SHERWOOD SCUBA®

www.SherwoodScuba.com

Insight

DIVE COMPUTER MANUAL

RESPONSIBLE COMPUTER DIVING

Since the advent of dive computers, it is a common mistake to assume that the old traditional rules of diving no longer apply, but the truth is just the opposite. Before you dive using your Insight, keep these basic rules in mind:

- Plan each dive, and dive your plan **- Your Insight was not designed to make decisions for you, only to provide you with the information you need to make responsible decisions for yourself. This begins with a dive plan that will help you avoid a low air or decompression situation.**
- Do not plan any dive that exceeds your training or experience level.
- Inspect your computer before every dive **- If it shows any signs of damage or abnormal function, DO NOT dive with it until it has received factory service.**
- Make your deepest dive first **- When making repetitive dives, it is imperative to ensure that each consecutive dive is shallower than the one before. This will allow your body's slower tissues to continue outgassing nitrogen.**
- Make the deepest part of your dive first, and gradually work your way to the surface using a staircase profile **- The ability to perform multilevel diving is one of the most important contributions of a dive computer, and you should take advantage of it. It will increase your bottom time and at the same time decrease your risk of decompression sickness.**
- Ascend slowly by following an ascent line whenever possible, or by ascending diagonally toward the surface **- Watch the Ascent Rate Indicator closely while you ascend, and keep it in the green zone as much as possible.**
- **A Safety Stop of 3 minutes or more is recognized as a prudent action to reduce the probability of bubble formation in divers.**

The following symbols are used throughout this manual to bring your attention to situations that require special consideration. Be sure to read and follow all instructions carefully.

A **WARNING** is used before a procedure that will result in serious injury or death if the procedure is not followed carefully.

A **CAUTION** is used before a maintenance technique that will result in damage to parts if that technique is not followed carefully.

A **NOTE** is used to emphasize an important maintenance technique.

WARNINGS:

- **The Insight 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) breathing gas 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 mixtures (nitrox) before using the Insight 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.**
- **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 manual completely before diving with the Insight.**
- **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 Sherwood dealer before you utilize this product.**
- **Never participate in sharing or swapping of a dive computer. Doing so may result in injury or death. The Insight provides information based upon a diver's personal dive profile, and therefore must not be "shared" between divers. You should never, under any circumstances, swap your computer with another unit between dives, or share your computer with another diver underwater.**

LIMITED TWO-YEAR WARRANTY

Sherwood Scuba guarantees, to the original purchaser only, that the Insight will be free of defects in materials and/or craftsmanship under normal recreational multilevel scuba use for two years from date of purchase, provided proper care and annual service are performed as described within this dive computer manual. Should your Insight prove to be defective for any reason (other than those listed in the limitations section below) it will be repaired or replaced (at Sherwood Scuba's discretion) free of charge excluding shipping and handling charges.

This warranty will be considered void if the registration card is not filled out completely at the time of purchase and mailed to Sherwood Scuba within 30 days of purchase, and/or if the annual inspection is not done according to this dive computer manual. This warranty is non-transferrable and applies to the original purchaser only. All correspondence concerning this warranty must be accompanied by a copy of the original sales receipt and a copy of the owner's portion of the warranty registration card including the annual inspection record.

Once each year you must return the Insight to an Authorized Sherwood Dealer within 30 days of the original purchase date anniversary to keep the two year limited warranty in force. Annual inspection includes verification of depth accuracy and proper general function. Labor charges for the annual inspection are not covered by the warranty. You must provide a copy of the original sales receipt and a copy of the owner's portion of the warranty registration card including the annual service record to obtain warranty service.

Statement of Limitations - General:

Warranty does not cover damage from accident, abuse, battery leakage, tampering, lack of proper care and maintenance and/or proper annual servicing, or improper use of the Insight. Modifications or repair by anyone other than a Sherwood Sales and Service Center authorized to service the Insight will void the warranty. Sherwood Scuba will not be responsible for recovery or replacement of the product in the event of loss or theft. Sherwood Scuba, its distributors, and retailers make no warranties, either expressed or implied, with respect to this product or its owner's manual except those stated in the preceding paragraphs. **In consideration of the sale of the Insight to you, you agree and understand that in no event will Sherwood Scuba, its distributors or retailers, be held liable for any personal injuries resulting from its operation, or for any other damages whether direct, indirect, incidental, or consequential even if Sherwood Scuba is advised of such damages.**

Some states do not allow the exclusion or limitation of implied warranties or liabilities for incidental or consequential damages, so the above limitation may not apply to you.

Warranty does not extend to plastic gauge face, o-rings, batteries, or damage due to accident, abuse, modification, or tampering.

COPYRIGHT NOTICE

TRADEMARK NOTICE

PATENT NOTICE

U.S. Patents have been issued, or applied for, to protect the following design features:
Data Sensing and Processing Device (U.S. Patent no. 4,882,678), Dive Time Remaining (U.S. Patent no. 4,586,136), and Ascent Rate Indicator (U.S. Patent no. 5,156,055).

DECOMPRESSION MODEL

The programs within the Insight 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 Insight dive computer model is based upon the latest research and experiments in decompression theory. **Still, using the Insight, 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.

CONTENTS

CONTENTS (CONTINUED)

FEATURES
and
DISPLAYS

INTRODUCTION

Congratulations on your recent purchase of the Sherwood Insight !

Your Insight presents the information that you need before, during, and after your air (or nitrox) dives using an intuitive combination of easy to read displays and unique identification icons.

Tissue loading of nitrogen and ascent rate are presented as segmented bar graphs alongside color coded reference indicators that bring quick focus to these important status displays.

As you progress through this instructional guide, you will become familiar with all of the unique functions and features available and see examples of the displays that you could expect to see in the various operational modes. Although it will require an initial investment of time to become acquainted with the various icons and symbols, you'll soon agree that your Insight is easy to understand and use.

Due to the importance that you understand the Insight thoroughly prior to using it, information will be expanded upon and some refreshed as you proceed. Relax and read through the complete owner's manual.

It is extremely important that you:

- **Read this dive computer manual in sequence and understand it completely before attempting to use the Insight.**
- **Check the Insight frequently during your dive.**
- **You must also be a trained diver, certified by a recognized training agency in SCUBA diving.**
- **Prior to using the oxygen related features of the Insight, you must also be trained and certified for diving with enriched nitrogen-oxygen (nitrox) breathing gas mixtures by a recognized training agency.**

Remember that the rules you learned in your basic SCUBA certification course still apply to the diving you will do while using a dive computer - some will become even more important. 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.

WARNING: Inspect your Insight prior to every dive, checking for any signs of the entrance of moisture, damage to the buttons, or damage to the LCD display. If these or other signs of damage are found, return the unit to an Authorized Sherwood Scuba Dealer. DO NOT attempt to use it until it has received factory service.

CONTROL BUTTONS

The Insight is a unique dive computer with interactive controls that allow you to select various display options and access specific information when you choose to see it. These are referred to as the **L (LEFT) (L)** and **R (RIGHT) (R)** buttons (Fig. 1).

The control buttons can be pressed repeatedly, or held in to scroll and continue as you set or access different display modes.

On the surface the control buttons are used to activate the Insight; activate the backlight; access the Date/Time, Fly, Plan, and Log modes; set variables such as FO2, Date/Time, etc.

The buttons can also be used to access an External Access mode to download (copy) dive data to a unique PC log/profile program.

Underwater, the buttons are used to activate the backlight and view Alternate displays of information.

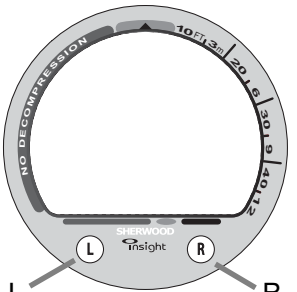


Fig. 1 - Control Buttons

INTUITIVE DISPLAYS

The Insight uses Sherwood Scuba's unique Dive Profile Diagram (Fig. 2a) and easy to understand symbols, displaying information where you would expect it to be when looking at a log profile.

When you enter Special Situations, such as Decompression, High PO2, High O2, and Out of Range modes, an UP Arrow symbol (Fig. 2b) will appear in the middle portion of the display as a warning that a controlled ascent is required.

It is imperative that you understand the formats, ranges, and values of the information presented by the Insight's numeric and graphic displays to avoid any possible misunderstanding that could result in error.

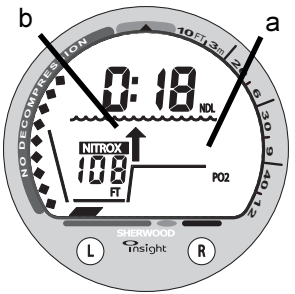


Fig. 2 - Profile & Arrow Symbols

NOTE: Throughout this dive computer manual reference is made to the term "breathing gas'. The rationale being that the Insight 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.

BAR GRAPHS

Two segmented bar graphs appear around the perimeter of the screen 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** and you are not getting too close to the no decompression limit or ascending too fast.

Ascent Rate Indicator (ARI)

The Ascent Rate Indicator located along the bottom of the LCD (Fig. 3a) is provided to help you avoid excessive Ascent Rates by providing a visual representation of ascent speed, rather than just showing that you are ascending too fast.

The LCD displays up to 5 segments that may be considered an Ascent Rate speedometer. Green is a 'normal' rate, yellow a 'caution' rate, and red is 'Too Fast'. The segments of the Ascent Rate Indicator represent 2 sets of speeds which change at a reference depth of 60 feet (18 meters). Refer to the chart at the right for segment values.

When your ascent rate exceeds the maximum recommended rate of 60 feet (18 meters) per minute when deeper than 60 feet (18 meters) or 30 feet (9 meters) per minute when shallower than 60 feet (18 meters), the bar graph segments will enter the red 'Too Fast' zone at which time the Audible Alarm will sound and all 5 segments will flash once per second until your ascent speed is slowed.

Deeper than 60 feet (18 m)

Segments Displayed	Ascent Rate = FPM	MPM
0	0-20	0 - 6
1	21-30	6.5-9
2	31-40	9.5-12
3	41-50	12.5-15
4	51-60	15.5-18
5	>60	>18

60 feet (18 m) & Shallower

Segments Displayed	Ascent Rate = FPM	MPM
0	0-10	0 - 3
1	11-15	3.5-4.5
2	16-20	5-6
3	21-25	6.5-7.5
4	26-30	8-9
5	>30	>9

Ascent Rate Indicator

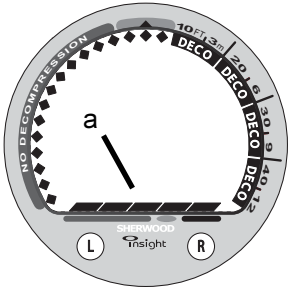


Fig. 3 - ARI

Nitrogen Bar Graph (NiBG)

The Nitrogen Bar Graph located around most of the perimeter of the LCD (Fig. 4a) represents tissue loading of nitrogen, showing your relative no decompression or decompression status. As your depth and elapsed dive time (BT) increase, segments will add to the graph, and as you ascend to shallower depths, the bar graph will begin to recede, indicating that additional no decompression time is allowed for multilevel diving.

The Nitrogen Bar Graph also assists you with managing decompression by filling red 'ceiling stop required' segments which are described in more detail in the Special Situations section of this manual.

The Nitrogen Bar Graph monitors 12 different nitrogen compartments simultaneously and displays the one that is in control of your dive at that time. It is divided into a green No Decompression zone, a yellow Caution zone, and a red DECO (decompression) zone.

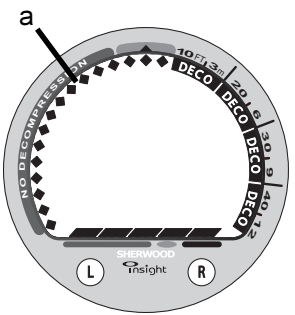


Fig. 4 - Nitrogen BG

The yellow Caution zone gives a visual representation of just how close you are to the no decompression limit which allows you to make a decision regarding safety stop duration or necessity.

The red DECO zone alerts you to focus your attention on the current required DECO stop 'ceiling' depth indicated by the bar graph segment. When stop depths of 50 FT (15 M) and 60 FT (18 M) are required, all red segments are displayed and the required stop depth (50 or 60, or 15 or 18) is displayed numerically.

DEPTH DISPLAYS

The **Depth** display indicates Depths from 0 to 330 feet (99.5 meters) in 1 foot (.5 meter) increments.

During a dive, **Current Depth** is displayed continuously on the Main display with the symbol FT (or M) below it (Fig. 5a).

When the L (LEFT) button is pressed 1 time to view the first Alternate display, **Maximum Depth** and the symbols MAX and FT (or M) are displayed in place of Current Depth.

In the event that you descend deeper than 330 feet (99.5 meters), the Depth display will show three dashes (- - -) to indicate that you have gone 'out of range'. This is described in more detail in the Special Situations section of this manual.

