Vector™ VS330 GNSS Receiver

Professional Positioning and Heading Receiver

key features

- **Athena™ RTK, Atlas® L-band, Beacon and SBAS capable**
- **Extremely accurate heading with baselines up 50 m**
- **Multi-frequency GPS/GLONASS/BeiDou RTK capable**
- **Automatic antenna baseline survey**
- **Maintain heading and position lock when more of the sky is blocked**
- **Runs Athena core GNSS engine offering improved initialization times, robustness in difficult environments, performance over long baselines and under scintillation**
- **Integrated gyro and tilt sensors help deliver fast start-up times and provide heading updates during temporary loss of satellites**

atlas

Experience the Vector VS330 with our powerful Athena GNSS core engine technology. The Vector VS330 supports precise marine, dynamic positioning, and land applications that require RTK positioning and precise heading performance.

The Vector VS330 utilizes all of the innovations in Hemisphere GNSS' Eclipse™ Vector technology. Our optimized Eclipse Vector technology brings a series of new features to the Vector VS330 including heave, pitch, and roll output, and more robust positioning and heading performance.

The Vector VS330 receiver, with its display and user interface, can be conveniently installed near the operator. The two antennas are mounted separately with a user-determined separation to meet the desired heading accuracy. The fully-subscribed Vector VS330 uses Atlas L-band, Beacon, and SBAS for differential positioning. Our firmware allows the VS330 to smoothly transition between DGNSS systems.

Hemisphere®

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Vector VS330 GNSS Receiver

GNSS Receiver Specifications

Receiver Type:	Vector GNSS L1/L2 RTK Receiver
Signals Received:	GPS, GLONASS, BeiDou, and Atlas
Channels:	502
GPS Sensitivity:	-142 dBm
SBAS Tracking:	3-channel, parallel tracking
Update Rate:	10 Hz standard, 20 Hz optional
Timing (1PPS) Accuracy:	20 ns
Rate of Turn:	100˚/s maximum
Compass Safe Distance:	30 cm (with enclosure)[5]
Cold Start:	60 s (no almanac or RTC)
Warm Start:	20 s typical (almanac and RTC)
Hot Start:	5 s typical (almanac, RTC and position)
Heading Fix:	20 s typical (valid position)
Maximum Speed:	1,850 mph (999 kts)
Maximum Altitude:	18,288 m (60,000 ft)
Differential Options:	SBAS, Beacon, External RTCM, Atlas L-band and Athena RTK

Positioning and Heading Accuracy

RMS:	Horizontal	Vertical
Single Point [1]:	1.2 m	2.5 m
SBAS (WAAS) [1]:	0.3 m	0.6 m
Code Differential GNSS [1]:	0.3 m	0.6 m
L-Band [2]:	0.08m	0.16 m
RTK [1, 3]:	10 mm + 1 ppm	20 mm + 2 ppm

Heading Accuracy:	0.2˚ rms @ 0.5 m antenna separation 0.1˚ rms @ 1.0 m antenna separation 0.05˚ rms @ 2.0 m antenna separation 0.02˚ rms @ 5.0 m antenna separation
Pitch/Roll Accuracy (RMS):	1˚
Heave Accuracy (RMS):	30 cm (DGPS) [5],10 cm (RTK) [1,3]

Beacon Receiver Specifications

Channels:	2-channel, parallel tracking
Frequency Range:	283.5 to 325 kHz
Operating Modes:	Manual, Automatic, and Database
Compliance:	IEC 61108-4 beacon standard

L-Band Receiver Specifications

Receiver Type:	Single Channel
Channels:	1530 to 1560 MHz
Sensitivity:	-130 dBm
Channel Spacing:	5 kHz
Satellite Selection:	Manual or Automatic
Reacquisition Time:	15 sec (typical)

Communications

Serial Ports:	2 full-duplex RS232, 1 half-duplex RS422 port
USB Ports:	1 USB-A
Baud Rates:	4800 - 115200
Correction I/O Protocol:	RTCM SC-104, L-Dif™ [6], RTCM v2 (DGPS), RTCM v3 (RTK), CMR (RTK), CMR+ (RTK) [3]
Data I/O Protocol:	NMEA 0183, Hemisphere GNSS binary [6]
Timing Output:	1 PPS (CMOS, active high, rising edge sync, 10 kΩ, 10 pF load)

Power

Input Voltage:	8-36 VDC
Power Consumption:	5.3 W nominal (GPS L1/L2 + GLONASS L1/L2) 7 W nominal (GPS L1/L2 + GLONASS L1/L2 + BeiDou B1/B2 + L-band)
Current Consumption:	0.44 A nominal (GPS L1/L2 + GLONASS L1/L2) 0.51 A nominal (GPS L1/L2 + GLONASS L1/L2 + BeiDou B1/B2 + L-band)
Power Isolation:	500 V
Reverse Polarity Protection:	Yes
Antenna Voltage:	5 VDC maximum 60mA
Antenna Short Circuit Protection:	Yes
Antenna Gain Input Range:	10 to 40 dB
Antenna Input Impedance:	50 Ω

Environmental

Operating Temperature:	-30°C to + 70°C (-22°F to + 158°F)
Storage Temperature:	-40°C to + 85°C (-40°F to + 185°F)
Humidity:	95% non-condensing
Mechanical Shock:	EP455 Section 5.14.1
Vibration:	Operational (when mounted in an enclosure with screw mounting holes utilized) EP455 Section 5.15.1 Random
EMC:	CE (IEC 60945 Emissions and Immunity) FCC Part 15, Subpart B CISPR22
Enclosure:	IP66 (IEC 60529)

Mechanical

Dimensions:	20.2 L x 12.0 W x 7.5 H (cm) 8.0 L x 4.7 W x3.0 H (in)
Weight:	~1.1 kg (~2.5 lbs.)
Status Indications (LED):	Power, Primary and Secondary GPS lock, Differential lock, DGPS position, Heading, RTK lock, L-band DGNSS lock
Power Switch:	Front panel soft switch
Power/Data Connector:	9-pin ODU metal circular
Power Connector:	2-pin ODU metal circular
Data Connector:	DB9 (sealed)
Antenna Connectors:	2 TNC (female)

Aiding Devices

Gyro:	Provides heading smoothing with GNSS. Drift rate is 1˚ per minute in heading for periods up to 3 minute when loss of GNSS has occurred [4]
Tilt Sensors:	Provide pitch, roll data, assist in fast start-up and heading reacquisition

1 Depends on multipath environment, number of satellites in view, satellite geometry, no SA, and ionospheric activity.

2 Requires a subscription

3 Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for differential services), and ionospheric activity.

4 Based on a 40 second time constant

5 This is the minimum safe distance measured when the product is placed in the vicinity of the steering magnetic compass. The ISO 694 defines "vicinity" relative to the compass as within 5 m (16.4 ft) separation.

6 Hemisphere GNSS proprietary

Authorized Distributor:

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