

Maverick

Mobile Mapping System



Portable

Weighing under 9 kilograms (20 lb.), Maverick is easily mounted on a variety of platforms, including vehicles, ATV/UTVs, trains, and backpacks. This highly portable system operates in widely varying conditions, including indoor GNSS-deprived environments using SLAM technology.

Powerful

Combining high-resolution 360° imaging, high-definition lidar, and an integrated position and orientation system, Maverick delivers impressive and accurate mobile data. It collects up to 700,000 data points per second, and captures high-resolution images using six high-quality 5-MP sensors. The Maverick system is packaged with real-time display and feedback, along with Distillery software to provide imaging, lidar, and GNSS post-processing.

Proven

Maverick was developed to fill the industry need for a portable and powerful mobile mapping unit. Its robust and multi-functional datasets are used for numerous projects and applications. To date, Maverick has collected data in the industries such as transportation safety, construction, asset management, rail, utilities, and 3D modeling.

Accurate

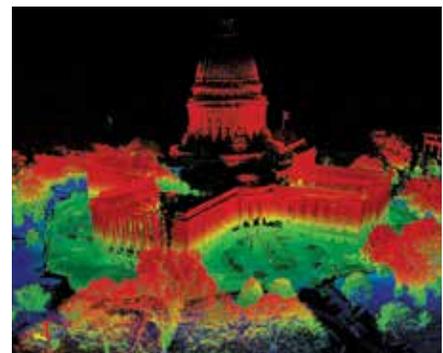
Maverick users can take their data accuracy to the next level with the optional Optech LMS Pro software solution. Besides improving absolute accuracy by using control points and relative adjustment of overlapping passes, LMS Pro also accommodates enhanced sensor calibration that significantly improves Maverick data precision.



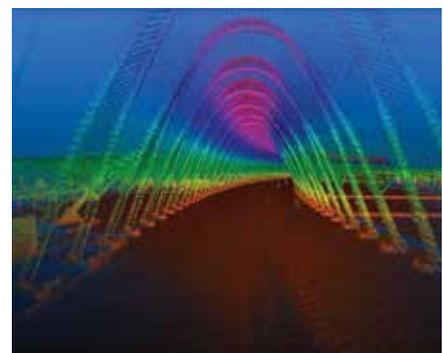
- » Transportation Safety
- » Construction
- » Roadway Assets
- » Railway
- » Utilities
- » 3D Modeling
- » Indoor Mapping



Multiple mount options



Dense urban data capture



Operation in GNSS-deprived areas

▶ Maverick Mobile Mapping System

Maverick Mounting Options: Maximum flexibility!

Optech Maverick is a compact, agile and flexible solution. Quick and easy to deploy, it supports many mounting options, both custom user mounts and Teledyne Optech mounting solutions.