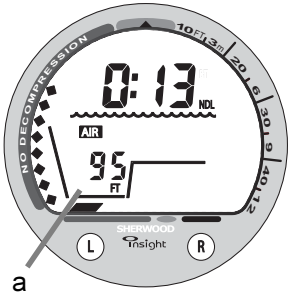


Fig. 5 - Depth (95 FT)

During a Decompression Dive, required **Ceiling Stop Depths** of 50 FT (15 M) and 60 FT (18 M) are displayed in the lower/right portion of the LCD. This is described in more detail in the Special Situations section of this manual.

DATE DISPLAY

The **Date** is displayed when the Insight is in Surface Mode (Fig. 6a/b). It is not displayed in any other modes on the surface or during Dive Modes.

Fig. 6 - Date (June 13)

TIME DISPLAYS

The Insight has three time displays.

The largest display is the **Main Time** display (Fig. 8 - top row of digits). Indicated are theoretical No Decompression Limit (NDL), Oxygen Tolerance Limit (OTL), Elapsed Dive Time (BT), Total Ascent Time (TAT), or Surface Time with the Wave symbol below it, depending on the operating mode that the Insight is in.

A second Time display (Fig. 8 - middle row of digits) indicates Decompression Stop Time required at the stop depth indicated, or Time to Desaturate after a dive, depending on the operating mode that the unit is in.

The third Time display (Fig. 8 - bottom row of digits) indicates Time of Day, or Time to Fly after a dive, depending on the operating mode that the unit is in.

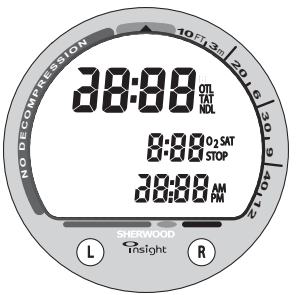


Fig. 8 - Time Displays

Each display is described in more detail in subsequent sections of this manual.

Time displays are shown in hour:minute format (i.e., 1:09 represents one hour and nine minutes, not 109 minutes!). The colon that separates hours and minutes blinks once per second when the display is indicating real time such as Surface Time, Bottom Time, and Time of Day. NDL, OTL, TAT, Deco Stop Time, Time to Fly, and Time to Desaturate are calculated projections of Time and use a solid (non-blinking) colon to indicate that they are counting down.

TEMPERATURE DISPLAY

While in the Surface Mode, Ambient Temperature (Fig. 9a) will be displayed for 10 seconds in place of Surface Time when the L (LEFT) button is pressed. During a dive, Water Temperature is displayed when the L (LEFT) button is pressed 2 times to view the Second Alternate display.

If the Temperature exceeds a value of '99', two dashes (- -) will be displayed on the screen until the unit's temperature decreases to '99'.

BACKLIGHT FEATURE

On the surface, while in Surface Mode or Fly Mode, the Insight's HydroGlo® Backlight will illuminate the display when the R (RIGHT) button is pressed and released. If the button is kept depressed, the Backlight will not come on.

During a dive, the Backlight will illuminate the display when the R (RIGHT) button is pressed. The display will remain illuminated as long as the Button is pressed, plus 10 seconds after being released.

OPERATING TEMPERATURE

The Insight will operate in water temperatures from 28° to 95° F (-2 to 35 °C) and out of the water from 20° to 140°F (-6 to 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), warm the module and battery with body heat before diving.

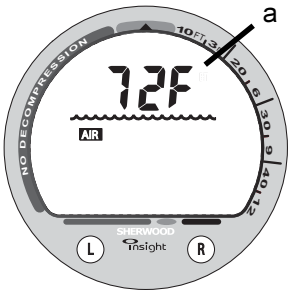


Fig. 9 - Temperature

AUDIBLE ALARM

When Cautionary situations activate the Alarm, the Insight will emit a beeping sound as a warning. When the situation corrected, the Alarm will cease. It will sound again if the same condition returns, or another Alarm condition occurs.

A single BEEP is emitted -

- after the unit performs a Diagnostic check upon push button activation.
- upon ascending to the No Deco Safety Stop depth of 20 FT (6 M).

One BEEP per second is emitted for 10 seconds-

- upon entry into Decompression Mode.
- when PO2 reaches 1.40 ATA.
- when PO2 reaches 1.60 ATA.
- upon Ascending above a Required Decompression Stop Depth.
- upon Descending deeper than 330 FT (99.5 M).
- when Ascent rate exceeds 60 FT (18 M) per minute when depth is greater than 60 FT (18 M), or 30 FT (9 M) per minute at 30 FT (9 M) or shallower. The Beeping will continue until the Ascent speed is reduced.
- when O2 Accumulation becomes equal to or greater than allowable per dive limit, or limit for a 24 hour period.
- when the Decompression obligation requires a Stop Depth greater than 60 FT (18 M).

A single long BEEP is emitted for 3 seconds -

- when above a required Decompression Stop Depth for more than 5 minutes.
- when the Decompression obligation requires a Stop Depth greater than 70 FT (21 M).
- upon being on the surface for 5 minutes after a Delayed Violation (described in the Special Situations section).

ACTIVATION
and
SETUP

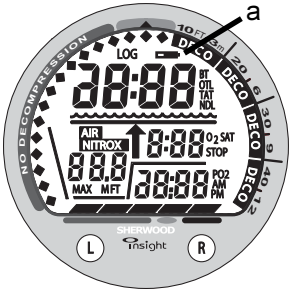


Fig. 10 - Diagnostic Mode

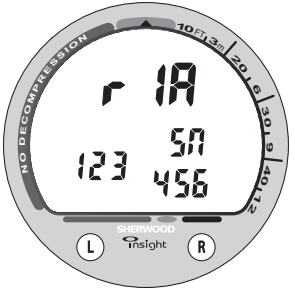


Fig. 11 - Serial Number

ACTIVATION

PUSH BUTTON (PRIMARY METHOD)

To **activate** the Insight, press the R (R (RIGHT)) button once and release. It will immediately enter **Diagnostic Mode**, displaying all "8's" (Fig. 10), followed by "dashes", and a countdown from 9 to 0. The left digit of the Main Time display and the lower Time display do not contain segments in their top/left positions.

While conducting diagnostics, the display is illuminated by the backlight as it checks its display functions to ensure that everything is working properly and that battery voltage is sufficient to complete a full day of diving. If there is not enough battery voltage, the unit will either deactivate itself or would not have activated at all.

STOP **WARNING: If the Low Battery symbol (Fig. 10a) is still displayed following diagnostics, Sherwood Scuba strongly recommends that you DO NOT dive until the battery is replaced.**

When the R button is held depressed as the Diagnostic countdown reaches 00, a Serial Number screen appears displaying the unit's firmware code Revision Number and Serial Number for as long as the button is held depressed (Fig. 11). Upon releasing the button, the unit shuts Off.

The unit will automatically turn OFF 2 hours after activation if no dive is made. If the water activation contacts are still bridged (the unit is wet), it automatically reactivates.

WATER CONTACT ACTIVATION (BACKUP METHOD)

NOTE: Water contact will only activate the unit if the Wet Activation feature is Set ON (a user setting).

The Insight has several contacts that cause it to activate, when the space between the contacts is bridged by a conductive material (e.g., water contact), and enter Surface Mode.

If the Wet Activation feature is Set ON and the water contacts are bridged when the unit shuts Off, it will automatically reactivate.

WARNING: Never attempt to activate the Insight underwater. This may result in inaccurate Depth and No Decompression time displays. If the unit is activated when deeper than 4 FT (1.2 M) underwater, or at elevations higher than 14,000 feet (4,270 meters), it will perform a diagnostic check followed by immediate shutdown.

Upon activation and every 30 minutes while on the surface, the Insight will also check the ambient barometric pressure, and calibrate its present Depth as zero. At elevations of 2,000 feet (610 m) or higher, it will recalibrate itself to provide adjusted No Decompression and O2 limits.

WARNING: If any display or function varies from the information presented here, return the Insight to your Authorized Sherwood Scuba Dealer for inspection.

SURFACE MODE

Surface Mode, identified by the Surface Wave symbol (Fig. 12a), immediately follows Diagnostic Mode after activation.

Information displayed includes Surface Time (Fig. 12b) with colon flashing, Date (Fig. 12c/d) and Time of Day (Fig. 12e) with AM or PM symbol (if set for 12 Hour Format), and the AIR (or NITROX) symbol (Fig. 12f).

ENTERING SETTINGS

The Set Mode allows you to set, or verify, FO2 50% Default (On or Off), Units of Measure (Imperial or Metric), 12/24 Hour Format, Date/Time, Alarms On/Off, Wet Contact Activation On/Off, and Dive Profile Sampling Rate (for download data).

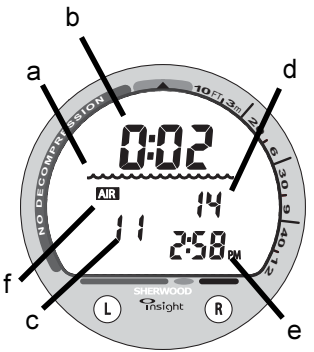


Fig. 12 - Surface Mode

WARNING: FO2 and Date/Time must be reset when the Battery is removed for more than 8 seconds .

While in the Set Mode, the L (L (LEFT)) button is used to advance through the available settings, and the R (R (RIGHT)) button is used to select the set point from those available.

NOTE: If the Insight is left unattended (no buttons pressed) for 2 minutes while in the Set Mode, it will automatically revert to Surface Mode.

SET MODE ACCESS

- To access the **Set Mode** while in the Surface Mode, press BOTH buttons simultaneously and release them when the Set FO2 Default screen appears with the set point (ON or OFF) flashing.

- To bypass a setting that you do not wish to change, press the L (L (LEFT)) button to move to the next setting in the Sequence (Fig. 13).

- While in Set Mode, operation will automatically revert to Surface Mode if there is no button action for a period of 2 minutes.

SURFACE MODE THEN -
1 - FO2 50% DEFAULT
2 - UNITS
3 - EXTERNAL ACCESS
4 - YEAR
5 - MONTH
6 - DAY
7 - HOUR FORMAT
8 - HOUR
9 - MINUTE
10 - SAMPLE RATE
11 - AUDIBLE ALARM
12 - WET ACTIVATION

Fig. 13 - Set Mode Sequence

TO SET FO2 (50%) DEFAULT - ON/OFF

Factory set for ON, the FO2 50% Default feature can also be set OFF.

- ON = FO2 Value set point reverts to 50% after dives (FO2 must be set prior to each dive)
- OFF = FO2 Value set point remains at the % set until changed or shut down

- press BOTH buttons while in Surface Mode, release when FO2 50 ON (or OFF) appears with ON, or OFF, flashing (Fig. 14)

- press the R (R (RIGHT)) button to toggle between ON and OFF
- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode

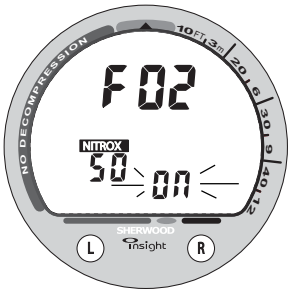


Fig. 14 - Set FO2 Default

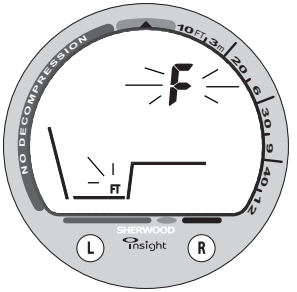


Fig. 15 - Set Units

TO SET UNITS OF MEASURE

Factory set for Imperial Units of Measure (F, FT), Units can also be set for Metric (C, M).

- press BOTH buttons while in Surface Mode, release when FO2 50 ON (or OFF) appears
- press the L (L (LEFT)) button 1 time to access Set Units
- F and FT (or M and M) appear flashing (Fig. 15)

- press the R (RIGHT) button to toggle between Imperial (F and FT) and Metric (C and M)
- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode

EXTERNAL ACCESS (EA) MODE

This mode does not have any set points or selections. It provides you access to the PC download feature described later in the Post Dive Mode section.

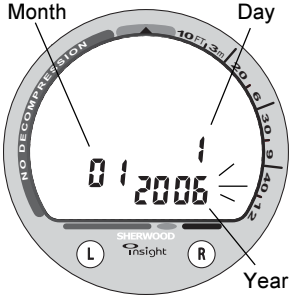


Fig. 16 - Set Date (Imperial)

TO SET DATE/TIME

Factory set for January 1, 2006, 12:00 AM (midnight), Date/Time can be set for your location.

- press BOTH buttons while in Surface Mode, release when FO2 50 ON (or OFF) appears
- press the L (L (LEFT)) button 3 times to access the DATE screen
  (If Units of Measure are set for Metric, the Month appears to the upper/right of the Year.)
- The DATE screen appears with the YEAR flashing (Fig. 16).

Hint: To bypass a display that is flashing, do not press the R (R (RIGHT)) button, instead press the L (L (LEFT)) button to move to the next function.

SETTING DATE/TIME

When the DATE screen appears with the YEAR flashing -

- press and hold the R (RIGHT) button until the correct YEAR appears
- press the L (LEFT) button once. The MONTH set point flashes.
- press and hold the R (RIGHT) button until the correct MONTH appears
- press the L (LEFT) button once. The DAY set point flashes.
- press and hold the R (RIGHT) button until the correct DAY appears
- press the L (LEFT) button once.

