

ELRF-O52

Laser Range Finder Module

Technical Specification



Lumispot

Version 2025.6

1. Overview

ELRF-O52 laser range finder module is developed based on the 1535nm erbium glass laser independently developed by *Lumispot*. It adopts single pulse TOF ranging mode and has a maximum measuring range of $\geq 15\text{km}$. It is composed of laser, transmitting optical system, receiving optical system and control circuit board, and communicates with host computer through RS422 serial port, and provides host computer test software and communication protocol, which is convenient for user secondary development. It has the characteristics of small size, light weight, stable performance, high impact resistance, first-class eye safety, etc.

2. Structural Composition and Main Performance Indicators

ELRF-O52 laser rangefinder consists of a laser, a transmitting optical system, a receiving optical system and a control circuit. The main performance is as follows:

2.1 Ranging Capacity

Visibility under conditions is not less than 20km, humidity $\leq 80\%$; For large targets (buildings) ranging distance $\geq 20\text{km}$; For vehicles (2.3m \times 2.3m target, diffuse reflectance ≥ 0.3) ranging distance $\geq 15\text{km}$; For personnel (1.75m \times 0.5m target) ranging distance $\geq 7\text{km}$;

2.2 Main functions

- a) single ranging and continuous ranging;
- b) Range strobe, front and rear target indication;
- c) Self-test function.

2.3 Performance

- a. Wavelength: $1535\text{nm} \pm 5\text{nm}$;
- b. Laser divergence Angle: 0.3mrad ;

- c. Continuous ranging frequency: 1~10Hz adjustable;
- d. Ranging accuracy: $\leq \pm 1.5\text{m}$;
- e. Accuracy: $\geq 98\%$;
- f. Minimum measuring range: $\leq 100\text{m}$;
- g. Ranging resolution: $\leq 30\text{m}$;
- h. Power supply voltage: DC5V ~ 28V;
- i. Weight: < 270g;
- j. Power consumption: standby power consumption $\leq 150\text{mW}$, average power consumption $\leq 6\text{W}$, peak power consumption $\leq 14\text{W}$;
- k. Size: $\leq 104 \times 61 \times 74\text{mm}$;

2.4 Environment adaptability

- a. Operating temperature: $-40^{\circ}\text{C} \sim +60^{\circ}\text{C}$;
- b. Storage temperature: $-55^{\circ}\text{C} \sim +70^{\circ}\text{C}$;
- c. Impact: 75g@11ms;
- d. Vibration: Vibration environment of combined wheel vehicles.

2.5 Interface

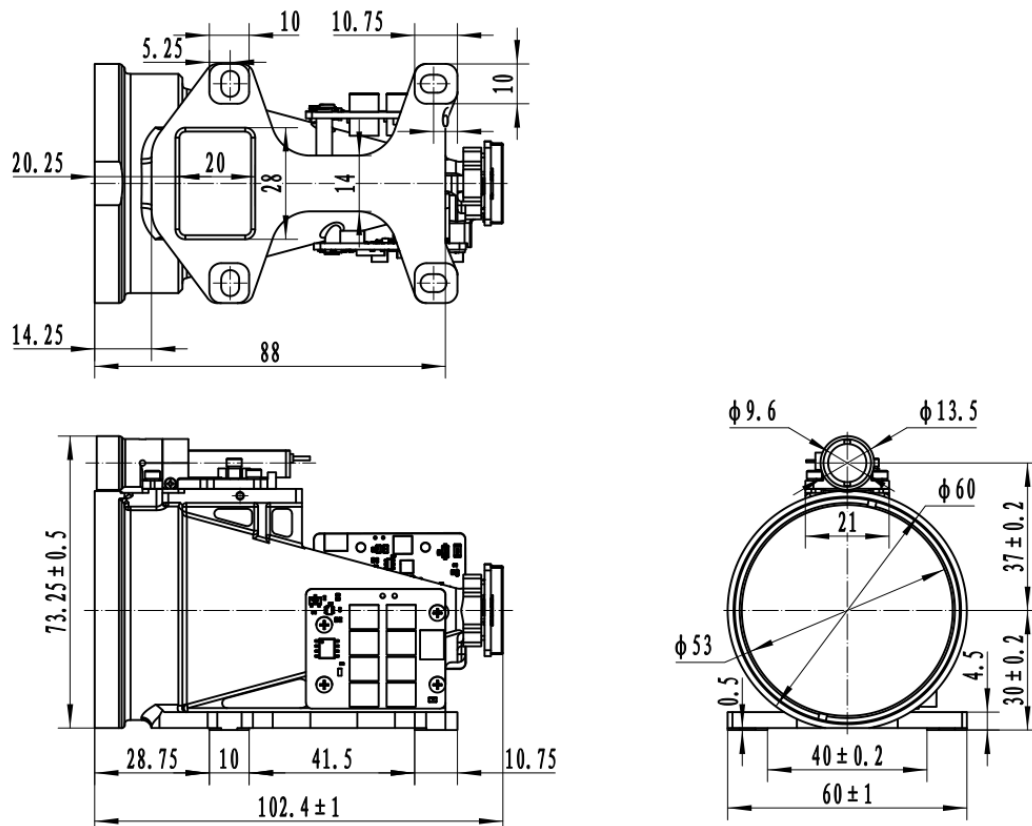
Communication interface: RS422, 115200bps

Electrical interface: The interface model is A1002WR-S-10P, and the interface definition is detailed in the following table.

No	Definition	Remarks
1	VIN+	Power supply +
2	VIN-	Power supply -
3	POWER_EN	Module power supply enabled, TTL_3.3V level; Module on (> 2.7V or suspended) Module off (< 0.3)
4	RS422 TX+	RS422 receive +

5	RS422 TX-(UART_TXD)	RS422 Reception – (UART serial port transmission, TTL3.3V level)
6	RS422 RX-(UART_RXD)	RS422 transmission – (UART serial port reception, TTL3.3V level)
7	RS422 RX+	RS422 transmit +
8	Reserved	
9	Reserved	
10	GND	Communication earthing

2.6 Mounting drawing



3. User Precautions

- The laser emitted by this rangefinder is 1535nm, which is safe for human eyes. Although it is an eye-safe wavelength, it is advised not to look directly into the laser.
- When adjusting the parallelism of the optical axis, be sure to cover the

receiving lens to avoid permanent damage to the detector due to excessively strong echoes.

- This rangefinder module is not airtight. Ensure that the relative humidity of the environment is below 80% and maintain a clean and sanitary environment to prevent damage to the laser.
- The range of the rangefinder is related to atmospheric visibility and the nature of the target. Range will be reduced in fog, rain, and sandstorms. Targets like green tree clusters, white walls, and exposed limestone have better reflectivity and can increase range. Additionally, increasing the angle of the laser beam to the target will reduce the range.
- Do not emit lasers at highly reflective targets such as glass or white walls within 100 meters to avoid echo overstrength and damage to the APD detector.
- Do not plug or unplug cables while the device is powered on.
- Ensure the correct polarity of the power supply connection to avoid permanent damage to the equipment.