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LIMF-10
Optical Thin Film Measurement

Lambda Scientific Pty Ltd

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LIMF-10 Optical Thin-Film Measurement

Thin films are widely used in a variety of applications and the Thin-Film Measurement system can easily determine their properties. Based on interference spectral analysis of multi-reflection beams, this instrument functions non-contact optical measurement of thickness, refractive index, and extinction coefficient of various thin films and coatings.

With dedicated hardware design and program development, this measurement system is easy to setup and the software is user friendly. It is suitable for both on-line manufacturing and desktop measuring. With the ability to connect to your microscope to reduce the spot size or to dismantle for solely spectroscopic use, the Thin-Film Measurement System really is your solution to your measurement requirements.



Key Features

- User friendly cursor controlled measurement of computed refractive index and absorption index
- Flexible choice of computation wavelength range (within the PC based spectrometer)
- Flexible choice of guess thickness range to minimize computation time
- Convenient selection of film and substrate materials from an included database with various film and substrate materials
- User defined materials selectable and user defined material data import/export
- Substrate refractive index and absorption index measurement
- Film thickness measurement, mean and standard deviation
- Film material refractive index and absorption index evaluation
- Saving of measured spectral dependent reflectance data
- Data loading of previously saved reflectance data
- Statistics of measurement results

LIMF-10 Software

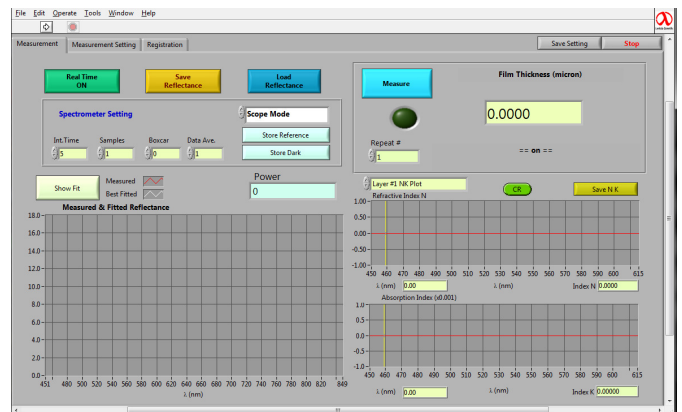
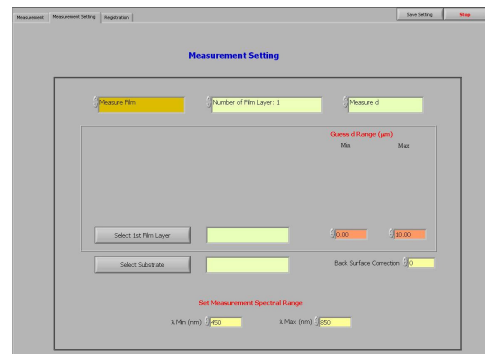
LIMF-10 Thin Film Measurement software is easy to use, powerful software. The measurement setting function is where the details are entered to setup the measurement. Some input options are:

- Select to measure a film or substrate
- Select the number of layers: Up to 4, and layer types
- Select to measure thickness (d) or index (n), absorption (k) and thickness (d)

Plus many more.

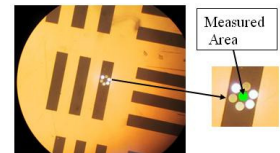
The main interface controls and displays the spectrometer settings, live signal and final results of the measurement. There are many functions to manipulate such as:

- Real Time: ON/OFF– ON for importing real time data, OFF for loading and observing previous data.
- Options for Scope Mode or Reflectance Mode and Reference data storage.
- Best fit curve can be fitted to the data after plotting the measured reflectance.



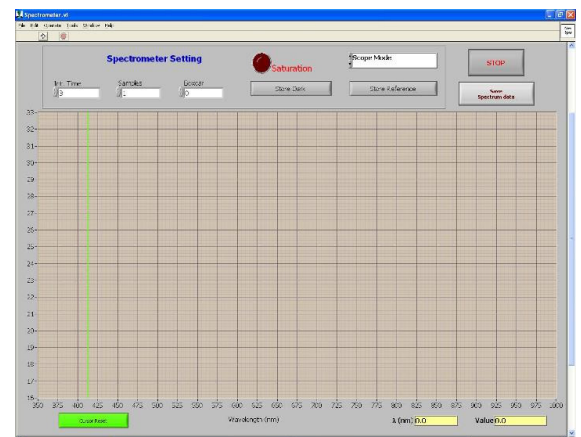
Microscope Connection

Both the light source and spectrometer are connected via SMA 905 Connectors at the back of the instrument. When connecting to a microscope, the microscope must have a C-mount to connect the Fibre Adapter. Once connected the ability to reduce the spot size to 10 μm is now possible and therefore expanding the LIMF-10 Optical Thin-Film Measurement's spot size range.



Spectrometer Software

With the ability to dismantle the Thin-Film Measurement unit it can be used as a spectrometer for general purpose spectrometer applications. Software is included for the use of the spectrometer. The spectrometer software is based on the Thin-Film software so the user will be familiar with the functionality and settings, and the results will be as accurate as when using the Thin-Film Measurement software.



LIMF-10 Optical Thin-Film Measurement Specifications

Measurement Range	
Thickness only	20nm to 50 μ m
Thickness with n and k	100nm to 10 μ m
Wavelength Range	380nm to 1000nm
Accuracy	The greater of ± 1 nm or $\pm 0.5\%$
Precision	0.2nm
Repeatability	0.1nm
Spot Size (normal)	Adjustable 1.2 mm to 10 mm
Spot Size (microscope)	Minimum 10 μ m
Sample Size	From 1mm and up
Layers	1 to 4 layers
Detector Type	Linear silicon CCD array
Light Source	Tungsten Halogen
Stage Size	160 \times 290 mm

Some examples of materials

Thin film layers					
SiO ₂	CaF ₂	MgF ₂	Photoresist	Polysilicon	Amorphous
SiNx	TiO ₂	Sol-Gel	Polyimide	Polymer Film	Silicon
Substrate material:					
Silicon	GaAs	ZnS	ZnSe	Germanium	Acrylic
Glasses	Polymer	Quartz	Aluminium	Polycarbonate	Sapphire



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