

SRX-INS00-DEV

Description

The SRX-INS00-DEV is a small size, low power and high performance Inertial Measurements Unit board that intends to be used for robotic applications development and prototyping.

Coupled with the included c++ library, it allows a 360° drift free attitude measurements, and precise altitude measurements.

Features

- Proprietary algorithm featuring robust EKF allows 360° orientation tracking with high accuracy.
- Adaptive algorithms to ensure correct disturbances rejection even in complex environment.
- Real-time gyro bias tracking and compensation.
- Set of customizable parameters for adaptability to every project.
- Calibration tools provided for magnetometer and accelerometer for maximum precision

Customizable software

Inertial Measurements Unit library is completely tunable thanks to exposed parameters.

It can be built and integrated in multiple applications on multiple platforms:

- Linux
- Windows
- MacOs apple silicon
- Esp32-s3
- Teensy 4.X

It can be paired with complete application provided for Esp32-s3 for immediate deployment

Caracteristics

Performances with fusion

- Pitch/Roll (static) 0,5° *RMS*
- Pitch/Roll (dynamic) 1,0° *RMS*
- Relative Yaw (static) 1,0° *RMS*
- Absolute yaw (static) 3,0° *RMS*
- Vertical Speed 0,2 $m \cdot s^{-1}$ *RMS*
- Relative Altitude 1,0 *m*
- Range (Yaw/Pitch/roll) ±180°/±90°/±180°
- Angular Resolution 0,0001°
- Vertical Speed Resolution 0,0001 $m \cdot s^{-1}$
- Altitude Resolution 2 · 10⁻⁷ *m*

Delays and bandwidth (-3dB)

- Angles Delays (configurable) 8,82 *ms*
- Vertical Delays (configurable) 8,82 *ms*
- Angular Rates BW (configurable) 72,5 *Hz*
- Vertical Acceleration BW (configurable) 72,5 *Hz*

Sensors characteristics¹

	Gyrometer	Accelerometer	Barometer	Magnetometer
Range	±2000 °/s	±16 <i>g</i>	260 – 1260 <i>hPa</i>	±8 <i>Gauss</i>
Noise (RMS at default Bandwidth)	0,045 °/s	0,85 <i>mg for XY</i> 1,15 <i>mg for Z</i>	0,0087 <i>hPa (0,073m)</i>	0,6 <i>mGauss</i>
Resolution	0,0038 °/s	3,0518 · 10 ⁻⁵ <i>g</i>	0,0244 <i>Pa (0,002 m)</i>	0,061 <i>mGauss</i>
In run bias	2 – 7 °	–	–	–
Polling Frequency (default)	500 <i>Hz</i>	500 <i>Hz</i>	71,4 <i>Hz</i>	100 <i>Hz</i>
Bandwidth (-3dB)	230,7 <i>Hz</i>	230,7 <i>Hz</i>	35,7 <i>Hz</i>	50 <i>Hz</i>

Hardware

Interface

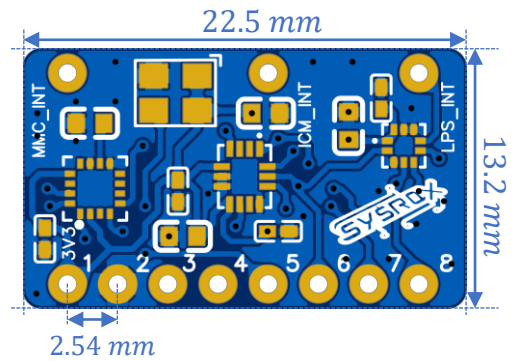
- SPI
- I2C

Dimensions

- Length = 22,5 *mm*
- Height = 13,2 *mm*
- Width = 1,2 *mm*

Supply

- 3,3V



Optional cover



1. Sensors used are Invensense ICM42688-p, Memsic MMC5983MA and ST LPS22HB