

CST-LTD-J1 30 Laser Target Designator



Features

Big pulse width: an output of 12ns under 130mJ

Small beam divergence: $\leq 0.16\text{mrad}$

Illumination: 2 long cycle and 8 short cycles at 60°C

Application

Applied in laser semi-active guidance, compatible with various integrated optoelectronic systems:

- Airborne, shipborne, and vehicle-mounted optoelectronic systems
- Electro-optical countermeasure system
- Weapon fire control system
- Ground-based optoelectronic reconnaissance system
- Portable individual soldier optoelectronic systems

Overview

It is developed based on our domestically leading high-energy all-solid-state laser technology solution. It employs a multi-configuration high-temperature LD array end-pumping Nd:YAG crystal combined with high-extinction-ratio electro-optic Q-switching technology to achieve typical 1064nm pulsed laser output with a single-pulse energy of 130mJ.

This product breaks through the technical bottleneck in China where high energy output could not be achieved simultaneously with large pulse width. Under the condition of 130mJ energy, the pulse width can stably maintain an output of 12ns. Additionally, a high-magnification laser beam expansion system is adopted to achieve a beam divergence angle of less than 0.16mrad.

The entire device can operate continuously within an ambient temperature range of $-45^{\circ}\text{C} \sim 60^{\circ}\text{C}$, meeting typical long-cycle (short-cycle) illumination requirements of 60s (30s) per single cycle with 40s (10s) intervals for 2 (8) cycles.

It can be mounted on airborne or other electro-optical pods to perform ranging and periodic illumination of targets, supporting the overall system in executing laser semi-active guidance missions.

Ranging/Illumination

Max Range ^[1]	$\geq 30\text{km}$
Min Range	$\leq 300\text{m}$
Accuracy	$\pm 2\text{m}$
Illumination Range	$\geq 12\text{km}$
Ranging Frequency	1~20Hz
Illumination Frequency	0~20Hz
Continuous ranging time	30min@5Hz
Illumination Model	Periodic
Illumination Time	Single cycle 60s (30s) interval 40s (30s) , 2 (8) cycles; rest 30 min after 2 (8) cycles
Laser coding pattern	Precision Frequency Code, Non-uniform Spacing Code, User-Definable Code Pattern
Encoding Accuracy	$\pm 1\mu\text{s}$

Environmental Adaptability

Operating Temp	$-45^{\circ}\text{C} \sim +60^{\circ}\text{C}$
Storage Temp	$-55^{\circ}\text{C} \sim +70^{\circ}\text{C}$
Vibration/Impact	Comply with MIL-STD-810H

Electrical Parameters

Power Supply	18~36VDC (typical 28V)
Device Power Consumption	Comms standby: $\leq 10\text{W}$
	TEC standby: $\leq 20\text{W}$
	Average: $\leq 120\text{W}$
	Peak: $\leq 300\text{W}$
Comms Interface	RS-422 (standard)
Baud Rate	115200bit/s

Laser Parameters

Type	LD-pumpedNd:YAG crystal
Cooling	Air-cooling with TEC
Wavelength	1064nm
Single pulse energy	$\geq 130\text{mJ}$
Energy Fluctuation	Room temp. 5% (RMSE) ; -45°C and $+60^{\circ}\text{C}$: 8% (RMSE)
Repetition Rate	0~20Hz adjustable
Pulse width	11~13ns
Divergence Angle	$\leq 0.16\text{mrad}$
beam axis instability	$\leq 0.05\text{mrad}$
Warm-up time	$\leq 30\text{s}$ (-45°C)
Safety Level	Class 4

MechanicalParameters

Weight	2.6kg
Dimension	275mm*127.5mm*77.5mm
Installation base/side Non-parallelism with the optical axis	$\leq 0.25\text{mrad}$ (pitch)
	$\leq 0.25\text{mrad}$ (Azimuth)

Note: visibility: 30 km on 2.3m×2.3m target, reflectivity is 0.3.