LWAS

Stationary system for testing laser warning systems



Fig. 1. LWAS test system

1 What is laser warning system?

A laser warning systems (LWS) is a warning system that detects and optionally locates directions of incoming laser emissions from potentially dangerous laser systems (laser designators, laser range finders, laser pointers). LWS are used in big numbers as a crucial part of active protection systems of military targets (aircraft, helicopters, ships, vehicles) or important civilian infrastructure. In detail, LWS is to activate various countermeasures like smoke, laser dazzlers, or weapons that enable protection of important military or civilian targets.
Requirements on laser warning systems depends mainly on type of laser range finder/designator to be detected. Old type LWS can detect only LRFs/designators built using high power- low frequency pulse lasers. Modern LWS can detect both LRFs/designators built using high power- low frequency pulse lasers (mono-pulse lasers) and LRFs/designators built using low power- high frequency pulse lasers (multi-pulse lasers).

2 What is LWAS system?

LWAS is an optical projector that emitts a calibrated uniform parallel optical beam to irradiate tested unit located at projector output. LWAS enables to irradiate tested LWS head using optical beam of precisely regulated pulse peak power, pulse time with, and pulse repetition frequency. Direction of incoming laser beam is also precisely known (it is equal to optical axis of LWAS collimator).
LWAS is a stationary test system optimized for use by manufacturers of LWSs at lab condition in contrast to portable LWAL system optimized for use by users of LWSs at field conditions. However, it should be noticed that in spite of smaller mass/size LWAL requires more space for tests because it need direct view of tested LWS from distance about 4-5m when distance LWAS to tested LWS is typically below 0.5m (both LWAS and LWS are on the same table.

3 Test capabilities

LWAS enables measurement two main parameters of LWS: minimal detectable irradiation, accuracy of detection angular direction of incoming laser beam. Measurement data can be used to calculate conditions when simulated laser system (LRF/designator) can activate laser warning system.

4 Modes of work

LWAS can be used for simulation two main groups of laser range finders/designators: 1) mono-pulse LRFs/designators, 2) multi-pulse LRFs. Therefore LWAS can work in two modes:
LWAS-A works emitting high power/low frequency laser pulses (mode A).
LWAS-B works emitting low power/ high frequency laser pulses (mode B).

5 Technical specifications

Table. 1. Parameters of LWAS working in mode A

Parameter	Value
Spectral band of laser source	1540nm (option: 1060nm)
Time width of light beam	Non regulated about 12ns

PRF	Regulated in range 1 – 10Hz
Range of intensity regulation	10W/m² to 50 kW/m²
Type of regulation	Step (four values)
Diameter of irradiance beam	At least 200mm at reference work distance (typically 0.5m)
Uniformity of irradiation	±10% in center 80% diameter ±20% in total field

Table. 2. Parameters of LWAS working in mode B

Parameter	Value
Spectral band of laser source	1060nm (option: 1550nm)
Time width of light beam	regulated 10 – 100ns
PRF	0.1kHz to 10 kHz
Range of intensity regulation	0.1W/m² to 20 W/m²
Type of regulation	Continuous (any value)
Diameter of irradiance beam	At least 200mm at reference work distance (typically 0.5m)
Uniformity of irradiation	±10% in center 75% diameter ±20% in total field

6 Versions

LWAS can be delivered in three main versions of different design and test capabilities:

1. LWAS-A for testing LWAS irradiated by mono-pulse lasers (majority of LRF/designators),
2. LWAS-B for testing LWAS irradiated by multi-pulse LRFs,
3. LWAS-AB for testing LWAS irradiated by both mono-pulse lasers and multi-pulse LRFs.

LWAS-AB is a bigger system built by combining two typical stations (LWAS-A and LWAS-B) controlled from the same controller (PC and software).

Version 1.3

CONTACT: Tel: +48 22 6668780 Fax: +48 22 3987244 Email: info@inframet.com