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Spectra Precision Distributor Confidential

SP60 Frequently Asked Questions

Q: What is Z-Blade technology?

Z-Blade is a patented, proprietary GNSS engine that is the core GNSS data processing technology implemented in SP60. Z-Blade is a GNSS-centric engine which processes all the available signals equally without preference to the GPS constellation. This technology has resulted in the ability to provide positions of admissible quality (standalone as well as RTK) in harsh conditions where satellite visibility is low due to obstacles like trees, buildings, etc. More information can be found at: <http://www.spectraprecision.com/products/technology/>

Q: What GNSS signals are supported by the SP60 receiver?

SP60 supports the following GNSS signals:

- GPS L1C/A, L1P(Y), L2P(Y), L2C
- GLONASS L1C/A, L2C/A
- BeiDou B1 (phase 2), B2
- Galileo E1, E5b
- QZSS L1C/A, L2C, L1SAIF
- SBAS (WAAS/EGNOS/MSAS/GAGAN) L1C/A
- L-Band

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Details of signal frequencies supported by the SP60 receiver:

Constellation and frequency	Frequency range or carrier	SP60 available configurations			
		SP60 L1 GPS	SP60 L1 GNSS	SP60 L1/L2 GPS	SP60 L1/L2 GNSS
GPS L1	1565 - 1586 MHz	Yes	Yes	Yes	Yes
GPS L2	1217 – 1238 MHz			Yes	Yes
SBAS L1	1565 - 1586 MHz	Yes	Yes	Yes	Yes
GLONASS L1	1593 – 1610 MHz		Yes		Yes
GLONASS L2	1238 – 1253 MHz				Yes
GLONASS L3 (K2)	1197 – 1217 MHz				Yes
GALILEO E1	1565 - 1586 MHz		Yes		Yes
GALILEO E5b	1197 – 1217 MHz				Yes
COMPASS B1 Phase II	1559 - 1563 MHz		Yes		Yes
COMPASS B1 Phase III	1575.42 MHz (carrier)		Yes		Yes
COMPASS B2 Phase II	1197 – 1217 MHz				Yes
COMPASS B2b Phase III	1207.14 MHz (carrier)				Yes
QZSS L1	1575.42 MHz (carrier)		Yes		Yes
QZSS L2C	1227.60 MHz (carrier)				Yes
L-Band	1525 – 1560 MHz	Yes	Yes	Yes	Yes

Q: What data formats are supported by an SP60 rover?

The following formats are supported by the SP60 as a rover:

- RTCM 2.1, 2.3, 3.0, 3.1 (including 1021-1025 messages), RTCM 3.2 (including MSM messages)
- Ashtech proprietary ATOM™ format
- CMR, CMR+, CMRx, sCMRx

Q: What are the data formats output by an SP60 base?

The SP60 as a base can output data in the following formats:

- RTCM 3.1, RTCM 3.2
- Ashtech proprietary ATOM™ format
- CMR, CMR+

Q: Can ATOM data format be converted to RINEX data format?

Yes. A RINEX Converter tool is available (Partners site), which supports the ATOM format and newer versions of the RINEX format. The current version of the RINEX converter (v4.6.4) does not support SP60 antenna parameters so conversion with the slant antenna model is not possible.

Q: How does Anti-Theft work on the SP60?

This function needs to first be activated using Survey Pro:

- Go to the Settings/Anti-Theft or Survey/Anti-Theft menu
- Enter your password (spectra by default)
- Click on « Enable »
- If you want to be prompted to enable Anti-Theft each time you start a survey job, check « prompt to enable Anti-Theft »

As soon as Anti-Theft has been activated, a position is stored in memory. If no more valid positions are computed in the following 20 seconds, or a different position from the one stored is reported, output messages will be stopped, and the power button will be inactivated.

Please also refer to the SP60 User Guide for more details and for the FAST Survey workflow.

Q: I have lost my Anti-Theft password and cannot de-activate the Anti-Theft mode on my SP60 receiver. What should I do?

If you lose your password, you will be unable to remove the Anti-Theft protection. You will need to contact Technical Support to have a specific password provided for you to disable this protection.

Q: How long can the SP60 receivers operate without interruption?

The SP60 receiver features a 2600mAh Li Ion battery. The battery life is about 8 hours with GNSS and internal UHF modules ON in receive mode. Without UHF, the battery life is 10 hours. There is not a hot swap capability available on the SP60.

Q: Can I use a standard range pole with the SP60?

Yes, if you use the SP60 without the optional UHF module.

