

Quartus' OptiQuiver Instrument Combines High Dynamic Range Wavefront Sensing with the Precision Angular Measurement and Internal Reference Source of an Electronic Autocollimator



Key Features and Options

- OptiQuiver's architecture simplifies optical systems which otherwise would require both electronic autocollimators and wavefront sensors
- Compatible with both coherent laser light and broad spectral width sources and injected beams
- Compact size and provided carry-on compliant travel case allow for remote inspections and easy transportation
- Large clear aperture and internal light source allow for inspection of reflective samples with no additional condensing optics or calibrations
- Integrated $\lambda/10$ reference mirror into kinematic lens cap for calibration audit capability in the field
- 3 Channels of on-board temperature measurement and integrated compensation for reliable results of a variety of environmental conditions with stability indicators
- Scalable and configurable architecture can be tailored to specific applications with options for aperture size, internal source wavelength and effective focal length

OptiQuiver Software

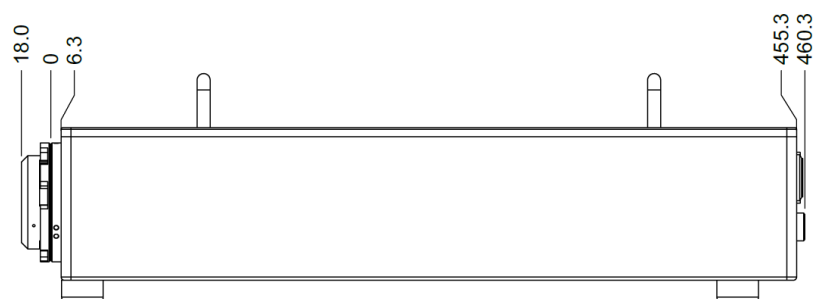
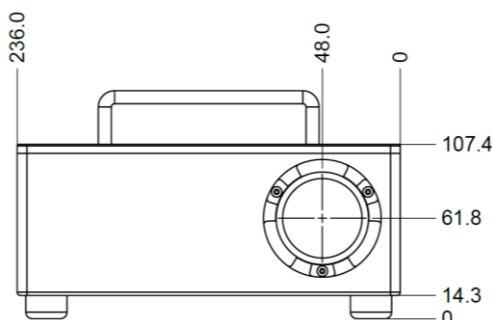
- Windows and MacOS UI software available to plot 2D and 3D Wavefront Maps, Zernike Decomposition, Residual Error, Angular Tilt, and Beam Profile in a configurable Client Application
- Self-testing Audit mode for periodic health monitoring
- Interactive plotting tools with live point tracking and user selectable color scales
- User control of internal light source state and brightness, instrument exposure, gain, region of interest, input wavelength, displayed Figures of Merit (FOMs) and exported data
- Logging feature for inspections over extended time domains and offline playback mode of recorded data
- APIs for OEM integration (gRPC via Python, C++, Matlab)

Details and Measurement Accuracy

Part Number	QHS-W-50-75	Clear Aperture	48mm
Internal Source	554nm LED, RG2 Group	Tilt FOV	> 6° x 6°
PC Interface	USB 3.0	Tilt Accuracy	0.0003°
Operating Temp	25-35° C	Tilt Sensitivity	0.0001°
Storage Temp	0-50° C	WFE Range	> 3000 λ
Power	24 VDC, 1 amp	WFE Accuracy (RMS)	0.050 λ
Mass	7 kg	WFE Sensitivity (RMS)	0.025 λ

OptiQuiver can be customized for specific applications and customer requirements. Configurable parameters include:

- Clear Aperture
- Optical Mask Pitch
- Focal Length
- Field of View / Dynamic Range
- Illumination Wavelength
- Operation Spectrum
- Form Factor
- Internal Source Power
- Internal Source Type
- Measurement Frame Rate

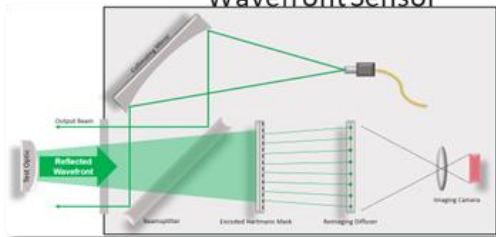


OptiQuiver's Unmatched Versatility Provides an All-In-One Solution for Many Applications

