

Handheld Broadband Spectrometer

ATP9100W

Features

- Maximum band range: 300 nm~1700nm or 300 nm~2500nm
- Ultra-small size, ultra-light weight
- Built-in Android operating system, No additional computer is required during operation
- Matching backpack, can be held and operated by one person, prevents it from being broken;
- Optical fiber probe measurement, light weight, flexible use
- Built-in anti-secondary diffraction coating and filter, high accuracy
- Display the inclination angle of the probe, and the laser indicates the detection position, which is convenient for adjustment
- Built-in GPS, altitude sensor, temperature and humidity sensor
- The host is dustproof and waterproof, not easy to damage
- Handheld, dedicated carrying case, easy to carry
- HD touch screen control, or PC software control
- HD camera display spectrum shooting area
- Direct calculation of vegetation index

Application

- Agriculture, geological research, prospecting, road surface evaluation
- Remote sensing measurement, satellite remote sensing data calibration and calibration
- Forest research, oceanographic research
- Environmental damage assessment

Description

ATP9100W-17 and ATP9100W-25 handheld full-band ground spectrometers (field spectroradiometers) are ultra-light full-band ground object spectrometers launched by Optosky on the basis of strong research and development capabilities of ground object spectrometers. The wavelength ranges are respectively 300 nm~1700nm and 300 nm~2500nm, and the weight is less than 1.5Kg, ATP9100W-17 and ATP9100W-25, in addition to the functions of conventional handheld ground object spectrometers, can also directly and intuitively display the area of the monitored spectrum in real time, make the experiment more accurate. Suitable for applications ranging from remote sensing surveys, crop monitoring, forestry research to oceanographic research.

ATP9100W-17 and ATP9100W-25 ground object spectrometers have the characteristics of high cost performance, fast and accurate measurement, simple operation, and easy to carry. They are equipped with powerful software packages. In addition to reflectance measurement, they can also be used for radiometry, photometry and colorimetric measurements.

Model	Description
ATP9100W-17	300-1700nm
ATP9100W-17TC	300-1700nm, with detector cooling
ATP9100W-25TC	300-2500nm, with detector cooling

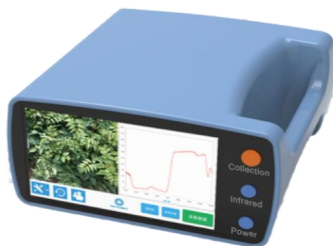


Fig. 1 ATP9100W Series Handheld Broadband Field Spectroradiometer



Fig. 2 Outdoor operation of field spectroradiometer

1. Selection Guide

Model	Description
ATP9100W-17	300-1700nm spectral range. The short-wave infrared adopts a 256-pixel InGaAs detector with low power consumption.
ATP9100W-17TC	300-1700nm spectral range. The short-wave infrared band adopts cooled 512-pixel InGaAs detector featuring high signal-to-noise ratio, stable performance and high reliability.
ATP9100W-25TC	300-2500nm spectral range. The short-wave infrared part uses a cooled 512-pixel InGaAs detector with high signal-to-noise ratio, stable performance and high reliability.

2. Performance

Optical parameters			
Model	ATP9100W-17	ATP9100W-17TC	ATP9100W-25TC
Spectral Range	300-1700nm	300-1700nm	300~2500 nm
Wavelength Accuracy	± 0.5nm		
Number of Spectral Channels	768	1024	1024
Spectral Resolution	<3.5nm@756nm	<3.5nm@756nm	<3.5nm@756nm
	<6.8nm@1550nm	<5.4nm@1550nm	<12nm@1550nm
Field of view (FOV)	Narrow field-of-view lenses with optional 1°, 8°, 15° and 25°.		
Indicate Laser Wavelength	Red laser, 650 nm		
Indicate Laser Power	5 mW		
SNR	VIS:>800:1	VIS:>800:1	VIS:>800:1
	SWIR:10000:1	SWIR:12000:1	SWIR:10000:1
Spectral Sampling Interval	0. 5nm		
Hardware Spectral Averaging	Up to 100,000 times		
Electrical parameters			
Operating System	Android		
Camera	1300million front camera		
LCD Screen	5" HD touch Screen, 720x1080		
Data Output	TYPE-C, Bluetooth		
Sensor	Gyroscope, temperature and humidity sensor, altitude and barometric pressure sensor		
Power Supply	Built-in lithium battery 5200mAh		
Battery Life	>3.5h	>2.5h	>2h
Storage Temperature	~ 20°C~+65°C		
Operating Temperature	~ 10°C~ +45°C		
Working Humidity	< 90%RH		
Physical parameters			
Waterproof Level	IP65		
Dimension	151×157×85mm	200×185×85mm	200×185×85mm
Weight	1.33 Kg	2 Kg	2 Kg

3. Accessories

No.	Standard Accessories	Specifications	Quantity
1	Charger	5V/3A	1
2	Reflectance Standard	10*10cm, 95%	1
3	Field of View (FOV) Lens	25°	1
4	Cosine Lens	/	1

