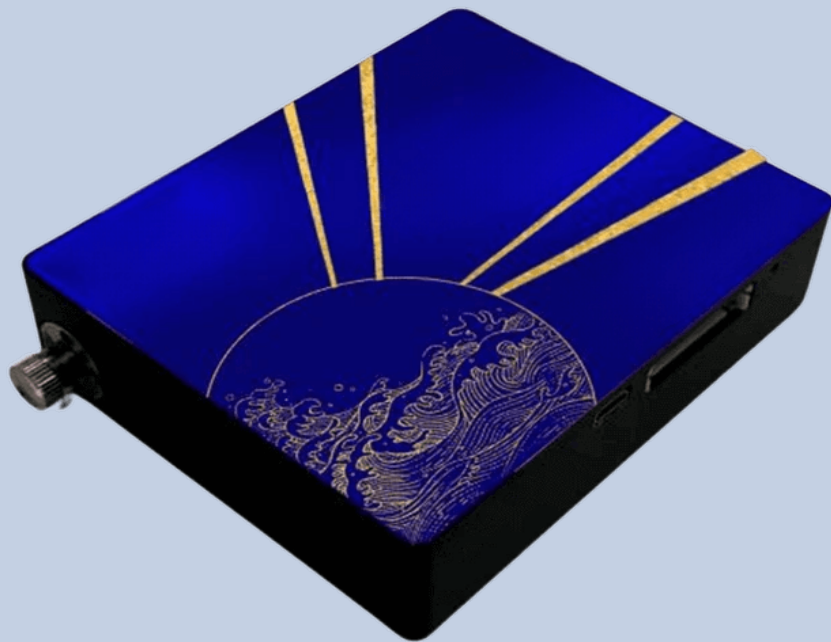


Sharp 2K Spectrometer



One Platform Many Possibilities

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Introduction

Sharp 2K Spectrometer is a miniature spectrometer with a compact structural design and configurable spectral range. It boasts high resolution, with the optimal resolution reaching up to 0.07 nm; low stray light, approximately 0.1%; and minimal temperature drift, with a wavelength temperature drift of about 0.1 pixel/°C.

It is suitable for various industrial on-site measurement scenarios, including laser measurement, plasma emission spectroscopy measurement, color measurement, absorbance measurement, and Raman measurement. It is a cost-effective industrial-grade fiber optic spectrometer.

Features

- Stray Light ~0.1%;
- With high resolution, up to a maximum of 0.07 nm;
- Wavelength temperature drift ~0.1 pixel/°C ;
- Compatible with Venuslab pin-type multi-core densely arranged bundled optical fibers, with consistency of fiber insertion/extraction strength $\pm 7\%$;
- Strong ultraviolet (UV) spectral response;
- CCD quantized background noise ≤ 30 RMS (at minimum integration time);
- Equipped with multiple communication interfaces including USB and serial port, a 24PIN interaction interface, and dedicated DAC and ADC, which enables enablement, intensity control and power feedback of matching light sources.

Applications

1. Illumination & Light Source Analysis

LED Production Testing: Sorting, Color Temperature (CCT), Color Rendering Index (CRI), and Dominant Wavelength measurement.

Laser Characterization: Measuring Center Wavelength, Spectral Bandwidth (FWHM), and Power Stability.

Display Panel Testing: Color uniformity and brightness calibration for OLED, LCD, and Micro-LED displays.

Solar Irradiance: Monitoring absolute irradiance and UV index.

2. Color Measurement (Colorimetry)

Industrial Color Quality Control: Ensuring color consistency in textiles, coatings, plastics, and painting industries.

Printing & Packaging: Ink color verification and print quality monitoring.

Reflective Color Analysis: Measuring CIE Lab* values and color difference (ΔE) for solid surfaces.

3. Material Science & Optical Testing

Transmittance & Absorbance: Analysis of optical lenses, filters, and glass materials.

Thin Film Measurement: Determining thickness of optical coatings and semiconductor layers via interference patterns.

Gemstone Identification: Spectral fingerprinting to distinguish natural from synthetic stones.

