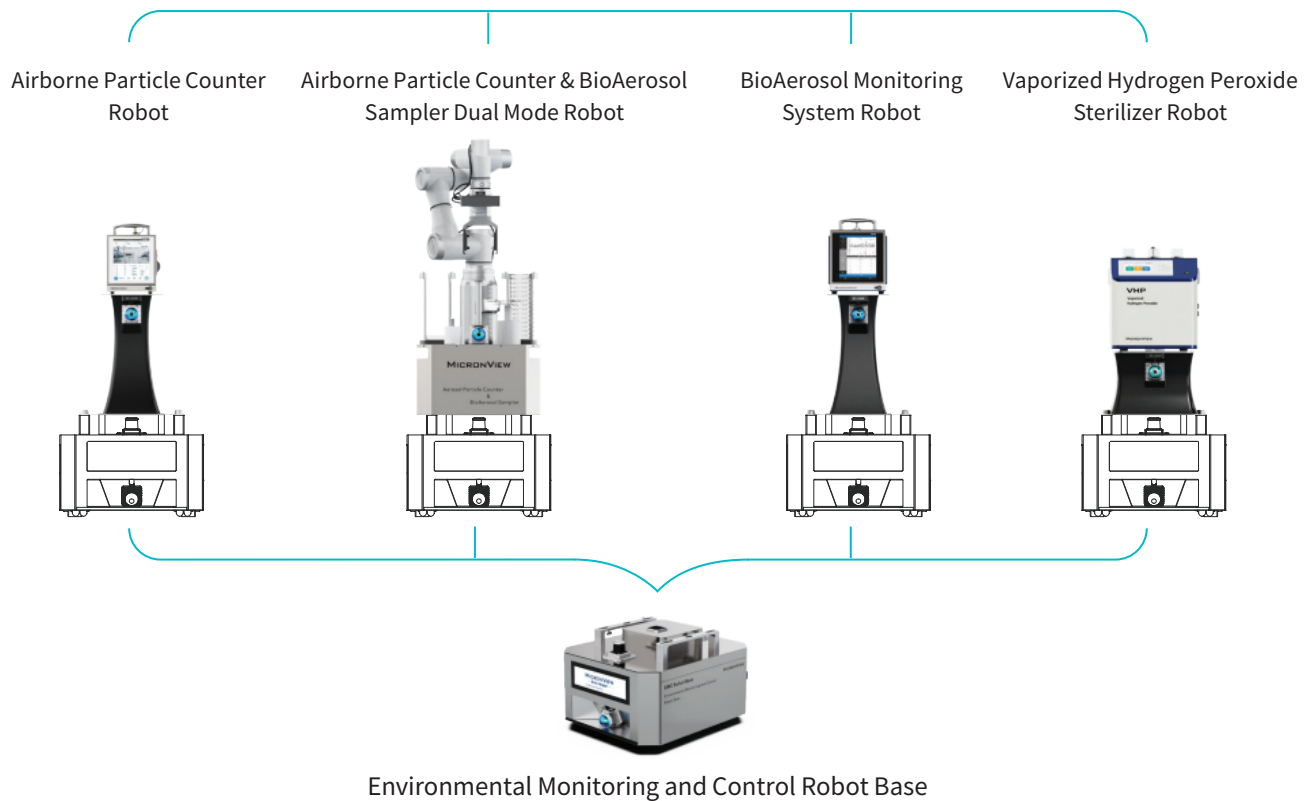# Environmental Monitoring and Control Robots

The EMC Robot series delivers cutting-edge solutions for intelligent cleanroom particle and airborne microbial detection, monitoring, and environmental disinfection, aligning with modern trends in unmanned robotics and multi-task collaboration. It addresses challenges in sterile production, such as complex sampling tasks and numerous locations, by utilizing robotic automatic sampling to maintain sterility and enhance efficiency. The embedded operating system ensures data integrity through compliance with international standards, incorporating robust controls for access, electronic signatures, and data management. This system significantly improves pharmaceutical production quality, optimizes personnel use, and supports digital transformation initiatives.

