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Trimble SPS700 Construction Total Station

Unmatched jobsite performance

General Description

The Trimble® SPS700 construction total station builds on over 50 years of total station technology to deliver unmatched performance for construction jobsite applications. The simple solution to all your site measurement and stakeout applications, the SPS700 construction total station takes little or no setup time and requires only two known points to establish position and orientation. Not only does the SPS700 provide superior tracking during measurements and stakeout, but the single-person operation increases cost savings and productivity.

Innovative technology – Exclusive MagDrive™ servos provide quiet, effortless operation and the fastest, most responsive and accurate tracking available. Unique SurePoint™ technology autocorrects instrument pointing for mislevelment and internal calibrations in real time.

Guaranteed, precise point measurement – Unique Active Target technology assures correct lock onto the right prism at all times during operation for constant, accurate positioning. Automated target pointing, tracking and sighting lets a traditional two-person crew operate with greater efficiency than a crew running a servo or mechanical total station.

Autolock® – Exclusive MultiTrack™ capability provides coaxial target tracking capability to any reflective foil target, prisms or prisms with Active Target ID (identification). This unique technology allows you to use conventional prisms for backsight, control point or monitoring applications and unique prisms with Target ID for site measurement and stakeout operations, eliminating locking errors in robotic mode during the search process.

Direct Reflect DR 300+ long-range reflectorless measurement – Quickly and safely measure hard-to-reach or unsafe places up to 600m away without a target or walking on the surface. You'll realize significant increases in productivity and safety when measuring stockpiles, profiling cuttings and rock faces.

Upgradeable Servo, Autolock or Robotic Options – The SPS700 construction total station gives you three options to choose from–Servo, Autolock and Robotic. Think of the flexible SPS700 as a future-proof investment–Servo today; Autolock or Robotic tomorrow–that expands as your needs or applications change.

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

Standard Features

- Totally cable-free at instrument and robotic rod for rapid setup and hassle-free operation during site measurement and stakeout in any operating conditions.
- Servo controls and telescope focus located on side panel provides fast and convenient instrument operation
- Long battery life allows over 6 hours of instrument robotic operation on one smart lithium ion battery and over 12 hours remote operation from an additional battery on the robotic controller holder.
- Eccentric, detachable handle allows a full 90° vertical sweep of the telescope for steep sights and operation in tight spaces
- Autolock and Robotic configurations allow operation in poor visibility or darkness with normal levels of efficiency.

Specifications

Physical characteristics	Specifications
Angle Measurement Accuracy (Standard deviation based on DIN 18723) Horizontal Accuracy Vertical Accuracy Angle Reading least count Standard Tracking	 5" (1.5 mgon) 2" (0.6 mgon) 1" (0.1 mgon) 2" (0.5 mgon)
Automatic level compensator	Dual-axis compensator ±6' (±100 mgon)
Distance Measurement Accuracy (Standard Deviation) Prism Mode Standard Tracking DR Mode Standard Tracking	 ±(3 mm + 2 ppm), ±(0.01 ft + 2 ppm) ±(10 mm + 2 ppm), ±(0.032 ft + 2 ppm) ±(3 mm + 2 ppm), ±(0.01 ft + 2 ppm) >300 m (656 ft) ±(5mm + 2 ppm), ±(0.016 ft + 2 ppm) ±(10 mm + 2 ppm), ±(0.032 ft + 2 ppm)
Measuring Time Prism mode Standard Tracking DR Mode Standard Tracking	 1.2 s 0.4 s 1-5 s 0.4 s

Physical characteristics	Specifications
Range (under standard clear conditions)[1,2]	
Prism Mode	
1 prism	2,500 m (8,202 ft)
1 prism Long Range mode:	5,500 m (18,044 ft) max range
Shortest possible range:	0.2 m (0.65 ft)
DR Mode	
Kodak Gray Card[3] (18% reflective)	>300 m (984 ft)
Kodak Gray Card[3] (90% reflective)	>800 m (2625 ft)
Concrete	300–400 m (984–1312 ft)
Wood construction	200–400 m (656–1312 ft)
Metal construction	200–250 m (656–820 ft)
Light rock	200–300 m (656–984 ft)
Dark rock	150–200 m (492–656 ft)
Reflective foil	20 mm 800 m (2,625 ft)
Reflective foil	60 mm 1600 m (5,249 ft)
Shortest possible range	2 m (6.56 ft)
Dynamic Measurement Capability	
Maximum position update rate	3 Hz
3D Positioning Accuracy	**Note:** 3D positioning accuracy is based on the following parameters: • Angle accuracy (horizontal and vertical position accuracies vary with angles measured) • Distance measurement accuracy (ppm error causes accuracy to vary with range measured) • Tracker lock on accuracy • Stationary or moving target The following 3D positioning accuracies provide an indication of total system accuracy at commonly encountered ranges from the instrument on a horizontal sighting. On steeper sightings, horizontal accuracy increases and vertical accuracy decreases with steeper vertical angles.

