

# Specifications

# Trimble SPS855 GNSS Modular Receiver



## Receiver Name

**SPS855 GNSS Modular Receiver**

## Configuration Option

Base and Rover interchangeability  
Rover position update rate  
Rover maximum range from base radio  
Rover operation within a VRS™ network  
Heading and Moving Base operation  
Factory options

Yes, upgradeable to Rover, Base or Rover / Base  
1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 Hz  
Unrestricted, typical range 2–5 km (1.2–3 miles) without radio repeater  
Yes  
Yes - option<sup>7</sup>  
See Receiver Upgrades below

## General

Keyboard and display

Vacuum Fluorescent display 16 characters by 2 rows. Invertable  
On/Off key for one-button startup  
Escape and Enter keys for menu navigation  
4 arrow keys (up, down, left, right) for option scrolls and data entry  
24 cm × 12 cm × 5 cm (9.4 in × 4.7 in × 1.9 in) including connectors  
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

Dimensions (L × W × D)  
Weight

## Antenna Options

GA510  
GA530  
GA810  
  
L1/Beacon, DSM 232  
Zephyr™ Model 2  
Zephyr Geodetic™ Model 2  
Zephyr Model 2 Rugged  
Zephyr, Zephyr Geodetic, Z-Plus, Micro-Centered™

L1/L2/L2C GPS, SBAS, and OmniSTAR  
L1/L2/L2C GPS, SBAS, and OmniSTAR  
GPS, Glonass, Galileo, Compass, OmniSTAR, SBAS (optimized for OmniSTAR)  
Not Supported  
L1/L2/L2C/L5 GPS, Glonass, Galileo, Compass, OmniSTAR, SBAS  
L1/L2/L2C/L5 GPS, Glonass, Galileo, Compass, OmniSTAR, SBAS  
L1/L2/L2C/L5 GPS, Glonass, Galileo, Compass, OmniSTAR, SBAS  
Refer to Antenna specification

## Temperature

Operating<sup>1</sup>  
Storage  
Humidity  
Waterproof

-40 °C to +65 °C (-40 °F to +149 °F)  
-40 °C to +80 °C (-40 °F to +176 °F)  
MIL-STD 810F, Method 507.4  
IP67 for submersion to depth of 1 m (3.3 ft), dustproof

## Shock and Vibration

Pole drop  
Shock – Non-operating  
Shock – Operating  
Vibration

Designed to survive a 1 m (3.3 ft) pole drop onto a hard surface  
To 75 g, 6 ms  
To 40 g, 10 ms, saw-tooth  
Tested to Trimble ATV profile (4.5 g RMS): 10 Hz to 300 Hz: 0.04 g/Hz<sup>2</sup>  
300 Hz to 1,000 Hz; -6 dB/octave

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# Trimble SPS855 GNSS Modular Receiver

## Measurements

Advanced Trimble Maxwell™ 6 Custom GPS Chips  
High-precision multiple correlator for GNSS pseudorange 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  
Trimble EVEREST™ multipath signal rejection  
L-Band: OmniSTAR VBS, HP and XP by subscription  
GPS L1 C/A, L2C, L2E (Trimble method for tracking unencrypted L2P) upgradable to L5. 440 channels  
Upgradeable to GLONASS L1/L2C/A, L1/L2P Full Cycle Carrier  
Upgradeable to Galileo: L1 CBOC, E5A, E5B & E5AltBOC<sup>8</sup>  
Upgradeable to Compass: B1, B2, B3  
4-channel SBAS L1 C/A, L5 (WAAS/EGNOS/MSAS)  
QZSS: L1 C/A, L1C, L1 SAIF, L2C, L5

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

Accuracy

Better than 5 m 3DRMS (16 ft)

### 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)

### 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)

### Location RTK Positioning

Horizontal accuracy

Location RTK (10/10) or (10/2) 10 cm + 1 ppm RMS (0.32 ft + 1 ppm)

Vertical accuracy

Location RTK (10/10) 10 cm + 1 ppm RMS (0.32 ft + 1 ppm)

Location RTK (10/2) 2 cm + 1 ppm RMS (0.065 ft + 1 ppm)

### Real-Time Kinematic (RTK up to 30 km)

#### Positioning<sup>2</sup>

Horizontal accuracy

8 mm + 1 ppm RMS (0.026 ft + 1 ppm RMS)