| Airborne Particle Counter Robot | Airborne Particle Counter & BioAerosol Sampler Dual Mode Robot | BioAerosol Monitoring System Robot | Vaporized Hydrogen Peroxide Sterilizer Robot |

Environmental Monitoring and Control Robot Base

- The EMC Robot Base serves as the core, allowing different functional monitoring units to be easily swapped out, creating a fully functional robot with just one base.
- The minimalist design ensures adaptability, enabling functional unit changes within ten minutes.
- Features obstacle avoidance with SLAM algorithms and laser radar for precise navigation, including automatic sampling, disinfection, door operation, and elevator use.
- Supports remote control and data management, reducing manual operations and contamination risks in critical areas.
- Returns to home base for charging when the battery is low.

Note: SLAM (Simultaneous Localization and Mapping) allows for localization and map construction in unknown environments.
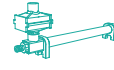
A Comprehensive Management System Creates an Optimal Monitoring

Environmental Monitoring and Control Robot Management System

Real-time Monitoring
Real-time monitoring of execution status, data, and alert information

Zone Management
Used for establishing zone maps, sampling locations, charging station positions, etc.

Scheme Management
Used for creating, editing, and deleting sampling schemes

Task Planning
Used for creating, configuring, managing, and monitoring automated sampling tasks

Data Statistical Analysis
Used for data viewing, statistical analysis, and exporting

Device Management
Registers and displays all EMC robot base and functional modules that have been connected to the system
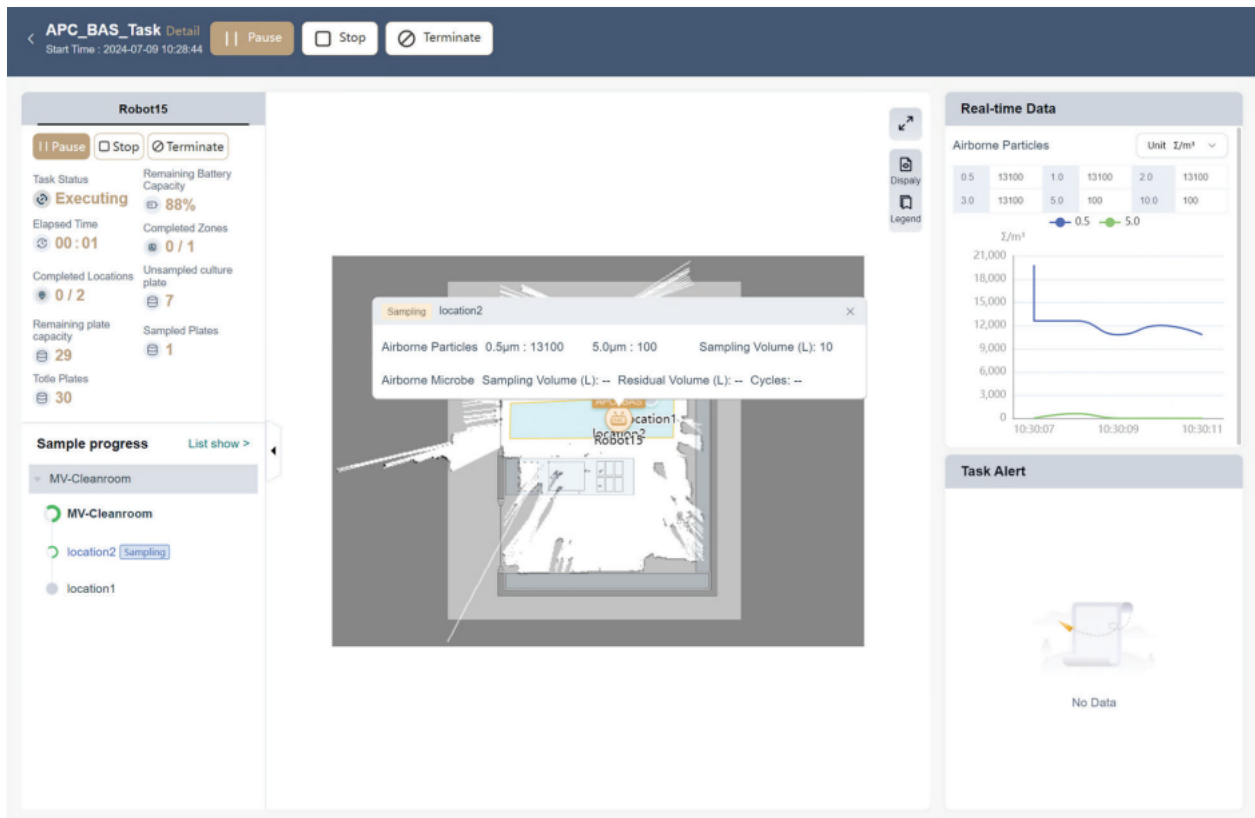
Audit Trail
Record all operational logs of personnel to form an audit trail.

