or commercial dives, unless it is used as an operator's further support device.

• Before diving it is necessary to check the battery autonomy. DO NOT dive if the battery level is at 30% or at lower percentages; make sure that the screen doesn't show malfunctioning signs. It must be read clearly.

• Check always that settings are the ones desired. Don't let the computer be manipulated by someone else before diving. In this case, check that settings are the ones you desire.

• Consider that our body experience changes everyday. The computer cannot take into consideration all these changes. If you don't feel at your best physical conditions or if you feel physical problems, don't dive.

• Avoid all behaviors increasing the risks connected to the DD such as rapid ascents, yo-yo dives, violation of compulsory decompressive stops, dives with too close surface intervals and any behavior which is contrary to the common sense and to the training received.

• This device doesn't allow its use without having the due skill, given by a specific training.

The failure to comply with the basic rules of diving exposes the diver at death danger.

• We recommend to do dives within the safety curve, to reduce the risks inherent to the Decompression Sickness (DCS).

• We recommend dives not deeper than 40 mt (130ft) or according to the oxygen percentage contained inside the tank.

• Respect the ascent speed recommended by the device; an excessive ascent speed exposes the diver to death danger.

• The computer calculates the total ascent time but this could be longer than the one visualised, according to some parameters calculated by the computer during the whole dive. Trying to ascend at the correct speed and respect the visualized depth of the stops helps to respect this time.

• Respect always the No FLY Time: never take a plane if the No FLY Time icon is still visible on the screen. Remember to plan the last dive of the series taking into consideration the advices given by DAN (Divers Alert Network).

• Even respecting all expected intervals, the current Hyperbaric Medicine cannot exclude the onset of the Decompression Sickness in a plane after diving .

Diving with Mix

The safety approximation of the Mix has to be decided by the diver.

If you are not sure about the EAN safety approximation to be set for your dive, ask your diving instructor or your diving certification agency

• Check the setting of the max PpO2.
• DO NOT DIVE without having checked the tank content with instruments that have been declared as trustworthy.

Ensure that the gas set on the computer matches with the one contained inside the tank you are going to use for diving.

The Nitrox-Trimix-CCR dives need a specific training, DO NOT dive without having received the due training.

 Passing the PPO2 set and advised maximum limit imposes an ascent at minor depths and in case the CNS (CSELECTI Nervous System) has values very close to the maximum limit, a reduction to O2 exposure is recommended.

• Use the diving computer only after having read the User's Manual in all its parts making sure to have understood its functioning.

In case of doubts or questions, address yourself to your instructor or to your dealer before diving.

• It is essential to know that every diver is fully responsible of his/her safety.

• Diving with gas mixes involves different risks in comparison with those made with standard air. A suitable training is necessary to learn to identify and avoid these risks, which are not immediately recognizable. Such risks concerns serious injuries or death.

Limits of diving computers

The computer takes into consideration the most updated safety guide lines, nevertheless, it is always necessary to know that such studies are theoretical and elaborated to reduce, not to avoid, the risk of Decompression Sickness (DCS).

At the moment, Hyperbaric Medicine doesn't totally eliminate the risk of DD.

Care and Maintenance

• Keep the computer clean and dry. DO NOT expose the computer to chemical agents, alcohol included.
To clean the computer, use exclusively fresh water, removing all salt sediments. Let the computer dry naturally, without using cold or warm air jets.

• Do not expose the computer to the sun directly or to heat sources higher than 50°C(120°F). Store the computer in a fresh (5°C-25°C / 40°F-75°F) and dry place.

• Do not attempt to open, modify or repair the computer by yourself. You must always address to a RATIO dealer.

• Do not put the computer inside a hyperbaric chamber.

The computer is designed for a reading precision of +/- 2%
(the precision level required by the EC laws is +/- 3.5%.)

The EC laws require that the unit is checked periodically from the reading precision, depth and time point of view.

• Warranty is voided if the computer is opened by an unauthorized assistance center.

• The RATIO iX3M 2 computer is designed to be waterproof in sea and fresh water but, at the end of every dive, it must be well rinsed in fresh water. Residue of salt, dirt or chlorine could cause the malfunctioning of the buttons.

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• The Ratio iX3M 2 must NOT be dried exposing it at the direct sun light or at heat sources.

• Make sure that there is no humidity signs inside the screen.

ATTENTION: Do not try to open the computer for any reason.
Any problem, turn to a RATIO® authorised center or to RATIO® directly.

Computer's technical characteristics

Hardware

The computer is fully built in POM C with Makrolon cover, allowing an extreme resistance to hits and to corrosion.

The screen is provided with a Display TFT 100%; its matrix has 320x240 pixel resolution

Particular commitment has been put in developing a navigation system allowing the diver to have an easy and intuitive access to all settings.
- Weight: 260gr
- Sensor's precision warranty: 130 mt (426 ft)
- Maximum Depth: 300 mt (984 ft)
- Absolute Pressure Measure precision

	min	max
p = 0 .. 5bar	-20 mbar	+20 mbar
p = 0 .. 10bar	-40 mbar	+20 mbar
p = 0 .. 14bar	-100 mbar	+20 mbar

- Maximum altitude: 5000 mt (16404 ft)
- Sensor's maximum error in measuring the temperature: -2 / +6°C
- Recharge the iX3M 2 using a PS1 category (EN 62368) (not included)
- Supply voltage: 5V c.c. +/-0.2V 500mAh

Certification

The computer's hardware comply with CE EN13319, ETSI EN 301 489-3, EN 61000-6-1, EN 61000-6-3 requirements.

Software
(see the table)

Summary of Technical Characteristics

(See the table)

RATIO®	iX3M 2 Pro	iX3M 2 Deep	iX3M 2 Tech+
Dive Modes	Air / Nitrox Gauge / Freedive	Air / Nitrox / Trimix (normoxic) Gauge / Freedive	Air / Nitrox / Trimix / CCR Gauge / Freedive
Mix	3 Mixes (O₂: 21% - 99%)	3 Mixes (O₂: 18% - 99% / He: 0% - 50%)	10 Mixes (+ 3 Diluents) (O₂: 05% - 99% / He: 0% - 95%)
Deco model (Algorithm)	Buhlmann ZHL-16 C	Buhlmann ZHL-12, Buhlmann ZHL-16 B, Buhlmann ZHL-16 C and VPM-B	Buhlmann ZHL-12, Buhlmann ZHL-16 B, Buhlmann ZHL-16 C and VPM-B
Algorithm adjustment	6 User Settable protection Levels.	12 User Settable protection Levels (6 for Buhlmann and 6 for VPM)	User settable Gradient Factors (GF Low and GF High) and User settable Critical Bubble Radius
Algorithm adjust. during the dive	Yes	Yes	Yes
Repetitive Dives management	Yes	Yes	Yes
Gas switch and Gas break	Yes	Yes	Yes
PO2	1.2 - 1.6	1.0 - 1.6	0.4 - 1.6
CNS/OTU Calculation	Yes	Yes	Yes
Altitude adjustment	Automatic	Automatic	Automatic
Water type	Salt / Fresh	Salt / Fresh	Salt / Fresh
Deep Stop	Yes	Yes (Standard+Pyle)	Yes (Standard+Pyle)
Safety Stop adjustment	Yes, Time and Depth	Yes, Time and Depth	Yes, Time and Depth
Last deco stop adjustment	Yes	Yes	Yes
All Deco stops Manual adjustment	No	No	Yes
Alarms	Vibration + acoustic + visual	Vibration + acoustic + visual	Vibration + acoustic + visual
Dive Planner	No Deco Limit + Full Deco Planner	No Deco Limit + Full Deco Planner	No Deco Limit + Full Deco Planner
Wireless Air Integration	Yes, up to 3 Transmitters (optional)	Yes, up to 3 Transmitters (optional)	Yes, up to 10 Transmitters (optional)
Multi Transmitter Side Mount	Yes, up to 2 Transmitters (optional)	Yes, up to 3 Transmitters (optional)	Yes, up to 10 Transmitters (optional)
Nitrox Analyser	Yes (optional)	Yes (optional)	Yes (optional)
Compass	3D Compass, 1° resolution	3D Compass, 1° resolution	3D Compass, 1° resolution
Bluetooth Smart (5.0)	Yes	Yes	Yes
Other Functions	Gas Blender, Barometer, Temperature	Gas Blender, Barometer, Temperature	Gas Blender, Barometer, Temperature
Color Display	IPS, 2.8-Inch, 320x240 pixel, 144 dpi, 100% matrix	IPS, 2.8-Inch, 320x240 pixel, 144 dpi, 100% matrix	IPS, 2.8-Inch, 320x240 pixel, 144 dpi, 100% matrix
View angle	over 150° (IPS Technology)	over 150° (IPS Technology)	over 150° (IPS Technology)
Backlight level	Yes, user settable	Yes, user settable	Yes, user settable
Top Glass	Mackrolon	Mackrolon	Mackrolon
Buttons	Mechanical buttons, Stainless Steel	Mechanical buttons, Stainless Steel	Mechanical buttons, Stainless Steel
Straps	Redundant Stretch-Belts (Bungees included)	Redundant Stretch-Belts (Bungees included)	Redundant Stretch-Belts (Bungees included)
Battery:	USB Rechargeable Li-ion ~20 hrs in dive mode	USB Rechargeable Li-ion ~20 hrs in dive mode	USB Rechargeable Li-ion ~20 hrs in dive mode
Logbook	~160 hr scuba (sampling 10 sec)	~160 hr scuba (sampling 10 sec)	~160 hr scuba (sampling 10 sec)
Max Depth	220 mt / 721 ft	220 mt / 721 ft	220 mt / 721 ft
PC/Mac Connect.	Yes, USB cable included	Yes, USB cable included	Yes, USB cable included
Updates	User updatable	User updatable	User updatable
Upgrade	Yes, to iX3M 2 Deep	Yes, to iX3M 2 Tech+	-

How to recharge the Battery

The RATIO iX3M 2 has a Li-Ion rechargeable battery without memory effect.
The autonomy data which are shown can change of +/- 15% depending on the environmental temperature, the device settings, the installed applications, the operative system version, the back light setting and the use of its inner (Bluetooth) or external (Analyser, Transmitter) peripheral devices.
ATTENTION: A complete charge cycle is necessary before the device first use.

Watch the video

To recharge the RATIO iX3M 2 we recommend to use a USB wall charger (like the one of your mobile/tablet).
If you decide to use a PC USB plug (deprecated), make sure that the PC doesn't interrupt the electricity flow once in stand-by.

Even if the RATIO iX3M 2 has a new generation battery without memory effect, we recommend to recharge the battery completely.
The average recharge time is 4-5 hours depending on the residual charge level.
Attention: It is suggested to not dive if the computer shows <30% of battery.
Do not dive if the computer shows <20% battery.
When connecting the USB cable to recharge the device, the symbol => will appear in the watch screen within 45 seconds.
It means that recharging procedure is in progress. When the recharge is finished the symbol => will disappear.

Once the battery charge is finished, even if the device remains connected to the plug, the computer automatically interrupts the electricity flow. In case the device is left in charge more than necessary (e.g. all night long), you could find it switched off. You can check the computer charge level pressing any button; the battery percentage can be visualized on the screen's left upper corner.

If the device is in charge and no button is pressed for more than 10 minutes, the back light is reduced to the minimum, to allow a faster recharge cycle.

If the recharge cycle is not completed, the battery indicator might not be precise until the next complete recharge cycle is carried out.

Attention: Do not leave the iX3M 2 completely without charge (0%) for a long period (e.g. 1-2 months). This may damage the battery. The iX3M 2 registers an alarm if left without charge for long time. This event is not covered by warranty.
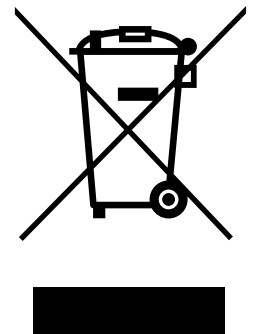
Diving in cold or freezing waters

The RATIO iX3M 2 can be used even in case of dives in cold or freezing waters (<3°C / <37°F); however, the exposure at particularly low temperatures, may negatively affect the residual battery voltage and the precision of the sensor

When diving in cold or freezing waters, the battery voltage may decrease more rapidly than normal. So, we recommend to recharge the battery before diving in extreme conditions.

ATTENTION: when diving in cold or freezing waters (<3°C / <37°F) recharge the device at 100% or make sure that there is at least 50% of battery power.

ATTENTION: Diving in cold or freezing waters (<3°C / <37°F) requires a specific training.

DAN DL7

The RATIO iX3M 2 is 100% compatible with the program for gathering data DAN DL7 of DSL Level 5

The DAN DL7 is a format owned by DAN, which summarizes all necessary information which are needed for the studies, arranging them to be sent directly to DAN Europe's cSELECTl database. All these data include, besides the diving profile, also information relating to the diver (fitness exercices, the medicines he/she ingested etc) and to the dive itself (possible problems, thermal conditions etc).

Contributing to the data gathering is easy: you just have to fill in all fields relating to the program DAN DSL (Diving Safety Laboratory) inside the Divelogger, export them in the format DAN DL7 and send them by e-mail to: dsl@daneurope.org

Give your diving profiles to the Research!
The profile of a dive made with a self breathing device contains extremely important information, such as the time spent in the depth, the ascent speed, how many dives enter in decompression, how many dives contain deep stops etc.

Giving our own diving profiles to the Research means to give a great help to DAN's scientists who, with great dedication and passion, are trying to render the diving activity more and more safe.

Privacy
Unless you send your data, neither the RATIO iX3M 2 nor the Divelogger will send anything automatically.

iX3M 2 outside the Water:
The main screen

To switch the RATIO iX3M 2 on, press any button.
The RATIO iX3M 2 switches off automatically after 10 minutes of total inactivity.
After diving the RATIO iX3M 2 activates the Sleep mode modality: after 10 minutes of inactivity it switches the screen off and deactivates all processes which are not useful for the post-diving de-saturation calculation .

Top part of the display

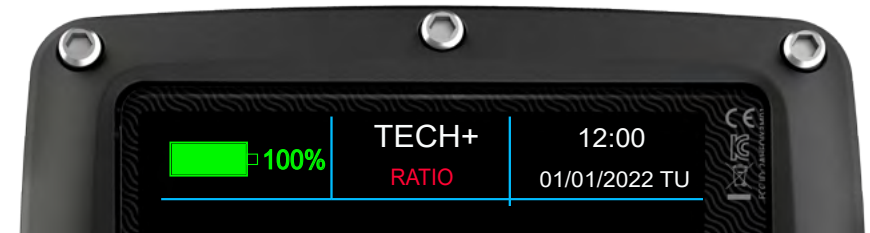In the first line of the introductory screen the RATIO iX3M 2 shows:

Battery indicator (on the top left side)
the RATIOiX3M 2 uses a color code to advise you on its battery status

> Green color (100%->50%): Everything is ok
> Yellow color (50%->20%): Alert (do not make extremely demanding
> dives or in cold or freezing waters)
> Red color (<20%): Recharge as soon as possible..

ATTENTION: It is suggested to not dive if the computer shows <30% of battery.
Do not dive if the computer shows <20% battery.

- Model name (position: top center)
Is possible to replace "RATIO" with your name. Connect your iX3M 2 to Ratio ToolBox to edit this part of the display.
The Ratio ToolBox is available on the support area of Ratio Computer website (www.ratio-computers.com).

- Date and Time (position: top right)
Current time and date. If a second GMT is set, iX3M 2 shows alternately GMT1 and GMT2

RATIO iX3M 2 can run up to 2 different time zones.
(eg. if we are in a country with a different time zone of our homeland's, it is possible to set both times on the RATIO iX3M 2)

Middle part of the display

AMBIENT PRESSURE: 950mb | MODE : OC
SALT
TEMPERATURE: 25.9°C | GF: 93/93
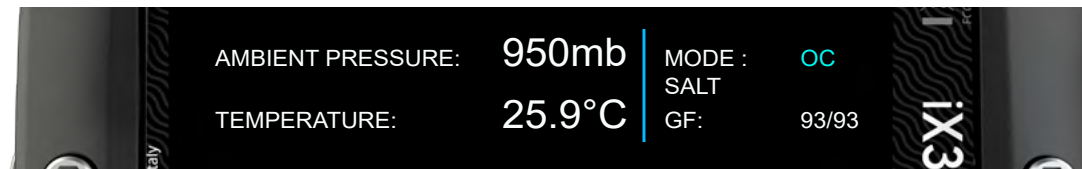
Left part:
- Atmospheric Pressure expressed in millibar and temperature.

