ELECTRO OPTICAL
TEST SOLUTIONS

IRCOL Test Bench

Versatile test bench for all electro-optical systems

HGH

Enlighten the Unseen

IRCOL Test Bench

CUSTOMIZABLE TEST BENCH FOR ELECTRO-OPTICAL SYSTEM

BUILD UP YOUR CUSTOM TEST BENCH

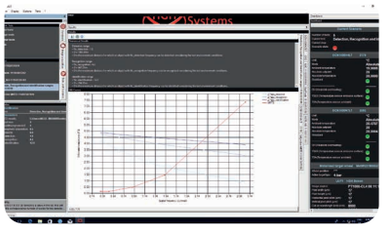
The IRCOL system is a test equipment dedicated to the characterization and performance validation of **any Electro-Optical system:** visible to SWIR cameras, Night Vision devices, Thermal imagers, laser Rangefinders, multi-axes sighting devices.
The core of the IRCOL system is the **IRCOL collimator** including:

- an off-axis mirror-based projector including a **wide clear aperture**
- **The best wavefront flatness** and a high transmittance covering a **wide spectral range** from near ultraviolet (UV) to far infrared (IR)
- A multi position motorized wheel enabling accurate test targets settings (collimator focus)

Multiple options, accessories and configurations are available to set up the bench optimized for your electro-optical systems testing needs:

- Targets (with various patterns)
- Blackbody sources
- Integrating sphere sources
- Laser rangefinder testing devices
- Auto-collimation module
- Equipment under test azimuth and elevation adjustment tools…

FULLY CONTROLLED BY INFRATEST SOFTWARE



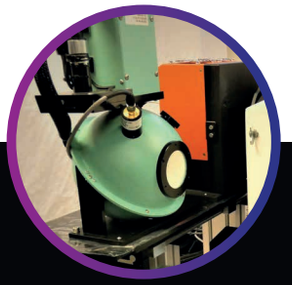
The INFRATEST software completes the IRCOL system, for the **automated control** of the bench and the computation of an exhaustive range of measurements: noise functions, NETD and other signal resolutions, bad pixel location and non-uniformity correction, MTF and spatial resolution data, distortion, MRTD, TOD, MRC and ranges calculation, multiple axes alignment control and laser rangefinder accuracy measurement and many other functions.

IRCOL SYSTEM BENEFITS

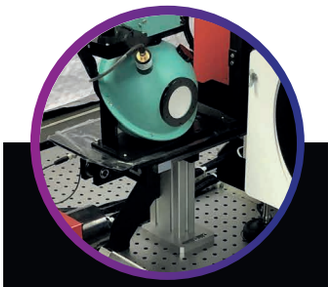
- Compatible with any blackbody and any Integrating Sphere Source (ISV) from HGH catalogue (all size or temperature supported)
- Customized targets with multiple pattern capabilities
- Accurate background temperature knowledge through target temperature measurement or reflective configuration with background simulating blackbody
- Accurate measurements at the center or at the edge of the field of view of the camera
- Fully automated bench controlled by INFRATEST software
- Exhaustive range of testing functions with proven algorithms applicable for any electro-optical equipment
- Short delivery time

