



Trimble R2

GNSS RECEIVER

VERSATILITY IN THE FIELD. FLEXIBILITY FOR YOUR WORKFLOW.

Work the way you want with the Trimble® R2 GNSS receiver. Using trusted Trimble technology the R2 receiver gives you the freedom to configure a solution by simply selecting the accuracy and GNSS performance to suit your application. Capable of achieving submeter to centimeter level positioning accuracy the Trimble R2 is the answer to keep you working productively in a wide range of geospatial applications, no matter what your workflow requirements are.

Whether you are performing pole-based stakeouts, surveying on roads, in mines or on construction sites, locating buried assets such as pipes and cables, capturing GIS field assets, or carrying out precision survey measurements, the versatile Trimble R2 is purpose-built for surveyors and mapping and GIS professionals alike.

Simple to setup and easy-to-use, the Trimble R2 pairs with any Trimble handheld, Trimble Access™ controller, or consumer-grade smart device across a variety of operating systems and platforms, to deliver reliable, high quality real-time data every time.

A Simple, Rugged System for Everyday Needs

Built to withstand the rigors in the field, the rugged IP65-rated Trimble R2 receiver will work as hard as you do in tough outdoor conditions. Its one-button start up and compact, streamlined form factor makes it fast to set up and can be operated either mounted on a pole, on a backpack or on a vehicle. The field-swappable battery means all day productivity with no interruptions, keeping you focused on the job at hand.

Technology to Keep you Productive

The Trimble R2 is capable of tracking the full range of GNSS satellite constellations and augmentation systems, and comes with an integrated Trimble Maxwell™ 6 chip and 220 channels to provide you with reliable accuracy and positioning performance. Achieve higher accuracy in real-time with the flexibility to choose correction sources from traditional RTK, VRS networks, to Trimble RTX™ correction services delivered by both satellite and Internet/cellular.

Trimble has evolved its Floodlight™ satellite shadow reduction technology to ensure the R2 receiver is able to provide reliable, accurate data even in difficult GNSS environments. Equipped with this advanced GNSS technology, you can achieve remarkable improvements to position availability and accuracy when heavy overhead cover, such as tree canopy and buildings, obstruct satellite signals, making even tough GIS workflows easier.

A Complete Solution

Connect the Trimble R2 receiver to your preferred controller or mobile device via a wireless Bluetooth® connection and add proven Trimble field and office software workflows to complete the solution. Data can be collected with the customizable workflows of Trimble field software such as Trimble Access or Trimble TerraFlex™ software that allow your teams to easily collect and communicate information between the field and office in real-time. Collected data can then be processed with Trimble office software, including Trimble Business Center or TerraFlex, providing you with data rich, high-quality deliverables for your organization.

For a simple, configurable, field-to-office solution, the innovative and flexible Trimble R2 GNSS receiver enables you to work accurately and productively your way.

Key Features

- ▶ A professional solution for geospatial applications ranging from sub-meter to centimeter accuracies to support any GIS or survey-grade workflow
- ▶ Easily collect data by pairing with devices such as smartphones, tablets or Trimble handhelds using Trimble Survey and GIS software
- ▶ Fast to setup, easy to use, keeping you productive and focused at your task at hand
- ▶ Supports multiple satellite constellations and correction sources for accurate data at any location
- ▶ Compact, cable-free design with integrated antenna



Trimble R2 GNSS RECEIVER

CONFIGURATION OPTION

Type	Smart antenna
Base operation	Yes, Logging only.
Rover operation	Yes
Rover position update rate	1 Hz, 2 Hz, 5 Hz
Rover operation within a VRS Now™ network	Yes

MEASUREMENTS

- Advanced Trimble Maxwell 6 custom GNSS chip
- High-precision multiple correlator for L1/L2 pseudo-range measurements
- Unfiltered, unsmoothed pseudo-range measurements data for low noise, low multipath error, low-time domain correlation, and high-dynamic response
- Very low noise carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Signal-to-noise ratios reported in dB-Hz
- Trimble EVEREST™ multipath signal rejection
- Proven Trimble low elevation tracking technology
- 220-channel GNSS
- 4-channel SBAS (WAAS/EGNOS/MSAS/GAGAN)

