

# Angle-Resolved Spectrometer

**GY8100**

## Features

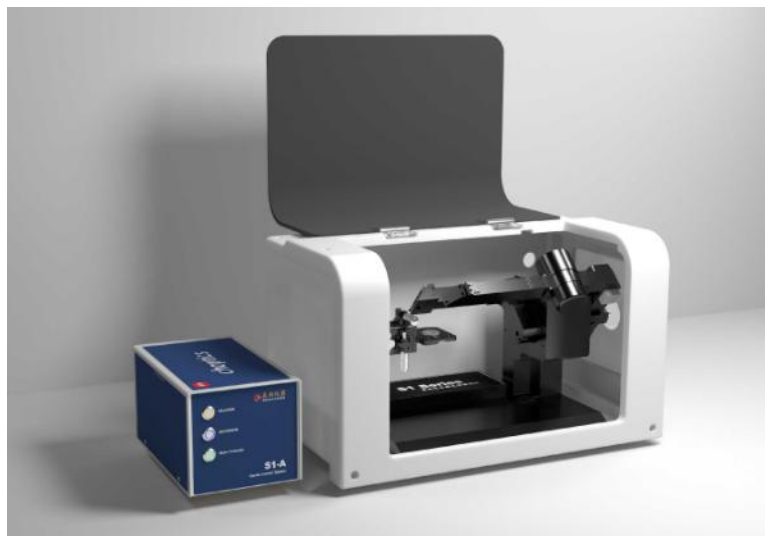
- Full-angle acquisition uses intelligent rotation design and supports 0-360° measurement.
- Multiple modes Support 7 spectral measurement modes.
- Wide spectrum range Supports spectral range detection from 200-2500nm.
- Supports expansion Can connect external light sources such as lasers.
- Multi-dimensional control Samples support multi-mode and multi-dimensional adjustment.
- Data analysis Proprietary software can realize automated spectral acquisition, data analysis and spectral display.
- Secondary development Provides a development toolkit to encapsulate all functions, add in one place, call in multiple places.

## Description

The GY8100 integrates Optosky's spectral technology with a precision optical system, designed specifically for multi-angle spectral measurement needs. Through a high-precision electric rotating arm, the GY8100 can precisely control the optical path for 360° spatial rotation, paired with a high signal-to-noise ratio spectrometer, supporting absolute spectral efficiency detection.

The GY8100 can be used for rapid measurement of the reflection, transmission, and other spectra of various planar optical components. It adopts an intelligent automatic rotation design, adjusting the incident and outgoing directions separately, to achieve spectral measurements at different angles of the sample under test. The measurement modes include: upper reflection, lower reflection, transmission, scattering, radiation, free mode, and programming mode. It aims to provide users with a more multidimensional, broader wavelength range high-precision spectral analysis experience, meeting the application needs of fields such as micro-nano optics, photonic crystals, superconducting materials, and luminescent materials.

## Product Appearance (To be updated)



## Measurement Targets



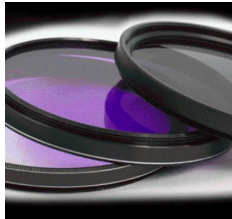
Prism



Parallel Plate



Optical Filter



Polarizer



Coated Mirror



Infrared Cut-off Filter

## Application

- Structural Colors: The fundamental attribute of structural colors is their colorful appearance at different angles, necessitating the system to have multi-angle spectral detection capabilities.
- Photonic Crystals: Photonic crystals achieve precise control over light beam characteristics such as polarization, direction, and frequency through their tunable band structure. Therefore, the system must have the capability to accurately characterize the band structure to guide the optimization of preparation processes.
- Optical Thin Films: Thin films exhibit different reflectance at various angles, so the system must be able to accurately measure the reflectance data of thin films at different angles for comprehensive performance evaluation and optimization.
- Luminescent Materials: The light intensity distribution is a crucial indicator for luminescent materials. Thus, the system needs to have the ability to receive luminescent information from all directions.
- Metamaterials
- Nanomaterials
- Surface Plasmons
- Gratings
- Liquid Crystal Materials
- Superlattice Materials

## Measurement Principle

**Transmission:** Parallel light passes through the sample, reaches the integrating sphere for reception, and the transmittance data is calculated by comparing the received light with the reference light using the spectrometer.

