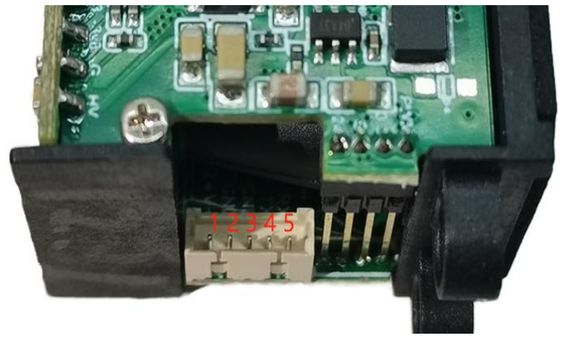
Siman

SDFM50 Laser rangefindingModule

SDFM50 is a...Based on the Time-of-Flight AlgorithmHigh-frequency, high-precision mid-range laser ranging module, equipped with a coaxial alignment light at the factory—this light can be freely enabled or disabled, making it easy for users to align and install the device. It boasts strong resistance to ambient light and is suitable for a variety of complex indoor and outdoor applications.It can be applied to fields such as overhead crane positioning, carriage coupling distance control, security, and inspection robots.For more product information, please visit:www.siman.asia

Warning	Please follow the equipment usage guidelines! This product is not a safety sensor and cannot be used for personnel protection.
	➢ The product features reverse-polarity and overvoltage protection. Please supply power and connect the wires correctly according to the specification sheet. ➢ The product’s indicating laser is Class 2; direct viewing of the laser beam is strictly prohibited. ➢ This product does not have an explosion-proof design and must not be used in flammable or explosive environments. ➢ Do not disassemble this product. ➢ Be sure to turn off the power before performing any operations. Do not perform wiring operations while the power is still on! 1. Avoid use in dusty/vapor environments or environments with corrosive gases; 2. Avoid inPlaces where corrosive gases are generatedUse; ➢ This product cannot be used in water. ➢ The product may fail when measuring highly reflective objects (such as 3M tape) or mirror surfaces. ➢ When using in dusty environments, it is recommended to add a red-transmitting glass or acrylic panel outside the product’s lens (with a transmittance of no less than 85% in the 905nm wavelength band). ➢ When using the product, it is necessary to add isolation between the transmitter and receiver (e.g., use black foam to isolate the transmitter and receiver). ➢ When handling the product, please wear antistatic gloves to prevent the product from malfunctioning.

Pin definitions



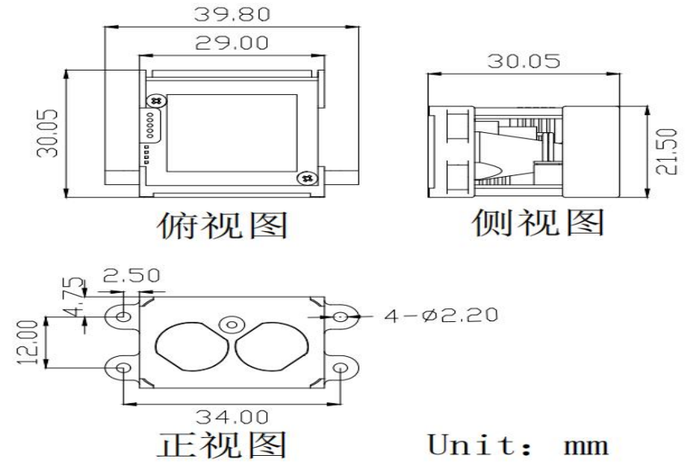
Pin	Line sequence definition	User interface
1	9~36V	External power positive
2	GND	GND
3	GND	GND
4	TX	RX
5	RX	TX

SpecificationsParameter

Model	**SDFM50**
Measurement range	0.05m-50m (90% reflectivity)[1] 0.05m-15m (10% reflectance)
AbsolutelyAccuracy	±5cm（<10m), 1% (≥10m)
Repeatability	±5 cm
Measure frequency	1kHz (adjustable from 20 to 10 kHz)
Measure laserWavelength	905nm,Class 1
Laser wavelength indication	650nm (visible red light)
Laser class indication	Class 2
Anti-environmental light capability	45m@100KLux [2]
Measure the laser field of view angle	Approximately 4 mrad
Communication method	UART
Protection level	N/A
Operating voltage	9~36VDC
Operating current	24V@100mA (peak current) 24V@34mA (average current)
Average power consumption	0.8W

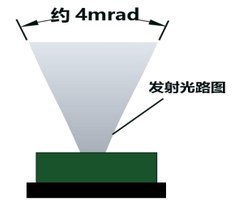
Weight	15±2g
Size	38 x 20 x 30 mm
Operating temperature	-20℃~+60℃（No freeze, red indicator light off)
Electrical connection	5Pin1.25mmTerminal, specification M1250V-05P, with50cmTin-plated stranded wire
Customization scope	Supports customized external structural designs and customized output protocols.
Comment	1. This parameter was measured under a 90% reflectance panel with an ambient outdoor temperature of 25℃. 2. This parameter was measured in an indoor environment at 25℃.

Dimensional drawing



Ranging characteristics

Since the probing light source has a certain divergence angle, in actual measurements, if an accurate distance value is required, the surface area of the object being measured must be larger than the diameter of the light spot at that distance.The optical path diagram for range measurement is as follows:



At different distancesSDFM50The diameters of the light spots are shown in the following table:

distance	1m	5m	10m	20m	30m	50m
Spot diameter	0.4cm	2cm	4cm	8cm	12cm	20cm

Communicationinterface:UART		
Baud rate	460800bps (default), can be modified	
Data bit 8	Stop bit 1	Check digit: None
Output format		
This product uses the little-endian hexadecimal format for both input and output.		