4. Chemical, Biomedical & Environmental Sensing

Water Quality Monitoring: Detecting chemical oxygen demand (COD), ammonia nitrogen, and heavy metals. **Fluorescence Spectroscopy:** High-sensitivity detection for biological tracers, DNA/RNA analysis (typically requires larger slit).

Agricultural Analysis: Non-destructive testing of fruit sugar content (Brix) and moisture levels.

LIBS (Laser-Induced Breakdown Spectroscopy): Rapid elemental analysis for alloy sorting and hazardous material detection.

Specification data for the Sharp 2K Spectrometer

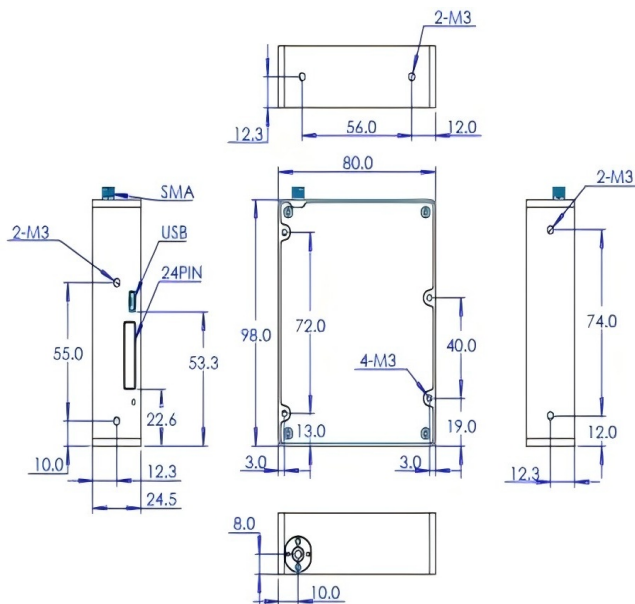
Category	Parameter	Value
Optical Parameters	Optical Fiber Interface	Key-SMA905
	Pixel Channel Count	2048
	Stray Light	~0.1%
	Wavelength Temperature Drift	~0.1 pixel/
	Consistency of Fiber Insertion/ Extraction	7%
	Functional Parameters	AD Sampling
Data Interfaces		USB2.0, RS232
Extended Function Interface		24 PIN
Acquisition Modes		Single-shot, Continuous, Software Trigger, Synchronous External Trigger, Asynchronous Reset External Trigger
Detector Integration Time		60 μ s (microseconds) - 65 s (seconds)
External Trigger Delay Accuracy		10 ns (nanoseconds)
CCD Readout Noise		30
CCD Dynamic Range		3000:1
Signal-to-Noise Ratio (SNR)		380:1
Response Linearity		98%
Operating Temperature		0 ~ 40
Operating Humidity		20% - 85%

Notes:

CCD Readout Noise: At the minimum integration time, it refers to the root mean square (RMS) of CCD readout noise.

CCD Dynamic Range: At the minimum integration time, the dynamic range is calculated as (saturation value - dark noise baseline) divided by the standard deviation of CCD readout noise; the evaluation method refers to Oceanhood's enterprise standards.

Dimension



Interface Definition

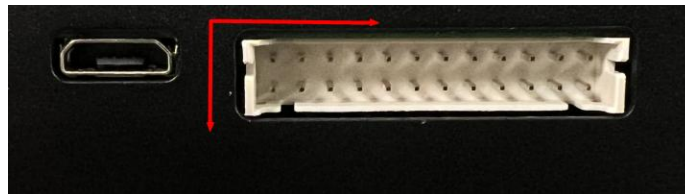
The figure below shows the various interfaces of the Sharp 2K Spectrometer. The optical fiber interface is an SMA905 interface, which is used to connect sampling accessories such as reflective probes, transmission-reflection holders, and liquid flow cells.

The Micro USB interface is used to connect to a computer via a data cable. The 2.0MM-24P interface (24-pin port) is used for the secondary development of the spectrometer.



