

PLRF-R138-B1.2

(18138)

Laser Range Finder

Specification Manual

Lumispot

2026.8

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1 Scope

1.1 Subject Scope

This technical agreement specifies the composition, interfaces, core functions, key performance indicators, environmental conditions, accompanying documents, quality assurance, delivery preparation and delivery schedule of the laser rangefinder for the XXX Project (hereinafter referred to as the Laser Rangefinder).

1.2 Applicable Scope

This technical agreement shall serve as the basis for the design, test acceptance and delivery of the laser rangefinder, and shall be attached to the purchase contract.

2 Functional

- 1) Receive control commands from the upper computer and feedback the system operating status;
- 2) Support self-inspection function and report self-test results;
- 3) Realize statistics of transmitted laser pulses and version number management; recorded data shall not be cleared after power-off;
- 4) Equipped with range gating function.

3 Technical Specification

- 1) Wavelength: $1.57\mu\text{m}\pm 0.005\mu\text{m}$
- 2) Operating Range: 300m–7km (visibility $\geq 10\text{km}$, target area 0.3m^2 , target reflectivity ≥ 0.1)
- 3) Ranging Accuracy: $\pm 5\text{m}$
- 4) Ranging Modes: Single shot, repetition frequency 1Hz, repetition frequency 5Hz
- 5) Beam Divergence Angle: $\geq 1.2\text{mrad}$
- 6) Minimum Ranging Distance: $\leq 300\text{m}$
- 7) Valid Ranging Rate: $\geq 98\%$
- 8) Warm-up Ready Time: $\leq 2\text{min}$

- 9) Laser Output Response Time: $\leq 0.45s$
- 10) Power Consumption: $\leq 300W$
- 11) Parallelism between Laser Emission Axis and Mounting Base Surface: $\leq 0.2mrad$
- 12) Power Supply Input: $24V \pm 3V$ DC
- 13) Rangefinder Overall Dimension: $\leq 500mm \times 300mm \times 170mm$ (Length $\times$ Width $\times$ Height)
- 14) Rangefinder Weight: $\leq 12kg$

4 Interface

4.1 Mechanical Interface

The mechanical interface layout (including mechanical mating interface, laser emission outlet and power chassis) is shown in the drawing below.

