

High-Performance, Scientific Spectrometer (Cooled CCD)

ATP6520

Features

- Detector: Back-illuminated CCD (cooled to -15 °C)
- Detector Pixels: 1044 x 64
- Ultra-low Noise CCD Signal Processing Circuit
- Quantum Efficiency: >90%
- Ultra-low Etalon Effect
- Ultra-high Dynamic Range
- Ultra-high Signal-to-Noise Ratio
- Spectral Range: 190-1100 nm(Maximum width: 800 nm)
- Spectral Resolution: 0.05-3 nm (depending on spectral range and slit width)
- Optical Path Structure: Crossed C-T
- Integration Time: 6ms - 65 s
- Power Supply: DC 5V $\pm$ 10% @ <2.3A
- 18-bit, 570 kHz A/D Converter
- Optical Input Interface: SMA905 or free space
- Data Output Interface: USB 2.0 (High speed) or UART
- 20-pin Dual-row Programmable Expansion Interface

Application

- Biological Fluorescence Detection
- Raman Spectrometer
- Micro, Rapid Spectrophotometer
- Transmittance Detection

Description

The ATP6520 is a scientific-grade high-performance cooled micro fiber optic spectrometer developed by Optosky. It features a 1044 x 64 pixel cooled back-illuminated linear CCD, which offers the maximum dynamic range and utilizes semiconductor cooling technology to reduce dark current during operation. The CCD operates in a controlled temperature environment (down to -15 °C), significantly lowering sensor noise and achieving an excellent signal-to-noise ratio (approximately twice that of competing models), thereby enhancing the measurement reliability of the ATP6520, with results unaffected by ambient temperature changes.

Optosky has specially customized an ultra-low noise CCD signal processing circuit for the ATP6520, with quantization noise less than 3 counts, setting the industry standard. The ATP6520 can accept light input from SMA905 optical fibers or free space and outputs measured spectral data via USB Type-C or UART ports. It



1. Selection Guide

Model	Description
ATP6520	200-1100nm(Maximum width: 800 nm)

2. Parameter

Detector	
Type	Linear array back-illuminated CCD
Effective Pixels	1024×64
Pixel size	24μm × 24μm
Cooling Temperature	-15°C
Sensitivity	6.5 uV/e-
Dark noise	8 e-
Optical parameters	
Wavelength range	190-1100 nm , Customizable spectral ranges (up to 800 nm bandwidth, e.g., 300–1100 nm)
Optimal optical resolution	0.1-3 nm (depending on the slit and spectral range)
Signal-to-noise ratio	>1000:1
Dynamic range	20000: 1
Optical path parameters	
Optical design	f/4 cross asymmetric C-T optical path
Entrance slit width	5, 10, 25, 50, 100, 150, 200 μm optional, other sizes can be customized
Incident light interface	SMA905 fiber interface, free space
Electrical parameters	
Integration time	6 ms -65s
Frame Rate	300fps
Data Output Interface	USB Type-C (High-Speed) or UART
ADC bit depth	16 bit
Power supply	DC 5V±5%
Operating current	<2.3A
Operating temperature	-20°C to +50°C
Operating humidity	< 90%RH

