

Spatial is a ruggedised miniature GPS aided inertial navigation system and AHRS that provides accurate position, velocity, acceleration and orientation under the most demanding conditions. It combines temperature calibrated accelerometers, gyroscopes, magnetometers and a pressure sensor with an advanced GNSS receiver. These are coupled in a sophisticated fusion algorithm to deliver accurate and reliable navigation and orientation.



PERFORMANCE

- 0.1 ° Roll, Pitch
- 0.2 ° Heading (GNSS)
- 20 mm RTK Positioning
- 3 °/hr MEMS Gyroscope
- 1000 Hz Update Rate
- 2000 g Shock Limit

KEY FEATURES

- Multi-Constellation RTK
- Hot Start Time : 500 ms
- Low Weight : 30 grams
- Small Size : 30 x 30 x 24 mm
- Low Power : 65 mA @ 5V

APPLICATIONS



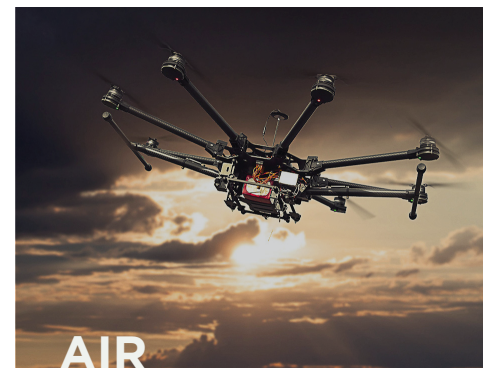
SEA

- AUV Navigation
- ROV Navigation
- Hydrography



LAND

- Ground Vehicle Navigation
- Georeferencing
- Robotics Control



AIR

- UAV Navigation
- Georeferencing
- Stabilisation & Pointing

SPECIFICATIONS

NAVIGATION

Horizontal Position Accuracy	2.0 m
Vertical Position Accuracy	3.0 m
Horizontal Position Accuracy (with RTK)	0.02 m
Vertical Position Accuracy (with RTK)	0.03 m
Horizontal Position Accuracy (Kinematic post processing)	0.01 m
Vertical Position Accuracy (Kinematic post processing)	0.02 m
Velocity Accuracy	0.05 m/s
Roll & Pitch Accuracy	0.1 °
Heading Accuracy (Dynamic with GNSS)	0.2 °
Heading Accuracy (Magnetic Only)	0.8 °
Roll & Pitch Accuracy (Kinematic post processing)	0.04 °
Heading Accuracy (Kinematic post processing)	0.08 °
Heave Accuracy (whichever is greater)	5 % or 0.05 m
Orientation Range	Unlimited
Hot Start Time	500 ms
Internal Filter Rate	1000 Hz
Output Data Rate	Up to 1000 Hz
Latency	0.4 ms

HARDWARE

Operating Voltage	5 to 36 V
Input Protection	± 60 V
Power Consumption (typical)	0.5 W
Hot Start Battery Capacity	> 48 hrs
Hot Start Battery Charge Time	30 mins
Hot Start Battery Endurance	> 10 years
Operating Temperature	-40 °C to 85 °C
Environmental Protection	IP67 MIL-STD-810G
MTBF	310,000 hrs
Shock Limit	2000 g
Dimensions (excluding tabs)	30 x 30 x 24 mm
Dimensions (including tabs)	30 x 40.6 x 24mm
Weight	37 grams

SENSORS

SENSOR	ACCELEROMETERS	GYROSCOPES	MAGNETOMETERS
Range (dynamic)	± 2 g ± 4 g ± 16 g	± 250 °/s ± 500 °/s ± 2000 °/s	± 2 G ± 4 G ± 8 G
Bias Instability	20 ug	3 °/hr	-
Initial Bias	< 5 mg	< 0.2°/s	-
Initial Scaling Error	< 0.06 %	< 0.04 %	< 0.07 %
Scale Factor Stability	< 0.06 %	< 0.05 %	< 0.09 %
Non-linearity	< 0.05 %	< 0.05 %	< 0.08 %
Cross-axis Alignment Error	< 0.05 °	< 0.05 °	< 0.05 °
Noise Density	100 ug/√Hz	0.004 °/s/√Hz	210 uG/√Hz
Bandwidth	400 Hz	400 Hz	110 Hz

GNSS

Model	u-blox M8P
Supported Navigation Systems	GPS L1 GLONASS L1 GALILEO E1 BeiDou L1
Update Rate	10 Hz
Cold Start Sensitivity	-148 dBm
Tracking Sensitivity	-160 dBm
Hot Start First Fix	1 s
Cold Start First Fix	26 s
Horizontal Position Accuracy	2.5 m
Horizontal Position Accuracy (with L1 RTK)	0.02 m
Velocity Accuracy	0.05 m/s
Timing Accuracy	30 ns
Acceleration Limit	4 g

COMMUNICATION

Interface	RS232
Speed	4800 to 2M baud
Protocol	AN Packet Protocol or NMEA
Peripheral Interface	2x GPIO and 2x Auxiliary RS232
GPIO Level	5 V or RS232
GPIO Functions	IPPS Odometer Stationary Pitot Tube NMEA input/output Novatel GNSS input Trimble GNSS input Packet Trigger Input Event Input