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› youyeetoo L1RM 4D LiDAR Scanner User Manual

youyeetoo L1RM

youyeetoo L1RM 4D LiDAR Scanner User Manual

Model: L1RM (AZ2-S-US-YSDP4DGWL1RM)

1. INTRODUCTION

The youyeetoo L1RM 4D LiDAR Scanner is an advanced rangefinder module designed for various applications including robotics, smart cities, and logistics. It provides 3D position and 1D grayscale data, enabling functions such as mapping, positioning, identification, obstacle avoidance, environment scanning, and 3D reconstruction.

This manual provides essential information for the proper setup, operation, and maintenance of your L1RM 4D LiDAR Scanner.

2. PRODUCT OVERVIEW

The L1RM 4D LiDAR features a 360° horizontal and 90° vertical field of view, offering omnidirectional ultra-wide-angle scanning. It includes built-in 3-axis acceleration and 3-axis gyroscope IMU modules, supporting a push frequency of 250Hz. The device is capable of stable ranging and high-precision mapping even in strong outdoor light conditions (up to 100K lux).

L1RM 4D LIDAR (3D position + 1D grayscale)

SLAM ROS LIDAR Sensor Scanner

3-axis acceleration and 3-axis gyroscope IMU modules

360° × 90°
Ultra-wide-angle scanning

0.05m ^[1]
Near blind spot

30m
@90% reflectivity

21600points/s
Effective frequency

230g
Weight

75×75×65mm
Compact size



360° × 90°

**Omnidirectional ultra-wide
angle scanning**

Replacing traditional LIDAR sensing solution,
Achieving the same effect,

with less than 1/10 of the price.

Figure 2.1: L1RM 4D LiDAR Scanner with key specifications including 360°x90° FOV, 0.05m near blind spot, 30m range, 21600 points/s effective frequency, 230g weight, and 75x75x65mm compact size.



Figure 2.2: Front view of the Unitree 4D LiDAR-L1 device.

2.1. Shipping List

Verify that all components are present in the package:

Shipping List



Unitree 4D LiDAR-L1 x 1



Rubber pad x 1



Screw package (M3) x 1



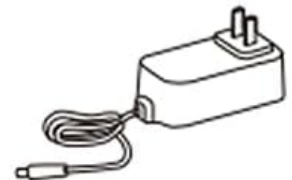
Adapter Module x 1



Hexagonal L-shaped wrench x 1



Adapter module x 1



Data cable x 1

Figure 2.3: The shipping list includes Unitree 4D LiDAR-L1 x 1, Rubber pad x 1, Screw package (M3) x 1, Adapter Module x 1, Hexagonal L-shaped wrench x 1, Adapter module x 1, and Data cable x 1.

2.2. Product Video Overview

Your browser does not support the video tag.

Video 2.1: Official product video demonstrating the features and capabilities of the youyeetoo L1RM 4D LiDAR Scanner, including its bionic human eye view, omnidirectional scanning, and application examples.

3. SETUP

Follow these steps to set up your L1RM 4D LiDAR Scanner:

1. Connect the Unitree 4D LiDAR-L1 to the Adapter Module using the provided cable.
2. Connect the Adapter Module to your computer via a USB to Type-C cable.
3. Connect the Adapter Module to an external power source using the data cable and power adapter.

