IDRONAUT OCEAN SEVEN 304 CTD LOGGER

LOW POWER MICRO CTD SELF-RECORDING CAPABILITY - FAST SAMPLING RATE: 8Hz
DISSOLVED OXYGEN - ARCTICA, ANTARCTICA - BRINE - ROVs and AUVs -

*The OCEAN SEVEN 304 CTD, completes the line of high quality and accuracy IDRONAUT OCEAN SEVEN CTDs, fulfilling the demand for a high performance CTD probe with very small diameter and **extremely low power consumption.** This CTD can be easily integrated/adapted to third-party systems like floating profilers and/or buoy-moored systems, ROVs and AUVs. The 304 CTD standard interface is RS232C; other interfaces like: TTL, RS422 and Wireless Bluetooth® can be optionally installed.*

*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 (46 mm) to guarantee self-flushing and no clogging after long-term deployment even in biologically active waters. Competitors' cells, which present few mm only of cell orifice and very long cell length, are prone to clog even if protected by dangerous and poisonous antifouling devices. The OCEAN SEVEN 304 CTD 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 304 CTD offers a combination of 16-bit high resolution data accuracy, with long-term sensor stability, making this CTD the best choice for both on-line profiling and self-recording moored applications. The CTD uses state-of-the-art electronics and is equipped with a 512-Mbyte logging memory.

Moreover, the user can select the proper conductivity range: for salt or fresh water, making this CTD a very advanced tool for sampling sites near shore influenced by fresh water inlets, or/and for groundwater profiling and monitoring applications.

SAMPLING MODES

User selectable sampling/operating modes include:

Continuous:	*Data is sampled at configurable sampling rates starting from 0.1 Hz to 8 Hz. Sampling continues until interrupted. Multiple cycles can be obtained by switching the CTD ON and OFF.*
Pressure:	*Data is sampled at regular pressure intervals. Multiple profiles can be obtained by switching the CTD ON and OFF. Two different methods (conductivity or pressure) can be used to interrupt acquisitions when the CTD returns to the surface. This data acquisition method is ideal for profiling.*
Timed:	*CTD collects a series of samples and then sleeps for the configured time interval before waking up again and repeating the acquisitions. Time interval can be configured between 2s and 1 day. Battery power is conserved while the probe is in sleep mode. This data acquisition method is ideal for long-term monitoring.*
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 2s and 1 day*
Burst:	*8 Hz measurements can be performed at configured time intervals between 2s and 1 day. Battery power is conserved by switching off the probe between bursts.*

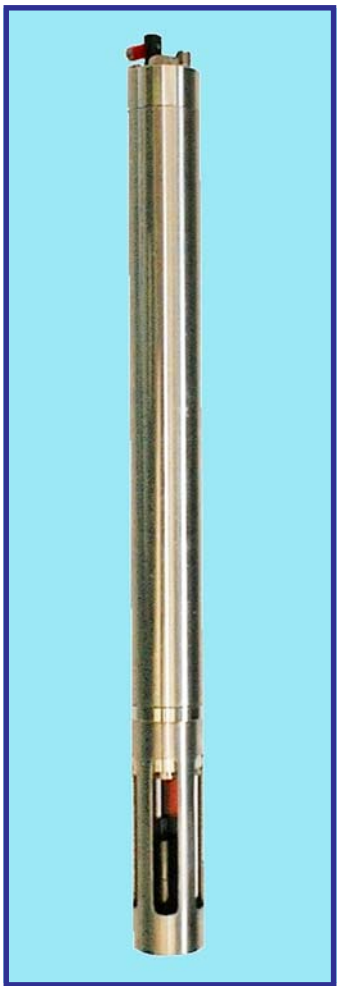
REAL-TIME COMMUNICATIONS

The OCEAN SEVEN 304 CTD communicates with a computer via a standard RS232C interface. Real-time data can be acquired by means of the REDAS Windows software. An optional RS422 interface overcomes the limitation of the RS232C cable maximum length (200 m) and allows the probe to transmit data through distances up to 1000 m. The communication speed is user selectable among: 9600, 19200, 38400 and 57600 bps. A Bluetooth® wireless interface can be optionally added to the wired interfaces.

