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## Handheld LiDAR Scanner

# TSR20

## Real-Time Mapping LiDAR System

(a complete range of Civil Surveying Products...)

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# TSR20 Handheld LiDAR Scanner

## Real-Time Mapping LiDAR System

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

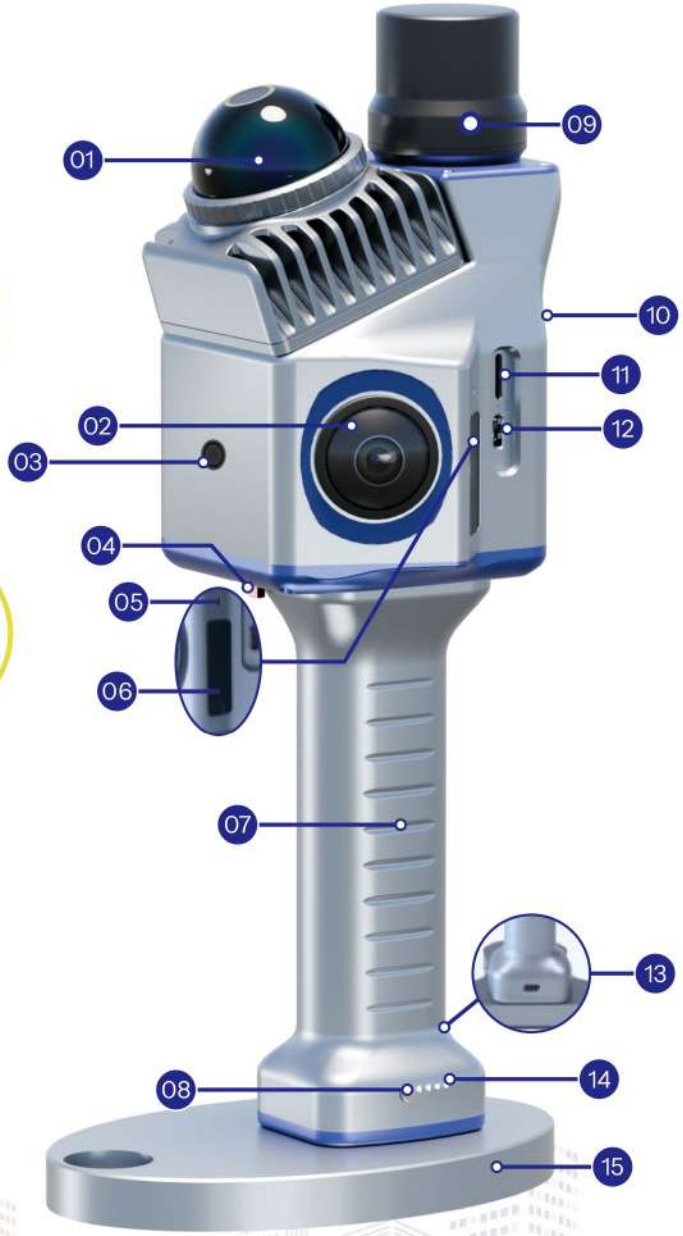
**Livox Mid-360 LiDAR**
40m range (10% reflectivity)
200,000 points/sec

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

**Centimeter-Level**
3cm(Absolute)

**Time-synchronized Scanning**
2*12MP RGB + 1MP Visual SLAM cameras

**128GB SD Card**




## Structure and Parts

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

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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 BDS) 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 3 cm absolute 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), 70m range (80% 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, backpack, and vehicle-mounted operation. Its rugged construction and wide operating temperature range ensure stable performance across diverse environments.

## True-Color 3D Reality

The TSR20 features 2*12MP RGB cameras and a 1MP Visual SLAM camera with 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 expandable 128GB SD card support, field data can be wirelessly transferred via WiFi and processed through the proprietary ToknavPointMaster software. The system also supports the Toknav PointMaster (optional) platform for automated classification, filtering, and modeling, delivering complete post-processing automation.

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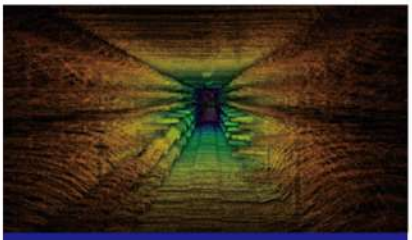
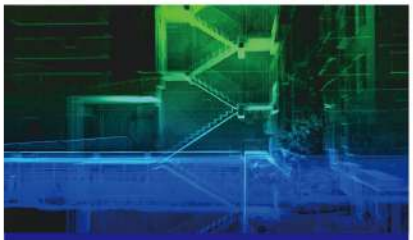
# Application Scenarios



Underground



Indoor Stairs



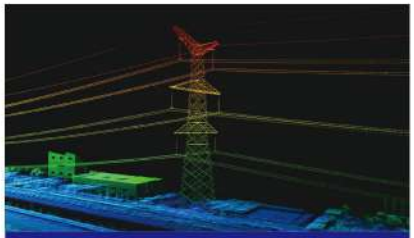
Parking Lots



Outdoor Buildings



Low-canopy Forest



Power Line Patrol

# SPECIFICATION

| SYSTEM SPECS | |
|---|---|
| Absolute Accuracy | 3cm |
| Point Cloud Thickness | 1cm |
| Battery Capacity | 13600mAh |
| 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 | 128GB SD Card |
| Carrying Platform | Handheld/Backpack/ Vehicle-mounted |

| POS SPECS | |
|---|---|
| Type | Single-antenna GNSS/INS integrated POS |
| IMU Update Rate | 200Hz |
| Point Cloud Update Frequency | 10Hz |
| GNSS System | GPS L1/L2 GLONASS L1/L2 GALILEO E1/E5b |
| GNSS System | BDS B1/B2a/B3 |
| Positioning Accuracy | Horizontal: ±0.02m Vertical: ±0.03m |
| Roll/Pitch Accuracy | 0.015° |
| Heading Accuracy | 0.040° |

| LASER SPECS | |
|---|---|
| Measuring Range | 40m/10%, 70m/80% |
| Horizontal FOV | 360° |
| Vertical FOV | -7°-52° |
| Wavelength | 905nm |
| Data | 200,000Points/Sec |
| Range Accuracy | ⩽2cm@10m, ⩽3cm@0.2m |
| Scanning Mode | Non-repetitive Scanning |

| CAMERA SPECS | |
|---|---|
| Resolution | 2*12MP RGB +1MP Visual SLAM |

| 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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