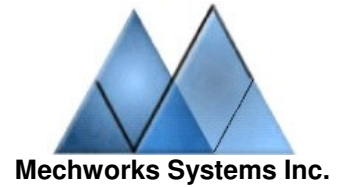


MechTrack

A MEMS Digital Inertial Measurement Unit

MDIMU-I Series



Features

- ▶ 6 DOF motion sensing with three linear accelerometers and three angular rate gyroscopes
- ▶ Fully calibrated and compensated digital outputs for temperature and physical misalignment
- ▶ Factory selected accelerometer bandwidth from DC-10 Hz to DC-250 Hz, in the range of $\pm 2g$ or $\pm 10g$
- ▶ Factory selected rate gyro bandwidth from DC-10Hz to DC-250Hz, in the range of ± 75 $\%s$, ± 150 $\%s$, or ± 300 $\%s$
- ▶ Update rate up to 500 Hz per channel
- ▶ Available with differential SPI outputs or optional USB converter dongle
- ▶ User friendly software for data storage and custom calibration
- ▶ Hermetically sealed with mechanical resistant packaging
- ▶ Analog outputs optional

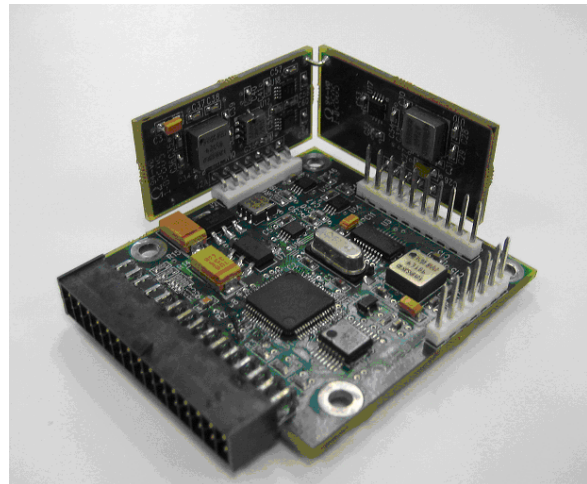
Applications

- ▶ Vehicle Dynamics Control Systems
- ▶ Autonomous Vehicles
- ▶ Robotics

General Description

MechTrack is a fully compensated, six degree-of-freedom (DOF) digital inertial-measurement-unit (IMU) for vehicle dynamics control systems, autonomous vehicles and robotics. It integrates 3 linear accelerometers and 3 angular rate gyros with user-selectable signal conditioning with differential SPI output or optional USB converter dongle at an update rate of up to 500Hz.

MechTrack uses a high performance processor, user-selectable fifth order filters and an onboard temperature sensor to provide an output that is stable over the temperature range of $-40^{\circ}C$ to $+85^{\circ}C$. Each signal is compensated for temperature variations and for sensor misalignments and calibrated for differences in sensitivity and offset.



The MechTrack accelerometers are available in ranges $\pm 2g$ and $\pm 10g$. The gyros are available in ranges of ± 75 $\%s$, ± 150 $\%s$, or ± 300 $\%s$. MechTrack is available in a compact, mountable and hermetically sealed package.

Included with MechTrack is the MechTrackCal™ software package that enables the user to conveniently collect, display and store data as well easily re-configure the sensor's calibration values as required.

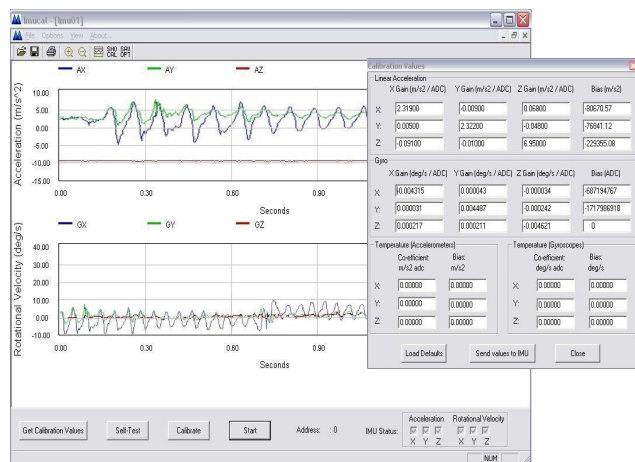
Characteristics

Specifications	Values	Comments
Accelerometer Performance		
Acceleration Range	$\pm 2g$, $\pm 10g$	
Resolution	$< 2mg$, $< 5mg$	@ 25 Hz
Nonlinearity	$< 0.2\%$ of FS	
Bandwidth	DC-10 Hz to DC-250 Hz	Factory selected
Rate Gyro Performance		
Rate Range	$\pm 75deg/s$, $\pm 150deg/s$, $\pm 300deg/s$	
Resolution	$< 2.0deg/s$, $< 2.0degs$, $< 4.0deg/s$	@ 25 Hz
Nonlinearity	$< 0.1\%$ of FS	
Bandwidth	DC-10 Hz to DC-250 Hz	Factory selected
Digital Performance		
Update Rate	500Hz	Customizable
Interface	500kbps	
Environment		
Operating Temp. Range	$-40^{\circ}C$ to $+85^{\circ}C$	
Shock	2000g	
Electrical		
Supply Voltage	$> 7VDC$	
Supply Current	100mA	Maximum
Physical		
Size	2.5" x 3.0" x 1.5"	
Weight	$< 300grams$	Not including cable
Mounting	Screw down	
Hermetically Sealed	Yes	

MechTrackCal™ Software

The accompanying MechTrackCal software replaces the need for a data acquisition system and provides the user with a convenient means of obtaining, plotting and storing data. The acceleration and gyro data output are digitized as 12-bit values and is conveniently stored as an ASCII tab delimited text file for exporting.

MechTrackCal also allows the user to re-calibrate the DIMU should re-calibration be required.



Ordering Information

Model	Linear Acceleration (X, Y, Z) [g]	Angular Rates (X, Y, Z) [deg/s]	Communication Interface
MDIMU-I-222-777-U	$\pm 2, \pm 2, \pm 2$	$\pm 75, \pm 75, \pm 75$	Differential SPI
MDIMU-I-222-111-U	$\pm 2, \pm 2, \pm 2$	$\pm 150, \pm 150, \pm 150$	Differential SPI
MDIMU-I-222-333-U	$\pm 2, \pm 2, \pm 2$	$\pm 300, \pm 300, \pm 300$	Differential SPI
MDIMU-I-221-777-U	$\pm 2, \pm 2, \pm 10$	$\pm 75, \pm 75, \pm 75$	Differential SPI
MDIMU-I-221-111-U	$\pm 2, \pm 2, \pm 10$	$\pm 150, \pm 150, \pm 150$	Differential SPI
MDIMU-I-221-333-U	$\pm 2, \pm 2, \pm 10$	$\pm 300, \pm 300, \pm 300$	Differential SPI

All models include MechTrackCal 1.0.

Optional USB converter dongle available.

Other accelerometer and rate gyro combinations available upon request.

Analog outputs and other customizations also available upon request.