- The HOUR FORMAT screen appears with the set point flashing (Fig. 17).
- press and release the R (RIGHT) button to toggle between ON and OFF
- press the L (LEFT) button once.

- The TIME screen appears with the HOUR flashing (Fig. 18).
- press and hold the R (RIGHT) button until the correct HOUR appears
- press the L (LEFT) button once. The MINUTE flashes.
- press and hold the R (RIGHT) button until the correct MINUTE appears

- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode

Fig. 17 - Set Hour Format

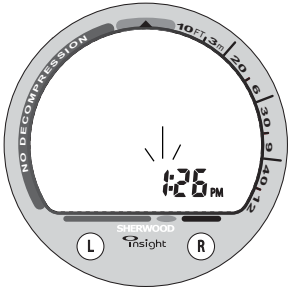


Fig. 18 - Set Time

Fig. 19 - Set Sample Rate

TO SET DIVE PROFILE DATA SAMPLING RATE

This setting allows you to select the rate that the Insight samples data for on board storage in memory for subsequent download to the PC software program. It does not affect the rate that data is sampled for operational calculations and displays.

Factory set for 30 seconds, the Sample Rate can also be set for 15 or 60 seconds .

- press BOTH buttons while in Surface Mode, release when FO2 50 ON (or OFF) appears
- press the L (LEFT) button 9 times to access Set Sampling Rate
- SEC and the numeric Rate appear with the Rate flashing (Fig. 19)
- press the R (RIGHT) button until the desired RATE appears
- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode

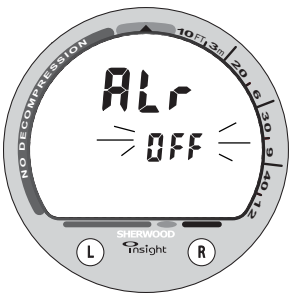


Fig. 20 - Set Alarm

TO SET ALARMS - ON/OFF

Factory set for ON, the Alarms can also be set for OFF.

- press BOTH buttons while in Surface Mode, release when FO2 50 ON (or OFF) appears
- press the L (LEFT) button 10 times to access Set Alarms
- the graphic ALr appears with ON, or OFF, flashing (Fig. 20)

- press the R (RIGHT) button to toggle between ON and OFF
- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode

TO SET WET ACTIVATION - ON/OFF

Factory set for On, Wet Activation can also be set for OFF.

WARNING: When set Off, the Insight must be activated by pushing the R (RIGHT) button prior to commencing a dive.

- press BOTH buttons while in Surface Mode, release when FO2 50 ON (or OFF) appears
- press the L (LEFT) button 11 times to access Set Wet Activation
- the graphic H2O appears with ON, or OFF, flashing (Fig. 21)

- press the R (RIGHT) button to toggle between ON and OFF
- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode

Fig. 21 - Set Wet Activation

CLEAR (RESET)

The Insight is configured with a feature that allows calculations pertaining to a dive series in progress to be interrupted. Activation of this feature will delete all data accumulated during the dive series necessary for planning a next dive and should only be performed if the user plans to suspend diving for at least 24 hours.

This feature is present to provide institutional users of the computer a means to provide a "clean" computer to subsequent users without having to wait for the computer to complete all calculations in real time. This practice requires strict control to ensure that the "clean" computer is not used by a diver that has been diving within the preceding 24 hours. Failure to follow this practice could adversely affect the accuracy of subsequent calculations by failing to account for previous exposure to elevated nitrogen and oxygen partial pressures.

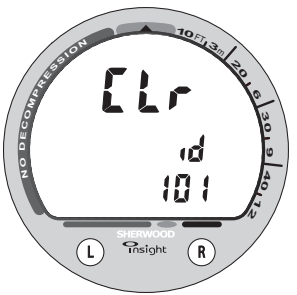


Fig. 22 - Clear

WARNING: Do not attempt to activate the CLEAR (Reset) function on your computer. Proper activation of this feature requires controlled procedures and is restricted to authorized personnel.

WARNING: Improper activation of this feature could expose the user to elevated risk of decompression sickness or oxygen toxicity. This is a serious risk and could result in injury or death.

WARNING: If the CLEAR (Reset) screen appears (Fig. 22), cease all operation of the unit's buttons and wait until Surface Mode appears on the display (2 minutes). If the unit shuts Off completely, all calculations for repetitive dives will be cleared in which case you must wait at least 24 hours before resuming diving activity.

PRE DIVE
and
DIVE
MODES

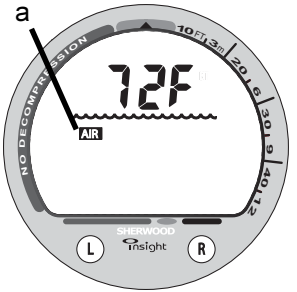


Fig. 23 - Temperature
(Set for Air Operating Mode)

Fig. 24 - Set for Nitrox

PRE DIVE MODES

While in the Surface Mode, press the L (LEFT) button to view Temperature (Fig. 23). Press the R (RIGHT) button to activate the HydroGlo™ backlight.

The L (LEFT) button is also used to access FO2, Plan, Fly, and Log Modes.

NOTE: Fly and Log modes are considered Post Dive modes and are described in the next section of this manual.

FO2 MODE

The Insight can be set for use 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 (e.g., a numerical value between 21 and 50 %).

If your Insight is set for use with Air as your breathing gas, the symbol **AIR** will be displayed (Fig. 23a) during all modes except the Set, Fly, and Gauge modes. If it is set for use with Nitrox, the symbol **NITROX** will be displayed (Fig. 24a).

WARNING: When set for use with Nitrox, you must verify that the FO2 setting correctly matches the Nitrox Mix being used prior to each Nitrox dive.

FO2 SET FOR USE WITH AIR

When FO2 is set for AIR (Fig. 25), the Insight will perform calculations the same as if FO2 were set for 21%, internally accounting for oxygen loading for any subsequent Nitrox dives.

Once a dive is made with the unit set as a NITROX computer (e.g., FO2 set for a numerical value), the unit cannot be programmed to operate as an AIR computer until 24 hours after the last dive. AIR will not be displayed as an option in the FO2 Set Mode. You can however set FO2 for 21% for use with Air.

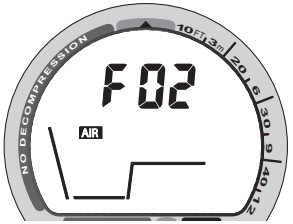


Fig. 25 - FO2 Set For AIR

FO2 SET FOR USE WITH NITROX

If FO2 is set at a value of 21% (Fig. 26), the unit will remain set as a 21% NITROX computer for subsequent dives until FO2 is set to a higher value (22 to 50%), or until it automatically turns off and is reactivated.

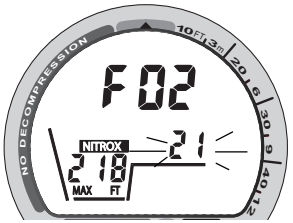


Fig. 26 - FO2 Set for 21%

WARNING: When the FO2 default is set On, the FO2 value must be set for <u>each</u> repetitive nitrox dive, or the value will automatically be 50 and the dives will be calculated based on 50% O2 for oxygen calculations and 21% O2 (79% nitrogen) for nitrogen calculations.

FO2 50% Default ON

When the FO2 50% Default feature is set **ON** and FO2 is set at a value of 22 to 50% to match the nitrox mix being used for that nitrox dive, the FO2 setting after that dive will automatically default to a value of 50% (Fig. 27A).

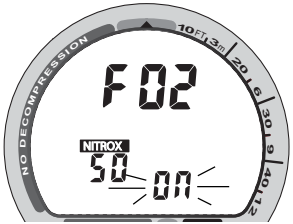


Fig. 27A - FO2 Default ON

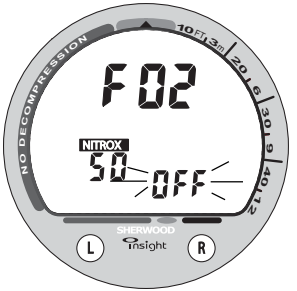


Fig. 27B - FO2 Default OFF

WARNING: If you surface for <u>greater than 10 minutes</u> during a dive and the FO2 Default is set On, a subsequent descent will be considered a new dive and the FO2 value must be reentered.

FO2 50% Default OFF

When FO2 is set for a numerical value (Nitrox Mode) and the FO2 Default feature is set **OFF** (Fig. 27B), the FO2 setting will remain fixed until another value is selected or the unit shuts Off. Upon reactivation, the unit operates in Air Mode until changed to Nitrox Mode.

Setting FO2 for Use with Nitrox

To set FO2 for the percentage of oxygen (FO2) in your specific Nitrox mix:

- press the L (LEFT) button <u>2 times</u> while in Surface Mode (Surf > Temp > FO2)
- The FO2 screen appears displaying the symbol AIR or NITROX (Fig. 28a).

- If AIR is displayed, press the R (RIGHT) button to change to Nitrox Mode and scroll the FO2 set point to the Value required (Fig. 28b).
  - The percentage displayed will advance 1% per second from 21 to 50%.
  - The **Depth** display simultaneously indicates the **Max**imum **Depth** (Fig. 28c) that can be achieved for an oxygen partial pressure (PO2) of 1.60 ATA for each of the FO2 Values.
- when the proper value of FO2 is displayed, release the button.
- press the L (LEFT) button to revert to Surface Mode

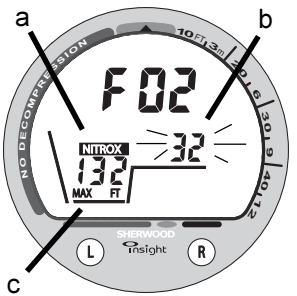


Fig. 28 - FO2 Set for 32%

PLAN MODE

NOTE: Sherwood Scuba strongly recommends that you access and review the Plan Mode 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 Plan Mode indicates adjusted no decompression limits, or oxygen tolerance limits, available for your next dive, based on any residual nitrogen and oxygen accumulation following your last dive and surface interval.

WARNING: The Plan Mode predicts only no decompression 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.

With each Depth displayed in the Plan Mode, you will see either 'predicted' no decompression limits (NDL) based upon your previous dive profiles, if calculated to be nitrogen controlled, or 'predicted' oxygen tolerance limits (OTL) based upon either a single dive exposure or your 24 hour accumulation of oxygen, if calculated to be oxygen controlled.

When Nitrogen is in control, the symbol NDL will be displayed (Fig. 29a). When Oxygen is in control, the symbol OTL will be displayed (Fig. 30a).

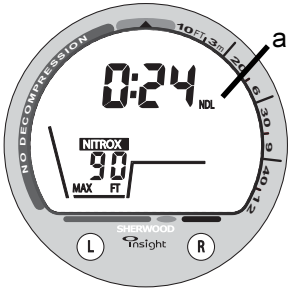


Fig. 29 - Nitrogen Control

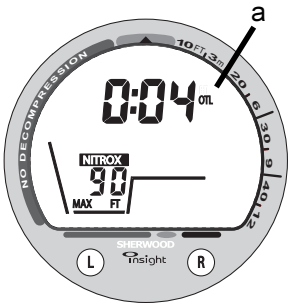


Fig. 30 - Oxygen Control

Depth FT (M)		NDL hr:min	
30	(9)	4:20	(4:43)
40	(12)	2:17	(2:24)
50	(15)	1:21	(1:25)
60	(18)	:57	(:59)
70	(21)	:40	(:41)
80	(24)	:30	(:32)
90	(27)	:24	(:25)
100	(30)	:19	(:20)
110	(33)	:16	(:17)
120	(36)	:13	(:14)
130	(39)	:11	(:11)
140	(42)	:09	(:09)
150	(45)	:08	(:08)
160	(48)	:07	(:07)
170	(51)	:07	(:06)
180	(54)	:06	(:06)
190	(57)	:05	(:05)

No Decompression Limits for an Air Dive at Sea Level (no dive made yet)

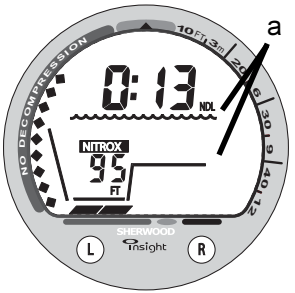


Fig. 31 - No Deco Main

No decompression times are only displayed for depths where there are at least 3 minutes of dive time available at the depth, taking into account a descent rate of 60 FT (18 M) per minute. Depths greater than the maximum depth that can be achieved with a PO2 of 1.60 BAR will not be displayed.

To access and view the Plan Mode while in Surface Mode:

- press the L (LEFT) button 3 times, while in Surface Mode (Surf > Temp > FO2 > Plan)
- press and release the R (RIGHT) button to advance through the sequence of Depths from 30 to 190 FT (9 to 57 M) in 10 FT (3 M) increments
- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode

STOP **WARNING: If the Wet Activation feature is Set OFF, the Insight must be manually activated prior to start of a dive. The unit will not activate automatically by immersion in water unless the Wet Activation feature is Set ON. Refer also to the Warning on page 72.**

NO DECOMPRESSION DIVE MAIN DISPLAY (FIG. 31)

The Insight will enter the No Decompression Dive Mode when you descend to 5 FT (1.5 M). This mode is identified by the Wave and Dive Profile symbols (Fig. 31a).

