SPEC SHEET

Trimble S9/S9 HP

TOTAL STATION



Performance and precision

Trimble® S9 total stations integrate the best field technologies plus the highest level of accuracy and specialized engineering features for ultimate performance and precision. Combine scanning, imaging and surveying into one solution, or focus on the highest level of accuracy with options such as Long Range Trimble FineLock™ technology and our Trimble DR High Precision (HP) EDM for applications where precision is priority. Back in the office, trust our powerful Trimble Business Center office software and Trimble 4D Control™ software to help you process and analyze your data.

Key features

- Available 0.5” or 1” angle accuracy
- Trimble DR Plus or HP EDM for optimal speed, accuracy and reliability
- Optional Trimble VISION™ and Trimble SureScan™ technology
- Trimble Sentinel real-time equipment management
- Intuitive Trimble Access™ field software
- Trimble Business Center office software for quick data processing
- Trimble 4D Control for monitoring management

Trimble

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Specialized for engineering applications

The Trimble S9 total station is built for specialized applications such as monitoring and tunneling, where you need a solution with optimal speed, accuracy and reliability. Combine the Trimble DR HP EDM in the S9 HP with your choice of 1" or 0.5" angular accuracies and Long Range FineLock and you have the flexibility to tackle the most demanding projects.

Trimble DR Plus and DR HP EDM

Trimble DR Plus range measurement technology provides extended range of Direct Reflex measurement without a prism to exceptionally long distances, while the Trimble DR HP EDM in the Trimble S9 HP offers higher accuracy when measuring to prisms. Trimble's high performance EDMs, combined with the smooth and frictionless drive capabilities of Trimble MagDrive™ servo technology, creates unmatched capability for quick measurements, without compromising on accuracy.

Advanced engineering features

Additional engineering-specific features in the Trimble S9 total stations include Trimble FineLock technology. Trimble FineLock detects targets without interference from surrounding prisms for high precision applications in close quarters. The Trimble Long Range FineLock option extends this functionality.

Manage your assets 24/7

Know where your total stations are 24 hours a day with Trimble Sentinel 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 VISION and SureScan technology

The Trimble S9 comes with optional Trimble VISION and Trimble SureScan technology. The improved Trimble VISION gives you the power direct your survey with live video images on the controller as well as create a wide variety of deliverables from collected imagery. Trimble SureScan in the Trimble S9 total station provides the flexibility to perform feature-rich scans every day, without the complexity of setting up a separate scanning system or switching to specialized field software. Trimble SureScan ensures that you have even coverage and get the most efficiency from your scanning.

Powerful field and office software

Trimble controllers and our specialized modules in Trimble Access field software such as Tunnels, Monitoring, Pipelines and Mines provide dedicated workflows to help you get the job done faster. Trimble Access workflows can also be customized to fit your needs. In the office, use Trimble Business Center to help you check, process and adjust your data in one software solution. Trimble 4D Control office software provides a comprehensive solution for the management of monitoring projects—both real-time and post-processed—to rapidly detect critical structural movements.

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Trimble S9 and S9 HP configurations

	EDM	Accuracy	Servo	Trimble VISION	Sure Scan	FineLock	Long Range FineLock	Trimble Tracklight®
S9	DR Plus	0.5"	Robotic	Yes	Yes	Yes	No	No
	DR Plus	0.5"	Robotic	No	No	Yes	Yes	No
	DR Plus	0.5"	Robotic	No	No	Yes	No	Yes
	DR Plus	1"	Robotic or Autolock®	No	No	Yes	Yes	No
S9 HP	DR HP	0.5"	Robotic	No	No	Yes	Yes	No
	DR HP	0.5"	Robotic or Autolock	No	No	Yes	No	Yes
	DR HP	0.5"	Robotic	Yes	No	Yes	No	No
	DR HP	1"	Robotic or Autolock	Yes	No	Yes	No	No
	DR HP	1"	Robotic or Autolock	No	No	Yes	No	Yes
	DR HP	1"	Robotic or Autolock	No	No	Yes	Yes	No
	DR HP	1"	Robotic	No	No	Yes	No	No

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Performance (DR Plus)

