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	**MIN**	**TYP[2]**	**MAX**
Range (°/s)	-400		+400
Bias Instability (°/hr)[1]		6	
Bias Stability over Temp (°/s)		0.3	
Scale Factor Accuracy (%FSR)		0.03	
Cross-Axis Error (%FSR)		0.02	
Angle Random Walk (°/√hr)[1]		0.3	
Configurable Bandwidth (Hz)	5		50
Acceleration	**MIN**	**TYP[2]**	**MAX**
Range (g)	-8		+8
Bias Instability (µg)[1]		10	
Bias Stability over Temp (mg)		3	
Scale Factor Accuracy (%FSR)		0.03	
Cross-Axis Error (%FSR)		0.03	
VRW (m/s/√hr)[1]		0.06	
Configurable Bandwidth (Hz)	5		50
Magnetic Field	**MIN**	**TYP[2]**	**MAX**
Range (mGauss)	-8000		+8000
Resolution (mGauss)		0.3	
Noise (mGauss/√Hz)		0.25	
Bandwidth (Hz)		5	
Electrical	**MIN**	**TYP**	**MAX**
Input Voltage (V)	3.0		5.5
Power Consumption (mW)			250
Interface	SPI or UART		
Output Data Rate – SPI (Hz)			200
Output Data Rate – UART (Hz)			100
Environment			
Operating Temperature (°C)	-40 °C to 85°C		
Non-Operating Temperature (°C)	-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: Allan 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