

# Spectra Precision SP80 GNSS Receiver



The Most Connected GNSS Receiver



CONNECTED  
RELIABLE  
RUGGED

INNOVATIVE

# SP80

## SP80 GNSS Receiver

The Spectra Precision SP80 is a next generation GNSS receiver that combines decades of GNSS RTK technology with revolutionary new GNSS processing. Featuring the new 240-channel "6G" chipset, the SP80 system is optimized for tracking and processing signals from all GNSS constellations.

In addition, SP80 is the most connected GNSS receiver in the industry. It is the first to offer a unique combination of integrated 3.5G cellular, Wi-Fi and UHF communications with SMS, email and anti-theft features.

These powerful capabilities, packaged in an ultra-rugged and cable-free housing with unlimited operation time (hot-swappable batteries), make SP80 an extremely versatile turnkey solution.

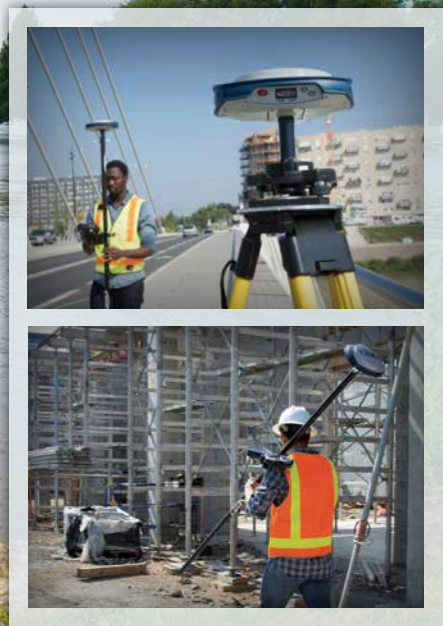
### Key Features

- New 240-channel 6G ASIC
- Z-Blade GNSS-centric
- 3.5G cellular modem
- Internal TRx UHF radio
- Built-in WiFi communication
- SMS and e-mail alerts
- Anti-theft protection
- Hot-swappable batteries



*Patented  
inside-the-rod  
mounted UHF  
antenna design*





## Unique 6G GNSS-centric Technology

Exclusive Z-Blade processing technology running on a next-generation Spectra Precision 240-channel 6G ASIC fully utilizes all 6 GNSS systems: GPS, GLONASS, BeiDou, Galileo, QZSS and SBAS. The unique GNSS-centric capability optimally combines GNSS signals without dependency on any specific GNSS system; this allows SP80 to operate in GPS-only, GLONASS-only or BeiDou-only mode if needed. In addition, SP80 supports the recently approved RTCM 3.2 Multiple Signal Messages (MSM), a standardized definition for broadcasting all GNSS signals from space, regardless of their constellation. This protects the surveyor's investment well into the future by providing superior performance and improved productivity as new signals become available.

## SMS and Email Messaging

SP80 has a unique combination of communication technologies including an integrated 3.5G GSM/UMTS modem, Bluetooth and Wi-Fi connectivity, and optional internal UHF transmit radio. The cellular modem may be used for SMS (text message) and e-mail alerts as well as regular Internet or VRS connectivity. Likewise, SP80 can use all available RTK correction sources and connect to the Internet from the field using WiFi hotspots, where available. The internal UHF transmit/receive radio allows for quick and easy setup as a local base station. This saves time and increases the surveyor's efficiency.



## Anti-Theft Protection

A unique anti-theft technology secures SP80 when installed as a field base station in remote or public places and can detect if the product is disturbed, moved or stolen. This technology allows the surveyor to lock the device to a specific location and make it unusable if the device is moved elsewhere. In this case, SP80 will generate an audio alert and show an alert message on its display. Furthermore, an SMS or e-mail will be sent to the surveyor's mobile phone or computer and provides the receiver's current coordinates allowing tracking of its position and facilitating recovery of the receiver. SP80's anti-theft technology provides surveyors with remote security and peace of mind.

## The Most Powerful Tool for Reliable Field Use

The SP80's rugged housing, created by Spectra Precision's engineering design lab in Germany, incorporates a host of practical innovations. Dual hot-swappable batteries can be easily exchanged in the field as a one hand operation for an interruption-free working day, ensuring surveyors remain productive until the job is done. The impact-resistant glass-fiber reinforced casing, designed to withstand 2m pole drops and waterproof to IP67, ensures that SP80 can handle the toughest outdoor conditions. The patented UHF antenna, set inside the rugged carbon fiber rod, extends the range of RTK radio performance at the same time as armoring protection. The sunlight-readable display offers instant access to key information like the number of satellites, RTK status, battery charge and available memory. These powerful design features combine to make SP80 the most capable, most reliable GNSS receiver, backed by a comprehensive standard 2 year warranty.



## The Spectra Precision Experience

With the most advanced and rugged field data collectors from Spectra Precision, surveyors get maximum productivity and reliability every day. Spectra Precision Survey Pro or FAST Survey software is specifically tailored for the SP80 GNSS receiver providing easy-to-use, yet powerful GNSS workflows, letting the surveyor concentrate on getting the job done. Spectra

Precision Survey Office Software provides a complete office suite for post-processing GNSS data and adjusting survey data, as well as exporting the processed results directly back to the field or to engineering design software packages. Combined with Spectra Precision field and office software, SP80 is a very powerful and complete solution.