Right part:
First line: The DIVE MODE currently set (see DIVE SET 1 on this manual)
Second line: The WATER TYPE currently set (see DIVE SET 1 on this manual)
Third line: The Algorithm and the Protection level currently set (see DIVE SET 1 on this manual)

Middle part:
iX3M 2 shows the composition of the MIX 1 as set
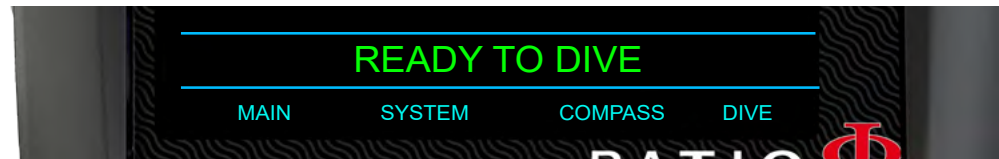in the MIX TABLE menu:

AIR (21/00)
EAN XX (es. 32/00)
TX O_2/He

The MIX value blinks in Red/Yellow if the set MIX can not be used as surface MIX.

Bottom part of the display

- Shows the current status of the unit:

　　　- READY TO DIVE - : The iX3M 2 is ready to dive.

　　　- TISSUE RESET - : A "RESET TO DEFAULT => TISSUE" as been performed on the unit (see RESET TO DEFAULT on this manual). This message will disappear after 48 hrs from the reset or after your next dive.

　　　- SELF TEST RUNNING - : iX3M 2 is performing a system check. You can activate the self test holding A button for more than 7 seconds. **Do not dive when the iX3M 2 is performing the SELF TEST.**

　　　- CALIBRATION IN PROGRESS - : iX3M 2 is performing an automatic recalibration of the pressure sensor. **Do not dive when the iX3M 2 is performing the calibration.**

LSK: Line select Keys:

The current function of each of the 4 button of the iX3M 2 is shown on the bottom part of the display. The function of each button may vary depending on the menu.
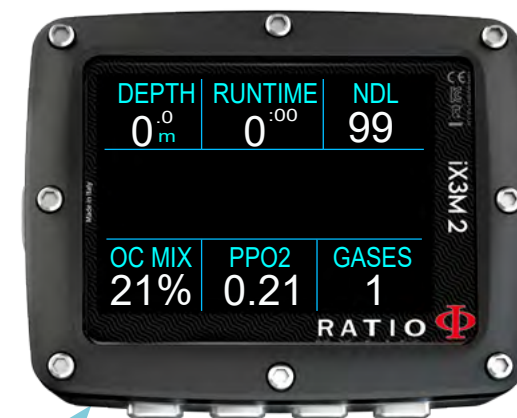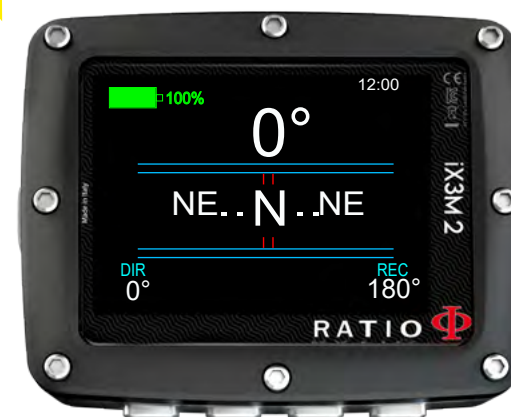
iX3M 2 Menu

MAIN MENU

DIVE SETS 1   PLANNER
DIVE SETS 2   LOGBOOK
MIX TABLE   ALLARMS SET
DECO STOP
APP MENU

BACK   ENTER   UP   DOWN

DIVE SETTINGS

100%   TECH+   12:00
        RATIO   01/01/2022 TU

AMBIENT PRESSURE: 950mb   MODE :   OC
                             SALT
TEMPERATURE: 25.9°C   GF: 93/93

AIR

READY TO DIVE

MAIN   SYSTEM   COMPASS   DIVE

Ⓐ Ⓑ Ⓒ Ⓓ

DIVE MODE

DEPTH	RUNTIME	NDL
0 .0 m	0 :00	99

OC MIX	PPO2	GASES
21%	0.21	1

SYSTEM SETTINGS

DISPLAY   COMPASS

GENERAL SETS   DEFAULT

PC MODE   INFO

TRANSMITTER   SWITCH OFF

BACK   ENTER   UP   DOWN

SYSTEM SETTINGS

COMPASS

100%   12:00

0°

NE . . N . . NE

DIR   REC
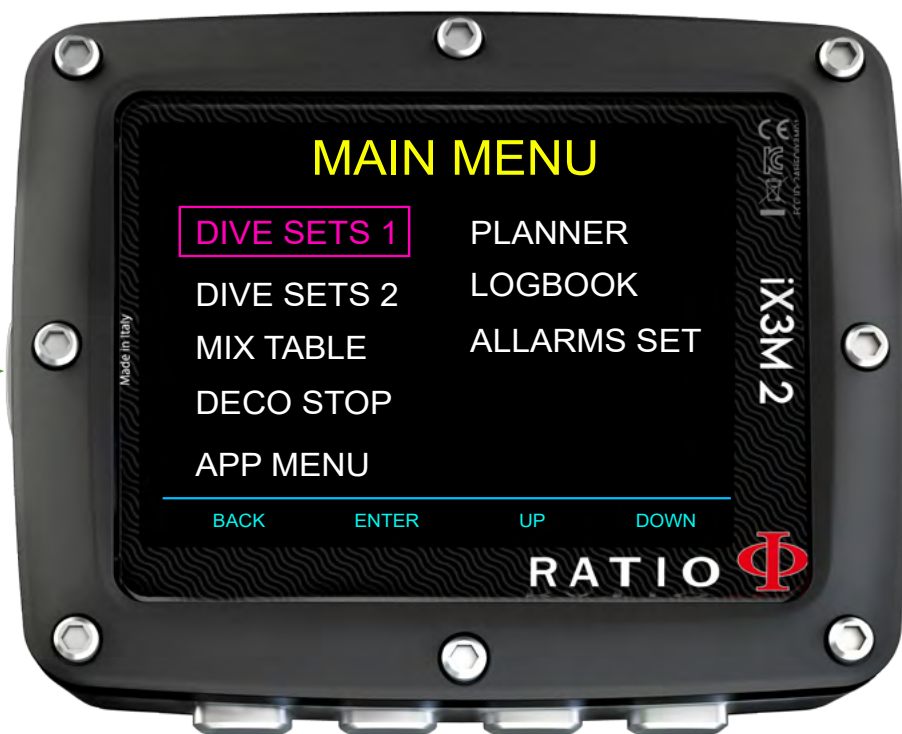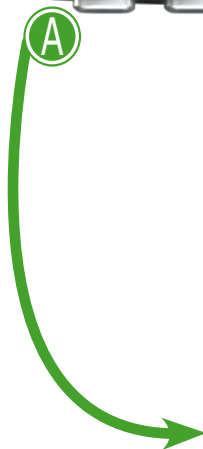0°   180°

MAIN MENU

From the main screen, press button A to have access to the menu.

Use buttons A-B-C-D as described in the picture to navigate in the menu.

The selected entry is indicated in red.
(According to your RATIO iX3M 2 model, some entries might not be visualized.)

Helpful tip:
You can change the RATIO iX3M 2's menu color, titles and data from the menu DISPLAY.

DIVE SET 1

WATER: (SALT/FRESH/ EN13319): It selects the kind of water (SALT= Salty, FRESH= fresh, EN13319= Standard water value used for certification (a sort of Salt/Fresh water mix)

Did you know?
The dive computers measure the pressure and convert it depth using the water density as constant. Without the SALT/FRESH setting the depth reading might be altered (If you dive in fresh water with WATER=SALT setting the depth detected by the iX3M 2 will be lower than the real one, vice versa if you dive in salt water with WATER=FRESH setting the depth detected will be higher than the real one.)

DIVE MODE: It sets the dive mode that will be activated by the iX3M 2 when entering water. ATTENTION always check that the kind of dive matches with the one actually carried out!

> SCUBA: the iX3M 2 begins a dive with tanks
> GAUGE: the iX3M 2 begins a dive in Gauge mode
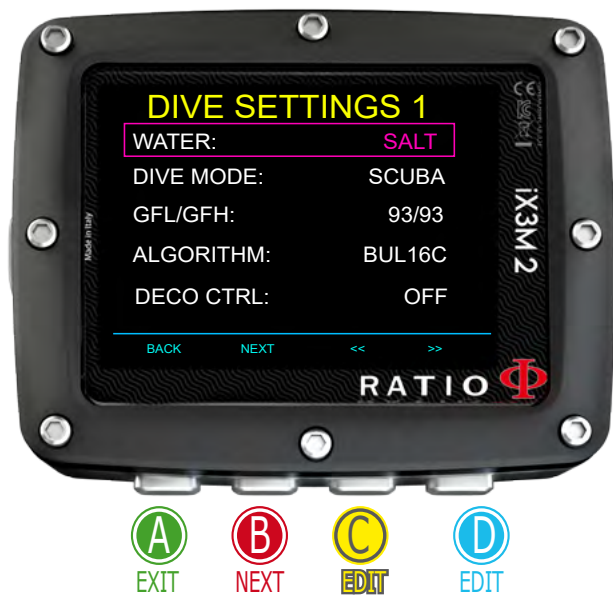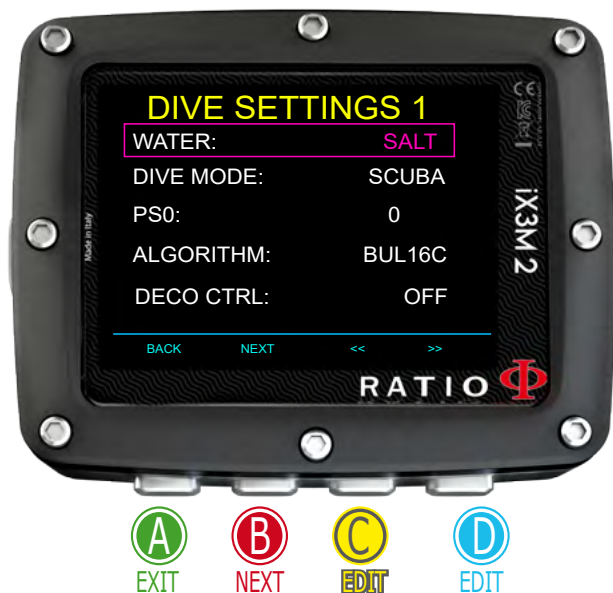> FREE: the iX3M 2 begins a free dive (without tanks).
> CCR: the iX3M 2 begins a rebreather dive.

it is NOT possible to set the FREE mode as main mode if at least 12 hours have passed from your last SCUBA, GAUGE or CCR dive. The RATIO iX3M 2 sets automatically the SCUBA mode if trying to force the dive with the main mode set on FREE.

PS0, GFL/GFH or R0: See following pages

DECO CTRL: (ON/OFF): If activated (ON) the iX3M 2 will not allow you to carry out a new dive during the 12 hrs after a dive in which there have been several deco violations. The DECO CTRL deactivation (OFF) is not recommended and will remain permanently in the iX3M 2 Logbook.

ATTENTION: The Safety Stop is NOT considered to be mandatory in those dives carried out within the safety curve. The Safety Stop violation doesn't entail penalties in decompression during your next dives and it is not considered to be a "deco violation". So DO NOT deactivate the DECO CTRL if you don't want to carry out the Safety Stop.

DIVE SET 1 for RATIO iX3M 2 Pro and iX3M 2 Deep

To navigate the menu, follow the clues in the picture.

DIVE SETTINGS 1

WATER:	SALT
DIVE MODE:	SCUBA
PS0:	0
ALGORITHM:	BUL16C
DECO CTRL:	OFF

BACK   NEXT   <<   >>

(A) EXIT (B) NEXT (C) EDIT (D) EDIT

Algorithm: Select the decompressive algorithm you want to use for your dive.

BUL16C: Bühlmann ZHL-16 C (for iX3M2 Pro, Deep and Tech+)
BUL16B: Bühlmann ZHL-16 B (for iX3M2 Deep and Tech+)
BUL: Bühlmann ZHL-12 (for iX3M2 Deep and Tech+)
VPM: VPM-B (for iX3M2 Deep and Tech+)

Attention: if you have a RATIO iX3M 2 Tech+ go to the next page.

PS: The RATIO iX3M 2 Pro and iX3M 2 Deep conservatism can be changed on pre-set levels from 0 to 5. The levels matches with the following tables:

Bühlmann (Gradients)

GFL/GFH
0 = 93/93   minimum conservatism
1 = 90/90
2 = 80/80
3 = 75/75   max linear conservatism
4 = 50/85
5 = 45/80

VPM -B (Critical bubble radius)

0 = 0.5   minimum conservatism
1 = 0.55
2 = 0.6
3 = 0.7
4 = 0.8
5 = 0.9   max linear conservatism

Helpful tip:
A higher conservatism will make the device makes its calculation in a more precautionary way .
Generally speaking, it is recommended to increase the conservatism if you feel an excessive tiredness after your last dive.

A hyperbaric doctor can advice you on how to set the conservatism according to your clinic status.
Bühlmann Lv4 and Lv5 are usually suggested for tech dives, a proper training is required.
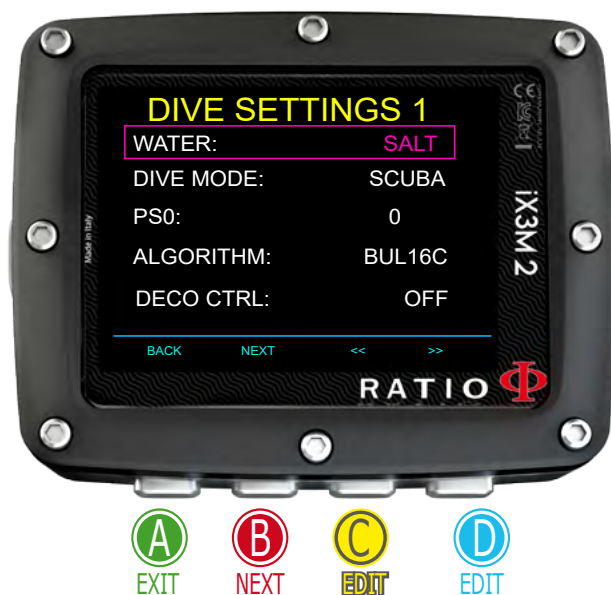
DIVE SET 1 for RATIO iX3M 2 Tech+

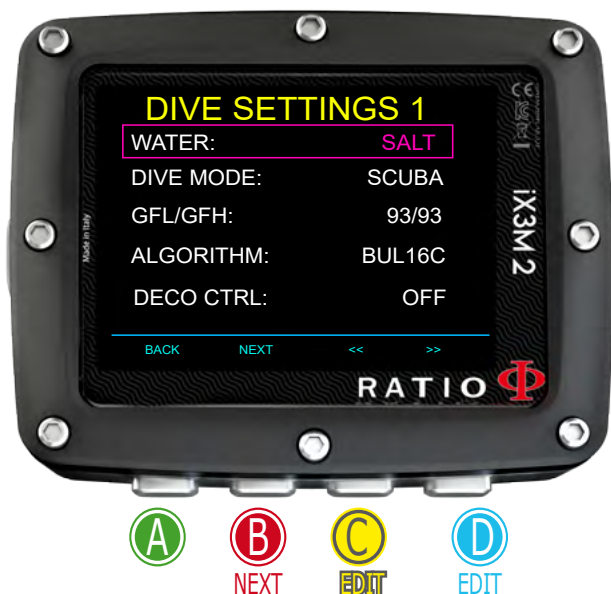To navigate this menu follow the clues in the picture on the left.

Algorithm: Select the decompressive algorithm you want to use for your dive.

BUL16C: Bühlmann ZHL-16 C (for iX3M2 Pro, Deep and Tech+)
BUL16B: Bühlmann ZHL-16 B (for iX3M2 Deep and Tech+)
BUL: Bühlmann ZHL-12 (for iX3M2 Deep and Tech+)
VPM: VPM-B (for iX3M2 Deep and Tech+)

If the chosen Algorithm is BUL / BUL16B / BUL16C:

GFL/GFH: set the Gradient Factor Low (GFL) e Gradient Factor High (GFH).

