

Cooled Spectrometer

ATP5200

Features

- Detector: Back-illuminated CCD (cooled to -10 °C)
- Detector pixels: 2048 pixels
- Special optimization for UV or IR: UV optimization: ATP5200P / Infrared optimization: ATP5200R
- Ultra-low noise CCD signal processing circuit
- Maximum spectral range: 190-1100 nm(maximum width of 900 nm)
- Spectral resolution: 0.1-3 nm
- Optical path structure: cross C-T
- Integration time: 10ms-65s
- Power supply: DC 5V±10% @ <2.3A
- ADC bits depth: 18 bit, 570KHz ADC
- 20-pin double-row expansion interface
- Light connector: SMA905 or free space
- Output data port: USB Type-C (High speed) or UART

Application

- Reflectance, transmittance, weak fluorescence detection
- Raman spectrometer, online spectral analysis
- Micro, fast spectrophotometer
- fruit sorting

Description

ATP5200 is the sixth-generation high-performance cooling miniature fiber optic spectrometer newly developed by OPTOSKY. It adopts the sixth-generation newly designed optical platform and carefully crafted optical components to achieve excellent optical sensitivity and spectral resolution; At the same time, it uses a variety of high-performance detectors, including high-sensitivity back-illuminated linear CCD, CCD adopts semiconductor refrigeration technology, and CCD can work in a set constant temperature environment, thus greatly reducing the temperature of the sensor. Noise, obtained an excellent signal-to-noise ratio, and improved the measurement reliability of ATP5200, and the measurement results do not change with the ambient temperature.

At the same time, Aoptian specially customized the ultra-low noise CCD signal processing circuit for ATP5200, and its quantization noise is less than 3 counts, which is the best level in the industry.



1. Selection Guide

Model	Features
ATP5200	Standard model with 2048-pixel CCD detector
ATP5200-LVF	Built-in LVF to eliminate multi-order diffraction
ATP5200P	Enhanced UV response, high-resolution, high-sensitivity cooled type
ATP5200R	Enhanced IR response, particularly suitable for Raman spectrometers, fruit sorting, and other infrared light detection
ATP5200P/R-LVF	Built-in LVF to eliminate multi-order diffraction
ATP5200-4	4096 pixels

2. Technical Parameters

	Parameter	ATP5200	ATP5200-4	ATP5200P	ATP5200R
Detector	Type	Linear array CMOS		Area array back-illuminated CCD	
	Cooling Method	TEC cooling (-5°C)		Detector cooling (-10°C)	
	Spectral Range	190-1100 nm			
	Effective pixel	2048	4096	2048×64	
	Sensitivity	1300V/(lx·s); 6.5 μV/e-			
	Dark noise	0.4V/RMS; (6e-)			
Optical Parameter	wavelength range	190-1100 nm (maximum width of 900 nm)			
	Optical resolution	0.1-3 nm (depends on slit width and spectral range)			
	Signal-to-noise	>600: 1		> 800: 1	
	Dynamic range	> 5000: 1		> 10000: 1	
	Optical Design	F/4 cross asymmetric Czerny-Turner optical path			
	Incidence slit	5/10/25/50/100/150/200 μm, other sizes customizable			
	Incident Interface	SMA905 fiber interface, free space			
Electrical Parameter	Integration time	10ms-65 s			
	Frame Rate	100 fps, Typical			
	Data interface	USB Type-C or UART			
	ADC Bit Depth	18 bit (output 16 bit)			
	Supply voltage	DC 5V			
	Operating current	<2.3 A			
Physics Parameter	Dimension	208×120×47 mm ³			
	weight	1.5 kg~1.7 kg			