IRCOL Test Bench

THE ULTIMATE VERSATILE PLATFORM FOR ELECTRO-OPTICAL TESTING

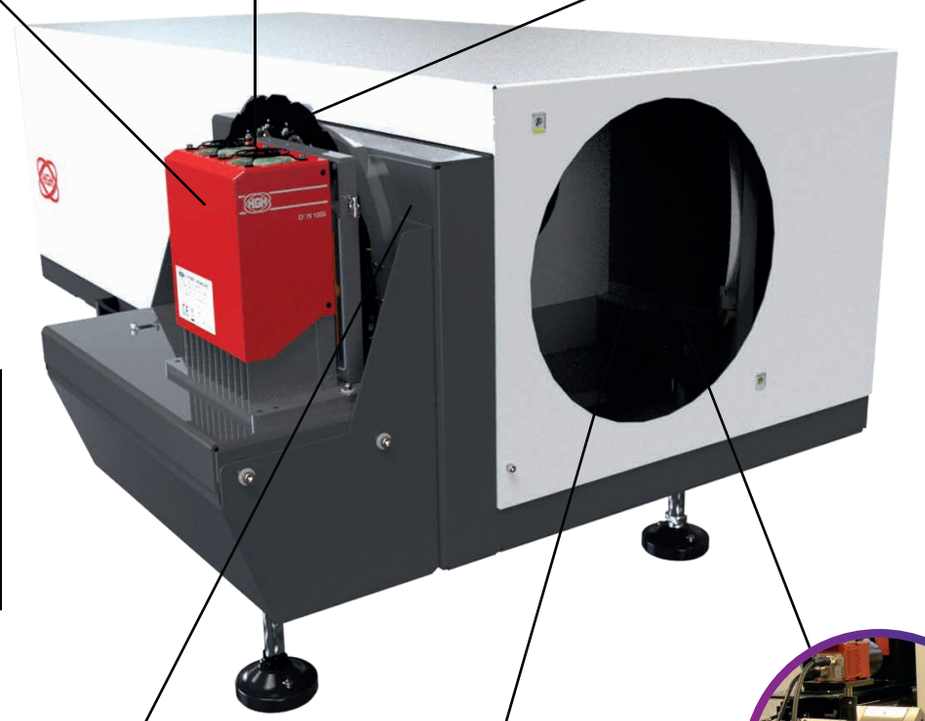


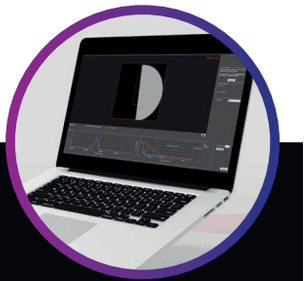
Source selection among the HGH catalogue:
- DCN1000
- ECN100
- RCN
- ISV



Multi sourcing configuration: Automated selection of the sources

Adjustable projected distance through motorized target position selection along the optical axis: from 100 m to infinity

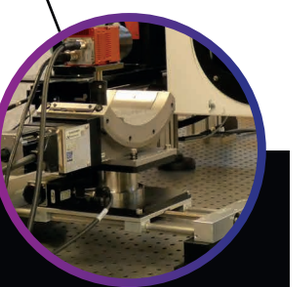




Full automation testing with INFRATEST software features

Exclusive automated auto-collimator module for mechanical axis vs. optical axis alignment check

Laser rangefinder dedicated testing tools for alignment check, power and energy measurement, divergence and distance accuracy



Azimuth, elevation and translation stages for high accuracy distortion and field of view measurement

IRCOL Test Bench

BEST CONFIGURATION FOR YOUR APPLICATION

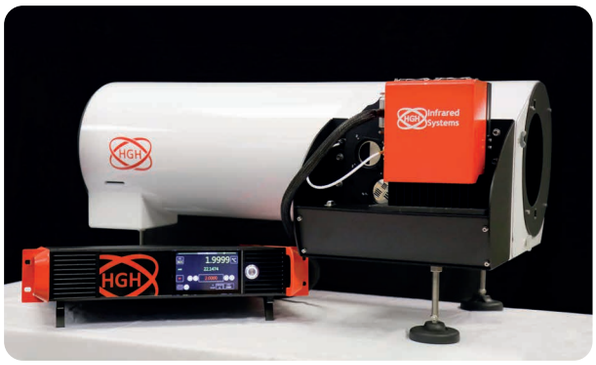
MAIN CONFIGURATIONS AND APPLICATIONS

IRCOL-FLIR Testing bench for cooled and/or uncooled IR thermal imagers

Get the essential measurements of your IR camera whatever its performances thanks to the multiple features of the IRCOL-FLIR configuration. With its easy-to-use and proven design, the IRCOL-FLIR is the main tool of your lab or your production line.

Configuration:

- IRCOL 150/1000 collimator
- Set of targets: knife-edge, multiple 4 bar patterns, hole
- DCN1000H4 blackbody source
- INFRATEST Camera Pack



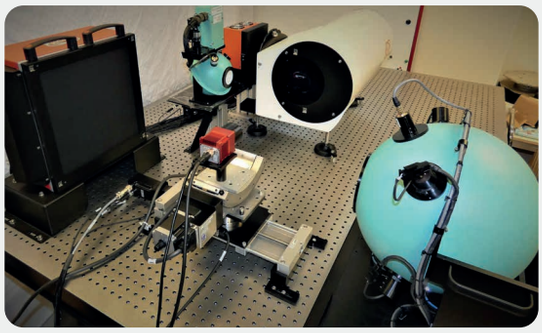
Typical measurement capabilities:

- Noise measurements: temporal, FPN
- NETD
- Bad pixels location and NUC matrix calculation
- Spatial resolution: LSF/MTF
- MRTD curve and range calculation

IRCOL-WFOV Testing bench for Wide field of view IR and visible cameras

A fully automated bench providing accurate measurements of demanding parameters such as the distortion or the resolution at the edge of field of view. The IRCOL-WFOV is an affordable, more accurate and multispectral alternative to lens based projectors.