Attention: The GFL can NEVER be higher than the GFH.
It is possible to set the GFH from 20% to 100% (20% < GFH < 100%)
It is possible to set the GFL from 20% to GFH (20% < GFL < GFH)

Helpful tip: You can keep the buttons C or D pressed to change the iX3M 2 data more rapidly.

ATTENTION: To change the Gradient Factor's value a suitable theoretical knowledge is needed.
DO NOT CHANGE THE GRADIENT FACTORS WITHOUT A SUITABLE TRAINING.

The RATIO iX3M 2 is not responsible for damages to people or objects due to a wrong setting of such parameters.

For suggested protection levels refer to the previous page of this manual.
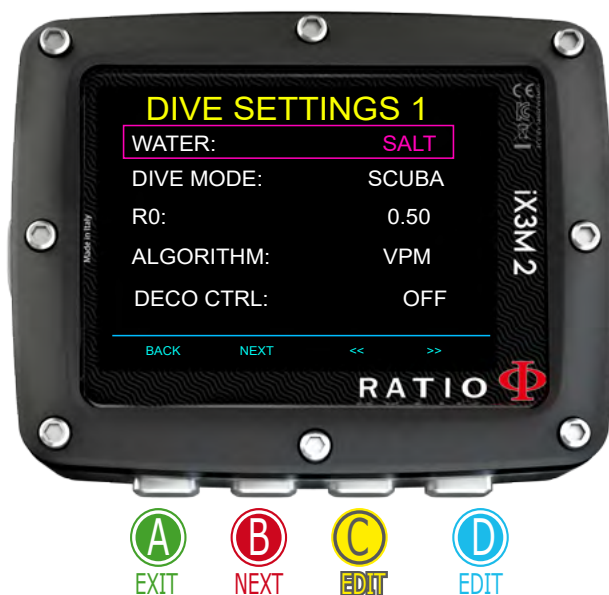
Helpful tip:
If you have any doubts on your device's setting, you can set the company's parameters from the menu DEFAULT
Helpful tip:
Generally speaking, reducing the GFH involves a computer increasing conservatism. The GFL's reduction involves a shift towards a major depth of the first compulsory decompressive stop.
Helpful tip:
With the RATIO iX3M 2 it is possible to change the value GFL/GFH while diving, to manage possible emergencies.

29

DIVE SETTINGS 1
WATER: SALT
DIVE MODE: SCUBA
R0:   0.50
ALGORITHM: VPM
DECO CTRL: OFF
BACK   NEXT   <<   >>

(A) EXIT   (B) NEXT   (C) EDIT   (D) EDIT

If the chosen Algorithm is VPM:

R0: sets the Critical Bubble Radius' value.
It is possible to set R0 from 0.4 to 1.0

Helpful tip: You can keep the buttons C or D pressed to change the iX3M 2 data more rapidly.

ATTENTION: To change the Critical Bubble Radius' value a suitable theoretical knowledge is needed.

⚠ **DO NOT CHANGE THE CRITICAL BUBBLE RADIUS WITHOUT HAVING RECEIVED A SUITABLE TRAINING.**

The RATIO iX3M 2 is not responsible for damages to people or objects due to a wrong setting of such parameters.

For suggested protection levels refer to the previous pages of this manual.

Helpful tip:

If you have any doubts on your device's setting, you can set the company's parameters from the menu DEFAULT

Helpful tip:
Generally speaking, the increasing of the R0 involves your computer's conservatism increase.

Helpful tip:
With the RATIO iX3M 2 it is possible to change the value R0 while diving, to manage possible emergencies.

DIVE SET 2

S. STOP TIME: It sets the Safety Stop's time in minutes.
You can set the time from 0 to 9 minutes (if 0 the Safety Stop is omitted)

Helpful tip:
Diving agencies can recommend different times for the Safety Stop.
Ask your Instructor or your diving certification agency for the value they suggest.

SAFETY STOP DEPTH: It sets the Safety Stop's depth.
You can set the Safety Stop's depth between 3mt (10ft) and 9mt (30ft).

The Safety Stop is carried out 1mt (3ft) deeper, than the depth you have set .
(eg. if S.STOP DEPTH= 5 the stop is carried out from 5.9 metres)

> The Safety Stop is recommended only for dives deeper than 9mt (60ft).
> The Safety Stop timer is re-set if the depth of 9mt (60ft).is passed again.
> The Safety Stop is automatically omitted if one or more mandatory deco stops have to be performed when the diver ascent to 10mt (30ft) depth. In case the diver has not to perform any deco stop when he/she ascent to 10mt (30ft) the Safety Stop will be shown.

DEEP STOP: It selects if use the Deep Stops and which algorithm is to be used to calculate the DEEP STOPS:

OFF: No Deep Stop
STD: Standard Method (half of the max. depth for 2,5 minutes)
PYLE: Pyle Method (ask your instructor for the Pyle Method)

LAST STOP: (1-10): The depth at which you want to carry out the last decompression stop (if the dive is outside NDLs and requires decompression stops)

Deco Stop for RATIO iX3M 2 Tech+

To navigate the menu follow the instructions in the picture on the left.
The whole dive profile is divided in 3 depth zones.

First Zone: from the surface to depth DEPTH1.
Second Zone: from DEPTH1 to DEPTH 2.
Third Zone: from DEPTH2 to the maximum depth reached during the dive

For every depth zone it is possible to specify which decompression step to use to calculate the different stops in that zone by the parameters STEP1, STEP2, STEP3.

example:
<-- see the settings in this picture

With this settings, for depths below 48mt the stops will be spaced out of 5 mt between them; the stops included between 48 mt and 15 mt will be spaced out of 3 mt while the stops between 15 mt and the surface will be spaced out of 3 mt.

Helpful tip: To force the last stop to a preset depth (eg. 6mt) you can set STEP1=6mt and DEPTH1=6mt
Helpful tip: You can keep the buttons C or D pressed to change the iX3M 2 data more rapidly.

STEP parameters can be modified with step of 1.0mt.
DEPTH parameters can be modified with step of 1.0mt.

DECO STOP

STEP 1:	3m
DEPTH 1:	15
STEP 2:	3m
DEPTH 1:	48
STEP 3:	5m

BACK   NEXT   <<   >>

Ⓐ EXIT   Ⓑ NEXT   Ⓒ EDIT   Ⓓ EDIT

WARNING: Do not change the DECO STOP setting if you are not sure what you are doing and you received the proper training! Keep in mind that the STEP 1 value affects the "LAST STOP" setting (see the previous page).

Helpful tip:
If you have any doubts on your device's setting, you can set the company's parameters from the menu DEFAULT
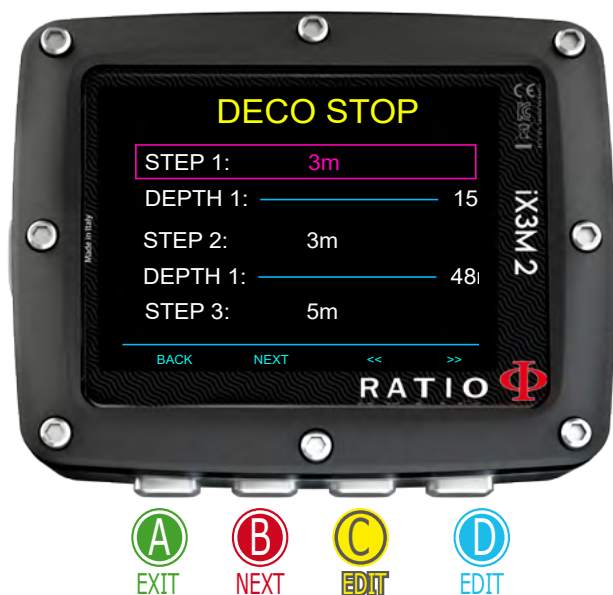
CCR Settings for RATIO iX3M 2 Tech+

To navigate the menu follow the instructions in the picture on the left.

CCR SETTINGS

SETPOINT 1:	0.70
DEPTH 1:	5m
SETPOINT 2:	1.30
DEPTH 2:	80m
SETPOINT 3:	1.10
SETPOINT MODE:	AUTO

BACK   NEXT   <<   >>

(A) EXIT   (B) NEXT   (C) EDIT   (D) EDIT

SETPOINT LOW: Range 0.40 a 1.60. It is the starting setpoint.

DEPTH 1: Automatic switch from SETPOINT LOW to SETPOINT MID and vice versa.

SETPOINT MED: Range 0.40 a 1.60 (Step 0.05)

DEPTH 2: Automatic switch from SETPOINT MID to SETPOINT HIGH and vice versa.

SETPOINT HIGH: Range 0.40 a 1.60 (Step 0.05)

SETPOINT MODE:

AUTO = During the dive the iX3M 2 will automatically switch from SETPOINT **LOW** to SETPOINT **MID** at **DEPTH 1**, from SETPOINT **MID** to SETPOINT **HIGH** at **DEPTH 2** and (during the ascending) from SETPOINT **HIGH** to SETPOINT **MID** at **DEPTH 2** and from SETPOINT **MID** to SETPOINT **LOW** at **DEPTH 1.**

MAN= The Set Point have to be managed manually during the dive.
(See "Change the set point during a dive" on this manual)

During the dive you can switch from AUTO to MAN,
During the dive you can NOT switch from MAN to AUTO.
(See "Change the set point during a dive" on this manual)
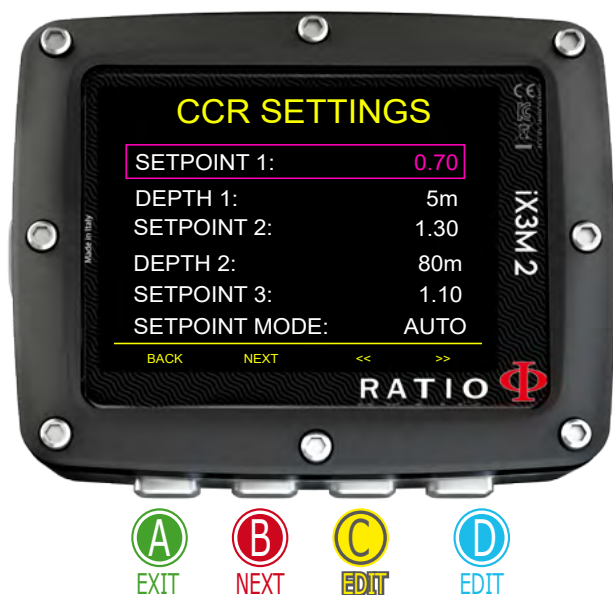
Attention: Enable the Rebreather mode (CCR) only for dives with rebreather. **The CCR mode is not suitable for dives in open circuit!**

Attention: Diving with Rebreather requires a specific training !!!

Diving with Rebreather without a suitable training or without the due caution can cause injuries or death.

Refer to your Rebreather instructor to get instructions on how to set the SET POINT.

MIX Table

To navigate the menu follow the instructions in the picture on the left.
According to your iX3M 2 model you can set:

iX3M 2 Pro: up to 3 mixes Oxygen % from 21% to 99%

iX3M 2 Deep: up to 3 mixes

Mix 1: $\%O_2$ from 18% to 99% %He from 0% to 50%
Mix 2-3: $\%O_2$ from 18% to 99%

iX3M 2 Tech+: up to 10 mixes ($\%O_2$ from 05% to 99%; %He from 0% to 95%)

MIX TABLE menu shows all available mixes. Select the mix using B button, edit the selected mix with C button and activate (ON) or deactivate (OFF) the selected mix with D button.

ATTENTION: Mix 1 is always the starting one.

The iX3M 2 will automatically suggests a mix as soon as a best deco mix is available considering the MOD of the set mixes regardless the label of the mix (Mix 2, Mix 3 etc.)

The iX3M 2 suggest the "best mix" during the ascent and during the descent. If you don't want to use the best mix during the <u>descent</u> phase ignore the suggestion. The iX3M 2 will adjust the deco calculations automatically.

WARNING: iX3M 2 calculates the TTS considering all the mixes set as ON.
Double check the MIX TABLE before each dive.

WARNING: Diving with Enriched air mixes or with Trimix requires a specific training. Diving with EAN or Trimix without a suitable training or without the due cautions is dangerous! If you have not received the specific training do not change the MIX settings and do not dive with EAN or Trimix! Set mixes are considered in the decompression calculations. Do not set mixes that are different from the mixes that you will use in your dive!

Edit a MIX

To navigate the menu follow the instructions in the picture on the left.

O2%: (Oxygen) Indicates the % of Oxygen in the mix.

HE%: (Helium) Indicates the % of Helium in the mix.
(0_2 + He % can not be higher than 100% at anytime. If "0_2 + He % > 99" iX3M 2 automaticcaly reduces the % of He in the Mix.

PPO2: (Partial O2 pressure): It indicates the maximum PPO2 that you want to tollerate using the mix during the dive.

MOD: Maximum depth to which the mix created can be used. The MOD is re-calculated automatically every time the MIX or the PPO2 value are changed. It is not possible to change the MOD directly.

During the dive an acoustic alarm will be activated if MOD value is exceeded (see "ALARM" on this manual). Once activated press and hold A button to mute the alarm.

EAD (Equivalent Air Depth): The equivalent air depth, for a given nitrox mix and depth, is the depth of a dive when breathing air that would have the same partial pressure of nitrogen.

Diluent Table for RATIO iX3M 2 Tech+

To navigate the menu follow the instructions in the picture on the left.

DILUENT TABLE

1:21/00	ON
2:15/35	OFF
3:10/50	OFF

RESET

BACK | NEXT | EDIT | ONOFF

Ⓐ EXIT Ⓑ NEXT Ⓒ EDIT Ⓓ ON / OFF

ATTENTION: The diluents are active ONLY if the CCR mode is ON
ATTENTION: The diluent 1 is always the starting one.

This menu shows all available diluents. Select the mix using B button, edit the selected mix with C button and activate (ON) or deactivate (OFF) the selected diluent with D button.

O2%: (Oxygen) Indicates the % of Oxygen in the mix.
Min. 7% Max. 100%

HE%: (Helium) Indicates the % of Helium in the mix.
Min. 0% Max. 95%

MOD: Maximum depth to which the mix created can be used. The MOD is re-calculated automatically every time the MIX or the PPO2 value are changed. It is not possible to change the MOD directly.

EAD: Equivalent Air Depth

DILUENT 2

O2%:	15	HE%:	35
PPO2:	1.60		
MOD:	96	EAD:	54

BACK | NEXT | << | >>

Ⓐ EXIT Ⓑ NEXT Ⓒ EDIT Ⓓ EDIT

Attention: Enable the Rebreather mode (CCR) only for dives with rebreather. The CCR mode is not suitable for dives in open circuit!
Attention: Diving with Rebreather requires a specific training. Diving with Rebreather without a suitable training or without the due caution can cause injuries or death.
Refer to your Rebreather instructor to get instructions on how to set the correct diluents.
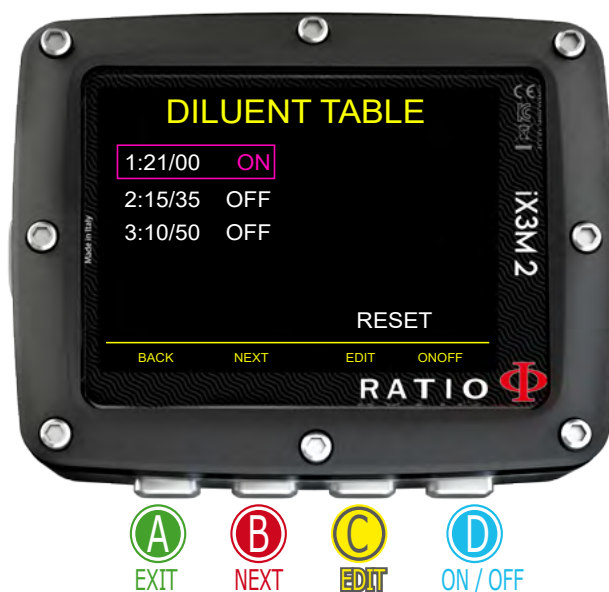
App Menu

To navigate the menu follow the instructions in the picture on the left.