Setting
Include account and permission management, etc.
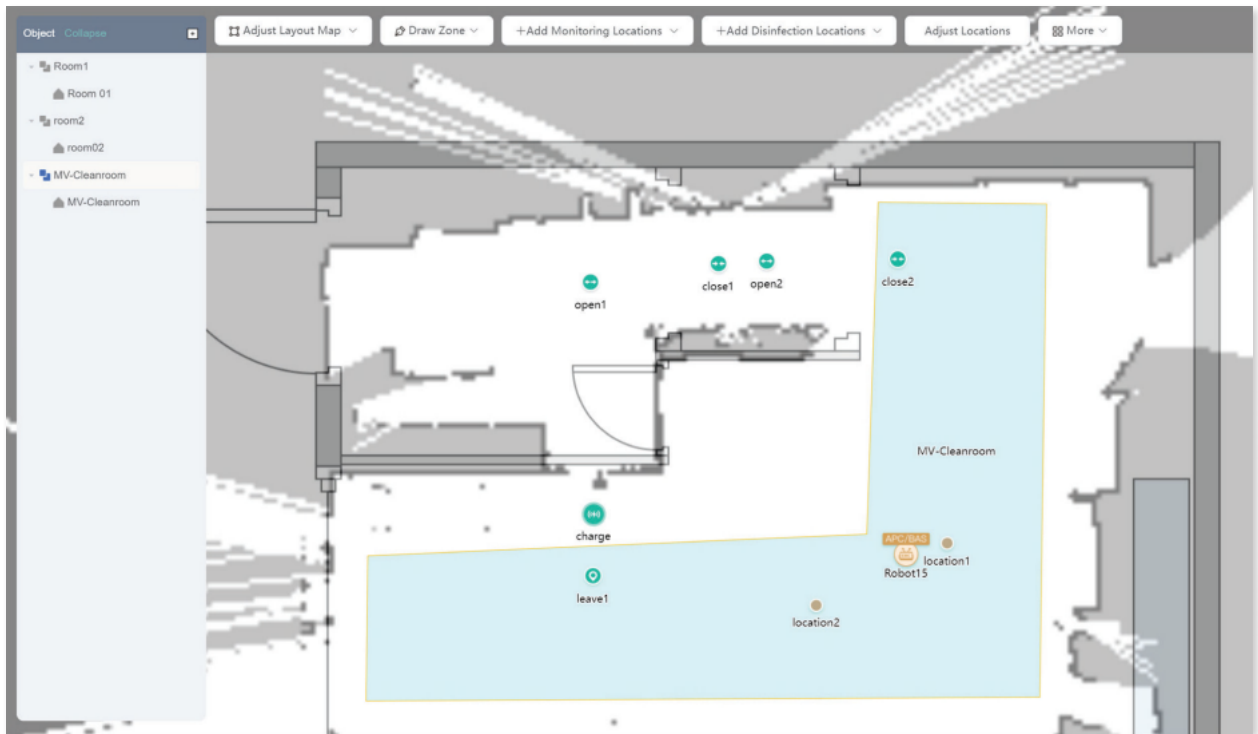
Real-time Monitoring Interface

Used for the viewing of progress status, data, and alarm information in real time.

