

## WayPonDEV TF-LC02

# WayPonDEV TF-LC02 Lidar Sensor User Manual

Model: TF-LC02

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## 1. INTRODUCTION

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The WayPonDEV TF-LC02 is a compact and cost-effective Lidar sensor module designed for short-range distance measurement. Utilizing Time-of-Flight (ToF) principles, it provides accurate single-point ranging from 3cm to 200cm. Its small size and light weight make it suitable for integration into various applications, including smart robots, drones for obstacle avoidance, and intelligent household devices. This manual provides essential information for the proper setup, operation, and maintenance of your TF-LC02 Lidar sensor.

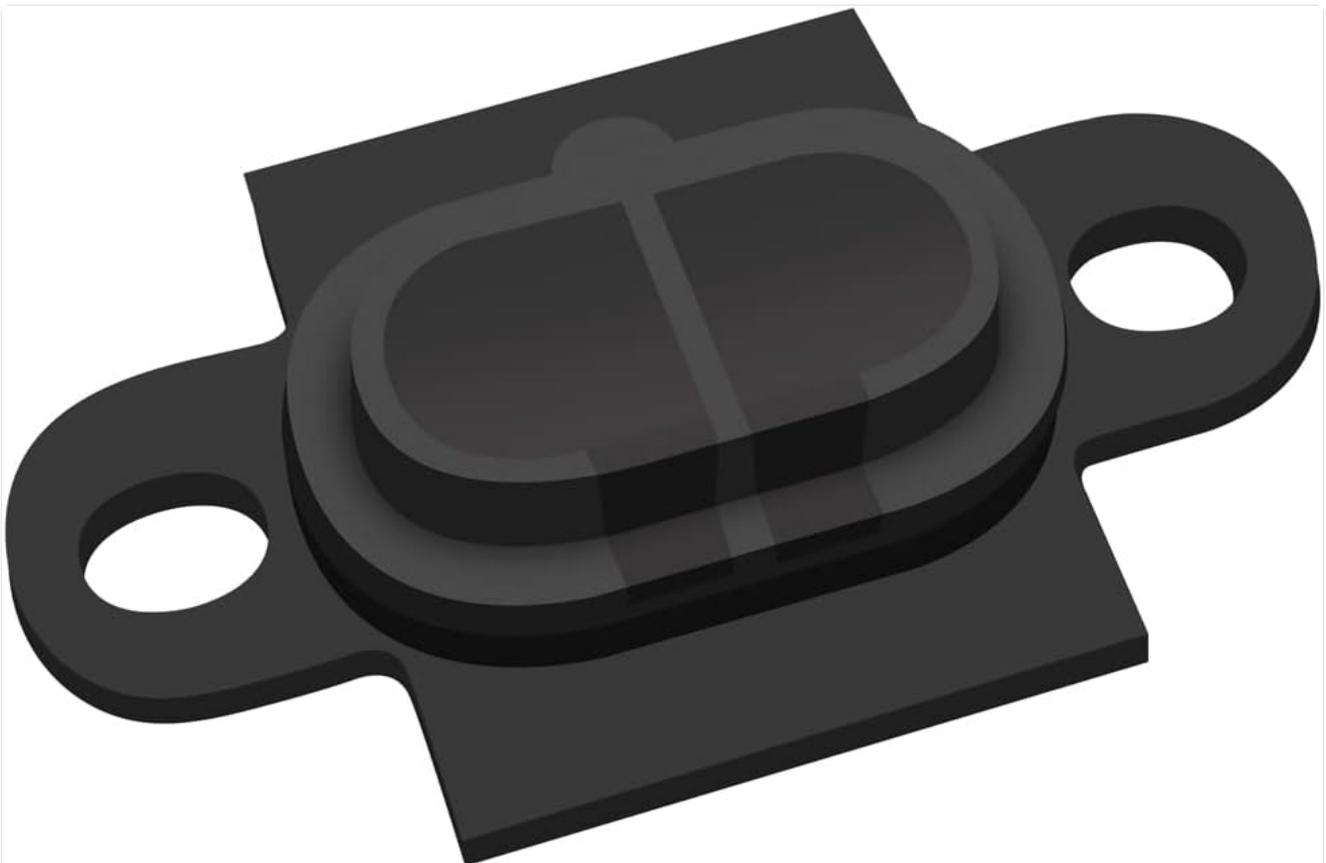


Figure 1: Top-down view of the TF-LC02 Lidar Sensor module.