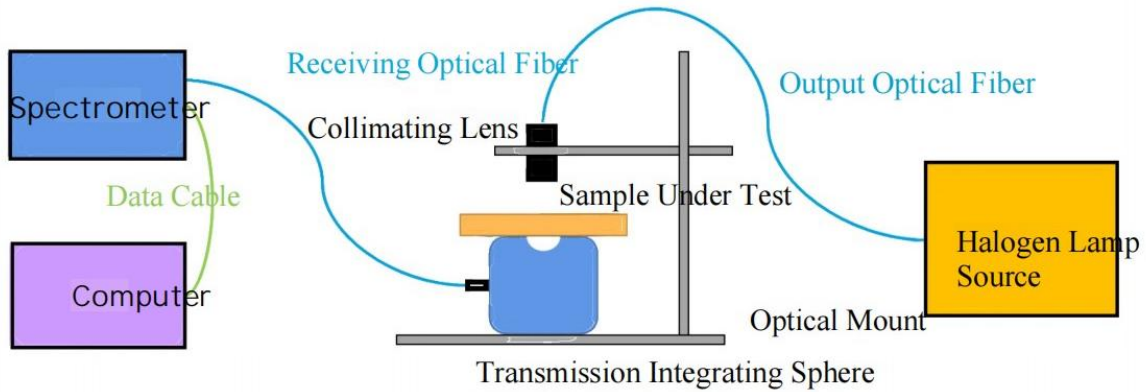


Figure 1: Schematic Diagram of Transmittance Measurement Optical Path

**Reflection:** Parallel light is reflected off the sample surface, and the reflected light reaches the integrating sphere. The reflectance data is calculated by comparing the received light with the reference light using the spectrometer.

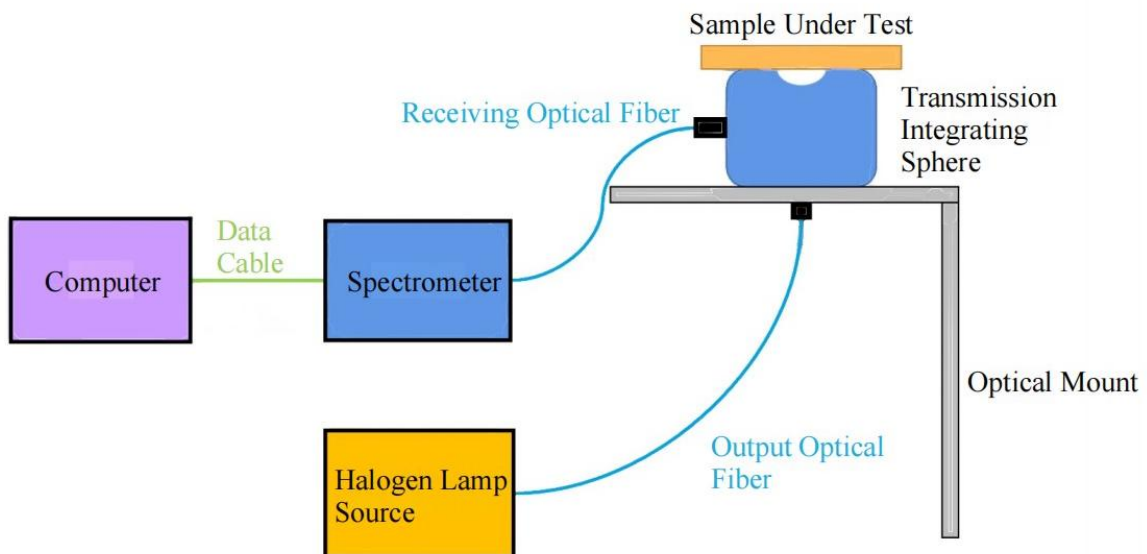
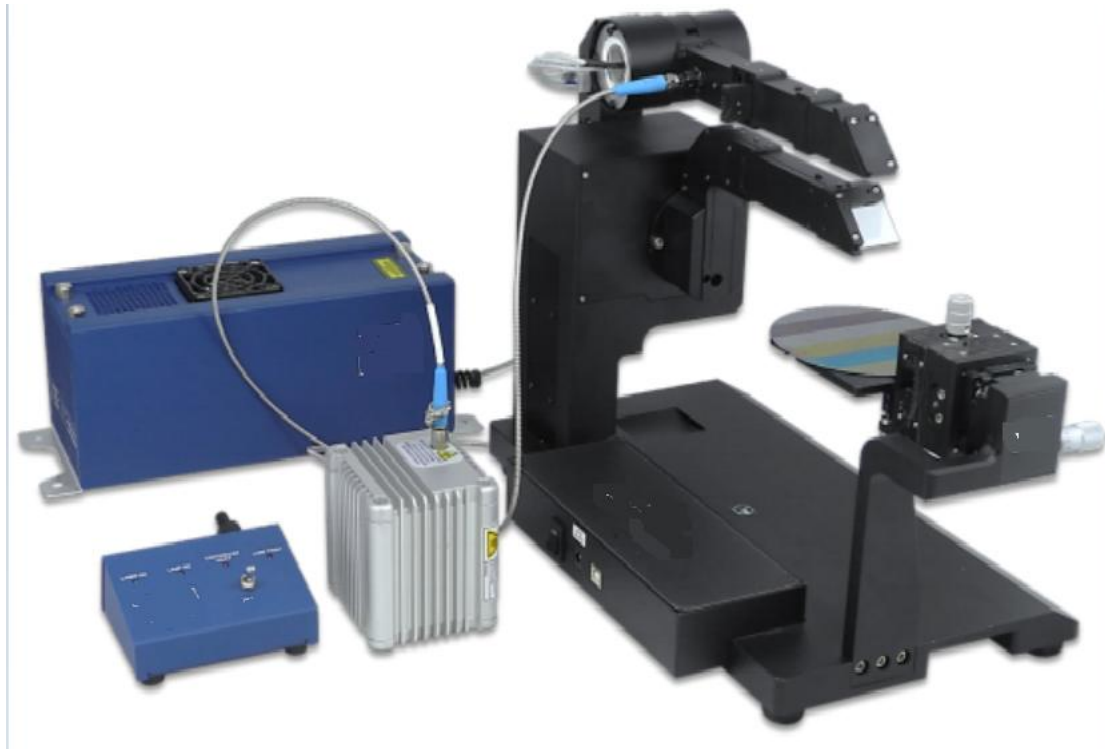