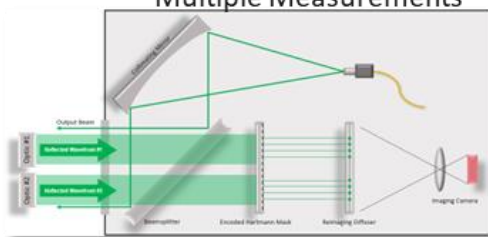
	OptiQuiver	PHASE SHIFTING INTERFEROMETER	SHACK-HARTMANN SENSOR	DIFFRACTION GRATING SENSOR	ELECTRONIC AUTOCOLLIMATOR
Wavefront Accuracy	✓ High	✓ Very high	✓ High	✓ Very high	✗ NA
Wavefront Dynamic Range	✓ Very High	✗ Low	✗ Medium	✗ Medium	✗ NA
Tilt Accuracy	✓ Very High	✗ NA	✗ NA	✗ NA	✓ Very High
Tilt Dynamic Range	✓ Very High	✗ NA	✗ NA	✗ NA	✗ Low
Reference Beam Internal	✓ Yes	✓ Yes	✗ No	✗ No	✓ Yes
Aperture Size	✓ Large	✓ Large	✗ Small	✗ Small	✓ Medium
Wavelengths	✓ Camera sensitivity	✓ 633nm only	✓ Camera/Lens sensitivity	✓ Any, Coherent	✓ Camera sensitivity
Size	✓ Medium	✗ Large	✓ Small	✓ Medium	✓ Medium
Cost	✓ \$\$	✗ \$\$\$	✓ \$\$	✗ \$\$\$	✓ \$\$
Measurement Frequency	✓ 2-10 Hz	✗ Slow	✓ 10-1000 Hz	✓ 60 Hz	✓ 4-100 Hz
Simultaneous Measurements	✓ Yes	✗ No	✗ No	✗ No	✗ No

OptiQuiver's Measurement Capabilities are Unique

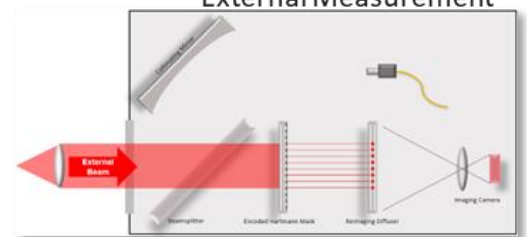
Wavefront Sensor



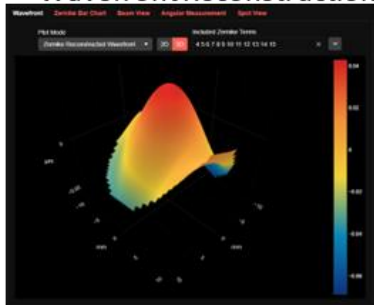
Multiple Measurements



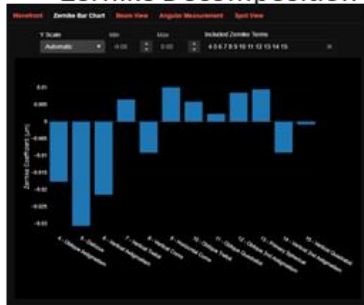
External Measurement



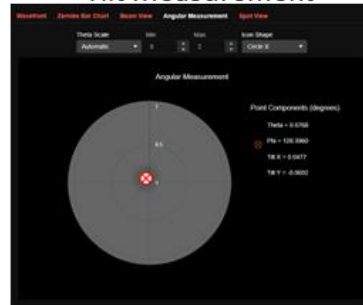
Wavefront Reconstruction



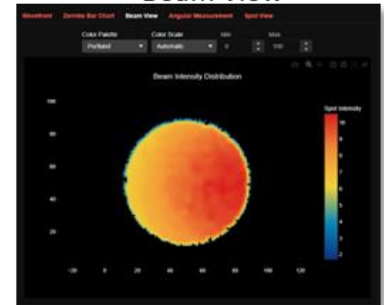
Zernike Decomposition



Tilt Measurement



Beam View



OptiQuiver Applications Include:

- Adaptive Optics (Wavefront + Steering)
- Surface Figure / Flatness Measurement
- Bearing Runout / Wobble Measurement
- Automated Optical Alignment
- Optical Wavefront Measurement
- Intensity Uniformity Measurement
- Beam Quality Measurement
- Lens Quality Measurement
- Transient Optical Measurement