

# 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

L1/L2/L2C GPS, SBAS, and OmniSTAR

GA530

L1/L2/L2C GPS, SBAS, and OmniSTAR

GA810

L1/L2/L2C GPS, Glonass, Galileo, BeiDou, OmniSTAR, SBAS (optimized for OmniSTAR)

L1/Beacon, DSM 232

Not Supported

Zephyr™ Model 2

L1/L2/L2C/L5 GPS, Glonass, Galileo, BeiDou, OmniSTAR, SBAS

Zephyr Geodetic™ Model 2

L1/L2/L2C/L5 GPS, Glonass, Galileo, BeiDou, OmniSTAR, SBAS

Zephyr Model 2 Rugged

L1/L2/L2C/L5 GPS, Glonass, Galileo, BeiDou, OmniSTAR, SBAS

Zephyr, Zephyr Geodetic, Z-Plus, Micro-Centered™

Refer to Antenna specification

## 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

Pole drop

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 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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## 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, XP, G2 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 BeiDou: B1, B2  
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)

### xFill Positioning

xFill accuracy

RTK<sup>11</sup> + 10mm(0.03 ft)/min Horiz. + 20mm(0.06 ft)/min Vert. RMS

### 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

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 during an ext 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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## 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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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 (10/2), (10/10), or (30/30)  
Precision RTK Base, Rover or Base/Rover, xFill  
L5, GLONASS, GALILEO, BeiDou GNSS<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  $-20\text{ }^{\circ}\text{C}$  to  $+48\text{ }^{\circ}\text{C}$

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. SPS855 must have Moving base option installed

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, BeiDou and QZSS, and existing and planned augmentations to these GNSS systems.

11 RTK refers to the last reported precision before the correction source was lost and xFill started

Specifications subject to change without notice.

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