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- Integrated GPS receiver, GPS antenna, radio and battery in a small lightweight and robust housing
- Cable-free base or rover operation using Bluetooth® technology
- Rapid daily base station setup with a single button push using AutoBase™ technology
- High mobility base or rover GPS receiver for site measurement and stakeout applications
- Integrated license-free 900 MHz radio or 450 MHz UHF radio
- Supports base station-free VRS messages or an Internet-enabled base station through GSM/GPRS phone with controller or modem in controller
- Supports GPS and L2C modernized GPS signals
- Trimble SPS881 can be upgraded with GLONASS and L5 GPS signals



SMarTEr ProducTiviTy on any Scale

The Trimble® SPS781 and SPS881 Smart GPS Antennas provide a rugged and highly portable GPS base station and rover solution for grade checkers and site engineers on site development or highways projects that require precise site measurement and stakeout capability.

The SPS781 and SPS881 Smart GPS Antennas can operate in Location GPS modes with Satellite Based Augmentation Systems (SBAS), as a rover in Real-Time Kinematic (RTK) mode with corrections from a site base station, Internet base station or VRS™ network and can act as a site base station for RTK operations.

In combination with the Trimble SCS900 Site Controller Software, the receivers provide the capability to:

- Determine cut fill anywhere on the jobsite
- Stake out site or road features, utilities, daylight lines and side slopes
- Carry out site measurements for progress and material stockpile volume computations
- Carry out as-built measurements, grade checks and laid material thickness checks

Easy Setup Saves Time and Money

The Trimble SPS781 and SPS881 models are easier than ever to set up.

The SPS781 and SPS881 Smart GPS Antennas make setup for base station and rover operation quick, easy and hassle-free

Base Station Operation

- One component to set up
- One button to start up using AutoBase technology
- Bluetooth cable-free operation when using a controller
- Easy to understand status LEDs that show receiver is switched on, tracking satellites and transmitting corrections

Rover Operation

- One component to set up
- One button to start up
- Bluetooth cable-free operation
- Automatically connect using the last used rover settings and source of corrections
- Easy to understand status LEDs that show receiver is switched on, tracking satellites and receiving corrections

Rover set up is fast and easy—just switch on the receiver, start up the controller and you're ready to go. And, because the GPS receiver, GPS antenna, radio, radio antenna and battery are integrated into one housing, you don't have to deal with cables and multiple components. It saves time and money by making them simple to transport and fast to setup.

Trimble AutoBase functionality provides users with rapid repeat daily set up of the base station without the need for a controller.

integrated radio

The SPS781 and SPS881 Smart GPS Antennas have integrated license-free 900 MHz spread spectrum or 450 MHz UHF radios for receiving or transmitting base station corrections. The Smart GPS antennas can be used with cellular communications for connection to VRS networks, Internet-enabled base stations for long-range operation and to provide infill for areas where base station corrections are unavailable over radio.

a future-proof investment

Available in a range of options to suit your application and performance requirements, versatile Trimble GPS receivers are a future-proof investment.

The SPS881 Smart GPS Antenna 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 SPS781 is available in three models to suit specific budget and application requirements. All models support GPS modernization through support of L2C code. The SPS781 Basic Rover and Basic Base can be upgraded to the SPS781 Max giving you flexibility to swap between base and rover functionality as work demands.

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.

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SPS781 Smart GPS antenna

Dimensions (W × H) 19 cm (7.5 in) × 10 cm (3.9 in)
including connectors
Measurements 72-channel L1 C/A code, L1/L2 GPS Full Cycle Carrier,
L2C GPS Full Cycle Carrier

SPS781 basic Smart GPS antenna

Base and Rover interchangeability No
Base only operation SPS781 Basic Base
Rover only operation SPS781 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

SPS781 Max Smart GPS antenna

Base and Rover interchangeability Yes
Rover position update rate 1 Hz, 2Hz, 5 Hz, 10 Hz
Rover maximum range from base Unrestricted
Typical range 3 – 5 km (1.8 – 3 miles) without radio repeater
Rover operation within a VRS network Yes

SPS881 Smart GPS antenna

Dimensions (W × H) 19 cm (7.5 in) × 11.2 cm (4.4 in)
including connectors
Measurements 72-channel L1 C/A code, L1/L2 GPS Full
Cycle Carrier, L2C Full Cycle Carrier
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 3 – 5km (1.8 – 3 miles) without radio repeater
Rover operation within a VRS network Yes