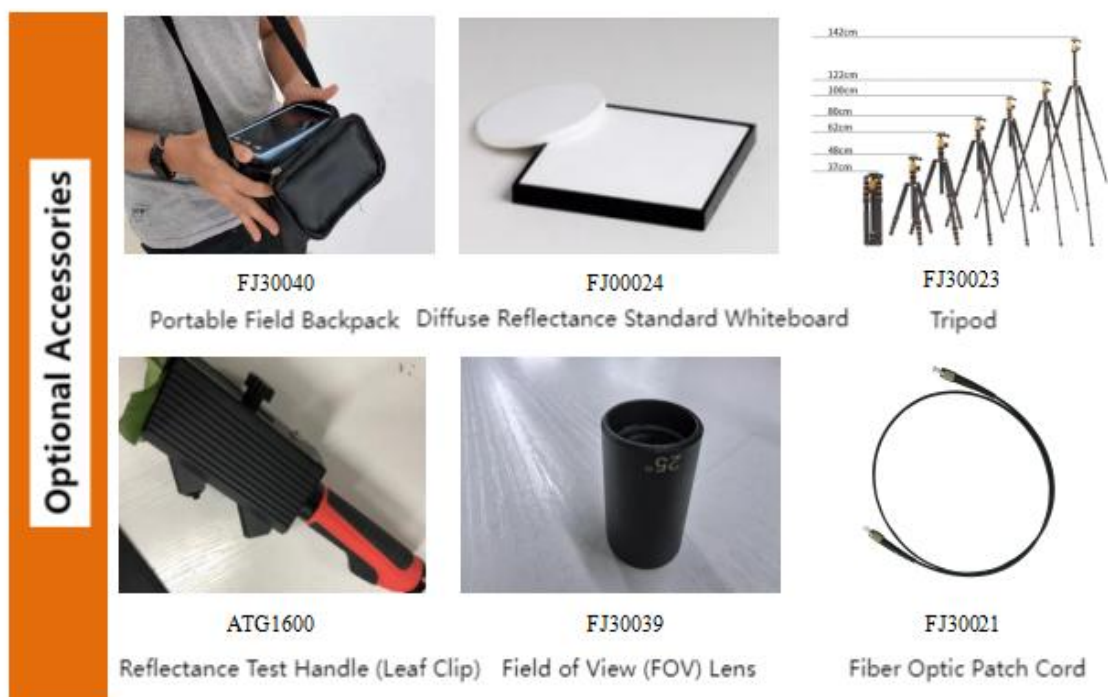


Fig 3 Comparison of measurement ranges between 25° field-of-view lens and 5° field-of-view lens

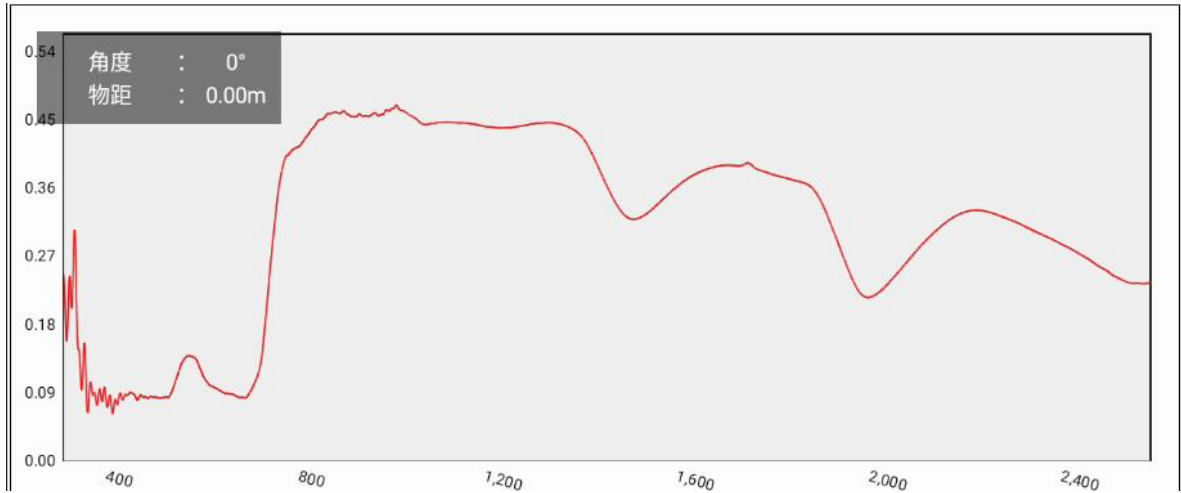


Fig. 4 Measured leaf reflectance obtained via reflectance test handle

4. Product Photos



5. Application cases of geodetic spectrometer

5.1 Application of geodetic spectrometer (hyperspectral) in ocean and water quality

Red tides, also known as red blooms, are ecological anomalies caused by the sudden proliferation or aggregation of certain phytoplankton, protozoa, or bacteria in seawater under specific environmental conditions over a short period. In recent years, toxic red tides have occurred frequently and on an increasingly larger scale, severely impacting coastal fisheries, aquaculture, and marine ecosystems. Red tide toxins also pose a threat to human life safety.

