Vector™ V103 and V113

Professional Heading and Positioning Compass

key features

- **IMO type approved as a Transmit Heading Device (THD)**
- **Enhanced heading performance with GLONASS**
- **Flexibility for easy integration into NMEA 0183 and 2000 interfaces**
- **Additional satellite tracking ensures a robust solution**
- **Maintains heading and position lock in obstructed areas**
- **Accurate heading up to 3 minutes during GNSS outages**
- **Integrated gyro and tilt sensors deliver fast start-up times and provide heading updates during temporary loss of satellites**

Now with GLONASS, the IMO Wheelmarked Vector V103 and V113 GNSS compass series is known for its superb heading and positioning performance. With the addition of GLONASS, the V103 and V113 now provides a more robust solution in critical areas where sky blockage occurs. The rugged IPX6 design housing is sealed for the harshest environments. It incorporates fixed and pole mounting capability for both marine and land applications. The Vector V103 and V113 series is suitable for both dynamic positioning and professional marine survey.

The V103 and V113 utilize all of the recent innovations in Hemisphere's Crescent® Vector GNSS technology. New cross-dipole low-multipath antennas are separated by 50 cm between phase centers, resulting in better than 0.3° heading performance while delivering position accuracy of better than 30 cm when using SBAS or Beacon corrections.

The Vector V103 and V113 support both NMEA 0183 and NMEA 2000 interfacing, enabling a seamless choice of communication protocols with Hemisphere's messaging. Crescent Vector technology delivers accurate and continuous performance, including position, heading, heave, pitch, and roll. The stability and maintenance-free design of the Vector V103 and V113 series replaces traditional gyrocompasses and stand-alone GPS at a fraction of the cost.

Hemisphere®

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Vector V103 and V113

GNSS Sensor Specifications

Receiver Type:	Vector GNSS L1 Compass
Signals Received:	GPS and GLONASS
Channels:	540
GPS Sensitivity:	-142 dBm
SBAS Tracking:	2-channel, parallel tracking
Update Rate:	50 Hz standard

Positioning Accuracy

RMS:	Horizontal	Vertical
Single Point [1]:	1.2 m	2.5 m
SBAS (WAAS) [2]:	0.3 m	0.6 m
Code Differential GPS [1]:	0.3 m	0.6 m
Heading Accuracy:	0.30˚	
Pitch/Roll Accuracy:	1˚	
Heave Accuracy:	30 cm [3]	
Timing (1PPS) Accuracy:	20 ns	
Rate of Turn:	90˚/s maximum	
Compass Safe Distance:	75 cm (with enclosure) [4]	
Cold Start:	60 s (no almanac or RTC)	
Warm Start:	20 s typical (almanac and RTC)	
Hot Start:	1 s typical (almanac, RTC and position)	
Heading Fix:	10 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	

Beacon Sensor Specifications (V113 version)

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

Communications

Serial Ports:	1 full-duplex RS232; 1 full-duplex RS422 and 1 half-duplex RS422 (Tx only)
Baud Rates:	4800 - 115200 (V103) and 4800 - 38400 (V113)
Correction I/O Protocol:	RTCM v2.3 (DGPS), RTCM SC-104, L-Dif [5]
Data I/O Protocol:	NMEA 0183, NMEA 2000, Hemisphere Crescent binary [5]
Timing Output:	1 PPS (CMOS, active high, rising edge sync, 10 kΩ, 10 pF load)
Heading Warning I/O:	Open relay system indicates invalid heading

Power

Input Voltage:	9 to 36 VDC
Power Consumption:	4.3 W nominal (GPS L1 + GLONASS L1) 4.6 W nominal (GPS L1 + GLONASS L1 + Beacon)
Current Consumption:	0.36 A nominal (GPS L1 + GLONASS L1) 0.38 A nominal (GPS L1 + GLONASS L1 + Beacon)
Power Isolation:	Yes
Reverse Polarity Protection:	Yes

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
Vibration:	IEC 60945 Section 8.7
EMC:	CE (IEC 60945 Emissions and Immunity) FCC Part 15, Subpart B CISPR22
IP Rating:	IPX6
IMO Wheelmark Certification:	Yes [6]

Mechanical

Dimensions:	66.3 L x 20.9 W x 14.6 H (cm) 26.1 L x 8.3 W x 5.8 H (in)	
Weight:	V103	V113
	2.1 kg (4.6 lb)	2.4 kg (5.4 lb)
Status Indications (LED):	Power	
Power/Data Connector:	18-pin, environmentally sealed	

Aiding Devices

Gyro:	Provides smooth heading, fast heading reacquisition and reliable 1˚ per minute heading for periods up to 3 minutes when loss of GNSS has occurred [4]
Tilt Sensors:	Provide pitch and roll data and assist in fast start-up and reacquisition of heading solution

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 NMEA 0183 only

Authorized Distributor:

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