

January 2007

## Trimble SPS550 Location GPS Receiver and Trimble SPS550H Heading Add-On Receiver

### Flexible modular receivers for up to decimeter positioning applications in construction and marine environments

The Trimble® SPS550 Modular GPS receiver provides a range of Location GPS positioning techniques ideal for system integrators, OEMs, and land and marine contractors requiring real-time position and or heading information. The Trimble SPS550 receiver can be combined with either the Trimble SCS900 Site Controller Software for land-based rover applications, or the Trimble HYDROpro™ software for marine positioning solutions.



Location GPS is a term that covers up to decimeter GPS positioning techniques including Satellite Based Augmentation Systems (SBAS – WAAS, EGNOS, and MSAS), DGPS (reference station and rover operations), OmniSTAR services, and Location RTK (decimeter-level RTK positioning). In addition, it includes moving baseline operations to determine both the position and heading of a moving vessel, providing the ability to rapidly position structures such as piling rigs, marine dredgers, or bridge sections in real time.



The Trimble SPS550 receiver can operate in all Location GPS modes, and when combined with the Trimble SPS550H Heading add-on receiver, it delivers both Location GPS and Precise GPS heading capability.

Modularity provides the flexibility to mount the receiver and GPS antenna in a variety of ways, allowing for operation on a pole, backpack, site vehicle, light machinery, or marine vessel. The receiver can be mounted in an accessible location where it is easy to configure and is secure from theft and from the weather, while the antennas can be mounted in a location that provides clear line of sight to the sky and is free from multipath.

Trimble Construction Division, 5475 Kellenburger Road, Dayton, OH 45424, USA

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The receiver has been designed for ease of use, ruggedness to withstand the environment it is used in, and connectivity in mind. The user can configure the receiver and check its status with the front panel display and keyboard without the need for an external computer. The Trimble SPS550 receiver supports Bluetooth® wireless connectivity for cable-free operation, Internet Protocol (IP) over an Ethernet connection through a web browser, serial and CAN communications. The Trimble SPS550 receiver also utilizes industry standard protocols for positioning data communication, making it easy to integrate into any 3D positioning system.

For DGPS and Location RTK operations, the receiver can be used with an external radio modem, or be equipped with a UHF or 900 MHz internal radio capable of both transmit and receive operations.

Location RTK operations can be accomplished using CMR™ outputs from any available RTK base station or Trimble VRS™ (Virtual Reference Station) network.

### **SPS550 receiver standard features**

- Location GPS capability – up to decimeter positioning
  - WAAS (Wide Area Augmentation System), EGNOS (European Geo-Stationary Navigation System), and MSAS Satellite Based Augmentation (SBAS) compatible
  - DGPS reference station or rover operation
  - OmniSTAR capability (requires valid subscription) for a base station-free service
  - Location RTK using CMR corrections by radio link, NTRIP, or VRS through cell phone
- 24-channel L1/L2 GPS receiver – Single frequency GPS for SBAS and DGPS positioning solutions and dual-frequency GPS for OmniSTAR XP/HP, Precise GPS heading and Location RTK solutions
- Long-life integrated battery, typically provides 10 hours operation as a base station with internal transmit/receive radio, or 13 hours as a rover.
- Configuration and monitoring interface through the following methods:
  - Web interface
  - Networked or peer-to-peer Ethernet
  - Integrated display and keyboard
  - Trimble SCS900 Site Controller software
- Integrated Bluetooth® wireless technology for cable-free configuration and operation with a computer
- Small, lightweight design – 1.65 kg (3.64 lbs) (receiver only including the battery)
- Permanent/semi-permanent, and mobile quick setup DGPS base station capability
- Can broadcast corrections through multiple radio links from one base station (for example, through an internal 450 MHz radio and an external 900 MHz radio)

- CAN (Controller Area Network) support
- Rugged, weatherproof construction with an IP67 environmental rating
- -40 °C to +65 °C (-40 °F to +149 °F) operating temperature range
- 10.5 V to 28 V DC input power range with over-voltage protection
- Up to 10 Hz measurement update rate

#### SPS550 receiver option features

- Internal 450 MHz (3 frequency bands) radio with transmit and receive capability
- Internal 900 MHz radio with transmit and receive capability

#### SPS550H Heading add-on receiver standard features

- Low-cost Precise GPS heading add-on receiver for the Trimble SPS550, SPS750, or SPS850 Extreme receivers
- Connection to another GPS receiver through Bluetooth wireless technology or a serial port
- 10 Hz heading update rate in NMEA 0183 and Trimble binary formats
- Configuration and heading on a two-line display
- Includes a GA510 rover GPS antenna, mounting bracket, and short interconnecting cable

This receiver is ideal for projects that require the precise heading of a vessel or structure.

