



Power Sensing Solutions for a Better Life

# AHRS280ZA

ATTITUDE HEADING REFERENCE SYSTEM

The MEMSIC AHRS280ZA is a low cost miniature fully-calibrated Attitude & Heading Reference System designed for demanding embedded applications that require a complete dynamic measurement solution in a robust low-profile package. The AHRS280ZA provides a standard SPI bus for cost-effective board-to-board communications.



UAV Flight Control



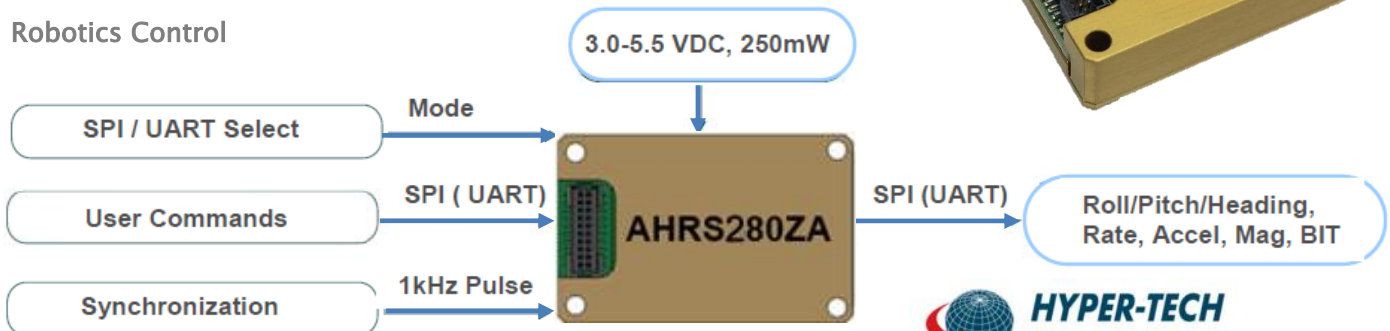
Uncertified Avionics

The MEMSIC AHRS280ZA integrates highly-reliable MEMS 6DOF inertial sensors and 3-axis magnetic sensors with extended Kalman filtering in a miniature factory-calibrated module to provide consistent performance through the extreme operating environments in a wide variety of dynamic control and navigation applications.

## Applications

- Unmanned Vehicle Control
- Uncertified Avionics
- Platform Stabilization
- Robotics Control

- ### Features
- Complete 9DOF Inertial System
  - Roll/Pitch/Heading Outputs
  - SPI (or UART) Interface
  - Update Rate, 1Hz to 200Hz
  - 1KHz Clock Sync Input
  - Miniature Package, 24 x 37 x 9.5 mm
  - Lightweight < 17 g
  - Low Power Consumption < 250 mW
  - Wide Temp Range, -40C to +85C
  - High Reliability, MTBF > 50k hours



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## Performance AHRS280ZA (-200, -400)

Performance	
<b>Heading</b>	
Range (°)	± 180
Accuracy (°)	< 1.0 <sup>4</sup> , < 3.0 <sup>3</sup>
Resolution (°)	< 0.02
<b>Attitude</b>	
Range: Roll, Pitch (°)	± 180, ± 90
Accuracy (°)	< 1.0 <sup>4</sup> , < 2.0 <sup>3</sup>
Resolution (°)	< 0.02
<b>Angular Rate</b>	
Range: Roll, Pitch, Yaw (°/sec)	± 200 (± 400 High Range Model)
Bias Instability (°/hr) <sup>1,2</sup>	< 20
Bias Stability Over Temp (°/sec) <sup>2</sup>	< 0.2
Resolution (°/sec)	< 0.02
Scale Factor Accuracy (%)	< 0.2
Non-Linearity (%FS)	< 0.2
Angle Random Walk (°/√hr) <sup>2</sup>	< 1.5
Bandwidth (Hz)	5-50 (user-configurable)
<b>Acceleration</b>	
Range: X, Y, Z (g)	± 4 (± 8 High Range Model)
Bias Instability (mg) <sup>1,2</sup>	< 0.05
Bias Stability Over Temp (mg) <sup>2</sup>	< 15
Resolution (mg)	< 0.5
Scale Factor Accuracy (%)	< 0.2
Non-Linearity (%FS)	< 0.2
Velocity Random Walk (m/s/√hr) <sup>2</sup>	< 0.1
Bandwidth (Hz)	5-50 (user-configurable)
<b>Magnetic Field</b>	
Range: X, Y, Z (Gauss)	± 4
Resolution (mGauss)	< 5
Noise Density (mGauss /√Hz) <sup>2</sup>	< 0.25
Bandwidth (Hz)	5

## Specifications

Specifications	
<b>Environment</b>	
Operating Temperature (°C)	-40 to +85
Non-Operating Temperature (°C)	-55 to +105
Enclosure	Aluminum (Gold Anodized)
<b>Electrical</b>	
Input Voltage (VDC)	3.0 to 5.5
Power Consumption (mW)	< 250
Digital Interface	SPI or UART (user-configurable)
Output Data Rate	1Hz to 200Hz (user-configurable)
Input Clock Sync	1kHz Sync Pulse
<b>Physical</b>	
Size (mm)	24.15 x 37.7 x 9.5
Weight (gm)	< 17
Interface Connector	20-Pin (10 x 2) 1.0 mm pitch header

## Ordering Information

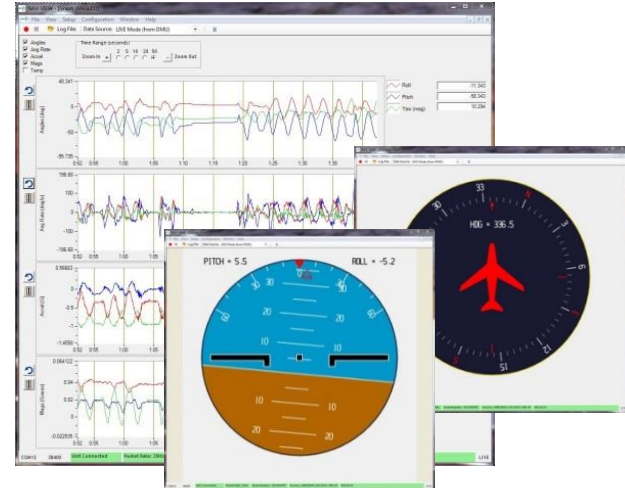
Model	Description
AHRS280ZA-200	Attitude and Heading Reference System (Standard Range)
AHRS280ZA-400	Attitude and Heading Reference System (High Range)

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<sup>1</sup> Allan Variance Curve, constant temperature. <sup>2</sup> 1-sigma error. <sup>3</sup> RMS error under all dynamics.

<sup>4</sup> RMS error under static conditions over full temperature range.

## NAV-VIEW Configuration and Display Software



NAV-VIEW provides an easy to use graphical interface to display, record, playback, and analyze all of the AHRS280ZA Attitude & Heading Reference System parameters.

NAV-VIEW can also be used to set a wide range of user-configurable fields in the AHRS280ZA to optimize the system performance for highly dynamic applications.

NAV-VIEW software is available for download from MEMSIC's website at: [www.memsic.com/support](http://www.memsic.com/support)

## Other Components

The DMU280ZA evaluation kits include an AHRS280ZA, evaluation board, and USB cable allowing direct connection to a PC for use with NAV-VIEW display and configuration software.



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