



OCEANIC®

DATA PLUS 2

owner's guide

RESPONSIBLE COMPUTER DIVING

- **Always Plan Each Dive**
- **Always Limit Your Dive to the Level of Your Training and Experience**
- **Always Make Your Deepest Dive First**
- **Always Make The Deepest Part of Every Dive First**
- **Check Your Computer Often During the Dive**
- **Do A Safety Stop on Every Dive**
- **Allow Adequate Surface Interval Between Each Dive**
- **Allow Adequate Surface Interval Between Each Day of Diving (12 Hours or Until Your Computer Clears)**

Read And Understand This Owner's Guide Thoroughly Before Using the Data Plus 2.





WARNINGS and SAFETY RECOMMENDATIONS

- **The Data Plus 2 is intended for use by recreational divers who have successfully completed a nationally recognized course in scuba diving, and diving with enriched nitrogen-oxygen (nitrox) mixtures.**
- **It is intended only for no decompression diving, NOT intentional decompression diving.**
- **It must not be used by untrained persons who may not have knowledge of the potential risks and hazards of scuba diving, and diving with enriched nitrogen-oxygen (nitrox) mixtures.**
- **You must obtain scuba certification, and certification in diving with enriched nitrogen-oxygen (nitrox) mixtures before using the Data Plus 2 if you have not already done so.**
- **It is NOT for use by military and commercial divers.**
- **It should NOT be utilized for any competitive, or repetitive square wave or decompression diving, as it is intended solely for recreational use and no decompression multilevel diving.**
- **As with all underwater life support equipment, improper use or misuse of this product can cause serious injury or death.**
- **Never participate in sharing or swapping of a dive computer.**
- **Conduct your dives in such a manner so as to insure that you continuously check the computer's proper function.**
- **Read and understand this owner's guide completely before diving with the Data Plus 2.**
- **If you do not fully understand how to use this dive computer, or if you have any questions, you should seek instruction in its use from your Authorized Oceanic Dealer before you utilize this product.**



LIMITED TWO-YEAR WARRANTY

For details, refer to the Product Warranty Registration Card provided.

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TRADEMARK NOTICE

Oceanic, the Oceanic logo, Data Plus 2, the Data Plus 2 logo, Oceanglo, Smart Glo, Graphic Diver Interface, Tissue Loading Bar Graph, Pre Dive Planning Sequence, Variable Ascent Rate Indicator, Set Point, Control Console, and OceanLog are all registered and unregistered trademarks of Oceanic. All rights are reserved.

PATENT NOTICE

U.S. Patents have been issued, or applied for, to protect the following design features:

Graphic Diver Interface, Pre Dive Planning Sequence, Dive Time Remaining, Depth Alarm Set Point, Smart Glo, Mode Menu Structure, Data Sensing and Processing Device (U.S. Patent no. 4,882,678), Tissue Loading Bar Graph (U.S. Patent no. 4,882,687), and Variable Ascent Rate Indicator Bar Graph (U.S. Patent no. 5,156,055).

DECOMPRESSION MODEL

The programs within the Data Plus 2 simulate the absorption of nitrogen into the body by using a mathematical model. This model is merely a way to apply a limited set of data to a large range of experiences. The Data Plus 2 dive computer model is based upon the latest research and experiments in decompression theory. **Still, using the Data Plus 2, just as using the U.S. Navy (or other) No Decompression Tables, is no guarantee of avoiding decompression sickness, i.e. "the bends."** Every diver's physiology is different, and can even vary from day to day. No machine can predict how your body will react to a particular dive profile.

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FEATURES and DISPLAYS



refer to page 12 for - WARNINGS and SAFETY RECOMMENDATIONS

INTRODUCTION

Welcome to Oceanic and thank you for choosing the Data Plus 2 !

The Data Plus 2 has a wide array of features described in detail throughout the pages that follow. Due to the importance that they be understood thoroughly prior to using the Data Plus 2, information will be expanded upon and some refreshed as you proceed. Relax and read through the complete guide.

It is extremely important that you read this owner's guide in sequence and understand it completely before attempting to use the Data Plus 2.

Remember that technology is no substitute for common sense, and a dive computer only provides the person using it with data, not the knowledge to use it.

INTERACTIVE CONTROL CONSOLE

The Interactive Control Console consisting of the **Advance** (Left) button and **Select** (Right) button (Fig. 1) allows you to select various display options and access specific information when you choose to see it. The buttons can be pressed repeatedly, or held in to scroll.



Advance

Select

Fig. 1 - Interactive Control Console

INFORMATIONAL DISPLAYS

Operational modes and status information are visually represented numerically and/or graphically and can be understood at a glance with the aide of universal icons (Fig. 2) that identify and bring quick focus to the displays. Segmented bar graphs will show how close you are to critical limits.

Each Data Plus 2 numeric and graphic display represents a unique piece of information. It is imperative that you understand the formats, ranges, and values of the information represented to avoid any possible misunderstanding that could result in error.



NOTE: Throughout this owner's guide reference is made to the term "breathing gas". The rationale being that the Data Plus 2 can be used for 'air' dives or 'nitrox' dives. For clarity these terms are defined as -

Breathing Gas - the gaseous mixture breathed during a dive.

Air - a breathing gas that contains approximately 21% oxygen and 79% nitrogen (nature's common nitrogen-oxygen mixture).

Nitrox - a nitrogen-oxygen breathing gas that contains a higher fraction of oxygen (22 to 50%) than air.

- Operating Mode
- Elapsed Dive Time
- Low Battery
- Temperature
- Deco Stop
- Log
- Maximum Depth

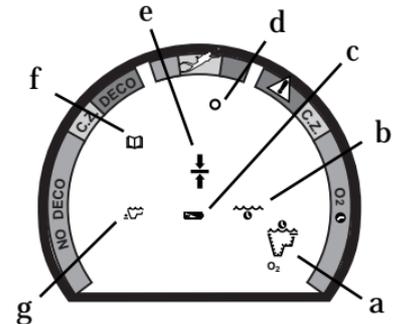


Fig. 2 - Universal Icons

UNIVERSAL GRAPHIC DIVER INTERFACE™



Fig. 3 - Bar Graphs

Three bar graphs referred to as the Universal Graphic Diver Interface™ appear around the perimeter of the screen (Fig. 3). These segmented bar graphs are located next to green, yellow, and red color coded portions of the peripheral decal that denote normal, caution, and danger zones, respectively.

When underwater, you can quickly focus on the bar graphs to make sure that they are **in the green**. You can quickly verify that you're not getting too close to the no decompression limit or the limit for exposure to oxygen (accumulation), or ascending too fast.

Tissue Loading Bar Graph™

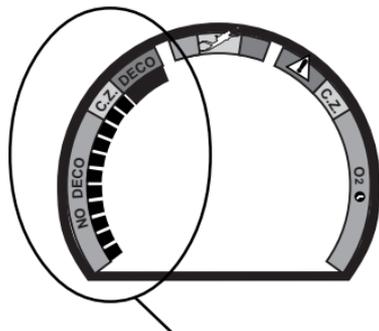


Fig. 4 - Tissue Loading Bar Graph

The Tissue Loading Bar Graph™ (TLBG) represents nitrogen loading (Fig. 4), showing your relative no decompression or decompression status. As your depth and elapsed dive time increase, segments will add to the graph beginning in the lower left portion of the screen. As you ascend to shallower depths, this bar graph will begin to recede, indicating that additional no decompression time is allowed for multilevel diving.

The Tissue Loading Bar Graph monitors 12 different nitrogen compartments simultaneously and displays the one that is in control of your dive. It is divided into a green No Decompression zone (NO DECO), a yellow Caution zone (C.Z.), and a red Decompression zone (DECO). The bar graph gives a visual

representation of just how close you are to the no decompression limit with a yellow Caution (C.Z.) Zone.

This Caution Zone portion of the bar graph allows you to make a decision regarding safety stop duration or necessity. While you cannot provide a guarantee against the occurrence of decompression sickness, you may choose your own personal zone of caution based upon age, physique, excessive weight, etc., to reduce the statistical risk.

The Tissue Loading Bar Graph also assists you with managing decompression (explained later) by filling a large red 'ceiling stop required' segment.

The Tissue Loading Bar Graph™ has been granted U.S. Patent No. 4,882,687.

Oxygen Accumulation (O₂) Bar Graph



NOTE: Displays associated with oxygen and the O₂ bar graph will only appear if FO₂ has been set at a value other than 'Air'.

The Oxygen Accumulation (O₂) Bar Graph (Fig. 5) represents oxygen loading, your relative oxygen tolerance dosage (OTU), showing the maximum of either per dive accumulated oxygen, or 24 hour period accumulated oxygen. As your exposure (accumulation of oxygen) increases during the dive, segments will add to the bar graph starting in the lower right portion of the screen. As oxy-

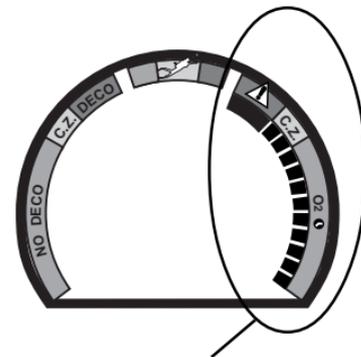


Fig. 5 - Oxygen Accumulation (O₂) Bar Graph

Segments = Speed (rate)

0 = 0 - 20 fpm (0 - 6 mpm)

1 = 21 - 30 fpm (6.5 - 9 mpm)

2 = 31 - 40 fpm (9.5 - 12 mpm)

3 = 41 - 50 fpm (12.5 - 15 mpm)

4 = 51 - 60 fpm (15.5 - 18 mpm)

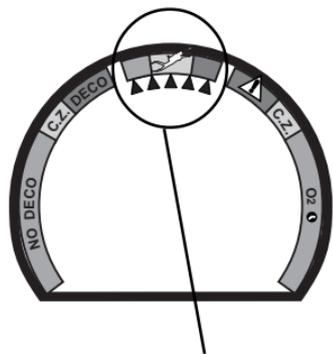
5 = 61+ fpm (18.5+ mpm)
(when 5, all will flash)

Fig. 6 - Variable Ascent Rate Indicator

gen loading decreases, the bar graph will begin to recede, indicating that additional exposure (accumulation) is allowed for that dive, and 24 hour period.

The O₂ bar graph also assists you with managing high partial pressure of oxygen (PO₂) by flashing the large red Danger zone segment as a warning when the level of PO₂ exceeds the maximum allowed limit of 1.60 ATA.

Variable Ascent Rate Indicator™

The Variable Ascent Rate Indicator™ (VARI), located along the top of the screen (Fig. 6), is provided to help you to avoid excessive ascent rates by providing a visual representation of ascent speed, rather than just showing that you are ascending too fast. The Variable Ascent Rate Indicator has been granted U.S. Patent no. 5,156,055.

The 5 triangular segments of the bar graph, located beside green, yellow, and red reference zones, appear beginning from the left and may be considered an ascent rate speedometer. Green is a 'normal' rate, yellow is a 'caution' rate, and red is 'Too Fast'.

In the event that your ascent rate exceeds the maximum recommended rate of 60 feet (18 meters) per minute, the bar graph segments will enter the red zone and all 5 segments will flash once per second until your ascent speed is slowed. If this occurs, you should immediately slow your ascent.

DIVE TIME REMAINING

One of the most important pieces of information on the Data Plus 2 is the patented Dive Time Remaining numeric display. To numerically display Dive Time Remaining, the Data Plus 2 constantly monitors two critical pieces of information; no decompression status and oxygen accumulation status. The Dive Time Remaining display will indicate the time that is more critical for you at that particular moment (i.e.; whichever time is the least amount available of the two). The time being displayed is identified by the No Decompression Dive Time icon (Fig. 7a), or the O₂ Time icon (Fig. 8a). This unique feature has been granted U.S. Patent No. 4,586,136.

