



Dynamic 10.6 μm Twyman-Green Interferometers

Flexible and Robust Measurements

The PhaseCam® LWIR is a temporal laser interferometer, with dynamic interferometry option, designed to operate at the 10.6 μm wavelength. With fully motorized control of internal functions and port selection, the dual LWIR measurement path is uniquely suited to maintaining two test setups. Use both in parallel, and significantly reduce set-up and alignment time for a specific test.

Dual Port Functionality

Configure the main LWIR port as a focal test station with a diverging beam to measure Transmitted Wavefront Error (TWE) of IR components, assemblies or telescope systems. Configure the auxiliary port with an OAP beam expander as an afocal test station for optical system alignment and TWE measurement of IR components, beam relays or infinite conjugate telescope tests. Perform either measurement type without disturbing the other.

Instantaneous Acquisition

The dual-mode PhaseCam operates in standard temporal mode, or in vibration-insensitive mode, utilizing Dynamic Interferometry®. The PhaseCam LWIR incorporates spatial phase shifting technology that makes a wavefront measurement in less than 1 millisecond—hundreds of times faster than a solely temporal phase shifting interferometer. Because dynamic acquisition time is so short, the PhaseCam can be used under almost any conditions without vibration isolation control. This insensitivity to environmental factors makes the PhaseCam ideally suited for use on the production floor or in cleanrooms.



PhaseCam LWIR showing dual measurement ports

Complete Measurement System

The PhaseCam LWIR is a turnkey instrument that includes the interferometer, 4Sight™ advanced wavefront analysis software, and a high-speed computer system. Samples with any reflectivity from 4% to 100% can be measured without the use of an external attenuator.

Industry Leading Analysis, Standard

4Sight wavefront analysis software features a user-friendly interface with unmatched simplicity, analysis features and graphical displays. The Measurement Screen display aids alignment and execution of single, averaged, burst or continuous data acquisition. The Measurement Flow interface lets you visualize the entire measurement data flow, from raw acquisition through masking, reference subtraction, terms removal, etc. The Measurement Stack enables complex data manipulation and comparison. Zernike, Seidel, geometric and diffraction analyses are easy to perform. Comprehensive data sharing capabilities let you read, write, save and print from most file types.

Accessory Optics

Diverging optics and collimated beam expanders enable quick and easy configuration of test setups.

FEATURES

- 10.6 μm wavelength
- Dual measurement ports: two apertures in one
- Vibration insensitive dynamic operation
- < 1 millisecond dynamic mode data acquisition time
- Outstanding data analysis and visualization software

APPLICATIONS

- Optical system alignment
- Measure focal and afocal TWE in parallel
- TWE measurement of IR components, optical assemblies and telescopes



PhaseCam LWIR

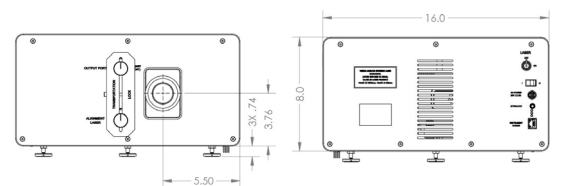
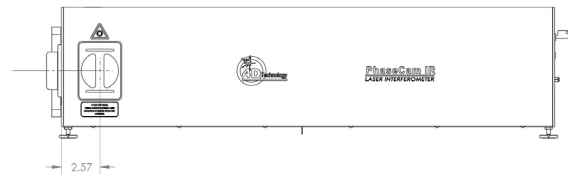
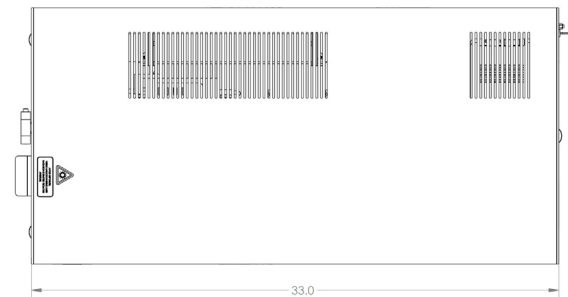
Specifications

Configuration	PhaseCam LWIR
Description	Twyman-Green interferometer
Acquisition Mode	Dynamic or temporal phase shifting
Alignment Mode	Visible alignment laser
Wavelength	10.6 μm
Max. Output	Test laser: <500 mW at 10.6 μm ; alignment laser: <5 mW at 532 nm
Max. Cavity Length	>60 m periodic coherence
Beam Diameter	14.0 mm collimated
Axis Height	95.5 mm (3.76") from bottom of interferometer
Polarization	Linear
Pupil Focus Range	± 20 mm
Camera	510 \times 510 pixels
Data Array	User-selectable full, half, quarter data arrays
Motorized Controls	Focus, reference beam block; main beam block
Manual Controls	Visible alignment laser; measurement port selection
Computer System	High performance PC
Operating System	Windows [®] 10 or higher
System Software	4Sight™ Analysis Software
	Instantaneous Phase Shifting data acquisition
	Reference generation, subtraction, data averaging, masking
	2D and 3D surface maps
	Zernike / Seidel / Slope / Geometric / Fourier Analysis
	Fiducial aided data set mapping
	HDF4 / HDF5 data format standard, others supported
	Absolute sphere, prism & corner cube analysis
	Multiple sub-aperture analysis
Physical Envelope	< 85 \times 41 \times 20 cm (33 \times 16 \times 8 in)
Weight	< 48 kg (105 lbs)
Power consumption	< 750 Watts @ 100-240VAC, 50/60Hz
Temperature Range	Operational: 16–27° C (60–80° F), non-condensing Storage: -1–38° C (30–100° F), non-condensing

Options	
Beam Expanders	Range of expanders available on request
Diverging Lenses	Range of lenses available on request

System Performance	
Max. Acquisition Rate	< 30 frames/sec display, < 30 frames/sec max data acquisition with dynamic mode*
Min. Exposure	500 μsec
Sample Reflectivity	4% to 100%
RMS Repeatability	< 0.0005 wave**
RMS Precision	< 0.001 wave***

Warranty
One year, limited, standard; extendable; Includes on-site system installation and operator training.



PhaseCam LWIR

- * In dynamic spatial carrier mode.
- ** One sigma for RMS of 10 data sets of calibration mirror, each data set being an average of 16 measurements.
- *** Average RMS of the pixel by pixel difference of 10 data sets between measured surface and the calibrated surface. Each data set is an average of 16 measurements. Calibrated surface is the average of all 160 measurements.

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All specifications subject to change without notice.

4D Technology

An Onto Innovation Subsidiary



VISIBLE AND/OR INVISIBLE LASER RADIATION.
AVOID EXPOSURE TO BEAM.
CLASS 3B LASER PRODUCT
<500mW at 10600nm, <5mW at 532nm

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