FOG GNSS/INS

SPATIAL FOG

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

PERFORMANCE

- 0.01 ° Roll and Pitch
- 0.05 ° Heading
- 8 mm RTK Positioning
- 0.05 °/HR FOG Gyroscope
- Heave : 2 % or 0.02 m (whichever is greater)

KEY FEATURES

- L1/L2/L5 RTK/PPK
- Hot Start Time : 2 seconds
- Rapid North Seeking : 10 s from hot start
- Low size, Weight and Power

APPLICATIONS

- Hydrography
- Oil Rig Monitoring
- Marine Navigation

- Georeferencing
- Underground Navigation
- Ground Vehicle Navigation

- Georeferencing
- UAV Navigation
- Stabilisation & Pointing

SPECIFICATIONS

NAVIGATION

Horizontal Position Accuracy	0.8 m
Vertical Position Accuracy	1.5 m
Horizontal Position Accuracy (with SBAS)	0.5 m
Vertical Position Accuracy (with SBAS)	0.8 m
Horizontal Position Accuracy (with RTK or Kinematica PPK)	0.008 m
Vertical Position Accuracy (with RTK or Kinematica PPK)	0.015 m
Velocity Accuracy	0.007 m/s
Roll & Pitch Accuracy	0.01 °
Heading Accuracy	0.05 °
Roll & Pitch Accuracy (Kinematica post-processing)	0.005 °
Heading Accuracy (Kinematica post-processing)	0.01 °
Heave Accuracy (whichever is greater)	2 % or 0.02 m
Orientation Range	Unlimited
Hot Start Time	2 s
Internal Filter Rate	1000 Hz
Output Data Rate	Up to 1000Hz

GNSS

Model	Trimble BD930
Supported Navigation Systems	GPS L1, L2, L5 GLONASS L1, L2 GALILEO E1, E5 BeiDou B1, B2
Supported SBAS Systems	WAAS EGNOS MSAS GAGAN QZSS
Update Rate	20 Hz
Hot Start First Fix	3 s
Cold Start First Fix	30 s
Horizontal Position Accuracy	1.2 m
Horizontal Position Accuracy (with SBAS)	0.5 m
Horizontal Position Accuracy (with RTK)	0.008 m
Velocity Accuracy	0.007 m/s
Timing Accuracy	20 ns
Acceleration Limit	11 g

HARDWARE

Operating Voltage	9 to 36 V
Input Protection	-40 to 100 V
Power Consumption (typical)	6.6 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 75°C
Environmental Protection	IP67 MIL-STD-810G
MTBF	> 36,000 hrs
Shock Limit	40 g
Vibration Limit	12 g
Dimensions	90 x 90 x 88 mm
Weight	655 grams

COMMUNICATION

Interface	RS422 (RS232 optional)
Speed	4800 to 10M baud
Protocol	AN Packet Protocol or NMEA
Peripheral Interface	2x GPIO and 2x Auxiliary RS232
GPIO Level	5 V or RS232
GPIO Functions	1PPS Odometer Stationary Pitot Tube NMEA input/output Novatel GNSS input Trimble GNSS input AN Packet Protocol input/output Packet Trigger Input Event Input

SENSORS

SENSOR	ACCELEROMETERS	GYROSCOPES	MAGNETOMETERS	PRESSURE
Range	± 10 g	± 490 °/s	± 8 G	10 to 120 KPa
Bias Instability	15 ug	0.05 °/hr	-	10 Pa
Initial Bias	< 1 mg	< 1 °/hr	-	< 100 Pa
Initial Scaling Error	< 0.03 %	< 0.01 %	< 0.07 %	-
Scale Factor Stability	< 0.04 %	< 0.02 %	< 0.09 %	-
Non-linearity	< 0.03 %	< 0.005 %	< 0.08 %	-
Cross-axis Alignment Error	< 0.04 °	< 0.02 °	< 0.05 °	-
Noise Density	120 ug/√Hz	0.7 °/hr/√Hz	210 uG/√Hz	0.56 Pa/√Hz
Bandwidth	200 Hz	440 Hz	110 Hz	50 Hz