

PhaseCam[®] NIR 4D Technology

Dynamic Near-Infrared Twyman-Green Interferometers

Instantaneous Acquisition

PhaseCam[®] NIR systems are compact, lightweight, dynamic laser interferometers operating at wavelengths of 1.053 μm to 1.55 μm . With simple, manual controls these systems are ideal for long optical path-length measurement of large, focal optical systems such as concave telescope mirrors and lens systems, and for testing small aperture afocal components such as flat mirrors and collimators.

PhaseCam NIR systems incorporate a single camera, high-speed optical phase sensor that makes a wavefront measurement in less than 30 microseconds—over 5000 times faster than a temporal phase shifting interferometer. Because acquisition time is so short, the PhaseCams can be used under almost any conditions without vibration isolation or turbulence control. This insensitivity to environmental factors makes the PhaseCams ideally suited for use on the production floor, in clean rooms and in environmental test chambers.

Complete Measurement System

The PhaseCam NIR is a turnkey instrument that includes the interferometer, 4Sight[™] advanced wavefront analysis software, and complete, high-speed computer system. Samples with any reflectivity from 1% to 100% can be measured with a simple adjustment.



PhaseCam NIR

Industry Leading Analysis, Standard

4Sight wavefront analysis software features a user-friendly interface with unmatched simplicity, analysis features and graphical displays. The Measurement Console 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 unique 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, including MetroPro IDL[®], MatLab[®], Opticode[®], Vision[®], HDF5[®] and CodeV[®]. Generating phase movies to characterize deforming surfaces and moving parts is simple and straightforward.

Accessory Optics

Numerous accessories and options are available including diverger lenses and beam expanders.

FEATURES

- Vibration Insensitive Dynamic Operation
- 30 μs Data Acquisition Time
- 1.053, 1.064, 1.3 and 1.55 μm Wavelengths
- Easy Sample Reflectivity Adjustment
- Outstanding Data Analysis and Visualization Software

APPLICATIONS

- Meter-Class Telescope Optics
- Quality Verification of Optical Components
- Vacuum and Environmental Chamber Testing
- Production Floor Quality Control

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PhaseCam[®] NIR

4D Technology

Specifications

Configuration	PhaseCam NIR
Description	Turnkey vibration insensitive dynamic Twyman-Green interferometer
Acquisition Mode	Single camera, high-speed optical phase sensor
Wavelength	1.053, 1.064, 1.3 and 1.55 μm
Maximum Output	< 50 mW at 1053 nm; < 300 mW at 1064 nm; < 10 mW at 1.3 μm ; < 30 mW at 1.55 μm
Maximum Cavity Length	> 60 m
Beam Diameter	7.0 mm collimated
Polarization	Circular
Pupil Focus Range	± 12.5 mm
Pupil Magnification	Fixed, 1x
Fringe Contrast	User adjustable for reflectivity from 1–100%
Camera	1K x 1K pixels standard; 640 x 512 pixels for 1.3 μm and 1.55 μm models
Data Array	User Selectable full, half, quarter data arrays
Computer System	Minimum Dual Core 2 GHz processor, 1 GB RAM, 160 GB hard drive CDRW, DVDRW, 19 in LCD monitor, keyboard, mouse
Operating System	Windows XP [®]
System Software	4Sight [™] Version 1.8 or later, with User Manual 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 Upgrades – free during warranty period
Physical Envelope	< 75 x 25 x 18.3 cm (30 x 10 x 7.2 in)
Weight	< 15 kg (33.1 lbs)
Power consumption	< 750 Watts
Temperature Range	Operational: 60–80° F, non-condensing Storage: 30–100° F, non-condensing

Warranty One Year, limited, on-site system installation and operator training

Options

Beam Expanders Optional 25 mm, 45 mm (others on request)
Divergers Range of lenses from f/1 to f/32

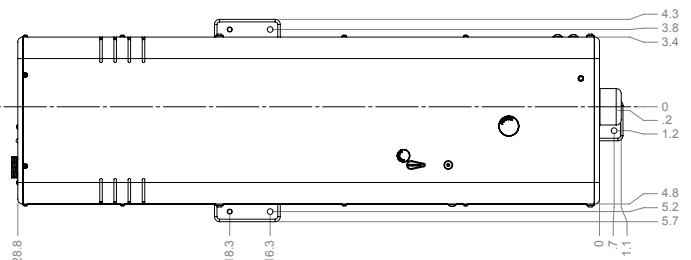
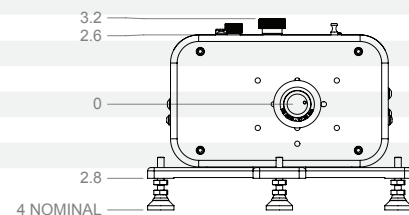
System Performance

Acquisition Rate > 10 frames/sec display; 4 interferograms/frame
> 25 frames/sec max data acquisition with post processing
Minimum Exposure 30 μsec
Sample Reflectivity 1 to 100%
RMS Repeatability < 0.001 wave*
RMS Precision < 0.002 wave**

* One sigma for RMS of 10 data sets of calibration mirror, each data set being an average of 16 measurements.

**Average RMS of the difference of 10 data sets between measured surface and the calibrated surface. Each data set being an average of 16 measurements. Calibrated surface is the pixel by pixel average of 10 measurements of calibration mirror.

All specifications subject to change without notice.



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