1535nm Laser Rangefinder -8K16

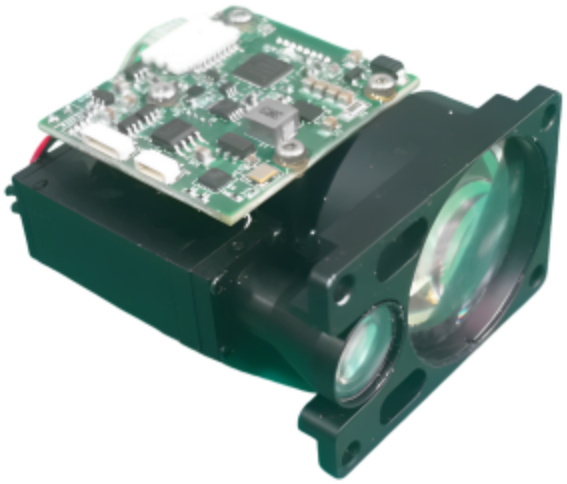
Instructions for the use

SKU:LRF-1535-8K16

1.SUMMARY

Laser range finder is a kind of precise distance sensing instrument, which is composed of laser receiving optical system, laser transmitting optical system, laser transmitter, laser receiver, power supply and controller and shell. (as shown in Figure 1), which is installed on the ground or on the vehicle platform, and is coaxial with the vehicle viewing system. Driven by the platform system, the target is searched and tracked. After the platform system searches for the target, it proceeds to the target.

The main features of the laser range finder are: long detection range, small size, light weight, fast response time, high detection accuracy, multi-target detection, and the output target range data can be integrated into the battlefield communication network.



graph 1 Structural shape diagram

2. CONSTRUCTION AND WORKING PRINCIPLE

The laser emitter of the laser range finder sends an extremely directional laser beam to the air target, which hits the target and returns to be received by the receiving optical system. The receiving optical system converges the laser beam to the photodetector of the laser receiver, and the photodetector converts the laser signal containing the target into an electrical signal. The electrical signal is amplified, sent to the signal processing and controller for acquisition and processing, and the signal characteristics are analyzed to eliminate noise and calculate the distance value of the

target. The mathematical model for calculating the distance is as follows:

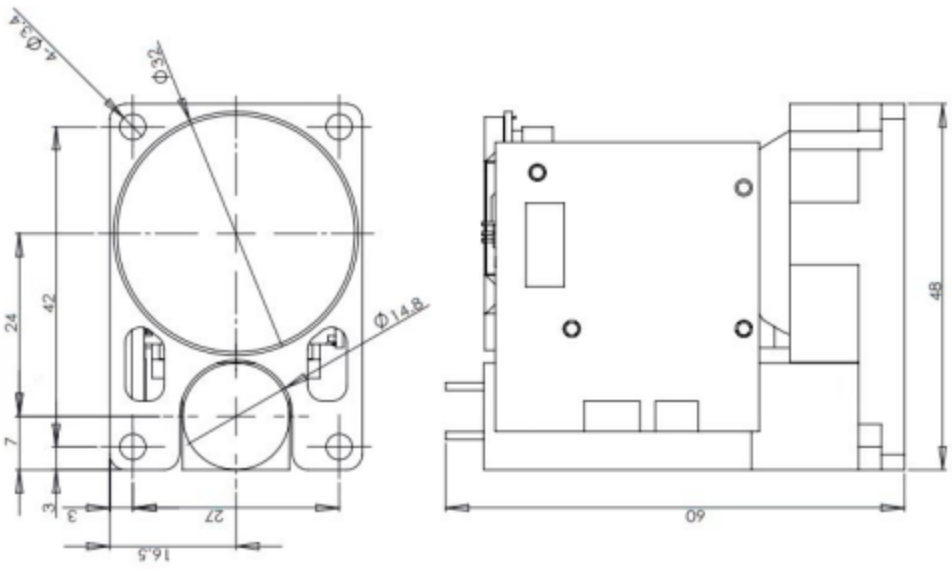
$$R = \frac{c}{2}t$$

Where c and t represent the speed of light and the time for the laser beam to travel back and forth between the range finder and the target, respectively.

3. TECHNICAL SPECIFICATIONS

Item	Technical parameter	
Laser wavelength	1.54μm	
Ranging capability	20m~8km	2.3m×2.3m vehicle target, 0.3 diffuse reflectance, visibility ≥10km
	20m~16km	Energy intensity ≥ 16km, 0.3 large reflectivity target
Voltage of operation	3.3V~12V	
False alarm rate	≤1%	
Quasi measurement rate	≥98%	
Minimum geodesic range	30m	
Standby current	≤0.065A@6V	
Divergence angle	≤0.5mrad	
Accuracy	±1m	
Frequency of operation	1 Hz, 5 Hz, emergency 10Hz	
Goal first	First and last target selection	
Output interface	RS422	
Storage property	Storage life 12 years	
Operating temperature	-40°C~+ 55°C	
Temperature of storage	-50°C~ + 70°C	

4.MECHICAL INTERFACE



4. ELECTRICAL INTERFACE

The external circuit interface of laser range finder adopts external socket, with external power interface and data

communication function. External socket 1.25mm spacing 8-core socket, the specific pin definition is shown in the table below:

pin	Definition	Function	Conductor color	Remarks
1	T+	Communication signal	Red	Connected to PC RX+
2	T-	Communication signal	Black	Connected to PC RX-
3	R-	Communication signal	Yellow	Connected to PC TX-
4	R+	Communication signal	Green	Connected to PC TX+
5	GND	Communication place	Blue	
6	GND	Power supply ground	White	
7	+8V/1A	Total power supply	Orange	Intertwine
8	+8V/1A	Total power supply	Brown	Connected to PC RX+

5. PACKING

5.1 Packaging Requirements

5.1.1 The surface of exposed optical parts shall not have dust, dirt, oil, watermark and handmark, etc.

5.1.2 There shall be no dust, debris and foreign matter in the packing box, and the outer surface shall be clean;

5.1.3 There shall be no dust, dirt, grease and accumulated sealant or filler on the outer surface of the product. The oxide layer is allowed to have no more than 3 scratches longer than 20mm and no more than 3 pitting points less than 2mm in diameter.

