



# Integrated Spectral Sensor

The NeoSpectra-Micro is an integrated spectral sensor that can be used in a wide variety of material sensing applications for qualification and quantification. The sensor offers performance comparable to laboratory based spectrometers, but at a dramatically smaller size and lower cost.

The sensors are based on Fourier Transform InfraRed (FT-IR) technology, which is a standard technique that offers a wide spectral range for the best qualification and quantification of materials. The sensors used patented Micro Electro Mechanical Systems (MEMS) technology, which allows for a Michelson interferometer to be created monolithically on a MEMS chip.



## Integrated Optical Head

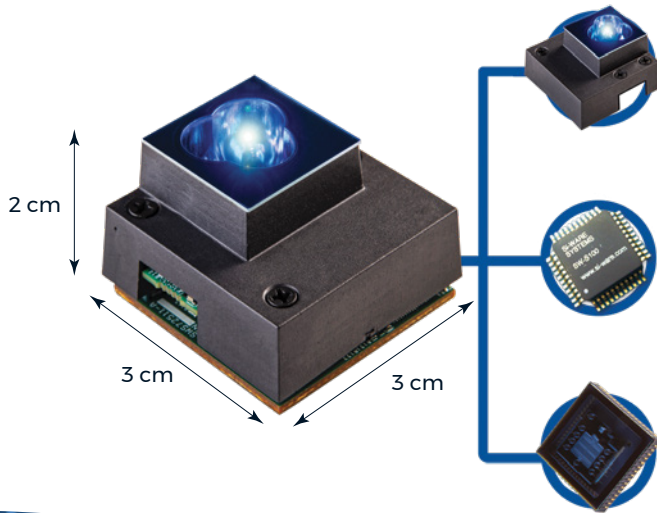
Optical head that with light sources for direct diffused reflectance measurements.

## BGA Solderable

Underside is solder bumped and is solderable to PCBs similar to a Ball Grid Array (BGA) package.

## SPI Communication

Control and read via Serial Peripheral Interface (SPI) communication.



## What's inside:

### Optical Head

- o Light sources for sample illumination
- o Collection of diffused reflected light

### Electronics

- o Application Specific Integrated Circuits (ASICs) for system control and data processing
- o Proprietary design for performance optimization
- o Reduces the amount of external components

### Optical Core Module

- o Monolithic MEMS Michelson interferometer
- o Single uncooled InGaAs photodetector

## Features:

### Performance

- o Wide spectral range
- o Different modes to optimize power consumption
- o Sensitivity optimization enabled

### Implementation

- o Miniature
- o Fully integrated
- o Free-space optics
- o No cooling required

### Economic Benefits

- o Low cost
- o Designed for high volume production
- o Minimum amount of external components

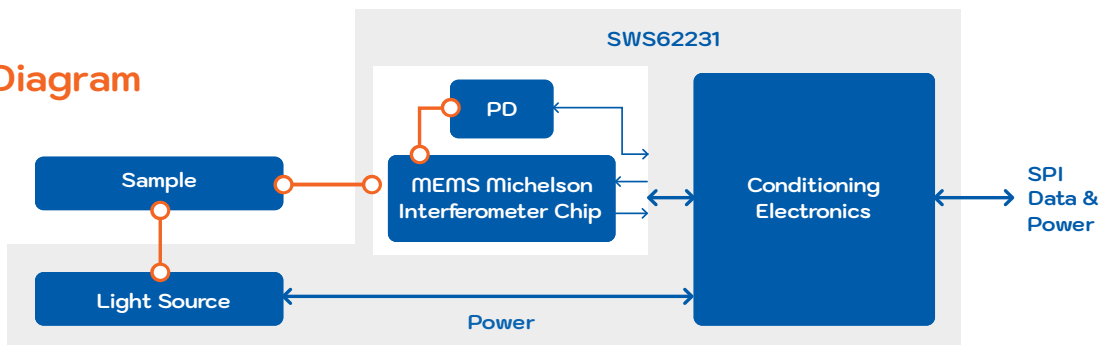
# Technical Specifications:

Parameter	Conditions	Value	Units
Wavelength Range	PSD <sup>*</sup> > max PSD/10	1,350 - 2,500	nm
Resolution	At $\lambda = 1,550$ nm, FWHM criterion	16	nm
Typical SNR (rms)	2s Scan time, @ $\lambda = 2,350$ nm	2,000 : 1	-
Temperature	Operation	-5 : 40	°C
Wavelength Accuracy	@ $\lambda = 1,400$ nm; temperature < 40° C	± 1.5	nm
Wavelength Repeatability	@ $\lambda = 1,400$ nm; absorbance level= 0.5 A.U.	±0.1	nm

\*PSD: Power Spectral Density

## Usage Model Typical Block Diagram

 Electrical Interface  
 Optical Interface



## What's Possible

Enabling a broad range of applications and use cases across multiple industries.



Smart Farming



Smart Food



Smart Healthcare



Smart Industry



Smart Consumer

## Plug-and-Play Development Kits

The NeoSpectra-Micro Development Kit (DVK) is a set of components that connect the NeoSpectra-Micro to a Raspberry Pi, which acts as a host for easy interfacing. The DVKs enable developers to evaluate the performance of the NeoSpectra-Micro and to start application and product development.

DVK includes:

- NeoSpectra-Micro unit
- Raspberry Pi board
- Evaluation software
- Software Development Kit (SDK) and reference code

Various operation modes:

- Connected to PC
- Standalone
- Component with SPI interface



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