

Coming
Soon

DMU41



High Performance Inertial Measurement Unit

DMU41 is a class leading high performance nine-degree of freedom Inertial Measurement Unit (IMU). It represents the next generation of a family of High Performance IMUs and Attitude Measurement Units (AMUs) that incorporate an optimised suite of Silicon Sensing's unique resonating ring gyroscopes and capacitive accelerometers. DMU41 takes the proven performance and reliability of DMU30, but packages it in a smaller form factor with added user functionality.

DMU41 contains three inductive and three, piezoelectric resonating ring gyroscopes, along with six accelerometers. All of these sensors have been designed and manufactured by Silicon Sensing.

The unique multi-sensor architecture enables the sensor outputs to be optimally blended to achieve benchmark, all-MEMS inertial performance, providing a realistic alternative to established FOG/RLG based IMUs. DMU41 provides exceptional angle random walk and bias instability coupled with low noise characteristics.

DMU41 has been designed specifically to meet the growing demand for high-end applications requiring a 'tactical grade' IMU without being ITAR controlled. It is able to provide messages at variable output rates up to 2kHz which can include a combination of angular rate, acceleration, delta angle and delta velocity, temperature and built in test results. Each DMU41 is calibrated over the full operational temperature range using Silicon Sensing's in-house state of the art test facility.

Silicon Sensing Systems is a market leader in silicon MEMS gyroscopes, accelerometers and inertial measurement systems, specialising in high performance, reliability and affordability. With a strong heritage in inertial sensing that can be traced back over 100 years, all sensors are based on in-house patented designs which are produced in its own state of the art MEMS foundry. Silicon Sensing has delivered over 40 million sensors to thousands of satisfied customers worldwide, and continues to drive performance through technical expertise and continuous innovation.

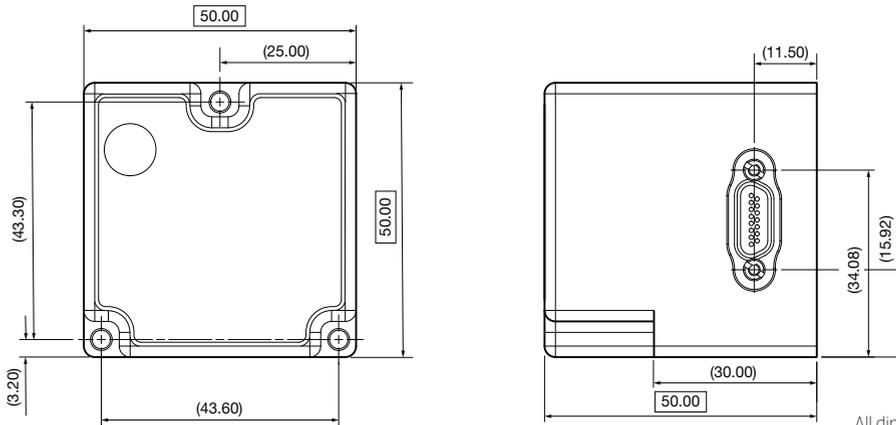
KEY FEATURES

- Silicon Sensing's class leading inductive gyro
- Silicon Sensing's latest dual axis capacitive MEMS accelerometer
- Excellent Bias Instability and Random Walk:
Angular - 0.1°/hr, 0.02°/√hr
Linear - 15µg, 0.05m/s/√hr
- Non-ITAR
- User programmable bias trim offset
- Configurable message rate and content
- External synchronisation (Ipps, NMEA, external trigger)
- RS422/RS485/RS232/SPI/CAN/USB interfaces and sync pulse output
- -40°C to +85°C operating temperature range
- Compact and lightweight - 50 x 50 x 48.4H (mm), 140g
- Low power consumption <1.5W
- Sealed aluminium housing (IP67)
- Magnetometer output
- Designed to support DO178, DO254 certification
- OEM variant coming soon

APPLICATIONS

- AHRS (Attitude and Heading Reference System)
- Airborne, railway and hydrographic survey and mapping
- INS (Inertial Navigation System)
- Guidance, navigation and control (Air, Land, Sea, Subsea)
- Autonomous vehicles, UAVs and ROVs
- Machine control and motion measurements
- Platform/camera/antenna stabilisation
- MEMS alternative to FOG/RLG IMUs
- Small satellite stabilisation and control

DMU41



All dimensions in millimeters

Typical Data

Parameter	Specification
Gyroscope Properties	
Rate range	$\pm 490^\circ/s$
Scale factor over temperature ($\pm 200^\circ/s$) (1σ)	$\pm 170\text{ppm}$
SF non-linearity ($\pm 200^\circ/s$) (1σ)	$\pm 170\text{ppm}$
Bias instability	$< 0.1^\circ/\text{hr}$
Bias over temperature (1σ)	$\pm 7^\circ/\text{hr}$
Noise (rms to 100Hz)	$0.05^\circ/s$
Angle random walk	$< 0.02^\circ/\sqrt{\text{hr}}$
Accelerometer Properties	
Acceleration range	$\pm 10g$
Scale factor over temperature ($\pm 1g$) (1σ)	$\pm 170\text{ppm}$
SF non-linearity ($\pm 10g$) (1σ)	$\pm 1700\text{ppm}$
Bias instability	$< 0.015\text{mg}$
Bias over temperature (1σ)	$\pm 1.7\text{mg}$
Noise (rms to 100Hz)	0.90mg
Velocity random walk	$< 0.05\text{m/s}/\sqrt{\text{hr}}$
Misalignment	
Cross-axis sensitivity (1σ)	$\pm 0.14\%$
IMU Temperature Sensor Properties	
Range	-45°C to 100°C
Accuracy at temperature (1σ)	$\pm 2^\circ\text{C}$
IMU Properties	
Operating temperature	-40°C to 85°C
Start-up time (full performance)	$< 1.0\text{s}$ ($< 20\text{s}$)
Supply voltage	4.5 to 28V
Power	$< 1.5\text{W}$
Mass	140 grams

For full technical datasheets please visit:
www.siliconsensing.com



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