TRIMBLE SPS751 AND SPS851 MODULAR GPS RECEIVERS

KEY FEATURES

- Highly flexible base or rover receiver for construction site measurement applications and system integrators
- Separate antennas and receiver for maximum radio coverage and security on the job site
- Integrated license-free 900 MHz or 450 MHz UHF radio for base and rover tasks
- Rapid daily base station setup with a single button push using AutoBase™ technology
- Internet enabled base station via Ethernet or GSM/GPRS phone
- Supports GPS and L2C Modernized GPS signals
- Trimble SPS851 can be upgraded with GLONASS or L5 signals
- Integrated battery that also acts as a UPS power supply
- 1PPS output for time synchronization with other devices

FLEXIBLE GPS RECEIVER FOR PRECISE POSITIONING

Trimble® SPS751 and SPS851 Modular GPS Receivers are ideal for semi-permanent or permanent base station setups, construction rover applications as well as marine based applications.

Now heavy and highway contractors have the ideal base station to support grade checking, site measurement and stakeout. The receivers can be utilized as a rover with a controller in a site supervisors vehicle or on a pole.

Modular Design Means Flexible Set Up
The Trimble SPS751 and SPS851 receivers combine the radio and GPS receiver in a single housing. This allows contractors to secure the majority of their investment inside a site trailer or carrying case, protected from the elements and theft, leaving only the antennas outside. The antennas can now be located clear of obstructions and provide maximum radio coverage on site.

A future-proof investment
Available in a range of options to suit your construction application and performance requirements, versatile Trimble GPS receivers are a future-proof investment.

The SPS851 Modular GPS Receiver is designed to receive current and future satellite signals. This receiver supports GPS modernization through support of L2C code and can be upgraded to receive GLONASS or L5 GPS signals, protecting your investment well into the future.

The SPS751 is available in three models to suit specific budget and application requirements. All models support GPS modernization through support of L2C code. The SPS751 Basic Rover and Basic Base can be upgraded to the SPS751 Max giving you flexibility to swap between base and rover functionality as work demands.

Get Connected, Stay Connected
The SPS751 and SPS851 each contain a built-in powerful web server component that enables increased operational efficiency and flexibility. Using this Internet-enabled base station allows for remote configuration and monitoring, eliminating the need for time-consuming and costly visits to the base station to set up each day or diagnose issues that may arise. Internet base stations can provide corrections to multiple jobsites in the same vicinity or provide corrections to cell phone enabled rovers in areas of radio blackout.

Larger site operations or system integrators can configure and monitor the quality of the system or utilize its multiple modes of operation by accessing the internal web server.

Improved GPS Performance
The new Trimble RTK engine improves performance under tree canopy and reduces initialization time after loss of lock, delivering high performance in a variety of measurement conditions. Combined with integrated 450 MHz UHF or license-free 900 MHz radio communications options these features make the receivers easier to use, faster to setup and more productive during measurement and stakeout.
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**UNIQUE PERFORMANCE SPECIFICATIONS**

**SPS751 Basic Modular GPS Receiver**
- Base and Rover interchangeability: No
- Base only operation: SP571 Basic Base
- Rover only operation: SP571 Basic Rover
- Rover position update rate: 1 Hz, 2 Hz
- Rover maximum range from base: 2.4 km (1.5 mile)
- Rover operation within a VRS™ network: No

**SPS751 Max Modular GPS Receiver**
- Base and Rover interchangeability: Yes
- Rover position update rate: 1 Hz, 2 Hz, 5 Hz, 10 Hz
- Rover maximum range from base: Unrestricted
  - Typical range 2 – 5 km (1.2 – 3 miles) without radio repeater
  - Rover operation within a VRS network: Yes

**SPS851 Modular GPS Receiver**
- Upgrade options: L5 GPS Full Cycle Carrier
- Base and Rover Interchangeability: Yes
- Rover position update rate: 1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 Hz
- Rover maximum range from base: Unrestricted
  - Typical range 2 – 5 km (1.2 – 3 miles) without radio repeater
  - Rover operation within a VRS network: Yes

**COMMON PERFORMANCE SPECIFICATIONS**

**General**
- Keyboard and display: VFD display 16 characters by 2 rows
- On/Off key for one button start up
- Escape and Enter key for menu navigation
- 4 arrow keys (up, down, left, right) for option scrolls and data entry
- Dimensions (L x W x D): 24 cm x 12 cm x 5 cm (9.4 in x 4.7 in x 1.9 in) including connectors
- Weight: 1.65 kg (3.64 lb) receiver with internal battery and radio
- 1.55 kg (3.42 lb) receiver with internal battery and no radio

**Antenna options**
- L1/L2/L2C GPS, GLONASS and OmniSTAR operation...
- Zephyr™, Zephyr Geodetic™, Zephyr, Zephyr Geodetic, Z+...
- Supports legacy Trimble antennas...
- Rugged Micro-Centered™, Choke ring...

