

## Ultra-Mini. Field Spectroradiometer

## ATP9101

### Feature

- Ultra-light, easy to carry
- USB, Bluetooth data interface, easy to connect with computer, mobile phone
- Waveband number: 512
- Wavelength range: 400~950 nm
- Wavelength resolution: 1.5~4 nm@811nm
- Wavelength accuracy:  $\pm 0.5$  nm;
- Wavelength repeatability:  $\pm 0.3$  nm @  $\pm 10$  °C Temp. variation
- SNR: >300:1
- Weight: <325 g (Whole)
- Power supply: Built-in lithium battery, standby time >6h
- Water proof: IP65
- Field of view lens: 25°/15°/8°/1°
- Built-in laser indicator, used to indicate the probe detection direction

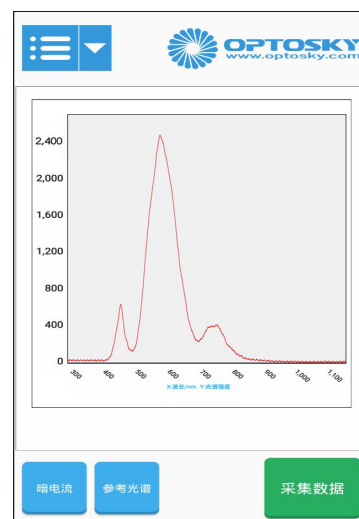
### Description

ATP9101 has high reliability, ultra-high speed, low cost, high cost performance and other characteristics, can adapt to online testing and other environmental applications of the micro field spectroradiometer.

The measurement spectrum is fast, accurate, nondestructive and non-contact. It is a real portable field spectroradiometer. Built-in battery, easy to carry, easy to connect with mobile phone or computer through Bluetooth, minimize the time of field data collection. At the same time, the quality of the measured spectrum is the best. The flexible and durable ATP9101 delivers the same quality as laboratory results for remote sensing and analytical applications, whether in different azimuth measurements or in different environments.

### Application

Remote sensing survey, crop monitoring, forest research, rivers and lakes, Marine research, aquaculture, scientific research and teaching.



## 1. Parameter

Detector	
Type	Linear array CMOS detector
Channels	512
Wavelength Accuracy	± 0.5 nm
Spectral Resolution	< 1.5~4 nm@811nm
Optical Parameter	
Spectral Range	400~950 nm
FOV	Small field Angle lens, 1 ° /8 ° /15 ° /25 ° optional
Laser Wavelength	650 nm
Laser Power	5 mW
Electrical Parameter	
Integration Time	10ms ~ 10 s
Interface	USB 2.0, Bluetooth
Bit depth	16 bit
Power supply	DC 5V±10%
Battery life span	>6 h
Working Current	<350 mA
Storage Temp.	-20°C ~ +65°C
Operating Temp.	-10 ~ 45 °C
IP level	IP65
Working Humidity	< 90%RH
Physical Parameter	
Dimension	35×146.5×169 mm
Weight	323 g

