Trimble R980

GNSS SYSTEM

The Trimble® R980 GNSS system is a premier solution for land surveyors, offering exceptional accuracy and efficiency. Featuring the Trimble ProPoint® GNSS engine and Trimble Inertial Platform™ (TIP™) IMU-based tilt compensation, users can collect precise data in challenging environments without leveling the pole. A full suite of connectivity options makes accessing real-time corrections in the field seamless.

Performance specifications

GNSS TECHNOLOGY	
	Constellation agnostic, flexible signal tracking, improved positioning in challenging environments[1] and inertial measurement integration with Trimble ProPoint GNSS technology.
	Increased measurement and stakeout productivity and traceability with Trimble TIP technology IMU-based tilt compensation
	Dual Trimble Maxwell™ 7 Custom GNSS chips with 672 channels
	Trimble EVEREST™ Plus multipath signal rejection
	Trimble IonoGuard™ technology for mitigation of ionospheric GNSS signal disruptions
	Trimble CenterPoint® RTX correction service is activated and ready to use for the initial 12 months. Learn more at **rtx.trimble.com**
	Spectrum Analyzer to troubleshoot GNSS jamming
	Digital Signal Processor (DSP) techniques to detect and recover from spoofed GNSS signals
	Iridium filtering above 1616 MHz allows antenna to be used up to 20 m away from iridium transmitter
	Japanese LTE filtering below 1510 MHz allows antenna to be used up to 100 m away from Japanese LTE cell tower
SATELLITE TRACKING	
	GPS: L1C, L1C/A, L2C, L2E, L5
	GLONASS: L1C/A, L1P, L2C/A, L2P, L3
	SBAS (WAAS, EGNOS, GAGAN, MSAS, SDCM): L1C/A, L5
	Galileo: E1, E5A, E5B, E5 AltBOC, E6[2]
	BeiDou: B1I, B1C, B2I, B2A, B2B, B3I
	QZSS: L1C/A, L1S, L1C, L2C, L5, L6
	NavIC (IRNSS): L5
	L-band: Trimble RTX® Corrections

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Positioning performance[3]

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 RTK[4]	Horizontal	8 mm + 0.5 ppm RMS
	Vertical	15 mm + 0.5 ppm RMS
	RTK start-up time for specified precisions[5]	2 to 8 seconds
TRIMBLE INERTIAL PLATFORM (TIP) TECHNOLOGY		
TIP Compensated Surveying[6]	Horizontal	RTK + 3mm + 0.15mm/°tilt (up to 40°) RMS
	Horizontal	RTX + 3mm + 0.15mm/°tilt (up to 40°) RMS
IMU Integrity Monitor	Bias monitoring	Temperature, age and shock
Operation	IMU alignment	Calibration-free and immune to magnetic interference
TRIMBLE RTX CORRECTION SERVICES		
CenterPoint RTX[7]	Horizontal	2 cm RMS
	Vertical	3 cm RMS
	Convergence time for specified precisions in Trimble RTX Fast regions	< 1 min
	Convergence time for specified precisions in non Trimble RTX Fast regions	< 3 min
	QuickStart convergence time for specified precisions	< 1 min
TRIMBLE XFILL®[8]		
	Horizontal	RTK[9] + 10 mm/minute RMS
	Vertical	RTK[9] + 20 mm/minute RMS
Code differential GNSS positioning	Horizontal	0.25 m + 1 ppm RMS
	Vertical	0.50 m + 1 ppm RMS
	SBAS[10]	Typically < 5 m 3DRMS

Hardware

PHYSICAL		
Dimensions (W×H)	11.9 cm x 13.6 cm (4.6 in x 5.4 in)	
Weight	0.84 kg (1.85 lb) receiver only, no radio model	
	0.86 kg (1.90 lb) receiver only, radio model	
	1.13 kg (2.49 lb) total weight including internal battery and UHF antenna	
	3.96 kg (8.73 lb) items above plus range pole, Trimble TSC7 data collector and bracket	
TEMPERATURE[11]		
	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	
Ingress protection	IP67 for temporary submersion to depth of 1 m (3.3 ft), dustproof	

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SHOCK AND VIBRATION		
	Pole drop	Designed to survive a 2 m (6.6 ft) pole drop onto a hard surface
	Shock - Non-operating	To 75 g, 6 ms
	Shock - Operating	To 40 g, 10 ms, saw-tooth
	Vibration	MIL-STD-810H, Fig 514.8C-6
ELECTRICAL		
External	11 to 24 V DC external power input with over-voltage protection on Port 1 and Port 2 (7-pin Lemo)	
Battery	Rechargeable, removable 7.4 V, 3.7 Ah Lithium-ion smart battery with LED status indicators	
Power consumption	4.2–4.6 W in rover mode with internal 450 MHz receive radio	5.5–6.6 W in base mode with internal 450 MHz transmit radio
	4.0 W in rover mode with internal 900 MHz receive radio	4.3 W in base mode with internal 900 MHz transmit radio
	3.7 W in rover mode with internal LTE modem	3.7 W in base mode with internal LTE modem
OPERATING TIMES ON INTERNAL BATTERY[12]		
Rover	450 or 900 MHz receive	5.5–6.3 hours
	Cellular receive (Internal or Controller via Bluetooth®)	7.0 hours
Base station	450 MHz transmit	3.7–5.8 hours (1.0 W transmit available only where legally permitted)
	900 MHz transmit (1.0 W)	6.0 hours (900 MHz transmit available only where legally permitted)
	Cellular transmit	7.0 hours