No Decompression Dive Time Remaining

No Decompression Dive Time Remaining is the maximum amount of time that you can stay at your present depth before entering a decompression situation. It is calculated based on the amount of nitrogen absorbed by twelve hypothetical tissue compartments. The rates each of these compartments absorb and release nitrogen is mathematically modeled and compared against a maximum allowable nitrogen level. Whichever one of the twelve is closest to this maximum level is the controlling compartment for that depth. Its resulting value will be displayed numerically (Fig. 7b) along with the No Decompression Dive icon and graphically as the Tissue Loading Bar Graph.



Fig. 7 - Dive Time Remaining
(No Deco Time is Less)



Fig. 8 - Dive Time Remaining
(O₂ Accum Time is Less)

As you ascend from depth following a dive that has approached the no decompression limit, the Tissue Loading Bar Graph will recede as control shifts to slower compartments. This is a feature of the decompression model that is the basis for multilevel diving, one of the most important advantages the Data Plus 2 offers.

The no decompression algorithm is based upon Haldane's theory using maximum allowable nitrogen levels developed by Merrill Spencer. Repetitive diving control is based upon experiments designed and conducted by Dr. Ray Rogers and Dr. Michael Powell in 1987. Diving Science and Technology® (DSAT), a corporate affiliate of PADI®, commissioned these experiments.

Oxygen Accumulation Time Remaining

Oxygen accumulation (exposure) during a dive, or 24 hour period, appears graphically as the Oxygen Accumulation (O₂) Bar Graph. As time remaining before reaching the oxygen exposure limit decreases, segments are added to the O₂ bar graph. When the amount of time remaining before reaching the oxygen limit becomes less than the No Decompression Dive Time Remaining, calculations for the current depth will be controlled by oxygen. Oxygen Time Remaining will then appear as the main numeric time display (Fig. 9a) as signified by the O₂ Time icon appearing to the right of the display. As oxygen accumulation continues to increase, the O₂ bar graph will enter the yellow Caution Zone (described later).



Fig. 9 - O₂ Time Remaining

ALPHA/NUMERIC DISPLAYS

Depth Displays

During a dive, **Current Depth** and **Maximum Depth** reached during that dive are displayed from 0 to 330 feet (99.5 meters) in 1 foot (.5 meter) increments (Fig. 10 a & b).

During a Decompression Dive, the required **Ceiling Stop Depth** is displayed from 60 to 10 feet (20 to 3 meters) in 10 foot (3 meter) increments.

Time Displays (Fig. 10 c & d) are shown in hour:minute format (i.e., 1:02 represents one hour and two minutes, not 102 minutes!). The colon that separates hours and minutes blinks once per second when the display is indicating real time such as elapsed Surface Time, Elapsed Dive Time, or Time of Day. Dive Time Available, Dive Time Remaining, Decompression Stop Time, Total Ascent Time required, Time to Fly, or Desaturation Time are calculated projections of time and use a solid (non-blinking) colon to indicate that they are counting down, rather than up.

Depth and Time displays will be illustrated and described in more detail as applicable for each of the operating modes.



Fig. 10 - Depth & Time

Ambient Temperatures from 0° to 99°F (-9 to 60°C) are displayed when the Advance (Left) button is pressed while in the Surface Mode or in a dive mode.

BACKLIGHT FEATURE

In addition to using a high contrast LCD for easy readability in low light conditions, the backlight features evenly illuminate the full display.

Smart Glo™, the surface mode backlight, senses the intensity of light that is passing through the small ports located between the control buttons. If a low level of light is sensed, the Smart Glo™ backlight will activate and illuminate the display for button depression time plus 10 seconds when either button is pressed.

Oceanglo®, the dive mode backlight, will illuminate the display for button depression time plus 5 seconds when the Select (Right) control button is pressed. Additional illumination time can be obtained by pressing the button again.



△ NOTE: Extensive use of the backlight reduces estimated battery life. The backlight will not activate during a 'low battery condition', or when downloading data to a PC.

OPERATING TEMPERATURE

The Data Plus 2 will operate in almost any temperature diving environment in the world between 0 and 140 °F (-9 and 60 °C).

At extremely low temperatures, the LCD may become sluggish, but this will not affect its accuracy. If stored or transported in extremely low temperature areas (below freezing), you should warm the module and its battery with body heat before diving.

Even though the Data Plus 2 will operate in this wide range of temperatures, **it is possible to damage the electronics if left exposed to direct sunlight, or in a hot confined space (like a car trunk).** After the dive, cover the Data Plus 2 and **keep it out of the sun.**

If inadvertently left in the direct sunlight for a long period, the LCD display may become totally black. If this occurs, immediately immerse the Data Plus 2 in water. The display should recover its normal appearance after a few minutes.

Damage from excess heat, or cold, is not covered by the Data Plus 2 two year limited warranty.



**Be a -
RESPONSIBLE DIVER
at all times.**



WARNINGS and SAFETY RECOMMENDATIONS

- **Inspect your Data Plus 2 prior to every dive, checking for any signs of the entrance of moisture, damage to the housing, or damage to the LCD display. If these or other signs of damage are found, return the unit to an Authorized Oceanic Dealer. DO NOT attempt to use it until it has received factory service.**
- **Oceanic advocates responsible diving practices consistent with your individual level of formal training and experience, and does not recommend decompression diving or diving below 130 feet (39 m).**
- **Always carry primary and backup dive lights when conducting dives that could include low light situations.**
- **You should never, under any circumstances, swap your computer with another unit between dives, or share your computer with another diver underwater. It is impossible for two divers to stay precisely together underwater, and your computer's dive profile tracking of previous dives will be pertinent to you only. Nitrogen and oxygen loading of a second user may be significantly different and thus swapping dive computers could lead to inaccurate and potentially dangerous predictions of decompression and oxygen accumulation status. This rule applies to the use of all dive computers, but is especially important when using the DataPlus2, due to the personal information it provides.**

ACTIVATION and SETUP



refer to page 21 for - WARNINGS and SAFETY RECOMMENDATIONS



Fig. 11 - Diagnostic Mode



Fig. 12 - Surface Mode

ACTIVATION

To activate the Data Plus 2, press the Select (Right) button once and release. The Data Plus 2 will immediately enter Diagnostic Mode, displaying all “8’s” (Fig. 11), followed by “dashes”, and a countdown from 9 to 0. While conducting diagnostics, the display is illuminated by the Smart Glo™ backlight as the Data Plus 2 checks its display functions and battery voltage to ensure that everything is working correctly.

Upon activation, the Data Plus 2 will also check the ambient barometric pressure, and calibrate its present depth as zero. At elevations of 2,000 ft. (610 m) or higher, it will recalibrate itself to measure depth in feet of fresh water instead of feet of sea water.

If no dive is made within 2 hours after initial activation, the Data Plus 2 will automatically deactivate to conserve its battery power. **Always check the display before entering the water to ensure that it is activated.**

SURFACE MODE

Surface Mode, identified by the Surface Time icon (Fig. 12a), immediately follows Diagnostic Mode after initial activation. Information displayed includes the Dive Number '0' (no dive made yet) and Surface Time with flashing colon.

If battery voltage is below the level sufficient for a day's operation, the Battery icon will be displayed, flashing (Fig. 13a). Below 15% of rated voltage, all graphic displays will shut off except the Battery icon that will flash for 5 seconds, then the unit will shutdown.

MAIN MODE MENU

While on the surface, you can access Temperature/Date/Time mode, FO2 Set mode, Pre Dive Planning Sequence, Time to Fly/Desaturate, Log mode, and Set mode. These are described later.

The menu structure of the Set Mode enables you to -

- turn the Dive Mode Alternate display feature On/Off.
- set Year/Month/Day
- select Hour Format (12 or 24 hour).
- set Hour/Minute.
- select the Dive Profile Sampling Rate (for PC download data).
- select Units of Measure (Imperial or Metric).
- turn the FO2 Default feature On/Off.
- initiate download of data (External Access).

Before going diving, enter settings that will be common for each of your dives (e.g., Date, Time, Units of Measure, etc.). Setting the FO2 value for a nitrox mix is a 'pre dive' setting that is entered before nitrox dives.



Fig. 13 - Low Battery

ENTERING SETTINGS

- The Advance (Left) button is used to gain access to settings.
- The Select (Right) button is used to toggle between, or scroll through, the individual set points available for each of the settings.
- The Advance (Left) button is then used to accept and save the set point and revert to Surface Mode, or continue to the next setting.
- **See page 22 for a 'Summary of Access to Set Modes' that also notes 'settings entered by the factory'.**

△ NOTE: While in the Set Mode, if neither button is pressed, the unit will automatically revert to Surface Mode in 2 minutes.



Fig. 14 - Set Alternate

TO SET: ALTERNATE ON/OFF

'OFF' - Dive Modes will display Max Depth and Elapsed Dive Time

'ON' - Max Depth and Elapsed Dive Time are 'accessed' by pressing button

- press BOTH buttons simultaneously, while in Surface Mode
- 'Alt' appears with 'On', or 'Off', flashing (Fig. 14)
- press Select (Right) button to toggle between 'On' and 'Off'
- press Advance (Left) button to accept the setting displayed, and either -
 - revert to Surface Mode (this setting changed)
 - advance to Set:Year (this setting not changed)

TO SET: DATE//HOUR FORMAT//TIME

- press BOTH buttons simultaneously, while in Surface Mode
- press Advance (Left) button 1 time
- the Date appears with the Year setting flashing (Fig. 15a)
- press Select (Right) button until the correct Year appears
- press Advance (Left) button 1 time to accept the setting displayed
- the Month setting flashes (Fig. 15b)
- press Select (Right) button until the correct Month appears.
- press Advance (Left) button 1 time to accept the setting displayed
- the Day setting flashes (Fig. 15c)
- press Select (Right) button until the correct Day appears.
- press Advance (Left) button 1 time to accept the setting displayed
- the Hour Format appears flashing (Fig. 16)
 - 12 Hr format = 12: Am to 11: Pm
 - 24 Hr format = 0: to 23: (hours)
- press Select (Right) button to toggle between '12' and '24'
- press Advance (Left) button 1 time to accept the setting displayed



Fig. 15 - Set Date

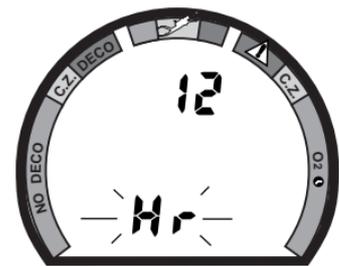


Fig. 16 - Set Hour Format

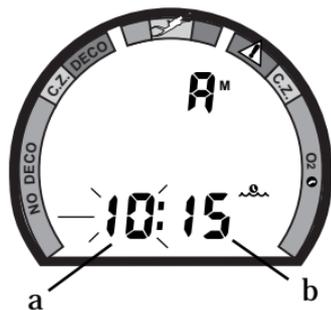


Fig. 17 - Set Time

- the Time appears with the Hour setting flashing (Fig. 17a)
- press Select (Right) button until the correct Hour appears.
- press Advance (Left) button 1 time to accept the setting displayed
- the Minute setting flashes (Fig. 17b)
- press Select (Right) button until the correct Minute appears.
- press Advance (Left) button to accept the setting displayed, and either -
 - revert to Surface Mode (date/time settings changed)
 - advance to Set: Sampling Rate (Date/Time settings not changed)



Fig. 18 - Set Sampling Rate

TO SET: SAMPLING RATE

Sampling Rate is the Time, or Depth, interval at which data samples will be recorded for subsequent download to the OceanLog™ PC software program. It has 'no effect' upon displayed data or data stored in the unit's viewable Log.

Rates available are 2 FT (.5M), 5 FT (1.5 M), 10 FT (3 M), 2 SEC, 5 SEC, 10 SEC, 15 SEC, 20 SEC, 25 SEC, 30 SEC. Lower rates = more samples and more memory used per dive (e.g., fewer dives stored for download).

