GWU-Lasertechnik

OPTOSKY
www.optosky.com

Datasheet

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

ATP6500

Features:

- Detector：back-thinned CCD, cooled down to -20 ℃
- 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

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 -20ºC 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.

Application:

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

3 Performance parameters

Detector	
Type	back-thinned linear CCD (cooled down to -20ºC)
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 mm3
Weight	0.97 kg
Sealing	Anti-sweat

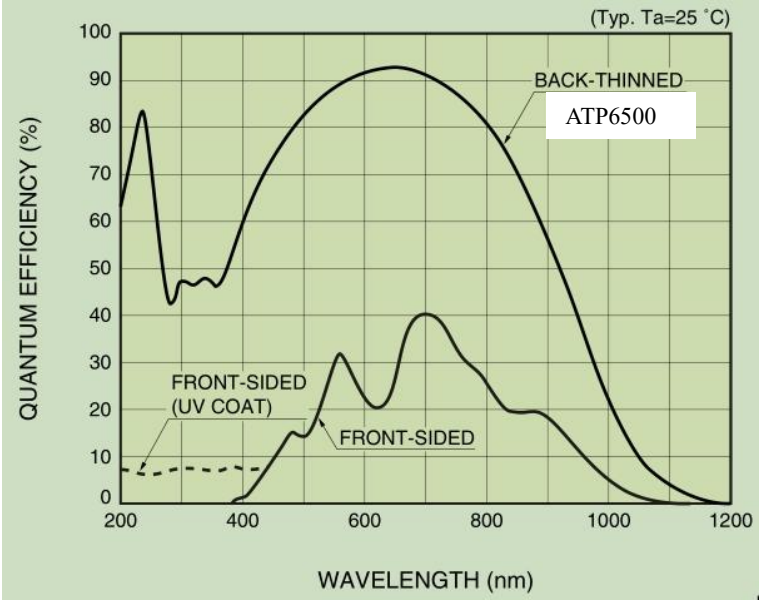


Fig 1 ATP6500 CCD employs 2 times higher quantum efficiency than normal CCD

