Product Specification: PocketHawk Miniature Spectrometer

Description

The The PocketHawk (PH) Series spectrometers combine compact design with high optical performance, utilizing a Crossed Czerny–Turner optical system for excellent resolution, sensitivity, and low stray light. Equipped with a linear CCD or CMOS sensor (UV-Vis) or an InGaAs sensor (NIR) and a 32-bit RISC controller, the PocketHawk is engineered for miniaturization and seamless system integration. The simplified optical engine and external MB-type casing enhance thermal management and stability, while programmable digital I/O and USB connectivity enable easy integration into OEM and laboratory platforms. Powered entirely by USB, the PH Series supports fast spectral acquisition, calibration coefficient storage, and plug-and-play operation for a wide range of UV-Vis and NIR applications.

Models and Wavelength Ranges

- **UV-Vis Models**
  - PH1014 / PH2014: 330–1050 nm (CCD)
    PH1034 / PH2034: 200–1050 nm (CMOS)
- **NIR Models**
  - PH2524 / PH2534: 900–1700 nm (InGaAs)

Main Features

- Crossed Czerny–Turner optical design with high sensitivity and low stray light
- Models available for UV-Vis (CCD/CMOS) and NIR (InGaAs) detection
- 32-bit RISC controller for fast processing and stable operation
- Optical resolution: 2.2–12 nm (Visible), 5–30 nm (NIR)
- Integration time: 100 µs – 15 s
- Modular configuration with customizable slits and gratings
- Up to 4,000 spectra buffering (continuous capture)
- 16-bit, 15 MHz A/D converter

- Flash ROM for wavelength, linearity, and intensity calibration coefficients
- 6 programmable 3.3 V digital I/O pins and UART TX/RX interface
- Micro USB 2.0 @ 480 Mbps and 4-pin extension for OEM control
- SMA905 fiber optic interface (Ø3.20 ± 0.01 mm ferrule)
- Compact and lightweight, ideal for portable and embedded applications

Technical Details

- Optical Design: Crossed Czerny–Turner, 2nd & 3rd order rejection
- f/#: 4.5, NA: 0.11 (recommended incident NA ≥ spectrometer NA)
- Sensors: CCD / CMOS (UV-Vis), InGaAs 128 or 256 pixel array (NIR)
- A/D Conversion: 16-bit, 15 MHz
- Optical Resolution: 2.2–12 nm (Visible), 5–30 nm (NIR)
- Integration Time: 100 µs – 15 s (configurable)
- SNR: 200–330 (Visible); up to 6500 (NIR)
- Dynamic Range: up to 8000 (depending on gain mode)
- Wavelength Accuracy: ±1.5 nm
- Repeatability: ±0.2 nm
- Thermal Stability: < 0.069 nm / °C (NIR)
- Stray Light: < 0.2 %
- Fiber Interface: SMA905 (Ø 3.20 ± 0.01 mm ferrule, max ferrule length <9.812 mm)
- Interfaces: Micro USB 2.0 @ 480 Mbps, 8-pin GPIO, UART
- Digital I/O: 6 programmable 3.3 V pins, external trigger, lamp control
- Power: USB 5 VDC @ 300–500 mA (4.75–5.25 V range)
- Dimensions: 65 × 65 × 29.8 mm
- Environmental: Operating 0–50 °C; Storage –30–70 °C; Humidity 0–90% non-condensing

Dimensions

- 65 (L) x 65 (W) x 29.8 (H) mm

Power Requirements

- USB powered, 4.75–5.25 VDC

Specifications

Model	Wavelength Range (nm)	Sensor Type	SNR (Single acquisition)	Dynamic Range	A/D	Stray Light (%)	Thermal Stability (nm/°C)
PH1014/2014	330–1050	CCD	200	2200:1	16 bits	<0.2%	<0.04
PH1034/2034	200–1050	CMOS	330	5650	16 bits	<0.2%	<0.04
PH2524	900–1700	InGaAs	2000	6250	16 bits	<0.2%	<0.04
PH2534	900–1700	InGaAs	6000	>7200	16 bits	<0.2%	<0.04