Zone Management Interface

Used for establishing zone maps, sampling locations, charging station positions, etc.

Scheme Management Interface

Used for creating, editing, and deleting sampling schemes.

Task Management Interface

Used for creating, configuring, managing, and monitoring automated sampling tasks.

‹ APC_BAS_Task				Delete	Edit
Catalog Number	task-20240705-14	Monitoring Items	Airborne Particles/Air Sample	Task Type	Daily EM
Task Name	APC_BAS_Task	Task Execution Timing	During production	Personnel Quantity	0/Maximum Challenge Quantity
Flat dish specifications	5e9f4479-0ee4-cf31-4d5f-7c456304c9d7mm	Perforated Lid Specification	280 holes φ 0.6 mm	Task Frequency	Manual Start
Approver	sysadmin	Executor	sysadmin	Airborne Particles/Air Sample Executive Device	Robot15
Start Time	· · ·	Working State	● Pending	Dispatch Status	● Successfully issued

Multitask conflict solution

Abandon this task directly

The order of location execution

The robot intelligently plans the shortest path ⓘ Only to select the execution locations, the robot will automatically plan the execution order according to the shortest distance principle

Location unreachable solution

① Nearby sampling, distance **5 cm**
   ⓘ If the attempts number is set to be **0** , no more sampling will be taken.

If failed

② Wait **00:05:00** , re-try sampling,re-try **0 times**
   ⓘ If the attempts number is set to be **0**, go directly to the next point

If failed

③ Go to next location **Current zone** after sampling completed in, return to the location and try again **0 times** interval · ·
   ⓘ If the attempts number is set to be **0**, it is deemed that no re-harvesting attempt is made

If failed

④ Abandon the location

Data Statistical Analysis Interface

Used for data viewing, statistical analysis, and exporting.

