ERDI LASER®

905nm Laser Rangefinder Module 1200A1
Model:LRF1200A3

⫢ OVERVIEW

LRF1200A3 laser ranging module is a new lightweight and compact ranging module, operating at a wavelength of 905nm. The maximum range of the product is ≥1200m, using a UART-TTL interface and supporting test software, which is convenient for users to further develop. It has the characteristics of small size, light weight and reliable performance. It can be used in aviation, communications, geology, police, outdoor sports and other occasions.

⫢ TECHNICAL SPECIFICATIONS

Project	Technical data
Model	LRF1200A3
Laser Wavelength	905nm
Eye Safety	Class 1
Divergence Angle	≤10mrad
Display accuracy	0.1m
Launch Lens Diameter	Φ6.6mm
Receiver Lens Diameter	Φ18mm
Measuring Range（3m x 3m Target)	≥5~1200m
Ranging Accuracy	±1m
Display Accuracy	0.1m
Ranging Frequency	1~3Hz
Accurately measuring probability	≥98%
Start Time	≤500ms
Data Interface	UART（TTL_3.3V）
Supply Voltage	3.3+/-0.1V
Standby Power Consumption	≤300mW
Work Power Consumption	≤800mW
Weight	≤20g
Dimention	Φ23mm×40mm
Operation Temperature	-20~＋55℃
Storage Temperature	-55~＋65℃
Impact Resistance	1200g，1ms
Anti-vibration	1000g/ms (10 times/s in the optical axis direction)
Dependability	MTBF≥1500 h

Protection Class	IP67(Head piece)
ESD Class	2 (Lens position) Contact discharge 6kV Air discharge 8kV
Electromagnetic Compatibility (EMC)	CE/FCC Certification
Eco-friendly	RoHS2.0

- In this mode, the device consumes minimal power. The MCU is in an off state and does not respond to any commands.

- When a measurement is needed, pull the enable pin low to switch the device into normal working mode and automatically perform one measurement.

- After the measurement is complete, pull the enable pin high to return the device to low-power mode, with power consumption below 3mW.
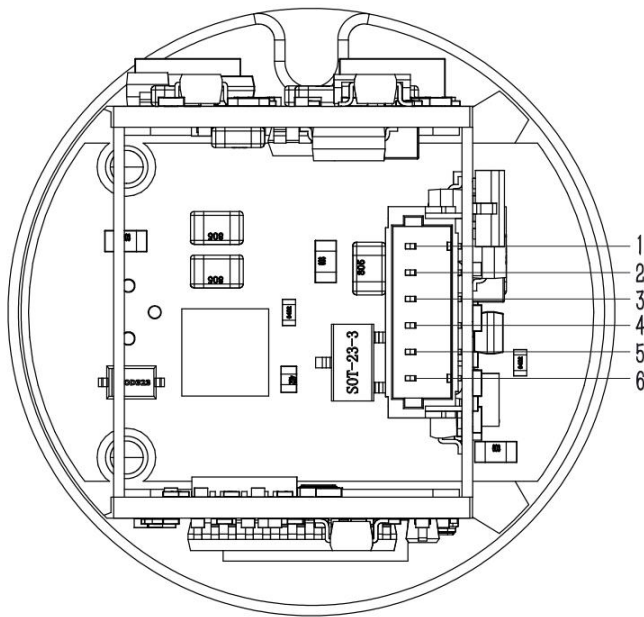
⊋ MECHANICAL DIMENSION(mm)
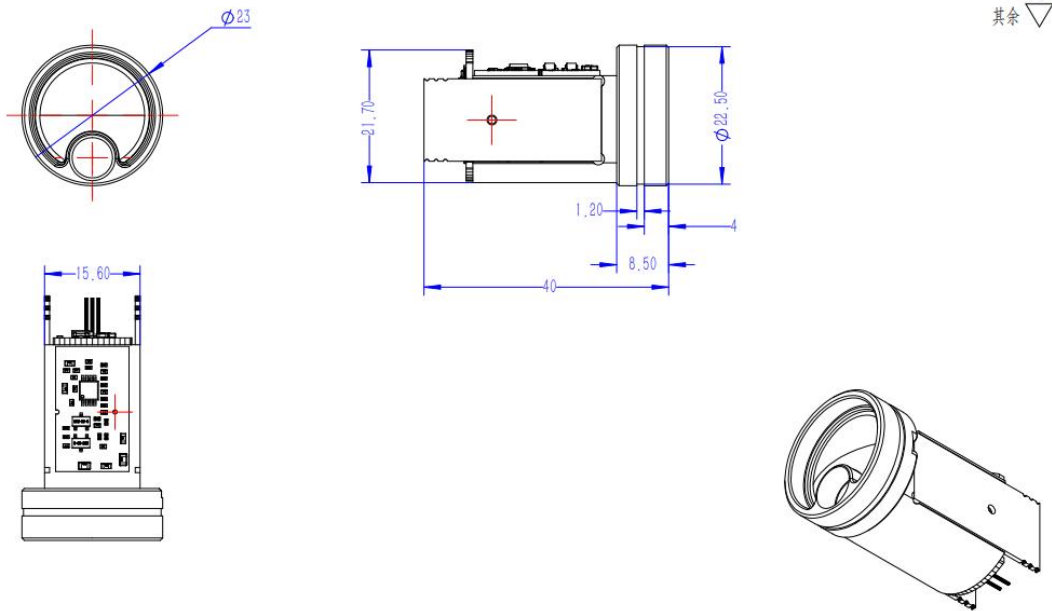
⊋ ELECTRICAL INTERFACE

