



Seatex MRU H

The Versatile Heave Compensator

An ideal sensor for heave compensation of echo sounders and sonars that provides output of heave, roll and pitch measurements. By combining angular rate sensors with linear accelerometers, the MRU H achieves high accuracy heave measurements in small vessels even during extreme sea conditions. With a variety of digital and analog output signals available, interfacing the unit to various systems is easy. No expensive additional equipment is needed to operate the system.

Typical applications

The MRU H can also be used to monitor ship motions. Applications such as motion sensing on high speed vessels, voyage recording, helideck motion monitoring, as well as use with offshore crane and winch motion compensation, are ideal for the MRU H.

Function

The MRU H is specially designed for motion measurements in marine applications requiring highly accurate heave measurement in environments with extreme horizontal accelerations. The unit incorporates an orthogonal array of solid-state sensors to measure linear accelerations and angular rates. The MRU H provides complete signal processing electronics and power supply. The MRU H achieves high reliability by using sensors with no rotational or mechanical wear-out parts. The unit accepts external input of speed and heading information for improved accuracy in heave, roll and pitch during turns and acceleration.

Output variables

The MRU H outputs relative (dynamic) heave, position, velocity and acceleration in adjustable frames and, in addition, roll, pitch and yaw angles. Status of the MRU H is also available.



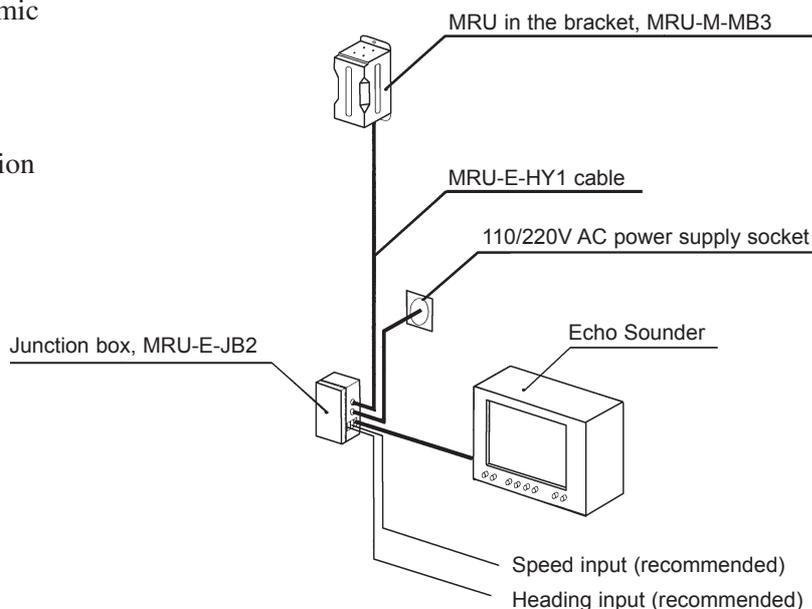
Now delivered with
Calibration Certificate

Digital I/O protocols

For two-way communication with the unit, a proprietary binary serial protocol is used. Output variables are transmitted as IEEE 32 bit floats (recommended) or as scaled integers. In addition, ASCII-based NMEA 0183 proprietary sentences or echo sounder formats can be selected for data variables output protocol.

Features

- High accuracy heave measurements even in dynamic environments
- Each MRU delivered with Calibration Certificate
- Negligible drift in heave after vessel turns
- Small size, light weight and low power consumption
- Outputs static and dynamic roll and pitch angles
- High output data rate (100 Hz)
- No limitation to mounting orientation
- 2-year warranty



Technical specifications

Orientation output data

Angular orientation range	±180°
Angular rate range	100°/s
Resolution roll, pitch and yaw	0.001°
Angular rate noise roll, pitch, yaw	0.1°/s RMS
Static ² accuracy roll, pitch	0.04° RMS
Dynamic ¹ accuracy roll, pitch (for a ±5° amplitude)	0.05° RMS
Scale factor error	0.2% RMS

Acceleration sensors

Acceleration range	±30 m/s ²
Acceleration noise ²	0.0020 m/s ² RMS
Acceleration accuracy	0.01 m/s ² RMS

Heave motion output

Output range	±50 m, adjustable
Periods	0 to 25 s
Dynamic accuracy	5 cm or 5% whichever is highest

Data output

Analog channels	#4, ±10V, 14 bit resolution
Digital output variables	#16 (max), RS232 or RS422
Output data rate (max)	100 Hz (10 ms)
Internal update rate	400 Hz (angular)

Power

Power requirements	12 - 30V DC, 6 W
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Environment

Temperature range	-5° to +55°C
Humidity range, electronics	Sealed, no limit
Max vibration (operational)	0.5 m/s ² (10-2000 Hz continuous)

Max vibration (non operational)	20 m/s ² (0-2000 Hz continuous)
Max shock (non operational)	1000 m/s ² (10 ms peak)

Other data

MTBF (computed)	50000 h
Housing dimensions	Ø105 x 204 mm (4.134" x 8.051")
Material	Anodized Aluminium
Weight	2.5 kg
Connector	Souriau 16-26

Velocity input formats

NMEA 0183, incl. VTG, VHW, VBW or IEEE single precision floating point

Heading input formats

NMEA 0183, HDT, HDM, LR 40 interface or IEEE single precision floating point (unit in radians)

Data output protocols

- MRU normal	- Sounder
- Elac Nautik (analog)	- Submetrix
- NMEA 0183 proprietary	- Sonar R & D Imaging system
- Atlas Fansweep 15/-20	- Simrad EM 1000
- Digital Hippy 120	- Simrad EM 3000
- RDI ADCP	- Reson Seabat

- 1) When the MRU is exposed to a combined two axes sinusoidal rotation over a five minutes period.
- 2) When the MRU is stationary over a 30 minutes period.

Specification subject to change without further notice

