OCEANIC
INNOVATION FIRST

U.S Military Special Forces won't get in the water without it

and soon you can dive with it. We're talking about the **DATAMASK HUD** – featuring an advanced air-integrated dive computer – built directly into the mask!
The **DATAMASK** contains a miniature liquid crystal display (LCD) panel, proprietary Digital Optic System, microprocessor, depth transducer, wireless cylinder pressure receiver, diver replaceable battery, and controlling software. The miniature LCD allows you to keep your eyes focused on the dive while presenting critical dive data including: current depth, elapsed dive time, cylinder pressure, and dive time remaining. The Digital Optic System provides a clear, highly magnified image of the LCD, which is viewable regardless of environmental conditions and may be seen clearly by the vast majority of people, regardless of vision

You Won't Believe Your Eyes

- In-Mask Dive Computer Digital Optic System
- Wireless Air Integrated Technology
- Patented Air Time Remaining Algorithm
- Audible Alarms with User Acknowledgment
- Backlighting may be adjusted underwater for brightness as well as full-time or on demand use
- Diver Replaceable Batteries
- OceanLog® PC Download and Settings Upload Software and USB Cable included

DEVELOPMENT STORY

Introduction

Special Operations Forces (SOF) divers typically consist of US Navy SEALs, Marine RECON, US Army Combat Swimmers, and US Air Force Combat Controllers. Their missions are often conducted in areas of extremely poor water visibility, such as harbors, rivers, and the coastal zone. SOF divers operating in these regions use specialized underwater breathing apparatuses (UBAs); such as the US Navy MK-25, or the MK-16 mixed-gas rebreather. SOF personnel may also employ a variety of underwater sensors including compasses, handheld sonars, and hydrographic survey systems that require the use of both hands during operation. Reading critical life support and UBA status from depth gauges, dive watches, pressure gauges, or wrist-worn displays can be nearly impossible under extremely poor visibility conditions - even with luminous dials or auxiliary lighting. The inability to accurately monitor current dive status can lead to a life-threatening situation in many cases. SOF divers need the capability to monitor this data regardless of water visibility, lighting, or other environmental conditions - all while remaining clandestine.

The purpose of the IDDM project was to develop an integrated diver display mask that could provide SOF divers this needed capability, and from which other diving applications could be ultimately developed.

Design Mission & Basic IDDM Requirements

The SOF Combat Swim Mission, along with CSS's experience in military dive operations and underwater systems design, was used to develop operational, functional, and technical requirements for the IDDM. These requirements helped define the environmental, human factors, technical, and operational modes of the IDDM.

Within the SOF Combat Swim Mission, the masked-based display information would need to be viewed occasionally during a mission (i.e. the diver periodically checking status of depth, time and cylinder pressure for 5 -10 seconds at a time). The display could not interfere with the diver's normal field-of-view through the mask while in use. These two developed requirements helped establish the physical location of the display in the periphery of the diver's vision within the mask frame. Based on eyestrain considerations and available space, the lower right section of the mask frame was selected. In this location, the diver could visually access the information by glancing downward and slightly to the right.

Integrated Systems Engineering: Mechatronics Approach

Today the design, development and manufacture of underwater technologies takes place in an increasingly multidisciplinary environment where the system elements are a mixture of mechanical, electronic, control, and software components. New products and systems based on the integrated application of mechanical, electronic and software engineering technologies often demonstrate reduced mechanical complexity, increased performance, and unique capabilities previously thought unattainable.

To achieve these results an integrated systems engineering, or mechatronics approach to design and development is needed. Mechatronics is the multi-disciplinary integration of mechanical, electronic, and software control systems.

To design and develop the IDDM system required the integrated application of an array of multidisciplinary subsystems; including miniature LCDs, transducers, optics, electronics, RF data transmission, and imbedded software control. Our approach was to assemble a multidisciplinary technical team comprised of Oceanic and military engineers, use the best available and custom developed technologies; and implement an integrated systems engineering, or mechatronics design and development process.

