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## Trimble SPS750 Modular GPS Receiver

### Flexible modular receiver for permanent base station, supervisor's systems, and rover operations

The Trimble® SPS750 Modular GPS receiver sets new standards for rapid setup and flexible operation in both base station and rover applications.

Modularity provides the ability to choose the appropriate GPS antenna for the application, Zephyr Geodetic™ Model 2 at the base station and the Zephyr™ Model 2 for the mobile units. The GPS and radio antennas can be mounted high in permanent and semi-permanent base station applications so that they are clear from obstructions and provide maximum radio coverage, while the receiver and radio are locked in a secure environment safe from theft and the weather. The choice of radio antennas allows them to be either attached to the receiver itself for mobile base station and rover applications, or equipped with high-gain or directional antenna for maximum range on large job sites.



### Standard system features

- Integrated GPS receiver and radio
- 450 MHz or 900 MHz radio
- 24-channel L1/L2 GPS receiver
- OmniSTAR XP/HP/VBS service capable
- WAAS (Wide Area Augmentation System), EGNOS (European Geo-Stationary Navigation System), and MSAS Satellite Based Augmentation Systems (SBAS) compatible
- Long-life integrated battery, typically provides 10 hours operation as a base station with internal transmit/receive radio, or 13 hours as a rover
- Configuration and monitoring interface through the following methods:
  - Web interface
  - Networked or peer-to-peer Ethernet

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- Integrated display and keyboard
- Trimble SCS900 Site Controller software
- Integrated Bluetooth® wireless technology for cable-free configuration and operation with a controller
- Choice of external GPS antenna for base station or rover operation
- Attached or external radio antenna for rover or high-gain base station radio operation
- Small, lightweight design – 1.65 kg (3.64 lbs) (receiver only including the battery); 4 kg (8.82 lbs) complete system weight (rover including controller and rod)
- Permanent/semi-permanent and mobile quick setup base station capability
- Backpack, belt, rod, truck, and marine vessel mounting options for rover applications
- Capable of all site measurement and stakeout operations within 2.4 km (1.5 m) (SPS750 Basic) and typically 5 km (3.1 m) (SPS750 Max)
- Easy-to-use menu system for rapid configuration and status checking
- AutoBase™ technology for rapid and automated repeated daily base station setups
- Can broadcast corrections through multiple radio links from one base station, for example, through an internal 450 MHz radio and an external 900 MHz radio
- CAN (Controller Area Network) support
- Rugged, weatherproof construction with an IP67 environmental rating
- -40 °C to +65 °C (-40 °F to +149 °F) operating temperature range
- 10.5 V to 28 V DC input power range, with over-voltage protection

#### **SPS750 Basic receiver features**

- Base station only, or rover only, operation

#### **SPS750 Basic base**

- Entry-level, low-cost RTK base station
- Unrestricted operational range for rovers and grade control systems
- Integrated transmit-only radio
- Easily upgraded to the SPS750 Max

#### **SPS750 Basic rover**

- Entry-level, low-cost RTK rover receiver
- 2 Hz measurement update rate

- 2.4 km (1.5 mile) operational range from the base station
- Integrated receive-only radio
- Easily upgraded to the SPS750 Max

This receiver is ideal for contractors new to GPS as a starter system or for operating multiple small projects.

### SPS750 Max receiver features

- RTK base station and rover operation in a single receiver
- Integrated receive/transmit radio
- 5 Hz or 10 Hz measurement update rate
- Unlimited rover operational range from a base station
- Operates within a Trimble VRS™ network, for base station-free rover capability
- Moving baseline support for applications such as heading

### Specifications

General Characteristics	Specifications
Keyboard and display	VFD display 16 characters by 2 rows On/Off key for one button start up using AutoBase technology Escape and Enter key for menu navigation 4 arrow keys (up, down, left, right) for option scrolls and data entry
Receiver type	Modular GPS receiver
Antenna type	
Base Station	Zephyr Geodetic Model 2
Rover	Zephyr Model 2
OmniSTAR Rover	GA510
Legacy support	Also supports legacy Trimble antennas Zephyr, Zephyr Geodetic, Z+, Micro-Centered™, Choke ring, Rugged Micro-Centered.

