ALAVA INGENIEROS

The MEMSIC AHRS380ZA is a 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 AHRS380ZA provides a standard SPI bus for cost-effective board-to-board communications.
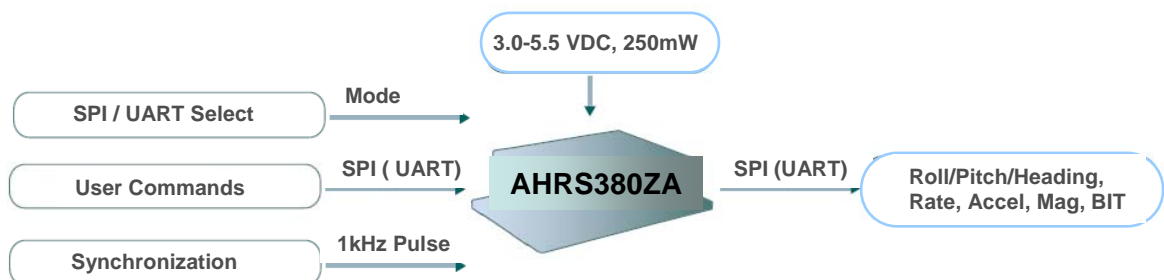
Precision Farming   Antenna Stabilization

The MEMSIC AHRS380ZA 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

- Precision Farming
- Platform Stabilization
- Unmanned Vehicle Control
- Robotics Control

Features

- Complete 9DOF Inertial System
- Roll/Pitch/Heading Outputs
- SPI (or UART) Interface
- Update Rate, 1Hz to 200Hz
- 1KHz Clock Synch
- 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

3.0-5.5 VDC, 250mW

SPI / UART Select	Mode		
User Commands	SPI (UART)	**AHRS380ZA**	SPI (UART) → Roll/Pitch/Heading, Rate, Accel, Mag, BIT
Synchronization	1kHz Pulse		

PRELIMINARY

AHRS380ZA
ATTITUDE HEADING REFERENCE SYSTEM

| Performance	AHRS380ZA-400
Heading	
Range (°)	± 180
Accuracy (°)	< 1.0
Resolution (°)	< 0.02
Attitude	
Range: Roll, Pitch (°)	± 180, ± 90
Accuracy (°)	< 0.2
Resolution (°)	< 0.02
Angular Rate	
Range: Roll, Pitch, Yaw (°/sec)	± 250, ± 125, ± 62.5 (user-configurable)
Bias Instability (°/hr)[1,2]	< 10
Bias Stability Over Temp (°/sec)	< 0.5
Resolution (°/sec)	< 0.02
Scale Factor Accuracy (%)	< 0.1
Non-Linearity (%FS)	< 0.1
Angle Randon Walk (°/√hr)[2]	< 0.75
Bandwidth (Hz)	5-50 (user-configurable)
Acceleration	
Range: X, Y, Z (g)	± 8, ± 4 (user-configurable)
Bias Instability (mg)[1,2]	< 0.05
Bias Stability Over Temp (mg)	< 5
Resolution (mg)	< 0.5
Scale Factor Accuracy (%)	< 0.1
Non-Linearity (%FS)	< 0.1
Velocity Random Walk (m/s/√hr)[2]	< 0.05
Bandwidth (Hz)	5-50 (user-configurable)
Magnetic Field	
Range: X, Y, Z (Gauss)	± 8
Bias Stability Over Temp (mGauss)	< 20
Resolution (mGauss)	< 5.0
Noise Density (µGauss/√Hz)	< 100
Bandwidth (Hz)	5-50 (user-configurable)

Specifications

Environment	
Operating Temperature (°C)	-40 to +85
Non-Operating Temperature (°C)	-55 to +105
Enclosure	Aluminum (Gold Anodized)
Electrical	
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 Synch	1kHz sync pulse
Physical	
Size (mm)	24.15 x 37.70 x 9.50
Weight (gm)	< 17
Interface Connector	20-pin (10 x 2) 1.0mm pitch header

Ordering Information

Model	Description
AHRS380ZA-400	Attitude & Heading Reference System
EVAL-KIT 380ZA	380ZA Evaluation Board and PC Interface Cable

This product has been developed exclusively for commercial applications. It has not been tested for, and MEMSIC makes no representation or warranty as to conformance with, any military specifications or the suitability for any military application or end use. Additionally, any use of this product for nuclear, chemical or biological weapons, or weapons research, or for any use in missiles, rockets, and/or UAVs of 300km or greater range, or any other activity prohibited by the Export Administration Regulations, is expressly prohibited without the written consent and without obtaining appropriate US export license(s) when required by US law. Diversion contrary to US law is prohibited. Specifications are subject to change without notice. [1] Allan variance curve, constant temperature. [2] 1-sigma error.

NAV–VIEW
Configuration and Display Software
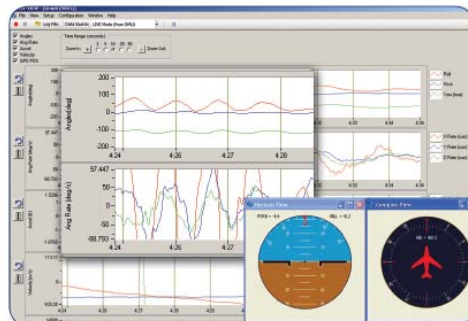
NAV-VIEW provides an easy to use graphical interface to display, record, playback, and analyze all of the AHRS380ZA Attitude & Heading Reference System parameters.

NAV-VIEW can also be used to set a wide range of user-configurable fields in the AHRS380ZA 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

Other Components

The AHRS380ZA evaluation kit includes a 380 interface card and cable allowing direct connection to a pc for use with NAV-VIEW display and configuration software.

Support

For more detailed information please refer to the 380-Series User's Manual available online at: www.memsic.com/support