- Dive Time Remaining with symbol NDL (or OTL) and Current Depth with symbol FT (or M) will be displayed.
- The operating mode symbol AIR (or NITROX) will also be displayed.
- The Bar Graphs will indicate nitrogen loading and ascent rate.
- Pressing the R (RIGHT) button will activate the HydroGlo™ backlight.

No Decompression Dive Mode Alternate Display 1 (Fig. 32)

To view Alternate Display 1, press the L (LEFT) button 1 time.

Bottom Time (BT), Maximum Depth (MAX), and (if set for Nitrox) percentage of Oxygen Saturation (O_2SAT) and level of PO2, will be displayed for 10 seconds.

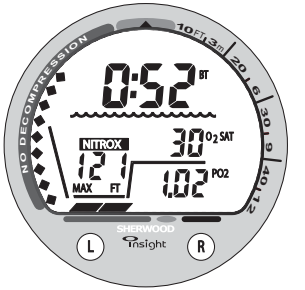


Fig. 32 - No Deco Alternate 1

No Decompression Dive Mode Alternate Display 2 (Fig. 33)

To view Alternate Display 2, press the L (LEFT) button 2 times while viewing the Main Display, or 1 time while viewing Alternate Display 1.

Water Temperature (F or C), Time of Day (AM or PM), and (if set for Nitrox) the FO2 value set will be displayed for 10 seconds.

Bar Graphs

As your Depth and Bottom Time increase during a dive, the Nitrogen Bar Graph will fill with segments (green toward red) to represent nitrogen loading. Segments of the Ascent Rate Indicator fill (and recede) as your Ascent Rate increases (and decreases) throughout the dive.

WARNING: Every effort should be made to keep each of the bar graphs *in the green* throughout your dives.

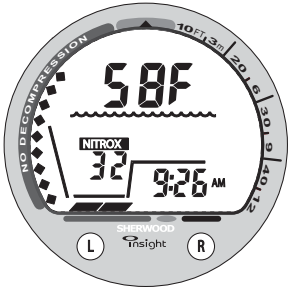


Fig. 33 - No Deco Alternate 2

NO DECOMPRESSION DIVE MODE SAFETY STOP

Upon ascending to 20 FT (6 M) on any No Decompression dive in which Depth exceeded 30 FT (9 M), a single beep Alert is sounded and a Safety Stop screen appears with a countdown timer beginning at 3:00 (min:sec) and counting down to :00.

The Safety Stop is not mandatory and there is no penalty if you surface during the countdown period.

In the event that you descend below 30 FT (9 M) during the countdown, the No Deco Main screen replaces the Safety Stop screen which reappears upon ascent to 20 FT (6 M).

Displayed from left to right and top to bottom are (Fig. 34) -

- Dive Time Remaining (min) and graphic NDL (or OTL)
- Mode icon AIR (or NITROX)
- Countdown Timer (min:sec) and graphic STOP
- Current Depth and graphic FT (or M)
- Safety Stop Depth of 20 FT (or 6 M) in the lower/right portion of the screen
- Applicable Bar Graphs - NiBG, ARI

Pressing the L (LEFT) button activates the Backlight.
Pressing the R (RIGHT) button accesses Alternate Displays.

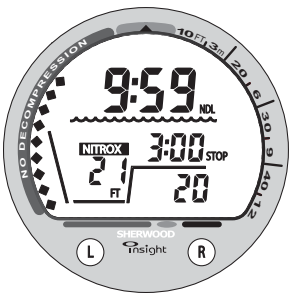


Fig. 34 - No Deco Safety Stop

POST DIVE MODES

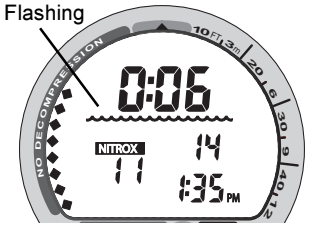


Fig. 35 - Transition Period

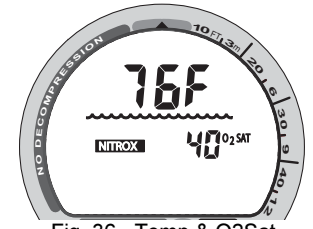


Fig. 36 - Temp & O2Sat

Fig. 37 - Log Mode

POST DIVE SURFACE MODE

When you ascend to 3 FT (1 M) or shallower, the Insight will enter Surface Mode 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 top to bottom (Fig. 35):

- Main Time display counting Surface Interval (colon flashing).
- Wave symbol flashing to indicate Surface Mode (the Dive Profile symbol disappears).
- Operating mode symbol AIR (or NITROX).
- Date (shown is 6/13) and Time (11:15 AM)
- Nitrogen Bar Graph indicating current nitrogen loading.

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 Bottom Time.

To view the Temperature and O2SAT (Fig. 36), press the L (LEFT) button 1 time.

- The unit will revert to Surface Mode after 10 seconds.

To view that dive's Log (Fig. 37), press the L (LEFT) button 2 times, then-

- press the R (RIGHT) button 1 time to view the Nitrogen data screen*
- press the R (RIGHT) button again to view the Oxygen data screen*

(* Nitrogen and Oxygen data screens are described on page 44.)

- The unit will revert to Surface Mode after 2 minutes.

NOTE: Data will not be stored in the unit's Log and Download memory until the 10 minute Transition Period on the surface is completed. Also, no other modes are accessible.

Fig. 38 - Surface Mode

AFTER THE TRANSITION PERIOD (THE FIRST 2 HOURS)

Once 10 minutes have elapsed, the Wave symbol stops flashing indicating that the dive and Transition Period are completed, and a subsequent descent will be considered a new dive. That dive will then be entered into the Dive Log and download memory.

For the remainder of the **first 2 hours after surfacing**, information will continue to be displayed as Surface Mode (Fig. 38) and you will have full access to the other modes.

To view the Temperature and O2SAT:

- press the L (LEFT) button 1 time, while in Surface Mode (Surf > Temp)
- The unit will revert to Surface Mode after 10 seconds.

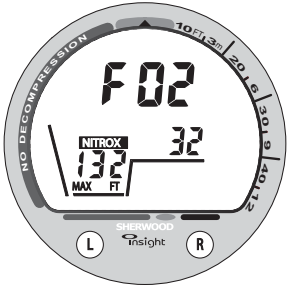


Fig. 39 - FO2 Set Mode

To access FO2 Mode (Fig. 39):

- press the L (LEFT) button 2 times, while in Surface Mode (Surf > Temp > FO2)
- If the FO2 Default was set OFF, the FO2 displayed will be the same value previously set.
- If the FO2 Default was set ON, the FO2 displayed will be the 'Default value' of 50 and will have to be set for the breathing gas used for the next dive.
- press the R (RIGHT) button to alter the FO2 setting, if required
- The unit will revert to Surface Mode after 2 minutes, unless the L (LEFT) button is pressed to access the Plan Mode.

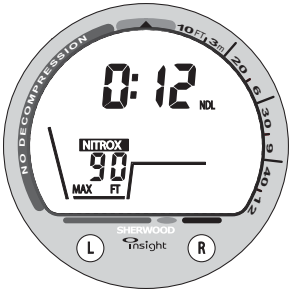


Fig. 40 - Adjusted NDLs

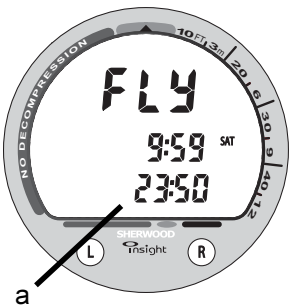


Fig. 41 - Fly/DeSat

To access Plan Mode:

- press the L (LEFT) button 3 times, while in Surface Mode (Surf > Temp > FO2 > Plan)
- press the R (RIGHT) button to scroll through the sequence of available Depths/Times.
- The unit will revert to Surface Mode after 2 minutes, unless the L (LEFT) button is pressed to access the Log Mode.

The **Plan Mode** will now show either adjusted no decompression limits based upon your previous dive profiles, if calculated to be nitrogen controlled (Fig. 40), or adjusted oxygen tolerance limits based upon either a single dive exposure or your 24 hour accumulation of oxygen, if calculated to be oxygen controlled. The symbol NDL, or OTL, will indicate which is in control.

The Plan Mode will only display Depths/Times to the Maximum Depth allowed by the nitrogen or oxygen limit, whichever is in control. Calculated dive times and the maximum allowed depth displayed will increase as the real time Surface Interval increases after completion of a dive.

To access Fly/Desat Mode countdowns (Fig. 41):

- press the L (LEFT) button 4 times, while in Surface Mode (Surf > Temp > FO2 > Plan > Fly)
- The unit reverts to Surface Mode after 2 minutes, unless the L (LEFT) button is pressed to access Log Mode.

The Time to Fly counter (Fig. 41a) begins counting down 10 minutes after the last dive (after the Transition Period) displaying FLY with a countdown that starts at 23:50 (hr:min) and counts down to 0:00 (hr:min).

The Desat counter (Fig. 42a) provides calculated time for tissue desaturation at sea level. It begins 10 minutes after the last dive displaying SAT with a countdown that starts at 9:59 (hr:min) maximum and counts down to 0:00 (hr:min).

If Time to Desaturate is calculated to be greater than 9:59 (hr:min), the display will indicate 9:++ (Fig. 43a) until the time decreases to 9:59.

If a Violation occurred during the dive, Time to Desaturate will not be displayed and a single dash (-) will appear instead of the letters FLY.

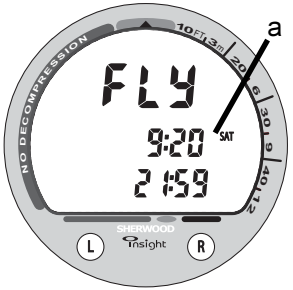


Fig. 42 - Fly/DeSat

LOG MODE

Information from your latest 50 dives is stored in the **Log** for viewing. After exceeding 50 dives, the Insight will overwrite the oldest dive in the Log (i.e., the most recent dive deletes the oldest). Log information will not be lost when the battery is removed/replaced, but factory service will delete data.

Log Mode recalls dives in reverse order from the one most recently recorded back to the oldest of the 50 dives stored. Your most recent dive will always be the first shown when Log Mode is accessed. Each dive has three Log screens - Date/Time started, Nitrogen data, and Oxygen data.

Dives are identified by the Dive Number (for that activation period) and Date/Time started. The first dive of a new Activation Period will be #1.

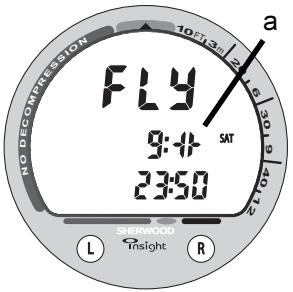


Fig. 43 - DeSat > 9:59

Fig. 44 - Log Screen 1

The L (LEFT) button is used to access (or bypass) dives in the Log and the R (RIGHT) button to view second and third screens for that dive (Nitrogen and Oxygen related data).

To access the Log Mode (10 minutes after a dive):

- press the L (LEFT) button 5 times, while in Surface Mode, or 1 time, while viewing Fly/ Desat
- the first screen (**Dive Identifier** - Fig. 44) of the most recent dive will appear displaying -
    - LOG symbol and Dive Number (1 to 50)
    - AIR (or NITROX) symbol
    - Date/Time the dive started

Hint: To 'bypass' this dive's Log to view an older dive's Log, press the L (LEFT) button repeatedly until that dive's Log appears.

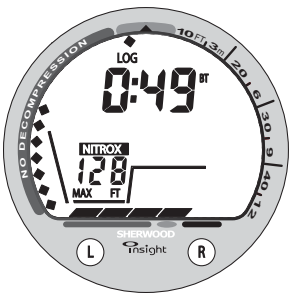


Fig. 45 - Log Screen 2

To view the second screen for that dive **(Nitrogen Data-** Fig. 45):

- press the R (RIGHT) button 1 time**.** Information includes -
    - LOG, AIR (or NITROX), and Dive Profile symbols
    - Elapsed Dive Time and symbol BT
    - Maximum Depth reached and symbols MAX and FT (or M)
    - Ascent Rate Indicator - showing the maximum ascent rate maintained for 4 consecutive seconds during the dive
    - Nitrogen Bar Graph - showing tissue nitrogen loading at the time you surfaced from the dive. It will also display the segment that reflects the maximum nitrogen loading that was achieved during the dive (Fig. 45a).

