

High-sensitivity, high-resolution Scientific, Mini Optic Fiber Spectrometer

ATP6500

Features:

- ✧ Detector: back-thinned CCD, cooled down to -20 °C
- ✧ CCD parameters: 1044×64 pixels
- ✧ Ultra-low noise CCD signal processing circuit
- ✧ Ultra-high dynamic range
- ✧ Ultra-low Etalon effect
- ✧ Quantum efficiency>90%
- ✧ Spectral range: 180-1100nm
- ✧ Spectral resolution: 0.01-4nm(depend on spectral range, slit size)
- ✧ Optical path: crossed Czerny-Turner (C-T)
- ✧ Integration time: 2ms-130s
- ✧ power supply: DC 5V±10% @ <3A
- ✧ 18 bit, 570KHz A/D Converter
- ✧ Entrance connector : SMA905 connector or free space
- ✧ Output interface: high speed USB2.0 or UART
- ✧ 20 pins, dual rows programmable extension connector

Application:

- ✧ Scientific research;
- ✧ Weak (biological) fluorescence measurement;
- ✧ Raman spectrometer;
- ✧ Microscale, fast spectrophotometer;
- ✧ Reflectance measurement;
- ✧ Transmittance measurement.

Description:

Optosky ATP6500 Fiber Optic Spectrometer employs ultra-high performance, 1044 x 64 pixel, back-thinned CCD with the widest dynamic range, semiconductor-cooled technology can reduce operating dark current, CCD cooled down to -20°C under constant temperature. It greatly reduces sensor noise resulting in almost 2 times higher SNR than other competitors. It increases measuring reliability, and measuring result does not changed with temperature.

Built inside the customized ultra-low noise CCD signal processing circuit attributes to quantization noise less than 3 counts that are excel in the industry.

ATP6500 can receive lights via SMA905 connector or free space, and output spectral data via USB2.0/UART.

ATP6500 requires only 5V DC supply, and convenient to integration.



3 Performance parameters

Detector	
Type	back-thinned linear CCD (cooled down to -20°C)
Spectral range	180-1100 nm
Effective pixels	1044 x 64
Pixel size	24μm × 24μm
Full range	~600 ke-
Sensitivity	6.5 uV/e-
Dark noise	8 e-
Optical parameters	
Wavelength range	180-1100 nm (available in custom wavelengths)
Resolution	0.01-1.3 nm (decide on slit size, spectral range)
SNR	>1000:1
Dynamic range	>50000: 1
Operating temperature	-10 - 45 oC
Operating humidity	< 90%RH
Optical path parameters	
Optical path	f/4 crossed C-T
Confocal distance	98 mm for incidence / 107 mm for output
Entrance slit width	5,10,25,50,100,150,200 μm optional, available in custom width
Incident connector	SMA905 connector or free space
Electrical parameters	
Integration time	8 ms – 30 minutes
Data output interface	USB 2.0
ADC bit depth	18 bit (output 16bit)
Power supply	DC 5V±10%
Operating current	<3A
Storage temperature	-20°C to +70°C
Operating temperature	-10°C to +45°C
Physical parameters	
Dimension	217×110×52 mm ³
Weight	0.97 kg
Sealing	Anti-sweat

