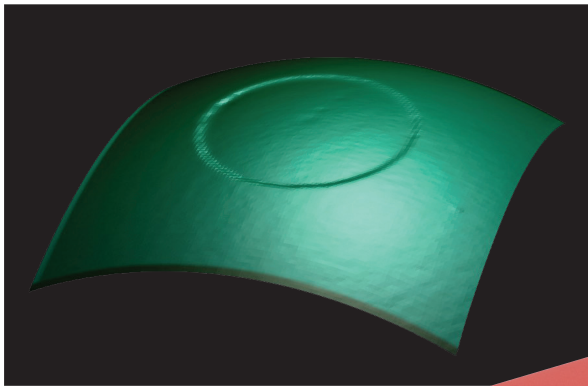
Fiber End Face Interferometer



3D Scan of Single Mode Fiber in an FC/PC Connector

GL16
Fiber End Face Interferometer

vytran® Fiber End Face Interferometer

Thorlabs' Vytran® GL16 Fiber End Face Geometry Measurement Instrument is an easy-to-use system for inspecting the end face geometry of single- and multi-fiber connectors. It uses a non-contact, scanning white-light interferometric (SWLI) technique to provide high-accuracy, repeatable, and reliable measurements for fiber connector testing, particularly for pass/fail testing using IEC or Telcordia requirements. All the system components, such as the interferometer, precision optics, high-speed cameras, and control system, are fully integrated within an enclosed 10.15" x 18.38" x 11.14" housing and can be controlled locally through the 7" capacitive touchscreen display or remotely through a browser-based application.

THORLABS

System Overview

Features

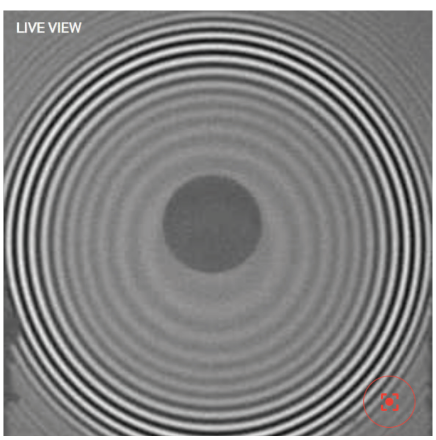
- Analyze Single- and Multi-Fiber Connector End Faces
- Accepts FC/PC, FC/APC, SC/PC, and LC/PC Connectors
- Built-In Test Parameters Based on IEC and Telcordia Standards
- Intuitive Touchscreen Controls
- Export Data, Scans, and 3D Images
- Fully Automated Operation

The GL16 Fiber End Face Interferometer measures step height changes on the surface of a fiber end face using a wide-bandwidth LED light source and a Michelson inteferometric objective lens. A piezoelectric stage moves the interferometric objective lens relative to the connector and collects the resultant interference patterns using a high-resolution camera.

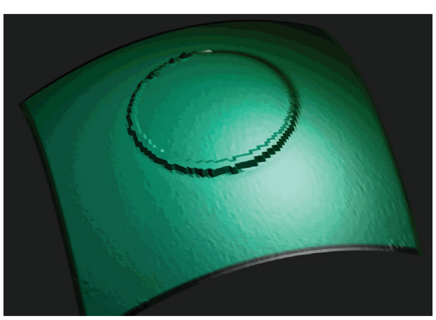
The interferometer accepts both single-fiber and multi-fiber connector types. The unit features an automated tilt stage designed to hold fiber connectors at either 0° or 8° in order to accommodate both flat and angle-polished connectors. The tilt stage is controlled by the software with no manual adjustment required.

Control the interferometer using the integrated touchscreen display and software that supports full programming of measurement and testing parameters, with features such as the built-in database of IEC and Telcordia requirements for pass/fail testing or custom, user-programmable test parameters. The intuitive controls and customization options ensure that the system is easy to use right out of the box while also providing sufficient flexibility to accommodate any user requirements during the measurement process. A USB 3.0 port in the rear allows for control via an external mouse, keyboard, or barcode scanner. An ethernet port is also provided for remote operation and software updates.