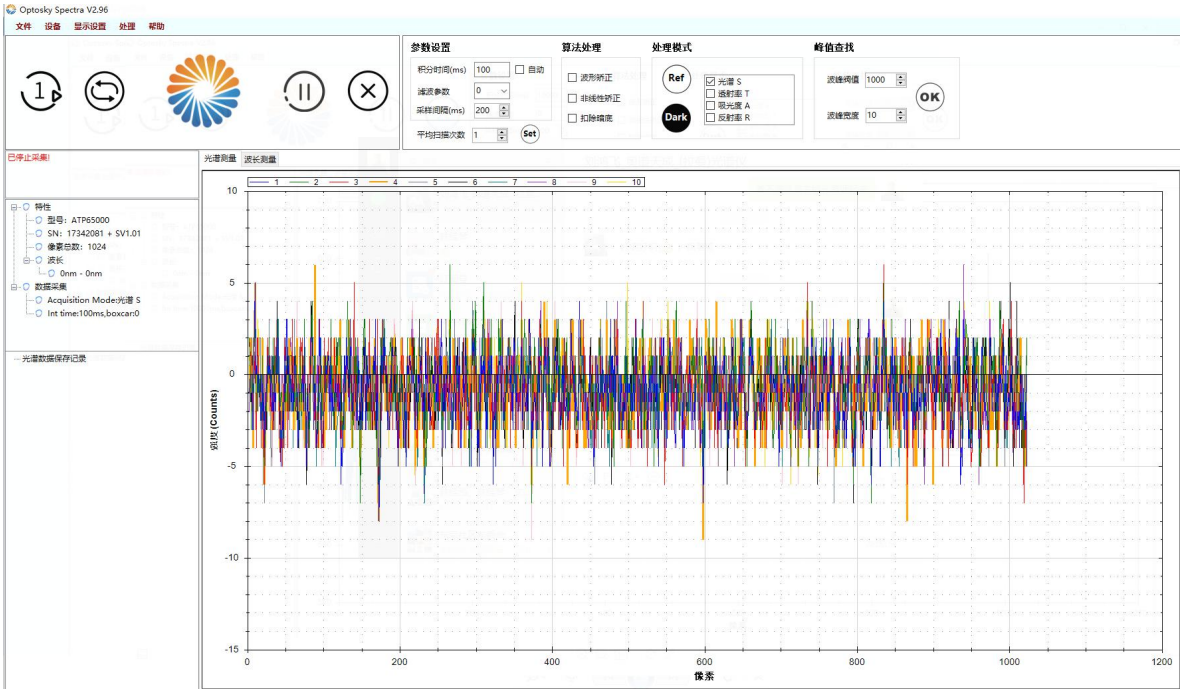


Fig 2 ATP6500 noise test（integration time is 100ms）

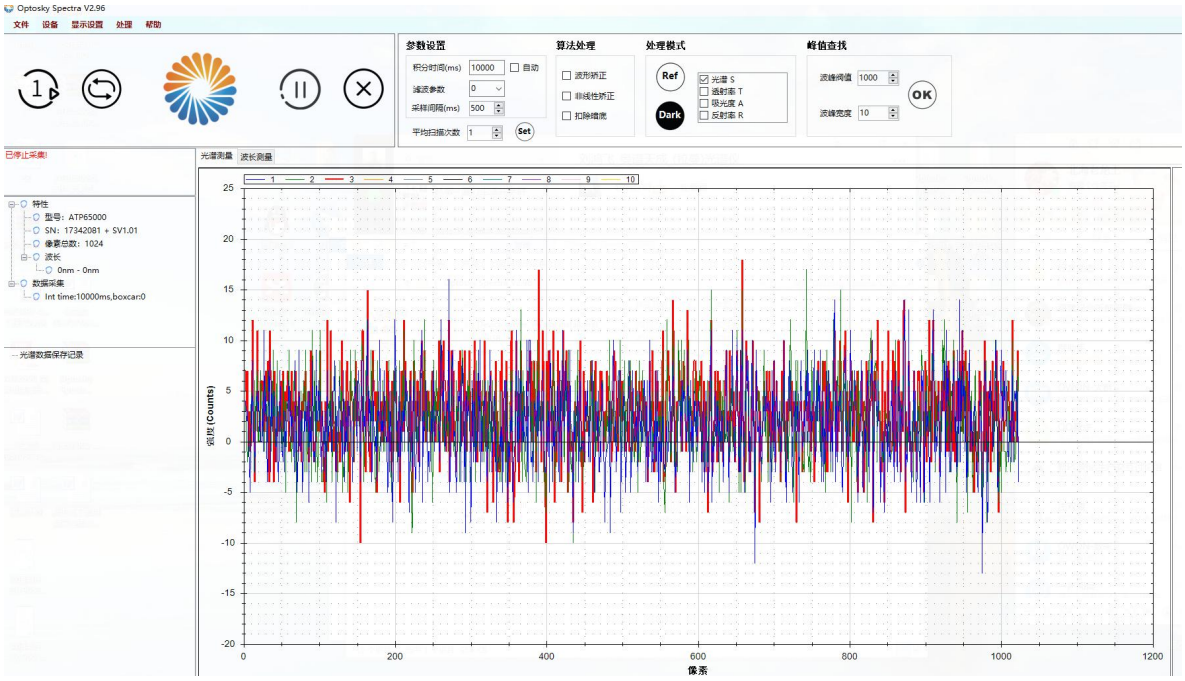


Fig 3 ATP6500 noise test（integration time is 10 s）

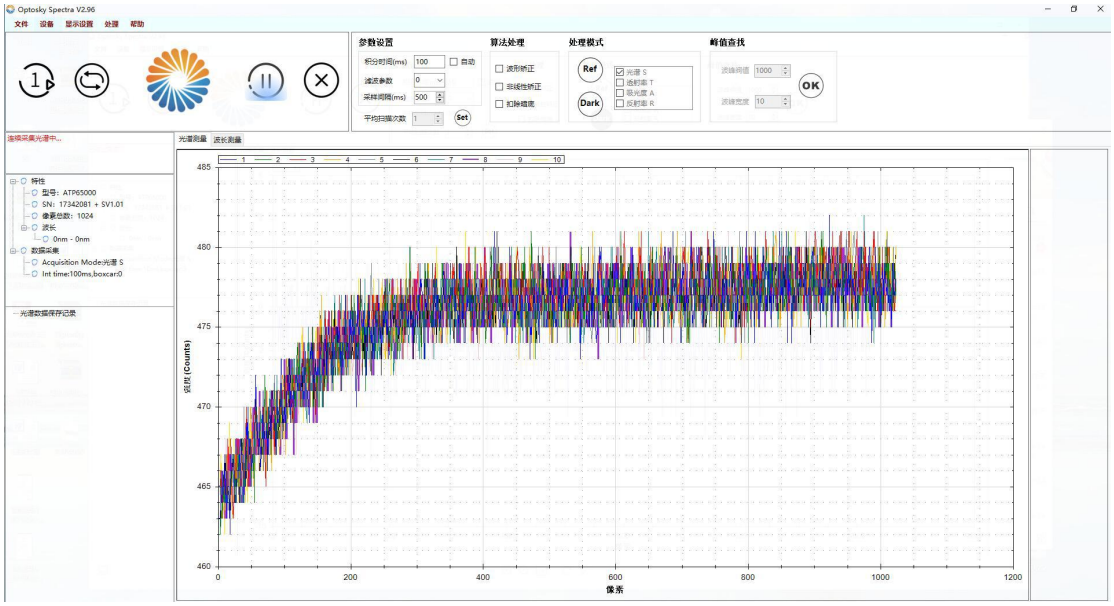


Fig 4　ATP6500 test result（integration time is 100ms），
average dark current around 477, noise is 6 counts.

