NIR Spectrometers 0.9 – 2.5 µm

(deep cooling, Low cost, high sensitivity, high resolution, USB)

Patent pending

DATASHEET

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Features

- High Sensitivity
- Low Cost
- USB/GUI
- Deep-Cooling Option
- MEMS Chopper Option

Applications

- Sensor
- Testing
- Instrumentation

The NIRS Series Spectrometer, based on TE-cooled Extended-InGaAs detectors, is optimized for NIR spectroscopic measurements requiring an exceptional signal-to-noise ratio and high dynamic range across the 0.9 - 2.5 µm spectral range. This system leverages innovative, patent-pending scanning technology, offering significant advantages: 1) Unmatched low cost; 2) Industry-leading sensitivity with deep cooling to -40°C; 3) Extended spectral coverage beyond traditional spectrometers; 4) Low power consumption; 5) Integrated MEMS chopper; 6) High-resolution performance. Additional features include photon integration for low-noise detection and connectivity via USB or RS232 with an intuitive GUI. The SFSD series is available in both OEM modules and turn-key units with integrated power supplies.

The NIRS Series spectrometers deliver high performance with ultra-low noise levels, making them suitable for a range of demanding applications. The detectors' excellent sensitivity supports broad-band applications, such as analyzing the optical properties of solids, liquids, and gases in the NIR range, chemical component analysis, moisture detection, and narrow-bandwidth tasks like NIR laser characterization. The NIRS series comes standard with a USB interface, and software support includes SDK examples, DLLs for custom application development, and Windows-based spectral acquisition and analysis tools.

Specifications

Parameter		Min	Typical	Max	Unit
Center Wavelength		0.9		2.5	µm
Spectral Resolution		0.5	1	10	nm
Wavelength Accuracy			1	3	nm
Wavelength Repeatability		-		±0.5	nm
PDL		-	0.5	3	dB
Signal to Noise Ratio [1]				15000:1	
Dark Readout Noise [2]			±1	-	RMS
Power Accuracy			±0.05	-	dB
Scan Time		30		10000	s
Input Optical Power	Standard version	-		0.3	W
	High power version			5	W
Electronic Interface				Mini USB	
Operating Temperature		-10	20	60	℃
Storage Temperature		-14	-	70	℃

Notes:

[1]. The lowest level requires -40 cooling, the high level is room temperature. These are also related to the integration time setting. Low spectral resolution increase sensitivity.

[2]. An integrated shutter is available to calibrate the dark readout

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

Rev 11/13/24

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Dimensions (mm)

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Electrical/Computer Connection

Module comes with a 12V DC power wall pluggable power supply

Turn-key unit has a 110-220 ACV input and a USB input at the back and optical input at the front.

Ordering Information

	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength**	**Input Optical Power**	**Cooling**	**Resolution ***	**Shutter**	**Chopper**	**Connector**
NIRS-	Module = 1 Turn-Key = 2	0.9-2.6µm = 2 Special = 0	Standard = 1 High Power = 2	Non = 1 -10°C = 2 -20°C = 3 -40°C = 5	1nm = 1 0.5nm = 2 5nm = 3 10nm = 4	Non = 1 Yes=2	Non = 1 Yes = 2	SMA905 = 1 FC/PC = 2 SC/PC = 4 ST/PC = 6 Special = 0

* Low resolution high sensitivity.

