

# UVISEL Plus: The REFERENCE Ellipsometer for Thin Film Measurements

Fast Plus

X1.5 FASTER

The UVISEL Plus integrates new FastAcq™, our newest Acquisition Technology designed to measure faster. A sample measurement from 190 to 2100 nm can now be completed in less than 3 minutes at high resolution.

X2 more SENSITIVE

Sensitive Plus

Built on 25 years of experience, the UVISEL Plus phase modulated ellipsometer delivers the most pure and efficient polarization modulation for accurate ellipsometric parameter measurements on any samples. The new FastAcq™ technology increases this sensitivity by a factor 2 providing deeper insight into thin film structures such as the most demanding interfaces and nanometer thin films on low contrast substrates.

Modular Plus

Simple Plus

The UVISEL Plus ellipsometer offers a **flexible design**, making it scalable to meet all of your application and budget needs. **Compared to other suppliers, the system upgrade** capabilities are a hallmark of the UVISEL Plus to meet your future demanding applications.

The Auto-Soft interface features an **intuitive workflow** to speed up data collection and analysis, and enables anyone from novice to experts to perform thin film measurements.

# New FastAcq™ Technology

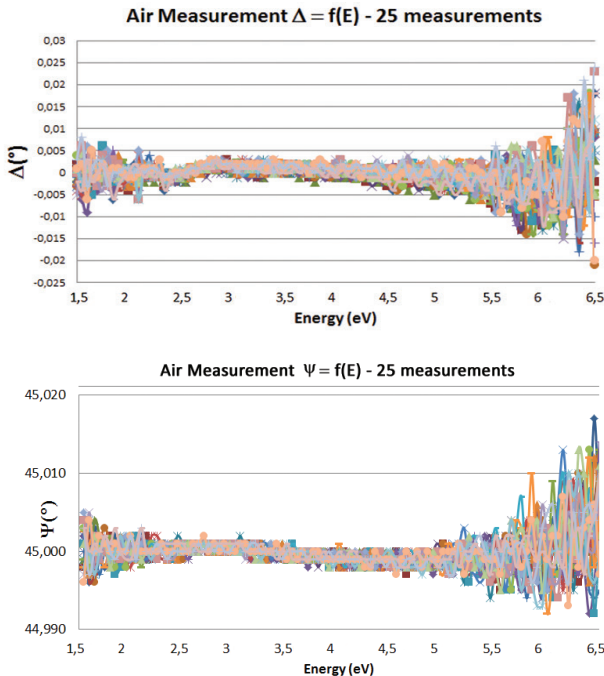


Based on a new electronic data processing and high speed monochromator, the new FastAcq™ technology provides users with speed and high resolution measurements.

Designed for real world thin film characterization, FastAcq™ is based on a **double modulation technology**, making sure you get the best results.

## Air Transmission Measurement: The Only REFERENCE to check!

The only material for which the ellipsometric parameters are absolutely known is air. An ellipsometric measurement in the straight-through configuration should, by definition, return :  $\psi=45^\circ$  and  $\Delta=0^\circ$ .



Integration time = 4 sec, Spot size = 1 mm, 25 measurements

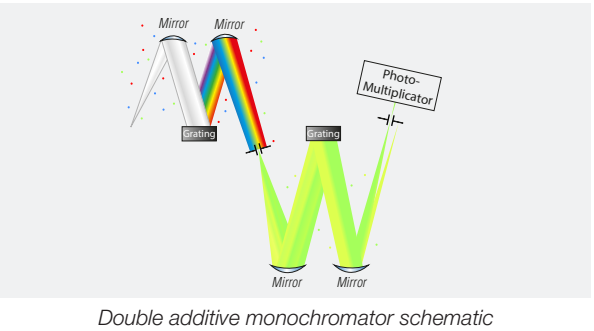
## UVISEL Plus: The New State-of-the Art

	0.6 eV - 1.5 eV (833 nm - 2100nm)	1.5 eV - 5.3 eV (235 nm - 833nm)	5.3 eV - 6.5 eV (190 nm - 235 nm)
$\Psi = 45^\circ$	+/- 0.07°	+/- 0.01°	+/- 0.02°
$\Delta = 0^\circ$	+/- 0.06°	+/- 0.01°	+/- 0.02°

Helping you get the BEST possible THIN FILM characterization

## Why use a Monochromator instead of a CCD based Spectrograph?

The UVISEL PLUS is equipped with a double additive monochromator. The main benefits of this type of monochromator are :



**Low Stray Light Level**  
The stray light level is lower than  $10^{-8}$ , making the measurement of very weak signals in the UV range straightforward.

**Spectral Resolution**  
In normal operating conditions, the best spectral resolution that can be achieved with a system, based on a spectrograph coupled to a CCD, is around 3-5 nm, while with a double spectrometer coupled to Photomultiplier, is around 0.1-2 nm.

Inadequate resolution involves dépolari-sation and erros on the measurements.

Ultimate Materials Science and Engineering

The UVISEL Plus has been enhanced to exceed our users' expectations.

All types of thin film materials can be characterized including dielectrics, semiconductors, polymers, metals, metamaterials and nanostructures.

Microspot Size Metrology

The UVISEL Plus features a microspot down to 50  $\mu\text{m}$  for efficient measurement of patterned films deposited on transparent or non-transparent substrates.

