

Compact NIR Spectrometers

ATP8200

Features

- Cooled InGaAs detector;
- wavelength range across 900-2600 nm;
- Ultra-low noise correlated double sampling circuit;
- Spectral resolution: related to the width of the Entrance slit;
- Integration time: 1.0ms - 60s (different instruments);
- CCD pixels: 256, 512, 1024 and 2048 optional;
- Power supply: DC 5V@<3A;
- Power interface: imported 2-pin industrial connector with lock;
- ADC parameters: 18 bits, 500 KHz;
- Input Fiber Connector: SM905 optical fiber interface or free space input;
- Data output interface: USB2.0 and UART;
- 20-pin expansion interface;

Application

- food sorting;
- Wastewater testing;
- Water, protein, fat, fiber detection of crops;
- paper sorting;
- On-line monitoring of traditional Chinese medicine production;
- Solar panel testing;

Description

ATP8200 family is a new generation of NIR spectrometer, newly developed by Optosky on the basis of the ATP8000. It has higher signal sensitivity and spectral resolution, and the maximum wavelength range can reach 900-2600nm (the actual range can be customized). Using cooling type InGaAs linear array detector, CCD adopts semiconductor refrigeration technology, CCD can work in a set constant temperature environment (minimum -30°C), thus greatly reducing the noise of the sensor, and obtaining an excellent Signal to Noise Ratio (approximately 2 times higher than similar competitors), and the measurement reliability of ATP8200 is improved, the measurement results would not be affected by environmental temperature.

ATP8200 has specially customized an ultra-low noise CCD signal Correlated Double Sampling processing circuit. Its quantization noise is less than 5 counts.

ATP8200 only requires a +5V DC power supply, which is very convenient for integration and use.

models	Wavelength range
ATP8200-17	900-1700 nm
ATP8200-22	900-2200 nm
ATP8200-25	900-2600 nm



1. Selection Guide

models	ATP8200-2-17	ATP8200-5-17	ATP8200-10-17	ATP8200-20-17	ATP8200-5-21	ATP8200-5-26	ATP8200-5-A
wavelength range	900-1700nm	900-1700nm	900-1700nm	900-1700nm	900-2100nm	900-2600nm	1510-1590nm
spectral resolution	< 10nm	< 3nm	<2nm	<1.4nm	< 4nm	< 6nm	< 0.3nm
wavelength resolution	<0.3nm	<0.1nm	<70pm	<50pm	<0.14nm	<0.2nm	<10pm
Dtector	High performance cooled InGaAs						
Pixel	256Pixels	512Pixels	1024Pixels	2048Pixels	512Pixels		
Detector cooling temperature	<ul style="list-style-type: none"> ● Default: -15°C ● T3: -30°C 						
Dynamic Range	16666:1	16666:1	16666:1	16666:1	16666:1		
Sensitivity	0.95A/W	0.95A/W	0.95A/W	0.95A/W	1.3A/W		
Input Fiber Connector	SMA905、FC/PC Fiber optic interface, free space						
Entrance slit	<ul style="list-style-type: none"> ● Fixed slit: 5、15、25、50、100、200、300μm Optional, other sizes can be customized ● Replaceable slits 						
Detector cooling temperature	<ul style="list-style-type: none"> ● Universal version: -15 °C (typical value) ● Deep cooling version: -30°C 						
Integration time	1ms - 60 s						
Data output interface	USB Type-c or UART						
ADC bit depth	18bits (output 16 bits)						
Power supply	5VDC±5%						
Working current	Universal version: <2.8 A T3version: <5.0 A						
storage temperature	-20°C to +70°C						
operating temperature	-10°C to +50°C						
Physical							
Size	208×120×50.2mm						
Weight	1.75 Kg						

Definition of model name ATP8200-A-B-C-D:

A: Pixel

- 2: 256 pixels;
- 5: 512 pixels;
- 10: 1024 pixels;

B: Spectral range

- 17: 900-1700 nm
- 21: 900-2200 nm;
- 25: 900-2600 nm;

The spectral range within the above range can be customized

C: Refrigeration

- None: primary or secondary refrigeration
- T3: Level 3 refrigeration, can cool to -30°C

D: Slit width

- XX: Slit width
- CH: Replaceable slits (including 3 types of slits)