APP MENU

MIX ANALYZER
GAS BLENDER

| BACK | ENTER | UP | DOWN |

RATIO Φ

iX3M 2

(A) EXIT (B) NEXT (C) UP (D) DOWN

MIX ANALYSER

O2:   --.-

CALIBRATE

DEV FW 0.00
SET TO MIX: 1

BACK   SET   -   +

RATIO Φ

iX3M 2

GAS BLENDER

	START	END
MIX	15/50	17/55
PRESSURE	50	200 BAR
TANK VOL:		15.00 L
BLENDING:		HE/02/AIR

EVALUATE

| BACK | ENTER | UP | DOWN |

RATIO Φ

iX3M 2
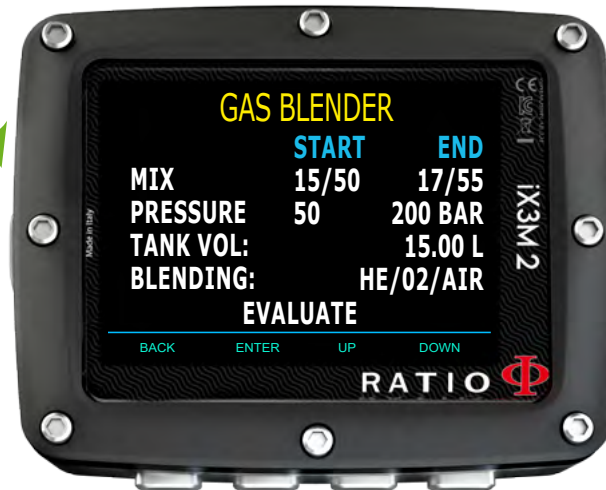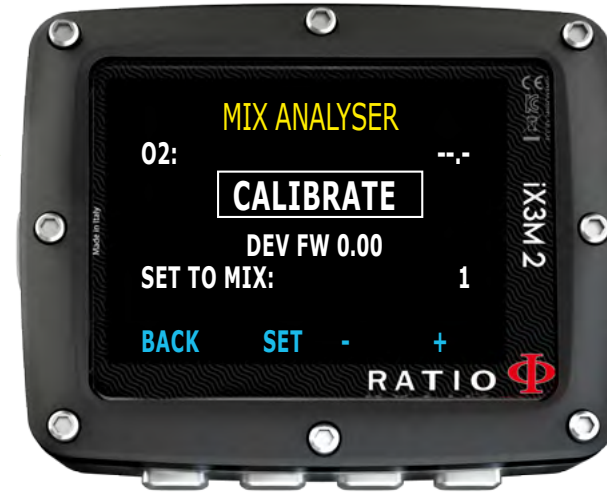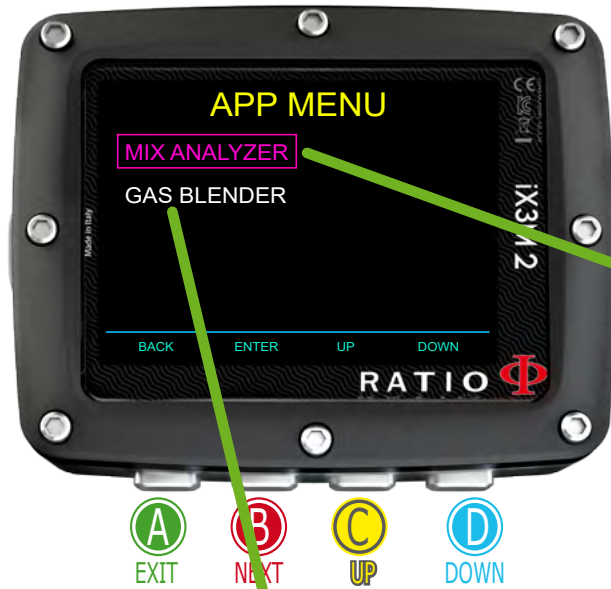
App Menu: MIX ANALYSER

To use the Mix Analyser the separated RATIO® Gas Analyser is needed. Ask your local RATIO® distributor for this accessory.

ATTENTION: DO NOT DIVE with the GAS MIX ANALYSER. It must be used only in surface!
Water would seriously damage the GAS MIX ANALYSER and the iX3M 2 computer if plugged!

The Gas Mix analyser is used to check the Oxygen% in the mix inside the tank.
Always remember that the safety approximation of the Mix has to be decided by the diver. If you are not sure about the EAN safety approximation to be set for your dive, ask your diving instructor or your diving certification agency.

Plug the Gas mix connector to the iX3M 2 port and turn gently counter-clockwise.
ATTENTION: Plug the Gas Mix Analyser to the iX3M2 <u>BEFORE</u> launching the MIX ANALYSER App or you will get a connection error.

Wait for the battery check and for the sensor calibration (about 30 sec.), than place the sensor near the tank and gently open the cylinder's valve to let the Analyser check the mix.

ATTENTION: Please refer to GAS MIX ANALYSER Maintenance manual that you found in the Gas Analyser's box for proper maintenance and storage of the accessory.

ATTENTION: To prevent the premature worn-out of the sensor plug the sensor's protection cap when you are not using the Analyser!
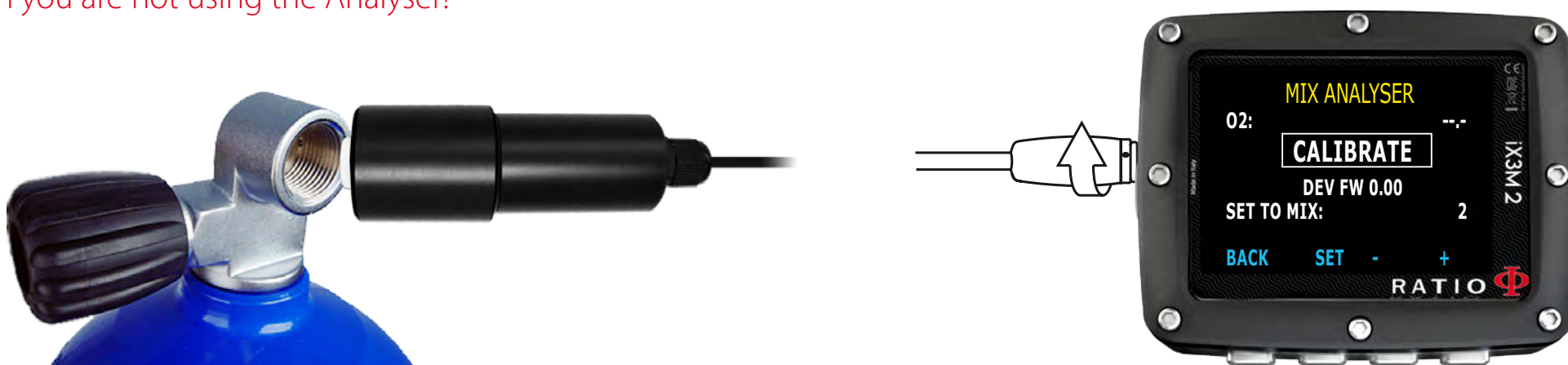
Set a MIX using the Analyser

iX3M 2 can to set the MIX that you are analysing directly as a MIX that will be used during the dive.

Once you can read the O2 value select the MIX that you want to set using C or D buttons (SAVE TO MIX) and press B to SET the Mix

Always check the MIX TABLE before each dive and be sure that all the gases that you are going to use in your dive are set as ON.

Remember that the safety approximation of the Mix has to be decided by the diver. If you are not sure about the EAN safety approximation to be set for your dive, ask your diving instructor or your diving certification agency.

WARNING: Diving with Enriched air mixes or with Trimix requires a specific training. Diving with EAN or Trimix without a suitable training or without the due cautions is dangerous! If you have not received the specific training do not change the MIX settings and do not dive with EAN or Trimix! Set mixes are considered in the decompression calculations. Do not set mixes that are different from the mixes that you will use in your dive!

Gas Blender

The Gas Blender App guides you in filling the tank up, suggesting you the necessary gas quantities to get the desired Mix.

WARNING!
The use of pressurized Gas (pure O_2 in particular) is highly dangerous!
This App can give just indicative information, coming from a mathematic calculation based on the data inserted by the user. **Refer always to specialized centers and to qualified personnel to fill your tanks up!**
Be always sure that your tanks are inspected and respect always the maximum pressure imprinted on each tank!

The Gas Blander App takes into consideration the ideal Gas law.

The calculation made by the Gas Blender App in the iX3M 2 is valid with the method of partial pressures only.

In case the desired mix cannot be made by using the data inserted by the user, the iX3M 2 indicates the reason.

Do you know what?: You can keep either C or D buttons pressed to modify the iX3M 2 values more quickly.
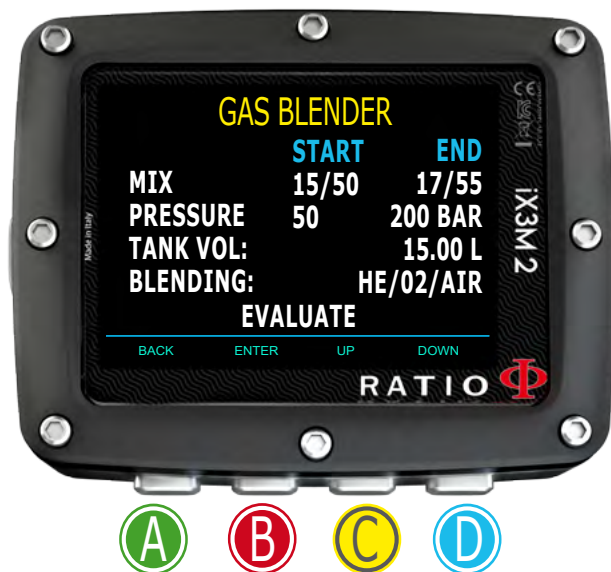
To set the Gas Blender App with the starting Mix and with the one you want to obtain:

Use the **B** button to browse the data, then press **C** e **D** buttons to increase or decrease the values as indicated in the picture.
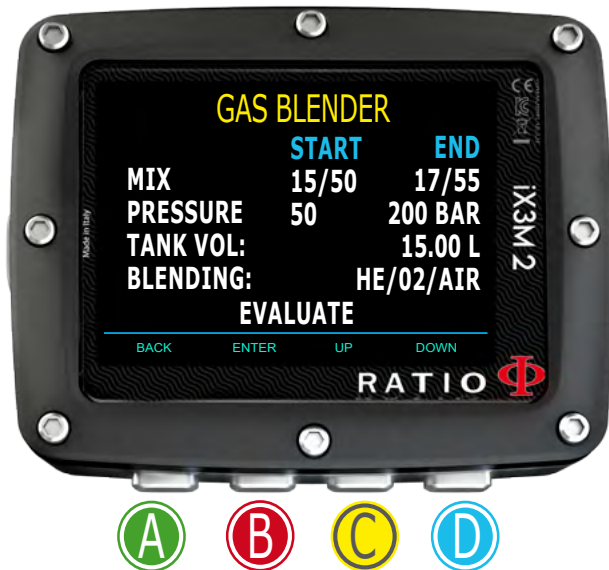
Do you know what?: You can keep either C or D buttons pressed to modify the iX3M 2 values more quickly.

START MIX (O_2/He): The Mix of Oxygen and Helium (in percentage) inside the tank at the moment.

START P (Bar): The pressure, expressed in Bar, inside the tank at the moment.

END MIX (O_2/He): The Mix of Oxygen and Helium (in percentage) that you wish to obtain after the blending.

END P (Bar): The final pressure that you wish to obtain inside the tank after the blending, expressed in Bar.

TANK VOL (L): The tank volume expressed in litres

BLENDING: The order in which you desire to to add the Gases He/02/Air or 02/He/Air

Select EVALUATE and press **C** to start the Blending calculation.

After pressing EVALUATE if the mix is possible with the inserted settings, the iX3M 2 will show the procedure to follow to obtain the desired mix.

In the example shown in the picture:

ADD HE UP TO: Add Helium in the tank until you reach 135 Bar of pressure inside the tank.

ADD 02 UP TO: Add Oxygen in the tank until you reach151.4 Bar of pressure inside the tank.

TOP UP WITH AIR: Add Air (21/00) inside the tank until you reach the final desired pressure (200 bar as in the example).

Do you know what?: In case the desired mix is not possible by using the inserted data, the iX3M 2 indicates the reason.

Pressing the D button the iX3M 2 visualizes more information on the Helium and Oxygen volumes used (considering a temperature of 25°C)

TOTAL: The total quantity of gas (Oxygen or Helium) inside the tank.

ADDED: The gas quantity (Oxygen or Helium) added inside the tank to obtain the desired blending.

At any time, press the A button to exit.
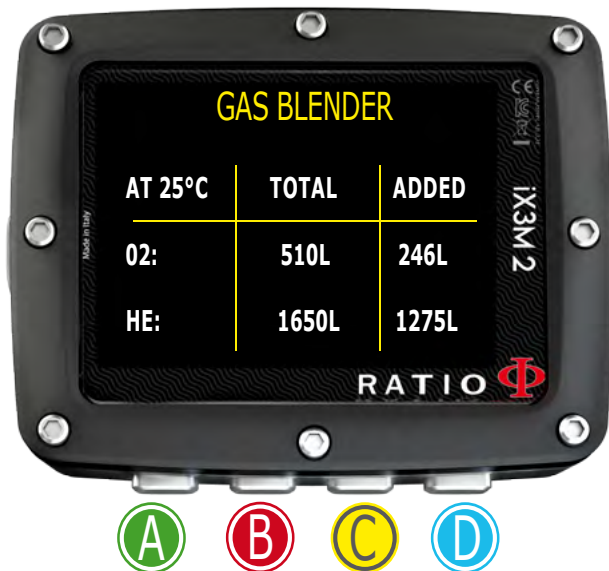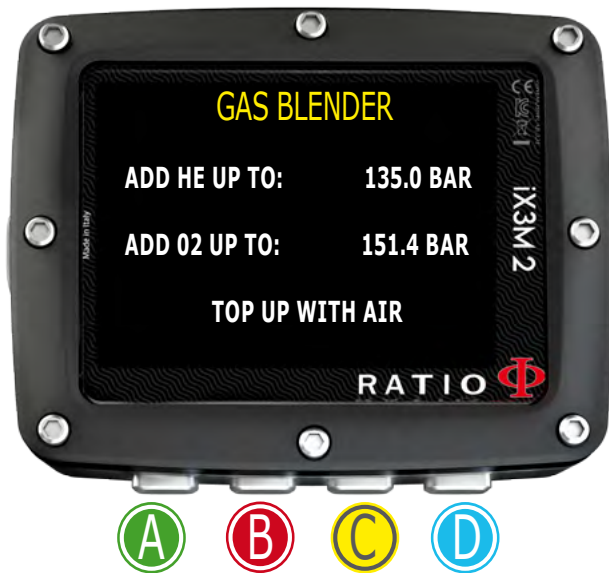
NDL Planner

To navigate the menu follow the instructions in the picture on the left.

The RATIO iX3M2 integrates a complete planner for square dives for both BUL & VPM

Attention: To modify the dive parameters set the device as desired entering the menu DIVE SET and the menu MIX

DEPTH: Set the dive's maximum depth.
TIME: Set the desired bottom time.

Evaluate: it starts the simulation (wait until the word "processing" disappears)

If the dive is within the safety parameters:

NDL: Remaining non decompression time (after the time you have set).
CNS: % of accumulated CNS.
OTU: % of accumulated OTU.

MIX QTY: Mix value expressed in litres which is presumably needed for the dive.

ATTENTION: The gas used quantity is purely approximate and referred to a standard use.
Take into consideration the information given by your diver certification agency to about the quantity of gas to be used.

DECO Planner

To navigate the menu follow the instructions in the picture on the left.
The RATIO iX3M 2 integrates a complete planner for square dives for both BUL & VPM

Attention: To modify the dive parameters set the device as desired entering the menu DIVE SET and the menu MIX

For DEPTH, TIME and EVALUATE make reference to "NDL Planner" (previous page)
Helpful tip: You can keep the buttons C or D pressed to change the iX3M 2 data more rapidly.

If the dive is outside safety parameters:

DEPTH: It indicates the decompression stop depth (in meters if not modified)

TIME: It indicates the decompression stop duration (in minutes)

RTIME: It indicates the run time (time from the dive's beginning) to the decompression stop

MIX: It indicates the mix used to calculate the decompression (to be set in menu MIX)

Press D to pass to the next screen to visualize CNS e OTU.

ATTENTION: the planner uses 18 mt/min (60ft/min) as descent speed and 9 mt/min (30ft/min) as ascent speed for the decompression calculations .

The iX3M 2 will highlight in red a deco stop if the planned PpO2 is above maximum threshold.

ATTENTION: The function Planner doesn't carry out the profile "validation", i.e. it doesn't consider a possible excess of CNS, limits on mixes' volumetric availability, a possible isobaric counter diffusion due to a mix change.