Marine brown algae, middle ribbed diatoms, and Danish columnar diatoms are three types of phytoplankton that cause red tides. Red chironomidae is the only reported protozoan capable of forming red tides; it is colorless and feeds on phytoplankton. The three major factors determining the optical properties of seawater are phytoplankton pigments (mainly chlorophyll, carotenoids, and other accessory pigments), inorganic suspended particles, and colored dissolved organic matter. These collectively influence the radiative information of the ocean above water (such as remote sensing reflectance spectra). Considering the spectral properties of these three water color elements, from a spectral morphology perspective, different types of red tide spectra exhibit distinct bimodal distributions in the 400-900 nm wavelength range. Notably, the second reflection peak located at 687-728 nm is a characteristic reflection peak that distinguishes red tide water spectra from normal seawater spectra. This feature has been successfully utilized in algorithms for detecting red tides based on aerial hyperspectral remote sensing.

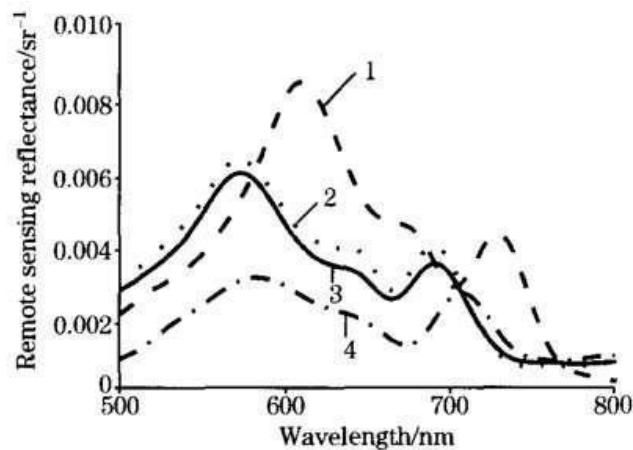


Fig7 Hyperspectral spectra of different types of red tides. 1: red mid-rib algae; 2: mid-rib algae; 3: Danish column algae; 4: Marine brown algae

- 1) The relatively high concentration of inorganic suspended matter is the main reason for the first reflection peak of 570~585nm. Due to its strong scattering effect on light, the reflection peak of chlorophyll at 550nm is obscured and cannot be clearly expressed in the spectral curve. The appearance of high concentration of inorganic suspended matter is directly related to the nearshore area of the experimental sea.
- 2) The absorption of phycocyanin (Phycocyanin), an accessory pigment, at 615~ 630nm forms a shoulder peak of reflection spectrum near 640nm.
- 3) The absorption peak near 670nm originates from the strong absorption of chlorophyll.
- 4) The second reflection peak of red tide water spectrum is not related to the existence and content of yellow substances and suspended sediment, but attributed to the fluorescence characteristics of chlorophyll in this band.
- 5) In previous Marine optical studies, it is generally believed that the fluorescence peak of chlorophyll is 685nm. However, recent experimental observations and spectral simulation studies show that with the increase of chlorophyll a concentration, the intensity of the fluorescence peak increases, and the emission wavelength of the fluorescence also redshifts.
- 6) The small reflection peak near 800nm in the spectral curve is due to the minimal absorption of pure water at this band.

ATP9100 Handheld ground object spectrometer (field spectral radiometer) is the latest product of Optosky (Aospectra), with a wavelength range of 300~1100nm, suitable for remote sensing measurement, crop monitoring, forest research and oceanographic research.

ATP9100 The ground object spectrometer boasts high cost-effectiveness, rapid and accurate measurement, simple operation, and easy portability. It comes with a powerful software package that can be used not only for reflectance measurements but also for radiometric, photometric, and chromatic measurements. In April 2020, it successfully monitored the red tide in the Sandu Bay waters off Ningde aboard the Jia Geng of Xiamen University. By analyzing the distribution maps at different times, it determined the direction of the red tide's movement and successfully issued a red tide warning.

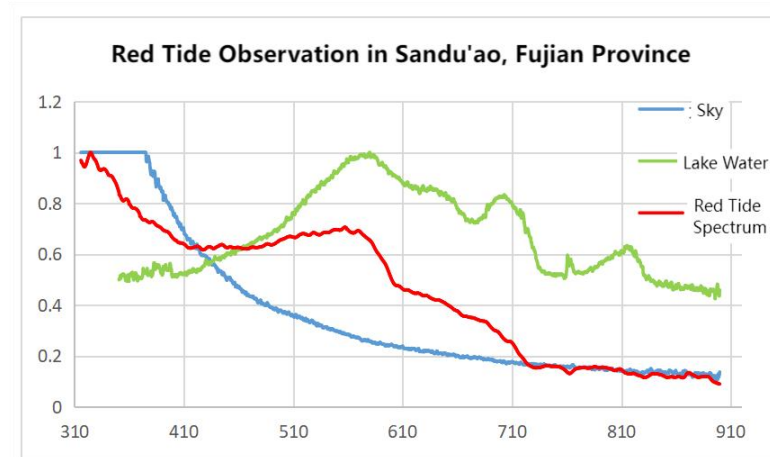


Fig 8 In April 2020, the Aositiancheng ATP9100 ground-based spectrometer monitored the red tide in Sandu Bay, Ningde, Fujian province