### Specifications

General Characteristics	Specifications
Keyboard and display	VFD display 16 characters by 2 rows On/Off key for one button start up Escape and Enter key for menu navigation 4 arrow keys (up, down, left, right) for option scrolls and data entry
Receiver type	Modular GPS receiver
Antenna type SPS550	User selectable: GA510 antenna, Zephyr™ Model 2, or Zephyr Geodetic™ Model 2 Also supports legacy Trimble antennas: <ul style="list-style-type: none"> <li>• Single frequency antenna for DGPS use</li> <li>• Dual-frequency antenna such as Z+, Zephyr, Zephyr Geodetic, and Micro-Centered™ for heading applications</li> </ul> For OmniSTAR functionality the GA510 antenna is recommended For DGPS base station functionality the Zephyr Geodetic Model 2 antenna is recommended
SPS550H	GA510 antenna included in kit

Physical characteristics	Specifications
Dimensions (L × W × D)	24 cm (9.4 in) × 12 cm (4.7 in) × 5 cm (1.9 in) including connectors
Weight	1.65 kg (3.64 lbs) receiver with internal battery and radio 1.55 kg (3.42 lbs) receiver with internal battery and no radio
Temperature <sup>1</sup>	
Operating	-40° C to +65° C (-40° F to +149° F)
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	Tested and meets the following environmental standards: 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 gRMS): 10 Hz – 300 Hz: 0.04 g <sup>2</sup> /Hz 300 Hz – 1,000 Hz: -6 dB/octave

Performance characteristics	Specifications
Measurements	Advanced Trimble Maxwell™ 5 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 <1 mm precision in a 1 Hz bandwidth L1 and L2 signal-to-noise ratios reported in dB-Hz Proven Trimble low elevation tracking technology 24-channels L1 C/A code L1/L2 full cycle carrier EVEREST™ multipath signal rejection SBAS – WAAS, EGNOS, and MSAS
Code differential GPS positioning <sup>2</sup>	
Horizontal accuracy	±(0.25 m + 1 ppm) RMS, ± (10 in + 1 ppm) RMS
Vertical accuracy	±(0.50 m + 1 ppm) RMS, ± (20 in + 1 ppm) RMS
SBAS (WAAS/EGNOS/MSAS) <sup>3</sup> positioning	
Horizontal accuracy	Typically 1 m (3.3 ft)
Vertical accuracy	Typically 5 m (16 ft)
OmniSTAR positioning	
VBS service accuracy	Horizontal <1 m (3.3 ft)
XP service accuracy	Horizontal 20 cm (8 in), Vertical 30 cm (12 in)
HP service accuracy	Horizontal 10 cm (4 in), Vertical 15 cm (6 in)
Location RTK positioning <sup>2</sup>	
Horizontal accuracy	±(0.1 m + 1 ppm) RMS, ± (4 in + 1 ppm) RMS
Vertical accuracy	±(0.15 m + 1 ppm) RMS, ± (6 in + 1 ppm) RMS
Heading accuracy with additional SPS550, SPS550H, SPS750 Max, or SPS850 Extreme	0.05° RMS (10 m antenna separation) Does not require shore-based corrections for heading solution

