

# M-R TYPE MULTI-RETURN ALTIMETER



The Oceanscan Multi-Return Altimeter fulfills many of the sonar data capture requirements of the oceanographic and scientific communities. This unit differs from most Altimeters of the "first-return" type by digitising the receiver output at high speed into a FIFO memory. The range to the sea-bed is then calculated in the digital domain by the mathematical processing algorithm programmed into the internal RISC microcontroller.

The sampling parameters of the M-R Type are set-up prior to the unit being deployed by linking the unit to a P.C. via an RS232 cable. The parameters are stored internally in the microcontrollers FLASH memory without any power required.

The Altimeter may be interfaced to other equipment using either its analogue or digital outputs. The analogue output is generated from a 12-bit digital to analogue converter and may be software selected for either 5v or 10v full-scale.

The digital data to 1mm resolution is available from both RS232 and RS485 outputs. Whilst cable connected to a P.C. the Altimeter can uplink the raw FIFO data in the same manner as an imaging sonar as shown in the inset pictures.

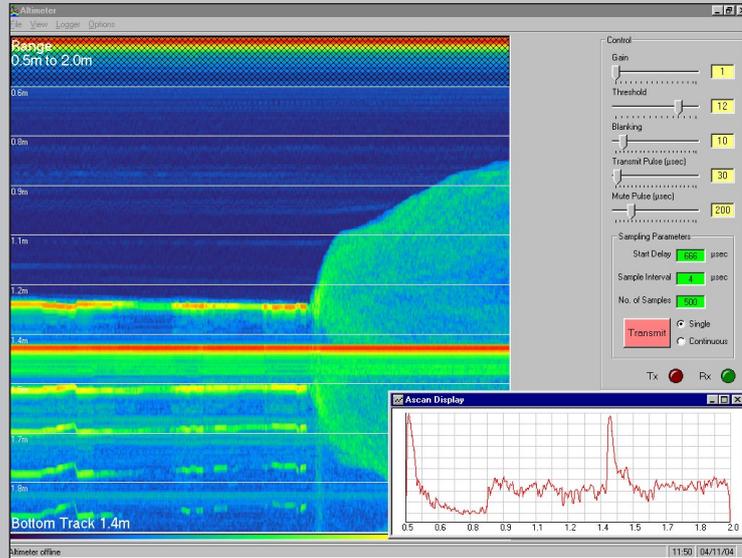
- Very high precision
- See through suspended sediments
- Programmable start and stop ranges give "True Zoom" capability
- 1µsec sample rate
- Up to 4095 samples
- RS232, RS485 and analogue data output
- Sea-bed detection using digital signal processing
- "Windows" software for programming and real-time imaging



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Accredited to BS EN ISO 9001:2000

# M-R TYPE MULTI-RETURN ALTIMETER



Most existing Altimeters operate by measuring the travel time between a transmitted acoustic pulse and the first received echo which exceeds a given signal threshold. These devices operate on what is known as a "first-return" basis. This method works satisfactorily in ideal conditions, where there is little ambient noise and the water is free from bubbles or suspended sediments, however, this is most often not the case. The Oceanscan Multi-Return Altimeter is a sophisticated digital sonar system whilst remaining simple to integrate with other equipment on both scientific platforms ROV's and AUV's.

The Oceanscan Altimeter transmits a narrow conical beam at 200kHz or 700kHz with a programmable pulse length from 10µsec in width. A high speed A/D converter captures the received echos directly into a FIFO memory buffer with a programmable sample rate and count. The start and stop ranges for which the A/D captures data are also programmable so that a specific range may be examined in minute detail with up to 4095 samples spaced as little as 1µsec apart. The M-R Altimeter examines the data stored in the FIFO and calculates the range to the sea-bed mathematically with a noise rejection algorithm.

## Technical Specification

Acoustic Frequency:	200kHz & 700kHz
Beamwidth:	14.8° & 7.4°
Transmit Pulse Width:	10µsec to 1msec in 10µsec steps
Gain:	40dB fixed 0-40dB variable in 16 steps
Start Ranges:	0.2m to 10m in 0.2m steps
Stop Ranges:	0.5m to 20m in 0.5m steps
Operating Depth:	3000m/Optional 6000m
Sample Rate:	1µsec to 100µsec in 1µsec steps
Number of Averages:	1 to 100
Number of Samples:	4095 maximum
Repetition (Ping) Rate:	0.1Hz to 10Hz in 100msec steps
Range Resolution:	1mm
Power Supply:	15 to 30VDC at 120mA
Digital Output:	RS232 at 38.4k baud or RS485 at 38.4k baud
Analogue Output:	0 to +5v full-scale or 0 to +10v full-scale
Materials:	Stainless Steel 316
Dimensions:	65mm diameter, 165mm long (excluding connector)

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