C-Nav®

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R330 GNSS Receiver

MULTI-GNSS RTK, High-accuracy receiver

Oceaneering is an authorized reseller of the Hemisphere® R330 GNSS receiver–a full solution product in a compact enclosure. The R330 uses the Hemisphere GNSS' Eclipse™ platform and the latest GNSS patented technology. The R330 provides accurate positioning using several differential correction methods such as Athena™ RTK, Atlas® L-band corrections (Atlas Basic, H30, H10), Beacon, and SBAS. Patented Multifunction Application (MFA) firmware enables the R330 to smoothly transition between DGNSS systems.

The R330 GNSS receiver works well in any marine or land application where positioning accuracy is required. The base unit is configured as single frequency, 10 Hz, SBAS, and raw data. The unit can be optionally subscribed to multi-frequency, multi-GNSS, 20 Hz, RTK, Atlas (Atlas Basic, H30, or H10), and Beacon. Compatible GNSS antennas for the R330 are various Hemisphere antennas, including the Beacon-capable A43 and the C-Nav289.

R330 GNSS Receiver

The R330 GNSS receiver works with two new advanced technology features: aRTK™ and Tracer™. Hemisphere's aRTK technology, powered by Atlas, enables the R330 to operate with RTK accuracies when RTK corrections fail. Tracer uses specialized algorithms to sustain positioning in the absence of corrections data.

Key Features

- Atlas® L-band capable to 4 cm RMS
- Athena™ GNSS engine providing best-in-class RTK performance
- Fast update rate of up to 20 Hz
- Status LEDs and menu system make R330 easy to monitor and configure
- USB flash drive for data logging

GNSS Receiver Specifications	
Receiver Type	Multi-Freqeuncy GPS, GLONASS, BeiDou, Galileo, and Atlas
Signals Received	GPS, GLONASS, BeiDou, Galileo, and Atlas
Channels	227
GPS Sensitivity	-142 dBm
SBAS Tracking	3-channel, parallel tracking
Update Rate Timing (1 PPS)	10 Hz standard, 20 Hz optional
Accuracy	20 ns
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)
Antenna Input Impedance	50 Ω
Maximum Speed	1,850 mph / 999 kts
Maximum Altitude	60,000 ft / 18 288 m

Accuracy		
Positioning	RMS (67%)	2DRMS (95%)
Autonomous, no SA [1]	3.9 ft / 1.2 m	8.2 ft / 2.5 m
SBAS [2]	1 ft / 0.3 m	2 ft / 0.6 m
Atlas H10 [3, 5]	0.13 ft / 0.04 m	0.3 ft / 0.08 m
Atlas H30 [3, 5]	0.49 ft / 0.15 m	1 ft / 0.30 m
Atlas Basic [3, 5]	1.6 ft / 0.50 m	3.3 ft / 1.0 m
RTK [4]	8 mm + 1 ppm	15 mm + 2 ppm

Beacon Receiver Specifications	
Channels	2-channel parallel tracking
Frequency Range	283.5 to 325.0 kHz
Operating Modes	Manual, Automatic, and Database
Compliance	IEC 61108-4 beacon standard

L-Band Receiver Specifications	
Receiver Type	Single Channel
Channels	1525 to 1560 MHz
Sensitivity	-130 dBm
Channel Spacing	5 kHz
Satellite Selection	Manual or Automatic
Reacquisition Time	15 sec (typical)

Communications	
Ports	2 x full-duplex (RS-232) 1 x USB Host 1 x USB Device
Baud Rates	4800 - 115200
Correction I/O Protocol	Hemisphere GNSS proprietary ROX format, RTCM v2.3, RTCM v3.2, CMR[6], CMR+[6]
Data I/O Protocol	NMEA 0183, Hemisphere GNSS binary[5]
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

Power	
Input Voltage	8-36 VDC
Power Consumption	2.8W nominal All Signals + L-band
Current Consumption	0.24 A nominal All Signals + L-band
Reverse Polarity Protection	Yes
Antenna Voltage Output	5 VDC maximum
Antenna Short Circuit Protection	Yes
Input Range	10 to 40 dB

Environmental	
Operating Temperature	-22°F to + 158°F / -30°C to + 70°C
Storage Temperature	-40°F to +185°F / -40°C to +85°C
Humidity	95% non-condensing
Mechanical Shock	EP455 Section 5.41.1 Operational
Vibration	EP455 Section 5.15.1 Random
EMC	CE (IEC 60945 Emissions and Immunity) FCC Part 15, Subpart B CISPR22

Mechanical	
Dimensions (L x W x H)	7.0 in x 4.7 in x 1.8 in / 17.8 cm x 12.0 cm x 4.6 cm
Display	LED
Weight	1.42 lbs / 0.65 kg

Status Indications	
LED	Power, GNSS lock, Differential lock
Power Switch	Soft Switch
Power Connector	2-pin metal ODU
Data Connector	2 x DB9 (female)
Port	2 x USB-A
Antenna Connector	TNC (female), straight

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, SBAS 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
6. CMR and CMR+ do not cover proprietary messages outside of the typical standard

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