To view the third Log screen for that dive (**Oxygen Data** - Fig. 46):

- press the R (RIGHT) button 1 time, while viewing Nitrogen Data. Information displayed includes -
  - LOG, NITROX, and Wave symbols
  - Surface Interval - prior to that dive
  - FO2 value - % set for that dive
  - O2SAT Value (O2 accumulated at the time you surfaced, whichever was higher of per dive or per day) and symbol O2SAT
  - Maximum PO2 Level (reached during that dive) and symbol PO2

- If FO2 was set for AIR for that dive, the O2 screen will only display the symbol AIR.
- press the L (LEFT) button 1 time to view the first screen (Identifier) of the previous dive's Log

Fig. 46 - Log Screen #3

To exit Log Mode and return to the Surface Mode:

- press BOTH buttons simultaneously for 2 seconds to revert to Surface Mode
- 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, Surface Mode will no longer be displayed. The **Fly/Desat Mode** (countdown timers) will be displayed continuously, giving the final countdowns from 22:00 and 9:59 (hr:min) to 0:00 (Fig. 47).

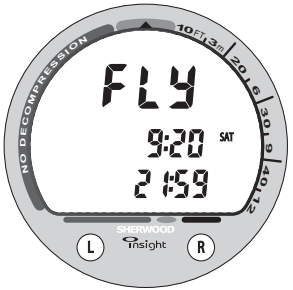


Fig. 47 - 2 Hours After a Dive

To access other modes or enter settings while in Fly/DeSat Mode:

- press the R (RIGHT) button 1 time, while Fly/Desat are displayed
- The Insight will revert to Surface Mode.
- It will return to Fly/Desat Mode again after 2 hours, if neither button is pressed.
- Fly/DeSat can be viewed during the 2 hours by pressing the L (LEFT) button 4 times while in Surface Mode

EXTERNAL ACCESS (EA) MODE

Dive profile data is stored in your Insight's memory for subsequent download to the optional PC program. Instructions for performing the interface and download are provided with the Download hardware/software.

To access the External Access (EA) Mode:

- press BOTH buttons simultaneously, while in Surface Mode
- press the L (LEFT) button 2 times - EA appears, flashing (Fig. 48)
- press the L (LEFT) button to bypass EA Mode, or -
- press the R (RIGHT) button to initiate download communication with the PC. The unit reverts to Surface Mode after 2 minutes, if neither button is pressed.
- The Backlight will not operate while in EA Mode.

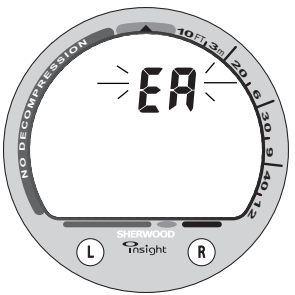


Fig. 48 - EA Mode

SPECIAL SITUATIONS

EMERGENCY DECOMPRESSION

The Insight 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.

WARNING: See pages 61 and 62 for Special Warnings and Additional Safety Information.

NITROGEN BAR GRAPH

The Nitrogen Bar Graph offers you a convenient way to consistently monitor how close you are coming to the No Decompression Limit. As you use the Insight and become familiar with the Nitrogen 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.

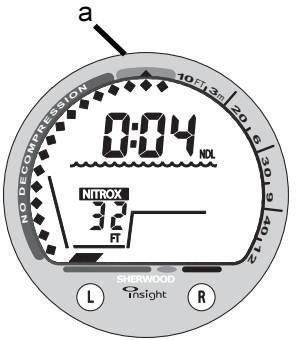


Fig. 49 - No Deco

NOTE: Use the yellow Caution Zone of the Nitrogen Bar Graph (Fig. 49a) as a visual reference to place a wider margin of protection between you and the No Decompression Limit.

Sherwood Scuba suggests keeping the Nitrogen Bar Graph in the green No Decompression zone during all of your dives, and that it always be in the 'green' when leaving the water.

DECOMPRESSION DIVE MODE

The Insight 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, one Beep per second will sound. You then need to immediately begin a safe controlled Ascent to a depth slightly deeper than, or equal to, the Required Ceiling Stop Depth indicated and decompress for the Stop Time indicated.

Entry into Decompression Mode (Fig. 50)

Upon entering Decompression Mode, Wave/Ceiling Bar symbols and UP Arrow symbol appear as a warning in the middle of the screen. The Nitrogen Bar Graph will display a segment next to the deepest Stop Depth required (Fig. 50c). Other information displayed includes:

- Total Ascent Time (TAT) (Fig. 50a) - stop times required at all ceilings plus vertical ascent time calculated at 30 FT (9 M) per minute.
- Operating Mode symbol NITROX (or AIR)
- Stop Time Required (Fig. 50b) - for the Stop Depth indicated
- Current Depth (Fig. 50d)
- Ascent Rate Indicator - while ascending

If a **Stop Depth of 50 FT (15 M) or 60 FT (18 M)** is required, all segments of the Nitrogen Bar Graph will be displayed and the required Stop Depth will appear numerically in the lower/right portion of the screen (Fig. 51a).

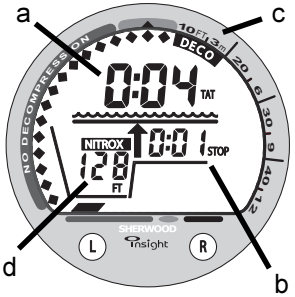


Fig. 50 - Entry into Deco/ Deco Main Display

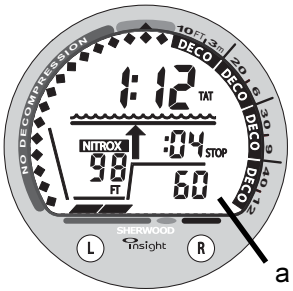


Fig. 51 - Stop > 40 FT (12 M)

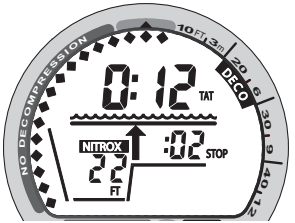


Fig. 52 - Deco Stop Main

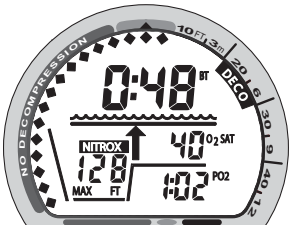


Fig. 53 - Deco Stop Alt 1

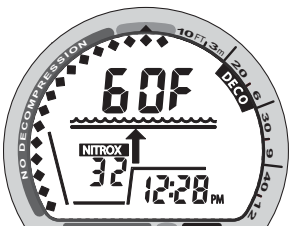


Fig. 54 - Deco Stop Alt 2

To activate the **Backlight** while in Deco Mode, press the R (RIGHT) button 1 time. The display will remain illuminated for button depression time plus 10 seconds.

Deco Stop Main Display (Fig. 52)

Information displayed is similar to that displayed upon Entry into Deco.

Deco Stop Alternate Display 1 (Fig. 53)

To view Alternate Display 1, press the L (LEFT) button 1 time while viewing the Main Display.

Elapsed Dive Time and symbol BT, Operating Mode symbol NITROX (or AIR), Maximum Depth and symbols MAX and FT (or M), percentage of Oxygen Saturation and symbol O_2SAT (if Nitrox), and Level of PO2 and symbol PO2 (if Nitrox), will be displayed for 10 seconds then revert to the Main Display.

Deco Stop Alternate Display 2 (Fig. 54)

To view Alternate Display 2, press the L (LEFT) button 2 times while viewing the Main Display, or 1 time while viewing Alternate Display 1.

Water Temperature with the graphic F (or C), Operating Mode symbol NITROX (or AIR), the FO2 Value set, and Time of Day and symbol AM (or PM) if set for 12 Hour Format, will be displayed for 10 seconds then revert to the Main Display.

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 below a Required Stop Depth.

You should stay slightly deeper (Fig. 55a) than the Required Stop Depth indicated (Fig. 55b) until the next shallower Stop Depth appears. Then, you can slowly ascend to, but not shallower than that indicated ceiling Stop Depth.

WARNING: You must not ascend shallower than the decompression ceiling indicated. Doing so will greatly increase your risk of decompression sickness and place the Insight into a Conditional Violation Mode (described on the next page).

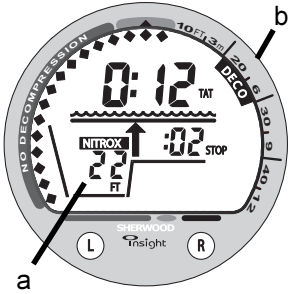


Fig. 55 - Managing a Deco Stop

Once all required decompression has been completed, the Insight will revert to the No Decompression Dive Mode (Fig. 56). This is indicated by Total Ascent Time = 0:00, and the Nitrogen Bar Graph receding into the Caution Zone.

Dive Time Remaining now appears in place of Total Ascent Time displaying the No Decompression Time Remaining (NDL) or Oxygen Accumulation Time Remaining (OTL), whichever time is the least and in control.

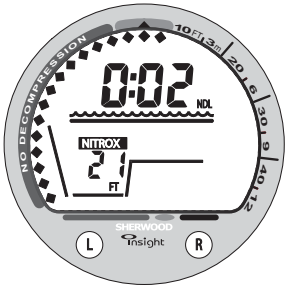


Fig. 56 - Deco Completed

WARNING: If you exceed certain limits, the Insight will not be able to respond with information to guide you to the surface. These situations exceed tested limits and can result in loss of some Insight functions for 24 hours after the dive in which a Violation occurred. It is important to understand each different Violation Mode and how to carry out emergency procedures in the event that you enter one.

VIOLATION MODES

Violation Modes the Insight can enter are termed Conditional, Delayed, and Immediate. Permanent Violation Mode and Gauge Mode are continuations of these. While in Violation Modes, Alternate Displays similar to those shown for Deco Mode can be still be accessed using the L (LEFT) button, and the Backlight can be activated using the R (RIGHT) button.

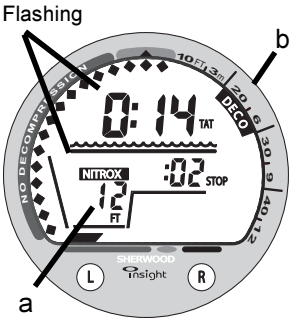


Fig. 57 - Conditional Violation (< 5 min above a Deco Stop)

CONDITIONAL VIOLATION MODE

The unit will enter the Conditional Violation Mode **if you ascend shallower than** (Fig. 57a) **the Required Deco Ceiling** Stop Depth displayed (Fig. 57b). One Beep per second will sound.

The UP Arrow will disappear, and Total Ascent Time (TAT) and the Ceiling Stop Bar symbol will flash until you descend below the Required Stop Depth.

If you descend below the Required Stop Depth before 5 minutes have elapsed, the Insight will continue to function in Decompression Dive Mode. In this case, no off-gassing credit will be given, and for each minute above the Required Stop Depth $1^{1}/_{2}$ minutes of **Penalty Time** is added to Required Stop Time and Total Ascent Time.

The added Penalty Time will have to be served before obtaining off-gassing credit begins again. Once the Penalty Time is served and off-gassing credit begins, Required Stop Depths and Times will decrease toward zero, then the Nitrogen Bar Graph will recede into the yellow Caution Zone and the Insight will revert to the No Decompression Dive Mode.

DELAYED VIOLATION MODE

Three conditions will cause the Insight to enter a Delayed Violation Mode:

1. You remain above the Required Ceiling Stop Depth for 'more than 5 minutes'.
Total Ascent Time (TAT), the Stop Bar and NITROX symbols, and NiBG DECO segment, flash (Fig. 58) until you descend below the Required Stop Depth. A single Long Beep will sound.

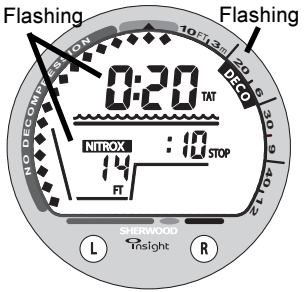


Fig. 58 - Delayed Violation
(> 5 min above a Deco Stop)

You would then need to follow the Stop Depths and Times toward the surface until the Nitrogen Bar Graph recedes into the yellow Caution Zone.

2. Your necessary Decompression requires a Ceiling Stop Depth between 60 FT (18 M) and 70 FT (21 M).
Total Ascent Time (TAT), the Stop Bar symbol, the full NiBG, and graphic 60 will flash (Fig. 59) until you descend below the Required Stop Depth. One Beep per second will sound.

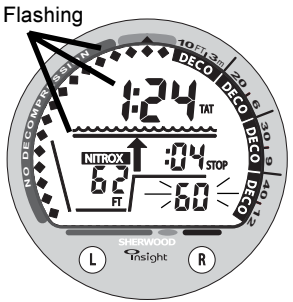


Fig. 59 - Delayed Violation
(> 60FT/18M Stop Required)

You must ascend to just deeper than 60 FT (18 M), staying as close to 60 FT (18 M) as possible without causing Total Ascent Time (TAT) to flash. When the Required Stop Depth indicates 50 FT (15 M), etc., you can ascend to, but no shallower than those depths and continue decompressing.

The Insight 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 a greater stop depth.

3. You exceed the maximum operating depth (330 FT/99.5 M).
Upon descending deeper than 330 FT (99.5 M), the loaded segments of the Nitrogen Bar Graph will flash as a warning (Fig. 60). One Beep per second will sound.

