TOPCON

IP-S3 HD1

COMPACT, HIGH-DENSITY 3D MOBILE MAPPING SYSTEM

The Ultimate in Feature Recognition and Mapping

- Integrated, turnkey solution
- Ultra-compact design
- Multiple lasers minimize scanning shades
- Unparalleled ease-of-use
- No user calibration required
- Full integration of cloud and images

The lightweight, compact IP-S3 HD1 offers a high-density point cloud with colorful image overlays

The IP-S3 HD1 bundles the longstanding experience of Topcon in mobile mapping systems in a small package. The system overcomes the challenges of mapping 3D features at a high level of accuracy. Accurate vehicle positions are obtained using three technologies: A dual frequency GNSS receiver establishes a geospatial position; an Inertial Measurement Unit (IMU) provides vehicle attitude; and connection to the vehicle or external wheel encoder obtains odometry information. These three technologies work in tandem to sustain a highly accurate 3D position for the vehicle even in locations where satellite signals can be blocked by obstructions such as buildings, bridges, or tree lines.

The IP-S3 HD1 system includes a single sensor head of LiDAR containing lasers oriented to cover roadside features up to 100 meters away. The panoramic, high-resolution 30 megapixel camera is included to collect images in fixed distance intervals. All sensor inputs are recorded and time stamped to a common clock driven by the IP-S3 HD1.

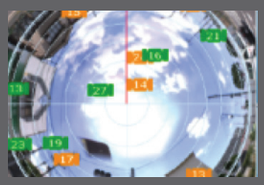
Use the powerful, all-in-one Mobile Master Field and Office software suite to collect and process geo-referenced LiDAR and/or digital imaging data into a colorful 3D representation which can be exported to third party software. Matching techniques and ground control functionality optimizes precision and absolute accuracy. Mobile Master software provides a simple interface for combining, viewing and working with your various sensor data collected from the IP-S3 HD1.

The IP-S3 HD1 quickly provides high-accuracy data and dynamic imaging for any mapping project. The easily mounted vehicle system can map data at normal travel speeds for roadway surface condition assessments and roadside feature inventories. Safety is increased by removing pedestrians from the travelled lanes. Other applications include pipelines, utilities, as-builts, construction progress monitoring and risk management.

High definition laser scanner

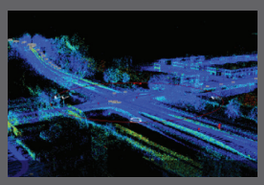
The high-definition laser scanner included with the IP-S3 HD1 collects 700,000 points-per-second at a range of 100 meters. The scanner has a 360° horizontal field of view and a 30° vertical field of view to increase data collection coverage and minimize laser shadowing. With those features, the system remains lightweight at under 18 kg making it the lightest and most compact high-precision mobile mapping system available today.

MAP → PROCESS → EXTRACT → DELIVER



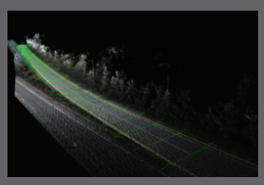
Map

Mapping with the IP-S3 HD1 allows you to collect more data in less time. A complete dataset is collected for a detailed continuous representation of reality.



Process

Easily process your data with Mobile Master Office software. Get high-precision with automatic pass and intersection matching. Achieve high-accuracy with control point matching. Produce colorized scans with images and excellent data visualization and utilization.



Extract

Mobile Master Office software easily moves the data to a point cloud extraction software of your choice such as Topcon ScanMaster, Orbit Asset Inventory software, Autodesk Recap, or Bentley PointTools.

Deliver

Export extracted information into GIS and CAD deliverables, enabling the use in down-stream workflows.

IP-S3 HD1 Timing Unit	
Size (w x d x h)	260 ×160 × 121 mm
Weight	3.0 kg
Input/Output ports	Power supply, Ethernet, scanner, spherical camera, wheel encoder, IMU, GNSS antenna
Timing resolution	10 nsec
Sensor Unit	
Size (w x d x h)	300 × 500 × 600 mm
Weight	18 kg
GNSS Receiver	
Tracking	226 universal channels for reliable, "all in view", dual-frequency L1/L2 code/carrier GPS and GLONASS tracking
IMU	
Gyro bias stability	1°/hr
Acceleration bias stability	7.5 mg
Laser Scanner	
Measurement rate	700,000 point/sec
Range	100 m at 100% reflectivity, 70 m typical
Calibration	Topcon calibrated
Spherical Camera	
Camera unit	CCD camera (6 pcs.)
Max resolution	8000 × 4000 pixels
System Performance	
Absolute coordinates accuracy	
(1 sigma)*1	50 mm at 10 m
(1 sigma)*2	10 mm on road surface
Continuous surveying time	8 hours (approx 1 TB of data)
Environmental / Temperature Range	
Operating	0°C to 45°C
Storage	-30°C to 60°C
Electrical	
Input voltage	9V to 36V
Power	60W

**1 Comparison to 10 known points, 30 passes at 30km/h*
**2 Plane fitting results on flat road surface*

High definition laser scanner

- Capture high-resolution, high-density 3D point clouds
- Project data into 3D global coordinates with accurate time stamps
- Produce geo-referenced panoramas

Positioning component

- Determine precise vehicle position and attitude
- Integrated dual frequency GNSS receiver
- Inertial Measurement Unit
- Constantly monitor vehicle motion and attitude

Vehicle wheel encoder

- Encoder further enhances accuracy and reliability
- Detects rotation of the wheel
- Only one wheel encoder required

Imaging component

- Panoramic 30 megapixel camera
- Add-on additional imagery sensors for enhanced clarity

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For more information:
topconpositioning.com/ips3

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