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TOKNAV



Handheld LiDAR Scanner

TSR20

Real-Time Mapping LiDAR System

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TSR20 Handheld LiDAR Scanner

The TSR20 is a new lightweight, high-performance handheld mobile LiDAR scanner launched by Toknav. Featuring the Livox Mid-360 sensor and advanced SLAM algorithms, it captures precise 3D point clouds in GNSS or GNSS-denied environments. Its compact design ensures easy mobility for indoor and outdoor mapping, including urban surveys, infrastructure inspection, and digital twin modeling. Combining LiDAR, GNSS, and INS, the TSR20 delivers reliable, seamless data processing across diverse applications.

CHARACTERISTIC

Centimeter-Level Accuracy

Integrating a high-performance positioning and orientation system, the TSR20 supports multi-constellation GNSS signals (GPS, GLONASS, Galileo, and BeiDou) with a 200Hz POS update rate. By flexibly switching between SLAM, RTK-SLAM, and PPK-SLAM mapping modes, it achieves deep fusion of LiDAR data with high-precision pose information, delivering ⩽5 cm absolute accuracy and ⩽1 cm relative accuracy. This performance meets the demanding requirements of professional applications including BIM 3D scanning and digital twin modeling.

Strong Penetration Capability

The TSR20 integrates Livox Mid-360 LiDAR with 40m range (10% reflectivity) and enhanced penetration. Its 360° non-repetitive scanning at 200,000 points/sec ensures detailed point clouds in complex environments including mining, powerline, and forestry applications.

Lightweight and Portable

Weighing only 1.0kg with compact dimensions and under 25W power consumption, the TSR20 supports handheld operation. Its rugged construction and wide operating temperature range ensure stable performance across diverse environments.

True-Color 3D Reality

The TSR20 features dual 20MP cameras with 200° ultra-wide views and synchronized point cloud-image capture. This delivers 3D models with both geometric precision and true textures, ideal for powerline inspection, digital twin modeling, and indoor-outdoor 3D reconstruction.

All-in-One Solution

The TSR20 delivers a complete workflow from data acquisition to intelligent analysis. With 64GB built-in storage and expandable 128GB SD card support, field data can be wirelessly transferred via WiFi and processed through the proprietary PointCloudCreater software. The system also supports the Point Cloud Automata (optional) platform for automated classification, filtering, and modeling, delivering complete post-processing automation.

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Weight: **1.0kg**
Dimensions: **16.5*12.0*32.4cm**

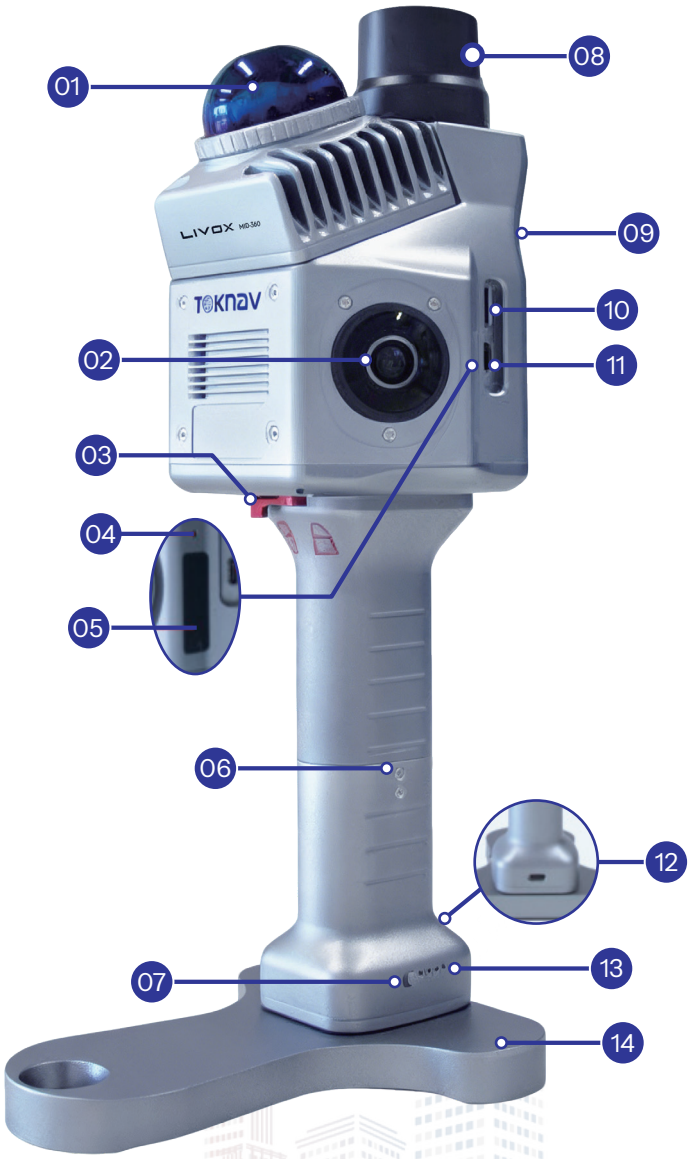
Livox Mid-360 LiDAR
40m range (10% reflectivity)
200,000 points/sec

