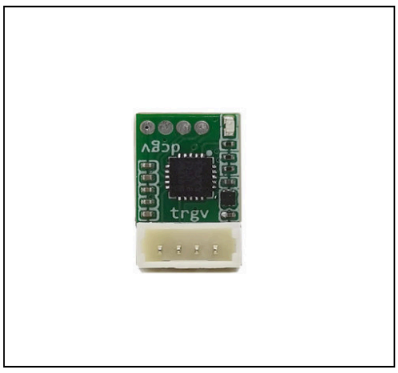
LRF10VB Single-Point LiDAR Based on DTOF Principle

50Hz Measuring Frequency / 9 meters Range /Outdoor Light Immunity 70Klux / High Cost-performance

Features

- Based on DTOF principle (Direct Time of Flight)
- Maximum Measuring Range:9m
- Measuring Blind Zone:5 cm
- Measuring Frequency:50Hz
- Accuracy:±5cm(<5m), 1%(≥5m)
- Resolution:1mm
- Operating Temperature:-20℃~+60℃
- Supply Voltage:4.5~5.5VDC
- Compact Size:12 x 7.5 x 9.1mm
- Weight:1g
- Anti-ambient light:2m@70KLux





Applications

- Camera Focusing
- Squat Detection
- Security Monitoring

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1. Product Overview

The LRF10VB LiDAR is a brand-new laser ranging solution launched by our company for fields such as camera focusing, security monitoring, and squat detection. Based on the DTOF ranging principle, this product features a small size, low cost, excellent performance, and strong anti-interference capability against ambient light, making it an upgraded alternative for related fields. It adopts UART to transmit distance information, ensuring easy operation, flexible installation, and convenient expansion.

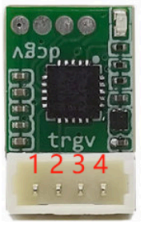
2. Specifications

#	Model	**LRF10VB**
1	Range	0.05m~9m (90%reflectivity), 0.05m~5m (10%reflectivity)
2	Frequency	50Hz
3	Accuracy	±5cm (<5m), 1% (≥5m)
4	Repeatability	±10mm
5	Ambient Light Immunity	2m@70KLux2
6	Central Wavelength	940nm
7	Photobiological Safety	Class1
8	FOV	3°
9	Wavelength for Indication	N/A
10	Photobiological Safety for Indication	N/A
11	Supply Voltage	4.5~5.5VDC
12	Peak Current	5V@4.5mA
13	Average Current	5V@4mA
14	Average Power Consumption	< 0.1W（Supports low power mode）
15	Communication Interface	UART
16	Protection Level	N/A
17	Dimension	12 x 7.5 x 9.1mm
18	Weight	1g
19	Operating Temperature	-20℃~ +60℃
20	Wire Specification	4pin 1.25mm terminal, 10cm tinned stranded wires
21	Customization	available in appearance / structure / output protocol

(Note: 1. This parameter was measured at 25°C in an indoor environment.
2. This parameter was measured with a 90% reflector in an outdoor environment at 25°C.)

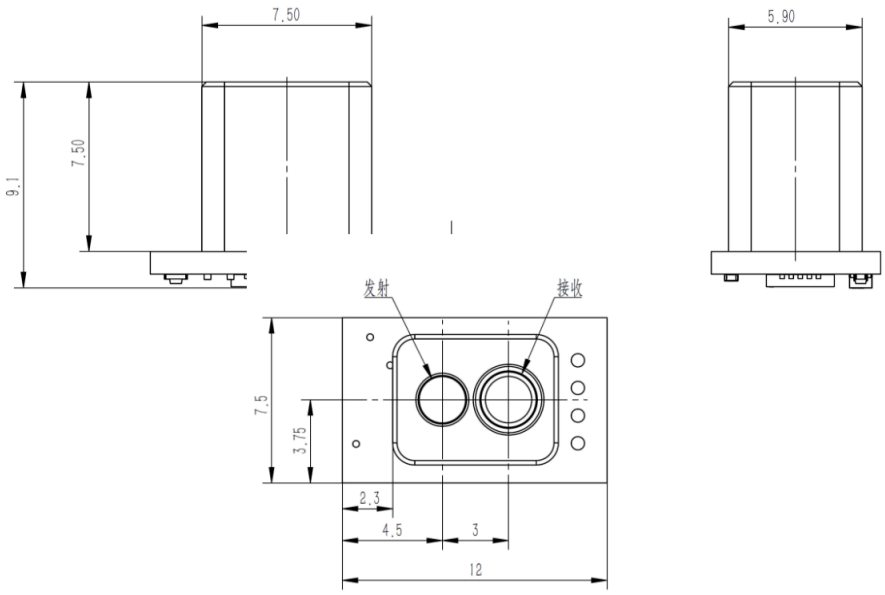
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3. Definitions of Pins



No.	Definition / Wire Color	User Interface
1	TX	RX
2	RX	TX
3	GND	External Power -
4	5V	External Power +

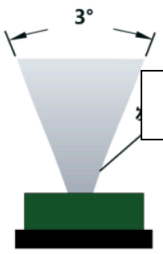
4. Dimensions



5. Measuring Characteristic

Because of the divergence angle, there would be a light spot with changing size on the target surface depending on the distance. In actual use, the surface area of the target object should be larger than the light spot so that the distance can be accurately measured.

