DATASHEET

TRIMBLE S8 TOTAL STATION

KEY FEATURES

Video-assisted robotic measurement

Visual verification with data overlay and photo documentation

Trimble DR Plus for longer range and fewer setups

Specialized configuration options available

THE POWER TO EXCEL

Delivering major workflow innovations for both typical surveying and specialized applications, you now have the power to redefine your performance potential.

ADVANCED SURVEYING PERFORMANCE

For typical survey tasks, choose the 1" angle accuracy and exceptional EDM range of Trimble DR Plus™. Extend your reach on the job for increased production from fewer setups.

Trimble Business Center office software provides a complete range of processing and analysis tools. Together with the Trimble S8, you have the most comprehensive solution for general surveying available today.

- **Video-Assisted Control**
  Trimble VISION™ gives you the power to see everything the instrument sees without a trip back to the tripod. Direct your survey with live video images on the controller. Now you are free to capture measurements, to prism or reflectorless surfaces, with point-and-click efficiency.
- **Visual Verification**
  The on-board camera integrates surveyed data with the live scene image, so you can verify the work that you've done before leaving the job. Calibrated photo documentation provides customers with deliverables they know they can trust.

UNSURPASSED TOTAL STATION TECHNOLOGY

Trimble MagDrive™ Servo Technology provides for exceptional speed and accuracy with smooth, silent operation.

Trimble SurePoint™ Technology ensures accurate measurements by automatically correcting for unwanted movement due to wind, sinkage, and other factors.

SPECIALIZED ENGINEERING APPLICATIONS

For precision-build applications, you need a measurement solution with optimal speed, accuracy and reliability. Combine the Trimble DR HP Precision EDM with your choice of angular accuracies and Trimble VISION or Long Range FineLock and you have the flexibility to tackle the most demanding projects.

Specialized modules in Trimble Access™ software such as Tunnels, Monitoring, or Mines provide dedicated workflows. Trimble 4D Control™ provides a comprehensive solution for the management of monitoring projects—both real time and post-processed—to rapidly detect critical structural movements.

- **Trimble FineLock™ Technology**
  Detect targets without interference from surrounding prisms for high precision applications in close quarters such as rail alignment, deformation monitoring, and tunneling applications. The Trimble Long-Range FineLock option extends this functionality to 2500 m with 1 cm accuracy.

OTHER ENGINEERING-SPECIFIC FEATURES

- Visually mark points, at greater range, in tunnels or undergound mines with the **Class 3R Laser Pointer**
- **Automatic Servo Focus** sets the optical focus for quick manual aiming when monitoring points in DR mode – with Trimble Access
- Silent, frictionless movement ensures unobtrusive operation in urban or residential settings

TRIMBLE S8 CONFIGURATION OPTIONS

EDM	Servo Control	Angle Accuracy	Hardware Options	FineLock
DR HP	Servo only	0.5" or 1"	Tracklight	
	Robotic, Autolock	0.5" or 1"	Tracklight	o
			Trimble VISION	•
		1"	Long Range Finelock	•
			3R Laser Pointer	•
DR Plus	Robotic Only	1"	Trimble VISION	o
	Robotic, Autolock	1"	Long Range Finelock	•

KEY: • = Included o = optional

Trimble

PERFORMANCE (DR PLUS)

Angle measurement accuracy (Standard deviation based on DIN 18723) . . . 1" (0.3 mgon)
Angle display (least count) . . . .1" (0.01 mgon)
Sensor type . . . Absolute encoder with diametrical reading
Other distance measurement
Accuracy (RMSE)
- Prism mode
  - Standard . . . 2 mm + 2 ppm (0.0065 ft + 2 ppm)
    - Standard deviation according to ISO17123-4 . . . .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)

Measuring time
- Prism mode
  - Standard . . . 1.2 s
  - Tracking . . . 0.4 s
- DR mode
  - Standard . . . .1–5 s
  - Tracking . . . 0.4 s

Range
- Prism mode (under standard clear conditions[1,2])
  - 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)[3]	1,300 m (4,265 ft)	1,300 m (4,265 ft)	1,200 m (3,937 ft)
Gray card (18% reflective)[3]	600 m (1,969 ft)	600 m (1,969 ft)	550 m (1,804 ft)

