

TRAL

Tester of discrete IR detectors

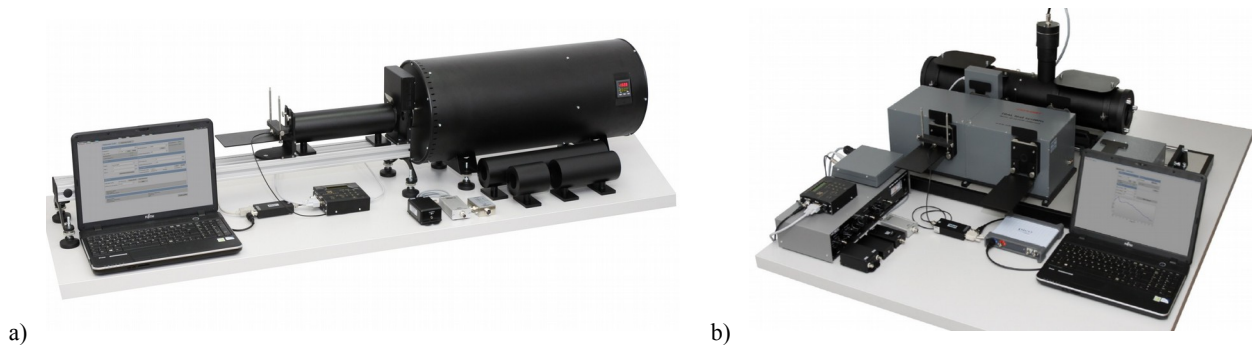


Fig. 1. Photo of TRAL station a) radiometric configuration, b) spectral configuration

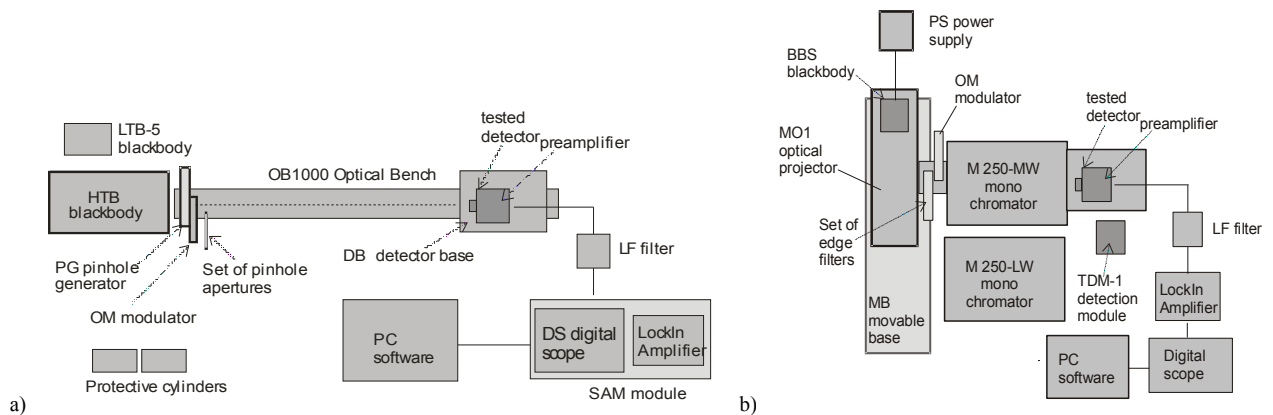


Fig. 2. Block diagram of TRAL test station: a) radiometric configuration, b) spectral configuration

BASIC INFORMATION:

TRAL test station is a quasi-universal test station designed to measure parameters of discrete (or small linear array) infrared detectors sensitive in a wide spectral range from about 700nm to about 16 000 nm (NIR/SWIR/MWIR/ LWIR detectors or broadband non selective detectors). All main types of infrared detectors can be tested: photonic detectors: photovoltaic/photoreconductive, cooled/non-cooled, thermal detectors, pyroelectric detectors etc.

TRAL test station is a modular system that can work in work in three main configurations: Radiometric configuration, Spectral configuration, and Spatial configuration. The latter one is considered as an optional configuration. Each configuration enables measurement a different set of parameters of discrete/linear infrared detectors.

In radiometric configuration TRAL station irradiates tested IR detector using a modulated beam. The detector generates output electrical signal proportional to power of incoming infrared radiation. Analysis of measured output electrical signal and power of radiation incoming to tested detector enables calculation of radiometric parameters of tested detector: blackbody responsivity, responsivity, blackbody detectivity, normalized detectivity, NEP, dark current, Quantum Efficiency.

In spectral configuration TRAL station irradiates the tested detector using variable wavelength, variable intensity radiation. Analysis of electrical signal at output of tested IR detector enables determination of relative spectral sensitivity of this detector.

Spatial configuration is used to determine spatial parameters of IR detectors: modulation transfer function MTF and responsivity non uniformity. In this mode TRAL projects images of edge/pinhole targets of controlled intensity and spatial position on tested detector. Analysis of signal generated by the detector enables determination of both MTF and non uniformity.

TRAL test station can be also optionally used for testing thermophotovoltaic cells.

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FEATURES:

- Universal test station capable to test all main types of infrared detectors.
- All important parameters of infrared discrete/linear detectors can be tested.
- PC controlled test station. Important blocks like monochromator, blackbody, modulator, acquisition system are controlled from PC.
- User friendly software to support semi automatic measurement of parameters of IR detectors.

TEST CAPABILITIES:

1. Radiometric parameters: blackbody responsivity, responsivity, blackbody detectivity, normalized detectivity, NEP, Dark current, Quantum Efficiency.
2. Spectral parameters: relative spectral responsivity
3. Spatial parameters: modulation transfer function and non uniformity.

VERSIONS:

TRAL test stations are modular test systems that can be delivered in form of different versions of different test capabilities and price.

Three letter code shown in Tab.1 is used to describe TRAL versions. The columns 1-3 present what letters are to be chosen to define precisely required version of ST test system.

As we see in this table by changing letters from A to C we increase test capabilities of TRAL test system but also the cost is increased.

Tab. 2. Definitions of the code used to describe versions of TRAL test system

Code	1	2	3
	Test capabilities	Spectral range	Detector type
A	Only radiometric parameters	2000-16000nm	Photovoltaic/photoconductive detectors
B	Only spectral parameters	700-6000nm	Photovoltaic/photoconductive/pyroelectric/thermal detectors
C	Radiometric parameters and spectral parameters	700-16000nm	Photovoltaic/photoconductive/pyroelectric/thermal detectors and additionally Thermophotovoltaic cells
D	Radiometric parameters and spectral parameters and spatial parameters	2000-6000 nm	Photovoltaic

Example: TRAL CAA test station means the TRAL test station of the following features:

- 1) test capabilities: measurement of both radiometric and spectral parameters
- 2) testing infrared detectors sensitive in spectral band 2000nm to 16000nm
- 3) type of tested detectors: photovoltaic/photoconductive detectors

Data sheet version 1.3

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