## 2. KEY FEATURES

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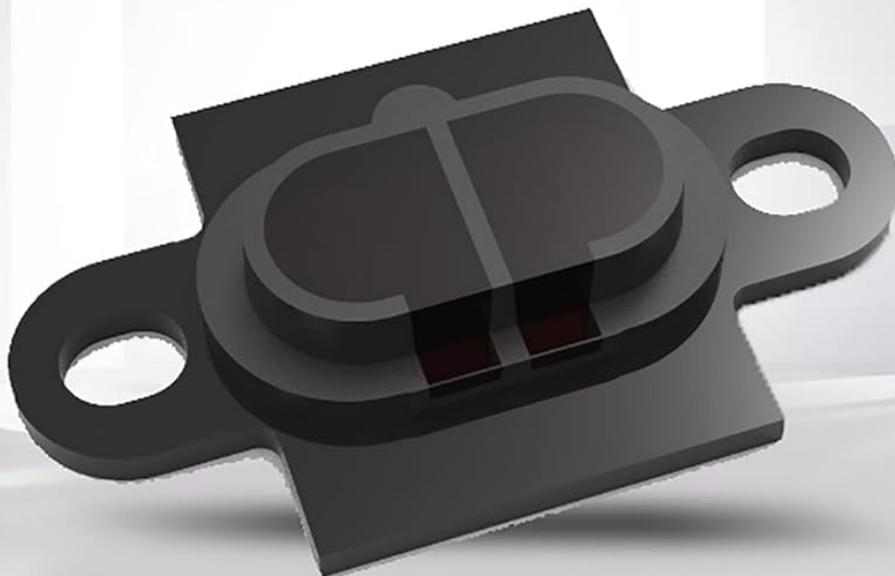
- **Cost-Effective Ranging:** Offers a measurement range of 3cm to 200cm, making it suitable for short-range applications.
- **Compact Design:** Dimensions of 20mm x 11.5mm x 7.6mm ensure easy installation and integration into space-constrained projects.
- **Lightweight:** Weighing approximately 1 gram, it is ideal for applications with strict weight and volume requirements, such as drones.
- **Versatile Communication:** Compatible with UART and IIC interfaces for flexible connectivity with microcontrollers like Pixhawk and Raspberry Pi.
- **Broad Application:** Applicable in smart robots, vacuum cleaning robots, drones, and intelligent household devices for obstacle detection and avoidance.

# Low-cost Ranging LiDAR module

✓ Low cost

✓ Small size

✓ Light weight



*Figure 2: The TF-LC02 Lidar module emphasizing its low cost, small size, and light weight attributes.*

## 3. SETUP AND INSTALLATION

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### 3.1 Physical Installation

The TF-LC02 sensor features mounting holes for secure attachment. Ensure the sensor is mounted in a position that provides a clear line of sight to the area where distance measurement is required. Avoid obstructions in front of

the sensor's optical path.



Figure 3: Underside of the TF-LC02 Lidar Sensor, showing the connector and circuit board components.

### 3.2 Electrical Connection

The TF-LC02 supports both UART and IIC communication interfaces. Refer to the pinout diagram (if available in documentation) for correct wiring. Ensure the supply voltage is within the specified range of 3-3.6V. Incorrect voltage can damage the module.

- **Power Supply:** Connect VCC to 3-3.6V and GND to ground.
- **UART Connection:** Connect TX to the microcontroller's RX pin and RX to the microcontroller's TX pin.
- **IIC Connection:** Connect SDA to the microcontroller's SDA pin and SCL to the microcontroller's SCL pin.

The module is compatible with popular development boards such as Pixhawk and Raspberry Pi. Consult the specific documentation for your chosen platform for detailed wiring instructions and library support.

## 4. OPERATION

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The TF-LC02 Lidar sensor operates by emitting a light pulse and measuring the time it takes for the pulse to return after reflecting off an object. This Time-of-Flight (ToF) principle allows for accurate distance calculation.

# 「 ToF Ranging principle 」

TF-LC02 is a LiDAR module with high precision and ToF principle

Easy to operate, easy to install with UART  
interface communication



Figure 4: Illustration of the ToF ranging principle used by the TF-LC02 Lidar module.