Current Depth and Max Depth displays will only indicate 3 dashes (- - -) until ascent is made to a depth shallower than 330 FT (99.5 M).

Once you ascend above 330 FT (99.5 M), the Current Depth display will be restored, however Max Depth will only display 3 dashes (- - -) for the remainder of that dive. The Log for that dive will also only indicate dashes (- - -) as the Max Depth achieved.

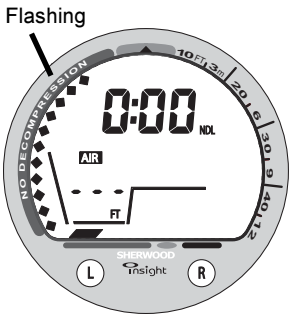


Fig. 60 - Delayed Violation
(> 330 FT/99.5 M)

WARNING: The expanded capabilities of the Insight are provided as safety features to assist you with emergency situations. Special training, equipment, and support are necessary for diving deeper than the maximum recommended sport diving depth limit of 130 FT (39 M).

IMMEDIATE VIOLATION MODE AND GAUGE MODE

WARNING: The Insight 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 Insight design, and a Insight should not be used for these types of dives.

Gauge Mode Underwater

If a Decompression ceiling Stop Depth of 70FT (21M) or greater is required, an Immediate Violation Mode (Gauge Mode) will be entered. A single Long Beep will sound. This situation would be preceded by entering Delayed Violation Mode, previously described.

The Insight would then operate with limited functions in **Gauge Mode** during the remainder of that dive and for 24 hours after surfacing.

Gauge Mode turns the Insight into a digital instrument without any decompression or oxygen monitoring functions. Only Current Depth and the Ascent Rate Indicator will be displayed. The full Nitrogen Bar Graph will flash as a warning (Fig. 61). Alternate Displays can be accessed using the L (LEFT) button, and the Backlight can be activated using the R (RIGHT) button.

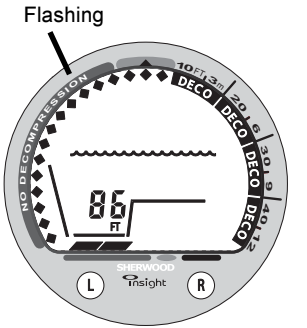


Fig. 61 - Immediate Violation/ Gauge Mode Underwater

Gauge Mode on the Surface

The Insight will also enter an **Immediate Violation/Gauge Mode** five minutes after surfacing from a dive in which a Delayed Violation occurred.

For the first 2 hours, **Gauge Mode** displays the Surface Interval, Date/Time, and the Nitrogen Bar Graph flashes as a warning (Fig. 62).

- To view Temperature, press the L (LEFT) button 1 time.
- To access FO2 Mode (in sequence but cannot be set), press the L (LEFT) button 2 times.
- To access Fly/DeSat Mode, press the L (LEFT) button 3 times.
- To access Log Mode, press the L (LEFT) button 4 times.
- To activate the Backlight, press the R (RIGHT) button.

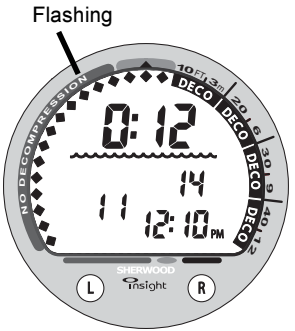


Fig. 62 - Immediate Violation/ Gauge Mode On Surface

The Countdown Timer that appears when you access Fly/DeSat Mode and 2 hours after the dive does not represent 'Time to Fly'. It is only provided to inform you of the time remaining before normal Insight operation can resume with full features and functions.

PERMANENT VIOLATION

Entering the Immediate Violation Mode, then Gauge Mode, will result in loss of all Insight decompression and oxygen monitoring functions for 24 hours after that dive. FO2 and Plan Mode will not be accessible. **This condition is considered a Permanent Violation, and in the event that a dive is made during the 24 hour period, a full 24 hour surface interval must then be served before all functions are restored.**

OXYGEN EXPOSURE

The Insight 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.

Refer to the Reference section of this manual for additional information.

PARTIAL PRESSURE OF OXYGEN

As depth increases during a dive, the partial pressure of oxygen (PO2) increases. The current Level of PO2 (Fig. 63a) may be viewed by pressing the L (LEFT) button 1 time to access the Dive Mode Alternate 1 Display.

Fig. 63 - No Deco Alt 1

High PO2 Dive Mode

The Insight enters the High PO2 Dive Mode when PO2 becomes equal to, or greater than, **1.40 ATA**, as indicated by the UP Arrow and symbol PO2 appearing on the display (Fig. 64) until PO2 decreases below a value of 1.40 ATA. The Audible Alarm emits one Beep per second.

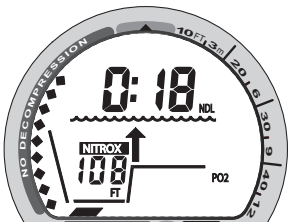


Fig. 64 - High PO2 Warning

If partial pressure of oxygen continues to increase, the value of PO2 will increase toward a maximum value of 5.00 ATA in increments of '.01' ATA.

When PO2 reaches a value of **1.60 ATA**, the UP Arrow, NITROX, and PO2 symbols will flash as a warning (Fig. 65). The Audible Alarm emits one Beep per second. When PO2 decreases below 1.60 ATA, the flashing will stop.

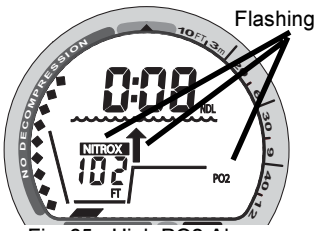


Fig. 65 - High PO2 Alarm

WARNING: In the event that you enter High PO2 Dive Mode, you must immediately focus on reducing the partial pressure of oxygen by slowly ascending to a shallower depth at a safe rate in accordance with your nitrox training. If you continue the dive at your current depth, or descend deeper, your exposure to CNS oxygen toxicity will increase.

OXYGEN ACCUMULATION

It is important that you understand that conducting repetitive dives using enriched nitrogen-oxygen (nitrox) mixtures can lead to increases oxygen saturation (O_2SAT) and the risk of pulmonary oxygen toxicity.

Sherwood Scuba strongly recommends that you avoid exceeding oxygen exposure limits, and reminds you that nitrox diving requires special training and understanding of the effects of oxygen toxicity.

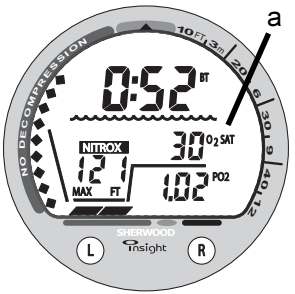


Fig. 66 - No Deco Alt 1

During a Nitrox dive, the current Level of O2 saturation with symbol O2SAT (Fig. 66a) may be viewed by pressing the L (LEFT) button 1 time to access the Alternate 1 Display.

Displayed will be either the percentage (%) of oxygen accumulated during that dive, or during the repetitive dives you conducted during that 24 hour period, whichever of the two is calculated to be greater at that time.

High O2 Saturation

If the calculated amount of oxygen saturation equals, or exceeds, **80%** of the theoretical limit for a single exposure or of the exposure limit for a 24 hour period, the UP Arrow and O_2SAT symbols appear on the display (Fig. 67a).

If oxygen saturation continues to increase, the value of O_2SAT will increase toward a maximum value of 100 (%) in increments of 2 (%).

When O_2SAT reaches a value of **100 (%)**, Oxygen Dive Time Remaining (OTL) becomes zero (0:00) and the O_2SAT, NITROX, and UP Arrow symbols will flash (Fig. 68) until O_2SAT decreases below 100% at which time Oxygen Dive Time Remaining (OTL) will increase above zero (0:00).

You must immediately focus on making **a safe controlled ascent** to the surface to prevent further exposure. The UP Arrow will disappear upon surfacing. As your level of saturation decreases during your surface interval, the amount of calculated dive time available will increase.

WARNING: If you exceed the per dive allowable oxygen exposure limit, it is recommended that you allow a surface interval of at least 2 hours before reentering the water. If you exceed the allowable limit for a 24 hour period, you must allow a surface interval of at least 24 hours before reentering the water.

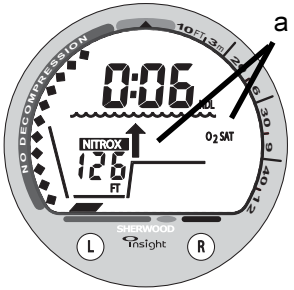


Fig. 67 - High O2 Warning

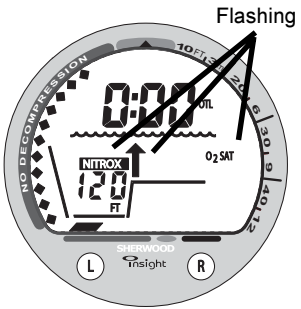


Fig. 68 - High O2 Alarm

UNEXPECTED LOSS OF DISPLAYED INFORMATION

While diving, if you find that any major piece of equipment is not functioning correctly, you must abort the dive immediately and surface slowly in a controlled manner.

If your Insight stops working for any reason, it is important that you have anticipated this possibility and are prepared for it. **This is an important reason to avoid pushing the no decompression and oxygen tolerance limits, and a critical reason to avoid entering decompression.**

Regardless of your diving habits, Sherwood Scuba advises you to dive with additional backup instrumentation that can provide the data necessary to properly surface if and when your primary instruments fail.

As with any other piece of equipment, unforeseen things can happen. By preparing ahead of time, you can spare yourself a great deal of frustration and disappointment. **If you dive in situations where your trip would be ruined or your safety would be jeopardized by losing the use of your Insight, an analog or digital backup system or use of standard air (or nitrox) tables is highly recommended.**

Be a -
RESPONSIBLE DIVER
at all times.

SPECIAL WARNINGS and ADDITIONAL SAFETY INFORMATION

• 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.

• Exiting the water with the Nitrogen Bar Graph in the red DECO zone greatly increases the risk of decompression sickness, and may result in injury or death.

• 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 FT (39 M), will greatly increase your risk of decompression sickness.

• Sherwood Scuba does not advocate diving to depths below 130 FT (39 M), the basis for which is purely theoretical.

SPECIAL WARNINGS and ADDITIONAL SAFETY INFORMATION

- **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.**

- **The oxygen features of the Insight 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.**

- **Allowing oxygen saturation (O2SAT) to increase to 100 (%) 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 Insight provide any implied approval or consent from Sherwood Scuba for individuals to exceed the defined limits of recreational dive profiles, as agreed on by all internationally recognized training agencies.**

- **The Insight is not intended for use by military or commercial divers.**

CARE, INSPECTION, AND SERVICE

CARE AND CLEANING

The Insight is a sensitive electronic instrument. Although it has been built to endure the rigors of diving, it still must be handled carefully to protect it from shock, excessive heat, chemical attack, and tampering. The housing is made of an impact resistant resin that is shock resistant but susceptible to scratches and attack by strong chemicals.

CAUTION: Never spray aerosols of any kind on, or near, the Insight. The propellants may chemically attack the plastic.

Be careful not to leave it in an unsupervised, unprotected location where it might be damaged. Many dive computers (and dive trips) are ruined due to carelessly tossed weight belts or cylinders.

If the lens becomes scratched, Sherwood Scuba can replace it, although small scratches will naturally disappear underwater. For even more convenience and additional protection against scratches, place a transparent Instrument Lens Protector on the gauge face. This can be purchased from your Authorized Sherwood Scuba Dealer.

CLEANING

Soak and rinse the Insight in fresh water following each day of diving, preferably after each dive, and ensure that it is free of any debris or obstructions that would block the sensors. If possible, use lukewarm water to dissolve any salt crystals. Salt deposits can also be dissolved using a 50% white vinegar/50% fresh water bath. Towel dry before storing, and transport your Insight cool, dry, and protected.

CAUTION: Never, under any circumstances, poke any object through any slots or holes on the rear side of the Insight. Doing so may damage the Depth Sensor, possibly resulting in erroneous depth and/or dive time remaining displays.

ANNUAL INSPECTIONS AND SERVICE

Your Insight should be inspected annually by an Authorized Sherwood Scuba 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). The original sales receipt and owner's portion of the Warranty Registration Card must be presented at the time of service. It is recommended that you have this inspection performed even after the warranty period has expired to ensure your Insight is working properly.

A service record is provided in the back of this manual for your convenience. It should be signed by the Authorized Sherwood Dealer service technician after each annual inspection or factory service. The costs of annual inspections are not covered under the terms of the 2 year limited warranty.

WARNING: If you are in doubt about the accuracy of your Insight's depth readings, DO NOT attempt to dive with it until it has been inspected by an Authorized Sherwood Scuba Dealer.

The facility conducting the depth check must have a pressure test chamber that is capable of pressurizing the Insight to its maximum operating depth (330 feet / 99.5 meters). Also, the test gauge on the pressure test chamber must be as accurate as the Depth Sensor in the Insight (±1% of full scale).