Communications and data storage

Radio modem	Fully-integrated, sealed 450 MHz wide band transceiver with frequency range of 410-473 MHz (RED 2014/53/EU compliant) or dual-band 450/900 MHz transceiver (410-473 / 902-928[13] MHz frequency range)	
	Support for Trimble, Pacific Crest, and SATEL radio protocols	
	Transmit power	0.1 W, 0.5 W, 1.0 W (1.0 W available only where legally permitted)
	Range	3-5 km typical, 10 km optimal[14]
Cellular	Fully integrated, fully-sealed LTE compliant module with 2G/3G fallback	FDD-LTE: bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 26, 28, 66
		TD-LTE: bands 38, 40
		UMTS (WCDMA/FDD): bands 1, 2, 3, 4, 5, 6, 8, 19
		Quad band GSM: 850, 900, 1800, 1900 MHz
Bluetooth	Fully-integrated, fully-sealed 2.4 GHz Bluetooth module	Bluetooth EDR/BR v5.1
Wi-Fi®	Fully-integrated, fully-sealed 2.4 GHz Wi-Fi module	Simultaneous Access Point (AP) and Client modes
Positioning rates	1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz	
I/O ports	Serial, USB, TCP/IP, IBSS/NTRIP, Bluetooth	
Data storage	9 GB internal memory	
Correction fomats	CMRx, CMR+, CMR, RTCM 2.x, RTCM 3.x (RTCM output not supported for 900 MHz UHF)	
Data outputs	NMEA 0183, GSOF, RT17 and RT27	
Serial	7-pin 0S Lemo, 3-wire RS-232	
USB	USB v2.0, supports data download and high speed communications	
Web UI	Offers simple configuration, operation, status, and data transfer using desktop or mobile web browsers	
	Accessible via Wi-Fi, Serial, USB, and Bluetooth	

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SUPPORTED CONTROLLERS & FIELD SOFTWARE	
	Trimble TSC7, TSC5, Trimble TDC6, Trimble T100, Trimble T7, Android™ and iOS devices running supported apps
	Trimble Access™ 2024.00 and later
	Supports Trimble Internet Base Station Service (IBSS) for streaming RTK corrections using Trimble Access 2023.10 and later

Certifications

Safety	IEC 62368-1, IEC 60950-1, IEC 62311, IEEE C95.3, UN 38.3, UL 2054
FCC	Part 15 Subpart B (Class B), Subpart C, Section 15.247, Part 90, Part 22/24/27, Part 2, KDB 447498 D01
Canada	ICES-003 (Class B). RSS-GEN, RSS-102, RSS-119, RSS-130, RSS-132, RSS-133, RSS-139, RSS-199, RSS-247
EU	RED 2014/53/EU, EN 300 113, EN 300 487, EN 300 328, EN 301 908, EN 303 413, RoHS Directive 2011/65/EU, WEEE Directive 2012/19/EU
UKCA	S.I. 2017 No. 1206, S.I. 2016 No. 1091, S.I. 2016 No. 1101
ACMA	AS/NZS 4268, AS/NZS CISPR 32
Communications	PTCRB, Bluetooth SIG, AT&T (data-only SIM)

Trimble Protected protection plans

Add a Trimble Protected protection plan for worry-free ownership over and above the standard Trimble product warranty. Added enhancements include coverage for wear & tear, environmental damage, and more. Accidental damage is covered with Premium plans, available only at point-of-sale in selected regions. For details, visit **trimbleprotected.com** or contact a local Trimble distributor.

1 Challenging GNSS environments are locations where the receiver has sufficient satellite availability to achieve minimum accuracy requirements, but where the signal may be partly obstructed by and/or reflected off of trees, buildings, and other objects. Actual results may vary based on user's geographic location and atmospheric activity, scintillation levels, GNSS constellation health and availability, and level of multipath and signal occlusion.
2 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.
3 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.
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. Initialisation reliability is continuously monitored to ensure highest quality.
6 TIP references the overall positioning error estimate at the tip of the surveying pole throughout the tilt compensation range. RTK refers to the estimated horizontal precision of the underlying GNSS position, which is dependent on factors that affect GNSS solution quality. The 3 mm constant error component accounts for residual misalignment between the vertical axes of the receiver and the built-in Inertial Measurement Unit (IMU) after factory calibration, assuming the receiver is mounted on a standard 2 m carbon fiber range pole which is properly calibrated and free from physical defects. The tilt-dependent error component is a function of the quality of the computed tilt azimuth, which is assumed here to be aligned using optimal GNSS conditions. To achieve + 3 mm + 0.15 mm/°tilt (up to 40°) RMS tilt spec, firmware version 6.43 or later is required.
7 RMS performance based on repeatable in field measurements. Achievable accuracy and initialisation 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 ends after 5 minutes of radio downtime. 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 Depends on SBAS system performance.
11 Receiver will operate normally to -40 °C, internal batteries are rated from -20 °C to +60 °C (ambient +50 °C).
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.
13 900 MHz range only available in select regions.
14 At 1.0 W transmit power. Varies with terrain and operating conditions.

Specifications subject to change without notice.

Made for
- iPhone 13
- iPhone 13 Pro
- iPhone 13 Pro Max
- iPad (9th generation)
- iPad Pro 12.9-in. (5th generation)
- iPad Pro 11-in. (3rd generation)

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