

Motion Reference Units

MRU-B2



Inertial Labs has developed Motion Reference Units (MRU) to meet requirements from marine and hydrographic applications. MRU is an enhanced, high-performance strapdown Motion Sensor that determines Pitch & Roll, Heave, Sway, Surge, Accelerations, Angular rates, Heading, Velocity and Positions for any device on which it is mounted.

The Inertial Labs Motion Reference Units utilizes solid state 3-axes each of precision accelerometers, magnetometers, gyroscopes and barometric sensors to provide accurate Heave, Sway, Surge, Pitch and Roll of the device under measure.

Integration of very low noise gyroscopes output provides high frequency, real-time measurement of the Vessel, Ships, Helidecks, ROV, Marine antennas, Cranes rotation about all three rotational axes.

Through a combination of proven sector expertise and a continued investment in technological innovation, Inertial Labs delivers the optimum balance of price and performance ratio solutions for its customers.

Key Features and Functionality

- Kongsberg/Seatex, Teledyne and SMC data formats
- State-of-the-art algorithms for Survey, Vessels, Ships, Active Heave Compensators, Cranes, Helideck,
- ROV, AUV, DPS, Buoys, Echo Sounders, Offshore Platforms
- 0.02 deg RMS Pitch & Roll dynamic accuracy
- 5% or 5 cm RMS (whichever is greater) Heave accuracy
- 3 cm Oceanix Nearshore Horizontal Position Accuracy, 1-0.05 m VERIPOS Horizontal Position Accuracy
- 0.005 m/sec² linear acceleration accuracy
- NMEA 0183, TSS1 output data formats
- HYPACK software compatibility
- Environmentally sealed (IP67) or Subsea Enclosure (200 meters depth)
- Affordable price

Specifications

Parameters	Units	MRU-B
Basic Output signals	-	Heave, Heave Velocity, Heave Acceleration, Surge, Sway, Pitch & Roll, Pitch & Roll Rate, Pitch & Roll Velocity, Accelerations, Angular rates, Significant Wave Height, Temperature, Barometric data, Pulse Per Second (PPS)
Output data formats	-	Kongsberg/Seatech, Ship Motion Control SMC, Teledyne TSS*
Compatibility	-	SBES/MBES: Teledyne; R2Sonic; WAASP; Kongsberg; EdgeTech; NORBIT; IMAGENEX HYPACK, QINSY and Novatel Inertial Explorer software*
Update rate	Hz	1 ... 200 (user settable)
Internal Data Logger	-	64 GB (optional)
Start-up time	sec	<1

Heave, Surge, Sway	Units	MRU-B
Measurement range	-	±300
Resolution	meters	0.01
Accuracy, RMS	% (meters)	5 (0.05)
Delayed Accuracy, RMS	% (meters)	3 (0.03)

Pitch & Roll	Units	MRU-B
Range: Pitch, Roll	deg	±90, ±180
Angular Resolution	deg	0.005
Dynamic Accuracy	deg RMS	0.02 (MRU-B1, B1.1, B2) / 0.01 (MRU-B22)

Positions, Velocity and Timestamps	Units	MRU-B
Timestamps accuracy	nano seconds	20
Gyroscopes	Units	MRU-B
Measurement range	deg/sec	±450
Bias in-run stability (RMS, Allan Variance)	deg/hr	1
Noise density	deg/sec/√Hz	0.004
Accelerometers	Units	MRU-B
Measurement range	g	±8
Bias in-run stability (RMS, Allan Variance)	mg	0.005
Noise density	mg/√Hz	0.025
Pressure	Units	MRU-B
Measurement range	hPa	300 – 1100
Bias in-run stability (RMS, Allan Variance)	Pa	2
Noise density	Pa/√Hz	0.8
Environment	Units	MRU-B
Operating temperature	deg C	-40 to +70
Storage temperature	deg C	-50 to +85
MTBF	hours	100,000
Vibration	-	IEC 60945/EN 60945

Electrical	Units	MRU-B
Supply voltage V	V DC	9 to 36
Power consumption	Watts	1 (2 with data logger)
Output Interface	-	Ethernet, RS-232, RS-422, CAN
Output data format	-	Binary, TSS-1, NMEA 0183 ASCII, Kongsberg /Seatex, SMC, Teledyne*
Compliance to EMCD, immunity/emission	-	IEC 60945/EN 60945
Connector *	-	Binder Series 723

Physical	Units	IP-67	Subsea
Size	mm	120 x 50 x 53	245 x 140 x115
Weight	gram	220	6570
Enclosure	-	IP-67	Subsea (1000m)

* Cable with pigtail wires or with Souriau 851-36RG 16-26s50 connector are the options

MRU-B / MRU-E mechanical interface drawing (IP-67 version)

