# Vector

4000 m, Generation 2

**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
- ✓ Low flow measurements

## Technical specifications

| Water velocity measurements | |
|---|---|
| Distance from probe | 0.15 m |
| Sampling volume diameter | 15 mm |
| Sampling volume height | 8 mm |
| Velocity range | ±0.01, 0.1, 0.3,1, 2, 4, 7 m/s (software-selectable) |
| 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 | 1-703 Hz |

| Echo intensity | |
|---|---|
| Acoustic frequency | 6 MHz |
| Resolution | 0.01 dB |
| Dynamic range | 84 dB |

| Sensors | |
|---|---|
| **Temperature** | Temperature sensor in probe head |

## Sensors

| | |
|---|---|
| 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 < 30° |
| **Tilt** | Solid state, full 3D |
| Accuracy/resolution | 0.2°/0.01° |
| Maximum tilt | Full 3D |
| **Pressure** | Piezoresistive |
| Range | 0-4000 m (inquire for options) |
| Accuracy/precision | 0.5% FS / Better than 0.005% of full scale |

## External inputs

| | |
|---|---|
| No. of analog channels | None |
| Digital channels | 1x RS485 or RS232/* |
| Supply voltage to external sensors | Fixed 5V or 12V |

/*Pyroscience AquapHOx soon supported

## Data recording

| | |
|---|---|
| Capacity (standard): | 16 / 64 / 128 / 256 GB SD card |

## Real-time clock

| | |
|---|---|
| Accuracy | ±1 min/year |
| Backup in absence of power | 4 weeks |

## Data communications

| | |
|---|---|
| I/O | RS-422 or Ethernet, user-selectable |
| Communication baud rate | 115200-921600 Bayd |
| Recorder download baud rate | Fast Ethernet 100BASE-TX (90s per GB) |
| User control | Nortek Deployment SW |
| Synchronization | Trigg/sync A and B (RS485). Sync in/sync out. |

## Connectors

| | |
|---|---|
| Bulkhead (Impulse) | MCBH-8-FS + MCBH-6-FS for communication and external sensor |
| Cable | PMCIL-8-MP on 5 m polyurethane cable (inquire for options) |

## Software

| | |
|---|---|
| Functions | Nortek Deployment SW, instrument configuration, live display, export to ASCII and MATLAB. Data view in Nortek Insight |

## Power

| | |
|---|---|
| DC input | 9-24 V DC |
| Maximum peak current | 2 Amp |
| Max. consumption | 2.7 W at 64 Hz |
| Typical consumption, 4 Hz | 2 W |
| Sleep consumption | < 150 µA |

| Power | |
|---|---|
| Transmit power | Adjustable 12 dB in 1 dB steps |

| Batteries | |
|---|---|
| Battery capacity | External battery pack: 50 Wh Alkaline (4x), 76 Wh Li-ion (4x), 165 Wh lithium (4x) |
| Data collection capacity | Refer to planning section in software |

| Environmental | |
|---|---|
| Operating temperature | -4 to +40 °C |
| Storage temperature | -20 to +60 °C |
| Vibration | IEC 60068-2-64, IEC 60068-2-27 |
| Depth rating | 4000 m |

| Materials | |
|---|---|
| Standard model | Titanium housing, titanium probe and screws |

| Dimensions (see drawings for details) | |
|---|---|
| Maximum diameter | 48 mm |
| Maximum length | 263 mm total |

| Weight | |
|---|---|
| Weight in air | 1000 g (instrument only) |
| Weight in water | 600 g (instrument only) |

| Distance measurements | |
|---|---|
| Distance measurements | Not yet released |