Trimble S9/S9 HP
TOTAL STATION

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

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 DR HP EDM in the S9 HP offers higher accuracy when measuring to prisms. Trimble’s high performance EDMs, combined with the smooth and frictionless drive capabilities of 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 LongRange FineLock option extends this functionality.

Manage Your Assets 24/7
Know where your total stations are 24 hours a day with Trimble L2P 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 AllTrak™ software lets you view usage and keep up-to-date on firmware, software and maintenance requirements. With Trimble L2P and AllTrak, you can rest assured knowing your equipment is up-to-date and where it should be.

Trimble VISION and SureScan Technology
The Trimble S9 comes with optional Trimble VISION™ and 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 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. 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.

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 SureScan technology
- Trimble L2P real-time equipment management
- Intuitive Trimble Access Field Software
- Trimble Business Center Office Software for quick data processing
- Trimble 4D Control for monitoring management
**Measurement Range**

- **Scanning**
  - Range: 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 ± 2 ppm (0.0065 ft ± 2 ppm)
  - Single 3D point accuracy: 4 mm ± 2 ppm (0.013 ft ± 2 ppm)

- **Distance measurement**
  - Standard: 1 mm ± 2 ppm (0.003 ft ± 2 ppm)
  - Shortest range: 1 m (3.28 ft)
  - Prism mode (under standard clear conditions):
    - White card (90% reflective): 2200 m
    - Gray card (18% reflective): 600 m

**PERFORMANCE (DR PLUS)**

- **Angle measurement**
  - Sensor type: Absolute encoder with diametrical reading
  - Accuracy (ISO): 0.5” (0.15 mgon)
  - Accuracy (RMSE): 0.5” (0.15 mgon)
  - Automatic level compensator: yes

- **Distance measurement**
  - Accuracy (RMSE): 0.5” (0.15 mgon)
  - Accuracy (ISO): 1 mm ± 2 ppm (0.003 ft ± 2 ppm)
  - Range: 2 mm ± 2 ppm (0.0065 ft ± 2 ppm)
  - Standard deviation: 1.5 mm ± 2 ppm (0.0065 ft ± 2 ppm)
  - Minimum point spacing: 10 mm (0.032 ft)
  - Speed: up to 15 points/sec

- **Scanning**
  - Range: 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 ± 2 ppm (0.0049 ft ± 0.064 ft)
  - Single 3D point accuracy: 10 mm ± 2 ppm (0.032 ft ± 0.049 ft)

---

**TRIMBLE S9 AND S9 HP CONFIGURATIONS**

<table>
<thead>
<tr>
<th>EDM</th>
<th>Accuracy</th>
<th>Servo</th>
<th>Trimble VISION</th>
<th>Sure Scan</th>
<th>FineLock</th>
<th>Long Range</th>
<th>FineLock</th>
<th>Tracklight</th>
</tr>
</thead>
<tbody>
<tr>
<td>S9</td>
<td>DR Plus</td>
<td>0.5”</td>
<td>Robotic</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR Plus</td>
<td>0.5”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR Plus</td>
<td>0.5”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>DR Plus</td>
<td>1”</td>
<td>Robotic or Autolock</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>S9 HP</td>
<td>DR HP</td>
<td>0.5”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>0.5”</td>
<td>Robotic or Autolock</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>0.5”</td>
<td>Robotic</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>1”</td>
<td>Robotic or Autolock</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>1”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

---

**White Card (90% reflective)**

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

---

**Trimble S9 DR Plus Configurations**

- **S9 DR Plus**
  - 0.5” Robotic
  - Yes
  - Yes
  - No
  - No

- **S9 DR HP**
  - 0.5” Robotic
  - No
  - No
  - Yes
  - No

- **S9 DR HP**
  - 1” Robotic
  - No
  - No
  - Yes
  - Yes

---

**TRIMBLE S9 AND S9 HP CONFIGURATIONS**

<table>
<thead>
<tr>
<th>EDM</th>
<th>Accuracy</th>
<th>Servo</th>
<th>Trimble VISION</th>
<th>Sure Scan</th>
<th>FineLock</th>
<th>Long Range</th>
<th>FineLock</th>
<th>Tracklight</th>
</tr>
</thead>
<tbody>
<tr>
<td>S9</td>
<td>DR Plus</td>
<td>0.5”</td>
<td>Robotic</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR Plus</td>
<td>0.5”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR Plus</td>
<td>0.5”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>DR Plus</td>
<td>1”</td>
<td>Robotic or Autolock</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>S9 HP</td>
<td>DR HP</td>
<td>0.5”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>0.5”</td>
<td>Robotic or Autolock</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>0.5”</td>
<td>Robotic</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>1”</td>
<td>Robotic or Autolock</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DR HP</td>
<td>1”</td>
<td>Robotic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

