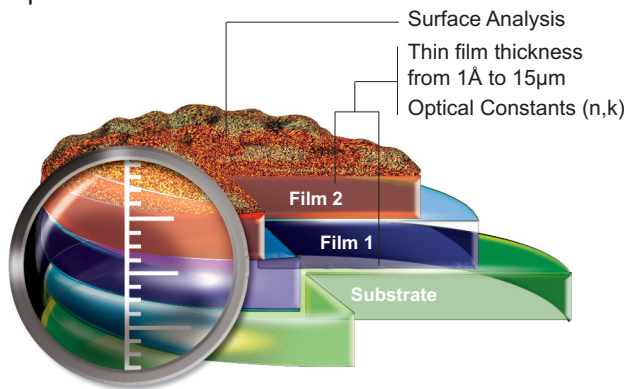


## MM-16 NIR Spectroscopic Ellipsometer for Thin Film Applications in the Near Infra Red

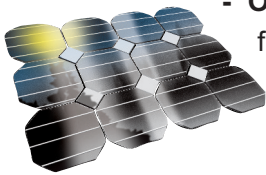
### NIR Thin Film Applications

The MM-16 NIR is an **easy-to-use, rapid and versatile ellipsometer for demanding research, process development and industrial applications** in the photovoltaic, microelectronic, telecommunication and optoelectronic area.



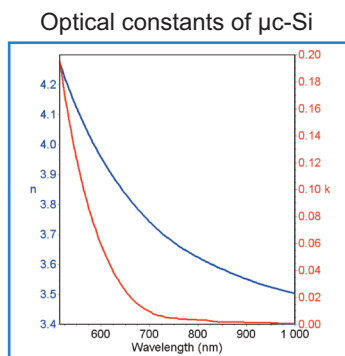
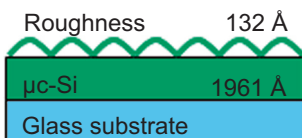
### Photovoltaic Applications

NIR measurement enables accurate characterization of:



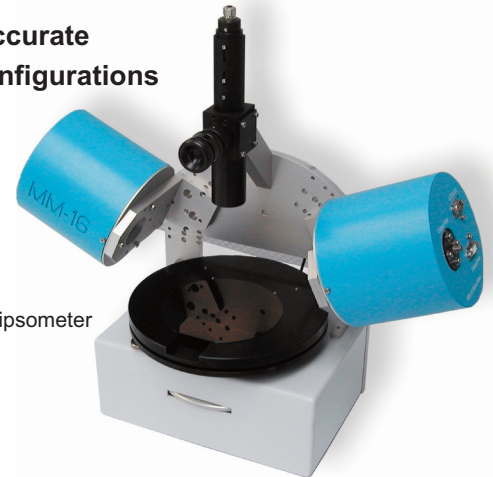
- **Optical bandgap** of thin silicon films, CIGS, CdS, CdTe materials
- **Conductivity, resistivity** of transparent conductive oxides (TCO)

The MM-16 NIR spectroscopic ellipsometer is optimized to provide high signal to noise ratio even in difficult measurement conditions such as **textured silicon films**. A dedicated sample holder is also available for the measurement of such films.



### System

- **Fast and Accurate**
- **Flexible Configurations**



MM-16 NIR Spectroscopic Ellipsometer

The MM-16 NIR Spectroscopic Ellipsometer features a CCD detection system for **rapid and accurate measurement down to 1s over the spectral range 515-1000nm**, and a **200µm microspot** for characterization of patterned.

When fully automated the system provides **fast uniformity mapping** of film thickness and optical constants.

### Flexible Configurations

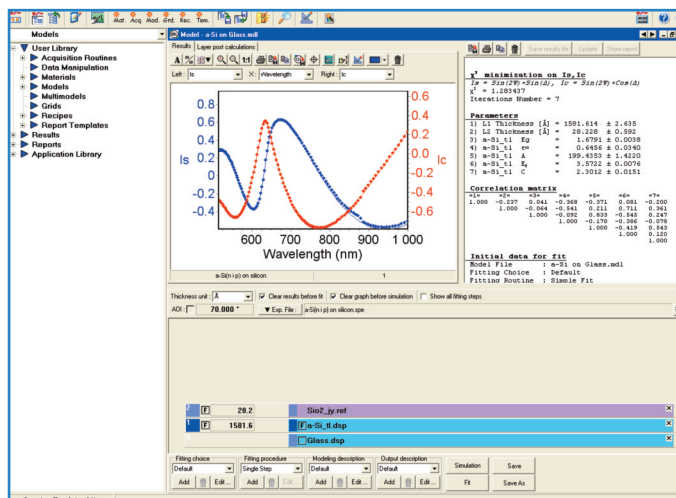
- **Compact, integrated goniometer** to provide a very cost-effective benchtop metrology tool.
- **Automatic configuration:** 200mm, 300mm mapping stage, and/or automatic goniometer for advanced thin film characterization.
- Integrated in **production lines** for in-line quality control of production processes. Standard software provides the user with the ability to perform a fully automatic thin film analysis with in-built reporting, and communication of results to host computers via TCP/IP and RS232 protocols.
- Mounted **in-situ** on process chambers for thin film thickness control of deposited or etched layers.
- An optional **Spectroscopic Reflectometer** may be incorporated into the design for added capability.

