# OCEAN SEVEN 305

## LOW POWER MULTIPARAMETER PROBE WITH TELEMETRY AND DATA LOGGING CAPABILITY

*The OCEAN SEVEN 305 multiparameter probe, completes the line of high quality and accuracy OCEAN SEVEN probes, fulfilling the demand for a high performance multiparametric probe with very small diameter and extremely low power consumption. This probe can be easily integrated/adapted to third-party systems like floating profilers and/or buoy-moored systems. The OCEAN SEVEN 305 probe can, upon request, be equipped with a wide range of interfaces like: RS232C, Asynchronous TTL, RS422 or IDRONAUT standard Telemetry FSK.*

*Idronaut prides itself on the design of its pressure balanced full ocean depth, pump free, low maintenance sensors. Central to which, is their well known high accuracy seven-platinum-ring quartz conductivity cell, which can be cleaned in the field without need of 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 poisonous anti-fouling devices. The OCEAN SEVEN 305 probe does not require pumps or other external devices to flush the sensors, which could further limit its power consumption.*
*Moreover, the user can select the proper Conductivity range: for salt or fresh water, making this probe a very advanced tool for sampling sites near shore influenced by fresh water inlets, or/and for borehole monitoring applications.*

*The OCEAN SEVEN 305 probe offers a combination of 16-bit high resolution data accuracy, with long term sensor stability, making this probe an ideal choice for both on-line profiling and self recording moored applications. The probe uses state-of-the-art electronics and is equipped with a 64-Mbyte logging memory, acquiring and storing data in memory, according to customer defined measurement schedules. Calibration coefficients and probe configuration are stored in the internal non-volatile memory.*

### SELF LOGGING - SAMPLING MODES

*User selectable sampling/operating modes include:*

*Continuous:* *Sampling at fixed rates starting from 0.1 Hz to 8 Hz. Sampling continues until interrupted. Multiple sessions are possible, switching the probe ON and OFF.*

*Pressure:* *Data is sampled at regular pressure intervals. Multiple profiles can be obtained switching the probe ON and OFF. Two different methods (conductivity/pressure) can be used to interrupt acquisitions when the probe returns to the surface. This data acquisition method is ideal for profiling.*

*Timed:* *Probe collects a series of samples, then sleeps for the configured interval time before waking up again and repeating the acquisitions. Time interval can be configured from 2 s up to 1 day. Battery power is conserved while in sleep mode. This data acquisition method is ideal for long-term monitoring.*


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### REAL-TIME COMMUNICATIONS

*The OCEAN SEVEN 305 probe communicates with a computer via one of the mentioned interfaces. Real-time data are acquired by means of the IDRONAUT REDAS Windows software. The optional RS422 and Telemetry interfaces overcomes the limitation of the RS232 cable maximum length (100 m) and allows the probe to transmit data through distances up to 10 km. The communication speed is user selectable among: 9600, 19200, 38400 and 57600 bps. When interfaced by means of the IDRONAUT FSK telemetry the communciation speed is fixed to 9600 bps.*

### SOFTWARE

*A programme operating under Windows 98se/ME/2000/XP allows the operator to configure the OS305 probe data acquisition and logger functions and upload data from the 64-MByte internal memory. The software package comprises:*

*ITERM:* *terminal emulation programme to easily communicate with the OS305 probe 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.*

## *DATA STORAGE AND BATTERY ENDURANCE*

*The OCEAN SEVEN 305 probe allows the storing of 1,146,630 data sets each one being composed of the reading of the standard 6 sensors (Conductivity, Temperature, Pressure, Dissolved Oxygen, pH, Redox) plus the acquisition date and time.The 305 probe is powered by two PP3 9V alkaline batteries connected in series which provide 0.5 A/h sufficient to keep the probe continuously ON for 80 hours in continuous sampling mode and at the maximum sampling rate. Further battery endurance can be obtained by using two lithium batteries (instead of the two 9V alkaline type) which increase the batteries endurance up to 160 hours of continuous operation. Whenever the probe operates in "Timed Mode", the battery endurance can be considerably extended because the probe waits for the interval between acquisitions in "Sleep mode" with negligible battery consmption.*

