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## On account of DTOF. Lidar of technology LM seriesSeries

OneK Hz Measure the speed; Two00 Meter measurement distance; outdoor resistance to ambient light  
100 Klux; Excellent cost performance

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### Distinguishing feature

- Based On The Time Of Flight Algorithm (Direct Time Of Flight)
- Maximum measuring range:Two00Medium size
- Measure the blind area: 5Cm
- MeasureFrequency:One kHz
- Absolute accuracy:  $\pm 10\text{cm}$  (inside 10m), 1% (outside 10m)
- Resolution:OneCentigradeMedium size
- Working temperature:-TwoZero°C-+6Zero°C
- Power supply voltage:9-36VDC.
- Small volume:33 Millimeter X34 Millimeter X 18Millimeter
- Weight:20 $\pm$ 2Generation
- Anti-ambient light: 100K Lux

### Apply

- UAV fixed height (inspection drone)
- Wind power
- Landslide
- Material level detection



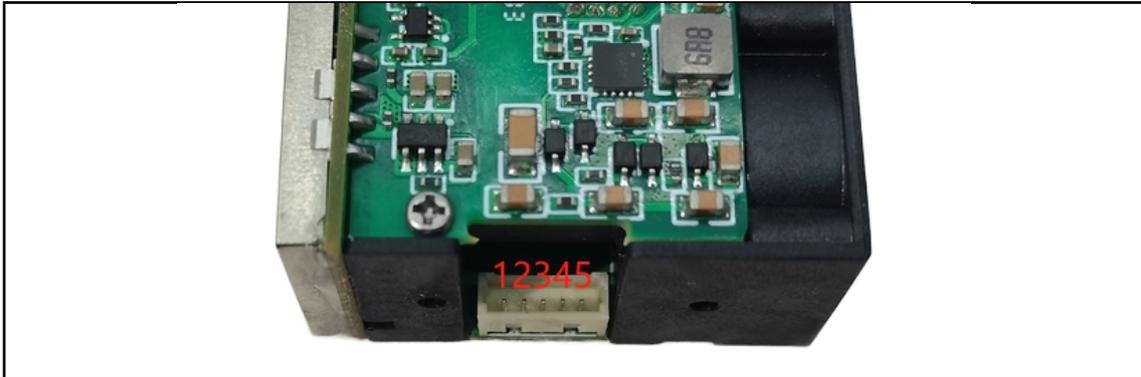
## 1. Product overview

LM series It is a high-precision medium and long-distance ranging lidar, which supports both indoor and outdoor applications and can resist the influence of strong electromagnetic interference. Land transport vehicles and truck cranes can be positioned or anti-collision monitoring can be carried out.

## 2. Specification parameters

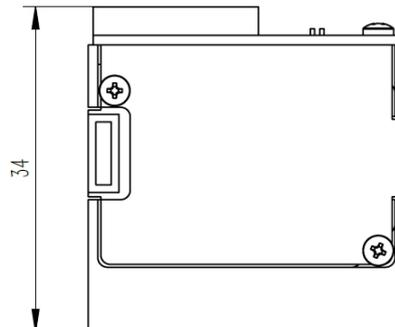
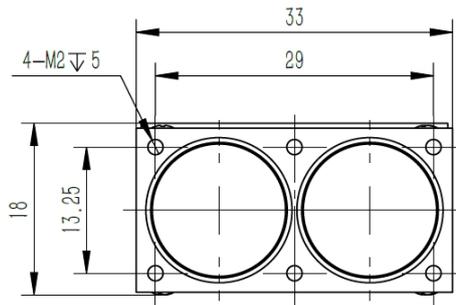
#	Model	LM series
One	Measuring range	0.05m-Two00Medium size( NineZero percentReflectivity),0.05m-SevenZeroMedium size( OneZero percentReflectivity)
Two	Frequency of ranging	1KHz(20~10KHz adjustable)
Three	Absolute accuracy	±10cMedium size(Within 10m),ULZ 000105 1% (outside 10m)1% (10m以外)
Four	Repeat accuracy	±5cm (within 10m), ±10cm@Two00 meters
Five	Ability to resist ambient light	100 Klux
6	Measure the wavelength of the laser	905nm
Seven	Measure the laser level	Class one
Eight	Measure the laser field of view angle	About 4mrad
Nine	Indicate the wavelength of the laser	N/A
Ten	Indicate the laser level	N/A
OneOne	Input voltage	Nine to thirty-sixVDC
OneTwo	Peak current	100 mA ULZ 000138 One
OneThree	Average current	30 millima
OneFour	Average power consumption	0.7W
OneFive	Communication method	UART,IIC.
One6	Protection level	N/A
OneSeven	Size (longUnknownWideUnknownHigh)	33 Unknown 34 Unknown 18 Millimeter
OneEight	Weight	20±2Generation
OneNine	Working temperature	-TwoZero°C ~ Plus6Zero°C
20	Cable specifications	1.25mm, 5P 50 centimeters Loose line
TwoOne	Customization range	Support shape structure customization, support output protocol customization

