INERTIALSENSE

A GUIDE TO CHOOSING THE RIGHT SENSOR

Like most builders and engineers, you have probably mapped out your desired specs. Now you are faced with many choices for sensor selection.

This guide to choosing the best sensor for your project begins with data, that is, what data or information do you need back from the sensor?

IMU

You need temperature, 3D acceleration, 3D magnetic field and 3D rate of turn. This sensor provides **raw, calibrated data** and is perfect for measuring motion while requiring your solution to have filters in place.

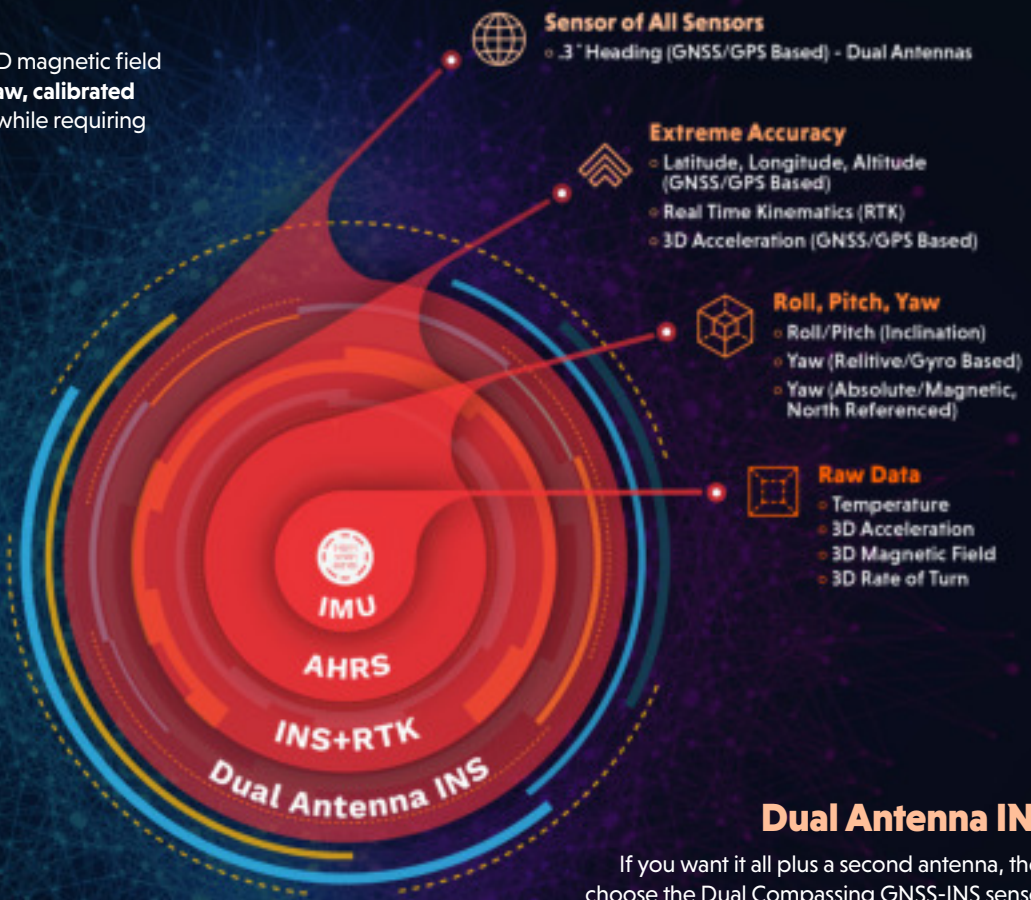
AHRS

In addition to IMU, you want data around roll, pitch, and yaw. The AHRS sensor will solve your needs. This orientation data is perfect for a robotic arm or even an indoor floor cleaner. This sensor uses algorithms to fuse raw data from the IMU with the Earth's gravity to provide orientation.

INS + RTK

Harness all the functionality of our IMU and AHRS sensors plus precise location by use of the Kalman Filter which fuse data with GPS. Our sensor fusion allows you to maintain position and provide improved location data. Perfect for a drone or small ground robot.

INS is not sold independently, instead we pair it with additional functionality. When we add our RTK (Real-Time Kinematic) you get "extreme accuracy." We're talking as close as within 3cm. INS+RTK includes corrections from satellites and is perfect for high-accuracy drones, autopilot applications, and small ground robots. The data includes GNSS/GPS-based latitude, longitude, and altitude; real-time RTK; and GNSS/GPS-based 3D acceleration.

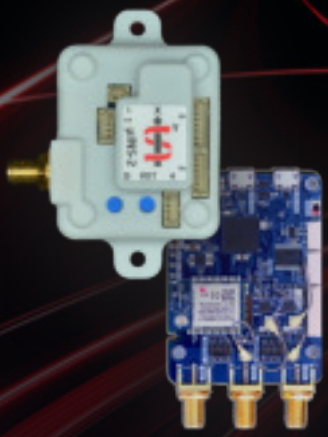


Dual Antenna INS

If you want it all plus a second antenna, then choose the Dual Compassing GNSS-INS sensor. The functionality of all Inertial Sense sensors are combined into one plus it uses two antennas for heading data. If electromagnetic interference is a concern based on your machine, then you will appreciate the dual antenna system which provides GPS-based heading data. This "sensor of all sensors" is perfect for radar/antenna pointing and anywhere electromagnetic output could skew data.

Which Form Factor Do You Prefer?

EVB Form Factor



Rugged

PCB Module

The last question we typically ask is, **"Does this need to be rugged?"** Our sensors are available with a "rugged" form factor which gives you an aluminum casing to protect your sensor in harsh applications. If you're using it for autopilot, mining, powerlines or other outdoor or harsh applications, we are probably going to suggest you go rugged.

It's important to consider the quality of both the sensor and the software behind the sensor when selecting for your project – **not all sensors are created equally!**

If You're Ready To Talk To Someone:

Carson Herbert
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We enable building autonomous navigation into vehicles such as robotic lawn mowers, delivery robots, drones, agriculture robots, mobile industrial robots, and autonomous marine vessels.

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Form Factor Benefits

PCB - This module is the smallest of our form factors weighing only 1.3 grams. It is designed as a surface mount component that can be hand soldered onto another circuit board and would be typically purchased post-evaluation. A PCB module saves a significant amount of space and reduces the overall board weight.

Rugged - A rugged module weighs 10 grams and has similar functions compared to the EVB-1 but in a more compact form factor with an aluminum enclosure. In addition, it includes the added features of dual antenna ports for GPS compassing and an integrated CAN transceiver which the EVB-1 does not. This unit would be best utilized in harsh environments where the integrity of the hardware may become compromised by the activity of your application. We recommend this form factor if your rover is constantly going to be in motion.

EVB-1 - The Inertial Sense EVB-1 is a development board which contains the Inertial Sense INS, AHRS, or IMU module and is intended for testing and evaluation with your application. It has access to all communications pins on the module, USB connections directly to the module or through an on-board FTDI Chip, and contains a RS232-RS422/RS485 transceiver.

EVB-2 - Builds on the foundation established by the EVB-1 and Rugged modules, but adds new features including an onboard XBee radio for RTK (real-time-kinematics), Wi-Fi and Bluetooth for remote data viewing and logging operation, Onboard logging to micro SD card, Companion Microchip SAME70 processor that serves as a communication bridge between the µINS, µAHRS, or µIMU and all other interfaces.

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