Smart Restaurant Robot - Mars

Smart, efficient, collaborative, innovative robot

- Large HD screen; delivery, promotion and hospitality all-in-one
- Independent suspension, stable movement
- 4 large smart trays, independent and high efficiency
- 3D obstacle avoidance, no blind area, ultimate passibility
- 5 delivery modes, suit your scenario
- IOT smart connection, remote calling, dynamic table locator

Applicable scenes Restaurant Hotel Conference Factory Office Building

New Upgraded Technology, New Smart Delivery Experience

3D Obstacle Avoidance

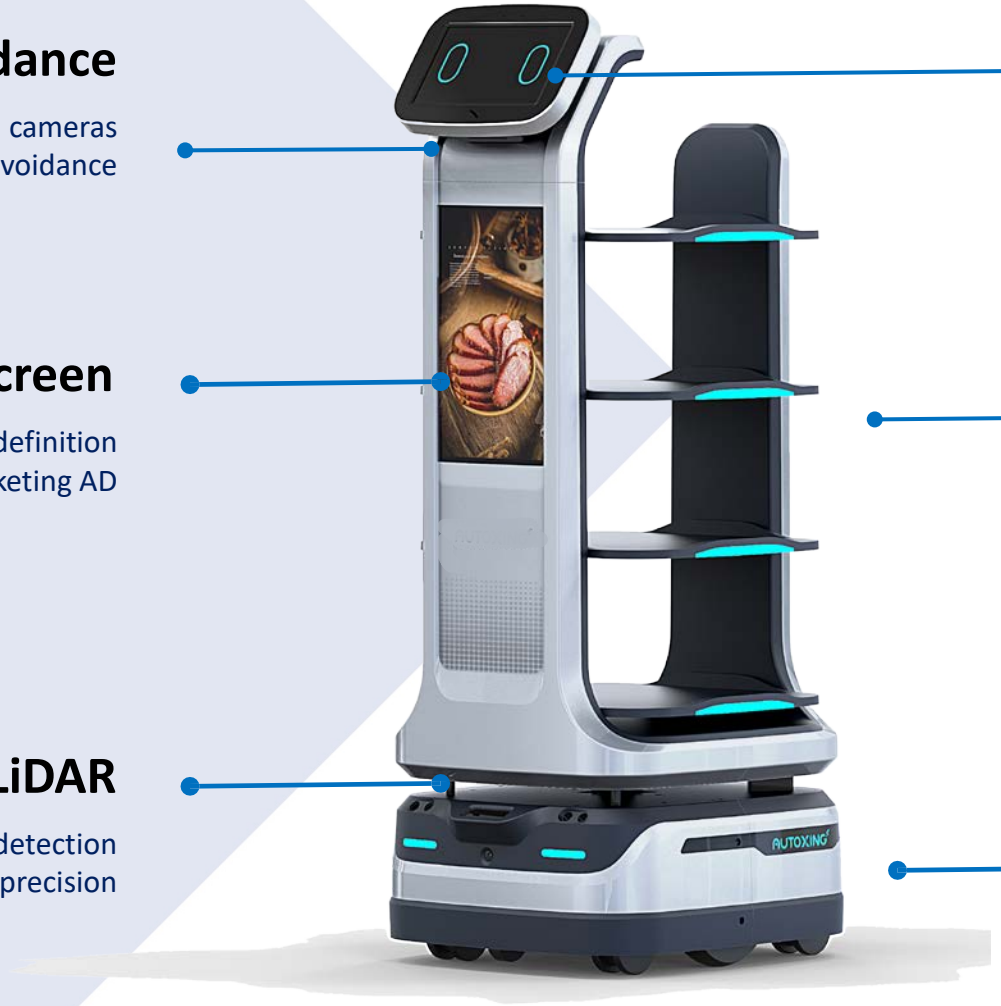
Up and down RGBD cameras
No blind spot, 360° flexible obstacle avoidance

Large HD Screen

Large size, max resolution, ultra high definition
Display your marketing AD

Powerful LiDAR

360° detection
Ultra far range, ultra high precision



Smart IoT System

Automatic take lift, pass through auto gate and auto door
Robot calling system
Smart table locator system

Smart Tray

Smart payload sensor, improve delivery efficiency
AI light belt reminder
Flexible and adjustable trays

Independent Suspension

Car-grade independent suspension of chassis
Flexible adjustment, effective damping

