
On account of DTOF. Lidar of technology LM series

OneKHz Measure the speed; Fifty Meter measurement distance; outdoor resistance to ambient light 100

ULZ 000338 The following are the settings that can be set K Lux; Excellent cost performance

Distinguishing feature

- Based On The Time Of Flight Algorithm (Direct Time Of Flight)
- Maximum measuring range: 50Medium size
- Measure the blind area: 5Cm
- Frequency of ranging:1KHz
- Absolute accuracy: $\pm 10\text{cm}$ (inside 10m), 1% (outside 10m)
- Resolution: 1CentigradeMedium size
- Working temperature:-Two0°C-+6Zero°C
- Power supply voltage:Nine to thirty-sixVDC.
- Small volume:Thirty-eight Mm* TwoZero Mm* ThreeZeroMillimet
- Weight:15 \pm 2Generation
- Resistant to ambient light: 100KLux



Apply

- The positioning of the sky car
- Car connection distance control
- Security
- Patrol robot

One,Product overview

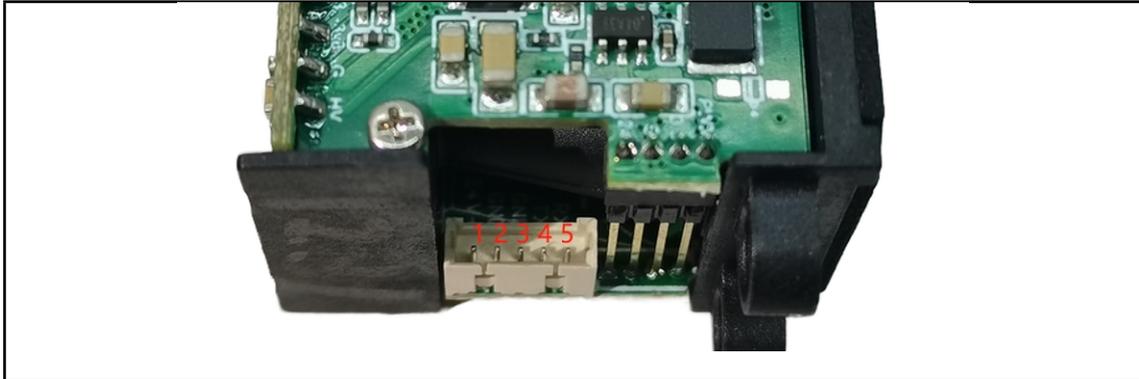
LM series It is a high-frequency and high-precision medium-range laser ranging module. It comes with its own coaxial guidance light from the factory. It can be freely controlled to turn on and off, which is convenient for users to aim and install. It has strong ability to resist ambient light and supports various indoor and outdoor complex scenario applications.

Two,Specification parameters

#	Model	LM series
One	Measuring range	0.05m-50m (Nine0% reflectivity),0.05m-15M(One0% reflectivity) 0.05m-50m (80% reflectance)
Two	Frequency of ranging	1KHz(20~10KHz adjustable)
Three	Absolute accuracy	±10cm (thin 10m), 1% (outside 10m)
Four	Repeat accuracy	±FiveCm
Five	Ability to resist ambient light	One hundred thousandLarge sizeUx
6	Measure the wavelength of the laser	905Nm
Seven	Measure ULZ 000105 Laser grade激光等级	Class One
Eight	Measure the laser field of view angle	About 4mrad
Nine	Indicate the wavelength of the laser	6FiftyNm(Visible red light)
Ten	Indicate the laser level	Class Two
OneOne	InputVoltage	Nine to thirty-sixVDC
OneTwo	Peak current	100 mA
OneThree	Average current	Thirty-four mA ULZ 000138One
OneFour	AveragePower consumption	0.8 watts
OneFive	Communication method	UART
One6	Protection level	N/A
OneSeven	Size (longUnknownWideUnknownHigh)	Thirty-eight X 20 x 30 mm
OneEight	Weight	15±2Generation
OneNine	Working temperature	-Two0°C~+ ULZ 000171 66Zero°C(No freezing, turn off the indicator red light)
20	Cable specifications	1.25mm spacing 5PLoose line, length 50cm

