Hemisphere®

Vector™ VS-i8
Inertial Navigation System

atlas®

Industry-Leading GNSS and INS Technology

The Hemisphere VS-i8 is a high accuracy, high precision, Inertial Navigation System (INS) product. Featuring Honeywell® proprietary sensor fusion technology, the VS-i8 leverages a powerful multi-frequency, multi-constellation, RTK-ready navigation and positioning solution for a wide variety of GNSS platforms and applications.

Full-Featured Performance

The VS-i8 combines Hemisphere's Athena RTK positioning engine, full Atlas L-band capability, and proven Honeywell IMU technology to deliver accurate time-stamped position, velocity, angular rate, linear acceleration, roll, pitch, and heading information. Featuring a lightweight compact size, the performance of the VS-i8 is ideal for marine, UAV, robotics, mapping, GIS, LiDAR, mobile mapping, and applications requiring high performance in a small package.

Key Features

- Athena GNSS engine-providing best-in-class RTK performance
- Extremely accurate dual-antenna heading
- Atlas® L-band capable
- Non-ITAR controlled
- 0.03° heading, 0.015° pitch and roll accuracy on a 2m baseline
- Rugged IP68 enclosure
- Onboard data logging
- SDK, ROS drivers available

GNSS Receiver Specifications

Receiver Type:	INS with Multi-Frequency GPS, GLONASS, BeiDou, Galileo, QZSS, NavIC (IRNSS), and Atlas L-band
Signals Received:	GPS L1CA/L1P/L1C/L2P/L2C/L5 GLONASS G1/G2/G3, P1/P2 BeiDou B1i/B2i/B3i/B1C/B2a/B2b/ AceBOC GALILEO E1BC/E5a/E5b/E6BC/ AltBOC QZSS L1CA/L2C/L5/L1C/L6 NavIC (IRNSS) L5 Atlas
Channels:	1,100+
GPS Sensitivity:	-142 dBm
SBAS Tracking:	3-channel, parallel tracking
Atlas L-band Channels:	Dual-Channel[1]
Atlas Satellite Selection:	Manual and Automatic

Communications

Ports:	2x Power / Data
Interface Levels:	2x RS-422, 1x RS-232, 5V CMOS, USB, Ethernet, CAN ISO 11898-2
Correction I/O Protocol:	NTRIP Client, Hemisphere GNSS proprietary ROX format, RTCM v2.3, RTCM v3.2, CMR[2], CMR+[2]
Output Rate:	GNSS 10 Hz Standard / Optional 20 Hz, INS up to 100 Hz Standard
Timing & Event I/O:	2x Event In, Direct Quadrature Encoder Input, 2x PPS
Sensor Input, Optional:	Odometer (DMI)
Onboard Logging:	16 GB With USB 2.0 Access

Mechanical

Dimensions[3]:	9.0 L x 6.0 W x 6.0 H (cm) 9.1 Lx6.5Wx3.1 H (in)
Weight:	<0.5 kg (<1.1 lb.)
Status Indicators (LED):	Power, GNSS, Navigation, Data
Power/Data Connectors:	2x Fischer Core 16 Contact DBPU 104 A086
Antenna Connectors:	2x SMA

Environmental

Operating Temperature:	-40°C to +71°C (-40°F to +160°F)
Storage Temperature:	-40°C to +85°C (-40°F to +185°F)
Humidity:	95% non-condensing
Enclosure:	IP68 per IEC 60529
Mechanical Shock:	40g for 11 msec (MIL-STD-810G)
Vibration:	Random 7.7g RMS 20-2000 Hz
MTBF:	>50,000 hours, ground mobile 25°C
EMC, Certifications:	RoHS, WEEE, FCC Part 15, ICES-003, CISPR 32, CE Mark Compliant

Electrical

Input Voltage:	9 to 36 V DC
Power Consumption:	7.5 W nominal
Antenna Voltage Output:	5 V DC maximum

1. With a future firmware update
2. CMR and CMR+ do not cover proprietary messages outside of the typical standard
3. Excludes mounting tabs
4. Using dual antennas with a 2m antenna separation. Longer baselines improve heading performance. Performance shown based on Hemisphere antennas, other antenna selection may impact final performance.
5. DMI pulse count aiding through direct quadrature encoder RS422 input. Motion Detect and Land Vehicle Constraints improve performance for land vehicles during GNSS outages independently of optional DMI input
6. Typical Horizontal RMS error of ~0.25% of distance traveled with no Velocity Aiding source (DMI, DVL etc.)
7. Statistics are calculated by taking the RMS of the maximum error over multiple complete GNSS outages in a Land Vehicle application
8. Horizontal and vertical RMS errors shown are based on starting from a fixed RTK solution before and after the GNSS outage. Autonomous, SBAS, and Atlas error

GNSS Outage Performance[5,6,7,8]

		Position Accuracy (RMS)		Velocity Accuracy (RMS)		Heading
Outage Duration	**Mode**	**Horizontal**	**Vertical**	**Horizontal**	**Vertical**	**(RMS)[4]**
0 Seconds	**SBAS**	<0.4 m	<0.4 m	<0.015 m/s	<0.01 m/s	<0.03°
0 Seconds	**RTK**	<0.01 m	<0.025 m	<0.015 m/s	<0.01 m/s	<0.03°
10 Seconds	**RTK**	0.10 m	0.10 m	0.04 m/s	0.01 m/s	0.06°
30 Seconds	**RTK**	1.0 m	0.30 m	0.06 m/s	0.02 m/s	0.07°
60 Seconds	**RTK**	3.5 m	0.70 m	0.15 m/s	0.03 m/s	0.08°

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