Vector - 4000 m



Investigate 3D velocity in the bottom boundary layer down to depths of 4000 m

The Vector is a high-accuracy single-point current meter that is capable of acquiring 3D velocity in a very small volume at rates up to 64 Hz. It is widely used for sediment transport applications, small-scale turbulence measurements and coastal engineering studies. It has an excellent track record of delivering outstanding data quality in a variety of applications. This titanium version of the Vector is suitable for investigating deep-water currents down to depths of 4000 m.

Highlights

- Small-scale turbulence
- Sampling up to 64 Hz
- Small sampling volume for measurements close to boundaries

Applications

- Studies of bottom boundary layers
- Studies of deep-water currents
- Ocean engineering projects
- Low flow measurements
- Flux measurements
- Deep ocean mining support

Technical specifications

→ Water velocity measurements	
Maximum profiling range	N/A
Distance from probe	0.15 m
Sampling volume diameter	15 mm
Sampling volume height (user-selectable)	5-20 mm
Cell size	N/A
Velocity range	±0.01, 0.1, 0.3,1, 2, 4, 7 m/s (software-selectable)
Adaptive ping interval	N/A
Accuracy	±0.5% of measured value ±1 mm/s
Velocity precision	typ. 1% of velocity range (at 16 Hz)
Sampling rate (output)	1-64 Hz
Internal sampling rate	100-250 Hz
→ Distance measurements	
Minimum range	N/A
Maximum range	N/A
Cell size	N/A
Accuracy	N/A
Sampling rate	N/A
→ Echo intensity	
Acoustic frequency	6 MHz
Resolution	0.45 dB
Dynamic range	90 dB
→ Sensors	
Temperature:	Thermistor embedded in end bell
Temp. range	-4 to +40 °C
Temp. accuracy/resolution	0.1 °C/0.01 °C
Temp. time response	10 min
Compass:	Magnetometer
Accuracy/resolution	2º/0.1º for tilt < 20°
Tilt:	Liquid level
Accuracy/resolution	0.2°/0.1°
Maximum tilt	30°
Up or Down	Automatic detect
Pressure:	Piezoresistive
Range	0-4000 m
Accuracy/precision	0.5% FS / Better than 0.005% of full scale

→ Analog inputs	
No. of channels	2
Supply voltage to analog output devices	Three options selectable through firmware commands: 1) Battery voltage/500 mA, 2) +5 V/250 mA, 3) +12 V/100 mA
→ Data recording	
Capacity (standard):	9 MB, can add 4/16 GB
Data record (Standard)	24 bytes at sampling rate + 28 bytes/second
Data record (IMU)	72 bytes at sampling rate
→ Real-time clock	
Accuracy	±1 min/year
Backup in absence of power	4 weeks
→ Data communications	
I/O	RS-232 or RS-422
Communication baud rate	300-115 200 Bd
Recorder download baud rate	600/1200 kBd for both RS-232 and RS-422
User control	Handled via ”Vector” software, ActiveX® function calls, or direct commands.
Analog outputs	3 channels standard, one for each velocity component or two velocities and pressure.
Output range	0–5 V, scaling is user-selectable.
Synchronization	TTL (5 V tolerant) sync in/sync out, start on sync, sample on sync
→ Connectors	
Bulkhead	MCBH-8-FS
Cable	PMCIL-8-MP on 10 m polyurethane cable
→ Software	
Functions	Deployment planning, instrument configuration, data retrieval and conversion (for Windows®).
→ Multi unit operation	
Software	N/A
I/O	N/A
→ Power	
DC input	9-15 V DC
Maximum peak current	3 A
Max. consumption	1.5 W at 64 Hz
Typical consumption, 4 Hz	0.6 - 1 W
Sleep consumption	< 100 µA
Transmit power	2 adjustable levels
→ Batteries	
Battery capacity	50 Wh (alkaline or Li-ion),165 Wh (lithium), single or dual

→ Batteries	
New battery voltage	13.5 V DC (alkaline)
Data collection capacity	Refer to planning section in software
→ Environmental	
Operating temperature	-4 to +40 °C
Storage temperature	-20 to +60 °C
Vibration	IEC 60068-1/IEC60068-2-64
Depth rating	4000 m
→ Materials	
Standard model	Titanium housing. Titanium probe and fasteners
→ Dimensions	
Maximum diameter	84 mm
Maximum length	485 mm (housing only), 246 mm (fixed stem) add 110 mm for double battery
→ Weight	
Weight in air	8.3 kg
Weight in water	5.1 kg
→ Options	
Probe mounted on fixed stem or on 2 m cable	
Vertical or horizontal probes	
Alkaline, lithium or Li-ion external batteries	
IMU - Inertial Measurement Unit	