3. Key Performance Tests

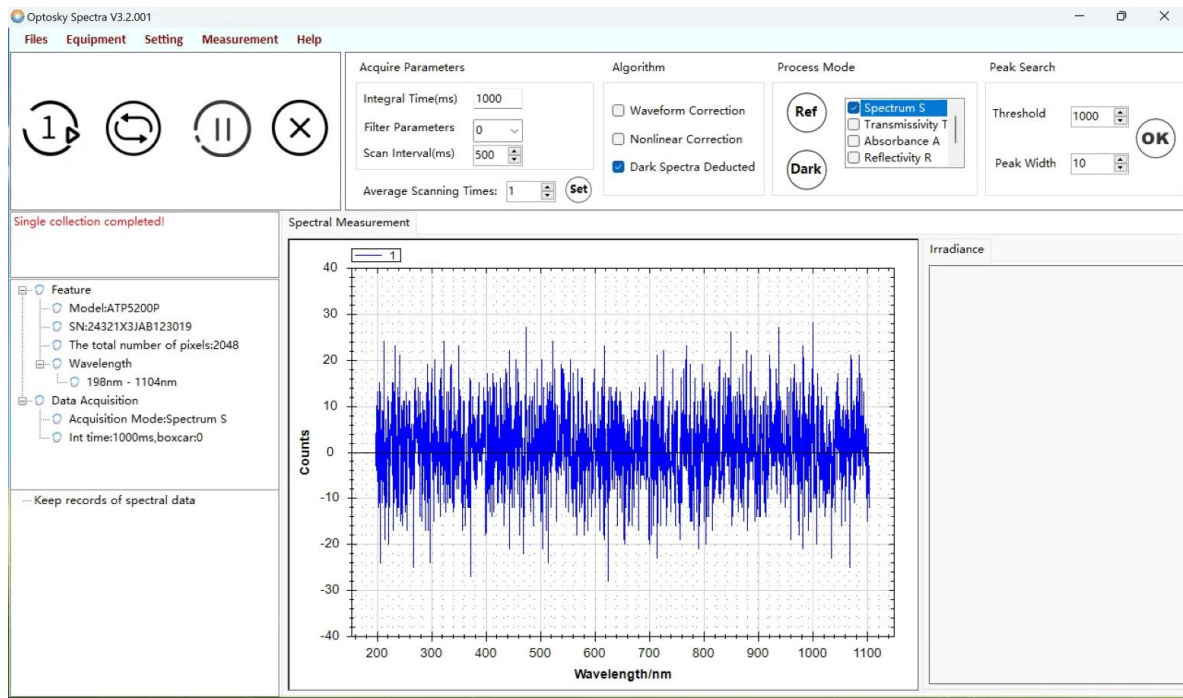


Figure1: ATP5200P Dark Current Test (Integration Time: 1000 ms)

