MRU 6

KONGSBERG

The Ultimate Marine Motion Sensor

The third generation MRU 6 is specially designed to supply precision marine motion measurements to any application requiring the highest accuracy in roll, pitch and heave measurements. In addition, the MRU 6 contains a three-axes servo vector fluxgate compass that provides magnetic heading data. The MRU 6 delivers high performance motion data for many different marine applications ranging from small underwater vehicle guidance to large vessel stabilization. The MRU 6 achieves high reliability by using solid-state sensors with no moving parts and the proven MRU electrical and mechanical construction.

Now with
0.02° accuracy

MRU 6 applications

The compact MRU is the ideal sensor for orientation and attitude measurements on tow-fish systems, AUVs, ROVs and oceanographic buoys requiring high accuracy roll and pitch measurements. The MRU 6 provides documented roll and pitch accuracy of 0.02° RMS at a ±5° amplitude. The MRU 6 can maintain the specified accuracy aboard any surface vessel or subsea vehicle.

Easy to set up and use

Interfacing the MRU 6 data output to various sonar systems is made easy since the MRU 6 software includes data protocols for a variety types of marine electronic and survey equipment. 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 6 and the MRC software are flexible and can accommodate a wide variety of application types.

Output variables

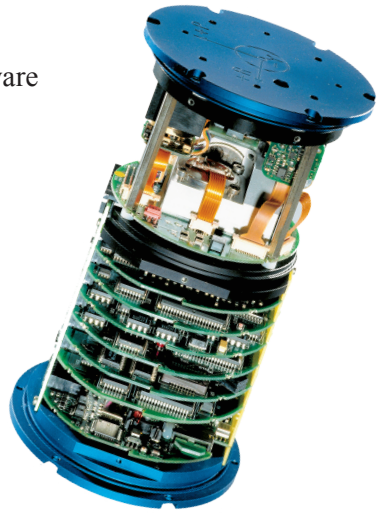
The MRU 6 offers 189 data output variables. These variables can either be digital or analog output signals. The MRU 6 outputs static and dynamic roll, pitch and heading angles and corresponding angular rate data. The unit outputs three axes acceleration (heave, surge and sway) in adjustable frames (body or geographic frame). Status messages of the MRU 6 health and overall performance can also be easily monitored by the user.

Digital I/O protocols

For two-way communication with the MRU 6, 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.

Features

- High accuracy roll, pitch and heave measurements even in extreme dynamic environments
- Each MRU delivered with Calibration Certificate
- Precision three-axes fluxgate compass built in, including magnetic neutralization software
- Very low offset in roll, pitch and heave during turns with external speed data input
- Small size, light weight, low power consumption
- High output data rate (100 Hz)
- No limitation in mounting orientation
- Lever arm compensation when mounted off the vessel's CG (center of gravity)
- Communication protocols for various marine electronic and survey equipment
- 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
Static heading accuracy (no magn. vehicle influence, <60° latitude)	0.3° RMS Dynamic heading accuracy
(at optimal magnetic conditions, <60° latitude)	1° 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

Magnetic sensors

Number of sensors	3
Magnetic sensor input range	±100 µTesla
Magnetometer resolution (all axes)	<10 nTesla
Magnetic sensor noise[2]	0,1 µTesla RMS
Magnetic sensor scale factor error	0.5% RMS
Magnetic signature (at 1 m distance, worst direction, typical 10 nTesla)	<50 nTesla
Magnetic output: 3-axis terrestrial field in the fixed vehicle or geographic frame	±100 µTesla

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

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.

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