Device Management Interface

Registers and displays all EMC robot base and functional modules that have been connected to the system.
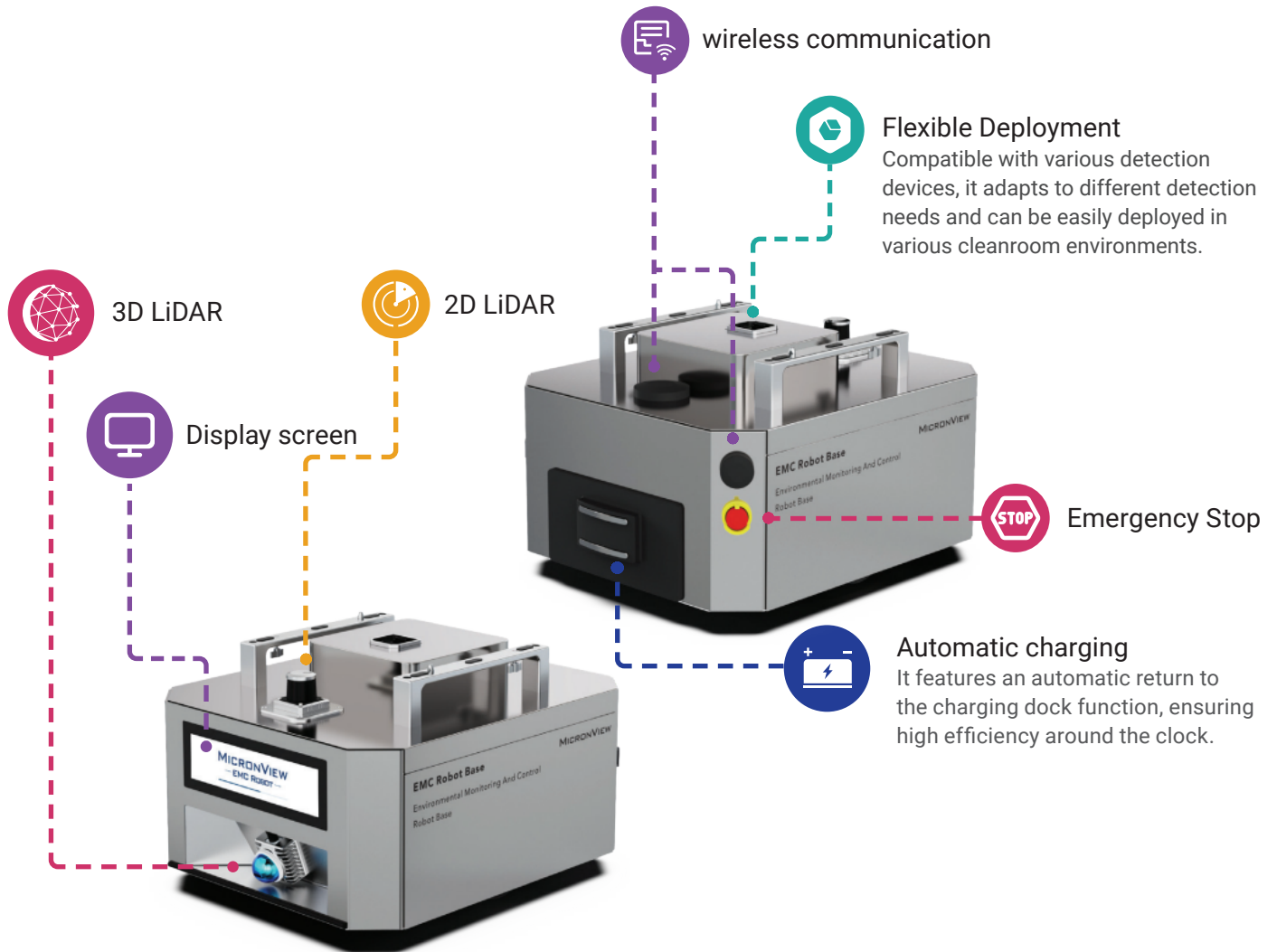
Robot15 Detail

Delete Edit ✕

Robot Basic Information

Serial NO.	S1100015	Name	Robot15
Model	S1100	Working Status	● Standby
State	● Online	Remaining Battery Capacity	87 %
Equipped function Units	A2100001;C510B0000	IP	192.168.3.2
Manufacturers	MicronView	Release Date	- - -
Warranty Period	2024-07-09	Maintenance Status	● Maintenance expired
System Version	1.0.11		- - -

Function Unit

Serial NO.	A2100001	Name	8A2100001
Model	A210	Working Status	● Standby
State	● Online	Correlation Robot Base	S1100015
Manufacturers	micronview	Release Date	2022-02-15
Activation Date	- - -	Calibration Date	2022-10-25
Warranty Period	- - -	Maintenance Status	● Maintenance expired
System Version	3.0.2		- - -

Environmental Monitoring and Control Robot Base | EMC Robot Base

wireless communication

Flexible Deployment
Compatible with various detection devices, it adapts to different detection needs and can be easily deployed in various cleanroom environments.

3D LiDAR

2D LiDAR

Display screen

Emergency Stop

Automatic charging
It features an automatic return to the charging dock function, ensuring high efficiency around the clock.

✓ **Precision Positioning**

SLAM technology achieves high-precision positioning with a navigation error of less than ±5mm, ensuring accurate detection every time.

✓ **Autonomous Navigation**

Equipped with intelligent planning and obstacle avoidance functions, it operates independently without the need for external positioning devices.

✓ **Data and Connectivity**

Multiple Network Connections:
Supports IoT SIM cards, WAN connections, and an internal wireless network module, ensuring normal operation even without external networks.

Flexible Data Storage:
Supports both local and cloud storage, ensuring data security, with multiple report export formats available.