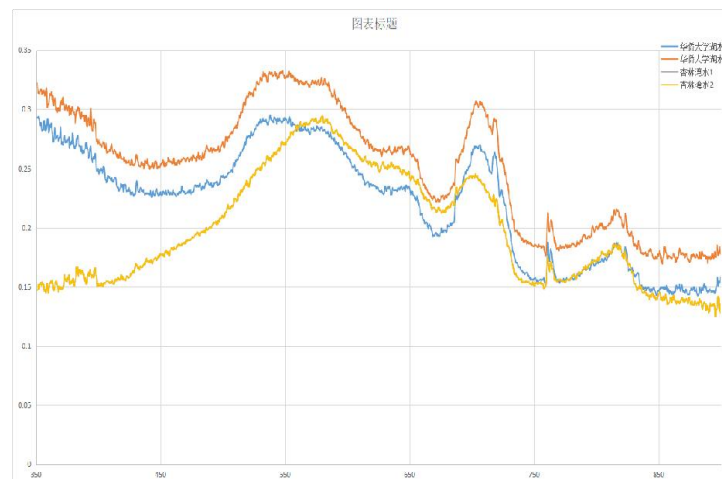


Fig 9. Application of ground-based spectrometer in analyzing lake water color



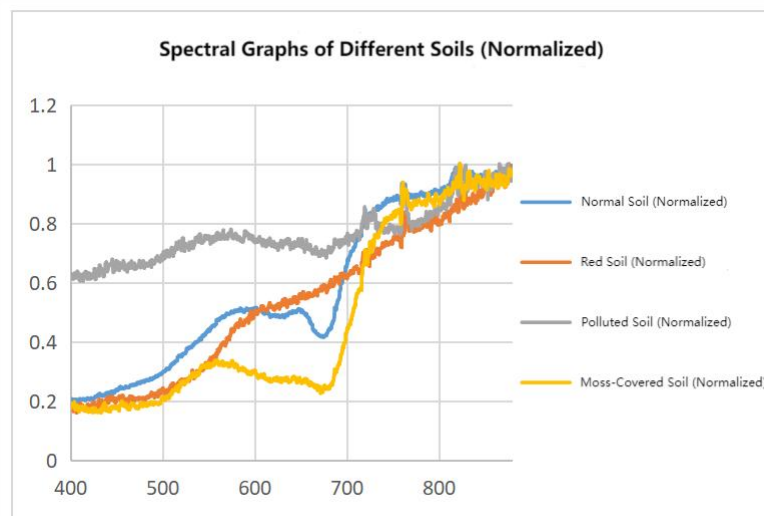


Fig 10. Application of geodetic spectrometer in monitoring Marine soil pollution

ATP9100 It is a completely self-developed product of Optosky, with high measurement accuracy, strong portability and low cost, which can perfectly replace imports, reduce costs and improve the market share and competitiveness of enterprises in our city in high-end Marine detection equipment.

5.2 Application of geodetic spectrometer (hyperspectral) in agriculture

Nitrogen is one of the primary limiting factors for increasing crop yields and economic benefits in arid regions. The nitrogen nutrition index (Nitrogen nutrition index, NNI) can effectively assess the nitrogen nutrient availability at different growth stages of crops. Using hyperspectral remote sensing technology to quickly and accurately diagnose the nitrogen nutrition status of drip-irrigated cotton fields, and subsequently optimize nitrogen supply at various growth stages, is a key measure to improve nitrogen fertilizer efficiency and soil environment. With the maturation of hyperspectral technology, applying this technology and algorithms to invert physiological and biochemical parameters such as leaf nitrogen content, chlorophyll concentration, leaf area, and biomass in crop leaves is currently the main method for studying nitrogen nutrition status in cotton. However, these parameters can vary due to differences in growth stage, canopy density, plant morphology, climate, and light conditions. Additionally, the parameters mentioned above only provide a relatively rough understanding of the nutrient status of cotton; they cannot qualitatively determine the degree of nutrient deficiency or excess. Vegetation indices are highly sensitive to nitrogen and less affected by other factors, so changes in vegetation indices can be used to infer changes in nitrogen levels. The nitrogen nutrition index is more closely related to nitrogen content, so monitoring changes in the nitrogen nutrition index can accurately assess the nitrogen nutrient status of plants.

