MOTION REFERENCE UNIT

eMRU (MRU ETHERNET)

TECHNICAL SPECIFICATIONS

eMRU

HIGH PERFORMANCE, PLUG & PLAY

6DOF MOTION SENSOR

with Power Over Ethernet (PoE)!

5 CM / 5 % | **0.01 - 0.05 RMS°** | **IP65**

NORSUB MRU ETHERNET

HIGH-PERFORMANCE MOTION REFERENCE UNITS

NORSUB MRUs are high-performance, compact, and affordable 6 DOF motion sensors. They use state-of-the-art MEMS technology and advanced sensor fusion algorithms, resulting in accurate and reliable roll, pitch, yaw, surge, sway, heave position and velocity measurements. Performance is high also during horizontal accelerations and in irregular coupled motions.

EASY TO INTEGRATE

The eMRU is dust and splash proof and is suitable for mounting indoors or inside a control box. It can be easily integrated in your active heave compensation system, motion compensated gangways, motion compensated sonar, helideck motion monitoring system, floating offshore wind turbine structures. High performance in irregular motions makes it ideal for real sea conditions.

PLUG & PLAY ETHERNET INTERFACE

NORSUB eMRUs (MRUs Ethernet) are plug & play due to the standard RJ 45 ethernet connector with passive power over ethernet (PoE). This makes cabling very fast & easy. Industrial communication protocols (e.g. Modbus TCP, Ethernet/IP) can be used for PLC interfacing. The MRU comes with a wide range of standard and customized, ASCII or binary data protocols.

TECHNICAL SPECIFICATIONS

PERFORMANCE				
PARAMETER	eMRU 3000	eMRU 6000	eMRU 9000	REMARKS
Roll & Pitch	± 0.05°	± 0.02°	± 0.01°	RMS (dynamic)
Heave (real-time)	5.0 cm or 5.0 %	5.0 cm or 5.0 %	5.0 cm or 5.0 %	Whichever is greater for 0 to 25 s periods
Heading (optional)	± 0.5°	± 0.5°	± 0.5°	Magnetic heading

RANGE				
PARAMETER	eMRU 3000	eMRU 6000	eMRU 9000	REMARKS
Rotation speed	± 150°/s	± 450°/s	± 450°/s	-
Acceleration	± 3 g	± 4 g	± 10 g	-
Heave	± 50 m	± 50 m	± 50 m	-
Yaw	± 360°	± 360°	± 360°	Requires optional magnetometer
Pitch	± 90°	± 90°	± 90°	-
Roll	± 180°	± 180°	± 180°	-
Output frequency	0-100 Hz	0-100 Hz	0-100 Hz	Adjustable output frequencies

GYRO OUTPUT			
PARAMETER	eMRU 3000	eMRU 6000	eMRU 9000
Scale factor error	0.2% max/min	0.2% max/min	0.2% max/min
Angular rate noise	0.05°/s RMS	0.025°/s RMS	0.015°/s RMS

ACCELERATION OUTPUT			
PARAMETER	eMRU 3000	eMRU 6000	eMRU 9000
Acceleration noise	0.0025 m/s^2 RMS	0.002 m/s^2 RMS	0.0015 m/s^2 RMS
Acceleration accuracy	0.01 m/s^2 RMS	0.01 m/s^2 RMS	0.01 m/s^2 RMS

TECHNICAL SPECIFICATIONS

PHYSICAL CHARACTERISTICS	
PARAMETER	eMRU 3000/6000/9000
Weight	0.55 kg
Footprint (L X B)	12.0 cm X 5.7 cm
Height	5.3 cm
Depth rating	IP65
Connector	RJ45 with PoE
Remarks	Aluminum housing
Application examples	Active heave compensation, motion compensated gangways, helideck monitoring, wave radar, hydrography, ship monitoring, stabilizing fins, buoys, aquaculture, dynamic positioning, offshore floating wind turbines.

