# Hemisphere®

# MULTI-GNSS RTK, HIGH-ACCURACY RECEIVER



The R330 GNSS receiver is a full solution product in a compact enclosure. The R330 use the Hemisphere GNSS' Eclipse™ platform and our 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. Our patented Multifunction Application (MFA) firmware allows 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-freqeuncy, multi-GNSS, 20 Hz, RTK, Atlas (Atlas Basic, H30, or H10), and Beacon. Compatible GNSS antennas for the R330 are A21, A25, A31, A42, A43, A45 and A52.

The R330 GNSS receiver works with two new advanced technology features; aRTK™ and Tracer™. Hemisphere's aRTK technology, powered by Atlas, allows 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:** | 10 Hz standard, 20 Hz optional |
| **Timing (1 PPS) 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 kph (999 kts) |
| **Maximum Altitude:** | 18,000 m (59,055 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:** [3, 5] | 0.04 m | 0.08 m |
| **Atlas H30:** [3, 5] | 0.15 m | 0.30 m |
| **Atlas Basic:** [3, 5] | 0.50 m | 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) <br> 1 x USB Host <br> 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

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|---|---|
| **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 |
| **Antenna Gain Input Range:** | 10 to 40 dB |

## Environmental

| | |
|---|---|
| **Operating Temperature:** | -30°C to + 70°C (-22°F to + 158°F) |
| **Storage Temperature:** | -40°C to +85°C (-40°F to +185°F) |
| **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) <br> FCC Part 15, Subpart B <br> CISPR22 |

## Mechanical

| | |
|---|---|
| **Dimensions:** | 17.8 L x 12.0 W x 4.6 H (cm) <br> 7.0 L x 4.7 W x 1.8 H (in) |
| **Display:** | LED |
| **Weight:** | 0.65 kg (1.42 lbs) |
| **Status Indications (LED):** | Power, GNSS lock, Differential lock |
| **Power Switch:** | Soft Switch |
| **Power Connector:** | 2-pin metal ODU |
| **Data Connector:** | 2 x DB9 (female) <br> 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

**Hemisphere**®

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