

**Pitch & Roll**

**Heave**

**Heading**

**Depth**

**Pitch Roll Heave  
MRU 333**



Single Beam Surveying  
Multi-beam Surveying  
Motion Stabilization  
USBL Navigation  
Hull Mounted ADCP

**Pitch Roll Heave  
MRU 333G**



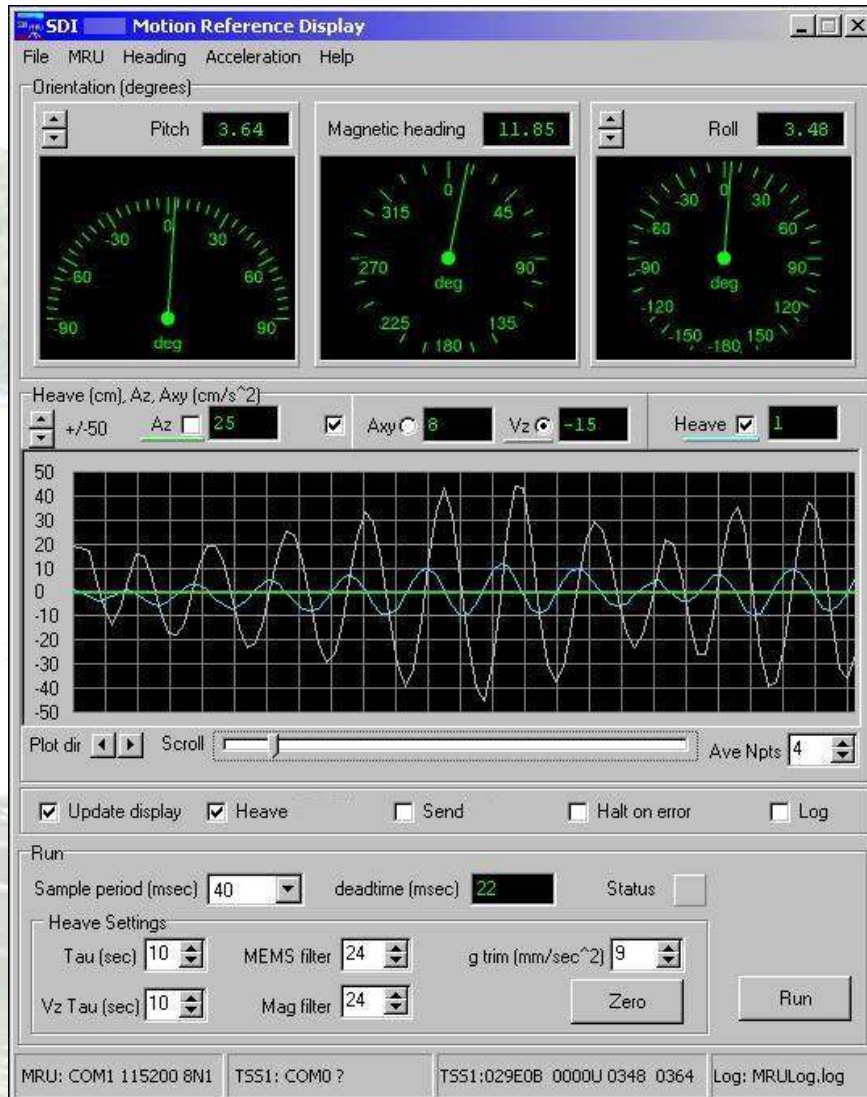
GPS Aided—Course Changes  
Single Beam Surveying  
Multi-beam Surveying  
USBL Navigation  
ADCP Stabilization

**Pitch Roll Heave  
Depth  
MRU 333D**



ROV Attitude  
Diver Tracking Systems  
Under-water Construction  
Dredging Operations  
Directional Drilling

**MRU Series  
Graphics  
Display**



**Industry  
Standard  
Formats**

**HYPACK  
Compatible**

## MRU Mechanical Specifications

Material	6061 anodized marine Aluminum
Diameter	7.6 cm (3 inch )
Length	25.5 cm (10 inch)
Weight	1.1 kg. (2.5 lbs.)
Depth Rating ( MRU 333 )	450 m (1500 Ft.) or 1,800 m (6,000 ft.) optional

**MRU series** includes software to display graphics and communications for simple interface.

The MRUs uses 3 axis accelerometers, 3 axis gyros and 3 axis magnetic sensors integrated with dual embedded micro-processors to produce accurate pitch, roll and heave information in an industry standard format.

The MRU 333G adds an internal GPS receiver and integrates GPS position with heading and speed to correct acceleration for heading changes. This improves settling following turns and removes errors in heave due to heading changes. A built in true north world magnetic map is used to produce a true north output. A "learning" software routine adjusts the MRU series to the boat characteristics to further improve overall accuracy.

The MRU Series is ideal for bathymetric single and mutli-beam survey systems, underwater vehicles, ship stability, and sub-bottom profiling and dredge monitoring operations .

## MRU 333 Performance Specifications

Pitch Roll and Heading	Resolution Degrees	Accuracy Degrees Static	Range Degrees	Repeatability Degrees
Pitch	0.02	0.2	+/- 180	0.05
Roll	0.02	0.2	+/- 180	0.05
Heading	0.10	0.3	360	0.10
Update Rate		All Parameters	50 per second	
Heave	Heave Amplitude Accuracy	Maximum Update Rate Samples /Sec.	Range Meters	Drift (T = 10s)
MRU 333	5 cm 0-10 sec +/- 5%	50	5	<5 cm (uncorrected)

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