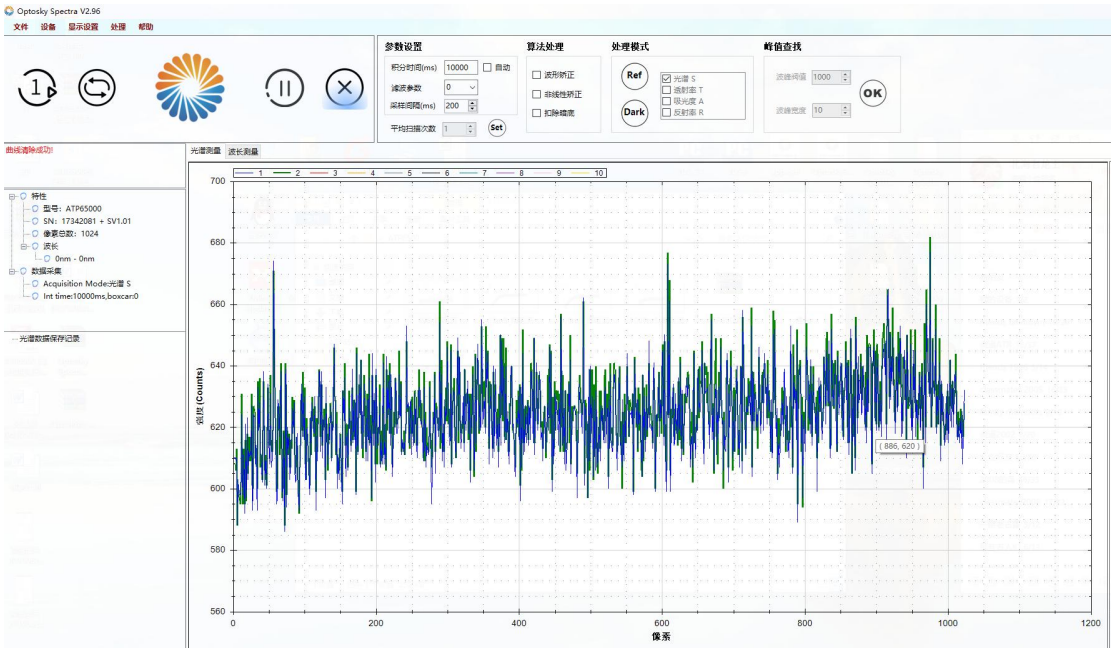


Fig 5 ATP6500 test result（integration time is 10s），
average dark current around 620, noise about 60 counts

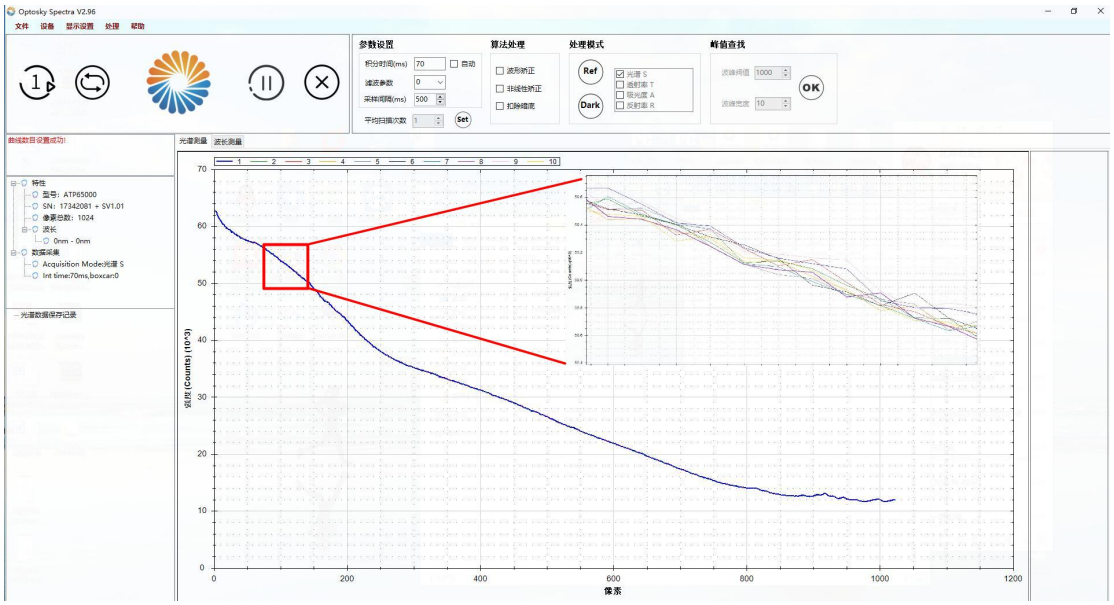


Fig 6 ATP6500 repeatability test (10 times), excellent repeatability!