To make the extreme modifications necessary to a basic mask frame, it was essential to build a digital 3D parametric solid model of the frame. All subsequent design changes could then be made within a virtual design environment. The solid model was constructed using Pro/Engineer ä design software and allowed different concepts, approaches and hardware solutions to be tested in the virtual design environment before committing to prototype production. This solid model was the foundation for the IDDM system from which operational prototypes were produced.

Miniature Liquid Crystal Display Screen

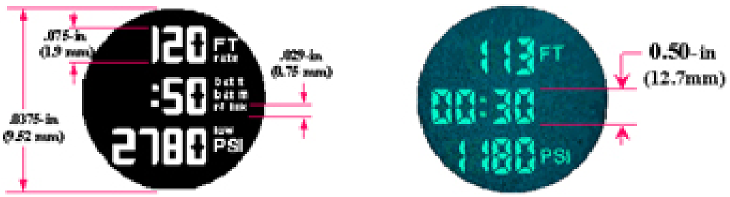
The display used in the mask is a custom designed miniature segmental liquid crystal display. This display technology was selected because it is a mature technology successfully used in many existing underwater applications (such as dive computers), possesses inherent reliability and ruggedness, and has a low power requirement with the possibility of extreme miniaturization. In order to combine the needed information on to a single screen that would fit integrally within the mask frame, it was necessary to approach the industry limit for miniaturization of segmental LCD technology.

The physical size of the display (0.375-inch [9.52mm] diameter viewing area), primary characters (0.075-in [1.9mm] height), and annunciators (0.029-inch [0.75mm]) actually makes them unreadable close to the eye without magnification. This necessitated developing a unique optical system to provide the required magnification.

Optical Design

The extremely small physical size of the display characters is such that they cannot be viewed close to the eye without high magnification. To help determine the minimum acceptable magnification, the displayed characters in existing dive computers were used as a reference point. Through limited subject testing using primarily Navy personnel (30 test subjects) we established a comfortable viewing reference distance of 10 inches (254mm). Approximately 75% of subjects tested could comfortably read alpha-numeric text height of 0.25-in (6.35mm) at the reference distance. More than 90% of test subjects could comfortably read text height of 0.375-in (9.5mm) at the same distance. This included test subjects who normally used glasses for reading. An additional margin was added to the test data results, and a minimum optical magnification requirement for the IDDM was established as 0.50-in (12.7mm) primary character height at the reference viewing distance.

Initially, we tested a large number of commercially available lenses with widely varying performance. Our best results were realized using a 0.86-in (21mm) diameter x 10X magnification lens that met all our basic optical requirements for magnification, eye relief, and physical size with acceptable distortion



To determine if the optical performance could be significantly improved, we retained a leading optical design firm to design a custom lens with improved characteristics over the commercially available lens. The custom solution surpassed our technical requirements in all areas - providing a 14X magnification (0.625-in [15.8mm] primary character height at 10-in [254mm] viewing distance). Additional analysis showed that this system would also provide sharper images with less distortion at the edges of the viewing area.

Optical Alignment

The optical assembly components (lens, display, and backlight) must stay precisely aligned along a center-viewing axis relative to each other and with precise spacing between components. This center-viewing axis extending from the diver's eye is perpendicular to the lens surface. The diver views the magnified display by shifting the eye downward and slightly to the right. Two additional variables affect the diver's ability to view the display within the mask. The distance between the diver's eyes, or interpupillary distance (IPD), affects the alignment of the diver's eye to the lens. The diver's face shape also affects viewing alignment since it determines the way the mask fits on the diver's face. This required the design of a fixed alignment mount that could accommodate as many different divers as possible, despite varying IPDs and face shapes. Finding the optimum location and alignment angle for a fixed mount system was a considerable challenge, requiring extensive trial and error, and human factor subject testing. After completing extensive testing using prototype masks with various alignment positions, the optimum alignment angle was achieved and incorporated into the digital 3D solid mask model

Embedded Electronic Control

The IDDM embedded electronic system is a combination of electronics, sensors, electromechanical hardware, and controlling software. This distributed system processes the sensor data and presents it to the diver's display screen.

IDDM System components.

