On account of DTOF. Lidar of technology LS series

OneKilohertz /50 Hz Measure the speed; 300Meter Measure the distance; outdoor anti-ambit light 100 Klux; Excellent cost performance

Distinguishing feature

- Based On The Time Of Flight Algorithm (Direct Time Of Flight)
- Maximum measuring range:300Medium size
- Measure the blind area: 5 Cm
- MeasureFrequency:OneKHz orFiftyHz
- Absolute accuracy:±10cm (thin 10m), 1% (outside 10m)
- Resolution:OneCentigradeMedium size
- Working temperature:-TwoZero℃~Plus6Zero℃
- Power supply voltage:Nine ULZ 000342 600~Thirty-sixV DC.
- Small volume:33 X 34 x 18mm
- Weight:20±2Generation
- Resistant to ambient light: 100KLux

Apply

- Traffic safety warning
- Camera focus
- Tower crane safety distance detection
- Detection of blade intrusion

1. Product overview

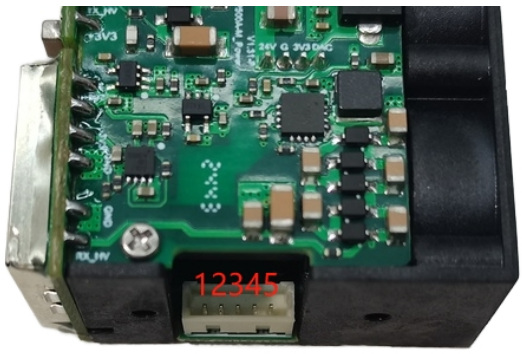
LS seriesIt is a high-precision medium and long-range range radar.,With small size and long measuring distance, it is widely used in drones, robots, special vehicles and other fields..The module form is convenient for secondary development and integration.

2. Specification parameters

#	Model	LS series
One	Measuring range	0.05m-300Medium size(Nine ULZ 000342 600Zero percentReflectivity),0.05m-One00Medium size(OneZero percentReflectivity)
Two	Frequency of ranging	One kHzOr 50Hz, the intensity of the visual reflection signal is automatically switched
Three	Absolute accuracy	±10c ULZ 000105 Medium sizeMedium size(Within 10m),1% (outside 10m)
Four ULZ 000374 60800	Repeat accuracy	±5cm (within 10m), ±10cm@300m
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 ULZ 000342 600	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
OneThree	Average current	Fifty-five mA
OneFour ULZ 000374 60800	Average power consumption	1.2W
OneFive	Communication method	UART,IIC.
One6	Protection level	N/A
OneSeven	Size (longUnknownWideUnknown High)	33 Unknown 34 Unknown 18Millimeter
OneEight	Weight	20±2Generation
OneNine ULZ 000342 600	Working temperature	-TwoZero℃ ~ Plus6Zero℃
20	Cable specifications	1.25mm, 5P 50 centimeters Loose line

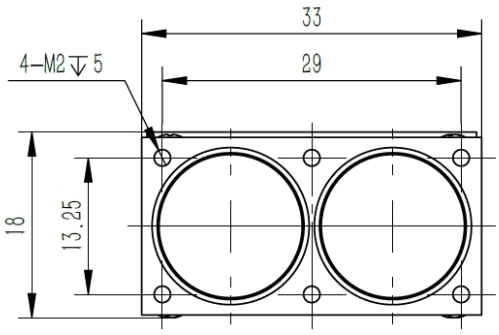
TwoOne	Scope of customization	Support shape structure customization, support output protocol customization

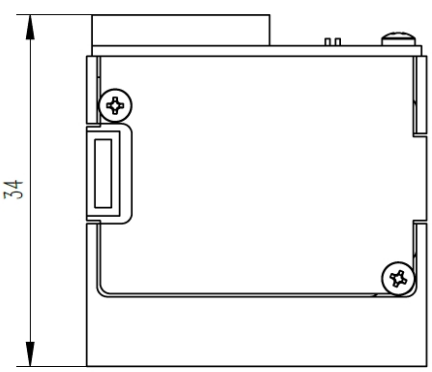
3. Pin definition



Pin	Definition / Wire color	User interface
One	RX(Blue)	TX
Two	TX(Green)	RX
Three	Serial port GND(Yellow)	GND.
Four ULZ 000374 60800	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 000338 60 00	460800 (adjustable)
Data bit	Eight
Stop bit	One
Oddity check	Not have

5.2 numberAccording to the communication protocol

The input and output of this product adopt hexadecimal and 4-byte output.

