

Trimble V10 Imaging Rover

Key Features

12 calibrated cameras **capture 60 MP panorama** for full site visualization

Generate **Survey, GIS or mapping accuracy positions**

Rapid data collection with **one-button capture of panoramas**

Create 3D models, point clouds from pictures

Seamless integration with Trimble R-series GNSS receivers or Trimble robotic total stations

Flexible, simple processing in Trimble Business Center to generate deliverables



THE POWER OF PICTURES

The Trimble V10 Imaging Rover with Trimble VISION™ technology is an integrated camera system that precisely captures 360-degree digital panoramic images for efficient visual documentation and measurement of the surrounding environment. Either standalone or combined with a Trimble positioning sensor, the Trimble V10 Imaging Rover provides the means to quickly capture rich data and create comprehensive deliverables. Together with Trimble Access™ field software and Trimble Business Center office software, the Trimble V10 is the complete geospatial solution.

Rapid Data Capture

The Trimble V10 featuring Trimble VISION technology allows you to capture a 60 MP panorama image with the simple push of a button. A total of 12 calibrated cameras provide complete site documentation that can be used to make photogrammetric measurements. This metric imaging functionality is ideal to perform work where there are many features to collect, or where features are complex or difficult to capture. Field work that has traditionally taken hours for data collection can now be completed in just minutes.

An easy-to-use workflow in Trimble Access field software is simple and intuitive to capture panoramas, review images and store observations. High dynamic range (HDR) imagery in the Trimble V10 and Trimble Business Center improves image quality, even when you are working in variable light conditions.

Capture Now, Measure Later

Communicate site conditions, avoid site rework and benefit from increased quality control and data validation by visually observing the site from the field and measuring in the office later. The images collected also help communicate site conditions to individuals who are not on site.

Back in the office, use the enhanced photo point measurement functionality in Trimble Business Center to measure and create points, lines, polygons and other imaging components which can be used to prepare rich deliverables for GIS, engineering and survey applications.

Point Clouds From Pictures

Using the Trimble V10, you can generate dense point clouds from terrestrial panorama data to achieve an accurate 3D representation of a site. The data can then be used for area and volume computations, linear measurement, and terrain modeling.

GNSS and Total Station Integration

The Trimble V10 seamlessly integrates with the Trimble R-series GNSS receivers, or the Trimble S-series Total Stations. Easily associate your collected images with positions to generate a highly accurate geospatial dataset or capture GNSS and total station data. With the existing data capture workflow in Trimble Access, add 360-degree panoramas to your dataset as needed for a complete integrated geospatial solution.

You can use the Trimble V10 without a positioning sensor to capture applications such as interior mapping, bridge inspection or other areas where positioning data is typically difficult or not necessary to obtain.

3D Models and More

The Trimble V10 with Trimble Business Center allows geospatial professionals to produce improved deliverables even faster. Data collected using the Trimble V10 makes it easier and faster to generate 3D models and images than when working with large point cloud files. Images captured with the powerful Trimble V10 Imaging Rover can be exported into SketchUp to create robust 3D models of buildings, bridges and a variety of other objects.

A Comprehensive Solution

The Trimble V10 Imaging System offers unprecedented capabilities to the geospatial professional – never before has a picture been so powerful. By leveraging Trimble VISION technology along with other Trimble hardware and software offerings, the Trimble V10 enables you to capture more critical information that can be transformed into enhanced, rich geospatial deliverables. With the Trimble V10, a picture is worth a thousand points.