- press BOTH buttons simultaneously, while in Surface Mode
- press Advance (Left) button 7 times
- the Rate setting appears flashing (Fig. 18)

- press Select (Right) button until the desired Rate appears.
- press Advance (Left) button to accept the setting displayed, and either -
 - revert to Surface Mode (this setting changed)
 - advance to Set: Unit (this setting not changed)

TO SET: UNITS OF MEASURE

- press BOTH buttons simultaneously, while in Surface Mode
- press Advance (Left) button 8 times
- the Units of Measure icons appear flashing (Fig. 19)

- press Select (Right) button to toggle between 'Imperial' (FT/°F) and 'Metric' (M/°C)
- press Advance (Left) button to accept the setting displayed, and either -
 - revert to Surface Mode (this setting changed)
 - advance to Set: FO2 Default (this setting not changed)

TO SET: FO2 50% DEFAULT ON/OFF

'Off' - FO2 value set point remains at % set

'On' - FO2 value set point reverts to 50% after dives

(The FO2 Default feature is described on page 25.)

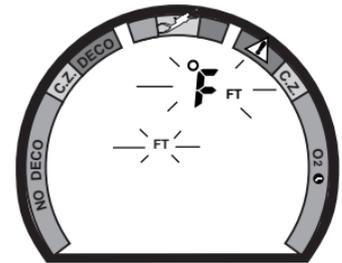


Fig. 19 - Set Units



Fig. 20 - Set FO2 Default



Fig. 21 - EA Mode

- press BOTH buttons simultaneously, while in Surface Mode
- press Advance (Left) button 9 times
- FO2 50 appears with On or Off flashing (Fig. 20)

- press Select (Right) button to toggle between 'On' and 'Off'
- press Advance (Left) button to accept the setting displayed, and either -
 - revert to Surface Mode (this setting changed)
 - advance to EA Mode (this setting not changed)

EA MODE

External Access (EA) Mode (described on page 42) is accessed only when data is being downloaded.

- press Advance (Left) button to bypass EA Mode (Fig. 21) and revert to Surface Mode





WARNINGS and SAFETY RECOMMENDATIONS

- **Never activate the Data Plus 2 underwater. This may result in inaccurate depth and no-decompression time displays. If the unit is activated when deeper than 4 feet (1 meter) underwater, or at elevations higher than 14,000 feet (4,267 meters), it will perform a diagnostic check followed by immediate shutdown.**
- **During activation and diagnostics, if any display or function varies from the information presented here, return the Data Plus 2 to your Oceanic Dealer for inspection.**
- **If a Low Battery condition is indicated following diagnostics, Oceanic strongly recommends that you DO NOT dive until the battery is replaced.**



SUMMARY OF ACCESS TO SET MODES*(settings entered by the factory appear in italics)***To access a specific Set mode from the Surface Mode, press the button(s) as follows:****SET MODE****TO ACCESS TOVIEW****TO SAVE**

To access>

Both '1' time>

- Alternate Display (*Off*)
- Year (*1999*)
- Month (*1*)
- Day (*1*)
- Hour Format (*12*)
- Hour (*12*)
- Minute (*00*)
- Sample Rate (*10 FT/3 M*)
- Units (*Imperial/Metric*)
- FO2 Default (*On*)
- EA (download)

- Left '0' time>
 - Left '1' time>
 - Left '2' times>
 - Left '3' times>
 - Left '4' times>
 - Left '5' times>
 - Left '6' times>
 - Left '7' times>
 - Left '8' times>
 - Left '9' times>
 - Left '10' times>
- Right - toggle (On/Off)>
 - Right - 1 year/second>
 - Right - 1 month/second>
 - Right - 1 day/second>
 - Right - toggle 12/24>
 - Right - 1 hour/second>
 - Right - 1 minute/second>
 - Right - 1 rate/second>
 - Right - toggle>
 - Right - toggle (On/Off)>

- Left - to Surface* or Year
- Left - to Month
- Left - to Day
- Left - to Hour Format
- Left - to Hour
- Left - to Minute
- Left - to Surface* or Rate
- Left - to Surface* or Units
- Left - to Surface* or Default
- Left - to Surface* or EA
- Left - to Surface

* If the setting was altered

*PRE DIVE
and
DIVE MODES*



refer to page 34 for - WARNINGS and SAFETY RECOMMENDATIONS

OPERATIONAL MODES

While on the surface the Interactive Control Console enables you to access six operational modes and activate the backlight. During a dive it enables you to view 'alternate' displays of information and activate the backlight.

TEMPERATURE/DATE/TIME MODE

To view Ambient Temperature/Date/Time (Fig. 22) while in Surface Mode:

- press the Advance (Left) button **1 time**
- During low light conditions, the Smart Glo™ backlight will illuminate the display for button depression time plus 10 seconds.
- The unit reverts to Surface Mode after 10 seconds, unless the Advance (Left) button is pressed to access FO2 Mode.



Fig. 22 - Temperature/
Date/Time

Set for Imperial units of measure, Month is on the left and Day on the right.
Set for Metric, Day is on the left and Month on the right. Year doesn't appear.

FO2 MODE

The Data Plus 2 can be used either as an Air computer or as a Nitrox computer. After activation, it will operate as an Air computer without displaying information associated with oxygen calculations, unless it is set for a percentage of oxygen (FO2) other than Air (numerical value between 21 and 50 %).

FO2 50% Default

If the Default is set to 'On' and FO2 is set to a value 'greater than 21%', the FO2 value will automatically revert to 50% 10 minutes after that dive.

- FO2 must be reset for each repetitive nitrox dive, or the value will automatically 'default' to 50 (Fig. 23) and the dives will be calculated based on 50% O2 for oxygen calculations and 21% O2 (79% nitrogen) for nitrogen calculations.
- If you surface for greater than 10 minutes during a dive, a subsequent descent will be considered a new dive and the FO2 value must be reentered.

If the Default is set to 'Off', the FO2 value for repetitive dives remains the same until the FO2 set point is manually changed.

FO2 Set for an Air Dive

When set with an FO2 value of 'Air', the Data Plus 2 will perform calculations the same as if FO2 were set for 21% oxygen, internally accounting for oxygen loading for any subsequent Nitrox dives. However, oxygen related displays, warnings, and the O2 Bar Graph will not appear on the display for that dive (Fig. 24), or subsequent dives, unless FO2 is set for a numerical value (21 to 50%).



Fig. 23 - FO2 Default



Fig. 24 - FO2 'Air'



Fig. 25 - Setting FO2



Fig. 26 - FO2 21%

Setting FO2

To access FO2 Mode while in the Surface Mode and set the unit for Air or the percentage (%) of oxygen (FO2) in your nitrox mix:

- press the Advance (Left) button **2 times**
- press the Select (Right) button, repeatedly or press and hold, until the value of FO2 for the nitrox mix being used is displayed
- the FO2 value displayed (Fig. 25a) will advance from 21 to 50 (%) in increments of 1 (%), then display 'Air' again.
- the Maximum Depth that can be achieved with an oxygen partial pressure (PO2) of 1.60 ATA will be displayed (Fig. 25b) for each FO2 value. No value will appear for Air.

The unit reverts to Surface Mode after 2 minutes, unless the Advance (Left) button is pressed to access the Pre Dive Planning Sequence.

FO2 Set for a Nitrox Dive

You can set the Data Plus 2 for nitrogen-oxygen (nitrox) mixtures of 21% to 50% oxygen (O2). If FO2 is set at a value of 21% (Fig. 25), the unit will remain set as a '21% nitrox computer' for subsequent nitrox dives until FO2 is set to a higher value, or until it automatically turns off and is reactivated.

Once a dive is made with the Data Plus 2 set as a nitrox computer (FO2 set for a numerical value), it cannot be set for 'Air' until 24 hours after the last nitrox dive. However, you can set FO2 for 21% for use with air.

PRE DIVE PLANNING SEQUENCE™

Oceanic strongly recommends that you review the Pre Dive Planning Sequence (PDPS) prior to every dive to help you plan your dive as required to avoid exceeding no decompression or oxygen exposure limits. This is especially important for repetitive dives, when the Pre Dive Planning Sequence (Fig. 27) will indicate for you the no decompression dive times that are available to you on your next dive, based on any residual nitrogen or oxygen accumulation (whichever is in control) following your last dive and surface interval.

To access the Pre Dive Planning Sequence while in the Surface Mode:

- press the Advance (Left) button **3 times**
- press the Select (Right) button, repeatedly or press and hold
- a sequence of depths from 30 to 160 feet (9 to 48 meters) in 10 foot (3 meter) increments will be displayed

The unit reverts to Surface Mode 2 minutes after the Select (Right) button is released, unless the Advance (Left) button is pressed to access the Log Mode.



Fig. 27 - Pre Dive Planning Sequence



Fig. 28 - Nitrogen Control



Fig. 29 - Oxygen Control

With each depth display, you will see either 'predicted' no decompression limits based upon your previous dive profiles (if calculated to be nitrogen controlled), or 'predicted' oxygen tolerance limits based upon either a single dive oxygen dose or your 24 hour accumulation of oxygen (if calculated to be oxygen controlled).

No decompression times are only displayed for depths where there is at least 3 minutes of dive time available at that depth, taking into account a descent rate of 120 feet (36 meters) per minute. Depths greater than the maximum depth that can be achieved with a partial pressure of oxygen (PO₂) of 1.60 ATA will not be displayed.

Prior to a Repetitive Nitrox Dive

If the segments of the Tissue Loading Bar Graph™ are displayed (Fig 28) during the Pre Dive Planning Sequence, that next dive is calculated to be controlled by nitrogen loading.

If the segments of the O₂ bar graph are displayed (Fig. 29), that next dive is calculated to be controlled by oxygen loading.

The Data Plus 2 will store oxygen accumulation for up to 10 dives conducted during a 24 hour period. In the event that the maximum limit for oxygen loading has been exceeded for that day, all of the segments of the O₂ bar graph will

be displayed flashing (Fig. 30). Depth and Time displays will not appear until the O₂ bar graph recedes into the green (normal) zone (e.g., your daily oxygen dosage decreases an amount equivalent to the amount accumulated during the latest dive completed).

NO DECOMPRESSION DIVE MODE

As long as it is activated on the surface, the Data Plus 2 will enter the No Decompression Dive Mode when you descend deeper than 5 feet (1.5 meters), regardless of the operating mode it is in. If activated below 4 feet (1 meter), the unit will perform a diagnostic check and shutdown.

To activate the Oceanglo® backlight underwater, press the Select (Right) button. The display will be illuminated for button depression time plus 5 seconds. It will not activate if a Low Battery condition exists.

Main Display (data shown depends on Alternate ON/OFF setting)

If the Alternate Display is set to 'OFF', information includes (Fig. 31) - Current Depth, Elapsed Dive Time (and icon), Dive Time Remaining (and icon), and Maximum Depth for that dive (and icon).

Data Plus 2

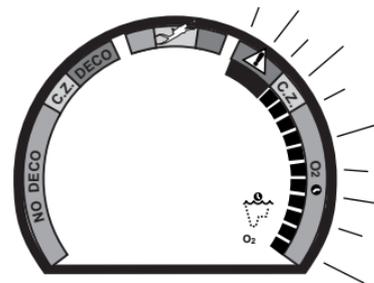


Fig. 30 - O₂ Limit Exceeded



Fig. 31 - Main Display
(Alternate Off)



Fig. 32 - Main Display (Alt On)



Fig. 33 - Secondary Display



Fig. 34 - Alternate Display

If the Alternate Display is set to 'ON', information includes (Fig. 32): Current Depth and Dive Time Remaining (and icon). Elapsed Dive Time and Maximum Depth are 'accessed' in Large Format, as described below.

Secondary Display (access if Alternate is set ON or OFF)

To view water Temperature, Time of Day, and if FO2 was set for a numerical value, display the current level of PO2 (Fig. 33):

- press the Advance (Left) button **1 time**
- the unit will revert to the Main Display after 10 seconds, if the Advance (Left) button is not pressed again.