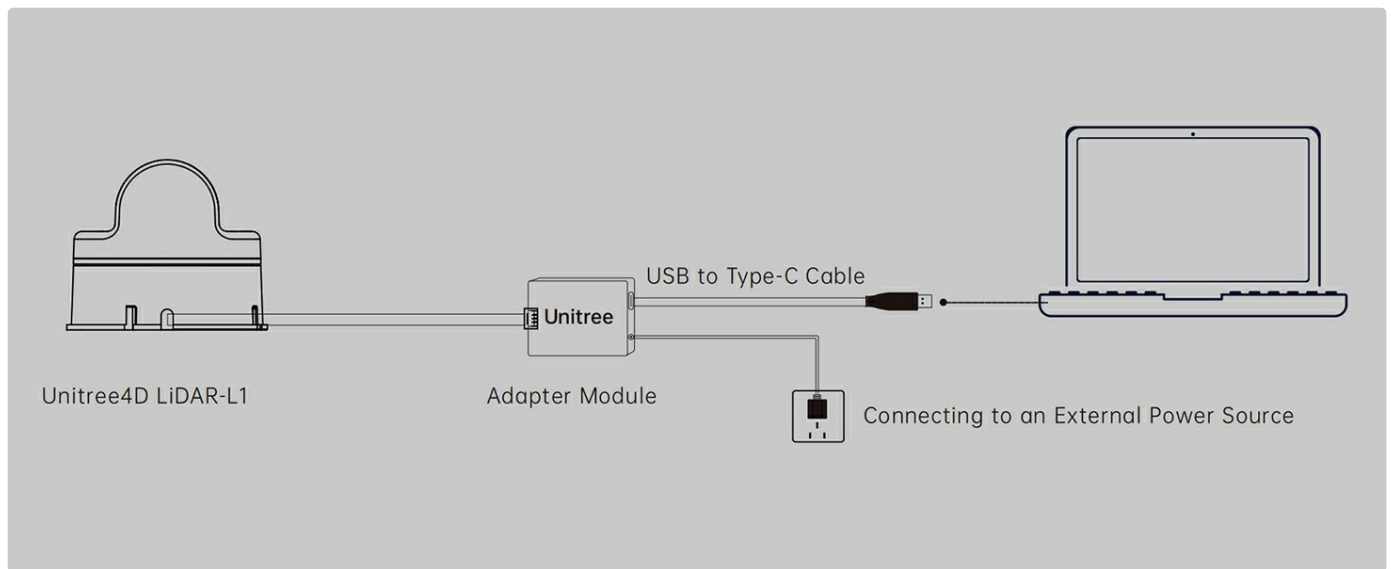


Figure 3.1: Diagram illustrating the connection of the Unitree 4D LiDAR-L1 to an Adapter Module, then to a computer via USB-C and to an external power source.

4. OPERATING INSTRUCTIONS

The L1RM LiDAR Scanner offers versatile scanning capabilities for various environments.

4.1. Omnidirectional Ultra-Wide Angle Scanning

The device provides a 360° horizontal and 90° vertical field of view, allowing for comprehensive environmental detection. This enables three-dimensional space detection with a hemispherical field of view, suitable for a wide range of commercial scenarios.

L1RM 4D LIDAR

(3D position + 1D grayscale)

SLAM ROS LIDAR Sensor Scanner

3-axis acceleration and 3-axis gyroscope IMU modules

$360^\circ \times 90^\circ$
Ultra-wide-angle scanning

0.05m ^[1]
Near blind spot

30m
@90% reflectivity

21600points/s
Effective frequency

230g
Weight

$75 \times 75 \times 65\text{mm}$
Compact size

$360^\circ \times 90^\circ$
Omnidirectional ultra-wide angle scanning

Replacing traditional LIDAR sensing solution,
Achieving the same effect,
with less than 1/10 of the price.

Figure 4.1: Visual representation of the L1RM's $360^\circ \times 90^\circ$ omnidirectional ultra-wide angle scanning, highlighting its ability to replace traditional LiDAR solutions with comparable effect at a lower cost.

4.2. Whole House Dynamic Scanning

The L1RM can quickly and accurately obtain the three-dimensional structural information of an entire house. This feature is beneficial for mobile robots, facilitating positioning and autonomous navigation, and supporting functions like whole-house cleaning and organization.

