Trimble MX9

MOBILE MAPPING SOLUTION

The Trimble® MX9 is a **complete field-to-finish mobile mapping solution** that combines leading edge hardware with intuitive field software and a powerful, integrated office software workflow.

The MX9 typically mounts on the roof of a vehicle and rapidly captures laser scans and images – both panoramic and multi-angle – as you drive. Rich, immersive data can be captured at highways speeds, avoiding the need for expensive road closures and eliminating the risk associated with employees working along busy highways in dense traffic.

Following data capture, integrated office software tools allow the processing of the data and the generation of meaningful deliverables that can be published to an audience within or outside of your organization.

One solution for many applications

Whether you are a transportation professional, highway or rail inspector, civil engineer or city planner, the Trimble MX9 is the ideal solution to generate deliverables such as:

▶ Road and rail assets
▶ Elevation models
▶ Volumetric analyses
▶ 3D city models
▶ As-Built surveys

The MX9 mobile mapping solution from Trimble allows you to quickly and efficiently survey a large corridor or project. Avoiding the cost for road closures and unnecessary safety risks for your field team, you can capture a vast amount of data which can be accessed by multiple stakeholders for a variety of applications.

Premium technology, simple to operate

The MX9 is lightweight and compact, making it easy to set up and operate. A tablet or laptop PC enables browser-based operations while users require only basic training. Associated software enables data and images to flow efficiently between the field and the office.

This high-performance mobile mapping solution fits seamlessly into the Trimble ecosystem with the additional option to publish and transfer MX9 data to third party CAD and GIS environments.

The MX9 Advantage

▶ Very high point cloud density and immersive imagery

▶ State of the art Trimble GNSS and Inertial technology

▶ Dual and single laser configuration available to match customer needs

▶ Lightest and most compact premium mobile mapping system

▶ Simple installation and browser based operation from a smart device

▶ Data processing in Trimble Business Center

▶ Trimble MX software for feature extraction and data publishing

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Road and Rail Infrastructure

The Trimble MX9 efficiently captures high precision survey data that facilitates the design of road and rail infrastructure and the mapping of corridor features to build a comprehensive asset database. Expensive road closures can be avoided and the risk associated with pedestrian site access is minimized.

Rich data enables the delivery of a wide range of products from terrain models and volumetric analysis to detailed CAD designs and GIS asset databases. Produce complete as-built information following a construction project and utilize this information in your BIM environment throughout the asset lifecycle. Large, extensive projects, which previously were beyond the scope of many enterprises, are now feasible. Accelerate the production of traditional survey and engineering deliverables and expand your capabilities for producing rich new digital data solutions for sharing with a wide range of project stakeholders.

Urban Infrastructure

For municipalities and city planners, the MX9 is a powerful solution providing fast capture of rich infrastructure data necessary for accurate urban modeling and high density point clouds allow detailed feature extraction with confidence.

The data enables the efficient generation of GIS layers as well as CAD linework. Public and private utilities of many kinds can be captured and extracted from Trimble MX9 data. Data from large utility network systems can be acquired quickly to establish a unique, immersive project planning environment and provide the basis for both qualitative and quantitative analysis and decision making. Existing assets can be inspected and updated with software procedures available for linking to existing databases and data schemas. By sharing data the need for expensive site visits can often be reduced or eliminated.

The Trimble MX9 workflow provides the ability to share data over the internet and to connect to popular CAD and GIS environments. The uses for published data are many and may include: asset inspection, right of way validation, site reconnaissance, security planning, contractor site planning, environmental planning, licenses and permitting.

Other Applications

▶ HD Maps for Autonomous Driving
▶ Surveillance & Security
▶ Insurance & Disaster Relief
▶ Transportation Management
▶ Airport Operations
▶ Oil & Gas Infrastructure
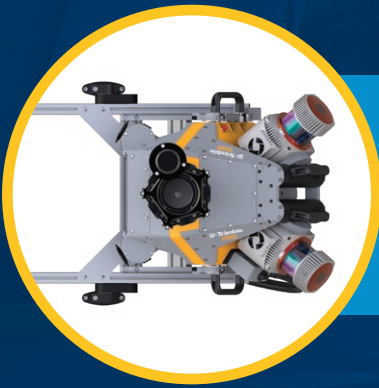
- ▶ Easy installation & simple operation
- ▶ Best in class – tightly coupled positioning
- ▶ Dense point cloud and immersive imagery
- ▶ Complete field-to-finish solution

GNSS antenna

360 camera

IMU

Scanners

Oblique cameras

Pavement camera

Roof rack

COLLECT

Use the Trimble MX9 to quickly obtain geospatial data:

- ▶ Control data acquisition with any smart device
- ▶ Single cable connection from sensor to control unit
- ▶ Online background maps for route tracking and supervision of mission
- ▶ Adjustable lasers and oblique camera orientations

PROCESS

Process vehicle trajectory using tightly coupled GNSS and Inertial data:

- ▶ Industry leading direct georeferencing to determine the best trajectory
- ▶ Point cloud registration to control points for the most demanding results
- ▶ Co-register vehicle runs
- ▶ Colorize point clouds using panoramic imagery

MODEL & ANALYZE

Produce high-quality deliverables for your customers and stakeholders:

- ▶ Calculate and quality control point clouds and image data
- ▶ Extract survey, engineering or GIS data
- ▶ Create new or use existing data schemas
- ▶ Connect to existing databases or export data in CAD, BIM or GIS formats

PUBLISH

Publish data for sharing across the internet:

- ▶ Share point clouds and images
- ▶ Share extracted data resources
- ▶ Collaborate with project stakeholders
- ▶ Avoid site revisits

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MX9 SYSTEM

Effective measurement rate[1]	Dual laser	Single laser
	2 MHz	1 MHz
	1.5 MHz	750 kHz
	1 MHz	500 kHz
	600 kHz	300 kHz
Scan speed	500 scans/sec	250 scans/sec
Number of laser scanners	2	1
Laser Positions	Adjustable in 3 horizontal and 3 vertical positions	

MX9 LASER SCANNER

Laser class	1, eye-safe			
EFFECTIVE MEASUREMENT RATE[1]	300 kHz	500 kHz	750 kHz	1 MHz
Maximum range, target reflectivity > 80%[2]	420 m	330 m	270 m	235 m
Maximum range, target reflectivity > 10%[2]	150 m	120 m	100 m	85 m
Maximum number of targets per pulse	practically unlimited			
Minimum range	1.2 m			
Accuracy[3] / precision[4]	5 mm / 3 mm			
Field of view	360° "full circle"			

EMBEDDED TRIMBLE GNSS-INERTIAL SYSTEM

IMU-Options	AP60	AP40
ACCURACY - NO GNSS OUTAGES (POST PROCESSED)[5]		
X, Y Position (m)	0.020	0.020
Z Position (m)	0.050	0.050
Velocity (m/s)	0.005	0.005
Roll and Pitch (deg)	0.005	0.015
Heading (deg)[6]	0.015	0.020
ACCURACY - 60 SECOND GNSS OUTAGE (POST PROCESSED)[5]		
X, Y Position (m)	0.100	0.120
Z Position (m)	0.070	0.100
Roll and pitch (deg)	0.005	0.020
Heading (deg)[6]	0.015	0.020
ACCESSORIES		
GAMS	yes, optional	
DMI[5,7]	yes, optional	

CAMERAS

Camera type	No	Mounting	FoV	Focal length
Spherical camera, 30 MP (6 x 5 MP)	1	fixed	90% of full sphere	4.4 mm
5 MP side looking camera[8]	2	adjustable (in horizontal and vertical positions)	H: 53,1° V: 45,3°	8.5 mm
5 MP backward/downward looking camera[8]	1	fixed	H: 53,1° V: 45,3°	8.5 mm
Capture modes	by distance or by time at 10 fps max.			

ELECTRICAL DATA

Power supply input voltage	12 V-DC (12 V–16 V)	
POWER CONSUMPTION		
	Dual laser	Single Laser
Max	350 W	250 W
Typical	280 W	200 W

SYSTEM COMPONENTS

Sensor unit	included
Control unit	included
Power unit	included
Roof rack	included, standard cross bars not included
Transport box	included
Field software	TMI, browser-based, no installation necessary
Cable, battery to power unit	5 m
Cable, power unit to control unit	3 m
Cable, control unit to sensor unit	5 m
Data storage	1 set (2 x 2 TBytes SSD, removable)
Control interface	Tablet or Notebook, WiFi or LAN cable, byod

3RD PARTY HARDWARE INTEGRATION OPTIONS

Synchronization output at sensor unit	1 (NMEA + PPS)

ENVIRONMENTAL CHARACTERISTICS

Maximum vehicle speed for data acquisition	110 km/h (68 mph)
IP rating	IP64 (sensor unit)
Operating temperature	0 °C to +40 °C
Storage temperature	−20 °C to +50 °C
Relative humidity (operating)	20 % to 80 %
Relative humidity (storage)	20 % to 95 %

PHYSICAL CHARACTERISTICS

Dimensions sensor unit	0.62 m x 0.55 m x 0.62 m
Weight sensor unit (dual laser unit)	37 kg
Weight sensor unit (single laser unit)	31 kg
Dimensions roof rack	1.03 m x 0.48 m x 0.28 m
Weight roof rack	18 kg

1 Rounded values, selectable by measurement program.
2 Typical values for average conditions.
3 Accuracy is the degree of conformity of a measured quantity to its actual (true) value.
4 Precision is the degree to which further measurements show the same results.
5 With DMI option.
6 With GAMS option, 2 m baseline.
7 One sigma values, with DMI option, post-processed using base station data. Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects.
8 Only available with dual laser version.

Specifications subject to change without notice.

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Contact your local Trimble Authorized Distribution Partner for more information

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