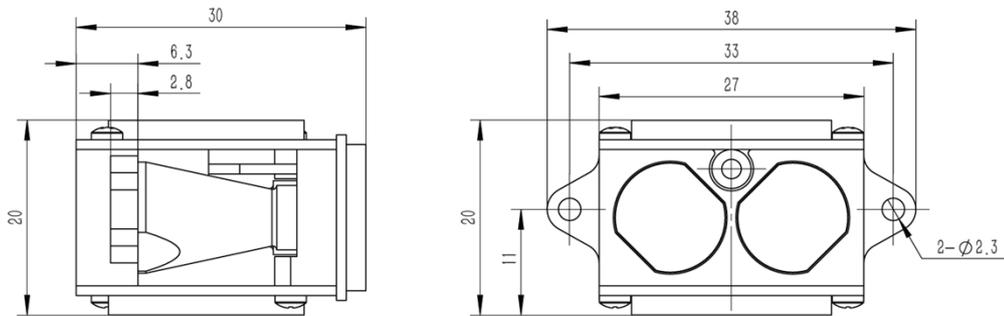
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TwoOne	Scope of customization	Support shape structure customization, support output protocol customization

3. Pin definition



Pin	Definition / Wire color	User interface
One	Nine to thirty-sixV(Red) ULZ 000199 The external	External power supply positive
Two	GND (Black)	GND.
Three	GND (Yellow)	GND.
Four	TX (Green)	RX
Five	RX (Blue)	TX

4. Product size



5. Characteristics of ranging

Due to the existence of a certain divergence angle of the detection light source, in the actual measurement, if you need to obtain an accurate distance value, it is required that the surface area of the measured object is greater than the light spot diameter of the light source at this distance.

At different distancesLM seriesThe diameter of the light spot is shown in the following table:

6. Communication protocol

6.1 Communication interface

UART	
Default rate	460800 (adjustable)
Data bit	Eight
Stop bit	One
Oddity check	Not have

6.2 Output format

The following instructions are format

Frame head	The distance value is two		Check
5C	02	11	EC.

data frame
all 16Decimal data

(1)UART serial dataTacitly approveThe output frequency is 1kHz, a frame of data has 4 bytes, and the format is as follows:

FiveC: Fixed frame header 1 byte

02 11: The distance value of three bytes means that the measured distance is 4354Cm, small end mode, range 0-65535cm, output 65535cm when it cannot be measured

EC.: From02From the beginning to the end of 11, do and check to take the reverse, one byte ULZ 000279
(

(Two) Set and read instructions:

OneProduct serial number reading

Transmit by radio	fiveA	0D	ZeroTwo	0D	0D	CalibrateByte
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Distance	One meter	Two minutes	Five meters	10 meters	15 meters	20 meters
Light spot diameter	0.2 centimeters	0.4 centimeters	One centimete 5 / 8	Two centimeters	Three centimeters	Four centimeters

Return	fiveA	8D	ZeroTwo	Ten	01	CalibrateByte
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10 01 Indicates that the serial number of the product is 272: Small terminal mode, the product serial number displayed on the upper computer is: S00272 (Add S in front of the 5-digit number)
Two UART Serial baud rate setting

Transmit by radio	fiveA	06	ZeroTwo	80	04	CalibrateByte
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Return	fiveA	86	ZeroTwo	80	04	CalibrateByte
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80 04 That is, decimal 1152: Small-end mode, indicating that the set baud rate is 115200 ULZ 000367 00 09 = 1152*100 ULZ 000338 The following are the settings that can be set

以下为可设置的SevenBaud rate, other baud rate settings serial ports do not respond

One6DECImal (small terminal mode)	Decimal system	Baud rate
60 00	Nine6	Nine600
Centigrade0 00	192	One9200
Eight0 01	Three84	Three8400
80 04	One152	One15200 ULZ 000367 00 09
00 09	Two304	Two30400
00 0A ULZ 000374 Two	Two560	Two56000
00 12	Four608	Four60800

ThreeProduct software version number reading ULZ 000385 Transmit by radio

Transmit by radio	fiveA	16	ZeroTwo	16	16	CalibrateByte
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Return	fiveA	96 ULZ 000397	ZeroTwo	03	02	CalibrateByte
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03 02 Indicates that the software version number of the product is V.Two point three: Small terminal mode, 02 Express Two, 03 Express Three, add a dot in the middle (.) Express
Four UART serial data output frequency setting (frequency division factor)

Transmit by radio	fiveA	ZeroB.	ZeroTwo	E7	03	CalibrateByte
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Return	fiveA	EightB.	ZeroTwo	E7	03	CalibrateByte
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E Seven ZeroThree The frequency division factor of the output frequency of the set serial data is 999: Small end mode, the frequency set at this time $f = 1000000 / (999 + 1) = 1000$ Hz.