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Emission Optical Path Diagram

The diameters of the light spot of VB10A in different distances are shown below：

Distance	1m	3m	5m	10m
Diameter of the light spot	6cm	16cm	30cm	55cm

6. Communication Protocol: UART

6.1 Communication Interface

UART	
Baud Rate	460800 (adjustable)
Data Bit	8
Stop Bit	1
Parity Bit	N/A

6.2 Output Format

This product uses little-endian mode for both input and output in hexadecimal.Output example:

Frame Header	Distance 2 Bytes		Check Byte
5C	02	11	EC

4 Bytes Output

5C： Fixed frame header: 1 byte

02 11： Distance value 2 bytes means the measuring distance is 4354mm,little-endian,

Range:0-65535,When out of range, its output is 65535.

EC： The checksum byte is calculated by summing all bytes from the second byte (02) to the second-last byte (11), then inverting the result.

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6.3 UART Commands

#	Description	Send	Return	Note
1	Modify Baud Rate	5A 0D 02 0D 0D 0D 0D BC(checksum)	5A 8D 02 10 01 00 00 5F(checksum)	60 00 (9600) C0 00 (19200) 80 01 (38400) 80 04 (115200) 00 09 (230400) 00 0A (256000) 00 12 (460800) Other baud rates are not supported
2	**Stop Ranging**	5A 0A 02 00 00 F3	5A 8A 02 00 00 73	Returns 5A 8A 02 00 00 73 Stop ranging
3	**Start Ranging**	5A 0A 02 02 00 F1	5A 8A 02 02 00 71	Returns 5A 8A 02 02 00 71 Start ranging

7. Checksum Function: All checksum bytes above are calculated using this function.

Begin with the second byte and end with the last second byte, find the inverse of the sum.

```
uint8_t Check_Sum(uint8_t *_pbuff, uint16_t _cmdLen)
{
uint8_t cmd_sum=0;
uint16_t i;
for(i=0;i<_cmdLen;i++)
{
 cmd_sum += _pbuff[i];
 }
 cmd_sum = (~cmd_sum);
 return  cmd_sum;
}
```

8.Quick Test

UART Test Bill of Materials:

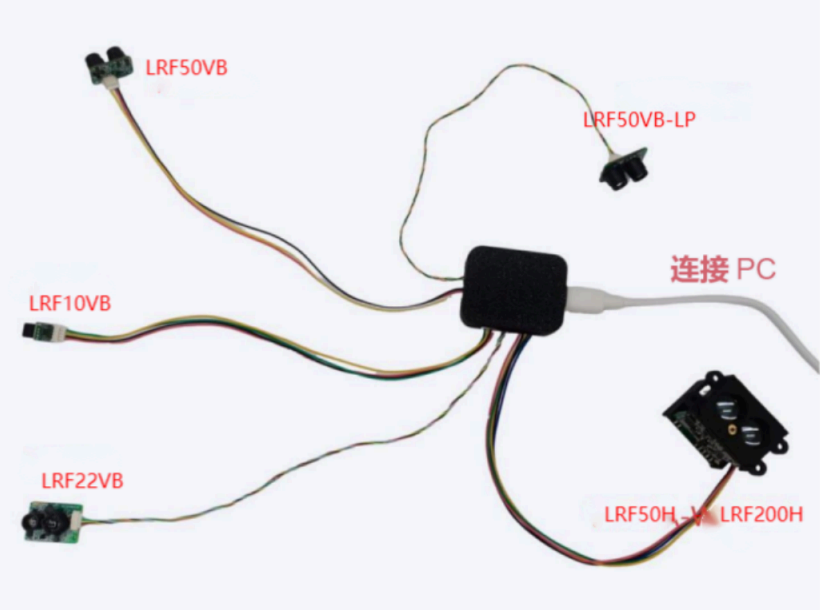
TTL to USB adapter board

5V power supply (storage battery, power bank, computer USB port are all acceptable)

Alternatively, our self-developed universal test kit + type-c data cable (as shown in the figure below)

Upper computer / serial port assistant

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After the LRF10VB successfully connected to your computer， select the baud rate and click “connect”, then the data can be monitored on the upper computer.

Here is a sample figure of upper computer:



Region	Function Description
Region 1	Set the baud rate and other parameters of the serial port for the corresp onding model, click Disconnect, then click Connect.
Region 2	Configure baud rate
Region 3	Real-time distance point-line graph
Region 4	Read real-time frequency values

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Region 5	Read real-time distance values
Region 6	Save data to file
Region 7	Clear all displayed data

7. Attentions

- The photobiological safety of this product is Class 1, so please DO NOT look straight at the lens after successfully connected.

- When operating this product in a dusty place, it is better to add a piece of red transparent glass or acrylic plate over the lens for dust prevention. (940nm wavelength needs a transmittance ≥ 85%.)

- When touching this product, please wear anti-static gloves to prevent the product from failing.

- There is a risk of failure when using this product to measure high-reflective objects (such as 3M tapes) and mirrors.

-This specification is copyrighted by ERDI. Any modifications are subject to change without prior notice.

8. Update History

Version	Date (YY/MM/DD)	Content
V1.0	24/12/30	Updated the format
V2.0	25/03/05	Revised some parameters
V3.0	25/7/1	Expanded Function,New Host Computer Added

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