

BOREHOLE PROBE 43mm

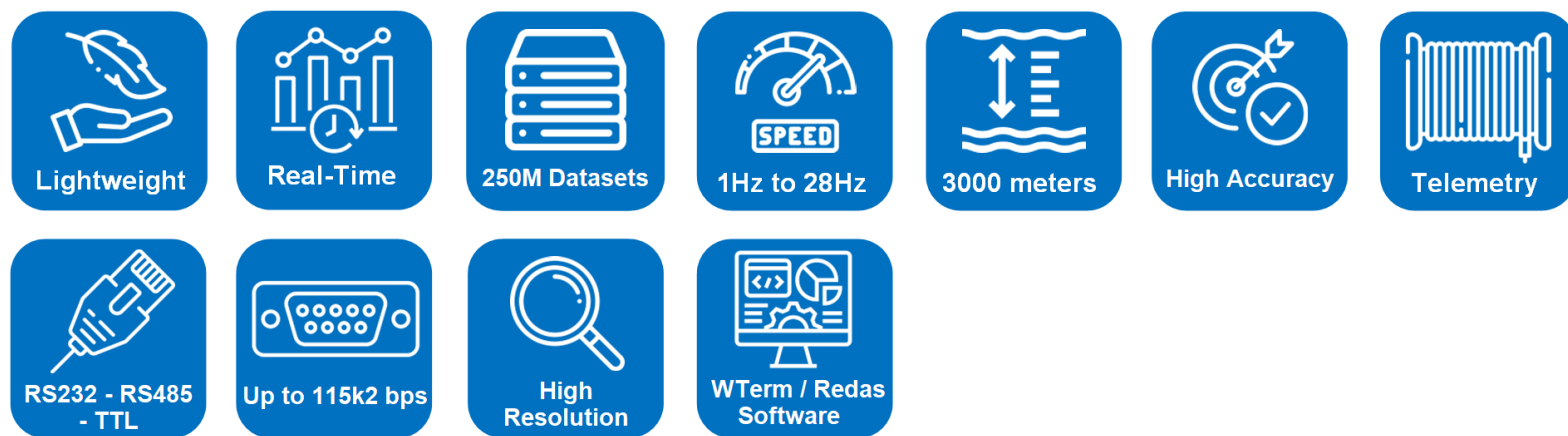
GROUND WATER MULTI-PARAMETER PROFILER

OCEAN SEVEN 310



The **OCEAN SEVEN 310 BOREHOLE** multiparameter CTD is the result of IDRONAUT's 40-year-old experience in the design and manufacturing of high-technology borehole probes for deep groundwater profiling. The OS310 CTD multiparameter probe, which presents very small size (diameter of only **43mm**), has been specifically designed for groundwater investigations through "boreholes" and uses very reliable, accurate and **drift-free high-quality sensors**, associated with advanced and miniaturized electronics. Thanks to the adoption of a new generation of electronic devices, the OS310 can guarantee sampling rates up to **28Hz**, with long-term sensor stability, making this probe the best choice for profiling applications. The OS310 CTD can be easily integrated/adapted to third-party systems like external data logger. The OS310 multiparameter CTD does not require pumps or any other external device to flush the sensors and continuously transmits acquired data converted into engineering units via **telemetry**. The OS310 CTD allows the operator to select the proper conductivity range for salt or fresh water, making this probe a very advanced tool for investigation of ground-water influenced by salt-water intrusion.

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 recalibration. 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.

DATA STORAGE

The OS310 CTD is equipped with a 4Gbyte data memory, which allows the storing of about 250 millions 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 up to 115k2 bps, thus keeping data uploading time to a minimum.

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 unit is mandatory. The OS310 can use both the low-voltage (30/60 VDC) **Portable deck unit** and the high-voltage (220 VDC) on-board **MkPlus deck unit**.

TEMPERATURE SENSOR

Features a very fast platinum resistance thermometer (response time: 50 ms). Negligible self-heating effect.

PHYSICAL CHARACTERISTICS

Housings	1500 dbar AISI316L	3000 dbar TITANIUM
Diameter	43 mm	48 mm
Length	500 mm	700 mm
Weight in air	1.4 Kg	2.1 Kg
Weight in water	0.7 Kg	0.8 Kg

SENSORS SPECIFICATIONS

Parameter	Range	Initial Accuracy	Resolution	Response Time
Pressure	0..3000 dbar ⁽²⁾	0.05% FS	0.002% FS	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 ⁽⁴⁾	0.010 mS/cm	0.0001 mS/cm	50 ms
Oxygen Optical	0..45 mg/l	0.1 mg/l	0.025 mg/l	3 s ⁽⁵⁾ or 1 s ⁽⁶⁾
	0..250 %sat.	±0.2 %sat.	0.05 %sat.	3 s ⁽⁵⁾ or 1 s ⁽⁶⁾
pH	1..13 pH	0.01 pH	0.0001 pH	3 s ⁽³⁾
Redox	-1000..+1000 mV	1 mV	0.1 mV	3 s

(1) At 1 m/second flow rate. (2) Other standard pressure transducers: 10, 40, 100, 200, 500, 1000, 2000 dbar. (3) Differential pH preamplifier, 10¹³-10¹⁴ ohm input impedance. (4) Optional extended range, available upon request. (5) Blue label membrane cap for profiling and monitoring.

(6) White label membrane cap for fast profiling.

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.

TELEMETRY PORTABLE DECK UNIT

The Telemetry Portable Deck Unit powers and interfaces, by coaxial oceanographic cables, the OCEAN SEVEN 310 multiparameter CTD with a personal computer. The portable deck unit is equipped with a transceiver (modem) which allows communication with the probe. The portable deck unit is housed in a waterproof plastic case and is provided with an internal mains rechargeable lead battery (12VDC, 7A/h) which permits probe operation in the absence of the mains supply.

The internal battery guarantees up to 20 hours of continuous probe and deck unit operation.

The portable deck unit comes complete with an international battery charger.

Telemetry power supply: 30/60 VDC (max 0.3A@12V).

Dimensions: 340 x 300 x 160 mm. **Weight:** 6.5 kg.

SPECIFICATIONS

Real-time and logging	Up to 28 Hz
Interfaces	Wired: RS232C, RS485, TTL, Data Telemetry
Power supply	9..32 VDC; Running: 90 mA @ 3.6VDC; Standby 10 µA @ 3.6VDC;

SOFTWARE

The Idronaut software allows the operator to configure the OS310 data acquisition, logger functions and upload data from the memory. They are:

- **WTERM:** Windows Terminal emulation software to easily communicate with the OS310 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.