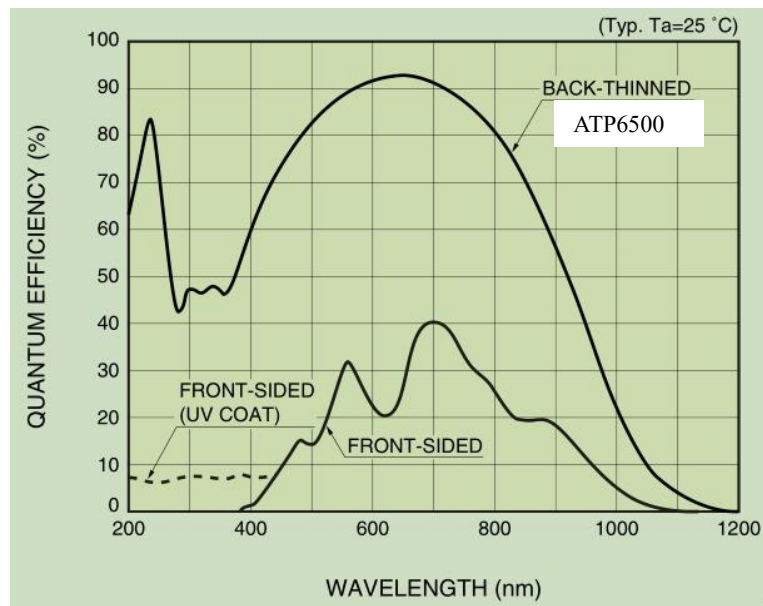


Fig 1 ATP6500 CCD employs 2 times higher quantum efficiency than normal CCD

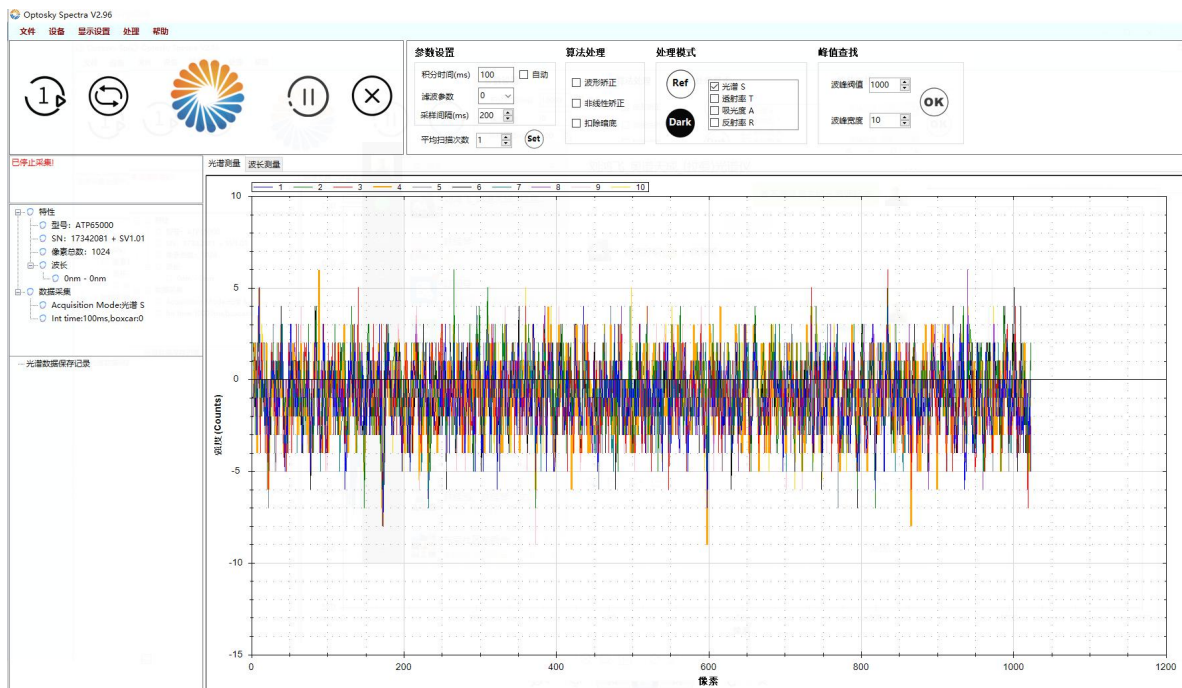


Fig 2 ATP6500 noise test (integration time is 100ms)

