ERDI LASER®

LRF200A Series Laser Radar High Repetition Rate Range Finder Module

Model: LRF200A

PRODUCT DESCRIPTION

The LRF200A is a high-precision, long-range laser radar ranging module suitable for both indoor and outdoor applications. It excels in positioning or collision avoidance monitoring for shuttle cars, land transport vehicles, overhead cranes, and laterally moving vehicles. Its stable measurement capabilities and ability to detect extremely dark or shiny materials ensure it meets the demands of applications such as thrust control, shelf occupancy, or load height control in logistics. The product's technical specifications guarantee it satisfies application needs, while its ultra-compact size and superior specifications ensure outstanding performance in any scenario.

Measurement Capability: The LRF200A boasts exceptional measurement capabilities with an operational distance up to 200 meters. Its dimensions of 33×36×18mm and weight of less than 50g make its small form factor and long-range capabilities widely applicable to various unmanned scenarios.

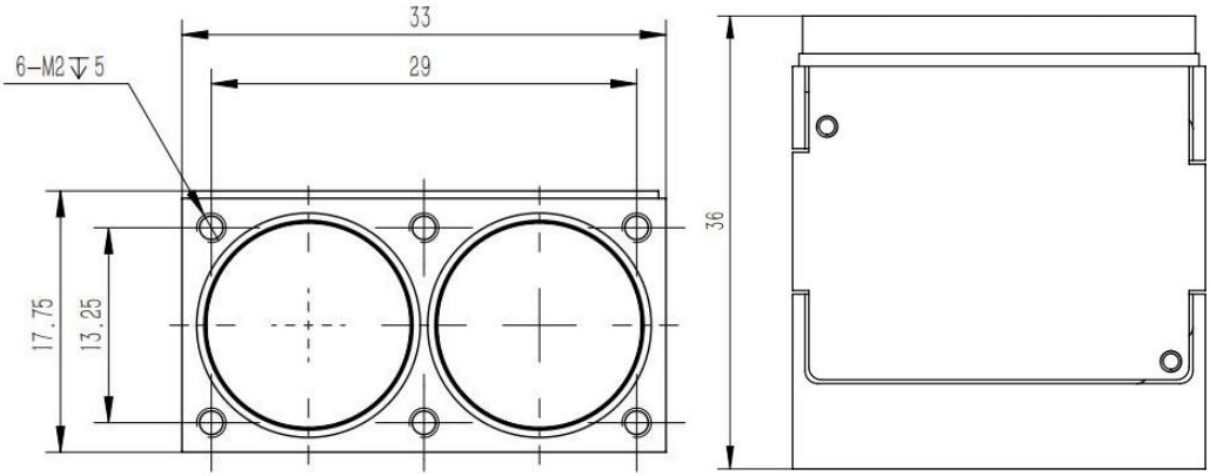
Outdoor Operational Capability: The LRF200A is fully designed to adapt to outdoor working environments. In terms of measurement technology, it can still function normally even in intense sunlight and possesses a certain ability to penetrate rain, fog, and dust, enabling it to detect actual targets without interference from atmospheric impurities.

In terms of electrical and structural design, it can withstand a 15% fluctuation in supply voltage and resist the impact of strong electromagnetic interference. The front of its housing has an IP67 protection level, and its operating temperature range spans from -40℃ to +85℃, ensuring robust outdoor performance.

TECHNICAL SPECIFICATIONS

Project Name	Technical parameters			
Laser Light Source	Laser diode 905nm, ≤10mW; Class I laser eye safety requirements			
Spot Area	20×10cm（100m）			
Weight	＜50g			
Power Supply Voltage	24V（9V~36V）			
Specification Range	0.05-50m	0.05-100m	0.05-150m	0.05-200m
Measurement Accuracy	±0.05m	±0.05m + (L-50) × 0.1%, where L is the measurement distance		
Standard Measuring Range	0.05m ~ 200m @ 80% reflectivity & visibility > 10km			
Distance Resolution	1cm			
Absolute Accuracy	±0.05m@50m			
Output Interface	3.3V TTL serial port output			
Measurement Frequency	20-20kHz (default 1kHz)			
Return Data	Direct measurement of distance, reflected light intensity, and working status			
Operating Temperature	－40℃~ +85℃			
Storage Temperature	－45℃~ +100℃			
Operating Humidity	0%~100% RH			
Anti-ambient Light	＞100kLux			