✓ **Performance and Efficiency**

Scheduled Tasks:
Supports scheduled task functionality, allowing preset detection times and routes, and automatically executing tasks according to the plan.

Long Battery Life:
With a single charge, it can operate continuously for up to 18 hours (the continuous working time varies depending on the modules installed).
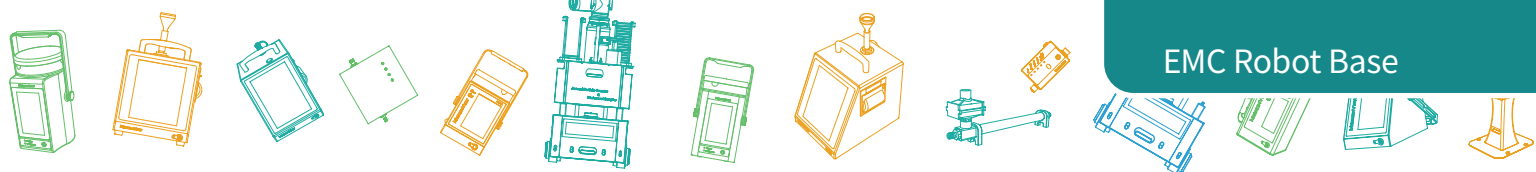
Specification Sheet

Specification		Environmental Monitoring and Control Robot Base	EMC Robot Base
Dimensions & Weight	Dimensions （H×W×D)	343×473×526 mm / 13.50×18.62×20.71 in
	Net Weight	40 kg (Incl. battery weight 14 kg)
	Maximum Load Capacity	40 kg
Material	Chassis	316L stainless steel
	Wheel	Polyurethane
Battery Performance	Battery Capacity	960 Wh (24V)
	Working Power	50 W (continuously working for about 18 hours on a full charge)
	Charging Time	5 h
	Battery Life	≥1,000 times
Cleaning		Sealed chassis, resists corrosivity of disinfectant wiping
Maximum Map Area		500 m x 500m
Ground Resolution		2 cm x 2 cm
Vehicle Performance	Cruising Speed	up to 0.7 m/s
	Passable Width	800 mm
Warranty		24 months (calculated from the date of product activation or six months after the date of manufacture, whichever comes first).

Airborne Particle Counter & BioAerosol Sampler Dual Mode Robot | APC&BAS Dual Mode Robot

Capabilities & Features

- Safe and Efficient - Automated active air sampling
- Easy Deployment - Scheduled environmental monitoring
- Integrated Mechanical Arm - High accuracy, reliable, low risk
- Convenient Monitoring - Flexible adaptation to various scenarios

Note: The EMC Robot in the diagram is equipped with a particle counter and an airborne microbial sampling functional module.

Product Introduction

The APC/BAS Dual Mode Robot enables automated sampling in cleanrooms with a mobile active air sampler and a high-precision 6-axis robotic arm that can autonomously place and remove agar plates. Using SLAM algorithms and LiDAR, the robot navigates accurately, avoiding obstacles, traversing designated areas, operating doors and elevators, and returning to base for charging. This automation reduces human error and environmental impact. The MicronView control software, compatible with tablets, smartphones, and PCs, allows easy configuration, task scheduling, and control of the robot for efficient active air sampling in controlled environments.

