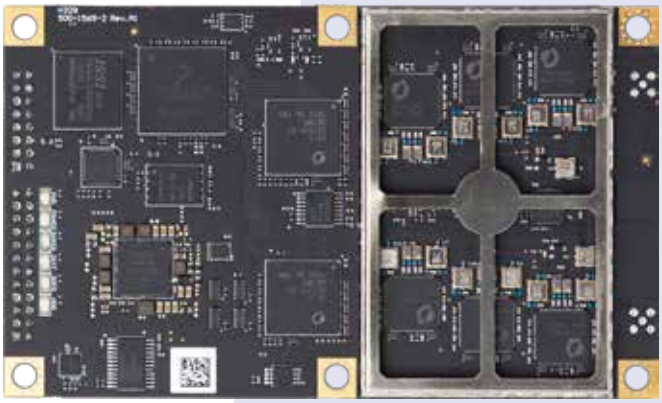
Vector™ H328 GNSS Compass Board

Advanced Heading and RTK Positioning

key features

- **Extremely accurate heading with long baselines**
- **Multi-frequency position, dual-frequency heading supporting GPS, GLONASS, BeiDou, Galileo, QZSS, IRNSS, and L-band**
- **Atlas® L-band capable to 4 cm RMS**
- **Athena™ GNSS engine providing best-in- class RTK performance**
- **Excellent coasting performance**
- **5 cm RMS RTK-enabled heave accuracy**
- **Strong multipath mitigation and interference rejection**
- **New multi-axis gyro and tilt sensor for reliable coverage during short GNSS outages**



atlas

Develop sophisticated machine control and navigation solutions in a world full of complex dynamic environments. The Vector H328 is our most advanced GNSS heading and positioning board.

The Vector H328 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, onboard Atlas L-band, RTK-enabled heave, low-power consumption, and precise timing.

Scalable Solutions
With the Vector H328, positioning is scalable and field upgradeable with all Hemisphere software and service options. Utilize the same centimeter-level accuracy in either single frequency mode, or employ the full performance and fast RTK initialization times over long distances with multi-frequency multi-constellation GNSS signals. High-accuracy L-band positioning from meter to sub-decimeter levels available via Atlas correction service.

Ease of Migration
Leverage the industry standard form factor for easy upgradeability from other manufacturers' modules.

Hemisphere®

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GNSS Receiver Specifications

Receiver Type:	Multi-Freqeuncy GPS, GLONASS, BeiDou, Galileo, QZSS, and Atlas
Signals Received:	GPS L1CA/L1P/L1C/L2P/L2C/L5 GLONASS G1/G2, P1/P2 BeiDou B1/B2/B3 GALILEO E1BC/E5a/E5b QZSS L1CA/L2C/L5/L1C Atlas
Channels:	1059
GPS Sensitivity:	-142 dBm
SBAS Tracking:	3-channel, parallel tracking
Update Rate:	10 Hz standard, 1 Hz or 20 Hz optional (with activation)
Timing (1PPS) Accuracy:	20 ns
Rate of Turn:	100°/s maximum
Cold Start:	60 s typical (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 (Hot Start)
Antenna Input Impedance:	50 Ω
Maximum Speed:	1,850 kph (999 kts)
Maximum Altitude:	18,288 m (60,000 ft)

Accuracy

Position:	RMS (67%)	2DRMS (95%)
Autonomous, no SA: [1]	1.2 m	2.5 m
SBAS: [2]	0.3 m	0.6 m
Atlas H10 (L-band): [1, 3]	0.04 m	0.08 m
Atlas H30 (L-band): [1, 3]	0.15 m	0.3 m
Atlas Basic (L-band): [1, 3]	0.50 m	1.0 m
RTK: [1]	8 mm + 1 ppm	15 mm + 2 ppm

Heading (RMS):	0.16° rms @ 0.5 m antenna separation 0.08° rms @ 1.0 m antenna separation 0.04° rms @ 2.0 m antenna separation 0.02° rms @ 5.0 m antenna separation
Pitch/Roll (RMS):	1°
Heave (RMS): [1]	30 cm rms (DGPS) , 5 cm rms (RTK)

L-Band Receiver Specifications

Receiver Type:	Single Channel
Channels:	1525 to 1560 MHz
Sensitivity:	-130 dBm
Channel Spacing:	5.0 kHz
Satellite Selection:	Manual and Automatic
Reacquisition Time:	15 seconds (typical)

Communications

Ports:	3 x full-duplex (1 x 3.3V CMOS, 1 x 3.3V CMOS with flow control, 1 x RS-232 with flow control) 1 x USB Device 1 x Ethernet 10/100Mbps 2 x CAN (NMEA2000, ISO 11783) 1 x SPI
Interface Level:	3.3V CMOS
Baud Rates:	4800 - 115200
Correction I/O Protocol:	Hemisphere GNSS proprietary ROX Format, RTCM v2.3, RTCM v3.2, CMR, CMR+
Data I/O Protocol:	NMEA 0183, Crescent binary [3]
Timing Output:	1PPS, CMOS, active high, rising edge sync, 10 kΩ, 10 pF load
Event Marker Input:	CMOS, active low, falling edge sync, 10 kΩ, 10 pF load

Power

Input Voltage:	3.3 VDC +/- 5%
Power Consumption:	2.0 W nominal GPS (L1) 2.7 W nominal GPS (L1/L2) and GLONASS (G1/G2) 3.8 W nominal All Signals + L-band
Current Consumption:	0.61 A nominal GPS (L1) 0.82 A nominal GPS (L1/L2) 1.15 A nominal All Signals + L-band
Antenna Voltage:	5 VDC maximum
Antenna Short Circuit Protection:	Yes
Antenna Gain Input Range:	10 to 40 dB

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 in an enclosure)
Mechanical Shock:	EP455 Section 5.14.1 Operational (when mounted in an enclosure with screw mounting holes utilized)
Vibration:	EP455 Section 5.15.1 Random
EMC:	CE (IEC 60945 Emissions and Immunity) FCC Part 15, Subpart B CISPR 22

Mechanical

Dimensions:	100 L x 60 W x 10 H (mm) 3.9 L x 2.4 W x 0.4 (in)
Weight:	44 g (1.56 oz)
Status Indication (LED):	Power, Primary and Secondary GNSS lock, Differential lock, DGPS position, Heading
Power/Data Connector:	24-pin male header 2 mm pitch 16-pin male header 2 mm pitch
Antenna Connectors:	MMCX, female, straight

Aiding Devices

Gyro:	Provides smooth and fast heading reacquisition. During loss of GNSS signals heading stability is degraded by < 1° per minute for up to 3 minutes.
Tilt Sensors:	Provide pitch, 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, and ionospheric activity

2 Depends on multipath environment, number of satellites in view, SBAS coverage, satellite geometry, and ionospheric activity

3 Hemisphere GNSS proprietary

4 With future firmware upgrade and activation

Authorized Distributor:

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