The smallest INDUSTRIAL-GRADE Inertial Navigation System

The ELLIPSE 2 MICRO SERIES brings the highest accuracy in the smallest and most economic package. Ellipse 2 Micro takes industrial-grade IMU, AHRS, and INS to high volume projects.

Navigation, Motion & Heave Sensing

SBG SYSTEMS
**Ellipse 2 Micro Series** - Highest Accuracy, Smallest Sensor

**High Performance**
0.1° Roll / Pitch

**Light-weight**
10 grams

**Calibrated in Dynamics**
and Temperature (-40° to 80°C)

**Industrial grade**
High End Gyroscopes and Accelerometers

**ALL ELLIPSE MODELS COME WITH A TWO-YEAR WARRANTY**

10 years of Filtering embedded in the 10-gram Ellipse 2 Micro

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**Land**

» Fusion with GNSS receiver and odometer for a robust position in all conditions (forest, tunnel, urban canyons, etc.)

» Specific motion algorithms dedicated to land vehicle

» CAN Protocol

**Marine**

» The only micro sensor to provide a 5 cm heave, automatically adjusted to the wave period

» Fusion with GNSS receiver for a robust position and heave in all conditions

**Aerial**

» Calibrated from -40 to +85°C for a constant behavior in all environments

» High resistance to shock and vibrations (< 2 000g)

» Fusion with GNSS receiver for a high accuracy position and heading
Bring the highest accuracy to your project, in the smallest and most economic package.

Development Kit for an Easy Integration

Ellipse 2 Micro IMU is an Inertial Measurement Unit. It embeds 3 gyroscopes, 3 accelerometers, 3 magnetometers and a temperature sensor.

Ellipse 2 Micro AHRS additionally runs an Extended Kalman Filter to provide Roll, Pitch, Heading, and Heave.

Ellipse 2 Micro INS additionally connects to a GNSS receiver and an odometer for Navigation.

Software

The Windows-based sbgCenter software allows:

- Real-time data visualization
- Easy configuration through motion profiles
- Data analysis by zooming through time
- Export into Excel, Matlab, Google Earth formats
- A C library, and some code source examples are provided.

Evaluation Board

The evaluation board integrates:

- A ublox module for INS applications (Model E)
- All the cables and accessories

There is no MOQ when ordering the Ellipse 2 Micro Development Kit.

Technical Support

When investing in a Development Kit (DK), you access free technical support by phone and email, and unlimited firmware updates.
**Specifications**

**IMU SENSORS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Accelerometers</th>
<th>Gyroscopes</th>
<th>Magnetometers</th>
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<tr>
<td>Range</td>
<td>± 16 g</td>
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<td>± 50 Gauss</td>
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<td>Gain stability</td>
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* Allan Variance, @ 25 °C

**AHRS ACCURACY**

- Roll & Pitch: 0.1 °
- Heading: 0.8 ° Magnetic** Heading
- Heave: 5 cm

**INS ACCURACY**

- Roll & Pitch: 0.1 °
- Heading: 0.8 ° Magnetic** or External GNSS
- Position: External GNSS
- Heave: 5 cm
- Aiding Equipment: GNSS and Odometer

**ENVIRONMENTAL**

- Specified Temperature: -40 to 85 °C (-40 to 185 °F)
- Humidity: 98 % - Non condensing
- MTBF (computed): 50,000 hours

**ELECTRICAL**

- Input voltage: 4 – 15 V
- Power consumption: 400 mW

**MECHANICAL**

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<tr>
<th>Specification</th>
<th>Remarks</th>
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<tr>
<td>Size</td>
<td>26.8 x 18.8 x 9.5 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>10 g</td>
</tr>
<tr>
<td>Shocks</td>
<td>&lt; 2000 g</td>
</tr>
<tr>
<td>Operating</td>
<td>3 g RMS - 20 Hz to 2 kHz</td>
</tr>
<tr>
<td>Vibrations</td>
<td>8 g RMS - 20 Hz to 2 kHz</td>
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</table>
| Aiding Equipment | GNSS: NMEA, UBX, Septentrio, Novatel
| Output rate   | 200 Hz  |
| Main Serial Interface | 1 RS5422 or 2 RS232, USB - up to 921,600 bps |
| Serial protocols | Binary eCom protocol, NMEA, ASCII, TSS |
| CAN interface | CAN 2.0A/B - up to 1 Mbit/s |
| Pulses        | Inputs: Events, PPS, DMI
|               | Outputs: Synchronization (PPS)
|               | 2 inputs / outputs |

**INTERFACES**

**Available data for A and E models**

- Euler angles, quaternion, velocity, position, heave, calibrated sensor data, delta angles & velocity, status

**Aiding sensors**

- GNSS: NMEA, UBX, Septentrio, Novatel

**Input voltage**

- 4 – 15 V

**Power consumption**

- 400 mW

**SERVICES: GET STARTED WITH YOUR SENSOR**

**TRAINING**

Full training based on your specific needs to help you shorten your project development.

**REMOTE QUICK START**

A 2-hour session with an SBG Support Engineer, using a remote access software.

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**PRODUCT CODE**

- **G#A#-M#**
- **ELLIPSE2-#-G#A#-M#**

**Ellipse type**

- I: Inertial Measure Unit
- A: AHRS
- E: Externally Aided INS

**Accel. range**

- 2: ± 8 g
- 3: ± 16 g*
- 4: ± 40 g

**Gyro. range**

- 4: 450 °/s*
- 5: 1,000 °/s

**Protocol**

- 1: RS422 + CAN
- 2: RS232 + CAN

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*Standard product options

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All parameters apply to full specified temperature range, unless otherwise stated. Full specifications can be found in the Ellipse 2 Micro Series user manual available upon request.

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