5.1.4 Cover the front end of the laser range finder with a cover and put it into an anti-static plastic bag and seal it in vacuum.Then put into the sponge inside the packing box, and then into the packing box with shock proof design.

6. INSTALLATION AND DEBUGGING

Do not fire laser rangefinders at human eyes and high reflectivity objects (objects with smooth surfaces such as glass)!

It is forbidden to directly observe the laser emission window with the naked eye when the laser range finder launches the laser!

When adjusting the laser and optical axis, the window of the receiving optical system must be blocked tightly!

6.1 Remove the laser range finder from the packing case and check the appearance for damage and contamination;

6.2 Install the laser range finder on the platform with the hexagonal stainless steel screw M2.5×6;

6.3 Before ranging, observe whether the working current of the laser range finder is normal after energizing;

6.4 After the laser range finder is powered off, please do not use luoiron welding because the capacitor is not fully

discharged. The external plug can be plugged and unplugged.

7. DECOMPOSE AND COMBINE

The laser range finder can be removed by loosening the four screws M2.5×6.

8 . USE OPERATIONS

Operate laser range finder according to software instruction.

9.COMMON FAULT ANALYSIS AND ELMINATION

Serial number	Fault phenomenon	Cause	Exclusion method	Remarks
1	There is no distance output	The plug-in is loose	Replug the connector	
2	No working current	The plug-in is loose	Replug the connector	
3	Not back to the target	Large error with the optical axis of the platform	Re-commissioning and installation	

10 . MAINTENANCE

10.1 It is necessary to keep the optical lens clean at ordinary times. To wipe the lens, lens paper or alcohol cotton must be used.

10.2 Laser range finder is not sealed to avoid water vapor entry.

10.3 Power off when not in use.

10.4 Avoid live plugging and unplugging output sockets.

11 .TRANSPORTATION AND STORAGE

11.1 Storage

11.1.1 The acceptance party shall be responsible for temporary storage of the qualified products.

11.1.2 Products shall be stored in a warehouse with protective measures, and the conditions of the warehouse shall meet:

a) The warehouse temperature should be kept in the range of -20°C ~ +30°C, and the relative humidity should be below 70%;

b) All warehouse facilities and stored items should be kept clean and tidy; There should be good lighting facilities in the library;

c) The warehouse shall have fire prevention, riot control, lightning protection and other facilities;

d) It is forbidden to put any corrosive items into the warehouse.

11.2 Transportation

11.2.1 Product delivery shall be the responsibility of the manufacturer, and product delivery shall meet the

following requirements:

a) Handling and placement shall be carried out according to the transport mark on the transport box, and all rules of handling and transport shall be observed;

b) stacking should be placed smoothly, neat and firm;

c) The vehicle shall not be super high or overweight, and the center of gravity distribution shall be as uniform as possible;

d) Laser range finder products are not allowed to be shipped with explosive and corrosive items in the same vehicle;

e) When transporting by car, the speed should be controlled according to the condition of the road;

f) In the process of transportation, there should be rain, dust, sun, anti impact, anti fall and other measures, and cover with a tarp when transporting with an open car;

g) When conditions permit, container transport shall be adopted as far as possible and shall be reported in accordance with relevant regulations;

h) The delivery of the products shall be carried out by the contracting Party and the ordering party in accordance with the provisions;

i) In the course of shipment and transportation, if the damage is found, the relevant departments shall be notified to deal with it in time.

APPENDIX A: A COMPLETE CHECKLIST

1 Complete set of products

1 laser range finder

1 set of packing boxes inside the product

1 shipping box

APPENDIX B RANGE FINDER COMMUNICATION PROTOCOL

RS422 Communications, Baud rate 115200.

After receiving the work instruction, the ranging finder triggers the laser to work according to the instruction, and replies the ranging according to the ranging information of the upward shift machine.

The following are all in 16 bases

Upper computer to ranging finder command

AA	Command word 1	Command word 2	0C
Head bytes	01 Start the continuous ranging 02 Stop the continuous ranging 03 Single ranging	Frequency of the continuous ranging 01~0A corresponds to 0 – 10 Hz	The tail bytes

for instance:

AA 01 01 0C Frequency of 1Hz continuous ranging

AA 01 05 0C Frequency of 5Hz continuous ranging

AA 02 00 0C Stop the continuous ranging

AA 03 00 0C Single ranging

Range finder to the upper computer reply message

55	XX	1H	1L	2H	2L	0D
Head bytes	status word 04: No laser 05: with laser without echo 15: Single target 35: Double target	Target 1 is located away from the high level	Target 1 is from low	Target 2 is located away from the high level	Target 2 is from low	The tail bytes

1H 1L Two unsigned bytes represent the distance of target 1, with the lowest bit =0.5m. When there is no target echo or no laser, the distance value is sent to 0.

2H 2L Two unsigned bytes represent the distance of target 2, with the lowest bit =0.5m. When there is no target echo or no laser, the distance value is sent to 0.

for instance:

55 04 00 00 00 00 0D no laser

55 05 00 00 00 00 0D with laser without echo

55 15 00 50 00 00 0D Target 1 with a distance of 40 m

55 35 00 50 01 00 0D Target 1 is 40 meters. Target 2 is 128 meters