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RM 1000
Spectroscopic Reflectometer

Product description

- Contactless, optical reflection measurement at normal incidence for the characterization of thin films and bulk materials
- Spectral range from 430 – 930 nm
- Powerful, unmatched analysis software package FTPadv Expert
- Highly stable halogen tungsten light source
- Highly precise sample alignment with optical auto collimating telescope and microscope
- Optional XY mapping up to 200 mm with high lateral resolution
- Modern, comfortable, streamlined and robust user interface includes a comprehensive package of predefined applications representing semiconductor microelectronics, magnetic media, life science, color measurements and more

SENTECH Erfolg durch Leistung

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1 General description

The Spectroscopic Tabletop Reflectometer **RM 1000** is an optical reflection measurement instrument for the characterization of thin films and bulk material in a broad spectral range.

The **VIS Reflectometer RM 1000** provides reflectivity spectra at normal incidence which are analyzed by the **FTPadv Expert** software according to the sample parameters like film thickness, absorption, composition, energy gap, color, spectral bandwidth and more.

A major application is the fast and easy thickness measurement of transparent and semitransparent films on transparent and absorbing substrates. It covers a film thickness range from 20 nm to 25 microns and can be applied to a high variety of material systems due to the large and extensible material library.

The principle of the **RM 1000** reflectivity measurement is based on the measurement of the reflected intensity which is normalized to an intensity taken at a reference sample. The reference sample is part of the delivery.

Fast algorithms allow performing the optical measurement and the calculation of the film thickness with a high repetition rate. The **AutoModeling** feature allows detecting sample types by fast comparison with a spectrum library.

The **VIS Reflectometer RM 1000** comprises the tabletop microscope unit with sample stage and optical setup for the illumination of a relatively small spot of the sample and detection of the reflected light. Further it comprises a sample alignment arrangement consisting of an auto-collimating telescope and a microscope objective for the exact control of height and tilt of the sample. The electronics box contains an embedded microcontroller and the spectrometer. The electronics box can be interfaced to any state of the art PC running under MS Windows via an Ethernet LAN connection.

The **VIS Reflectometer RM 1000** can be optionally equipped with a computer controlled XY – mapping stage to scan the sample properties laterally. The mapping software allows to define any kind of measurement pattern, to display the results in 2D and 3D plots and to perform statistics over the sample.

The user software is easy to handle and presents the measurement result in a clear way. It supports the thickness measurement of single layers as well as the analysis of layer stacks. The software offers ready and user defined applications.

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2 Technical specifications:

- Measured values: Reflectivity R
- Analysis and Display of Film thickness, refractive index, absorption and more
- Range of thickness measurement 20 nm ... 25 µm
- Thickness accuracy better than 1 nm (typ. for 400 nm SiO2/Si)
- Precision (1 σ) 0.3 nm (typ. for 400 nm SiO2/Si)
- Measurement time Typical 300 ms
- Spectral range 430 nm - 930 nm
- Spot size 80 mm
- Light source: stabilized Halogen Tungsten lamp
- Detector: spectrometer with SMA fiber input, high performance photodiode array for spectral intensity measurement

- 19” Controller box table top case, 6HE
- Wide range (85...264VAC) power supply,
- Power cable (specify country specific plugs),
- Network connector RJ-45

- Requirements for user PC Desktop-PC with monitor, keyboard, mouse or notebook with 600 MHz, 64 MB RAM, Ethernet-network connector, 10 Mbit (10Base-T), CD-ROM drive, OS: WinNT 4.0, Win2000, WinXP

User PC is not part of the VIS Reflectometer RM 1000

VIS Reflectometer RM 1000 software comes on CD-ROM with the instrument.
The measurement software includes

- **FTPadv Expert** software for the measurement of thickness and refractive index and recipe oriented operation,
- measurement of reference sample, background signal and sample,
- display of measured and fitted spectra,
- display of thickness result,
- reporting,
- modelling,
- **AutoModeling** with sample type detection from extendable spectra library,
- communication with FTP controller box via TCP/IP using XML formatted commands.

3 Ordering information of VIS Reflectometer RM 1000

Spectroscopic Tabletop Reflectometer **RM 1000** including:
microscope stand with illumination and detection optics, adjustable sample stage with 6” sample platform, sample alignment arrangement with auto-collimating telescope and microscope objective, optical fiber between spectrometer in controller box and microscope stand, network cable, FTPadv Expert software, tool with reference sample and background measurement position.