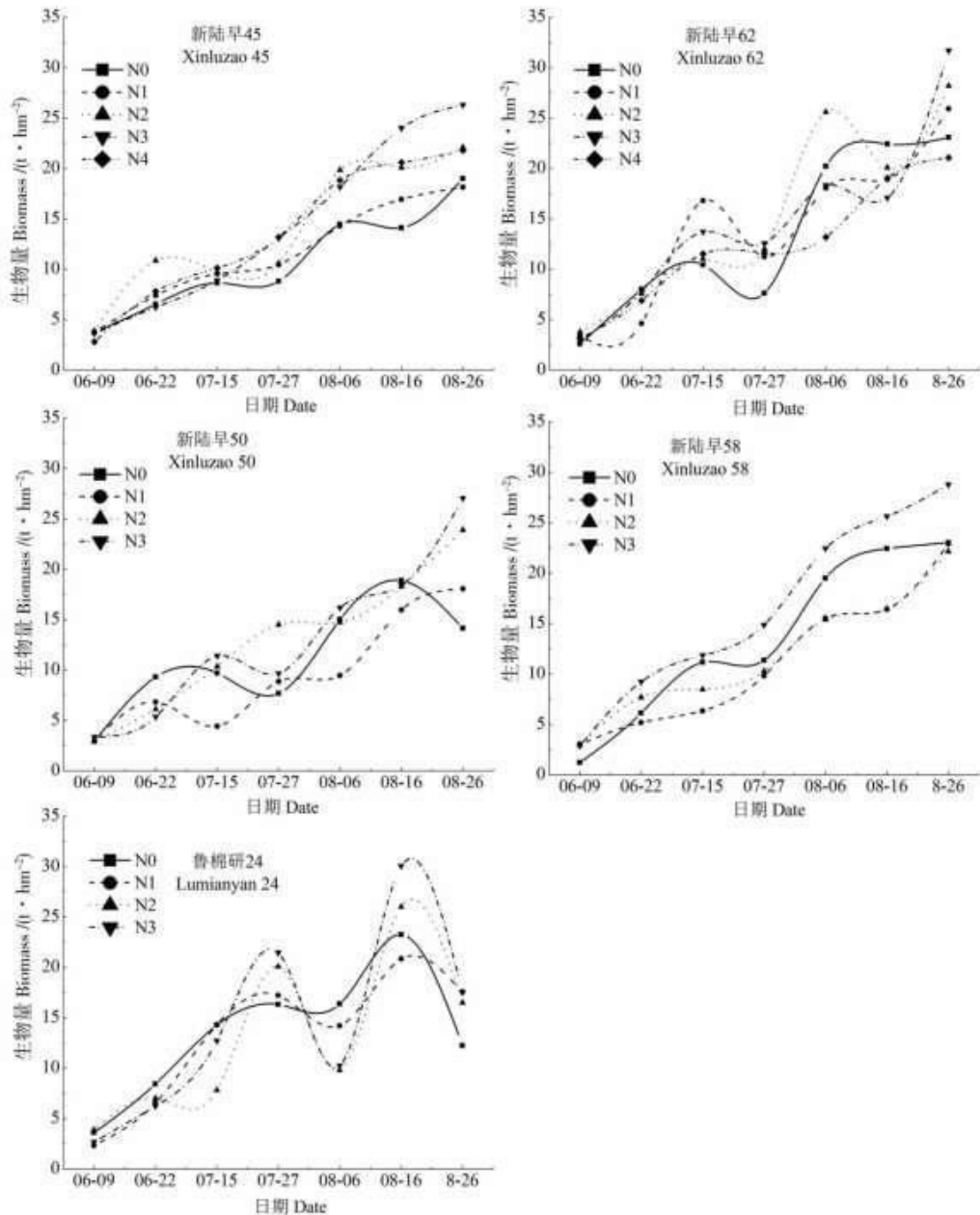


Fig 11 Biomass dynamics of different cotton varieties throughout the whole growth period

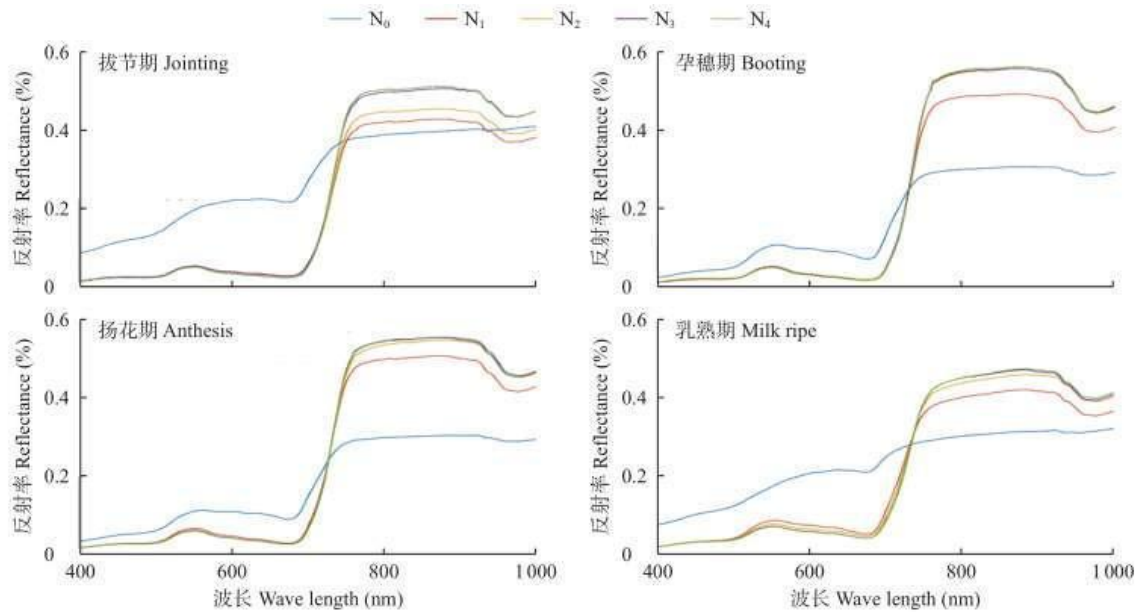


Fig 12. Spectral reflectance of winter wheat canopy under different nitrogen fertilizer gradients