Custom User Mounts

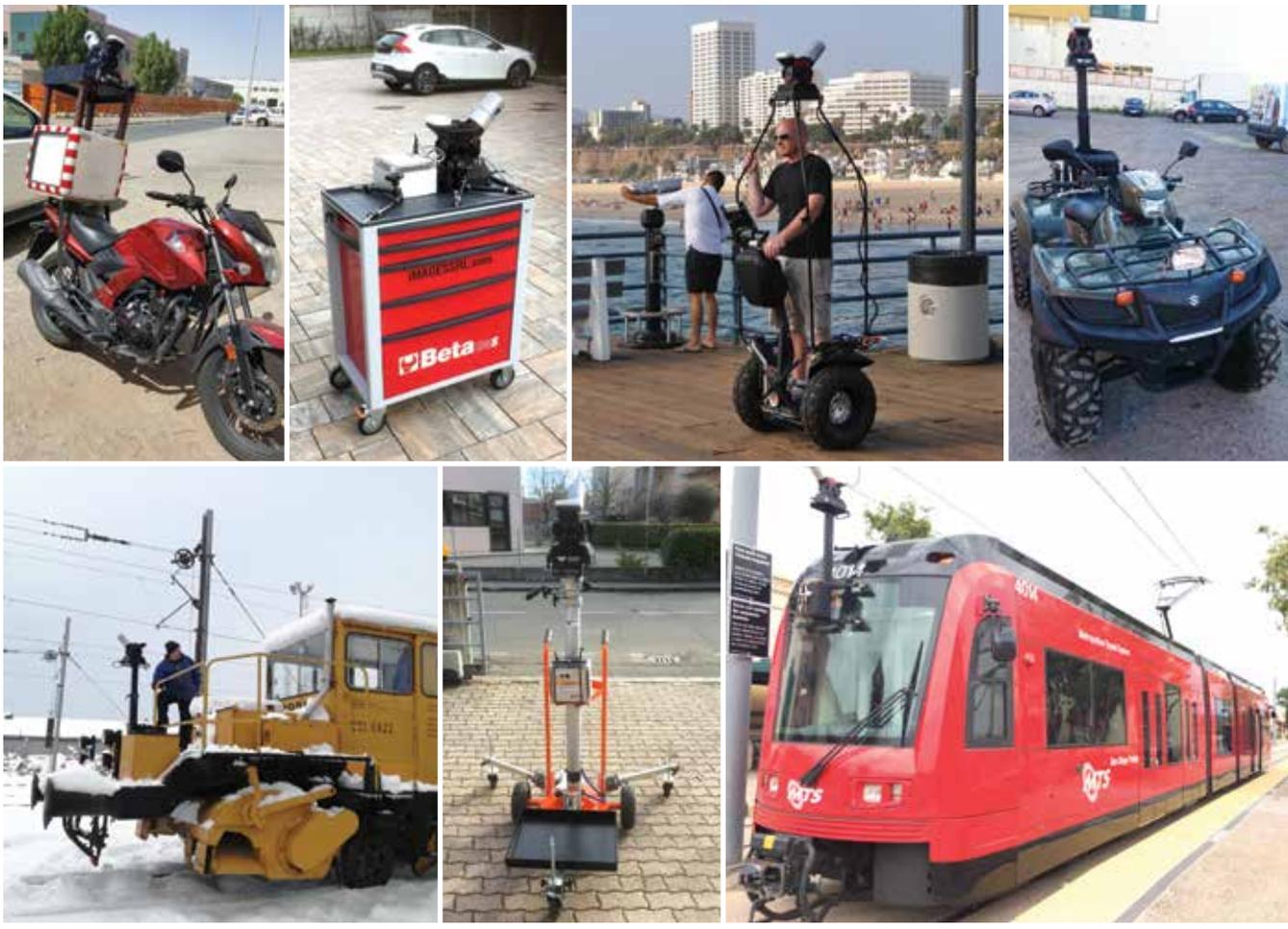
Direct Mount

Attach Maverick directly to your own mount structure using just four 0.64-mm (1/4") – 20 NC socket head cap screws.

Using the Quick-Connect Mount Adapter from Teledyne Optech

The adapter serves as an interface between Maverick and your mounting platform. Its quick-connect latch makes it fast and easy to attach the sensor to the mount and then remove it when the survey is over. You can use this adapter to install Maverick onto your own vehicle mount or onto the Teledyne Optech mounting options.

EXAMPLES OF CUSTOM USER MOUNTS



Maverick Mobile Mapping System

Teledyne Optech Mounting Options

Actuated Roof Mount (Vehicle Mount)

	Type	Installed directly onto the roof rack (e.g., roof rails or Thule bars), using actuators to raise/lower Maverick to/from its survey position.	
	Features	<ul style="list-style-type: none"> » Highly adjustable mount: Adjustable legs, with hand cranks to loosen and tighten the legs in position; adjustable feet, to clamp onto roof bars of various widths and spacing; telescoping arm, to optimize the survey position of the Maverick unit » Quick-connect mount adapter » Installed in minutes without specialized tools 	
	Weight	13.1 kg (28.9 lb.)	
	Shipping Case	Type	Custom-designed shipping case
Dimensions		92 x 37 x 25 cm (36.2 x 14.6 x 9.8 in)	
Shipping Weight		23.3 kg (51.4 lb.)	