3. Pin definition



Pin	Definition / Wire color	User interface
One	RX(Blue)	TX
Two	TX(Green)	RX
Three	Serial port GND(Yellow)	GND.
Four	Power supply GND(Black)	External power supply is negative
Five	9-36V(Red)	The external power supply is positive

4. Product size



**5. Communication protocol**

**5.1 Communication interface**

UART	
Baud rate ULZ 000342 60 00	460800 (adjustable)
Data bit	Eight
Stop bit	One
Oddity check	Not have

**5.2 Data communication protocol**

The input and output of this product both adopt 16 Decimal small terminal mode 4 bytes output

**(One) UART serial data** Tacitly approve The output frequency is 1kHz, a frame of data has 4 bytes, and the format is as follows:

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

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

EC.: From 02 From the beginning to the end of 11, do and check to take the reverse, one byte

**(Two) Set and read instructions:**

One ULZ 000279 Product serial number reading Product serial number reading

Transmit by radio	fiveA	0D	0D	0D	CalibrateByte
Return	fiveA	8D	Ten	01	CalibrateByte

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
Return	fiveA	86	ZeroTwo	80	04	CalibrateByte

80 04 That is, decimal 1152: Small-end mode, indicating that the set baud rate is 115200= 1152\*100

**The following are the settings that can be set Seven Baud rate, other baud rate settings serial ports do not respond**

One 6 DECI mal (small terminal mode)	Decimal system	Baud rate ULZ 000342 60 00
60 00	Nine 6	Nine 600
Centigrade 0 00	192	One 9200
Eight 0 01	Three 84	Three 8400
80 04	One 152	One 15200
00 09	Two 304	Two 30400
00 0A	Two 560	Two 56000 ULZ 000374 00 12

00 12	Four608	Four60800
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ThreeProduct software version number reading

Transmit by radio	fiveA	16	ZeroTwo	16	16	CalibrateByte
Return	fiveA	96	ZeroTwo	03	02	CalibrateByte

03 02Indicates that the software version number of the product is V.Two point three: Small terminal mode,02ExpressTwo,03ExpressThree, add a dot in the middle (.) Express FourUART serial data output frequency setting (frequency division factor)

Transmit by radio	fiveA	ZeroB.	ZeroTwo	E7	03	CalibrateByte
Return	fiveA	EightB.	ZeroTwo	E7	03	CalibrateByte

E Seven ZeroThreeThe frequency division factor of the output frequency of the set serial data is999: Small end mode, the frequency set at this time  $f=1000000/(999PlusOne)EqualTen00$  Hz.

**5.Three 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;
}

```

**6. Quick test**

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

LM series seriesAfter connecting correctly, select the baud rate and click OK to observe the required data on the host computer.

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

Plug the TTL to USB adapter board into the serial port of the computer, click the serial port detection, and click connect after the serial slogan is displayed (the default state shown in the figure above). The laser ranging frequency defaults 1000 /50 Hz, serial baud rate default 460800 adjustable, data bit 8, 1 stop bit, no parity check

LM seriesAfter the series ranging module is powered on, it actively outputs data (4 bytes per frame of data), and outputs 0xFFFF(65535) when it cannot be measured.

The upper computer is displayed as follows:

