Trimble R750 Model 2

MODULAR GNSS RECEIVER

Base station solution with advanced technologies for accurate and reliable data.

Connected receiver for precision and flexibility

Advanced

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

Trimble Maxwell™ 7 GNSS ASIC dual chipset tracks the latest signals from all GNSS constellations with improved EVEREST™ Plus multipath mitigation, interference detection, and protection against GNSS spoofing.

Trimble IonoGuard™ technology mitigates ionospheric GNSS signal disruptions.

Data logging internally and to external drive.

USB-C PD charging.

Convenient 4-line front panel display and configuration.

Connected

Integrated 450/900 MHz dual-band UHF radio.

Integrated worldwide 4G LTE modem.

Bluetooth® and Wi-Fi® data connectivity.

Ethernet, serial and USB support.

Trimble CenterPoint® RTX correction service delivers global RTK-level precision without a base station or real-time network.

Trimble xFill® correction outage technology.

Stream RTK corrections over the internet with the Trimble Internet Base Station Service (IBSS).

Flexible

Choice of configuration and features to meet the needs of your job.

Flexibility to add more functionality as requirements change.

Find out more at:
geospatial.trimble.com/r750
civilconstruction.trimble.com/r750

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SPEC SHEET

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CONFIGURATION OPTION		
MODULAR		
	Base and Rover interchangeability	Yes, upgradeable to Rover, Base or Rover and Base
	Rover position update rate	1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 Hz, 50 Hz
	Rover maximum range from base	Unrestricted, typical range 2–5 km (1.2–3 miles) without radio repeater
	Rover operation within a Trimble VRS™ network	Yes
	Heading and Moving Base operation	Yes
	Internal Memory	9.25 GB logging
GENERAL		
KEYBOARD AND DISPLAY		
	OLED Display (256 x 64), 32 characters by 4 rows	
	On/Off k y for one-button startup	
	Escape and Enter keys for menu navigation	
	4 arrow keys (up, down, left, right) for option scrolls and data entry	
Dimensions (L × W × D)	269 mm (10.6 in) × 141 mm (5.5 in) × 61 mm (2.4 in)	
Weight	2.05 kg (4.52 lb)	
GNSS ANTENNA (Recommended)		
	Zephyr™ 3 or Zephyr Model 2 series [Base, Rover, Rugged, Geodetic]	Triple-frequency GNSS (GPS, GLONASS, Galileo, BeiDou, QZSS, NavIC) MSS, SBAS
	GA830	Triple-frequency GNSS (GLONASS, Galileo, BeiDou, QZSS), MSS, SBAS
	LNA Filters	Japanese LTE filtering below 1510 MHz allows usage >100 m from LTE cell tower
		Iridium filtering above 1616 MHz allows usage >20 m from Iridium transmitter
TEMPERATURE		
	Operating[1]	-40 °C to +65 °C (-40 °F to +149 °F)
	Storage	-40 °C to +80 °C (-40 °F to +176 °F)
Humidity	93% humidity at 40 °C for a duration of 3 hours (IEC-60945 Method 8.3)	
Water ingress protection	IP67 for temporary submersion to depth of 1 m (3.3 ft), dust-proof	
SHOCK AND VIBRATION		
	Pole drop	Designed to survive a 1.1 m (3.6 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	IEC 60945 Method 8.7 Random 6.2 g RMS operating 9.8g RMS 24–2000 Hz for 1 hrs each axis survival
GNSS TECHNOLOGY		
	Advanced Trimble Maxwell 7 custom GNSS dual chipset	
	Constellation agnostic, flexible signal tracking with Trimble ProPoint technology	
	Unfiltered, unsmoothed pseudo-range measurements data for low noise, low multipath error, low-time domain correlation, and high-dynamic response	
	Trimble EVEREST multipath signal rejection	
	Trimble IonoGuard technology for mitigation of ionospheric GNSS signal disruptions	
	Spectrum Analyser to troubleshoot GNSS jamming	
	Anti-spoofi g capabilities	
	Trimble xFill technology for short gaps in correction messages	
	Multi-channel GNSS [672 channels]	
	GPS: L1 C/A, L1C, L2C, L5, L2E (Trimble method for tracking unencrypted L2P)	
	GLONASS: L1-C/A, L2-C/A, L2P, L3	
	Galileo: E1, E5A, E5B & E5AltBOC[2], E6.	
	BeiDou: B1, B1C, B2, B2A, B2B, B3	
	SBAS L1 C/A (EGNOS/MSAS/GAGAN,SDCM), L1 C/A, L5 (WAAS)	
	QZSS: L1 C/A, L1C, L1S, L2C, L5, L6D, L6E	
	NavIC (IRNSS) L5-C/A	
	MSS Band (2-channels): Trimble CenterPoint RTX correction service and Omnistar®/Marinestar® by subscription	
	Trimble CenterPoint RTX corrections service is ready to use for 12 months from TIM Activation. Learn more at rtx.trimble.com	