POSITIONING PERFORMANCE

SBAS (WAAS/EGNOS/MSAS/GAGAN) Positioning¹

Horizontal accuracy	±0.50 m
Vertical accuracy	±0.85 m

Code Differential GPS Positioning²

Correction type	DGPS RTCM 2.x
Correction source	IBSS
Horizontal accuracy	±(0.25 m + 1 ppm) RMS
Vertical accuracy	±(0.50 m + 1 ppm) RMS

Static GNSS Positioning

Static and Fast Static

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

Post-Processed Kinematic (PPK)²

Horizontal accuracy	10 mm + 1 ppm RMS
Vertical accuracy	20 mm + 1 ppm RMS

Trimble RTX Positioning^{3,4}

CenterPoint® RTX

Horizontal accuracy	2 cm RMS
Vertical accuracy	5 cm RMS

FieldPoint RTX™

Horizontal accuracy	10 cm Horizontal RMS
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RangePoint® RTX

Horizontal accuracy	30 cm Horizontal RMS
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ViewPoint RTX™

Horizontal accuracy	50 cm Horizontal RMS
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RTK Positioning²

Horizontal accuracy	10 mm + 1 ppm RMS
Vertical accuracy	20 mm + 1 ppm RMS

Network RTK²

Horizontal accuracy	10 mm + 0.5 ppm RMS
Vertical accuracy	20 mm + 0.5 ppm RMS

BATTERY AND POWER

Internal	Replaceable internal battery 7.4 V, 2800 mA-hr, Lithium-ion
External	Power input on the Mini-B USB connector, non-charging as per the USB standard 10 W USB adapter
Power consumption	4.95 W (VFD 100%), 3.7 W (VFD 12.5%) at 18 V, in rover mode

Operation time on internal battery

Rover	5 hours; varies with temperature
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MECHANICAL

User interface	LED indicators for receiver status On/Off key for one-button startup
Dimensions	14.0 cm diameter x 11.4 cm height
Weight	1.08 kg receiver only

ENVIRONMENTAL

Temperature	
Operating	-20 °C to +55 °C
Storage	-40 °C to +75 °C
Humidity	100% condensing
Waterproof	IP65
Pole drop	Designed to survive a 2 m drop onto all faces and corners onto concrete (25°C)
Shock	
Non-operating	To 75 g, 6 ms, saw-tooth
Operating	To 40 g, 10 ms, saw-tooth 100 shock events at 2 Hz rate
Vibration	MIL-STD-810G (Operating), Method 514.6, Procedure I, Category 4, Figure 514.6C-1 (Common Carrier, US Highway Truck Vibration Exposure) Total Grms levels applied are 1.95 g

INTERNAL ANTENNA

Frequency Range	L1/L2 (GPS, GLONASS, Galileo, BeiDou, QZSS), MSS (RTX), L1 SBAS
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COMMUNICATIONS

USB	1 USB 2.0 (Type B) device
Wi-Fi	Simultaneous client and access point (AP) modes
Bluetooth wireless technology	Fully-integrated, fully-sealed 2.4 GHz Bluetooth module ⁵
Network protocols	HTTP (web browser GUI); NTP Server, TCP/IP or UDP; NTRIP v1 and v2, Client mode; mDNS/uPnP service discovery; dynamic DNS; eMail alerts; network link to Google Earth; PPP and PPPoE
Supported data formats	
Correction inputs	CMR, CMR+™, CMRx, RTCM 2.x, RTCM 3.0, RTCM 3.1, RTCM 3.2
Correction outputs	None
Data outputs	NMEA, GSOF
External GSM/GPRS modem, cell phone support	
Integrated receiving radio (optional)	Integrated 450 MHz UHF Radio
Channel spacing (450 MHz)	12.5 and 25 kHz
Sensitivity (450 MHz)	-103 dBm, GMSK 9600 baud 25kHz channel spacing
Data storage	.48 MB internal memory ⁶

CERTIFICATIONS

IEC 60950-1 (Electrical Safety); FCC OET Bulletin 65 (RF Exposure Safety); FCC Part 15.105 (Class B), Part 15.247, Part 90; Bluetooth SIG; IC ES-003 (Class B); Radio Equipment Directive 2014/53/EU, RoHS, WEEE; Australia & New Zealand RCM; Japan Radio and Telecom MIC

"Made for iPhone" and "Made for iPad" mean that an electronic accessory has been designed to connect specifically to iPhone or iPad respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPhone or iPad may affect wireless performance.

