TRIMBLE SPS551 AND SPS551H LOCATION GPS RECEIVERS

KEY FEATURES

- Rugged, weatherproof modular receiver design

- GPS L1/L2, SBAS and OmniSTAR VBS/XP/ HP capable

- Keypad and display for easy configuration and status monitoring

- Bluetooth®, Ethernet, Serial, and USB communications

- Integrated battery that also acts as a UPS power supply

- Optional integrated 450M Hz UHF or 900 MHz radios for easy configuration

- Industry standard NMEA, RTCM, and CMR™ inputs and outputs

- 1PPS output for time synchronization with other devices

- Upgrades available to track GPS L2C and GLONASS

SPS551H HEADING ADD-ON RECEIVER FEATURES

- Provides precise heading capability when combined with any SPSx51 receiver

- Upgrade available to track L2C and GLONASS

FLEXIBLE GPS RECEIVERS FOR LOCATION GPS POSITIONING IN LAND AND MARINE ENVIRONMENTS

The Trimble® SPS551 Modular GPS receiver provides a range of Location GPS[1] positioning techniques ideal for system integrators, OEMs, and land or marine contractors who require real-time positions. The Trimble SPS551 receiver can also be combined with either the Trimble SCS900 Site Controller Software for land-based rover applications or Trimble HYDROpro™ software for marine positioning solutions.

The SPS551 receiver can operate in all Location GPS modes, including operation with Satellite Based Augmentation Systems (SBAS), Differential GPS (DGPS), OmniSTAR (VBS, XP, and HP services), and Location RTK mode for decimeter level positioning. When combined with the Trimble SPS551H Heading Add-on receiver, the SPS551 receiver delivers both Location GPS position and precise GPS heading capabilities suitable for rapid real time positioning and orientation of vessels, barges and vehicles.

Location RTK Accuracy to 10 Centimeters

Location RTK mode delivers a horizontal and vertical positioning accuracy of 10 cm. Location RTK operations can be accomplished using CMR+™ correction outputs from any available Trimble RTK (Real-time Kinematic) base, CORS station or Trimble VRS™ network through radio, cell phone, or an Internet connection.

For DGPS and Location RTK operations, the receiver can be used with an external radio modem, or be equipped with either a 450 MHz (UHF) or 900 MHz internal radio capable of both transmit and receive operations.

Flexible Options to Suit Changing Job Site Requirements

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, on light machinery, or on a 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 reduces the potential for multipath.

The SPS551 receiver provides reliable real-time GPS positioning for offshore, near shore and land-based applications including: Offshore drilling platforms, barges, ports, marine channels, and land reclamation.

The Trimble SPS551 receiver can be upgraded with GLONASS and GPS L2C signals to provide better positioning solutions in harsh GPS conditions such as areas where job site obstructions create sky visibility issues or during times of limited GPS-only availability.

---

1   Location GPS receivers provide GPS positioning techniques including Satellite Based Augmentation Systems (SBAS), DGPS, OmniSTAR (VBS, XP and HP services), and Location RTK (decimeter-level RTK positioning) for up to decimeter-level (0.3-ft) positions.

®Trimble

GENERAL

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

Dimensions (L × W × D) . . . . .24 cm × 12 cm × 5 cm
(9.4 in x 4.7 in x 1.9 in)
including connectors

Weight . . . . 1.65 kg (3.64 lb) receiver
with internal battery and radio
1.55 kg (3.42 lb) receiver
with internal battery and no radio

Antenna options

L1/L2/L2C GPS operation . . . GA510[*] or Zephyr™ Model 2[**]
GLONASS operation . . . . .Zephyr Model 2[**]
DGPS Base Station . . . . .Zephyr Geodetic™ Model 2[**]
OmniSTAR operation . . . . . . .GA510[*] or Zephyr Model 2[**]
* GA510 is included in the SPS551H receiver kits and
provides superior OmniSTAR tracking.
** Zephyr Model 2 antenna is included in the SPS551H GLN
receiver kit

Supports legacy
Trimble antennas. . . Single frequency antenna for DGPS use
Dual frequency antenna such
as Z+, Zephyr, Zephyr Geodetic, and
Micro-Centered™ for heading applications

Temperature[1]

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

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^2/Hz;
300 Hz–1,000 Hz; –6 dB/octave

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. Upgradable
  to L2C and GLONASS L1/L2 Full Cycle Carrier.
• Trimble EVEREST™ multipath signal rejection
• 4-channel SBAS (WAAS/EGNOS/MSAS)

Code differential GPS positioning[2]

Horizontal accuracy . . . . 0.25 m + 1 ppm RMS
(0.8 ft + 1 ppm RMS)
Vertical accuracy . . . . 0.50 m + 1 ppm RMS
(1.6 ft + 1 ppm RMS)

SBAS (WAAS/EGNOS/MSAS)[3] positioning

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 . . . . .Horizontal 0.2 m (0.66 ft),
Vertical 0.3 m (1.0 ft)
HP service accuracy . . . . .Horizontal 0.1 m (0.33 ft),
Vertical 0.15 m (0.5 ft)

Location RTK positioning[2]

