

## MMQ™ A

### Applications

The MMQ™ A has a wide variety of applications.

- Heading and Attitude Applications
- Targets and drones
- EO/IR Stabilization
- Unmanned Aerial Vehicles
- Remotely Operated Vehicles (Underwater)
- General Aviation (Experimental)
- Land Navigation
- Robotics
- Electronic Flight Instrumentation System (EFIS) Integration



### Description

The MMQ™ A offers a unique combination of the Systron Donner Inertial solid-state MMQ50 Inertial Measurement Unit (IMU) and advanced software that calculates an Attitude and Heading Reference (AHS) solution from the gyro and accelerometer sensors, and an external 3-axis magnetometer. The MMQA's MEMS quartz rate sensors and MEMS accelerometers make up an IMU system that is used to calculate a highly accurate Roll, Pitch and Heading angle solution in varying dynamic applications. Roll and Pitch are stabilized by the accelerometers, and heading is stabilized by an external 3-Axis magnetometer. The user can configure the MMQA to output data at various sample rates with extremely low output rate jitter, and the data output format is simple to understand containing the 6 sensor outputs, the angle outputs, a Built-In-Test (BIT) word output and a multi-parameter revolving word output that provides system information including version string. The MMQA combines tremendous performance and versatility with an extremely compact size, low power consumption and low weight.

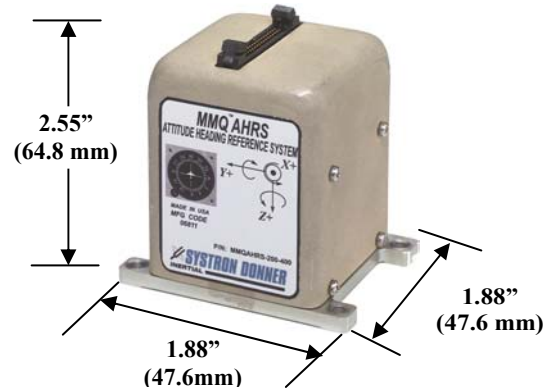


### Key Performance Features

- Extremely Small Size
- AHS Solution for many Dynamic Applications
- RS-232 Digital Interface
- Low Power Consumption (<5W)
- Configurable Output Rate
- Jitter Free Output Rate (400 Hz Max)
- Tested to meet TSO-C4c bank (roll) and pitch angle performance
- Tested to meet TSO-C6d heading angle performance
- MMQA Demo Software supplied to facilitate integration

# Miniature MEMS Quartz Attitude and Heading Reference System

www.systron.com



Physical Characteristics	
Part Number	MMQA-200-100
Size (Vol.)	9.0 in <sup>3</sup>
Weight	<0.50 lbs (<0.227 kg)
Power	+ and - 12 Vdc at < 5 watts total
I/O	RS-232 - 400 Hz Output Rate with < 100 microsecond jitter
Attitude and Heading Performance	
Static Accuracy (Roll, Pitch, Heading)	< 0.5 Deg
Dynamic Accuracy (Roll/Pitch)	1.5 Deg RMS - Tested to TSO-C4c roll and pitch performance standards
Dynamic Accuracy (Heading)	3.0 Deg RMS - Tested to TSO-C6d heading performance standards
Rate Channels	
Range	±200°/ sec
Bias Turn-on to turn-on Stability	≤100°/hr, 1σ
Bias In-run Stability (at any temperature)	100°/hr, 1σ
Bias Instability	<4-15°/hr
Angle Random Walk	0.3 °/rt-hr (0.005 °sec/rt-Hz)
Scale Factor error	≤5000 ppm (0.5%)
Alignment	≤5 mrad
Bandwidth (-90°)	50 Hz, nominal
Acceleration Channels	
Range	±10g
Bias Turn-on to turn-on Stability (fixed temp)	≤2.5 mg, 1σ
Bias In-run Stability (at any temperature)	≤3 mg, 1σ
Velocity Random Walk	0.5 mg/rt-Hz
Scale Factor Error	≤5000 ppm (0.5%)
Alignment	≤5 mrad
Bandwidth (-90°)	50 Hz, nominal
Environmental	
Temperature Range	-54°C to +70°C (operating)
Vibration, random	6.0g rms, 20Hz -2kHz, flat <b>Meets DO-160D Curves C, C1</b>
Shock, operating	30g, powered <b>Meets DO-160D operational shock and crash safety</b>
Altitude	35,000 ft. <b>Meets DO-160D Category C</b>

**For more information contact:**

Systron Donner Inertial  
2700 Systron Drive  
Concord, California 94518 USA  
+1-925-979-4500 or +1-866-234-4976



Email: [Sales@systron.com](mailto:Sales@systron.com)

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