Frame header	Distance value, two bytes		Check digit
5C	02	11	EC
5C: Fixed frame header, 1 byte			
02 11:The distance value, represented by three bytes, indicates a measured distance of 4354 cm. Little-endian mode, range 0 – 65535 cm; when no measurement is available, output 65535 cm.			
EC:From 02 to 11 inclusive, perform the AND operation and then take the bitwise NOT; one byte.			

Set and read instructions

Function	direction	Data	Definition
readProduct serial number	Send	5A 0D 02 0D 0D D6	10 01Indicates the product serial number is272: Little-endian mode; the product serial number displayed on the host computer is: S00272（Add "S" before the 5-digit number to display it.
	Return	5A 8D 02 10 01 5F	
ModifyBaud rate	Send	5A 06 02 80 04 73	80 04That is, decimal 1152: in little-endian format, indicating that the configured baud rate is 115,200 = 1152 × 100.
	Return	5A 86 02 80 04 F3	

7 configurable baud rates	16Endianness (little-endian mode)	Decimal	Baud rate
	60 00	96	9600
	C0 00	192	19200
	80 01	384	38400
	80 04	1152	115200
	00 09	2340	230400
	00 0A	2560	256000
	00 12	4608	460800

Reading the product software version number	Send	5A 16 02 16 16 BB	03 02Indicates that the product software version number is V.2.3: Little-endian mode,02indicates2,03indicates3, add a period (.) in the middle to indicate
	Return	5A 96 02 03 02 62	
Turn on the indicator laser	Send	5A 0C 02 01 00 F0	Return5A 8C 02 01 00 70, turn on the laser
	Return	5A 8C 02 01 00 70	
Turn off the indicator laser	Send	5A 0C 02 00 00 F1	Return5A 8C 02 00 00 71Turn off the laser. It will operate after power-on.20min, laser automatically shuts off.
	Return	5A 8C 02 00 00 71	
Modification frequency	Send	5A 0B 02 E7 03 08	E7 03The frequency division factor representing the serial port data output frequency that has been set is:999: Little-endian mode; the frequency f set at this time =1000000/（999+1）=1000Hz.The serial port frequency supports only 20 – 20 kHz.
	Return	5A 8B 02 E7 03 88	
Reading frequency	Send	5A 1B 02 1B1B AC	E7 03Indicates serial port dataFrequency division factor: Little-endian mode, indicatingReadof theThe serial port frequency divider factor is 999 (E7). 03）The corresponding serial port data output frequency f = 1,000,000 / (999 + 1) = 1,000 Hz; the serial port frequency supports only a range of 20 – 20 kHz.
	Return	5A 9B 02 E7 03 78	
Stop ranging	Send	5A 0A 02 00 00 F3	Return 5A 8A 02 00 00 73 Stop ranging
	Return	5A 8A 02 00 00 73	
Start ranging	Send	5A 0A 02 02 00 F1	Return 5A 8A 02 02 00 71 Start ranging
	Return	5A 8A 02 02 00 71	

Validation Function

All of the above checksum bytes are generated using this checksum function.

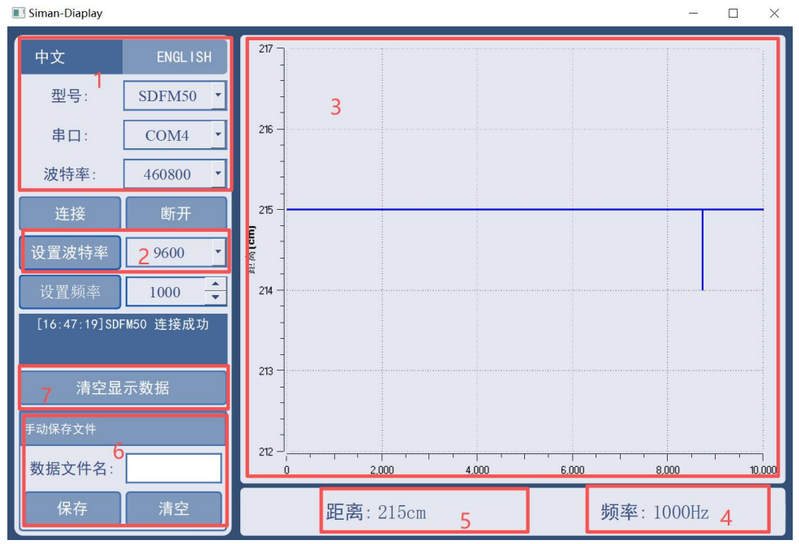
Sum the bytes starting from the second byte up to, but not including, the second-to-last byte, then take the bitwise complement.

```
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;
}
```

Fast Test:

Test Bill of Materials: TTL-to-USB adapter board, 9 – 36V DC power supply, host computer/serial port assistant.

After correctly connecting the SDFM50, select the baud rate and click OK to start observing the measured data on the host computer. The host computer displays the following:



Area 1: Set the correspondingModelSerial portBaud rate, etc.Parameter

Region 2: Set the baud rate, frequency

Area 3:Real-time distance point-line chart

Region 4: ReadReal-time frequency

Region5ReadReal-time distance value

Region6: Save data to file

Region7: Clear all displayed data

Contact Us

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