*Smart tray, smart lighting indication, smart IoT systems are optional units

Multi-Functional Large Screen, Eye-Catching Marketing

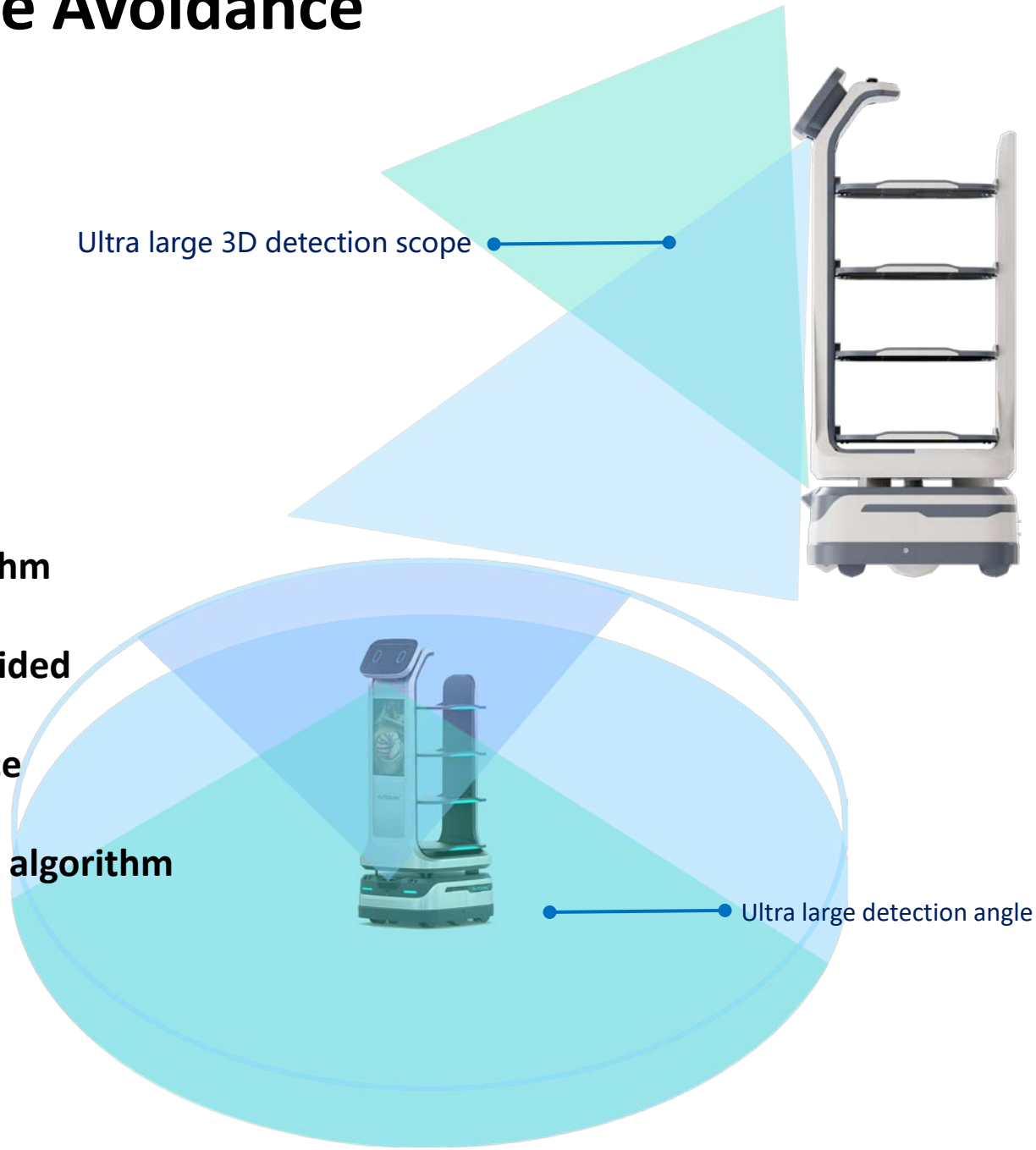
Ultra-Large HD Screen
Smart Specialist Marketing

- 15.6 inch
- HD dpi 1920*1080
- Picture/video/GIF/Music, various format support
- Fixed-time/festival/birthday, flexible time setting
- Robot/phone/PC end resource management

Industry Leading 3D Smart Obstacle Avoidance

3D Perception
Precise and Safe Movement

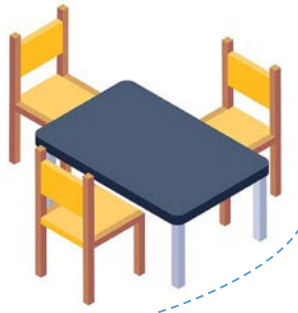
- 2 excellent 3D perception RGBD cameras
- 180° large detection angle, no blind spot
- AX-Chaos multi-sensor fusion obstacle avoidance algorithm
- Suspension/low/irregular shape obstacles can all be avoided
- Support foot detection, chair leg detection and avoidance
- Self-developed AX-Memory obstacle avoidance memory algorithm



Flexible and Swift Passing Capability

Swift Reaction in Crowded Place

- Strong passing capability in narrow path
- H-shape body is both flexible and stable
- Easy to pass through complex environment and crowded place



Smart Tray, Higher Automatic Efficiency

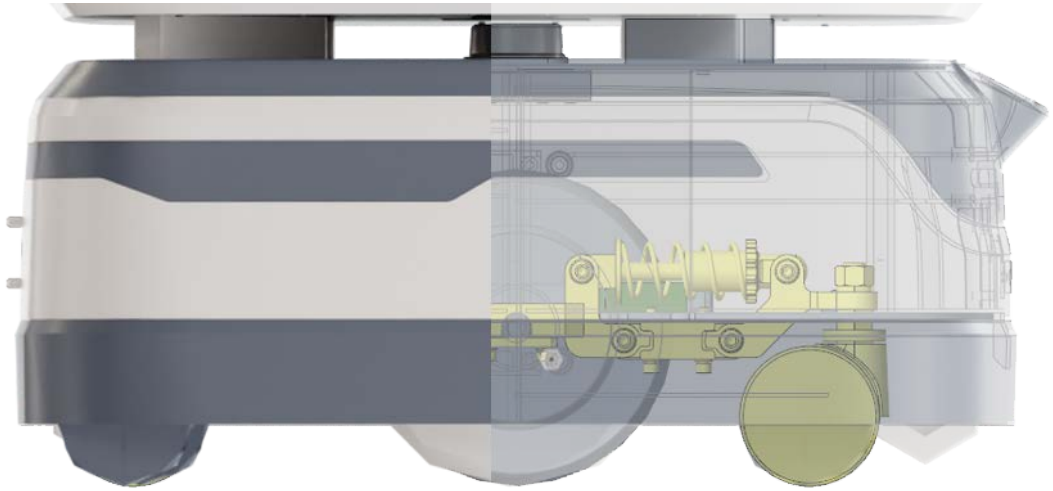
Automatic and Efficient Delivery Pickup Perception System

- Infrared sensor tray (optional)
- Modular detachable structure
- Smart light belt, multiple lighting indication modes

