

### 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.

# TRIMBLE SPS751 AND SPS851 MODULAR GPS RECEIVERS

## UNIQUE PERFORMANCE SPECIFICATIONS

### SPS751 Basic Modular GPS Receiver

Base and Rover interchangeability	No
Base only operation	SPS751 Basic Base
Rover only operation	SPS751 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, 2Hz, 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 GLONASS L1/L2
Base and Rover Interchangeability	Yes
Rover position update rate	1 Hz, 2Hz, 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™ Model 2
L1/L2/L2C GPS and GLONASS Base Station	Zephyr Geodetic™ Model 2
Supports legacy Trimble antennas	Zephyr, Zephyr Geodetic, Z+, Micro-Centered™, Choke ring, Rugged Micro-Centered GPS L1/L2

### Temperature

Operating <sup>1</sup>	-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<sup>2</sup>

Horizontal accuracy	0.25 m + 1 ppm RMS (0.8 ft + 1 ppm RMS)
Vertical accuracy	0.50 m + 1 ppm RMS (1.6 ft + 1 ppm RMS)

### SBAS (WAAS/EGNOS/MSAS) positioning<sup>3</sup>

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 (0.032 ft + 1 ppm RMS)
Vertical accuracy	20 mm + 1 ppm RMS (0.065 ft + 1 ppm RMS)

### Initialization time

Regular RTK operation with base station	Single/Multi-base minimum 10 seconds + 0.5 times baseline length in km, up to 30 km
RTK operation with Scalable GPS infrastructure	Typically <30 seconds anywhere within coverage area (SPS751 Max and SPS851 only)
Initialization reliability <sup>4</sup>	>99.9%

# TRIMBLE SPS751 AND SPS851 MODULAR GPS RECEIVERS

## Power

### Internal

- Integrated internal battery 7.2 V, 7800 mA-hr, 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 0-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<sup>5</sup> ..... 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/SG/AC.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

1PPS (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<sup>6</sup> 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  
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<sup>TM</sup>, CMR+<sup>TM</sup>, RTCM 3, RTCM 2.x

Correction data output ..... CMR/CMR+, RTCM 2.x

Data outputs ..... NMEA, GSOE, 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

1 Receiver will operate normally to -40°C. Internal batteries are rated to -20°C.

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

3 Depends on SBAS system performance.

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

5 If your receiver has the 2.0 W upgrade, you will experience reduced battery performance compared to the 0.5 W solution.

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

Specifications subject to change without notice.

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