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- 1 Depends on SBAS system performance.
- 2 Accuracy and reliability may be subject to anomalies such as multipath, obstructions, satellite geometry, interference and atmospheric conditions. Always follow recommended practices.
- 3 CenterPoint RTX accuracy is typically achieved within 5 minutes in select regions, and within 30 minutes worldwide. FieldPoint RTX accuracy is typically achieved within 5 minutes in select regions, and within 15 minutes worldwide. RangePoint RTX and ViewPoint RTX accuracy is typically achieved within 5 minutes worldwide.
- 4 Receiver accuracy and convergence time varies based on GNSS constellation health, level of multipath, and proximity to obstructions such as large trees and buildings.
- 5 Bluetooth type approvals are country-specific. For more information, contact your local Trimble office or representative.
- 6 The actual available capacity of the internal memory is less than the specified capacity because the firmware occupies part of the memory. The available capacity may change when you upgrade receiver firmware.

Specifications subject to change without notice.



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Trimble R8s

GNSS SYSTEM

One Receiver Configured for Today Scalable for Tomorrow

Rather than a pre-configured system, the Trimble® R8s GNSS system gives you just the features and benefits you need, in one flexible, scalable system. It's never been easier to build a system tailored to your job.

The Trimble R8s easily integrates with Trimble S-Series total stations and the innovative Trimble V10 imaging rover. Create a complete solution by combining the Trimble R8s receiver with a Trimble controller running Trimble Access™ field software, and Trimble Business Center office software.

Configure and Scale With Ease

With the Trimble R8s, it's easy and simple to build a receiver that is right for the job. Choose the configuration level that suits your needs best, whether it's post-processing, base, rover, or a combination of base and rover functionality. After you've selected a configuration level, additional individual options can be added to further extend the receiver functionality.

The Trimble R8s offers the ultimate in scalability. As your requirements change, the Trimble R8s can adapt. Simply add functionality whenever you need it.

Trimble 360 Technology

Each Trimble R8s comes integrated with powerful Trimble 360 tracking technology that supports signals from all existing and planned constellations, and augmentation systems. Trimble 360 technology can expand the reach of your GNSS rover to sites that were previously inaccessible due to moderate vegetation or other obstructions by taking advantage of the availability of additional satellite signals.

The Trimble R8s includes two integrated Maxwell™ 6 chips and 440 GNSS channels. Capable of tracking a full range of satellite systems, including GPS, GLONASS, Galileo, BeiDou and QZSS.

Communication Options and Remote Access Via Web UI

The Trimble R8s GNSS receiver provides data communication options including an integrated wide-band UHF radio or 3G cellular modem.

Trimble's exclusive Web UI eliminates the need to travel for routine monitoring of base station receivers.

The Complete Solution

Create an industry-leading field solution by pairing the Trimble R8s GNSS receiver with a powerful Trimble controller loaded with our easy-to-use Trimble Access field software.

Trimble Access field software offers the features and capabilities to simplify everyday work. Our streamlined workflow modules such as Roads, Monitoring, Mines, and Tunnels guide crews through common project types, enabling them to get the job done faster. Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK).

Once you're back in the office, Trimble Business Center enables you to check, process and adjust your data with confidence. No matter what Trimble solution you use in the field, you can trust that Trimble Business Center office software will help you generate industry leading deliverables.

Trimble Mobile App—A New Way to Quickly Collect GNSS Raw Data

The Trimble DL Android app provides a simple and easy to use mobile interface for collecting static GNSS raw data for post-processing purposes without the need of using a Trimble controller or Trimble Access field software. This free of charge app is available through the Google Play Store and operates on Android smart phones and tablets.

