

# SF-GXZ80 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 SF-GXZ80 Laser Target Designator & Rangefinder.

## 1.2 Application

This document applies to the ordering, manufacturing, acceptance testing, and delivery of the SF-GXZ80 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:  $\pm 5$  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  $\geq 23$  km, medium atmospheric turbulence, 6 km altitude, target reflectivity 0.2)
- (14) Continuous Irradiation:  $\geq 60$ s per cycle,  $\leq 60$  s interval between cycles. Conduct continuous irradiation for two cycles. After 2 cycles, subsequent intervals: 30 min
- (15) Continuous Ranging:  $\geq 1$  min (5 Hz)
- (16) Parallelism between the laser optical axis and the installation reference plane:  $\leq 0.6$  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:  $\leq 120$ W (peak).

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

### 4.2 Mechanical Interfaces

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

## 5 Quality Requirements

### 5.1 Reliability

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

### 5.2 Maintainability

Full-unit replacement within  $\leq 30$  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:  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ ;
- 2) Storage Temperature:  $-55^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ ;
- 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