To fully leverage the advantages of reflectance spectral data in monitoring physiological and biochemical parameters and the advantages of canopy SIF data in monitoring the photosynthetic physiological state of vegetation, we integrate reflectance spectral data with canopy SIF data to invert the incidence of stripe rust in wheat. Through comparative analysis of experimental data, it is found that the precision of the stripe rust monitoring model constructed using both reflectance spectral data and canopy SIF data is higher than that of the model built solely on reflectance spectral data.

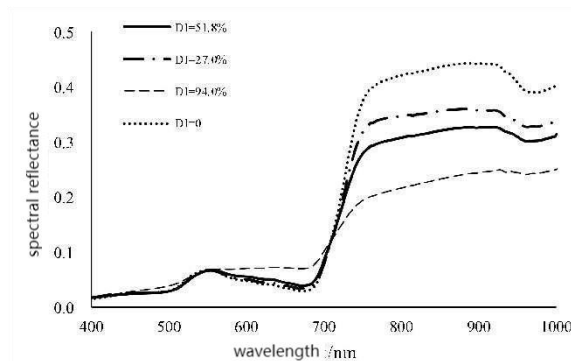


Fig 13 Original canopy spectral curves of different wheat stripe rust severity.

Comprehensive use of reflectance spectral data and canopy SIF data can improve the monitoring accuracy of wheat stripe rust severity. The SIF detector produced by Optosky is on the right.

6. Series of Optosky Field Spectroradiometers

 **FieldSpec WL Range**



Fig 13 Series of Field Spectroradiometers Produced by Optosky

7. OptoSky—Company Profile

OptoSky was founded in 2015 with group headquarters in Xiamen, a picturesque coastal city. It is a national-level key "Little Giant" enterprise featuring specialization, refinement, differentiation and innovation, dedicated to the R&D, production and sales of high-end spectral analysis instruments. The enterprise was initiated by Dr. Liu Hongfei, an international specialist in spectral instruments, who is an academican of the Russian Academy of Natural Sciences, leading talent of the National Ten-Thousand Talents Program, beneficiary of the Ministry of Science and Technology Innovation Talent Promotion Program, Class A talent under Xiamen Double Hundred Talent Program, PhD holder from Shanghai Institute of Technical Physics, Chinese Academy of Sciences and postdoctoral fellow of Xiamen University. The company devotes itself to developing globally advanced spectral analysis instruments and aims to be a top-tier international supplier of spectral instruments, evolving into a domestic pacesetter in the spectral instrument sector.

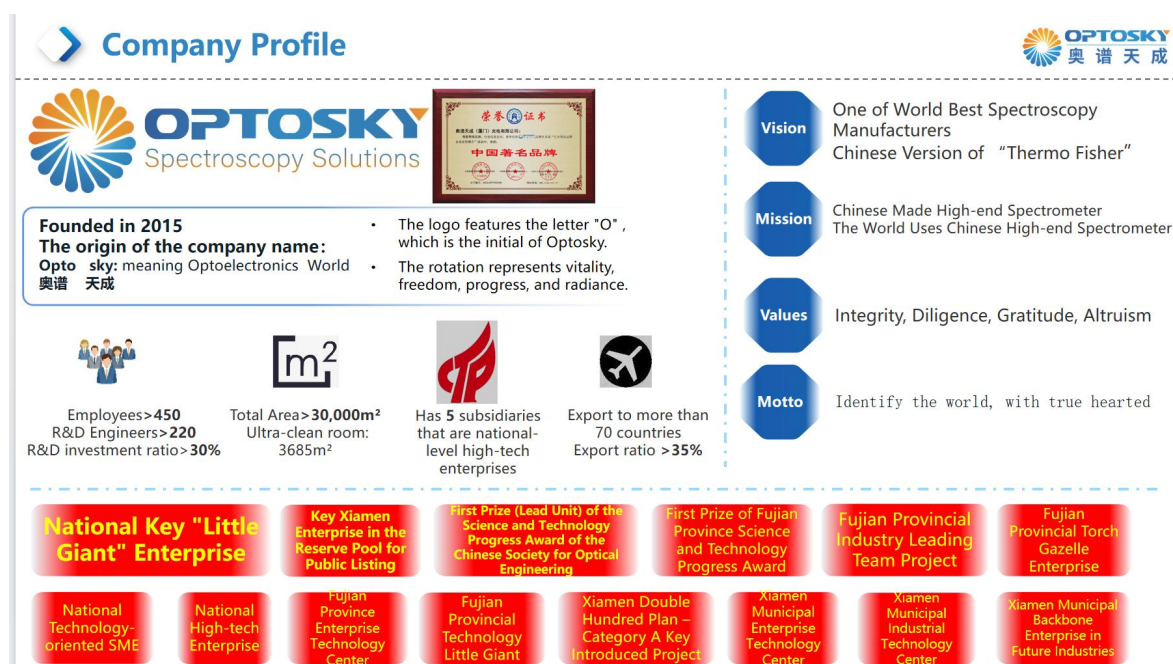


Figure 35 Group Profile

Founder——Dr. Hongfei Liu



Ph.D Hongfei Liu University Professor

- Russian fellower
- 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 remote sensing
- 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
- Coherent Corp.** 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

