



IDRONAUT OCEAN SEVEN 304Plus CTD LOGGER

VERY LOW POWER, SELF-RECORDING, MICRO CTD, DISSOLVED OXYGEN -
ARCTICA, ANTARCTICA - BRINE - ROVs and AUVs -

The OCEAN SEVEN 304Plus CTD completes the line of high quality and accuracy IDRONAUT OCEAN SEVEN CTDs, fulfilling the demand of a high performance CTD probe with very small diameter and very low power consumption. This CTD can be easily integrated/adapted to third-party systems like floating profilers and/or oceanographic moorings, ROVs and AUVs. IDRONAUT prides itself on the design of its full ocean depth, pump-free, low-maintenance sensors. Central to which is their high accuracy seven-platinum-ring quartz conductivity cell (patented) which can be cleaned in the field without the need for re-calibration. This unique quartz cell employs a large diameter (8 mm) and a short length (46mm) to guarantee self-flushing.

The OS304Plus does not require pumps or any other external device to flush the sensors, which minimizes its power consumption and allows the use in **Arctica** and **Antarctica**. The OS304Plus CTD standard interface is RS232C; other optional interfaces are: TTL, RS485 and **wireless Bluetooth®**.

The RS485 interface overcomes the RS232C limitation (max 200m cable). The OS304Plus communicates at a speed up to 115k2 bps, thus reducing data uploading time to a minimum. The OS304Plus can be manufactured with a 316 grade L stainless steel housing or a titanium housing allowing deployment to depths of 1000m or 6000m respectively.

Features:

- Up to 6Hz CTD simultaneous sampling.
- Very low power consumption.
- Expandable: O₂, Turbidity and other sensor interfaces, available upon request.
- Large memory (2Gbytes) 60.000.000 data sets.
- High-speed data uploading.

SAMPLING MODES

- Continuous:** Sampling at configurable rate: 0.1 Hz to 6 Hz.
Multiple cycles can be obtained by switching the CTD on/off.
- Pressure:** Data is sampled at pressure intervals.
Multiple profiles are obtained by switching the CTD on/off.
- Timed:** CTD collects a series of samples and then sleeps for the configured time interval. Time intervals are: between 5s and 1 day.
- Conditional:** Data acquisition is started and continues while the reading from a selected sensor is above a threshold value. Monitoring of the selected sensor threshold value can be configured to occur at intervals: between 5s and 1 day.
- Burst:** Burst sampling carried out at configured time intervals: between 5s and 1 day.

DATA STORAGE AND BATTERY ENDURANCE

The OS304Plus CTD is equipped with a 2-Gbyte internal non-volatile FLASH memory which allows the storing of about 60,000,000 data sets each one being composed of the reading of: CTD sensors plus the acquisition date and time.

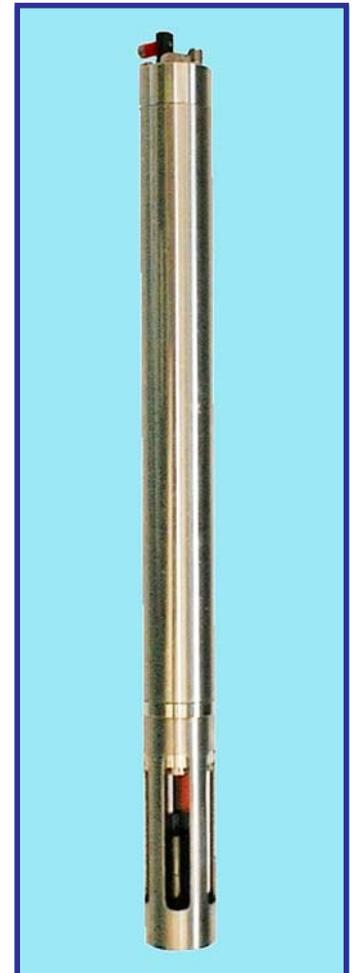
Different types of battery can be installed in the CTD housing.

- 2 x size "AA" Alkaline 1.5V battery assembled in a single pack. 3.0V
- 1 x size "AA" Lithium non rechargeable battery 3.6V, 2.4Ah
- 1 x size "C" Lithium non rechargeable battery 3.6V, 8.4Ah
- NiMH rechargeable IDRONAUT custom battery pack (3x1.2 AA) 3.6V, 2.6Ah

The NiMH rechargeable battery pack allows up to 50 hours of continuous operation, while the "C" size Lithium non rechargeable battery allows up to 186 hours of continuous operation.

Whenever the OS304Plus operates in Timed, Burst and Conditional modes, the battery endurance is considerably extended because the OS304Plus enters a deep sleep mode between acquisitions and drains only 8µAh from the battery.

