

## (Cooled) Ultra-thin&High resolution

### M-shape C-T Micro-spectrometer

# ATP3330 ATP5330

#### Description:

ATP3330 and ATP5330 are newly designed ultra thin, cooled, ultra high resolution miniature spectrometers developed by Optosky. ATP3330 and ATP5330 are m-type optical path structures, which have extraordinary ultra-high resolution. Cooled 2048 or 4096 pixels at the same time, it uses the linear array detector, reached the acme of the ultra high resolution, high resolution can reach <0.04 nm, suitable for all kinds of applications, high resolution and high reliability, ultra-high speed, low cost, high cost performance and other characteristics, can adapt to the online test USES a variety of environments such as micro spectrometer.

ATP3330 is uncooled, while ATP5330 USES TEC cooled at -5℃, which greatly reduces the dark current and noise , improves the dynamic range and signal-to-noise ratio, and improves the environmental adaptability of the spectrometer.

ATP5330P adopts cooled back-illuminated CCD with better signal-to-noise ratio.

ATP3330 and ATP5330 can receive SMA905 fiber input light or free space light, and output the spectral data obtained through USB2.0 or UART port.

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|          | Cooled             | Pixels |
|----------|--------------------|--------|
| ATP3330  | NO                 | 2048   |
| ATP3334  | NO                 | 4096   |
| ATP5330  | YES, -5℃           | 2048   |
| ATP5334  | YES, -5℃           | 4096   |
| ATP5330P | YES, -10℃, BI CMOS | 2048   |

#### Feature

- M-shape, high resolution;
- Wavelength range: 200-1100 nm ;
- Resolution: 0.04 ~ 3 nm ;
- Optical path: M-shape C-T;
- Detector: 2048/4096 pixel;
- Cooling Temperature: -5 ℃
- Integration time: 0.1ms ~ 256s;
- Power supply: DC 5V power supply;
- ADC: 16 bit;
- Output: USB Type-C;
- 20-pin expansion interface;

#### Application

- LIBS, Plasma luminescence detection;
- Raman detection;
- Wavelength monitoring, laser, LED and other luminous bodies
- Water quality analyzer
- LED sorting machine, color detection;
- Spectral analysis, radiation spectroscopic analysis, spectrophotometric analysis;
- Reflection and transmission spectrum detection

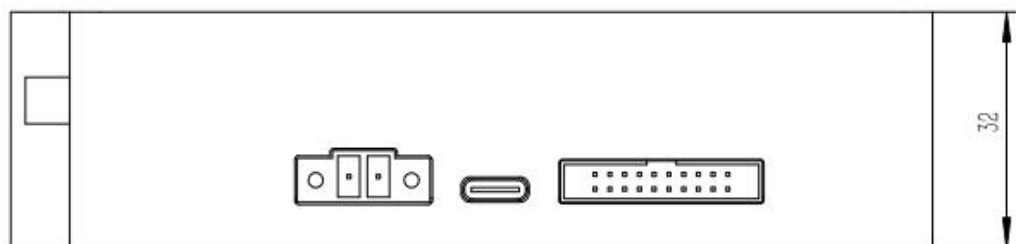
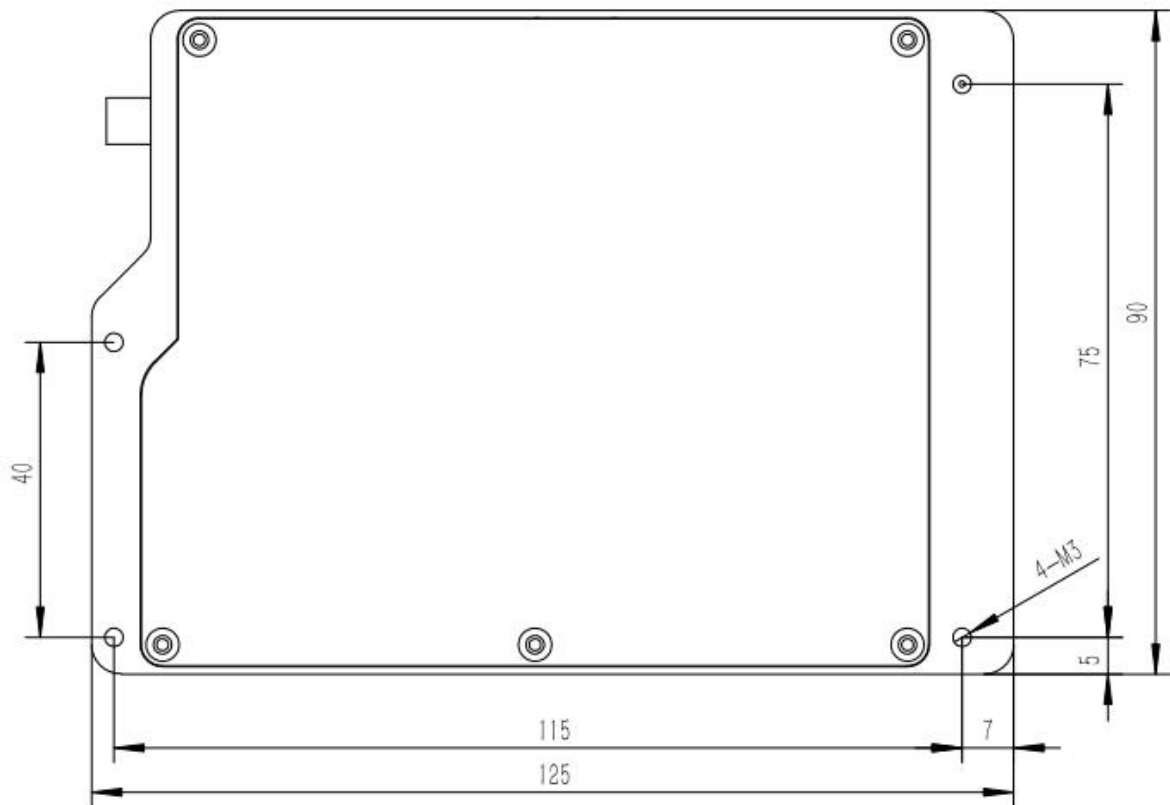