  - Shortest range . . . 1 m (3.28 ft)
- DR Ranges (typically)
  - Concrete . . . .600–800 m (1,968–2,624 ft)
  - Wood construction . . . .400–800 m (1,312–2,624 ft)
  - Metal construction . . . .400–500 m (1,312–1,640 ft)
  - Light rock . . . .400–600 m (1,312–1,968 ft)
  - Dark rock . . . .300–400 m (984–1,312 ft))
  - Reflective foil 20 mm . . . .1,000 m (3,280 ft)
- Extended Range Mode
  - White Card (90% reflective)[3] . . . .2,000–2,200 m
  - Gray Card (18% reflective)[3] . . . 900–1,000 m
  - Accuracy . . . 10 mm + 2 ppm (0.033 ft + 2 ppm)

Camera (also available as an option in the DR High Precision version)
- Chip . . . Color Digital Image Sensor
- Resolution . . . 2048 x 1536 pixels
- Focal length . . . .23 mm (0.07 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 . . . Automatic
- Brightness . . . .User-definable
- Contrast . . . .User-definable
- Image storage . . . Up to 2048 x 1536 pixels
- File format . . . .JPEG

EDM SPECIFICATIONS (DR PLUS)

Light source . . . . . Pulsed Laser diode 905 nm; Laser class 1
Laser pointer coaxial . . . . . Laser class 2
Beam divergence Prism mode
  Horizontal . . . . . 4 cm/100 m (0.13 ft/328 ft)
  Vertical . . . . . 8 cm/100 m (0.13 ft/328 ft)
Beam divergence DR mode
  Horizontal . . . . . 4 cm/100 m (0.13 ft/328 ft)
  Vertical . . . . . 8 cm/100 m (0.13 ft/328 ft)
Atmospheric correction. . . . . –130 ppm to 160 ppm continuously

PERFORMANCE (DR HP)

Angle measurement accuracy (standard deviation based on DIN 18723) . . . . . 0.5" (0.15 mgon) or 1" (0.3 mgon)
Angle display (least count) . . . . . 0.1" (0.01 mgon)
Distance measurement
Accuracy (RMSE)
  Prism mode
    Standard. . . . . 1 mm + 1 ppm (0.003 ft + 1 ppm)
      Standard deviation according to ISO17123-4 . . . . . 0.8 mm + 1 ppm (0.0026 ft +1 ppm)
    Tracking . . . . . 5 mm + 2 ppm (0.016 ft + 2 ppm)
  DR mode
    Standard measurement . . . . . 3 mm + 2 ppm (0.01 ft + 2 ppm)
    Tracking . . . . . 10 mm + 2 ppm (0.032 ft + 2 ppm)
Measuring time
  Prism mode
    Standard. . . . . 2 s
    Tracking . . . . . 0.4 s
    Averaged observations . . . . . 2 s per measurement
  DR mode
    Standard. . . . . 3–15 s
    Tracking . . . . . 0.4 s
Range (under standard clear conditions[1,2])
  Prism mode
    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)[3]	>150 m (492 ft)	150 m (492 ft)	70 m (229 ft)
Gray card (18% reflective)[3]	>120 m (394 ft)	120 m (394 ft)	50 m (164 ft)

    Shortest range . . . . . 1.5 m (4.9 ft)
Camera (see DR Plus page for specifications)

EDM SPECIFICATIONS (DR HP)

Light source . . . . . Laserdiode 660 nm; Laser class 1 in Prism mode
Laser class 2 in DR mode
Laser pointer coaxial (standard). . . . . Laser class 2
Laser pointer non-coaxial (not available in all models). . . . . Laser class 3R
Beam divergence Prism mode
  Horizontal . . . . . 4 cm/100 m (0.13 ft/328 ft)
  Vertical . . . . . 4 cm/100 m (0.13 ft/328 ft)
Beam divergence DR mode
  Horizontal . . . . . 2 cm/50 m (0.066 ft/164 ft)
  Vertical . . . . . 2 cm/50 m (0.066 ft/164 ft)
Atmospheric correction. . . . . –130 ppm to 160 ppm continuously

