WayPonDEV L2 4D 3D Lidar Sensor Scanner

WayPonDEV L2 4D Lidar Sensor Instruction Manual

Model: L2 4D 3D Lidar Sensor Scanner
Brand: WayPonDEV

1. Introduction

This manual provides detailed instructions for the WayPonDEV L2 4D Lidar Sensor, a high-performance 4D lidar rangefinder module designed for various applications including robotics, smart cities, smart toys, and logistics. It supports advanced functions such as mapping, positioning, identification, obstacle avoidance, environmental scanning, and 3D reconstruction.

2. Package Contents

Verify that all items listed below are present in your package:

- Unitree 4D LIDAR-L2 x 1
- Rubber pad x 1
- Adapter Module x 1
- Screw package (M3) x 1
- Hexagonal L-shaped wrench x 1
- Data cable x 1

Pack List

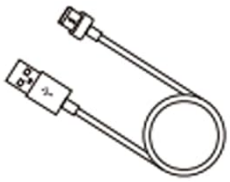
Unitree 4D LiDAR-L1 x 1

Rubber pad x 1

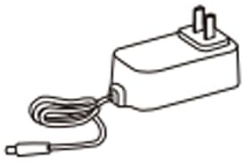
Adapter Module x 1

Screw package (M3) x 1

Hexagonal L-shaped wrench x 1



Adapter module x 1

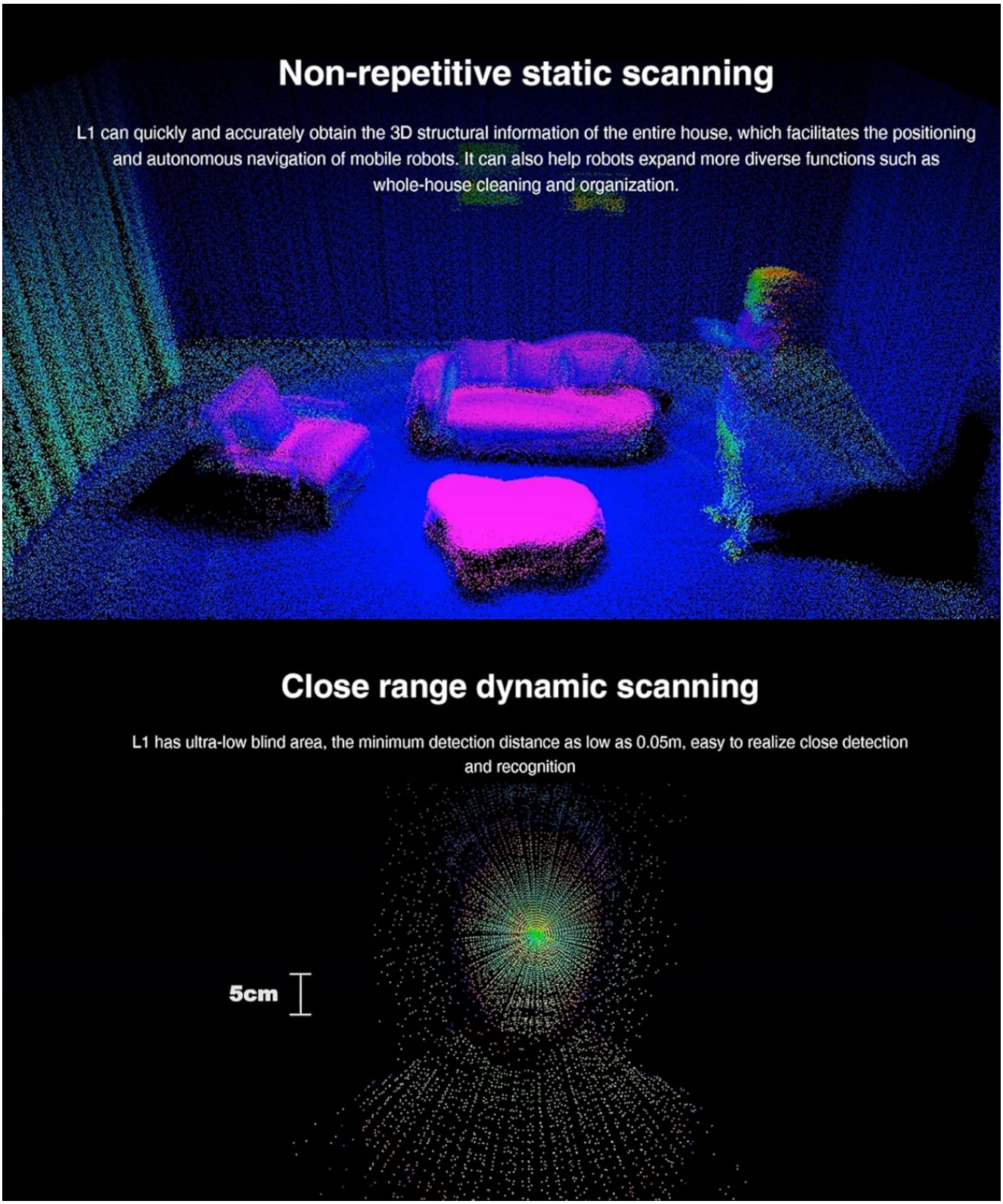


Data cable x 1

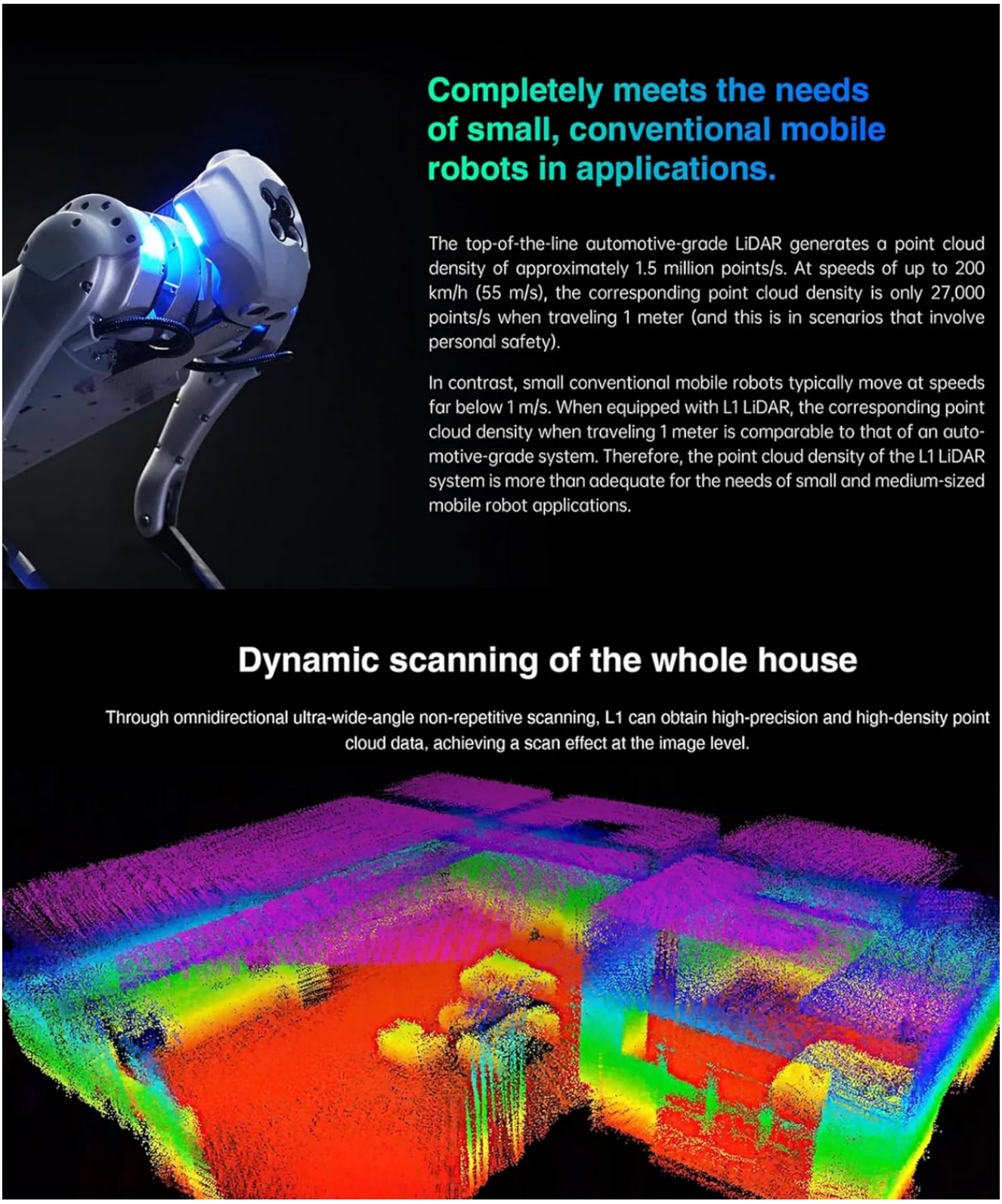
The package includes the main Lidar unit, a rubber pad for stable placement, an adapter module, a screw package for mounting, a hexagonal L-shaped wrench for assembly, and a data cable for connectivity.