Alternate Display (access only if Alternate is set ON)

To view Maximum Depth and Elapsed Dive Time in Large Format in place of Current Depth and Dive Time Remaining (Fig. 34):

- press the Advance (Left) button **2 times**, or -
- press the Advance (Left) button **1 time**, if viewing Temp/Time/PO2.
- the unit will revert to the Main Display after 10 seconds, or if the Advance (Left) button is pressed.

The **Graphic Diver Interface** (bar graphs) will be active with each display representing nitrogen loading, oxygen accumulation (if FO2 was set for a value other than Air), and your ascent rate.

DECOMPRESSION DIVE MODE

The Data Plus 2 provides information that will help you avoid, or if necessary, manage emergency decompression.

The Decompression Dive Mode activates when the Tissue Loading Bar Graph enters the red 'DECO' zone (Fig. 35a).

VIOLATION MODES

The Data Plus 2 enters Violation Modes when it is unable to predict an ascent procedure.

GAUGE MODE

If the Data Plus 2 enters a Permanent Violation Mode, it will not display information relating to nitrogen or oxygen loading for the remainder of that dive or for subsequent dives conducted during the 24 hour period after surfacing.



NOTE: Decompression Dive Mode, Violation Modes, and Gauge Mode are described later on pages 46 - 52.



Fig. 35 - Entering Into Decompression Mode

ASCENDING TO THE SURFACE

While ascending to shallower depths, the segments that have filled up the Tissue Loading Bar Graph will begin to recede (Fig. 36), offering a graphic representation of your multilevel diving capability. By 'backing off' on the bar graph (fewer segments), you can establish a personal level of conservatism and margin of protection.

If you entered Decompression Mode, you must not complete your ascent until the Tissue Loading Bar Graph is at least inside the yellow Caution Zone.

If you have not entered Decompression Mode, a safety stop made between 15-20 feet (5-6.5 meters) is strongly recommended as a standard procedure before completing your ascent.

You should make every effort to complete all of your ascents with the Tissue Loading Bar Graph inside of the green zone.

While you cannot provide a guarantee against the occurrence of decompression sickness, you may choose your own personal zone of caution based upon your individual age, physique, excessive weight, training, experience, etc. to reduce the statistical risk.



Fig. 36 - Tissue Loading Bar Graph (receding)

The Variable Ascent Rate Indicator™ shows how fast you are ascending. When you exceed the maximum recommended ascent rate of 60 feet per minute (18 meters per minute), the bar graph will enter the red (Too Fast) zone (Fig. 37a). You will be alerted by all segments of the bar graph flashing. The flashing will stop when your ascent rate is slowed.

ALTITUDE DIVING

The mathematical model within the Data Plus 2 accounts for the reduced No Decompression dive time available at higher elevations based on NOAA (National Oceanic and Atmospheric Administration) guidelines. When diving in high altitude lakes or rivers from 2,000 to 14,000 feet (610 to 4,268 meters), the Data Plus 2 will adjust automatically, providing corrected depth and reduced No Decompression and Oxygen Exposure times.

Also, when above 2,000 feet (610 meters), depth calibration is automatically changed to read in feet of freshwater rather than feet of seawater. If activated above 14,000 feet (4,268 meters), the unit will perform a diagnostic check and shutdown.



Fig. 37 - Ascent 'Too Fast'

**WARNINGS and SAFETY RECOMMENDATIONS**

- **The percentage of oxygen (FO₂) in the nitrox mix being used must be set 'before each' nitrox dive, unless the FO₂ 50% Default is set to 'Off'.**
- **The Pre Dive Planning Sequence provides predicted times for subsequent dives. Depending on cylinder size, breathing gas consumption, and oxygen accumulation you may have *less time available* than indicated because of breathing gas quantity or other limitations.**
- **The Data Plus 2 must be manually activated and be in an operating mode prior to start of a dive. The unit will not activate automatically by immersion in water.**
- **Every effort should be made to keep each of the bar graphs *in the green* throughout your dives to reduce your risk of exposure to decompression sickness and oxygen toxicity.**
- **Until it has shut itself off, you must not use the Data Plus 2 at a different altitude than the altitude where it was originally activated. Doing so will result in an error equal to the difference in barometric pressure, and possibly a false dive mode with erroneous data.**

POST DIVE MODES



refer to page 43 for - WARNINGS and SAFETY RECOMMENDATIONS



Fig. 38 - Post Dive Surface Mode (< 10 min)



Fig. 39 - Temperature/Date/Time

FIRST 2 HOURS AFTER A DIVE

When you ascend to 3 feet (1 meter) or shallower, the Data Plus 2 will enter Surface Mode (Fig. 38) and begin counting your surface interval.

TRANSITION PERIOD

The first 10 minutes is, in affect, a Transition Period during which time the following information is displayed (Fig. 38):

- Surface Mode icon (flashing).
- 'Number' of that dive
- Surface Interval (colon flashing).
- Tissue Loading Bar Graph indicating current nitrogen loading.
- O2 Bar Graph indicating current oxygen loading (if a nitrox dive)

If you descend during the 10 minute transition period, time underwater will be considered a continuation of that dive. The time at the surface (if less than 10 minutes) will not be added as Elapsed Dive Time.

To view the Temperature/Date/Time (Fig. 39):

- press the Advance (Left) button **1 time**
- the unit will revert to Surface Mode after 10 seconds, if no button is pressed

To view that Dive's Log (during the Transition Period):

- press the Advance (Left) button **2 times**, or -
- press the Advance (Left) button **1 time**, if viewing Temperature/Date/Time
- the unit will revert to Surface Mode after 2 minutes, if no button is pressed

Data will not be stored in the unit's memory until the 10 minute Transition Period is completed.

Once 10 minutes have elapsed, that dive and transition period are completed, and a subsequent descent will be considered a new dive.

AFTER THE TRANSITION PERIOD

For the remainder of the **first 2 hours after surfacing** the information described above will continue to be displayed as the Surface Mode (Fig. 40) and you will have full access to other modes.

To view the Temperature/Date/Time:

- press the Advance (Left) button **1 time**
- the unit will revert to Surface Mode after 10 seconds, if no button is pressed



Fig. 40 - Surface Mode
(first 2 hours)



Fig. 41 - FO2 (Default OFF)



Fig. 42 - FO2 (Default ON)



Fig. 43 - Adjusted NDLs

To access FO2 Mode:

- press the Advance (Left) button **2 times** (while in Surface Mode)
- If the FO2 Default was set OFF, the FO2 setting displayed will be the same value previously set (Fig. 41).
- If the FO2 Default was set ON, the FO2 value displayed (Fig. 42) will be the 'default value' of 50 (%) and will have the be set for the beathing gas used for the next dive.
- press the Select (Right) button to alter the setting, if required.
- the unit reverts to Surface Mode after 2 minutes, unless the Advance (Left) button is pressed to access the Pre Dive Planning Sequence.

To access Pre Dive Planning Sequence™:

- press the Advance (Left) button **3 times** (while in Surface Mode)
- press the Select (Right) button to scroll through the sequence
- The unit reverts to Surface Mode after 2 minutes, unless the Advance (Left) button is pressed to access the Fly Mode.

The Pre Dive Planning Sequence will now show 'adjusted' No Decompression Limits (Fig. 43) based on residual nitrogen calculated to be remaining from the previous dives. Calculated dive times and the maximum allowed depth displayed will increase as the real time surface interval increases after completion of a dive.

The Pre Dive Planning Sequence will only scroll to the maximum depth allowed by the nitrogen or oxygen limit, whichever is in control. The respective bar graph will be displayed to indicate which is in control.

To access Time to Fly and Desaturate Countdowns:

- press the Advance (Left) button **4 times** (while in Surface Mode)
- The unit reverts to Surface Mode after 2 minutes, unless the Advance (Left) button is pressed to access the Log Mode.

The Time To Fly counter begins counting down 10 minutes after the last dive has ended (after the 10 minute Transition Period) displaying the word 'FLY' with a countdown (Fig. 44a) that starts at 23:50 (hr:min) and counts down to 0:00 (hr:min).

The Time to Desaturate counter (Fig. 44b) provides calculated time for tissue desaturation at sea level. The countdown starts 10 minutes after the dive at 9:59 (hours:minutes) maximum and counts down to 0:00. If the time is calculated to be greater than 9:59, the display will indicate 9:- (Fig. 45a) until it decreases to 9:59.

If a violation occurred during the dive, Time to Desaturate will not be displayed and a single dash (-) will appear (Fig. 46a) instead of the letters FLY. The time shown is only time until the unit will resume normal operation.



Fig. 44 - Time to Fly/Desaturate



Fig. 45 - Desaturate (> 9:59)



Fig. 46 - After Violation

LOG MODE

Information from your 12 latest dives is stored in the **Log** for viewing. After 12 dives are accumulated, each subsequent dive will overwrite the oldest dive in the log (i.e., the most recent dive deletes the oldest). Log information will not be lost when batteries are removed, but factory service will delete the logs.

Dives are displayed in a reverse sequence that starts with the dive most recently recorded back to the oldest of the 12 dives stored. Thus, your most recent dive will always be the first shown in the sequence. Each dive has three log screens - Date/Time started, Nitrogen data, and Oxygen data.

Dives are identified by the Date/Time and number. The first dive of a new day (after midnight) will be #1.

The Advance (Left) button is used to access each dive's log.

The Select (Right) button is used to view second and third screens for that dive (Nitrogen and Oxygen related data).



Fig. 47 - Log Mode
(first screen - date/time)

To access the Log Mode:

- press the Advance (Left) button **5 times** (while in Surface Mode)
- the first screen (Fig. 47) of the most recent dive will appear
 - Log Mode icon and Dive Number
 - Date and Time of Day that the dive started (and icon)

To access a specific dive's log, press the Advance (Left) button repeatedly.

To view the second screen (**Nitrogen Log**) for that dive (Fig. 48):

- press the Select (Right) button **1 time**
 - Log Mode icon
 - Dive number
 - Maximum Depth reached for the dive (and icon)
 - Elapsed Dive Time (and icon)
 - Surface Interval prior to that dive (and icon)
 - Variable Ascent Rate Indicator - showing the maximum ascent rate maintained for 4 consecutive seconds during the dive
 - Tissue Loading Bar Graph - showing tissue nitrogen loading at the end of the dive



Fig. 48 - Log Mode
(second screen - nitrogen)

To view the third screen (**Oxygen Log**) for that dive Fig. 49):

- press the Select (Right) button **1 time**
 - Log Mode icon
 - FO₂ value - set for that dive (and 'FO₂' symbol)
 - Maximum PO₂ level - reached during that dive (and 'PO₂' symbol)
 - O₂ bar graph - showing oxygen loading at the time you surfaced.
- If FO₂ was set for 'Air', the O₂ screen will only display 'FO₂' and 'Air'.
- press the Select (Right) button 1 time to view the first screen of the previous dive's log, or press the Advance (Left) button repeatedly to revert to the Surface Mode.



Fig. 49 - Log Mode
(third screen - oxygen)

To exit Log Mode and return to the Surface Mode (at any time):

- press the Advance (Left) button repeatedly to proceed through the remaining recorded dives.
- the unit will automatically revert to Surface Mode after 2 minutes, if no button is pressed

AFTER THE FIRST 2 HOURS

Two hours after the last dive the Surface Mode will no longer be displayed. The **Time to Fly and Desaturate** countdown timers will be displayed continuously, giving the final countdowns from 22:00 and 9:xx to 0:00 (Fig. 50).

To access other modes or enter settings:

- press the Select (Right) button to enter Surface Mode
- the unit will revert to Fly Mode after 2 hours, if no button is pressed



Fig. 50 - Display
(after 2 hours on surface)

DOWNLOADING DATA TO PC

Using special infrared linking hardware and a unique PC software program, data from your dives can be downloaded (copied) from your Data Plus 2 into an IBM compatible PC program running on a Windows® 95 or 98 operating system. Instructions for performing the interface and download are provided with the OceanLog™ for Data Plus 2 hardware and software package. The OceanLog™ program provides profile data sampled throughout the dive.