Backpack Mount (Wearable Mount)

	Type	Enables operator to collect Maverick data on foot indoors and in other environments that are inaccessible to vehicles.	
	Features	<ul style="list-style-type: none"> » Unobstructed field of view for both Maverick lidar and 360° camera system » Adjustable height » Quick-connect mount adapter » Battery pack included (specifications below)¹ 	
	Weight	7.3 kg (16.1 lb.) for backpack frame + empty battery pack 18.1 kg (39.9 lb.) for backpack frame + battery pack + 4 batteries + Maverick unit	
	Shipping Case	Type	Custom-designed shipping case
Dimensions		92 x 56 x 28 cm (36.2 x 22 x 11 in)	
Shipping Weight		30 kg (66 lb.), including battery pack	

EXAMPLES OF AREAS INACCESSIBLE TO VEHICLES: PIPELINE CORRIDOR (left), WALKWAY (centre and right) ILLUSTRATING COLLECTED LIDAR/IMAGERY DATA



¹To reduce the risk of serious injury from excessive strain, an operator should only use the backpack mount for 30-60 minutes at a time. Multiple operators are necessary for longer use.

Battery Pack

	Batteries	Up to 4 batteries (total operating time of up to 4 hours) ¹
	Battery Extension	Batteries can be hot-swapped to extend operation time ¹
	Weight	2.35 kg (5.2 lb.) for empty battery pack 1.8 kg (4 lb.) for 4 batteries
	Battery Status	Monitoring device to view battery charge

▶ **Maverick: A Comprehensive Software Workflow**



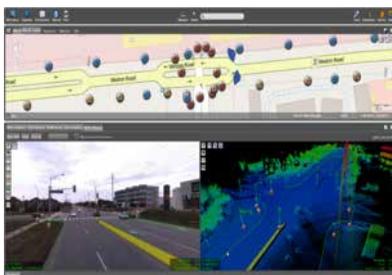
Data Collection



Distillery



NEW - LMS Pro



Collect

- » Real-time web-based data display and feedback
- » Moving map display, accessible by any device with a WiFi connection
- » Ability to load survey plan

Process

Distillery

- » Standard data processing solution
- » Image, lidar, and GPS post-processing
- » Intuitive and simple to use
- » Visualize collected lidar and imagery data almost in real time

LMS Pro

- » Comprehensive data processing solution
- » Takes Maverick to the next level with improved precision/accuracy and extended capabilities:
 - » Robust quality assurance and quality control tools
 - » Batch, parallel and distributed processing
 - » On-the-fly coordinate transformation
 - » Point cloud colorization

Extract / Analyze / Share

- » Highly automated feature extraction process
- » Premium data analysis and sharing capabilities
- » Tightly integrated with best-in-class third-party solutions

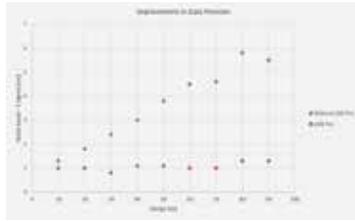
LMS Pro

Making your Maverick system even more versatile and efficient with extended capabilities.

LMS Pro: Extending the use of your Maverick in projects requiring higher precision and accuracy data

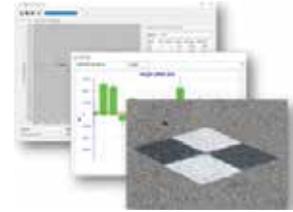
Improved Data Precision

LMS Pro accommodates enhanced sensor calibration that significantly improves Maverick data precision by further refining the alignment of each of the 32 channels of the Maverick lidar sensor.



