

## 9-Megapixel Fizeau Interferometer

### Accurate Mid-Spatial Frequency Surfaces on Curved or Flat Optics

#### System Overview

Measurement Capability	Mid-Spatial Frequency Surface Structure
Output Diameter	9 mm
Working Distance/ Fixed Focus	Nominally 34.5 mm (fixed)
Interferometer Size (L x W x H)	45.6 x 15.3 x 16.4 cm
Weight	4.5 kg
Spatial Coherence Control	Virtual extended source
Measurement Techniques	Fast/Low-Noise Synchronous, and Vibration Tolerant PSI
Light Source	SpectrÄ 2.0
Alignment System	Not required with 9 mm Field of View
Variable Coherence Length	0.15 mm to 1.0 mm
Output Polarization	Circular
Camera Resolution	3000 X 3000 pixels
Camera Frame Rate (max)	≤ 75 Hz (source dependent)
Shutter Speed (shortest)	≥ 5 μs
Digitization	8 bit
Mounting Configurations	Horizontal or Vertical Manual, Semi-Automated or Automated

#### Performance

Spatial Frequency Range	0.2 l/mm to 160 l/mm
Fringe Resolution	> 1,000 fr/aperture
Retrace Error <sup>3</sup> @ 512 fringes	< λ/15
Noise Floor <sup>1</sup>	< 30 pm RMS
Flat PSD Reponse <sup>2</sup>	0.1 l/mm to 160 l/mm
Standard Part Reflectivity	0.5% to 40% Other options available

#### Operational Environment<sup>4</sup>

Temperature	15°C to 30°C
ΔT/Δt	< 1°C per 15 min
Humidity	5 to 80% relative, non-condensing
Vibration Isolation	Isolation System Required

#### High Resolution with Low Spatial & Temporal Coherence

Ä9|9MP Fizeau interferometer enables practical Mid-Spatial Frequency measurement: Advanced camera limited optical design, controlled spatial and temporal coherence, and rapid data acquisition.

Low temporal and spatial coherence yields a sub-nanometer noise floor with 10's of picometer repeatability.

Temporal coherence control is accomplished using ÄPRE patented Spectrally Controlled Interferometry (SCI). In the short coherence mode interference fringes are isolated to the measurement surface. This eliminates interference fringes produced by other surface back reflections.

A spatial coherence buster minimizes speckles, spurious fringes, and other noise sources to minimize the measurement noise.

Notably, the design achieves retrace error performance approaching 30 nm, even at maximum slopes of 1,200 fringes across the field of view.

Advanced PSD Analysis and filtering reports the surface performance with easy to understand RMS result over a specified spatial frequency band.



<sup>1</sup> Noise Floor is determined from the residual of two data sets both averaging 30 data acquisitions and reported over a mid-spatial frequency range of 0.5 l/mm to 5 l/mm  
<sup>2</sup> Flat PSD Reponse is measured with a Binary PseudoRandom Test standard, and compared to a white light profiler. The test is limited to 90 l/mm by the BPRT resolution.  
<sup>3</sup> Retrace Error is defined as the PV residual error between a nulled measurement (the reference), subtracted from a measurement with 900 fringes of tilt, and expressed by the first 36 Zernike polynomials  
<sup>4</sup> These parameters outline the conditions under which the system can operate; they do not represent the environmental stability required to meet specified performance.

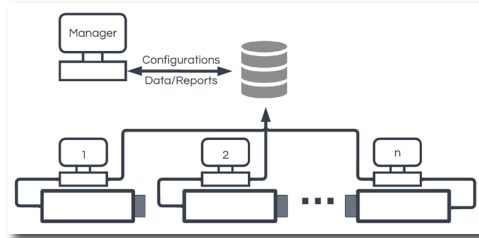
# REVEAL

## Metrology Software for Interferometers

### Introducing REVEAL 25

#### UNIQUE and NEW!: No interferometer is an island...with REVEAL 25

Load measurement recipes and report forms from a central controlled library. Automatically save data to your database. Eliminates setup errors, and user-to-user variations by standardizing the entire measurement process from a central, password controlled location.

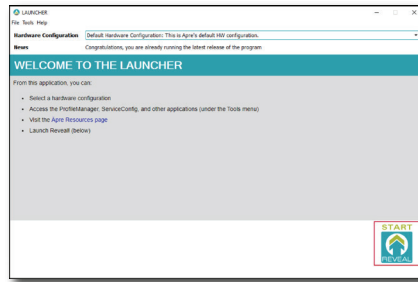


#### NEW! Setup user access and passwords:

In the Profile Manager grant or restrict global or individual access to measurements. Assign what can be edited, where data is saved, and then password (encrypted) protect.

#### NEW! Configure your hardware with a click:

ÄPRE state-of-the-art interferometers use multiple sources, which means multiple hardware configurations. Just switch the source, click the hardware configuration and launch REVEAL 25 to start measuring.



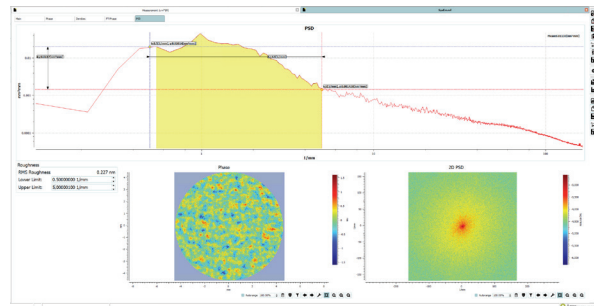
### Inside REVEAL 25

#### REVEAL functionality is maintained:

All the menus, results, screens, data and setups are maintained. So there is no learning curve.

#### More Analyses are Standard:

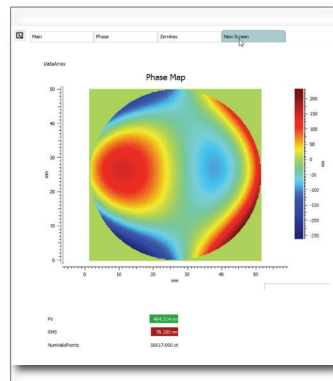
Standard analysis, Optical Shop Testing and Fourier Analysis are included in the standard package so licensing is easier.



**NEW! Create Your Own Custom Screens:** With an easy to use editor, display the graphs and results required and even set GO/NOGO tolerance flags on important results. Then save your custom screen for future use. The screen at the right was configured in five minutes! It's that easy.

**NEW! "Undo" mask shapes.** You're in the middle of creating a mask and you want to make a change. The new Undo function takes you back one step to retry. Less time lost, and more freedom to experiment.

**NEW! Event Log:** Sometimes "things" happen. To correct an error and to get production up and running the Event Log gives you just the important information. Now



Over ten years ago REVEAL innovated interferometer software

- Traceable metrology via the analysis tree, saved with as-measured (.rvl) data
- Data analysis based on international standards and leading laboratories worldwide
- Apply filters/masks to data along the entire analysis tree
- Fast, consistent reporting via a default, and customizable report library
- 64-bit operation to handle modern 9-Megapixel and larger cameras without crashing
- Remote training and debugging via TeamViewer
- Clean, browser like, non-overlapping screens
- Compatible with historical .dat data files

Now REVEAL 25 tightens QC with enterprise control, increases security, and lets you customize screens



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