To plan a technical dive properly, a suitable training is necessary. Make reference to your instructor or to your diving certification agency you belong to in case of doubts about planning a dive.

OC PLANNER

DEPTH	TIME	RTIME	MIX
0m	0:	38:	21/0
3m	9:	29:	21/0
6m	4:	24:	21/0
9m	1:	23:	21/0
40m	20:	20:	21/0

(A) EXIT　(B)　(C)　(D) NEXT

MAX Depth

Logbook

To navigate the menu follow the instructions in the picture on the left.

The first visualized dive is the most recent one.

Helpful tip: The dive diagram shown in the RATIO iX3M 2's Logbook is in HD and exploits at maximum the device screen's definition.

N: Dive's number, start time and date.
RT: RunTime (dive's duration)
AVG: Average depth of the dive
CNS: Accumulated CNS %
OTU: Accumulated OTU
BUL(/VPM): Selected algorithm and Conservatism factor
MIX: Main used mix (bottom mix)
MODE: Dive mode (OC= Open Circuit, CC=Rebreather)
TEMP: Minimum recorded temperature

⚠ **Special Records:** In some cases the iX3M 2 will record special events happened before the dive in the logbook.

The special records are identified by a number following this legenda:

! 1 = A tissue reset has been performed before the dive
! 2 = An user settings reset has been performed before the dive
! 3 = A tissue reset and a user setting reset has been performed before the dive
! 128 = The deco violation control has been disabled
! 129 = The deco violation control is disabled & a tissue reset has been performed before the dive
! 130 = The deco violation control is disabled & an user setting reset has been performed before the dive
! 131 = The deco violation control is disabled & a tissue reset and user settings reset have been performed before the dive.
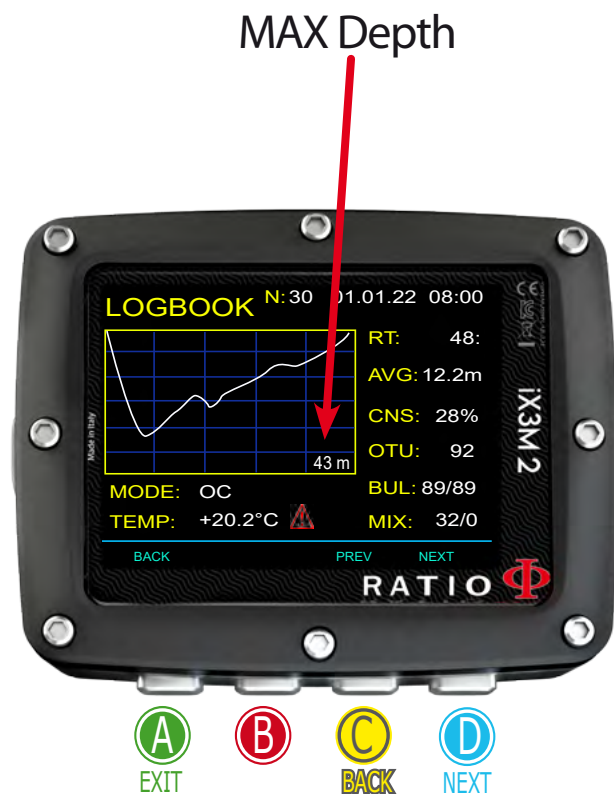
ALARMS SET (Dive Alarms)

To navigate the menu follow the instructions in the picture on the left.
The RATIO iX3M 2 is equipped with color visual, acoustic and vibrating alarms
Did you know? The RATIO iX3M 2 series has been the wolrd first dive computer to have a vibration alarm

TYPE: Set the alarms that you want to use:

SOUND: Use the acoustic alarm only. ("beep") (iX3M 2 will not VIBE)
VIBE: Use the vibrating alarm only. ("buzz") (iX3M 2 will not SOUND)
BOTH: Use the both vibrating and acoustic alarm.
NONE: iX3M 2 will not use vibrating alarm and acoustic alarm (not suggested)

Helpful tip: The hearing of some people is more sensitive to high frequencies (beep), while the hearing of some other is more sensitive to low frequencies (buzz); the vibration, apart from the "physical vibration" itself, has also the aim of creating a low-frequency sound. It is then common that some people are more sensitive to piercing sounds produced by the beeper and some others to the one produced by the vibration.

ASC Speed: It activates/deactivates the alarm in case of ascending too fast.

MOD: It activates/deactivates the alarm in case of passing the MOD of the mix you are currently breathing.

GAS RES: iX3M 2 activates the alarm when the pressure of the main tank is below the RES value (settable in the TRANSMITTER menu).

DECO: Activates/deactivates the alarms related to decompression:

ENT.= iX3M 2 activates the alarm 1 minute before the NDL expires (1 minute alarm).
VIOL= iX3M 2 activate the alarm in case of violation of a compulsory decompression stop. (DEEP STOP or SAFETY STOP are not considered compulsory stops).
BOTH = IX3M 2activates the alarm according to the conditions of both ENT. and VIOL.
OFF = The decompression alarm are turned off (not suggested)

Time: It indicates the time in minutes (max. 360 minutes) that once it is passed either the acoustic or vibrating alarm is activated.If it is set at 0 the alarm is deactivated.

Depth: It indicates the depth in meters (max. 300 mt/985 ft) that once it is passed either the acoustic or vibrating alarm is activated. If it is set at 0 the alarm is deactivated.

You can MUTE every kind of alarm during the dive by pressing A button for more than 3 seconds.
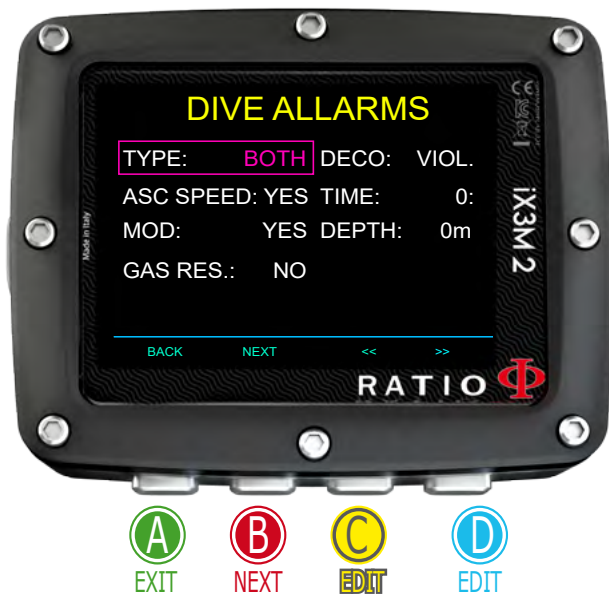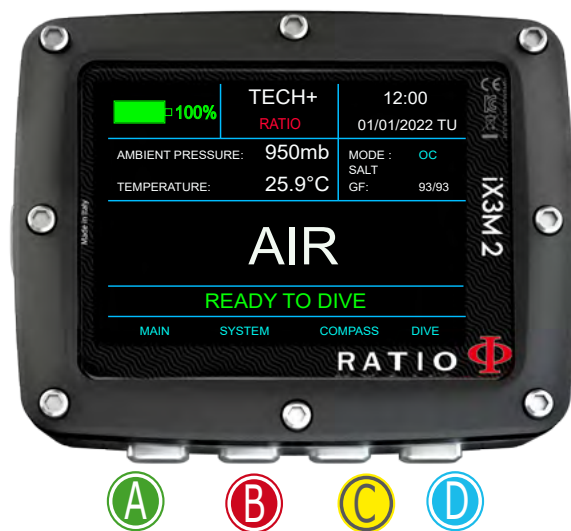
SYSTEM SETTINGS

From the main screen press **B** buttons to have access to the menu.

Use buttons **A**-**B**-**C**-**D** as described in the picture to navigate the menu.

The selected entry is indicated in red color.
(According to your RATIO iX3M 2 model some entries might not be visualized)
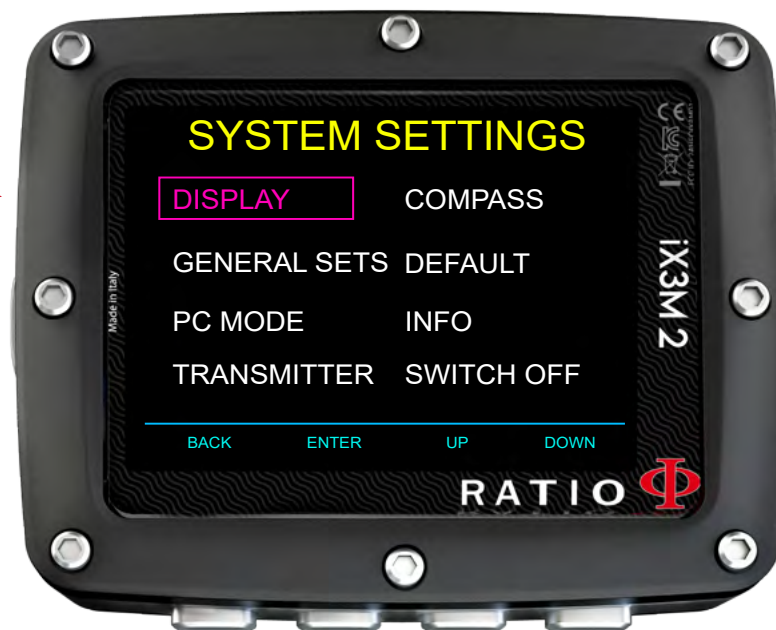
Helpful tip:
You can change the RATIO iX3M 2 menu, headlines and data colors from the menu DISPLAY.

Display Set

To navigate the menu follow the instructions in the picture on the left.

BACKLIGHT: Display luminous intensity. From 1 to 15

ROTATION: (0 or 180 degrees) ativates/deactivates the the flip screen.

ATTENTION: the screen's brightness affects considerably the device's battery run time.

COLOR CODE: The RATIO iX3M 2 allows you to change the color of the screen data .

DATA: Dive data color.

LABEL: Dive parameters labels' color.

TITLE: the Menu headlines color.

ITEM: the different menu's parameters color.

SEL: the color of the selected menu entry.

Helpful tip:
If you have any doubts on your device's setting, you can set the company's parameters from the menu DEFAULT
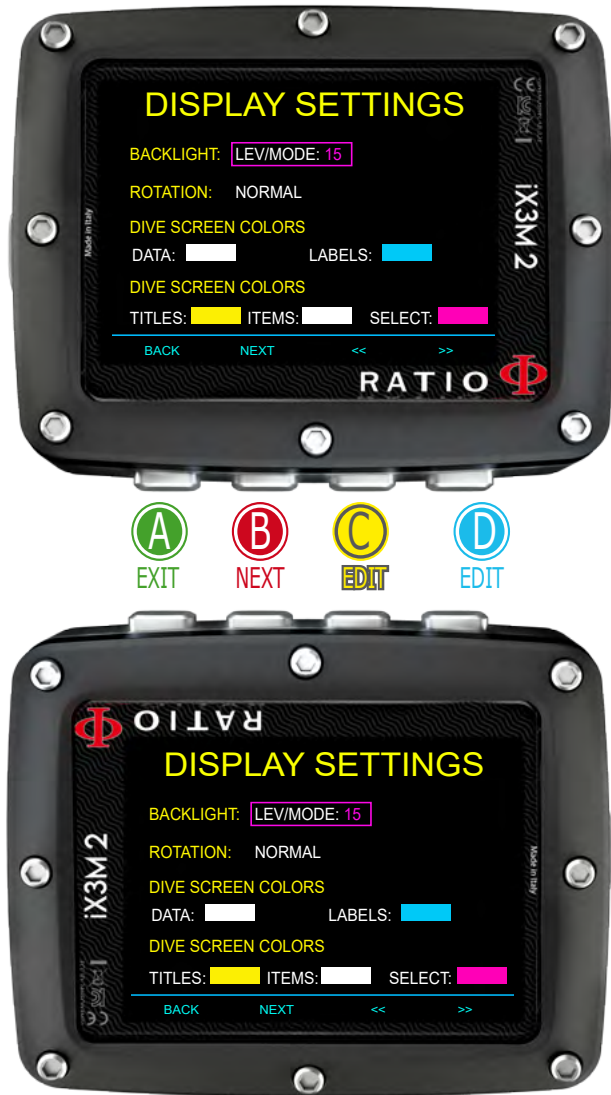
General Set (time, date, sea pressure)

To navigate the menu follow the instructions in the picture on the left.

UTC: Main time zone (0:00 Greenwich)

UTC2: Secondary time zone

Attention: in the Logbook only the UTC is registered, not the UTC2

TIME: It changes the time hh:mm:ss (seconds can be only reset)

FORMAT: It sets the time format (24hr o 12hr)

DATE: It sets the date

UNITS: it sets the metric or imperial unit of measure .
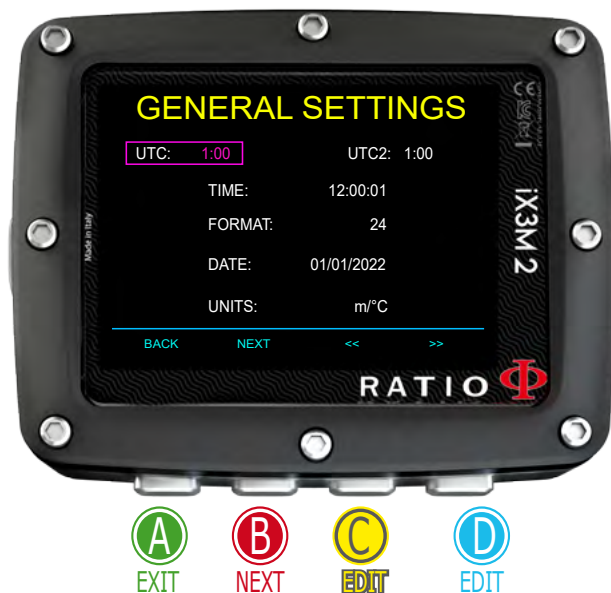
PC Mode (connect to a PC/Mac/Linux)

To connect the iX3M 2 to the PC/Mac/Linux install the Ratio ToolBox available for free in the web site www.ratio-computers.com, support section.

Tutorials are available on the website.
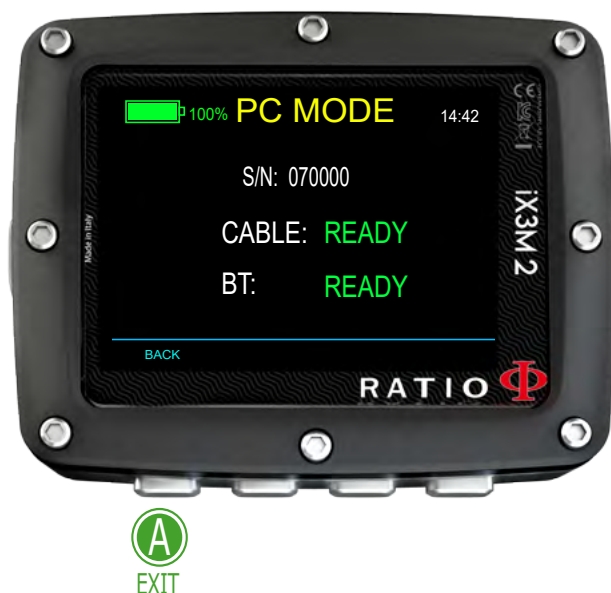
Reset to Default (reset the factory data)

To navigate the menu follow the instructions in the picture on the left.

SETTINGS: Yes/No. It resets all menu entries to the factory settings. The command SETTING resets all menu and settings (MIX, Alarms, Colors etc.) It doesn't reset the diver's tissues saturation.

TISSUES: Yes/No. It resets the diver's tissues saturation. .

Attention: NEVER EVER reset the tissue saturation if the device is always used by the same person! This doesn't allow the computer to carry out a correct decompressive calculation. !