To access the External Access (EA) Mode:

This mode is used only to download data to the Oceanlog™ PC software program.

- press **both** buttons simultaneously (while in Surface Mode)
- press the Advance (Left) button **10 times**
- the letters EA appear, flashing (Fig. 51)
- press the Advance (Left) button to revert to Surface Mode, or -
- press the Select (Right) button to initiate download
- the unit will automatically revert to Surface Mode after download is complete, or in 2 minutes if no button is pressed
- the backlight will not operate upon entering EA Mode or when download is initiated



Fig. 51 - EA Mode

**WARNING and SAFETY RECOMMENDATION**

- **The longer you wait to fly (or travel to higher elevations) after diving, the more you will reduce your exposure to decompression sickness.**

SUMMARY OF ACCESS TO POST DIVE MODES

During the first 2 hours after a dive* (after the 10 minute Transition Period has ended):

<u>MODES</u>	<u>TO ACCESS</u>	<u>TO VIEW</u>
Backlight (if low light level is sensed)	press Either '1 time'	
Temperature/Date/Time	press Left '1 time'	
FO2 set	press Left '2 times'	> press Right (hold or repetitive)
Pre Dive Plan Sequence	press Left '3 times'	> press Right (hold or repetitive)
Fly/Desaturate	press Left '4 times'	
Log Mode	press Left '5 times'	> press Right (hold or repetitive)
Set Mode	press Both '1 time'	> Refer to page 22 of this Guide
EA Mode	press Both '1 time'	> press Left '10 times' > Right '1 time'

***After the First 2 Hours, the unit will remain in Fly/Desaturate Mode. To access other Modes:**

- press the Right button to return to the Surface Mode, then press the buttons as indicated above.**

HANDLING THE EXTREMES



refer to pages 56-58 for - WARNINGS and SAFETY RECOMMENDATIONS

AVOIDING AND MANAGING DECOMPRESSION

The Data Plus 2 is a sophisticated instrument designed with capabilities that go beyond the range of recreational diving with compressed air. It will help you to avoid and, if necessary, manage decompression.

TISSUE LOADING BAR GRAPH™

The Tissue Loading Bar Graph offers you a convenient way to consistently monitor how close you are coming to the No Decompression Limit. As you use the Data Plus 2 and become familiar with the Tissue Loading Bar Graph, you will notice that it displays fewer segments for shorter dive times and shallower depths. Use this feature to adjust conservatism to your diving needs.



Fig. 52 - Caution Zone

Use the yellow Caution (C.Z.) Zone (Fig. 52a) as a visual reference to place a wider margin of protection between you and the No Decompression Limit.

Oceanic suggests keeping the Tissue Loading Bar Graph **in the green** No Decompression (NO DECO) zone during all of your dives, and that it be **in the green** when leaving the water.

DECOMPRESSION DIVE MODE

The Data Plus 2 is designed to help you by providing a complete representation of how close you are to entering decompression. Decompression Dive Mode activates when theoretical no decompression time/depth limits are exceeded.

In the event that you enter Decompression Mode, as indicated by the large red segment of the Tissue Loading Bar Graph (Fig. 53a) and flashing ceiling bar of the Decompression Mode icon, immediately begin a safe controlled ascent to a depth slightly deeper than, or equal to, the Required Ceiling Stop Depth indicated (Fig. 53b) and decompress for the Stop Time indicated (Fig. 53c).

Main Display (data shown is the same if Alternate is set ON or OFF)

Information displayed in addition to Stop Depth/Time includes:

- current Depth
- Total Ascent Time (Fig. 53d) - that includes stop times required at all ceilings and vertical ascent time calculated at 60 ft (18 m) per minute.
- O₂ bar graph (if a nitrox dive) and Variable Ascent Rate Indicator - continue to represent their respective information

Additional data can be accessed using the Advance (Left) button, and the Oceanglo® backlight can be activated using the Select (Right) button.



Fig. 53 - Main Display (Alternate set ON or OFF)



Fig. 54 - Secondary Display



Fig. 55 - Alternate Display



Fig. 56 - Managing a Stop

Secondary Display (access if Alternate is set ON or OFF)

To view water Temperature, Time of Day, and if FO2 was set for a numerical value, display the current level of PO2 (Fig. 54):

- press the Advance (Left) button **1 time**
- the unit will revert to the Main Display after 10 seconds if the Advance (Left) button is not pressed again.

Alternate Display (access only if Alternate is set ON)

To view Elapsed Dive Time and Maximum Depth in Large Format in place of Current Depth and Dive Time Remaining (Fig. 55):

- press the Advance (Left) button **2 times**, or -
- press the Advance (Left) button **1 time**, if viewing Temp/Time/PO2.
- the unit will revert to the Main Display after 10 seconds, or if the Advance (Left) button is pressed.

MANAGING DECOMPRESSION STOPS

The amount of decompression credit time that you receive is dependent on depth, with slightly less credit given the deeper you are. You should stay slightly deeper (Fig. 56a) than the Required Stop Depth indicated (Fig. 56b) until the next shallower Stop Depth appears. Then, you can slowly ascend to, but not shallower than, that indicated ceiling Stop Depth.

Once all required decompression has been completed, the Data Plus 2 will switch to the No Decompression Dive Mode. This is indicated by Total Ascent Time = 0:00, and the Tissue Loading Bar Graph receding into the yellow Caution Zone. Time Dive Remaining now appears in place of Total Ascent Time .

VIOLATION MODES

It is important to understand each different Violation Mode and how to carry out emergency procedures in the event you enter one.

While in Violation Modes, the Secondary and Alternate displays previously described can be accessed using the Advance (Left) button, and the Oceanglo® backlight can be activated using the Select (Right) button.

CONDITIONAL VIOLATION MODE

The Data Plus 2 will enter Conditional Violation Mode **if you ascend shallower (Fig. 57a) than the required decompression ceiling indicated by the Required Stop Depth displayed (Fig. 57b)**. The Total Ascent Time display (Fig. 57c) will flash until you descend below the Required Stop Depth.

If you descend below the required decompression ceiling before 5 minutes have elapsed, the Data Plus 2 will continue to function as if no violation had occurred. In this case, no off-gassing credit will be given, and for each minute

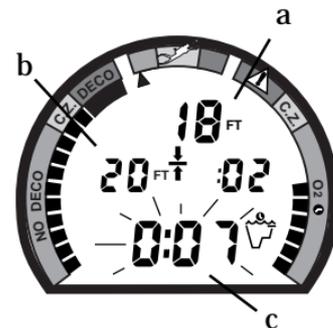


Fig. 57 - Conditional Violation



Fig. 58 - Delayed Violation
(> 5 minutes above Stop)



Fig. 59 - Delayed Violation
(Required Stop > 60FT/18M)

above the ceiling 1½ minutes of penalty time is added to Required Stop Time.

The added penalty decompression time will have to be 'worked off' first, before obtaining off-gassing credit. Once the penalty time is worked-off, and off-gassing credit begins, required decompression Stop Depths and Time will decrease toward zero, then the Tissue Loading Bar Graph will recede into the caution zone and the Data Plus 2 will revert to the No Decompression Dive Mode.

DELAYED VIOLATION MODE

Three conditions cause the Data Plus 2 to enter the Delayed Violation Mode:

- 1. You remain above the required Decompression Ceiling Stop Depth for 'more than 5 minutes' (Fig. 58).** You would then need to follow the Stop Depths and Times toward the surface as the Tissue Loading Bar Graph recedes into the caution zone.
- 2. Your decompression requires a ceiling Stop Depth 'between' 60 feet (18 meters) and 70 feet (21 meters).** In this situation the Tissue Loading Bar Graph will flash (Fig. 59). Total Ascent Time needed to get back to the surface will still be displayed.

You must ascend to just deeper than 60 feet (18 meters) staying as close to 60 feet (18 meters) as possible without causing the Total Ascent Time display to

flash. When the Required Stop Depth indicates 50 FT/ 15 M, 40 FT/ 12 M, 30 ft/ 9 M, 20 FT/ 6 M, then 10 FT/ 3 M, you can ascend to, but no shallower than those depths and continue decompressing.

The Data Plus 2 cannot accurately calculate decompression times for Stop Depths much greater than 60FT (18M) and offers no indication of how much time spent underwater would result in the need for greater than a 60 FT (18 M) decompression stop depth.

3. You descend deeper than 330 feet (99.5 meters). Upon descending deeper than 330 feet (99.5 meters), the Tissue Loading Bar Graph will flash and the Current Depth and Maximum Depth displays will only indicate (Fig. 60) 3 dashes (- - -) until ascent is made to a depth shallower than 330 feet (99.5 meters), at which time the Current Depth display will be restored. Max Depth will continue to display 3 dashes.

IMMEDIATE VIOLATION MODE

Five minutes after reaching the surface from a dive in which a Delayed Violation occurred, the Data Plus 2 will enter an Immediate Violation Mode.

If a ceiling *much greater* than 60FT (18M) is required, an Immediate Violation Mode (Fig. 61) will be entered. This situation would be preceded by entering Delayed Violation Mode, previously described. The Data Plus 2 would then



Fig. 60 - Delayed Violation (deeper than 330ft/99.5m)



Fig. 61 - Immediate Violation (Alternate set OFF)



Fig. 62 - Gauge Mode
(underwater - Alt set OFF)



Fig. 63 - Gauge Mode
(surface)

operate with limited functions (Current Depth, Max Depth, and Elapsed Dive Time) in Gauge Mode during the remainder of that dive and for 24 hours after surfacing.

GAUGE MODE

Underwater, the Gauge Mode (Fig. 62) is a continuation of the Immediate Violation Mode that turns the Data Plus 2 into a digital instrument. Dive Time Remaining will not be displayed and the Tissue Loading Bar Graph and O₂ Bar Graph will flash as a warning of this condition.

After surfacing, Gauge Mode does not provide the FO₂, Pre Dive Planning Sequence, or Time to Fly features. The countdown timer that appears (Fig. 63) 10 minutes after the dive at 23:50 (hr:min) does not represent Time to Fly. It is only provided to inform you of the time remaining before normal Data Plus 2 operation can resume with full features and functions.

PERMANENT VIOLATION

Entering the Immediate Violation Mode, then Gauge Mode, will result in loss of all Data Plus 2 decompression and oxygen monitoring functions for 24 hours after that dive. This condition is considered a Permanent Violation. If a dive is made during the 24 hour period, a 'full 24 hour surface interval' must be served before all functions are restored.

EXCEEDING MAXIMUM OPERATING DEPTH

The maximum depth the Data Plus 2 will display all of its features is 330 feet (99.5 meters). Upon exceeding 330 feet (99.5 meters), the Tissue Loading Bar Graph will flash, and the Depth and Maximum Depth displays will only indicate 3 dashes (- - -) signifying that you are 'out of range' (Fig. 64). The numeric display for Current Depth will reappear when you ascend shallower than 330 feet (99.5 meters). For the remainder of that dive, and in the log for that dive, only 3 dashes will be displayed as the value for Maximum Depth.



Fig. 64 - Out of Range

OXYGEN EXPOSURE

The Data Plus 2 is a sophisticated instrument designed with capabilities that go beyond the range of recreational diving with compressed air. It will help you to avoid and manage excessive oxygen exposure.

PARTIAL PRESSURE OF OXYGEN

As depth increases during the dive, the partial pressure of oxygen (PO₂) increases.

To view the current value of PO₂ (Fig. 65a):

- press the Advance (Left) button **1 time** to access the Secondary Display.



Fig. 65 - Current PO₂
(secondary display)



Fig. 66 - High PO2
(= /> 1.40 ATA)



Fig. 67 - High PO2
(= /> 1.60 ATA)

HIGH PO2 DIVE MODE

The Data Plus 2 enters the High PO2 Dive Mode when partial pressure of oxygen becomes equal to, or greater than, **1.40 ATA**. The current PO2 value and the symbol 'PO2' will appear in the center portion of the display (Fig. 66). If the Alternate Display is set to ON, they replace Max Depth and Elapsed Dive Time. They will remain on display until partial pressure of oxygen decreases below a value of 1.40 ATA.