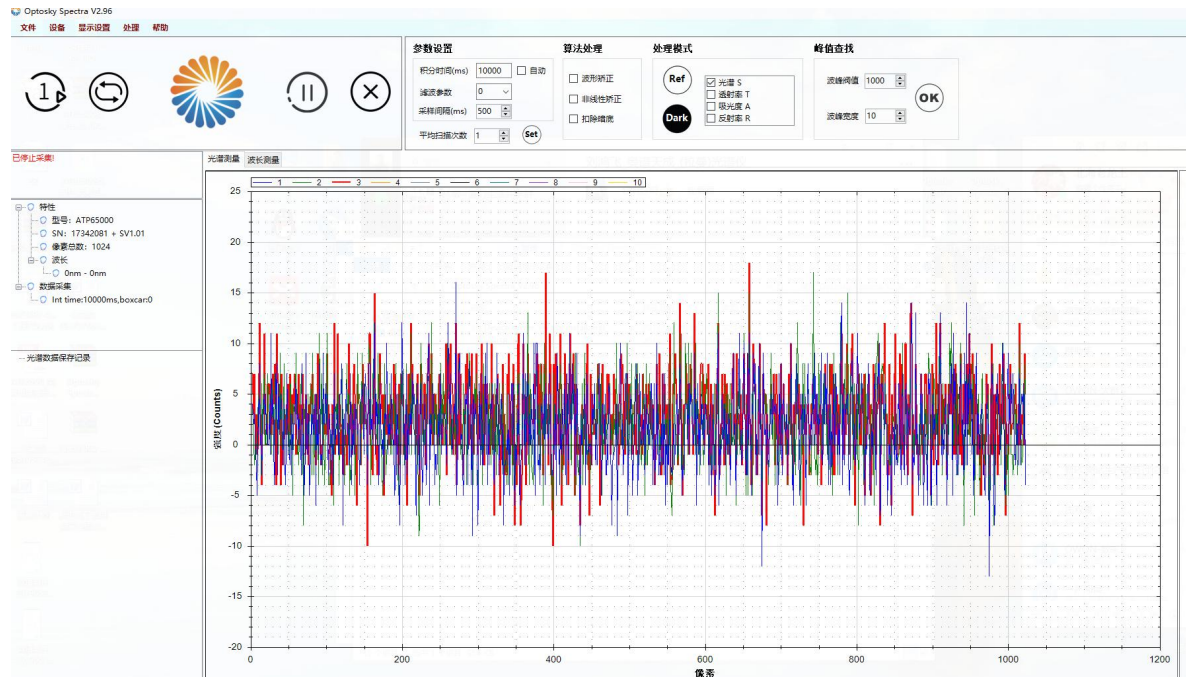


Fig 3 ATP6500 noise test (integration time is 10 s)