EXECUTE: It carries out the reset of the entries set as YES.
(Select the command EXECUTE and press D to process)
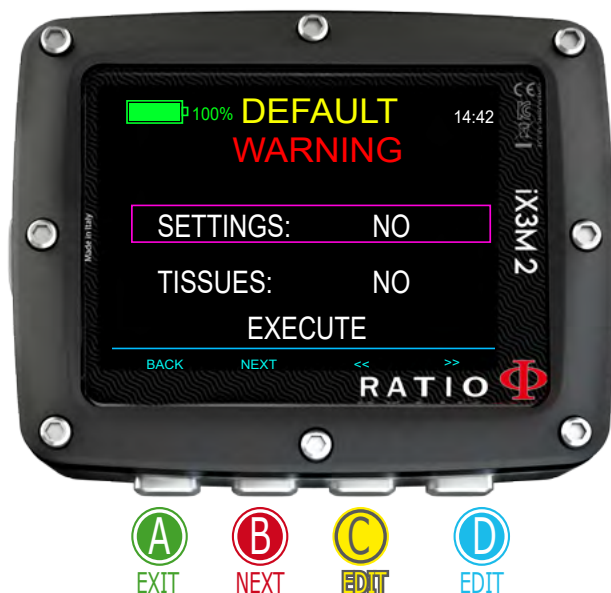
WARNING - DANGER

DO NOT reset the tissue saturation (TISSUES=YES)
if the device will be always used by the same person!!!
This may cause the risk of injuries, even lethal.

It is possible to reset the tissue saturation only if the iX3M 2l device will be used by a person who does not have carried out dives during the previous 48 hours .

ATTENTION!

A possible tissue saturation reset is recorded permanently in the RATIO iX3M 2 Logbook (see "Logbook" on this manual).
The user will be fully responsible of the tissue saturation reset.

iX3M 2 after a Tissue Reset

After performing a tissue saturation reset the alarm "TISSUE RESET" is shown on the iX3M 2's main screen.

It warns the user that a Tissue Reset has been performed on the device.
The device have to be used only by a person who has not carried out dives during the previous 48 hours.

You can ignore the message if you have NOT carried out any dive during the previous 48 hours.

The alarm will be displayed until the next dive.
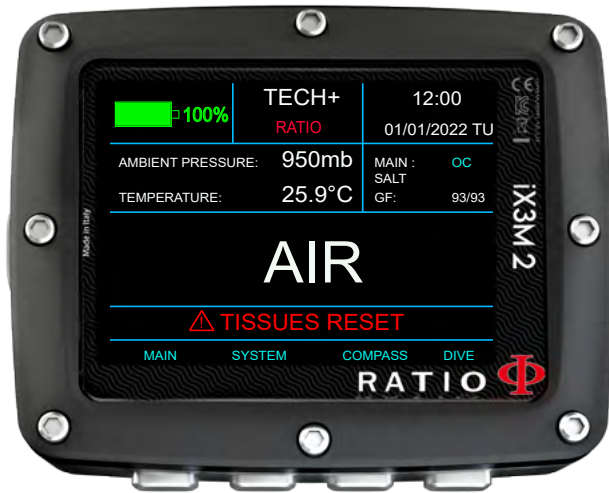
TRANSMITTERS

If your iX3M 2 is compatible with the RATIO® CC Wireless Transmitter (CC Wireless Transmitters sold separately) the TRANSMITTER menu will show up.

The iX3M 2 Tech+ can handle up to 10 transmitters,
The iX3M 2 Deep can handle up to 3 transmitters,
The iX3M 2 Pro can handle up to 3 transmitters,

The RATIO® CC Transmitter dedicated manual (how to pair, how to use, etc.) is available on:

http://www.ratio-computers.com/support/
(manuals section)
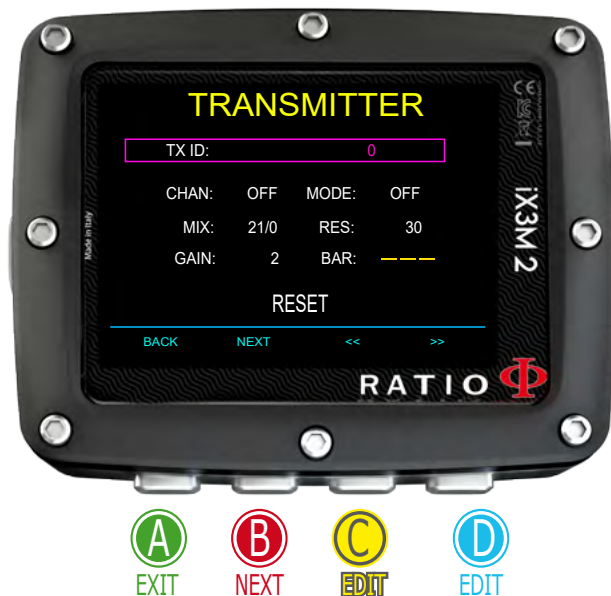
Compass settings (COMPASS)

To navigate the menu follow the instructions in the picture on the left

COMPASS SETTINGS

DECLINATION: 0.0

DIRECTION: EAST

CALIBRATE: START

BACK NEXT << >>

iX3M 2

RATIO Φ

Made in Italy

(A) EXIT

(B) NEXT

(C) EDIT

(D) EDIT

DECLINATION: The declination is meant to compensate the difference between the geographic and the magnetic north; this factor can be found visiting dedicated web sites.

DIRECTION: EAST/WEST. The direction is meant to indicate the direction of the magnetic field's declination.

Helpful tip:

You can deepen your knowledge about the compass' Direction and Declination on:
https://en.wikipedia.org/wiki/Magnetic_declination

CALIBRATE: Calibrate the compass. (see pictures below)

ROTATE

COMPASS SETTINGS

DECLINATION: 0.0

DIRECTION: EAST

CALIBRATE: ROTATE

BACK NEXT << >>

iX3M 2
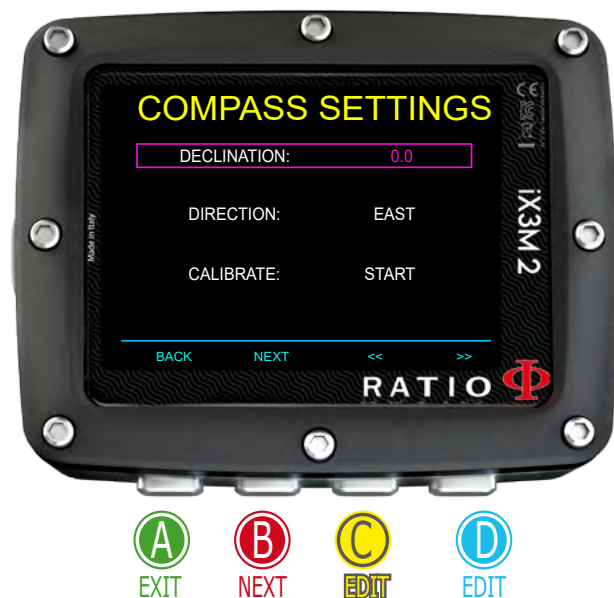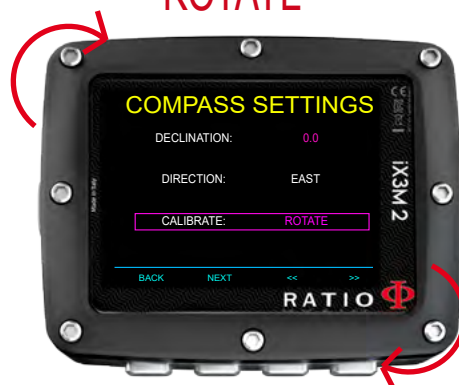
RATIO Φ

Slowly and constantly turn the unit on a flat surface.

TILT

COMPASS SETTINGS

DECLINATION: 0.0

DIRECTION: EAST

CALIBRATE: TILT

BACK NEXT << >>

iX3M 2
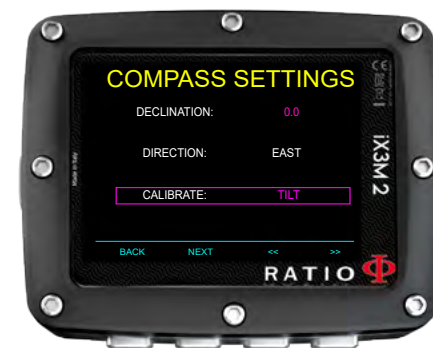
RATIO Φ

Slowly and constantly turn the uniton its vertical axis.

For a correct survey, carry out the calibration far from magnetic field sources i (PC, TV, light poles etc.)

Model, serial number and operative system

To navigate the menu follow the instructions in the picture on the left.

In this page you can visualize: Model name, serial number (S/N) and the installed operative system version (OS).

In case you need assistance for your RATIO iX3M 2 these data are important.

SWITCH OFF (Manual switching off)

The RATIO iX3M 2 switches off automatically after a certain inactivity period.. However, you can also switch the device off manually.

If the device is in charge, the command will be executed only once the charge is finished.

If the device is still carrying out the tissue desaturation after a dive, the command "switch off" deactivates all systems which are not essential.
Nevertheless, the device goes on to carry out the desaturation calculation.

Compass

To navigate the menu follow the instructions in the picture on the left

Compass resolution: 1°

Compass accuracy: +/-1°

Press **D** Button to set the current Route

Press and hold **B** to increase the reactivity of the compass

When in "Compass" mode the iX3M 2 shows:

DIRECTION (on the top centre): the current direction expressed in degrees (°)

GRAPHIC COMPASS (on the centre): graphic compass with route indications.

Direction in route (+/- 5° in comparison with the one set with **D**)

It indicates the direction to follow to find the route you have set

Reciprocal direction (+/- 5° in comparison with the set reciprocal route)

DIR: Current set route

REC: Reciprocal of the set route

Helpful tip:
The RATIO iX3M 2's 3D compass is compensated by 2 accelerometers. The iX3M 2 can compensate your arm's grade automatically up to an angle of 85° from the horizontal position.

ATTENTION:
The Compass works correctly only if its calibration has been done correctly.
See paragraph: COMPASS

iX3M 2 during the dive

To navigate the menu follow the instructions in the picture.

iX3M 2 automatically starts the dive at 1,5mt/5ft depth. If the iX3M 2 is turned OFF when juming in the water it will take up to 1 muinute after the 1,5mt/5ft threshold depth to turn ON and start the dive.
It is suggested to turn ON the iX3M 2 before juming in the water.

ADDITIONAL DATA

DEPTH	RUNTIME	NDL
21.2m	5 :00	12

OC MIX	PPO2	MAX
50%	0.86	45.2m

DEPTH	RUNTIME	NDL
31.2m	5 :00	12

MIX TABLE
TRASMITTER
PREFERENCE

BACK   ENTER   UP   DOWN

Ⓐ Ⓑ Ⓒ Ⓓ

SETTINGS

DEPTH	RUNTIME	TTS
56.2m	45 :00	12

MIX: 21/0   ACT
GLF / GLH: 20/70
MODE: OC

BACK   ENTER   <<   >>

COMPASS

DEPTH	RUNTIME	NDL
31.2m	5 :00	12

NE··N··NE

DIR		REC
0°	0°	180°

Dive Screen
Main Data

29.6m Green/White Ascent speed <8 mt/min

29.6m Yellow (Attention) Ascent speed >9 mt/min

29.6m Red (Warning) Ascent speed >10 mt/min

DEPTH	RUNTIME	NDL
21.2 m	5 :00	12

OC MIX	PPO2	MAX
50%	0.86	45.2 m
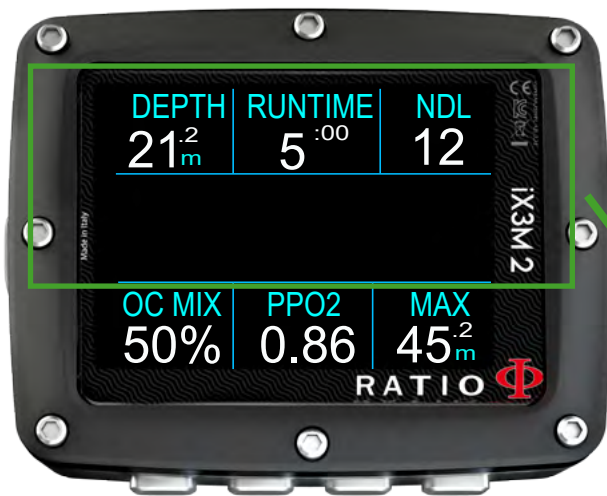
Within NDL:

<u>DEPTH:</u> Current depth with color alarm code when passing the gas MOD, mandatory stop and depth alarm.

<u>RUNTIME:</u> Runtime in minutes:seconds

<u>NDL:</u> (No Decomprression Limit) Time in minutes in which it is possible to remain at the current depth without passing the safety parameters, without needing mandatory decompressive stops. In general, we always recommend to remain within the safety parameters.

DEPTH	RUNTIME	TTS
56.2 m	45:00	12

⬆⬆ 9m   4:

GF	OTU	CNS
93/93	98	47
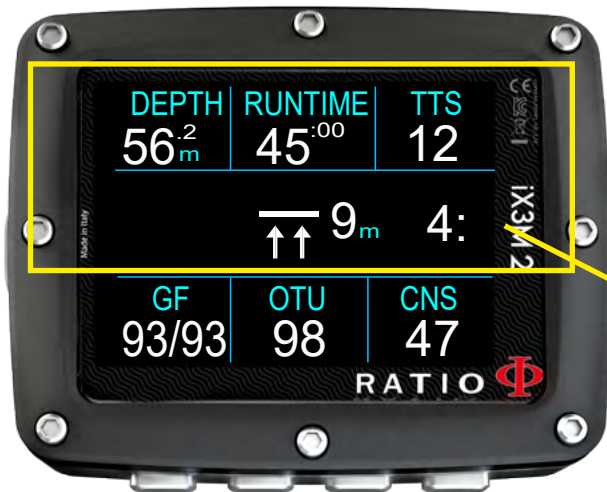
If DECO Stops are required:

TTS: (Top Left) Time-to-surface. Total ascent time.
STOP: (Center) Next mandatory stop depth.
TIME: (Right) Minutes relating to the next safety stop.

DECO POSITION: (center left) Graphical indication of the deco stop:

⬆⬆ Reduce your depth to reach the next DECO Stop depth

⬇⬇⬆⬆ Right DECO Stop depth (the ":" sign of the STOP is blinking)

⬇⬇ Increase your depth to back to the correct DECO stop depth
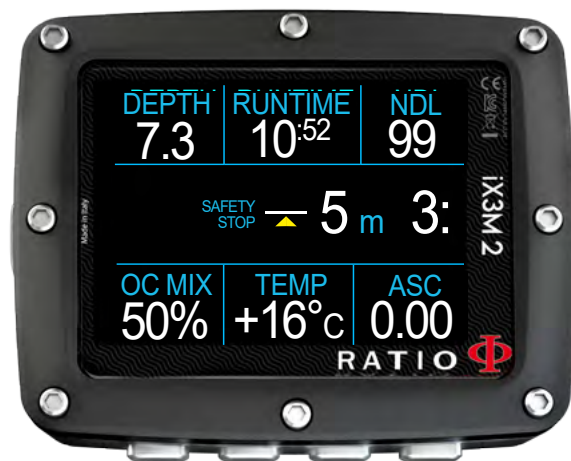
If Safety Stop is activated:

     If the Safety Stop (recommended for any kind of dive) is activated, it will be shown on the computer's cSELECTl line during the ascent starting from a depth of 9m (30ft).

Helpful tip:
You can customize the Safety Stop's duration and depth from the menu DIVE SET
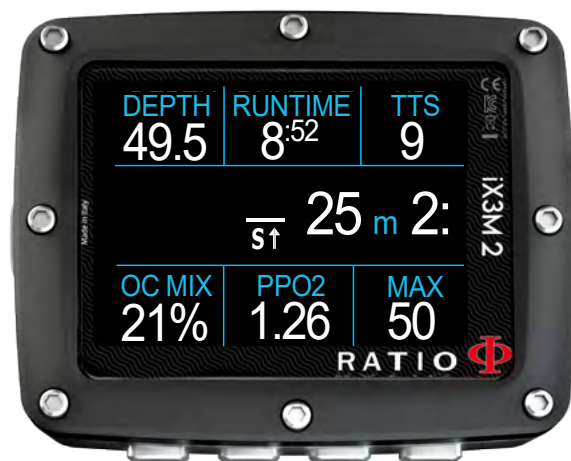
If Deep Stop is activted:

If the function Deep Stop is activated, iX3M 2 shows the Deep Stop in the cSELECTl line of the display and will remove it (even if not carried out) 5m (16ft) after the required depth.

S↑   Standard Deep Stop (See DIVE SETS 2 on this manual)

P↑   Pyle Deep Stop (See DIVE SETS 2 on this manual)

In case the Deep Stop is carried out in NDL dives, the NDL time will remain visible on the screen's right part with black background.