Wiring Pin Definition

The 24pin interface uses a 2.0MM-24P connector.



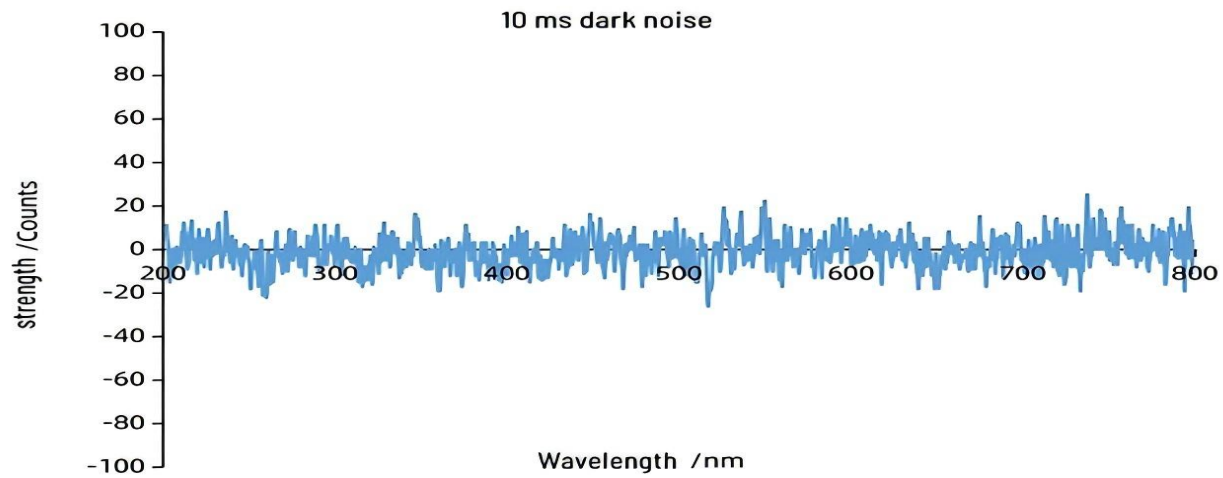
Physical Diagram of the Spectrometer's 24pin Interface (Note the Interface Direction)

24	22	20	18	16	14	12	10	8	6	4	2
23	21	19	17	15	13	11	9	7	5	3	1

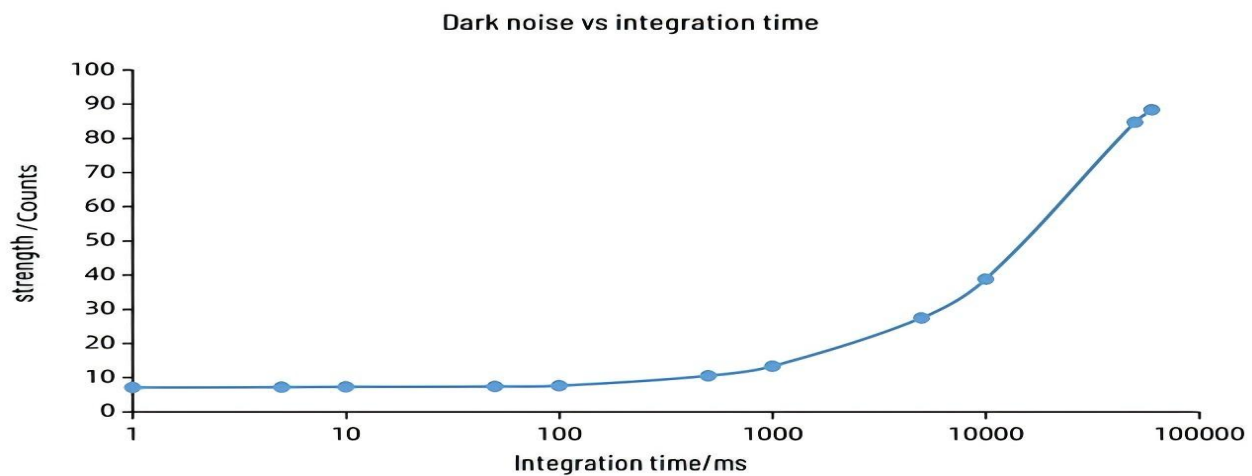
Pin No.	Definition	Function
1	EX_SET	Analog power output for laser power control (input voltage: 0~2.5V)
2	Monitor_RT	Laser temperature feedback
3	TEMP_SET	Reserved
4	Monitor_ILD	Laser power feedback
5	GPIO_PC6	TEC_SB mode
6	GPIO_PC10	Bluetooth device status pin
7	GPIO_PC7	GPIO output state configurable
8	GPIO_PC11	GPIO output state configurable
9	GPIO_PC8	Laser enable control
10	GPIO_PB8	Reserved
11	GPIO_PC9	Bluetooth control mode pin
12	GPIO_PB9	Reserved
13	UART5_TX	UART data transmission (TTL UART)
14	I2C2_SCL	Reserved
15	UART5_RX	UART data reception (TTL UART)
16	I2C_SDA	Reserved
17	SYNC_OUT	External trigger output signal
18	Laser_CLK	External laser clock output signal
19	InterLock_N	Laser InterLock control (controls laser on/off)
20	SYNC_IN	External trigger input signal
21	DC5V	Positive power supply (DC5V)
22	GND	Power ground
23	DC5V	Positive power supply (DC5V)
24	GND	Signal ground

