

SFC80A Laser Target Designator & Rangefinder

Technical Specifications

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1 Scope and Application

1.1 Scope

This specification defines the functional requirements, composition, technical parameters, and environmental conditions for the SFC80A Laser Target Designator & Rangefinder.

1.2 Application

This document applies to the ordering, manufacturing, acceptance testing, and delivery of the SFC80A Laser Target Designator & Rangefinder, serving as the contractual basis for procurement.

2 Referenced Standards

GJB 150A-2009	Environmental Test Methods for Military Equipments
GJB 151B-2013	Electromagnetic Emission and Susceptibility Requirements for Military Equipments and Subsystem
GJB 368B-2009	General Requirements for Maintainability of Military Equipment

3 Functional and Performance Specifications

3.1 Functional Capabilities

- (1) Laser ranging;
- (2) External synchronized coded Irradiation and internal coded Irradiation;
- (3) Built-in self-diagnostics (power-on self-test, startup self-test, periodic self-test) and status monitoring;
- (4) Power supply protection.

3.2 Performance Parameters

- (1) Laser Type: Non-temperature-controlled semiconductor pumped solid-state laser
- (2) Wavelength: $1.064\ \mu\text{m} \pm 0.003\ \mu\text{m}$
- (3) Energy: $\geq 80\ \text{mJ}$
- (4) Pulse Width: $15 \pm 5\ \text{ns}$
- (5) Startup Time: $\leq 1\ \text{min}$
- (6) Beam Divergence: $\leq 0.1\ \text{mrad}$
- (7) Single-Pulse Energy Stability: $\leq 8\%$ fluctuation (after 2s warm-up)
- (8) Ranging Accuracy: $\pm 5\ \text{m}$
- (9) Ranging Frequency: 5 Hz

- (10) Irradiation Base Frequency: 20 Hz
- (11) Built-in Encoding: 8 preset fixed-frequency codes
- (12) Encoding Precision: $\leq \pm 1 \mu s$
- (13) Ranging Distance (Ground-to-Ground, Large Targets): 300 m~25,000 m (Visibility ≥ 23 km, medium atmospheric turbulence, 6 km altitude, target reflectivity 0.2)
- (14) Continuous Irradiation: $\geq 60s$ per cycle, $\leq 60 s$ interval between cycles. Conduct continuous irradiation for two cycles. After 2 cycles, subsequent intervals: 30 min
- (15) Continuous Ranging: ≥ 1 min (5 Hz)
- (16) Parallelism between the laser optical axis and the installation reference plane: ≤ 0.6 mrad (laser beam axis/installation base misalignment)

4 Interfaces

4.1 Electrical Interfaces

- (1) Data Bus: 1-channel RS422 ,communication rate 115,200 bps
- (2) Power Supply: 28 VDC (Operating range: 22~32 V);
- (3) External Sync Signal: RS422 differential;
- (4) Power Consumption: $\leq 120W$ (peak).

The electrical interface definitions of the product are detailed in Appendix A.

4.2 Mechanical Interfaces

- (1) Dimensions: $\leq 150 \text{ mm} \times 102 \text{ mm} \times 55 \text{ mm}$ (3D model in Appendix B);
- (2) Weight: $\leq 860 \text{ g}$.

5 Quality Requirements

5.1 Reliability

Mean Time Between Failures (MTBF): 1,800 hours.

5.2 Maintainability

Full-unit replacement within ≤ 30 minutes.

5.3 Testability

Built-in BIT (Built-In Test) with real-time fault detection and status reporting.

5.4 Supportability

- a) Maintenance tools list, user manual, control software, and cables;

b) Control software, and cables.

5.5 Safety Compliance

Designed per GJB 900, GJB/Z99, and GJB/Z102.

5.6 Environmental Resilience

- 1) Operating Temperature: -40 ° C to +60 ° C;
- 2) Storage Temperature: -55 ° C to +70 ° C;
- 3) Max Altitude: 4,500 m;
- 4) Complies with GJB 150.xA-2009 for military environmental testing.

Appendix A

Connector model (system): J30JZLN15ZKWA000			
External connector model: J30JZ/XN15TJCAL01(L=300)			
PIN	Definition	Remarks	
1	24V+(DC22V~DC32V)	Positive 24V power supply	
2	24V+(DC22V~DC32V)		
3	24V+(DC22V~DC32V)		
4	24V+(DC22V~DC32V)		
5	24VGND	24V power ground	
6	24VGND		
7	24VGND		
8	24VGND		
9	RS422 Data Reception+	Laser Receiver for RS422	
10	RS422 Data Reception-		
11	RS422 Data Transmission-	Laser Transmitter for RS422	
12	RS422Data Transmission+		
13			
14	External Time Signal+	RS422+	
15	External Time Signal-	RS422-	

Appendix B