If partial pressure of oxygen continues to increase, the value of PO2 displayed will increase from 1.40 ATA toward a maximum value of 5.00 ATA in increments of '.01' ATA. When PO2 reaches a value of **1.60 ATA**, the large red segment of the O2 bar graph, the PO2 value, and PO2 symbol will flash continuously as a warning (Fig. 67) until the level of PO2 decreases below 1.60 ATA.

HIGH OXYGEN ACCUMULATION

The O2 bar graph provides you with a convenient graphic representation of your oxygen accumulation, displaying either oxygen accumulated during that dive, or during your repetitive dives conducted during that 24 hour period, whichever of the two is greater at that time.

The yellow Caution Zone of the O2 Bar Graph offers you a convenient way to consistently monitor how close you are coming to the limits of oxygen toler-

ance. **Use it as a visual reference to place a wider margin of protection between you and the Limits.**

If the theoretical amount of oxygen accumulated equals, or exceeds, the limit for a single exposure, or exposure for a 24 hour period, Oxygen Dive Time Remaining becomes 0:00. The O2 Bar Graph will enter the red danger zone (Fig. 68) and the full bar graph will flash as a warning.

You must immediately focus on making a safe controlled ascent to the surface to prevent further exposure. As your accumulation (dose) decreases during your surface interval, the O2 bar graph will gradually recede into the yellow (caution) zone and green (normal) zone.

UNEXPECTED LOSS OF DISPLAYED INFORMATION

If your Data Plus 2 stops working for any reason, it is important that you have anticipated this possibility and are prepared for it.

If you dive in situations where your trip would be ruined or your safety would be jeopardized by losing the use of your Data Plus 2, an analog or digital backup system or use of standard air (or nitrox) tables is highly recommended.



Fig. 68 - High O2



WARNINGS and SAFETY RECOMMENDATIONS

- **There are few legitimate excuses for making unplanned Decompression dives, and the consequences of this type of diving can be severe. By making an unplanned Decompression dive without the necessary preparation and training, you will have placed yourself in an unnecessarily dangerous situation. Allow a surface interval of at least 24 hours before reentering the water in the event a dive requires emergency decompression.**
- **By entering decompression, you automatically impose a “ceiling” above you which you cannot immediately ascend beyond, denying you free access to the surface.**
- **Existing data for making planned decompression dives is extremely limited, and virtually nonexistent for repetitive decompression diving. Decompression diving greatly increases your risk of decompression sickness.**
- **Decompression diving, or diving deeper than 130 feet (39 m), will greatly increase your risk of decompression sickness.**
- **Special training, equipment, and support are necessary for diving deeper than the maximum recommended sport diving depth limit of 130 feet (39 meters). Oceanic does not advocate diving to depths below 130 feet (39 meters), the basis for which is purely theoretical.**



WARNINGS and SAFETY RECOMMENDATIONS

- **Exiting the water with the Tissue Loading Bar Graph in the red decompression zone greatly increases the risk of decompression sickness, and may result in injury or death.**
- **The oxygen features of the Data Plus 2 are intended for use only by recreational divers trained for nitrox diving by an instructor certified by a recognized training agency to teach diving with nitrox.**
- **The Data Plus 2 enters Immediate Violation Mode when a situation totally exceeds its capacity to predict an ascent procedure. These dives represent gross excursions into decompression that are beyond the boundaries and spirit of the Data Plus 2 design. If you are following these dive profiles, Oceanic advises you not use a Data Plus 2 dive computer.**
- **If you exceed certain limits, the Data Plus 2 will not be able to tell you how to get safely back to the surface. These situations exceed tested limits and can result in loss of some Data Plus 2 functions for 24 hours after the dive in which a violation occurred.**
- **The Data Plus 2 is not intended for use by military or commercial divers.**



WARNINGS and SAFETY RECOMMENDATIONS

- **Maximum limits for exposure to oxygen should not be exceeded, and the consequences of CNS (Central Nervous System) oxygen toxicity can be severe, resulting in Gran Mal convulsions and drowning.**
- **Conducting repetitive dives using enriched nitrogen-oxygen mixtures can lead to oxygen buildup, reducing oxygen tolerance while increasing the risk of pulmonary oxygen toxicity.**
- **In the event that you exceed the maximum per dive allowable oxygen exposure (dose), it is recommended that you allow a surface interval of at least 2 hours before reentering the water. If you exceed the maximum 24 hour period allowable oxygen exposure (dose), you must allow a surface interval of at least 24 hours before reentering the water.**
- **Allowing the O₂ Bar Graph to enter the red (Danger) zone greatly increases the risk of CNS oxygen toxicity, and may result in serious injury or death.**
- **It should not be considered that the capabilities built into the Data Plus 2 provide any implied approval or consent from Oceanic for individuals to exceed the defined limits of recreational dive profiles, as agreed on by all internationally recognized training agencies.**

*CARE
and
MAINTENANCE*



refer to page 68 for - WARNINGS and SAFETY RECOMMENDATIONS

CARE AND CLEANING

The Data Plus 2 must be protected from shock, excessive heat, chemical attack, and tampering. The housing, made of an impact resistant resin, is extremely shock resistant but susceptible to chemical attack and scratches. To protect the lens against scratches, place a transparent Oceanic Instrument Lens Protector on it. If it becomes scratched, Oceanic can replace it, although small scratches will naturally disappear underwater.

AFTER THE DIVE

Soak and rinse the Data Plus 2 in fresh water following each dive, and check the low pressure sensor guard cap to ensure that it is free of any debris or obstructions. If possible, use lukewarm water to dissolve any salt crystals. Salt deposits can also be dissolved using a slightly acidic vinegar/water bath. After removal from a fresh water bath, place the Data Plus 2 under gently running water and towel dry before storing. Transport cool, dry, and protected.



ANNUAL INSPECTIONS AND SERVICE

Your Data Plus 2 should be inspected annually by an Authorized Oceanic Dealer who will perform a factory prescribed function check and inspection for damage or wear. To keep the 2 year limited warranty in effect, this inspection

must be completed one year after purchase (+/- 30 days). Oceanic recommends that you continue to have this inspection performed every year to ensure your Data Plus 2 is working properly. The costs of annual inspections are not covered under the terms of the 2 year limited warranty.



NOTE: Annual inspections are only performed by Authorized Oceanic Dealers and are not performed by the factory.

TO OBTAIN SERVICE

Take your Data Plus 2 to an Authorized Oceanic Dealer.

To return your Data Plus 2 to Oceanic:

- Obtain an RMA (Return Merchandise Authorization) number by contacting Oceanic at 510/562-0500 or email service@oceanicusa.com.
- Remove accessories and other items not related to service.
- Package it using a protective cushioning material.
- Include a legible note stating specific reason for return, your name, street address, daytime phone number, serial number, and a copy of your original sales receipt and Warranty Registration Card.
- Send insured and freight prepaid using a trackable method to the nearest Oceanic service facility listed at the right.
- Non-warranty service must be prepaid. COD is not accepted.

OCEANIC USA

2002 Davis Street

San Leandro, Ca. 94577

Tel: 510-562-0500; Fax: 510-569-5404

Oceanic International (Pacific)

Kapolei, Hawaii

Tel: 808-682-5488; Fax: 808-682-1068

Oceanic Europe

Pomezia, Italy

Tel: 39-6-910-4148; Fax: 39-6-910-4163

Oceanic SW, Ltd

Devon, United Kingdom

Tel: 44-1-404-89-1819; Fax: 44-1-404-89-1909

Oceanic Diving Australia Pty. Ltd

Sorrento, Victoria, Australia

Tel: 61-3-5984-4770; Fax: 61-3-5984-4307

Oceanic Asia-Pacific Pte. Ltd

Singapore

Tel: 65-779-3853; Fax: 65-779-3945

Oceanic Germany

Numberg, Germany

Tel: 49-911-324-6630; Fax: 49-911-312-999

Oceanic Japan

Tokyo, Japan

Tel: 3-3664-6541; Fax: 3-3667-6187/6

Additional information is available at the Oceanic web site -
<http://www.oceanicusa.com>

△ NOTE: Be sure to record all dives in the Log. Dive log data will be erased whenever your Data Plus 2 receives factory service.

BATTERY LIFE

Battery consumption rate varies throughout periods of operation, which begin upon activation and continue for 24 hours after surfacing from a dive. The exact number of dives, or hours of operation, that you will obtain is subject to variables, such as, temperature, the number of dives conducted during each operational period, and the frequency and duration that the backlight is used (excessive use will reduce battery life).



Tests and calculations indicate that a new Tadiran® 1/2AA model TL-2150, .95Ah, 1.0 ma, Lithium battery will maintain unit operation for approximately 350 dive hours (if 1 - 1 hour dive per dive day) to over 700 dive hours (if 2 or more 1 hour dives per dive day). Yearly replacement is recommended.

△ NOTE: The disposable battery supplied with the unit is not covered by the Data Plus 2 limited 2 year warranty.

LOW BATTERY CONDITION

During unit operation, voltage level is checked every 10 minutes. A Low Battery condition is indicated by the Battery icon appearing on the display (Fig. 69a). Upon decreasing to a voltage level that will not maintain proper unit operation, the icon will flash for 5 seconds followed by shutdown of the unit.

If the unit did not display the Low Battery icon 'prior' to entering the Dive mode, and a low battery condition occurs during a dive, you will be alerted by the Low Battery icon appearing on the display. There will be sufficient battery power to maintain unit operation 'for the remainder of that dive', however the backlight will be disabled.

BATTERY REPLACEMENT

△ NOTE: The following procedure must be closely adhered to. Damage due to improper battery replacement is not covered by the Data Plus 2 limited 2 year warranty.

MODULE REMOVAL FROM BOOT

Wrist or Hose Mount Boot - peel the lips of the boot downward off the module while applying pressure from underneath, working it out slowly.



Fig. 69 - Low Battery

Console - bend the rubber console boot back to expose the edge of the module. If the boot is flexible enough to permit, you may bend it back far enough to scoop the module out with your index finger. Otherwise, it may be necessary to insert a blunt screwdriver until the tip rests *just underneath* the module. **DO NOT** pry the module from the console! Slowly increase the pressure under the module by releasing the tension on the rubber boot. The module will slide up the screwdriver and exit the console.

BATTERY REMOVAL

The battery compartment should only be opened in a dry and clean environment, with extreme care taken to prevent the entrance of moisture or dust.

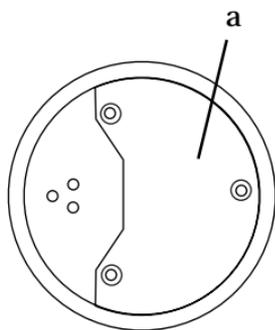


Fig. 70 - Case Back

Examine the case back to find the Battery Hatch (Fig. 70a):

- Remove the three screws that secure the battery hatch to the housing by turning counter clockwise with a small philips head screwdriver.
- Lift the hatch up and out of the housing.
- Lift the battery, positive (+) end first, out of the battery compartment.
- Remove the battery hatch o-ring and inspect it for any signs of deterioration or deformity. **DO NOT** use tools to remove the o-ring.
- O-ring replacement is highly recommended to ensure proper sealing.
- Check the battery hatch and housing sealing surfaces for any signs of damage which might impair proper sealing, and the inside of the battery compartment for any signs of corrosion indicating entrance of moisture.

- **If damage is found, return your Data Plus 2 to your Authorized Oceanic Dealer, and DO NOT attempt to use it until it has received factory service.**

If moisture or corrosion is found in the battery compartment, DO NOT use it until it has received proper service. It is best to have your unit inspected and cleaned by an Authorized Oceanic Dealer. If you are cleaning it in the field, proceed as follows:

- Inspect the lens and housing to ensure they are not cracked or damaged.
- Inspect the button coverings to ensure they do not have cuts or holes.
- Remove the battery and discard, DO NOT attempt to reuse.
- Check the battery hatch o-ring for damage (nicks, cuts, divots, etc.). If found, discard and replace with new.
- Before replacing the o-ring and battery, flush the battery hatch and compartment with a solution of 50% white vinegar and 50% water. Rinse with fresh water, and allow to dry overnight, or blow dry with a hair dryer (set at 'no heat').



