

AIRBORNE CLOUD DROPLET SPECTROMETER



Introduction

The Airborne Cloud Droplet Spectrometer developed by Zhice Yunlian adopts bright field synchronous illumination and microscopic magnification imaging to capture magnified images of cloud and fog particles within the sampling area on a CMOS image sensor.

The captured images are preprocessed and compressed by the built-in embedded program, then transmitted to the upper computer via Ethernet port. The matching application software conducts automatic analysis, rapidly identifying particle information in images, calculating particle count and diameter, and statistically displaying spectral classification data of cloud droplets.

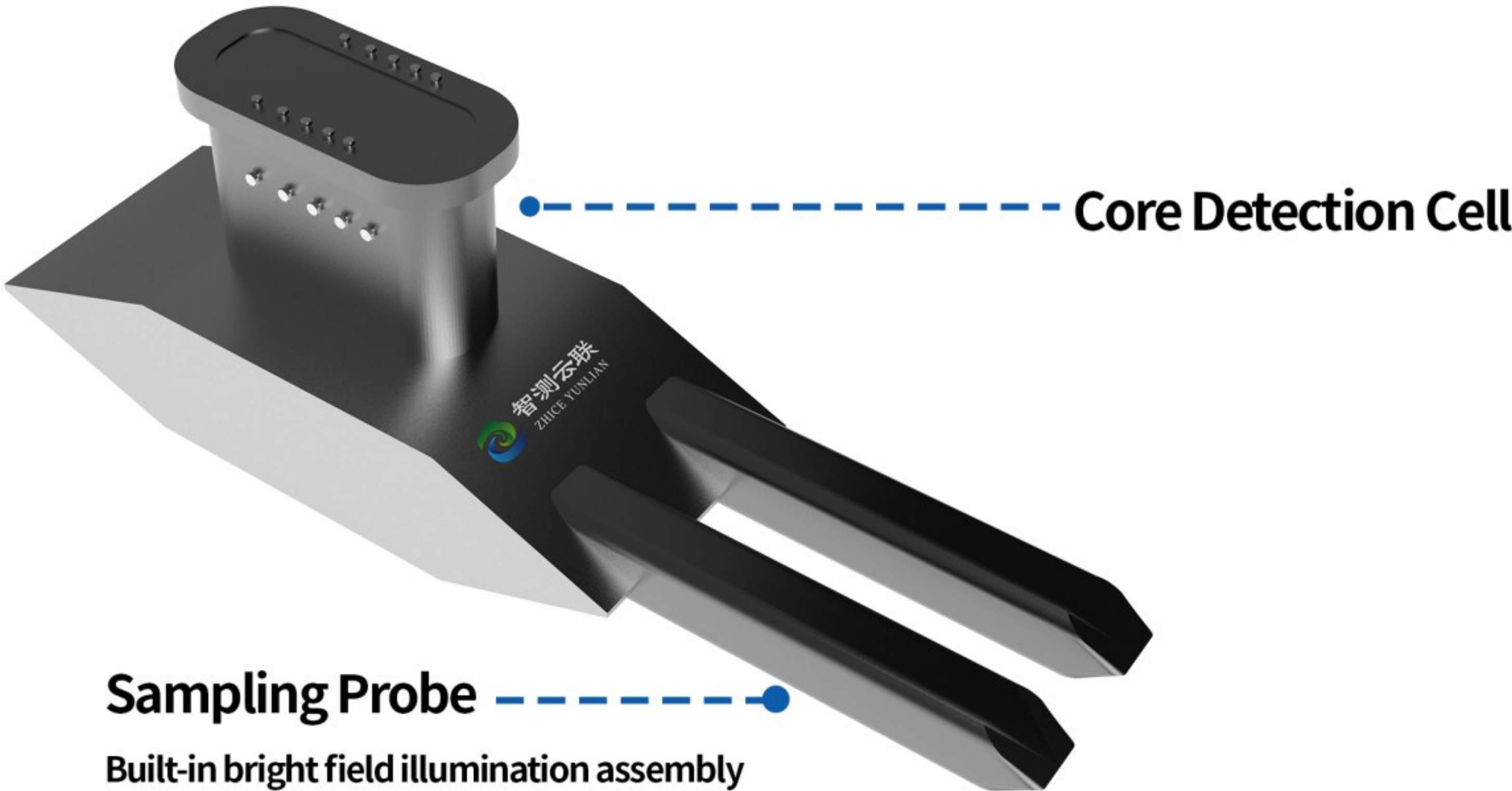
Precautions

1. Before operation, inspect bright field illumination, CMOS image sensor and Ethernet connection to ensure no obstruction and good contact.
2. Regularly clean the sampling zone and lens to avoid stains impairing imaging precision; calibrate the microscopic magnification and imaging system per specifications.
3. Maintain stable airborne operating environment to prevent internal component damage caused by severe vibration.
4. Cut off power supply promptly after use, wipe the equipment surface clean, and store in a dry and ventilated area to avoid circuit and sensor performance degradation caused by humidity, so as to guarantee accurate and reliable data transmission & analysis.



