

# Trimble R7 GPS Receiver

*Advanced Dual Frequency GPS and WAAS/EGNOS receiver system  
with L2C capability and integrated UHF radio modem*

## GENERAL

- Tough, lightweight magnesium alloy casing
- Fully integrated internal radio modem fully sealed
- Incorporates the Trimble R-track technology, which allows tracking of the L2 Civil Signal (L2C)
- CompactFlash data storage expandable up to 128 MB
- Integral USB (Universal Serial Bus) for ultra fast download
- Greater than 10 hours data logging or 7 hours of RTK operation on 2 internal 1.8 ampere-hour lithium-ion batteries
- Tripod clip or integrated base case
- Mount rover on-the-pole, in a belt pouch or in a backpack
- Front panel for control of power, data logging, formatting of CompactFlash cards, ephemeris and application file deletion and restoring default controls. LED indicators for satellite tracking, radio link operation data logging and power monitoring
- Low power consumption

## PERFORMANCE SPECIFICATIONS

### Measurements

- Advanced Maxwell™<sup>5</sup> Custom Survey GPS Chip
- High precision multiple correlator L1 and L2 pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurements data for low noise, low multipath error, low time domain correlation and high dynamic response
- Very low noise L1 and L2 carrier phase measurements with <1 mm precision in a 1Hz bandwidth
- L1 and L2 Signal-to-Noise ratios reported in dB-Hz
- Proven Trimble low elevation tracking technology
- 24 Channels L1 C/A Code, L2C<sup>8</sup>, L1/L2 Full Cycle Carrier, WAAS/EGNOS Support

### Code Differential GPS Positioning<sup>7</sup>

**Horizontal** 0.25 m + 1 ppm RMS

**Vertical** 0.50 m + 1 ppm RMS

WAAS differential positioning accuracy typically <5 m 3DRMS<sup>1</sup>

### Static and Fast Static GPS Surveying<sup>7</sup>

**Horizontal** ±5 mm + 0.5 ppm RMS

**Vertical** ±5 mm + 1 ppm RMS

### Kinematic Surveying<sup>7</sup>

Real-time and Postprocessed Kinematic Surveys

**Horizontal** 10 mm + 1 ppm RMS

**Vertical** 20 mm + 1 ppm RMS

0.02 seconds (20 millisecond) latency

**Initialization time** Single/Multi-Base eRTK min 10 secs  
+0.5 times baseline length in km, up to 30 km  
VRS™ (Virtual Reference Stations) initialization time  
<30 seconds typical anywhere within coverage area

**Initialization reliability** Typically >99.9%<sup>2</sup>

### eRTK Wide Area Coverage

- Conventional RTK typical coverage 300 sq km (115 sq mi) per base
- Single Base eRTK up to 1,250 sq km (500 sq mi)<sup>3</sup>
- Multiple Base eRTK up to 3,750 sq km (1,500 sq mi)<sup>3,4</sup>
- VRS eRTK 8,500+ sq km (3,300 sq mi)<sup>3,5</sup>

## HARDWARE

### Physical

<b>Casing</b>	Tough, lightweight fully sealed magnesium alloy
<b>Water/dustproof</b>	IP67 Dustproof, protected from temporary immersion to depth of 1 m (3.28 ft)
<b>Shock and Vibration</b>	Tested and meets the following environmental Standards: Shock MIL-STD-810-F to survive a 1m (3.28ft) drop onto concrete. Vibration MIL-STD-810-F on each axis
<b>Weight</b>	With internal batteries, internal radio, internal battery charger, standard UHF antenna: 1.4 kg (3 lb) As entire RTK Rover with batteries for 7 hours, less than 4 kg (8.8 lb)
<b>Dimensions</b>	13.5 cm W x 8.5 cm H x 24 cm L (5.3 in. W x 3.4 in. H x 9.5 in. L)

