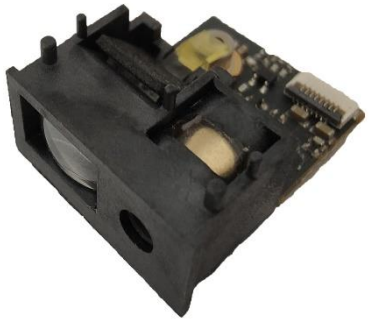
20m High Precision Compact Laser Distance Sensor Module



Key Properties

- Measurement Range: 0.045~20m
- Measurement Frequency: 1~3 Hz
- Measurement Accuracy: ≤10m is ±2mm
  >10m is ±2mm+0.05x(D-10), D is distance(mm)
- Wavelength: 650 nm
- Laser Safety: Class 2
- Communication Interface: TTL (UART)

Function

- Single Measurement
- Continuous Measurement (100 times)
- Laser ON/OFF

Introduction

LRF20M3PS is a phase shift based laser rangefinder module with better accuracy than the pulse method. LRF20M3PS uses standard TTL serial communication to make it easy for users to develop their own measurement applications, we also provide USB cable for evaluation.

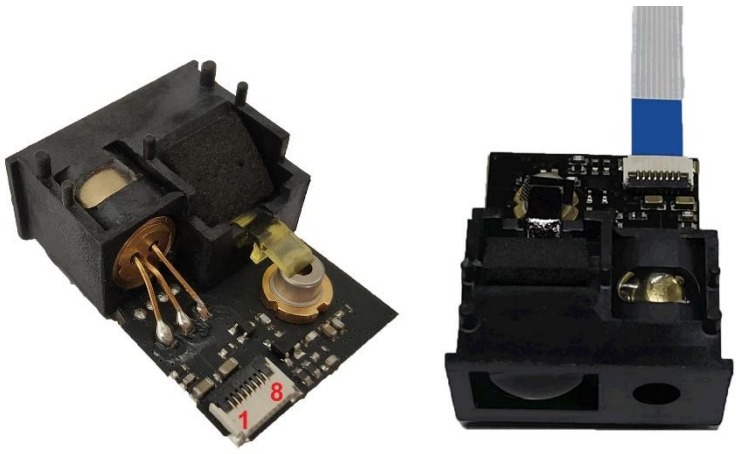
LRF20M3PS is an ideal laser rangefinder module for measuring distance applications. The compact, eye safe and highly integrated laser rangefinder module is utilized in various applications from versatile systems to handheld devices. The module is delivered without enclosure enabling OEM-users to embed the module into their own system or device.

1. Specifications

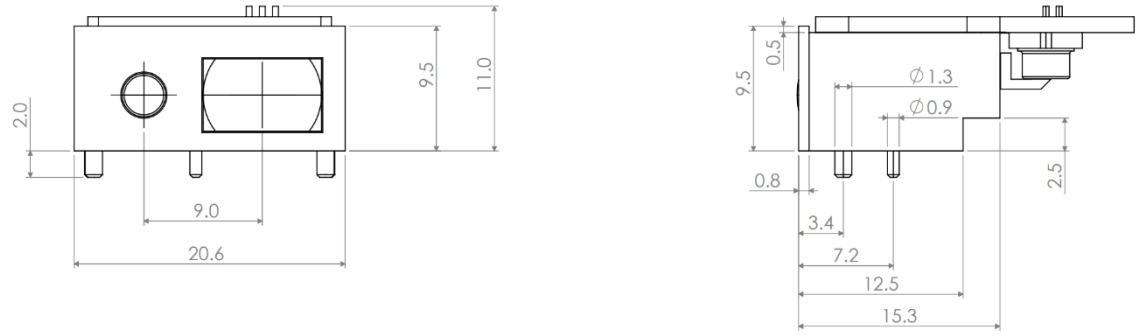
Technical specifications	
Model Name	LRF20M3PS
Measurement Range	0.045m ~ 20m
Measurement Frequency	1~3Hz
Measurement Accuracy	≤10m: ±2mm >10m: ±2mm+0.05x(D-10), D is distance(mm)
Wavelength	650nm
Laser Safety	<0.95mW, Class 2 (IEC 60825-1:2014)
Measurement Method	Phase-shift
Electrical	
Input Voltage	DC 3.3~3.6V
Operating Current	150mA
Communication	
Communication Interface	3.3V TTL (UART)
Interface Connector	Molex 503480-0800 (8 Position 0.5 mm FFC & FPC Connectors)
Data Resolution	1mm
Baud Rate	115200 bps
Mechanical	
Dimensions	21 x 11 x 26mm
Weight	~6g
Environmental	
Operating Temperature	0°C~40°C
Storage Temperature	-20°C~70°C

