PhaseCam® Model 5030

4D Technology

High Performance Dynamic Twyman Green Interferometer

Instantaneous Acquisition

The PhaseCam® 5030 is a compact, lightweight dynamic laser interferometer with fully motorized controls for measurement of optics and optical systems. The industry standard for measuring large, focal optical systems such as concave telescope mirrors and lens systems, the PhaseCam is equally well suited for testing small aperture afocal components such as flat mirrors and collimators.

The PhaseCam 5030 incorporates Dynamic Interferometry® technology, using a single camera, high-speed optical phase sensor to make wavefront measurements in less than 30 micro-seconds—over 5000 times faster than a temporal phase shifting interferometer. Because acquisition time is so short, the PhaseCam can be used under almost any conditions, even for measuring moving parts, without vibration isolation. This insensitivity to environmental factors makes the PhaseCam ideally suited for use on the production floor, in clean rooms and in environmental test chambers. It can even measure moving parts such as deformable or scanning mirrors, spinning disks, or vibrating membranes.

Compact and lightweight, the PhaseCam 5030 was designed with performance and remote measurement in mind. Moving the system to reconfigure a test set is simple and easy, and isolation equipment is not required. Fully motorized controls make it easy to operate the system in remote locations.

Complete Measurement System

The PhaseCam 5030 is a turnkey instrument that includes the interferometer, 4Sight™ advanced wavefront analysis software, and complete computer system. Samples with reflectivity from 1% to 100% can be measured with a simple adjustment. The diffraction-limited, custom-designed optical system provides real 3X zoom and the ability to maximize sampling of the full aperture of the test part. The easy to use, vibration insensitive PhaseCam 5030 ensures rapid and accurate data acquisition.

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Industry Leading Analysis, Standard

4Sight wavefront analysis software features a user-friendly interface with unmatched simplicity, analysis features and graphical displays. The Measurement Screen aids alignment and execution of single, averaged, burst or continuous data acquisition. The Measurement Flow interface lets you visualize the entire measurement process, from raw acquisition through masking, reference subtraction, terms removal, etc. 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 µsec Data Acquisition Time
- Fully Motorized Controls for Remote Operation
- Optical and Digital Zoom
- 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
- Optical Testing of Moving Parts

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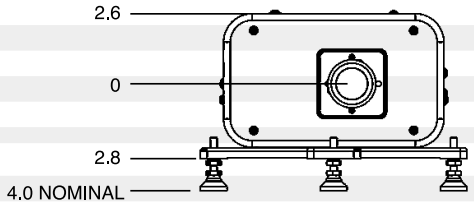
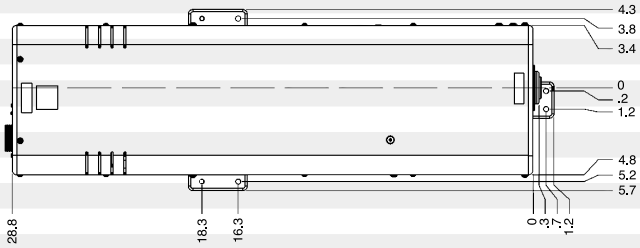
PhaseCam®

Specifications

Configuration	**Model 5030**
Description	Vibration insensitive dynamic Twyman-Green interferometer
Acquisition Mode	Instantaneous Phase Shifting with pixelated phase sensor
Laser Source	Stabilized HeNe @ 632.8 nm
Maximum Cavity Length	>100 m
Beam Diameter	9 mm collimated FWHM
Polarization	Circular
Field of View	8.85 mm (9.5mm with 4 MP camera option)*
Focus Range	±12.5 mm, optical magnification dependent
Magnification	3X optical zoom, 4X digital zoom
Fringe Contrast	User adjustable attenuator not required for high reflectance optics
Camera	1K X 1K pixels, 10-bit standard
Data Array	User selectable full, half, quarter data arrays
Motorized Controls	Zoom, focus, reference beam block, aperture block, contrast adjustment
Computer System	High performance PC
Operating System	Windows® 7
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
	Upgrades free during warranty period
Physical Envelope	< 75 x 25 x 17 cm (30 x 10 x 6.6 in)
Weight	< 15 kg (33.1lbs)
Power consumption	< 750 Watts
Temperature Range	Operational: 16–27° C (60–80° F), non-condensing
	Storage: -1–38° C (30–100° F), non-condensing
Options	
4 MP Camera	2048 x 2048 pixels, 12-bit, 2X zoom
Beam Expanders	Optional 25 mm, 45 mm (others on request)
Divergers	Range of lenses from f/1 to f/32
Special Analysis	Modal (Vibration) Analysis
Extended Cables	10 m, 30 m lengths
System Performance	
Acquisition Rate	> 10 frames/sec display; 4 interferograms/frame
	(camera dependent)
	> 25 frames/sec max data acquisition with post processing
Minimum Exposure	30 µsec
Sample Reflectivity	1–100%
RMS Repeatability	< 0.001 wave**
RMS Precision	< 0.002 wave***
Warranty	One Year, limited, on-site system installation and operator training





* 7 mm when used with diverging lens.

** 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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