**Temperature**
- 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**
- Designed to survive a 1 m (3.3 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: Tested to Trimble ATV profile (4.5 gRMS):
  - 10 Hz–300 Hz: 0.04 g2/Hz;
  - 300 Hz–1,000 Hz: –6 dB/octave

**Measurements**
- Advanced Trimble Maxwell™ 5 Custom GPS 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
- L1/L2 signal-to-noise ratios reported in dB-Hz
- Proven Trimble low elevation tracking technology
- 72-channel L1 C/A code, L1/L2/L2C Full Cycle Carrier. Upgradable to GLONASS L1/L2 Full Cycle Carrier.
- Trimble EVEREST™ multipath signal rejection
- 4-channel SBAS (WAAS/EGNOS/MSAS)

**Code differential GPS positioning**
- Horizontal accuracy: 0.25 m + 1 ppm RMS
- Vertical accuracy: 0.50 m + 1 ppm RMS

**SBAS (WAAS/EGNOS/MSAS) positioning**
- Horizontal accuracy: Typically <1 m (3.3 ft)
- Vertical accuracy: Typically <5 m (16.4 ft)

**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)

**Real-Time Kinematic (RTK) positioning**
- Horizontal accuracy: 10 mm + 1 ppm RMS
- Vertical accuracy: 20 mm + 1 ppm RMS

**Initialization time**
- Regular RTK operation with base station: Typically <30 seconds anywhere within coverage area (SPS751 Max only
- Initialization reliability: >99.9%
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Power

Internal
- Integrated internal battery 7.2 V, 7800 mAh, Lithium-ion
- Internal battery operates as a UPS in the event of external power source failure
- Internal battery will charge from external power source when input voltage is >15 V
- Integrated charging circuitry

External
- Power input on 7-pin D-shell Lemo connector 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 Lithium-ion battery input with a cut-off threshold of 9.5 V
- Power source supply (Internal/External) is hot-swap capable in the event of power source removal or cut off
- 9.5 V to 28 V DC external power input with over-voltage protection
- Receiver will automatically turn on when connected to external power

Power consumption ........................................... 6.0 W in rover mode with internal receive radio
8.0 W in base mode with internal transmit radio

Operation time on internal battery
Rover ............................................................... 13 hours; varies with temperature
Base station (SPS851 with GPS and GLONASS):
450 MHz systems ............................................. Approximately 11 hours; varies with temperature
900 MHz systems .............................................. Approximately 9 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/SAC.10.11/Rev. 3, Amend. 1 (Lithium-Ion Battery)
- UN ST/SG/AC.10.27/Add. 2 (Lithium-Ion Battery)
- RoHS compliant (excludes those with an internal 900 MHz radio)
- WEEE compliant

Communications
Port 1 (7 pin 05 Lemo)
Serial 1 ........................................................... 3 wire RS-232
Port 2 (26 pin D-sub)
Serial 2 ........................................................... Full 9 wire RS-232
Serial 3 ........................................................... 3 wire RS-232
1 PPS (pulse per second) ....................... via adapter cable
USB (On the Go) ........................................... via multi-port adapter
Ethernet ....................................................... via multi-port adapter
Bluetooth ................................................... Fully-integrated, fully-sealed 2.4 GHz Bluetooth® module

Integrated radios (optional) ......................... Fully integrated, fully sealed internal 450 MHz (UHF) Tx/Rx;
Internal 900 MHz Tx/Rx
Channel spacing (450 MHz) ....................... 12.5 kHz or 25 kHz spacing available
450 MHz output power ................................... 0.5 W, 2.0 W
(2.0 W available only in certain countries)
900 MHz output power ................................. 1.0 W
(2.0 W available only in certain countries)
Frequency approvals (900 MHz) ............... USA/Canada (-10)
New Zealand/Australia (-20)
Australia (-30)

External GSM/GPRS, cell phone support . . Supported for direct dial and Internet-based correction streams
Cellular phone or GMS/GPRS modem inside TSC2 controller
Receiver position update rate .................... 1 Hz, 2 Hz, 5 Hz
10 and 20 Hz positioning
Correction data input ................................. CMR™, CMR+™, RTCM 3, RTCM 2.x
Correction data output ................................ CMR/CMR+, RTCM 2.x
Data outputs ............................................. NMEA, GSOF, 1PPS Time Tags

Receiver options and upgrades
SPS751 Basic to SPS751 Max ...................... Adds Base/Rover and VRS capability, high update rate and unrestricted range
SPS851 GLONASS upgrade ..................... Uses GLONASS L1/L2 satellite signals
SPS851 L5 upgrade ................................. Capable of tracking GPS modernization L5 signals
Internal Data Logging ............................... 2 MB for SPS751 Max
28 MB for SPS851

Specifications subject to change without notice.

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RoHS compliant (excludes those with an internal 900 MHz radio)
UN ST/SG/AC.10.11/Rev. 3, Amend. 1 (Lithium-ion Battery)