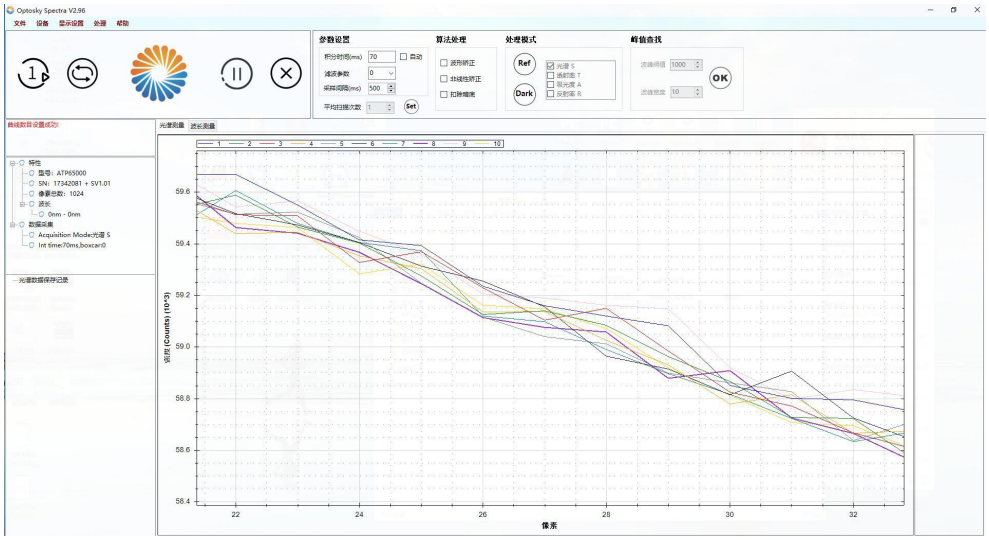
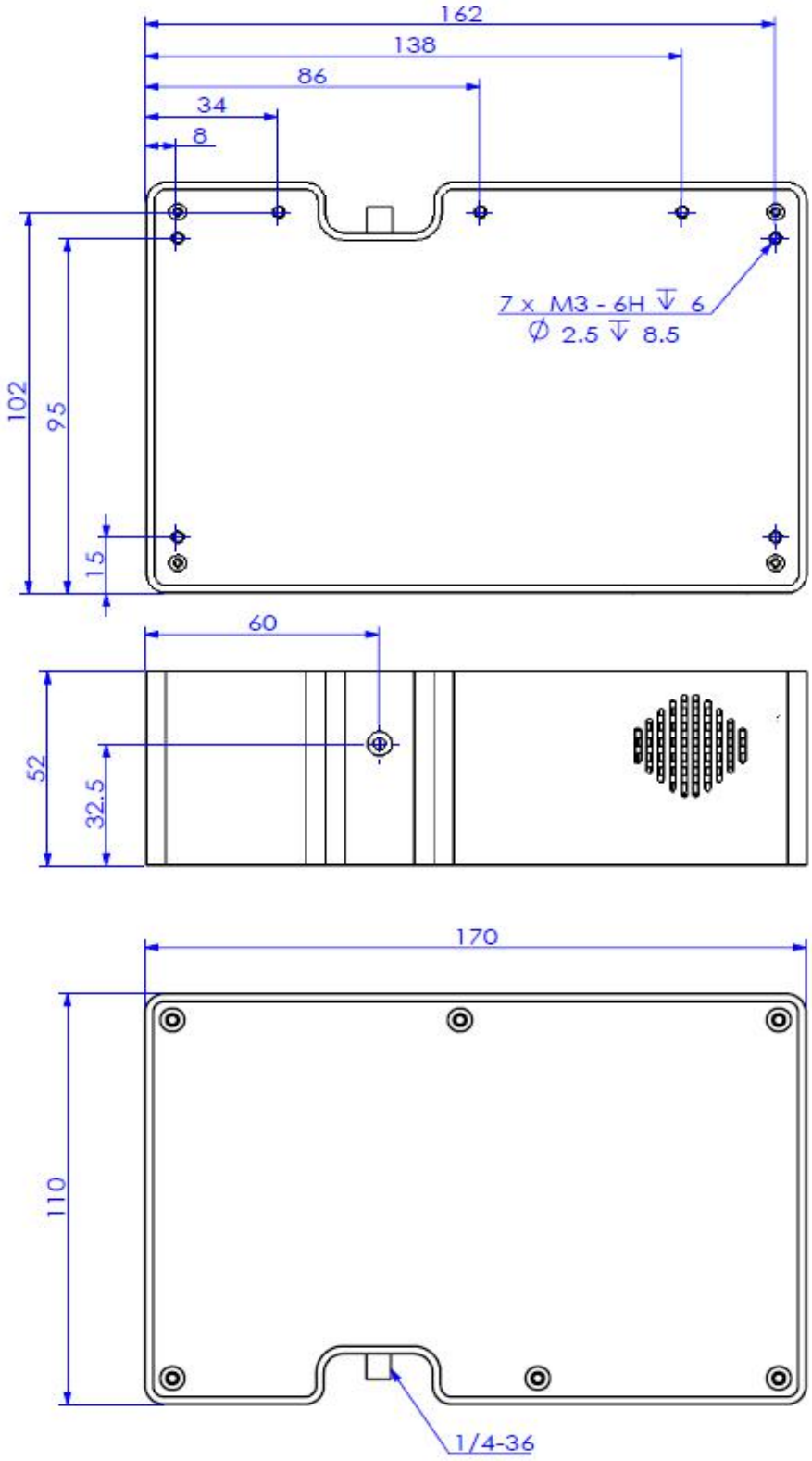