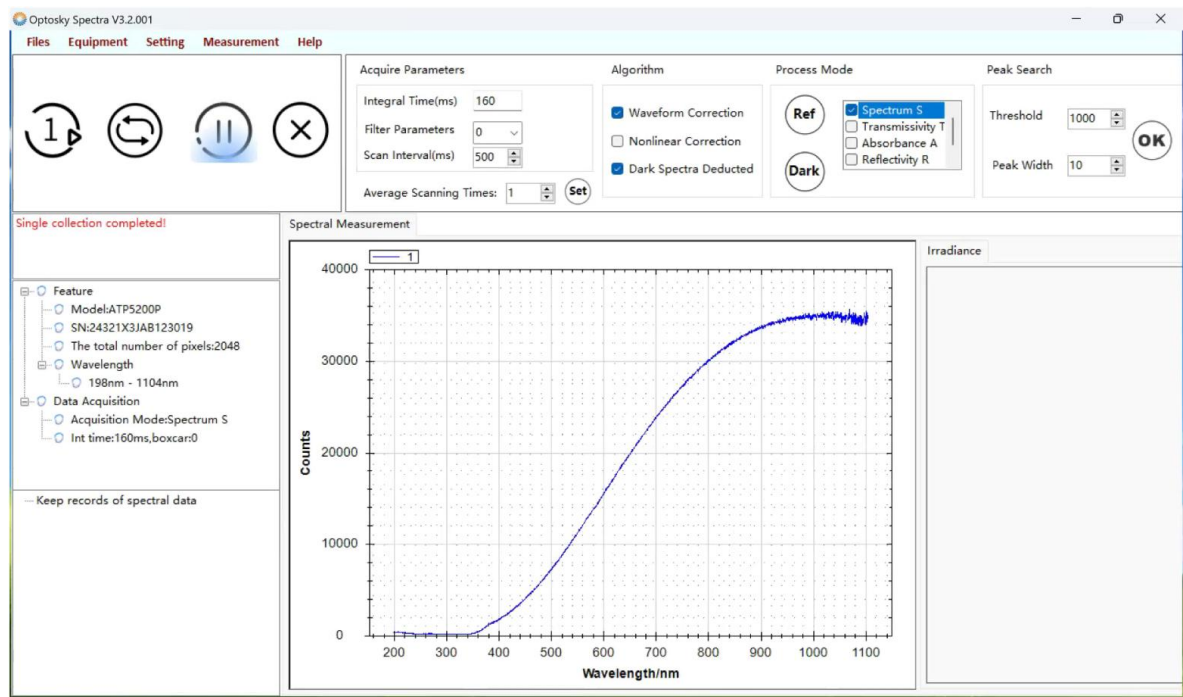
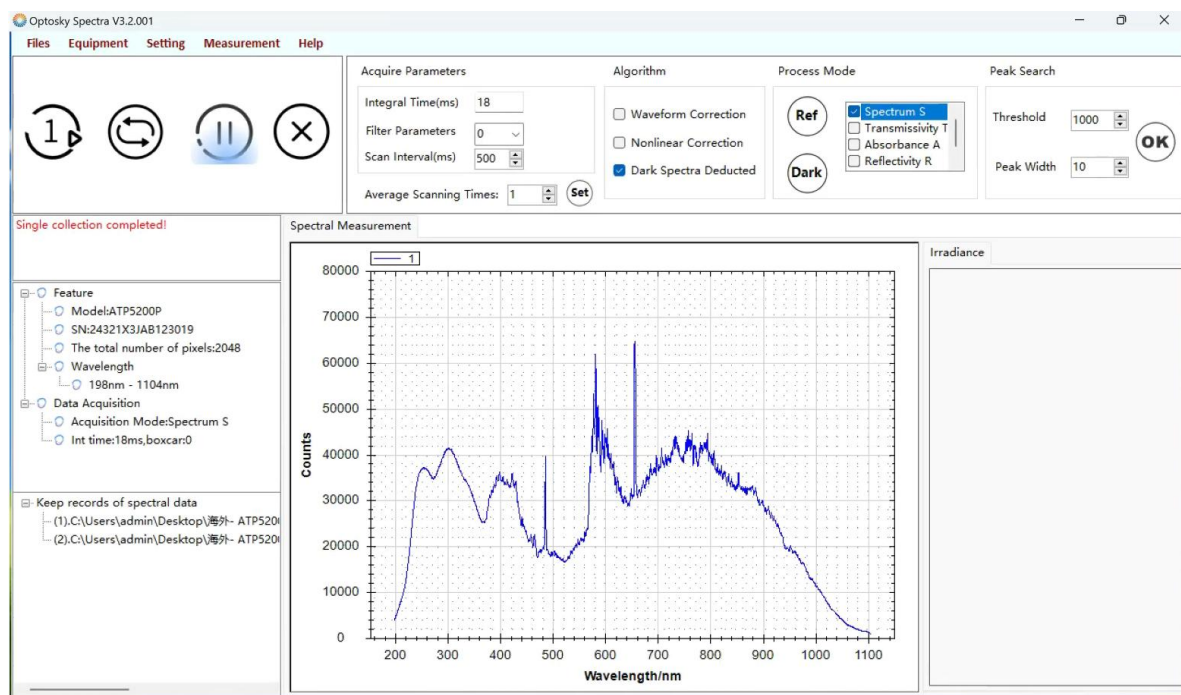
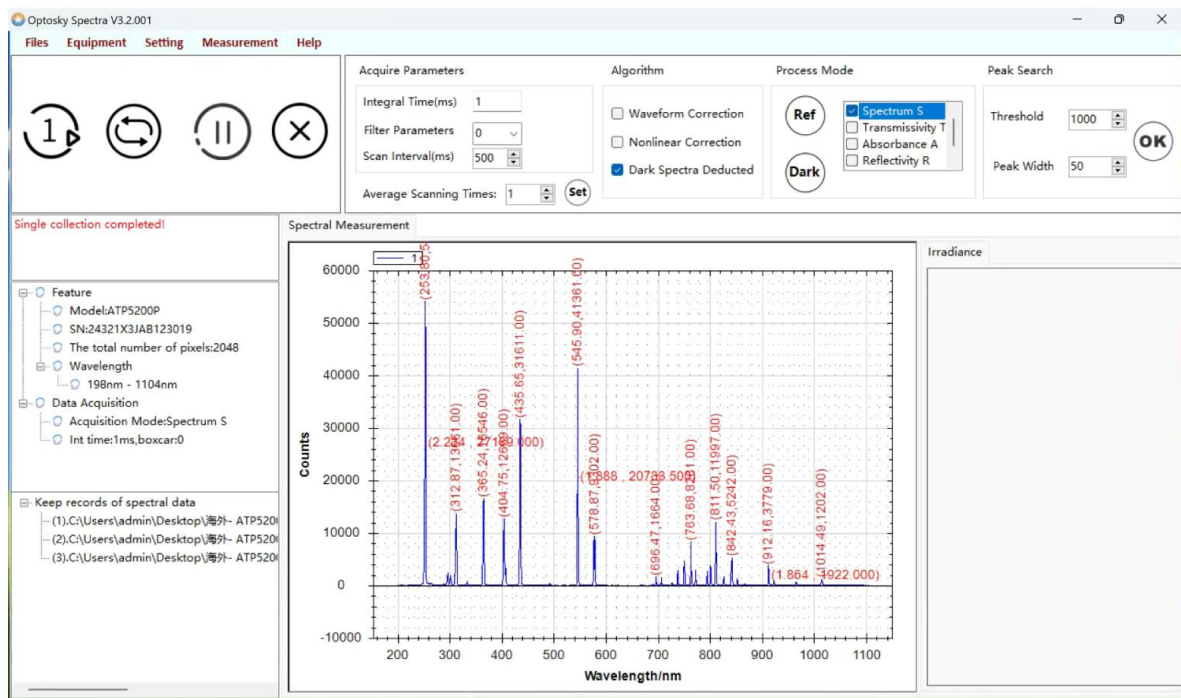