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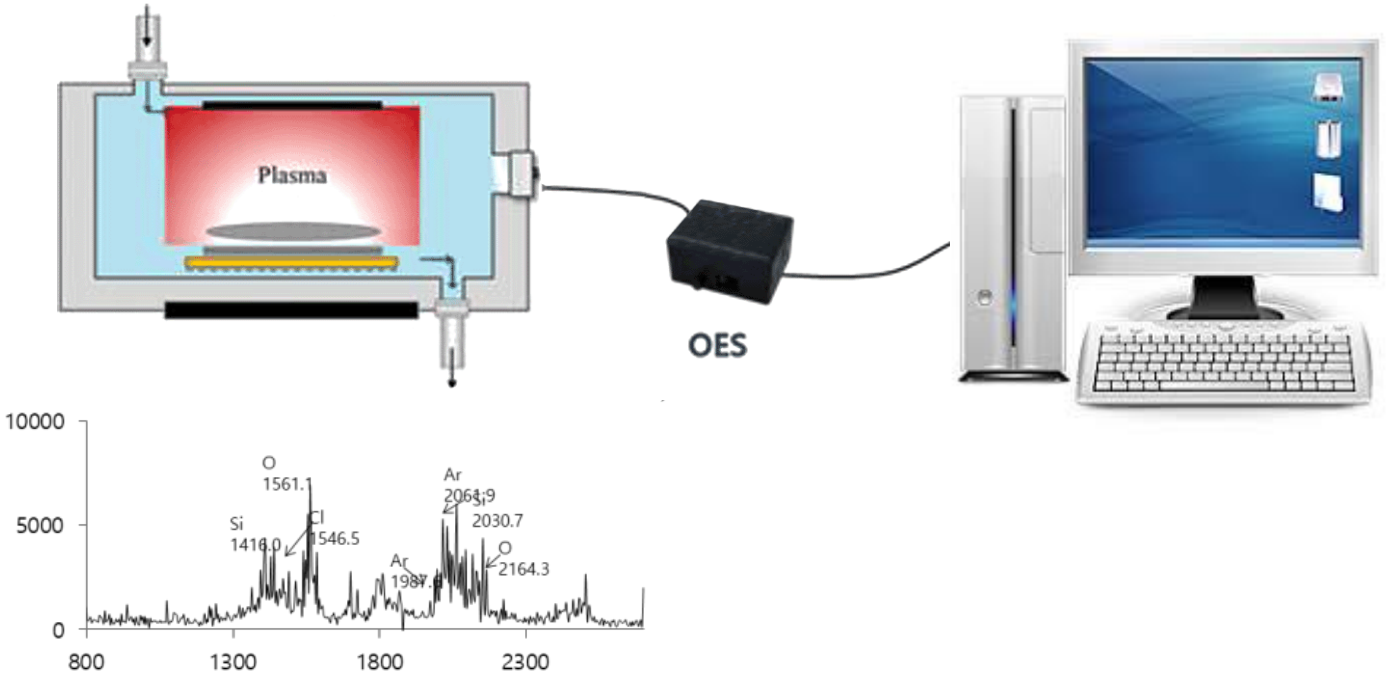
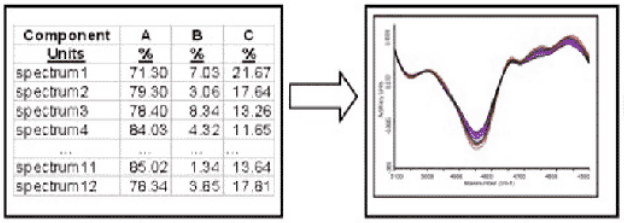
Application Example: PECVD Plasma and Gas Diagnostics of $Si_2Cl_6 + O_2 + Ar$



Application Example: Optical Absorption Measurement

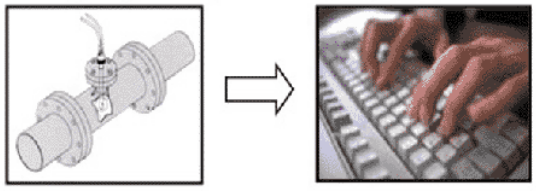
❑ Creating Calibrations

Component Units	A %	B %	C %
spectrum1	71.30	7.03	21.67
spectrum2	79.30	3.06	17.64
spectrum3	78.40	8.34	13.26
spectrum4	84.03	4.32	11.65
...	...	...	...
spectrum11	85.02	1.34	13.64
spectrum12	78.34	3.65	17.81



1. Prepare Standards
2. Collect Spectra
3. Build , Optimize & Test Model

❑ Analyzing Samples



Report	
Sample #081897-049	
Component A	81.55%
Component B	5.38%
Component C	13.06%

1. Measure Unknown
2. Access Model
3. Predict Concentrations

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