Key Features

- ▶ One configurable receiver that is scalable for future needs
- ▶ Available in post-processing, base only, rover only, or base & rover configurations
- ▶ Advanced satellite tracking with Trimble 360 receiver technology
- ▶ Includes Trimble Maxwell 6 chips with 440 channels
- ▶ Simple integration with Trimble S-Series Total Stations and the V10 Imaging Rover
- ▶ Intuitive Trimble Access Field Software and Trimble Business Center Office Software



PERFORMANCE SPECIFICATIONS¹

Measurements

- Advanced Trimble Maxwell 6 Custom Survey GNSS chips with 440 channels
- Future-proof your investment with Trimble 360 tracking
- High precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, un-smoothed 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
- Satellite signals tracked simultaneously:
 - GPS: L1C/A, L1C, L2C, L2E, L5
 - GLONASS: L1C/A, L1P, L2C/A, L2P, L3
 - SBAS: L1C/A, L5 (for SBAS satellites that support L5)
 - Galileo: E1, E5A, E5B
 - BeiDou (COMPASS): B1, B2
- SBAS: QZSS, WAAS, EGNOS, GAGAN
- Positioning rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz

POSITIONING PERFORMANCE²

Code differential GNSS positioning

Horizontal	0.25 m + 1 ppm RMS
Vertical	0.50 m + 1 ppm RMS
SBAS differential positioning accuracy ³	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 Fast Static	
Horizontal	3 mm + 0.5 ppm RMS
Vertical	5 mm + 0.5 ppm RMS

Postprocessed Kinematic (PPK) GNSS surveying

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

Real Time Kinematic surveying

Single Baseline <30 km	
Horizontal	8 mm + 1 ppm RMS
Vertical	15 mm + 1 ppm RMS
Network RTK ⁴	
Horizontal	8 mm + 0.5 ppm RMS
Vertical	15 mm + 0.5 ppm RMS

Initialization time ⁵	typically <8 seconds
Initialization reliability ⁵	typically >99.9%

HARDWARE

Physical

Dimensions	19 cm x 10.4 cm (7.5 in x 4.1 in), including connectors
Weight	1.52 kg (3.35 lb) with internal battery, internal radio and antenna 3.81 kg (8.40 lb) items above plus range pole, controller & internal radio

Operating Temperature ⁶	-40 °C to +65 °C (-40 °F to +149 °F)
Storage Temperature	-40 °C to +75 °C (-40 °F to +167 °F)
Humidity	100%, condensing
Ingress Protection	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 2 m (6.6 ft) pole drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
Vibration	MIL-STD-810F, FIG.514.5C-1

ELECTRICAL

- Power 10.5 V DC to 28 V DC external power input with over-voltage protection on Port 1 (7-pin Lemo)
- Rechargeable, removable 7.4 V, 2.8 Ah Lithium-ion smart battery
- Power consumption is <3.2 W in RTK rover mode with internal radio and Bluetooth[®] in use⁷
- Operating times on internal battery⁸:
 - 450 MHz receive only option.....5.0 hours
 - 450 MHz receive/transmit option (0.5 W)2.5 hours
 - Cellular receive option.....4.0 hours

COMMUNICATIONS AND DATA STORAGE

- Serial: 3-wire serial (7-pin Lemo) on Port 1; full RS-232 serial (Dsub 9 pin) on Port 2
- Radio Modem¹: fully Integrated, sealed 450 MHz wide band receiver/transmitter with frequency range of 403 MHz to 473 MHz, support of Trimble, Pacific Crest, and SATEL radio protocols:
 - Transmit power: 0.5 W
 - Range: 3–5 km typical / 10 km optimal⁹
- Cellular¹: fully integrated, sealed internal GSM/GPRS/EDGE/UMTS/HSPA+ modem option. CSD (Circuit-Switched Data) and PSD (Packet-Switched Data) supported.Global Operation:
 - Penta-Band UMTS/HSPA+ (850/800, 900, 1900, and 2100 MHz)
 - Quad-Band GSM/CSD & GPRS/EDGE (850, 900, 1800, and 1900 MHz)
- Bluetooth: fully integrated, fully sealed 2.4 GHz communications port (Bluetooth)¹⁰
- External communication devices for corrections supported on Serial and Bluetooth ports
- Data storage: 56 MB internal memory, 960 hours of raw observables (approx. 1.4 MB/day), based on recording every 15 sec from an average of 14 satellites