CAUTION: Never pressure test the Insight in an air environment. Doing so may damage the Depth Sensor; possibly resulting in erroneous depth or time readings.

It is possible to damage the Insight Depth Sensor if it is not pressure tested properly. The Insight must be placed completely underwater when being pressure tested to protect the Depth Sensor.

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 CR2450 Lithium battery will maintain unit operation for approximately 300 hours or -

- 150 dives, if 1 - 1 hour dive per activation period to over -
- 300 dive hours, if 2 or more 1 hour dives per activation period

LOW BATTERY CONDITION

During unit operation, voltage level is checked every second while on the surface. You will be alerted to a Low Battery condition by a flashing Battery symbol (Fig. 69a).

Upon decreasing to a voltage level that will not maintain proper unit operation, the symbol will flash for 5 seconds followed by shutdown of the Insight.

If the Insight did not display the Low Battery symbol prior to entering the Dive mode, and a Low Battery condition occurs during a dive, there will be sufficient battery power to maintain unit operation for the remainder of that dive, however the Backlight will be disabled. You will be alerted by the Battery symbol.

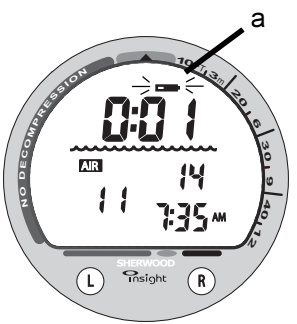


Fig. 69 - Low Battery

NOTE: Sherwood Scuba strongly advises that you replace the Battery and DO NOT attempt to dive when the Battery symbol remains on the display, and that you replace the Battery with a new one prior to any multi day dive trip.

BATTERY REPLACEMENT PROCEDURES

MODULE REMOVAL FROM BOOT

If the Insight is in a Wrist Boot, it will be necessary to peel the lips of the Boot downward off the Module while applying pressure from underneath, working it out slowly.

If it is in a 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 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.

CAUTION: The procedure that follows must be closely adhered to. Damage due to improper battery replacement is not covered by the Insight's limited 2 year warranty.

BATTERY REPLACEMENT

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.

As an additional precautionary measure to prevent formation of moisture in the Battery Compartment, it is recommended that the Battery be changed in an environment equivalent to the local outdoor temperature and humidity (e.g., do not change the Battery in an air conditioned environment, then take it outside during a hot sunny day).

- Inspect the Buttons, Lens, and Housing to ensure they are not cracked or damaged.
- If there is any sign of moisture in the module, DO NOT use the Insight until it receives proper service by an Authorized Sherwood Scuba Dealer.

WARNING: If damage, moisture, or corrosion is found, it is recommended that you return your Insight to an Authorized Sherwood Scuba Dealer, and DO NOT attempt to use it until it has received factory prescribed service.

NOTE: If the old battery can be removed and the new one inserted within 8 seconds, nitrogen and oxygen calculations ,and settings, will be retained for repetitive dives.

Battery Hatch Removal

- Locate the Battery Compartment on the back of the unit.
- While applying steady inward pressure on the center of the Battery Hatch, rotate the Hatch Retaining Ring 10 degrees clockwise by pressing against the upper tab of the Retaining Ring with a small blade screwdriver (Fig. 70).
- Lift the Hatch Ring up and away from the Housing, or turn the module over to allow the Ring to drop out into your hand.
- Remove the Battery Hatch.

Fig. 70 - Hatch Ring Removal

Battery Removal

- Remove the Retaining Bar located across the lower portion of the Battery (Fig. 71a).
- Remove the Hatch O-ring. DO NOT use tools
- Using care not to damage the Battery Contacts (Fig. 71 b/c), slide the Battery up and out of the Battery Compartment.

Inspection

- Closely check all of the sealing surfaces for any signs of damage that might impair proper sealing.
- Inspect the Buttons, Lens, and Housing to ensure they are not cracked or damaged.
- If it is necessary to clean the Battery Compartment, flush it and all components with a solution of 50% white vinegar and 50% fresh water. Rinse with fresh water, and allow to dry overnight, or blow dry with a hair dryer (set at 'no heat').

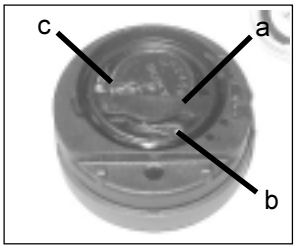


Fig. 71 - Battery Compartment

Fig. 72 - Battery Insertion

Fig. 73 - Retaining Bar

Fig. 74 - Retaining Ring

WARNING: If damage or corrosion is found in the Battery Compartment, return your Insight to an Authorized Sherwood Scuba Dealer, and DO NOT attempt to use it until it has received factory prescribed service.

Battery Installation

- Slide a new 3 volt type CR2450 Lithium Battery, negative (-) side down into the Battery Cavity. Slide it in from the right side and ensure that it slides under the contact clip on the left rim of the cavity (Fig. 72).
- Orient the Retaining Bar across the lower portion of the Battery and carefully push it down into position (Fig. 73).

Battery Hatch and Hatch Retaining Ring Installation

- Replace the Hatch O-ring with a new one. This O-ring must be a genuine Sherwood Scuba part that can be purchased from an Authorized Sherwood Scuba Dealer. Use of any other O-ring will void the warranty.
- Lightly lubricate the **new** Hatch O-ring with silicone grease and place it on the inner rim of the Battery Hatch. Ensure that it is evenly seated.
- Slide the Hatch Retaining Ring, top portion first (small opening), onto your thumb (Fig. 74).
- Carefully place the Battery Hatch (with O-ring) into position on the rim of the Battery Compartment, then press it evenly and completely down into place with your same thumb.
- Maintain the Battery Hatch securely in place and, using your other hand, slide the Retaining Ring down off your thumb and into position around the Battery Compartment.

- The tabs on the Retaining Ring fit down into the two slots located at the 2 and 8 o'clock positions.
- Using your fingers, turn the Ring counter clockwise 5 degrees until the tabs engage (Fig. 75), then tighten it 5 more degrees by turning it counter clockwise with the aide of a small blade screwdriver (Fig. 76).

Fig. 75 - Retaining Ring Tabs

NOTE: While tightening (turning) the Retaining Ring, exert continuous inward pressure on it until it is secured in the proper position. A small symbol located on the Ring should be aligned with the Locked symbol located on the Housing (Fig. 76 a/b)

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.

WARNING: If there are any portions of the display missing or appearing dim, or if a Low Battery condition is indicated, return your Insight to an Authorized Sherwood Scuba Dealer for a complete evaluation before attempting to use it.

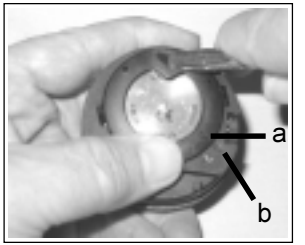


Fig. 76 - Securing the Retaining Ring

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.

NOTE: The Wet Activation Contacts are located on the stems of the Buttons and on metal Pins located on the lower left side of the module. The Insight module is designed for use in a Boot that has an opening on the left side which exposes the Pins (and side Wet Activation Contact) to water upon immersion.

WARNING: If the Insight is installed in a Boot that does not have the side opening where the side Wet Activation Contact is located, the unit may not activate automatically upon descending on a dive.

REFERENCE

DIVE TIME REMAINING

One of the most important pieces of information on the Insight is the patented Dive Time Remaining numeric display. To numerically display Dive Time Remaining, the Insight 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).

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 with the NDL symbol (Fig. 77a) and graphically as the Nitrogen Bar Graph.

As you ascend from depth following a dive that has approached the no decompression limit, the Nitrogen 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 Insight offers.

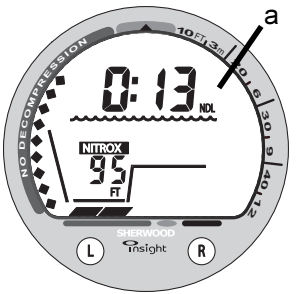


Fig. 77 - No Deco Dive Time Remaining

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.

O2 Dive Time Remaining

As oxygen accumulation increases during a nitrox dive, Dive Time Remaining before reaching the oxygen saturation limit for that dive, or 24 hour period, decreases.

When the O2 time becomes less than the No Deco Dive Time Remaining (NDL), calculations for the current depth will be controlled by oxygen. Oxygen Time Remaining will then appear as the main numeric time display as signified by the OTL symbol (Fig. 78a).

ALTITUDE DIVING

Atmospheric pressure decreases as Altitude increases above sea level. Weather systems and ambient temperature also affect barometric pressures. Consequently, depth reading instruments that do not compensate for the decrease in ambient pressure indicate depth readings shallower than the depth they are actually at.

The Insight automatically compensates for decreased ambient pressures for Altitudes between 2,000 (610 meters) and 14,000 feet (4,270 meters). Its program contains a high altitude algorithm that reduces no decompression and oxygen exposure limits to add a larger zone of caution.

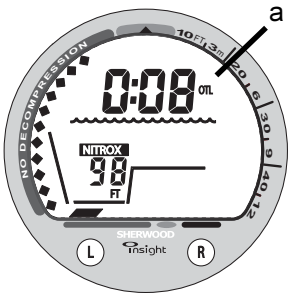


Fig. 78 - Dive Time Remaining (OTL < NDL)

The Insight senses ambient pressure when it is manually activated, every 15 minutes while it is activated, or every 30 minutes when it is not activated. At an Altitude of 2,000 feet (610 meters), it will automatically recalibrate itself to measure depth in feet of fresh water rather than feet of sea water. It will then readjust the no decompression and oxygen limits at additional intervals of 1,000 feet (305 meters). Therefore, when returning to lower Altitudes, diving should not be conducted until the unit automatically clears of any residual nitrogen and oxygen loading and resets to operate at the new lower Altitude.

WARNING: Diving at high altitude requires special knowledge of the variations imposed upon divers, their activities, and their equipment by the decrease in atmospheric pressures. Sherwood Scuba recommends completion of a specialized Altitude training course by a recognized training agency prior to diving in high altitude lakes or rivers.

FLYING AFTER DIVING

In 1990 the Undersea and Hyperbaric Medical Society (UHMS) published a set of guidelines aimed at minimizing the possibility of decompression sickness due to flying too soon after diving. The UHMS suggests* that divers using standard air cylinders and exhibiting no symptoms of decompression sickness wait 24 hours after their last dive to fly in aircraft with cabin pressures up to 8,000 feet. (2,440 meters).

The two exceptions to UHMS's recommendation are:

- If a diver had less than 2 hours total accumulated dive time in the last 48 hours, then a 12 hour surface interval before flying is recommended.
- Following any dive that required a decompression stop, flying should be delayed for at least 24 hours, and if possible, for 48 hours.

* excerpted from “The UHMS Flying After Diving Workshop”

Since the 1990 UHMS guidelines were introduced, data from the Diver's Alert Network (DAN) was introduced that resulted in DAN's position** that "A minimum surface interval of only 12 hours would be required in order to be reasonably assured a diver will remain symptom free upon ascent to altitude in a commercial jet airliner (altitude up to 8,000 feet/2,440 meters). Divers who plan to make daily, multiple dives for several days, or make dives that require decompression stops, should take special precautions and wait for an extended surface interval beyond 12 hours before flight".

** excerpted from "DAN's Position on Recreational Flying After Diving"

Both the UHMS and DAN agree that "There can never be a flying after diving rule that is guaranteed to prevent decompression sickness completely. Rather, there can be a guideline that represents the best estimate for a conservative . . . surface interval for the vast majority of divers. There will always be an occasional diver whose physiological makeup or special diving circumstances will result in the bends".

NITROX DIVING

Both central nervous system (CNS) oxygen toxicity and pulmonary oxygen toxicity were taken into consideration when the Maximum Durations (Fig. 79) for a Single Exposure and for Any 24-Hour Day were published by in the October 1991 NOAA Diving Manual. Although CNS oxygen toxicity is considered the primary constraint for higher levels of partial pressure of oxygen (PO2), there are circumstances in which pulmonary oxygen toxicity can limit exposures.

CNS oxygen toxicity is not considered likely at PO2 levels below 1.30 ATA. It is, however, related to diver's work level. **Performing strenuous tasks could cause the symptoms of O2 poisoning at PO2 levels lower than they normally would appear during casual diving.**

	Maximum Exposure Time	
PO2 (ATA)	Per Dive (Min)	Per 24 hr (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. 79 - NOAA O2 Limits

WARNING: In the event that you exceed the maximum limit of per dive allowable oxygen exposure (dose), it is recommended that you allow at least 2 hours at a normoxic PO2 before diving again. If you have reached the Maximum Total 24-hour Day Limits, you must spend at least 12 hours at a normoxic PO2 before diving again (you should allow a surface interval of at least 24 hours before reentering the water).

WARNING: Diving with enriched nitrogen-oxygen (nitrox) mixtures requires special knowledge of the variations imposed upon divers, their activities, and their equipment by the increased percentage of oxygen. Sherwood Scuba recommends completion of a specialized Nitrox training course by a recognized training agency prior to diving with any enriched nitrogen-oxygen (nitrox) mixtures.