Fig 7 ATP6500 repeatability test result（10 times）,enlarge the partial

Mechanical **Diagrams**



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 LVTTL, 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 LVTTL)				
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.

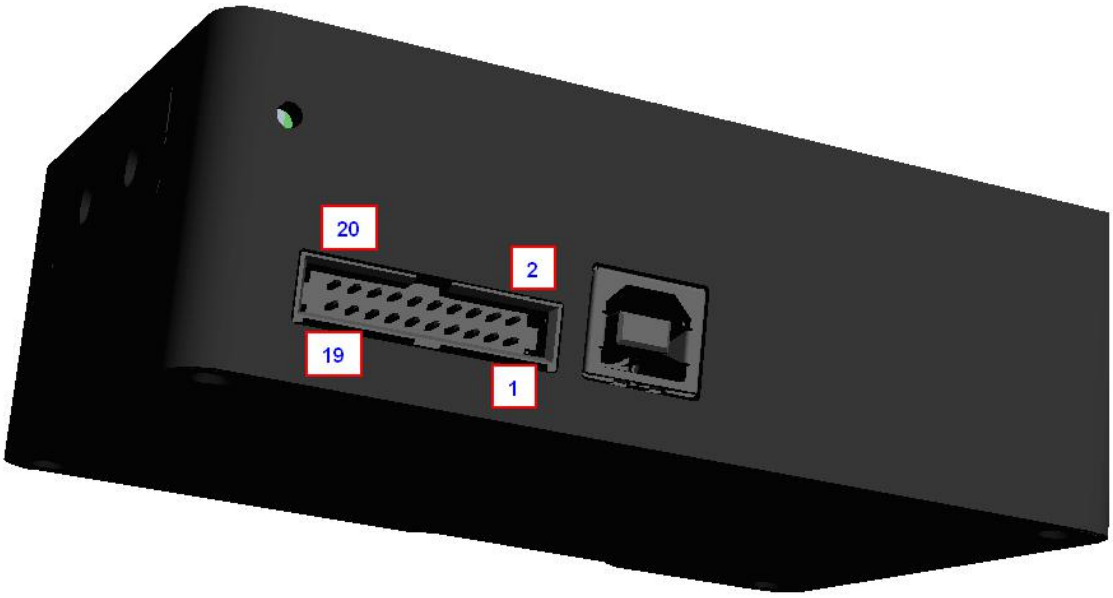


Table 2 Electrical Pin-Out

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	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 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, LVTTL Logic.
14	GPIO1	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
15	GPIO2	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
16	GPIO3	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
17	GPIO4	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
18	GPIO5	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
19	GPIO6	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
20	GPIO7	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL 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	

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:_____µm	
atp6500-300-1100-###	300-1100		
atp6500-###-###-###	Other		