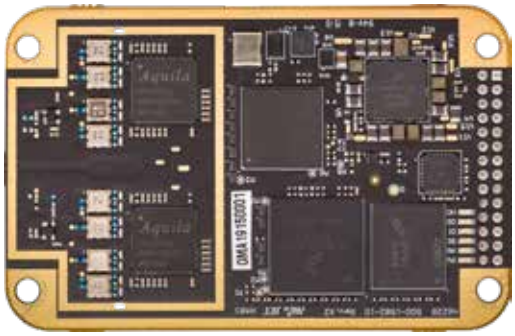
Hemisphere®

Vega™ 28

GNSS Compass Board

ADVANCED HEADING AND RTK POSITIONING



atlas®

Develop sophisticated machine control and navigation solutions in a complex world full of dynamic environments. The Vega 28 is one of our most advanced GNSS heading and positioning boards.

The Vega 28 uses dual antenna ports to create a series of additional capabilities 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 Vega 28, 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.

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

GNSS Receiver Specifications

Receiver Type:	Multi-Frequency GPS, GLONASS, BeiDou, Galileo, QZSS, and Atlas
Signals Received:	GPS L1CA/L1P/L1C/L2P/L2C/L5 GLONASS G1/G2/G3, P1/P2 BeiDou B1i/B2i/B3i/B10C/B2A/B2B/ACEBOC GALILEO E1BC/E5a/E5b/E6BC/ALTBOC QZSS L1CA/L2C/L5/L1C/LEX IRNSS L5 Atlas
Channels:	1,100+
GPS Sensitivity:	-142 dBm
SBAS Tracking:	3-channel, parallel tracking
Update Rate:	10 Hz standard, 1 Hz or 20 Hz optional (with activation)
Timing (1 PPS)	
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 mph (999 kts)
Maximum Altitude:	18,288 m (60,000 ft)

Accuracy

Positioning:	**RMS (67%)**	**2DRMS (95%)**
Autonomous, no SA: [1]	1.2 m	2.5 m
SBAS: [1]	0.3 m	0.6 m
Atlas H10: [1, 3]	0.04 m	0.08 m
Atlas H30: [1, 3]	0.15 m	0.3 m
Atlas Basic: [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):	0.5°
Heave (RMS): [1]	30 cm rms (DGNSS) , 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)

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
5. CMR and CMR+ do not cover proprietary messages outside of the typical standard

Communications

Ports:	2 x full-duplex (1 x 3.3V CMOS, 1 x 3.3V CMOS with flow control) 1 x USB Host/Device 1 x Ethernet 10/100Mbps 2 x CAN (NMEA2000, ISO 11783)
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[5], CMR+[5]
Data I/O Protocol:	NMEA 0183, Crescent binary
Timing Output:	1 PPS, 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:	< 2.5 W all signals + L-band
Current Consumption:	757 mA 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:	71 L x 45 W x 10 H (mm) 2.8 L x 1.8 W x 0.4 (in)
Weight:	24 g (0.85 oz)
Status Indications (LED):	Power, Primary and Secondary GNSS lock, Differential lock, DGNSS position, Heading
Power/Data Connector:	2 x 14-pin male header
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

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