If the Deep Stop is carried out in dives with mandatory decompression stops (not recommended), the Deep Stop information are shown at the place of STOP and TIME data.

The Deep Stop is not mandatory and in case it is omitted even after having set it, it does not affect on the iX3M 2 decompressive calculation.
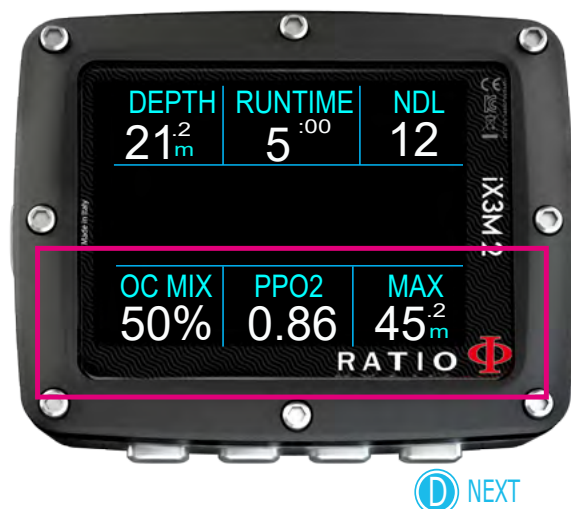
OC MIX: Indicates the current dive mode (OC= Open Circuit or CCR = Closed Circuit) and the Mix currently used (it blinks in red if a better mix is available for the current depth).

PPO2: O2 partial pressure of the active mix.

MAX: Maximum reached depth

GASES: (On surface only) The number of mixes that are set as active (ON)and will be used in the next dive (as "GASES" is intended to be used to check how many mixes are active before the dive, "GASES" is hid during the dive)

Press **D** button to display:

TEMP: Current water temperature

ASC: Ascent or descent speed expressed in mt/min (or ft/min)

> **Low alarm level**: if the ascent speed is >8 mt/min (25ft/min)
> **Medium alarm level**: if the ascent speed is >9 mt/min (30ft/min)
> **High alarm level**:if the ascent speed is >10 mt/min (33ft/min)

AVG: Average dive's depth

TIME: A resettable stopwatch (MINUTES + SECONDS) that you can operate using **C** button (press **C** one time to start the stopwatch, press **C** again to reset the stopwach, the stopwatch will automatically stop at the end of the dive)

GF (R0)(PS): Set conservatism (Gradients, Critical Bubble Radius or livels)
OTU: accumulated OTU
CNS: accumulated CNS
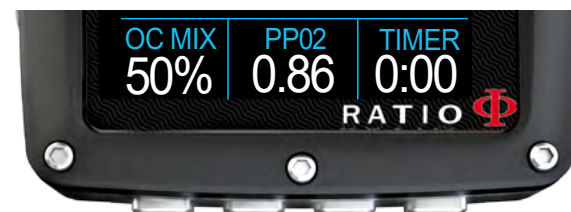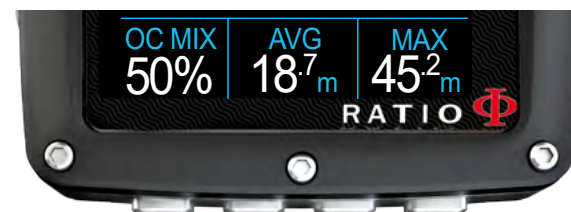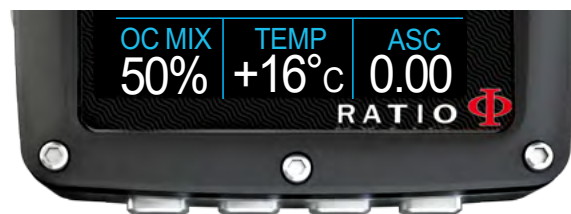
Current dive's profile:

DEPTH: (left) Current depth with color alarm code when passing the gas MOD, mandatory stop and depth alarm.

RUNTIME: (Center) Runtime in minutes:seconds

NDL or TTS (Right)

Diagram: Current dive profile in HD

Tissues saturation when diving:

The diagram represents the 16 tissues which are taken into consideration by the two decompressive algorithms (BUL or VPM).

The yellow lines represent the nitrogen levels .
The green lines represent the helium levels (if present)
The blue line represents the environment pressure in the surface at the dive's beginning.
The different tissues' saturation, represented by the yellow/green lines, represents the inertial partial pressure in comparison to the environment pressure on the surface .

In case of deco, the "pilot" tissue of that precise moment is highlighted by a red rectangle .
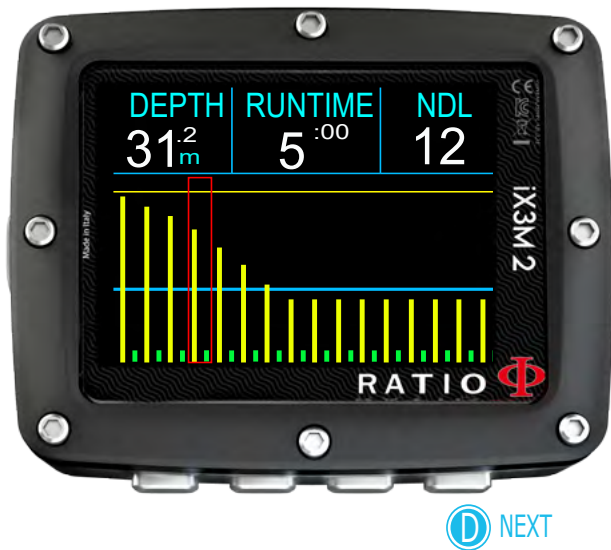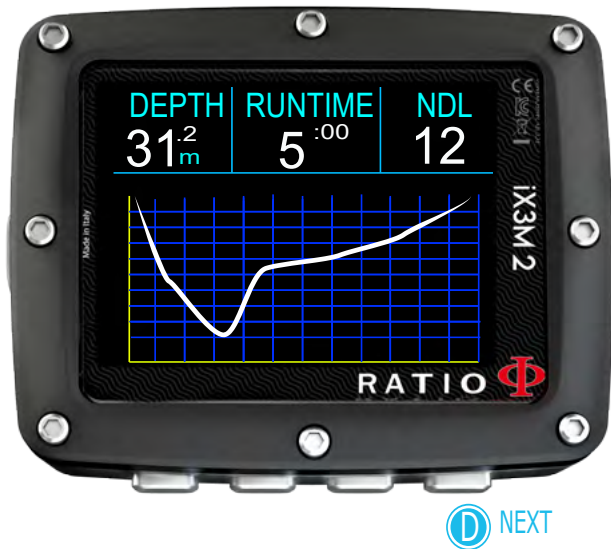
Deco Table:

This menu is available only if during diving you have accumulated decompression.

In this menu it is possible to visualize all decompression stops and the Mix that can be used among the ones expected for the current dive status.

The Decompressive Stops are updated in Real Time.

For every mandatory Decompressive Stop the iX3M 2 shows:
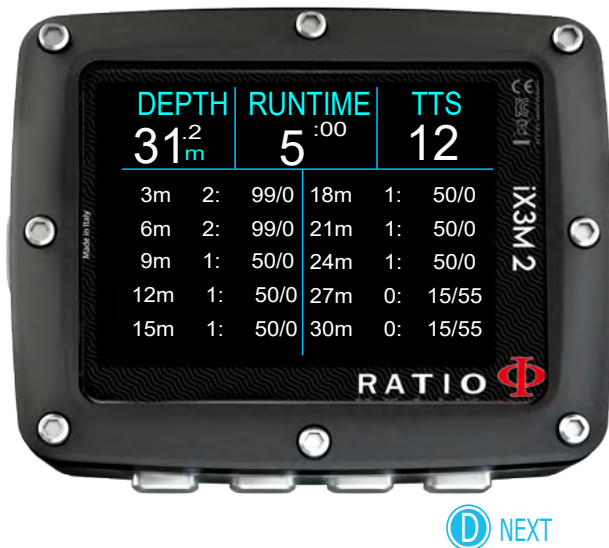
Stop Depth	Stop Time	Expected Mix
3m	2:	99/0
6m	2:	99/0
9m	1:	50/0
12m	1:	50/0

The possible Safety Stop and Deep Stop, since they are not mandatory, are not shown in the Decompressive Chart, even if they will be suggested to the diver during the dive.

Compass when diving

To navigate this menu follow the instructions shown in the picture on the left.

Compass resolution: 1°
Compass accuracy: +/-1°

Press **D** Button to set the current Route
Press and hold **B** to increase the reactivity of the compass

When in Compass mode, the iX3M 2 shows:

Current depth (on top left): Expressed in meters (or feet if ft)
RunTime (on top right): Expressed in Minutes : Seconds
Direction (on bottom centre): Current direction expressed in degrees (°)
Graphic Compass (on centre): Graphic compass with route indication.

⬆ Direction in route (+/- 5° from the one set with **D**)

◀ Direction to follow to find the route initially set (right or left)

⬇ Direction in reciprocal (+/- 5° from the reciprocal of the set route)

DIR: Route currently set
REC: Reciprocal of the route that has been set.

Helpful tip:
The iX3M 2 electronic 3D compass is compensated with 2 accelerometers. The iX3M 2 can compensate automatically your arm's inclination until an angle of 85° from the horizontal position.
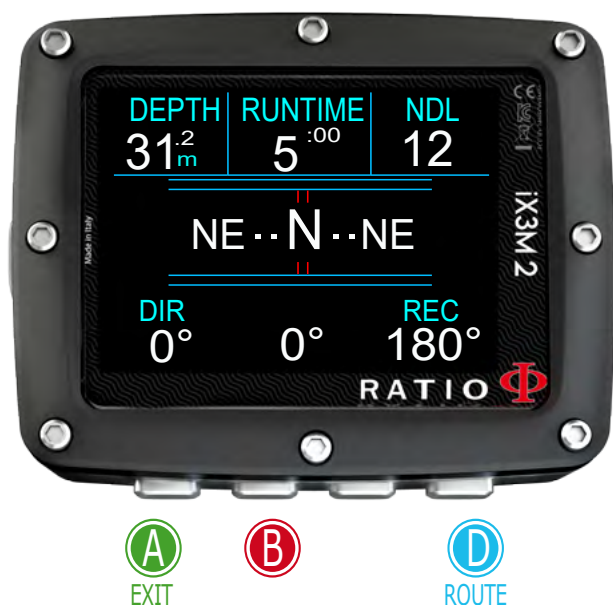
ATTENTION:
The compass must be calibrated correctly in order to function properly.
See chapter: COMPASS

Mix Change during the dive

If besides the bottom mix in the mix chart, decompressive mixes are set as well, the computer will warn the user when it's the right moment to change the mix, making the MIX area (on bottom left of the main screen) flash in yellow.
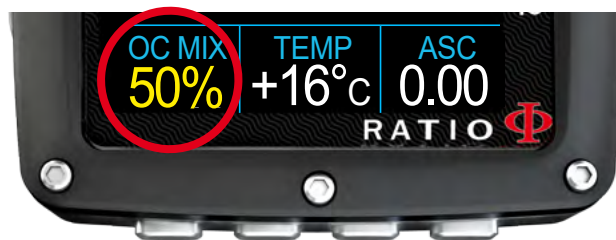
Press **B** (when MIX is flashing) to open MIX CHANGE menu

- To CONFIRM the suggested MIX press YES **B**

- To <u>REFUSE</u> the MIX change press NO **C**
(Warning, if you REFUSE the mix change the suggested mix will be DISABLED.iX3M 2 assumes that you will not be able to use the suggested mix during the dive.) You can reactivate the mix in the MIX TABLE (see following pages)

- To <u>IGNORE</u> the mix change press BACK **A**
In this case iX3M 2 assumes that you are able to use the suggested mix, but you want to postpone the mix change.

- To open the MIX TABLE press "MIX" **D**
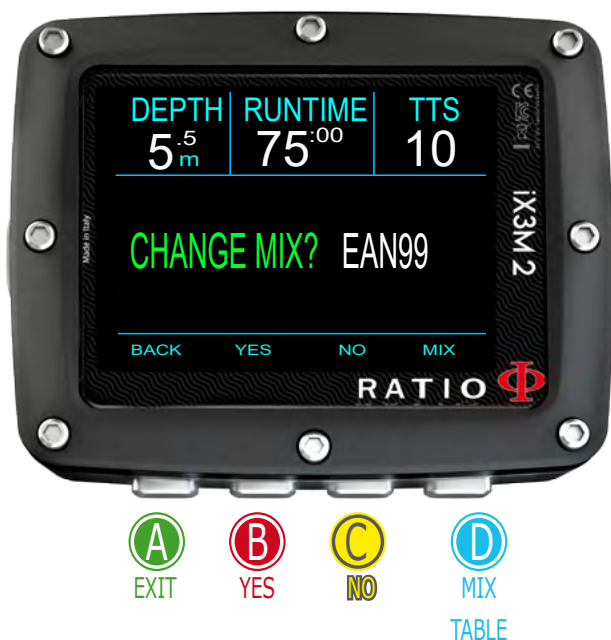
Alarms management during the dive

DEPTH
24.1

RUNTIME
4:17

NDL
21

⚠️
MOD EXCEEDED
CONFIRM?

OC MIX
50%

PPO2
1.70

MAX
28

iX3M 2
RATIO Φ

Ⓐ
CONFIRM
(PRESS AND HOLD 3 SEC.)

DEPTH
24.1

RUNTIME
4:17

NDL
21

⚠️
PPO2 HIGH
CONFIRM?

OC MIX
50%

PPO2
1.70

MAX
28

iX3M 2
RATIO Φ

Ⓐ
CONFIRM
(PRESS AND HOLD 3 SEC.)

When an alarm is triggered during the dive (acustic or vibration alarm) iX3M 2 shows the alarm description in yellow in the middle part of the display (see picture).

Press and hold for at least 3 seconds Ⓐ button to mute the alarm.

In case of multiple violations and multiple alarms (e.g. in the picture both MOD and PpO2 are triggering an alarm) you have to mute each alarm individually.
(Press and hold A to mute the first alarm, than press and hold A to mute the second alarm)
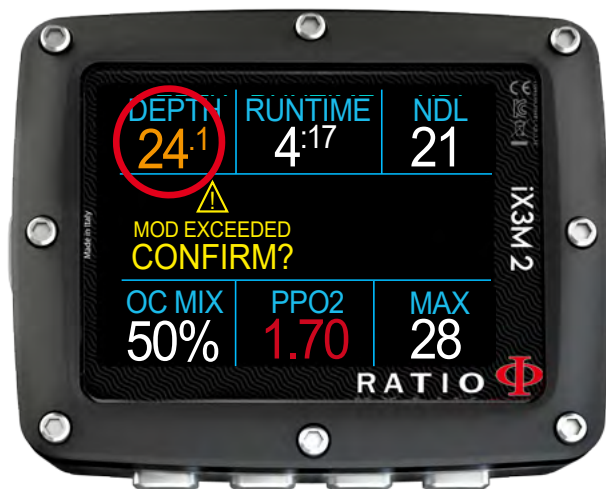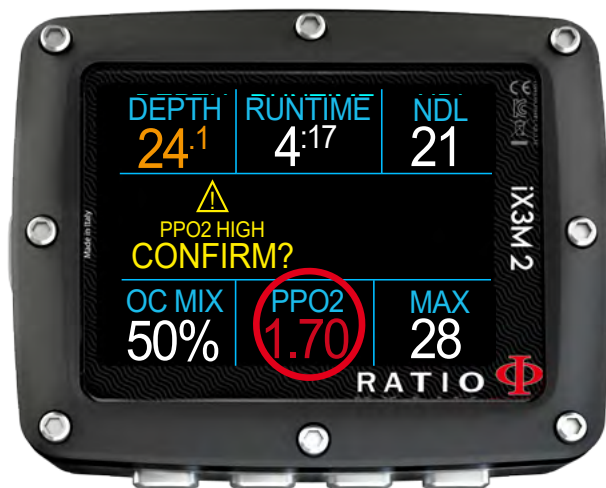
Settings change during the dive

General Settings

Press A button during the dive to open the General Setting menu. To navigate follow the instruction on the picture.

