Product Description

ATP5020 Miniature Fiber Optic Spectrometer employs the ultra-high performance, 2048 x 64-pixel, semiconductor-cooled, back-thinned CCD array, down to -10ºC. The special designed low noise CCD signal processing circuit improves the signal-to-noise ratio and increases its measurement reliability. Also, the measuring results are not changed with the ambient temperature.

ATP5020 is designed with SMA905 fiber optic entrance connector or free space, and it outputs spectrum data via USB2.0/UART.

Key Features

- Detector: Back-thinned CCD, cooled down to -10 ℃
- CCD parameters：2048×64pixel, 14×14um
- Ultra-low noise CCD signal processing circuit
- Spectral range: 180-1150nm
- Spectral resolution: 0.1-2 nm (depend on spectral range, slit width)
- Optical path: crossed Czerny-Turner (C-T)
- Integration time：2ms-130s
- Power supply: 5VDC±10% @ <2.3A
- 18 bits, 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

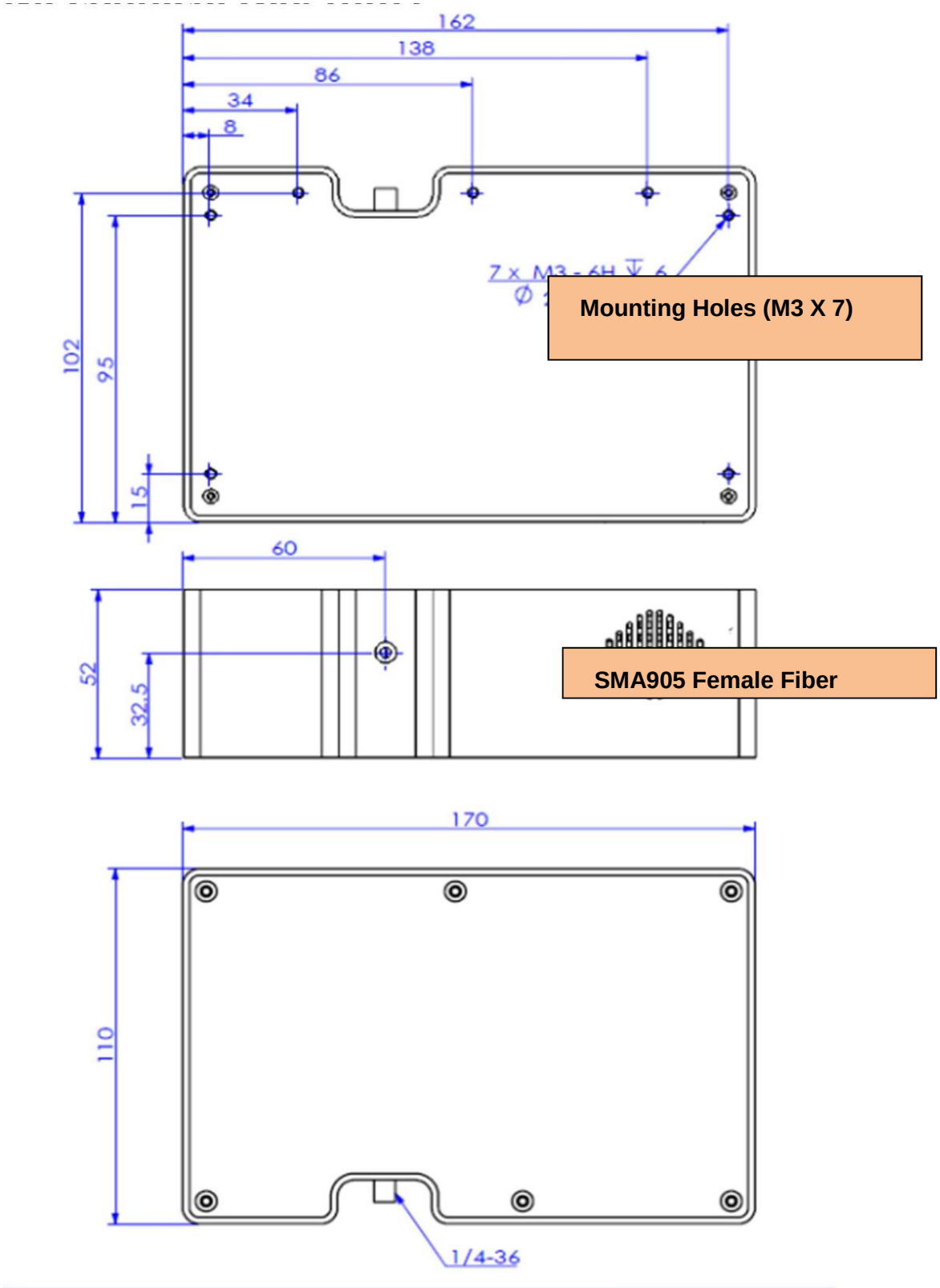
Typical Applications

- Raman spectrometer
- Micro spectrophotometer,
- high speed spectrophotometer
- Spectral analysis /radiation spectrophotometer/ spectrophotometric analysis
- Transmittance, absorbance, reflectance detection
- UV-, VIS-, shortwave NIR-
- Wavelength detection
- LIBS.

