

## UAV-borne Methane Leak Inspection System

# GF920

### Features

- Unmanned aerial vehicle, large patrol range
- Ultra-high sensitivity: 5 ppm\*m
- UAV flight height: <100m
- Low-altitude remote sensing detection, no need to approach danger
- 1.5m wheelbase large multi-rotor UAV, high load, strong expandability
- Ultra-long flight time: about 45 minutes, large cruising area

### Application scenarios

- Residential building
- Natural gas station
- Gas pipeline inspection
- Factory Pipeline Leak Inspection

### Description

GF920 series unmanned aerial vehicle-borne methane leakage inspection system is the third-generation improved model launched by Optech. The unmanned aerial vehicle-borne laser methane telemeter has built-in infrared laser, emits infrared laser, and simultaneously receives reflected light, using tunable laser The diode modulation spectroscopy technique scans the absorption peaks of methane, on the optical path methane gas was measured. The measurement reading is the methane column concentration on the optical path, that is, the integral of the methane concentration (ppm) and the distance (m), and the unit is ppm\*m.

GF920 series unmanned aerial vehicle-borne methane leakage inspection system can be used in residential buildings, natural gas stations, gas pipeline inspections, factory pipeline leakage inspections, etc., to detect methane leakage in time and avoid explosions.

GF920 can also be designed to be hand-held and online, and form an independent measurement system with the field rotating platform. It can also be mounted with drones for handheld mobile operations.







## 1. Selection

Model	Description
GF920	Unmanned aerial vehicle type, can scan a large area
GF920HH	Handheld
GF920OL	Online, 360° scan

## 2. Performance

Laser Absorption Spectroscopy	
Detectable Gas Type	Methane and methane-containing gases
Measurement principle	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
Measurement methods	Echo Reflection Telemetry
Sensitivity (ppm*m)	5 ppm*m (measured)
Measuring range (methane)	0~99999 ppm*m
Measurement accuracy	±10%



Responding speed	0.1 s
Telemetry distance	<100 m (related to reflectivity)
Output Data	Methane concentration, light intensity, ambient temperature, etc.
Laser Safety Level	Detection Laser: Class I Eye Safe, Wavelength: 1651 nm, <10 mW Green indication laser: Wavelength: 520 nm, <5 mW, Class 3R, avoid direct laser to eyes
Laser spot size	Divergence: 2 mrad (4 cm at 20 m)
<b>UAV System</b>	
Drone	Luxury Six Rotor Drone customized with load hour > 45 minutes
Cloud Platform	High stable Cloud platform driven by 3-Phase BLDC Motor
Rotor No.	Six Rotors
Lift	Take off and land vertically
Wheelbase	1500 mm
Max base	6 Kg
Max altitude	5000 m
Drone size	1650 X 1410 X 500 mm
GPS accuracy	1.5 m
Remote change imaging specs (Y/N)	No
Flight duration	>45 minutes
Ground control distance	5 Km
<b>Reliability</b>	
Operation Temp	-20 ~ +45°C
Storage Temp	-25 ~ +65°C
Working Humidity	< 80%RH, no condensation



## 3. UAV-borne methane leakage inspection system



Figure 1 UAV-borne methane leakage inspection system





Fig 2 Flight Experiment of UAV-borne Methane Leak Inspection System (Location: Xiamen Rare Earth Research Institute, Chinese Academy of Sciences)





Fig 3 UAV-borne methane leakage inspection system



## 1. Company Profile

Optosky company has been providing first-class spectroscopy solution with 20 year, with the headquarter covers a area of 2500 square meter with 50 engineers in Xiamen city where held the international 9<sup>th</sup> BRICK summit in 2017. Another R&D research centers locates in Wuhu city with 30 engineers covering an area of 2035 square meters.

The company founder & CEO Dr.Hongfei,Liu received Doctor degree in Chinese Academic of Science and postdoctoral degree in Xiamen University, by cooperating with two top Universities' spectroscopy technology to integrate into Optosky company aiming at developing global leading spectroscopy solution provider.

The company technology bases on Optomechanics, Spectroscopy Analysis, Process Weak Optical and Electrical Signals, Cloud Computing, and have been developed wide products line of Raman spectroscopy products, 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 technology innovation, market-driven innovation, 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 leading industrial companies, as well as many innovative intellectual properties, software copyright, qualification certification, and winner awards over hundred numbers.The company has received over 26 IPs, 35 innovative patents, and 32 copy rights.

Optosky receives top class A introduced the 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 the 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 dollars. Optosky company in charge of drafting 7 Chinese National Standards (GB) , including VNIR and SWNIR Field Spectroradiometer, Hazmat detector based on Raman spectroscopy, Buoy-type Monitor eco-environment, water quality monitor in the unmanned vessel, online water quality monitor by spectroscopy, UV-absorbent measure fabrics etc.

