

Vector™ VR1000 GNSS Position & Heading Receiver

GNSS Compass for Machine Control Systems

key features

- Athena™ RTK Engine
- Extremely accurate heading with baselines up to 10 m
- Multi-frequency GPS/GLONASS/BeiDou/Galileo/QZSS/IRNSS/Atlas® GNSS Global Correction Service
- Integrated Ethernet, CAN, internal 400MHz radio, Serial, Bluetooth, and Wi-Fi
- Powerful WebUI accessed via Wi-Fi plus 12 multi-color LEDs
- Integrated IMU delivers fast start-up times and maintains heading during temporary GNSS outage
- Fully rugged IP69K, and MIL-STD810G compliant solution for the harshest environments



The Vector VR1000 is Hemisphere GNSS' premiere multi-GNSS, multi-frequency position and heading receiver designed specifically for the machine control market. Providing precise heading, Athena RTK positioning, and full Atlas capability, its rugged design is compliant to IP69K, MIL-STD810G, and IEC 60068-2 standards.

The VR1000 supports antenna separations up to 10 meters, offering heading accuracy to 0.01 degrees RMS in addition to RTK position accuracy and full support for Hemisphere GNSS' Atlas Global Correction Service.



precision@hgns.com
www.hgns.com

Vector VR1000 GNSS Position & Heading Receiver

GNSS Receiver Specifications

Receiver Type: GNSS Position & Heading RTK Receiver
 Signals Received: GPS, GLONASS, BeiDou, Galileo, QZSS, IRNSS and Atlas
 Channels: 1059
 GPS Sensitivity: -142 dBm
 SBAS Tracking: 3-channel, parallel tracking
 Update Rate: 10 Hz standard, 20 Hz optional
 Timing (1PPS): 20 ns
 Accuracy: 100°/s maximum
 Rate of Turn: 40 s (no almanac or RTC)
 Cold Start: 20 s typical (almanac and RTC)
 Warm Start: 5 s typical (almanac, RTC and position)
 Hot Start: 10 s typical (Hot Start)
 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)
 Differential Options: SBAS, Atlas (L-band), RTK

Accuracy

Positioning:	Horizontal (95%)	Vertical (95%)
Autonomous, no SA: ²	1.2 m	2.5 m
SBAS (WAAS): ²	0.25 m	0.5 m
Atlas (L-band): ^{2,3}	0.04 m	0.08 m
RTK: ¹	10 mm + 1 ppm	20 mm + 2 ppm
Heading (RMS):	$< 0.2^\circ$ @ 0.5 m antenna separation $< 0.1^\circ$ @ 1.0 m antenna separation $< 0.05^\circ$ @ 2.0 m antenna separation $< 0.02^\circ$ @ 5.0 m antenna separation $< 0.01^\circ$ @ 10.0 m antenna separation	
Pitch/Roll (RMS):	1°	
Heave (RMS):	30 cm (DGPS) ³ , 10 cm (RTK) ³	

L-Band Receiver Specifications

Receiver Type: Single Channel
 Channels: 1530 to 1560 MHz
 Sensitivity: -140 dBm
 Channel Spacing: 5 kHz
 Satellite Selection: Manual or Automatic
 Reacquisition Time: 15 sec (typical)

Communications

Ports: 1x full-duplex RS-232/RS-422, 1x full-duplex RS232, 2x CAN, 1x Ethernet
 Baud Rates: 4800 - 115200
 Radio Interfaces: Bluetooth 2.0 (Class 2), Wi-Fi 2.4 GHz, UHF (400 MHz)
 Correction I/O Protocol: Atlas, Hemisphere GNSS proprietary, RTCM v2.3 (DGPS), RTCM v3 (RTK), CMR, CMR+
 Data I/O Protocol: NMEA 0183, Hemisphere GNSS binary
 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: 9-36 VDC
 Power Consumption: 10.8W Maximum (All signals and L-band)
 Current Consumption: 1.2A Maximum
 Power Isolation: No
 Reverse Polarity Protection: Yes

Environmental

Operating Temperature: -40°C to +70°C (-40°F to +158°F)
 Storage Temperature: -40°C to +85°C (-40°F to +185°F)
 Humidity: 95% non-condensing
 Mechanical Shock: 50G, 11ms half sine pulse (MIL-STD-810G w/ Change 1 Method 516.7 Procedure 1)
 Vibration: 7.7Grms (MIL-STD-810G w/Change 1 Method 514.7 Category 24)
 EMC: CE (ISO14982/EN13309/ISO13766/IEC60945), Radio Equipment Directive 2014/53/EU, E-Mark, RCM, IP69K

Mechanical

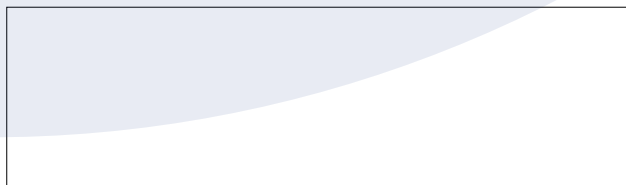
Dimensions: No mounting Plate
 23.2 L x 16.5 W x 7.9 H (cm)
 9.1 L x 6.5 W x 3.1 H (in)
 With Mounting Plate
 23.2 L x 21.4 W x 8.3 H (cm)
 9.1 L x 8.4 W x 3.3 H (in)
 Status Indications (LED): Power, Primary Antenna, Secondary Antenna, Heading, Quality, Atlas, Bluetooth, Wi-Fi, CAN1, CAN2, Ethernet, Radio
 Power/Data Connector: 23-pin multi-purpose

Aiding Devices

Gyro: Provides smooth heading, fast heading reacquisition and reliable $< 0.5^\circ$ per min heading for periods up to 3 min. when loss of GNSS has occurred⁴
 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, no SA, and ionospheric activity
² Depends on multipath environment, number of satellites in view, WAAS coverage and satellite geometry
³ Requires a subscription
⁴ Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for differential services), and ionospheric activity
⁵ Hemisphere GNSS proprietary

Authorized Distributor:



Copyright Hemisphere GNSS, Inc. All rights reserved. Specifications subject to change without notice.
 Hemisphere GNSS, aRTK, Athena, Atlas, BaseLink, Crescent, Eclipse, SmartLink, SureFix, Tracer, and Vector are trademarks of Hemisphere GNSS, Inc.
 Rev. 03/19



Hemisphere GNSS, Inc.
 8515 E. Anderson Drive
 Scottsdale, AZ, USA 85255

Toll-Free: +1 (855) 203-1770
 Phone: +1 (480) 348-6380
 Fax: +1 (480) 270-5070
 Precision@HGNS.com
 www.HGNS.com