## 4.1 Data Acquisition

Once connected and powered, the sensor will begin to output distance data via the selected communication interface (UART or IIC). You will need to write code on your microcontroller to read and interpret this data. Typically, libraries are available for common platforms to simplify this process.

## 4.2 Performance Considerations

- **Measurement Range:** The sensor is optimized for distances between 3cm and 200cm. Readings outside this range may be less accurate or unreliable.
- **Environmental Factors:** Performance can be affected by ambient light conditions, the reflectivity of the target

object, and the presence of dust or fog.

- **Field of View:** The sensor has a specific field of view. Ensure the target object is within this area for accurate detection.

## 5. TECHNICAL SPECIFICATIONS

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Below are the detailed technical specifications for the WayPonDEV TF-LC02 Lidar Sensor:

Parameter	Value
Measuring Range	3cm - 200cm @90% Reflectance
Detection Speed	33msec
Light Source	VCSEL
Central Wavelength	940nm
Eye Safety	Class 1 (IEC6082512400)
Field Angle	±9° (9° on the left and right of the optical central axis, 18° in total)
Supply Voltage	3 - 3.6V
Average Current	≤15mA
Power Waste	≤50mW
Communication Level	LVTTL (3.3V)
Storage Temperature	-20°C - 85°C
Working Temperature	-20°C - 70°C
Dimensions (L*W*H)	20mm * 11.5mm * 7.6mm (including terminal height)
Item Weight	Approximately 0.32 ounces (less than 1g)

# 「Small size」

20mm\*11.5mm\*7.6mm

Easy installation and easy integration



*Figure 5: The TF-LC02 Lidar Sensor demonstrating its compact size when held.*

## 6. MAINTENANCE

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The TF-LC02 Lidar sensor is designed for durability, but proper care ensures optimal performance and longevity.

- **Keep Clean:** Regularly inspect the optical lens for dust, dirt, or smudges. Use a soft, lint-free cloth and, if necessary, a small amount of isopropyl alcohol to gently clean the lens. Avoid abrasive materials or harsh chemicals.
- **Environmental Protection:** While the sensor has a working temperature range, avoid prolonged exposure to extreme temperatures, high humidity, or direct water contact unless the application specifically allows for it.
- **Physical Protection:** Protect the sensor from physical impact or excessive vibration, which can damage internal components.

- **Power Management:** Always ensure the power supply is stable and within the specified voltage range to prevent electrical damage.

## 7. TROUBLESHOOTING

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If you encounter issues with your TF-LC02 Lidar sensor, consider the following troubleshooting steps:

### 1. No Data Output:

- Verify all electrical connections (VCC, GND, TX/RX or SDA/SCL) are correct and secure.
- Ensure the power supply voltage is within the 3-3.6V range.
- Check your microcontroller code for correct initialization of the UART/IIC interface and data reading protocol.
- Confirm the sensor is receiving power (some modules may have an indicator LED).

### 2. Inaccurate Readings:

- Ensure the sensor's optical path is clear and unobstructed.
- Clean the sensor lens if there is any dust or smudges.
- Check for strong ambient light sources that might interfere with the Lidar signal.
- Verify the target object is within the 3cm-200cm measurement range.
- Consider the reflectivity of the target; very dark or highly reflective surfaces can affect accuracy.

### 3. Intermittent Operation:

- Check for loose connections or faulty wiring.
- Ensure the power supply is stable and not fluctuating.
- Review the operating environment for potential interference (e.g., other IR sources).

If problems persist after following these steps, please contact WayPonDEV support for further assistance.

## 8. WARRANTY AND SUPPORT

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### 8.1 Warranty Information

Specific warranty details for the TF-LC02 Lidar Sensor are typically provided at the point of purchase or on the manufacturer's official website. Please retain your proof of purchase for warranty claims.

### 8.2 Technical Support

For technical assistance, additional documentation, or inquiries not covered in this manual, please contact WayPonDEV directly. You can typically find contact information on their official website or through the retailer where the product was purchased. When contacting support, please provide your product model (TF-LC02) and a detailed description of the issue you are experiencing.

As per the product description: "Click [WayPonDEV](#) and ask questions."