## 2. ATP9101 Drawing

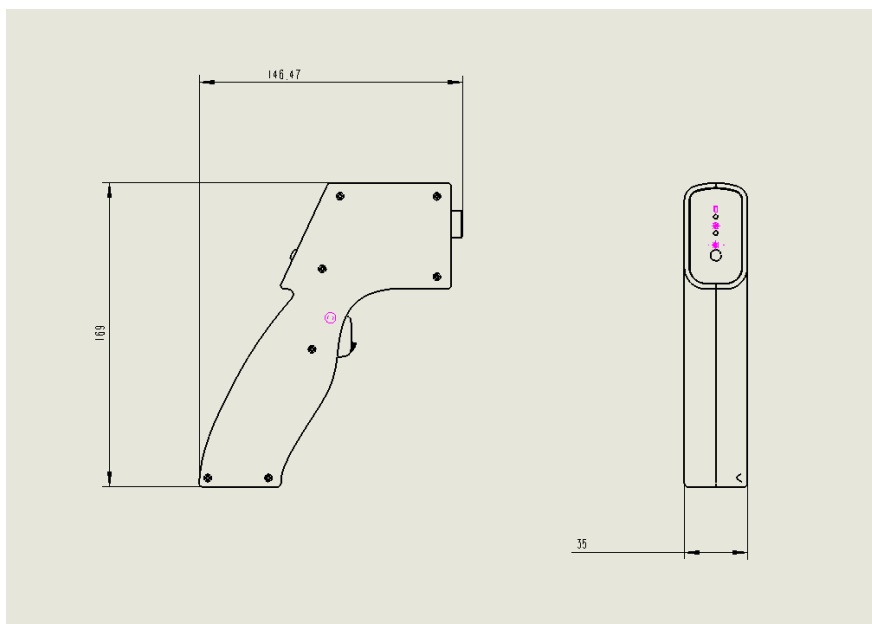


Figure 1 ATP9101 Drawing





Figure 2 ATP9101 Image

## 3. FieldSpec Application

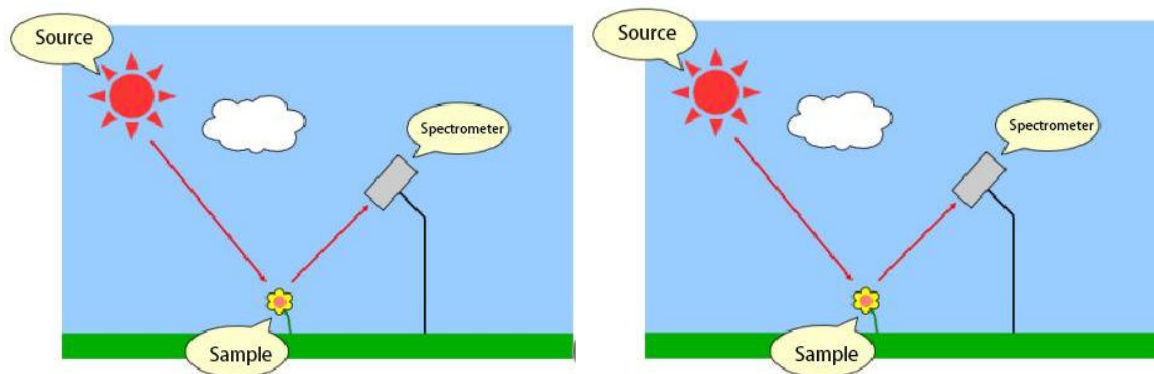


Figure 3 Field spectroradiometer working principle



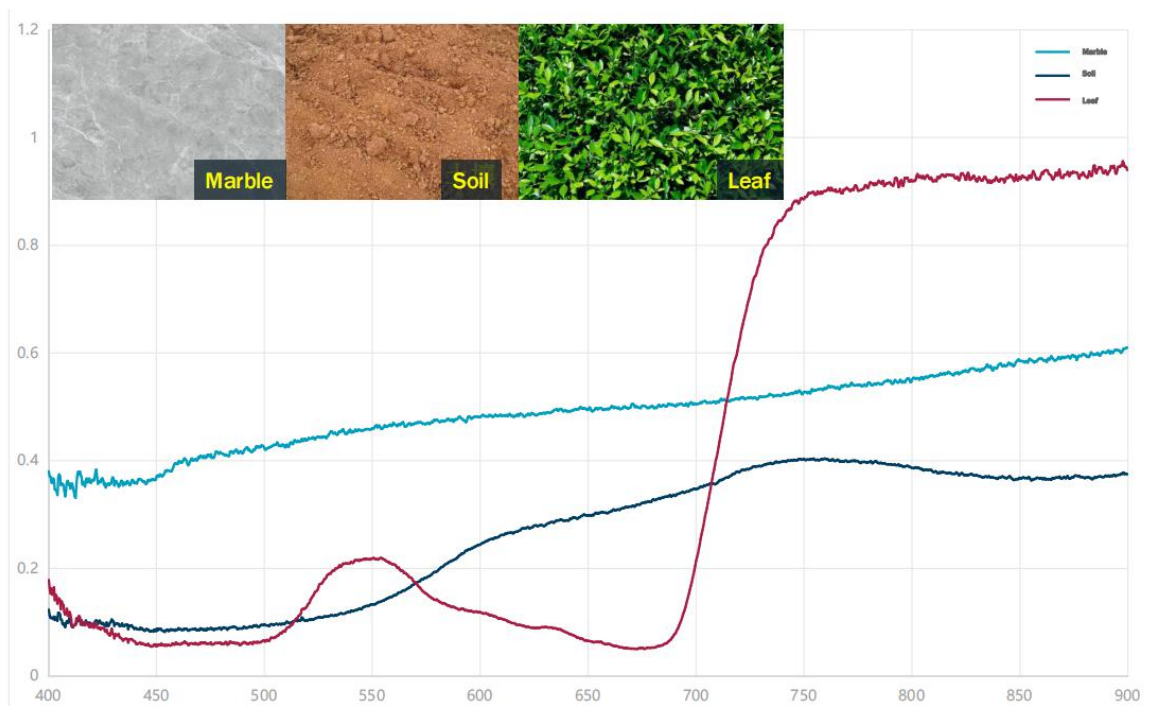


Figure 4 Spectra of marble, soil and green leaf tested by field spectroradiometer

