MRU D

KONGSBERG

THE ROLL AND PITCH MOTION SENSOR

This fifth generation roll and pitch motion sensor is specially designed for use in marine applications and is the ideal sensor for roll and pitch measurements on board ships.

Typical applications
The MRU D is specially designed for roll and pitch measurements within voyage recording, dynamic positioning systems, fishing sonars and telecommunication antenna system.

This unit has to be mounted in a fixed direction relative to the ship and is best suited for applications with limited range in roll and pitch. If unlimited mounting orientation and/or unlimited mounting range is required, we recommend one of the MRU models with sensors in all three axis. The MRU D has to be mounted with the connector pointing up or down.

Function
The unit is delivered with a Windows based configuration and data presentation software. By configuring the unit with the vector between the MRU and the vessel Center of Gravity (CG), the MRU D will output accurate roll and pitch measurements even when it is mounted high up in the ship, like on the bridge. This is due to the capability to suppress the effect of horizontal acceleration on the roll and pitch performance. This makes the unit superior to inclinometers, pendulous devices and standard Vertical Reference Units.

Each MRU D unit is delivered with a Calibration Certificate stating that the unit is tested and found within the specifications.

Variables output
The MRU D outputs roll and pitch angles and corresponding angular rate vectors fixed to the vehicle frame. The unit can in addition output surge and sway accelerations.

Digital I/O protocols
MRU data is available through both serial lines and Ethernet interface enabling easy distribution of MRU data to multiple users on board the vessel. Output data are available on two individually configurable serial lines and Ethernet/UDP. Output variables are transmitted as IEEE 32-bit floats (recommended) or as scaled integers. In addition,
ASCII-based NMEA 0183 proprietary sentences can be selected as data output protocols.

FEATURES MRU D

- Outputs real-time roll and pitch measurements
- Suppression of horizontal acceleration when mounted off the vessel Center of Gravity (CG)
- Outputs on RS-232, RS-422 and Ethernet
- High output data rate (200 Hz)
- High reliability and no scheduled maintenance, no mechanical wear-out parts
- Small size, light weight and low power consumption
- Each MRU delivered with Calibration Certificate
- Selectable communication protocols in the Windows based MRU configuration software
- Export license not required
- 2-year warranty

TECHNICAL SPECIFICATIONS

ROLL AND PITCH OUTPUT

Angular orientation range	±25°
Angular rate range	±100 °/s
Resolution roll, pitch	0.001°
Angular rate noise	0.5 °/s RMS
Static[2] accuracy	0.3° RMS
Dynamic[1] accuracy (for a ±5° amplitude)	0.35° RMS
Scale factor error	0.8 % RMS

SURGE AND SWAY ACCELERATION OUTPUT

Acceleration range	±50 m/s2
Acceleration noise[2]	0.01 m/s2 RMS
Acceleration accuracy	0.05 m/s2 RMS

ELECTRICAL

Voltage input	10 to 36 V DC
Power consumption	Max 3 W
Serial ports:	
Com1	Bidirectional RS-422
Com2	Bidirectional RS-422 from junction box, user configurable RS-232, RS-422
Com3 & Com4	Input only, user configurable RS-232, RS-422
Analog channels (junction box)	# 4, ±10V, 14 bit resolution
Input serial line	Two RS-232 or two RS-422
Ethernet ports	5
Ethernet UDP/IP	10/100 Mbps
Output data rate (max)	200 Hz
Timing	<1 ms

OTHER DATA

MTBF (computed)	50000 h
MTBF (service history based)	100000 h
Material	Anodised aluminium
Connector (MIL. spec.)	Souriau 851-36RG 16-26S50

WEIGHTS AND DIMENSIONS

Weight	2.4 kg
Dimensions	Ø 105 x 140 mm (4.134” x 5.525”)

ENVIRONMENTAL SPECIFICATIONS

Operational temperature range	-5 °C to +55 °C
Storage temperature range	-25 °C to +70 °C
Enclosure protection	IP66
Vibration	IEC 60945/EN 60945

ELECTROMAGNETIC COMPATIBILITY

Compliance to EMCD, immunity/emission	IEC 60945/EN 60945

1) When the MRU is exposed to a combined two-axes sinusoidal angular motion with 10 minutes duration.

2) When the MRU is stationary over a 30-minute period.

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Specifications subject to change without any further notice.

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