Configuration:



- IRCOL 150/750 collimator
- Set of targets: knife-edge, multiple 4 bar patterns, hole, USAF 1951 with various contrasts
- DCN1000H4 blackbody source and ISV210 visible source
- Motorized source selection
- Azimuth and elevation stages for camera under test
- INFRATEST Camera Expert Pack

Typical measurement capabilities:

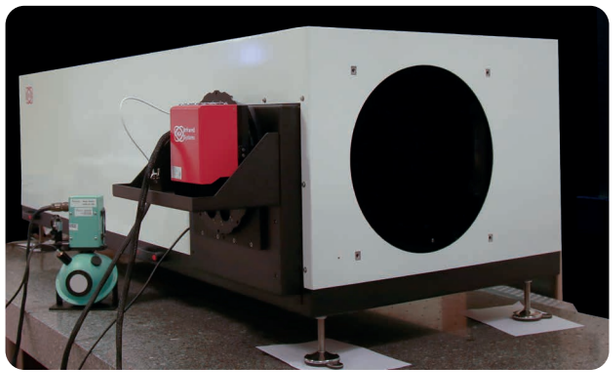
- MRC curve at center and edge of the field of view
- MRTD curve and range calculation at center and edge of the field of view
- Distortion and field of view also for fisheye cameras
- Spatial resolution: LSF/MTF

IRCOL-LRF Testing bench for EO payload with IR camera and eye safe LRF

The IRCOL-LRF is the most complete configuration of the IRCOL test benches allowing the realiable measurement of the parameters of the most demanding electro-optical systems.

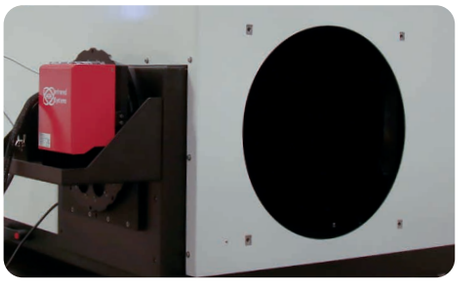
Configuration:

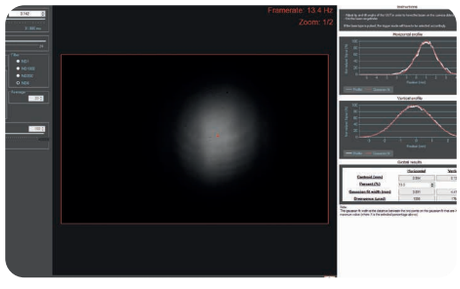
- IRCOL 400/2500 collimator
- Set of targets: knife-edge, multiple 4 bar patterns, hole
- LRF testing kit with LRDS 80 10 distance simulation unit
- DCN1000H4 blackbody source and ISV210 visible source
- INFRATEST Camera Pack and INFRATEST Laser Pack



Typical measurement capabilities:

- Alignment between transmitter and camera axis
- Laser power and energy
- LRF distance measurement accuracy
- Spatial resolution of the camera: LSF/MTF
- MRTD curve and range calculation at center and edge of the field of view





LASER RANGEFINDER TESTS FOCUS

The IRCOL system includes multiple tools for laser rangefinder and laser pointer testing. They support all laser types, including eye safe.

- Phosphor or IR emitting targets for alignment check between camera and transmitter
- Auto-collimator assembly with camera for alignment and divergence measurement
- Power meter and Joulemeter for laser power and energy measurement
- Fiber optic line for distance correctness measurement
- Exclusive LRDS 80 10 unit for high accuracy distance correctness measurement:
  - Simulated distance range: from 75 m to 40 km
  - Simulated distance accuracy: 1 meter

IRCOL Test Bench

SERVICES

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COLLIMATOR RECONDITIONING

Need to renew a mirror-based collimator to benefit from automated testing capabilities?
HGH technical support team converts any mirror-based collimator into a true IRCOL system:

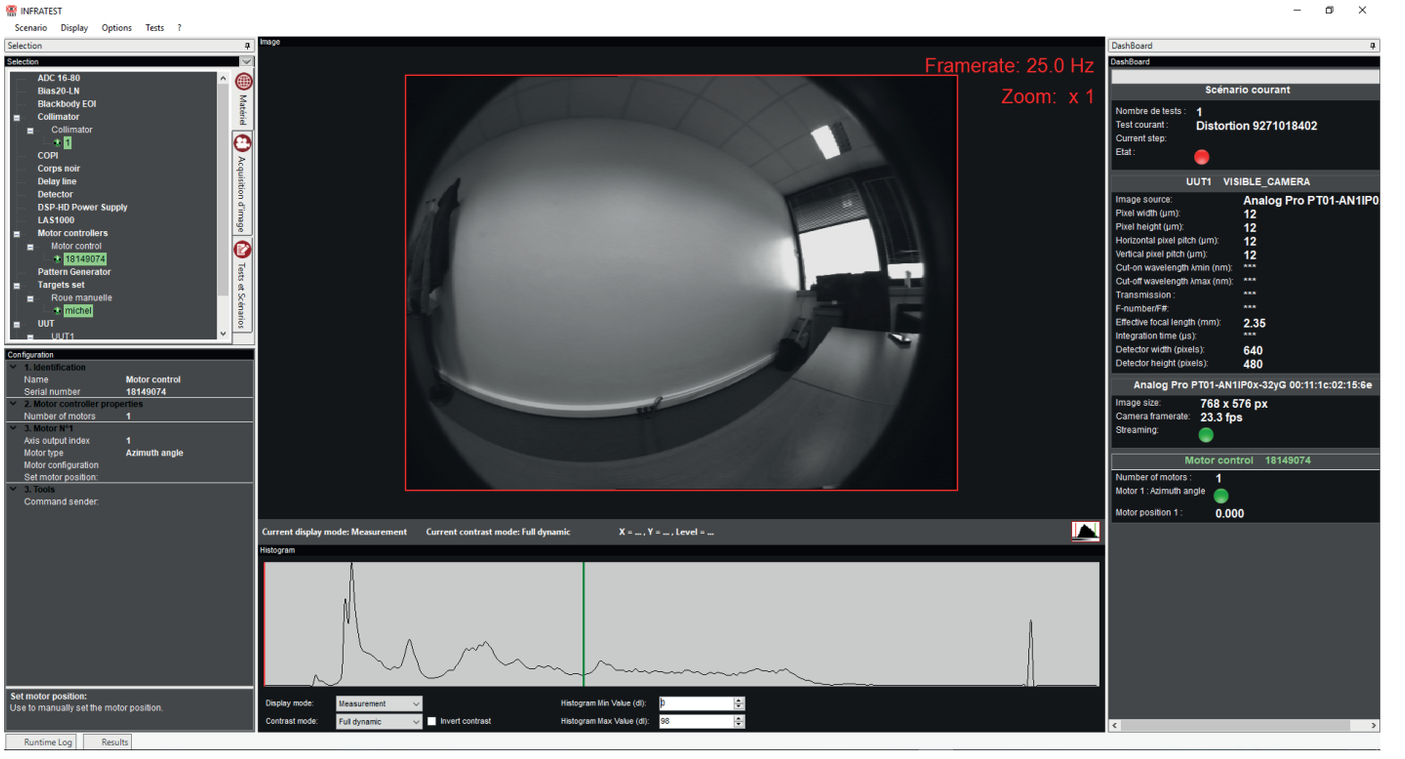
- Motorized target wheel integration at the focus
- Wheel adjustment to locate the targets at the best focus position
- Test report including the collimator's wavefront measurement

TRAINING

Get a yearly training aiming at optimizing the use of the IRCOL test bench for the operators to collect **the most accurate data** on the tested equipment. This **personalized training**, held in the customers' facilities, is provided by an HGH engineer specialized in electro-optical systems' design, development and testing methods.

PERIODIC ALIGNMENT CONTROL

Have the alignment of your IRCOL test bench checked periodically or punctually after a move by an HGH's optical engineer using a highly accurate wavefront analyser.



IRCOL Test Bench

SPECIFICATIONS

IRCOL COLLIMATORS

	150/750	150/1000	300/1500	300/4000	400/2500	600/6000	250/1500S	400/2500S
Focal length (mm)	750	1000	1500	4000	2500	6000	1533	2500
F-number	5.2	6.9	5.3	14.0	6.3	10.0	5.7	6.3
Field of view for full aperture	3.4°	2.5°	1.7°	0.6°	1.0°	1.0°	1.6°	1.0°
Motorized target wheel	6 positions		10 positions			6 positions	12 positions	10 positions
Operating temperature range	+15°C to +35°C						-54°C to +71°C	
Wavefront quality @633 nm	Better than λ/3 peak to peak and λ/20 rms						Better than λ/4 rms whatever the temperature	

IRCOL COLLIMATORS BENEFITS

- Wide range of optical projector compatible with the test of any electro-optical system supported:
  - 150 to 600 mm clear aperture
  - 750 to 6000 mm focal length
- UV and Visible to far IR operating spectral range with robust standard silver coating
- High optical quality individually measured with wavefront map
- Remotely selectable target position with high repeatability
- Robust and stable mechanical structure with a protective cover of the optical components against shocks, dust and stray light
- Interchangeable targets with 90° orientation capability

OPTIONS OF THE IRCOL COLLIMATORS

- Custom focal length and aperture upon request
- Customized targets patterns
- Alternative aluminum or gold coating for optimized operation in UV or in IR
- Reflective target configuration for controlled background temperature simulation
- Climatic chamber environment compatibility
- Motorized adjustment of the projected distance

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ref: COL - Len - am1 IRCOL Series

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