HGH

Enlighten the Unseen

BIRD

→ Test of IR detectors

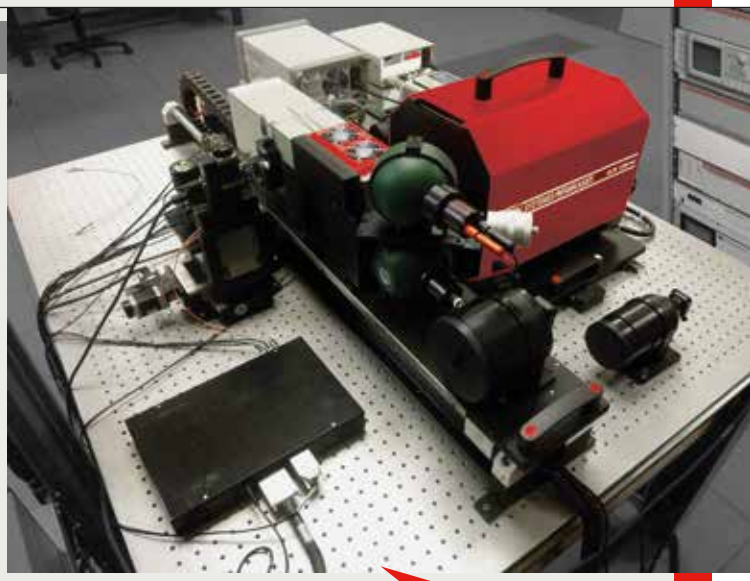
BIRD 210™

UNIVERSAL ELECTRO-OPTIC TEST BENCH for IR DETECTORS

APPLICATIONS AND CHALLENGES

Testing detectors requires the implementation of **ultra-low noise** driving electronics and presenting **high quality optical stimuli** to the detector under test. The BIRD 210 meets all these requirements and allows to test any type of detector by easily implementing the detector's driving signals and providing exhaustive and accurate measurement results:

- Noise tests: fixed pattern noise, temporal noise, NETD, responsivity, detectivity, 3D-noise, 2D-detectivity,
- Dynamic range, linearity,
- Non-uniformity correction,
- Bad pixel localisation,
- Spectral response,
- Crosstalk, MTF.

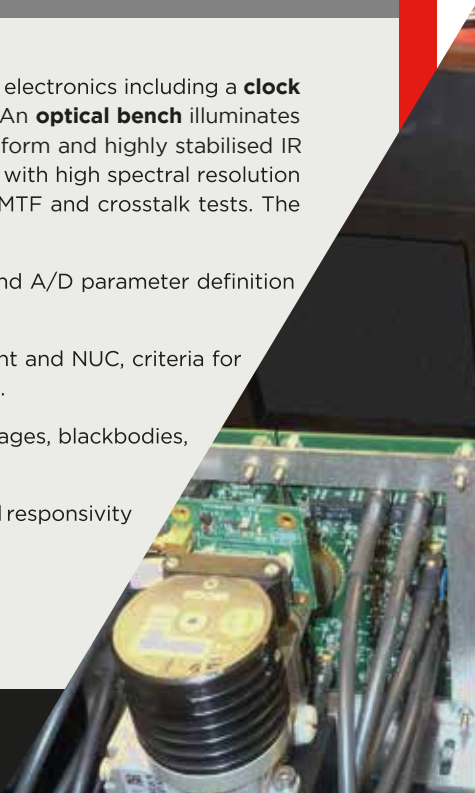


→ BIRD optical bench

KEY FEATURES

The BIRD210 bench consists of an **electronic cabinet** equipped with a set of ultra-low noise electronics including a **clock signal generator**, a **bias voltage unit** and a **high frequency analogue to digital converter**. An **optical bench** illuminates the detector under test with accurate and calibrated optical signals: a low temperature uniform and highly stabilised IR reference source for noise measurements, NUC and bad pixel tests, an adjustable IR source with high spectral resolution for spectral response measurements and an aberration-free pinhole or thin slit source for MTF and crosstalk tests. The **BIRD software** has the following features:

- User–friendly interface for clock signal design, pixel remapping, bias voltage settings and A/D parameter definition and application of these parameters and signals to the detector,
- Setting of parameters for testing functions such as temperatures for noise measurement and NUC, criteria for bad pixel localisation (up to 6 criteria), spectral range for spectral response analysis, etc.
- Automatic control of the opto-mechanical elements of the optical bench (translation stages, blackbodies, monochromator) depending on the selected functions and the corresponding settings,
- Acquisition and processing of the detector's video signal, including the exclusive noise and responsivity optimisation as a function of the bias voltage values,
- Display and recording of the complete tests results.



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UNIVERSAL ELECTRO-OPTIC TEST BENCH | **for IR DETECTORS**

→ BIRD software

→ BIRD electronic cabinet

CONFIGURATIONS AND TECHNICAL DATA

Multi-configuration is achieved thanks to an optical table equipped with a mechanical system for the selection of sources. The basic equipment for noise tests configuration of BIRD210 includes:

- Bias voltage unit,
- Clock signals generator,
- Analog to digital converter,
- Computer with acquisition board and BIRD software,
- DCN1000H4 low temperature blackbody.

BIAS VOLTAGE UNIT - BIAS 20LN	
Number of channels	Configurable from 4 to 20
Voltage range	± 12 V
Maximum output current	150 mA (500 mA in option) with current limiting function
Output noise	Lower than 100nV/√Hz at 10 Hz
PATTERN GENERATOR – PATTERN 3250	
Number of channels	32
Maximum frequency	50 MHz
High level voltage	1.8V, 2.5V, 3.3V, 5V (user-selectable through software)
Memory	8Mbit per channel, programmable, cycle reading without limitation
ANALOG TO DIGITAL CONVERTER - ADC16 80	
Number of channels	Configurable from 4 to 16
Noise level (average)	200 µV
A/D rate per channel	80 Mpixels/s
A/D dynamic range	16 bit

MTF/CROSSTALK CONFIGURATION

- RCN1200N1 high temperature cavity blackbody,
- Aberration-free F/1.5 Cassegrain optics and/or F/1 LWIR optics,
- Set of 8 thin slits and pinholes,
- Three motorized translation stages with 1 µm resolution assembly for accurate selection of pixel.

SPECTRAL RESPONSE CONFIGURATION

- RCN1200N1 high temperature cavity blackbody,
- Monochromator equipped with gratings and filters to cover the 1.1 µm to 12 µm spectral range (additional gratings and filters in option to cover the 0.4 µm to 18 µm spectral range). Typical spectral resolution: 1%.
- Spectral response calibration set including chopper, pyroelectric detector and lock-in amplifier.

VISIBLE DETECTORS CONFIGURATION

- Visible CMOS detector can be tested through the addition of visible sources to the above configurations.

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