2. Electrical interface

Parameter	Min	Typ	Max	Unit
Power Supply				
Operating voltage range	4.5	5	5.5	V
Operating current		170		mA
Logic Inputs (3.3V LVTTTL, 5V compatible)				
High level input voltage	1.7		3.6	V
Low level input voltage	-0.3		1.0	V
Logic Output(3.3V LVTTTL)				
High level output voltage	2.4			V
Low level output voltage			0.4	V

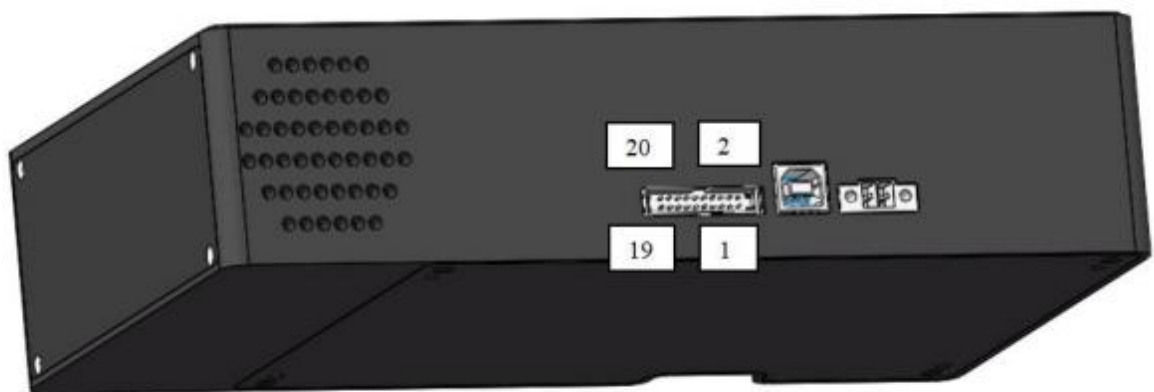


Figure 1 Spectrometer side view

Table 2 Electrical Pin-Out

Pin#	Description	I/O	Function Description
1	VCC	/	Power Supply, 12±0.5,
2	GND	/	Ground
3	RS232_TX	Output	RS232 Transmit signal
4	RS232_RX	Input	RS232 Receive signal
5	Lamp_En	Output	LVTTL output the lamp enable signal.
6	Continuous_strobe	Output	LVTTL output the continues strobe signal.
7	Ext_trigger_in	Input	LVTTL input the trigger signal.
8	Single_strobe	Output	LVTTL output the single strobe signal.
9	SPI_SCK	Output	The SPI Clock signal for communications to other SPI peripherals
10	SPI_MOSI	Output	The SPI Master Out Slave In (MOSI) signal for communications to other SPI peripherals
11	SPI_MISO	Input	The SPI Master in Slave In (MOSO) signal for communications to other SPI peripherals
12	SPI_CS	Output	The SPI Chip/Device Select signal for communications to other SPI peripherals
13	GPIO0	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.
14	GPIO1	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.
15	GPIO2	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.
16	GPIO3	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.
17	GPIO4	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.
18	GPIO5	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.
19	GPIO6	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.
20	GPIO7	Inputs/Outputs	General Purpose Software Programmable Digital Inputs/Outputs,LVTTL Logic.

3. Overall dimensions and installation structure data

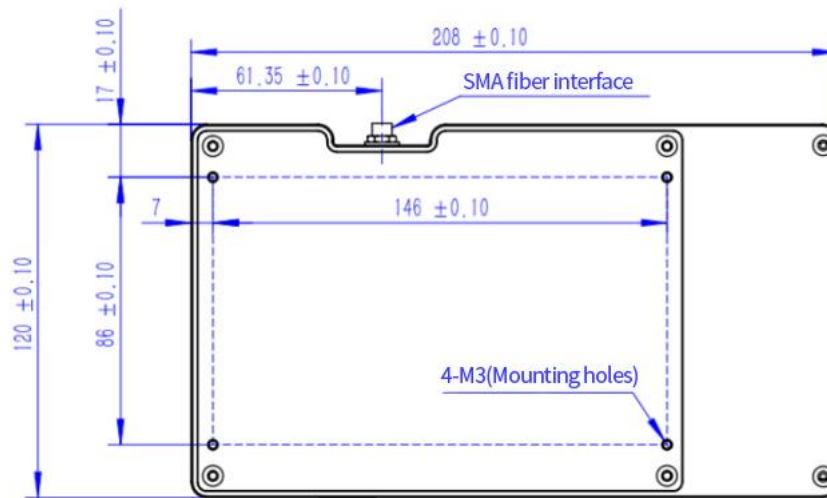


Figure 2 Mechanical dimension drawing (top view)

