

AHRS

ATTITUDE & HEADING REFERENCE SYSTEM

- ▼ FAA TSO for C4c and TSO C6d Requirements
- ▼ Primary Flight Attitude and Heading
- ▼ No External Air-Data or GPS "Aiding" Required
- ▼ Avionics-Style Enclosure meets DO-160D Requirements
- ▼ Continuous BIT (Built-in Test)

**NOW
FAA
CERTIFIED!**



AHRS500GA

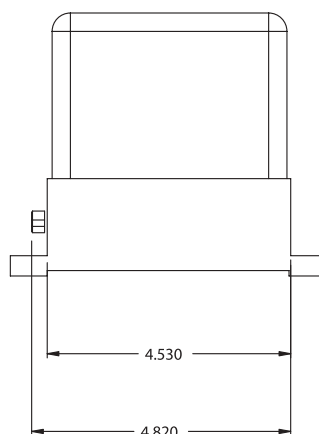
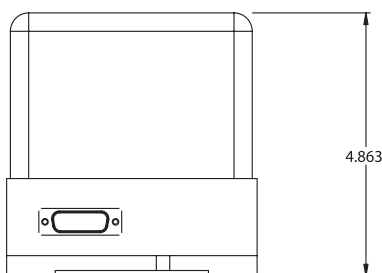
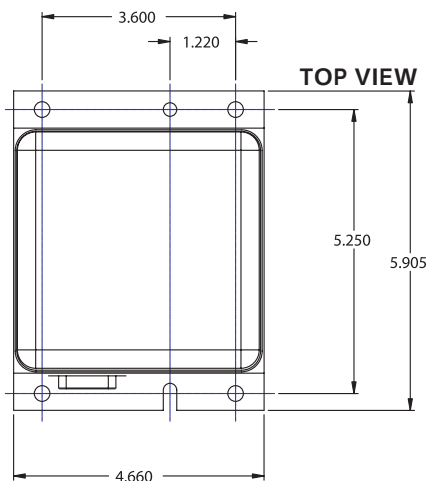
Crossbow Technology's AHRS500GA is the world's first stand-alone MEMS Attitude and Heading Reference System (AHRS) to receive FAA certification. FAA TSO certification means the AHRS500GA has passed an extensive regimen of rigorous qualification tests, including the newly proposed DO-160D multiple lightning strike test. Stand-alone means the Crossbow AHRS500GA operates as a truly independent device, eliminating the need for Air Data or GPS inputs as compared to other, less desirable, solutions.

The AHRS500GA is a high-performance, solid-state attitude and heading reference system intended for general aviation aircraft.

This high reliability inertial system provides attitude and heading measurement with static and dynamic accuracy superior to traditional spinning mass vertical and directional gyros.

The AHRS500GA meets all FAA requirements for FAR 23 aircraft. A sophisticated suspension system, similar to those found on commercial air transport navigation systems, ensures full performance in aircraft vibration environments. A sealed enclosure provides long trouble-free life and full performance over the entire altitude and temperature range without risk of moisture contamination. A comprehensive Built-in-Test (BIT) monitors all sensors and internal electronics continuously during operation and sends a system status update in every output message.

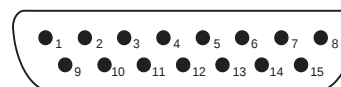
The AHRS500GA is an "output only" device, ensuring stable operation by offering immunity from any external settings. Output data is provided on a digital RS-232 serial data bus.



