

# Trimble S7 Total Station

## Key Features

Surveying, imaging and 3D scanning in one powerful solution

Improved **Trimble VISION technology** for video robotic control, scene documentation and photogrammetric measurements

Locate2Protect **real-time equipment management**

Trimble DR Plus for **long range and superior accuracy**

Intuitive **Trimble Access Field Software**

Trimble Business Center Office Software for **quick data processing**

**Seamless integration** with the Trimble V10 Imaging Rover and GNSS receivers

## THE MOST PRODUCTIVE TOTAL STATION

The Trimble® S7 Total Station combines scanning, imaging and surveying into one powerful solution. Now you only need one instrument on the job site to perform all your data capture. Create 3D models, high accuracy visual site documentation, point clouds, and more using the Trimble S7, Trimble Access™ field software and Trimble Business Center office software.

The Trimble S7 is the ultimate system for efficient surveying, allowing you to adapt to any situation and increasing your productivity in the field. The combination of SureScan, Trimble VISION™, FineLock™ and DR Plus technology, along with many other features, means you'll be able to collect data faster and more accurately than ever before.

### Integrated 3D Scanning

Save time in the field and in the office with Trimble SureScan technology. Now you have the flexibility to perform feature-rich scans every day. Efficiently capture the information you need to create digital terrain models (DTMs), perform volume calculations and make topographic measurements faster than with traditional surveying methods. SureScan technology enables you to collect and process data faster by focusing on collecting the right points, not just more points.

### Improved Trimble VISION Technology

Trimble VISION technology gives you the power to direct your survey with live video images on the controller as well as create a wide variety of deliverables from collected imagery. Capture measurements to prisms or reflectorless with point-and-click efficiency via video. Quickly document your site and add notes directly to the pictures in the field to ensure you never miss that critical information. Back in the office, you can use your Trimble VISION data for measurements, or to process 360-degree panoramas and high dynamic range (HDR) images for even clearer deliverables.

### Superior Accuracy with Trimble DR Plus

Trimble DR Plus range measurement technology provides extended range of Direct Reflex measurement without a prism. Now you can measure further with fewer instrument set-ups and enhance your scanning performance. Trimble DR Plus, combined with the smooth and silent MagDrive™ servo technology, creates unmatched capability for quick measurements, without compromising on accuracy.

### Stay On Point

Reduce aiming error, avoid costly re-measurement and be confident in your results with Trimble SurePoint™. The Trimble S7 Total Station aims and stays on target through wind, handling, and sinkage, actively correcting for unwanted movement ensuring accurate pointing and measurement every time. With its exclusive MultiTrack™ technology and Target ID capabilities, surveyors can choose the type of target, passive or active, that best suits the job site conditions and be confident that they will find and lock to the correct target.

### Manage Your Assets

Know where your total stations are 24 hours a day with Trimble Locate2Protect technology. See where your equipment is at any given time and get alerts if your instrument leaves a job site or experiences unexpected equipment shock or abuse.

Trimble InSphere™ Equipment Manager lets you view usage and keep up-to-date on firmware, software and maintenance requirements. With Trimble Locate2Protect and InSphere Equipment Manager, you can rest assured knowing your equipment is up-to-date and where it should be.

### Powerful Field and Office Software

Choose from a variety of Trimble controllers operating the feature rich, intuitive Trimble Access field software. Streamlined workflows like Roads, Utilities and Pipelines guide crews through common project types, helping to get the job done faster with less distractions. Trimble Access workflows can also be customized to fit your needs.

Back in the office, trust Trimble Business Center to help you check, process and adjust your optical and GNSS data in one software solution.

