

# VM Operations

333 kHz

**Assists operators on vessels to make informed decisions during subsea operations in areas affected by underwater currents**



In recent years, offshore operations have moved farther offshore, often into challenging operational environments. Variable local current and tide patterns make for increased risk, uncertainty, and operational costs. Subsea operations can be limited by these challenges without real-time knowledge of currents.

Using our renowned Signature ADCP technology, the VM Operations is designed to give offshore operators clear and detailed information on current speed and direction from the vessel to the seafloor. This situational awareness improves efficiency during vessel time. Data can be stored and analyzed during future project planning.

Read more about the VM Operations capabilities [here](#).

## Highlights

- ✓ Concave transducer design allowing for flush mounting, independent of salinity changes
- ✓ A 333 kHz frequency for an optimal balance in required range, resolution and accuracy for a wide range of operations at the coastal continental shelf
- ✓ Outstanding bottom-track performance, even under challenging conditions
- ✓ Robust sea valve allows mounting without increased draft,
- ✓ In-water serviceable, diverless, concept via the DNV type-approved sea valve
- ✓ Optional hull or pole mount bracket, instead of sea valve solution
- ✓ Unique, easy-to-use graphical ADCP interface for the operator, superintendent or client

## Applications

- ✓ ROV and diver inspections
- ✓ Subsea installations (as cable laying or rock dumping)
- ✓ Towed (seismic) surveys
- ✓ Aid to navigation
- ✓ Fuel efficiency monitoring

## Technical specifications

| Water velocity measurements |       |
|-----------------------------|-------|
| Profiling range*            | 100 m |
| Cell size                   | 1-6 m |

## Water velocity measurements

|                       |                               |
|-----------------------|-------------------------------|
| Max no. cells         | 128                           |
| Min. blanking         | 0.5 m                         |
| Minimum accuracy      | 0.3% of the measured value    |
| Velocity resolution   | 0.1 cm/s                      |
| Maximum sampling rate | 2 Hz                          |
| No. of beams          | 4 slanted beams at 25 degrees |

\* Maximum range depends on acoustic scattering conditions and transmit power

## Bottom velocity measurements

|                         |           |
|-------------------------|-----------|
| Single ping std @ 3 m/s | 0.5 cm/s  |
| Long-term accuracy (1)  | ± 0.3 %   |
| Minimum altitude        | 0.3 m     |
| Maximum altitude (2)    | 255 m     |
| Velocity resolution     | 0.01 mm/s |
| Maximum sampling rate   | 2 Hz      |

(1) Following standard calibration procedures

(2) Bottom-track distance dependent upon bottom type

## Other, Vessel Mounted ADCP

|                                    |  |
|------------------------------------|--|
| Temperature sensor range /accuracy | -4 °C to 40 °C / 0.1 °C                    |
| Pressure                           | Piezoresistive                             |
| Compass                            | Solid State magnetometer                   |
| Tilt                               | Solid State accelerometer                  |
| AHRS                               | Attitude sensor (option)                   |
| IO                                 | Ethernet (DF21 over serial as option)      |
| DC Input                           | 24 V DC                                    |
| Operating temperature              | 0 °C to 40 °C                              |
| Storage temperature                | -20 °C to 60 °C                            |
| Depth rating                       | Bottom track is limited to surface vessels |

## Mechanical

|                       |   |
|-----------------------|---|
| Instrument materials  | POM with Titanium fastener                                    |
| Instrument weight     | 7 kg  |
| Installation          | Instrument to be flush mounted with hull (sea valve solution) |
| Sea valve (option)    | DNV type approval; TAS00002CU                                 |
| Sea valve material    | Ductile Iron (body), Bronze (seat)                            |
| Sea valve weight      | 85 kg   |
| Bell housing material | Steel DIN17121  |
| Bell housing weight   | 29 kg   |

## Processing unit

|                  |                          |
|------------------|--------------------------|
| Processor/memory | Intel i5/8 GB            |
| Hard disk        | SSD, 256 GB              |
| Operating system | Windows® 11 IoT Ent LTSC |
| Housing          | 19" rack-mountable 2 HE  |
| Dimensions       | 482x87x400 mm            |

## Processing unit

|              |  |
|--------------|--|
| Input        | 110-240 V AC, 100 W Max  |
| Total weight | 7 kg   |
| Connections* | Power, Signature ADCP, 2x DisplayPort, 1x LAN, 2x USB, 4x RS232 RS422 RS485 configurable port* |

\* Processing unit requires heading and GNSS input over Serial or Ethernet

## Nortek VM Acquisition software - Operations

|                      |   |
|----------------------|---|
| Acquisition input    | Signature VM - binary, Advanced Navigation GNSS - binary, KM - binary, common NMEA  |
| Timing               | IEEE1588/PTP or NTP for absolute time stamping of Gyro/GNSS/Signature ADCP data or < 0.6 s under \$ZDA NMEA   |
| Configuration        | ADCP data or < 0.6 s under \$ZDA NMEA   |
| Display              | Vessel track in map, Bottom-track magnitude, direction and depth: (SOG), (COG), Speed Through Water (STW), Mean water column magnitude and direction, 4x depth selectable layer (magnitude and direction), 3D velocity profile (magnitude and direction), 2D vessel cross track current, 24h mean current and direction history (tides), Notes, Echo correlation, Echo amplitude, Frequency spectrum analyser |
| Status               | Signature VM BT and VB + NMEA GGA, HDT, VTG   |
| Online output        | NMEA data formats or binary AD2CP with embedded NMEA. DF21 BT proprietary (optional)  |
| Post processing      | Nortek VM Review software (optional)  |
| Multi vessel display | Nortek VM Acquisition streaming data and display (optional)   |

\*Please note that the package includes the VM Operations license of the Nortek VM Acquisition software. The post-processing Nortek VM Review software is optional.