## Modular

Expand the versatility of your UVISEL Plus with a large array of accessories and options developed for specific thin film measurements.

Horizontal handling of the sample makes it easy!

Options & Accessories

- Motorized XY stage
- Rotation stage
- Temperature controlled stage
- Automatic goniometer
- Reflectometry module
- Electrochemical, liquid, sealed cells
- Transmission
- Camera

## Uncompromising Performance

The UVISEL Plus is based on Phase Modulation Technology.

Specific features of this technology are:

- No moving parts during signal acquisition
- No additional components in the optical path
- High modulation frequency (50 kHz)
- $\Psi$  (0-90) and  $\Delta$  (0-360) angles are measured over their entire range

The unique combination of phase modulation technology with high quality achromatic optical design provides unparalleled world class results for thin film thickness & optical constants measurements.

	Phase Modulation	Rotating Compensator or Rotating Polarizer
Moving parts during measurement	No	Yes
Modulation frequency	50 kHz	20 Hz
Signal to noise	Averaging 50 <sup>4</sup> cycles (IT= 1 sec)	Averaging 20 cycles (IT= 1 sec)
Accuracy - Straight through air measurement		
Autofocus	Not sensitive to optical path	Highly sensitive to optical path



# From Simplified Workflow to Advanced Research



## Simplified Thin Film Analysis: Assurance in Results

AutoSoft™ is a software package designed for **push button thin film analysis**. It includes a large library of ready-to-use recipes to handle all of your ellipsometric analysis.

### Custom Recipes

Create your recipes to collect data, automate mapping and analyze your thin film structure. **All in one step!**

### Complete Database of Materials & Models

AutoSoft provides a **large range of models** which conveniently describe material and layer settings.

### Multi-Guess

Multi-Guess is HORIBA algorithm developed over more than 15 years, which finds the best parameter to match the data. Multi-Guess can be applied to thickness, and any dispersion parameters. With Multi-Guess, you can eliminate the tedious & repetitive fitting approach!

## DeltaPsi2 for Full Ellipsometric Functionalities

The DeltaPsi2 software offers complete functionality for measurements, modeling and reporting, in addition to automatic operations, which facilitate routine thin film analysis.



### Measurement

- Reflection and transmission ellipsometry
- Reflectance and transmittance intensity
- Kinetic ellipsometry
- Variable angle
- Depolarization
- Scatterometry
- Mueller matrix

### Modeling & Simulation

- Materials library
- 40 dispersion models
- Roughness, interface, gradient, periodic structure, anisotropy, alloy, nanoparticle
- Automatic backside correction for transparent substrate
- Bandgap calculation
- (n,k), multi-guess, multi-sample fitting

### Data Reporting

- Customized reporting
- 2D/3D image display
- Data import/export package



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Find out more at [www.horiba.com/ellipsometry](http://www.horiba.com/ellipsometry)

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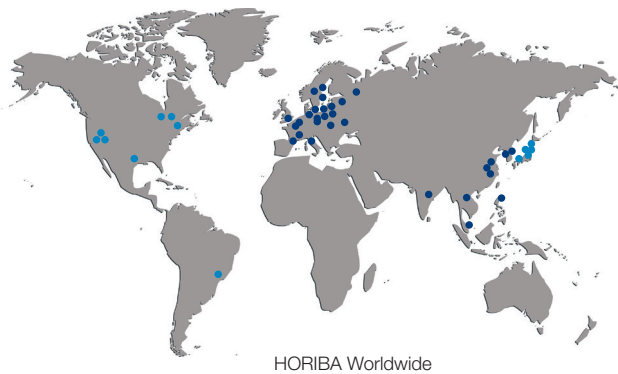


## Worldwide Training and Technical Support

Our staff of experienced application and service engineers, located around the world, provides full support for your instrument.

Well-equipped application laboratories allow for sample analysis and hands-on training for new and experienced users.

UVISEL Plus comes with on-site installation and training, technical support, and application support to help optimize your thin film modeling.



## UVISEL Plus Specifications

	UVISEL Plus	UVISEL Plus Extended Range
Spectral Range	190 - 920 nm	190 - 2100 nm
Light Source	75 W Xenon lamp	
Spot size & Microspot	<b>Standard spot size :</b> < 3 mm (at 90°) <b>Manual microspot option:</b> 3 positions: 50 µm - 100 µm - 1 mm (at 90°) <b>Automatic microspot option:</b> 4 positions: 80 µm - 120 µm - 250 µm - 1.2 mm (at 90°)	
Sample Stage	<b>Manual stage:</b> 150 mm, manually adjustable height (20 mm) and tilt <b>Motorized stage option:</b> 200 mm or 300 mm (on request) <b>Rotation stage option:</b> 150 mm, high precision automated sample rotation (360° - 0 only), resolution: 0.005°	
Goniometer	<b>Manual goniometer:</b> manually adjustable angle from 55° to 90° by step of 5° <b>Motorized goniometer option:</b> automatically adjustable angle from 40° to 90° by steps of 0.01°	
Monochromator	High resolution scanning monochromator For FUV-VIS range: High sensitivity photomultiplier detector & low stray light For NIR extension: InGaAs detector	

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## UVISEL Plus

The Reference Ellipsometer for Thin Film Measurements

For Ultimate Materials Science and Engineering

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