Absolute Accuracy Optimization

LMS Pro improves absolute accuracy by incorporating control points in the block adjustment process. Several quality control tools are available for checking the data against control points.



LMS Pro: Extended capabilities and production features to increase your overall processing workflow efficiency

Point Cloud Colorization

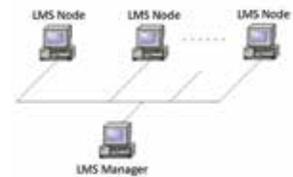
RGB extract functionality enables Maverick users to generate colorized point clouds that can be output in industry-standard formats, as well as custom formats, in the desired output reference frame.



Production Features

Key production utilities help to process large projects cost-effectively by minimizing user interaction:

- » Batch, parallel, and distributed processing
- » Cloud compatibility.

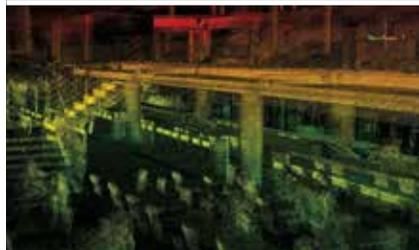


LMS Pro: Extending the use of Maverick for indoor mapping

SLAM Capability

LMS Pro enables Maverick users to determine the trajectory in GNSS-denied environments through its SLAM capability. This Simultaneous Localization and Mapping functionality extends the use of Maverick for indoor applications such as:

- » Space planning and utilization
- » Asset/facility management
- » Documentation of existing conditions
- » Virtual 3D walk-throughs.



Specifications

System

Operating Temperature	0° to 43°C (32° to 110°F)	Power Supply	12 V - 36 V DC
Dimensions	34.4 cm x 21.6 cm x 36.3 cm (13.60" x 8.50" x 14.28")	Weight	8.85 kg
Mount	Mount bolts to existing roof racks (four 1/4" screws) or quick release installation; specific vehicle mount options available	IP rating:	IP65

Laser Components

Laser/Detector Pairs	32	Horizontal Field-of-View	360°
Vertical Field-of-View	+10° to -30°	Output	Up to 700,000 points/second
Maximum Range	Up to 100 m	Safety	Class 1, eye-safe
Absolute Accuracy	Better than $\pm 3\text{cm}^*$	Relative Accuracy	$\pm 1\text{cm}$ (1 sigma)**

* Root Mean Square Error (RMS). Assumes good GNSS data (PDOP <3), data collected following best practices, and a 10-m range using a post-processed trajectory. Also assumes use of the LMS Pro software solution to adjust data with control points. Contact Teledyne Optech for more details.

**Plane fitting results on flat wall at approximately 10 m from the sensor. Average from assessment performed on 10 different Maverick units from 20 collection drives. Assumes the use of LMS Pro sensor calibration and good-quality post-processed trajectory data. Contact Teledyne Optech for more details.

Imaging Components

Type	Ladybug 5	Megapixels	30 MP (5 MP x 6 sensors)
Imaging Sensor	Sony ICX655 CCD x 6, 2/3"	Optics	6 high-quality 4.4-mm focal length lenses
Field-of-View	90% of full sphere	Spherical Distance	Calibrated from 2 m to infinity
Focal Distance	≈200 cm. Objects have an acceptable sharpness from ≈60 cm to infinity		

Shipping Case

Type	Durable, custom-designed shipping case	Dimensions	55.9 cm x 45.7 cm x 25.4 cm (22" x 18" x 10")
Shipping Weight	18.14 kg		

SLAM

^{1,2} Relative position accuracy: $\pm 5\text{-}10\text{ cm}$ for a loop of 100 m	² Georeferenced position accuracy: 40-150 cm per 10 minutes of GNSS outage with typical dynamics (lots of turns) and no loop closure
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1. Standard deviation of offsets between lidar and control.

2. Accuracy results obtained using lidar sensor positioned vertically, following operational best practices. Results may vary depending on the type of environment scanned. For more details, please contact Teledyne Optech

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