



Think Sensor Research Inc.
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TSR-50 MOTION REFERENCE UNIT with GPS



The TSR-50 is a Motion Reference Unit (MRU) designed to accurately measure pitch, roll, heading, heave and position.

The TSR-50 MRU is designed to be used as a sensor that can be mounted on marine vessels, remotely operated surface vehicles, autonomous surface vehicles and wave buoys to help support your mission objectives such as positioning, sonar survey motion compensation, attitude measurement and orientation.

The TSR-50 motion reference unit features:

- gyro compensated pitch, roll, heading and heave output for operations in static and dynamic conditions
- GPS position, velocity and time output
- designed to be easily interfaced to existing systems
- magnetic interference detection



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TSR-50 MRU with GPS SPECIFICATIONS

FEATURE	SPECIFICATION
Size	178 mm L x 70 mm W x 51 mm H, 7"L x 2.75" W x 2" H
Material	Powder Coated Aluminum
Weight	600 grams, 1.32 lbs
Environmental Rating	IP67
Power	7 VDC to 36 VDC reverse polarity protected
Communication	RS-232, RS-485, RS-422, USB
Connectors	Mini-USB, 6 pin circular connector, SMA GPS antenna
Pitch / Roll Accuracy	0.1 ° RMS Note that the orientation and heave accuracy depends on the application and the environment that the sensor is operating in (i.e. vibration, dynamic motion and etc.).
Heading Accuracy	1.0 ° RMS typical for most conditions under ideal magnetic conditions
Heave Accuracy	5 cm if heave is less than 1 meter, 5% if heave is greater than 1 meter
Heave Resolution	1 cm
MRU Output	TSS1, NMEA 0183
Wave Height	+/-10 meters
Wave Period Range	Up to 20 seconds
GPS Satellites	22 tracking, 66 searching
Warm/cold start	34 seconds
Acquisition sensitivity	-145 dBm
Tracking sensitivity	-165 dBm
GPS Update Rate	1 to 10 Hz
GPS Position Accuracy	1.8 m
GPS Velocity Accuracy	0.1 m/s
GPS Output	NMEA 0183

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