

OCEAN SEVEN 316S

**SELF-RECORDING and PROFILING,
REALTIME TELEMETRY 7000m,
MULTIPARAMETER PROBE**



The **OCEAN SEVEN 316S CTD multiparameter probe** is equipped with the IDRONAUT full ocean depth long-term stability sensors, central to which, is the high accuracy seven-platinum-ring quartz conductivity cell. The OS316S does not require pump or any other external device to flush the sensors, which minimizes its power consumption and allows the use in **Arctica and Antarctica**. For added flexibility, the OS316S can be easily interfaced/integrated on **buoys, ROVs and AUVs**, thus making this probe an ideal choice for both on-line profiling and self-recording moored applications. Optional data telemetry is available for on-line full ocean depth, **real-time communications**. The OS316S can optionally accommodate **analogue and digital inputs** dedicated to interface external sensors.

FEATURES AND OPTIONS AVAILABLE



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, optionally two UV-LED (Ultraviolet, 280 nm @500µW, Light-Emitting Diode) are integrated into the conductivity cell, sterilizing the sample under measurement, thus avoiding the early growth of biofouling inside the quartz measuring cell.

DATA STORAGE

Allows storage of up to **300M dataset**, each one being composed of the reading of all installed sensors plus the date & time, using the internal **4 GByte data memory**. The OS316S communicates at a default speed of **38k4 bps**, thus keeping data uploading time to a minimum.

TEMPERATURE SENSOR

Features a very fast platinum resistance thermometer (response time: **50ms**). Negligible self-heating effect. Optionally **combined C/T sensor** featuring a **7ms** fast thermistor (20ms after processing) integrated in the conductivity cell is available upon request.

SELF-RECORDING MODES

- Continuous:** Sampling at configurable rate.
- Pressure:** Data is sampled at pressure intervals.
- Timed:** Data is sampled at time interval.
- Conditional:** Data is sampled when a threshold value is reached.
- Burst:** Burst sampling at time intervals.

SENSORS SPECIFICATIONS

Parameter	Range	Initial Accuracy	Resolution	Response Time
Pressure	0..7000 dbar ⁽³⁾	0.05% FS	0.002% FS	50 ms ⁽¹⁾
Temperature	-5..+50 °C	0.0015 °C	0.0001 °C	50 ms ⁽¹⁾
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⁾	0.010 mS/cm	0.0001 mS/cm	50 ms ⁽¹⁾
Oxygen Polarographic	0..50 ppm	0.1 ppm	0.01 ppm	3 s ⁽²⁾
	0..500 %sat.	1 %sat.	0.1 %sat.	3 s ⁽²⁾
Oxygen Optical	0..44 mg/l	±0.1 mg/l	0.025 mg/l	3 s ⁽⁶⁾ or 1 s ⁽⁷⁾
	0..500 %sat.	±1 %sat.	0.25 %sat.	3 s ⁽⁶⁾ or 1 s ⁽⁷⁾
pH	1..13 pH	0.01 pH	0.0001 pH	3 s ⁽⁴⁾
Redox	±1000 mV	±1 mV	0.1 mV	3 s

(1) At 1 m/sec flow rate. (2) From nitrogen to air. (3) Other standard pressure transducers: 10,40,100,200,500,1000,2000,4000,7000,10000 dbar. (4) Differential pH preamplifier, 10¹³-10¹⁴ ohm input impedance. (5) Optional extended range, available upon request. (6) Blue label membrane cap for profiling and monitoring. (7) White label membrane cap for fast profiling. The fundamental properties of seawater like: **Salinity, 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, Fresh Water Conductivity** corrected at 20°C and 25°C are automatically calculated.



PHYSICAL CHARACTERISTICS

Housings	1500 dbar POM	2000 dbar POM	7000 dbar TITANIUM
Diameter	100 mm	105 mm	89 mm
Length	710 mm	710 mm	720 mm
Weight in air	4.2 Kg	4.2 Kg	8.0 Kg
Weight in water	0.2 Kg	0.2 Kg	4.3 Kg

ANALOGUE AND DIGITAL INTERFACES

Parameter	Range	Initial Accuracy	Resolution	Response Time
<i>Itronaut</i> Pressure Highly Accurate	0..7000 dbar ⁽¹⁾	0.01% FS	0.002% FS	50 ms
<i>Seapoint</i> Turbidity Meter	0..>2500 FTU	0.1 FTU	0.025 FTU	3 s ⁽²⁾
<i>Seapoint</i> Chlorophyll Fluorometer	0..150 µg/l	0.02 µg/l	0.01 µg/l	3 s ⁽²⁾
<i>LI-COR</i> LI-192SA / LI-193SA PAR	0..10 µA	0.05 µA	0.01 µA	
<i>TURNER DESIGNS</i> C-FLUOR™ ⁽⁴⁾	0..100 µg/l ⁽³⁾	0.03 µg/L	0.01 µg/L	
<i>CHELSEA</i> UNILUX / TRILUX	0..100 µg/l ⁽³⁾			
<i>VALEPORT</i> VA500 ALTIMETER	0.1m – 100m		1mm	
WATER SAMPLING SYSTEM	GO ROSETTE 1018-1015 / IDRONAUT MISS / SBE32 CAROUSEL			

(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. (4) Alternatively it is possible to interface the Turner Designs CYCLOPS-7F™. Up to 6

SPECIFICATIONS

Sampling rate	Up to 28 Hz
Interfaces	Wired: RS232C, RS485, Telemetry QAM; Wireless: Bluetooth
Power supply	9...32 VDC; Running: 70 mA @ 12VDC; Standby 8 µA @ 12VDC;

SOFTWARE

Itronaut software allow the operator to configure the OS316S data acquisition, logger functions and upload data from the memory. They are:

- **WTERM:** Windows Terminal emulation software to easily communicate with the OS316S using the built-in operator interface and communication protocol. Users are easily able to view real time data, configure the probe for unattended acquisition and upload stored data.
- **REDAS-5:** Windows Data processing and retrieval software, 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.

ACCESSORIES

PORTABLE and MKPlus DATA TELEMETRY DECK UNITS	The Telemetry deck unit powers and interfaces, by coaxial oceanographic cables, the OS316S with a PC.
MANUAL PORTABLE WINCH	Includes 2-way or 5-way slip ring and hold: up to 350 m of 5 mm polyurethane jacketed armored cable or up to 200 m of 8.3 mm polyurethane multi-conductor shielded cable.
TITANIUM PROTECTIVE CAGES	Sensors and/or upper connectors protection: Ø 260 mm. Mooring frame for the CTD and additional probes available.
EXTERNAL SUBMERSIBLE RECHARGEABLE BATTERY PACKS	14.4VDC (no. 12 NiMH cells), 4.5Ah, Ø 75 x 315 mm, 1500(POM housing) or 7000(Titanium housing) meters max. depth.