Figure 36 Dr. Liu Hongfei, co-founder of Optosky

OptoSky Group owns five national high-tech enterprises. It has established multiple R&D and manufacturing bases across China in Xiamen, Changsha, Wuhan, Chengdu, Xuzhou, Wuhu and other cities. The total global office space exceeds 30,000 square meters, and the company employs more than 450 staff members, including over 220 seasoned R&D engineers. The company has filed and obtained more than 500 intellectual property rights, among which over 100 are invention patents including two US invention patents. Currently, it undertakes more than 20 national, provincial and municipal research projects such as a major industrialization special project sponsored by the State Oceanic Administration with total funding of 30 million RMB. Meanwhile, OptoSky presides over and participates in formulating over 20 national, industrial and association standards. Standards led by the company: Near-infrared Terrestrial Object Spectrometer, Rapid Water Quality Detector Using Spectroscopy, Technical Specification for Multispectral Imaging in Smart Agriculture, Handheld Fruit Quality Detector, Technical Requirements for Medical Near-infrared Spectrometer, Portable Rapid Water Quality Detector Using Spectroscopy, etc. Standards participated in formulation: Technical Specification for Raman Spectrometer, Hazardous Chemical Detector Based on Raman Spectroscopy, Online Rapid Water Quality Detection System Using Spectroscopy, Technical Specification for Ecological Environment

Monitoring System Based on Mobile or Fixed Buoys, Determination of Benzophenone Ultraviolet Absorbers in Textiles, Determination of Antifungal Performance of Textiles Part 1: Fluorescence Method, Plant Phenotype Chlorophyll Fluorescence Imaging Analysis Equipment, Technical Requirements for Plant Monitoring Using UAV Hyperspectral Remote Sensing, etc. OptoSky keeps guiding the formulation of spectral technical standards and industrial upgrading.

Our Offices



Optosky Technology Park (Xiamen North Station) – Under Construction



Xiamen Headquarters Base (Approx. 3,000 m², Self-owned Property)



Changsha Head office (>10,000 m²)



Wuhan R&D Center (>2,000 m²)



Taizhou Manufacturing Base (>4,000 m²)



Xuzhou R&D Center (>2,000 m²)



Chengdu R&D Center (>1,300 m²)

Figure 37 Optosky National R&D Center/Smart Manufacturing Base

主持和参与制定的多个国家标准



Figure 38: Leading and participating in multiple national standards

Relying on its exclusive technologies including opto-mechatronics integration, spectral analysis, weak photoelectric signal processing and cloud computing, OptoSky has built a full-spectrum product portfolio with Raman spectrometers as flagship products, covering fiber spectrometers, hyperspectral imagers, field spectroradiometers, infrared spectrometers, fluorescence spectrometers, spectrophotometers and LIBS instruments. These products are widely adopted in scientific research, semiconductor, new energy, biomedicine, chemical pharmacy, public security, smart agriculture, military industry and other fields, ranking among the world's top tier in both product performance and brand influence. Its products are sold to more than 70 countries and regions worldwide. OptoSky is the top Chinese optical instrument brand in Russia, among the top three high-end optical instrument brands in the Middle East, and one of the fastest-growing Chinese brands in Europe and America. The company has realized domestic substitution and export breakthroughs for high-end spectral instruments.

Product Lines

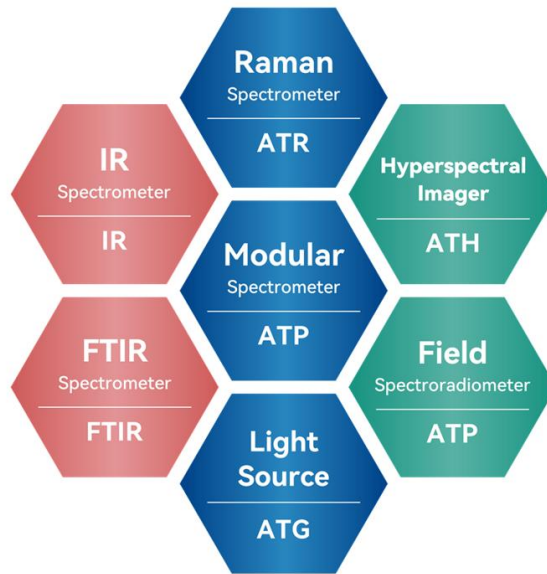


Figure 39: Main Product Series and Application Areas

OptoSky bases its development on technology, follows market demands and prioritizes customers, delivering outstanding solutions and high-quality products and services for numerous industries. Widely recognized by governments at all levels and the industry, the company has acquired more than 300 innovation patents, software copyrights, qualification certifications and domestic and international honors in total.