Results from a scan are stored in an internal SQL database. At the end of a scan, the result logs show the pass/fail status of each connector scanned and the causes of a failed device. Further details such as 3D scan images and a report of all measured parameters are available for each scanned device. Scan data reports can be exported in CSV or PDF format and can be viewed locally or through remote access. Exported measurements can be stored offline after downloading them via remote access.



Live Interferometric Scan of Single Fiber Connector



3D Image Based on Single-Fiber Interferometric Scan

Specifications

Accepted Fiber Diameters	Single Fiber	60 - 280 µm
	Multi-Fiber	60 - 250 µm
Accepted Connectors	Single Fiber	FC/PC, FC/APC, SC/PC, or LC/PC
	Multi-Fiber	MT-Style Ferrule (MT12 or MT16) MPO-Style Connector[a] (MPO12 or MPO16)
Measurement Lateral Resolution		2.2 µm
Measurement Height Resolution[b]		1.1 nm
Field of View (W x H)		4.2 mm x 2.4 mm
Depth Scan Range		70 µm
Total Measurement Time	Single Fiber	4 s (Typical)
	Multi-Fiber	8 s (Typical)
Hard Drive (SSD) Storage		500 GB
Weight		23 lbs. (10.4 Kg)
Electrical Power		120 / 240 VAC, 50 / 60 Hz at 1 A
Dimensions (L x W x H)		10.15" x 18.38" x 11.14" (257.8 mm x 466.9 mm x 238.0 mm)

a. MTP® connectors can also be mounted in the fixtures that are compatible with an MPO-style connector.
b. Defined as the measurable height difference on the connector surface using the interferometric fringes and camera bit depth.

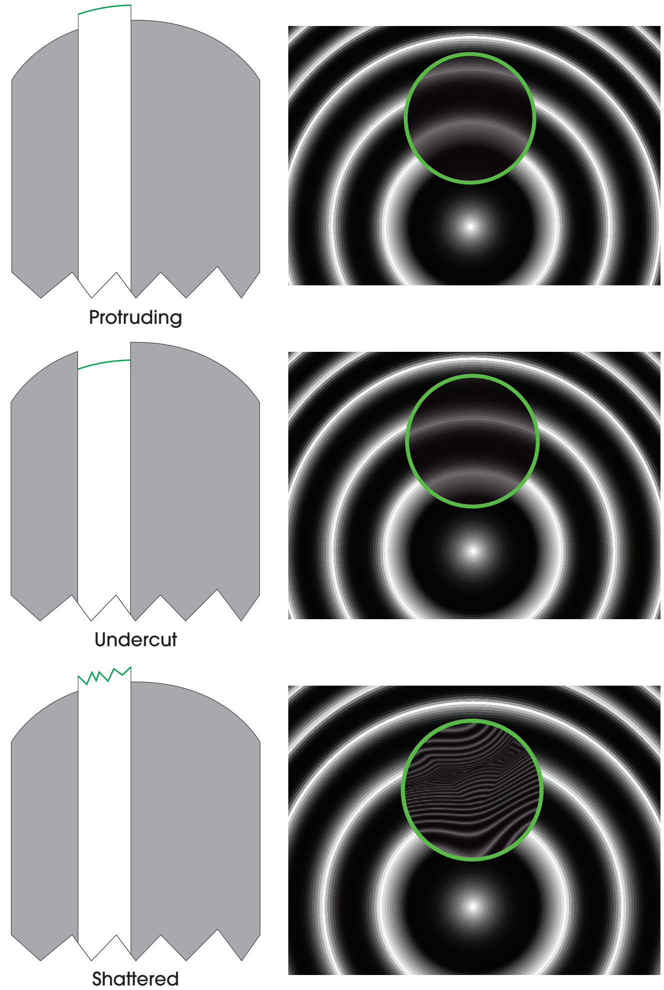
Operating Principle

The GL16 instrument uses a white-light LED, an objective lens optimized for Michelson interferometry, and a piezo-controlled stage to analyze connector surfaces. This method, called scanning white-light interferometry (SWLI), allows for a highly accurate measurement of a connector or fiber surface and can characterize imperfections that would be missed using a monochromatic interferometer.

