

Product Specification: Phenom (PN) & Phenom-NIR (PN-NIR) Spectrometers

Description

The Phenom (PN) and Phenom-NIR (PN-NIR) Series spectrometers are designed for high-resolution, high-sensitivity spectral measurements across the visible and near-infrared regions. Featuring a T-R-T (Transmissive-Reflective-Transmissive) Czerny-Turner optical design and precision reflection gratings, the Phenom Series achieves excellent wavelength stability, low stray light, and fast spectral response.



Powered by USB and equipped with a 32-bit RISC microcontroller, the Phenom Series ensures efficient data transfer, multi-mode triggering, and stable performance under thermal and vibrational variation. Its modular design supports customizable slit widths, gratings, and sensors for seamless integration in laboratory and OEM systems.

Models and Wavelength Ranges

- PN1050: 535–565 nm or 535–650 nm (customizable 400–1000 nm)
- PN1080 / PN2080: 535–565 nm or 535–650 nm (customizable 400–1000 nm)
- PN2570 (NIR): 1522–1578 nm (customizable 900–1700 nm)

Main Features

- T-R-T Czerny-Turner optical design with 2nd and 3rd order rejection
- Choice of CCD, CMOS, or InGaAs sensors
- High dynamic range and low noise performance
- Integration time: 0.1 ms to 65 s (model dependent)
- USB 2.0 interface (480 Mbps) with plug-and-play SpectraSmart software
- Modular configuration for grating, slit, and sensor customization
- Onboard Flash ROM storage for wavelength, linearity, and intensity correction
- Supports up to 4,000 spectra buffering in ring-buffer mode
- External 8-pin I/O port for GPIO, UART, trigger, and light-source control

- Compact, vibration-resistant design for stable measurement under thermal drift

Technical Details

- Optical System: T–R–T Czerny–Turner structure, 2nd & 3rd order rejection
- f/# 5.0, NA 0.1; Effective focal length (R1–R2): 85–101.5 mm
- Grating: 1500 g @ 600 nm, 2400 g @ 300 nm (PN); 830 g @ 1200 nm (PN-NIR)
- Slit Widths: 10 μm or 25 μm
- Integration Time: 0.1 ms–65 s (model dependent)
- A/D Conversion: 16-bit, 15 MHz
- Fiber Interface: SMA905 or FC/PC (ferrule length < 9.812 mm)
- Data Interface: USB 2.0 High-Speed (480 Mbps)
- Trigger Modes: Single, multiple, and software trigger options with programmable delay
- Digital I/O: Six 3.3 V pins (GPIO, UART TX/RX, light source control, external trigger)
- Calibration: Wavelength, linearity, and intensity coefficients stored in Flash ROM
- Environmental: Operating 0–50 °C; Storage –30–70 °C; Humidity 0–90% non-condensing

Dimensions

- 180 (L) $\times$ 175 (W) $\times$ 60.7 (H) mm

Power Requirements

- Supply: +5 VDC, 300 mA (via USB)
- Voltage Range: 4.75–5.25 V

Specifications

Model	Wavelength Range (nm)	Sensor Type	SNR (Single acquisition)	Dynamic Range	A/D	Stray Light (%)
PN1050	535–565 / 535–650 (400–1000 customizable)	2048-pixel CCD	4700 (>3300)	500	16 bits	0.2%

PN1080/2080	535–565 / 535–650 (400–1000 customizable)	4096- pixel CMOS	3200 (>2000)	350	16 bits	0.2%
PN2570 (NIR)	1522–1578 (900–1700 customizable)	512- pixel InGaAs	6000–9300	2500 (HG), 4000 (LG)	16 bits	0.2%