Through several iterations of integrating electromechanical and industrial design requirements, a well-balanced frame design with a natural distribution by function of the electronic, mechanical, and optical system components was developed. The embedded electronic control system is located within this frame design and distributed in four subsystems: the controller, the display, the RF receiver, and the battery.

Rapid Prototyping and Manufacturing

To produce interim and final prototype masks with such a complicated mechanical design it was essential to use state-of-the-art rapid prototyping techniques. Several interim prototype versions of the IDDM were produced using a process called stereolithography in order to test human factors, optical alignment, backlight intensity, and system integration. Stereolithography uses proprietary photo-reactive liquid polymer resins and ultraviolet laser light to produce functional prototypes from the digital 3D solid models.

Other Diving Applications

Military Special Operations:

The miniature display screen and control software can be customized for the specific diving apparatus and mission profile, with SOF combat swimmers able to monitor critical life support and mission data inside the dive mask - regardless of poor environmental conditions.

An IDDM system could also be modified for the US Navy MK-16 or similar UBA for use by EOD divers. Adapting the IDDM into a full facemask configuration is also possible. This future integrated full facemask system could potentially provide the EOD diver with depth, bottom time, cylinder pressure, oxygen level (PPO_2), and battery status without large wrist-mounted displays.

Recreational and Technical Divers:

An increasing number of civilian divers (deep, wreck, cave, photographers, and marine biologists) are using enriched air, other mixed-gasses, and commercially available rebreathers to extend dive time at depth, and reduce decompression obligations. A modified version of the IDDM could similarly provide enhanced safety and effectiveness for these applications.

Public Safety Divers:

These divers typically perform rescue and recovery operations in environmental conditions with little or no visibility. Police and other specialist divers may be required to operate special equipment (such as hand held sonars), or perform special missions, which make monitoring critical life support data very difficult. A custom IDDM could enhance safety and mission effectiveness here.

Handicapped or Physically Challenged Divers:

A growing number of handicapped, or physically challenged individuals are entering the realm of recreational diving. Organizations such as the Handicap Scuba Association International and the International Association of Handicapped Divers specialize in training handicapped individuals to scuba dive. One challenge for instructors is enabling the handicapped diver to monitor his or her depth, bottom time and cylinder pressure. This is difficult since many times the handicapped diver cannot manipulate limbs into a position to view gauges, dive computers, watches, or consoles. In these instances the handicapped diver must rely solely on his or her dive buddy to monitor life support data. An IDDM would allow the handicapped diver an added level of control, confidence, and peace of mind by allowing direct monitoring of dive data.

In-Mask Digital Optic System

The DATAMASK contains a miniature liquid crystal display (LCD) panel, proprietary Digital Optic System, microprocessor, depth transducer, wireless cylinder pressure receiver, diver replaceable battery, and controlling software. The miniature LCD allows you to keep your eyes focused on the dive while presenting critical dive data including: current depth, elapsed dive time, cylinder pressure, and dive time remaining. The Digital Optic System provides a clear, highly magnified image of the LCD, which is viewable regardless of environmental conditions and may be seen clearly by the vast majority of people, regardless of vision.

Wireless Air Integration

The DataMask HUD is a sophisticated Personal Dive Computer featuring Oceanic's wireless air integration technology. A transmitter threaded into the first stage high-pressure port continuously sends cylinder pressure data to the mask. Frequencies are individually coded to allow multiple divers to swim side by side without interference with other units. Because the transmitter and display module are independent and separately powered units, the mask may also be easily used as a stand alone, non-air integrated dive computer.

Advanced Free Dive Mode

The DataMask HUD provides accurate depth and time with an amazing 1-second sampling rate for subsequent PC download and analysis. Dive Time is displayed in seconds and minutes. Custom audible alarms include Elapsed Dive Time, Countdown Timer and (3) Independent Max Depth Alarms. The DataMask HUD is the first Free Diving Computer to calculate and track Nitrogen Tissue Loading, allowing you to switch between SCUBA dives and Free Dives on the same dive day.