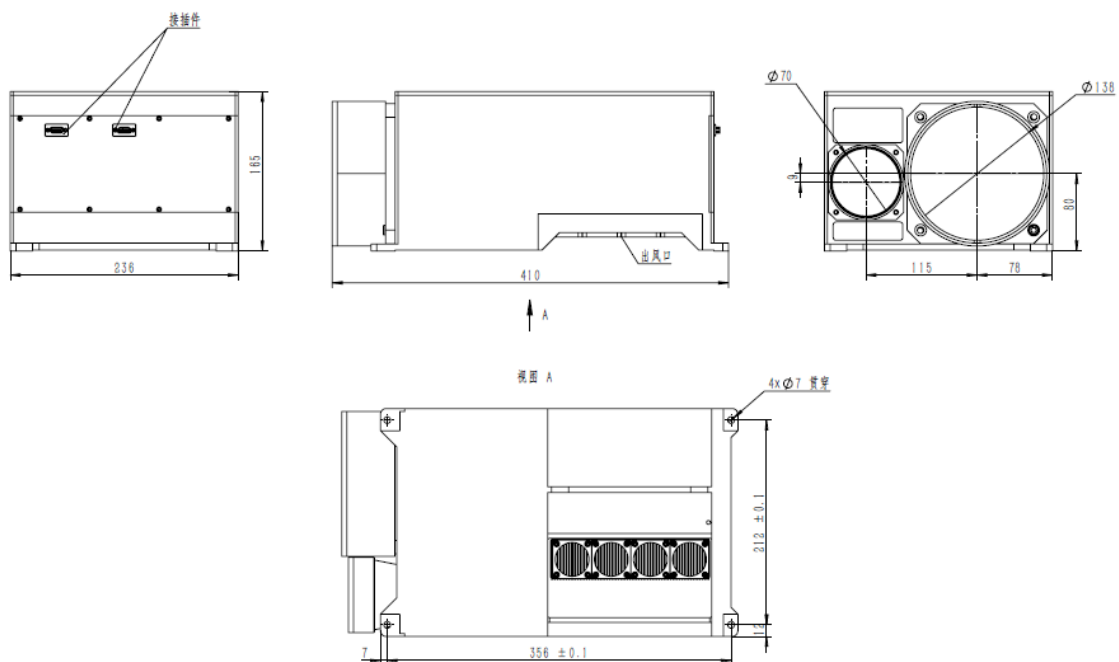


Figure 1 Mechanical Interface Drawing of Laser Rangefinder

4.2 Electrical Interface

Electrical interfaces are defined in Table 1 below.

Table 1 Electrical Interface List

No.	Signal Description	Connector Model	Connector Location	Mating Equipment	Remarks
1	Laser Rangefinder Power & Communication Socket	J30JM-15ZKP29	XS1	Platform	Platform mating connector: J30J-15TJL-C1(L100)
2	Program Update Port	J30JM-9ZKP29	XS2	N/A	To be determined

Table 2 Pin Definition of Power & Communication Interface XS1 for Laser Rangefinder Module

Pin No.	Definition	Remarks
1	DC 24V+	Positive power input
2	DC 24V+	Positive power input
3	DC 24V+	Positive power input
4	DC 24V+	Positive power input
5	DC 24V-	Negative power return circuit
6	DC 24V-	Negative power return circuit
7	DC 24V-	Negative power return circuit
8	DC 24V-	Negative power return circuit
9	RS422 Y	Laser rangefinder transmit +
10	RS422 Z	Laser rangefinder transmit -

Pin No.	Definition	Remarks
11	RS422 B	Laser rangefinder receive -
12	RS422 A	Laser rangefinder receive +
13	RS422 GND	RS422 signal ground of laser rangefinder
14	—	Spare pin
15	—	Spare pin

Table 3 Pin Definition of Program Update Port XS2

Pin No.	Definition	Remarks
1	TDO	FPGA firmware update
2	TDI	—
3	TCK	—
4	TMS	—
5	VDD	MCU firmware update
6	SWDIO	—
7	SWCLK	—
8	GND	—
9	Reserved	—

5 General Quality Characteristic

5.1 Reliability (Assessed Along with the System)

Mean Time Between Failures (MTBF) $\geq 1500\text{h}$. Implementation shall comply with relevant clauses of GJB450A-2004 *General Requirements for Equipment Reliability Work*.

5.2 Maintainability

The equipment shall comply with GJB 368B-2009 *General Requirements for Equipment Maintainability Work*. Mean Time To Repair (MTTR) at organizational maintenance level: $\leq 30\text{min}$.

5.3 Testability

Built-In Test (BIT) functions shall be equipped to support on-board fault detection and output self-test reports.

5.4 Supportability

- a) List of supporting tools & equipment, Operation & Maintenance Manual;
- b) Control software and control cables.

5.5 Safety

Design shall follow GJB900A-2012 *General Requirements for Equipment Safety Work*, to guarantee personal safety and equipment safety.

5.6 Environmental Adaptability

1. Operating ambient temperature: $-40^{\circ}\text{C} \sim +55^{\circ}\text{C}$
2. Storage temperature: $-50^{\circ}\text{C} \sim +70^{\circ}\text{C}$
3. Shock resistance: Half-sine wave, peak acceleration 200m/s^2 , pulse width 11ms, 3 shocks along vertical axis
4. Vibration resistance: Meet wheeled vehicle medium-combination vibration environment specified in GJB150.16A-2009 *Laboratory Environmental Test Methods for Military Equipment – Vibration Test*