3. Key Features

- **Performance Upgrade:** Built-in 3-axis acceleration and 3-axis gyroscope IMU module, supporting 250Hz push frequency. Scanning distance: 15m~30m, Sampling Frequency: 128K dots/sec, Vertical Scanning Frequency: 216Hz, Circumferential Scanning Frequency: 5.55Hz. Stable distance measurement and high accuracy mapping under 100K lux bright light outdoors.
- **0.05m Ultra-low Blind Zone:** Minimum detection distance of 0.05m for close-range detection and recognition. Supports non-repetitive static scanning for high-precision point cloud data and image-level scanning effects.
- **High-speed Ranging Sampling:** 4D lidar rangefinder module (3D position + 1D grayscale) for mapping, positioning, identification, obstacle avoidance, environment scanning, and 3D reconstruction (supports 2D mode).
- **3D Space Detection:** Field of view (FOV) of 360° horizontally and 96° vertically, enabling hemispherical field of view detection.
- **Open Source SLAM Program:** Built-in IMU, capable of map building using the POINT-LIO algorithm without other positioning sensors. Supports network port/serial port communication.

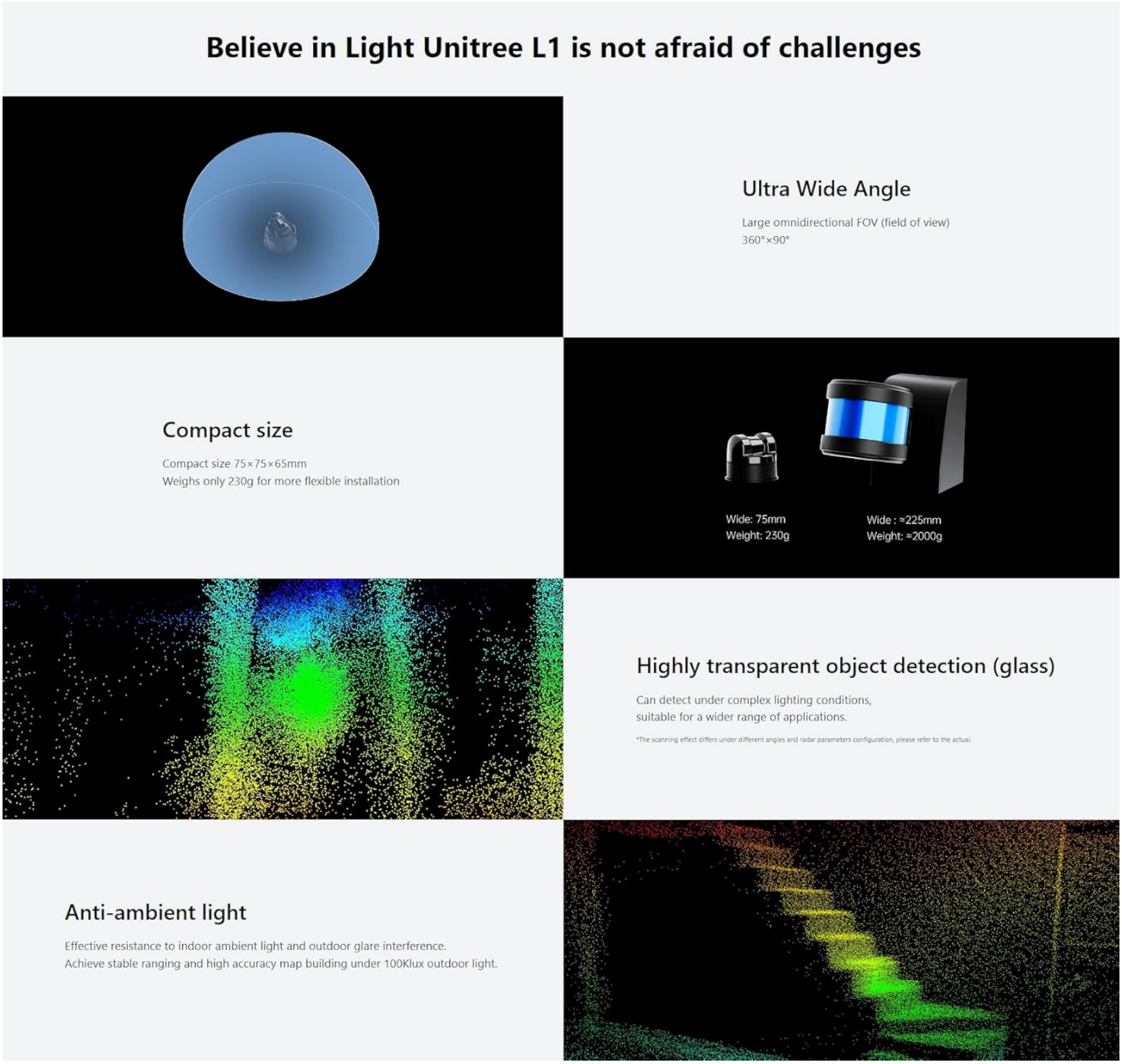


The L2 Lidar excels in both non-repetitive static scanning, capturing detailed 3D structural information for mapping and navigation, and close-range dynamic scanning, with an ultra-low blind zone of 0.05m for precise object detection.



The sensor's omnidirectional ultra-wide-angle non-repetitive scanning capability allows for high-precision and high-density point cloud data acquisition, creating detailed scans of entire environments.

The L2 Lidar features an omnidirectional ultra-wide-angle bionic 4D laser radar design, enabling comprehensive environmental perception. It is suitable for integration into various mobile robot platforms for intelligent distribution and other applications.



The L2 Lidar offers a wide field of view (360°x96°), a compact and lightweight design for flexible installation, and advanced capabilities for detecting transparent objects and operating reliably in bright outdoor conditions.

4. Setup and Installation

The WayPonDEV L2 Lidar Sensor is designed for integration into various systems.

4.1 Physical Installation

Securely mount the Lidar sensor using the provided screw package and hexagonal L-shaped wrench. Ensure the sensor has an unobstructed view of the environment for optimal performance. Refer to the product dimensions for space planning.

The Lidar unit measures approximately 75x75x65 mm (2.95"D x 2.95"W x 2.55"H), making it suitable for integration into compact systems.

4.2 Electrical Connection

Connect the Lidar sensor using the provided data cable and adapter module. The sensor supports TTL UART/Ethernet Port communication. Ensure proper power supply (10 watts).

4.3 Software Setup

For software development and integration, an SDK is available. Please contact WayPonDEV support for SDK download and technical assistance. The sensor supports open-source SLAM programs, including the POINT-LIO algorithm for map building.

