# Hemisphere

## Vector V103 and V113 GPS Compass

Professional Heading and Positioning Smart Antenna; Supports NMEA 0183 and NMEA 2000



### Vector V103

Experience the IMO Wheelmarked Vector<sup>™</sup> V103<sup>™</sup> GPS Compass series for its superb heading and positioning performance. The new, rugged IP69K design housing is sealed for the harshest environments. It incorporates fixed and pole mounting capability for both marine and land applications. The Vector V103 Series is suitable for both commercial and professional marine, as well as for machine mounting in open pit mining, construction and other applications.

The V103 and V113 utilize all of the recent innovations in Hemisphere GPS' Crescent<sup>®</sup> and Vector technology. New Cross-Dipole low-multipath antennas are separated by 50 cm between phase centers, resulting in better than 0.3° rms heading performance while delivering position accuracy of better than 60 cm 95% of the time when using SBAS (EGNOS, MSAS & WAAS) or Beacon corrections.

The V103 and V113 support both NMEA 0183 and NMEA 2000 interfacing, enabling a seamless choice of communication protocols with Hemisphere GPS' 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 Series replaces traditional gyrocompasses and stand-alone GPS at a fraction of the cost.

### Key Vector V103 and V113 GPS Compass Advantages

- IMO type approved as a Transmit Heading Device (THD)
- Professional heading < 0.3° rms
- Differential position accuracy of < 60 cm @ 95%</li>
- Heave < 30 cm rms
- Pitch and Roll < 1° rms
- Reliable IP69K smart antenna housing design
- Accurate heading up to 3 minutes during GPS outages
- COAST technology maintains differentially-corrected positioning for 40 minutes or more after loss of differential signal

Cres(ent

- Integrated gyro and tilt sensors deliver fast start-up times and provide heading updates during temporary loss of GPS
- Flexibility for easy integration into NMEA 0183 and 2000 interfaces

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#### **GPS Sensor Specifications**

GPS Sensor Specifications		Environmental		
Receiver Type:	L1 C/A code, with carrier phase smoothing	Operating Temperature:	-30°C to + 70°C (-22°F to + 158°F)	
SignalTracking:	Dual L1 GPS receiver design, parallel	Storage Temperature:	-40°C to + 85°C (-40°F to + 185°F)	
	tracking	Humidity:	95% non-condensing	
GPS Sensitivity:	-142 dBm	Vibration:	IEC 60945	
SBASTracking:	2-channel, parallel tracking	EMC:	CE (IEC 60945 Emissions and Immunity)	
Update Rate:	20 Hz standard		FCC Part 15, Subpart B	
Horizontal Accuracy:	< 0.6 m 95% confidence (DGPS <sup>1</sup> )		CISPR22	
	< 2.5 m 95% confidence	IMO Wheelmark		
	(autonomous, no SA <sup>2</sup> )	Certification:	Yes <sup>7</sup>	
Heading Accuracy:	< 0.30° rms			
Pitch/Roll Accuracy:	< 1° rms	Power		
Heave Accuracy:	30 cm <sup>6</sup> rms			
Timing (1PPS) Accuracy:	50 ns	Deves Consumptions	0 10 30 VDC	1/110
Rate of Turn:	90°/s maximum	Fower Consumption:	<u>2 W nominal</u>	<u>V 113</u>
Compass Safe		Current Commentions		
Distance:	.75 m (with enclosure)⁵	Current Consumption.		
Cold Start:	< 60 s (no almanac or RTC)		~ 320 mA @ 9 VDC	~ 350 mA @ 9 VDC
Warm Start:	< 20 s typical (almanac and RTC)		~ 240 MA @ 12 VDC	~ 205 IIIA @ 12 VDC
Hot Start:	< 1 s typical (almanac, RTC and position)	Prove la latina	a lot IIA @ 10 VDC ~ 200 IIIA @ 10 VDC	
Heading Fix:	< 10 s typical (valid position)	Power isolation:		
Maximum Speed:	1.850 mph (999 kts)	Reverse Polarity Protection:	res	
Maximum Altitude:	18,288 m (60,000 ft)			
		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)	
Beacon Sensor Specifications (V113 version)				
Channels:	2-channel, parallel tracking	Weight:	V103	V113
Frequency Range:	283.5 to 325 kHz		2.1 kg (4.6 lb)	2.4 kg (5.4 lb)
Operating Modes:	Manual, automatic, and database	Power/Data Connector:	18-pin, environmentally sealed	
Compliance:	IEC 61108-4 beacon standard	Status Indications (I ED):	Power	
			i owci	
Communications				
Serial Ports:	1 full-duplex RS-232; 1 full-duplex			
	RS-422 and 1 half-duplex RS-422 (Tx only)	Aiding Devices		
Baud Rates:	4800 - 38400	Gyro:	Provides smooth head	ing, fast heading
Correction I/O Protocol:	RTCM v2.3 (DGPS), RTCM SC-104, L-Dif <sup>™ 3</sup>		reacquisition and relia	ble < 1° per
Data I/O Protocol:	NMEA 0183, NMEA 2000, Crescent binary <sup>3</sup> ,		minute heading for pe	riods up to 3
	L-Dif		minutes when loss of	GPS has occurred <sup>4</sup>
Timing Output:	1PPS CMOS, active low, falling edge sync,	Tilt Sensors:	Provide pitch and roll of	data and assist in
	10 kΩ, 10pF load		fast start-up and reacq	uisition of
Heading Warning I/O:	Open relay system indicates invalid heading		heading solution.	

#### Authorized Distributor:

HEMISPHERE GPS 4110 - 9th Street S.E. Calgary, AB T2G 3C4 Canada

### Phone: 403.259.3311 Fax: 403.259.8866

<sup>6</sup> Based on a 40 second time constant

<sup>1</sup> Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services), and ionospheric activity

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.

<sup>2</sup> Depends on multipath environment, number of satellites in view and

precision@hemispheregps.com www.hemispheregps.com

satellite geometry <sup>3</sup> Hemisphere GPS proprietary <sup>4</sup> Under static conditions

<sup>7</sup> NMEA 0183 only

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