DATASHEET

Trimble X9

3D Laser Scanning System

An innovative, high-speed 3D laser scanning system with enhanced performance and function to increase efficiency and provide confidence in the field.

Proven

- Simple and efficient workflows suitable for all users
- Powerful Trimble® FieldLink software to easily manage and validate projects in the field with auto-registration
- Smart auto-calibration and self-levelling optimised to increase productivity and function
- Durable, compact, and lightweight with backpack for easy transport and mobility

Versatile

- High-speed scanning up to 1 million pts/s to effectively increase scan density
- Long range with accuracy and data quality to support a wider range of applications
- High sensitivity to capture difficult dark and shiny surfaces
- Flexible operation with tablet or one-button workflow

Reliable

- Reduce instrument downtime with trusted auto-calibration
- With in-field automatic registration, refinement, and reporting, leave the jobsite with confidence
- Built-in laser pointer for georeferencing and single point measurements
- IP55 rating and wide operating temperature range for demanding environments
- Backed by 2-year standard warranty

NY NEW YORK PRODUCT DESIGN AWARDS 2024 WINNER GOLD

Trimble

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SYSTEM OVERVIEW	
Trimble X9 3D laser scanning system	High-speed 3D laser scanner with combined servo drive/scanning mirror, integrated HDR imaging, automatic calibration, survey-grade self-leveling and laser pointer.
Trimble FieldLink software	Easy to use software for automatic in-field registration, georeferencing, 3D visualisation, annotations, cloud-to-model analysis, floor analysis, processing and exporting.

SCANNING PERFORMANCE	
GENERAL	
Scanning EDM laser class	Laser class 1, eye safe in accordance with IEC EN60825-1
Laser wavelength	1530–1570 nm, invisible
Field of view	360° × 282°
Beam divergence / Beam diameter	0.8 mrad/ 7.95 mm @ 10m
Scan speed	Up to 1000 kHz
RANGE MEASUREMENT	
Range principle	High speed, digital time-of-flight distance measurement
Range noise[1, 2]	< 1.5 mm @ 30 m
Range[3]	0.6 m–150 m (High Speed max range 120 m)
High sensitivity	Dark (asphalt) and reflective (stainless steel) surfaces
SCANNING ACCURACY	
Validation	Guaranteed over lifetime with auto-calibration
Range accuracy[1, 2]	2 mm
Angular accuracy[1, 4]	< 16"
3D point accuracy[1, 4]	2.3 mm @ 10 m, 3.0 mm @ 20 m, 4.8 mm @ 40 m

SCANNING PARAMETERS

SCAN MODE	DURATION[5, 6, 7] (MIN:SEC)	SPACING (MM) @ 10 M	SPACING (MM) @ 35 M	SPACING (MM) @ 50 M	NUMBER OF POINTS (MPTS)	MAX FILE SIZE (MB)
Indoor	0:50	-	-	-	6.8	32
Standard	2:03	8	26	38	27.2	95
	3:33	5	18	25	61.2	204
	5:36	4	13	19	108.8	340
High Speed	1:27	8	26	38	27.2	175
	3:15	4	13	19	108.8	610
	6:08	3	9	13	244.8	1.250

IMAGING PERFORMANCE	
Sensors	3 coaxial, calibrated 10 MP cameras
Resolution	3840 x 2746 pixels for each image
Raw image capture	Fast - 15 images - 158 MP - 1 minute - with HDR 3 minutes Quality - 30 images - 316 MP - 2 minutes - with HDR 6 minutes
Settings	Auto exposure and HDR Auto white balance correction and indoor/outdoor presets

AUTOMATIC LEVEL COMPENSATION	
Type	Automatic self-leveling, selectable on/off
Range	± 10° (Survey grade), ± 45° (Coarse)
Upside down	± 10° (Survey grade)
Survey grade accuracy	< 3” = 0.3 mm @ 20 m