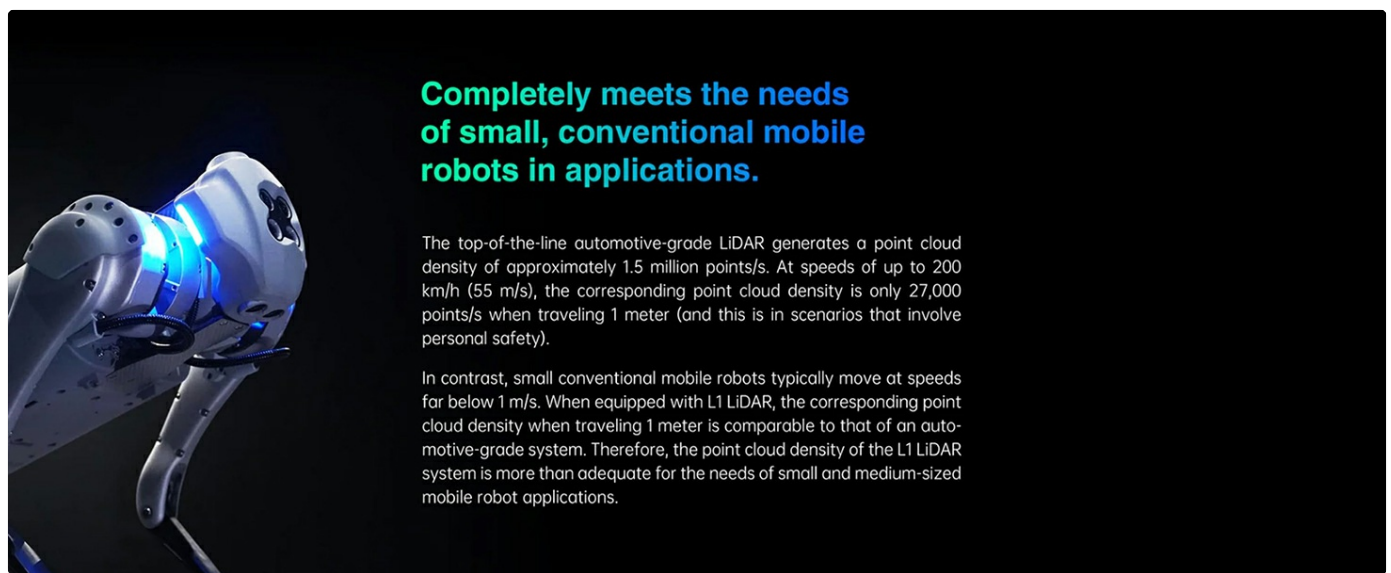


Figure 4.2: Visualization of dynamic scanning of a whole house, demonstrating the high-precision and high-density point cloud data obtained by the L1RM.

4.3. Non-Repetitive Static and Close-Range Dynamic Scanning

The L1RM supports non-repetitive static scanning, providing high-precision point cloud data for image-level scanning effects. It also features an ultra-low blind zone with a minimum detection distance of 0.05m, enabling easy close-range detection and recognition.