No, if your receiver has the UHF module installed. Because the UHF antenna connector was designed to be aligned with the vertical axis of the range pole, a standard range pole with its external 5/8" tapping cannot be screwed into the base of the SP60 nor is it possible for the UHF antenna to fit inside a standard range pole. With the UHF module installed, you must fix the receiver on top of the Spectra Precision 2m fiberglass range pole provided in the UHF kit (rover configuration), or on top of the special 25cm pole extension with the oblong hole (base configuration). The UHF antenna then fits inside the pole for optimal radio propagation.

Q: What is the IP rating of the SP60?

The SP60 receiver is rated IP67 except for the battery compartment which is not waterproof. This means that water could enter the battery compartment but will not enter the receiver and therefore will not introduce any electrical risk to the receiver itself. The only possible damage could be to the battery itself which is not waterproof.

Q: Can I set the channel/frequency of the UHF module directly from the receiver or from the data collector?

No, you cannot. The frequency must be set by an authorized dealer based on your licensed frequencies. The current channel in use can be easily changed in the field using the data collector software.

Q: Which field software should be used with the SP60?

To control the SP60, you can use a range of rugged Spectra Precision data collectors and the following field software:

- Survey Pro (version 5.6.2 and higher)
- FAST Survey (version xxx and higher)
- ProMark Field (version xxx and higher)

Q: Which office software should be used with the SP60?

Spectra Precision Survey Office software (version 3.50 and higher) should be used to process data collected with the SP60.

Q: How are data files transferred from the SP60 to a PC?

To download (or delete) raw data and log files from the receiver's internal memory, you can use:

- Spectra Precision File Manager PC tool (USB cable is recommended to connect the SP60 and PC)
- Survey Pro or FAST Survey

Data files can also be downloaded directly onto a USB key connected to the SP60.

SP File Manager PC tool is available from the support page on www.spectraprecision.com or from the Partners web site.

Q: How can I upgrade the SP60 firmware and related software?

A new tool is available to upgrade firmware on the SP60: Spectra Precision Loader (This tool also supports MobileMapper 300, ProMark 700 and SP80).

Please refer to the SP60 User Guide for the detailed workflow to follow.

New SP60 firmware versions and related software such as FAST Survey, Survey Pro or Survey Office software are periodically made available at the Spectra Precision website on the Support tab for the specific product web-page. Release Notes including upgrade instructions can also be found there.

Q: How are new options loaded in the SP60?

Spectra Precision Loader is used to install new options.

Q: What are the benefits of using the Bluetooth link for the correction stream?

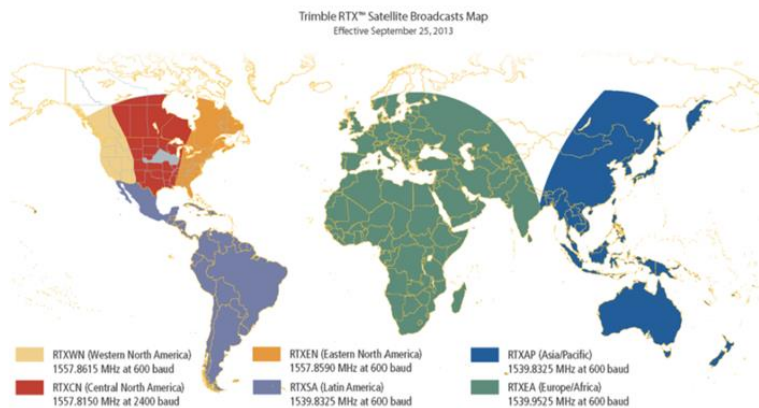
Bluetooth is built into all SP60 receivers and does not require a license. Bluetooth connection between two SP60 receivers is very easy and does not require any settings. Simply create Bluetooth rover and Bluetooth base profiles in Survey Pro and connect. Compared to UHF, it is simpler and completely free of charge.

Q: How long is the Bluetooth range?

The Bluetooth used in the SP60 is Class 1 (100 mW) which provides a range of several hundred meters. This is much shorter than what can be achieved with the internal UHF module but it is very convenient for small construction sites and is free.

Q: What is L-Band?

L-Band is a frequency range between 390MHz and 1.55GHz which is used for satellite communications. Trimble RTX service uses L-Band at 1525 – 1560 MHz to broadcast differential corrections by satellite. Most of the regions of the world are covered by several geostationary satellites as shown below:



The SP60 receiver supports L-Band (by default, no option is needed) and can then receive corrections directly from the satellites (that is, in areas where no cellular coverage is available). Trimble offers these services known as Trimble RTX.