Horizontal accuracy . . . . 0.07 m + 1 ppm RMS
(0.23 ft + 1 ppm) RMS
Vertical accuracy . . . . 0.07 m + 1 ppm RMS
(0.23 ft + 1 ppm) RMS

Heading accuracy with
SPS551H or additional SPSx5x . . . . .0.05° RMS
(10 m antenna separation)
Does not require shore-based
corrections for heading solution

POWER
Internal

• Integrated internal battery 7.2 V, 7800 mA-hr, Lithium-ion
• Internal battery operates as a UPS in the event of external
  power source failure
• Internal battery will charge from external power source
  when input voltage is >15 V
• Integrated charging circuitry

External

• Power input on 7-pin 0-shell Lemo connector is optimized
  for lead acid batteries with a cut-off threshold of 10.5 V
• Power input on the 26-pin D-sub connector is optimized for
  Trimble Lithium-ion battery input with a cut-off threshold
  of 9.5 V
• Power source supply (Internal/External) is hot-swap capable
  in the event of power source removal or cut off
• 9.5 V to 28 V DC external power input with over-voltage
  protection
• Receiver will automatically turn on when connected to
  external power

Power consumption . . . . 6.0 W in rover mode
with internal receive radio
8.0 W in base mode
with internal transmit radio

Base station operation times on internal battery

External radio . . . . 15 hours;
varies with temperature
Internal radio (450 MHz, 0.5 W) . . . . 11 hours;
varies with temperature

Rover operation times on internal battery

450 MHz systems . . . . 13 hours; varies with temperature
900 MHz systems . . . . 13 hours; varies with temperature

Regulatory approvals

- FCC: Part 15 Subpart B (Class B Device) and Subpart C, Part 90
- Industry Canada: ICES-003 (Class B Device), RSS-210, RSS-Gen, RSS-310, RSS-119
- 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
- UN ST/SG/AC.10.11/Rev. 3, Amend. 1 (Lithium-ion Battery)
- UN ST/SG/AC. 10/27/Add. 2 (Lithium-ion Battery)
- RoHS compliant (excludes those with an internal 900 MHz radio)
- WEEE compliant

Communications

Port 1 (7 pin 0S Lemo)
   Serial 1 . . . . 3 wire RS232
Port 2 (26 pin D-sub)
   Serial 2 . . . . Full 9 wire RS-232
   Serial 3 . . . . 3 wire RS232
   1PPS (pulse per second) . . . . via adapter cable
   USB (On the Go) . . . . via multi-port adapter
   Ethernet . . . . via multi-port adapter
Bluetooth . . . . Fully-integrated, fully-sealed
2.4 GHz Bluetooth[5] module

Integrated radios (optional) . . . . Fully integrated, fully sealed
internal 450 MHz (UHF) Tx/Rx;
Internal 900 MHz Tx/Rx
Channel spacing (450 MHz) . . . . 12.5 KHz or 25 KHz
spacing available
End-user configurable
450 MHz output power . . . . 0.5 W, 2.0 W
(2.0 W available only
in certain countries)
Frequency approvals (900 MHz). . . . . USA/Canada (-10)
New Zealand/Australia (-20)
Australia (-30)
Receiver position update rate . . . . 1 Hz, 2 Hz, 5 Hz,
and 10 Hz positioning
Correction data input
(SPS551) . . . . CMR, CMR+, RTCM 3, RTCM 2.x
Correction data output
(SPS551) . . . . CMR/CMR+ (for Moving Baseline),
RTCM 2.x (DGPS only)
Data outputs . . . . NMEA, GSOF, 1PPS Time Tags

Receiver options and upgrades

SPS551 GLONASS . . . . Uses GLONASS L1/L2
satellite signals
450 MHz Radio 2.0 W. . . . . Available only in certain countries
SPS551 L2C (upgrade only). . . . . Uses GPS L2C
satellite signals

Receiver operations capability

SPS551 . . . . SBAS, OmniSTAR services,
DGPS Base or Rover,
Moving Base or Heading,
Location RTK Rover
SPS551H . . . . Heading add-on only

1 Receiver will operate normally to –40°C. Bluetooth module and 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 If your receiver has the 2.0 W upgrade, you will experience reduced battery performance compared to the 0.5 W solution.
5 Bluetooth type approvals are country-specific. For more information, contact your local Trimble office or representative.

Specifications subject to change without notice.

Bluetooth® C E

NORTH AMERICA
Trimble Construction Division
5475 Kellenburger Road
Dayton, Ohio 45424
USA
800-538-7800 (Toll Free)
+1-937-245-5154 Phone
+1-937-233-9441 Fax

EUROPE
Trimble GmbH
Am Prime Parc 11
65479 Raunheim
GERMANY
+49-6142-2100-0 Phone
+49-6142-2100-550 Fax

ASIA-PACIFIC
Trimble Navigation
Singapore PTE Ltd.
80 Marine Parade Road, #22-06
Parkway Parade
Singapore, 449269
SINGAPORE
+65 6348 2212 Phone
+65 6348 2232 Fax

YOUR LOCAL TRIMBLE OFFICE OR REPRESENTATIVE

Trimble

www.trimble.com