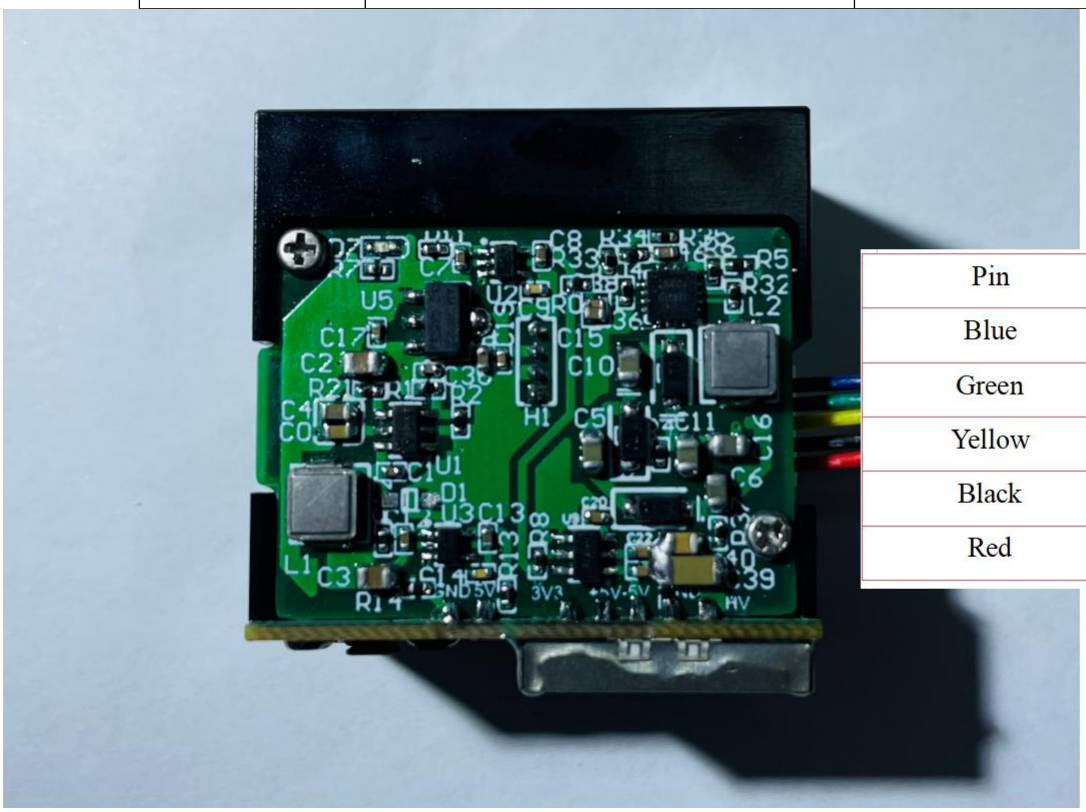
STRUCTURAL DRAWING (mm)



ELECTRICAL INTERFACE

Pin definition of LRF200A series LiDAR high-repetition-rate rangefinder module, power supply 9-36VDC, 3.3V TTL serial port output.

Pin	Signal Definition	Notes
1	RX	Blue
2	TX	Green
3	GND	Yellow
4	GND	Black
5	DV9 ~ 36V	Red



Pin	Definitions
Blue	RX
Green	TX
Yellow	GND
Black	GND
Red	DV9～36V

COMMUNICATION PROTOCOL(Baud rate and frequency adjustable)

The default laser ranging frequency is 1000Hz, adjustable from 20-20000Hz. The default baud rate of the serial port is 460800, adjustable, with 8 data bits, 1 stop bit, and no parity check.

After powering on the SPXXA rangefinder module, it actively outputs data (one frame of data is 4 bytes). When no measurement is available, it outputs 65535.
Example:5C 02 11 EC
5C: Fixed frame header of 1 byte
02 11: Two bytes representing the measured distance of 4354cm, in little-endian mode, with a range of 0-65535cm
EC: Checksum inversion of the sum from 02 to 11, 1 byte.
Verification function: (Summing from the second byte to the second-to-last byte and taking 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;
}
```

Configuration and Reading Commands:

- **Reading the Serial Number of the Rangefinder Module**

Host Computer -> Rangefinder Module:
5A 0D 02 0D 0D Checksum (inverted sum checksum)
Rangefinder Module -> Host Computer:
5A 8D 02 XX XX Checksum (inverted sum checksum)
XX XX represents the serial number: little-endian mode, for example, 0x10 01 is displayed as "S00272" on the host computer (with an "S" prefixed to the number).

- **Setting the Frequency of the Rangefinder Module**

Host Computer -> Rangefinder Module:
5A 0B 02 31 00 Checksum (inverted sum checksum)
Rangefinder Module -> Host Computer:
5A 8B 02 31 00 Checksum (inverted sum checksum)
31 00 represents a frequency division factor of 49: little-endian mode, at this time, the set frequency f = 1000000 / (49 + 1) = 20000Hz. The frequency division factor ranges from 49999～49, corresponding to a frequency range of 20-20000Hz.

- **Reading the Frequency of the Rangefinder Module**

Host Computer -> Rangefinder Module:
5A 1B 02 1B 1B Checksum (inverted sum checksum)
Rangefinder Module -> Host Computer:
5A 9B 02 31 00 Checksum (inverted sum checksum)
31 00 represents a read frequency division factor of 49: little-endian mode, at this time, the read frequency f = 1000000 / (49 + 1) = 20000Hz. The frequency division factor ranges from 49999～49, corresponding to a frequency range of 20-20000Hz.

- **Setting the Serial Port Baud Rate of the Rangefinder Module**

Host Computer -> Rangefinder Module:
5A 06 02 80 04 Checksum (inverted sum checksum)
Rangefinder Module -> Host Computer:
5A 86 02 80 04 Checksum (inverted sum checksum)
80 04: little-endian mode, i.e., 1152, representing a set baud rate of 115200 = 1152 ×100.
Below are the six baud rates that can be set; the module will not respond to other baud rate settings.

Hexadecimal (Little Endian)	Decimal	Baud Rate
60 00	96	9600
C0 00	192	19200
80 04	1152	115200
00 0A	2560	256000
00 12	4608	460800
00 24	9216	921600

Note: Due to the limitation on the number of bits that can be output per second by the serial port (the maximum number of points that can be output per second = baud rate / 10 / number of bytes per point), please set the frequency and baud rate

according to the following instructions:

- **When the ranging frequency is less than 200Hz, any baud rate can be used.**
- **When the ranging frequency is greater than 200Hz, the baud rate needs to be set to 19200 or higher.**
- **When the ranging frequency is greater than 400Hz, the baud rate needs to be set to 115200 or higher.**
- **When the ranging frequency is greater than 2500Hz, the baud rate needs to be set to 256000 or higher.**
- **When the ranging frequency is greater than 6000Hz, the baud rate needs to be set to 460800 or higher.**
- **When the ranging frequency is greater than 10500Hz, the baud rate needs to be set to 921600.**