

# VED

## System for testing multi-sensor EO systems at field conditions

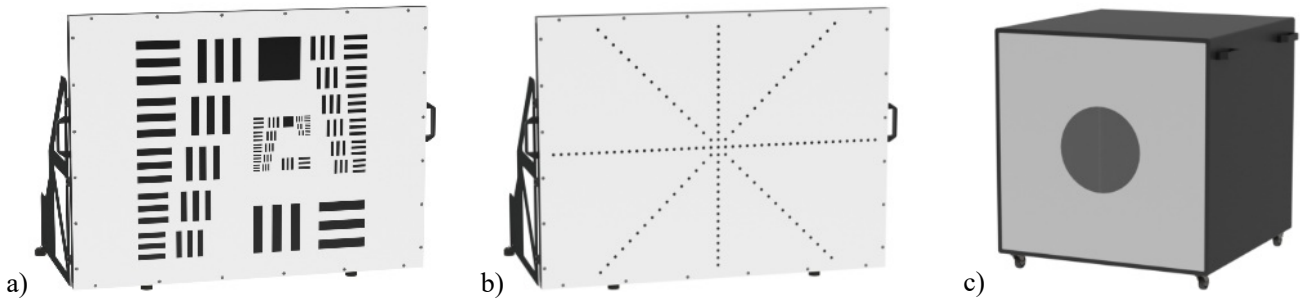


Fig. 1. View of three test stations of VED system

### 1 Introduction

Majority of electro-optical imaging/laser systems (multi-sensor imaging/laser systems) used for surveillance applications are small size/mass portable systems. Due to small mass/size they can be easily delivered for testing at laboratory/workshop conditions. Therefore great majority of Inframet test systems are systems optimized for tests at laboratory/workshop conditions.

However, significant portion of multi sensor imaging/laser systems used worldwide are systems mounted on different types of vehicles (optionally aircraft). Due to big size/mass and difficult disconnecting of such EO system from vehicle electrical/mechanical system it is difficult or often not possible to have such EO system at laboratory/workshop rooms where could be tested using typical test systems located on optical tables. Such vehicle mounted EO system must be tested at field/depot conditions. Therefore a new class of test systems is needed to enable testing vehicle mounted systems at field depot conditions.

### 2 Methods of testing vehicle mounted systems

Inframet uses three methods to carry out testing multi sensor EO systems at field/depot conditions:

1. VEMS system: modified collimator based MS test system (details of typical MS at [https://www.inframet.com/multi-sensor\\_systems.htm](https://www.inframet.com/multi-sensor_systems.htm)) mounted on a special elevating frame (see VEMS system)
2. Collimators based portable/mobile collimator test systems that can be easily transported and located opposite tested EO system (see LBOR or JAT200 [https://www.inframet.com/boresight\\_systems.htm](https://www.inframet.com/boresight_systems.htm))
3. VED system: set of direct-view non-collimator test stations located at significant distance from tested EO system that simulate real targets.

This data sheet presents a test system based on the third method.

### 3 What is VED system?

VED system is Inframet systems optimized for testing EO imaging/laser systems at field/depot conditions. It is built as a set of test systems located at significant distance (typical range 100-200m) from tested EO system that projects reference images to tested EO system or measure properties of laser beams emitted by lasers of tested EO system. simulate real targets during real work of EO system.



Fig. 2. Graphical concept of work of VED system (direct view of test station)

VED system can be used for expanded testing/boresight of both simple multi sensor systems (TI, VIS, LRF) or advanced multi sensor systems (TI, VIS, SWIR, LRF, LD, laser tracker, laser pointer).

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### 4 Versions of VED system

VED is a modular system that can be delivered in myriads of version optimized for testing virtually all multi sensor EO imaging/laser systems. Regulation of test capabilities is achieved by change of modules (independent test stations test systems).

Version of VED is determined using using ten digit code that describe test capabilities of VED station

Table 1. Coding of VED system

	A	B	C	D	E
	Testing thermal imagers	Testing VIS-NIR cameras	Testing SWIR cameras	Boresight TI to VIS-NIR	Boresight transmitter of monopulse LRF/LD to VIS-NIR
1	No	No	No	No	No
2	Basic: resolution	Basic: resolution	Basic: resolution	Yes	Yes
3	Expanded: MRTD	Expanded: MRC	Expanded: MRC		

	F	G	H	I	J
	Testing transmitter of monopulse LRF/LD	Boresight transmitter of multipulse LRF	Testing transmitter of multipulse LRF	Testing laser marker/pointer	Testing laser spot detector/tracker
1	No	No	No	No	No
2	Pulse energy	Yes	Pulse power/energy	Yes, power	Yes-Sensitivity
3	Pulse energy, pulse width time, PRF		Pulse power/energy, pulse width time, PRF		

Example code:

VED 22-12-21-11 means VED system capable to do

- measurement of resolution of thermal imagers,
- measurement of resolution of VIS-NIR cameras,
- boresight of TI to VIS-NIR,
- boresight of monopulse LRF to VIS-NIR camera
- measurement of pulse energy of monopulse LRF

### 5 Why VED?

There are many commercially available systems capable to do expanded testing/boresight at laboratory conditions. VED is probably the only one commercially available system capable to do expanded testing/boresight of advanced multi sensor EO imaging/laser systems at field/depot conditions.

Great advantage of VED is elimination of sensitive and bulky optical systems like reflective collimators. Therefore VED is much less sensitive to harsh environmental conditions comparing to typical test systems.

Much bigger test area is a certain disadvantage of VED system (test table in a room is replaced by narrow rectangle of length up to 200m to enable direct view of tests stations by tested EO system).

Version: 1.2

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