## Trimble S7 Configurations

EDM	Angle Accuracy	Servo Control	Trimble VISION	FineLock	Scanning
DR Plus	1", 2", 3", or 5"	Robotic or Autolock®	Included	Included	Included



**PERFORMANCE**

**Angle measurement**

Sensor type ..... Absolute encoder with diametrical reading  
 Accuracy (Standard deviation based on DIN 18723) ..... 1" (0.3 mgon)  
 2" (0.6 mgon), 3" (1.0 mgon), or 5" (1.5 mgon)  
 Display (least count) ..... 0.1" (0.01 mgon) Automatic level compensator  
 Type ..... Centered dual-axis  
 Accuracy ..... 0.5" (0.15 mgon)  
 Range ..... ±5.4' (±100 mgon)

**Distance measurement**

Accuracy (RMSE)  
 Prism mode  
 Standard<sup>1</sup> ..... 1 mm + 2 ppm (0.003 ft + 2 ppm)  
 Tracking ..... 4 mm + 2 ppm (0.013 ft + 2 ppm)  
 DR mode  
 Standard ..... 2 mm + 2 ppm (0.0065 ft + 2 ppm)  
 Tracking ..... 4 mm + 2 ppm (0.013 ft + 2 ppm)  
 Extended range ..... 10 mm + 2 ppm (0.033 ft + 2 ppm)

**Measuring time**

Prism mode  
 Standard ..... 1.2 sec  
 Tracking ..... 0.4 sec  
 DR mode  
 Standard ..... 1–5 sec  
 Tracking ..... 0.4 sec

**Measurement range**

Prism mode<sup>5,6</sup>  
 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  
 Reflective foil 20 mm ..... 1,000 m (3,280 ft)

	<b>Good</b> (Good visibility, low ambient light)	<b>Normal</b> (Normal visibility, moderate sunlight, some heat shimmer)	<b>Difficult</b> (Haze, object in direct sunlight, turbulence)
<b>White card (90% reflective)<sup>2</sup></b>	1,300 m (4,265 ft)	1,300 m (4,265 ft)	1,200 m (3,937 ft)
<b>Gray card (18% reflective)<sup>2</sup></b>	600 m (1,969 ft)	600 m (1,969 ft)	550 m (1,804 ft)

Shortest possible range ..... 1 m (3.28 ft)  
 DR Extended Range Mode  
 White Card (90% reflective)<sup>3</sup> ..... 2,000–2,200 m

**Scanning**

Range<sup>2,3</sup> ..... from 1 m up to 250 m (3.28 ft–820 ft)  
 Speed<sup>4</sup> ..... up to 15 points/sec  
 Minimum point spacing ..... 10 mm (0.032 ft)  
 Standard deviation ..... 1.5 mm @ ≤50 m (0.0049 ft @ ≤164 ft)  
 Single 3D point accuracy ..... 10 mm @ ≤150 m (0.032 ft @ ≤492 ft)

**EDM SPECIFICATIONS (DR PLUS)**

Light source ..... Pulsed Laser diode 905 nm; Laser class 1  
 Beam divergence  
 Horizontal ..... 2 cm/50 m (0.06 ft/164 ft)  
 Vertical ..... 4 cm/50 m (0.13 ft/164 ft)

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## SYSTEM 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)

### Servo system

MagDrive servo technology	Integrated servo/angle sensor electromagnetic direct drive
Rotation speed	115 degrees/sec (128 gon/sec)
Rotation time Face 1 to Face 2	2.6 sec
Positioning speed 180 degrees (200 gon)	2.6 sec
Clamps and slow motions	Servo-driven, endless fine adjustment

### Centering

Centering system	Trimble 3-pin
Optical plummet	Built-in optical plummet
Magnification focusing distance	2.3x/0.5 m to infinity (1.6 ft to infinity)

### Telescope

Magnification	30x
Aperture	40 mm (1.57 in)
Field of view at 100 m (328 ft)	2.6 m at 100 m (8.5 ft at 328 ft)
Focusing distance	1.5 m (4.92 ft) to infinity
Illuminated crosshair	Variable (10 steps)
Autofocus	Standard

### Camera

Chip	Color Digital Image Sensor
Resolution	2048 x 1536 pixels
Focal length	23 mm (0.09 ft)
Depth of field	3 m to infinity (9.84 ft to infinity)
Field of view	16.5° x 12.3° (18.3 gon x 13.7 gon)
Digital zoom	4-step (1x, 2x, 4x, 8x)
Exposure	Spot, HDR, Automatic
Brightness	User-definable
Image storage	Up to 2048 x 1536 pixels
File format	JPEG
Compression ratio	User-definable
Video streaming <sup>8</sup>	5 frames/sec