## Integrated DeltaPsi2 Software

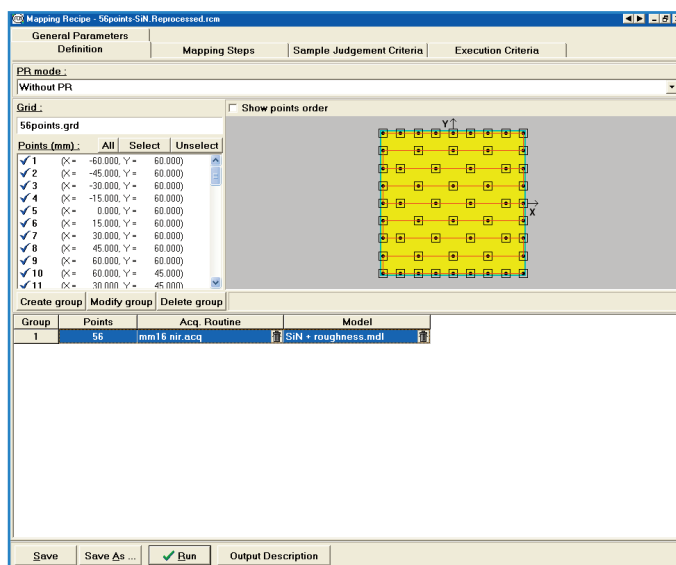
The MM-16 NIR is controlled by the DeltaPsi2 software platform that is common to all HORIBA Scientific thin film metrology tools.

DeltaPsi2 provides a **complete measurement and modelling package** allowing to address both routine and advanced thin film applications.

DeltaPsi2 software provides **display of mapping results** on semiconductor wafer and glass panels, statistical analysis of data, import/export package function, and data re-processing capabilities.



Comprehensive user interface showing the model, the graphic results and the report



Grid definition for automatic mapping recipe

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## MM-16 NIR Technical Specifications

**Light source:** Halogen lamp

**Spectral range\*:** 515-1000 nm

**Spot size:** 1x3 mm

**Detection:** CCD 2048 – Resolution <2 nm

\*The MM-16 is also available in the visible spectral range 430-850nm.

### Configurations

#### Integrated goniometer

- Manual angle of incidence: 35° to 90° by 5° step
- Sample holder: 150mm, 20mm z height adjustment
- Autocollimation system for sample alignment in option
- Dimension: width: 25cm; height: 35cm; depth: 21 cm

#### Automatic configuration

- Automatic angle of incidence: 40° to 90° by 0.01° step
- Automatic sample stage: 200x200mm; 300x300mm, manual height (4mm) and tilt adjustment

#### In situ configuration

- Mechanical adaptation: CF35 flanges

#### Production lines

- Contact us directly for your production line equipment: [tfd-sales-sci.fr@horiba.com](mailto:tfd-sales-sci.fr@horiba.com)

### Options

**Microspot:** 200 µm

**Vision:** CCD camera

**Accessories:** liquid cell, electrochemical cell, temperature controlled cell, and more

**Spectroscopic reflectometer:** 450-850nm, spot size 10µm

### System Performance

#### Accuracy

- NIST 1000 Å:  $d \pm 4 \text{ \AA}$  ;  $n (632.8\text{nm}) \pm 0.002$
- Fused silica:  $n \pm 0.004$
- Straight-through air measurement:  $\Psi = 45^\circ \pm 0.05^\circ$  ;  $\Delta = 0^\circ \pm 0.2^\circ$

**Repeatability:** NIST 1000 Å:  $d = \pm 0.2 \text{ \AA}$  (30 measurements)

**Measurement time:** <1s, adjustable from 1 to 10s

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