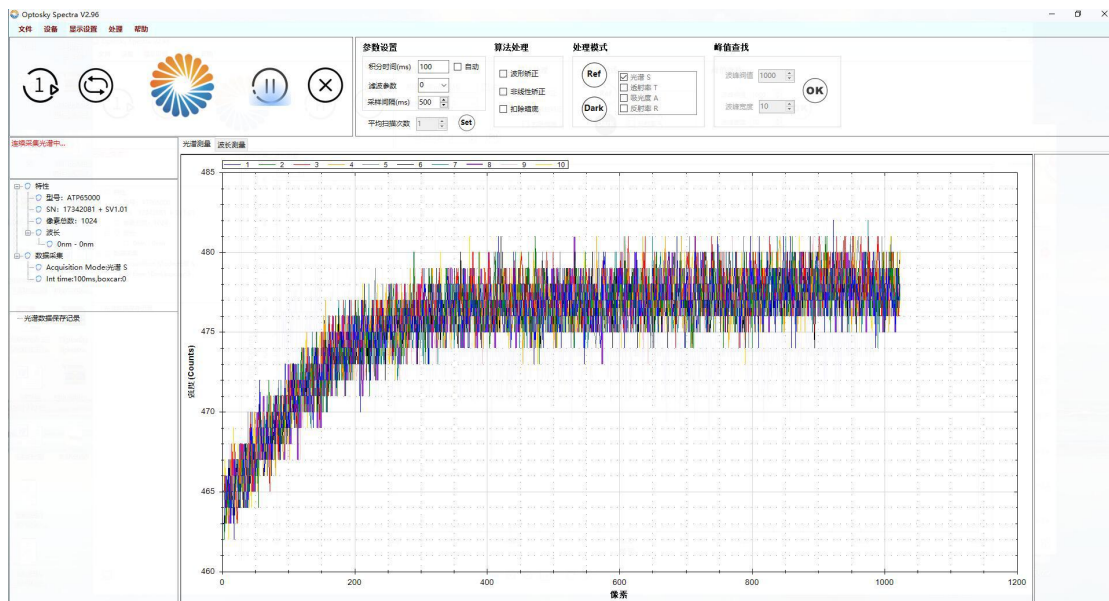


Fig 4 ATP6500 test result (integration time is 100ms) ,
average dark current around 477, noise is 6 counts.

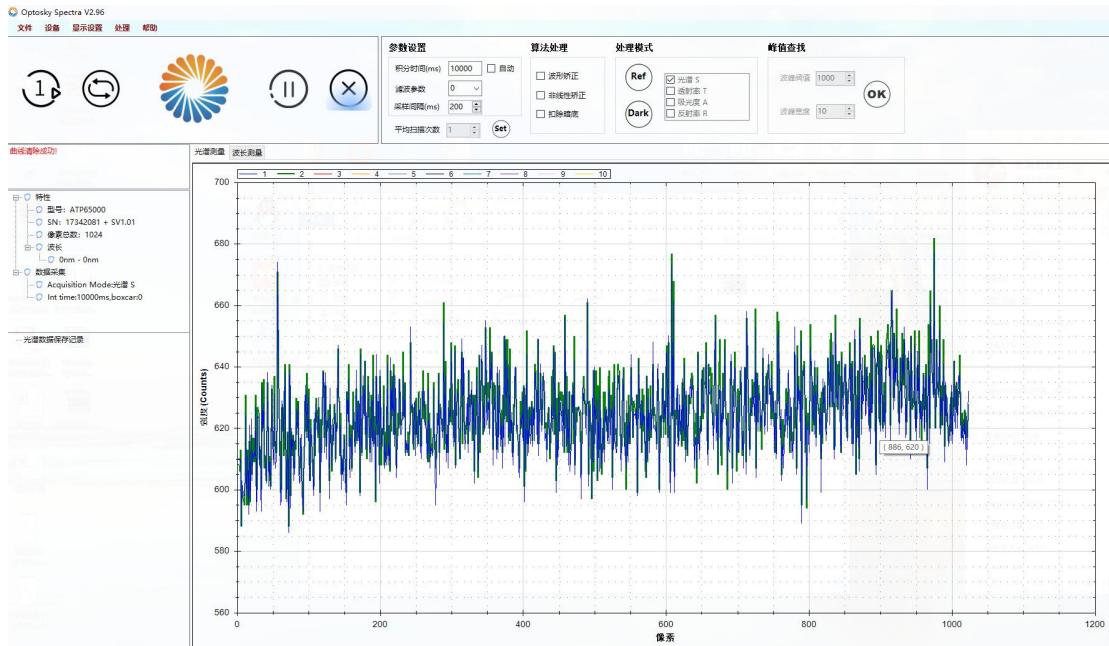


Fig 5 ATP6500 test result (integration time is 10s) ,
average dark current around 620, noise about 60 counts