# SP80 Technical Specifications

## GNSS Characteristics

- 240 GNSS channels
  - GPS L1C/A, L1P(Y), L2P(Y), L2C, L5
  - GLONASS L1C/A, L2C/A, L3
  - BeiDou B1 (phase 2), B2
  - Galileo E1, E5a, E5b
  - QZSS L1C/A, L2C, L1SAIF, L5
  - SBAS (WAAS/EGNOS/MSAS/GAGAN) L1C/A
- Patented Z-Blade technology for optimal GNSS performance
  - Full utilization of signals from all 6 GNSS systems (GPS, GLONASS, BeiDou, Galileo, QZSS and SBAS)
  - Enhanced GNSS-centric algorithm: fully-independent GNSS signal tracking and optimal data processing, including GPS-only, GLONASS-only or BeiDou-only solution (Autonomous to full RTK)
  - Fast Search engine for quick acquisition and re-acquisition of GNSS signals
- Patented SBAS ranging for using SBAS code & carrier observations and orbits in RTK processing
- Patented Strobe™ Correlator for reduced GNSS multi-path
- Up to 20 Hz real-time raw data (code & carrier and position output)
- Supported data formats: ATOM, CMR, CMR+, RTCM 2.1, 2.3, 3.1 and 3.2 (including MSM)
- NMEA 0183 messages output

## Real-Time Accuracy (RMS) <sup>(1)(2)</sup>

### SBAS (WAAS/EGNOS/MSAS/GAGAN)

- Horizontal: < 50 cm
- Vertical: < 85 cm

### Real-Time DGPS position

- Horizontal: 25 cm + 1 ppm
- Vertical: 50 cm + 1 ppm

### Real-Time Kinematic Position (RTK)

- Horizontal: 8 mm + 1 ppm
- Vertical: 15 mm + 1 ppm

## Real-Time Performance

- Instant-RTK® Initialization
  - Typically 2 sec for baselines < 20 km
  - Up to 99.9% reliability
- RTK initialization range: over 40 km

## Post-Processing Accuracy (RMS) <sup>(1)(2)</sup>

### Static & Fast Static

- Horizontal: 3 mm + 0.5 ppm
- Vertical: 5 mm + 0.5 ppm

### High-Precision Static <sup>(3)</sup>

- Horizontal: 3 mm + 0.1 ppm
- Vertical: 3.5 mm + 0.4 ppm

## Data Logging Characteristics

### Recording Interval

- 0.05 - 999 seconds

## Physical Characteristics

### Size

- 22.2 x 19.4 x 7.5 cm (8.7 x 7.6 x 3.0 in)

### Weight

- 1.17 kg (2.57 lb)

### User Interface

- Graphical PMOLED display

### I/O Interface

- RS232 serial link
- USB 2.0/UART
- Bluetooth 2.1 + EDR
- WiFi (802.11 b/g/n)
- 3.5G quad-band GSM (850/900/1800/1900 MHz) / penta-band UMTS module (800/850/900/1900/2100 MHz)

### Memory

- 2 GB internal memory (1.5 GB user data)
- Over a year of 15 sec. raw GNSS data from 14 satellites
- Removable SD/SDHC memory card (up to 32GB)

### Operation

- RTK rover & base
- RTK network rover: VRS, FKP, MAC
- NTRIP, Direct IP
- CSD mode
- Post-processing

### Environmental Characteristics

- Operating temperature: -40° to +65°C (-40° to +149°F) <sup>(4)(5)</sup>
- Storage temperature: -40° to +85°C (-40° to +185°F) <sup>(6)</sup>
- Humidity: 100% condensing
- IP67 waterproof, sealed against sand and dust
- Drop: 2m pole drop on concrete
- Shock: ETS300 019
- Vibration : MIL-STD-810F

### Power Characteristics

- 2 Li-Ion hot-swappable batteries, 38.5 Wh (2 x 7.4 V, 2600 mAh)
- Battery life time (two batteries): 10 hrs (GNSS On, and GSM or UHF Rx On)
- External DC power: 9-28 V

### Standard System Components

- SP80 receiver
- 2 Li-Ion batteries
- Dual battery charger, power supply and international power cord kit
- Tape measure (3.6 m / 12 ft)
- 7 cm pole extension
- USB to mini-USB cable
- Hard case
- 2 year warranty

## Optional System Components

- SP80 UHF Kit (410-470 MHz 2W TRx)
- SP80 Field Power Kit
- SP80 Office Power Kit
- Data collectors
  - Ranger 3
  - T41
  - MobileMapper 20
  - ProMark 120
- Field software
  - Survey Pro
  - FAST Survey

- (1) Accuracy and TTFF specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality.
- (2) Performance values assume minimum of five satellites, following the procedures recommended in the product manual. High multi-path areas, high PDOP values and periods of severe atmospheric conditions may degrade performance.
- (3) Long baselines, long occupations, precise ephemeris used
- (4) At very low temperatures UHF module should not be used in the transmitter mode.
- (5) At very high temperatures an external battery may be required.
- (6) Without batteries. Batteries can be stored up to +70°C.

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