SYSTRON DONNER INERTIAL

# MMQ™A

## Miniature MEMS Quartz AHRS

**Ideal for High-Precision Civil & Military Applications:**

- Heading & Attitude Applications
- UAVs,Targets & Drones
- EO/IR Stabilization
- Remotely Operated Vehicles (Underwater)
- General Aviation (Experimental)
- Land Navigation
- Robotics
- Electronic Flight Instrumentation System (EFIS) Integration

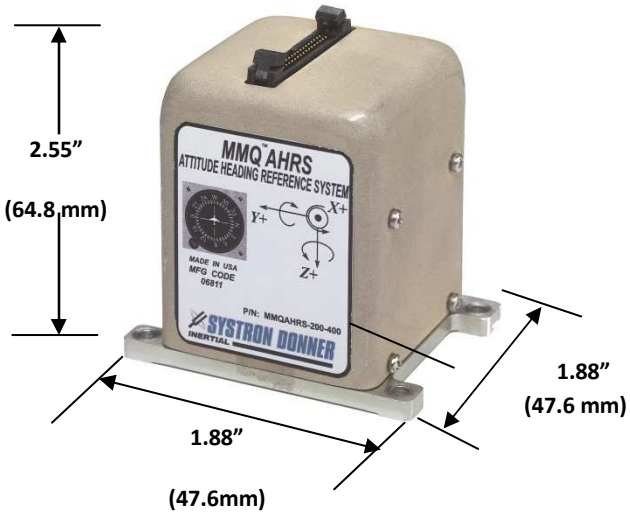

## Key Performance Features:

- **Extremely Small Size**
- **AHRS 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) & Pitch Angle Performance**
- **Tested to meet TSO-C6d Heading Angle Performance**
- **MMQA Demo Software Supplied to Facilitate Integration**


The MMQ™A offers a unique combination of the Systron Donner Inertial solid-state MMQ™50 Inertial Measurement Unit (IMU) and advanced software that calculates an Attitude and Heading Reference (AHRS) solution from the gyro and accelerometer sensors, and an external 3-axis magnetometer. The MMQ™A'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 MMQ™A 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 MMQ™A combines tremendous performance and versatility with an extremely compact size, low power consumption and low weight.

# MMQ™A

## Miniature MEMS Quartz AHRS




| | MMQA-200-100 |
|---|---|
| **Physical Characteristics** | |
| Size (Vol.) | 9.0 $in^3$ |
| Weight | <0.50 lbs (<0.227 kg) |
| Power | + & – 12Vdc at <5W total |
| I/O | RS-232 – 400Hz Output Rate with < 100 microsecond jitter |
| **Attitude & Heading Performance** | |
| Static Accuracy (Roll, Pitch, Heading) | < 0.5 Deg |
| Dynamic Accuracy (Roll/Pitch) | 1.5°RMS – **Tested to TSO-C4c Roll & Pitch Performance Standards** |
| Dynamic Accuracy (Heading) | 3.0° RMS – **Tested to TSO-C6d Heading Performance Standards** |
| **Rate Channels** | |
| Range | ±200°/sec |
| Bias Turn-on to turn-on Stability | ≤100°/hr, 1 σ |
| Bias In-run Stability (at any temperature) | 100°/hr, 1 σ |
| Bias Instability | <4-15°/hr |
| Angle Random Walk | 0.3°/√hr (0.005 °sec/√Hz) |
| Scale Factor error | ≤5000 ppm (0.5%) |
| Alignment | ≤5 mrad |
| Bandwidth (-90° Phase Shift) | 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/√Hz |
| Scale Factor Error | ≤5000 ppm (0.5%) |
| Alignment | ≤5 mrad |
| Bandwidth (-90° Phase Shift) | 50 Hz, nominal |
| **Environmental** | |
| Temperature Range | -54°C to +70°C (operating) |
| Vibration, Random | 6.0$g_{rms}$, 20Hz –2kHz, flat **Meets DO-160D Curves C, C1** |
| Shock, Operating | 30g, powered **Meets DO-160D Operational Shock & Crash Safety** |
| Altitude | 35,000 ft. **Meets DO-160D Category C** |


**For more information, contact:**

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