Figure 2: ATP5200P Waveform Correction



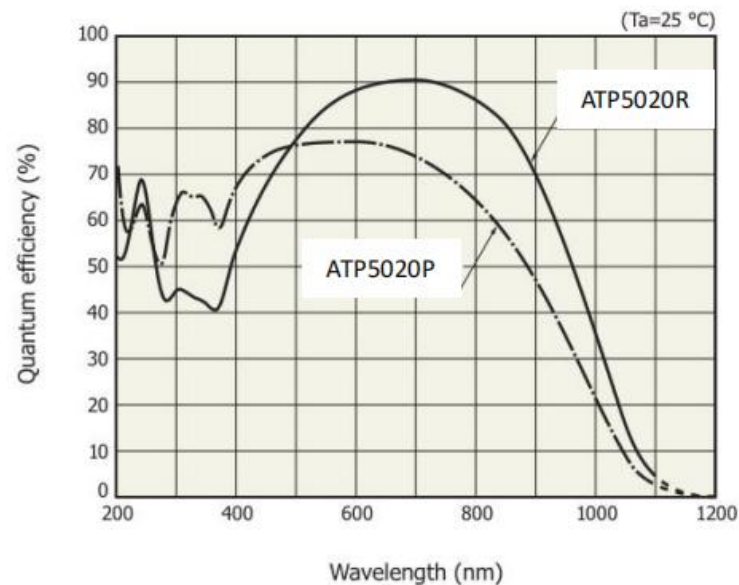


Figure 5: ATP5200P/R Spectral Band Optimization:
 — In the >500 nm range, ATP5200R has a higher response rate
 — In the <500 nm range, ATP5200P has a higher response rate