Q: How is RTX activated?

Several RTX services are available and subscriptions are available directly from <https://store.trimble.com>. The SP60 supports CenterPoint RTX via L-Band or IP delivered (cellular). Activating a subscription can be achieved by entering an activation passcode via the SP Loader PC tool. CenterPoint RTX provides 4cm accuracy after 30 minutes of convergence time. It also requires L2 to be activated on the SP60.

Q: Is there any difference between RTX over IP or L-Band?

Accuracy and performance are the same with both correction streams. However, there are significant differences in operating modes.

	Pros	Cons
RTX L-Band	Available anywhere regardless of cellular coverage. Cellular service subscription is not required.	Need to have RTX satellite (geostationary) visibility.
RTX over IP	Corrections can be received in urban areas or under canopy where cellular is available	Cellular coverage is required.

Q: What are the different configurations of the SP60 and their associated accuracies?

SP60	GNSS configuration	Correction source	Real time accuracy (RMS)		Post processing	Time to fix	Max base line length	Comments	
			Horizontal	Vertical					
SP60 L1 GPS Single Receiver Kit P/N: 104234-00	GPS ⁽⁴⁾ L1	SBAS	<50cm	<85cm	3mm + 0.5 ppm				
		DGPS	25cm+ 1 ppm	50cm+ 1 ppm	3mm + 0.5 ppm				
		RTK	VRS/PRS	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	7min	<5kms	
			FKP/MAC	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	7min	<5kms	
			BT (LR) ⁽¹⁾	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	7min		
			UHF ⁽²⁾	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	7min		
		RTX ⁽³⁾	L-Band	N/A	N/A	N/A	N/A	N/A	
IP	N/A		N/A	N/A	N/A	N/A			
SP60 L1 GNSS Single Receiver Kit P/N: 104234-01	GPS ⁽⁴⁾ L1 GLO L1 GAL E1 BDS B1	SBAS	<50cm	<85cm	3mm + 0.5 ppm				
		DGPS	25cm+ 1 ppm	50cm+ 1 ppm	3mm + 0.5 ppm				
		RTK	VRS/PRS	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	5min	<7kms	
			FKP/MAC	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	5min	<7kms	
			BT (LR) ⁽¹⁾	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	5min		
			UHF ⁽²⁾	10mm + 1ppm	20mm + 1ppm	3mm + 0.5 ppm	5min		
		RTX ⁽³⁾	L-Band	N/A	N/A	N/A	N/A	N/A	
IP	N/A		N/A	N/A	N/A	N/A			
SP60 L1/L2 GPS Single Receiver Kit P/N: 104234-02	GPS ⁽⁴⁾ L1/L2	SBAS	<50cm	<85cm	3mm + 0.5 ppm		N/A		
		DGPS	25cm+ 1 ppm	50cm+ 1 ppm	3mm + 0.5 ppm				
		RTK	VRS/PRS	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<20kms	
			FKP/MAC	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<20kms	
			BT (LR) ⁽¹⁾	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<1 km	
			UHF ⁽²⁾	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<5kms	
		RTX ⁽³⁾	L-Band	4cm	9cm		30min	N/A	CenterPoint RTX available worldwide(In Europe RTXEU offers faster convergence)
IP	4cm		9cm		30min	N/A			
SP60 L1/L2 GNSS Single Receiver Kit P/N: 104234-03	GPS ⁽⁴⁾ L1/L2 GLO L1/L2/L3 GAL E1/E5b BDS B1/B2	SBAS	<50cm	<85cm	3mm + 0.5 ppm		N/A		
		DGPS	25cm+ 1 ppm	50cm+ 1 ppm	3mm + 0.5 ppm				
		RTK	VRS/PRS	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<20kms	
			FKP/MAC	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<20kms	
			BT (LR) ⁽¹⁾	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<1 km	
			UHF ⁽²⁾	8mm + 1ppm	15mm + 1ppm	3mm + 0.5 ppm	2s	<5kms	
		RTX ⁽³⁾	L-Band	4cm	9cm		30min	N/A	CenterPoint RTX available worldwide(In Europe RTXEU offers faster convergence)
IP	4cm		9cm		30min	N/A			

1. BT (LR): Bluetooth (LongRange)
2. UHF is a hardware option
3. Trimble RTX service requires a subscription for both L-Band and IP
4. GPS includes GPS+SBAS+QZSS

IMPORTANT: Performance measurement conditions are

- **Open sky**
- **Low multipath**
- **Quiet ionosphere**
- **Uninterrupted correcting service**