MIX TABLE: Edit the MIX TABLE. (see MIX TABLE on this manual)

TRANSMITTER: Edit the Wireless Transmitter settings. (see TRANSMITTER on this manual)

PREFERENCE: Open the Settings sub-menu

> **DISPLAY**: edit the display settings (see DISPLAY on this manual)
> **DIVE ALARMS**: edit the Alarms settings (see ALARMS SET on this manual)
> **DIVE SETS 2**: edit the Safety Stop, Deep Stop end Last Stop settings (See DIVE SETS 2 on this manual)

(For iX3M 2 Tech+ only, if CCR MODE)

DILUENT TABLE: edit the diluent table. (see DILUENT TABLE on this manual)

CCR SET: edit the CCR setting (Set Points). (see CCR SET on this manual)
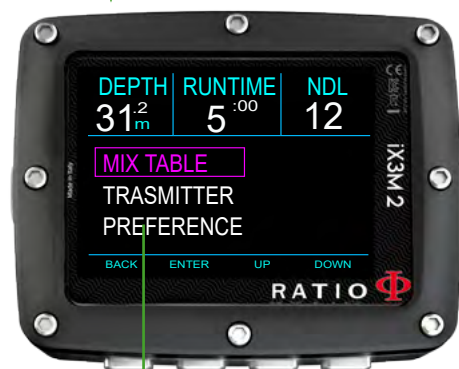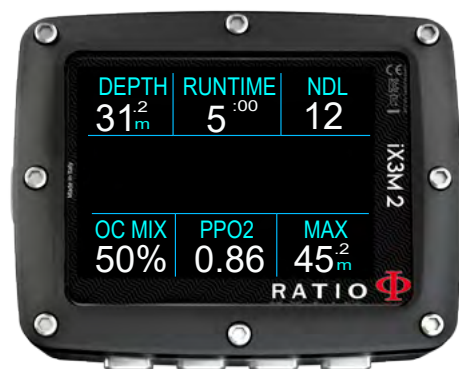
Quick Settings

To navigate follow the instruction on the picture..

MIX: Use C and D buttons to scroll the available mixes. Set the MIX as ACT, YES or NO. Mixes are shown as %O2 / %He.

> **ACT**: Mix that you are currently using
> **YES**: Mix enabled, you are able to use the mix if needed
> **NO**: Mix disabled

(if iX3M2 Tech+)   GFL/GFH (R0 if VPM):

> Change the Gradient Factor Low and High if BUL algorithm is set, or change Critical Bubble radius if VPM algorithm is set.

(if iX3M2 Pro or iX3M2 Deep) PS: Change the conservatism level.

> (see DIVE SET 1 on this manual)

> **MODE:** OC/CCR (for iX3M2 Tech+ only) Switch between Open Circuit mode (OC) and Closed Circuit Mode (CCR) and viceversa.

Press **A** to save and exit.

Attention: in the following pages we will explain how to modify the MIX and the algorithm settings during the dive.
However remember always that:
To modify the Gradients and the Critical Bubble Radius a suitable training is necessary!

To use more than one Mix when diving a suitable training is necessary!

DO NOT modify these parameters if you have not received such training!
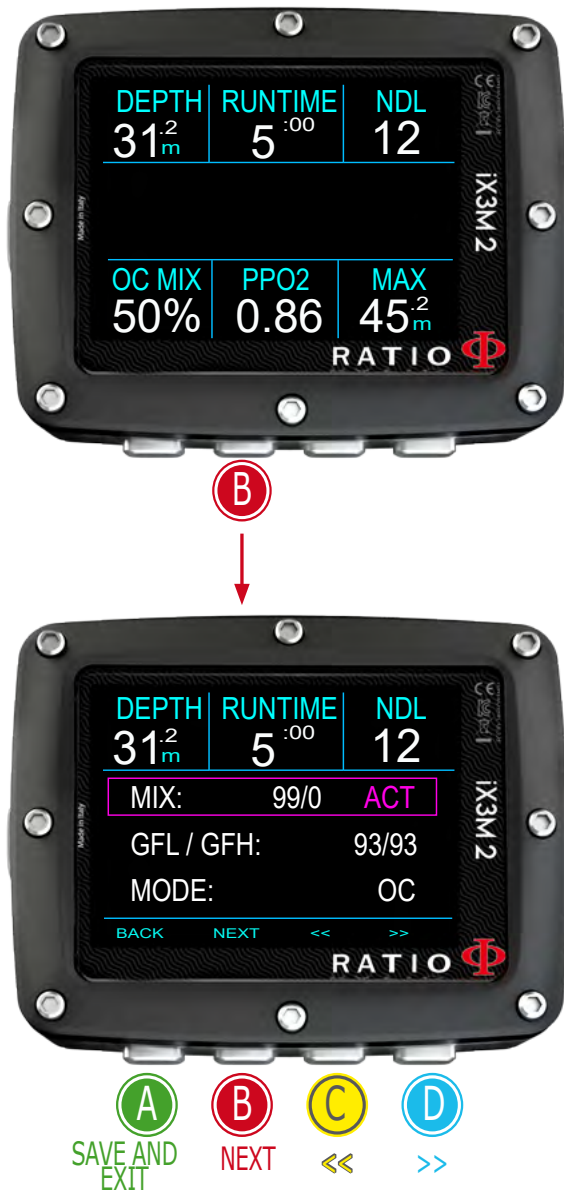
Force a MIX CHANGE during the dive

To navigate this menu follow the instructions shown in the picture.

Press **B** to open the menu

Press **D** and scroll the set mixes and select the MIX you want to force as active

Press **B** to select the status of the MIX (ACT, YES, NO)

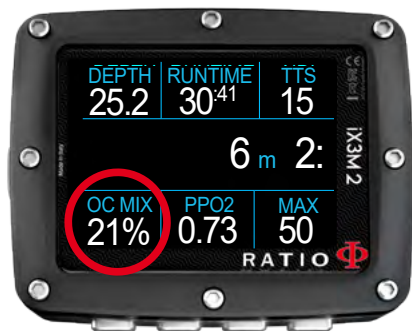Press **D** to set the MIX as ACT (Active) (in the picture 50/0)

Press **A** to exit

> Set the MIX as **ACT** to FORCE iX3M 2 to use that mix.
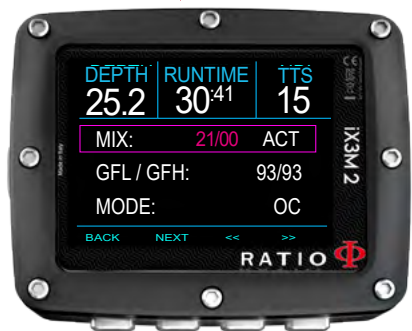> in the example to pass from 21/0 a 50/0)
>
> Set the MIX as **YES** to activate the MIX
> (which will be suggested in the most suitable moment to make the change)
>
> Set the MIX as **NO** to deactivated the MIX
> (for example in the case a stage tank doesn't work)

ATTENTION: it is possible to force the mix change exceeding the MOD of the MIX. To force a MIX an adequate theorethical base is needed! Do NOT force the mix if not necessary. In the example a forced mix chnage from 21/0 to 50/0 (exceeding the MOD)
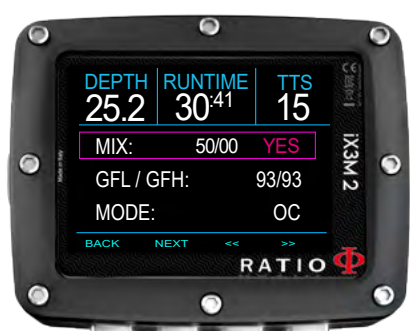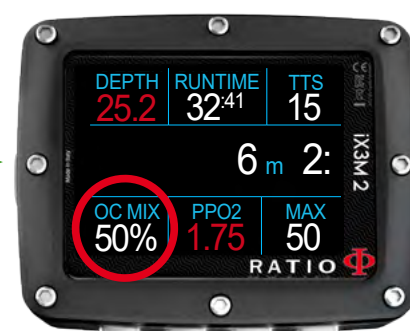

B

D
>>

B
NEXT

D
>>

A
SAVE AND EXT1

Change Conservatism during the dive

To navigate this menu follow the instructions shown in the picture on the left.

In the example it is shown the value GFL/GFH; if you have chosen the VPM algorithm the R0 will be visualized (for the iX3M 2 Deep you'll visualize the conservatism levels). The procedure to modify the parameters is the same:

Press button **B** to select the GFL

Press button **C** (+) or **D** (–) to set the desired GFL

(Remember that the GFL must never ever be higher than GFH)

Press button **B** to select the GFH and press button **C** (+) or **D** (–) to set the desired GFH.

Press button **A** at any time to save the selection and go back to the dive.

Helpful tip:

Reduce the algorithm conservatism is particularly useful to handle possible emergencies during the dive. If, for any reason, you have not enough gas for the ascent, it is possible to decrease the algorithm conservatism to reduce TSS as much as possible.

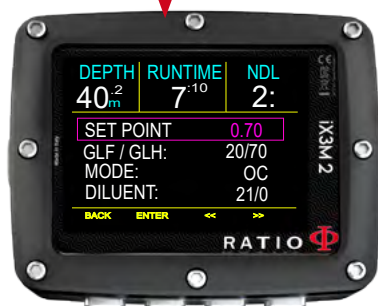(Note the decreasing of TSS inthe first and in the last screen on the example)

In the example a Gradient change from 20/70 to 93/93
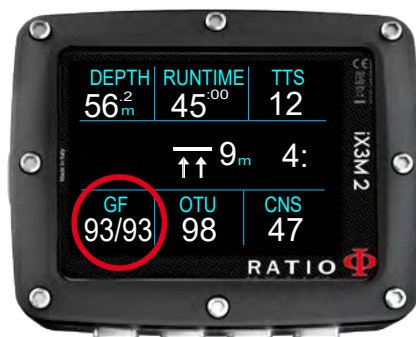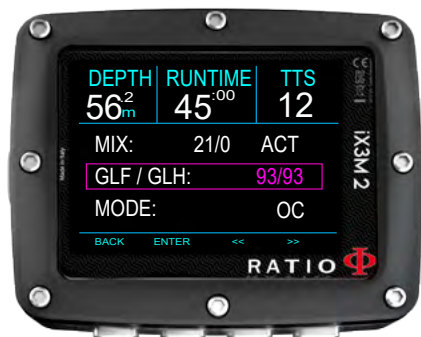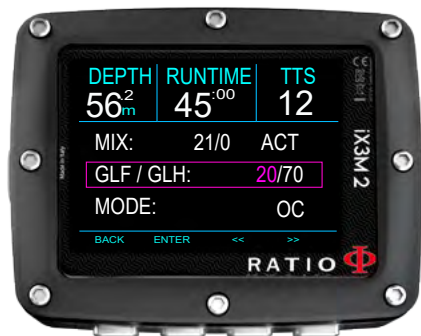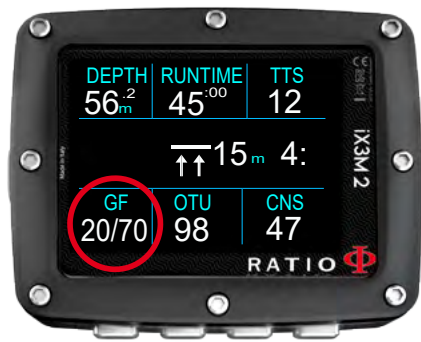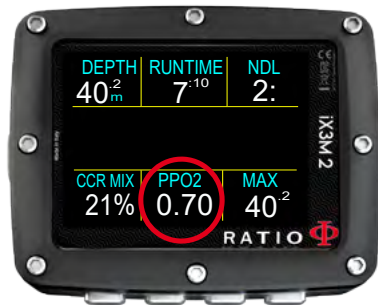
Change the set point during a dive

iX3M 2 Tech+ allows to manually change the SET POINT during the dive:

ATTENTION: Refer to "CCR Settings" on this manual to know how to Set the SETPOINTS on your iX3M 2 Tech+

During the dive you can switch between SETPOINT LOW, MID and HIGH.

In order to switch the SETPOINT during a CCR dive:
Press button Ⓑ to access the Menu
Press Ⓒ or Ⓓ to set the desired SETPOINT (LOW, MID or HIGH)
(the value of the SETPOINT will be shown)
Press button Ⓐ at any time to save the selection and go back to the dive.

If the SETPOINT MODE was set to AUTO, it will be switched to MAN (manual) once you manually switch a SET POINT during the dive. (see CCR SET on this manual)

Attention: Enable the Rebreather mode (CCR) only for dives with rebreather. The CCR mode is not suitable for dives in open circuit!

Attention: Diving with Rebreather requires a specific training !
Diving with Rebreather without a suitable training or without the due caution can cause injuries or death.

Refer to your Rebreather instructor to get instructions on how to set the SET POINTS

iX3M 2 in GAUGE mode

Use the Gauge mode as described in the example on the left.

ATTENTION: To use the iX3M 2 in GAUGE mode an adequate training is necessary!

To start the dive in GAUGE mode set DIVE MODE = GAUGE in the DIVE SETS1 menu before to start the dive.

iX3M 2 uses a double selection system to prevent unintended reset of Time or Average Depth.

To **Reset the Stopwatch** (top left part of the display) press A (stopwatch is highlighted in green) then press B

To **Reset the Average Depth** (bottom right part of the display) press D (AVG is highlighted in green) then press B

Do your know what?:
The iX3M 2 calculates in background the tissue saturation and desaturation also in GAUGE mode using a fake Mix (10/60) with a high inert contents. This value is registered in the logbook. If after a dive in GAUGE you want to to carry out a dive in OC using the iX3M 2 decompressive calculations, the iX3M 2 will consider the new dive as the next repetitive of the day.

Well note:
Even if the iX3M 2 carries out the decompressive calculation in background, they are not shown on the display and they don't affect the GAUGE mode.

SELECT STOPWATCH (A)

COMPASS (C)

SELECT AVERAGE DEPTH (D)

CONFIRM RESET (B)

The iX3M 2 after a dive
No-Fly

Flying after scuba diving (OC or GAUGE), increases the risk of DCS because of the decreasing atmospheric pressure as we ascend. You might have only a few tiny bubbles, causing no problems at all, in your body when you reach the surface after a dive. If, however, you go flying, the small bubbles can expand (due to the reduction in pressure with altitude) and could cause DCS symptoms.

In order to reduce this risk the most common suggested guideline are:

- Minimum 12 hours pre-flight surface interval after single no-decompression dives.
- Minimum 18 hours pre-flight surface interval after multiple days of no-decompression dives.
- Minimum 24 hours pre-flight surface interval after decompression dives.

The above is for sports diving and should not apply to commercial diving. Because of the complex nature of DCS there can never be a fixed flying after diving rule that can guarantee prevention of bends completely.

WARNING: These indications may vary due to new studies and research.
Please check the if there are new research guidelines on this matter. Ask your instructor, your diving / medical association.

After each dive in OC or GAUGE iX3M 2 displays the NO FLY icon.
The NO FLY icon is a statistic indication. Therefore always refer to the most current guidelines about flying after a dive.

After a dive in GAUGE mode the NO FLY icon will show up for 24 hr.

Desat: (Desaturation): Time left for (supposed) completed desaturation.(hh:mm)

No Fly: (No Fly Time): No Fly time left

Surf time: Surface time from your last dive.

Connect your iX3M 2 to a PC or a Mac

The iX3M 2 can be connected to a Pc or to a Mac in order to download the dive data and to update the device.

To connect the iX3M 2 to a Windows PC, Mac, or Linux PC follow step-by-step the tutorial available here: http://www.ratio-computers.com/support

Need help? Write an email to support@ratio-computers.com

Update your iX3M 2

Is very important to keep your iX3M 2 always up-to-date.
Subscribe the "Update alerts" service for free following the instruction in the next page.

The iX3M 2 can be connected with the USB cable to a Pc or to a Mac in order to update the device.

To connect the iX3M 2 to a Windows PC, Mac, or Linux PC follow step-by-step the tutorial available here:
http://www.ratio-computers.com/support

Attention: During the update a new OS version will replace the old OS version.
　　　　After an update always:
　　　- Check that your dive settings are the one you need for your next dive (mixes, algorithm settings etc.)
　　　- Consider that you will need to calibrate the compass. (see page COMPASS of this manual)
　　　- Consider that after an update the iX3M 2 can "Reset to Default" (see "RESET TO DEFAULT" of this manual)
　　　- Consider to perform a complete recharge of your iX3M 2 (not mandatory but suggested)

Warning!

To receive all updates of this manual and notice of future updates of the iX3M 2 by e-mail, please send a message writing

"iX3M 2"

to the following address: update@ratio-computers.com
This service is highly recommended
and it is completely free of charge.

For further support, have a look at the tutorial video
available on www.ratio-computers.com

For assistance by mail write to support@ratio-computers.com