Typical Spectrum

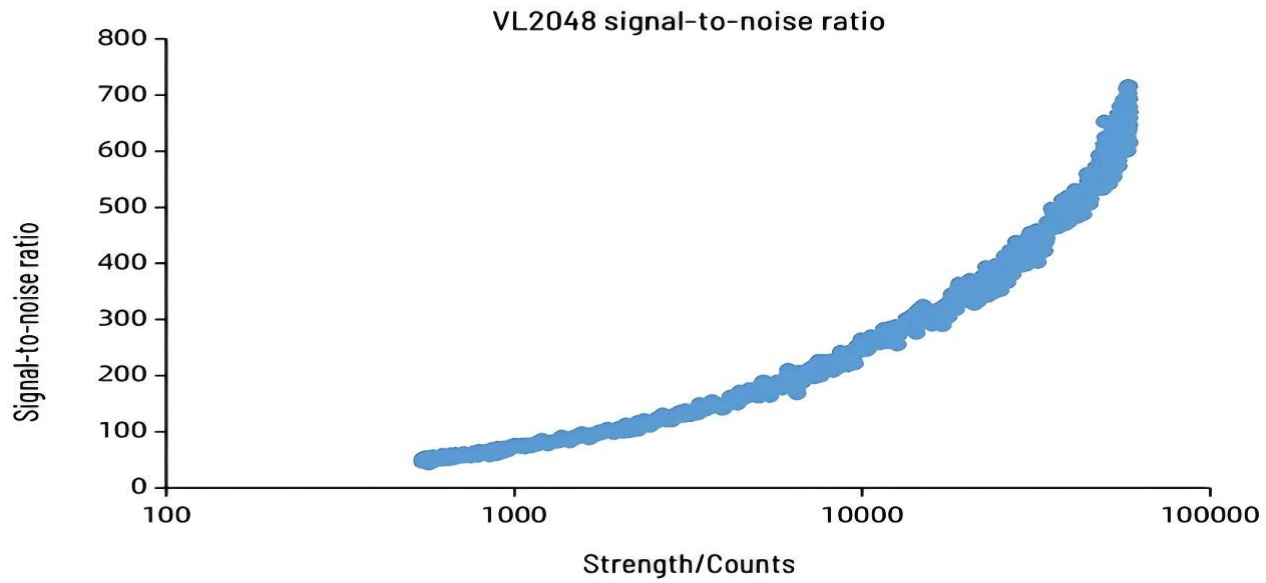
(1) Dark noise at 10 ms



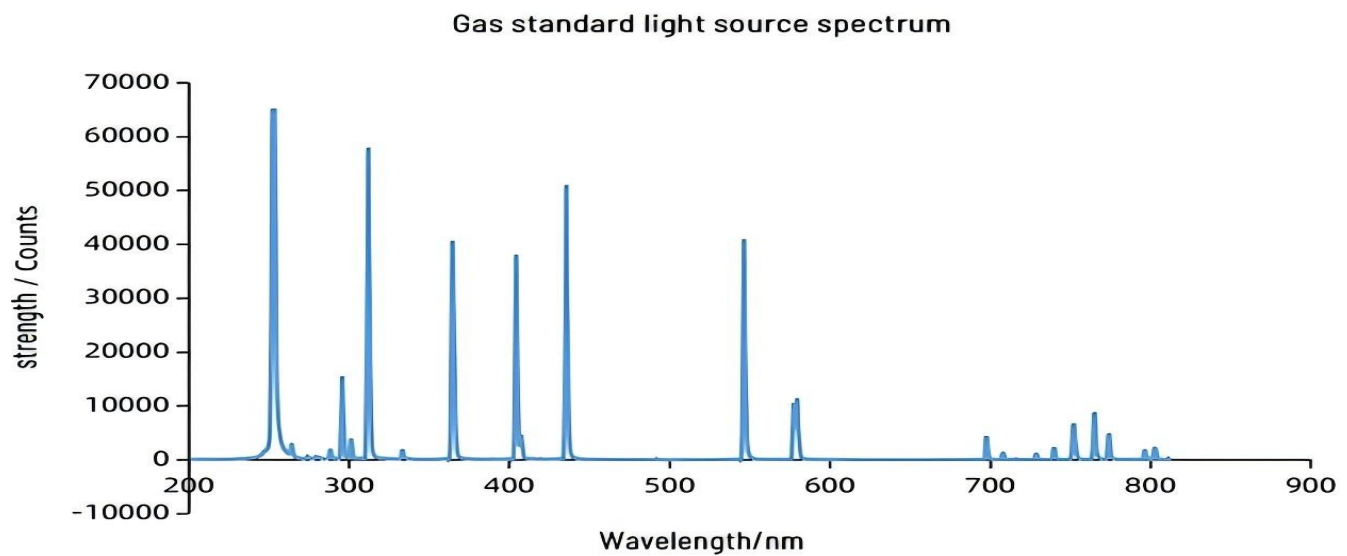
