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## Trimble SPS780 Smart GPS Antenna - Basic and Max

Highly portable, flexible GPS receiver

### General Description

The Trimble® SPS780 Smart GPS Antenna is the simple, upgradeable solution to all your site measurement and stakeout applications. The rugged smart antenna includes an integrated radio, GPS receiver, GPS antenna and battery in a single, lightweight housing designed for maximum portability, quick setup and optimal flexibility.

The Trimble SPS780 Smart GPS Antenna offers contractors an easy-to-use, wide area measurement system for a variety of site preparation and grade checking applications. It can be used as either a rover for site measurement and stakeout or as a base station to support site measurement and machine control operations. As a base station, the Trimble SPS780 Smart GPS Antenna takes is quick to setup, and only requires a single person to move the necessary equipment.

### Basic and Max Options

The Trimble SPS780 Smart GPS Antenna gives you two options to choose from: Basic or Max. Varying levels of functionality and price give the contractor an optimum solution no matter the size of their job site or their budget.



### SPS780 Smart GPS Antenna Standard System Features

- Small, lightweight design – 1.31 kg (2.89 lb) (integrated radio, GPS receiver, GPS antenna and battery) 3.7 kg (8.16 lb) complete system weight (Rover including controller and rod)
- The quick setup, high mobility base and rover receiver system is ideal for small to mid-size jobsites and for working on multiple jobsites on a daily or weekly basis

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- 24-channel L1/L2 GPS receiver
- Internal, removable, smart Li-Ion battery provides up to 5.5 hrs GPS rover operation per battery
- Bluetooth® wireless technology for cable free, no hassle base or rover operation
- Simple keypad with on/off key and LED indicators for power, radio and satellite tracking
- 10 Hz update rate (Max); 2 Hz update rate (Basic)
- Allows measurement from a moving chassis, for example mounted on a vehicle for increased efficiency on large jobsites

## **SPS780 Smart GPS Antenna System Option Features**

### **Basic option features**

- Rover or base configurations, not interchangeable
- 2 Hz measurement update rate
- Rover operational range limited to 1.5 mile (2.4 km) from base station
- Base station operational range limited to the range of the radio
- Integrated transmit radio (Base configuration only, 450 MHz only)
- Integrated receive radio (Rover configuration only)
- Entry level price point for lower cost of base station or rover
- Upgradeable to Max capability

### **Max option features**

- Full Base/Rover interchangeability
- 10 Hz measurement update rate
- Unrestricted range as base station or rover
- Operates within a VRS network for base station-free rover capability
- Integrated Transmit / Receive radio (450 MHz) or integrated Receive radio (900 MHz)

## SPS780 Smart GPS Antenna Specifications

General characteristics	Specifications
Keyboard and display	On / Off key, satellite tracking display, radio status display
LED indicators	For satellite tracking, radio link reception and power monitoring
Receiver type	Fully integrated “Smart” GPS antenna

Physical characteristics	Specifications
Dimensions (WxH)	19 cm (7.5 in) x 10 cm (3.9 in) including connectors
Weight	1.28 kg (2.88 lb) receiver only with internal battery 3.70 kg (8.16 lbs) complete system weight (Rover including controller and pole)
Temperature <sup>1</sup> Operating Storage	-40 °C to +65 °C (-40 °F to +149 °F) -40 °C to +75 °C (-40 °F to +167 °F)
Humidity	100%, condensing
Waterproof	IPX7 for submersion to depth of 1 m (3.28 ft)
Shock and vibration Shock - non operating Shock – operating Vibration	Tested and meets the following environmental standards: Designed to survive a 2m (6.6 ft) pole drop onto concrete To 40 G, 10 msec, sawtooth MIL-STD-810F, FIG.514.5C-1

Performance characteristics	Specifications
Measurements	Advanced Trimble Maxwell™ Custom GPS chip High-precision multiple correlator for L1 and L2 pseudo range measurements Unfiltered, unsmoothed pseudo range measurements data for low noise, low multi-path error, low time domain correlation and high dynamic response Very low noise L1 and L2 carrier phase measurements with <1mm precision in a 1 Hz bandwidth Proven Trimble low elevation tracking technology 24 Channels L1/L2 L1/L2 Full Cycle Carrier SBAS support
Code differential GPS positioning <sup>2</sup> Horizontal accuracy Vertical accuracy	±(0.25 m + 1 ppm) RMS ±(0.5 m + 1 ppm) RMS
SBAS <sup>3</sup> Horizontal accuracy Vertical accuracy	Typically <1 m (3.28 ft) Typically <5 m (16.40 ft)
Real Time Kinematic (RTK) positioning <sup>2</sup> Horizontal accuracy	±(10 mm + 1 ppm) RMS, ±(0.032 ft +1 ppm) RMS