### Electrical

<b>Power</b>	DC input 10.5 V to 28 V with over voltage protection
<b>Power consumption</b>	2.5 W receiver only, 3.75 W including internal radio
<b>Battery</b>	>10 hours postprocessed, 7 hours RTK (with two 1.8 ah batteries)
<b>Battery weight</b>	0.1 kg (1.6 oz)
<b>Battery charger</b>	Internal with external AC power adapter; no requirement for external charger
<b>Power output</b>	10.5 V to 20 V (Port 1), 10.5 V to 7.5 V (Port 3)
<b>Certification</b>	Class B Part 15 FCC certification and CE Mark approved Environmental
<b>Operating temperature</b>	-40 °C to +65 °C (-40 °F to +149 °F) C-Tick approved
<b>Storage temperature</b>	-40 °C to +80 °C (-40 °F to +176 °F)
<b>Humidity</b>	100%, condensing

## COMMUNICATIONS AND DATA STORAGE

- 2 external power ports, 2 internal battery ports, 3 serial ports
- Integrated USB for data download speeds in excess of 1 megabit per second (10 times faster than even the fastest serial port)
- CompactFlash—advanced lightweight and compact removable data storage. Options of 64 MB or 128 MB from Trimble
- More than 3,400 hours continuous L1+L2 logging at 15 seconds with 6 satellites typical (128 MB)
- Fully integrated, fully sealed internal UHF radio modem option
- GSM, Cell Phone and CDPD modem support for eRTK and VRS operation
- Range pole antenna for eRTK Wide Area Real Time Kinematic. For long range UHF communications without interference to GPS antenna phase center
- Dual event marker inputs
- 1 Hz, 2 Hz, 5 Hz and 10 Hz Positioning and Data Logging
- 1 Pulse Per Second Output
- CMRII, CMR+, RTCM 2.1 Input and Output Standard
- 14 NMEA outputs
- Supports BINEX and smoothed carrier

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## ZEPHYR™ ANTENNA

- Dimensions: 16.2 cm diameter × 5.7 cm (6.4 in × 2.25 in) maximum depth
- Weight: 0.45 kg (1 lb)
- Operating temperature range: -40 °C to +70 °C (-40 °F to 158 °F)
- 100% humidity proof, fully sealed
- The GPS antenna meets the following environmental standards:
  - MIL-810-F Figure 514 5c-17 vibration levels on each axis
  - Shock tested to MIL-810-F Table 516.5-I to survive a 2 m (6.56 ft) drop
- 4-point antenna feed for sub-mm phase center repeatability.
- Integral Low Noise Amplifier
- 50 dB antenna gain
- Phase Center Repeatability <1 mm horizontal

## ZEPHYR GEODETIC™ ANTENNA

- Dimensions: 34.3 cm diameter × 7.6 cm (13.5 in × 3 in) maximum depth
- Weight: 1.0 kg (2.2 lb)
- Operating temperature range: -40 °C to +70 °C (-40 °F to 158 °F)
- 100% humidity proof, fully sealed
- The GPS antenna meets the following environmental standards:
  - MIL-810-F Figure 514 5c-17 vibration levels on each axis
  - Shock tested to MIL-810-F Table 516.5-I to survive a 2 m (6.56 ft) drop
- Shock tested for a drop of 2 m (6.56 ft) onto concrete
- 4-point antenna feed for sub-mm phase center repeatability
- Integral Low Noise Amplifier
- 50 dB antenna gain
- Trimble Stealth™ Ground Plane for reduced multipath
- Phase Center Repeatability <1 mm horizontal

- 1 Depends on WAAS system performance.
- 2 May be affected by atmospheric conditions, signal multipath and satellite geometry.
- 3 May require cellular telephone coverage.
- 4 Based on configuration of 3 stations at 40 km spacing.
- 5 Based on configuration of 6 stations at 70 km spacing.
- 6 Receiver operates normally to -40 °C but some office based functions such as USB download or internal battery charging are not recommended at temperatures below freezing.

- 7 Accuracy may be subject to conditions such as multipath, obstructions, satellite geometry, atmospheric parameters. Always follow recommended survey practices.
- 8 The availability of L2C signal is dependent on the US Government.

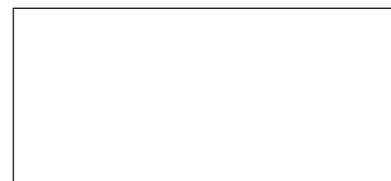
Specifications subject to change without notice.



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