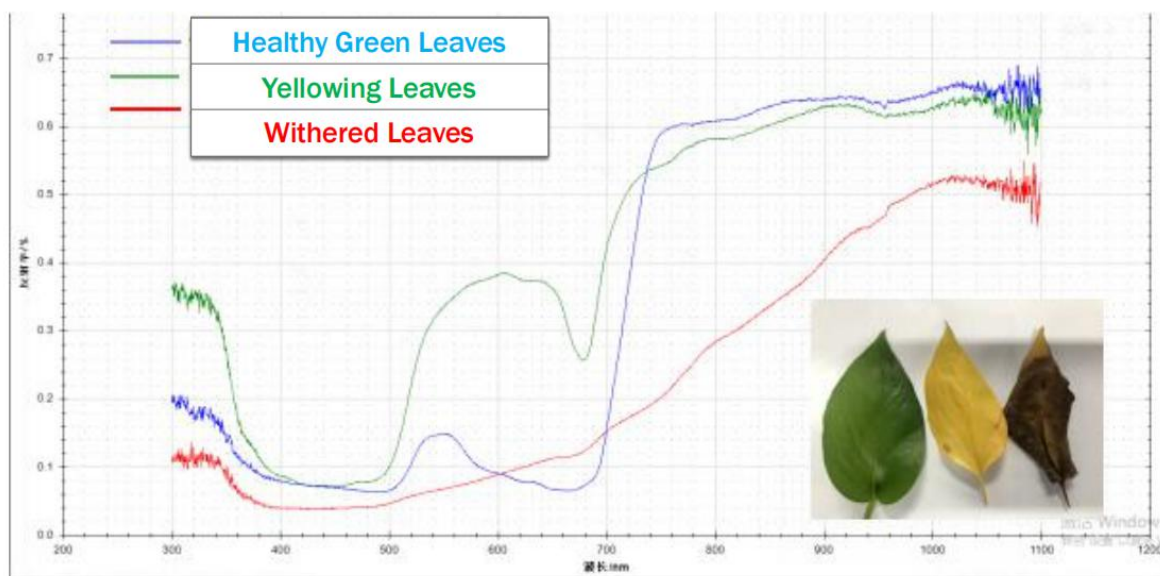


Figure 5 Spectra of different leaves tested by field spectroradiometer

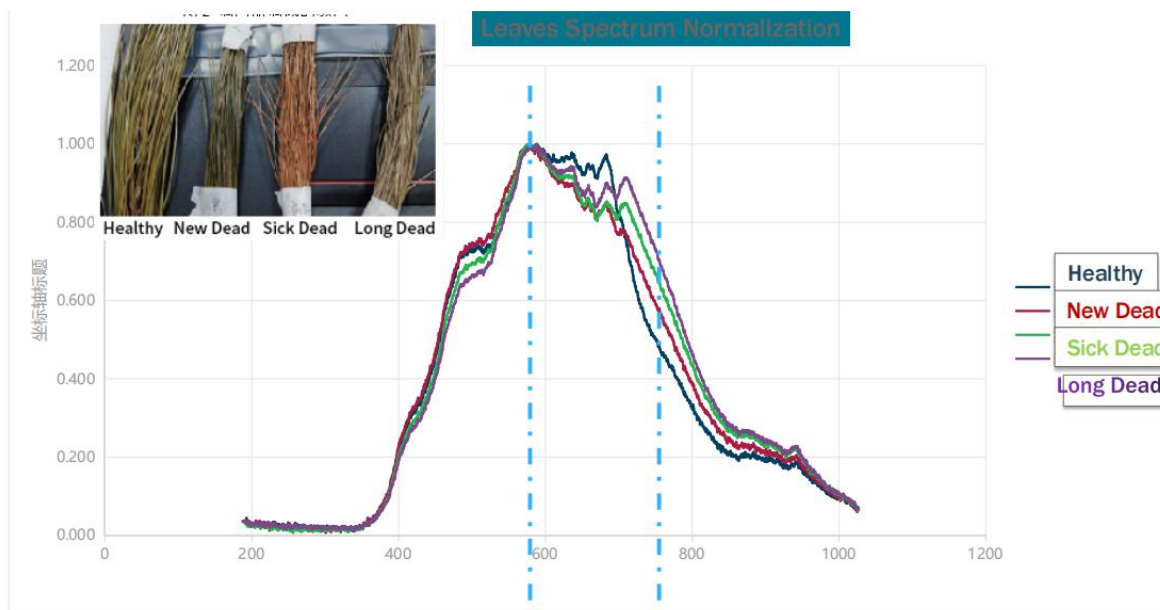


Figure 6 spectrogram of ground object spectrometer test of *Castanopsis kawakamii* infusion

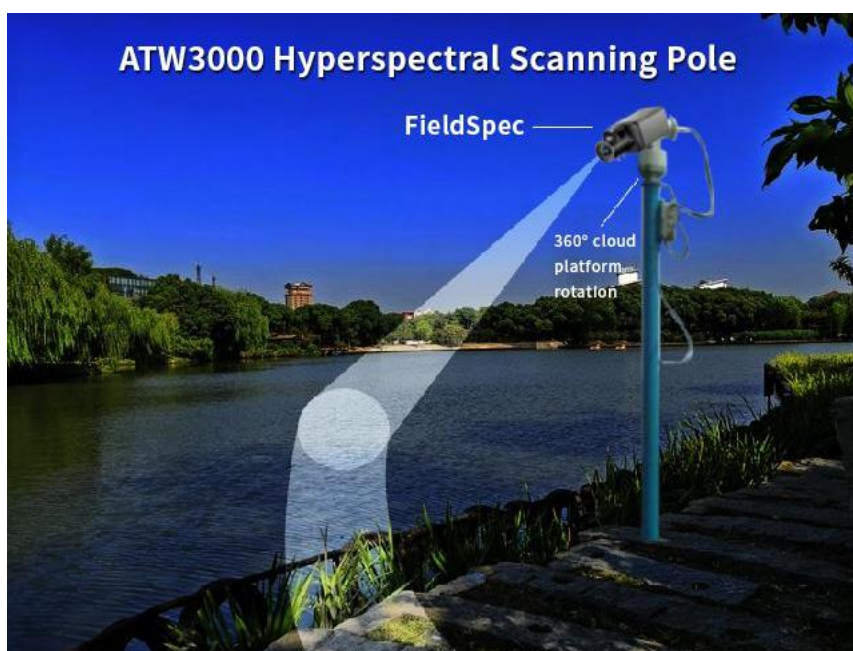


Figure 7 Application of field spectroradiometer in water quality monitoring

The spectral resolution of hyperspectral can be accurate to nanometer level, which makes it have unique advantages in detecting plant life information and analyzing vegetation growth status. Therefore, it will be more helpful to quantitatively study the vertical gradient nutrient status of crops by using hyperspectrum to penetrate into the interior of the crop ecosystem. The composition, structure, quality, nutrients and insect and disease stress of wheat, rice, soybean and maize were studied by using ground object spectrometer. For example, Zhao Chunjiang et al. collected the multi-angle spectral information of winter wheat canopy by ground object spectrometer, and studied the nutrient status at different levels of wheat. Wang Xiuzhen et al. studied the spectral information of rice canopy and leaves and established the

pigment inversion model with high accuracy.

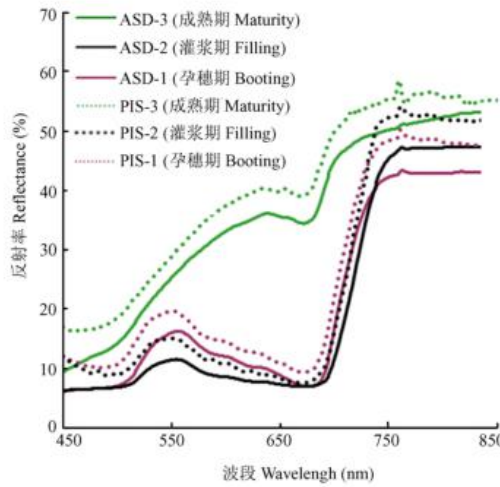


Figure 8 Leaf reflectance at different growth stages measured by field spectroradiometer

The types and quantities of petroleum compounds entering the natural water environment under abnormal conditions are also increasing rapidly. It is of far-reaching significance for the sustainable use of fresh water resources to increase the investment in the research on monitoring methods of oil spill on water surface, establish monitoring system related to oil spill disaster on water surface, strengthen the timely control of oil spill pollution on water surface, and minimize the impact of oil spill disaster on fresh water resources.

An effective analysis of oil spills is carried out by using ground object spectroscopy.

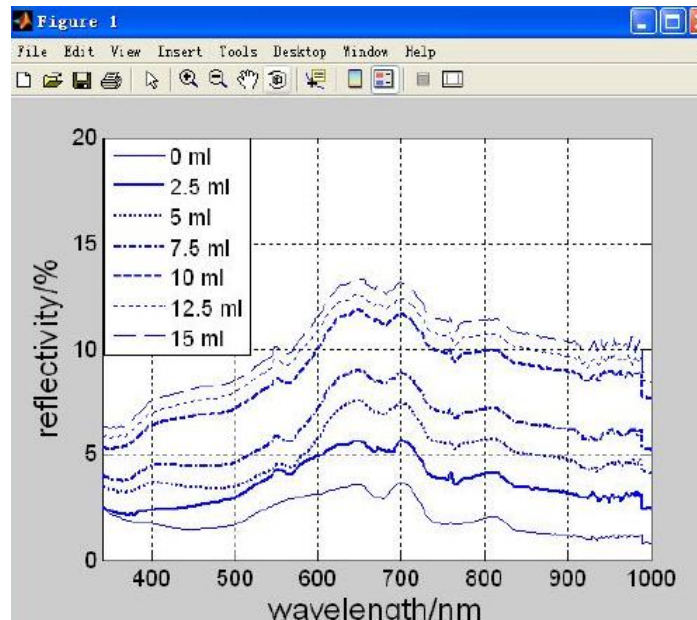


Figure 9 Application of field spectroradiometer in marine oil spill test

Surface covered with oil film, the reflectivity of the whole of the oil film was obviously higher than that of no oil film of the water, near the center wavelength of green light band, reflectivity curves present a tiny peak reflectivity,

overall in the 650 - nm around the second peak reflectivity data, add lubricating oil for the first time after the measured reflectivity value is about 1.5 times of water around. And can see that with the increase of dispersant, reflectance curve as well as increases gradually, the spectral characteristics of the main focus on green light wave band and red band, no obvious in the ultraviolet band and blue band reflection peak curve, in terms of curve of the overall trend, in blue and green wavelengths, reflectivity value with the increase of wavelength, shows the tendency of increasing.

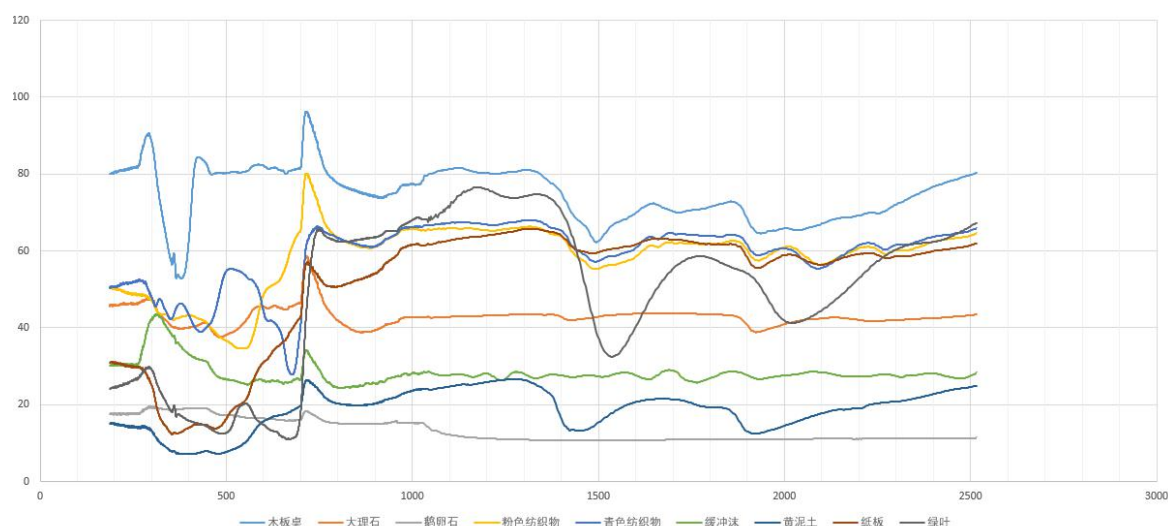


Figure 10 Spectra of various samples tested by the field spectroradiometer(measured by the ATP9110-25 wide-spectrum field spectroradiometer)



Figure 11 ATP9110-25 field spectroradiometer



## 4. Other FieldSpec Series



图 12 奥谱天成生产的地物光谱仪系列产品（截止 2020 年 12 月）

## 5. Company Profile

Optosky company is an first-class spectroscopy solution provider, with the headquarter locates in the 7<sup>th</sup> floor of the research institute of the Chinese Academic of Science at an area of 2500 square meter in Xiamen city where successfully held the international 9<sup>th</sup> BRICK summit in 2017. The subsidiary company locates in Wuhu city with an area of 2035 square meter.

The company founder Dr. Hongfei, Liu graduated Doctor degree from Chinese Academic of Science and postdoctoral degree from Xiamen University, by integrating both of top Universities' spectroscopy technology background into Optosky company aiming at developing the leading spectroscopy equipment in the world.

The company bases on unique technologies of Optomechatronics, Spectroscopy Analysis, Process Weak Optical and Electrical Signals, Cloud Computing, and have been developed wide products line of the competitive Raman spectroscopy instruments, micro spectrometer, hyperspectral imager, field spectroradiometer, fluorescence spectroscopy, LIBS etc. Driven by advanced technologies and products, Optosky brand has been well-known to customers all over the world.

Optosky company base on technologies innovation, market driven direction, customer first, provides first-class products and services, and one-stop solutions to many fortune 500 companies in many industries. The company received

praise from different industries companies, as well as many innovative intellectual property, software copyright, qualification certification, and winner awards over hundred numbers.

Optosky receives top class A introduced high-tech company to international Xiamen city, the national high-tech and new innovative technology company award. The founder Dr.Hongfei Liu receives the innovation talent award by ministry of science and technology.

The company is currently conducting the exclusive project of major industrialization national oceanic administration with a total fund of five million us dollar. The company in charge of drafting national industry standard of VNIR and SWNIR Field Spectroradiometer, and six national standard drafter, including China National Standard Drafter for Hazmat detector based on Raman spectroscopy, China National Standard Drafter for Buoy-type Monitor eco-environment, China National Standard Drafter for water quality monitor in unmanned boat, China National Standards drafter for online water quality monitor by spectroscopy, China National Standard Drafter for UV-absorbent measure fabrics.

The company has over 70 IPs and over 20 innovative patents.

The company received ISO9001:2015 certification, CE certification, Police Administration Certification, FDA approval compliant, IQOQPQ compliant.