Physical characteristics	Specifications
Dimensions (L × W × H)	24 cm (9.4 in) × 12 cm (4.7 in) × 5 cm (1.9 in) including connectors
Weight	1.65 kg (3.64 lbs) receiver with internal battery and radio 1.55 kg (3.42 lbs) receiver with internal battery and no radio
Temperature <sup>1</sup>	
Operating	-40 °C to +65 °C (-40 °F to +149 °F)
Storage	-40 °C to +80 °C (-40 °F to +176 °F)
Humidity	MIL-STD 810F, Method 507.4
Waterproof	IP67 for submersion to depth of 1 m (3.3 ft), dustproof
Shock and vibration	Tested and meets the following environmental standards: Designed to survive a 1 m (3.3 ft) drop onto a hard surface
Shock – non-operating	To 75 g, 6 ms
Shock – operating	To 40 g, 10 ms, saw-tooth

Physical characteristics	Specifications
Vibration	Tested to Trimble ATV profile (4.5 gRMS): 10 Hz – 300 Hz; 0.04 g <sup>2</sup> /Hz 300 Hz – 1,000 Hz; -6 dB/octave
Measurements	Advanced Trimble Maxwell™ 5 Custom GPS chip High-precision multiple correlator for L1 and 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 L1 and L2 carrier phase measurements with <1 mm precision in a 1 Hz bandwidth L1 and L2 Signal-to-Noise ratios reported in dB-Hz Proven Trimble low elevation tracking technology 24-channel L1 and 24-channel L2 receiver L1/L2 full cycle carrier WAAS/EGNOS/MSAS corrections
Code differential GPS positioning <sup>2</sup> Horizontal accuracy Vertical accuracy	±(0.25 m + 1 ppm) RMS, ± (9.84 in + 1 ppm) RMS ±(0.50 m + 1 ppm) RMS, ± (19.68 in + 1 ppm) RMS
SBAS (WAAS/EGNOS/MSAS <sup>3</sup> ) positioning Horizontal accuracy Vertical accuracy	Typically <1 m (3.28 ft) Typically <5 m (16.40 ft)
OmniSTAR positioning VBS service accuracy XP service accuracy HP service accuracy	Horizontal <1 m (3.3 ft) Horizontal 20 cm (7.87 in), Vertical 30 cm (11.80 in) Horizontal 10 cm (3.93 in), Vertical 15 cm (5.90 in)
RTK positioning <sup>2</sup> Horizontal Vertical	±(10 mm + 1 ppm) RMS, ± (0.38 in +1 ppm) RMS ±(20 mm + 1 ppm) RMS, ± (0.78 in +1 ppm) RMS
Initialization time Regular RTK operation with base station  RTK operation with Scalable GPS infrastructure  Initialization reliability <sup>4</sup>	Single/Multi-base minimum 10 sec + 0.5 times baseline length in km, <30 km  Typically <30 seconds anywhere within coverage area (SPS750 Max only)  Typically >99.9%

Electrical characteristics	Specifications
Power Internal   External	Integrated internal battery 7.2 V, 7800 mA-hr, Lithium-ion Internal battery operates as a UPS in the event of external power source outage Internal battery will charge from external power source when input voltage is >15 V Integrated charging circuitry  Power input on 7-pin 0-shell Lemo is optimized for lead acid batteries with a cut off threshold of 10.5 V Power input on the 26-pin D-sub connector is optimized for Trimble

Electrical characteristics	Specifications
	Lithium-ion battery input (P/N 49400) with a cut-off threshold of 9.5 V Power source (internal/external) is hot-swap capable in the event of power source removal or cut off 10.5 V to 28 V DC external power input with over-voltage protection Receiver will automatically turn on when connected to external power of 15 V or greater
Power consumption	6 W, in RTK rover mode with internal receive radio 8 W, in RTK Base mode with internal transmit radio
Rover operation times on internal battery 450 MHz 2.0 W systems 900 MHz 1.0 W systems	13 hours; varies with temperature 13 hours; varies with temperature
Base station operation times on internal battery External radio 450 MHz 0.5 W systems <sup>5</sup> 900 MHz 1.0 W systems	15 hours; varies with temperature 11 hours; varies with temperature 10 hours; varies with temperature
Regulatory approvals	FCC: Part 15 Subpart B (Class B Device) and Subpart C, Part 90  Industry Canada: ICES-003 (Class B Device), RSS-210, RSS-Gen, RSS-310, RSS-119  R&TTE Directive: EN 301 489-1/-5/-17, EN 300 440, EN 300 328, EN 300 113, EN 60950, EN 50371 ACMA: AS/NZS 4295 approval CE mark compliance C-tick mark compliance UN ST/SG/AC.10.11/Rev. 3, Amend. 1 (Li-Ion Battery) UN ST/SG/AC. 10/27/Add. 2 (Li-Ion Battery)  WEEE Compliant

