TAIM

Testers of thermal sights and clip-ons

Fig.1. Photos TAIM system

1 BASIC INFORMATION

DT series systems are the most popular quasi universal Inframet stations for testing testing of surveillance thermal imagers. All main types of thermal imagers can be tested: thermal cameras used as independent device or as blocks of multi-sensor systems, portable thermal binoculars/monoculars, thermal sights or thermal clip ons. From design point of view DT system is delivered as image projector and computer system for system control and analysis of output electronic image. Customer is typically responsible to deliver proper stage for tested thermal imager, proper table for both DT system and tested imager, and all other tools needed for proper positioning imager to test system. TAIM can be treated as a version of DT systems optimized for testing typical small size thermal sights or thermal clip ons.

2 BASIC INFORMATION

TAIM is built as typical DT120 test system (used as image projector and image analysis computer system) with a set of additional blocks: Picatinny rail for tested tested sight/clip on, set of three HEC cameras to do capture image from tested sight/clip on, AHEC adpter for positioning of HEC cameras, YNAS10 stage as an angular platform for both tested sight/clip on and the HEC cameras, VDT variable distance target, DPM diopter power meter, AT720 optical table, and some additional software to analyse images from HEC cameras.

These additional blocks convert typical DT120 system into a new test system of new features:

1. Ability to measure some paramers (MTF, FOV, distorion) of thermal sights/clip ons not only using electronic image output but by analysis of output image presented on device display,
2. Ability to measure defection angle of thermal clip ons (angular shift of passing parall beam)
3. Ability to measure range of regulation of diopter power of ocular of thermal sight
4. Ability to check if minimal focus distance is below simulated short distance
5. Ability to check if there is any image shift when focusing from infinity to simulated short distance
6. Easy mounting of tested thermal sight/clip on on Picatinny rail of regulated angular position,
7. CDT12100 collimator of aperture and focal length optical for testing typical thermal sights/clip on of optics below 120mm,
8. TCB-2D blackbody delivered in special version with internal illumination in visible light,
9. Delivery of expanded test system that does not need any additional parts to start tests of thermal sights/clip ons of optics below 120mm.

To summerize, TAIM can be considered as near perfect system for expanded testing and boresight of thermal sights/clip ons available on international market.

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3 SYSTEM STRUCTURE

TAIM test system is a modular system built using a series of blocks:

1. CDT12100HT off axis reflective collimator (other collimators of different aperture, focal length can be delivered). Details at http://www.inframet.com/Data%20sheets/CDT.pdf
2. TCB-2DV differential blackbody – special version of TCB-2D blackbody with illumination of its emitter). Details as in https://www.inframet.com/Data%20sheets/TCB.pdf
3. MRW-8 motorized rotary wheel (optimized for cooperation with a set of IR targets). Details as in http://www.inframet.com/rotary_wheels.htm
4. Set of IR targets (typically set of eight 4-bar targets, edge target, dot cross target, cros target). Details as in http://www.inframet.com/targets.htm
5. PBP passive blackbody plate (special passive are blackbody used during noise/sensitivity tests of thermal imagers)
6. Analog video frame grabber for capturing analog video image (http://www.inframet.com/computing_system.htm). Optional digital frame grabbers are possible: Camera Link, GigE , LVDS, HD-SDI/DVI/HDMI, AHD/HD-TVI/HD-CVI, CoaXPress, USB2.0, USB3.0, Ethernet.
7. PC set - typical PC/laptop working under Windows 7/10 operating system (with installed frame grabbers and tested by Inframet to check compatibility with the grabbers and Inframet software).
8. High performance analog video monitor for subjective image quality tests of tested imagers
9. TCB Control - computer program used for control of TCB blackbody and MRW wheel
10. SUB-T program - computer program that offers software support during measurement of subjective parameters like MRTD, MDTD (TOD - option)
11. TAS-T - computer program used for semi-automatic measurement of a series of objective parameters of thermal imagers: MTF, SiTF, NETD, FPN, non uniformity, distortion, FOV, magnification. Other paramters optional.
12. Picatinny rail for tested tested sight/clip on,
13. set of three HEC cameras to do capture image from display of tested sight/clip on,
14. AHEC adpter for positioning of HEC cameras,
15. YNAS10 stage as an angular platform for both tested sight/clip on and the HEC cameras,
16. set of three VDT variable distance targets,
17. DPM diopter power meter to measure range of regulation of diopter power of ocular of thermal sight
18. AT720 optical table to work as a platform for both TAIM and the tested devices. Technical details as in https://www.inframet.com/Data%20sheets/AT.pdf

4 TEST AND BORESIGHT CAPABILITIES

TAIM offers expanded testing and borsight of thermal sights and thermal clip ons of optical aperture not higher than 120mm. The tests can be carried out using analysis of image captured from electronic output or image captured from display of tested device.

A. Tests on basis of analysis of image captured from electronic output:

1. Measurement of MRTD, MTF, NETD, FPN, non uniformity, FOV, distortion
2. Checking if minimal focus distance if below simulated distance
3. Checking if there is any image shift when focusing from infinity to simulated short distance

B. Tests on basis of analysis of image captured from display:

1. Measurement of MRTD, MTF, FOV, distortion, magnification of therma sights/ clip ons,
2. Measurement of deflection angle and image rotation of thermal clip ons,
3. Measurement of range of regulation of diopter power of ocular and accuracy of diopter scale,
4. Checking if minimal focus distance if below simulated distance,
5. Checking if there is any image shift when focusing from infinity to simulated short distance.

5 SUMMARY

TAIM is the best system for testing thermal sights and thermal clip ons available on international market. It offers test and boresitht capabilties not met in case of typical test systems.

Version 1.2

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