MultiSpec CCD

UV/VIS/NIR Detector Array Spectrometer System

MultiSpec is a modular instrument family of fast and simultaneous readout spectrometer systems for the UV/VIS/NIR. Based on flexible 19“ chassis technology it is ideal for process applications. Various spectral ranges, resolutions and PC-interfaces are available. The integrated spectrometers are high-quality modules without moving parts and with outstanding long-term stability. An optical multiplexer makes 2-channel sampling possible. The standardized SMA connectors at the front side allow easy connection of fiber-optic accessories.

MultiSpec*Desktop CCD* with light source

- **UV sensitive CCD technology**
- **possible spectral ranges:**
  200 – 600 nm and 200 – 980 nm
- **fast, precise, robust**
- **high dynamic range of 16 bit**
- **various PC interfaces**
- **versatile software packages**

Advantages

The back thinned / back illuminated CCD technology combines very high sensitivity over the whole spectral range from UV to NIR with the large dynamic range of a classical photo-diode detector array. These CCDs are especially suitable for low light level detection like fluorescence, film thickness, plasma or diffuse reflection measurements. Due to the capability to detect even smallest amounts of light, short exposure times can be achieved for high speed process control.

Carl Zeiss Spectrometer Module

The MultiSpec system is based on the monolithic spectrometer modules from Carl Zeiss. The high light sensitivity and the extreme stability of this module, together with the tec5 16-bit electronics, allow very accurate measurements with large dynamic range.

Plug-In Cassette Design

MultiSpec systems follow a modular concept. All components, such as spectrometers or light sources, are integrated in cassettes, which can be changed easily. System parameters (e.g. sensor type, sensor length, calibration coefficients) are stored within the cassettes and will be read out at system start. This keeps the necessary flexibility for future measuring demands and easy exchange during maintenance.

PC Interfaces

Different PC interfaces guarantee easy data transfer for the laboratory and process environment:

MultiSpec*Desktop*: Desktop version with PCI or USB 2.0 (1.1 compatible) Bus.

MultiSpec*StandAlone*: Stand-alone version with integrated embedded PC. For process communication it provides ethernet interface, analog 4...20mA outputs and digital I/Os.

Optical Multiplexer

The optional multiplexer module offers a sequential 2-channel operation. This can be used for a direct referencing of the light source to compensate for long term variations. Also spectra at 2 different measurement locations can be taken.

Process Communication

The MultiSpec systems can be equipped with analog (4-20mA) and digital I/Os for process communication to transfer results and status information (e.g. system error, system warning, out-of-range signal) to a process control system. In addition, a remote control from an SPS or PLS is available to trigger a measurement cycle or to stop the continuous data aquisition for maintenance. Various add-on I/O-boards with and without opto-isolation are available. Other communication protocols (Profibus, Ethernet...) can be integrated on customer request.

Accessories

Equipped with appropriate fiberoptics and probes the system can be adapted for your measurement task. For rough environment a 19" rack enclosure (or Ex-proof housing) is available. We assist you in finding the optimized solution.

Software Modules

- MultiSpec Pro Process Software with various data processing algorithms (e.g. color evaluation/ chemometrics with The Unscrambler, NIRCal & GRAMS models) based on LabVIEW™
- 32 bit function library for LabVIEW™ and programmer interface for C++/ VB/ Delphi for the development of application specific software
- Instrument drivers for GRAMS/AI from Thermo Galactic (21 CFR part11 compliant)
- Film Thickness Meas. Software FTM-ProVis2000
- Additional modules on request

Spectroscopy Software MultiSpec Pro

Light Sources

The MultiSpec systems can be equipped with various light sources, depending on the application.

- Usable wavelength range:
  Halogen lamp: 360nm – 2500nm
  Deuterium lamp: 200nm – 600nm
  Shine-through lamp: 200nm – 2500nm
  Xenon flash lamp: 200nm – 1100nm
- Lamp and shutter control by PC
- 2 internal filter ports

Technical Data

Spectral Sensor

Spectral range:	MCS UV: 200 - 600 nm MCS UV-NIR: 200 - 980 nm
CCD array:	Hamamatsu S7031-0906 bzw. S7031-1006
Number of pixels:	532 / 1044 (horizontal)
Resolution (Rayleigh):	< 3 nm (<3.5 nm)
Pixel dispersion:	0.8 nm
Wavelength accuracy:	< 0.5 nm (absolut)
Reproducibility:	< 0.1 nm

Temperature – induced drift: < 0.01 nm/K

Operating Electronics

Intensity Resolution:	16 Bit
Integration time:	variable from 8 ms – 6 s with array of 1044 columns variable from 4.5 ms – 6 s with array of 532 columns

Optical Interface

Standard SMA connectors

Other

Power supply:	110/220V, 50/60Hz
Dimensions (HxWxD) (Std.-enclosure)	180 x 427 x 411 [mm] (3/4 HE / 84TE)
Weight:	≈ 12 kg
Operating temperature:	5 °C – 35 °C

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