MULTIPLE TISSUE TRACKING

The Insight tracks twelve tissue compartments with halftimes ranging from 5 to 480 minutes. The Nitrogen Bar Graph always displays the controlling compartment that is the only one important at that time.

Think of the Nitrogen Bar Graph as transparent displays laid on top of one another. The tissue compartment that has filled up fastest is the only one that can be seen from the top.

At any particular point, one tissue compartment may be absorbing nitrogen, while another that was previously higher may be off-gassing. 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 Insight offers you**. Take advantage of this feature and make all of your dives multilevel dives.

REPETITIVE DECOMPRESSION DIVING

The decompression model used by the Insight 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 FT (27 M) or Decompression dives. Due to the present unavailability of statistical data, the Insight's decompression predictions are based on U.S. Navy theory. Therefore, pay special attention to the following warnings.

WARNINGS:

The decompression capabilities of the Insight are intended strictly for emergency use.

Decompression diving is inherently hazardous and greatly increases your risk of decompression sickness, even when performed according to the computer's calculations. In the event that you must make an emergency decompression dive, you must not make another dive for at least 24 hours.

Using the Insight, just as using the U.S. Navy (or other) No Decompression Tables, is no guarantee of avoiding decompression sickness, i.e. "the bends."

Sherwood Scuba advocates responsible diving practices and does not recommend decompression diving, or diving below 130 FT (39 M).

NO DECOMPRESSION LIMITS

Note how the No Decompression Limits (NDL) for the Insight compare with the U.S. Navy limits (Fig. 80). For most depths, the Insight provides somewhat less no decompression times than the U.S. Navy Tables. However, while the No Decompression Limits may be less, you will receive increased allowable Bottom Times as you take advantage of the multilevel dive capabilities offered by the Insight.

CONCLUSION

The Insight is an informational tool whose entire worth depends on using it correctly. **Learn how to use it and use it wisely.** Have fun with the Insight, and **thank you for being a responsible diver!**

Insight Depth FT (M)	NDL-mins. Eng (Metric)	U.S.N. NDL mins.
30 (9)	260 (283)	- - -
35	- - -	310
40 (12)	137 (144)	200
50 (15)	81 (85)	100
60 (18)	57 (59)	60
70 (21)	40 (41)	50
80 (24)	30 (32)	40
90 (27)	24 (25)	30
100 (30)	19 (20)	25
110 (33)	16 (17)	20
120 (36)	13 (14)	15
130 (39)	11 (11)	10
140 (42)	9 (9)	10
150 (45)	8 (8)	5
160 (48)	7 (7)	5
170 (51)	7 (6)	5
180 (54)	6 (6)	5
190 (57)	5 (5)	- - -

Fig. 80 - NDL Comparison

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 FT (3, 6, 9, 12, 15, & 18 M)

Altitude Algorithm:
- Based on NOAA tables

Oxygen Exposure Limits:
- Based on NOAA tables

OPERATIONAL MODES

- Activation/Diagnostic
- Surface
- Temperature/O2SAT
- FO2 Set
- Plan
- Fly/DeSat
- Log (identifier/nitrogen/oxygen)
- Set -
  - FO2 50% Default (On/Off)
  - Units of Measure (Imperial / Metric)
  - External Access (to download)
  - Date (year, month, day)
  - Hour Format, Time (hour, minutes)
  - Dive Profile Sampling Rate
  - Alarms (On/Off)
  - Wet Activation (On/Off)
- No Decompression Dive (Main, Alt 1, Alt 2)
- Decompression Dive (Main, Alt 1, Alt 2)
- Conditional Violation
- Delayed Violation
- Immediate Violation/Gauge
- High PO2 Level
- High O2SAT

DISPLAY RANGE/RESOLUTION

Numeric Displays:	Range:	Resolution:
• Dive Number	0 - 50	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	Air, 21 - 50 %	1 %
• PO2 Value	1.40 - 5.00 ATA	.01 ATA
• O2SAT Value	0 - 100 %	2 %
• Dive Time Remaining	0 - 9:59 hr:min	1 minute
• Total Ascent Time	0 - 9:59 hr:min	1 minute
• Decompression Stop Time	0 - 99 min. (per stop depth)	1 minute
• Elapsed Dive Time	0 - 9:59 hr:min.	1 minute
• Surface Time	0 - 23:59 hr:min	1 minute
• Dive Log Surface Interval	0 - 25:59 hr:min	1 minute
• Time to Fly	23:59 hr:min - 0* (* starting 10 min after the dive)	1 minute
• Time to Desaturate	9:59 hr:min - 0* (* starting 10 min after the dive)	1 minute

Special Displays:	Occurrence
• Diagnostic Display	Activation
• Out of Range (- - -)	>330 FT (>99.5 M)
• Gauge Mode Countdown Timer	24:00 - 0:00 hr:min (after violation)

BAR GRAPHS

Nitrogen Bar Graph:	segments
No Decompression zone (green)	13
No Deco Caution zone (yellow)	1
Decompression Warning zone (red)	4

Ascent Rate Indicator:

At depths of 60 FT (18 M) and shallower

	segments	FPM	MPM.
	0	0 - 10	0 - 3
Normal zone (green)	1	11 - 15	3.5 - 4.5
Caution zone (yellow)	2	16 - 20	5 - 6
	3	21 - 25	6.5 - 7.5
	4	26 - 30	8 - 9
Too Fast zone (all flashing)	5	> 30	> 9

At depths deeper than 60 FT (18 M)

	segments	FPM	MPM
	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 (all flashing)	5	> 60	> 18

SPECIFICATIONS (continued)

OPERATIONAL PERFORMANCE

Function:	Accuracy:
• Depth	±1% of full scale
• Timers	1 second per day

Dive Counter:
- Displays Dives #1 to 50
- Displays #1 for 51st dive of an activation period
- Resets to Dive #1 upon reactivation after shutdown

Dive Log Mode:
- Stores 50 most recent dives in memory for viewing
- After 50 dives, the 51st dive is added, overwriting the oldest
- Screens - Identifier, Nitrogen data, Oxygen data (if Nitrox)

Altitude:
- Operational to 14,000 feet (4,270 meters) elevation
- Sampling of ambient pressure every 30 minutes
- Recalibration of depth readings at 1,000 feet (305 m) intervals beginning at 2,000 feet (610) elevation

Power:

• Battery	1 - 3 volt CR2450, Lithium
• Shelf life	Up to 5 years
• Replacement	User replaceable (yearly is recommended)
• Life expectancy	150 dive hours (if 1 - 1 hr dive per activation period)
	300 dive hours (if 2 or more 1 hr dives per period)

Activation:
- Manual - push button (recommended)
- Automatic - by water contact (if set On)
- Cannot be activated deeper than 4 FT (1.5 M) - if Wet Activation is set Off
- Cannot be activated at elevations higher than 14,000 feet (4,267 m)

Shutoff:
- Automatically shuts off if no dive is made within 2 hours after initial activation.
- Automatically shuts off 24 hours after the last dive (will reactivate if the Wet Activation feature is set On and the contacts are wet).
- Cannot be shut off manually.

PROGRAMMING (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 (if the FO2 50% Default is set ON). The previous FO2 value set will be retained, if the FO2 50% Default is set OFF.

GLOSSARY

The following are diving terms to become familiar with. Some apply specifically to the Insight.

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 Insight).
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.
Ascent Rate Indicator - A graphic representation of vertical ascent rate (speed) displayed alongside a color coded indicator.
Boot - A protective rubber covering that surrounds an instrument module.
Bottom Time - The total time spent underwater during a dive between 5 FT (1.5 M) on initial descent to 3 FT (1 M) on final ascent.
BT - Abbreviation for Bottom Time (Elapsed Dive Time).
Caution Zone - The yellow section of a bar graph that gives visual warning of a diver's proximity to projected limits.
Ceiling - See decompression ceiling.
Clean Dive - A dive preceded by 24 hours of no diving activity.
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).
CNS - Abbreviation for the Central Nervous System of the body.
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 DCS.
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 electromechanical device that converts water pressure into an electrical signal, that is converted to a visual depth display.
Diagnostic Mode - The first display seen on Sherwood Scuba dive computers after initial activation during which time a self–check for internal faults and battery voltage is performed.
Display - A visual readout of information.
Dive Time Remaining - A display of time allowed before a diver must surface based on no decompression status or oxygen saturation.
FO2 - The fraction (percent / 100) of oxygen (O2) in the breathing gas mixture.
HydroGlo - A Sherwood Scuba term for an instrument backlight feature.

GLOSSARY (continued)

LCD - Abbreviation for liquid crystal display, an easily viewed low voltage display usually found on dive computers
Log Mode - A computer display of previous dive information.
Maximum Depth - The deepest depth attained during a dive.
Mode - A specific set of functions in a dive computer.
Multi-level Dive - A type of dive profile where the diver spends various times at different shallower depths (opposite of a “Square Wave” dive profile).
NDL - Abbreviation for No Decompression Limit.
Nitrogen Bar Graph - A graphic display of simulated nitrogen absorption.
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 Decompression - Any part of a dive where the diver can surface without requiring a decompression stop.
No Decompression Limit - The amount of dive time remaining based on no-decompression status.
O2SAT - Abbreviation for oxygen saturation.
OTL - Abbreviation for oxygen tolerance limit.
Out of Range - The point at which a dive computer can no longer supply correct dive information.
Oxygen Tolerance Limit - The amount of dive time remaining based on exposure to 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.
Plan Mode - An accessible sequential display of available dive times at 10 FT (3 M) intervals from 30 to 190 FT (9 to 57 M) used when dive planning.
PO2 - Partial pressure of oxygen. The proportion of total pressure of a gas mixture contributed by oxygen.
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.
Square Wave Dive - A type of dive profile where the entire dive is spent at one depth between descent and ascent.
Symbol - a small pictorial representation of an operational mode or informational display.
Tissue - See Compartment.
Tissue Compartment - See Compartment.
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 FT (1 M) from a dive.

INSPECTION / SERVICE RECORD

SERIAL NUMBER _____

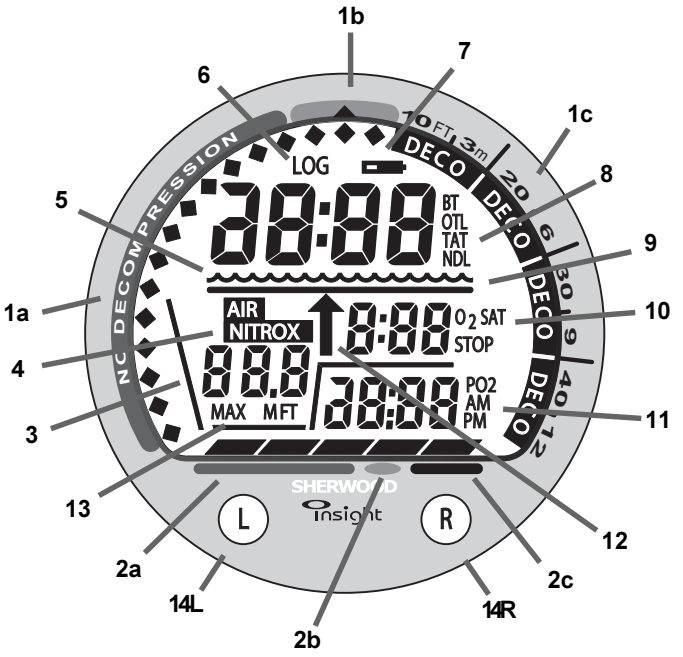
DATE OF PURCHASE _____

PURCHASED FROM (DEALER) _____

BELOW TO BE FILLED IN BY AN AUTHORIZED SHERWOOD SCUBA DEALER:

DATE	INSPECTION / SERVICE PERFORMED	DEALER / TECHNICIAN

FULL LCD DISPLAY



1a. Nitrogen Bar Graph - (Green - No Deco)
1b. Nitrogen Bar Graph - (Yellow - No Deco Caution)
1c. Nitrogen Bar Graph - (Red - Deco)
2a. Ascent Rate Indicator - (Green - normal)
2b. Ascent Rate Indicator - (Yellow - caution)
2c. Ascent Rate Indicator - (Red - 'Too Fast')
3. Symbol - Dive Profile - Plan or Dive Mode
4. Symbol - Operating Mode - AIR or NITROX
5. Symbol - Wave - Surface Time or Dive Mode
6. Symbol - Log Mode
7. Symbol - Low Battery
8. Symbol - Time - BT/OTL/TAT/NDL
9. Symbol - Deco Stop Bar (below Wave)
10. Symbol - O2 Saturation or Deco Stop Time
11. Symbol - PO2 Level or AM/PM if 12 hour format
12. Symbol - Up Arrow (ascend)
13. Symbol - Current Depth or Max Depth
14. Control Buttons - L (LEFT) and R (RIGHT)

SHERWOOD SCUBA®

www.SherwoodScuba.com

Insight

DIVE COMPUTER MANUAL

Doc. No. 12-2704-r01 (12/29/05)