



# IMU381ZA

INERTIAL MEASUREMENT SYSTEM

The IMU381ZA is an improved version of the popular IMU380ZA miniature fully-calibrated Inertial Measurement System. The changes include better gyro performance, improved synchronization capability, and a bootloader function, which allows field upgrade-ability and also enables customers to take advantage of the ACEINNA open source navigation software development platform.



*Precision Farming*



*Platform Stabilization*

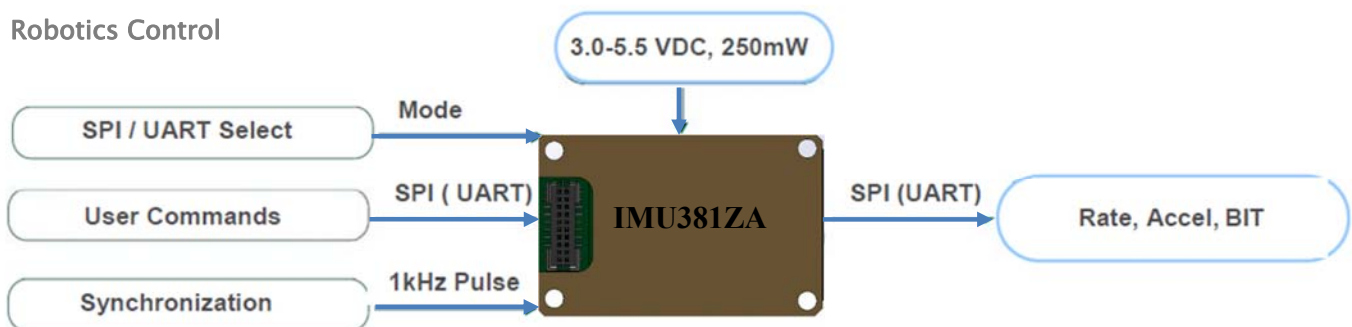
The ACEINNA IMU381ZA integrates highly-reliable MEMS 6DOF inertial sensors in a miniature factory-calibrated module to provide consistent performance through the extreme operating environments in a wide variety of dynamic control and navigation applications.

## Applications

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

### Features

- Complete 6DOF Inertial System
- SPI (or UART) Interface
- Update Rate, 1Hz to 200Hz
- 1KHz Clock Sync Input
- Miniature Package, 24 x 37 x 9.5 mm
- Drop-in upgrade for IMU380ZA
- Low Power Consumption < 250 mW
- Wide Temp Range, -40C to +85C
- High Reliability, MTBF > 50k hours



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## Performance IMU381ZA (-200/400)

Angular Rate	
Range: Roll, Pitch (°/sec)	± 200 (± 400 High Range Model)
Bias Instability (°/hr) <sup>1,2</sup>	6
Bias Stability Over Temp (°/sec) <sup>3</sup>	< 0.5
Resolution (°/sec)	< 0.02
Scale Factor Accuracy (%)	< 0.1
Non-Linearity (%FS)	< 0.1
Angle Random Walk (°/√hr) <sup>1,2</sup>	0.3
Bandwidth (Hz)	5-50 (user-configurable)
Acceleration	
Range: X, Y, Z (g)	± 4 (± 8 High Range Model)
Bias Instability (mg) <sup>1,2</sup>	0.02
Bias Stability Over Temp (mg) <sup>3</sup>	< 5
Resolution (mg)	< 0.5
Scale Factor Accuracy (%)	< 0.1
Non-Linearity (%FS)	< 0.1
Velocity Random Walk (m/s/√hr) <sup>1,2</sup>	0.05
Bandwidth (Hz)	5-50 (user-configurable)

## Other Specifications

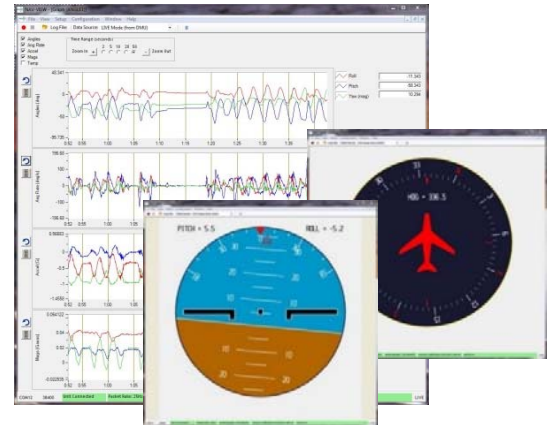
Environment	
Operating Temperature (°C)	-40 to +85
Non-Operating Temperature (°C)	-55 to +105
Enclosure	Die-Cast Aluminum
Electrical	
Input Voltage (VDC)	3.0 to 5.5
Power Consumption (mW)	< 250
Digital Interface	SPI or UART (user-configurable)
Output Data Rate	1Hz to 200Hz (user-configurable)
Input Clock Sync	1kHz Sync Pulse
Physical	
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
IMU381ZA-200	Inertial Measurement Unit (6 DOF, 200dps Range)
IMU381ZA-400	Inertial Measurement Unit (6 DOF, 400dps Range)
EVAL-KIT DMU381ZA-200	Evaluation Kit for DMU381 Family (Std Range)
EVAL-KIT DMU381ZA-400	Evaluation Kit for DMU381 Family (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 over temperature



NAV-VIEW provides an easy to use graphical interface to display, record, playback, and analyze all of the IMU381ZA system parameters.

NAV-VIEW can also be used to set a wide range of user-configurable fields in the IMU381ZA to optimize the system performance for highly dynamic applications.

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

## EVAL KIT

The DMU381ZA evaluation kits include an IMU381ZA, evaluation / interface board and USB 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 DMU381ZA Series User's Manual available online at:

[www.aceinna.com/support](http://www.aceinna.com/support)