

MIM

Simple tester of multi-sensor imaging systems



Fig. 1. Photo of MIM110 test system

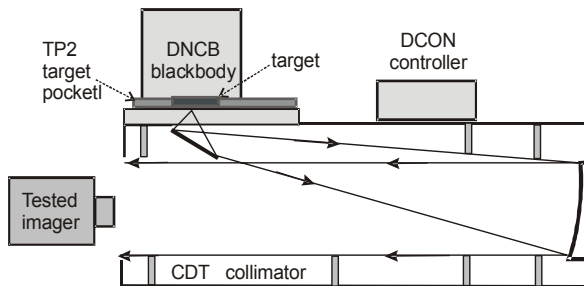


Fig. 2. Block diagram of MIM test system

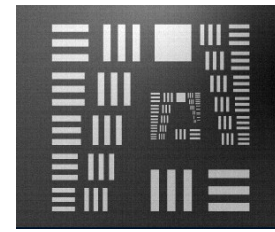


Fig. 3. Image of IR USAF1951 target

BASIC INFORMATION:

Inframet offers MS series test systems based on high performance DCB dual-color blackbodies that work at the same time as typical blackbody and as a typical light source for testing multi sensor imaging systems (typically thermal imager combined with VIS-NIR camera). These test systems offer accurate measurement of a long series of parameters of such imaging systems (see http://www.inframet.com/multi-sensor_systems.htm). However, MS systems are expensive. Therefore Inframet offers also, low cost MIM systems based on a simpler DNCB non calibrated dual-color blackbodies. Test capabilities of MIM are significantly limited comparing to classical MS systems. Therefore MIM is a perfect tool for manufacturers of multi sensor imaging systems or maintenance workshops that need simple, low cost tool to check focusing, resolution, sensitivity and boresight errors of tested multi-sensor imaging system.

DESIGN

MIM is a modular system built is from five main blocks: CDT off axis reflective collimator, DNCB blackbody . DCON controller, TP2 target pocket, and a set of targets. Optionally PC set can be delivered to analyse data from tested imager. MIM works as an image projector that projects images of a target located at collimator focal plane and irradiated by the DNCB dualcolor blackbody. Targets are manually exchanged using TP2 target pocket but optionally motorized MRW8 wheel can be used.

Thermal contrast of projected images can be regulated using DCON controller by changing temperature of DNCB blackbody. Both positive and negative thermal contrast can be achieved. Light intensity in VIS-NIR band can be regulated too. It should be noted that DNSB is a non calibrated dual-color blackbody. User can regulate of temperature and light intensity of the emitter but it is relative regulation when user does knows current fraction of regulation stimulus but not absolute value of temperature/luminance.

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TEST CAPABILITIES

B basic version of MIM enables following tests:

1. infinity focusing of both thermal imagers and VIS-NIR camera
2. measurement of resolution and relative sensitivity of thermal imagers,
3. measurement of resolution and relative sensitivity of VIS-NIR cameras,
4. checking boresight errors between thermal imager and VIS-NIR cameras.

Test capabilities can be optionally expanded to enable also measurement of MTF, FOV, distortion, magnification of both thermal imager and VIS-NIR camera and MRC of VIS NIR cameras.

VERSIONS

MIM test systems are modular test systems that can be delivered in form of different versions of slightly different configurations. The basic division of MIM series system is based on output aperture of the collimator: MIM110 means collimator aperture equals 110mm. Collimators of HR class and of aperture up to 250mm are typically offered.

TECHNICAL SPECIFICATIONS

Technical specifications of of MIM test station are presented below.

Collimator	CDT11100HR; CDT15150HR; CDT20200HR; CDT25250HR (optional cheaper SR class possible too)
Collimator type	reflective, off-axis
Aperture	Depends on model from 110mm to 250mm
Focal length	Depends on model from 1000mm to 2500mm
Spectral range	0.4-15 um
Spatial resolution	not less than 100 lp/mrad
Mirror manufacturing accuracy	L/6 at 630 nm P-V for HR class collimators
Coating	Protected aluminum
Field of view	Depends on model from 1.3° to 2.7° details at http://www.inframet.com/Data%20sheets/CDT.pdf
Operating temperature	10°C to 35°C
Dimensions	Depends on model from about 610x140x210 to 2610x350x400
Mass	Depends on model from about 7 kg to 50 kg
Blackbody	
Type	Non calibrated, relative regulation
Emitter dimensions	At least 35x35 mm
Emissivity	≥ 0.95
Differential temperature range	At least -10°C to +10°C from ambient
Luminance range	At least up to 500 cd/m ²
Dimensions	From 100x110x130 mm
Mass	3.5 kg
Targets	
Number and types of targets	Three targets: negative contrast USAF1951 IR target, positive contrast USAF1951 target, pinhole target
Metal USAF 1951 target	Substrate -metal sheet with holes Spatial frequency of 3-bar patterns of in range 1,00 – 14,30 lp/mm
Glass USAF1951 target	Substrate -glass plate with opaque patterns Spatial frequency of 3-bar patterns of in range 1,00 – 57 lp/mm
Pinhole target	Hole diameter: 0.5 mm (optional different sizes)

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Other parameters

Power supply	220/110 VAC 50/60Hz
Operating temperature	+5°C ÷ +35°C
Mass	Depends on model from about 17 kg to 60 kg

OPTIONS

Following options are possible:

- A) MRW8 motorized rotary wheel to replace manual TP2 target pocket
- B) Additional set of targets.
- C) PC set, frame grabber and software to expand test capabilities.

Please contact Inframet for details on options.

Version 1.2

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