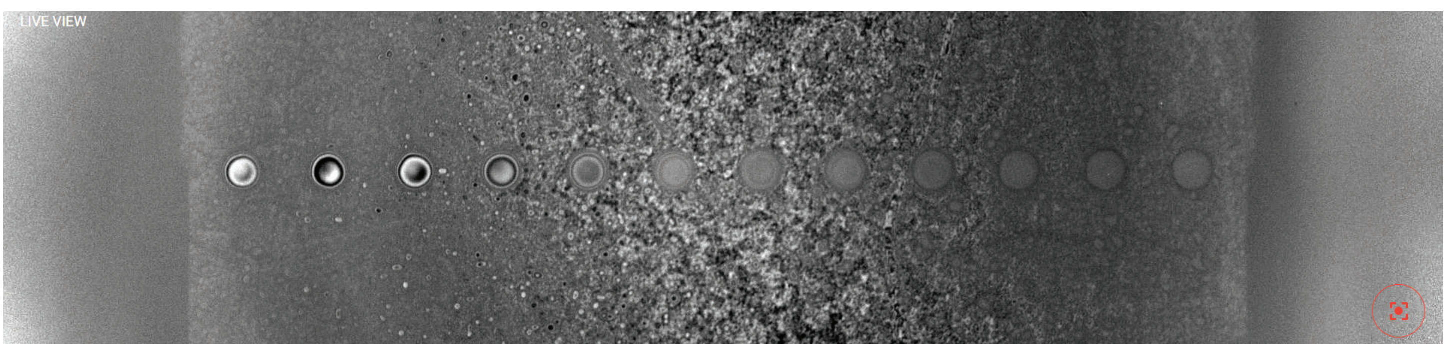
Constructive and destructive interference from the two beam paths created by the interferometric objective result in a bullseye interference pattern. The light and dark fringes of the pattern form a contour map of the connector surface.

An ideal fiber tip will produce a smooth bullseye pattern. A protruding or undercut fiber will result in a distortion where an area of the fringe pattern is shifted farther from or closer to the apex of curvature. An undercut fiber could collect dust, which will either absorb or scatter light, causing dots to appear in the interferogram. If a fiber end has shattered in the polishing process, the interferogram will be highly irregular.

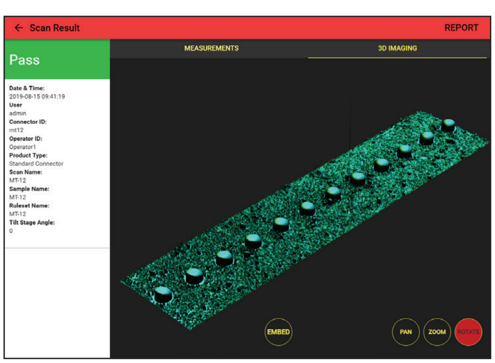
As the piezo stage moves the interferometric objective with respect to the connector surface, the fringe pattern moves across the ferrule surface. The system analyzes the collection of interference patterns, assigns a height value to each point on the surface, and creates a complete, 3D height map of the connector end face.



Example Diagrams and Corresponding Interferograms of Imperfect Ferrules



Live Interferometric Scan of MT-Style 12-Fiber Ferrule



3D Image Based on Interferometric Scan of 12-Fiber Ferrule

Contact Us

Contact Vytran for assistance in selecting components for your specific application.

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