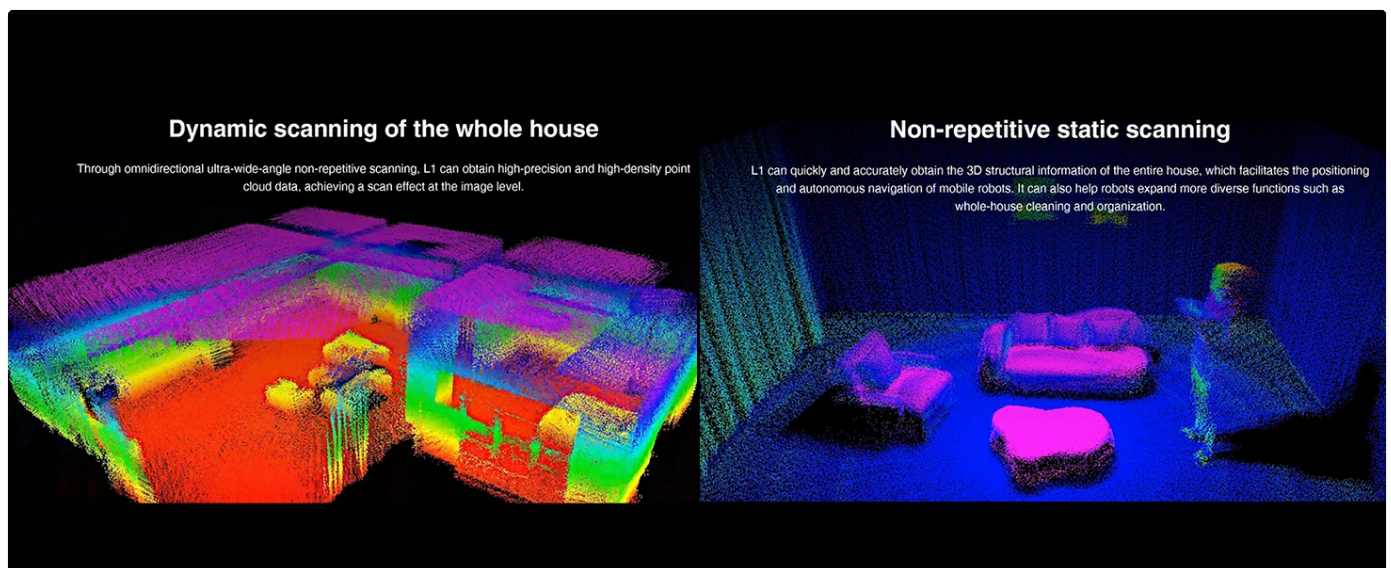


Figure 4.3: Examples of non-repetitive static scanning (top) and close-range dynamic scanning (bottom), illustrating the LiDAR's ability to capture detailed environmental data and detect objects as close as 5cm.

5. MAINTENANCE

To ensure optimal performance and longevity of your youyeetoo L1RM 4D LiDAR Scanner, follow these general maintenance guidelines:

- **Keep Clean:** Regularly clean the exterior of the LiDAR unit with a soft, dry cloth. Avoid using abrasive cleaners or solvents that could damage the housing or optical components.
- **Protect Optics:** Ensure the optical windows are free from dust, dirt, and fingerprints. Use a lens cleaning cloth and appropriate cleaning solution if necessary, being careful not to scratch the surface.
- **Environmental Conditions:** Operate and store the LiDAR within the specified operating environment temperature range (-10°C to 60°C) to prevent damage. Avoid exposure to excessive moisture or extreme temperatures.

- **Cable Management:** Ensure all cables are securely connected and not under strain. Avoid sharp bends or kinks in the cables that could lead to internal damage.
- **Firmware Updates:** Periodically check the official youyeetoo website or support channels for any available firmware updates. Keeping the firmware up-to-date can improve performance and add new features.

6. TROUBLESHOOTING

If you encounter issues with your L1RM 4D LiDAR Scanner, refer to the following troubleshooting tips:

- **No Power:**
 - Check all power connections. Ensure the power adapter is correctly plugged into a working outlet and the Adapter Module.
 - Verify that the power indicator light on the LiDAR unit is on.
- **No Data Output:**
 - Confirm the USB to Type-C cable is securely connected between the Adapter Module and your computer.
 - Ensure the correct drivers are installed on your computer. Refer to the product WIKI for driver information.
 - Check the communication interface settings (e.g., baud rate) in your software to match the LiDAR's specifications.
- **Inaccurate or Inconsistent Readings:**
 - Clean the optical window of the LiDAR unit. Dust or smudges can interfere with laser performance.
 - Ensure the operating environment is within the specified temperature range.
 - Avoid strong light sources directly interfering with the LiDAR's field of view, although the L1RM has good anti-strong light ability, extreme conditions can still affect performance.
- **Device Not Recognized by Software:**
 - Restart your computer and the LiDAR unit.
 - Try a different USB port or cable.
 - Consult the product WIKI for specific software setup instructions and compatibility.

For further assistance, please contact youyeetoo support or refer to the online WIKI.

