



The Vega 28 is our most advanced GNSS heading and positioning board.

Vega 28 uses dual antenna ports to create a series of additional capabilities; including fast, high-accuracy heading over short baselines, RTK positioning, on-board Atlas L-band, RTK enabled heave, low power consumption, and precise timing.

Scalable Solutions

With Vega 28, heading and positioning are scalable and field upgradeable with all Hemisphere software and service options. Utilize the same multi-constellation GNSS solutions in either single-frequency mode or employ the full performance and fast RTK initialization times over long distances with multi frequency signals. High accuracy L-band positioning from meter to sub-decimeter levels is available via the Atlas correction service.

Ease of Migration

Leverage the 28-pin industry standard form factor for easy upgradeability from other manufacturers' modules.

Key Features

- Extremely accurate heading with long baselines
- Available multi-frequency position, dual-frequency heading supporting GPS, GLONASS, BeiDou, Galileo, QZSS, NavIC (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 rejection and Cygnus™ interference mitigation
- 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, NavIC (IRNSS) and Atlas L-band |
| Signals Received: | GPS L1CA/L1P/L1C/L2P/L2C/L5 GLONASS G1/G2/G3, P1/P2 BeiDou B1i/B2i/B3i/B1C/B2a/B2b/ AceBOC GALILEO E1BC/E5a/E5b/E6BC/ AltBOC QZSS L1CA/L2C/L5/L1C/L6 NavIC (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 (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: ² | 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: | Dual Channel ⁴ |
| Channels: | 1525 to 1560 MHz |
| Satellite Selection: | Manual and Automatic |
| Reacquisition Time: | 15 seconds (typical) |

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 |

Communications

| | |
|---------------------------------|---|
| Ports: | 3 x full-duplex 3.3V CMOS 1 x USB Host/Device 1 x Ethernet 10/100Mbps 2 x CAN (NMEA2000, ISO 11783) 1 x PPS output, 2 x Event input ⁶ 3.3V CMOS |
| Interface Level: | 3.3V CMOS |
| Baud Rates: | 4800 - 460800 |
| 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, Hemisphere binary |
| Timing & Event I/O: | CMOS, programmable edge sync, 10 kΩ, 10 pF load |

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 46 W x 10 H (mm) 2.8 L x 1.8 W x 0.4 H (in) |
| Weight: | 24 g (0.85 oz) |
| Status Indicators (LED): | Power, Primary and Secondary GNSS lock, Differential lock, DGNSS position, Heading |
| Connectors: | 2 x 14-pin male header, 2 mm pitch RF: 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 update
5. CMR and CMR+ do not cover proprietary messages outside of the typical standard
6. Multi pin use requires future firmware update



Hemisphere GNSS

8515 E. Anderson Drive
Scottsdale, AZ 85255, USA

Phone: +1 (480) 348-6380
Toll-Free: +1 (855) 203-1770
Fax: +1 (480) 270-5070

precision@hgns.com
hgns.com