

## LWIR Fizeau Interferometer for Surface and Wavefront Metrology

System Overview	S50 LWIR	S150 LWIR
Output Diameter	51 mm (2 inch)	153 mm (6 inch)
Optical Centerline	108 mm (4.25)	133 mm (5.24 mm)
Focus Range (position readout)	±0.5 meters	±4.5 meters
Interferometer Size (L x W x H)	63 x 29 x 18 cm	90.2 x 40.8 x 23.9 cm
Weight	25 kg (55 lbs)	50 kg (110 lbs)
Measurement Techniques	Vibration-Tolerant PSI	
Alignment System	External visible laser alignment tool	
Light Source	Single Frequency Laser $\lambda$ : 9.27 $\mu\text{m}$ to 10.6 $\mu\text{m}$	
Output Polarization	Linear (perpendicular to the instrument base)	
Instrument Resolution	512 X 512 Measurement Pixel Array	
Camera Pixel Format	640 X 512 Pixels	
Camera Frame Rate (max)	60Hz (USA), 9 Hz (ROW)	
Camera Digitization	8 bit	
Computer & Software	High-Performance PC, Windows11, 64-bit OS & REVEAL Software	
Mounting Configuration	Horizontal	
Accessories	Optical Accessories and Mounts	



### Performance

Image Resolution	500 $\mu\text{m}$ (2.0 l/mm)	1,500 $\mu\text{m}$ (0.7 l/mm)
Image Distortion	<5%	
Fringe Resolution	>85 fr/aperture	
Retrace Error <sup>3</sup> @ 85 fringes	< $\lambda/10$ @ $\lambda$ = LWIR	
RMS Simple Repeatability <sup>1</sup>	<18 nm RMS 2 $\sigma$	
RMS Wavefront Repeatability <sup>2</sup>	<18 nm RMS 2 $\sigma$	
Measurable Part Reflectivity	0.1%to 40% direct	

### Operational Environment<sup>6</sup>

Temperature	15°C to 24C
$\Delta T/\Delta t$ for Accurate Measurements	<1°C per 15 min
Humidity	5 to 95% relative, non-condensing
Vibration Isolation	Isolation System recommended for VTPSI

<sup>1</sup> RMS Simple Repeatability Test: The RMS for 36 sequential measurements with each measurement the average of 16 measurements each of a short <2 mm plano cavity

<sup>2</sup> RMS Wavefront Repeatability Test: Measure 36 sequential Measurements (M1, M2, ...M30) each consisting of 16 averages. Then average all 36 measurements create a synthetic reference, "Ref"; RMS wavefront repeatability equals the 2X the standard deviation of all 30 Ref - Mn results.

<sup>3</sup> Retrace Error is defined as the PV residual error between a nulled measurement (the reference), subtracted from a measurement with 75 fringes of tilt, and expressed by the first 36 Zernike polynomials

<sup>4</sup> Resolution is detector limited at 200 lines/aperture

<sup>6</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

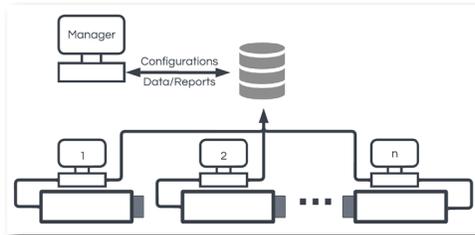
## Metrology Software for Interferometers

### Introducing REVEAL 25

#### REVEAL 25 Starts with the REVEAL Launcher

##### **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.

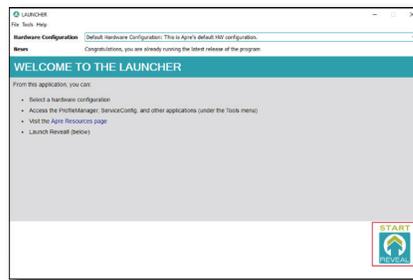


##### **NEW!** Setup user access and passwords:

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

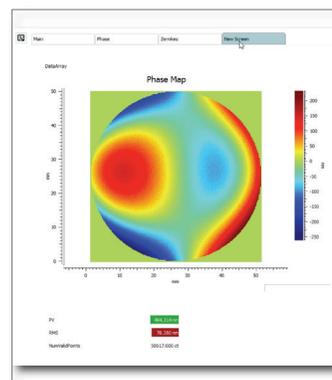
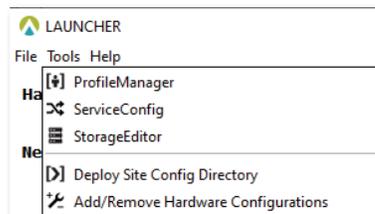
**REVEAL functionality is maintained:** All the menus, results, screens, data and setups are maintained. So there is no learning curve.

**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 you can act on it, or contact ÄPRE with the key information, and save time.



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 historic .dat data files

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



Äpre Instruments Inc.  
2440 West Ruthrauff Rd.  
Tucson, AZ 85705  
520.639.8195  
sales@apre-inst.com

Contact ÄPRE to get REVEAL 25 on your system today.