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POSITIONING

REGIONAL SBAS POSITIONING[3]	
WAAS, MSAS, EGNOS, QZSS, GAGAN, SDCM, SouthPAN	
Accuracy	Horizontal ± 0.50 m (1.6 ft), Vertical ± 0.85 m (2.8 ft)
PRECISE POINT POSITIONING (PPP)	
Galileo HAS, SL1 [global][2]	Horizontal ± 0.20 m (0.7 ft), Vertical ± 0.40 m (1.3 ft), Convergence 300 s
QZSS CLAS [Japan only][2]	Horizontal 0.07 m (0.2 ft) RMS, Vertical ± 0.12 m (0.4 ft) RMS
CODE DIFFERENTIAL GPS POSITIONING[4]	
Horizontal accuracy	±(0.25 m + 1 ppm) RMS ±(0.8 ft + 1 ppm) ±(250+1×D×10^{-6}) mm [D = distance from base in Km]
Vertical accuracy	±(0.50m + 1 ppm) RMS ±(1.6 ft + 1 ppm) ±(500+1×D×10^{-6}) mm [D = distance from base in Km]
OMNISTAR POSITIONING	
VBS service accuracy	Horizontal <1 m (3.3 ft)
XP service accuracy	Horizontal 0.2 m (0.66 ft), Vertical 0.3 m (1.0 ft)
HP service accuracy	Horizontal 0.1 m (0.33 ft), Vertical 0.15 m (0.5 ft)
Marinestar G2+ service accuracy	Horizontal 0.02 m (0.06 ft), Vertical 0.06 m (0.20 ft), 95%
CENTERPOINT RTX POSITIONING[5]	
Convergence time for specified precisions	<1 min [RTX Fast regions], <3 min [Worldwide]
CenterPoint RTX accuracy (with valid subscription)	Horizontal 0.02 m (0.06 ft) RMS, Vertical 0.03 m (0.1 ft) RMS
xFill mode (limited to 5 minutes) [6, 7]	RTK Horizontal + 10 mm (0.03 ft)/min RMS, RTK Vertical + 20 mm (0.06 ft)/min RMS
xFill-RTX mode (with valid CenterPoint RTX subscription) [6, 7]	Horizontal 0.03 m (0.01 ft) RMS, Vertical 0.07 m (0.2 ft) RMS
REAL-TIME KINEMATIC POSITIONING[4]	
Horizontal accuracy	8 mm + 1 ppm RMS (0.026 ft + 1 ppm RMS) ±(8+1×D×10^{-6}) mm [D = distance from base in Km]
Vertical accuracy	15 mm + 1 ppm RMS (0.05 ft +1 ppm RMS) ±(15+1×D×10^{-6}) mm [D = distance from base in Km]
NETWORKED RTK[8]	
Horizontal accuracy	8 mm + 0.5 ppm RMS ±(8+0.5×D×10^{-6}) mm [D = distance from base in Km]
Vertical accuracy	15 mm + 0.5 ppm RMS ±(15+0.5×D×10^{-6}) mm [D = distance from base in Km]
PRECISE HEADING	
Heading accuracy	With incoming Moving Base CMRx corrections
2 m antenna separation	0.09° RMS
10 m antenna separation	0.05° RMS
HIGH PRECISION STATIC	
Horizontal accuracy	3 mm + 0.1 ppm RMS (0.01 ft +0.1 ppm) ±(3+0.1xDx10^{-6}) mm [D = distance from base in Km]
Vertical accuracy	3.5 mm + 0.4 ppm RMS (0.011 ft +0.4 ppm) ±(3.5+0.4xDx10^{-6}) mm [D = distance from base in Km]
VELOCITY	
Doppler horizontal accuracy	H 0.008 m/s RMS, V 0.025 m/s RMS
INITIALIZATION TIME	
Regular RTK operation with base station	Single/Multi-base
Initialization	2–8 seconds
Initialization reliability[9]	>99.9%

