

# 1.2km laser rangefinder module



JIO-W012X The ranging module is a new lightweight and compact ranging module, working at 905nm wavelength. Using UART-TTL interface, equipped with test software, convenient for further development, with the characteristics of small size, light weight and reliable performance. Suitable for thermal imaging, UAV pod, night vision instrument and other equipment integration.

- Measurement range: 5-1200 /1500meters
- Measurement of trees ≥800 meters
- Measurement of deer ≥ 500 meters
- Measurement accuracy ±1m
- Weight ≤20g

## 2. performance index

project	technical parameter
laser wave length	905nm

Range range	5m-1200m/1500m
ranging accuracy	±0.5m
Distance measurement frequency	1Hz
Quadrant measurement rate	≥98%
false alarm rate	≤1%
angle of divergence	≤6mrad
Receive caliber	18mm
communication interface	UART-TTL
supply voltage	3.3-5V
Work power consumption	1W
Standby power consumption	≤500mW
size	Φ23mm 48mm <sup>×</sup>
weight	≤20g
operating temperature range	-15℃ +60℃
Storage temperature range	-55℃ +70℃

### 3. Interface

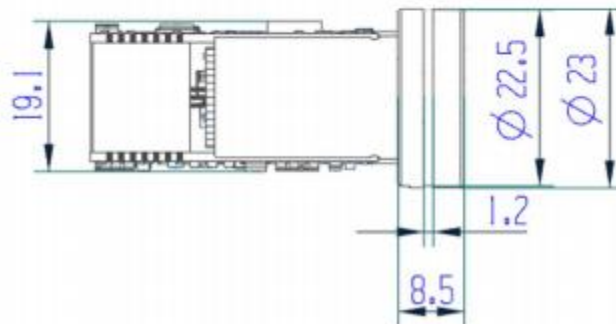
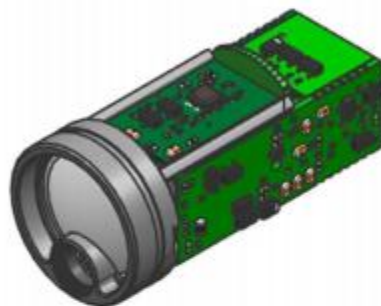
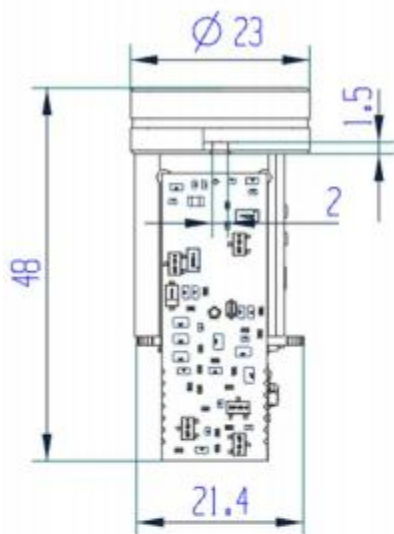
#### 3.1 Electrical interface

pin	definition	explain
1	GND	Power anode-
2	5V	Power supply cathode + 5V / 1A power supply
3	NC	hang in the air
4	TXD	The module serial port sends the TTL level

5	RXD	The module serial port receives the TTL level
6	EN#	Module enabling pins, 0V low level enabled, 5V high level disability



### 3.2 Mechanical interface



## Protocol

Version number: V1.2

Update the log		
20230209	V1.0	Create a document
20230307	V1.1	Increase the angle measurement protocol
20240306	V1.2	Correct errors, add a description

Communication mode: adopt serial port communication mode

Baud rate: 115200 (default)

Data bit: 8 bits

One-frame length: 8 bytes

Data protocol									
		Frame head H	Frame head L	function word	D1	D2	D3	D4	verification
	transmit by radio	55	AA						SUM(function word +DATA1+ ...+DATA 4)
	reply	55	AA						SUM (Frame Head H + Frame Head L +... + DATA 4)

Survey Instruction									
Single ranging	transmit by radio	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 failed; STA = 1: measured measurement DIS_H: Measure high bytes; DIS_L: Measure low bytes When the measurement fails: DIS_H = FF; DIS_L = ErrCode <b>Converting output in hexadecimal to decimal, multiply by 10 to get the target distance.</b>									
Continuous ranging	transmit by radio	55	AA	89	FF	FF	FF	FF	SUM [3: 7]
		55 AA 89 FF FF FF FF 85							
	reply	55	AA	89	STA	FF	DIS_H	DIS_L	SUM [1: 7]
STA = 0 failed; STA = 1: measured measurement DIS_H: Measure high bytes; DIS_L: Measure low bytes When the measurement fails: DIS_H = FF; DIS_L = ErrCode <b>Converting output in hexadecimal to decimal, multiply by 10 to get the target distance.</b>									
Stop ranging	transmit by radio	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]
STA = 0 failed to turn off multiple measurements; STA = 1 to successfully turn off multiple measurements									
angular surveying	transmit by radio	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 failed; STA = 1: measured measurement ANG_H: measurement result high byte; ANG_L: measurement result low byte <b>Converting output in hexadecimal to decimal, multiply by 10 to get the target distance.</b> Only in the movement with angangle sensor									

Boot self-inspection									
Self-inspection information	reply	55	AA	80	STA	00	00	ErrCode	SUM [1: 7]
		STA = 0 startup initialization failure, ErrCode is error code; STA = 1 boot initialization successfully							

Set up the system									
Baud rate	transmit by radio	55	AA	TYPE	FF	FF	FF	FF	SUM [3: 7]
	TYPE = 01 sets the port rate to 9600 bps TYPE = 02 set the baud rate to 14400 bps TYPE = 03 sets the baud rate to 19,200 bps TYPE = 04 sets the baud rate to 38,400 bps TYPE = 05 sets the baud rate to 56,000 bps TYPE = 06 set the baud rate to 57600bps TYPE = 07 sets the baud rate to 115,200 bps TYPE = 08 sets the baud rate to 128,000 bps TYPE = 09 sets the baud rate to 230,400 bps  <b>Porter rate will not change immediately after setting and will not take effect until after restart</b>								
	reply	55	AA	TYPE	STA	FF	FF	FF	SUM [1: 7]
STA = 0 set failed; STA = 1 set successfully									
External circuit enables	transmit by radio	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, enable success Power / disabled: work on the transmitting and receiving circuit units, other circuit units are not affected									
External circuit is disabled	transmit by radio	55	AA	71	AB	CD	00	00	SUM [3: 7]
	55 AA 71 AB CD 00 00 E9								
	reply	55	AA	71	STA	00	00	00	SUM [1: 7]
STA = 0, disabled failed; STA = 1, disabled successfully Power / disabled: work on the transmitting and receiving circuit units, other circuit units are not affected									

ErrCode		
Error code	description	remarks
0x00	No echo signal was received	
0x16	no to scale	0m below the minimum range
0x18	No echo signal was received	
0x19	The system voltage regulation failed	The reflectivity of the reference at the target is too large or too small
0x21 、 0x24	Data transfer failed	
0x30 、 0x31	The system is not activated	When the system is not activated, the return distance information is 0m
0x01~0x07	hardware error	

matters need attention:

1. The verification content of sending and reply is different, so pay attention to the discrimination.
- 2, the check bit is: need to check the byte and lower eight bits.
3. All the data are sent and received in a 16 decimal system.