

# TRIMBLE R7 GNSS SYSTEM

## KEY FEATURES

**Trimble R-Track** technology for comprehensive GNSS support

A modular system with external antenna for **maximum flexibility**

**Advanced receiver technology** and proven system design combined

An important component of the **Trimble Connected Site**



The Trimble® R7 GNSS System is a multi-channel, multi-frequency GNSS (Global Navigation Satellite System) receiver and UHF radio combined in one exceptionally rugged unit. The Trimble R7 GNSS combines advanced receiver technology with proven system design to provide maximum flexibility, accuracy, and productivity.

### TRIMBLE R-TRACK TECHNOLOGY FOR COMPREHENSIVE GNSS SUPPORT

Powered by the enhanced RTK engine, Trimble R-Track™ technology in the Trimble R7 GNSS supports the GPS Modernization signals L2C and L5, as well as GLONASS. The R7 GNSS is also capable of using the three levels of OmniSTAR<sup>1</sup> positioning – OmniSTAR HP, OmniSTAR XP and OmniSTAR VBS.

Its ability to track more satellites—both GPS and GLONASS—means Trimble R-Track can help to improve field productivity, and the resulting postprocessed or RTK solution is enhanced. The new and coming L2C and L5 will also improve the solution, plus these signals are more easily acquired and tracked in challenging GPS conditions.

Investing in the power of Trimble R-Track prepares you for future GNSS capabilities. Trimble, already proven in GPS, will continue to lead in additional GNSS support<sup>2</sup>.

### PROVEN SYSTEM DESIGN

The overall design of the Trimble R7 GNSS system has been tried, tested, and proven in the field.

### FLEXIBLE SEPARATE ANTENNA OPTIONS

Use the Trimble® Zephyr Geodetic™ 2 ground plane antenna<sup>3</sup> to minimize signal multipath at the Trimble R7 GNSS base, providing the “cleanest” data.

As a rover, the modular Trimble R7 GNSS with Trimble Zephyr™ 2 antenna is extremely flexible: Carry the receiver on the pole, wear it in the purpose-built Trimble backpack, or drive with the Trimble R7 GNSS inside your vehicle. The Trimble R7 GNSS supports the way you want to work.

### NEW BLUETOOTH WIRELESS COMMUNICATION

For extra convenience and fewer cable hassles, the Trimble R7 GNSS includes Bluetooth for wireless connection to a Trimble controller, such as the Trimble® TSC3 Controller.

### EXCEPTIONALLY RUGGED AND LIGHTWEIGHT

The GNSS receiver and internal UHF radio are fully protected from water, dust, and shock inside the unit's full metal jacket. This field sturdiness makes the Trimble R7 GNSS ideal for tough environments.

### THE ORIGINAL INTEGRATED SURVEYING SOLUTION AND BEYOND

The Trimble R7 GNSS system is designed to support Trimble's original Integrated Surveying™ solution. Combine your GPS and optical data in one job file in powerful Trimble field software such as Trimble Access™, then transfer the job file seamlessly to your Trimble office software, such as Trimble Business Center, for processing.

Whenever you're facing a new surveying challenge, your partnership with Trimble places the right tools and techniques, including GNSS technology, at your fingertips. Each Trimble system seamlessly integrates via shared workflows and technologies, making your everyday job site a place where the whole is greater than the sum of its parts: Welcome to the Connected Site.

1 OmniSTAR Subscription required. See [www.omnistar.com](http://www.omnistar.com) for more information.  
2 Trimble research and development divisions are already working closely with Galileo satellite system teams to ensure delivery of the benefits of this new GNSS in advance of the system being operational.  
3 The Trimble Zephyr Geodetic 2 antenna supports COMPASS, GPS, GLONASS, and Galileo signals.

