

PhaseCam[®] 6100 SWIR 4D Technology

Dynamic Infrared Twyman-Green Interferometer

Instantaneous Acquisition

The PhaseCam[®] 6100 SWIR is a highly compact, lightweight dynamic laser interferometer with fully motorized controls for measurement of optics and optical systems. Operating at a wavelength of 1550 nm the PhaseCam 6100 SWIR is 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.

The PhaseCam 6100 incorporates Dynamic Interferometry[®] technology, using a single camera, high-speed optical phase sensor to make wavefront measurements thousands of times faster than a temporal phase shifting interferometer. Because acquisition time is so short, the PhaseCam can measure under almost any conditions, without vibration isolation, making the PhaseCam ideally suited for the production floor, in clean rooms and in environmental test chambers.

Compact and lightweight, the PhaseCam 6100 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



PhaseCam 6100 SWIR

The PhaseCam 6100 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 maximizes sampling of the full aperture of the test part. The easy to use, vibration insensitive PhaseCam 6100 ensures rapid and accurate data acquisition.

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.

FEATURES

- Vibration Insensitive Dynamic Operation
- 30 μ sec Data Acquisition Time
- 1550 nm Wavelength
- Easy Sample Reflectivity Adjustment
- Outstanding Data Analysis and Visualization Software

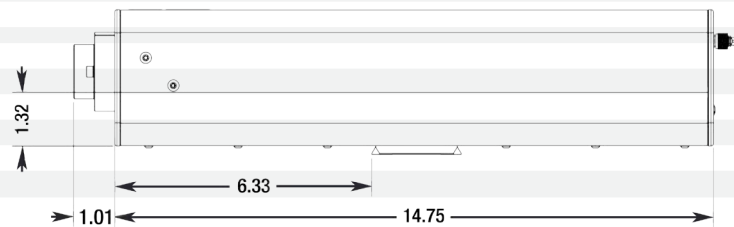
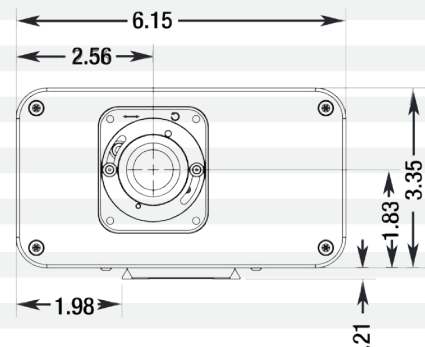
APPLICATIONS

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

PhaseCam[®] 6100 SWIR

Specifications

Configuration	Model 6100 SWIR
Description	Vibration insensitive dynamic Twyman-Green interferometer
Acquisition Mode	Single camera, high-speed optical phase sensor
Laser Source	1550 nm
Maximum Output	< 30mW
Maximum Cavity Length	> 60 m
Beam Diameter	9 mm FWHM
Polarization	Circular
Field of View	9 mm
Focus Range	±12.5 mm, optical magnification dependent
Pupil Magnification	1X Fixed
Fringe Contrast	User adjustable for reflectivity from 1–100
Camera	512 x 512 pixels, 10-bit standard
Data Array	User selectable full, half, quarter data arrays
Motorized Controls	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	< 40.1 x 15.7 x 9.1 cm (15.8 x 6.2 x 3.6 in)
Weight	< 4.5 kg (10.0 lbs)
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

Divergers Range of lenses from f/1 to f/32

System Performance

Acquisition Rate	≥ 15 frames/sec live video ≥ 30 frames/sec 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.

Patent 7,230,717. Other patents may apply.

PhaseCam and Dynamic Interferometry are registered trademarks of 4D Technology Corporation.

MetroPro IDL, MatLab, Opticode, Vision, HDF5, CodeV and Windows are registered trademarks of their respective owners.

All specifications subject to change without notice.