7. SPECIFICATIONS

The following table details the technical specifications of the youyeetoo L1RM 4D LiDAR Scanner:

Parameter Specifications

Unitree 4D LiDAR	
Model	L1 PM(Precision Measurement)
	L1 RM(Remote Measurement)
Laser Wavelength	905nm
Eye Safety Rating ^[1]	Class 1(IEC60825-1:2014) Eye Safety
Max Range ^[2]	20M(L1 PM @90% reflectivity) , 30M(L1 RM @90% reflectivity)
	10M(L1 PM @10% reflectivity) , 15M(L1 RM @10% reflectivity)
Near Blind Zone ^[3]	0.05m
FOV	360°* 90°
Sampling Frequency	43200 points/s
Effective Frequency	21600 points/s
Scanning Method	Contactless Brushless Mirror Scanning
4D Information	3D Position + 1D Grayscale
Horizontal Scanning Frequency	11Hz
Vertical Scanning Frequency	180Hz
Communication Interface	TTL UART
Communication Baud Rate	2000000 bps
Measurement Accuracy ^[4]	±2.0cm
Measurement Resolution	8 mm
IMU Sampling Rate	1kHz
IMU Reporting Frequency	250Hz
Attitude Perception Dimension	3-axis Accelerometer + 3-axis Gyroscope
LED Ring Resolution	1°
LED Ring Refresh Rate	11Hz
Anti-Strong Light Ability	100Klux
Operating Environment Temperature ^[5] -10℃-60℃	

Figure 7.1: Detailed technical specifications table for Unitree 4D LiDAR, including model types, laser wavelength, eye safety rating, max range, near blind zone, FOV, sampling/effective frequency, scanning method, 4D information, scanning frequencies, communication interface/ baud rate, measurement accuracy/resolution, IMU sampling/reporting frequency, attitude perception dimension, LED ring resolution/refresh rate, anti-strong light ability, and operating environment temperature.

Feature	Specification
Brand	youyeetoo
Model	L1RM (Remote Measurement)

Feature	Specification
Mfr Part Number	AZ2-S-US-YSDP4DGWL1RM
Laser Wavelength	905nm
Eye Safety Rating	Class I (IEC60825-1:2014)
Max Range	30M (L1 RM @90% reflectivity)
Near Blind Zone	0.05m
Field of View (FOV)	360° x 90°
Sampling Frequency	43200 points/s
Effective Frequency	21600 points/s
Scanning Method	Contactless Brushless Mirror Scanning
4D Information	3D Position + 1D Grayscale
Horizontal Scanning Frequency	11Hz
Vertical Scanning Frequency	180Hz
Communication Interface	TTL UART
Communication Baud Rate	2000000 bps
Measurement Accuracy	±2.0cm
Measurement Resolution	8 mm
IMU Sampling Rate	1kHz
IMU Reporting Frequency	250Hz
Attitude Perception Dimension	3-axis Accelerometer + 3-axis Gyroscope
LED Ring Resolution	1°
LED Ring Refresh Rate	11Hz
Anti-Strong Light Ability	100Klux
Operating Environment Temperature	-10°C ~ 60°C

8. WARRANTY INFORMATION

The youyeetoo L1RM 4D LiDAR Scanner comes with a **1-year warranty** from the date of purchase. This warranty covers defects in materials and workmanship under normal use. It does not cover damage caused by misuse, accidents, unauthorized modifications, or operation outside the specified environmental conditions.

Please retain your proof of purchase for warranty claims. For detailed warranty terms and conditions, refer to the official youyeetoo website or contact customer support.

9. SUPPORT

For additional information, technical support, or to access resources such as drivers, software, and detailed documentation, please visit the official youyeetoo WIKI:

[http\(s\)://wiki.youyeetoo.com/Lidar/L1PM](http(s)://wiki.youyeetoo.com/Lidar/L1PM)

You can also contact youyeetoo customer support through their official website for personalized assistance.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question