Figure 1 Optosky (Xiamen) Photonics Inc. Company Headquarter

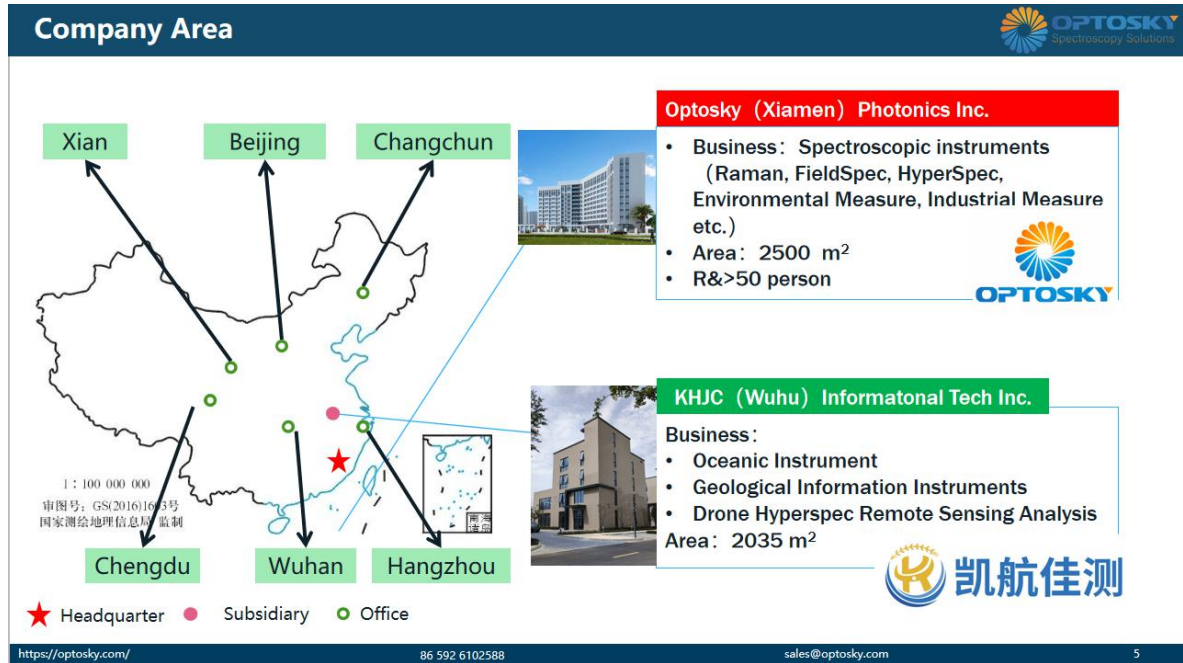


Figure 2 Optosky Company Area

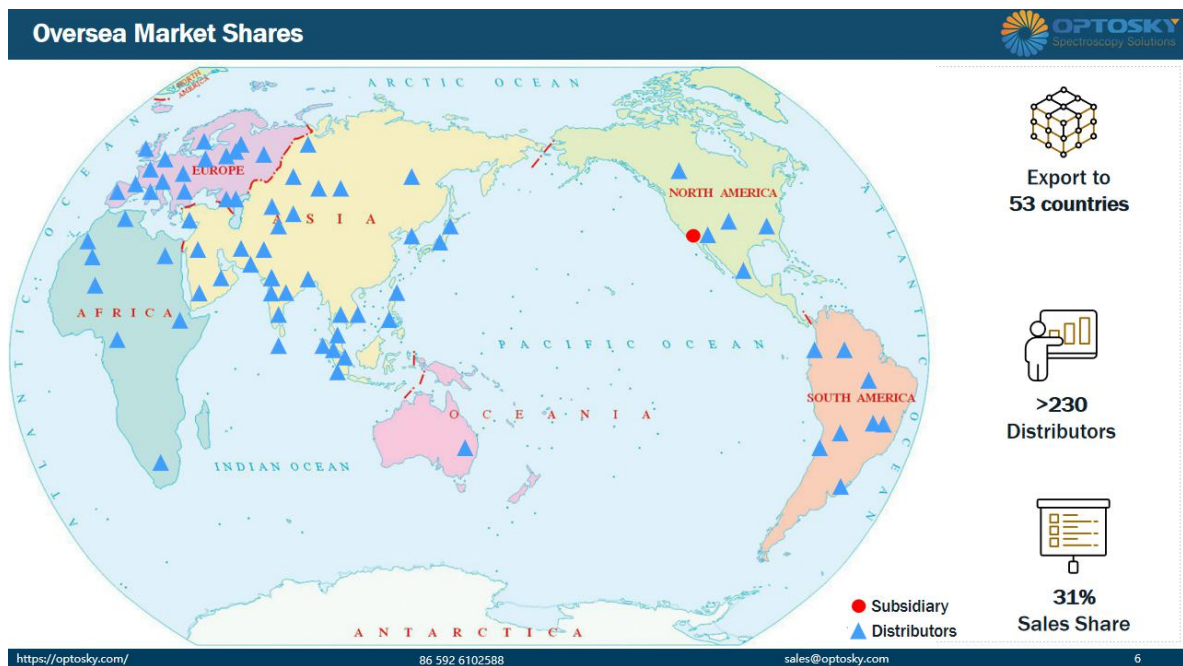


Figure 3 Overseas Market Shares



**Optosky Chair and Draft National Standards Lists:**

**Chair Drafter**

National Industry Standard Of VNIR & SWNIR  
Field Spectroradiometer

**GB**

China National Standard  
Drafter for Buoy-type Monitor  
eco-environment

**GB**

China National Standard  
Drafter for water quality  
monitor in unmanned boat

**GB**

China National  
Standard  
Drafter for  
Raman  
spectrometer

**GB**

China National  
Standard Drafter for  
Hazmat detector  
based on Raman  
spectroscopy

**GB**

China National Standards  
drafter for online water  
quality monitor by  
spectroscopy

**GB**

China National Standard Drafter  
for UV-absorbent measure fabrics

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Figure 4 Optosky Chair and Draft National Standards Lists.

