Specifications

Trimble SPS461
Modular GPS Heading Receiver

Receiver Name	**SPS461 GPS Heading Receiver**
Configuration Option	**DGPS**
Type	Modular
Base and rover interchangeability	No, rover only
Base operation	NA
Rover operation	All models
Heading operation	All models[5]
Rover position update rate	1 Hz, 2 Hz, 5 Hz, 10 Hz, 20Hz
Rover maximum range from base	Unlimited
Rover operation within a VRS™ network	DGPS only
Factory options	Location RTK, OmniSTAR HP/XP, Precise Vertical, Precision RTK
General	
Keyboard and display	VFD display 16 characters by 2 rows On/Off key for one-button startup Escape and Enter keys for menu navigation 4 arrow keys (up, down, left, right) for option scrolls and data entry
Dimensions (L × W × D)	24 cm (9.4 in) × 12 cm (4.7 in) × 5 cm (1.9 in) including connectors
Weight	1.22 kg (2.70 lb) receiver only 1.37 kg (3.00 lb) receiver with internal radio
Antenna Options	
GA510	L1/L2 GPS, SBAS, and OmniSTAR (optimized for OmniSTAR)
GA530	L1/L2 GPS, MSK Beacon, SBAS, and OmniSTAR
L1/Beacon, DSM 232	Not supported
Zephyr™ Model 2	L1/L2 GPS, SBAS, and OmniSTAR
Zephyr Geodetic™ Model 2	L1/L2 GPS, SBAS, and OmniSTAR
Zephyr Model 2 Rugged	L1/L2 GPS, SBAS, and OmniSTAR
Zephyr, Zephyr Geodetic, Z-Plus, Micro-Centered™	Refer to antenna specification
Temperature	
Operating	–40 °C to +65 °C –40 °F to +149 °F)[1]
Storage	–40 °C to +80 °C (–40 °F to +176 °F)
Humidity	MIL-STD 810F, Method 507.4
Waterproof	IP67 for submersion to depth of 1 m (3.3 ft), dustproof
Shock and Vibration	
Drop	Designed to survive a 1 m (3.3 ft) pole drop onto a hard surface
Shock – Non-operating	To 75 g, 6 ms
Shock – Operating	To 40 g, 10 ms, saw-tooth
Vibration	Tested to Trimble ATV profile (4.5 g RMS): 10 Hz to 300 Hz: 0.04 g/Hz;[2] 300 Hz to 1,000 Hz; –6 dB/octave

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Measurements	
	Advanced Trimble Maxwell™ 5 Custom GPS chip High-precision multiple correlator for L1/L2 pseudo-range measurements
	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 Proven Trimble low elevation tracking technology 72-channel L1 C/A code, L1/L2 Full Cycle Carrier
	Trimble EVEREST™ multipath signal rejection 2-channel MSK Beacon (Optional) 4-channel SBAS (WAAS/EGNOS/MSAS)
Code Differential GPS Positioning[2]	
Correction type	DGPS RTCM 2.x
Correction source	DGPS Base via radio or Internet
Horizontal accuracy	±(0.25m + 1 ppm) RMS ±(0.8 ft + 1 ppm)
Vertical accuracy	±(0.50m + 1 ppm) RMS ±(1.6 ft + 1 ppm)
SBAS (WAAS/EGNOS/MSAS) Positioning[3]	
Horizontal accuracy	Typically <1 m (3.3 ft)
Vertical accuracy	Typically <5 m (16.4 ft)
OmniSTAR Positioning	
VBS service accuracy	Horizontal <1 m (3.3 ft)
XP service accuracy	NA
HP service accuracy	NA
Location RTK Positioning[2]	
Horizontal accuracy	NA
Vertical accuracy	NA
Precise Heading	
Heading accuracy	
2 m antenna separation	0.09° RMS
10 m antenna separation	0.05° RMS
Power	
Internal	NA
External	Power input on the 26-pin D-sub connector is optimized for lead acid batteries with a cut-off threshold of 11 V DC 11 V DC to 28 V DC external power input with over-voltage protection Receiver automatically turns on when connected to external power
Power over Ethernet (PoE)	44 V DC to 57 V DC, IEEE802.3af compliant device
Power consumption	6.0 W in rover mode with internal receive radio

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Operation Time on Internal Battery

Rover	NA
Base station	NA
450 MHz systems	

Regulatory Approvals

FCC: Part 15 Subpart B (Class B Device) and Subpart C, 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.
R&TTE Directive: EN 301 489-1/-5/-17, EN 300 440, EN 300 328, EN 300 113, EN 60950, EN 50371
ACMA: AS/NZS 4295 approval
CE mark compliance
C-tick mark compliance
RoHS compliant
WEEE compliant

Communications

Lemo (Serial)	NA
Modem 1 (Serial)	26-pin D-sub, Serial 2, Full 9-wire RS232, using adaptor cable
Modem 2 (Serial)	26-pin D-sub, Serial 3, 3 wire RS-232, using adaptor cable
1PPS (1 pulse-per-second)	Available
Ethernet	Through a multi-port adaptor
Bluetooth wireless technology	Fully-integrated, fully-sealed 2.4 GHz Bluetooth module[4]
Integrated radios (optional)	Fully-integrated, fully-sealed internal MSK Beacon and 450 MHz (UHF) Rx only, Internal MSK Beacon only or Internal 900 MHz Rx only
Channel spacing (450 MHz)	12.5 kHz or 25 kHz spacing available
450 MHz output power	NA
900 MHz output power	NA
Frequency approvals (900 MHz)	NA
External GSM/GPRS, cell phone support	Supported for direct-dial and Internet-based correction streams Cell phone or GSM/GPRS modem inside controller
Internal MSK Beacon receiver	If internal MSK Beacon Radio is installed[6] Frequency range 283.5–325.0 kHz Channel spacing 500 Hz MSK bit rate 50, 100, and 200 bps Demodulation minimum shift key (MSK)
Correction data input	RTCM 2.x
Correction data output	Repeat DGPS RTCM from MSK Beacon or OmniSTAR VBS source
Data outputs	NMEA, GSOF, 1PPS Time Tags

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Receiver Upgrades

Location RTK OmniSTAR, Location RTK PV, Precise RTK

Notes

1 Receiver will operate normally to –40 °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 Bluetooth type approvals are country specific. For more information, contact your local Trimble office or representative.

5 Two of the supported antennas (See Antenna Options) must be connected for heading.

6 One of the antennas must be a GA530 for MSK Beacon signal reception.

Specifications subject to change without notice.

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