

Guidelines for choosing between the SBG Ellipse 3D and 3N

Resonon offers two choices for the GPS/IMU in airborne systems, the Ellipse 3D and the 3N. The 3D is a dual antenna system that uses the GNSS antennas to compute heading, where the 3N is a single GPS antenna system that uses a magnetometer to determine heading.

Both systems share the following features and accuracies when used in their appropriate manner:

- Five constellation GNSS (GPS, GLONASS, GALILEO, BEIDOU, QZSS)
- RTK Capable
- Navigation Accuracy: 1.2 meter (single point), 1 meter (SBAS), 1 cm (RTK)
- Roll/Pitch Accuracy: 0.1° (single point), 0.05° (RTK)
- Heading: 0.2° single antenna with dynamics, 0.2° dual antenna with 2-meter baseline.

The primary advantage of the 3D is the ability to maintain heading accuracy during extended periods of low dynamic flight, as well as the elimination of the magnetometer calibration and potential magnetic disturbances common in manned and unmanned vehicles. It requires a minimum .5 meter separation between antennae which can add complexity for use on unmanned vehicles.

The primary advantage of the 3N is the need for only a single antenna. However, it does require a precise magnetic calibration and frequent flight dynamics to achieve the stated heading accuracy. It can be susceptible to magnetic interference.

In general, the 3D is recommended if the use of dual antennas is not prohibitive. It is always recommended for manned aircraft due to the difficulty of achieving a clean magnetic environment on board. If the 3N is used, flight plans should be created to include turns and/or accelerations every 30-60 seconds, or at least before data collection passes.