Figure 2: Schematic Diagram of Reflectance Measurement Optical Path

## 1. System Components (To be updated)



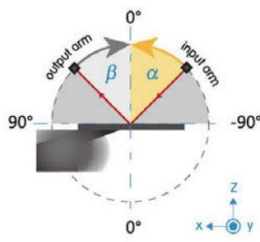
Optional Configurations:

- Deuterium Lamp, External Laser Light Source
- Optical Filters, Aperture
- Multi-band Spectrometer
- Polarizer Mount, External Optical Fiber, Customizable Sample Stage

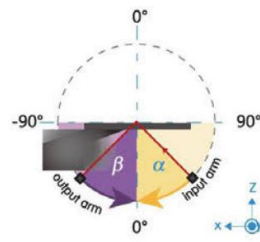
## 2. Test Modes:

The angle-resolved spectral measurement modes include: upper reflection, lower reflection, transmission, scattering, radiation, free mode, and programming mode. The schematic diagram is as follows:

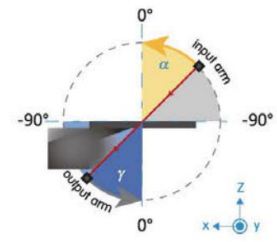
上反射模式/ Upper Reflection



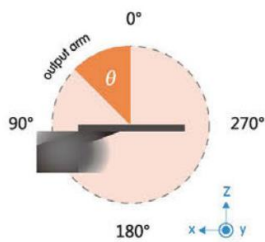
下反射模式/ Lower Reflection



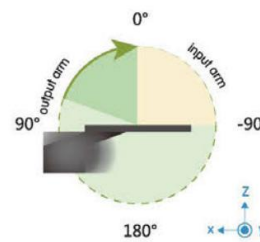
透射模式/ Transmission



辐射模式/ Radiation

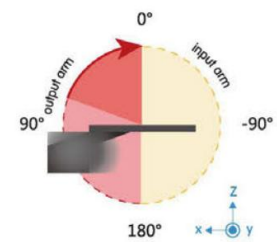


散射模式/ Scattering



F 自由角度模式/ Free Angle

P 编程模式/ Programming



## 3. Parameter

Angle Parameters		
Incident Angle	0~180°	
Outgoing Angle	0~360°	
Angle Accuracy	0.02°	
Angle Step	0.0015(min)	
Incident Light Cone Angle (Customizable)	With Aperture	$\angle 1^\circ / 2^\circ / 3^\circ$ full cone angle, three aperture choices
	Without Aperture (Default)	$\angle 3.9^\circ$ full cone angle
Electrical Parameters		
Operation Mode	Electric	
Power Interface	DC24V	
Control Interface	USB Interface	
Control Method	Sampling mechanical arm electric control, manual adjustment of the sample stage	
Structure and Consumables		
Sample Size	/	
Extended Light Source Interface	SMA905	
Light Source Output Interface	SMA905	
Standard References	Standard whiteboard, standard aluminum mirror	
Optical Parameters		
Spectral Band	200nm-1000nm, expandable to2500nm	
Light Source	External 250nm-2500nmDeuterium-Tungsten Halogen Lamp, optional Deuterium Lamp	
Sampling Spot	$\phi 0.8\text{mm}$ fine collection for small areas	
Measurement Modes	Raw, Background Subtraction, Reflection, Transmission, Absorption, Absorbance, Radiation Mode	
Detection States	Upper/Lower Reflection, Transmission, Scattering, Radiation, Free, Programming (7 modes)	
Polarizer Mount (Optional)	Optional, adjustable polarization direction	
Polarizers (Customizable)	360~790nm, R1.PMF.P-Vis	
	560~2400nm, R1.PMF.P-Nir	
	300~3200nm, R1.PMF.P-EX	

Filter Holder (Customizable)	Optional, compatible with various filter models
Filter (Customizable)	Various models available

## 4. Supporting Software (To be updated)