Electrical characteristics	Specifications
<p>Power</p> <p>Internal</p> <p>External</p>	<p>Integrated internal battery 7.2 V, 7800 mA-hr, Lithium-Ion</p> <p>Internal battery operates as a UPS in the event of external power source failure</p> <p>Internal battery will charge from external power source when input voltage is &gt;15 V</p> <p>Integrated charging circuitry</p> <p>Power input on 7-pin 0-shell Lemo connector is optimized for lead acid batteries with a cut-off threshold of 10.5 V</p> <p>Power input on the 26-pin DSub connector is optimized for Trimble Lithium-ion battery input (P/N 49400) with a cut-off threshold of 9.5 V</p> <p>Power source supply (Internal/External) is hot-swap capable in the event of power source removal or cut off.</p> <p>10.5 V to 28 V DC external power input with over-voltage protection</p> <p>Receiver will automatically turn on when connected to external power</p>
Power consumption	<p>6 W, in rover mode with internal receive radio</p> <p>8 W, in base mode with internal transmit radio</p>
<p>Base station operation times on internal battery</p> <p>External radio</p> <p>450 MHz 0.5 W systems<sup>4</sup></p> <p>900 MHz 1.0 W systems</p>	<p>15 hours; varies with temperature</p> <p>11 hours; varies with temperature</p> <p>10 hours; varies with temperature</p>
<p>Rover operation times on internal battery</p> <p>450 MHz 2.0 W systems</p> <p>900 MHz 1.0 W systems</p>	<p>13 hours; varies with temperature</p> <p>13 hours; varies with temperature</p>
Regulatory approvals	<p>FCC: Part 15 Subpart B (Class B Device) and Subpart C, Part 90</p> <p>Industry Canada: ICES-003 (Class B Device), RSS-210, RSS-Gen, RSS-310, RSS-119</p> <p>R&amp;TTE Directive: EN 301 489-1/-5/-17, EN 300 440, EN 300 328, EN 300 113, EN 60950, EN 50371</p> <p>ACMA: AS/NZS 4295</p> <p>CE mark</p> <p>C-tick mark</p> <p>UN ST/SG/AC.10.11/Rev. 3, Amend. 1 (Li-Ion Battery)</p> <p>UN ST/SG/AC. 10/27/Add. 2 (Li-Ion Battery)</p> <p>WEEE Compliant</p>

Communications Characteristics	Specifications
<p>Communications</p> <p>Port 1 (7-pin 0S Lemo)</p> <p>Port 2 (D-sub 26-pin)</p> <p>USB</p> <p>Ethernet</p> <p>Bluetooth</p>	<p>3-wire RS-232/CAN</p> <p>Full RS-232 (through multi-port adaptor)</p> <p>3-wire RS-232</p> <p>USB (On the Go) (through multi-port adaptor)</p> <p>Ethernet (through multi-port adaptor)</p> <p>Fully-integrated, fully-sealed 2.4 GHz Bluetooth<sup>5</sup></p>
Integrated radios (optional)	<p>Fully-integrated, fully-sealed internal 450 MHz, Tx/Rx</p> <p>Fully-integrated, fully-sealed internal 900 MHz, Tx/Rx</p>

Communications Characteristics	Specifications
Channel spacing (450 MHz)	12.5 KHz or 25 KHz spacing available End-user configurable
Frequency approvals (900 MHz)	USA/Canada (-10), New Zealand/Australia (-20), Australia (-30)
450 MHz transmitter radio power output	0.5 W / 2.0 W (2.0 W upgrade only available in certain countries)
900 MHz transmitter radio power output	1.0 W (30 dBm)
Receiver position update rate	1 Hz, 2 Hz, 5 Hz, and 10 Hz positioning
Correction data input	CMR, CMR+™ (for Moving Baseline or Location RTK), RTCM 2.0–2.3
Correction data output (SPS550 only)	CMR, CMR+ (for Moving Baseline), RTCM 2.0–2.3
Data outputs	NMEA, GSOF

## Receiver operations capability

Receiver	Specifications
SPS550	SBAS, OmniSTAR services, DGPS Base or Rover, Heading Base, Heading Rover, Location RTK Rover
SPS550H	Heading add-on only (Heading Rover)

### **Specifications are subject to change without notice**

<sup>1</sup> Receiver will operate normally to -40°C. Bluetooth module and internal batteries are rated to -20°C.

<sup>2</sup> Accuracy and reliability may be subject to anomalies such as multipath, obstructions, satellite geometry, and atmospheric conditions. Always follow recommended practices.

<sup>3</sup> Depends on SBAS system performance.

<sup>4</sup> If your receiver has the 2.0 W upgrade, you will experience lesser battery performance compared to the 0.5 W solution.

<sup>5</sup> Bluetooth type approvals are country-specific. For more information, contact your local Trimble office or representative.