Vertical accuracy

15 mm + 1 ppm RMS (0.05 ft + 1 ppm RMS)

#### Trimble VRS<sup>9</sup>

Horizontal accuracy

8 mm + 0.5 ppm RMS (0.026 ft + 0.5 ppm)

Vertical accuracy

15 mm + 0.5 ppm RMS (0.05 ft + 0.5 ppm)

### Precise Heading

Heading accuracy

When combined with SPS555H<sup>7</sup>

2 m antenna separation

0.09° RMS

10 m antenna separation

0.05° RMS

### Initialization Time

Regular RTK operation with base station

Single/Multi-base  
typically less than 8 seconds

Initialization reliability<sup>4</sup>

>99.9%

### 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 as long as source can support the power drain  
Integrated charging circuitry

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# Trimble SPS855 GNSS Modular Receiver

## Power

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

Power input on the 26-pin D-sub connector is optimized for Trimble lithium-ion battery input with a cut-off threshold of 10.5 V

Power source supply (Internal/External) is hot-swap capable in the event of power source removal or cut off

DC external power input with over-voltage protection

Receiver automatically turns on when connected to external power  
N/A

Power over Ethernet (PoE)

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

450 MHz systems

Approximately 11 hours; varies with temperature<sup>5</sup>

900 MHz systems

Approximately 9 hours; varies with temperature

## Regulatory Approvals

FCC: Part 15 Subpart B (Class B Device) and Subpart C, Part 90  
Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Canadian RSS-310, RSS-210, and RSS-119.

Cet appareil est conforme à la norme CNR-310, CNR-210, et CNR-119 du Canada.

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

WEEE compliant

## Communications

Lemo (Serial)

7-pin 0S Lemo, Serial 1, 3-wire RS-232

Modem 1 (Serial)

26-pin D-sub, Serial 2, Full 9-wire RS232, using adaptor cable

Modem 2 (Serial)

26-pin D-sub, Serial 3, 3 wire RS-232, using adaptor cable

1PPS (1 Pulse-per-second)

Available on Marine versions

Ethernet

Through a multi-port adaptor

WiFi

N/A

Bluetooth wireless technology

Fully-integrated, fully-sealed 2.4 GHz Bluetooth module<sup>6</sup>

Integrated radios (optional)

Fully-integrated, fully-sealed internal 410-470 MHz Tx/Rx; Internal 900 MHz Tx/Rx

Channel spacing (450 MHz)

12.5 kHz or 25 kHz spacing available

Sensitivity (450 MHz)

-114 dBm (12 dB SINAD)

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

Frequency approvals (902-928 MHz)

USA/Canada

External GSM/GPRS, cell phone support

Supported for direct-dial and Internet-based correction streams – directly using the external SNM940 or using the SCS900 software

Cell phone or GSM/GPRS modem inside controller or external SNM940

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# Trimble SPS855 GNSS Modular Receiver

Internal MSK Beacon receiver

N/A

Receiver position update rate

1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz positioning

Correction data input

CMR™, CMR+™, CMRx™, RTCM 2.x, RTCM 3 (require Rover upgrade)

Correction data output

CMR, CMR+, CMRx, RTCM 2.x, RTCM 3 (require Base upgrade)

Data outputs

NMEA, GSOFF, 1PPS Time Tags (Marine version)

## Receiver Upgrades

Location RTK (10/10) or (10/2)  
Precision RTK Base, Rover or Base/Rover  
L5, GLONASS, GALILEO, COMPASS<sup>10</sup>  
28 MB Internal Data Logging option. Moving Base and Heading  
2 Watt upgrade for 450 MHz radio

## Notes

*1 Receiver will operate normally to those temperature limits. Internal batteries will operate from -20 °C to +48 °C*

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

*7 When receiver is combined with an SPS555H or other suitable SPS receivers.*

*8 Galileo Commercial Authorization*

*Developed under a Licence of the European Union and the European Space Agency.*

*9 Networked RTK PPM values are referenced to the closest physical base station*

*10 This Trimble SPS Receiver is capable of supporting existing and planned GNSS satellite signals, including GPS, GLONASS, GALILEO, Compass and QZZ, and existing and planned augmentations to these GNSS systems.*

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