For instance, by monitoring every hour, the OS304Plus will run, in theory, for 12 years on a single Lithium size "C" cell.



**TECHNOLOGY
IN SEARCH OF
NEW DEPTHS**



SENSOR SPECIFICATIONS

The OS304Plus CTD can be equipped with the following sensors to measure:

<u>Parameter</u>	<u>Range</u>	<u>Accuracy</u>	<u>Resolution</u>	<u>Time Constant</u>
Pressure	0..1000dbar ⁽¹⁾	0.05 %full scale	0.0015 % full scale	50 ms
Temperature	-5..+35 °C	0.002 °C	0.0001 °C	50 ms
Conductivity	0..90 mS/cm	0.003 mS/cm	0.001 mS/cm	50 ms ⁽²⁾
Analogue	0..5000 mV	1 mV	0.1 mV	50 ms ⁽³⁾

(1) Other standard pressure transducers, immediately available, have : 10, 40, 100, 200, 500, 2000, 4000, 6000 dbar ranges.

(2) At 1 m/second flow rate.

(3) Six analogue inputs available for future expansion.

The fundamental properties of seawater, like:

Salinity, Sound Speed, Water Density, Oxygen ppm are obtained using the algorithms described in the UNESCO technical papers in marine science no. 44 "Algorithms for computation of fundamental properties of sea water".

The freshwater properties like:

TDS (Total Dissolved Solids), Fresh Water Conductivity corrected at 20°C and 25°C are automatically calculated.

OPTIONAL SENSOR SPECIFICATIONS

The OS304Plus CTD can be optionally equipped with the IDRONAUT Highly Accurate Precise (0.01%FS) pressure transducer, the IDRONAUT OEM Turbidity Meter and the IDRONAUT dissolved oxygen sensor.

<u>Parameter</u>	<u>Range</u>	<u>Accuracy</u>	<u>Resolution</u>	<u>Time Constant</u>
Pressure	0..6000dbar	0.01 %full scale	0.002 %full scale	50 ms
Oxygen	0.. 50 ppm	0.1 ppm	0.01 ppm	3 s (from nitrogen to air)
	0.. 500 % sat.	1 % sat.	0.1 %sat.	3 s (from nitrogen to air)
Turbidity	0.03..>750FTU	5 FTU*	0.5* FTU	0.1s

*Accuracy and resolution are referred to 750 FTU scale.

ELECTRONIC SPECIFICATIONS

<i>Real-time and logging:</i>	6Hz.
<i>Interfaces:</i>	RS232C, TTL (0..3.3VDC), RS485, wireless Bluetooth® .
<i>Real time clock accuracy:</i>	3 ppm/year.
<i>Communication speed:</i>	38K4 bps (up to 115k2 bps).
<i>Data memory:</i>	2 Gbyte µSD-CARD.
<i>Supply voltage:</i>	<i>Battery:</i> 2 x size "AA" Alkaline 1.5V battery assembled in a single pack, 3.0V. 1 x size "AA" Lithium non rechargeable battery, 3.6V, 2.4Ah.
	<i>External:</i> 4.5..18VDC.
<i>Supply current:</i>	Running:45 mA @ 3.6V; Sleep: 8 µA @ 3.6V.

SOFTWARE

Idronaut programmes operating under all Windows versions allow the operator to configure the OS304Plus data acquisition and logger functions and upload data from the memory. They are:

ITERM: Terminal emulation programme to easily communicate with the OS304Plus using the built-in operator interface and communication protocol.

REDAS-5: Data processing and retrieval programme, which allows the display and plotting of conductivity, temperature, pressure and derived variables such as salinity, sound speed and water density, according to UNESCO formulas and recommendations.

µREDAS: REDAS-5 customized for Windows mobiles running on PDA devices.

PHYSICAL CHARACTERISTICS

<u>Housing:</u>	<u>1000 dbar (AISI 316/black POM)</u>	<u>2000 dbar (white POM)</u>	<u>6000 dbar (Titanium GR 2)</u>
<i>Dimensions:</i>			
housing diameter	43 mm	75 mm	48 mm
total length (with hanging rod)	580 mm	580 mm	595 mm
<i>Weight:</i>			
in air	1.2 kg	2.2 kg	1.85 kg
in water	0.65 kg	0,5 kg	1.15 kg



Via Monte Amiata, 10
20861 Brugherio (MB) - ITALY
Tel. +39 039 879656 - Fax +39 039 883382
E-mail: idronaut@idronaut.it
<http://www.idronaut.it>

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