



# PROFESSIONAL GNSS HEADING & POSITIONING SMART ANTENNA



The Vector™ V123/133 is Hemisphere GNSS' all-in-one single-frequency, multi-GNSS smart antenna which provides Atlas decimeter-level position and precise heading. This rugged design is sealed for the harshest environments and is a great solution for professional marine and other challenging applications.

The all-in-one V123/133 combines simple installation with consistent and precise heading accuracy and decimeter positioning.

#### Key Features

- Simple all-in-one single-frequency, multi-GNSS heading solution
- Single-frequency GPS/GLONASS/ BeiDou/Galileo QZSS
- Atlas® L-band and beacon (V133) capable
- Integrated gyroscope provides smooth, fast heading reacquisition
- Reliable < 1° per minute heading for periods up to 3 minutes when loss of GNSS has occurred
- Fully rugged solution for the harshest environments

## GNSS Receiver Specifications

<b>Receiver Type:</b>	Vector GNSS Receiver
<b>Signals Received:</b>	GPS, GLONASS, BeiDou, Galileo, QZSS <sup>7</sup> , and Atlas <sup>6</sup>
<b>Channels:</b>	424
<b>GPS Sensitivity:</b>	-142 dBm
<b>SBAS Tracking:</b>	2-channel, parallel tracking
<b>Update Rate:</b>	20 Hz standard, 50 Hz optional
<b>Timing (1 PPS)</b>	
<b>Accuracy:</b>	20 ns
<b>Rate of Turn:</b>	100°/s maximum
<b>Compass Safe</b>	
<b>Distance:</b>	50 cm <sup>4</sup>
<b>Cold Start:</b>	60 s (no almanac or RTC)
<b>Warm Start:</b>	30 s typical (almanac and RTC)
<b>Hot Start:</b>	10 s typical (almanac, RTC and position)
<b>Heading Fix:</b>	10 s typical (valid position)
<b>Antenna Input</b>	
<b>Impedance:</b>	50 Ω
<b>Maximum Speed:</b>	1,850 kph (999 kts)
<b>Maximum Altitude:</b>	18,000 m (59,055 ft)
<b>Differential Options:</b>	SBAS, Atlas (L-band)

## Accuracy

<b>Position:</b>	<b>RMS (67%)</b>
<b>Autonomous, no SA:</b> <sup>1</sup>	1.2 m
<b>SBAS:</b> <sup>2</sup>	0.3 m
<b>Atlas (L-Band):</b> <sup>6</sup>	0.3 m
<b>Heading (RMS):</b>	0.3°
<b>Pitch/Roll (RMS):</b>	1°
<b>Heave (RMS):</b>	30 cm (DGPS) <sup>3</sup> , 10 cm (Atlas) <sup>6</sup>

## Beacon Receiver Specifications

<b>Channels:</b>	2-channel, parallel tracking <sup>8</sup>
<b>Frequency Range:</b>	283.5 to 325 kHz <sup>8</sup>
<b>Operating Modes:</b>	Manual, Automatic, and Database <sup>8</sup>
<b>Compliance:</b>	IEC 61108-4 beacon standard <sup>8</sup>

## L-Band Receiver Specifications

<b>Receiver Type:</b>	Single Channel
<b>Channels:</b>	1525 to 1560 MHz
<b>Sensitivity:</b>	-130 dBm
<b>Channel Spacing:</b>	5 kHz
<b>Satellite Selection:</b>	Manual or Automatic
<b>Reacquisition</b>	
<b>Time:</b>	15 sec (typical)

1. Depends on multipath environment, number of satellites in view, satellite geometry, no SA, and ionospheric activity
2. Depends on multipath environment, number of satellites in view, WAAS coverage and satellite geometry
3. Based on a 40-second time constant
4. 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
5. Hemisphere GNSS proprietary
6. Requires a Hemisphere GNSS subscription
7. With future firmware upgrade and activation
8. V133 only



## Communications

<b>Ports:</b>	1x RS232, 1x RS422, 1x half-duplex RS422(TX), NMEA2000 4800 - 115200
<b>Baud Rates:</b>	
<b>Correction I/O Protocol:</b>	Atlas, Hemisphere GNSS proprietary, RTCM v2.3 (DGPS) NMEA 0183, NMEA 2000, Hemisphere GNSS binary
<b>Data I/O Protocol:</b>	
<b>Timing Output:</b>	1 PPS (active high, rising edge sync, 10 kΩ, 10 pF load)
<b>Event Marker Input:</b>	Active low, falling edge sync, 10 kΩ, 10 pF load
<b>Heading Warning I/O:</b>	Open relay system indicates invalid heading

## Power

<b>Input Voltage:</b>	9 - 36 VDC with reverse polarity operation		
<b>Power Consumption:</b>	(multi-GNSS, typical continuous draw @ 12V)		
	<b>SBAS</b>	<b>Beacon</b>	<b>Atlas</b>
<b>V123</b>	3.9 W	-	4.3 W
<b>V133</b>	-	4.2 W	4.36 W
<b>Current Consumption:</b>	(multi-GNSS, typical continuous draw @ 12V)		
	<b>SBAS</b>	<b>Beacon</b>	<b>Atlas</b>
<b>V123</b>	0.33 A	-	0.36 A
<b>V133</b>	-	0.35 A	0.38 A
<b>Reverse Polarity Protection:</b>	Yes		

## Environmental

<b>Operating Temperature:</b>	-40°C to +70°C (-40°F to +158°F)
<b>Storage Temperature:</b>	-40°C to +85°C (-40°F to +185°F)
<b>Humidity:</b>	95% non-condensing
<b>Vibration:</b>	IEC60945 Section 8.7
<b>EMC:</b>	IEC60945 FCC part 15 Subpart B, CISPR32

## IMO Wheelmark Certification:

MED/4.41 Transmitting Heading Device THD (GNSS Method)  
IP66/IP69

## Enclosure:

## Mechanical

<b>Dimensions:</b>	66.5 L x 20.8 W x 14.6 H (cm) 26.2 L x 8.2 W x 5.8 H (in)
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<b>Weight:</b>	
<b>V123</b>	2.1 kg (4.6 lb)
<b>V133</b>	2.4 kg (5.4 lb)

## Status Indications

<b>(LED):</b>	Power
<b>Power/Data Connector:</b>	18-pin environmentally sealed

## Aiding Devices

<b>Gyro:</b>	Integrated gyroscope provides smooth heading, fast heading reacquisition and reliable < 1° per minute heading for periods up to 3 minutes when loss of GNSS has occurred
<b>Tilt Sensors:</b>	Provide pitch, roll data and assist in fast start-up and reacquisition of heading solution

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

Phone: +1 (480) 348-6380  
Toll-Free: +1 (855) 203-1770  
Fax: +1 (480) 270-5070

precision@hgns.com  
www.hgns.com