User Electrical Interface: UART (TTL_3.3V)
Connector Model No.: FWF08002-S06B13W5M, wire sequence and specific definitions are shown below:

Pin	Definition	Illustrate
1	GND	Earth (wire)
2	Power supply	3.3V DC power supply
3	NC	Empty pin
4	TTL_TXD	Serial transmitter, TTL level 3.3V
5	TTL_RXD	Serial Receiver, TTL Level 3.3V
6	Enable Pin	low level power on

℞ COMMUNICATION PROTOCOL

Communication mode: using serial communication mode

Baud rate: 115200 (default)

Data Bits: 8 Bits

Length of a frame: 8 bytes

		Frame header H	Frame header L	Function word	D1	D2	D3	D4	Calibration
DATA PROTOCOL									
	Send	55	AA						SUM(function word +DATA1+...+DATA4)
	Reply	55	AA						SUM(frame header H + frame header L + ...+DATA4)

MEASUREMENT INSTRUCTION									
Single ranging	Send	55	AA	88	FF	FF	FF	FF	SUM[3：7]
		55 AA 88 FF FF FF FF 84							
	Reply	55	AA	88	STA	FF	DIS_H	DIS_L	SUM[1：7]
		STA = 0 measurement failure; STA = 1: The measurement was successful DIS_H: high bytes of the measured result; DIS_L: The lower bytes of the measurement result **Data returns are returned in hexadecimal, and all data results are output by multiplying the real data by 10**							
Continuous ranging	send	55	AA	89	FF	FF	FF	FF	SUM[3：7]
		55 AA 89 FF FF FF FF 85							
	Reply	55	AA	88	STA	FF	DIS_H	DIS_L	SUM[1：7]
		STA = 0 measurement failure; STA = 1: The measurement was successful DIS_H: high bytes of the measured result; DIS_L: The lower bytes of the measurement result **Data returns are returned in hexadecimal, and all data results are output by multiplying the real data by 10**							
Stop ranging	send	55	AA	8E	FF	FF	FF	FF	SUM[3：7]
		55 AA 8E FF FF FF FF 8A							
	Reply	55	AA	8E	STA	FF	FF	FF	SUM[1：7]

Angular measurement	send	55	AA	8A	FF	FF	FF	FF	SUM[3：7]
		55 AA 8A FF FF FF FF 86							
	Reply	55	AA	8A	STA	FF	ANG_H	ANG_L	SUM[1：7]
		STA= 0 Measurement failure; STA= 1: Measurement success ANG_H: Measurement result high byte; ANG_L: Measurement result low byte, data return to hexadecimal return, all data results will be the real data multiplied by 10 output, only in the movement with an angle sensor effective							

Note: STA= 0 closes multiple measurement failures; STA = 1 closes multiple measurements successfully (appears at top of Angular measurement block)

POWER-ON SELF-TEST							
Self-test information	Reply	55	AA	80	STA	00	00	ErrCode	SUM[1：7]

STA= 0 Boot initialization failed, ErrCode is the error code;
STA= 1 Boot initialization success. By default, initialization success does not reply to such messages.

SETTING UP THE SYSTEM								
Baud rate	Send	55	AA	TYPE	FF	FF	FF	FF	SUM[3：7]
		TYPE = 01 sets the baud rate to 9600 bps TYPE = 02 Set the baud rate to 14400 bps TYPE = 03 Set the baud rate to 19200 bps TYPE = 04 Set the baud rate to 38400bps TYPE = 05 Set the baud rate to 56000 BPS TYPE = 06 Set the baud rate to 57600bps TYPE = 07 Set the baud rate to 115200bps TYPE = 08 Set the baud rate to 128000bps TYPE = 09 Set the baud rate to 230400bps **The baud rate does not change immediately after it is set and only takes effect after a restart**							
	Reply	55	AA	TYPE	STA	FF	FF	FF	SUM[1：7]
		STA = 0 setting failure; STA = 1 is set successfully							
External circuit enable	Send	55	AA	70	AB	CD	00	00	SUM[3：7]
		55 AA 70 AB CD 00 00 E8							
	Reply	55	AA	70	STA	00	00	00	SUM[1：7]
		STA = 0, enable failure; STA = 1, enabling success							
		55	AA	71	AB	CD	00	00	SUM[3：7]
		55 AA 71 AB CD 00 00 E9							
		55	AA	71	STA	00	00	00	SUM[1：7]
		STA = 0, disable failure; If STA = 1, it is disabled successfully							

ErrCode		
Error code	Description	Remarks
0x00	No echo signal was received	
0x16	Out of range: below the minimum range	
0x18	No echo signal was received	
0x00~0x07	Hardware error	

⊋ SECONDARY LOW- POWER MODE

➢ In this mode, the device's power consumption is reduced, and the MCU is in standby mode, capable of responding to other commands.
➢ Send the "External Circuit Disabled" command to switch the device into secondary low-power mode.
➢ When a measurement is needed, simply send a "Measurement" related command to automatically switch the device into normal working mode for measurement.
➢ Alternatively, send the "External Circuit Enabled" command to switch the device into normal working mode independently.

⊋ NOTES

1. The verification content for sending and receiving may differ, so please pay attention to discrimination.
2. The checksum is the lower eight bits of the sum of the bytes requiring verification.
3. All data is transmitted and received in hexadecimal.