

# Specifications

# Trimble SPS985 GNSS Smart Antenna

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## Receiver Name

**SPS985 GNSS Smart Antenna**

## 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

LED indicators for satellite tracking, radio link status, WiFi and power  
 On/Off key for one-button startup  
 N/A  
 N/A

Dimensions (L × W × D)

12 cm (4.7 in) × 13 cm (5.1 in) including connectors

Weight

1.55 kg (3.42 lb) receiver only including radio and battery  
 Complete system (rover including controller and pole) 3.9 kg (8.6 lbs)

## 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™

NA, inbuilt  
 N/A  
 N/A  
  
 N/A  
 N/A  
 N/A  
 N/A  
 N/A

## Temperature

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

–40 °C to +65 °C (–40 °F to +149 °F)  
 –40 °C to +75 °C (–40 °F to +167 °F)  
 100%, condensing  
 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 2 m (6.6 ft) pole drop onto concrete  
 To 115 G, 6msec  
 To 60 g, 10msec, half-sine  
 Mil-Std-810G, FIG 514.6D-I, Mil-Std-202G, FIG 214-I, Condition D

## Measurements

|  |   |
|--|---|
|  | <p>Advanced Trimble Maxwell™ 6 Custom GNSS chips</p> <p>High-precision multiple correlator for GNSS pseudorange measurements</p> <p>Unfiltered, unsmoothed pseudo-range measurements data for low noise, low multipath error, low-time domain correlation, and high-dynamic response</p> <p>Very low noise carrier phase measurements with &lt;1 mm precision in a 1 Hz bandwidth</p> <p>Trimble EVEREST™ multipath signal rejection</p> <p>L-Band: OmniSTAR VBS, HP, XP, G2 by subscription</p> <p>GPS L1 C/A, L2C, L2E (Trimble method for tracking unencrypted L2P) upgradable to L5. 440 channels</p> <p>Upgradeable to GLONASS L1/L2C/A, L1/L2P Full Cycle Carrier</p> <p>Upgradeable to Galileo: L1 CBOC, E5A, E5B &amp; E5AltBOC<sup>8</sup></p> <p>Upgradeable to Compass: B1, B2, B3</p> <p>4-channel SBAS L1 C/A, L5 (WAAS/EGNOS/MSAS)</p> <p>QZSS: L1 C/A, L1C, L1 SAIF, L2C, L5</p> |
| <b>SBAS (WAAS/EGNOS/MSAS) Positioning<sup>3</sup></b>                |   |
| Accuracy   | Better than 5 m 3DRMS (16 ft)   |
| <b>Code Differential GPS Positioning<sup>2</sup></b>                 |   |
| 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)   |
| <b>OmniSTAR Positioning</b>  |   |
| 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)  |
| <b>Location RTK Positioning</b>                                      |   |
| 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)   |
| <b>Real-Time Kinematic (RTK up to 30 km) Positioning<sup>2</sup></b> |   |
| 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)   |
| <b>Trimble VRS<sup>9</sup></b>                                       |   |
| 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)   |
| <b>Precise Heading</b>   |   |
| Heading accuracy   | When combined with SPS985 <sup>7</sup>  |
| 2 m antenna separation   | 0.09° RMS   |
| 10 m antenna separation  | 0.05° RMS   |
| <b>Initialization Time</b>   |   |
| Regular RTK operation with base station                              | Single/Multi-base typically less than 8 seconds   |
| Initialization reliability <sup>4</sup>                              | >99.9%  |
| <b>Power</b>   |   |
| Internal   | Rechargeable, removable 7.4 V, 2.6 Ah Lithium-ion battery in internal battery compartment   |
|  | 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

External power input with over-voltage protection on Port 1 ( 7-pin Lemo 2-key).  
Minimum 10.8 V, shutdown optimized for 12V lead acid battery operation

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 on Port 1 (Lemo)  
Receiver automatically turns on when connected to external power  
N/A

Power over Ethernet (PoE)

Power consumption

3.7 W in rover mode with internal receive radio  
5.2 W in base mode with internal 0.5 W transmit radio

## Operation Time on Internal Battery

Rover

4.6 hours; varies with temperature

Base station

450 MHz systems

Approximately 3.5 hours; varies with temperature<sup>5</sup>

900 MHz systems

Approximately 3.5 hours; varies with temperature

## Regulatory Approvals

FCC Part 15 Subpart B (Class B Device), Part 15.247, 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.

CE mark compliance  
C-tick mark compliance  
Japan MIC

RoHS compliant  
WEEE compliant

## Communications

Lemo (Serial)

7-pin Lemo 2-key, Power Input, USB

Modem 1 (Serial)

N/A

Modem 2 (Serial)

N/A

1PPS (1 Pulse-per-second)

N/A

Ethernet

N/A

WiFi

Client or Access Point. Receive or transmit corrections

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, upgradeable to 2W

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 using the  
SCS900 software

Cell phone or GSM/GPRS modem inside controller

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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, GSOF

## Receiver Upgrades

Location RTK (10/2), (10/10), or (30/30)

Precision RTK Rover, Base or Rover/Base

L5, GLONASS, GALILEO, Compass GNSS<sup>10</sup>

1 GB Internal Data Logging. 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  $-20^{\circ}\text{C}$  to  $+48^{\circ}\text{C}$

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 SPS985 with Moving Base installed 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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Specifications subject to change without notice.

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