(2) Dark noise vs. Integration time



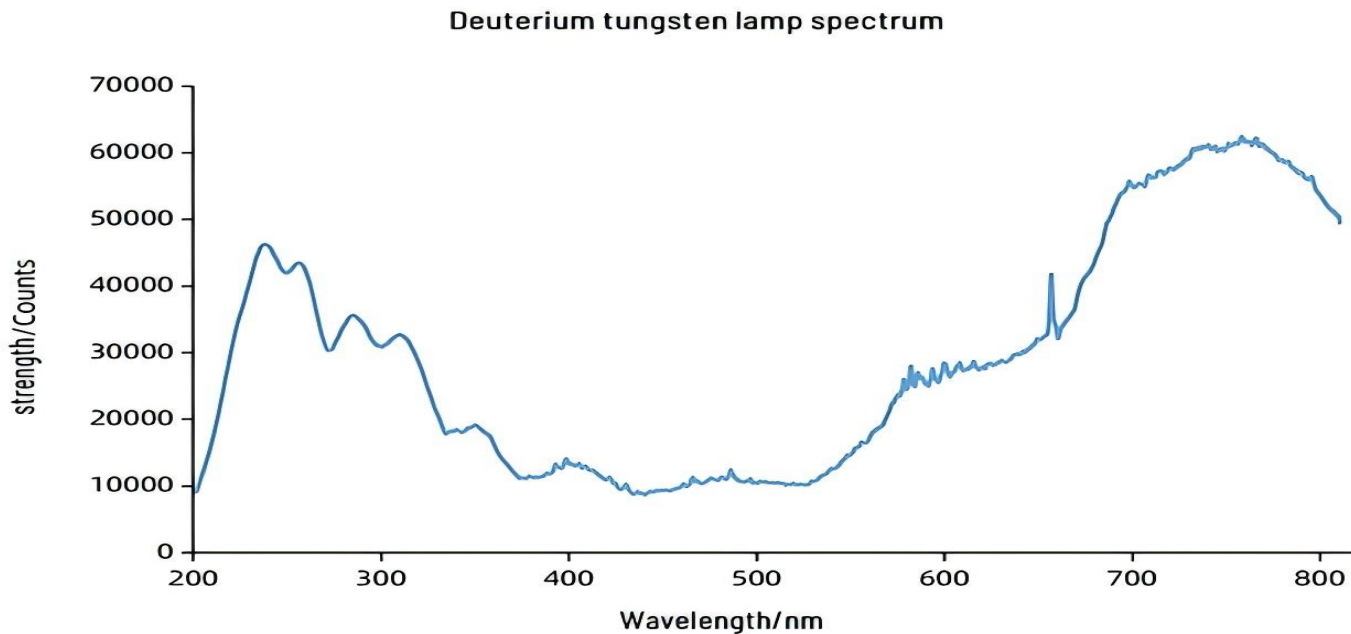
(3) Signal-to-noise ratio (SNR)



