

## Evaluation Line: Compact Diode Array Spectrometer Unit with separate UV-VIS Light Sources

Compact and high-grade diode array based spectrometer units with outstanding performance for feasibility studies and measurement tasks in research, development and industry. Various light source units are offered which

cover the spectral range from 200 to 1100 nm. Easy adaptation of light guides and fiber-optic probes is possible by use of standard SMA connectors on the front panel.

### Spectrometer Unit LOE-MMS

The Evaluation Line consists of a spectrometer module and an operating electronics which offers precise acquisition of spectral data over a wide dynamic range. The data are transferred to PC or a notebook by a USB interface (Ethernet as an option). An external power supply is included.

The Evaluation Line is based on the Carl Zeiss MMS monolithic miniature spectrometer module series with simultaneous readout. Its main features are high signal-to-noise ratio, outstanding wavelength accuracy and long-term stability (permanently wavelength calibrated).



### Light Source Units

Various compact light source units are available such as a combined deuterium/halogen light source for operation in the UV-VIS range (Heraeus FiberLight), a Xe flash lamp (PE RSL-3100) as well as a 7W Halogen lamp. The miniaturized lamps,

optimized for low power consumption, are ideally suited for transmission measurements. The power and control signals for the shutter control are supplied via a flat-ribbon cable from the LOE unit.

### Applications

- Multifunctional measurement system for research and laboratory
- Quality control of liquid, gaseous and solid samples
- Monitoring of light emission, solar spectrum and plasma
- Color measurements
- Reaction monitoring and end point determination
- Thin film measurements
- Monitoring of extraction and distillation processes
- UV-purity checks
- Suitable for integration in inspection and production machinery

# Systems

## Product Information Evaluation Line

### Technical Data

#### LOE Spectrometer Unit

(USB) Art-Nr.: 11 -0138003- (ETH) Art-Nr.: 11 -0138005-	00	01	02	03	04
Spectrometer Units	MMS1 NIR enh.	MMS1 UV-VIS	MMS UV-VIS	MMS UV-VIS II	MMS UV
Wavelength Range	310–1100 nm	310–1100 nm	190–720 nm	250–785 nm	195–390 nm
Specified Range	400–1100 nm	360–900 nm	200–720 nm	250–785 nm	220–390 nm
Spectral Resolution	< 10 nm	< 10 nm	< 7 nm	< 7 nm	< 3 nm
Pixel Dispersion	3,3 nm	3,3 nm	2,2 nm	2,2 nm	0,8 nm
Wavelength Accuracy	0,3 nm	0,3 nm	0,2 nm	0,2 nm	0,2 nm
Thermal Drift	< 0,02 nm/K		< 0,006 nm/K		
Number of Pixels	256				
Dynamic Range	15 bit (2 <sup>15</sup> Counts = 32768 Counts)				
Noise	typ. < 1,5 Counts standard deviation; S/N: ≈ 20000				
Integration Time	adjustable of 1,5 ms–6 s				
Optical Interface	SMA connector				
Interface (PC)	USB 2.0 (USB 1.1 compatible); Ethernet				
External I/Os	Ext. Hardware Trigger, Flash Trigger, 2x Digital In, 2x Digital Out at 15 pin D-Sub Connector (not available if Light source LS-C is used)				

#### LS-C Light Sources

Art-Nr.:	11-0202041-00	11-0202042-00	11-0202043-00
Lamp	Deuterium/Halogen	Xe Flash lamp	Halogen
Wavelength Range	200–2500 nm	220–900 nm	400–2500 nm
Max. Power	6 W	2 W	7 W
Life Time	> 2000 h (Deuterium) > 1000 h (Halogen)	10 <sup>9</sup> Flashes	> 2000 h
Stability	< 10 <sup>-3</sup> AU @ 250 nm	< 5 x 10 <sup>-3</sup> AU @ 300 nm < 2% Flash to flash (is reduced by accumulating multiple flashes)	< 5 x 10 <sup>-5</sup> AU @ 500 nm

#### Miscellaneous

Power Supply	110/220 V; 50/60 Hz (external power supply)
Dimensions (per unit) [mm]	220 x 150 x 72
Weight	Ca. 1,5 kg (LOE-MMS) Ca. 1,2 kg (Lamp unit)
Operating Temperature	5°C – 50°C

#### Available Software Modules (excerpt)

MultiSpec Pro & MultiSpec Lite	Powerful spectroscopy software for laboratory and process application
Software Development Kits	32-Bit SDK for LabVIEW, MSVC, MSVB, C#.NET, Delphi with example programs
TFProLite UV-VIS	Application for measurements of thin films



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