

# Vector H321 GNSS Compass Board

Advanced Positioning & Heading with Athena™ RTK and Atlas™

## key features

- Atlas L-band capable to 8 cm 95%
- L1/L2 GPS/GLONASS/BeiDou RTK capable
- Extremely accurate heading with short baselines
- Fast RTK acquisition and reacquisition times
- Excellent coasting performance
- 5 cm rms RTK-enabled heave accuracy
- Strong multipath mitigation and interference rejection



---

Develop sophisticated machine control and navigation solutions in a world full of complex dynamic environments. The Vector H321 is our most advanced GNSS heading and positioning board.

The Vector H321 utilizes dual antenna ports to create a series of additional capabilities to Eclipse™ Vector™ technology including fast, high-accuracy heading over short baselines, RTK positioning, on-board Atlas L-Band, RTK-enabled heave, low power consumption, and precise timing.

Integrate the Vector H321 into your applications to experience exceptional performance, flexibility and cost savings. This incredible GNSS board uses advanced multipath mitigation techniques and offers full scalability and expandability from L1 GPS to L1/L2 GPS/GLONASS/BeiDou RTK performance.



precision@hgns.com  
www.hgns.com

# Vector H321 GNSS Compass Board

## GNSS Receiver Specifications

Receiver Type:	Dual-frequency, multi-GNSS RTK
Signals Received:	GPS, GLONASS, and BeiDou
Channels:	744
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
Cold Start:	< 60 s typical (no almanac, ephemeris, position, or RTC)
Warm Start:	< 20 s typical (almanac and RTC)
Hot Start:	< 5 s typical (almanac, ephemeris, position, or RTC)
Heading Fix:	< 20 s typical (Hot Start)
Antenna Input Impedance:	50 Ω
Maximum Speed:	1,850 kph (999 kts)
Maximum Altitude:	18,288 m (60,000 ft)

## Positioning and Heading Accuracy

	RMS (67%)	2DRMS (95%)
RTK: <sup>1,2</sup>	10 mm + 1 ppm	20 mm + 2 ppm
L-Band: <sup>1,3</sup>	0.08 m	0.16 m
SBAS (WAAS): <sup>1</sup>	0.25 m	0.50 m
Autonomous, no SA: <sup>1</sup>	1.20 m	2.50 m
Heading Accuracy:	< 0.17° rms @ 0.5 m antenna separation	< 0.09° rms @ 1.0 m antenna separation
	< 0.04° rms @ 2.0 m antenna separation	< 0.02° rms @ 5.0 m antenna separation
Pitch / Roll Accuracy:	< 1° rms	
Heave Accuracy:	30 cm rms (DGPS) <sup>4</sup> , 5 cm rms (RTK) <sup>4</sup>	

## L-Band Receiver Specifications

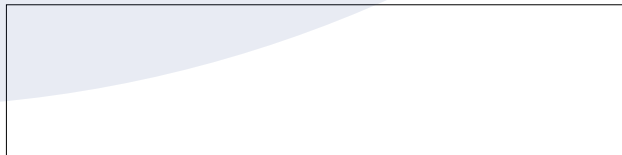
Receiver Type:	Single Channel
Channels:	1530 to 1560 MHz
Sensitivity:	-130 dBm
Channel Spacing:	5.0 kHz
Satellite Selection:	Manual and Automatic
Reacquisition Time:	15 seconds (typical)

## Communications

Serial Ports:	4 full-duplex 3.3 V CMOS (3 main serial ports, 1 differential-only port), 1 USB Host, 1 USB Device
Baud Rates:	4800 - 115200
Correction I/O Protocol:	L-Dif™ <sup>5</sup> , RTCM v2.3 (DGPS), RTCM v3 (RTK), CMR, CMR+
Data I/O Protocol:	NMEA 0183, Crescent binary <sup>5</sup> , L-Dif <sup>5</sup>
Timing Output:	1PPS, CMOS, active low, falling edge sync, 10 kΩ, 10 pF load
Event Marker Input:	CMOS, active low, falling edge sync, 10 kΩ, 10 pF load
Heading Warning I/O:	Pin 62

- <sup>1</sup> Depends on multipath environment, number of satellites in view, satellite geometry, and ionospheric activity
- <sup>2</sup> Depends also on baseline length
- <sup>3</sup> Requires a subscription from Hemisphere GNSS
- <sup>4</sup> Based on a 40 second time constant
- <sup>5</sup> Hemisphere GNSS proprietary

## Authorized Distributor:



Copyright Hemisphere GNSS, Inc. All rights reserved. Specifications subject to change without notice.

Hemisphere GNSS, Hemisphere GNSS logo, Athena, Atlas, Atlas logo, Eclipse, Vector, and L-Dif are trademarks of Hemisphere GNSS.

Rev. 09/15

## Power

Input Voltage:	3.3 VDC +/- 5%
Power Consumption:	< 4.3 W at 3.3 V (L1/L2 GPS/GLONASS/BeiDou; gyro)
	< 4.7 W at 3.3 V (L1/L2 GPS/GLONASS/BeiDou; gyro, L-Band)
Current Consumption:	< 1290 mA at 3.3 V (L1/L2 GPS/GLONASS/BeiDou; gyro)
	< 1410 mA at 3.3 V (L1/L2 GPS/GLONASS/BeiDou; gyro, L-Band)
Antenna Voltage:	15 VDC maximum
Antenna Short Circuit Protection:	Yes
Antenna Gain Input Range:	10 to 40 dB
Antenna Input Impedance:	50 Ω

## Environmental

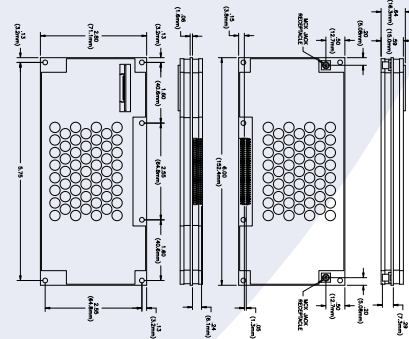
Operating Temperature:	-40°C to +85°C (-40°F to +185°F)
Storage Temperature:	-40°C to +85°C (-40°F to +185°F)
Humidity:	95% non-condensing (when installed in an enclosure)

## Mechanical

Dimensions:	15.2 L x 7.1 W x 1.6 H (cm)
	6.0 L x 2.8 W x 0.63 H (in)
Weight:	105 g (3.70 oz.)
Status Indication (LED):	Power, Primary and Secondary GPS lock, Differential lock, DGPS position, Heading, RTK lock, Atlas L-Band lock
Power/Data Connector:	70-pin male header, 0.05" pitch (1.27 mm)
Antenna Connectors:	MCX, female, straight

## Aiding Devices

Gyro:	Provides smooth heading, fast heading reacquisition and reliable < 0.5° per minute heading for periods up to 3 minutes when loss of GNSS has occurred
Tilt Sensors:	Provide pitch and roll data, and assist in fast start-up and reacquisition of heading solution



Hemisphere GNSS, Inc.  
8515 E. Anderson Drive  
Scottsdale, AZ, USA 85255

Toll-Free: +1-855-203-1770  
Phone: +1-480-348-6380  
Fax: +1-480-270-5070  
precision@hgns.com  
www.hgns.com