

# ClearWave™ Plus

## Contact Lens Measurement System



In 2015 Lumetrics was awarded a patent for an apparatus (now known as the ClearWave Plus) that measures the optical performance characteristics and dimensions of an optical element using a Shack-Hartmann wavefront sensor and a low coherence interferometer. This is a major improvement on current contact lens manufacturing inspection methods.

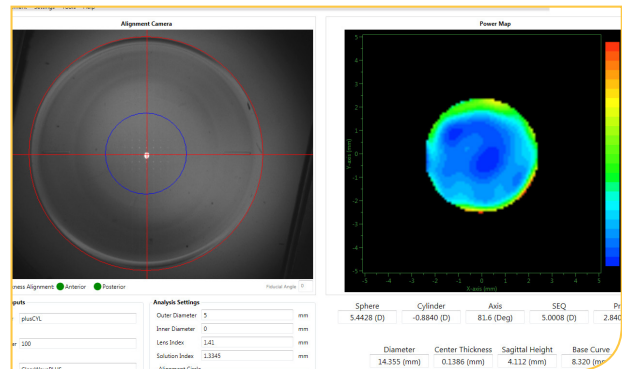
The ClearWave™ Plus uses a modified ClearWave in combination with the industry standard OptiGauge® thickness measurement system. This provides contact lens manufacturers center thickness (CT), Sagittal Height (SAG), diameter, radius of curvature, and all the wavefront measurements that currently require three separate systems to obtain.

Lumetrics is the leading provider of Ophthalmic related measurement solutions as the ClearWave & OptiGauge systems have been implemented in the world's leading contact lens manufacturers R&D laboratories and production facilities. The ClearWave Plus provides the best of these products in a single operator friendly solution that results in less handling of the contact lens. The ClearWave Plus has been designed for fast and accurate screening of contact lenses.

The ClearWave Plus is the ultimate metrology solution for contact lens manufacturers providing simultaneous measurements of:

- Sphere, Cylinder, Axis
- Zernike WaveFront Aberrations
- Diameter, CT, SAG
- Label Power

All this with the simplicity of **one button operation**.





### About Lumetrics®

For more than a decade, Lumetrics has provided precision measurement solutions to leading edge companies throughout the world. Our systems are deployed in quality, R&D labs, and production floors. We provide real-time measurements to improve yield, reduce cost, improve quality, and meet compliance requirements. Our commitment to our customers sets us apart from the competition.

***The ClearWave™ Plus is a unique all-in-one instrument that provides contact lens measurements with the simplicity of a single button.***

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### Optical Measurements:

- Sphere
- Cylinder
- Axis
- Spherical Aberration
- Coma
- High Order Aberrations
- Zernike Polynomials up to the 20th order
- Multizone Analysis (for bifocal contact lens)
- Modal Wavefront Map
- Power Maps
- OPD Map at all points within analysis diameter
- Zemax compatible Zernike files

### High-Resolution ClearWave Wavefront Sensor (Standard):

- 101x101 lenslet array grid
- Field of view: 10.4 x 10.4 mm
- Spatial resolution: 0.104 mm
- Spherical range: -74 to +37 D for typical wet lenses
- Dry spherical range is +8 to -16 Diopters
- Cylinder range:  $\pm 27$  D for typical wet lenses
- Dry cylinder range is 6 (+/-3) Diopters
- Spherical aberration accuracy 0.004 (dry)
- Spherical aberration repeatability 0.002  $\mu\text{m}$  (dry)

### Prism Measurement:

- Prism measurement 0 to 3 prism diopters for dry lenses
- Prism accuracy 0.1 prism diopters
- Prism repeatability 0.05 prism diopters

### Dimensional Measurements:

- Diameter up to 20mm,  $\pm 25\mu\text{m}$
- Thickness and CT
  - Methodology - Low Coherence Interferometry
  - Accuracy 0.1  $\mu\text{m}$
  - Repeatability 0.1  $\mu\text{m}$
  - Measurement Wavelength 1310nm