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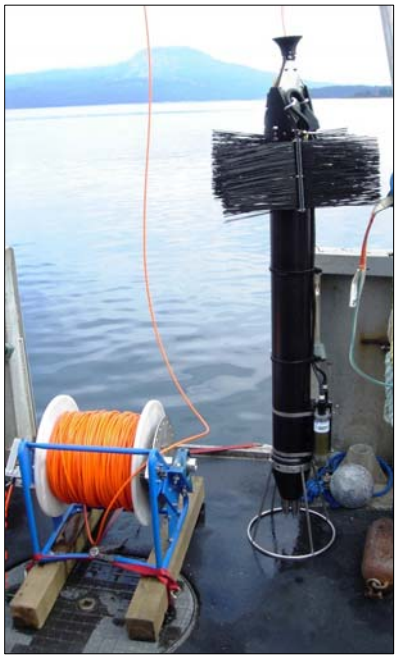
VMP 500

Coastal Vertical Microstructure Profiler



Description:

The VMP500 is a vertical microstructure turbulence profiler for the measurement of dissipation-scale turbulence in oceans and lakes up to 500 m depth. It is equipped with state-of-art microstructure velocity probes (shear probes), high-resolution temperature sensors (thermistors), and high-accuracy CTD sensors. Light and usable from small vessels and boats.

Features:

- Pressure case rated to 500 m depth
- Pressure sensor
- Three-axis, high-accuracy accelerometers
- SPM-38-1 shear probes
- FP07-38-1 fast thermistors
- SBE7-38 microstructure conductivity sensor*
- SBE-3F / SBE-4C temperature and conductivity sensors*
- Bottom landing guard
- Signal conditioning and telemetry electronics
- Deck unit for data communication
- ODAS4-RT real-time data acquisition software
- DISS 2.0 data processing library for Matlab*
- Training in Victoria, 2 days.

Specifications:

Sampling rate	up to 2048 Hz
Depth rating	0 – 500 m
Weight (in air)	19.5 kg (26.7 kg with SBE3/4 sensors)
Length overall	165 cm

Velocity shear

Range	3×10^{-10} – 10^{-4} W kg^{-1}
Accuracy	5%
Resolution	2.5×10^{-3} s^{-1}

Pressure (Keller)

Range	0 – 500 dbar
Accuracy	0.1 %
Resolution	0.0005 dbar (using signal + derivative technique)

Water temperature (SBE 3F)*

Range	-5 – 35 °C
Accuracy	1×10^{-3} °C (NIST traceable)
Resolution	1×10^{-4} °C
Time Response	0.070 s ± 0.010

Analog / Digital Converter

Number of channels	16
Resolution	16 bits (true)
Linearity	15 ppm

Micro Temperature (FP07)

Range	5 – 35 °C
Accuracy	N/A
Resolution	1×10^{-5} °C (using signal+derivative technique)
Time Response	0.007 s ± 0.003

Accelerometers (IC Sensors)

Range	±2 g
Accuracy	0.5º
Resolution	3×10^{-5} g (1 – 20 Hz)
Stability/Linearity	±0.5º, ±0.01g
Frequency response	0 – 300 Hz

Conductivity (SBE 4C)*

Range	0 – 7 S/m
Accuracy	0.0003 S/m
Resolution	0.00004 S/m at 24 Hz
Time response	0.060 seconds (pumped)

* optional

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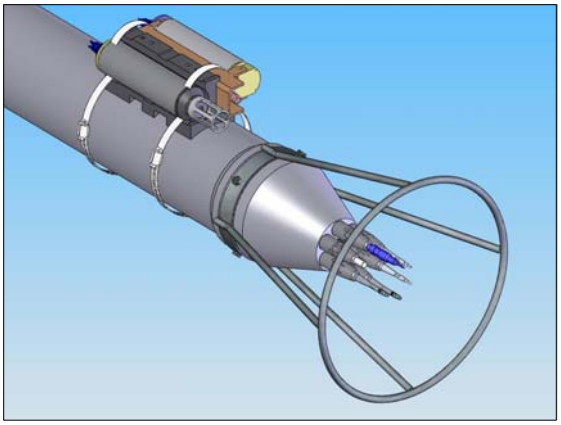
System components:

Mechanical Components

Qty. Description

1 Composite pressure case for electronics and sensors, two end-caps and tapered nose cone with six positions for turbulence sensors, drag elements, bottom landing guard. Overall pressure rating 500 m.

5 Proprietary probe holders machined from SS316, to hold 3/8 inch probes with o-ring seals rated to 10000 PSI.



Sensors

2 IC-Sensors 3140: accelerometers mounted with axes along horizontal x- and y directions

1 PA-11: Keller Pressure Transducer 500 dBar full scale. Sensor calibrated with dead weight tester, 0.1%.

2 SPM-38-1: turbulence microstructure shear probes, with Teflon water protection, mounted on 3/8" diameter SS316 sting. Pressure rated to 1000 m.

1 FP07-38-1: Thermometric fast microstructure thermistor, mounted on 3/8" diameter SS316 sting. Pressure rated to 1000 m.

1 SBE7-38 micro-conductivity sensor, mounted (optional)

1 SBE-3F, Seabird temperature probe, including cables and mounting brackets (optional).

1 SBE-4C, Seabird conductivity probe, including cables and mounting brackets (optional).

Electronics

1 ASTP analog board: Supports two (2) shear probes, two (2) FP07DA202K thermistors, three (3) accelerometers and one (1) pressure transducer. Outputs are du1/dt, du2/dt, T1+dT1/dt, T1, T2+dT2/dt, T2, P, P+33dP/dt. Full-scale is -2 to 40°C and 500 dBar.

3 16-channel anti-aliasing filter board. Cutoff at 100 Hz for du1/dt, du2/dt, and T1+dT1/dt T2+dT2/dt. Integrated with A/D converter.

1 Premium Analog-to-Digital converter (16 channels, 16-bits, 15 ppm linearity, +/-2.5V) to support microstructure, accelerometers and pressure sensors.

1 Two-channel frequency-to-number converter for SBE3F and SBE4C or other frequency output sensors. Accuracy +/- 1 count or 1.5 ppm, whichever is greater.

1 MC-1 Micro-conductivity electronics board to support one SBE7 sensor. (optional)

1 Shipboard transceiver (deck-unit) for serial communication with remote instrument(s) and USB2.0 communication with shipboard recording computer.

1 RTRANS Remote transceiver for serial data communication with ship-board transceiver (UTRANS), using 2 conductors on tether cable.

Software

1 ODAS4-RT real time data acquisition and display software (for Windows XP)

1 DISS 2.0 function library for Matlab, designed for processing and display of turbulence microstructure data. (optional)

Miscellaneous

1 Frequency response and noise testing, component validation, system integration, telemetry testing, documentation, etc.

1 Hands-on training in Victoria (2 days)

1 Plywood shipping case with foam cushions

1 Set of manuals and full technical documentation

Winch System (optional)

1 Light-duty hand winch with 4-conductor low-noise electrical slip rings, drum capacity 300m of 0.7 mm diameter tether cable

1 300m Kevlar reinforced 4-conductor tether cable, polyurethane jacket (orange), installed on winch.

1 Set of deck cables.