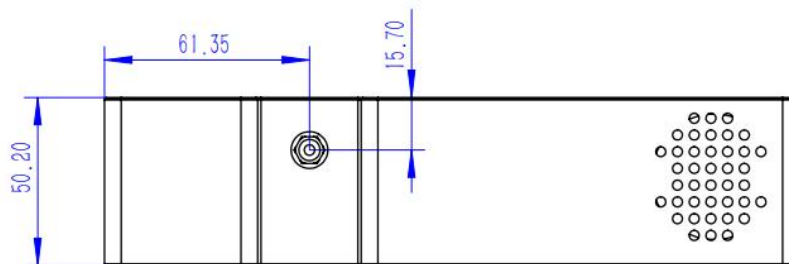


Figure 3 Mechanical Dimensional Drawing (Horizontal View)

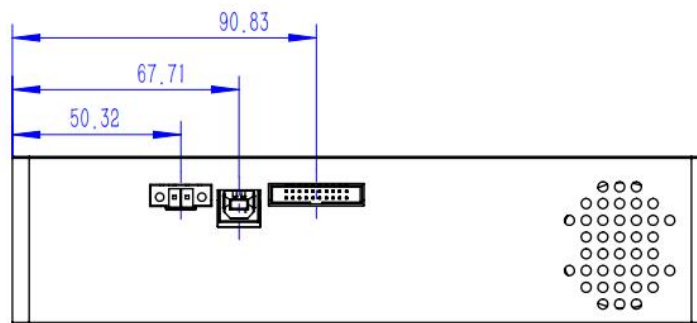


Figure 4 Mechanical dimension drawing (side view), 4 holes are fixing holes for installation and fixing