Patented Air Time Remaining Algorithm

You're at 80 feet with 1300 psi remaining in your cylinder - how long before you need to begin an ascent to a shallower depth? Our patented Air Time Remaining feature calculates your current depth, breathing rate, cylinder pressure, ascent time, and decompression status to tell you exactly how much time you can remain underwater.

Full-Time Air Time Remaining Display

The DataMask HUD's primary dive mode always displays approximate Air Time Remaining in 10 minute increments.

Dive Time Remaining

Dive Time Remaining, like Air Time Remaining provides a 'real' number in minutes, considering Air Time Remaining, Nitrogen and Oxygen absorption, and automatically displays whichever allows less time.

Turn-Around Pressure Alarm

The 'Turn-Around' Pressure Alarm is a unique patent-pending feature that allows you to pre-program an audible reminder when you reach 1000 to 3000 psi in 250 psi increments. This helps ensure that you return to your exit point with plenty of air.

Oversized Digits

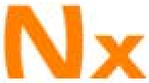
Take the Oceanic challenge: When shopping for a new dive computer, compare the displays. When it comes to viewing critical information, which would you rather see at 100 feet?

Audible Alarms

The DataMask HUD features a variety of system and user-customized audible alarms, alerting you to situations that pose a potential danger, or simply serve as a convenient reminder.

Audible Alarm Acknowledgement™

Have you ever had difficulty hearing your computer's audible alarm? Perhaps that little beep signifying a potentially dangerous situation was timed perfectly with your exhaust bubbles rushing past your ears. Or maybe it seemed insignificant as that huge manta ray soared overhead. You won't miss the DataMask HUD's audible alarm. Once triggered, the alarm will sound continuously for 10 seconds. We know what you're thinking. "That's nice, I'll definitely hear the alarm, but isn't that going to annoy me and everyone else in the water?" We thought of that too. The alarm's job is to get your attention so that you look at the computer. Once it does that, simply press the button and it will stop. You're a responsible diver and the DataMask HUD treats you that way.



Air or Nitrox

The DataMask HUD acts simply as an 'Air' computer until you tell it otherwise, whether that is this weekend or 2 years down the road.

Oceanic Personal Dive Computer Algorithm

Decompression theory can be trusted only as far as it has been demonstrated by actual test dive data. In 1987 a unique series of experiments were conducted by Diving Science and Technology (DSAT). Commissioned by the Professional Association of Diving Instructors (PADI), these Doppler ultrasound monitored human experiments conducted by Dr. Michael Powell produced the most comprehensive data set that exists for recreational divers to this day. These data were used to validate the PADI Recreational Dive Planner and are the basis of the algorithm used in all Oceanic Personal Dive Computers (PDCs).

Personal Conservative Factor Adjustment

When the Conservative Factor is set On, the no-decompression limit times are reduced to values equivalent to those that would be available at the next higher 3000 foot (915 meter) altitude.

"The Ultimate Adjustable Algorithm"

That's the way divers, instructors and Authorized Dealers refer to Oceanic PDCs. Our tissue loading bar graphs provide complete control of your margin of safety for each dive. Want to be a bit more cautious? Make it a personal rule to never enter into the caution zone; or stay one or more pixel away. Now you can even program several of our PDCs to do it for you with our patent pending Nitrogen Bar Graph Alarm; set it once and let the DataMask HUD alert you when your bar graph reaches that level.

No Deco Safety Stop Prompt with Adjustable Depth and Time

An audible and visual alarm remind you as you approach your programmed no decompression safety stop depth and an automatic timer counts down to zero. As in any other dive mode, you still have access to other pieces of information, and there is no penalty should you choose to disregard the safety stop.

FastSet User Interface

Speed through menu items and set modes easily and quickly with Oceanic's FastSet Menu and intuitive button operation.

Date and Time Stamp

The DataMask HUD features time of day on the surface as well as underwater for quick reference. Time and date stamp also helps you to easily identify specific dives in Log Mode or PC download memory.

Alphanumeric Display

An alphanumeric "Message Box" is incorporated in the upper portion of the DataMask HUD display to provide text and numeric readouts in simple, unambiguous terms. Imagine beginning an ascent and as the ascent speed increases hearing a warning beep from the DataMask HUD as the message box alerts with the words "TOO FAST".