POWER AND COMMUNICATIONS

Internal	Integrated internal battery 7.26 V, 6700 mAh, Lithium-ion
	Internal battery operates as a UPS during an ext power source failure
	Internal battery will charge from USB-PD source or approved AC power supply
	Integrated charging circuitry
External	Power input on 7-pin 0-shell Lemo connector is optimized for lead acid batteries with a cut-off threshold of 11.5 V. Max 28 V DC
	Power input on the 26-pin D-sub connector has a cut-off threshold of 10.5 V
	Power supply will hot-swap between internal and external sources
	USB-PD input from device capable of 15V @ 2A
	DC external power input with over-voltage protection
	Receiver automatically turns on when connected to external power
Power consumption	6.6 W in rover mode with internal receive radio
	8.5 W in base mode with internal transmit radio
OPERATION TIME ON INTERNAL BATTERY	
Rover	7 hrs: CMRx over UHF 7 hrs: VRS/IBSS over LTE (Internal or Controller via BT)
Base station	450 MHz: 5.5 hrs (0.5 W), 5.0 hrs (1 W): CMRx over UHF and LTE
	900 MHz: 7 hrs: CMRx over UHF and LTE
	Adding a USB-PD Powerpack (30,000 mAh) to a fully charged internal battery will provide ~13.9 hrs @11.4 W for a 450 MHz at 1 W
REGULATORY APPROVALS	
Country Compliance Notices	
COMMUNICATIONS	
Serial 1 (COM1)	7-pin 0S Lemo, Serial 1, 3-wire RS-232
Serial 2 (COM2)	26-pin D-sub, Serial 2, 5-wire RS232, using adaptor cable (Selectable) 26-pin D-sub, Serial 2, 4-wire RS422, using adaptor cable (Selectable)
Serial 3 (COM3)/CAN	26-pin D-sub, Serial 3, 3-wire RS232, using adaptor cable (Selectable) 2 wire CAN Output [NMEA 2000] (Selectable)
Serial 4 (COM4)	26-pin D-sub, Serial 4, 4-wire RS422, using adaptor cable (Selectable)
1PPS (1 Pulse-per-second)	Supported on both Lemo and 26-pin D-sub
Event In	Supported on Lemo
USB	USB v2 (Supports USB-PD charging)
Ethernet	Through a multi-port adaptor (PN 57168)
Wi-Fi	Fully-integrated, fully-sealed 2.4 GHz Wi-Fi module Simultaneous Access Point (AP) and Client modes
Bluetooth wireless technology	Fully-integrated, fully-sealed 2.4 GHz Bluetooth module[10]
Cellular	Fully-integrated, fully-sealed LTE compliant module Nano-SIM card FDD-LTE: bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 26, 28, 66 TD-LTE: bands 38, 40, 41 UMTS (WCDMA/FDD): bands 1, 3, 2, 4, 5, 6, 8, 19 Quad Band GSM: 850, 900, 1800, 1900 MHz