4. ATP8200 Physical map



Figure 5 ATP8200 Physical map

5. ATP8200 measured spectrum

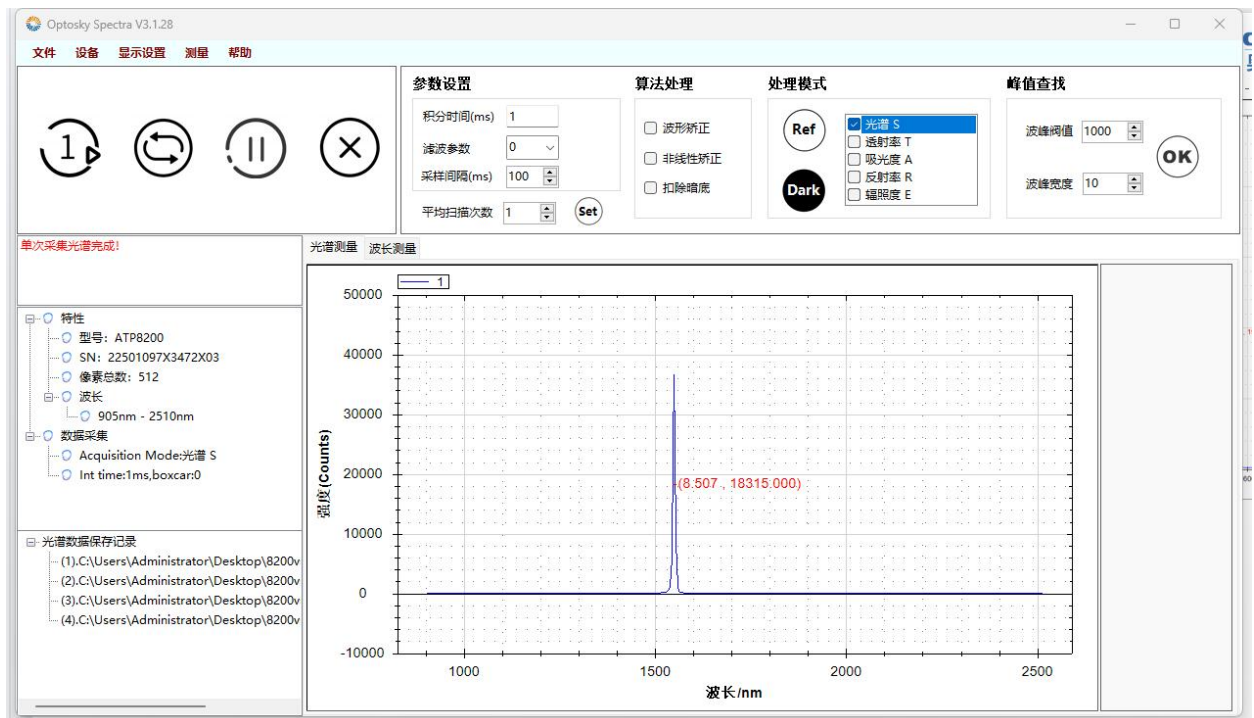


Figure 6 Spectrum measured by ATP8200, 905nm-2510nm, optical resolution 8.507nm

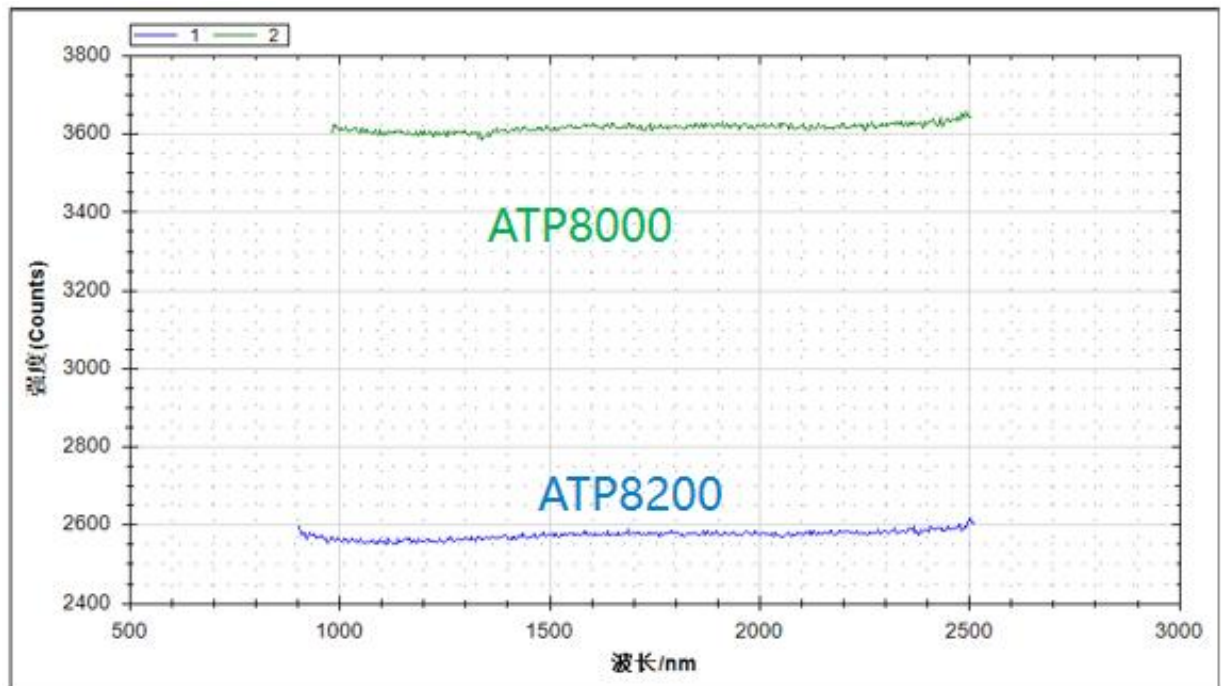


Figure 8 Comparative test of dark current and noise between ATP8200 and ATP8000. At 1ms integration time, the dark current of ATP8200 is about 2600 counts, and the dark current of ATP8000 is about 3600 counts. ATP8200 is significantly better than ATP8000.