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





Figure 1 Optosky (Xiamen) Photonics Inc. Company Headquarter

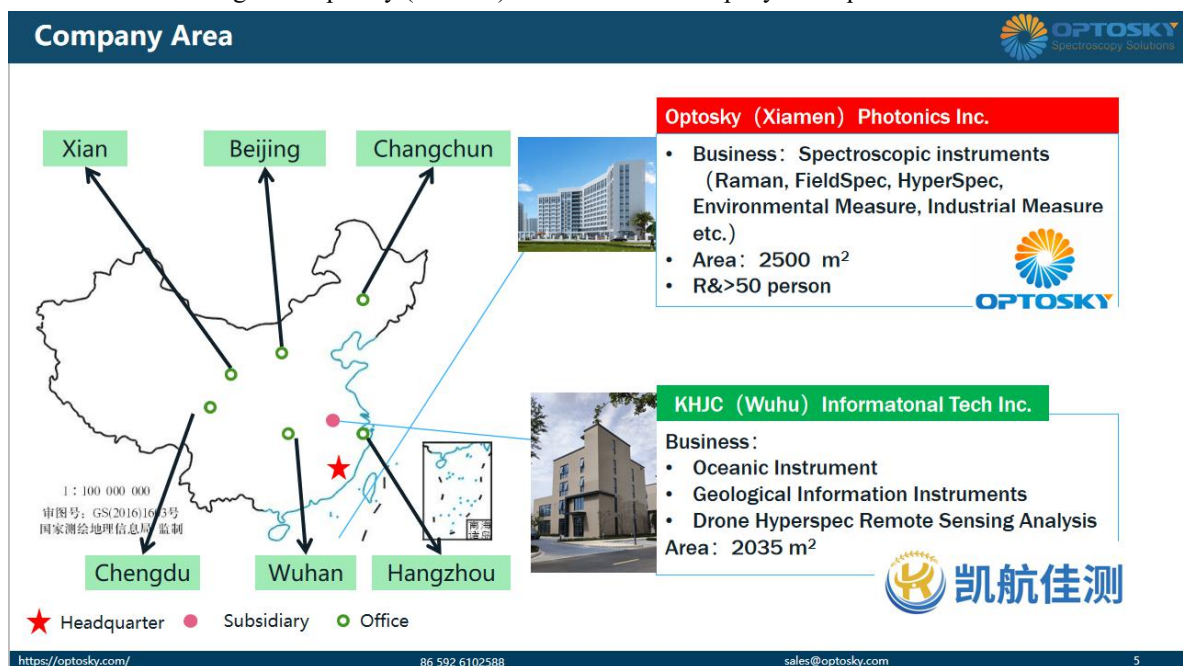


Figure 2 Optosky Company Area



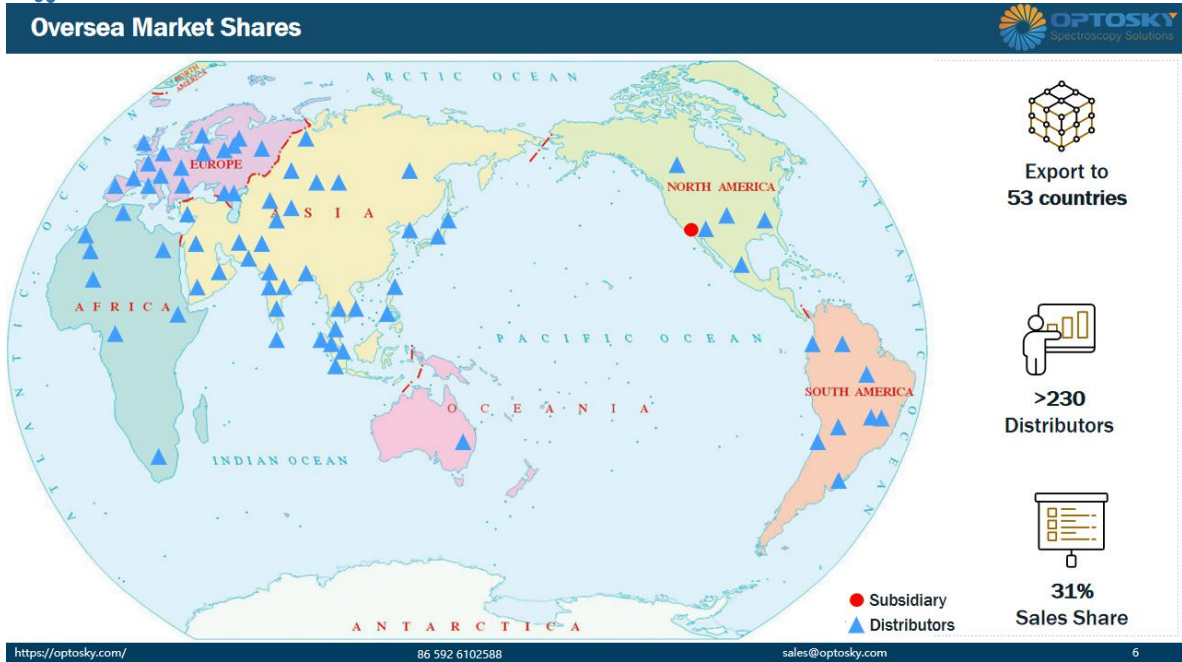


Figure 3 Oversea Market Shares



Figure 4 Optosky Chair and Draft National Standards Lists.



