Seatex MRU 5
The Ideal Marine Motion Sensor

The third generation MRU 5 is specially designed for high precision motion measurements in marine applications and for users requiring high accuracy roll, pitch and heave measurements. The MRU 5 provides high performance motion data for various marine applications ranging from small underwater vehicles to large ship motion control. Very high reliability is achieved by using solid-state sensors with no moving parts and the proven MRU electrical and mechanical construction.

MRU 5 applications

The MRU 5 is the ideal sensor for motion compensation of swathe bathymetric echo sounders, DP systems, ROVs, helideck monitoring systems, high speed vessel motion damping systems and tow-fish systems. It is also ideal for structural monitoring of offshore platforms and large vessels or any application where accurate motion data is crucial for high quality performance and safety. The MRU 5 provides documented roll and pitch accuracy of 0.02° RMS at a ±5° amplitude. The MRU 5 maintains its specified accuracy aboard any surface vessel or subsea vehicle.

Easy to set up and use

Interfacing the MRU 5 data output to various sonar systems is made easy since the MRU 5 software includes data protocols for more than twenty frequently used single and multibeam echo sounder systems. Using the configuration cable and the Windows version of the configuration software MRC, a series of simple menu prompts allows the user to choose the optimum configuration for the application. The MRU 5 and the MRC software are flexible and can accommodate a wide variety of application types.

Output variables

The MRU 5 offers 189 data output variables. These variables can be either digital or analog output signals. Status messages of the MRU 5 health and overall performance can also be easily monitored by the user.
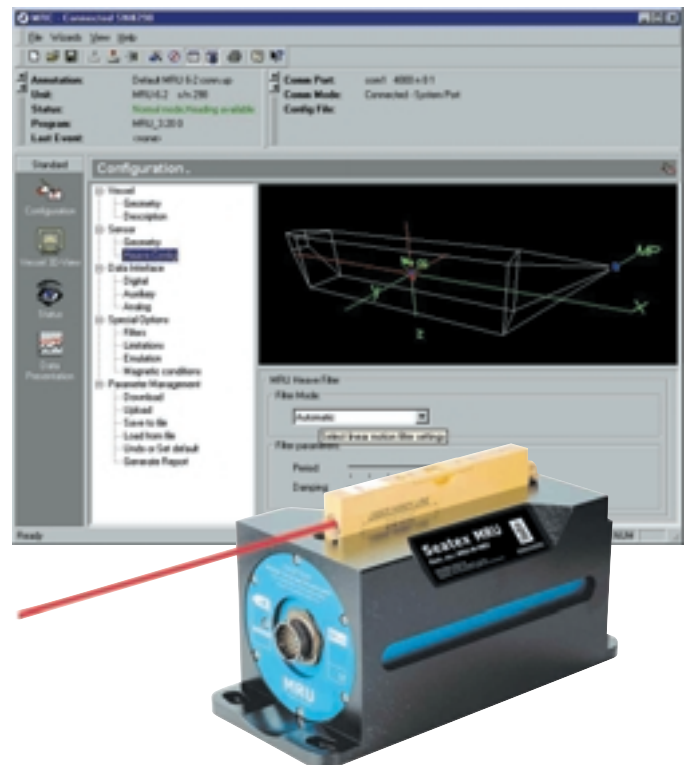
Now with
0.02° accuracy

Digital I/O protocols

For two-way communication with the MRU 5, 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 various echo sounder formats may be selected as the data output protocol.

External communication

The MRU 5 accepts external input of speed and heading information on separate serial lines for improved accuracy in heave, roll and pitch during turns and accelerations. Additionally, a third CMOS input line is available for polling or synchronizing the MRU data output from a peripheral computer.

- High accuracy roll, pitch and heave measurements during turns and accelerations
- Each MRU delivered with Calibration Certificate
- Small size, light weight, low power consumption
- Improved dynamic accuracy in heave, roll and pitch
- Negligible drift in heave after vessel turns
- High output data rate (100 Hz)
- No limitation in mounting orientation
- Lever arm compensation when mounted off the vessel CG (centre of gravity)
- Selectable communication protocols in the Windows based MRC configuration software
- 2-year warranty

Technical specifications

Orientation output data

Angular orientation range	±180°
Angular rate range	150°/s
Resolution in all axes	0.001°
Angular rate noise roll, pitch, yaw	0.015°/s RMS
Accuracy[1, 2] roll, pitch (for a ±5° amplitude)	0.020° RMS
Scale factor error	0.15% RMS

Acceleration sensors

Number of sensors	3
Acceleration range (all axes)	±30 m/s²
Acceleration noise[2]	0.0020 m/s² RMS
Acceleration accuracy	0.01 m/s² RMS
Scale factor error	0.020% 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), RS 232 or RS 422
Data output rate (max)	100 Hz
Internal update rate	400 Hz (angular)

Power

Power requirements	12-30V DC, max 11 W

Environment

Temperature range	-5° to +55°C
Humidity range, electronics	Sealed, no limit
Max vibration (operational)	0.5 m/s² (10-2000 Hz continuous)
Max vibration (non operational)	20 m/s² (0-2000 Hz continuous)
Max shock (non operational)	1000 m/s² (10 ms peak)

Other data

MTBF (computed)	50000 h
Housing dimensions	Ø105 x 204 mm (4.134" x 8.051")
Material	Anodised Aluminium
Weight	2.5 kg
Connector	Souriau 851-36RG 16-26S50

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

1) **When the MRU is exposed to a combined two-axes sinusoidal angular motion with five minutes duration.**
2) **When the MRU is stationary over a 30 minutes period.**

Specification subject to change without further notice

KONGSBERG