Adjustable Independent Suspension, Smooth Delivery

Precise Speed Control
Fast and Steady Movement

- Car-grade suspension
- Adjustable damper based on payload
- Smart damping, stable speed control
- Thick carpet, wooden floor, marble splicing, up and down slopes can be passed
- Precise speed control, smooth start and brake
- Fast, stable, multi-mode switch based on scenes



Carpet

Cement

Floor

Marble

Self-Developed Powerful Positioning Perception Algorithm

Stable and Never Lose Positioning Compatible with All Scenes

- No need for QR code marker
- More stable self-developed SLAM solution
- Senseless incremental mapping
- Dynamic perception of environmental changes
- Multi-sensor fusion algorithm



Never lose positioning in all situations:
violent interference/pushing/moving/shaking/change location/slippery road…


Support extreme environments:
bright light/foggy/open large area/outdoor…

Smart IoT System Connects to Smart Restaurant

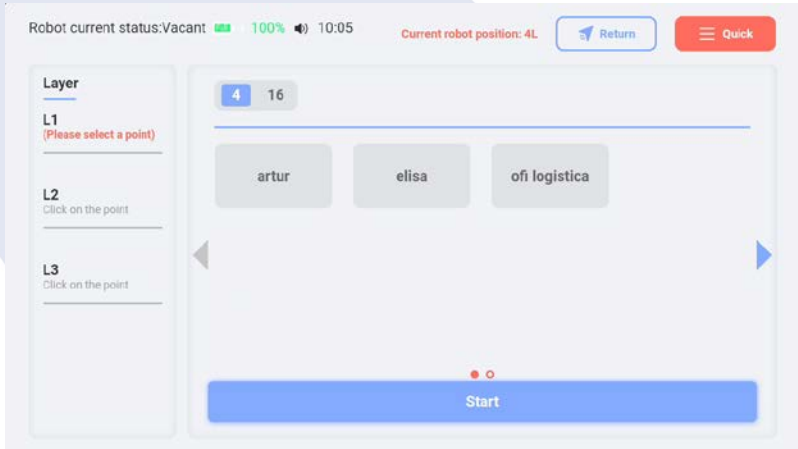
Remote Call Smart Locator
Cross-Area Delivery

- Plate collection, remote calling
- Wireless waiter calling system (optional)
- Smart table tracker and calling system (optional)
- Cross-floor and cross-area delivery

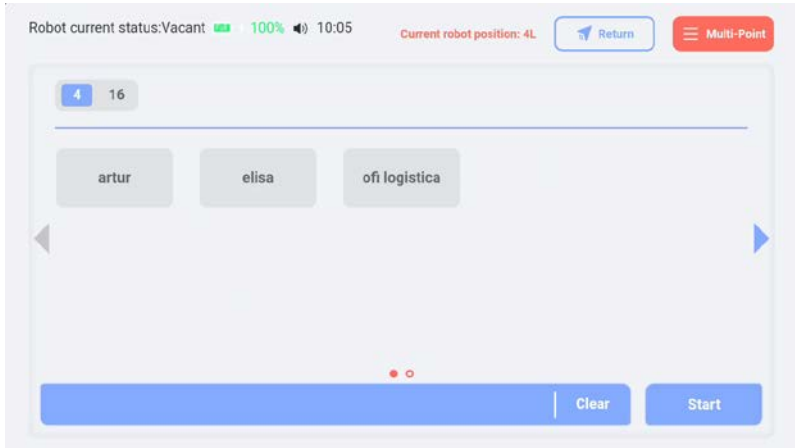
Remate Calling

Table Tracker

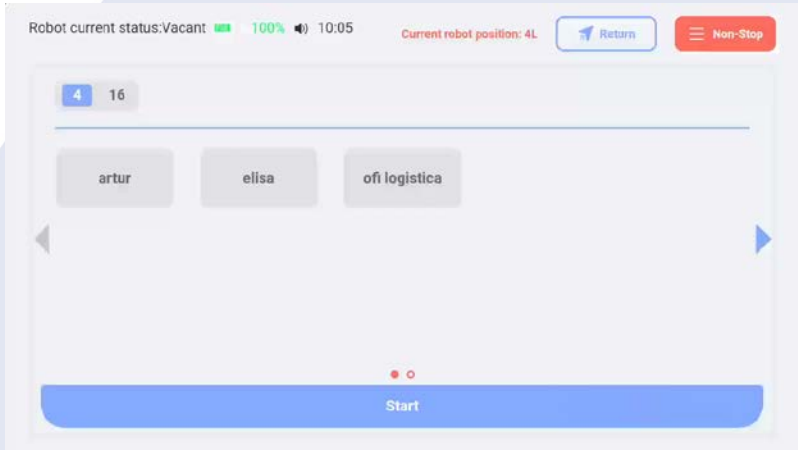
Multiple Delivery Modes



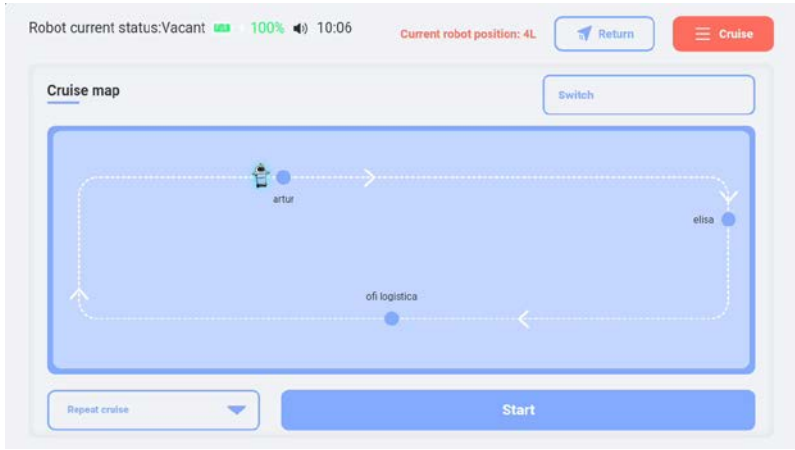
Deliver based on tray layers



Multi-destination delivery



Go to destination directly



Cruise route

Various Interaction Modes

Various Operation Modes
Simple and Convenient

- **PAD/phone and more interaction modes, user friendly operation**
- **AI voice assistant, support scene-based dialogue**
- **10+ light indications**
- **Facial expression design, perceptual robotics service**
- **Smart tray, smart reminder and automatic process**

Smooth AI Voice Interaction Experience

Smart Voice Recognition Technology

- Big data emotion speech synthesis technology
- Supports user-defined scene-based dialogue
- More convenient and interesting interaction

AI Speech Chip

- Smart speech synthesis technology
- 99%+ wake up rate
- 5m far-field speech recognition rate
- 96%+ NLP accuracy

Mic Array

- All-round sound reception
- 360° near and far field full coverage
- 100 million times wake-up practices

Large Volume and Payload

4 trays
Ultra Large Volume and Payload

- 4 trays design, more tasks handled simultaneously
- Detachable trays, free combination of spaces, larger transport capacity
- Multi-point delivery and more powerful functions

1 layer load: 10KG

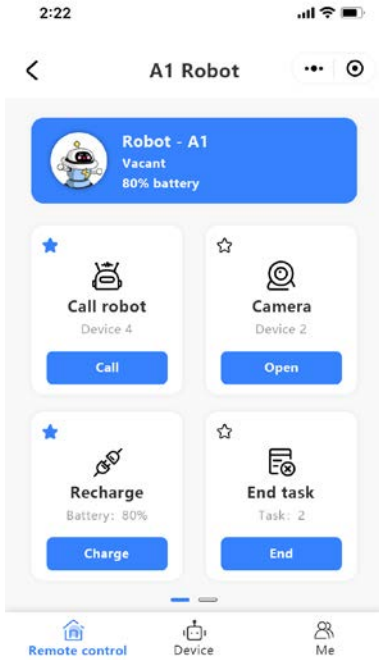
1 layer volume: 12L

Full Solution: Hardware + APP + Platform + Monitoring

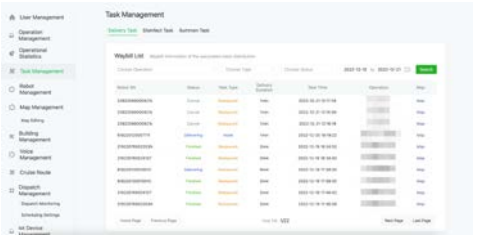
Terminal+Management Platform+Cloud Full Integration Solution

- Operable on robot, phone, PAD, PC, etc.
- Real-time remote monitoring and dispatch
- Big data analysis, standard management, trackable work process
- Remote task dispatch, unattended working, contactless delivery
- Open API/SDK, access to business systems

Robot



Phone

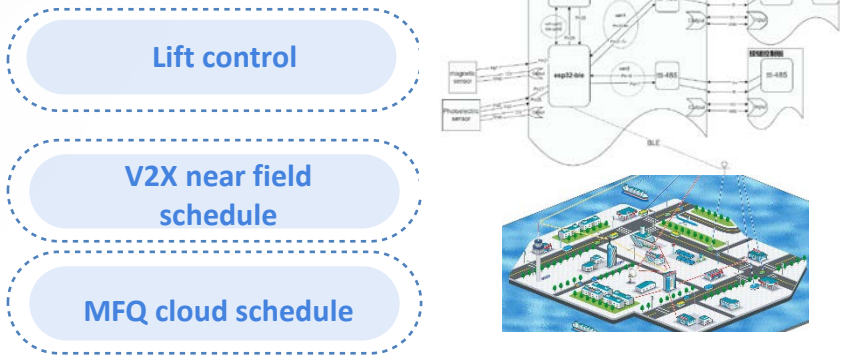


Cloud

Cloud Smart Multi-Robot and Multi-Task Dispatch

Scheduling and Queuing:
V2X Near Field Dispatch + cloud MFQ Dispatch

- Fleet driving and queueing up for task execution
- Flexible multi-task allocation
- Multi types of robot in hybrid tasks
- Schedule IoT movement: lift taking, auto gate, auto door, etc.

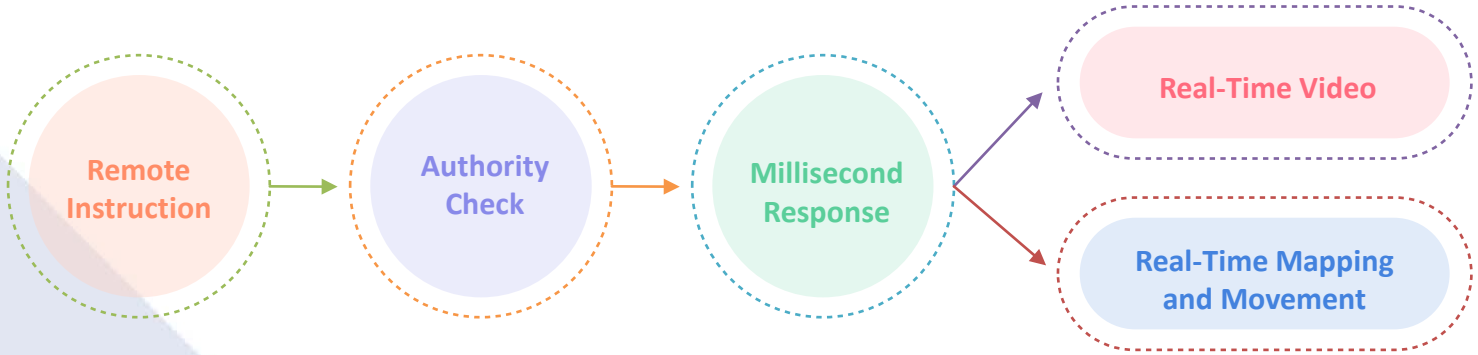


The 1st in the Industry: Remote Rapid Mapping Deployment

Whole process remote deployed

No on-site standby, no contact

Ready-to-use in 10 min

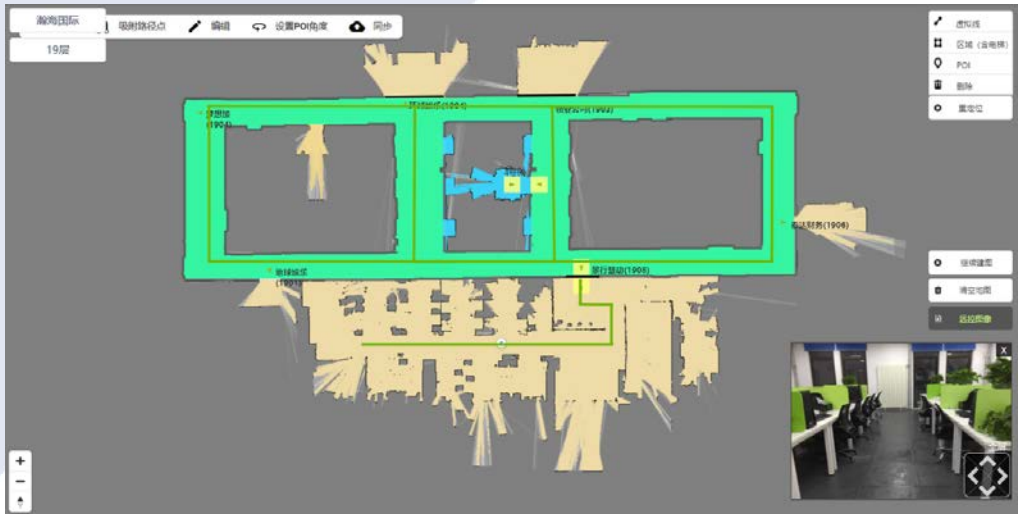


Remote VR map building

PAD, mobile phone, PC

Lidar+RGBD + IMU Dual-mode map building

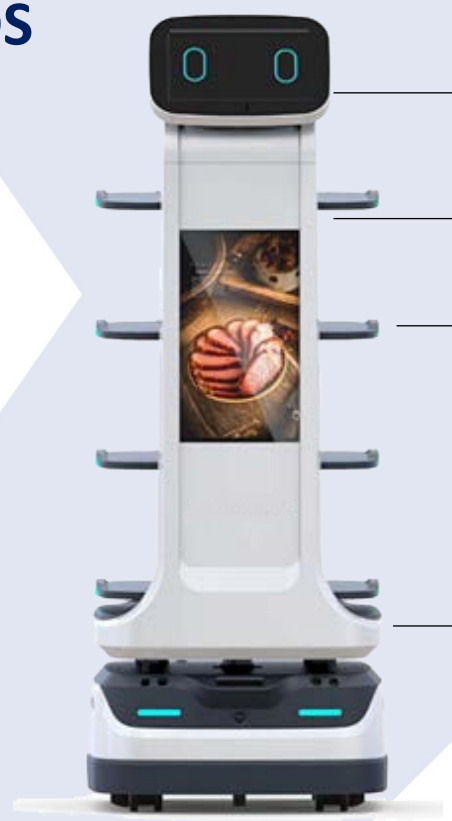
Simple operation



Cross-Platform Building Block Secondary Development Quickly Build Customer Application

Auto Driving OS API+SDK

- Cross-platform and cross-language
- Remote control
- Cloud-based, private
- Data visualization
- Virtual robot



Software customization interface

- Partner customization: UI, business
- API+SDK
- Autonomous driving algorithm engine

Hardware structure
Modular building blocks

- Combination of sensors
- Classification of suspension structures
- Electronic interface module
- Appearance and box structure

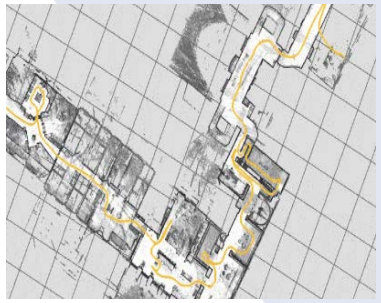
- Easy to access
- Cross platform
- Rich interface (API/SDK)
- Bottom control layer
- Business logic
- Strong extension capability

Specs

Items	Specs
Robot size	58*49*129 (cm)
Tray size	43*40 (cm)
Max payload	40Kg
Velocity	0.3~1.2m/s
Min passing space	65cm
Slope	≤ 10°
Obstacle	20mm
Gap	65mm
Position precision	cm
Network	4G/wifi
Battery	15Ah
Screen size and dpi	Operational screen: 10.1 inch, 1280*720 Display screen: 15.6 inch, 1920*1080
Operation time	Continuous working > 10h
Charging hours	3h

Tech Innovations with Autopilot Driving as the Core

Initiated unmanned automatic deployment

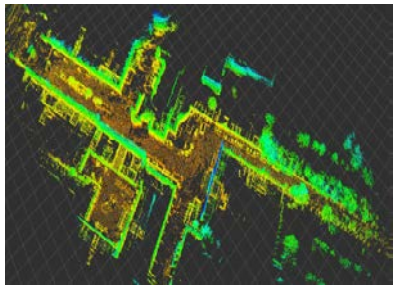


Break the bottleneck of on-site deployment

- Minute-level mapping
- Cm-level HD 3Dmap
- Small data
- Unlimited area
- Remote and unmanned
- No need for markers