Angle measurement					
Sensor type	Absolute encoder with diametrical reading				
Accuracy[1]	0.5" (0.15 mgon) or 1" (0.3 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 (ISO)	Prism mode	Standard[2]	1 mm + 2 ppm (0.003 ft + 2 ppm)		
Accuracy (RMSE)	Prism mode	Standard	2 mm + 2 ppm (0.0065 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 s		
		Tracking	0.4 s		
	DR mode	Standard	1–5 s		
		Tracking	0.4 s		
Measurement range					
Prism mode (under standard clear conditions[3, 4])	1 prism		2,500 m (8,202 ft)		
	1 prism Long Range mode		5,500 m (18,044 ft) (max. range)		
	Shortest range		0.2 m (0.65 ft)		
DR mode			**Good** *(Good visibility, low ambient light)*	**Normal** *(Normal visibility, moderate sunlight, some heat shimmer)*	**Difficult** *(Haze, object in direct sunlight, turbulence)*
	White card (90% reflective)[5]		1,300 m (4,265 ft)	1,300 m (4,265 ft)	1,200 m (3,937 ft)
	Gray card (18% reflective)[5]		600 m (1,969 ft)	600 m (1,969 ft)	550 m (1,804 ft)
Reflective foil 20 mm	1000 m (3280 ft)				
Shortest possible range	1 m (3.28 ft)				
DR Extended Range Mode	White Card (90% reflective)[5]		2200 m		
Scanning					
	Range[3, 4]		from 1 m up to 250 m (3.28 ft–820 ft)		
	Speed		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)		

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EDM specifications (DR Plus)

Light source	Pulsed laserdiode 905 nm	
Beam divergence	Horizontal	4 cm/100 m (0.13 ft/328 ft)
	Vertical	8 cm/100 m (0.26 ft/328 ft)

Performance (DR HP)

Sensor type	Absolute encoder with diametrical reading			
Angle measurement	Angle accuracy[1]		0.5" (0.15 mgon) or 1" (0.3 mgon)	
	Angle 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 (ISO)	Prism mode	Standard[2]	0.8 mm + 1 ppm (0.0026 ft +1 ppm)	
Accuracy (RMSE)	Prism mode	Standard	1 mm + 1 ppm (0.003 ft +1 ppm)	
		Tracking	5 mm + 2 ppm (0.016 ft + 2 ppm)	
	DR mode	Standard	3 mm + 2 ppm (0.01 ft + 2 ppm)	
		Tracking	10 mm + 2 ppm (0.032 ft + 2 ppm)	
Measuring time				
	Prism mode	Standard	3 s	
		Tracking	0.4 s	
	DR mode	Standard	3–15 s	
		Tracking	0.4 s	
Range				
Prism mode (under standard clear conditions[3, 4])	1 prism		3,000 m (9,800 ft)	
	1 prism Long Range mode		5,000 m (16,400 ft)	
	3 prism Long Range mode		7,000 m (23,000 ft)	
	Shortest range		1.5 m (4.9 ft)	
DR mode		**Good** *(Good visibility, low ambient light)*	**Normal** *(Normal visibility, moderate sunlight, some heat shimmer)*	**Difficult** *(Haze, object in direct sunlight, turbulence)*
	White card (90% reflective)[5]	>150 m (492 ft)	150 m (492 ft)	70 m (229 ft)
	Gray card (18% reflective)[5]	>120 m (394 ft)	120 m (394 ft)	50 m (164 ft)
Shortest range	1.5 m (4.9 ft)			

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EDM specifications (DR HP)

Light source	Laserdiode 660 nm	
Beam divergence	Horizontal	4 cm/100 m (0.13 ft/328 ft)
	Vertical	4 cm/100 m (0.13 ft/328 ft)

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	2.3×/0.5 m–infinity (1.6 ft–infinity)		
Telescope			
Magnification	30×	Focusing distance	1.5 m (4.92 ft)–infinity
Aperture	40 mm (1.57 in)	Illuminated crosshair	Variable (10 steps)
Field of view at 100 m (328 ft)	2.6 m at 100 m (8.5 ft at 328 ft)	Autofocus	Standard
Camera (Not available in all models)			
Chip	Color Digital Image Sensor	Digital zoom	4-step (1x, 2x, 4x, 8x)
Resolution	2048 × 1536 pixels	Exposure	Spot, HDR, Automatic
Focal length	23 mm (0.09 ft)	Brightness	User-definable
Depth of field	3 m to infinity (9.84 ft to infinity)	Image storage	Up to 2048 × 1536 pixels
Field of view	16.5° × 12.3° (18.3 gon × 13.7 gon)	File format	JPEG
Power supply			
Internal battery	Rechargeable Li-Ion battery 10.8 V, 6.5 Ah		
External power supply	12 V only external		
Operating time[6]	One internal battery	Approx. 6.5 hours	
	Three internal batteries in multi-battery adapter	Approx. 18 hours	
	Robotic holder with one internal battery	13.5 hours	
Operating time for video Robotic[6]	One battery	5.5 hours	
	Three batteries in multi-battery adapter	17 hours	