Product Application

The unit's automated navigation and sampling minimize contamination risks by reducing human presence in critical areas, ensuring accurate sampling locations and timing. It optimizes resource allocation by automating routine tasks, allowing personnel to focus on more critical functions. Additionally, the APC&BAS Dual Mode Robot can be equipped with a temperature and humidity sensor to monitor and store environmental data, enhancing its versatility and multifunctionality.
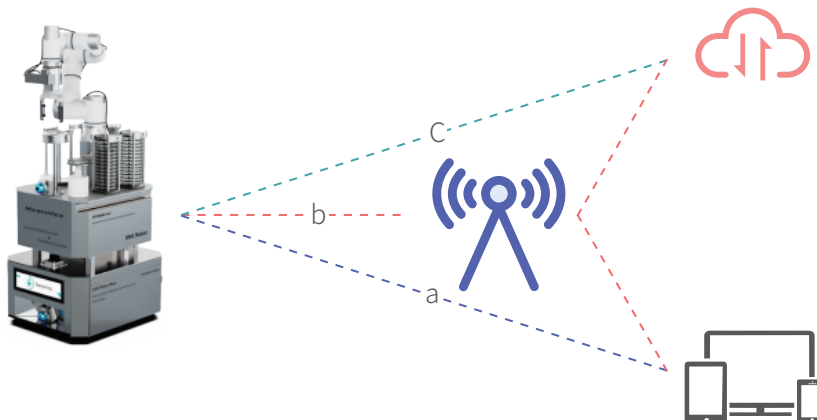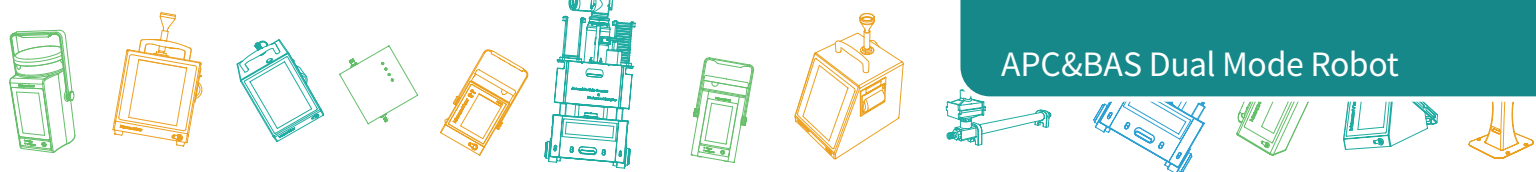
High-Precision 6-Axis Mechanical Arm

- IP54 protection class, designed to be sprayed, disinfected and sterilized directly
- Meets ISO 15066 and ISO 13849
- High accuracy: repeatability of ±0.02mm
- 6-axis articulated arm enables complex movements in a small working radius

Working radius: Φ626 mm

Sampling height: 820mm
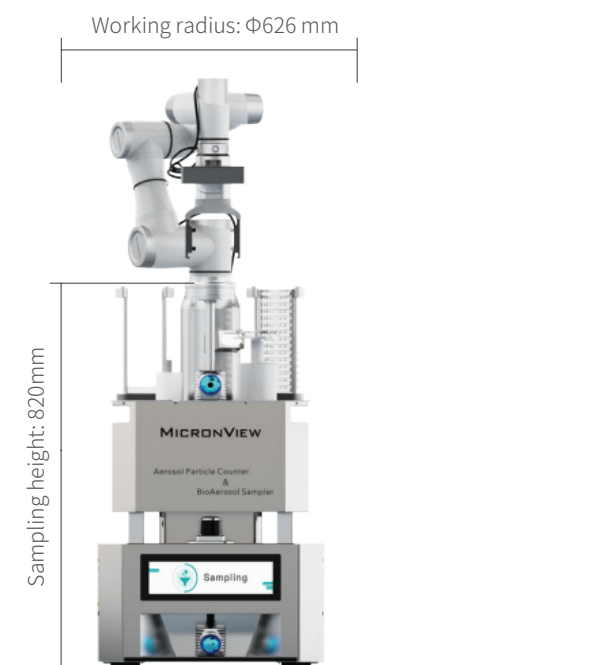
Specification Sheet

Specification	BioAerosol Sampling Module	Airborne Particle Counting Module
Flow Rate	100 LPM±2.5%	100 LPM±5%
Module Power Consumption	17 W (Max)	40 W
Sampling Volumes (L)	Freely configurable	Freely configurable

Ordering Information

Name	Model	Order No.
Environmental Monitoring and Control Robot Base	EMC Robot Base	S110	MACHS110
Airborne Particle Counter & BioAerosol Sampler Dual Mode Robot	APC&BAS Dual Mode Robot	SAC510B	MACHSAC510B