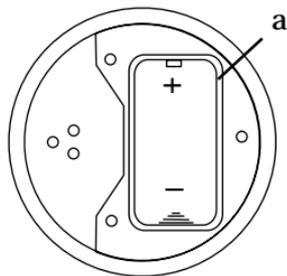


Fig. 71 - O-ring Installation

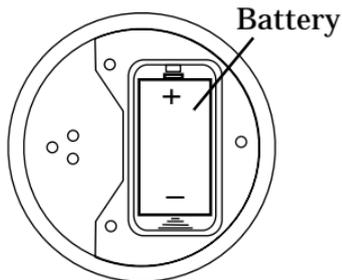


Fig. 72 - Battery Orientation

BATTERY INSTALLATION

- To replace the battery hatch o-ring, lightly lubricate it with silicon grease and place it on the beveled outer edge of the battery compartment (Fig. 71a). Ensure that it is evenly seated.



NOTE: This o-ring must be a genuine Oceanic part that can be purchased from your Authorized Oceanic Dealer. Use of any other o-ring will void the Data Plus 2 warranty.

- Place a new 3.6 volt TADIRAN[®], model TL-2150, .95Ah, 1.0ma, Lithium battery, negative end first, into the battery compartment toward the spring, ensuring proper orientation of the positive (+) and negative (-) ends (Fig. 72).
- Carefully place the battery hatch into position so that it seats on top of the o-ring, and while holding it in place with your thumb, secure it with the three screws by turning them clockwise with a small Philips head screwdriver. **DO NOT** attempt to use any other screws.
- *Carefully tighten the screws until secure by alternately turning them each one turn at a time. Turn the upper left, then the right, then the lower left..*
- *Repeat the sequence until all of the screws are evenly secure. The outer surface of the battery hatch should be flush with the outer surface of the housing. DO NOT overtighten.*

INSPECTION

- Activate the unit and watch carefully as it performs a full diagnostic and battery check and enters Surface Mode.
- Observe the LCD display to ensure it is consistently clear and sharp in contrast throughout the screen.
- If any portions of the display are missing or appear dim, or if a Low Battery condition is indicated, return the unit to your Authorized Oceanic Dealer for a complete inspection before attempting to use it.

RETURNING THE MODULE TO BOOT

- If the boot was fitted with a spacer and it was previously removed, replace the spacer into the boot.
- Orient the module over the opening in the boot, and dip the bottom edge into it while pressing the top edge with the palm of your hand. Stop pressing when the bottom edge of the module has just entered the boot.
- Correct the alignment of the module as needed so that it is straight.
- Press the module completely into place with your thumbs, watching the alignment, until it snaps into place.

Care and maintenance is simple and easy, and will help keep your Data Plus 2 in top condition for years of diving enjoyment.





WARNINGS and SAFETY RECOMMENDATIONS

- **When the Low Battery icon is displayed prior to a dive, DO NOT attempt to dive with the Data Plus 2 until the batteries are replaced.**
- **Never, under any circumstances, poke any object through any slots or holes of the Data Plus 2. Doing so may damage the depth sensor, possibly resulting in erroneous depth and/or dive time remaining displays.**
- **If you are in doubt about the accuracy of your Data Plus 2 depth readings, DO NOT attempt to dive with it until it has been inspected by Oceanic Customer Service.**
- **Never pressure test the Data Plus 2 in an air environment. Doing so may damage the depth sensor; possibly resulting in erroneous depth or time readings.**
- **Never spray aerosols of any kind on, or near, the Data Plus 2. The propellants may chemically attack the plastic.**
- **Nitrogen and Oxygen calculations will be erased when the battery is replaced between repetitive dives. Also, date and time settings will have to be reset. To avoid any inconvenience, the batteries should be replaced with new prior to any multi-day dive trip that will include a profile of repetitive dives, such as multiple days on a liveboard vessel.**

REFERENCE



refer to page 70 for - WARNINGS and SAFETY RECOMMENDATIONS



WARNINGS and SAFETY RECOMMENDATIONS

- **Diving at high altitude requires special knowledge of the variations imposed upon divers, their activities, and their equipment by the decrease in atmospheric pressures. Oceanic recommends completion of a specialized Altitude training course by a recognized training agency prior to diving in high altitude lakes or rivers.**
- **Altitude compensation provided by the Data Plus 2 takes place when the unit is activated. DO NOT dive at any different altitude until the Data Plus 2 shuts off. It will recalibrate automatically when reactivated at the new altitude.**
- **When returning to lower altitudes, diving should not be conducted until the Data Plus 2 automatically clears of any residual nitrogen and oxygen loading and resets to operate at the new altitude.**
- **Decompression diving is inherently hazardous and greatly increases your risk of decompression sickness - even when performed according to the computer's calculations.**
- **Using the Data Plus 2, just as using the U.S. Navy, or other, No Decompression Tables, is no guarantee of avoiding decompression sickness, i.e. "the bends."**

NO DECOMPRESSION LIMITS

Note how the No Decompression Limits for the Data Plus 2 are contrasted with the U.S. Navy limits (Fig. 73). For most depths, the Data Plus 2 provides somewhat less no decompression times than the U.S. Navy Tables. However, while the No Decompression Limits may be less, you will receive greatly increased allowable bottom times as you take advantage of the multilevel dive capabilities offered by the Data Plus 2. Notice also that the Data Plus 2 Pre Dive Planning Sequence does not scroll past 160 feet (48 meters).

DECOMPRESSION MODEL

The decompression model used by the Data Plus 2 is based on the no decompression multilevel repetitive dive schedules successfully tested by Dr. Ray Rogers and Dr. Michael Powell. These tests did not include repetitive dives deeper than 90 feet (27 meters) or decompression dives.

Due to the present unavailability of statistical data, Data Plus 2 decompression predictions are based on U.S. Navy theory. Therefore, pay special attention to the Warnings and Safety Recommendations that have been provided in this owner's guide.

<u>Depth feet (meters)</u>	<u>Data Plus 2 NDL-mins. Eng (Metric)</u>	<u>U.S. Navy NDL -mins.</u>
30 (9)	260 (283)	---
35	---	310
40 (12)	137 (144)	200
50 (15)	80 (84)	100
60 (18)	57 (58)	60
70 (21)	40 (41)	50
80 (24)	30 (31)	40
90 (27)	24 (26)	30
100 (30)	19 (20)	25
110 (33)	16 (16)	20
120 (36)	13 (13)	15
130 (39)	10 (11)	10
140 (42)	9 (9)	10
150 (45)	8 (8)	5
160 (48)	7 (7)	5
170 (51)	* *	5
180 (54)	* *	5
190 (57)	* *	5

[* The Data Plus 2 will not scroll past 160 feet (48 meters), or when projected bottom /descent time is less than three minutes.]

Fig. 73 - No Decompression Limits

PO2 (ATA)	Maximum Exposure Time	
	Per Dive (Min)	Per 24hr (Min)
0.60	720	720
0.70	570	570
0.80	450	450
0.90	360	360
1.00	300	300
1.10	240	270
1.20	210	240
1.30	180	210
1.40	150	180
1.50	120	180
1.60	45	150

Fig. 74 - Oxygen
Exposure Limits

OXYGEN EXPOSURE LIMITS

Predicted exposure limits and oxygen calculations of the Data Plus 2 are based on maximum exposure durations (Fig. 74) published by the National Oceanic and Atmospheric Administration in the October 1991 NOAA Diving Manual.

MULTIPLE TISSUE TRACKING

The Data Plus 2 tracks twelve tissue compartments with halftimes ranging from 5 to 480 minutes. The Tissue Loading Bar Graph always displays the controlling compartment that is the only one important at that time. Think of the Tissue Loading Bar Graph as twelve separate transparent displays laid on top of one another (Fig. 75). The tissue compartment that has filled up fastest is the only one the viewer can see from the top.

At any particular point, one tissue compartment may be absorbing nitrogen, while another that was previously higher may be off-gassing. Figure 76 illustrates the point at which one compartment “hands over” control to another compartment at a different depth. This feature of the Decompression Model is the basis of multilevel diving, one of the most important contributions the Data Plus 2 offers you.

SPECIFICATIONS

NO DECOMPRESSION MODEL

Basis:

- Modified Haldanean Algorithm
- 12 tissue compartments

Data Base:

- Diving Science and Technology (DSAT) - Rogers/Powell

Performance:

- Tissue compartment halftimes (in mins.) Spencer's "M" values
5, 10, 20, 40, 80, 120, 160, 200, 240, 320, 400, 480
- Reciprocal subsurface elimination
- 60 minute surface credit control for compartments faster than 60 minutes
- Tissue compartments tracked up to 24 hours after last dive

Decompression Capabilities:

- Decompression stop ceilings at 10, 20, 30, 40, 50, & 60 feet
(3, 6, 9, 12, 15, & 18 meters)

Altitude Algorithm:

- Based on NOAA tables

Oxygen Exposure Limits:

- Based on NOAA tables

OPERATIONAL MODES

- Activation/Diagnostic
- Surface -
 - Temperature/Date/Time
 - FO2 Set Point
 - Pre Dive Planning Sequence
 - Time to Fly/Desaturate
 - Dive Log (Date/Nitrogen/Oxygen)
- Set -
 - Alternate (On/Off)
 - Year, Month, Day
 - Hour Format (12/24)
 - Hour, Minute
 - Sampling Rate
 - Units (Imperial/Metric)
 - FO2 Default (On/Off)
 - External Access (EA)
- No Decompression Dive - Main
 - Secondary
 - Alternate (Large Format)
- Decompression Dive -Main
 - Secondary
 - Alternate (Large Format)
- Violation (conditional, delayed, & immediate)
- Gauge
- High PO2
- High O2
- Backlight (Oceanglo®/SmartGlo™)

SPECIFICATIONS (continued)

DISPLAY RANGE/RESOLUTION

Numeric Displays:	<u>Range:</u>	<u>Resolution:</u>
• Dive Number	0 - 9	1
• Depth	0 - 330 ft (0 - 99.5 m)	1 ft (.5 m)
• Maximum Depth	330 ft (99.5 m)	1 ft (.5 m)
• FO2 Set Point	21 - 50 %	1 %
• PO2 Value	.01 - 5.00 ATA	.01 ATA
• Dive Time Remaining	0 - 9 hr. 59 min.	1 minute
• Total Ascent Time	0 - 9 hr. 59 min.	1 minute
• Decompression Stop Time	0 - 99 min. (per stop depth)	1 minute
• Elapsed Dive Time	0 - 1 hr. 59 min.	1 minute
• Surface Time	0 - 23 hr. 59 min.	1 minute
• Dive Log Surface Interval	0 - 23 hr. 59 min.	1 minute
• Time to Fly	23 hr. 59 min. - 0*	1 minute
	(* starting 10 min. after the dive)	
• Time to Desaturate	9 hr. 59 min. - 0	1 minute
	(* starting 10 min. after the dive)	
• Temperature	0 to 99°F (-9 to 60°C)	1°

GRAPHIC DIVER INTERFACE™

Tissue Loading Bar Graph™:	<u>segments</u>
No Decompression zone (green)	9
No Deco Caution zone (yellow)	2
Decompression Warning zone (red)	1

Oxygen Accumulation (O2) Bar Graph:	<u>segments</u>
Normal zone (green)	9
Caution zone (yellow)	2
Danger zone (red)	1

Variable Ascent Rate Indicator™ (VARI):

	<u>segments</u>	<u>feet/min.</u>	<u>meters/min.</u>
	0	0 - 20	0 - 6
Normal zone (green)	1	21 - 30	6.5 - 9
Caution zone (yellow)	2	31 - 40	9.5 - 12
	3	41 - 50	12.5 - 15
	4	51 - 60	15.5 - 18
Too Fast zone (red flashing)	5	61 +	18.5 +

Special Displays:

	<u>Occurrence</u>
• Diagnostic Display	Activation
• Out of Range	> 330 feet (> 99.5 meters)
• Gauge Mode Countdown Timer	22 - 0 hours (after violation)

OPERATIONAL PERFORMANCE**Function:**

	<u>Accuracy:</u>
• Depth	± 1% of full scale
• Timers	1 second per day

Dive Counter:

- Displays Dives #1, 2, 3, 4, 5, 6, 7, 8, 9, 0 (continues #1 to #0)
- Displays #0 for dives #10, 20, etc.
- Resets to Dive #1, upon diving (after midnight - new date)

Dive Log Mode:

- Stores 12 most recent dives in memory for viewing
- After 12 dives, adds 13th dive in memory and deletes the first dive

SPECIFICATIONS (continued)

OPERATIONAL PERFORMANCE (continued)

Altitude:

- Operational from sea level to 14,000 feet (4,267 meters) elevation
- Recalibration of depth readings from 'feet of sea water' to 'feet of fresh water' when higher than 2,000 feet (610 meters) elevation

Power:

- Battery 1 - 3.6 volt, 1/2AA TADIRAN[®] model TL-2150, .95Ah, 1.0ma, Lithium (must be 3.6 v, .95Ah, 1.0ma rating)
- Shelf life Up to 5 years
- Replacement User replaceable (annual recommended)
- Life expectancy 350 dive hours (if 1 - 1 hour dive per dive day) to over 700 dive hours (if 2 or more 1 hour dives per dive day). Yearly replacement is recommended.