Automatic Altitude Compensation

The DataMask HUD automatically compensates for altitude dives up to 14,000 feet, giving adjusted no-decompression times and depths. The DataMask HUD even automatically recalibrates the depth displays for freshwater instead of seawater above 2,000 feet.

Diver-Replaceable Batteries

The DataMask HUD and wireless transmitter feature diver replaceable batteries. This can be a real trip-saver on board a live-aboard boat!

Battery Hot Swap
Should you be in a tight spot between dives, the "hot-swap" feature allows you to change batteries between dives while maintaining all calculations.

24-Hour Fly Countdown *and* Calculated Desaturation Time
The DataMask HUD features both a 24-hour countdown timer and calculated Desaturation Time, the theoretical time required to off-gas all residual nitrogen at sea level.

Depth-Dependent Ascent Rate
The DataMask HUD features a depth-dependant ascent rate, allowing increased rates at deeper depths and providing additional safety as you near the surface.

Adjustable OceanGlo® Backlighting
Backlighting may be adjusted before the dive or "on-the-fly" underwater for brightness as well as full-time or on demand use.

24 Dive On-Unit Log Book
The DataMask HUD features on-unit data storage capacity for 24 dives. Date and time stamp makes locating and viewing a specific dive quick and easy .

History Mode
History Mode displays accumulative information for up to 9999 dives, 9999 dive hours and the maximum depth achieved. History information is maintained indefinitely, even if the battery is replaced .

OceanLog® PC Download and Settings Upload Interface
Oceanic's DataMask HUD OceanLog PC Interface is an exquisitely detailed digital dive log. OceanLog allows you to easily transfer dive data from your DataMask HUD to your PC via a plug-in USB cable. Following download, your dive data is automatically formatted for easy viewing, sorting, analysis, and printing. Enter location, dive buddy and your notes and you've instantly created your own digital logbook.

In addition to detailed dive analysis, the DataMask HUD OceanLog PC Interface also allows you to quickly and easily set most of your user settings and options through your PC.

Gauge Mode
Divers using advanced breathing gas may utilize the DataMask HUD as an advanced air integrated digital depth gauge and bottom timer with detailed PC Interface.

Split Set Mode Access
To make easy work of customizing your DataMask HUD, our user settings and options are organized in one of four set modes. Set F (FO2) includes all Nitrox settings. Set A (Alarms) allows you to activate and customize all audible alarms. Set U (Utilities) includes units of measurement, PC sampling rate, transmitter link codes, and conservative factor settings, and Set T (Time) includes date and time.