6.3 Verification function: The above verification bytes all use this verification function.

From the beginning of the second byte to the end of the penultimate byte, find the sum and take the inverse.

```

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;
}

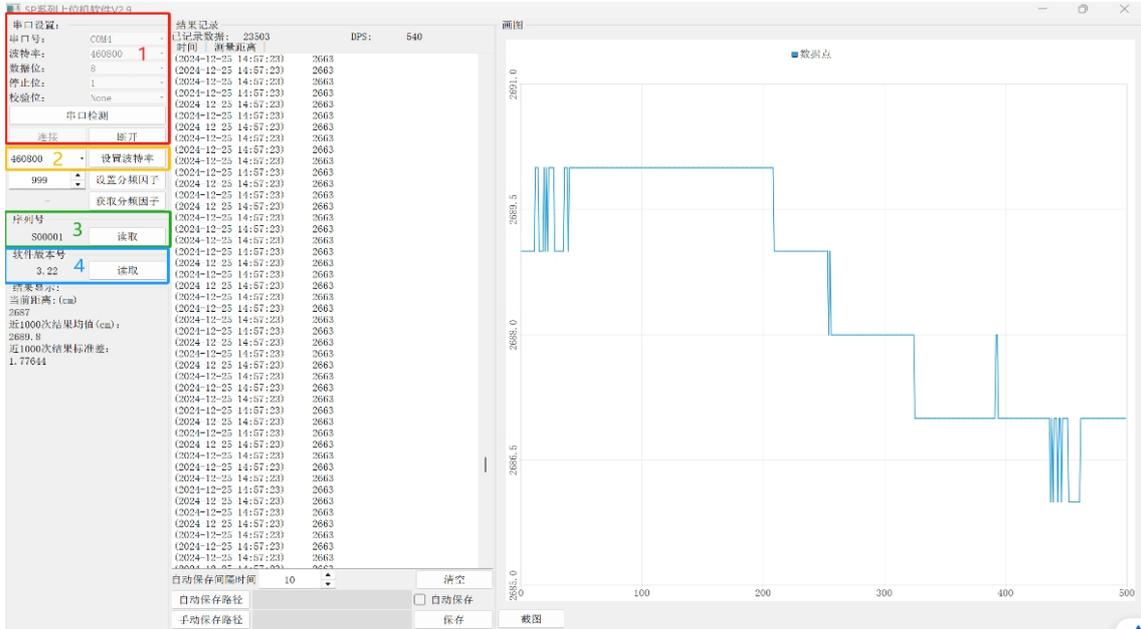
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7. Quick test

Test material list: TTL to USB adapter board, 9-36V DC power supply, upper computer/serial assistant.

LM series After connecting correctly, select the baud rate, click OK, and you can observe the measured data on the upper computer.

The upper computer is displayed as follows:



Area 1: Set the corresponding serial parameters and click to connect

Area 2: Set the baud rate

Area 3: Read the product serial number

Area 4: Read the software version number

8. Precautions for use

- The product has no reverse connection and overvoltage protection. Please supply and wire the power and wiring correctly according to the specifications.

- Products Instructions Laser is Class Two, Strictly prohibit Sight at the camera

- When used in a dusty environment, it is recommended to add red glass or acrylic panels on the product lens (905nm band transmittance is not less than 85%)

- When touching the product, please wear anti-static gloves to avoid product failure.

- The product is at risk of failure when measuring high-altitude objects (such as 3M tape), mirrors, etc.

9. Update the resume

File version	Update time	Updated content ULZ 000495 V1.0
V1.0	December 24th and 30th	According to the current design scheme, sort out the first version
V2.0 ULZ 000499 March 25, 05	25/03/05	Modify some parameter data