Communications Characteristics	Specifications
Communications Port 1 (7-pin 0S Lemo) Port 2 (26-pin D-sub)  Ethernet Bluetooth	3-wire RS-232/CAN Full 9-wire RS-232 (through multi-port adaptor) 3-wire RS-232 USB (On the Go) (through multi-port adaptor) Ethernet (through multi-port adaptor) Fully-integrated, fully-sealed 2.4 GHz Bluetooth <sup>6</sup>
Integrated radios  Channel spacing (450 MHz)  Frequency approvals (900 MHz)  450 MHz transmitter radio power output	Fully-integrated, fully-sealed internal 450 MHz, Tx, Rx, or Tx/Rx <sup>7</sup> Fully-integrated, fully-sealed internal 900 MHz, Tx, Rx, or Tx/Rx <sup>7</sup>  12.5 kHz or 25 kHz spacing available Dealer configurable: Tx, Tx/Rx End-user configurable: Rx only  USA/Canada (-10), New Zealand/Australia (-20), Australia (-30)  0.5 W / 2.0 W (2.0 W upgrade available only in certain countries)

Communications Characteristics	Specifications
900 MHz transmitter radio power output	1.0 W (30 dBm)
External GSM/GPRS, cell phone support (SPS750 Max only)	Supported for direct dial and Internet-based VRS correction streams Cell phone or GSM/GPRS modem inside a TSC2™ controller
Receiver position update rate SPS750 Basic SPS750 Max	1 Hz and 2 Hz positioning 1 Hz, 2 Hz, 5 Hz, and 10 Hz positioning
Correction data input	CMR™, CMR+™, RTCM 2.0–2.3, RTCM 3.0
Correction data output	CMR, CMR+, RTCM 2.0–2.3
Data outputs	NMEA, GSOE, RT1, and BINEX (SPS750 Max only optional upgrade)

Receiver Options	Specifications
Internal Data Logging option	Provides approx 2 MB of internal memory for static data measurements
Real-time Binary Output option	Allows real-time data output messages such as RT17 (format subject to License Agreement)
Basic to Max upgrades	Basic base to Max or Basic rover to Max upgrade
450 MHz 2W Power option	Allows 2 W power output for 450 MHz frequency radio transmitter (2.0 W upgrade only available in certain countries)

450 MHz integrated radio capabilities	Base Station Receiver	Rover Receiver
SPS750 Basic	Transmit only	Receive only
SPS750 Max	Transmit/Receive	Transmit/Receive

900 MHz integrated radio capabilities	Base Station Receiver	Rover Receiver
SPS750 Basic	Transmit only	Receive only
SPS750 Max	Transmit/Receive	Transmit/Receive

#### Base/Rover operations capability

Receiver	Specifications
SPS750 Basic	Base only or Rover only
SPS750 Max	Base and Rover

#### Measured vector baseline length (Rover operational range from base station)

Receiver	Specifications
SPS750 Basic	1.5 miles (2.4 km)
SPS750 Max	Unrestricted (limited to radio or cellular coverage only). Typically 3 km to 5 km (1.8 miles to 3 miles) without repeater radio.

#### Rover operation within a VRS network using cellular or rebroadcast solution

Receiver	Specifications
SPS750 Basic	Disabled
SPS750 Max	Enabled

#### **Specifications are subject to change without notice.**

<sup>1</sup> Receiver will operate normally to -40°C. Bluetooth module and internal batteries are rated to -20°C.

<sup>2</sup> Accuracy and reliability may be subject to anomalies such as multipath, obstructions, satellite geometry, and atmospheric conditions. Always follow recommended practices.

<sup>3</sup> Depends on WAAS/EGNOS/MSAS system performance.

<sup>4</sup> May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.

<sup>5</sup> If your receiver has the 2.0 W upgrade, you will experience lesser battery performance compared to the 0.5 W solution.

<sup>6</sup> Bluetooth type approvals are country-specific. For more information, contact your local Trimble office or representative.

<sup>7</sup> Rx or Tx only option only on Basic, Tx/Rx option on Max receiver.