GENERAL SPECIFICATIONS

GENERAL SPECIFICATIONS (DR PLUS AND DR HP)

Leveling
- Circular level in tribrach . . . . . 8'/2 mm (8'/0.007 ft)

Automatic level compensator
- Type . . . . . Centered dual-axis
- Accuracy . . . . . 0.5" (0.15 mgon)
- Range . . . . . ±5.4' (±100 mgon)

Servo system. . . . . MagDrive servo technology, integrated servo/angle sensor; electromagnetic direct drive

Rotation speed. . . . . 115 degrees/s (128 gon/s)

Rotation time Face 1 to Face 2. . . . . 2.6 s

Positioning speed180 degrees (200 gon) . . . . . 2.6 s

Clamps and slow motions. . . . .Servo-driven, endless fine adjustment

Centering
- Centering system. . . . . Trimble 3-pin
- Optical plummet . . . . . Built-in optical plummet

Magnification/shortest focusing distance . . . . . 2.3×/0.5 m to infinity (1.6 ft to infinity)

Telescope
- Magnification . . . . . 30×
- 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)
- Shortest focusing distance . . . . . 1.5 m (4.92 ft) to infinity
- Illuminated crosshair. . . . . Variable (10 steps)

Autofocus. . . . . Standard

Tracklight built in . . . . . Not available in all models

Operating temperature . . . . . –20 °C to +50 °C (–4 °F to +122 °F)

Dust and water proofing IP55

Humidity. . . . . 100% condensing

Power supply
- Internal battery . . . . . Rechargeable Li-Ion battery 11.1 V, 5.0 Ah
- Operating time[4]
  - 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 with video robotic[4]
  - One battery . . . . . 5.5 hours
  - Three batteries in multi-battery adapter . . . . . 17 hours

Weight
- Instrument (Servo/Autolock®) . . . . . 5.15 kg (11.35 lb)
- Instrument (Robotic) . . . . . 5.25 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)

Communication . . . . . USB, Serial, Bluetooth®[5]

Security . . . . . Dual-layer password protection

ROBOTIC SURVEYING

Autolock and Robotic range[2]
- Passive prisms. . . . . 500–700 m (1,640–2,297 ft)
- Trimble MultiTrack Target . . . . . 800 m (2,625 ft)

Autolock pointing precision at 200 m (656 ft) (standard deviation)[2]
- Passive prisms. . . . . <2 mm (0.007 ft)
- Trimble MultiTrack™ Target . . . . . <2 mm (0.007 ft)

Shortest search distance . . . . . 0.2 m (.65 ft)

Search time (typical)[6]. . . . . 2–10 s

FINELOCK

Available on Autolock and Robotic versions
- Pointing precision at 300 m (980 ft) (standard deviation)[2] . . . . . <1 mm (0.003 ft)
- Range to passive prisms (min–max)[2] . . . . . 20 m–700 m (64 ft–2,297 ft)
- Minimum spacing between prisms at 200 m (656 ft) . . . . . 0.8 m (2.625 ft)

Long Range (not available in all models)
- Pointing precision at 2,500 m (8,200 ft) (standard deviation)[2] . . . . . <10 mm (0.039 ft)
- Range to passive prisms (min.–max.)[2,7] . . . . . 20 m–2,500 m (64 ft–8,200 ft)
- Minimum spacing between prisms at 2,500 m (8,200 ft) . . . . . <10.0 m (32.808 ft)

GPS SEARCH/GEOLOCK WITH TRIMBLE MULTITRACK TARGET

GPS Search/GeoLock . . . . . 360 degrees (400 gon) or defined horizontal and vertical search window

Solution acquisition time . . . . . 15–30 s[8]

Target re-acquisition time. . . . . <3 s

Range . . . . . Autolock and Robotic range limits

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.*
4 *The capacity in –20 °C (–5 °F) is 75% of the capacity at +20 °C (68 °F).*
5 *Bluetooth type approvals are country specific. Contact your local Trimble Authorized Distribution Partner for more information.*
6 *Dependent on selected size of search window.*
7 *Uses a combination of Standard and Long Range FineLock.*
8 *Solution acquisition time is dependent upon solution geometry and GPS position quality.*

Specifications subject to change without notice.

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