(One) The output small terminal mode serial data is 1khz 50hz at long frequency of UART 4 bytes per frame at close range and is as follows: distance. There are of data. The format

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

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

(Two) Set and read instructions:

OneProduct serial number reading

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

10 01Indicates that the serial number of the product is272: Small terminal mode, the product serial number displayed on the upper computer is: S00272(Add S in front of the 5-digit number)

TwoUARTSerial baud rate setting

Transmit by radio	fiveA	06	ZeroTwo	80	04	CalibrateByte
Return	fiveA	86	ZeroTwo	80	04	CalibrateByte

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

The following are the settings that can be setSevenBaud rate, other baud rate settings serial ports do not respond

One6DECImal (small terminal mode)	Decimal system	Baud rate ULZ 000338 60 00
60 00	Nine ULZ 000342 6006	Nine ULZ 000342 600600
Centigrade0 00	192	One9200
Eight0 01	Three84	Three8400
80 04	One152	One15200
00 09	Two304	Two30400
00 0A	Two560	Two56000
00 12	Four ULZ 000374 60800608	Four ULZ 000374 6080060800

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. ULZ 000397 Two point three2.3: Small terminal mode,02ExpressTwo,03ExpressThree, add a dot in the middle (.) Express

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.

LS 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

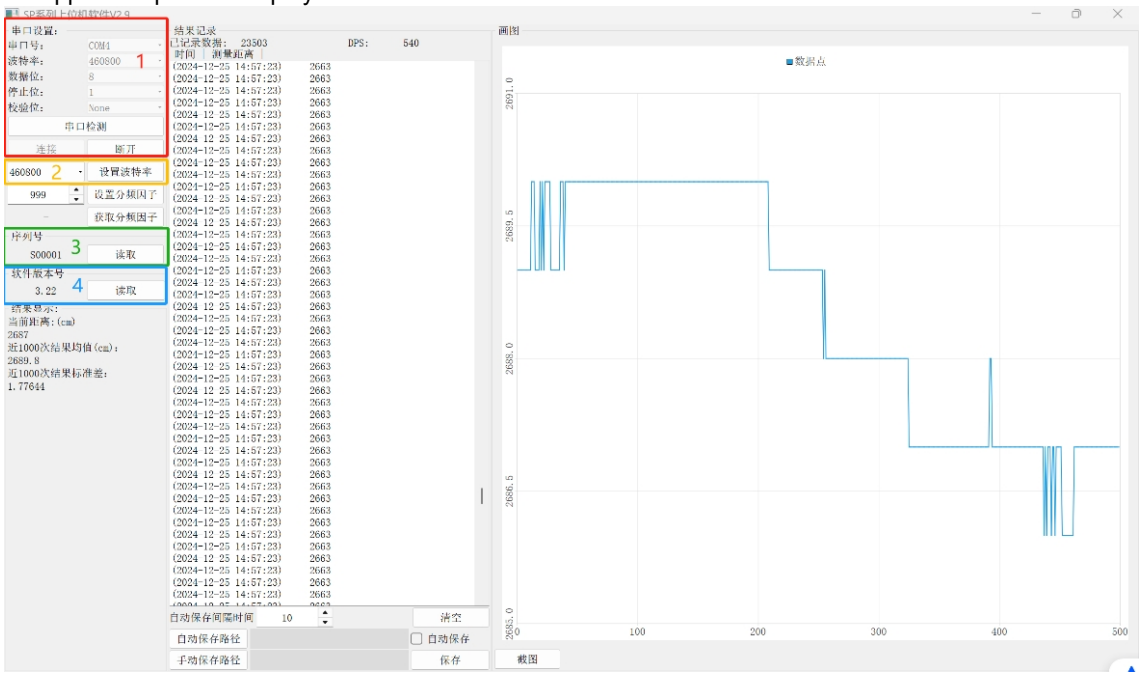
Area 3: Read the product serial number

Area 4: Read the software version number

Transfer TTL to UPlug the SB transfer board into the serial port of the computer, click the serial port detection, and click to connect after the serial slogan is displayed (The figure above shows the default state) The laser ranging frequency is 1000Hz by default, the serial baud rate is 460800 by default, the data bit is 8, and the stop bitOne, no parity check

LS 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:



7. Update the resume

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