USER SETTINGS AND OPTIONS
Air or Nitrox
The DataMask HUD acts simply as an 'Air' computer until you tell it otherwise, whether that is this weekend or 2 years down the road. As your training and experience grow, the DataMask HUD is designed to grow with you, being easily programmed for Nitrox mixtures from 21% to 50%.
FO2 50% Default On/Off
Following a Nitrox dive, many dive computers calculate your next dive based on a "worse-case scenario", mix of 50% Oxygen and 79% Nitrogen should you forget to reset your actual mix. With FO2 50% Default OFF, your mix remains at the original set point until you change it again.
Receiver ON/OFF
Since the only information sent by the wireless transmitter is cylinder pressure and transmitter battery status, the DataMask HUD is actually a fully functional Personal Dive Computer without air integration features when the Receiver is set Off.
Dive Mode Selection
Activate Digital Gauge Mode for dives conducted beyond the limits of the Air/Nitrox computer, Free Dive Mode or NORM Mode for Air and Nitrox dives.
Audible Alarm On/Off
You may choose to deactivate all audible alarms.
Maximum Depth Alarm
The Maximum Depth Alarm provides an audible warning upon reaching your planned maximum depth. This is an important safety feature for deeper dives or less experienced divers, and it comes in handy for rebreather diving where you can pre-set another level of safety.
Elapsed Dive Time Alarm
You're on a boat trip and the captain says, "Dive your own profiles, but be back in an hour - we're having lunch!" Just set your DataMask HUD to alert you when your elapsed dive time reaches one hour.
Nitrogen Tissue Loading Bar Graph Alarm
Oceanic's trademark nitrogen bar graph design provides the ultimate user-adjustable computer. Want to be a bit more cautious? Make it a personal rule to never enter into the caution zone, or stay one pixel away, or - you get the point. Now you can program the DataMask HUD to do it for you. Set it once and let your computer alert you when your bar graph reaches a pre-determined level.
Dive Time Remaining Alarm
Dive Time Remaining provides a 'real' number in minutes. This calculation considers both Nitrogen and Oxygen absorption, displaying whichever allows less time. With this unique DataMask HUD feature, you are able to program an audible alarm to alert you upon reaching a pre-set number in minutes.
Turn-Around Pressure Alarm
The 'Turn-Around' Pressure Alarm is a unique patent-pending feature that allows you to pre-program an audible reminder when you reach 1000 to 3000 psi in 250 psi increments. This helps ensure that you return to your exit point with plenty of air.
Ending Pressure Alarm
Air Time Remaining calculations are based on the 'Ending' Pressure Alarm. You define how much air you want in reserve upon reaching the surface.
Maximum PO2 Level Alarm (Nitrox)
When diving Nitrox, do you prefer your maximum PO2 exposure to be 1.2 ATA? 1.6 ATA? Depending on where you learned and your own personal comfort zone, the answer may be very different from diver to diver. The DataMask HUD lets you set your own limit. Program an audible alarm to sound at the level that you prefer.
Water Activation On/Off
The DataMask HUD automatically enters Dive Mode when the water contacts are wet, and the unit is submerged past 4 feet. To avoid this when swimming or enjoying other water sports, simply set Water Activation Off.
Units of Measurement
Choose between Metric and Imperial settings for date, temperature, depth and pressure.

FEATURES & FUNCTIONS	DATAMASK HUD
Modes of Operation	Air, Nitrox, Gauge, and Free Dive
Push Buttons	2
Mounting Options	Mask
Activation	Water or Push Button
Algorithm Basis	Modified Haldanean / DSAT (Diving Science and Technology) Database
Personal Conservative Factor Adjustment	Each Level provides No Decompression Limits for the next dive +3000 ft altitude
Altitude Algorithm Basis	NOAA
O2 Limit Basis	NOAA
Tissue Compartments	12 (5 to 480 minutes)
Automatic Altitude Adjustment	2,000 - 14,000 ft
Decompression Capability	10 - 60 ft (3-18 m)
Automatic Safety Stop Prompt	YES
Cylinder Pressure and Air Time Remaining	WIRELESS TRANSMISSION
Audible Alarm	YES
Alarm Acknowledgment (U/W Deactivation)	YES
Ascent Rate Range	11-30 fpm / 21-60 fpm
Ascent Rate Maximum	30 fpm (<60 ft) 60 fpm (>60 ft)
OceanGlo Backlight (Push Button)	YES
SmartGlo Backlight (Sensor)	NO
Diver Replaceable Batteries	YES
Battery Type	DATAMASK - 3.6v CR2 TRANSMITTER - 3.6v CR2
Battery Life*	DATAMASK - 160 DIVE HOURS TRANSMITTER - 1500 HOURS
Battery Hot Swap (retains calculations)	YES
Low Battery Indicator (Graphic)	YES
Calendar / Clock	YES
Operating Depth (Max)	330 ft
Operating Depth (Gauge/Free Dive Mode)	330 ft
12/24 Hour Time to Fly Countdown	YES

Calculated Desaturation Count-down	YES
Dive Mode Displays	MAIN, UP TO 2 ALTERNATES AND 1 SECONDARY
High O2 Alarm / Warning	300 SOTU / DOTU
High PO2 Alarm / Warning	1.6 DEFAULT OR USER SETTING
On-Unit Log Capacity	24 DIVES
OceanLog PC Download	Included
OceanLog PC Settings Upload	Included
OceanLog Download Memory Capacity	512K**
Pre-Dive Planning Sequence	PUSH BUTTON 30-190 ft
Message Box	ALPHA NUMERIC GRAPHICS - MODES, ALARMS AND SETTINGS
Temperature Display	YES
Buddy Pressure Check	N/A
Air Time Remaining Bar Graph	NUMERIC
Nitrogen Tissue Loading Bar Graph	YES
Oxygen Loading Bar Graph	YES
Variable Ascent Rate Bar Graph	YES
No Decompression Time Re-maining Display	YES
Air Time Remaining Display	YES
O2 Time Remaining Display	YES
Set Mode with Rapid Advance	YES
Set "Turn Around" Pressure Alarm	YES
Set "Ending" Pressure Alarm	YES
Set FO2 Value (%) Gas 1	AIR, 21-50%
Set FO2 Value (%) Gas 2	N/A
Set FO2 Value (%) Gas 3	N/A
Set Audible Alarm On/Off	YES
Set Max Depth Alarm	YES
Set Elapsed Dive Time Alarm	YES
Set Maximum Nitrogen Tissue Loading Bar Graph Alarm	YES
Set Personal Conservative Factor	YES
Set Dive Time Remaining Alarm	YES
Set Units Of Measurement	YES

Set Time Format (12/24 Hour)	YES
Set Time of Day	YES
Set Date	YES
Set Maximum PO2 Alarm	YES
Set FO2 50% Default	YES
Set Backlight Duration/Intensity	YES
Set Safety Stop Time and Depth	YES
Set Sampling Rate (OceanLog Download)	1 (Free Dive Mode Only)/ 2/15/30/60 SECONDS
Set Digital Gauge Mode On/Off	YES
Set Water Activation On/Off	YES
Set Free Dive Elapsed Dive Time Alarm	YES
Set Free Dive Countdown Timer	YES
Set Free Dive Max Depth #1	YES
Set Free Dive Max Depth #2	YES
Set Free Dive Max Depth #3	YES
Warranty	2 YEAR
30-Day Satisfaction Guarantee	YES

Oceanic Personal Dive Computer Algorithm

Decompression theory can be trusted only as far as it has been demonstrated by actual test dive data. In 1987 a unique series of experiments were conducted by Diving Science and Technology (DSAT). Commissioned by the Professional Association of Diving Instructors (PADI), these Doppler ultrasound monitored human experiments conducted by Dr. Michael Powell produced the most comprehensive data set that exists for recreational divers to this day. These data were used to validate the PADI Recreational Dive Planner and are the basis of the algorithm used in all Oceanic Personal Dive Computers (PDCs).

Patent Pending Nitrogen Tissue Loading Bar Graph Adjustment allows you to select the personal degree of conservatism you wish to build into each dive. An audible alarm alerts you when the bar graph has reached your maximum desired set point. (all models exept Veo 100/150)

"The ultimate adjustable algorithm." That's the way divers, instructors and Oceanic Dealers refer to Oceanic PDCs. Our trademark bar graphs provide complete control of your margin of safety for each dive. Want to be a bit more cautious? Make it a personal rule to never enter into the caution zone, or stay one pixel away, or – you get the point. Now you can even program several of our PDCs to do it for you with our patent pending Nitrogen Bar Graph Alarm; set it once and let your computer alert you when your bar graph reaches that level.

*Battery Life: Battery life estimates are based on full-capacity batteries, and continuous usage as described.

- Backlight set on continously throughout dive
- 7 days per week
- 2 dives per day
- 1 hour dive time
- 2 hour surface interval
- 18 hour interval from last dive to the first of the next day

* The DataMask HUD Transmitter consumes little or no battery power when inactive, or not pressurized. For purposes of this specification, use life is based on continuous use, 24 hours a day, 7 days a week.

** Oceanic Personal Dive Computers have user selectable Sampling Rates that determine when data is sampled and stored for subsequent download to associated PC interface programs. More frequent sampling provides more data per dive yet results in storage of fewer dives for download. Use with Air or Nitrox, with or without air integration, dive profiles, Free Diving activities, and other variables may also affect the number of dives that can be stored