## SENSOR SPECIFICATIONS

The Ocean Seven 305 probe can be equipped with the following sensors to measure:

| Parameter | Range | | Accuracy | | Resolution | | Time Constant |
|---|---|---|---|---|---|---|---|
| Pressure | 0.. 1000 | dbar(3) | 0.05 | %F.S. | 0.0015 | %F.S. | 50 ms |
| Temperature | -1.. +50 | °C | 0.005 | °C | 0.001 | °C | 50 ms |
| Conductivity | | | | | | | |
| Salt water | 0.. 64 | mS/cm | 0.005 | mS/cm | 0.001 | mS/cm | 50 ms(1) |
| Fresh water | 0..6400 | µS/cm | 1 | µS/cm | 0.1 | µS/cm | 50 ms(1) |
| Oxygen | 0.. 50 | ppm | 0.1 | ppm | 0.01 | ppm | 3 s (2) |
| | 0.. 500 | % sat. | 1 | % sat. | 0.1 | %sat. | 3 s |
| pH | 0.. 14 | pH | 0.01 | pH | 0.001 | pH | 3 s |
| Redox | +/-1000 | mV | 1 | mV | 0.1 | mV | 3 s |
| no. 3 analogue inputs for: | | | | | | | |
| *Ammonia | 0.. 100 | mg/l-N | | | 0.1 | mV | |
| *Nitrate | 0.. 100 | mg/l-N | | | 0.1 | mV | |
| *Chloride | 0.5.. 18000 | mg/l-N | | | 0.1 | mV | |

(1) At 1 m/second flow rate. (2) In air. (3) Other standard pressure transducers : 10, 40, 100, 200, 500, 2000, 4000, 6000 dbar ranges.

The following parameters are calculated from CTD sensor signals (according to UNESCO 1986 formula - Millero):

- **SALINITY**
- **FRESH WATER CONDUCTIVITY** corrected at 20 °C;
- **OXYGEN % SATURATION to OXYGEN ppm CONVERSION**

## ELECTRONIC SPECIFICATIONS

| | |
|---|---|
| *Real-time data output rate*: | 8 Hz |
| *Logging*: | up to 8 Hz (depending on the probe sampling method). |
| *Interfaces* | RS232C, Asynchronous TTL, RS422, IDRONAUT FSK telemetry(4) |
| *Baud Rate* | up to 57600 bps (9600 bps default). |
| *Data memory* | 64 Mbytes. |
| *A/D converter* | 16-bit successive approximation. |
| *Analogue input* | multiplexed analogue inputs. |
| *Supply Voltage* | 8.5..36V, nominal 12V. |
| *Supply Current* | |
| Running: | 50 mA @ 12V. |
| Sleep: | 0.025 mA @ 12V. |
| *Communication protocol* | proprietary byte oriented binary and plain message protocol. |
| *Operator interface* | friendly menu driven user interface |
| *Batteries* | two 9V, 0.5 A/h, PP3 alkaline batteries assembled in series. |

(4) Telemetry interface require the purchasing of the IDRONAUT "FSK Portable Deck Unit". This unit powers and interfaces the OCEAN SEVEN 305 probethrough a standard oceanographic coaxial armoured cables.

## PHYSICAL CHARACTERISTICS

| | | 1000 dbar (AISI 316/black POM) | 4000 dbar (AISI 316) |
|---|---|---|---|
| *Housing:* | | | |
| *Dimensions*: | housing diameter | 43 mm (*) | 48 mm |
| | total length | xxx mm | xxxx mm |
| *Weight:* | in air | 1.30 kg | 1.90 kg |
| | in water | 0.70 kg | 1.20 kg |

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