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Weight and Dimensions			
Instrument (Autolock)	5.4 kg (11.35 lb)	Tribrach	0.7 kg (1.54 lb)
Instrument (Robotic)	5.5 kg (11.57 lb)	Internal battery	0.35 kg (0.77 lb)
Trimble CU controller	0.4 kg (0.88 lb)	Trunnion axis height	196 mm (7.71 in)
Laser Class (DR PLUS)		**Laser Class (DR HP)**	
EDM	Laser Class 1	**EDM**	Laser Class 1 in Prism mode, Laser Class 2 in DR mode
Laser pointer coaxial (standard)	Laser Class 2	**Laser pointer coaxial (standard)**	Laser Class 2
Overall product laser class	Laser Class 2	**Overall product laser class**	Laser Class 2

Autolock and Robotic surveying

Autolock and Robotic Range[4]	Passive prisms	500 m–700 m (1,640–2,297 ft)
	Trimble ST30 smart target	600 m (1,968 ft)
	Trimble MultiTrack™ target	800 m (2,625 ft)
	Trimble Active Track 360 target (DR Plus EDM)	500 m (1,640 ft)
	Trimble Active Track 360 target (DR HP EDM)	100 m (328 ft)
Autolock pointing precision at 200 m (656 ft) (Standard deviation)[4]	Passive prisms	<2 mm (0.007 ft)
	Trimble ST30 smart target	<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)	
Search time (typical)[7]	2–10 sec	

FineLock

FineLock pointing precision at 300 m (980 ft)	(standard deviation)[4]	<1 mm (0.003 ft)
	Range to passive prisms (min–max)[4]	20 m–700 m (65 ft–2,297 ft)
	Minimum spacing between prisms at 200 m (656 ft)	0.5 m (1.65 ft)
Long Range FineLock (not available in all models)	Pointing precision at 2,500 m (8,200 ft) (standard deviation)[4]	<10 mm (0.039 ft)
	Range to passive prisms (min.–max.)[4, 8]	250 m–2,500 m (64 ft–8,200 ft)
	Minimum spacing between prisms at 2,500 m (8,200 ft)	0.5 m (1.65 ft)

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GeoLock

Trimble GeoLock™ technology	360 degrees (400 gon) or defined horizontal and vertical search window
Solution acquisition time[9]	15–30 sec
Target re-acquisition time	<3 sec
Range	Autolock & Robotic range limits

Other specifications

Tracklight built in	Not available in all models	**Humidity**	100% condensing
Operating temperature	-20 °C to +50 °C (-4 °F to +122 °F)	**Communication**	Model dependent: 2.4 GHz, USB, Serial, Bluetooth®[10]
Storage temperature	-40 °C to +70 °C (-40 °F to +158 °F)	**Security**	Dual-layer password protection, Trimble Sentinel[11]
Dust and water proofing	IP65	**Tracking rate**	10 Hz

Trimble Protected protection plans

Add a Trimble Protected protection plan for worry-free ownership over and above the standard Trimble product warranty. Added enhancements include coverage for wear & tear, environmental damage, and more. Accidental damage is covered with Premium plans, available only at point-of-sale in selected regions. For details, visit trimbleprotected.com or contact a local Trimble dealer.

1 Standard deviation according to ISO17123-3.
2 Standard deviation according to ISO17123-4.
3 Standard clear: No haze. Overcast or moderate sunlight with very light heat shimmer.
4 Range and accuracy depend on atmospheric conditions, size of prisms and background radiation.
5 Kodak Gray Card, Catalog number E1527795.
6 The capacity in –20 °C (–5 °F) is 75% of the capacity at +20 °C (68 °F).
7 Dependent on selected size of search window.
8 Long Range FineLock can be used with standard FineLock from 20 m.
9 Solution acquisition time is dependent upon solution geometry and GPS position quality.
10 Bluetooth type approvals are country specific. Contact your local Trimble Authorized Dealer for more information.
11 Functionality and availability dependent on region.
Specifications subject to change without notice



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