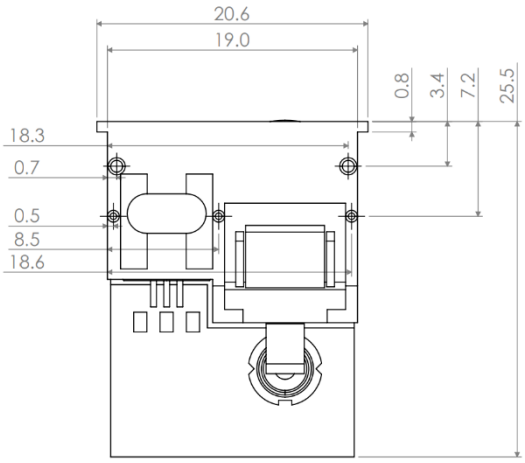
2. Pin Assignment

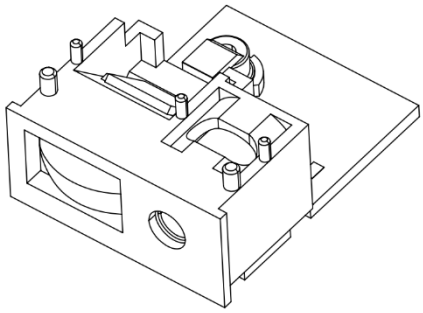
8 Position 0.5 mm FFC & FPC Connectors	
1	VCC
2	VCC
3	GND
4	GND
5	VCC
6	VCC
7	TXD
8	RXD

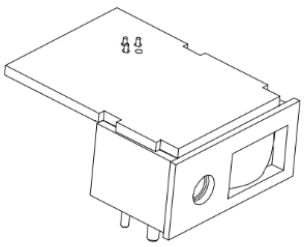


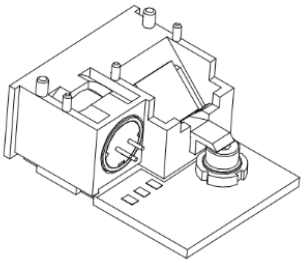
3. Dimensions

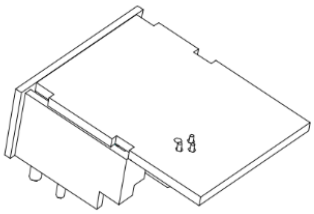


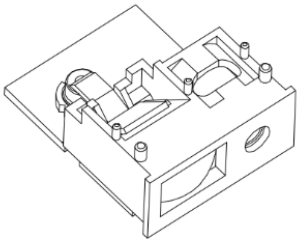












4. Communication

4.1 Communication frame format:

Head (1 byte ASCII)	Length (2 byte BCD)	Command (1 byte BCD)	Data (N byte BCD)	Checksum (1 byte BCD)	End (1 byte ASCII)
'$'					'&'

* Length, Command, Data and Checksum are BCD type, and 1 byte of BCD is converted to 2 byte of ASCII code during transmission.

*Head: Fixed as '$' in ASCII type.

*Length: Total number of byte from Command to Checksum.

*Command: Function identification, please refer to Chapter 5.1 Command List.

*Checksum: Length + Command + Data and divided by 100 to get the remainder.

Ex: Length is 6, Command is 10, Data is 12 34 56 78.