Range (m) / (ft)	Position Accuracy (m) / (ft)	Height Accuracy (m) / (ft)
50 / 164	0.003 / 0.010	0.001 / 0.003
100 / 328	0.003 / 0.010	0.002 / 0.006
200 / 656	0.006 / 0.020	0.002 / 0.006
300 / 984	0.008 / 0.026	0.003 / 0.009

General characteristics	Specifications
Light source	Pulsed laser diode 870 nm, Laser class 1
Laser pointer coaxial (standard)	Laser class 2
Beam divergence	
Horizontal	4.0 cm/100 m (0.13 ft/328 ft)
Vertical	0.8 cm/100 m (0.26 ft/328 ft)
Atmospheric correction	–130 ppm to 160 ppm continuous

General characteristics	Specifications
Leveling	
Circular level in Tribrach	8'/2 mm (8'/0.007 ft)
Electronic 2-axis level in the LC- display with a resolution of:	0.3" (0.1 mgon)
Centering	
Centering system	Trimble 3-pin
Optical plummet	Alidade optical plummet
Magnification/shortest focusing distance	2.3×/0.5m–infinity (1.6 ft–infinity)
Servo system	MagDrive servo technology, integrated servo/angle sensor electromagnetic direct drive
Rotation speed	115 degrees/sec (128 gon/sec)
Pointing speed 180 degrees (200 gon)	3.2 sec
Clamps and slow motions	Servo-driven, endless fine adjustment
Telescope	
Magnification	30×
Aperture	40 mm (1.57 in)
Field of view	2.6 m at 100m (8.5 ft at 328 ft)
Shortest focusing distance	1.5 m (4.92 ft)–infinity
Illuminated crosshair	Variable (10 steps)
Focus type	Servo assisted on side cover
Track light built in	Standard
Power supply	
Internal battery	Rechargeable Li-Ion battery 11.1 V, 4.4 Ah
Operating time[4] servo instrument	Approx. 4 hours on a single internal battery
Operating time[4] robotic instrument	Approx. 6 hours on a single internal battery
Operating time[4] robotic rod with controller	Approx. 12 hours on a single internal battery
Charging time per battery	Approx. 2 hours per battery
Weights and dimensions	
Instrument (Servo/Autolock)	5.15 kg (11.35 lb)
Instrument (Robotic)	5.25 kg (11.57 lb)
Trimble CU controller	0.40 kg (0.88 lb)
Tribrach	0.70 kg (1.54 lb)
Internal battery	0.35 kg (0.77 lb)
Trunnion axis height	196 mm (7.71 in)
Removable Data Storage Media[6]	USB Stick or Compact Flash Card
Instrument Handle	Detachable and eccentric for unrestricted sighting

Tracker and Radio Performance	Specifications
Autolock and Robotic Range[1,2]	
Robotic	500–700 m (1,640–2,297 ft)
Autolock	500–700 m (1,640–2,297 ft)
Shortest search distance	0.2 m (.65 ft)
Autolock pointing precision at 200 m (656 ft) (Standard deviation)	<2 mm (0.007 ft)
Radio	
Type of radio internal/external	Integrated 2.4 GHz frequency-hopping, spread-spectrum radios
Tracker	
Coaxial with telescope	Yes
Passive tracking capability	Yes
Active target capability	Yes
Number of Target ID channels	8
Automatic lock on sighting prism	Yes (No search required)

Tracker and Radio Performance	Specifications
Search Operation	
Search time (typical)[5]	2–10 s
Search area	360° (400 gon) or defined horizontal and vertical search window

Environmental Characteristics	Specifications
Operating temperature	–20 ºC to +50 ºC (–4 ºF to +122 ºF)
Dust and water proofing	IP55

Notes:

1 Standard clear: No haze. Overcast or moderate sunlight with very light heat shimmer.

2 Range and accuracy depend on atmospheric conditions, size of prisms and background radiation.

3 Kodak Gray Card, Catalog number E1527795.

4The capacity at –20 ºC (–5 ºF) is 75% of the capacity at +2 ºC (+68 ºF).

5 Dependent on selected size of search window

6 USB Stick or CF Card can be connected to Robotic holder or docking cradle to transfer information from controller to stick or card

Specifications subject to change without notice.