The enterprise holds multiple accreditations and honors including National Key Specialized, Sophisticated, Unique and Innovative Little Giant Enterprise, Key Pre-listing Enterprise of Xiamen, Leading Industrial Talent Team of Fujian Province, Xiamen Industrial Technology Center, Fujian Gazelle Enterprise, Class A key introduction project of Xiamen Double Hundred Talent Program and National High-tech Enterprise. It has also been awarded Xiamen Specialized, Sophisticated, Unique and Innovative Enterprise, Xiamen High-tech, High-growth and High-value Key Enterprise and Xiamen High-tech Enterprise.

Partial Honors Obtained by OptoSky:

- August 2025: Won the first prize in the final of the New Generation Information Technology Industry Group, Sichuan Division, the 14th China Innovation and Entrepreneurship Competition 2025
- July 2025: Approved as a Postdoctoral Innovation and Entrepreneurship Practice Base
- July 2025: Listed as a national-level key Specialized, Sophisticated, Unique and Innovative Little Giant enterprise
- March 2025: Approved for the Changsha Expert Workstation
- September 2024: Selected as a national-level Specialized, Sophisticated, Unique and Innovative Little Giant enterprise
- June 2023: Named a key pre-listing enterprise of Xiamen
- May 2023: Included in the Leading Industrial Talent Team Program of Fujian Province
- 2023: Accredited as Xiamen Industrial Technology Center
- 2022: Dr. Liu Hongfei elected an academician of the Russian Academy of Natural Sciences

- 2022: Recognized as a Fujian Torch Gazelle Enterprise
- 2022: Certified as a Fujian technology-based small and medium-sized enterprise
- December 2021: Its Raman spectrometer won the Second Prize of Fujian Provincial Science and Technology Progress Award
- 2021: Dr. Liu Hongfei selected for the National Ten-Thousand Talents Program organized by the Central Organization Department 2021: OptoSky awarded Fujian Provincial Science and Technology Little Giant Enterprise
- 2020: Dr. Liu Hongfei included in the Innovation Talent Promotion Program of the Ministry of Science and Technology
- 2020: Led the formulation of the national industrial standard Visible and Near-Infrared Field Spectroradiometer
- 2020: Dr. Liu Hongfei certified as Class B high-level talent of Fujian Province 2019: Certified as a national high-tech enterprise
- 2019: Honored the Independent Innovation Gold Medal issued by China Instrument and Control Society
- 2019: Recognized as a Specialized, Sophisticated, Unique and Innovative micro and small enterprise in Xiamen
- 2018: Won Excellent Enterprise Award in the National Final of the 7th China Innovation and Entrepreneurship Competition
- 2018: Received the second prize in Xiamen Division, the 4th China Innovation and Entrepreneurship Competition
- 2018: Won Silver Award in Fujian Division and Bronze Award in National Final of the 5th World New Materials Innovation and Entrepreneurship Competition
- 2016: Included in Class A key high-level talent introduction project (highest tier), the 8th Xiamen Double Hundred Talent Program
- Listed on Strait Equity Exchange Market, Stock Code: 865147
- Certified compliant with ISO9001:2015 Quality Management System

- Participated in formulating national standards Raman Spectrometer and Hazardous Chemical Detector Based on Raman Spectroscopy Technology
- Undertaken the major marine economic collaborative innovation project Research, Development and Industrialization of Marine Three-Dimensional Monitoring Sensors and Systems sponsored by State Oceanic Administration with total funding of RMB 30 million
- Established strategic partnership with School of Electronic Science and Engineering, Xiamen University since 2017
- Served as undergraduate internship base and joint postgraduate training institution of Xiamen University of Technology since 2016
- Served as undergraduate internship base and joint postgraduate training institution of Jimei University since 2017
- Member unit of Fujian Young Entrepreneurs Association; director unit of Xiamen Young Entrepreneurs Association
- Implementation entity for industry-university-research cooperation projects of Xiamen
- Member unit of Xiamen Emergency Association

8. Contact Us

Company Name: Optosky (Xiamen) Optoelectronics Co., Ltd.

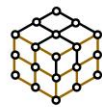
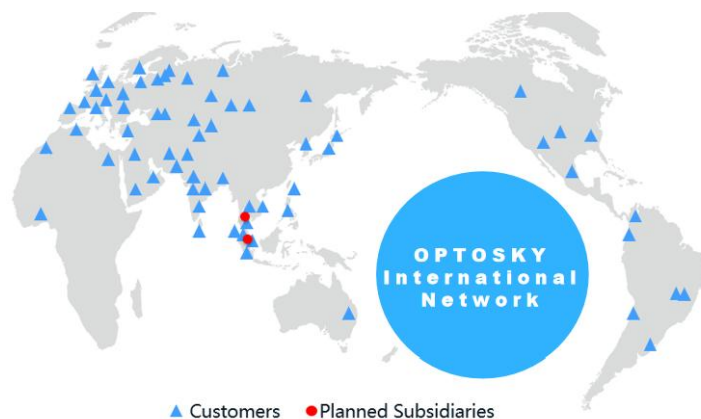
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China market and Global Distributors



Exported to
>70 countries



>260
Distributors



36%
share

=====The Essence of Exploration • Dedication to Authenticity=====

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