Physical parameters	
Dimensions	170×110×52 mm ³
Weight	0.8 kg

3. Main Performance Tests

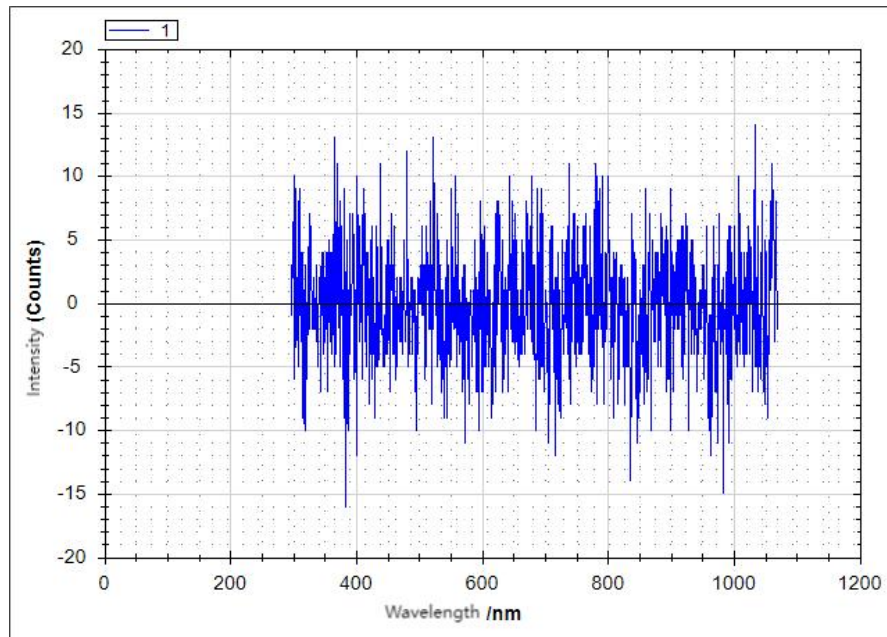


Figure 1: ATP6520 Dark Noise Test (Integration Time: 1000ms)

