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TOKNAV



*Versatile Mobile LiDAR Scanner*

# TSR120

## Multifunctional Mobile LiDAR Scanning Platform

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# TSR120 Versatile Mobile LiDAR Scanner

The TSR120 is Toknav's new multifunctional mobile LiDAR scanning platform. With a 360° rotating pan-tilt, it covers 270°×360° point clouds. Using advanced SLAM, it captures high-detail 3D data without light or GPS. It has built-in control & storage, swappable battery, two 13MP fisheye cameras (ultra-wide FOV), 300m max range, multi-return, and supports backpack, drone, and vehicle mounting. The companion APP enables true-color point clouds and panoramas. Applications include deep mine surveying, large earthworks, long tunnels, power line inspection, and multi-source fusion mapping.

# CHARACTERISTIC

## High-precision & Multi-mode Mapping

The TSR120 integrates a high-precision positioning and attitude system with multi-constellation GNSS (GPS, GLONASS, Galileo, BeiDou) and offers five mapping modes: SLAM, RTK-SLAM, PPK-SLAM, GNSS, and INS. In open areas, RTK-SLAM or GNSS mode delivers absolute coordinates; in GNSS-denied environments (indoors, tunnels, shafts), switch to PPK-SLAM or SLAM/INS. Deep fusion of LiDAR and attitude data achieves absolute accuracy ⩽3 cm and relative accuracy ⩽1 cm, meeting professional surveying standards.

## Ultra-long Range & Strong Penetration

TSR120 delivers 300m range with a 32-channel LiDAR and 640,000 pts/s. It penetrates vegetation, grilles, and gaps to capture occluded features. It provides high-density, high-detail point clouds for open-pit mines and dense forests, boosting data integrity and efficiency in complex environments.

## Multi-platform Adaptability

The device weighs only 1.7 kg, making it lightweight and portable. It supports multiple mounting options: handheld, backpack, Airborne, and Vehicle-mounted. This versatile adaptability significantly improves equipment utilization and reduces the cost of purchasing multiple devices.

## True-color Point Cloud

The device is equipped with dual 20MP fisheye cameras (actual effective pixels: 2×13MP) featuring a 200° ultra-wide angle and simultaneous synchronized shooting, generating high-precision true-color point clouds and local panoramas, thereby enhancing feature recognition and visual clarity of the results.

## All-in-One Solution

The TSR120's self-developed SLAM algorithm requires no deliberate loop closure — stop scanning and power off. The integrated workflow: pre-scan (app preview, RTK setup), during-scan (real-time point cloud, one-tap anchors, auto-save), and post-scan (one-click Toknav PointMaster for denoising, smoothing, densification, dynamic object removal, and true-color generation) — all without third-party tools.

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## Multifunctional Mobile LiDAR Scanning Platform

Weight: **1.7kg**
Dimensions: **15.3*9.3*39.4cm**

### Ultra-long Range

**300m** range (80m @ 10% reflectivity)
640,000 pts/s (Point Rate)

### Multiple Mapping Mode

SLAM; RTK-SLAM; PPK-SLAM;
GNSS; INS

### Centimeter-Level

⩽**1cm**(Relative)
⩽**3cm**(Absolute)

### Time-synchronized Scanning

Dual 13MP cameras with
Single camera: fisheye, 200°

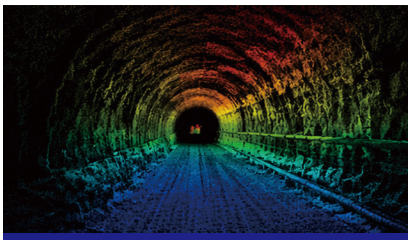
**64GB** internal flash memory
**128GB** MicroSD Card




## Structure and Parts

01. GNSS Antenna
02. Power button
03. USB-A port
04. USB-C port
05. TF card slot /microSD card slot
06. Handle battery charging port
07. LiDAR
08. Camera
09. Handle battery

# Application Scenarios



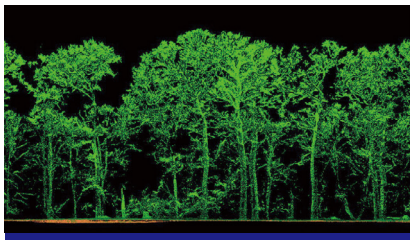
Underground & Enclosed Spaces



Large-scale Earthworks & Engineering Surveying



Long-distance Linear Projects



Forestry & Agricultural Surveys



3D Modeling of Complex Environments



Infrastructure Inspection

# SPECIFICATION

| SYSTEM SPECS | |
|---|---|
| Accuracy | ⩽1cm(Relative), ⩽3cm(Absolute) |
| Voltage Range | 12-18V |
| Dimensions | 15.3*9.3*39.4cm |
| Weight | 1.7kg (including battery) |
| Operating Temperature | -20°C-55°C |
| Power Supply Range | 12V-16.8V |
| System Consumption | 25W |
| Storage | 64GB internal flash memory<br>128GB MicroSD Card |
| Carrying Platform | Handheld / Backpack / Airborne / Vehicle-mounted |
| Battery | 3500mAh |
| Operating time | 2h |

| POS SPECS | |
|---|---|
| GNSS System | GPS L1/L2 GLONASS L1/L2<br>GAL E1/E5a/E5b BDS B1/B3/B2a<br>(Supports Single BeiDou Mode) |
| Positioning Accuracy | Horizontal: ±0.02m<br>Vertical: ±0.03m |
| Pitch Accuracy | 0.015° |
| Heading Accuracy | 0.040° |
| Roll Accuracy | 0.015° |

| LASER SPECS | |
|---|---|
| Range | 80m @ 10% reflectivity,<br>maximum range 300m |
| Channels | 32 |
| Horizontal FOV | 360° |
| Vertical FOV | 40.3° (-20.8° ~ +19.5°) (Laser device)<br>270° (Handheld device) |
| Point Rate | 640,000/pts |
| Range Accuracy | 0.5cm (typical, 1 σ ) /<br>1cm (standard) |

| CAMERA SPECS | |
|---|---|
| Actual effective pixels | 2*13MP |
| Shooting Mode | Interval shooting /<br>Equal time-interval shooting |
| FOV | Single camera: fisheye, 200° |

| MAPPING | |
|---|---|
| Mapping Mode | SLAM; RTK-SLAM; PPK-SLAM;<br>GNSS; INS |

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

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