(4) Spectrum of spectral line lamp (200 - 800 nm)



(5) Spectrum of deuterium-tungsten lamp (200 - 800 nm)



Service & Support

We are dedicated to delivering exceptional optoelectronic solutions to every client. From precision manufacturing and secure delivery to full-lifecycle technical support, we are here to ensure a seamless and reliable experience at every step.

1. Warranty Policy

Quality First, Worry-Free Operation

Warranty Period: We offer a **two-year** warranty service for all of our core optoelectronic products, effective from the date of shipment.

Coverage: We provide free repair or replacement services for malfunctions caused by material defects or workmanship errors under normal operating conditions.

Rapid Response: Upon receiving a warranty claim, we guarantee to initiate the assessment process within **24 hours** to minimize your equipment downtime.

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Expert Team, Full-Process Guidance

Technical Consultation: Our team of senior optical engineers provides **24/7 online support** to assist with installation, commissioning, optical path alignment, and parameter optimization.

Scheduled Maintenance: We offer full-lifecycle maintenance recommendations, including firmware upgrades, optical component cleaning guidelines, and precision calibration services.

Training Services: We provide customized remote or on-site operational and safety training to ensure your team can operate the equipment efficiently and safely.

3. Logistics & Delivery

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Professional Packaging: Given the fragile nature of optical instruments, we utilize industrial-grade shockproof, anti-static, and moisture-proof vacuum packaging to ensure zero damage during transit.

Logistics Partners: We partner with top-tier global logistics providers (**DHL / FedEx / UPS / SF Express**) to offer reliable shipping with real-time tracking.

Shipping Insurance: All shipments are fully insured to eliminate logistics risks.

4. Compliance & Certification

Strict Standards, Total Compliance


Quality Certification: Our manufacturing process is **ISO 9001 certified**, and our products comply with international standards such as **CE** and **RoHS**.

Export Compliance: "Committed to environmental responsibility, all our products comply with **RoHS 2.0** and **REACH** standards, ensuring safety and global compliance."

Explore Series

VL2048 Series Spectrometer Selection Guide

Model	Spectral Region (nm)	Resolution @ 10µm Slit (nm)	Resolution @ 25µm Slit (nm)	Resolution @ 50µm Slit (nm)	Resolution @ 100µm Slit (nm)	Resolution @ 200µm Slit (nm)
VL2048-200-800	200 - 800	0.90	1.00	1.40	2.40	3.50
VL2048-350-940	350 - 940	0.80	1.00	1.50	2.40	3.60
VL2048-200-1100	200 - 1100	1.00	1.80	-	3.00	4.20
VL2048-350-1050	350 - 1050	0.90	1.00	1.60	2.80	4.00

 Get in touch with our team to explore configurations, request a quote, or learn more about customized solutions tailored to your needs.

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