SIDE VIEWS

Specifications	AHRS500GA	Remarks
Performance		
Update Rate (Hz)	25 or 100	See Ordering Information
Full Accuracy Data (sec)	< 90	
Heading		FAA TSO C6d Test Conditions
Range (°)	0 to 360	
Accuracy (°)	± 2	
Resolution (°)	0.1	
Attitude		FAA TSO C4c Test Conditions
Roll Range (°)	± 180	
Pitch Range (°)	± 180	
Accuracy (°)	± 2.5	
Verticality (°)	< 1.0	
Resolution (°)	0.1	
Environment¹		FAA DO-160D Test Conditions
Operating Temperature (°C)	-40 to +70	
Non-Operating Temperature (°C)	-55 to +85	
Operating Vibration (g rms)	DO-160D, Section 8	Category S, Curve M
EMI	DO-160D, Section 20	Category W
	DO-160D, Section 21	Category M
Waterproof/Humidity	Sealed Housing	
Altitude (ft)	35,000	
Maximum Angular Rate (°/sec)	200	Roll, Pitch, or Yaw
Maximum G Range (G)	10	
Electrical		
Input Supply Voltage (VDC)	12V or 24V Elec. System	DO-160D Section 16, Cat. B
Input Power (W)	< 4	@ 12 VDC
Digital Output Format	RS-232	
Physical		
Size (in)	4.66 x 4.53 x 4.863	Excludes Mounting Flanges
(cm)	11.84 x 11.51 x 12.35	Excludes Mounting Flanges
Weight (lbs)	3.5	
(kg)	1.6	
Connector	15 Pin Sub-Min DB Male	

15 Pin "D" Connector Male Pinout



Pin	Signal
1	RS-232 Transmit
2	No Connection
3	Power Input
4	Power Input Ground
5	No Connection
6	No Connection
7	No Connection
8	No Connection
9	Signal Ground
10	No Connection
11	No Connection
12	Magnetometer Cal Input (Hard and soft iron cal)
13	No Connection
14	No Connection
15	No Connection

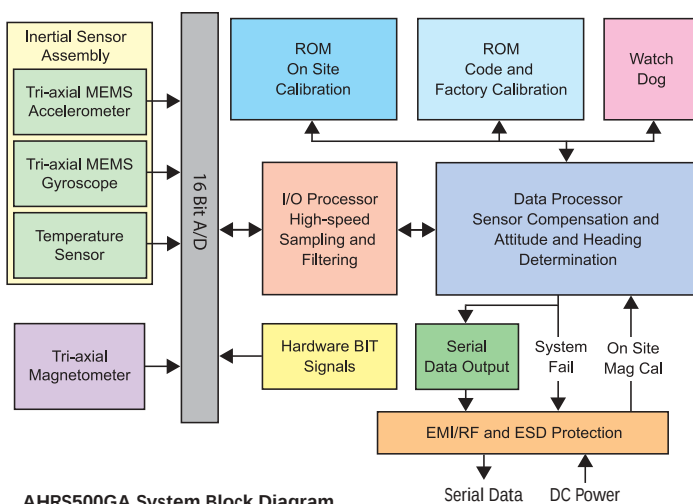
Pin Diagram



Notes

¹DO-160D Environmental Category: C4BBB[SM]XWXXXZBABCWMA3G33XAA

Specifications subject to change without notice



AHRS500GA System Block Diagram

Hardware Test	Power On BIT	Operation BIT
Power Supply Voltage	Y	Y
RAM Memory Integrity	Y	N
ROM Memory Integrity	Y	N
Processor(s) Integrity	Y	Y
ADC Integrity	Y	Y
Gyro(s) Integrity	Y	Y
Accelerometer(s) Integrity	Y	Y
Temp Sensor Integrity	Y	Y
Sensor Temperature	Y	Y
Magnetometer(s) Integrity	Y	Y

Bit Tests Performed

inertial systems

Ordering Information

Model	Description	Baud Rate	Packet Rate	Axis Orientation
AHRS500GA-200	Avionics AHRS Solution	38.4k	100	connector faces aft
AHRS500GA-201	Avionics AHRS Solution	38.4k	100	connector faces forward
AHRS500GA-204	Avionics AHRS Solution	9600	25	connector faces aft
AHRS500GA-205	Avionics AHRS Solution	9600	25	connector faces forward

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