### Power supply

Internal battery	Rechargeable Li-Ion battery 11.1 V, 5.0 Ah
Operating time <sup>9</sup>	
One internal battery	Approx. 6.5 hours
Three internal batteries in multi-battery adapter	Approx. 20 hours
Robotic holder with one internal battery	Approx. 13.5 hours
Operating time for video robotic <sup>4</sup>	
One battery	5.5 hours
Three batteries in multi-battery adapter	17 hours

### Weight and dimensions

Instrument	5.5 kg (11.57 lb)
Trimble CU controller	0.4 kg (0.88 lb)
Tribrach	0.7 kg (1.54 lb)
Internal battery	0.35 kg (0.77 lb)
Trunnion axis height	196 mm (7.71 in)

### Other

Laser pointer coaxial	Laser class 2
Operating temperature	-20 °C to +50 °C (-4 °F to +122 °F)
Dust and water proofing	IP65
Communication	2.4 GHz, USB, Serial, Bluetooth <sup>®10</sup>
Security	Dual-layer password protection, Locate2Protect <sup>11</sup>

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## AUTOLOCK AND ROBOTIC SURVEYING

Autolock and Robotic Range <sup>6</sup>	
Passive prisms . . . . .	500–700 m (1,640–2,297 ft)
Trimble MultiTrack Target . . . . .	800 m (2,625 ft)
Trimble ActiveTrack 360 Target . . . . .	500 m (1,640 Ft)
Autolock pointing precision at 200 m (656 ft) (Standard deviation) <sup>5</sup>	
Passive prisms . . . . .	<2 mm (0.007 ft)
Trimble MultiTrack Target . . . . .	<2 mm (0.007 ft)
Trimble ActiveTrack 360 Target . . . . .	<2 mm (0.007 ft)
Shortest search distance . . . . .	0.2 m (0.65 ft)
Type of radio internal/external . . . . .	2.4 GHz frequency-hopping, spread-spectrum radios
Search time (typical) <sup>7</sup> . . . . .	2–10 sec

## FINELOCK

Pointing precision at 300 m (980 ft) (standard deviation) <sup>6</sup> . . . . .	<1 mm (0.003 ft)
Range to passive prisms (min–max) <sup>6</sup> . . . . .	20 m–700 m (64 ft–2,297 ft)
Minimum spacing between prisms at 200 m (656 ft) . . . . .	0.8 m (2.625 ft)

## GPS SEARCH/GEOLOCK

GPS Search/GeoLock . . . . .	360 degrees (400 gon) or defined horizontal and vertical search window
Solution acquisition time <sup>12</sup> . . . . .	15–30 sec
Target re-acquisition time . . . . .	<3 sec
Range . . . . .	Autolock & Robotic range limits

1 Standard deviation according to ISO17123-4.  
 2 Target color, atmospheric conditions, and scanning angles will impact range.  
 3 Kodak Gray Card, Catalog number E1527795.  
 4 Target shape, texture, and color; grid size; and distance and angle to target; will impact speed.  
 5 Standard clear: No haze. Overcast or moderate sunlight with very light heat shimmer.  
 6 Range and accuracy depend on atmospheric conditions, size of prisms and background radiation.  
 7 Dependent on selected size of search window.  
 8 0.5 frames per second with remote operation.  
 9 The capacity in –20 °C (–5 °F) is 75% of the capacity at +20 °C (68 °F).  
 10 Bluetooth type approvals are country specific.  
 11 Functionality and availability dependent on region.  
 12 Solution acquisition time is dependent upon solution geometry and GPS position quality.

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**NORTH AMERICA**  
 Trimble Navigation Limited  
 10368 Westmoor Dr  
 Westminster CO 80021  
 USA

**EUROPE**  
 Trimble Germany GmbH  
 Am Prime Parc 11  
 65479 Raunheim  
 GERMANY

**ASIA-PACIFIC**  
 Trimble Navigation  
 Singapore Pty Limited  
 80 Marine Parade Road  
 #22-06, Parkway Parade  
 Singapore 449269  
 SINGAPORE

