KONGSBERG

The fish sonar motion sensor

The MRU S roll, pitch and heave motion sensor is specially designed for fish finding equipment.

Typical applications

The MRU S model is typically used for real-time roll, pitch and heave compensation of fishery sonars and echosounders. In rough weather conditions the MRU S provides vessel motion data to the fish finding equipment to present a display free from wave motion due to vessel rolling, pitching and heaving..

Function

This cost-effective MRU S model incorporates 3-axis Micro-Electro-Mechanical-System (MEMS) sensors for both linear acceleration and angular rate. This unit achieves high reliability by using solid state sensors with no rotational or mechanical wear-out parts.

The unit is delivered with a Windows based configuration and data presentation software. In this software vector arms from where the MRU is mounted to the centre of gravity (CG) and to two individually configurable monitoring points (MPs), can be defined. The heave measurement can be output in four different locations (the MRU itself, CG, MP1 and MP2) simultanously on the same serial line or Ethernet port. A typical monitoring point is the transducer head.

Variables output

The MRU S outputs roll, pitch and heave, together with linear acceleration and angular rate.

Digital I/O protocols

MRU data is available through both Ethernet interface and serial lines enabling easy distribution of MRU data to multiple users on board the vessel. Output protocols for commonly used sonar equipment are available on two individually configurable serial lines and Ethernet/UDP.

FEATURES

- 0.1° roll and pitch dynamic accuracy
- Outputs real-time roll, pitch and heave measurements
- Outputs on RS-232, RS-422 and Ethernet
- High output data rate (200 Hz)
- Lever arm compensation to two individually configurable monitoring points
- 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

MRU S

Orientation output

Angular orientation range	±45°
Resolution roll & pitch	0.0001°
Static accuracy[1)]	0.2° RMS
Dynamic accuracy[2)], (for a ±5° amplitude)	0.1 1-sigma

Gyro output

Angular rate range	±75°/s
Angular rate noise	0.03°/s RMS
Scale factor error	0.3 % RMS

Acceleration output

Acceleration range	±160 m/s^2
Acceleration noise	0.01 m/s^2 RMS
Scale factor error	0.05% RMS

Heave output

Output range	±50 m, adjustable
Heave accuracy for 0 to 18 s motion periods (real-time)	15 cm or 15% whichever is highest (RMS)
Heave velocity accuracy	0.02 m/s RMS

Electrical

Voltage input	10 - 36 V DC
Power consumption	Max 5.5 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, ±10 V, 14 bit resolution
Ethernet output ports	5
Ethernet UPD/IP	10/100 Mbps
Data output rate (max)	200 Hz
Timing	< 1 ms

Data output protocols

- MRU normal	- Sounder
- NMEA 0183 proprietary	- EM3000
- KM binary	

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	2.0 kg
Dimensions	Ø 105 × 140 mm (4.134 × 5.525”)

Environmental specifications

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

Electromagnetic compatibility

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

1 *When the MRU is stationary over a 30-minute period.*

2 *When the MRU is exposed to a combined two-axis sinusoidal angular motion with 10 minutes duration.*

Specifications subject to change without any further notice.

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