Checksum is 96 and the data packet sent is $0006101234567896&.

*End: Fixed as '&' in ASCII type.

4.2 UART configuration parameters:

8N1 with default 115200 baud rate, byte data are expressed in ASCII.

Data bits: 8

Parity bits: None

Stop bits: 1

4.3 Device response

*Device responds immediately when receiving the command, if it receives the measurement command, it will first transmit a response code to master device and then respond to the measurement result after calculation is completed.

*Command invalid response: '$' + Length + 00 + Checksum + '&

5. Command

5.1 Command List

Master Command	
Command code	**Description**
21	Single measurement
24	Continuous measurement (100 times)
26	Laser ON / OFF
33	Communication Test

5.2 Command Detail

5.2.1 Single measurement

Master sends					
Head1	Data Length	Command	Data	Checksum	End1
'$'	2	21	-	23	'&'
Slave responses					
Head1	Data Length	Command	Data	Checksum	End1
'$'	6	21	*DATA	*CHEC	'&'

*DATA: 4 byte BCD, equivalent to 8 byte ASCII

Example: Send $00022123&, Receive$00023335& $0006210000043061&.

$00023335& is the response code.

*Data is 00000430, means 430mm.

*CHEC is 6+21+4+30= 61.

5.2.2 Continuous measurement (100 times)

Master sends					
Head1	Data Length	Command	Data	Checksum	End1
'$'	2	24	-	26	'&'
Slave responses					
Head1	Data Length	Command	Data	Checksum	End1
'$'	16	24	*DATA	*CHEC	'&'

*DATA: 2 byte BCD(4 byte ASCII) for measured times.

4 byte BCD(8 byte ASCII) for current measured distance.

4 byte BCD(8 byte ASCII) for maximum measured value.

4 byte BCD(8 byte ASCII) for minimum measured value.

*CHEC is 16+24+6+4+76+17+20+4+76=243.

Example: Send $00022426&, receive$00023335& **once**, and subsequently receive

$0016240006000004760000172000000047643& multiple times.

$00023335& is the response code.

*0006 means is measured 6 times.

*00000476 means current distance is 476mm

*00001720 means current maximum distance is 1720mm

*00000476 means current minimum distance is 476mm

5.2.3 Laser ON / OFF

Master sends					
Head1	Data Length	Command	Data	Checksum	End1
'$'	3	26	*DATA	* CHEC	'&'
Slave responses					
Head1	Data Length	Command	Data	Checksum	End1
'$'	3	26	0	29	'&'

*DATA: 1 for Laser ON, 0 for Laser OFF

Example: Send $0003260130& for Laser ON, Receive $00023335&$0003260029&

Send $0003260029& for Laser OFF, Receive $00023335&$0003260029&

5.2.4 Communication Test

*This command is used to test the communication function,

Send $00023335& should receive $00023335&.

Laser Safety

The light emitted from these devices has been set in accordance with IEC60825. However, staring into the beam, whether directly or indirectly, must be avoided.

Class I

The maximum permissible exposure(MPE) cannot be exceeded, it includes High-power lasers within an enclosure that prevents exposure to the radiation and that cannot be opened without shutting down the laser. For example, a continuous laser at 600nm can emit up to 0.39mW, but for shorter wavelengths, the maximum emission is lower.

Class II

“Caution”, visible laser light less than 1.0mW. Considered eye safe, normal exposure to this type of beam will not cause permanent damage to the retina.

Class IIIA

“Danger”, visible laser light between 1.0mW and 5.0mW. Considered eye safe with caution. Focusing of this light into the eye could cause some damage.

Class IIIB

“Danger”, infrared(IR), and high power visible lasers considered dangerous to the retina if exposed. NB: it is important to note that while complying with the above classifications, unless otherwise stated. Our laser diode products are not certified and are designed solely for use in OEM products. The way in which device is used in the final product may alter its original design classification, and it is the responsibility of the OEM to ensure compliance with the relevant standards.

Specifications are subject to change without notice.