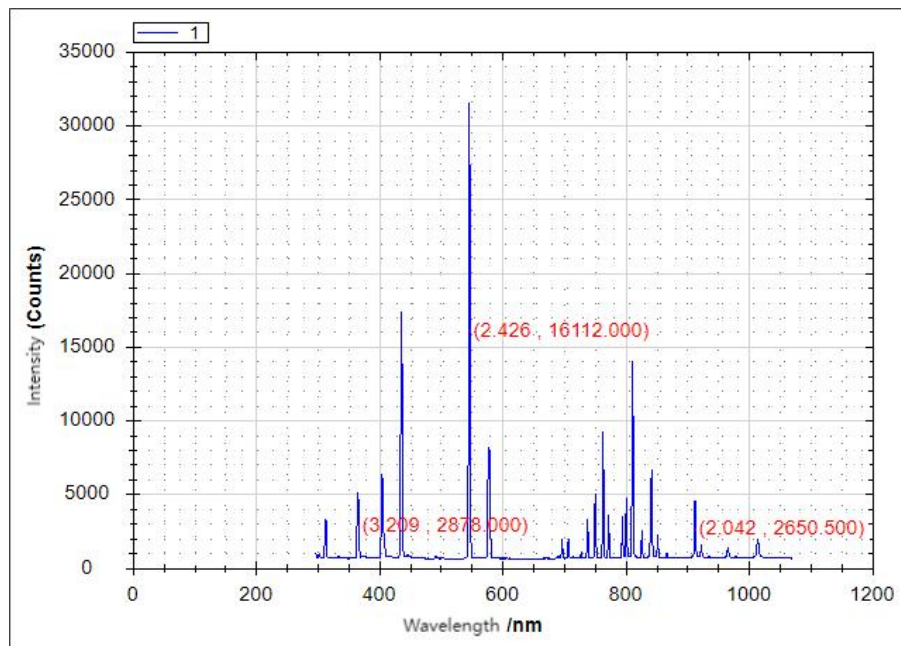


Figure 2: ATP6520 Resolution Test – 2.426nm @ 546nm

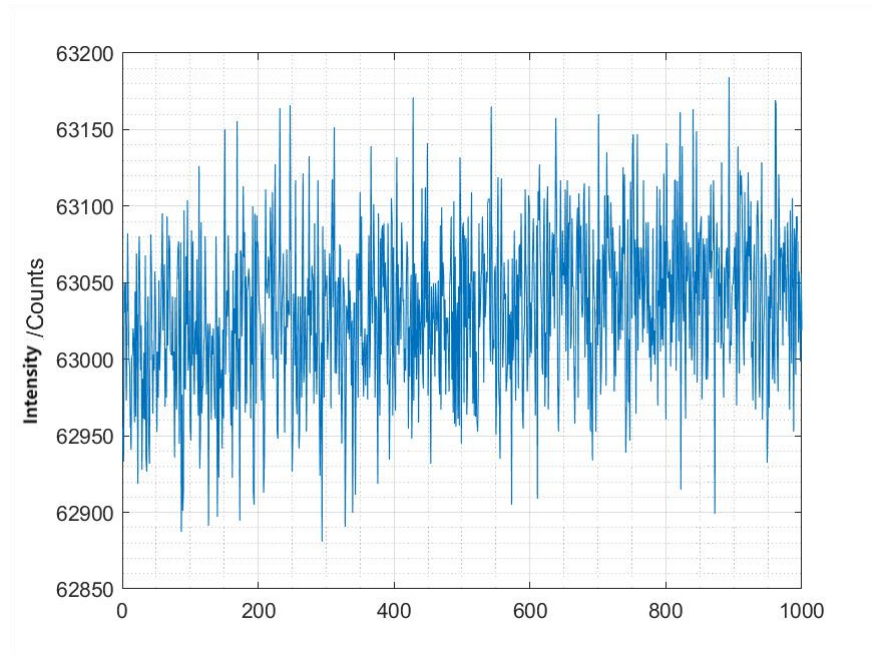


Figure 3: ATP6520 Signal-to-Noise Ratio Test – 1216:1

4. Physical Object and Dimensional Drawing



Figure 4: ATP6520 Physical Device Image

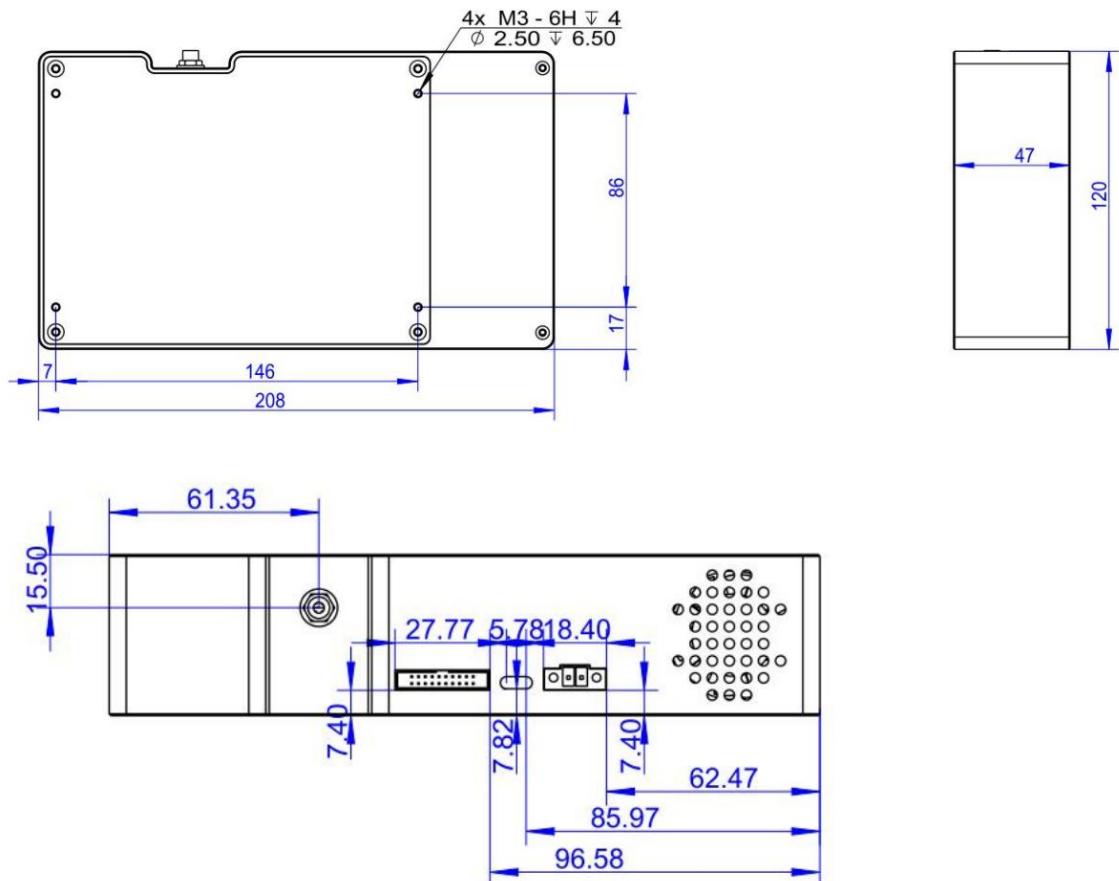


Figure5: ATP6520 Dimension Diagram

5. Accessories

Standard Accessories	