---

**White Card (90% reflective)**

<table>
<thead>
<tr>
<th>Good (Good visibility, low ambient light)</th>
<th>Normal (Normal visibility, moderate sunlight, some heat shimmer)</th>
<th>Difficult (Haze, object in direct sunlight, turbulence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White card (90% reflective)</td>
<td>1,300 m (4,265 ft)</td>
<td>1,200 m (3,937 ft)</td>
</tr>
<tr>
<td>Gray card (18% reflective)</td>
<td>600 m (1,969 ft)</td>
<td>550 m (1,804 ft)</td>
</tr>
</tbody>
</table>
EDM SPECIFICATIONS (DR PLUS)

Light source ................................................................. Pulsed laser diode 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)

Angle measurement
  Angle accuracy1 ...................................................... 0.5" (0.15 mgon) or 1" (0.3 mgon)
  Angle display (least count) ........................................ 0.1" (0.01 mgon)

Distance measurement
  Prisms mode
    Accuracy (ISO) ....................................................... 0.8 mm + 1 ppm (0.0026 ft + 1 ppm)
    Accuracy (RMSE)
      Standard .................................................................... 1 mm + 1 ppm (0.003 ft + 1 ppm)
      Tracking ................................................................... 3 mm + 2 ppm (0.01 ft + 2 ppm)

  DR mode
    Accuracy (ISO) ....................................................... 1 mm + 2 ppm (0.0032 ft + 1 ppm)
    Accuracy (RMSE)
      Standard .................................................................... 1 mm + 2 ppm (0.0032 ft + 2 ppm)
      Tracking ................................................................... 5 mm + 2 ppm (0.016 ft + 2 ppm)

Measuring time
  Prisms mode
    Standard ...................................................................... 3 s
    Tracking ...................................................................... 0.4 s
  DR mode
    Standard ...................................................................... 3–15 s
    Tracking ...................................................................... 0.4 s

Range
  Prisms mode (under standard clear conditions3, 4)
    1 prism ................................................................. 3,000 m (9,800 ft)
    1 prism Long Range mode ....................................... 5,000 m (16,400 ft)
    3 prisms Long Range mode ....................................... 7,000 m (23,000 ft)
  Shortest range ........................................................... 1.5 m (4.9 ft)

EDM SPECIFICATIONS (DR HP)

Light source ................................................................. Laser diode 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 (±0.007 ft)
- Electronic 2-axis level in the LC-display: with a resolution of: 0.3' (±0.01 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 System: Trimble 3-pin
- Optical plummet: Built-in optical plummet
- Magnification focusing distance: 2.3'÷0.5 m–infinity (1.6 ft–infinity)
- Translation: 30x
- Aperture: 40 mm (1.57 in)
- Field of view at 100 m (328 ft): 2.6 m at 100 m (0.5 ft at 328 ft)
- Focusing distance: 1.5 m (4.92 ft)–infinity
- Illuminated crosshair: Variable (10 steps)
- Autofocus: Standard
- Camera (not available in all models):
  - Chip: Color Digital Image Sensor
  - Resolution: 2048x1536 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 2048x1536 pixels
  - 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:
    - 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:
      - One battery: 5.5 hours
      - Three batteries in multi-battery adapter: 17 hours
- Weight and Dimensions:
  - Instrument (Autolock):
    - Laser pointer coaxial (standard): Laser class 1
      - Laser pointer coaxial (standard): Laser class 2
    - Overall product laser class: Laser class 2
  - Laser Class (DR PLUS):
    - Laser class 1 in Prism mode, Laser class 2 in DR mode
    - Laser pointer coaxial (standard): Laser class 2
    - Overall product laser class: Laser class 2
- Focusing distance:
  - 1.5 m (4.92 ft)–infinity
- Magnification focusing distance:
  - 2.3'÷0.5 m–infinity (1.6 ft–infinity)
- Illuminated crosshair:
  - Variable (10 steps)
- Autofocus:
  - Standard
- Chip:
  - Color Digital Image Sensor
- Resolution:
  - 2048x1536 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 2048x1536 pixels
- File format:
  - JPEG

