SDC500

Quartz MEMS Inertial Measurement Unit (License Free)

emcore®

DATASHEET | DECEMBER 2023

A New Era in Navigation

Applications

- General Aviation / Flight Control
- AHRS (Attitude Heading Reference System)
- GPS-aided Navigation
- Autonomous Vehicles
- Remotely Operated Vehicles
- Aerial and Marine Geomapping / Surveying
- Commercial Pipeline Inspection
- Mining / Agriculture
- Robotics

Key Performance Features

- 1 to 20°/hr Gyro Bias Over Temperature
- 19 in.^{3} Compact Size
- 12 g rms, Vibration Operating Performance Environment (20-2,000 Hz random)
- Superior Quality & Reliability
- Greater Than 100,000 hr MTBF
- Data Time of Validity (TOV) Input & Output Synchronization
- Smaller, Lower Power, and Cost-Effective Replacement for open-loop Fiber Optical Gyro (FOG) IMU

Ideal for High-Precision Civil & Industrial Applications

SYSTRON DONNER QUARTZ MEMS

The compact SDC500 Quartz MEMS Inertial Measurement Unit (IMU) meets commercial aerospace, industrial and marine application needs globally. It is available in several performance-cost options ranging from 1°/hr / 1 mg to 20°/hr / 5 mg over thermal, shock and vibration environments. The SDC500 IMU is constructed with EMCORE's latest generation quartz gyros, quartz accelerometers, and high-speed signal processing to achieve outstanding precision performance. The SDC500's breakthrough gyro design retains Quartz MEMS sensitivity and linearity and greatly improves noise immunity.

The small, light, low-power, hermetically sealed SDC500 IMU provides industry-standard serial communication, configurable communications protocols, TOV sync, continuous Built-in Test (BIT), electromagnetic interference (EMI) protection, long MTBF and flexible input power compatibility making the SDC500 IMU easy to use in a wide range of challenging applications and operating environments.

Performance Highlights

Parameter	SDC500-AA00	SDC500-BA00	SDC500-CA00	SDC500-DA00
Gyro Performance				
Bias (over temperature) 1σ	1.0°/hr	3.0°/hr	10.0°/hr	20.0°/hr
Bias In-Run Stability 1σ	1.0°/hr	1.5°/hr	3.0°/hr	5.0°/hr
Angle Random Walk (max)	0.02°/√hr	0.02°/√hr	0.03°/√hr	0.04°/√hr
Bandwidth, Phase Shift (-90o Phase) (min)	90Hz	90Hz	90Hz	90Hz
Accelerometer Performance				
Bias Variation (over temperature) 1σ	1.0 milli-g	2.0 milli-g	3.0 milli-g	5.0 milli-g
Bias In-Run Stability 1σ	150 µg	200 µg	250 µg	400 µg
Velocity Random Walk 1σ	100 µg/√Hz	120 µg/√Hz	150 µg/√Hz	200 µg/√Hz

NON ITAR

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Performance Specifications

Specifications are based on 100 Hz Inertial Data (ΔV/ΔΘ)

Parameter	SDC500-AA00	SDC500-BA00	SDC500-CA00	SDC500-DA00
System Performance				
Start-Up Time for Valid Data Output (max)	<1.5 secs	<1.5 secs	<2.0 secs	<2.0 secs
Gyro Channels				
Bias (over temperature) 1σ	1.0°/hr	3.0°/hr	10.0°/hr	20.0°/hr
Bias In-Run Stability 1σ	1.0°/hr	1.5°/hr	3.0°/hr	5.0°/hr
Scale Factor Error 1σ	200 ppm	200 ppm	250 ppm	400 ppm
Angle Random Walk (max)	0.02°/√hr	0.02°/√hr	0.03°/√hr	0.04°/√hr
Bandwidth, Phase Shift (-90o Phase) (min)	90Hz	90Hz	90Hz	90Hz
Angular Rate – Dynamic Range (min)	±490°/sec	±490°/sec	±490°/sec	±490°/sec
Accelerometer Channels				
Bias Variation (over temperature) 1σ	1.0 milli-g	2.0 milli-g	3.0 milli-g	5.0 milli-g
Bias In-Run Stability 1σ	150 µg	200 µg	250 µg	400 µg
Scale Factor Error 1σ	200 ppm	200 ppm	250 ppm	400 ppm
Velocity Random Walk 1σ	100 µg/√Hz	120 µg/√Hz	150 µg/√Hz	200 µg/√Hz
Acceleration - Calibrated Range (min)	±20g	±20g	±20g	±20g
System Physical & Environmental				
Input Voltage	10 to 42 Vdc			
Power	<5.0 watts			
I/O	RS232/422			
Data Synchronization Pulse	(1Hz, 100Hz, 200Hz, 400Hz, 600Hz, 1200Hz Input or Output) and (2400Hz Output only)			
Dimensions (height x diameter)	2.9 x 2.9 inches			
Volume	19 cu in			
Weight	1.3 lbs			
Temperature	-40 to +71°C			
Vibration (Operating/Survival)	12 g, rms			
Shock	150, 11 g, ms			
MTBF @ 35o C (ground benign)	100,000 hrs			

Dimensions/Scale

EMCORE P/N 966762 Rev B1

For More Information

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ISO9001 CERTIFIED

AS9100 REGISTERED

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MADE IN USA

Revision 12.12.2023