SOFTWARE

Idronaut programmes operating under Windows 2K, XP, VISTA and Windows 7 allow the operator to configure the OCEAN SEVEN 304 CTD data acquisition and logger functions and upload data from the 512-MByte internal memory. They are:

ITERM:	*terminal emulation programme to easily communicate with the OCEAN SEVEN 304 CTD using the probe integrated operator interface.*
REDAS:	*data processing and retrieval programme which allows the display and plotting of conductivity, temperature, pressure and derived variables such as salinity, sound speed, density, according to UNESCO formulas and recommendations.*



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DATA STORAGE AND BATTERY ENDURANCE

The OCEAN SEVEN 304 CTD allows the storing of 4,100,000 data sets each one being composed of the reading of: CTD sensors plus the acquisition date and time. The 304 CTD is powered by two PP3 9V alkaline batteries connected in parallel which provide 1 Ah sufficient to keep the CTD continuously ON for 36 hours in continuous sampling mode and at the maximum sampling rate. Further battery endurance can be obtained by using lithium batteries. Whenever the CTD operates in "Timed, Burst and Conditional" modes, the battery endurance is considerably extended because the CTD enters a deep sleep mode between acquisitions.

CTD CHAINS

Chains of OCEAN SEVEN 304 CTDs are deployed by easily clamping the CTDs with a screwdriver to a rope (see picture). Chains of OS304 CTDs can be used to profile or perform long-term monitoring by properly configuring the CTD data acquisition method. Furthermore, the Bluetooth® wireless connectivity option allows the instant recovery of data stored in the CTDs internal memory once they are back to the surface. OS304 CTD Bluetooth® unique addressing identification code allows the operator to select one OS304 among the others present in the chain.

Set of 304 CTDs ready to be clamped on a rope

SENSOR SPECIFICATIONS

The OS 304 CTD can be equipped with the following sensors to measure:

Parameter		Range	Accuracy	Resolution	Time Constant
Pressure		0..1000 dbar[2]	0.05 %full scale	0.0015 % full scale	50 ms
Temperature		-5..+35 °C	0.005 °C	0.0006 °C	50 ms
Conductivity	*Salt water*	0..70 mS/cm	0.007 mS/cm	0.001 mS/cm	50 ms[1]
	Fresh water	0..7000 µS/cm	5 µS/cm	0.1 µS/cm	50 ms[1]

(1) At 1 m/second flow rate. (2) Other standard pressure transducers, immediately available, have : 10, 40, 100, 200, 500, 2000, 4000, 6000 dbar ranges.

OPTIONAL SENSOR SPECIFICATIONS

The OS304 CTD can be optionally equipped with the Highly Accurate Precise (0.01%FS) pressure transducer[1], the IDRONAUT OEM Turbidity Meter and the IDRONAUT dissolved oxygen sensor.

Parameter	Range	Precision	Resolution	Time Constant
Pressure [1]	0..6000dbar	0.01 %full scale	0.002 %full scale	50 ms
Oxygen [2]	0.. 50 ppm	0.1 ppm	0.01 ppm	3 s [3]
	0.. 500 % sat.	1 % sat.	0.1 %sat.	3 s [3]

(1)This sensor cannot be installed if the wireless Bluetooth option is installed too. (2) This option increases the probe warm-up time to 120s. (3) In air.

ELECTRONIC SPECIFICATIONS

Real-time and logging:		8Hz.
Interfaces:		RS232C, Asynchronous TTL (0..5VDC), RS422, Bluetooth® .
Baud Rate:		up to 57600 bps (9600 bps default).
Data memory:		512 Mbytes.
A/D converter:		16-bit successive approximation, 4 multiplexed analogue inputs.
Supply Current	*Running:*	23 mA, 4.5..11V, nominal 9V.
	Sleep:	70 µA @ 9V.
Communication protocol:		proprietary byte oriented binary and plain message protocol.
Operator interface :		friendly menu driven user interface.
Batteries:		two 9V, 0.5 Ah, PP3 alkaline batteries connected in parallel.

PHYSICAL CHARACTERISTICS

***Housing*:**		**1000 dbar (AISI 316/black POM)**	**6000 dbar (Titanium grade 2)**
Dimensions:			
	housing diameter	43 mm	48 mm
	total length	630 mm	635 mm
Weight:	in air	1.3 kg	3.7 kg
	in water	0.7 kg	2.8 kg

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