Data Formats

- CMR, CMR+, CMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 inputs and outputs
- 23 NMEA outputs, GSOF, RT17 and RT27 outputs, supports BINEX and smoothed carrier

WebUI

- Offers simple configuration, operation, status, and data transfer
- Accessible via Serial and Bluetooth

Supported Trimble Controllers¹

- Trimble TSC3, Trimble Slate, Trimble CU, Trimble Tablet Rugged PC

CERTIFICATIONS

IEC 60950-1 (Electrical Safety); FCC OET Bulletin 65 (RF Exposure Safety); FCC Part 15.105 (Class B), Part 15.247, Part 90; PTCRB (AT&T); Bluetooth SIG; IC ES-003 (Class B); Radio Equipment Directive 2014/53/EU, RoHS, WEEE; Australia & New Zealand RCM; Japan Radio and Telecom MIC

1 Based on Trimble R8s GNSS receiver configuration. Radio frequency settings are country specific.
 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 time 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 SBAS system performance.
 4 Network RTK PPM values are referenced to the closest physical reference 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, internal batteries are rated to -20 °C, optional internal cellular modem operates to -40 °C.
 7 Tracking GPS, GLONASS and SBAS satellites.
 8 Varies with temperature and wireless data rate. When using a receiver and internal radio in the transmit mode, it is recommended that an external 6 Ah or higher battery is used. The specified operating times on an internal battery for the cellular receive option are in GSM CSD (Circuit-Switched Data) or GPRS PSD (Packet-Switched Data) mode.
 9 Varies with terrain and operating conditions.
 10 Bluetooth type approvals are country specific.

Specifications subject to change without notice.



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Trimble R10

MODEL 2 GNSS SYSTEM

PURE, UNINTERRUPTED SURVEYING

Collect more accurate data faster and easier, no matter what the job or the environment, with the Trimble® R10 GNSS system.

Trimble 360 Receiver

Powerful Trimble 360 receiver technology in the Trimble R10 supports signals from all existing and planned GNSS constellations and augmentation systems. With the latest and most advanced Trimble GNSS technology, the Trimble R10 offers an unparalleled 672 GNSS channels to future-proof your investment.

The new Trimble R10 also provides improved interference protection to suppress a variety of intentional and unintentional sources of interference, as well as spoofing, for optimal performance in today's increasingly crowded signal frequency spectrum.

Trimble HD-GNSS Processing Engine

The advanced Trimble HD-GNSS processing engine provides markedly reduced convergence times as well as high position and precision reliability while reducing measurement occupation time. Transcending traditional fixed/float techniques, it provides a more accurate assessment of error estimates than traditional GNSS technology.

Trimble SurePoint

With Trimble SurePoint™ technology, an electronic level bubble is displayed on the Trimble controller screen, allowing surveyors to maintain focus where it matters most. Full tilt compensation allows the survey pole to be tilted up to 15° when measuring, allowing the Trimble R10 to capture points that would be inaccessible to other GNSS surveying systems.

Trimble CenterPoint RTX

Trimble CenterPoint® RTX delivers RTK level precision anywhere in the world without the use of a local base station or VRS™ network. Survey using satellite or internet delivered CenterPoint RTX correction services in areas where terrestrial based corrections are not available.

Trimble xFill

Leveraging a worldwide network of Trimble GNSS reference stations and satellite datalinks, Trimble xFill® technology seamlessly fills in for gaps in your RTK or VRS correction stream. Maintain centimeter-level accuracy beyond 5 minutes with a CenterPoint RTX subscription.

Smart, Versatile

The Trimble R10 is a versatile solution, loaded with smart features to support any workflow, all day long:

- ▶ Integrated cellular modem to receive VRS corrections or operate as a mobile hotspot
- ▶ Wi-Fi to connect to a laptop or smartphone to configure the receiver without a Trimble controller
- ▶ Bluetooth to connect to an Android or iOS mobile device running supported apps
- ▶ 6 GB internal memory to store raw observations
- ▶ Smart lithium-ion battery, with built-in battery status indicator
- ▶ Improved power management increases battery life and operating time in the field on average by 33%

