

FLD-E40-B03_V20
Laser Target Ranging Designator

Technical Specification



Lumispot

Ver.2026.1

1. Main Functions

- (1) Serial port control, receiving and responding to the upper computer bus instructions;
- (2) Power-on/off function;
- (3) Laser ranging function, reporting the distance value in real time;
- (4) APD locking protection function;
- (5) Distance selection function;
- (6) Laser designation function, capable of conducting laser designation in accordance with the specified internal synchronous encoding and external synchronous encoding;
- (7) Laser signal synchronization output function;
- (8) Laser pulse counting function;
- (9) Equipment status self-check and monitoring function;
- (10) Power protection function;
- (11) Serial port online upgrade function

2. Technical Specification

- (1) Laser type: Uncooled common-aperture semiconductor-pumped solid-state laser designator without temperature control;
- (2) Laser wavelength: $1.064\ \mu\text{m} \pm 0.003\ \mu\text{m}$;
- (3) Laser energy: $\geq 40\ \text{mJ}$;
- (4) Laser pulse width: $15 \pm 5\ \text{ns}$;
- (5) Preparation time for operation (at full temperature): $\leq 1\ \text{min}$;
- (6) Beam divergence angle: $\leq 0.3\ \text{mrad}$;
- (7) Spatial pointing instability of the beam: $\leq 0.03\ \text{mrad}$ (1σ , within one designation cycle);
- (8) Laser single-pulse energy fluctuation within one cycle: $\leq 10\%$ (excluding the first 2 seconds);
- (9) Laser ranging accuracy: $\pm 2\ \text{m}$;

- (10) Ranging frequency: once/1 Hz/5 Hz;
- (11) Detection rate: $\geq 98\%$;
- (12) Designation frequency: 20 Hz;
- (13) Laser coding: 1024 groups of fixed frequency codes, 4 groups of 1024-bit pseudo-random codes, 4 groups of 1024-bit PCM codes;
- (14) Designation coding accuracy: $\leq 2\mu\text{s}$;
- (15) Measuring distance: 200m - 9000m (visibility $\geq 15\text{km}$, $2.3\text{m} \times 2.3\text{m}$ target, target reflectivity $\geq 20\%$);
- (16) Continuous laser designation time
Single-shot mode: The designation time per shot is not less than 25s, the interval is not more than 15s, and continuous designation for 8 cycles;
Fast-shot mode: The designation time per shot is not less than 60s, the interval is not more than 60s, and continuous irradiation for 3 cycles;
After 8 single-shot cycles or 3 fast-shot cycles, the designation time interval: 30min.
- (17) Continuous laser ranging time: not less than 5min (1Hz), not less than 2min (5Hz);
- (18) Parallelism of laser optical axis to installation reference: $\leq 0.6\text{mrad}$ (perpendicular to the installation base surface direction);

3. Electrical Interface

- (1) Bus: One RS422 line, communication rate 115200bps;
- (2) Power supply: 28VDC, normal operating range 18V - 36V;
- (3) External synchronization signal: 422 differential level signal;
- (4) Synchronous output signal: 422 differential level signal or 5V TTL output;
- (5) Power-on control signal: 5V high-level enable input;
- (6) Power consumption: $\leq 40\text{W}$ (average power consumption, 20Hz), $\leq 5\text{W}$ (standby power consumption);
- (7) Power supply ground, digital ground, and chassis ground are isolated from

each other.

Product electrical interface definitions is provided in the appendix A.

4. Mechanical interface

(1) Dimensions: $\leq 98\text{mm} \times 65\text{mm} \times 52\text{mm} (\pm 1\text{mm})$. The overall shape of the product is shown in Appendix B;

(2) Weight: $\leq 550\text{g}$

5. General Standard

5.1 Reliability

Mean Time Between Failures (MTBF): 1800 hours.

5.2 Maintainability

The laser designator can be replaced as a complete part, and the average replacement time is less than 30 minutes.

5.3 Testability

It has internal BIT test measures, has online fault detection function, and reports self-check results.

5.4 Assurance

- a) Use maintenance manual;
- b) Control software and control cables.

5.5 Safety

The product has laser safety warning signs.

5.6 Environmental Adaptability

- 1) Operating temperature range: -40°C to $+60^{\circ}\text{C}$;
- 2) Storage temperature range: -55°C to $+70^{\circ}\text{C}$;
- 3) Maximum altitude: 4500m;
- 4) Vibration: Tested in accordance with GJB150.16A-2009 "Military Equipment Laboratory Environmental Test Methods";
- 5) Shock: Performed in accordance with the shock test regulations of

GJB150.18A-2009 "Military Equipment Laboratory Environmental Test Methods"; peak acceleration not less than 20g, half-sine pulse shock waveform, pulse width 11ms, in two directions of positive and negative axes, 3 times each direction, a total of 18 times;

6) Other usage environments must meet the requirements of relevant provisions in GJB150.xA-2009 "Military Equipment Laboratory Environmental Test Methods" and other related regulations.

Annex A

Interface definition

Connector type: J30JZ/XN21TJCAL01, 21P, L=300mm				
No.	Name	Interface definition	Signal flow	Remarks
1	28V+	Power supply +	Laser Designator←System	18~36V DC Power supply
2	28V+	Power supply +		
3	28V+	Power supply +		
4	GND_28V	Power supply -		
5	GND_28V	Power supply -		
6	GND_28V	Power supply -		
7	RS422_TX+	422 communication sent +	Laser	RS422 Differential signal, baud rate 115200bps
8	RS422_TX-	422 communication sent -	Designator→System	
9	RS422_RX-	422 communication received -	Laser	
10	RS422_RX+	422 communication received +	Designator←System	
11	GND1	422 communication ground	Designator←→System	
12	CLK+	External trigger +	Laser Designator←System	External synchronous input: RS422 differential signal
13	CLK-	External trigger -		
14	SY+	Light synchronization output +	Laser Designator→System	Optical synchronous output: RS422 differential signal / 5V_TTL signal (default 5V_TTL)
15	SY-	Light synchronization output -		

16	SD+	Power-on control +	Laser	Power-on enable: 5V high level is valid.
17	SD-	Power-on control -	Designator←System	
18	-	-	-	-
19	-	-	-	-
20	GND2	Signal ground 2	Laser Designator←System	Light synchronous output and external trigger signal ground
21	-	-	-	-

Annex B

