

SDI500

MEMS Quartz Tactical Inertial Measurement Unit

Ideal for High-Precision Applications:

- Precision Guided Munitions
- Tactical Missiles
- Unmanned Aerial Vehicles (UAVs)
- GPS-Aided Navigation Systems
- Torpedos
- Gimbal & Platform Stabilization
- Targeting & Pointing Systems
- Aircraft Precision Attitude & Heading Systems



Key Performance Features:

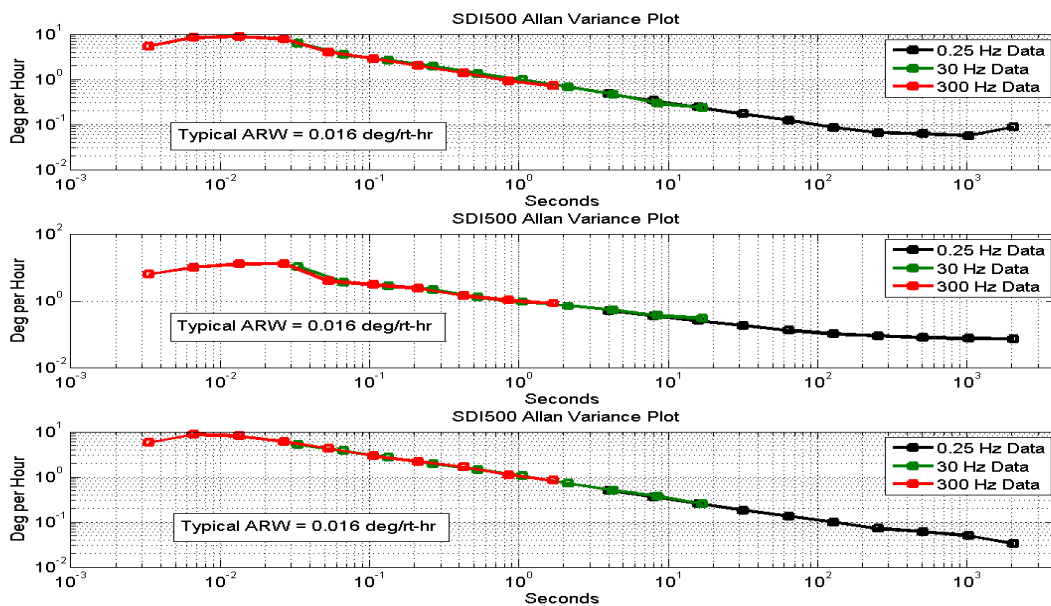
- **1°/hr Gyro Bias**
- **0.02°/hr Angle Random Walk - 5X Better Than Competition**
- **19 in.³ Compact Size**
- **Customer Programmable Output Data Rates**
- **Superior Quality & Reliability**
 - **20 Year Lifetime without Calibration**
 - **Greater Than 25,000 Hr MTBF**



The SDI500 is a breakthrough in MEMS-based Inertial Measurement Units (IMUs) and is the first MEMS-based IMU to demonstrate true tactical grade performance with 1°/hr bias stability and very low 0.02°/hr angle random walk. The breakthrough performance of the SDI500 IMU is based on a SDI's proven quartz MEMS inertial sensor technology. SDI's quartz technology enables high volume production of precisely machined sensor structures combined with the inherent large signal output and thermal stability of quartz materials.

The SDI500 is a compact IMU constructed with SDI's next generation quartz gyros, quartz accelerometers, and high speed signal processing that achieves tactical grade performance. The SDI500 IMU is rated for rugged military environments. The solid state quartz sensors and sealed IMU construction provide reliable 25,000+ hr. MTBF, and a 20 year operating and storage life. Continuous Built-in Test (BIT), configurable communications protocols, electromagnetic interference (EMI) protection, and flexible input power requirements make the SDI500 IMU easy to use in a wide range of higher order integrated system applications.

	Units	Measure	SDI500-AB00	SDI500-BB00	SDI500-CB00
System Performance					
Start Up Time for Valid Data	secs	max		<1.5	
Bandwidth, Phase (-90° Phase Shift)	Hz	min		75	
Gyro Channels					
Bias	deg/hr	1 σ	1.0	3.0	10.0
Bias In-Run Stability	deg/hr	1 σ	1.0	1.5	2.0
Scale Factor Error	ppm	1 σ	<200	<300	<400
Angle Random Walk	deg/ $\sqrt{\text{hr}}$	nom	0.02	0.02	0.03
Angular Rate – Dynamic Range	deg/sec	min	± 1000	± 1000	± 1000
Accelerometer Channels					
Bias	milli-g	1 σ	1.0	1.5	2.0
Bias In-Run Stability	micro-g	1 σ	100	200	200
Scale Factor Error	ppm	1 σ	<200	<300	<300
Random Walk Noise	$\mu\text{g}/\sqrt{\text{Hz}}$	1 σ	100	100	120
Acceleration - Calibrated Range	g	min	± 50	± 50	± 50
System Physical & Environmental					
Input Voltage	Vdc			10 to 42	
Power	watts			<5.0	
Dimensions (height x diameter)	in			2.9 x 2.9	
Volume	cu in			19	
Weight	lbs			1.3	
Temperature	°C			-55 to +85	
Vibration (Operating)	g, rms			19	
Shock	g, ms			150, 11	
Operating Life	yrs			20	
Reliability @ 35°C	hrs			60,000 MTBF, ground: 7,000 MTBF, air cargo	
Dormancy	yrs			20	



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