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General

Keyboard and display On/Off key for one button start up
LED indicators For satellite tracking, radio link reception
and power monitoring
Receiver type Fully-integrated “Smart” GPS antenna
Weight
receiver only including internal battery 1.35 kg (2.97 lb)
complete system (rover including controller and pole) 3.7 kg (8.2 lbs)

Temperature

Operating ¹ –40 °C to +65 °C (–40 °F to +149 °F)
Storage –40 °C to +75 °C (–40 °F to +167 °F)
Humidity 100%, condensing
Waterproof IPX7 for submersion to depth of 1 m (3.3 ft)

Shock and vibration

Shock – non-operating Designed to survive a 2 m (6.6 ft)
pole drop onto concrete
Shock – operating To 40 G, 10 msec, sawtooth
Vibration MIL-STD-810F, FIG.514.5C-1

Measurements

- Advanced Trimble Maxwell™ 5 Custom GPS chip
- Trimble R-Track™ technology for tracking the new L2C Civil Signal
- 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
- 72 channels GPS and GLONASS (option)
- Trimble EVEREST™ multipath signal rejection
- Proven Trimble low elevation tracking technology
- 4-channels SBAS (WAAS/EGNOS/MSAS)

TrimBLE SPS781 and SPS881 SMarT GPS anTenna

code differential GPS positioning ²

Horizontal accuracy 0.25 m + 1 ppm RMS
 (0.8 ft + 1 ppm RMS)
 Vertical accuracy 0.5 m + 1 ppm RMS
 (1.6 ft + 1 ppm RMS)

SbaS (WaaS/EGnoS/MSaS) positioning ³

Horizontal accuracy Typically <1 m (3.3 ft)
 Vertical accuracy Typically <5 m (16.4 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 (Max and Extreme options only)
 Initialization reliability ⁴ >99.9%

Power

Internal Rechargeable, removable 7.4 V, 2.4 Ah Lithium-ion battery
 in internal battery compartment
 External 11 to 28 V DC external power input with
 over-voltage protection on Port 1 (7-pin Lemo)
 Power consumption <2.5 W, in RTK mode with internal radio

rover operation times on internal battery

450/900 MHz systems ... Receive only, 5.5 hours; varies with temperature

base station operation times on internal battery

450/900 MHz systems Approximately 4.2 hours;
 varies with temperature (Tx/Rx)

regulatory approvals

- FCC certification Class B Part 15, 22, 24
- Canadian FCC
- CE mark approval
- C-tick approval
- RoHS compliant (excludes those with internal 900 MHz radios)
- WEEE Compliant

communications

Port 1 (7-pin 0-Shell Lemo)
 Serial 1 3-wire RS232
 Port 2 (9-pin D-sub)
 Serial 2 Full 9-wire RS232
 Bluetooth Fully-integrated, fully-sealed
 2.4 GHz Bluetooth module
 Integrated radios Fully-integrated, fully-sealed internal 450MHz
 Tx or Rx, Tx/Rx⁵
 Fully-integrated, fully-sealed internal 900 MHz
 Tx or Rx, Tx/Rx⁵
 450 MHz transmitter radio power output 0.5 W
 900 MHz transmitter radio power output 0.5 W (27 dBm)
 Frequency approvals (900 MHz) USA/Canada (-91)
 New Zealand/Australia (-92)
 Australia (-93)
 Correction data input CMR™, CMR+™, RTCM 2.0-RTCM 2.3, RTCM 3
 Correction data output CMR, CMR+, RTCM 2.0-2.3
 Data outputs NMEA, GSOFF, RT17 and BINEX (optional upgrade)

receiver options and upgrades

SPS781 Basic to SPS781 Max Adds Base/Rover and VRS capability,
 high update rate and unrestricted range
 SPS881 GLONASS upgrade Uses GLONASS L1/L2 satellite signals
 SPS881 L5 upgrade Capable of tracking GPS modernization L5 signals

- 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 Tx/Rx with SPS781 Max or SPS881. Tx only with SPS781 Basic Base. Rx only with SPS781 Basic Rover.

Specifications subject to change without notice.

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