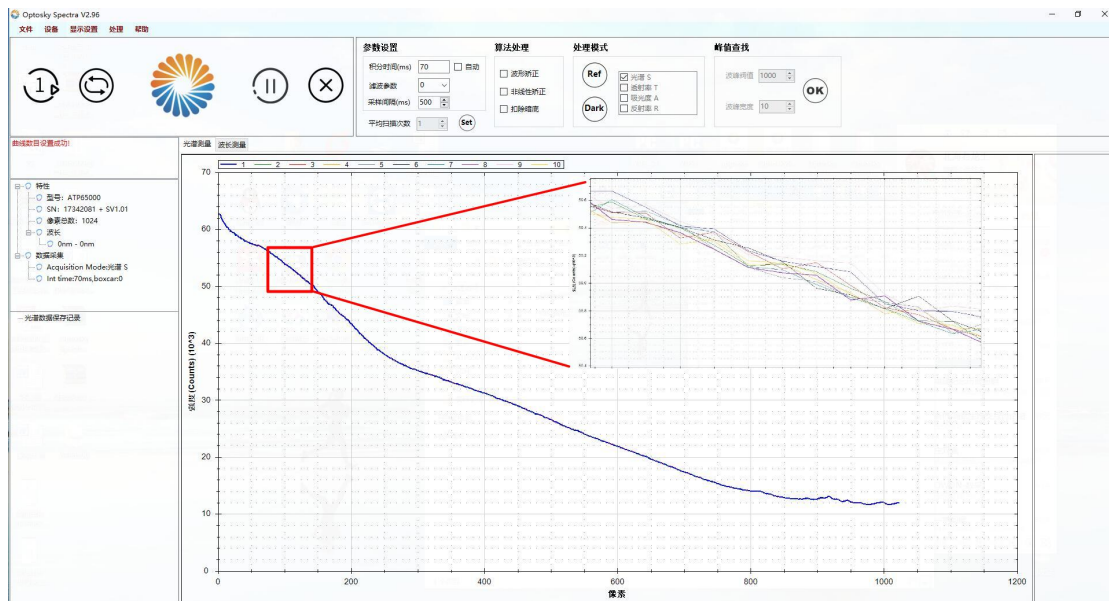


Fig 6 ATP6500 repeatability test (10 times), excellent repeatability!

