OpenIMU300

EZ-Family High-Performance IMU

The ACEINNA OpenIMU300 "EZ" is an easy-to-use high-performance 9-DOF open inertial platform. The OpenIMU300 features a precision 3-Axis Accelerometer, low-drift 3-Axis Rate Gyro, and 3-Axis Magnetometer. The low-power platform is powered by a 168MHz ARM M4 CPU with a Floating Point Unit. The OpenIMU300 runs the OpenIMU open-source stack that includes an optimized full-state Kalman Filter for Attitude and GPS-Aided Position-Velocity-Time (PVT) measurement. A free tool-chain based on VS Code supports PC, MAC, Ubuntu.

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Performance Characteristics

Ta = 25°C, VDC = 3.3V, unless otherwise stated

Ready-to Use Algorithms	Outputs	
IMU	Calibrated Accel, Gyro, Mags	
VG-AHRS	Dynamic Roll, Pitch Heading	
INS	Position, Velocity, Attitude	

Angular Rate	TYP[2]	LIMIT
Range (°/s)		±400
Bias Instability (°/hr)[1]	6	10
Bias Stability over Temp (°/s)	0.3	1
Scale Factor Accuracy (%)	0.01	0.1
Non-Linearity (%FSR)	0.02	0.1
Angle Random Walk (°/√hr)[1]	0.3	0.6
Configurable Bandwidth (Hz)	5 – 50	

Acceleration	TYP[2]	LIMIT
Range (g)		±8
Bias Instability (μg)[1]	10	25
Bias Stability over Temp (mg)	3	5
Scale Factor Accuracy (%FSR)	0.03	0.1
Non-Linearity (%FSR)	0.03	0.1
VRW (m/s/√hr)[1]	0.05	0.1
Bandwidth (Hz)	5 – 50	

Magnetic Field	TYP[2]	LIMIT
Range (mGauss)		±4000
Resolution (mGauss)	5	
Noise (mGauss/√Hz)	0.25	
Bandwidth (Hz)	5	

Electrical	
Input Voltage (V)	3.3 - 5.0
Power Consumption (mW)	<250
Interface	SPI or UART
Output Data Rate (Hz)	up to 200

Environment	
Operating Temperature (ºC)	-40 °C to 85°C
Non-Operating Temperature (ºC)	-55 °C to 85°C

Physical	
Size (mm)	24.15 x 37.7 x 9.5
Weight (gm)	< 17
Interface Connector	20-Pin (10x2) 1.0 mm pitch header

Note 1: Allen variance curve, constant temperature

Note 2: Typical values are 1 sigma values unless otherwise noted

Part Ordering Information	
EZ Family High-Performance OpenIMU Platform	
OpenIMU300ZA	9 DOF IMU, FSR = 400dps / ±8g
OpenIMU300ZA EVK	Developer Kit with OpenIMU300ZA, EVB, JTAG, and Precision Test Fixture

Features

- Easy to Customize Open Source Algorithms
- 168MHz ARM M4 CPU
- Built in 16-State Open Source Extended State Kalman Filter
- Low-Drift 3 axis MEMS angular rate sensor
- High Performance 3 axis MEMS Accelerometer
- 3 axis magnetic sensor
- SPI and UART interfaces
- Up to 3 UARTs
- Wide Temp Range, -40C to +85C
- High Reliability, MTBF > 50k hours
- Open Community & Support

Developer Tools

Embedded navigation applications can be quickly developed on PC, MAC, and Ubuntu and deployed to run on OpenIMU hardware.

Aceinna Navigation Studio developer tools and GUI are found on our developer site: developers.aceinna.com
Full manual and API and Algorithm documentation is found at:
openimu.readthedocs.io
IDE and Compilation tools, download VS Code and Add Aceinna Extension:
code.visualstudio.com