1. Performance Specifications

Detector	
Type	TE-cooled, back-thinned CCD array, cooled down to-10ºC)
Spectral range	165-1180 nm
Effective pixels	2048×64
Pixel sizes	14μm×14μm
Full range	~200 ke-
Sensitivity	6.5 uV/e-
Dark noise	6 e-
Optical parameters	
Wavelength range	180-1180 nm
resolution	0.02-2 nm （depend on slit, spectral range）
SNR	>8000:1
Dynamic range	10000:1
Operating temperature	-10-40 C
Operating humidity	< 85%RH
Optical parameters	
Optical path	f/4 crossed Czerny-Turner (C-T)
Focal	77.5 mm for incidence / 111.6 mm for output
Entrance slit width	5,10,25,50,100,150,200μm (optional) Available in customized other widths
Entrance connector	SMA905 Fiber optic connector, free space
Electrical parameters	
Integration time	1ms - 130 second
Data output port	USB 2.0
ADC in-depth	18 bits
Power supply	DC 5V±10%
Operating current	<2.3A
Storage temperature	-20°C to +70°C
Operating temperature	-10°C to +40°C
Physical parameters	
Size	170×110×52 mm^3
Weight	1.3 kg
Sealing	Anti-sweat

2. Mechanical Drawings



3. Electrical Pin-out

Table 1 Electrical Characteristics

Parameter	Min	Typical	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.

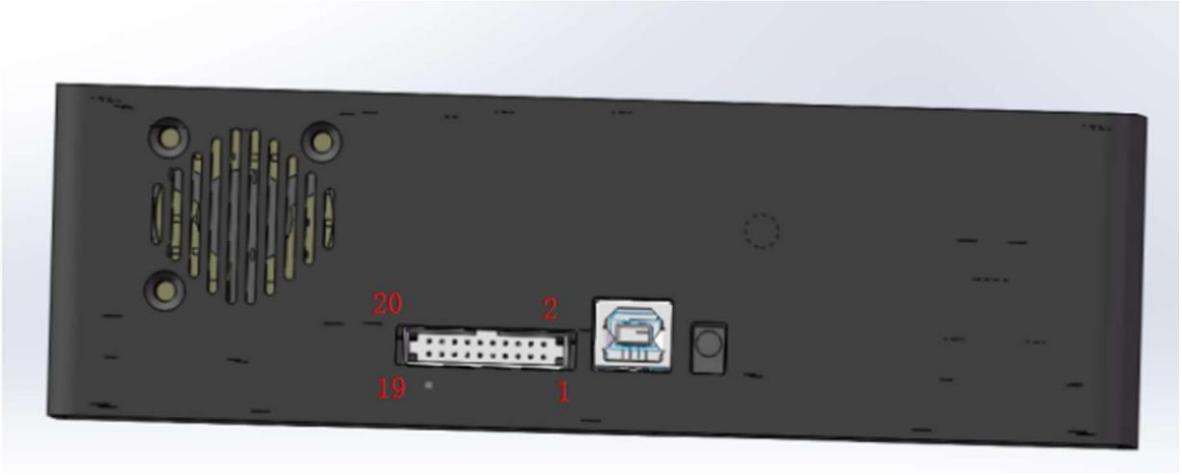


Table 2 Electrical Pin-Out

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.	LD_ Control	Output	LVTTL output the LD enable signal.
6.	NC	/	Remained to define.
7.	LD_ Trigger_ in	Input	LVTTL output the LD trigger signal.
8.	NC	/	Remained to define.
9.	LD_TX	Output	LD UART Transmit signal
10.	NC	/	Remained to define.
11.	LD_RX	Input	LD UART Receive signal
12.	NC	/	Remained to define.
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.

4. Order Guide

Order number Rules:

Model	Spectral region		Slit width	
ATP5020	Short wavelength	Long wavelength	Slit width	

For example:
What to buy ATP5020, spectral region: 200-850nm, slit width is 50 um, then the order no is: **ATP5020-200-850-050**

Order No	Spectral region	Slit	
ATP5020-200-400-###	200~400	10 μm	
ATP5020-200-850-###	200~850	25 μm	
ATP5020-200-1100-###	200~1000	50 μm	
ATP5020-340-850-###	340~850	100 μm	
ATP5020-600-1100-###	600~1100	200 μm	
ATP5020-###-###-###	Other	Other:__μm	