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NETWORK PROTOCOLS	
HTTP (web browser GUI)	HTTP, HTTPS
NTP Server	Yes
TCP/IP or UDP	Yes
NTRIP	NTRIP v1 and v2, Client, Server and Caster modes
mDNS/uPnP Service discovery	Yes
Dynamic DNS	Yes
eMail alerts	Supports SSL/TLS secure Email Servers
INTEGRATED RADIO (Hardware dependant)	
Fully-integrated, fully-sealed internal 403-473 MHz or dual band 410-475 MHz / 902-928 MHz; Rx/Tx	
450 MHz Band	12.5 kHz or 25 kHz spacing available
Sensitivity	-114 dBm (12 dB SINAD)
Transmit power	0.1 W, 0.5 W, 1.0 W [Configured by Trimble Dealer]
Frequency approvals	403-473 MHz (PN 218500-40) ETSI Compliant 410-475 MHz (PN 218500-50) Worldwide excluding UAE/S. Africa/Thailand (Depending on the local licensing)
900 MHz Band	Fully-integrated, internal 900 MHz; Tx/Rx [1.0 W]
Frequency approvals (902-928 MHz)	USA/Canada/Australia/NZ
INTERNAL MSS DEMODULATOR (L-BAND)	
Channels	2
Frequency range	1525–1559 MHz
Correction Services[11]	Trimble CenterPoint RTX, OmniSTAR and Fugro Marinestar
CELLULAR SUPPORT	
Internet-based correction streams: (IBSS, VRS, NTRIP)	Internal LTE modem Connected smartphone Connected Trimble Controller (SiteWorks, Trimble Access™)
Remote access	Using DynDNS and appropriate service

INPUT/OUTPUT	
Correction data	CMR, CMR+™, CMRx, RTCM 2.x, RTCM 3, RTCM 3.3(MSM) MSS [Marinestar, Trimble RTX®]
Data outputs	NMEA 0183, NMEA 2000, GSOF, 1PPS Time Tags, RT17, RT27
Data inputs	Event
Maximum data rate	50 Hz (depending on data type)
FEATURES AND UPGRADES	
Standard Options[12]	RTX Rover, GPS, GLN, BDS, GAL, QZSS, SBAS, 3F, XFill, NMEA, Wi-Fi, Logging, Field Radio, Moving Base
Raw data logging (*.T02, *.T04)	9.25 GB Internal
Precision upgrades[13]	Precise Base, Precise Rover with Base as backup, Rover 10/2, Rover 10/10
Signal / Constellation upgrades	All constellations and signals are included as standard
Feature upgrades	Programmatic interface

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 Operating up to +65 °C ambient when the device is powered by external DC supply and the battery is fully charged or is not being charged. Operating up to +30 °C ambient when the battery is being charged by an external DC supply Operating up to +48 °C ambient when the device is powered by a USB-PD battery or charger.
2 The receivers' current capability is based on publicly available information. As such, Trimble cannot guarantee they will be fully compatible with future generations of Galileo and QZSS satellites or signals.
3 Depends on SBAS system performance.
4 Accuracy and reliability may be subject to anomalies such as multipath, obstructions, satellite geometry, interference and atmospheric conditions. Always follow recommended survey practices.
5 Receiver accuracy and convergence time varies based on GNSS constellation health, level of multipath, and proximity to obstructions such as large trees and buildings.
6 Accuracies are dependent on GNSS satellite availability. xFill positioning without an xFill Premium subscription ends after 5 minutes of radio downtime. xFill Premium will continue beyond 5 minutes providing the solution has converged, with typical precisions not exceeding 3 cm horizontal, 7 cm vertical. xFill is not available in all regions, check with your local sales representative for more information.
7 RTK refers to the last reported precision before the correction source was lost and xFill started.
8 Networked RTK PPM values are referenced to the closest physical base station.
9 May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
10 Bluetooth type approvals are country specific. For more information, contact your local Trimble office or representative.
11 Correction services supported are subject to regional availability.
12 Standard options are dependent on country compliance for Wi-Fi and LTE.
13 Available upgrades may differ by region.

Specifications subject to change without notice.

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