Multiple Mapping Mode
SLAM; RTK-SLAM; PPK-SLAM

Centimeter-Level
⩽1cm(Relative)
⩽5cm(Absolute)

Time-synchronized Scanning
Dual 20MP cameras with
200° ultra-wide views

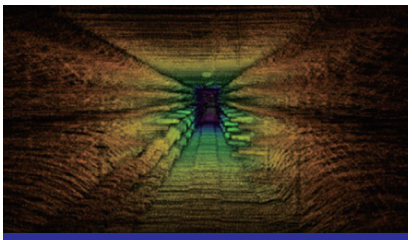
64GB internal flash memory
128GB MicroSD Card

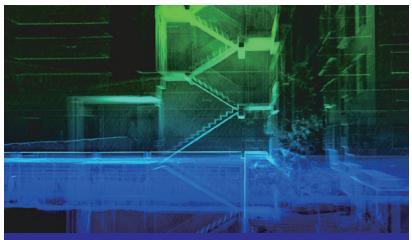


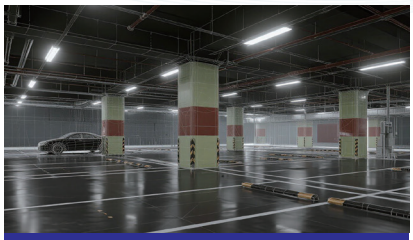
Structure and Parts

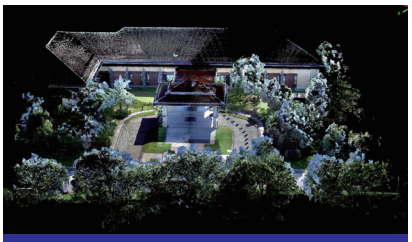
01. Laser Sensor
02. Fisheye Camera
03. Latch
04. Wi-Fi Indicator
05. Wi-Fi Module
06. Handle (Built-in Battery)
07. Power Switch
08. GNSS Antenna
09. Phone Holder
10. TF Card Slot
11. Type-C Interface
12. Type-C Charger Interface
13. Power Indicator
14. Base Plate

Application Scenarios

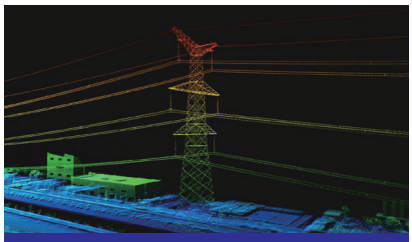

Underground


Indoor Stairs


Parking Lots


Outdoor Buildings


Low-canopy Forest


Power Line Patrol

SPECIFICATION

SYSTEM SPECS	
Accuracy	⩽1cm(Relative), ⩽5cm(Absolute)
Voltage Range	12-20V
Dimensions	16.5*12.0*32.4cm
Weight	1.0kg (including battery)
Operating Temperature	-20°C-55°C
Power Supply Range	12V-16.8V
System Consumption	25W
Storage	64GB internal flash memory 128GB MicroSD Card
Carrying Platform	Handheld
WiFi Transmission Distance	Data reception is smooth within 5m

POS SPECS	
Model	Built-in GNSS positioning and orientation dual antenna
POS Update Rate	200Hz
GNSS System	GPS L1/L2/L5 GLONASS L1/L2 GAL E1/E5a/E5b BDS B1c/B1/B2/B2a/Bab/B3
Positioning Accuracy	Horizontal: ±0.02m Vertical: ±0.03m
Pitch Accuracy	0.015°
Heading Accuracy	0.040°
Roll Accuracy	0.015°

LASER SPECS	
Measuring Range	40m/10%
Horizontal FOV	360°
Vertical FOV	-7°-52°
Wavelength	1535mm
Data	Single echo, 200,000Points/Sec
Range Accuracy	⩽2cm/10m, ⩽3cm/0.2m
Scanning Mode	Non-repetitive Scanning

CAMERA SPECS	
Effective Pixel	2*20MP
Scanning Mode	Time-synchronized Scanning
FOV	Horizontal/Vertical FOV: 200°

MAPPING	
Mapping Mode	SLAM; RTK-SLAM; PPK-SLAM

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Manufacturers may update parameters at any time, please refer to the latest product information.

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