## PERFORMANCE SPECIFICATIONS

### Measurements

- Trimble R-Track technology
- Advanced Trimble Maxwell™ Custom Survey GNSS Chip
- High precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurements data for low noise, low multipath error, low time domain correlation and high dynamic response
- Very low noise GNSS carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Signal-to-Noise ratios reported in dB-Hz
- Proven Trimble low elevation tracking technology
- 72 Channels:
  - GPS L1 C/A Code, L2C, L1/L2/L5 Full Cycle Carrier<sup>1</sup>
  - GLONASS L1 C/A Code, L1 P Code, L2 P Code, L1/L2 Full Cycle Carrier
  - 4 SBAS WAAS/EGNOS Channels

## POSITIONING PERFORMANCE<sup>2</sup>

### Code differential GNSS positioning

Horizontal	0.25 m + 1 ppm RMS
Vertical	0.50 m + 1 ppm RMS
SBAS differential positioning accuracy <sup>3</sup>	typically <5 m 3DRMS

## STATIC GNSS SURVEYING

### High-precision static

Horizontal	3 mm + 0.1 ppm RMS
Vertical	3.5 mm + 0.4 ppm RMS

### Static and FastStatic

Horizontal	3 mm + 0.5 ppm RMS
Vertical	5 mm + 0.5 ppm RMS

## REAL-TIME KINEMATIC SURVEYING<sup>4</sup>

### Single Baseline <30 km

Horizontal	8 mm + 0.5 ppm RMS
Vertical	15 mm + 1 ppm RMS

## NETWORK RTK<sup>5</sup>

Horizontal	8 mm + 0.5 ppm RMS
Vertical	15 mm + 0.5 ppm RMS
Initialization time <sup>5</sup>	typically <8 seconds
Initialization reliability <sup>5</sup>	typically >99 %

1 The availability of the L5 signal is dependent on the US Government.

2 Precision and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation times appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hours may be required to achieve the high precision static specification.

3 Depends on WAAS/EGNOS system performance.

4 Network RTK PPM values are referenced to the closest physical base station.

5 May be affected by atmospheric conditions, signal multipath, obstructions and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.

6 Receiver will operate normally to -40 °C, and internal batteries are rated to -20 °C.

7 Bluetooth type approvals are country specific.

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## HARDWARE

### Physical

Casing	Tough, lightweight, fully sealed magnesium alloy
Dimensions (WxHxL)	13.5 cm x 8.5 cm x 24 cm (5.3 in x 3.4 in x 9.5 in)
Weight	1.5 kg (3 lb) with internal batteries, internal radio, internal battery charger, standard UHF antenna. Less than 4 kg (8.8 lb) entire RTK rover including batteries for 7 hours, range pole, controller and bracket

### Temperature<sup>6</sup>

Operating	-40 °C to +65 °C (-40 °F to +149 °F)
Storage	-40 °C to +80 °C (-40 °F to +176 °F)
Humidity	100%, condensing
Water/dustproof	IP67 dustproof, protected from temporary immersion to depth of 1 m (3.28 ft)
Shock and vibration	Tested and meets the following environmental standards:
Shock	Non-operating: Designed to survive a 1 m (3.3 ft) drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
Vibration	MIL-STD-810F, FIG.514.5C-1

### Electrical

- Power input 10.5 V DC to 28 V DC with over-voltage protection
- Two rechargeable, removable 7.4 V, 2.4 Ah Lithium-Ion batteries in internal battery compartments
- Power consumption:
  - 4.0 W for receiver only (tracking and logging)
  - 4.4 W including internal radio (not receiving CMR)
  - 5.9 W (tracking SV's, logging at 1 Hz, Bluetooth<sup>®7</sup> Active, external antenna and RTK in Fixed mode)
- Operating times on internal battery:
  - >10 hours postprocessed
  - 6–8 hours RTK (with two 2.4 Ah batteries)
- Battery charger internal with external AC power adapter; no requirement for external charger
- Power output:
  - 6.5 V to 20 V (Port 1) maximum 50 mA
  - 10.5 V to 28 V (Port 3) maximum 0.5 A
- FCC Part 15C (2.4 GHz) certification, compliant with FCC Part 15B (Class B device); IC RSS-210 and RSS-310 certifications, compliant with ICES-003 (Class B device); CE-mark and C-tick mark conformity

### 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
- Fully integrated, fully sealed internal UHF radio modem option
- External cell phone support for GSM/GPRS/CDPD modems for RTK and VRS operations
- Fully integrated, fully sealed 2.4 GHz communications port (Bluetooth<sup>®7</sup>)
- 16 NMEA outputs. GSOF and RT17 output
- Dual event marker inputs, 1 Pulse Per Second Output
- 1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz positioning and data logging
- CMR+, CMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1 Input and Output
- Data Storage on 256 MB CompactFlash memory at 15 second intervals:
  - 4600 hours of raw observables, GPS + GLONASS with 13 SV average
  - 8900 hours of raw observables, GPS-Only with 8 SV average

Specifications subject to change without notice.



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