



IDRONAUT OCEAN SEVEN 310

28Hz VERY-LOW-POWER, SELF-RECORDING and PROFILING MULTI PARAMETER CTD

The OCEAN SEVEN 310 multiparameter CTD represents a real breakthrough in the concept of miniaturization, integration and performance. Thanks to the adoption of a new generation of electronic devices, the OS310 can interface with up to 14 analogue sensors and up to 2 digital sensors (see list) and can guarantee sampling rates up to 28Hz.

The OS310 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. The OS310 does not require pumps or any other external device to flush the sensors, which minimizes its power consumption. The OS310 is characterized by a **drift free sensor preamplifiers**.

The operator can easily select the OS310 sampling rate from 1Hz to 28 Hz (samples per second), according to the required monitoring or profiling activity.

CONDUCTIVITY CELL

The high accuracy seven-platinum-ring quartz conductivity cell (patented) can be cleaned in the field without the need for re-calibration. This unique quartz cell employs a large diameter (8mm) and a short length (46mm) to guarantee self-flushing and no clogging after long-term deployment even in biologically active waters. Furthermore, **an optional UV LED (280 nm), integrated into the conductivity cell**, sterilizes the sample under measurement, thus avoiding the early growth of biofouling inside the quartz measuring cell.

BATTERY-OPERATED SELF-RECORDING MODES

- Continuous: Sampling at configurable rates: up to 28 Hz. Multiple cycles can be obtained by switching the CTD ON/OFF.
- Pressure: Data is sampled at pressure intervals. Multiple profiles can be obtained by switching the CTD ON/OFF.
- Timed: CTD collects a series of samples and then sleeps for the configured time interval.
Time intervals: 5s up to 1 day.
- Conditional: Data acquisition is started and continues while the reading from a selected sensor is above the 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: 5s up to 1 day.

OS310 On-Line module

The OS310 can be equipped with a transparent acrylic flow-through cell (250ml) becoming an On-Line module. The flow-through cell can be easily removed for sensor maintenance and cleaning.

DATA STORAGE AND BATTERY

The OS310 CTD is equipped with a 2-Gbyte SD memory card, which allows the storing of about 30,000,000 data sets each one being composed of the reading of all the installed sensors plus the acquisition date and time. The OS310 communicates at a speed of 115k2 bps, thus keeping data uploading time to a minimum.

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

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|--|-------------|
| •1x Size "AA" Li-SOCl ₂ Lithium-thionyl chloride non rechargeable battery | 3.6V, 2.4Ah |
| •3x Size "AA" 1.5V Alkaline non rechargeable battery assembled in a single pack | 4.5V |
| •1x Size "C" Li-SOCl ₂ Lithium-thionyl chloride non rechargeable battery | 3.6V, 8.4Ah |
| •1x NiMh rechargeable IDRONAUT custom battery pack(3x1.2 AA) | 3.6V,4.5 Ah |

Whenever the OS310 operates in *Timed*, *Burst* and *Conditional* modes, the battery endurance is considerably extended because the CTD enters a deep sleep mode between acquisitions.

DATA TELEMETRY

The telemetry interface allows interfacing the OS310 through standard oceanographic coaxial cables up to 10Km long. When communicating through data telemetry, the IDRONAUT deck units are mandatory. The OS310 can use both the low-voltage (60 VDC) **Portable deck unit** and the high-voltage (220 VDC) on-board **MkPlus deck unit**.