## Qualification



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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14

Figure 5 Qualification

## Informationization & Industrilization Fusion Management System

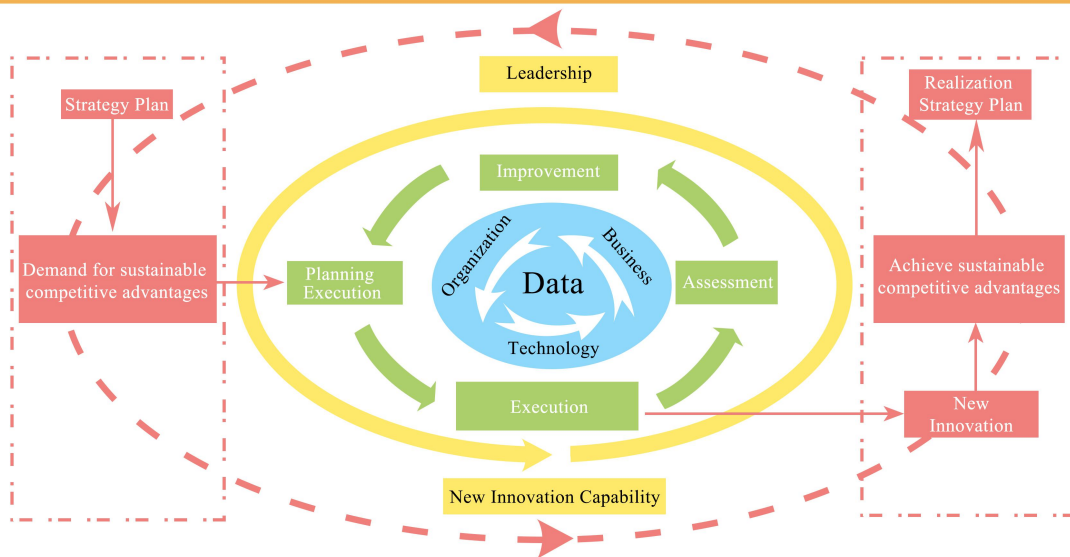


Figure 6 GB/T 23001\_Informationization & Industrilization Fusion Management System



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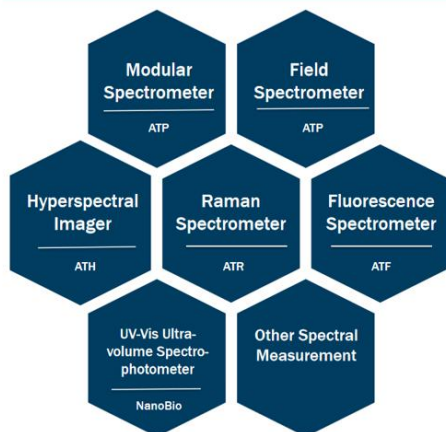
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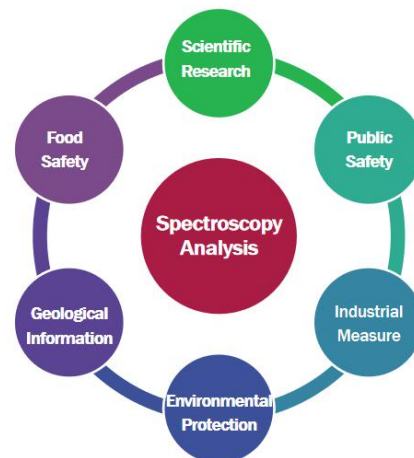
Figure 7 Optosky's Co-founder\_Dr. Hongfei Liu

## Category & Application

### Category



### Application



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15

Figure 8 Category & Application




**Model Name Rule**

**Model Name Rule:**

- Prefix
- Category
- Model
- Suffix

Prefix

↓

Abbreviation  
OPTOSKY

AT   R   3000   -1064

↑   ↑   ↑   ↑

Category   Model   Suffix

- ATR – Raman Spectrometer
- ATP – Micro Spectrometer
- ATH – Hyperspectral Imager
- ATF – Micro Fluorescence Spectrometer
- ATL – LIBS
- ATW – Water
- ATE – Environment Protect
- ATFD – Food Safety
- GA – Public Safety (Gong An)
- GF – Gas Monitor (Gas Finder)
- GY – Industrial Monitor (Gong Ye)

eg:

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

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16

Figure 9 Model Name Rule