# Trimble R980

GNSS SYSTEM

**Unmatched GNSS performance with connected workflows to elevate survey productivity.**


## Seamless connectivity. Total confidence.

### Productive

Trimble® Inertial Platform™ (TIP™) technology. Calibration-free IMU-based tilt compensation for topo measurements and stakeout.

Trimble ProPoint® GNSS positioning engine. Engineered for improved accuracy and productivity in challenging GNSS conditions.

Trimble CenterPoint® RTX corrections for RTK level accuracy worldwide via satellite or internet.

### Connected

Integrated 450 MHz or dual-band 450/900 MHz UHF transceiver.

Integrated worldwide 4G LTE modem.

Internet base station and remote receiver control capabilities.

Bluetooth® and Wi-Fi® data connectivity.

### Trusted

Trimble TIP integrity monitoring.

Trimble xFill® correction outage technology.

Trimble IonoGuard™ technology for mitigation of ionospheric GNSS signal disruptions.

Military-spec rugged design and IP-67 rating.

Lithium ion battery with built-in status indicator.

Trimble®

Find out more at:
geospatial.trimble.com/r980

SPEC SHEET

# Trimble R980

GNSS system

## 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 |

## 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 + 5 mm + 0.4 mm/° tilt (up to 30°) RMS |
| | Horizontal | RTX + 5 mm + 0.4 mm/° tilt (up to 30°) 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 |

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## GNSS system

| 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 | 1.13 kg (2.49 lb) with internal battery, integrated radio and UHF antenna<br>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 | |
| 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 | 5.4–6.6 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 (0.5 W) | 4.7 hours |
| | 450 MHz transmit (1.0 W) | 3.7–4.1 hours<br>(1.0 W transmit available only where legally permitted) |
| | 900 MHz transmit (1.0 W) | 6.0 hours<br>(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 | 0.5 W, 1.0 W (1.0 W available only where legally permitted) |
| | Range | 3-5 km typical, 10 km optimal[14] |
| Cellular[15] | 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 | |

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| | |
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| **Web UI** | |
| | Offers simple configuration, operation, status, and data transfer using desktop or mobile web browsers |
| | Accessible via Wi-Fi, Serial, USB, and Bluetooth |
| **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.<br>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.<br>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 5 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.
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 Varies with terrain and operating conditions.
15 Due to local regulations, the integrated cellular modem cannot be enabled in China, Taiwan, or Brazil. A Trimble controller integrated cellular modem or external cellular modem can be used to obtain GNSS corrections via an IP (Internet Protocol) connection.

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)

Made for iPhone | iPad

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