1	Type-C to USB Data Cable
2	5V Standard Adapter with Matching Power Cable
Optional Accessories	
1	UV-Visible Resistant Optical Fiber
2	Adjustable Optical Attenuator
3	Standard Diffuse Reflectance Whiteboard
4	Integrating Sphere Bracket for Transmission/Reflectance Measurements

6. Application Scenarios and Measured Data

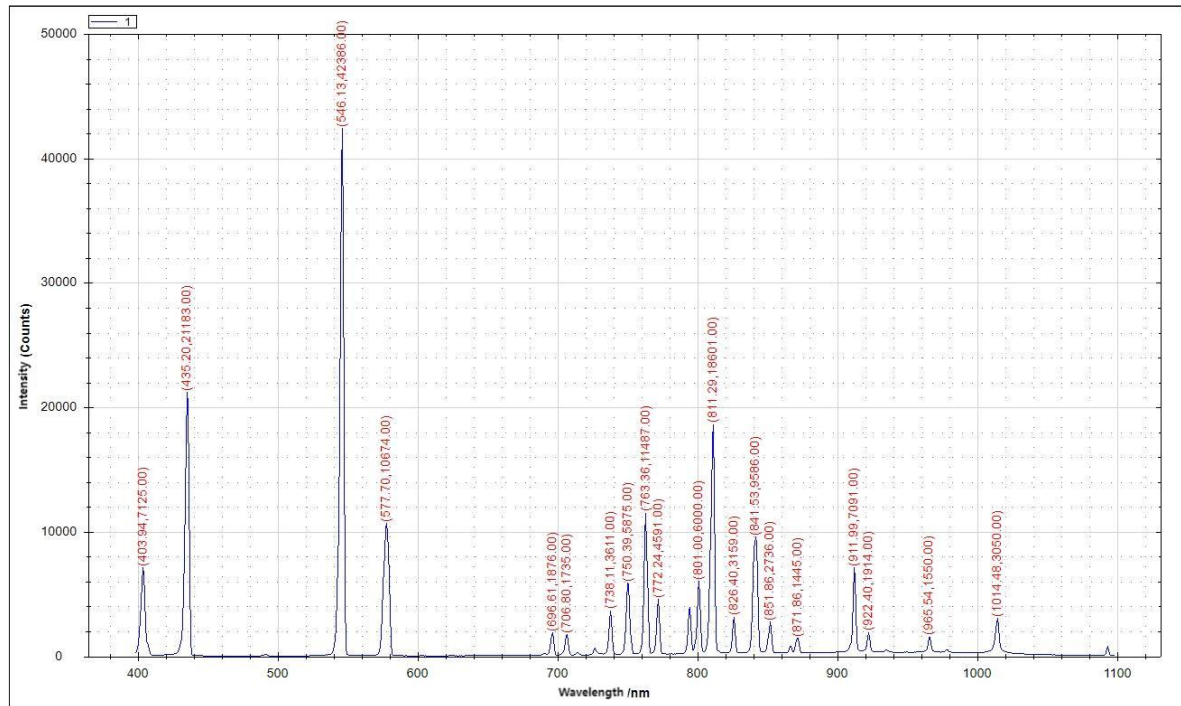


Figure 6: ATP6520 Neon Lamp Test Spectrum