Performance characteristics	Specifications
Vertical accuracy	±(20 mm + 1 ppm) RMS, ±(0.065 ft + 1 ppm) RMS
Initialization time Regular RTK operation with base station RTK operation with Scalable GPS infrastructure Initialization reliability <sup>4</sup>	Single/Multi-base minimum 10 seconds + 0.5 times baseline length in km, up to 30 km <30 seconds typical anywhere within coverage area (Max option only) >99.9%

Electrical characteristics	Specifications
Power	11 to 28 VDC external power input with over-voltage protection on Port 1 (7-pin Lemo)
Battery	Rechargeable, removable 7.4 V, 2.4 Ah Lithium Ion battery in internal battery compartment.
Power consumption	<2.5 W, in RTK mode with internal radio
Rover operation times on internal battery 450 MHz systems 900 MHz systems	Receive only 5.5 hrs: varies with temperature Receive only 5.5 hrs: varies with temperature
Base station operation times on internal battery 450 MHz systems 900 MHz systems	Approximately 4.2 hrs; varies with temperature (TXRX) Approximately 5.5 hrs; varies with temperature (RX)
Certification	Class B Part 15, 22, 24 FCC certification, Canadian FCC, CE mark approval and C-tick approval, WEEE compliant

Communications characteristics	Specifications
Communications	Port 1 - 3-wire RS-232 (7-pin 0-Shell Lemo) Port 2 - Full RS-232 (DSub 9-pin) Fully integrated, fully sealed 2.4 GHz Bluetooth <sup>5</sup>
Integrated Radios	Fully integrated, fully sealed internal 450 MHz, TX or RX, TXRX <sup>6</sup> Fully integrated, fully sealed internal 900 MHz, RX only <sup>7</sup>
450MHz Transmitter radio power output	0.5 w
Receiver position update rate SPS780 Basic SPS780 Max	1 Hz and 2 Hz positioning 1 Hz, 2 Hz, 5 Hz, and 10 Hz positioning
Data Input and Output	CMR, CMR+, RTCM 2.1, RTCM 2.3, RTCM 3.0
Outputs	NMEA, GSOF and RT17

450 MHz integrated radio capabilities	Base Station Receiver	Rover Receiver
SPS780 Basic	Transmit only	Receive only
SPS780 Max	Transmit and Receive	Transmit and Receive

900 MHz integrated radio capabilities	Base Station Receiver	Rover Receiver
SPS780 Basic	No radio, use external SNB900	Receive only
SPS780 Max	Receive only, use external SNB900	Receive only

#### Base/Rover operations capability

Receiver	Specifications
SPS780 Basic	Rover only or Base only
SPS780 Max	Base and Rover interchangeability

#### Measured vector baseline length (Rover operational range from base station)

Receiver	Specifications
SPS780 Basic	1.5 miles (2.4 km)
SPS780 Max	Unrestricted (limited to radio operational range). Typically 1.8 – 3 miles (3-5 km) without repeater radio.

#### Rover operation within a VRS network using cellular phone dial up

Receiver	Specifications
SPS780 Basic	No
SPS780 Max	Yes

#### Notes:

1. Receiver will operate normally to -40 °C. Bluetooth module and internal batteries are rated to -20 °C
2. Accuracy and reliability may be subject to anomalies such as multi-path, obstructions, satellite geometry and atmospheric conditions. Always follow recommended practices
3. Depends on SBAS system performance
4. May be affected by atmospheric conditions, signal multi-path and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality
5. Bluetooth type approvals are country-specific. Contact your local Trimble office or representative for more information
6. TX only or RX only with Basic, TXRX with Max
7. 900MHz is RX only with SPS780, external transmit radio must be used when configured as a base

*Specifications are subject to change without notice.*