Product Specification: Magna (MN) & Magna-NIR (MN-NIR) Spectrometers

Description

The Magna (MN) Series spectrometers are high-resolution, thermoelectrically cooled (TE-cooled) instruments designed for applications requiring outstanding wavelength stability and sensitivity across both visible and near-infrared ranges.
Featuring a TRT-Czerny–Turner optical design with precision reflection gratings, the Magna Series offers exceptional resolution, low stray light (<0.2%), and long-term spectral stability (<0.002 nm/°C). The combination of CCD (VIS) and InGaAs (NIR) sensors delivers high dynamic range and excellent signal-to-noise performance.
Compact, rugged, and USB-powered, the Magna Series integrates easily into laboratory and OEM systems for chlorophyll fluorescence, laser diode, and VCSEL/LED testing.

Models and Wavelength Ranges

- **VIS Models (CCD)**
  - MN1060S / MN1110S – Customizable within 400–1000 nm
- **NIR Models (InGaAs)**
  - MN2870S / MN6870ES – Customizable within 900–1700 nm

Main Features

- High-resolution TRT-Czerny–Turner optical bench with harmonic suppression
- TE-cooled CCD (VIS) and InGaAs (NIR) sensor options for superior thermal stability
- f/# 5.0, NA 0.1; focal length (R1–R2): 85–101.5 mm
- Ultra-low stray light (<0.2%)
- Integration time from microseconds to 65 s (model dependent)
- High SNR (up to 4900) and dynamic range (up to 10,000)
- Modular configuration: customizable grating, sensor, and slit width
- USB 2.0 High-Speed (480 Mbps); optional Ethernet (MN6870ES)

- External 8–16 pin I/O for GPIO, trigger, UART, PWM, and lamp control
- Onboard Flash memory for wavelength, linearity, and intensity calibration coefficients
- Compact and rugged housing with high thermo-hydro tolerance

Technical Details

- Optical System: f/# 5, NA 0.1; focal length (R1–R2): 85–101.5 mm
- Gratings: 1000 g @ 900 nm; 600 g @ 1200 nm; 830 g @ 1200 nm
- Slit Widths: 10, 25, 50, or 150 µm
- Typical Resolution: 0.31–0.35 nm (VIS); 0.2–0.4 nm (NIR, 10 µm slit); 2.9 nm (NIR, 150 µm slit)
- Integration Time: MN1060S/MN1110S: 5 ms – 65 s; MN2870S: 0.1 ms – 24 s; MN6870ES: 6 µs – 24 s
- Dark Noise: 7–13 e^- average (gain-dependent)
- Fiber Interface: SMA905 or FC/PC
- Calibration: Wavelength, linearity, and intensity correction stored in Flash ROM
- Cooling: Single-stage TEC, 0 °C default sensor temperature at 25 °C ambient
- Environmental: Operating 0–50 °C; Storage –30–70 °C; 0–90% RH non-condensing

Dimensions

- 199 (L) × 170 (W) × 64.5 (H) mm

Power Requirements

- USB Power: 330–350 mA @ +5 VDC
- TEC Power (via DC jack): up to 2000 mA @ +5 VDC
- Supply Voltage: 4.75–5.25 V

Specifications

Model	Wavelength Range (nm)	Sensor Type	SNR (Single acquisition)	Dynamic Range	A/D	Stray Light (%)	Thermal Stability (nm/°C)
MN1060S	400–1000 (customizable)	2048-pixel CCD (back-thinned)	500	5000	16 bits	<0.2%	<0.002
MN1110S	400–1000 (customizable)	2048-pixel CCD (back-thinned)	500	5000	16 bits	<0.2%	<0.002
MN2870S	900–1700 (customizable)	512-pixel InGaAs (TE-cooled)	2700–4900 (gain-dependent)	7700–10000	16 bits	<0.2%	<0.002
MN6870ES	900–1700 (customizable)	512-pixel InGaAs (TE-cooled)	2700–4900 (gain-dependent)	7300–9300	16 bits	<0.2%	<0.002