

System for testing multi imaging/laser systems

Questionnaire for potential buyers





The main application of MS test system is testing multi-imaging/laser system. If testing stand alone imagers (thermal imagers, VIS-NIR cameras, SWIR cameras or stand alone laser systems (LRF, pointers, designators) is the main application then please consider specialized test systems like DT, TVT, ST, LUNI, L64.

The questionnaire is divided into two part: 1)Basic questionnaire, 2)Detail questionnaire. The first part presents questions about basic features of tested multi imaging/laser system. The second part presents questions on details of design of multi-sensor systems. It is perfect if both parts are filled. However, even basic questionnaire gives valuable information about tested multi imaging/laser systems that enables to prepare optimal proposal.

Dear customer, please note that the higher number and ranges of the requirements marked in this questionnaire will have direct influence on the price of proposal version of MS test system.

1 Basic questionnaire

1. What is list of main types of multi imaging/laser systems to be tested?

Type	Image of exemplary device
<input type="checkbox"/> gimbal type multi imaging/laser systems,	
<input type="checkbox"/> pan-tilt type multi imaging/laser systems,	
<input type="checkbox"/> box type multi imaging/laser systems,	
<input type="checkbox"/> binocular/monocular portable multi imaging/laser system,	
<input type="checkbox"/> other:.....,	

If it is possible please attach the images of systems similar to your system (internet data).

2. What types of imagers are used to built multi imaging systems to be tested:

<input type="checkbox"/> LWIR	<input type="checkbox"/> MWIR	<input type="checkbox"/> VIS/VIS-NIR	<input type="checkbox"/> SWIR	<input type="checkbox"/> Other:
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3. What is aperture of biggest optical objective used by imagers in your system?

4. What are simulated illuminance conditions when testing VIS-NIR imagers/SWIR imagers Day

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Night Day & Night

5. Do your EO systems include lasers ? If yes, what types of lasers: LRF, laser designators, laser pointers? *Please note that if only multi imaging systems (several imagers combined) are to be tested then there is no needed to add many costly blocks.*

6. What is minimal diameter of a circle that overlaps totally optics of all sensors (imagers/lasers) of your multi-imaging/laser systems?

7. What is approximate minimal range to detect human target using your tested imagers?.....

8. What is approximate maximal range to detect human target using your tested imagers?

9. Do you want to check boresight of laser to imager? Yes, No

10. Do you want to test laser (measure performance parameters) Yes, No

Some customers what only to check boresight of laser to imagers. Measurement of performance parameters of lasers/LRFs – not needed.

11. Choose protection level of the test systems when high pulse energy lasers (pulse energy >10mJ) are tested:

<input type="checkbox"/> Low level: optical attenuators manually located at collimator output opposite laser	<input type="checkbox"/> High level: test system capable to withstand high pulse energy lasers even if user forgets to locate properly optical attenuators.
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Low protection level is typically offered by typical test systems. If user forgot to use properly located optical attenuator then collimator flat mirror or laser meters can be damaged when testing high pulse energy lasers (especially 1064nm pulsed lasers). High protection is offered by Inframet test systems based on modified collimator and laser meters that protect system even if attenuators are not used. High protection level is not needed when only low power multi pulse LRFs are to be tested.

12. What are your budget preferences

<input type="checkbox"/> Cheapest option	<input type="checkbox"/> Typical version comparable to offered on the world market	<input type="checkbox"/> Advanced option
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2 Detail questionnaire

1. Please fill in the table with detail informations about imaging systems to be tested:

Spectral range	Maximum aperture	Nyquist frequency	Parameters to be measured	
<input type="checkbox"/> LWIR	Min.: Max.:	<input type="checkbox"/> MRTD <input type="checkbox"/> NETD <input type="checkbox"/> SiTF	<input type="checkbox"/> FOV <input type="checkbox"/> Other:
<input type="checkbox"/> MWIR	Min.: Max.:		
<input type="checkbox"/> VIS/VIS-NIR	Min.: Max.:	<input type="checkbox"/> Resolution <input type="checkbox"/> MRC (for performance of VIS-SWIR imager against low	<input type="checkbox"/> FOV <input type="checkbox"/> Other:
<input type="checkbox"/> SWIR	Min.:		

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		Max.:	contrast targets) <input type="checkbox"/> SiTF <input type="checkbox"/> NEI	
<input type="checkbox"/> Other:	Min.: Max.:	<input type="checkbox"/> Other:	

2. What is preferable spectrum of light source used to test VIS-NIR/SWIR imagers Halogen Polychromatic 2856K, 0.4 – 2 μm or LED Polychromatic >5000K, 0.4 – 0.9 μm?

Halogen source offers wider spectral band. LED source offers more realistic day illuminance conditions and much longer life time.

3. What are types of boresight errors of your multi-imaging/laser systems are to be tested?
- Imager to imager (example: misalignment between thermal imager and VIS-SWIR imager),
 - Imager to laser (misalignment between thermal imager and transmitter of laser range finder)
 - Imager to reference mechanical plane (valid for imagers having such reference mechanical plane).

4. Please fill in the table with informations about laser systems to be tested:

Type	Type	Wavelength	Pulse energy	Parameters to be measured
<input type="checkbox"/> Pulsed	<input type="checkbox"/> Mono-pulse laser range finder (low PRF, high pulse energy) <input type="checkbox"/> Multi-pulse laser range finder (high PRF, low pulse energy) <input type="checkbox"/> Laser designator <input type="checkbox"/> Other:	<input type="checkbox"/> 910 nm <input type="checkbox"/> 1064 nm <input type="checkbox"/> 1540 nm <input type="checkbox"/> 1550 nm <input type="checkbox"/> 1570 nm <input type="checkbox"/> Other:	<input type="checkbox"/> <1mJ <input type="checkbox"/> <10mJ <input type="checkbox"/> <100mJ	Transmitter channel: <input type="checkbox"/> Pulse energy <input type="checkbox"/> Beam divergence angle <input type="checkbox"/> Pulse peak power <input type="checkbox"/> Pulse width <input type="checkbox"/> PRF <input type="checkbox"/> Other: Receiver channel: <input type="checkbox"/> Distance simulation <input type="checkbox"/> Distance accuracy <input type="checkbox"/> Other:
<input type="checkbox"/> Continuous	<input type="checkbox"/> Laser pointer <input type="checkbox"/> Other:	<input type="checkbox"/> 0.4 – 1.1 μm <input type="checkbox"/> 0.9 – 1.7 μm <input type="checkbox"/> Other:	<input type="checkbox"/> <1W/mrad ² <input type="checkbox"/> <10W/mrad ² <input type="checkbox"/> <100W/mrad ²	<input type="checkbox"/> Optical mean power <input type="checkbox"/> Beam divergence angle <input type="checkbox"/> Other:

5. Do you need optical table to be delivered by Inframet

- No Optical table for test system Optical table for test system and tested system:

Required space for tested system:

6. What are video interfaces used by tested imagers (mark up to four interfaces):

7. Please fill in the table with informations about other informations about systems to be tested:

<input type="checkbox"/> Analog <input type="checkbox"/> USB 2.0 (DirectShow) <input type="checkbox"/> USB 3.0 (DirectShow, Gemicam) <input type="checkbox"/> Camera Link
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- HD-SDI/HDMI
- LVDS
- GigE
- CoaXPress
- Custom:

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Special conditions

- 8. Will the tested system be used in vacuum chamber ? Yes, No
- 9. Will the tested system be used in cleanroom? Yes, No
- 10. Will the tested system be used in temperature chamber? Yes, No

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