Key Features

- ▶ Advanced satellite tracking with Trimble 360 receiver technology and latest generation Trimble Custom Survey GNSS ASIC with 672 GNSS channels
- ▶ Improved protection against sources of interference and spoofed signals
- ▶ Support for Android and iOS platforms
- ▶ Cutting-edge Trimble HD-GNSS processing engine
- ▶ Precise position capture and full tilt compensation with Trimble SurePoint technology
- ▶ Trimble CenterPoint RTX provides RTK level precision worldwide without the need for a base station or VRS network
- ▶ Trimble xFill technology provides centimeter-level positioning during connection outages
- ▶ Sleek ergonomic design for easier handling



PERFORMANCE SPECIFICATIONS

MEASUREMENTS

Measuring points sooner and faster with Trimble HD-GNSS technology	
Increased measurement productivity and traceability with Trimble SurePoint electronic level bubble and tilt compensation	
Worldwide centimeter-level positioning using Trimble CenterPoint RTX satellite or internet delivered correction services	
Reduced downtime due to loss of radio signal or cellular connectivity with Trimble xFill technology	
Advanced Trimble Custom Survey GNSS chips with 672 channels	
Future-proof your investment with Trimble 360 GNSS tracking	
Satellite signals tracked simultaneously	GPS: L1C/A, L2C, L2E, L5 GLONASS: L1C/A, L1P, L2C/A, L2P, L3 SBAS: L1C/A, L5 (For SBAS satellites that support L5) Galileo: E1, E5A, E5B, E5 AltBOC, E6 ¹ BeiDou: B1, B2, B3 QZSS: L1C/A, L1-SAIF, L1C, L2C, L5 NavIC (IRNSS): L5
CenterPoint RTX, OmniSTAR [®] HP, XP, G2, VBS correction services	
WAAS, EGNOS, GAGAN, MSAS	
Reliable tracking in challenging environments with advanced Low Noise Amplifier (LNA) with 50 dB signal gain to reduce signal tracking effects caused by high power out-of-band transmitters	
Additional iridium filtering above 1616 MHz allows antenna to be used as close as 20 m of iridium transmitter	
Additional Japanese filtering below 1510 MHz allows antenna to be used as close as 100 m of Japanese LTE cell tower	
Digital Signal Processor (DSP) techniques to detect and recover from spoofed GNSS signals	
Advanced Receiver Autonomous Integrity Monitoring (RAIM) algorithm to detect and reject problem satellite measurements to improve position quality	
Improved protection from erroneous ephemeris data	
Positioning Rates	1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz

POSITIONING PERFORMANCE²

CODE DIFFERENTIAL GNSS POSITIONING

Horizontal	0.25 m + 1 ppm RMS
Vertical	0.50 m + 1 ppm RMS
SBAS differential positioning accuracy ³	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 Fast Static

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

REAL TIME KINEMATIC SURVEYING

Single Baseline <30 km

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

Network RTK⁴

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

RTK start-up time for specified precisions⁵

	2 to 8 seconds
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TRIMBLE RTX™ TECHNOLOGY (SATELLITE AND CELLULAR/INTERNET (IP))

CenterPoint RTX⁶

Horizontal	2 cm RMS
Vertical	5 cm RMS
RTX convergence time for specified precisions - Worldwide	< 15 min
RTX QuickStart convergence time for specified precisions	< 1 min
RTX convergence time for specified precisions in select regions (Trimble RTX Fast Regions)	< 1 min

TRIMBLE XFILL⁷

Horizontal	RTK ⁸ + 10 mm/minute RMS
Vertical	RTK ⁸ + 20 mm/minute RMS

Trimble R10 MODEL 2 GNSS SYSTEM

HARDWARE

PHYSICAL

Dimensions (W×H)	11.9 cm x 13.6 cm (4.6 in x 5.4 in)	
Weight	1.12 kg (2.49 lb) with internal battery, internal radio with UHF antenna, 3.57 kg (7.86 lb) items above plus range pole, controller & bracket	
Temperature ⁹	Operating	-40 °C to +65 °C (-40 °F to +149 °F)
	Storage	-40 °C to +75 °C (-40 °F to +167 °F)
Humidity	100%, condensing	
Ingress protection	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 2 m (6.6 ft) pole drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
	Vibration	MIL-STD-810F, FIG.514.5C-1