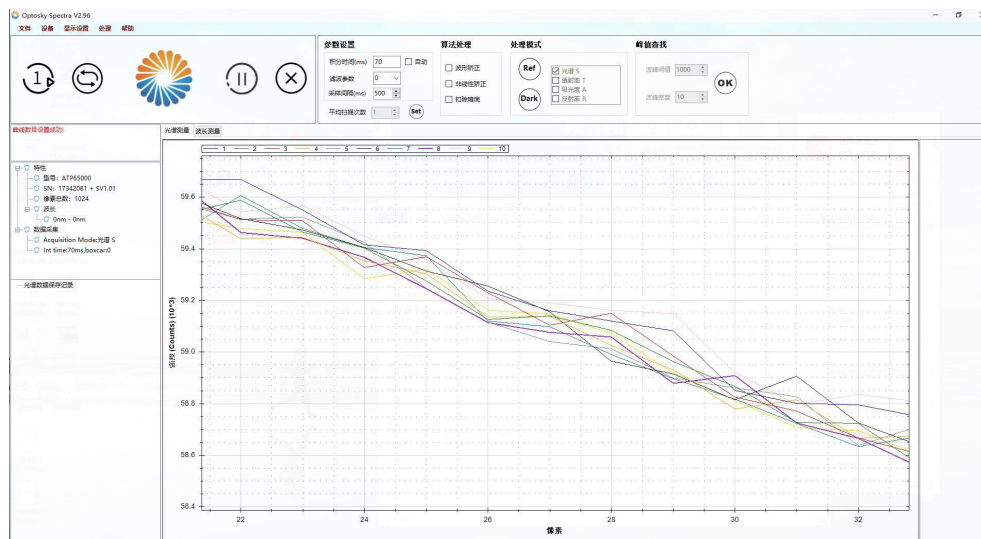
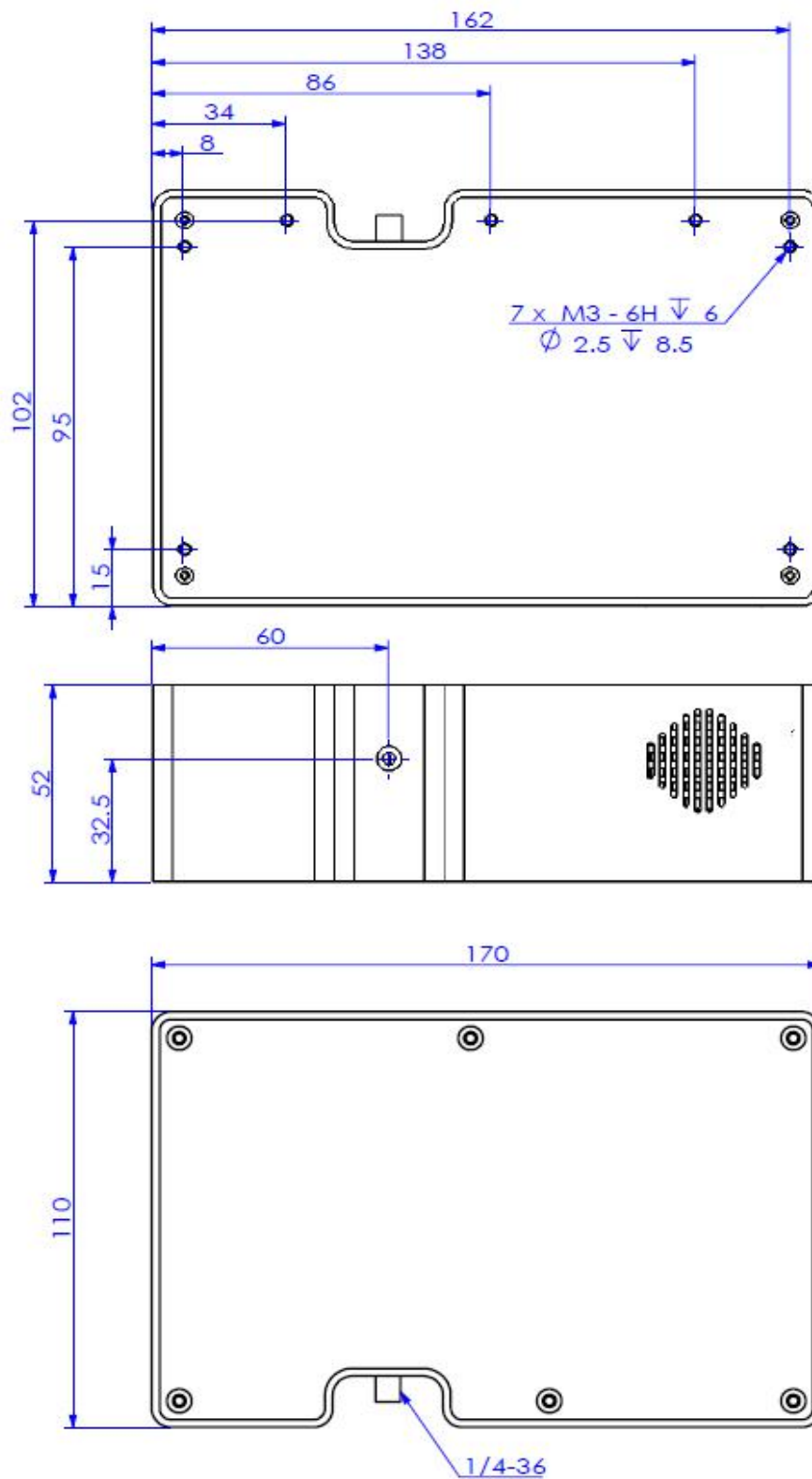


Fig 7 ATP6500 repeatability test result (10 times) ,enlarge the partial



4 Electrical Pin-out

Table 1 Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Power Supply				
Operating voltage range	4.5	5	5.5	V
Operating current	170	500	2000	mA
Logic Inputs(3.3V LVTTTL, Five-volt tolerant)				
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

The module is equipped with a 20-pin male angled box header(2x10, 2.00 mm pitch) and USB2.0 B type interface. The 20-pin connector is a Samtec part # STMM-110-02-L-D-RA connector. The mate to this is a Samtec part # TCSD-10-D-XX.XX-01-N.