5. Operation

The L2 Lidar sensor provides real-time 3D point cloud data for various applications.

5.1 Data Acquisition

The sensor operates with a sampling frequency of 128K dots/sec and an effective frequency of 64K dots/sec. It can capture detailed environmental data for both indoor and outdoor scenarios.

5.2 Mapping and Navigation

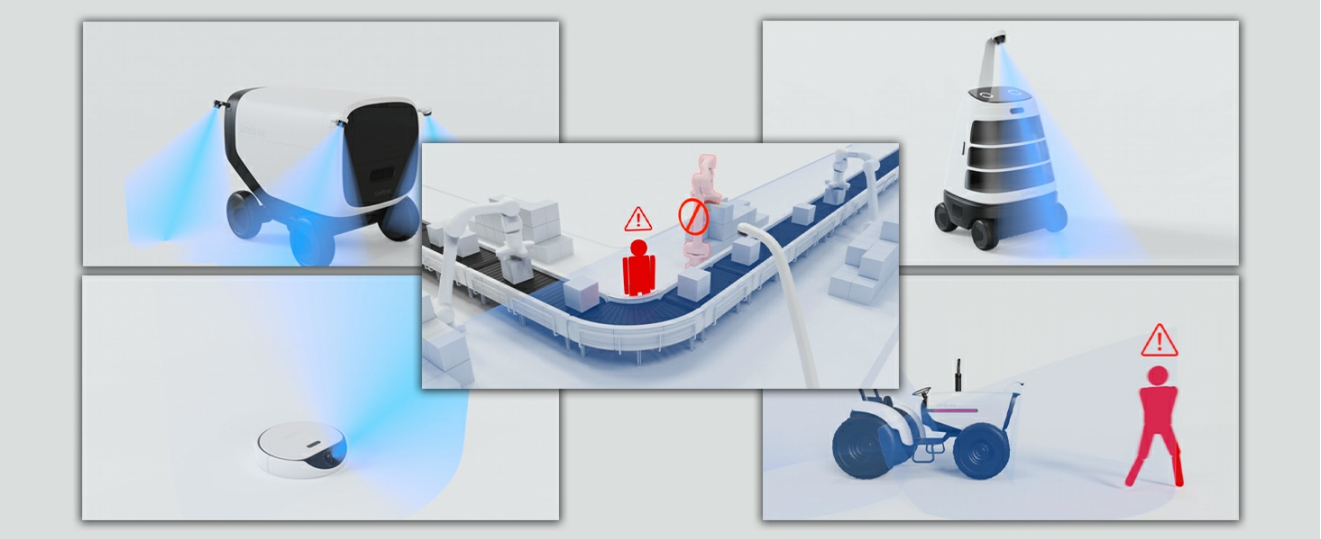
Utilize the provided open-source SLAM program and the POINT-LIO algorithm to generate accurate maps and enable autonomous navigation for robots. The sensor's 360° horizontal and 96° vertical FOV ensures comprehensive environmental coverage.

Official product video demonstrating the WayPonDEV L2 4D Lidar Sensor's capabilities in mapping and navigation, showcasing its performance in various environments.

Parameter comparison

Product	Unitree L2	A depth camera	A wide-angle 3D radar
FOV	360°x96° [1]	86°x 57°(±3°)	120°x75°
Non-repetitive scanning	√	×	×
Scanning method	Non-contact brushless rotating mirrorscanning	Global shutter	Solid or quasi-solid state scanning
Data reception processing CPU consumption (Additional cost for user)	Extremely low	High	High
Scanning distance	30m [3]	4-5m	30m
Nearby blind area	0.05m [2]	0.1 m	0.3m
IMU	3-axis acceleration+ 3-axis gyroscope	×	×
Power	10W [5]	5W	12W
Size mm	75x75x65	90x25x25	100x130x65
Weight	230g	About 100g	About 500g
Operating environment	Indoor/outdoor	Indoor/outdoor (close range)	Indoor/outdoor
Technology	Laser TOF	Infrared binocular	-aser TOF

The L2 Lidar can quickly and accurately obtain 3D structural information of entire indoor spaces, facilitating positioning and autonomous navigation for mobile robots.



