

# Vector

4000 m

**Investigation des vitesses 3D dans les zones limites jusqu'à des profondeurs de 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
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## Distance measurements

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	2°/0.1° 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):	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.

## Data communications

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®).
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## 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 $\mu$ A
Transmit power	2 adjustable levels

## Batteries

Battery capacity	50 Wh (alkaline or Li-ion), 165 Wh (lithium), single or dual
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
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## 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

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Vertical or horizontal probes

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Alkaline, lithium or Li-ion external batteries

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IMU - Inertial Measurement Unit