SENSOR SPECIFICATIONS

The OS310 multiparameter CTD can be equipped with the following sensors to measure:

Parameter		Range	Accuracy	Resolution	Time constant
Pressure		0..7000 dbar ⁽³⁾	0.05 % F.S.	0.0015 % F.S.	50 ms
Temperature		-5..+50 °C	0.0015 °C	0.0001 °C	50 ms
Conductivity	salt water	0..90 mS/cm	0.0015 mS/cm	0.0001 mS/cm	50 ms ⁽¹⁾
	fresh water	0..7000 µS/cm	5 µS/cm	0.1 µS/cm	50 ms ⁽¹⁾
	brine	0..350 mS/cm ⁽⁵⁾	0.1 mS/cm	0.0001 mS/cm	50 ms ⁽¹⁾
Oxygen	polarographic	0..50 ppm	0.1 ppm	0.01 ppm	50 ms ⁽²⁾
		0..500 %sat.	1 %sat	0.1 %sat.	3 s ⁽²⁾
Oxygen	optical	0..45 mg/l	0.1 mg/l	0.025 mg/l	5 s
		0..250 %sat.	±0.2 %sat.	0.05 %sat.	5 s
pH		2..12 pH	0.01 pH	0.1 mpH	3 s ⁽⁴⁾
Redox		± 1000 mV	1 mV	0.1 mV	3 s

(1) At 1 m/second flow rate. (2) From nitrogen to air. (3) Other standard pressure transducers: 10, 40, 100, 200, 500, 1000, 2000, 4000, 7000 dbar. (4) Differential pH preamplifier, $10^{13} \div 10^{14}$ ohm input impedance. (5) Optional extended range, available upon request. 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". The fresh water properties like: **TDS (Total Dissolved Solids), Fresh Water Conductivity** corrected at 20°C and 25°C are automatically calculated.

OPTIONAL ANALOGUE AND DIGITAL INTERFACES

The OS310 can be optionally equipped with up to 14 analogue sensors and 2 digital devices. The measuring range, resolution, accuracy and time constant if not indicated, belong to the interfaced sensor.

Parameter	Range	Accuracy	Resolution	Time constant
Pressure	0..7000 dbar ⁽¹⁾	0.01 % F.S.	0.002 % F.S.	50 ms
Turbidity meter	0..>2500 FTU	0.1 FTU	0.025 FTU	3 s ⁽²⁾
Fluorometer	0..150 µg/l	0.02 µg/l	0.01 µg/l	3 s ⁽²⁾
PAR	0..10 µA	0.05 µA	0.01 µA	
UNILUX (single channel)	0..100 µg/l			
TRILUX (three channel)	0..100 µg/l			
CYCLOPS fluorometers	0..100 µg/l			
ECO fluorometers	0..100 µg/l			
Sampling system:	GENERAL OCEANICS 1018 Rosette, IDRONAUT Miniaturized 6 bottle Water Sampling System			

(1) Other standard pressure transducers: 100, 1000, 2000, 4000, 7000 dbar. (2) Provided with auto-range, 25, 125, 500, >2500 FTU; 5, 15, 50, 150 µg/l. (3) **Chlorophyll a, Phycocyanin, Phycoerythrin** for algae monitoring; **Rhodamine WT** or **Fluorescein** for dye tracing applications; **Nephelometer** for turbidity monitoring

SPECIFICATIONS

Real-time and logging:

up to 28 Hz

Interfaces:

RS232C, RS485, TTL, Data telemetry (QAM) up to 10Km; Wireless

Real-time clock accuracy:

3 ppm/year

Software:

REDAS-5 and ITERM

Power supply:

Battery:

2.9..5.0 VDC; running: 90 mA @ 3.6V;

External power:

9..32 VDC

Data telemetry:

Low voltage: 18..60 VDC; High voltage: 90..220 VDC

PHYSICAL CHARACTERISTICS

Housings	1000 dbar	1500 dbar	2000 dbar	6000 dbar	7000 dbar
	AISI316	POM	POM	Titanium	Titanium
Dimensions: housing diameter	48mm	100 mm	75mm	48mm	89 mm
total length	715mm	710mm	660mm	660mm	720 mm
Weight:	in air	1.3kg	4.2 Kg	3.3kg	2.1kg
	in water	0.7kg	0.2 Kg	1.7kg	1.3kg
					8.0 Kg
					4.3 Kg



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