Hemisphere®

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Vector™ V123 & V133 GNSS Smart Antennas

The Vector™ V123/133 is Hemisphere GNSS' all-in-one single-frequency, multi-GNSS smart antenna which provides 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
- 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

Receiver Type:	Vector GNSS Receiver
Signals Received:	GPS, GLONASS, BeiDou, Galileo, QZSS [7]
Channels:	424
GPS Sensitivity:	-142 dBm
SBAS Tracking:	2-channel, parallel tracking
Update Rate:	20 Hz standard
Timing (1 PPS) Accuracy:	20 ns
Rate of Turn:	100°/s maximum
Compass Safe Distance:	50 cm [4]
Cold Start:	60 s (no almanac or RTC)
Warm Start:	30 s typical (almanac and RTC)
Hot Start:	10 s typical (almanac, RTC and position)
Heading Fix:	10 s typical (valid position)
Antenna Input Impedance:	50 Ω
Maximum Speed:	1,342 mph (1,166 kts)
Maximum Altitude:	18,000 m (59,055 ft)
Differential Options:	SBAS

Accuracy

Position:	**RMS (67%)**
Autonomous, no SA: [1]	1.2 m
SBAS: [2]	0.3 m
Heading (RMS):	0.3°
Pitch/Roll (RMS):	1°
Heave (RMS):	30 cm (DGPS)

Beacon Receiver Specifications

Channels:	2-channel, parallel tracking [8]
Frequency Range:	283.5 to 325 kHz [8]
Operating Modes:	Manual, Automatic, and Database [8]
Compliance:	IEC 61108-4 beacon standard [8]

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

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

Power

Input Voltage:	9 - 36 VDC with reverse polarity operation
Power Consumption:	(multi-GNSS, typical continuous draw @ 12V)

	SBAS	**Beacon**
V123	3.3 W	-
V133	-	3.6 W

Current Consumption:	(multi-GNSS, typical continuous draw @ 12V)

	SBAS	**Beacon**
V123	0.33 A	-
V133	-	0.35 A

Reverse Polarity Protection:	Yes

Environmental

Operating Temperature:	-40°C to + 70°C (-40°F to + 158°F)
Storage Temperature:	-40°C to + 85°C (-40°F to + 185°F)
Humidity:	95% non-condensing
Vibration:	IEC60945 Section 8.7
EMC:	IEC60945 FCC part 15 Subpart B, CISPR32
Enclosure:	IP66/IP69

Mechanical

Dimensions:	66.5 L x 20.8 W x 14.6 H (cm) 26.2 L x 8.2 W x 5.8 H (in)
Weight:	
V123	2.1 kg (4.6 lb)
V133	2.4 kg (5.4 lb)
Status Indications (LED):	Power
Power/Data Connector:	18-pin environmentally sealed

Aiding Devices

Gyro:	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
Tilt Sensors:	Provide pitch, roll data and assist in fast start-up and reacquisition of heading solution

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