**Qualification**

**ISO**

ISO9001:2005

**GB/T 23001**  
Informationization  
& Innovation

**CE, RoHS, LVD**  
17 models

**Police  
Approval**  
11 models

**GB/T 29490**  
IP implementation

**5 Innovative patents**

**35 patents**  
new utility design

**32 Software  
copyright**

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Figure 5 Qualification



## Informationization & Industrilization Fusion Management System

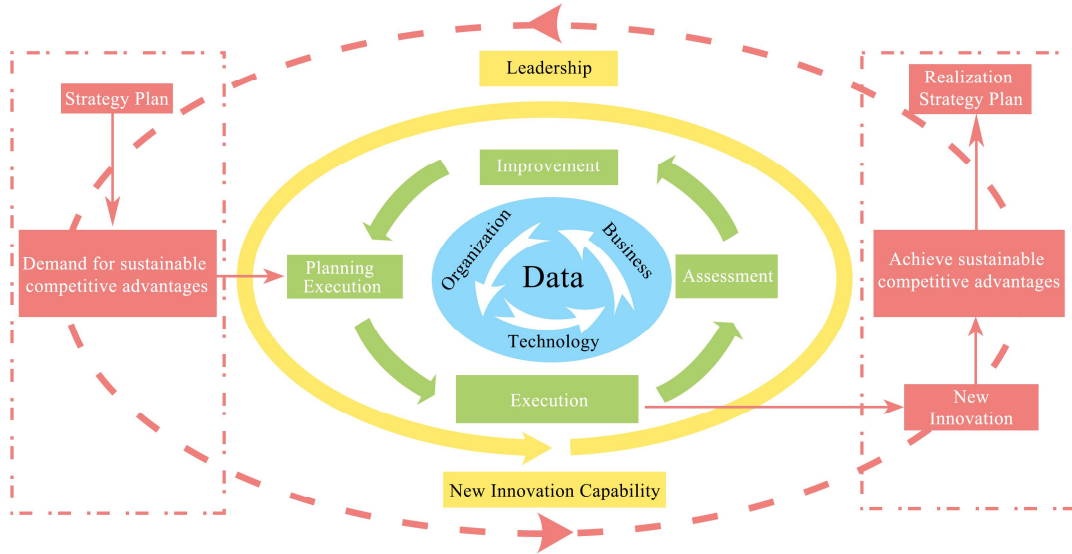


Figure 6 GB/T 23001\_Informationization & Industrilization Fusion Management System

### Co-Founder—Dr. Hongfei Liu



#### Postdoctoral Hongfei Liu

- Selected "Innovative Talent" by Science and Technology ministry
- Top Class A Talent by Xiamen City
- CCTV Science & Technology Interview
- Fortune 500 experience in Agilent, II-VI

#### Honors

- Selected by science & technology ministry as "Innovation Talent"
- CCTV Science & Technology Interview
- Top Class A Talent credited by Xiamen City
- Innovation Hero**

#### Education

- PhD • Chinese Science of Academic • Prof. Gui-Lin Chen, Originator in spectroscopy
- Postdoctoral • Xiamen University • Prof. Zhong-Qun Tian guided by the SERS founder M.Fleischmann

#### Career

- Engineer → R&D Manager → GM
- Agilent**, Leader of instrument, Fortune 500 company, Job: engineer
- II-VI Incorporated (Nasdaq: IIVI) leader in optical & electrical industries, Job: GM of Instrumentation and Automation

#### Academic

- University graduate tutor
- obtain more than 60 IPs, more than 10 Innovation patents;
- Publish more than 20 papers, 2 recorded SCI, 8 recorded EI



Selected "Innovative Talent" by Science and Technology ministry



Top Class A Talent by Xiamen City



Founder & Tutors

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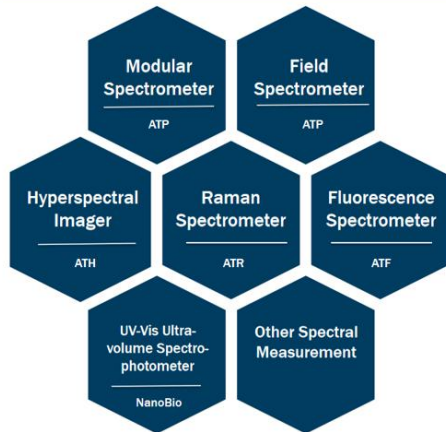
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Figure 7 Optosky's Co-founder\_Dr. Hongfei Liu

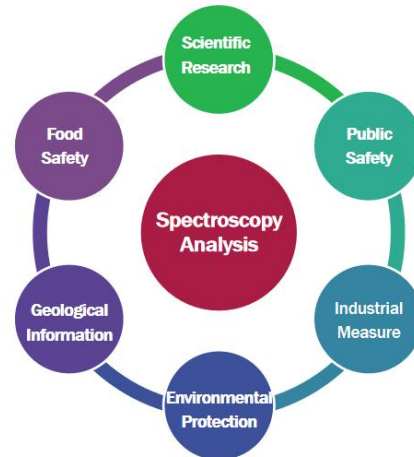
## Category & Application



### Category



### Application



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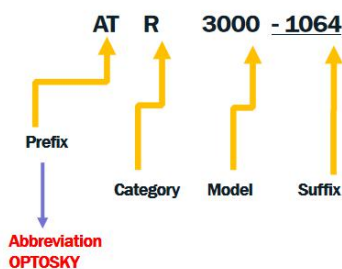
Figure 8 Category & Application

## Model Name Rule



### Model Name Rule:

- Prefix
- Category
- Model
- Suffix



- **ATR** - **R**aman Spectrometer
- **ATP** - Micro **S**pectrometer
- **ATH** - **H**yperspectral Imager
- **ATF** - Micro **F**luorescence Spectrometer
- **ATL** - **L**IBS
- **ATW** - **W**ater
- **ATE** - **E**nvironment **P**rotect
- **ATFD** - **F**ood Safety
- **GA** - Public Safety (**G**ong **A**n)
- **GF** - Gas Monitor (**G**as **F**inder)
- **GY** - Industrial Monitor (**G**ong **Y**e)

eg:

- Raman Microscope: ATR8300MP-1064
- Hyperspectral Imager: ATH9500

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Figure 9 Model Name Rule

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