**SYSTEM SPECIFICATIONS (Continued)**

- **3-pin Centering: Trimble**
- **Optical plummet:** Built-in optical plummet
- **Magnification focusing distance:** 2.3’÷0.5 m–infinity (1.6 ft–infinity)
- **Translation:** 30x
- **Aperture:** 40 mm (1.57 in)
- **Field of view at 100 m (328 ft):** 2.6 m at 100 m (0.5 ft at 328 ft)
- **Focusing distance:** 1.5 m (4.92 ft)–infinity
- **Illuminated crosshair:** Variable (10 steps)
- **Autofocus:** Standard
- **Camera (not available in all models):**
  - **Chip:** Color Digital Image Sensor
  - **Resolution:** 2048x1536 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 2048x1536 pixels
  - **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:**
  - 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:**
  - One battery: 5.5 hours
  - Three batteries in multi-battery adapter: 17 hours

**Weight and Dimensions:**
- **Instrument (Autolock):**
  - Laser pointer coaxial (standard): Laser class 1
  - Overall product laser class: Laser class 2
- **Laser Class (DR PLUS):**
  - Laser class 1 in Prism mode, Laser class 2 in DR mode
  - Laser pointer coaxial (standard): Laser class 2
  - Overall product laser class: Laser class 2

**Contact your local Trimble Authorized Distribution Partner for more information.**

---

**modo de visión transformador para el mundo**

**DATASHEET**

**Trimble S9/S9 HP TOTAL STATION**

**AUTOLOCK AND ROBOTIC SURVEYING**

- **Tribrach Target:** 500 m–700 m (1,640–2,297 ft)
- **Tribrach MultiTrack Target:** 800 m (2,625 ft)
- **Tribrach ActiveTrack 360 Target (DR Plus EDM):** 500 m (1,640 ft)
- **Tribrach ActiveTrack 360 Target (DR HP EDM):** 100 m (328 ft)
- **Circular level in tribrach:** ± 8'/2 mm (±0.007 ft)
- **Autolock pointing precision at 200 m (656 ft):** (Standard deviation)
  - Passive prisms: <2 mm (0.007 ft)
  - Tribrach MultiTrack 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):** 2–10 sec

**FINELOCK**

- **FineLock pointing precision at 300 m (980 ft):** (standard deviation)
  - Passive prisms: <1 mm (0.003 ft)
- **Range to passive prisms (maximum):** 20–700 m (64–2,297 ft)
- **Minimum spacing between prisms at 200 m (656 ft):** 0.8 m (2.6 ft)
- **Long Range FineLock (not available in all models):**
  - **Pointing precision at 2,500 m (8,200 ft):** (standard deviation)
    - Passive prisms: <30 mm (0.039 ft)
  - **Range to passive prisms (min–max):**
    - 250 m–2,500 m (64–6,200 ft)
  - **Minimum spacing between prisms at 2,500 m (8,200 ft):** <0.03 (32.808 ft)

**GPS SEARCH/GEOLOCATION**

- **GPS Search/Geolock:** 300–1,000 meters (1,000–3,281 ft)
- **Solution acquisition time:** 15–30 sec
- **Target re-acquisition time:** <3 sec
- **Autolock & Robotic range limits:**
  - **Operating temperature:** –20 ºC to +50 ºC (–4 ºF to +122 ºF)
  - **Storage temperature:** –40ºC to +70ºC (–40 ºF to +158 ºF)
  - **Dust and water proofing:** IP66
  - **Humidity:** 100% condensing
- **Communication:**
  - USB, Serial, Bluetooth®
- **Security:**
  - Multi-layer password protection, L2P11
- **Tracking rate:** 30 Hz

**OTHER SPECIFICATIONS**

- **Laser Class (DR PLUS):** Laser Class 1
- **Laser Class (DR HP):** Laser Class 1 in Prism mode, Laser class 2 in DR mode

Specifications subject to change without notice.

---

© 2015–2020 Trimble Inc. All rights reserved. Trimble, the Globe & Triangle logo, and Autolock are trademarks of Trimble Inc., registered in the United States and in other countries. 4D Control, Access, FineLock, MagDrive, MultiTrack, SurePoint, and VISION are trademarks of Trimble Inc. The Bluetooth word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by Trimble Inc. is under license. All other trademarks are the property of their respective owners. PN 022356-359M (03/20)

www.trimble.com

---

**NORTH AMERICA**

Trimble Inc.
10368 Westmoor Dr
Westminster CO 80021
USA

**EUROPE**

Trimble Germany GmbH
Am Prime Parc 11
65479 Rauheim
GERMANY

**ASIA-PACIFIC**

Trimble Navigation
Singapore PTE Limited
3 HarbourFront Place
#13-02 HarbourFront Tower Two
Singapore 099254
SINGAPORE

---

Contact your local Trimble Authorized Distribution Partner for more information.