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Structure



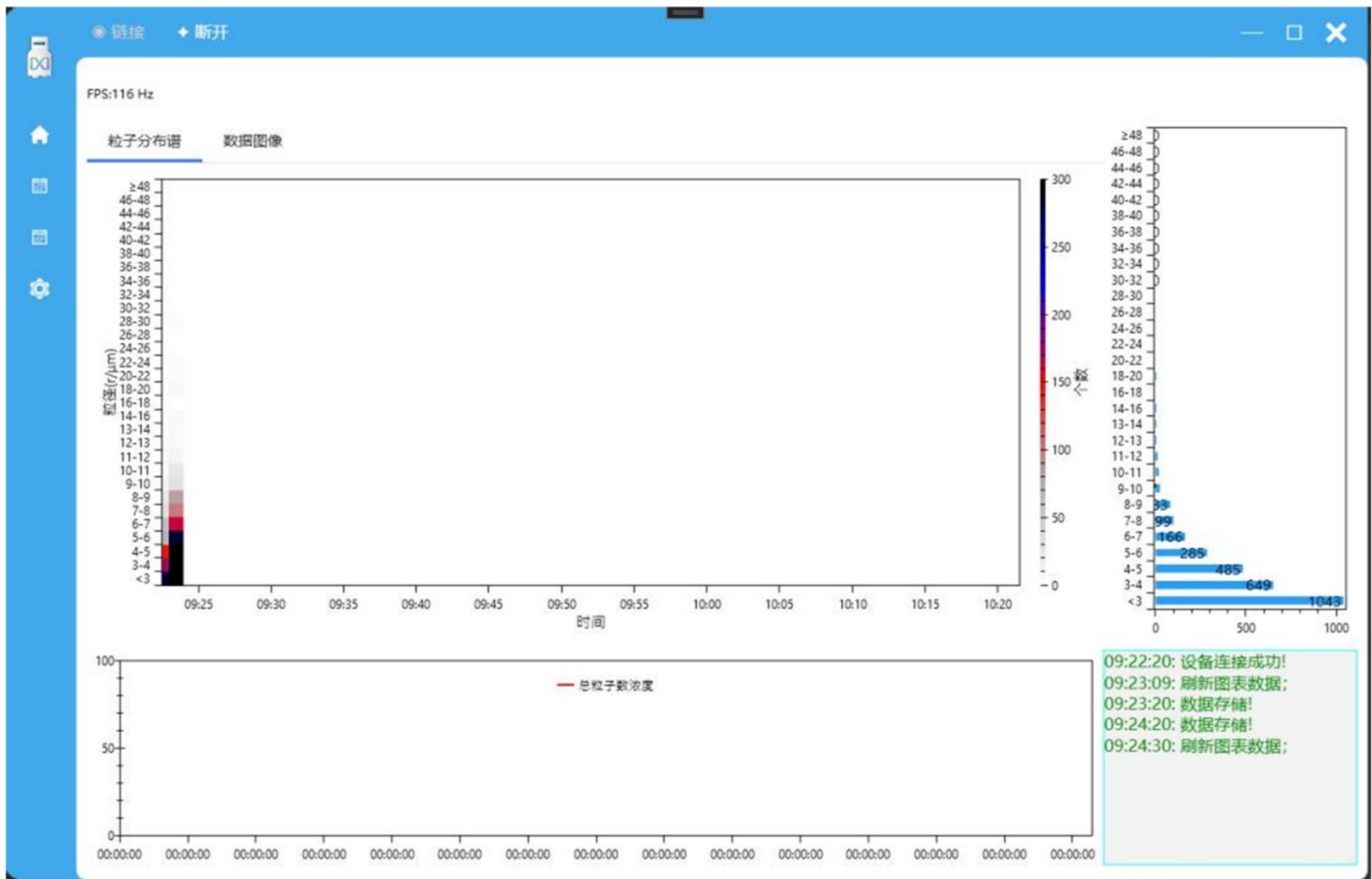
Built-in bright field illumination assembly and sampling zone with streamlined protective housing design. It captures cloud and fog droplets, provides clear samples for imaging, and avoids measurement interference from splashing particles.

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Specifications & Parameters

Category	Parameter Item	Specification Description
Physical Specs	Overall Dimension (L×W×H)	(320±10) mm × (150±10) mm × (170±10) mm
	Weight	≤ 2kg
Measurement Performance	CMOS Pixel Size	4μm
	CMOS Resolution	1280 × 1064
	Imaging View Area	≥ 2mm × 1.6mm
	Particle Measuring Range	5~300μm
	Particle Size Resolution	≤ 2μm
	Temperature Measuring Range	-40~50℃
	Temperature Accuracy	±0.3℃
	Temperature Resolution	0.1℃
	Humidity Measuring Range	0~100%RH
	Humidity Accuracy	±4%RH
	Humidity Resolution	1%RH
	Barometric Pressure Range	500~1100hPa
	Pressure Accuracy	±0.5hPa
Electrical Performance	Power Supply	DC 12V
	Communication Interface	RJ45
	Power Consumption	≤ 10W @12V
Environmental Adaptability	Protection Grade	IP56—— IP67 customizable
	Operating Environment	Temp: -40~50℃; Humidity: 0~100%RH
	Storage Environment	Temp: -50~60℃; Humidity: 0~100%RH

Software Interface



Monitoring Software Interface

Left area: Magnified imaging of cloud & fog droplets for clear particle morphology viewing.

Middle core data: Real-time display of total particle count, particle diameter and spectral classification data, synchronized with auxiliary parameters including temperature, humidity and air pressure.

Right operation bar: Supports preview of preprocessed images, data export and equipment calibration.

The bottom section switches between real-time monitoring and historical data modes.

The intuitive operation layout enables rapid observation and analysis of cloud droplet related data.