Trimble V10 Imaging Rover

PANORAMA SPECIFICATIONS

Total Panorama Resolution	60 MP
High Dynamic range imagery	Yes
Exposure modes	Auto
White balance modes	Auto
Live view frame rate, normal light conditions	15 Fps
Live view frame rate, low light conditions	7.5 Fps
Resolution of each camera	5 MP
File format of images	.Jpeg
File size of one panorama	10 MB–20 MB
File size of HDR Images	10 MB–20 MB
Field of view angle captured by panorama cameras	360° x 43°
Field of view angle captured by down looking cameras	210° x 57.5°
Vertical field of view	93.1°

POSITIONING PERFORMANCE

Position Accuracy (RMSE) ^{1, 2}	
Horizontal	10 mm RMS
Vertical	7 mm RMS

HARDWARE

Physical

Diameter of V10 housing	113 mm (4.45 in)
Height of V10 housing	124 mm (4.88 in)
Weight	
V10	900 g (1.98 lb)
Battery	182 g (.40 lb)
2-piece power rod with battery compartment	1.29 kg (2.85 lb)
Bipod	1.61 kg (3.55 lb)

Environmental

Temperature	
Operating	–20 °C to +50 °C (–4 °F to +122 °F)
Storage	–40 °C to +70 °C (–40 °F to +158 °F)
Operating humidity	100% condensing
Dust and water protection	IP54
Shock:	
Non-operating drop test	Designed to survive a 2 m (6.6 ft) pole drop onto concrete.
Vertical drop onto tip of the pole	100,000 rep.@5 cm (15G) 100 rep.@30 cm (100G)
Vibration	MIL-STD-810F, FIG.514.5C-1

Electrical

Battery	
Voltage, nominal	7.4 V
Capacity	3.7 Ah
Smart Battery with capacity display	Yes
Camera Operating time	
with 1 Battery in normal operating mode ³	4 h
Number of panoramas with one battery	350
Interfaces	USB Mini B, USB A

Built-in Sensors

2 axis tilt sensor range	15°
Tilt sensor accuracy using bipod	0.03°
Magnetic sensor accuracy at undisturbed surrounding	1°

CAMERAS

Panorama	
Orientation	Landscape
Number of cameras	7
Field of view	57.5° (horizontal) x 43° (vertical)
Downlooking	
Orientation	Portrait
Number of cameras	5
Field of view	43° (horizontal) x 57.5° (vertical)
Lens type	f-theta
Temperature compensated	Yes
Infrared blocking filter	Yes
Angle per pixel	0.39 mrad/Pix (1.33 arcmin/Pix)
Focal length	3.63 mm (0.14 in)
Depth of field	0.1 to ∞ m
Calibration of	
Camera better than	1 Pix
Optical distortion, interior and exterior orientation	Yes
Stability of calibration	2 Pix
Calibration of Sensors with respect to the cameras	Yes

2-PIECE POWER ROD

Hot swappable dual smart batteries	Yes
Shock absorbing tip. Shock load to user and camera reduced by factor of	4 x
Exchangeable tip	Yes
Compatible with 5/8 length extension	Yes

SUPPORTED TRIMBLE CONTROLLERS

- Trimble TSC3 and Trimble Tablet Rugged PC

ACCESSORIES

- 360-degree prism with quick release
- High-Accuracy Kit with power mount, prism base and two targets
- Trimble R-Series GNSS adapters

1 The position accuracy expressed as Root Mean Square Error (RMSE) can be obtained with the following set-up conditions: Three panoramic images were taken from 3 photo stations on known locations with control point quality. Those locations had a triangular geometry with sides of 15 m, a base of 24 m, and an angle of 100°. The distance to the objects was up to 25 m resulting in intersection angles at the objects of close to 90deg. The object positions were determined with TBC photogrammetry software using manual tie points and full orientation option and then compared with the nominal object positions. Checker-board targets were used as objects. The use of the instrument is not limited to distances up to 25 m but the error increases with larger distance, smaller base length or worse geometry of the photo station locations.

2 The presence of control points visible in the panoramas and used in the photo point measurements will improve the orientation of the related photo stations both in horizontal and vertical direction, stabilize the whole bundle and result in even better horizontal and vertical accuracy.

3 Normal Operating mode is standard runtime capturing panoramas as needed, not continuously.



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