Activation:

- Manual (push button) - cannot be activated by water immersion
- Cannot be activated deeper than 4 feet (1.5 m)
- Cannot be activated at elevations higher than 14,000 feet (4,267 m)
- Needed before first dive.
- Automatically shuts off if no dive is made within 120 minutes after initial activation. Reactivation required.
- Cannot be shut off manually.

Setting FO2:

- Automatically set for 'Air' upon activation
- Remains set for Air unless an FO2 numerical value is set
- Nitrox set points from 21 to 50 %
- If set for 21%, remains set for 21% until changed
- If set for >21%, reverts to 50% 10 minutes after the dive (however, if the FO2 Default setting is OFF, the previous value set will be retained)

ACCESSORIES

Optional items available from your Authorized Oceanic Dealer:

- Battery Kit - includes 1 battery, 1 o-ring, silicon grease
- Lens Protector - adheres to lens face, prevents scratches
- OceanLog™ for Data Plus 2 - PC Download Package (hardware and software program)

GLOSSARY

Air Dive - A dive conducted using air (approximately 21% oxygen & 79% nitrogen) as the breathing gas.

Algorithm - A step-by-step mathematical formula designed to accomplish a particular result (i.e. Dive Time Remaining in the Data Plus 2).

Altitude Dive - A dive made at an elevation above sea level (2,000+ ft. / 610+ m.) where a different set of no decompression tables is used .

Ascent Rate - The speed that a diver ascends toward the surface.

C.Z. - Abbreviation for Caution Zone.

Caution Zone - The yellow sections of the Tissue Loading Bar Graph and O2 bar graph that gives a visual warning of a diver's proximity to respective decompression or oxygen tolerance limits.

Ceiling - See decompression ceiling.

Clean Dive - A dive preceded by 24 hours of no diving activity.

CNS - Abbreviation for the Central Nervous System of the body.

Competitive Dive - A dive conducted for profit or prize.

Compartment - A term applied to the hypothetical modeling of nitrogen absorption in the tissues (more accurate than the term "tissue" because dive computer models have no direct relation to human tissues).

DCS - Abbreviation for decompression sickness, i.e., "the bends".

DECO - Abbreviation for Decompression.

Decompression Ceiling - The shallowest depth a diver may reach upon ascent without risking decompression sickness.

Decompression Stop - The depth(s) at which a diver must pause during ascent to allow absorbed nitrogen to escape naturally from the tissues.

Depth Sensor - An electro-mechanical device that converts water pressure into an electrical signal, that is converted to a visual depth display.

Diagnostic Mode - The first display seen on dive computers after initial activation during which time a self-check for internal faults is performed.

GLOSSARY (continued)

Display - A visual readout of information.

Dive Log Mode - A computer display of previous dive information.

Dive Time Remaining - A display of the time before a diver must surface based on no-decompression status, or oxygen accumulation status.

Elapsed Dive Time - The total time spent underwater during a dive between 5 feet (1.5 meters) on initial descent to 3 feet (1 meter) on final ascent.

FO₂ - The fraction (percent / 100) of oxygen (O₂) in the breathing gas mixture.

Graphic Diver Interface™ - A feature of Oceanic dive computers. Easily understandable color coded bar graphs that indicate diver status; green = normal, yellow = caution, red = danger.

Icon - a small pictorial representation of an operational mode

LCD - Abbreviation for liquid crystal display, an easily viewed low voltage display usually found on dive computers

Maximum Depth - The deepest depth attained during a dive.

Mode - A specific set of functions in a dive computer.

Multiplexing Display - A display on an instrument that alternates to show different information relating to separate events.

Multi-level Dive - A type of dive profile where the diver spends various times at different depths (opposite of a "Square Wave" dive profile).

Nitrox - A nitrogen-oxygen breathing gas mixture that contains a higher fraction of oxygen than air.

Nitrox Dive - A dive conducted using nitrox (22 to 50 % O₂) as the breathing gas.

No Deco - Abbreviation for No Decompression.

No Deco Time Remaining - The amount of dive time remaining based on no-decompression status.

No Decompression - Any part of a dive where the diver can surface without requiring a decompression stop.

O₂ Bar Graph - A visual representation of oxygen accumulation on a dive computer display.

Oceanglo® - An Oceanic name for an instrument backlight feature.

OceanLog™ - An Oceanic name for a PC interface hardware/software package.

GLOSSARY (continued)

OTU - Abbreviation for oxygen tolerance unit. A Hamilton's Repex method term for oxygen dose.

Out of Range - The point at which a dive computer can no longer supply correct dive information.

Oxygen Tolerance - Dose or exposure to the physiological affects of elevated levels of oxygen.

Oxygen Toxicity - The adverse physiological affects of exposure to elevated levels of oxygen.

Partial Pressure - The proportion of the total pressure contributed by a single gas in a mixture of gases.

PDPS - Abbreviation for Pre Dive Planning Sequence

PO₂ - Partial pressure of oxygen. The proportion of total pressure of a gas mixture contributed by oxygen.

Pre Dive Planning Sequence™ - A display of available dive times at 10 foot. (3 meter) intervals from 30 to 160 feet. (9 to 48 meters) used when dive planning.

Repetitive Dive - Any dive that takes place within 12 hours of a previous dive.

Safety Stop - A depth at which a diver may choose, but is not required, to pause during ascent to allow absorbed nitrogen to escape naturally from the tissues.

Smart Glo™ - An Oceanic name for an instrument backlight feature sensitive to light intensity.

Square Wave Dive - A type of dive profile where the entire dive is spent at one depth between descent and ascent.

Tissue - See Compartment.

Tissue Compartment - See Compartment.

Tissue Loading Bar Graph™ - A graphic display of simulated nitrogen absorption on Oceanic dive computers.

TLBG - Abbreviation for Tissue Loading Bar Graph.

Transducer - An electro-mechanical device in a dive computer that acts as a depth or pressure sensor.

Transition Period - The first 10 minutes of surface time after ascending above 3 feet (1 meter) from a dive.

VARI - Abbreviation for Variable Ascent Rate Indicator.

Variable Ascent Rate Indicator™ - A display on the Data Plus 2 that shows ascent rate as a bar graph alongside a color-coded indicator (part of the Graphic Diver Interface).

THE CODE OF THE RESPONSIBLE DIVER

AS A RESPONSIBLE DIVER
I UNDERSTAND AND ASSUME
THE RISKS I MAY ENCOUNTER
WHILE DIVING.

RESPONSIBLE DIVING BEGINS WITH

- DIVING WITHIN THE LIMITS OF MY ABILITY AND TRAINING
- EVALUATING THE CONDITIONS BEFORE EVERY DIVE AND MAKING SURE THEY FIT MY PERSONAL CAPABILITIES
- BEING FAMILIAR WITH AND CHECKING MY EQUIPMENT BEFORE AND DURING EVERY DIVE
- KNOWING MY BUDDY'S ABILITY LEVEL AS WELL AS MY OWN
- ACCEPTING THE RESPONSIBILITY FOR MY OWN SAFETY ON EVERY DIVE

DATA PLUS 2 SERVICE RECORD

Serial Number _____

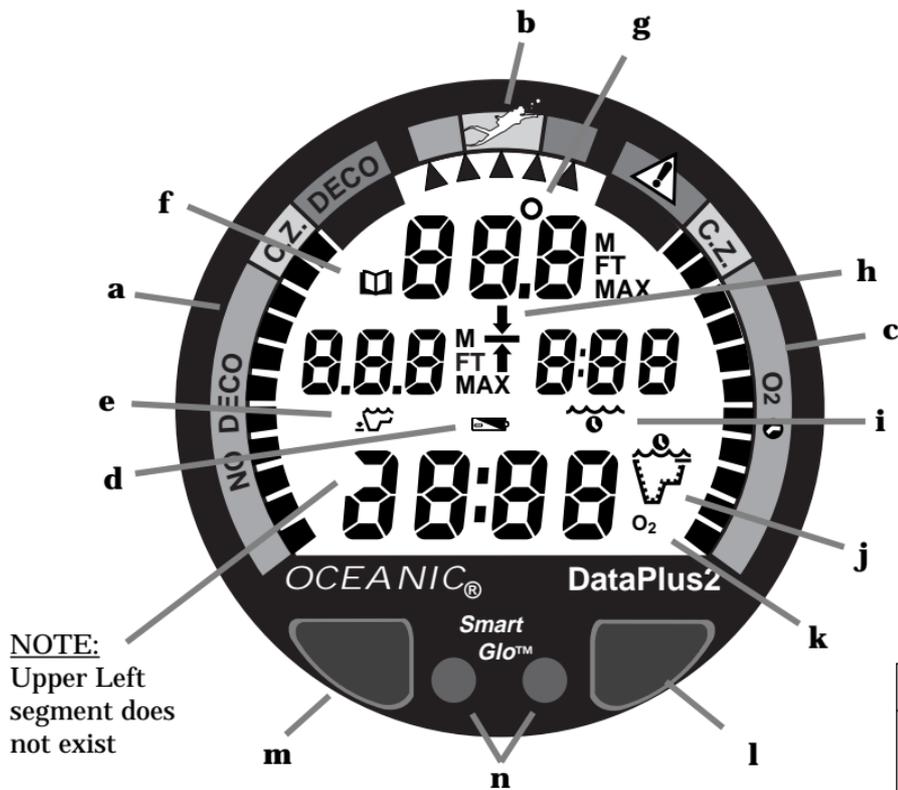
Date of purchase _____

Purchased from _____

Below to be filled in by an Authorized Oceanic Dealer:



Date	Service Performed	Dealer / Technician



- a. Tissue Loading Bar Graph
- b. Variable Ascent Rate Indicator
- c. Oxygen Loading Bar Graph
- d. Icon - Low Battery
- e. Icon - Maximum Depth
- f. Icon - Log Mode
- g. Icon - Temperature
- h. Icon - Deco Stop Ceiling
- i. Icon - Elapsed Dive Time
- j. Icon - Operating Mode (detail A)
- k. Symbol - O2 in Control
- l. Control Button - Select
- m. Control Button - Advance
- n. Sensors - Smart Glo™/ Download

NOTE:
Upper Left
segment does
not exist

Graphic Interface Legend

Detail 'A' - Operating Mode Icons

Surface	Plan	No Deco	O2 Time	Deco

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