4. Physical Device Images



Figure 6: ATP5200 Physical Device Image

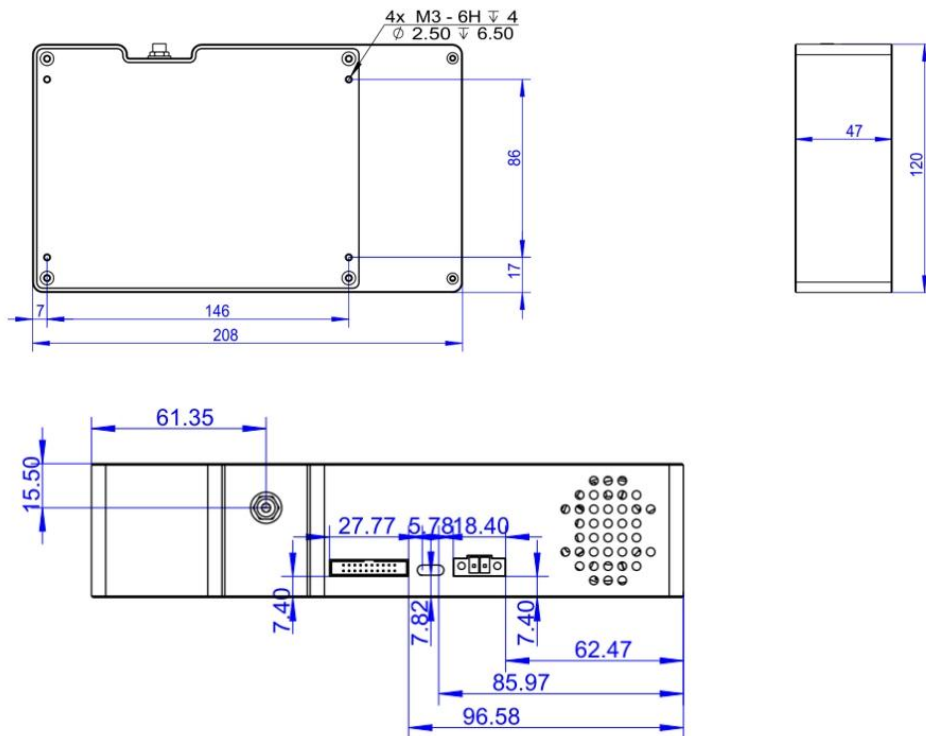


Figure7: ATP5200 Dimensional Drawing

5. Accessories

Standard Accessories	
1	Type-C USB Data Cable
2	5V Standard Power Adapter
Optional Accessories	
1	UV-Visible Light Resistant Optical Fiber
2	Adjustable Optical Attenuator
3	Standard Diffuse Reflectance White Board
4	Integrating Sphere Stand for Transmission/Reflectance Measurement
5	Fiber Optic Collimator
6	Cosine Corrector

6. Application Scenarios and Measured Data

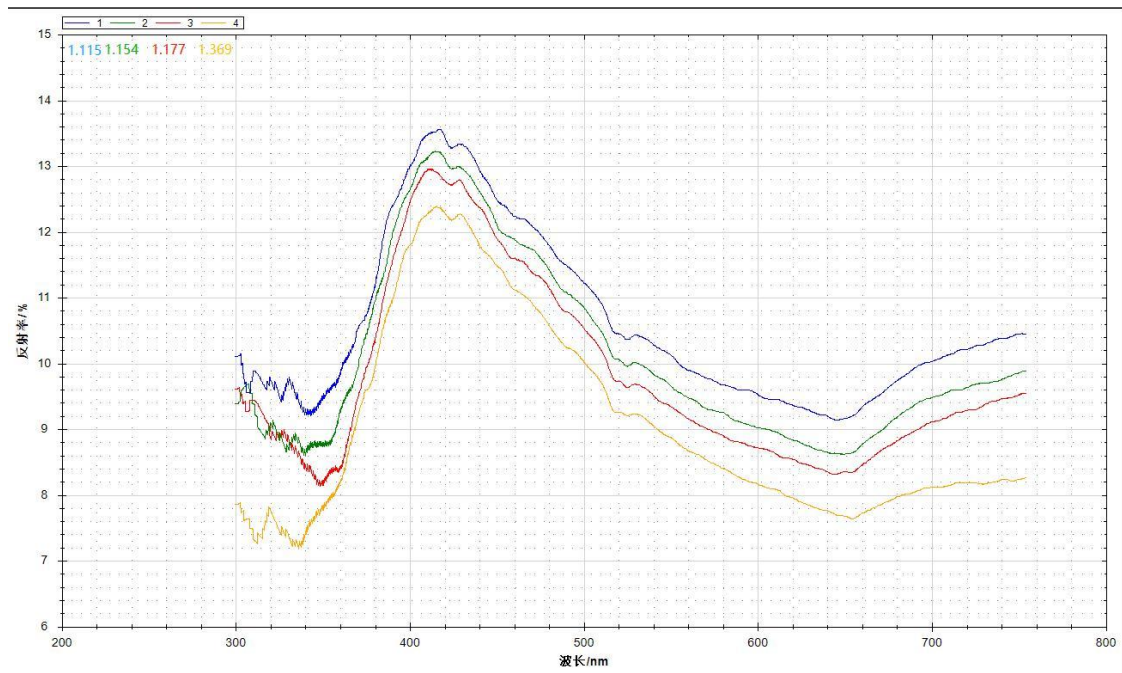


Figure 8: ATP5200P Comparison Test of Reflectance for Different Lenses