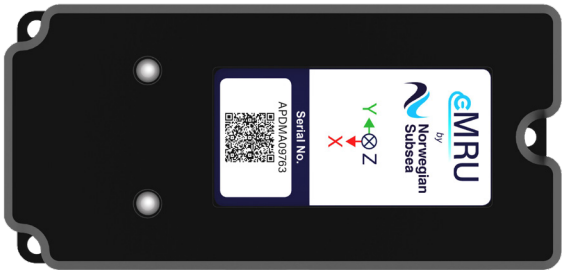
POWER & INTERFACE	
PARAMETER	eMRU 3000/6000/9000
Power consumption	6 W
Supply voltage	9-36 V DC (24 V nominal)
Internal storage	32 GB
Ports	Ethernet
Communication	RJ45, passive PoE at the connector
Data protocols	NMEA, ASCII, Binary, Atlas, Gyrocompas 1, Ifremer Victor, MDL, Simrad EM 3000, SMCA, SMCC, TSS1 ++ (wide range of protocols included, see user manual)

ENVIRONMENTAL SPECIFICATIONS	
PARAMETER	eMRU 3000/6000/9000
Enclosure material	Aluminum
Enclosure protection	IP-65
Operating temperature range	-40 to +85 degrees Celsius
Storage temperature range	-40 to +85 degrees Celsius
Electromagnetic compatibility (immunity/emission)	IEC 60945/EN 60945
Vibration	IEC 60945/EN 60945
Max shock non-operational (10 ms peak)	2000 m/s² (half-sine 0.5 msec)
MTBF (computed)	100000 h

NORSUB MRU ETHERNET

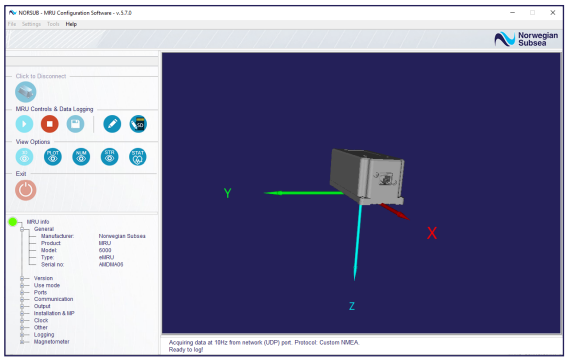
AN MRU FOR YOUR NEEDS

The eMRU comes in three versions (3000, 6000, and 9000) to accommodate for different performance requirements and budgets. All eMRUs are in compliance with CAP 437 standards for use in helideck monitoring systems. The eMRU internal health monitoring system ensures high performance operatibility and fault detection. Special DP and gangway use modes are available.



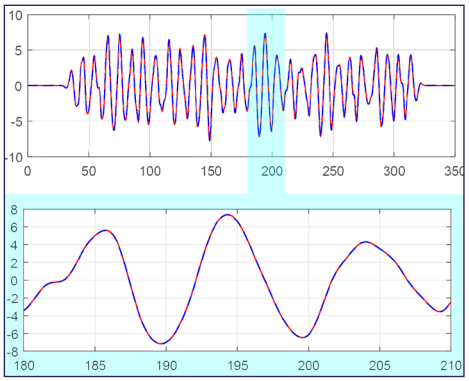
USER-FRIENDLY CONFIGURATION SOFTWARE

The free Windows-based NORSUB MRU Configuration Software is used to set-up the MRU. Here you can configure the communication ports, customize the output data protocol, configure the MRU installation parameters, set up remote monitoring points, calibrate the magnetometer. The software can also update the MRU firmware, log the MRU data to file, and plot output data.



EVERY UNIT IS CALIBRATED, TESTED & VALIDATED

Every MRU is delivered with a Configuration, Calibration, and Validation Certificate. Every unit is calibrated and validated independently through a systematic sequence of rigorous tests in our labs simulating both regular and irregular sea motions. The calibration certificate is valid for four years and full product specifications are mantained in this period under normal operating conditions.



ABOUT US

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www.dynalabs.com.cnSubsea delivers high performance Motion Reference Units (MRU) and motion sensors for marine, subsea and land use. Our products combine MEMS sensor technology and sensor fusion algorithms to give accurate and reliable motion, velocity and acceleration measurements for control and monitoring applications.

founded in 2014

Today, we are a fast-growing supplier of motion sensors to customers worldwide. We deliver motion sensors to satisfied customers in industries as diverse as ship motion monitoring, hydrography, green energy, and subsea oil production.

Our mission is to create better and more affordable motion sensors for users in marine, land and subsea industries. We do this by combining advanced sensor fusion algorithms with high quality hardware and the latest MEMS sensors. Our sensors are thoroughly put to test in state-of-the-art labs as well as in the field.