ELECTRICAL

	Power 11 to 24 V DC external power input with over-voltage protection on Port 1 and Port 2 (7-pin Lemo)	
	Rechargeable, removable 7.4 V, 3.7 Ah Lithium-ion smart battery with LED status indicators	
	Power consumption is 4.2 W in RTK rover mode with internal radio ¹⁰	
Operating times on internal battery ¹¹		
	450 MHz receive only option	6.5 hours
	450 MHz receive/transmit option (0.5 W)	6.0 hours
	450 MHz receive/transmit option (2.0 W)	5.5 hours
	Cellular receive option	6.5 hours

COMMUNICATIONS AND DATA STORAGE

Serial	3-wire serial (7-pin Lemo)	
USB v2.0	Supports data download and high speed communications	
Radio modem	Fully Integrated, sealed 450 MHz wide band receiver/transmitter with frequency range of 403 MHz to 473 MHz, support of Trimble, Pacific Crest, and SATEL radio protocols:	
	Transmit power	2 W
	Range	3–5 km typical / 10 km optimal ¹²
Cellular	Integrated, 3.5 G modem, HSDPA 7.2 Mbps (download), GPRS multi-slot class 12, EDGE multi-slot class 12, Penta-band UMTS/HSDPA (WCDMA/FDD) 800/850/900/1900/2100 MHz, Quad-band EGSM 850/900/1800/1900 MHz, GSM CSD, 3GPP LTE	
Bluetooth	Fully integrated, fully sealed 2.4 GHz communications port (Bluetooth) ¹³	
Wi-Fi	802.11 b.g, access point and client mode, WPA/WPA2/WEP64/WEP128 encryption	
USB v2.0	Supports data download and high speed communications	
External communication devices for corrections supported on	Serial, USB, TCP/IP and Bluetooth ports	
Data storage	6 GB internal memory; over ten years of raw observables (approx. 1.4 MB /day), based on recording every 15 seconds from an average of 14 satellites	
Data format	CMR+, CMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 input and output 24 NMEA outputs, GSOF, RT17 and RT27 outputs	

WEBUI

	Offers simple configuration, operation, status, and data transfer
	Accessible via Wi-Fi, Serial, USB, and Bluetooth

SUPPORTED CONTROLLERS

	Trimble TSC7, Trimble T10, Trimble TSC3, Trimble Slate, Trimble CU, Trimble Tablet Rugged PC, Android and iOS devices running supported apps
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CERTIFICATIONS

	FCC Part 15 (Class B device), 24, 32; CE Mark; RCM; PTCRB; BT SIG
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Trimble R10 MODEL 2 GNSS SYSTEM

- 1 The current capability in the receivers is based on publicly available information. As such, Trimble cannot guarantee that these receivers will be fully compatible with a future generation of Galileo satellites or signals.
- 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.
- 6 Initialization reliability is continuously monitored to ensure highest quality.
- 7 RMS performance based on repeatable in field measurements. Achievable accuracy and initialization time may vary based on type and capability of receiver and antenna, user's geographic location and atmospheric activity, scintillation levels, GNSS constellation health and availability and level of multipath including obstructions such as large trees and buildings.
- 8 Accuracies are dependent on GNSS satellite availability. xFill positioning without a Trimble CenterPoint RTX subscription ends after 5 minutes of radio downtime. xFill positioning with a CenterPoint RTX subscription will continue beyond 5 minutes providing the Trimble RTX solution has converged, with typical precisions not exceeding 6 cm horizontal, 14 cm vertical or 3 cm horizontal, 7 cm vertical in Trimble RTX Fast regions. xFill is not available in all regions, check with your local sales representative for more information.
- 9 RTK refers to the last reported precision before the correction source was lost and xFill started.
- 10 Receiver will operate normally to -40 °C, internal batteries are rated to -20 °C.
- 11 Tracking GPS, GLONASS and SBAS satellites.
- 12 Varies with temperature and wireless data rate. When using a receiver and internal radio in the transmit mode, it is recommended that an external 6 Ah or higher battery is used.
- 13 Varies with terrain and operating conditions.
- 14 Bluetooth type approvals are country specific.

Specifications subject to change without notice.



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