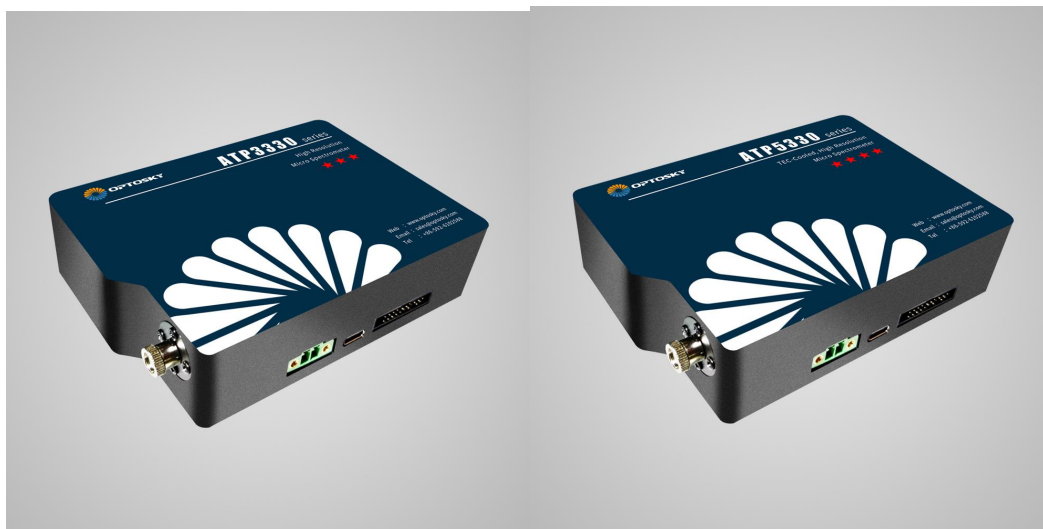
## Specifications

| Detector                  |                                                                 |
|---------------------------|-----------------------------------------------------------------|
| Type                      | Linear array detector                                           |
| Detectable range          | 200-1100 nm                                                     |
| Effective pixel           | 2048 or 4096 pixels                                             |
| Sensor Cooled             | TEC cooled, -5 °C                                               |
| Pixel dimension           | 14μm × 200μm                                                    |
| Sensitivity               | 1300 V/(lx·s)                                                   |
| Dark noise                | 13 RMS @ 13 °C                                                  |
| Optical Parameter         |                                                                 |
| Wavelength range          | 200-1100 nm (optimal design for >500 nm)                        |
| Optical resolution        | 0.04-3 nm                                                       |
| Signal-to-noise           | >600:1                                                          |
| Dynamic range             | 8.5 × 10 <sup>7</sup> (system); 2000:1 for a single acquisition |
| Stray light               | <0.05% at 600 nm; <0.09% at 435 nm                              |
| Optical Configuration     |                                                                 |
| Optical Design            | Traditional Czerny-Turner, M-shape light path                   |
| Focal Distance            | 75mm                                                            |
| Incidence slit            | 50 μm (10, 25, 100, 200 μm are optional)                        |
| Incident Interface        | SMA905 connector                                                |
| Electrical Parameter      |                                                                 |
| Integration time          | 0.1 ms - 256 second                                             |
| Interfaces                | USB Type-C                                                      |
| A/D conversion resolution | 16 bit                                                          |
| Supply voltage            | DC 4.5 to 5.5 V (type @5V)                                      |
| Operating current         | ATP3330: 200mA, ATP5330: 1.5 A@Typ. 3A Max                      |
| Storage temperature       | -30 °C to +70 °C                                                |
| Operating temperature     | -25 ~ 50 °C                                                     |

|                          |                                  |
|--------------------------|----------------------------------|
| Working humidity         | < 90%RH                          |
| <b>Physics Parameter</b> |                                  |
| Dimension                | 125 × 90 × 32 mm                 |
| weight                   | 500 g (ATP3330), 670 g (ATP5330) |

## 2 Mechanical Diagrams





## 3 Electrical Pin-out

Table 1 Electrical Characteristics

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

The module is equipped with a 30-pin male angled box header(2x15, 2.00 mm pitch) and Type-C 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  | 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.            |

## 4 Order Guide

Order number Rules:

| Model   | Spectral region  |                 | Slit width |  |
|---------|------------------|-----------------|------------|--|
| ATP5330 | Short wavelength | Long wavelength | Slit width |  |

For example:

What to buy ATP5330, spectral region: 200-1000nm, slit width is 50  $\mu$ m, then the order no is:

**ATP5030-200-1000-050**

| Order No             | Spectral region | Slit                 |  |
|----------------------|-----------------|----------------------|--|
| ATP5330-200-400-###  | 200~400         | 10 $\mu$ m           |  |
| ATP5330-200-850-###  | 200~850         | 25 $\mu$ m           |  |
| ATP5330-200-1000-### | 200~1000        | 50 $\mu$ m           |  |
| ATP5330-340-850-###  | 340~850         | 100 $\mu$ m          |  |
| ATP5330-600-1100-### | 600~1100        | 200 $\mu$ m          |  |
| ATP5330-###-###-###  | Other           | Other: _____ $\mu$ m |  |