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AUTOMATIC CALIBRATION	
Integrated calibration system	Full auto-calibration of range and angular systems when required with no user interaction or targets
Angular calibration	Applies a correction to the collimation error, i.e., the deviation of the horizontal, vertical or sight axis
Range calibration	Applies a distance correction in the albedo and the distance measurement
Smart calibration	Monitors environmental temperature, ambient light, vibration, instrument temperature and vertical speed for optimum performance
TRIMBLE REGISTRATION ASSIST	
Inertial navigation system	IMU tracks instrument position, orientation and movement
Auto-registration	Automatic scan orientation and alignment with last or pre-selected scan
Manual registration	Manual alignment or split screen cloud to cloud
Visual checks	Dynamic 2D and 3D viewing for QA
Refinement	Automatic registration refinement
Registration report	Report with project and station average error, overlap and consistency results
GENERAL SPECIFICATIONS	
WEIGHT AND DIMENSIONS	
Instrument (including battery)	6.045 kg (13.33 lbs)
Internal battery	0.35 kg
Dimensions	178 mm (W) x 353 mm (H) x 170 mm (D)
POWER SUPPLY	
Battery type	Rechargeable Li-Ion battery 11.1V, 6.5Ah (standard for Trimble optical instruments)
Typical duration	3.5 hours per battery (3 batteries included)
ENVIRONMENTAL	
Operating temperature	-20 °C to +50 °C (-4 °F to +122 °F)
Storage temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Ingress protection rating	IP55 (dust protected and water jet)
Altitude	2000 m
Relative humidity	95 %
Equipment pollution degree	4
OTHERS	
Laser pointer	Class 2 laser with a wavelength of 620–650 nm
Remote control	Trimble T10x tablet or comparable Microsoft® Windows® 10 tablet via WLAN or USB cable
Push button	One-button scan operation
Communications / Data transfer	WLAN 802.11 A/B/G/N/AC or USB Cable
Data storage	Standard SD Card (32GB SDHC included)
Accessories	Backpack for easy transport and airline carry-on Lightweight carbon fiber tripod with bell connector Quick release adapter for X9 and carbon fiber tripod
Warranty	2 year standard

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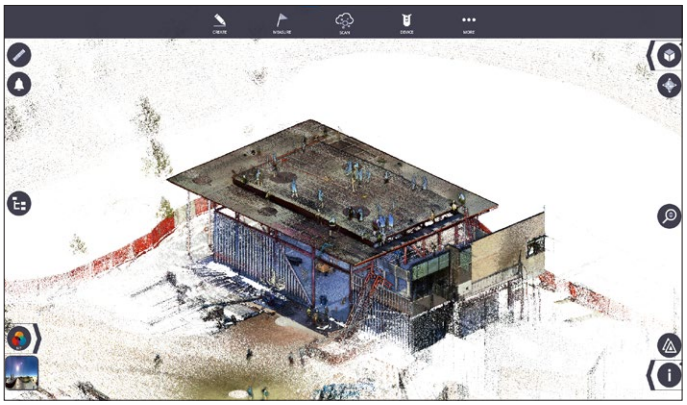

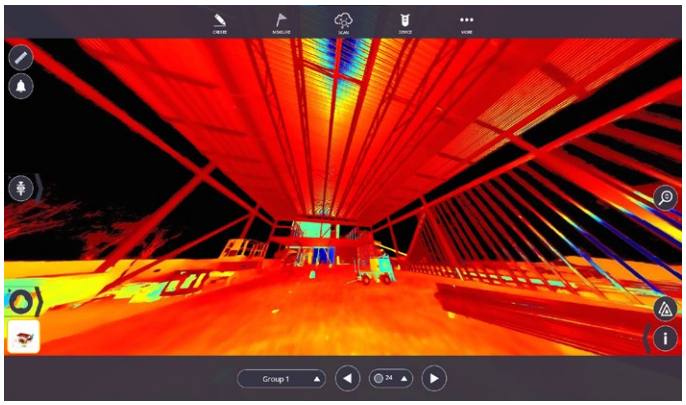

TRIMBLE FIELDLINK SOFTWARE	
SYSTEM REQUIREMENTS	
Operating system	Microsoft® Windows 10
Processor	Intel® 8th Generation Core™ i5 2.5 GHz processor or better
RAM	16 GB or better
VGA card	Intel HD Graphics 620 or better
Storage	512 GB Solid State Drive (SSD), 1 TB recommended
FEATURES	
Scanner operation	Tablet or cable
Trimble registration assist	Automatic and manual registration, refinement and reporting
Data interaction	2D, 3D and Station View
In-field documentation	Scan labels, annotations, pictures and measurements
Auto sync	Automatic data sync from one-button operation
Georeferencing	Laser pointer for georeferencing and precision point measurement
Reports	Registration, Field Calibration and Diagnostics reports
Data redundancy	Data stored on SD Card and tablet
Data integration	Export formats to support Trimble and non-Trimble software File formats: TDX, TZF, E57, RCP, LAS, POD

1 Specification given as 1 sigma.
2 On 80% albedo. Albedo given @ 1550 nm
3 On matte surface with normal angle of incidence.
4 After automatic calibration and self-leveling within ± 10°.
5 Durations for scan times include self-leveling time within ± 10°.
6 Self-leveling will take ~ 10 seconds longer when scanner is not within ± 10°.
7 Scan times can increase up to 30 seconds for full calibrations after startup or idle time until thermal stabilization. Full system checks occur every 30 min.

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