Exclusive **Autopilot Fast Mapping** Technology

Disruptive multi-sensor fusion positioning technology



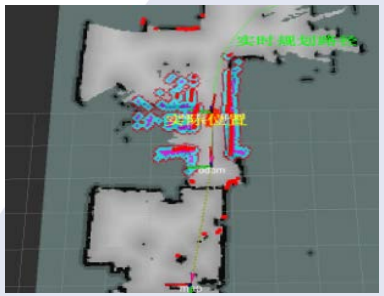
Location reliability **99%**

- Environment fingerprint location
- 100% automatic correction
- Perfectly handle skidding, violent pushing, and environmental change

Self-R&D **Cartographer Enhanced Sensor Fusion** Algorithm

AX-Cloud AI Platform

Cross indoor and outdoor complex environment operation



- Multi-level dynamic path
- Identification of low obstacles
- Millisecond sensitive obstacle avoidance
- Memory motor control

Car-grade L4 autonomous driving
perception, decision-making, control engine

AX-KIT Unmanned Terminal

AX-Engine Auto Driving Engine

- AIOT
- Full life cycle OTA

Cloud Intelligent robot brain

Big data platform

AI SaaS platform

Global scheduling

Phone

Elevator

Gate

Door

Daily monitoring

maintenance information

Fault message

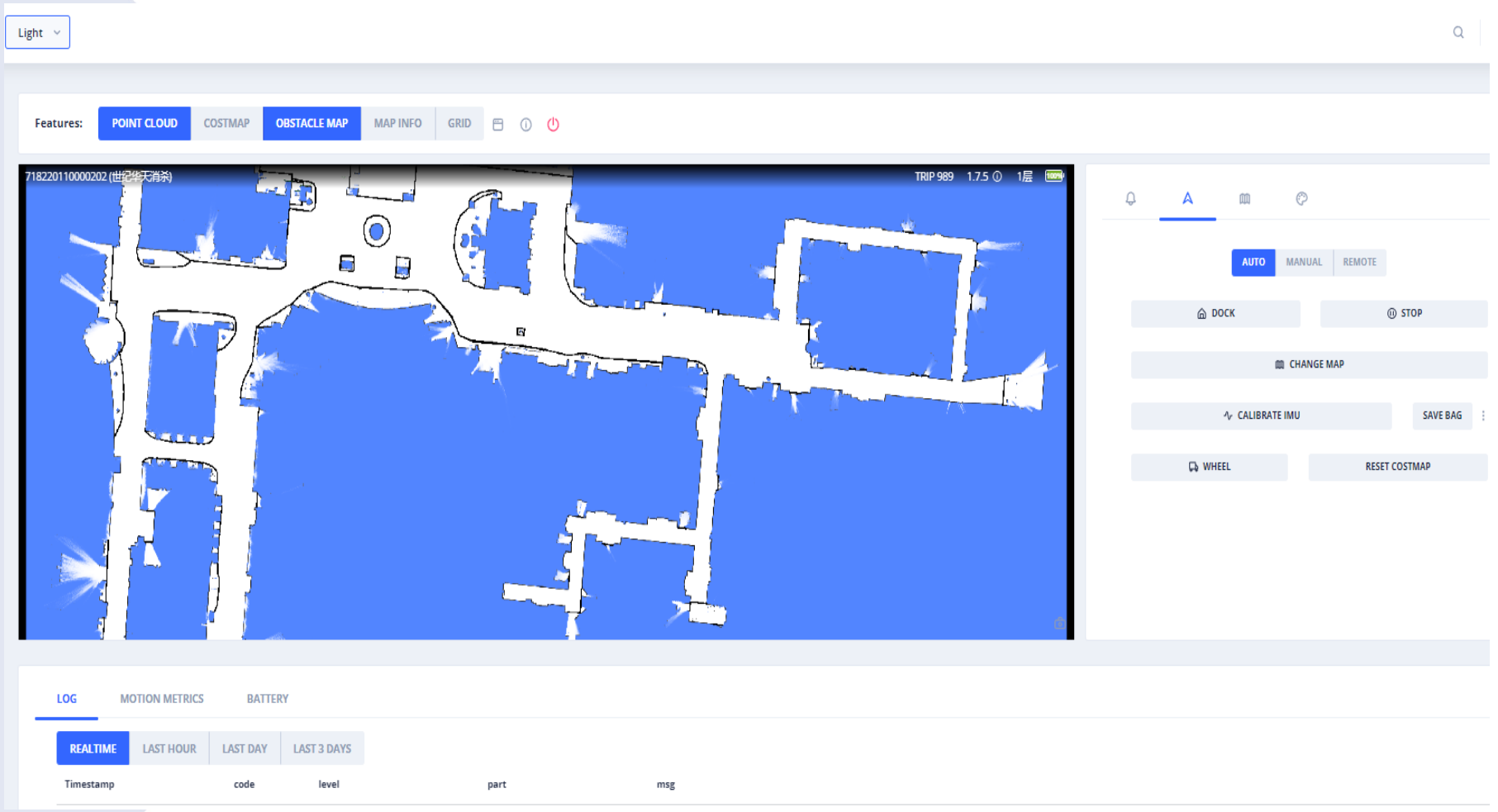
OTA

Smart remote control, global scheduling, full life cycle OTA, AIOT

Robot Remote Monitoring Platform

Remote monitoring control

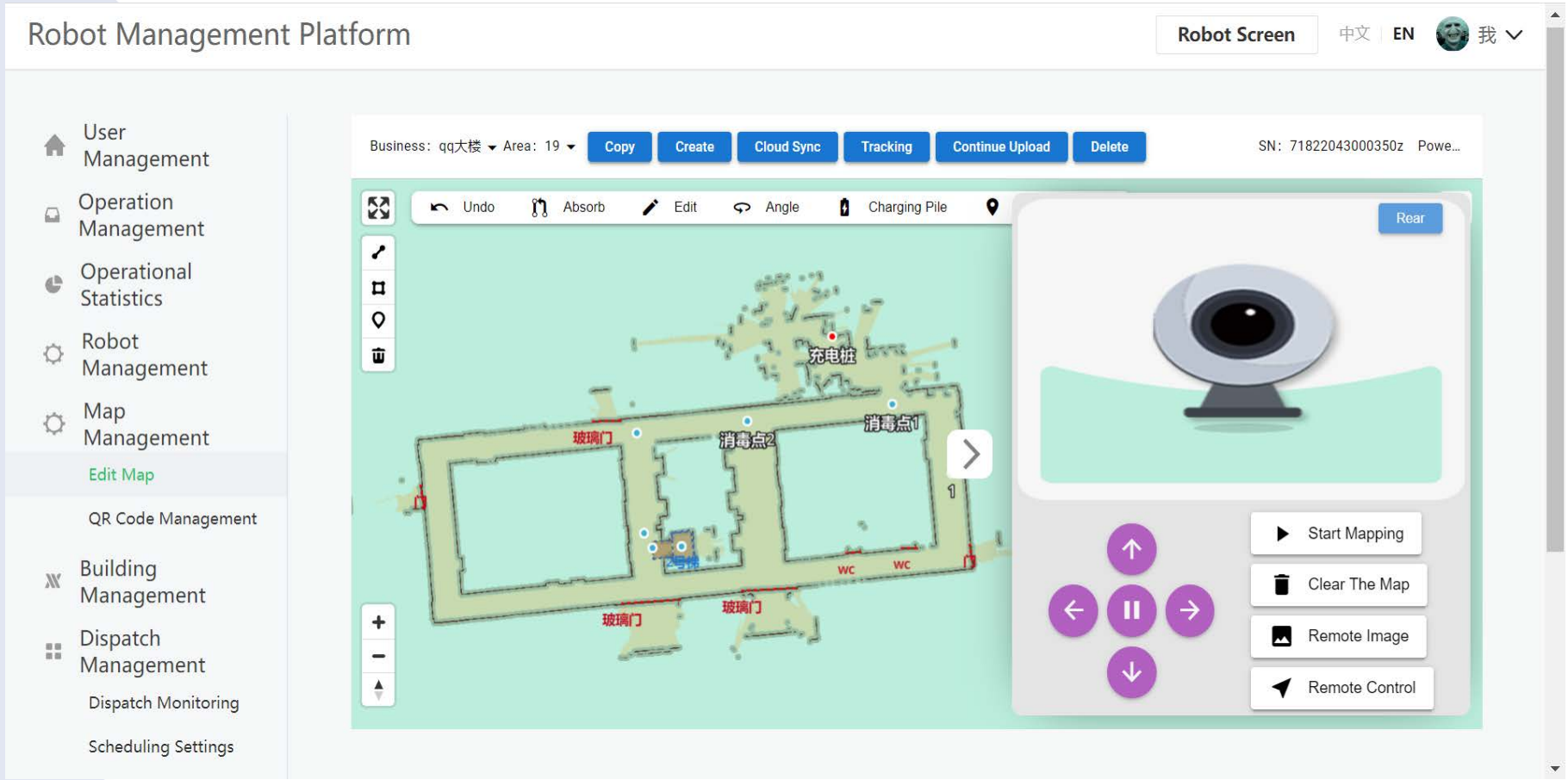
The monitoring platform monitors various real-time status of the robot and report faults, such as faults in positioning, current, voltage, speed, acceleration, angular velocity, point cloud data, IMU, abnormal warning, etc.
Remote robot control, robot status management and other operations can be achieved.



Remote Map Building Platform

Remote Map Building

It supports quick map building on mobile phone/computer and can connect the robot remotely across regions, display the robot surrounding environment in real time through the camera, and assist to build navigation map remotely, which saves time and enhances efficiency.

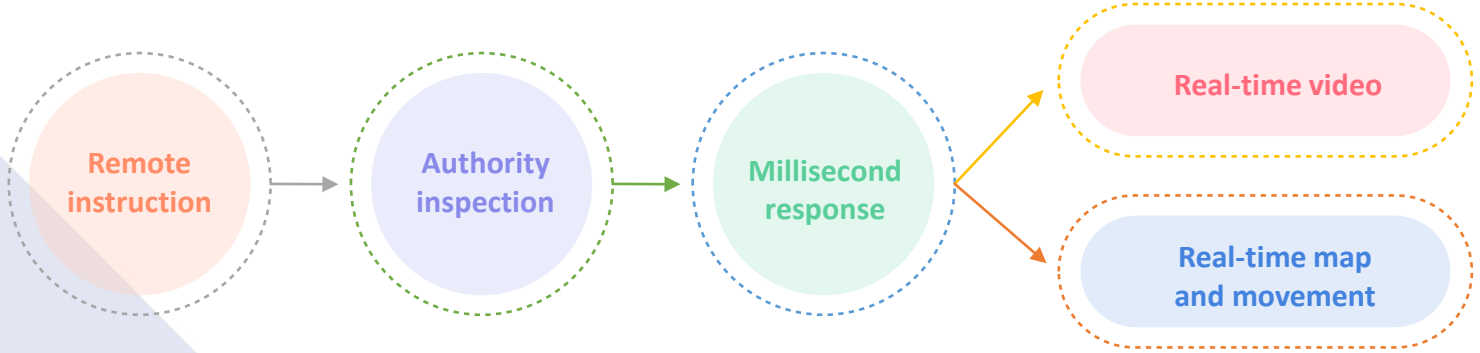


Robot Remote Dispatch Platform

Virtual field scheduling

Maintain cross-space & cross-time support

Sense of user control and sense of games

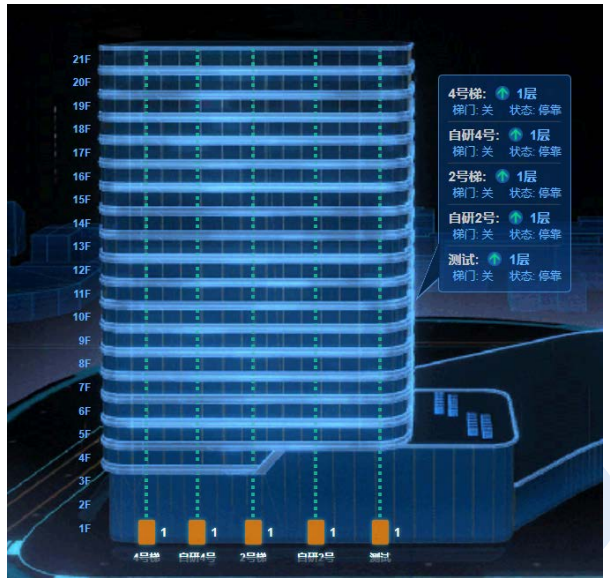


Robot Data Visualization

Data platform

Robot state visualization

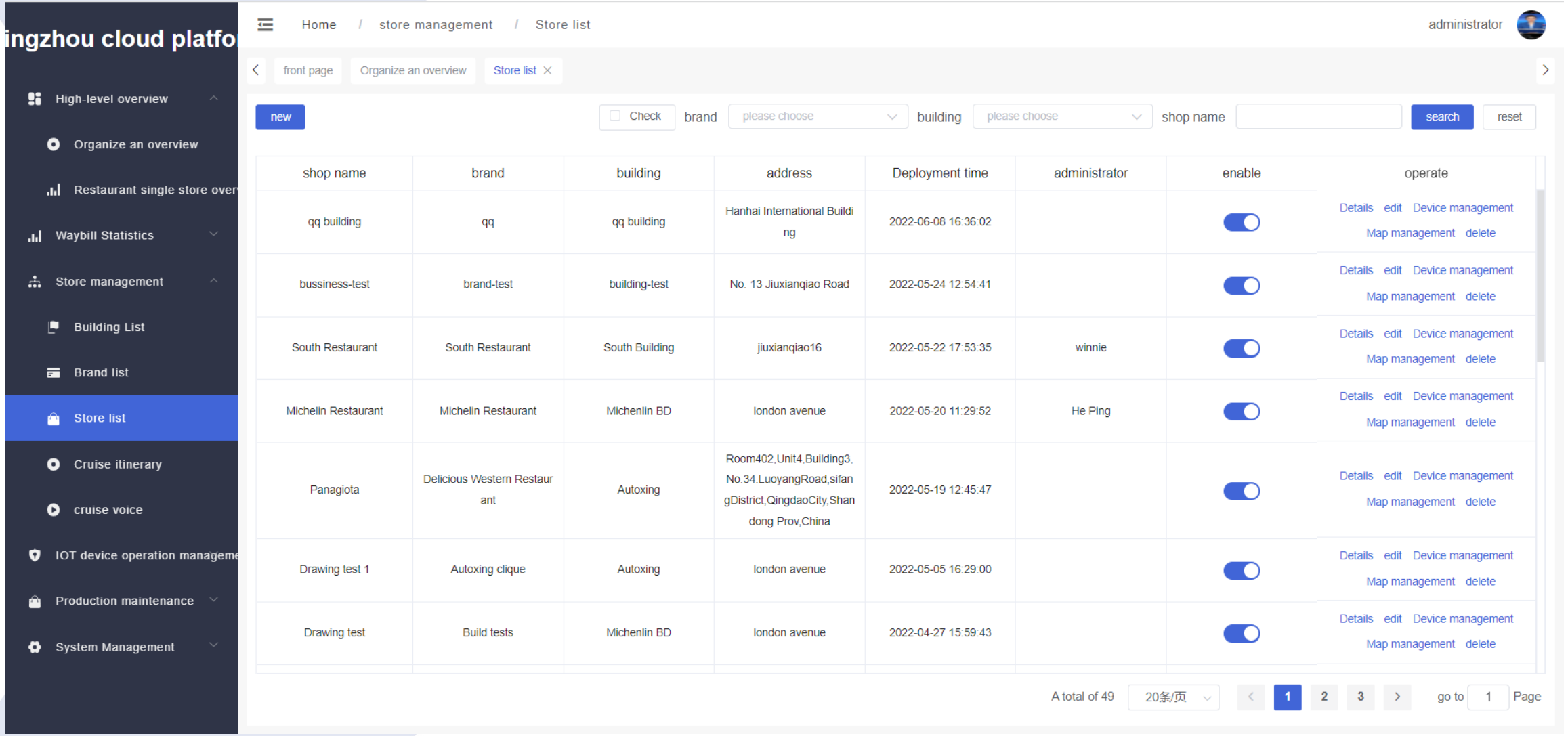
Task visualization



IOT device (elevator, gate) Operational visualization

Single area data

Robot Operation Management Platform



Authorization management
(building, places, device management)

Robot Big Data Cloud Computing Management Scheme

Client side

- APP
- Applet
- Big data display
- Web management
- Smart terminal

SaaS

- Robot status
- Disinfection task statistics
- Delivery task statistics
- Task data recording
- Big data analysis

PaaS

- Robot monitoring platform
- Operation management platform
- Business management platform

Intellectual base

- Customer integration platform
- IoT device platform
- Data platform
- AI platform
- External application

Robot side


Delivery robot


Disinfection robot


Patrol robot


Other robot

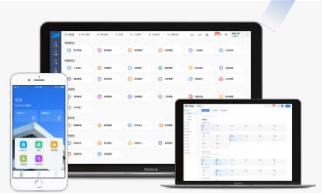

Operational monitoring screen


Cloud scheduling system

Intelligent Platform

Fully connected system

Fully integrated data


SaaS


Scenario-based business system