The L2 Lidar effectively resists interference from ambient light and strong outdoor light, achieving stable ranging and high-precision mapping even in bright conditions up to 100K lux.

5.3 Obstacle Avoidance and Object Recognition

The ultra-low blind zone of 0.05m allows for precise close-range detection, crucial for obstacle avoidance and identification in dynamic environments.

The L2 Lidar is versatile, suitable for applications such as AGV robot navigation, industrial safety, smart home integration, and other scenarios requiring accurate 3D environmental perception.

6. Maintenance

To ensure optimal performance and longevity of your WayPonDEV L2 Lidar Sensor, follow these general maintenance guidelines:

- Keep the sensor's optical window clean and free from dust, dirt, or smudges. Use a soft, lint-free cloth for cleaning.
- Avoid exposing the sensor to extreme temperatures or harsh environmental conditions beyond its specified operating range.
- Regularly check all cable connections to ensure they are secure.
- Store the sensor in a dry, clean environment when not in use.

No user-serviceable parts inside. Do not attempt to disassemble the unit.

7. Troubleshooting

If you encounter issues with your L2 Lidar Sensor, consider the following:

- **No Data Output:**
  - Verify all power and data cable connections are secure.
  - Ensure the power supply meets the sensor's requirements (10 watts).
  - Check software configuration and communication settings (TTL UART/Ethernet Port).
- **Inaccurate Readings/Poor Point Cloud Quality:**
  - Clean the sensor's optical window.
  - Ensure the sensor is mounted stably and is not vibrating.
  - Check for obstructions in the sensor's field of view.
  - Verify ambient light conditions are within the specified operating range (up to 100K lux outdoors).
- **Software/SLAM Issues:**
  - Refer to the SDK documentation for specific software troubleshooting.
  - Ensure your SLAM algorithm implementation is correct.

- Check for updates to the SDK or firmware.

For further technical assistance, please contact WayPonDEV support atwpd@youyeetoo.com.

8. Specifications

Feature	Specification
Brand	WayPonDEV
Model	L2 4D 3D Lidar Sensor Scanner
Power Source	Corded Electric
Maximum Range	30 Meters
Mounting Type	Pole Mount
Compatible Devices	Security Systems, Smart Home Hubs, Robots, AGV Robots
Effective Frequency	64 KHz (64K dots/sec)
Product Dimensions	2.55"D x 2.95"W x 2.95"H (75x75x65 mm)
Item Weight	8.8 ounces
Wattage	10 watts
Item Package Quantity	1
Batteries Included?	No
Batteries Required?	No
Field of View (FOV)	360° (Horizontal) x 96° (Vertical)
Minimum Detection Distance	0.05m
Sampling Frequency	128K dots/sec
Vertical Scanning Frequency	216Hz
Circumferential Scanning Frequency	5.55Hz
Communication Interface	TTL UART/Ethernet Port
IMU	Built-in 3-axis acceleration and 3-axis gyroscope

A detailed comparison table outlines the superior specifications of the Unitree L2 Lidar, including its wide FOV, non-contact brushless rotating mirror scanning, low CPU consumption, 30m scanning distance, 0.05m near blind area, built-in IMU, 10W power, compact size, and Laser TOF technology, distinguishing it from other sensing technologies.

9. Warranty and Support

9.1 Warranty Information

Please refer to the official WayPonDEV website or your purchase documentation for detailed warranty terms and conditions.

9.2 Technical Support

For all technical and after-sales questions, please contact WayPonDEV support. SDK download and further assistance can be obtained by visiting the "WayPonDEV" store or by sending an email to wpd@youyeetoo.com. We kindly request that all users refrain from making any dangerous modifications or using the robot in a hazardous manner. Please visit the Unitree Robotics Website for more related terms and policies, and comply with local laws and regulations.