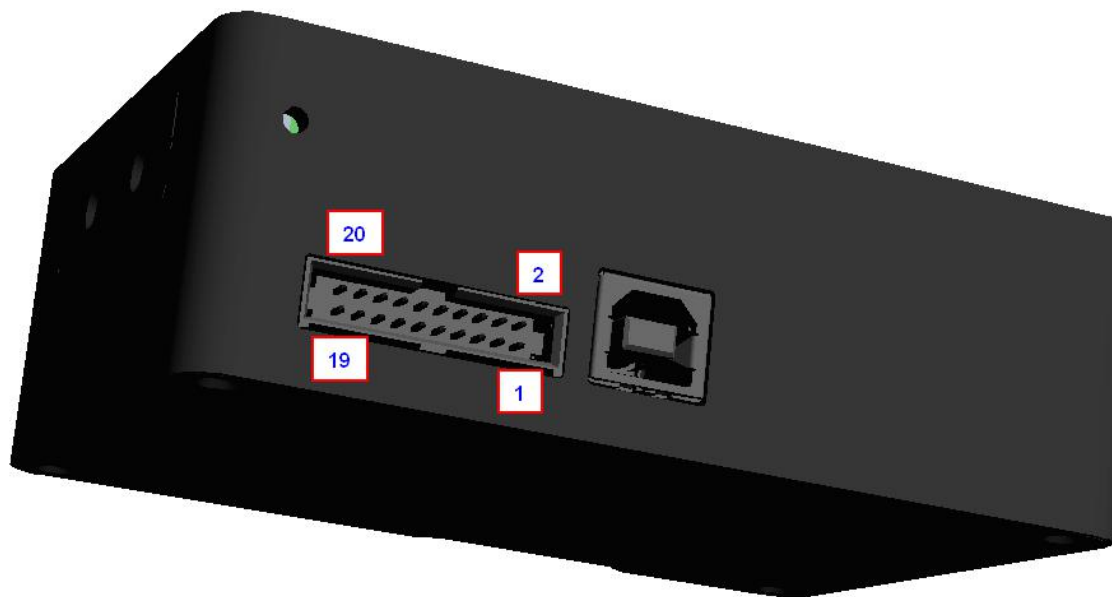


Table 2 Electrical Pin-Out

Pin#	Description	I/O	Function Description
1	VCC	/	Power Supply, 5V±0.5,
2	GND	/	Ground
3	UART_TX	Output	UART Transmit signal
4	UART_RX	Input	UART Receive signal
5	Lamp_En	Output	LVTTTL output the lamp enable signal.

6	Continuous_strobe	Output	LVTTTL output the continues strobe signal.
7	Ext_trigger_in	Input	LVTTTL input the trigger signal.
8	Single_strobe	Output	LVTTTL 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 Out (MISO) 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	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.
14	GPIO1	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.
15	GPIO2	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.
16	GPIO3	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.
17	GPIO4	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.
18	GPIO5	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.
19	GPIO6	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.
20	GPIO7	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.

5 Order Guide

Order number Rules:

Model	Spectral region		Slit width	
ATP6500	Short wavelength	Long wavelength	Slit width	

For example:

What to buy atp6500, spectral region: 200-850nm, slit width is 50 um, then the order no is:

atp6500-200-850-050

Order No	Spectral region (nm)	Slit	
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Datasheet

atp6500-200-400-###	200~400	10 μm	
atp6500-200-850-###	200~850	25 μm	
atp6500-200-1100-###	200~1000	50 μm	
atp6500-340-850-###	340~850	100 μm	
atp6500-600-1100-###	600~1100	200 μm	
atp6500-800-1000-###	800-1000	Other: _____μ	
atp6500-300-1100-###	300-1100	m	
atp6500-###-###-###	Other		