AGIBOT

Security Patrol and Inspection Solution



AGIBOT Innovation (Shanghai) Technology Co., Ltd.

Create Unlimited Productivity via Intelligent Machines

Security Patrol and Inspection Solution Covers 2 Primary Scenarios and Can Be Applied Across Multiple Environments

Security Patrol Scenarios



Police Security

Security inspections, temporary control measures, mobile outreach, major event security, and support for community-level security management

Area Patrol

Daily patrols and security maintenance across factories, industrial parks, hospitals, schools, and airports



Intelligent Inspection Scenarios

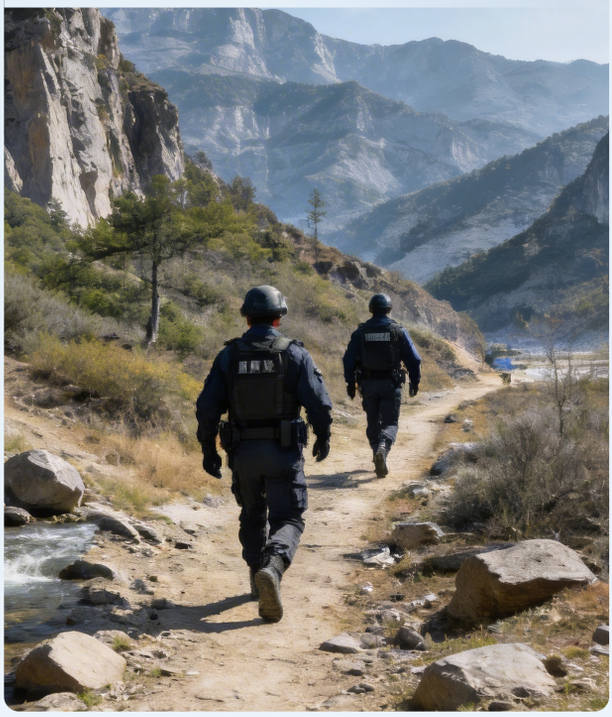


Intelligent Inspection Scenarios

Energy and power, data centers, industrial production, and agricultural operations

Challenges in Modern Police Security Scenarios

Complex environments: obstacle-rich terrain and low-light conditions



High Population Density: Dynamic crowds increase management complexity



Device limitations: communication latency and incomplete surveillance coverage



1

Safety Risks to Police Officers

Complex and high-risk environments across various response scenarios pose significant safety risks to officers

2

Limited law enforcement resources

High patrol frequency, high labor costs, and increased officer fatigue

3

Limitations of Traditional Manual Patrols

Reliance on visual inspection makes it difficult to detect hidden hazards. Most manual patrol records are stored in paper form or fragmented video footage, lacking structured data to support analysis and decision-making. In addition, complex environments create blind spots

4

Insufficient Emergency Response Efficiency

Challenges in concurrent multi-tasking, cross-department coordination barriers, and lack of real-time evidence for remote command

Challenges in Modern Zone Patrol Scenarios



1

Inconsistent effectiveness of traditional manual patrols

Manual patrols are highly subjective and prone to missed or reduced patrols due to sudden incidents, distractions, or fatigue especially at night

2

Delayed response Time

In emergency situations, it is difficult for personnel to promptly issue instructions and reach the response site

3

Insufficient end-point coverage of the patrol network

Lack of mobile early warning and public awareness; in remote alleys, blind spots, and industrial parks, safety alerts and information reach remain weak

4

Insufficient Digitalization of Scenarios

There is an urgent need for intelligent solutions to support remote decision-making and information recording in dynamic scenarios

Solution Overview

The quadruped robot, serving as a mobile platform, is equipped with an intelligent recognition PTZ camera, an intelligent loudspeaker, and a multi-sensor fusion positioning module. It enables 24/7, three-dimensional patrol in complex terrains thanks to its **Intelligent Following** and **Autonomous Navigation** modes supported by these modules. This quadruped robot system integrates capabilities such as facial recognition, abnormal behavior analysis, and real-time positioning and tracking. It also links with the big data platform of the public security command center, forming a closed-loop system for police security patrol.

Solution Architecture



Platform Functions

Quadruped Robot Fleet Management

Fleet management includes quadruped robot monitoring, system status information, data visualization, alert notifications, interactive interfaces, video feeds, and other relevant information.



Real-Time Monitoring

Real-time monitoring displays live feeds from 4 visible light cameras and 1 infrared thermal imaging camera. It supports zoom in/out, screenshot capture, video recording, and adjustment of image clarity.

Inspection Configuration

The system supports multiple inspection modes for flexible configuration across various scenarios, including autonomous, fixed-point, and remote-controlled inspection.

Video Playback

The management platform allows users to select a camera, choose a date and time range for playback, download recordings for a specified period, seek to specific timestamps, display the current playback time, play or pause video, and adjust playback speed.

Inspection Task Management

Main features include task templates (create, edit, delete), task execution methods, and task control functions such as start, stop, pause, and viewing execution records. The system supports three task execution modes: one-time execution, scheduled execution, and periodic execution.

Smart Alerts

The system supports custom configuration of various alarm thresholds. Alarm types are categorized into quadruped robot system alerts and operational alerts. Based on the impact level of alert events, severity can be defined as normal, severe, or critical. The system supports audible and visual alerts on both the quadruped robot and the backend management platform.

Smart Monitoring

The system supports functions such as facial recognition, behavior analysis, and vehicle recognition.
The system supports real-time monitoring of environmental data such as temperature, humidity, smoke, and PM2.5 levels.

Product Overview

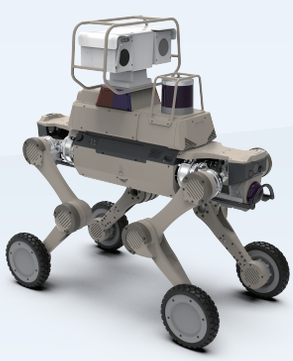
Autonomous patrol | Autonomous obstacle avoidance | Broadcast and intercom | Video surveillance | Image capture

Facial recognition | License plate detection | No-parking zone detection | Abnormal alerts | Patrol report

Two-way audio | Thermal imaging camera | Warning strobe light | 360° LiDAR

D1 Max Patrol Solution

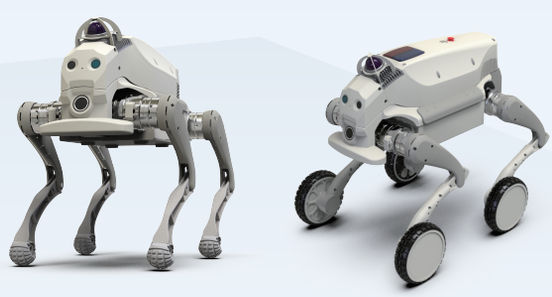
Medium-sized quadruped robot



Battery Life	Range	Ingress Protection (IP) Rating
2.5-3.5h	>20km	IP66

D1 Ultra/Ultra-W Patrol Solution

Small-sized Quadruped Robot



Battery Life	Range	Ingress Protection (IP) Rating
1-1.5h	9km *	IP54

* For the D1 Ultra-W wheeled version

Solution Value

Enhanced Safety

24-hour uninterrupted operation, comprehensively covering high-risk areas

Improved Efficiency

Replace repetitive manual patrols

Data Accumulation

Structured storage of inspection data, enabling post-event traceability and analysis

Application Scenarios



Key organizations

Schools and government agencies



Commercial districts

Commercial complexes and CBDs



Parks and Scenic Areas

Parks and scenic areas and large squares



Transportation Hubs

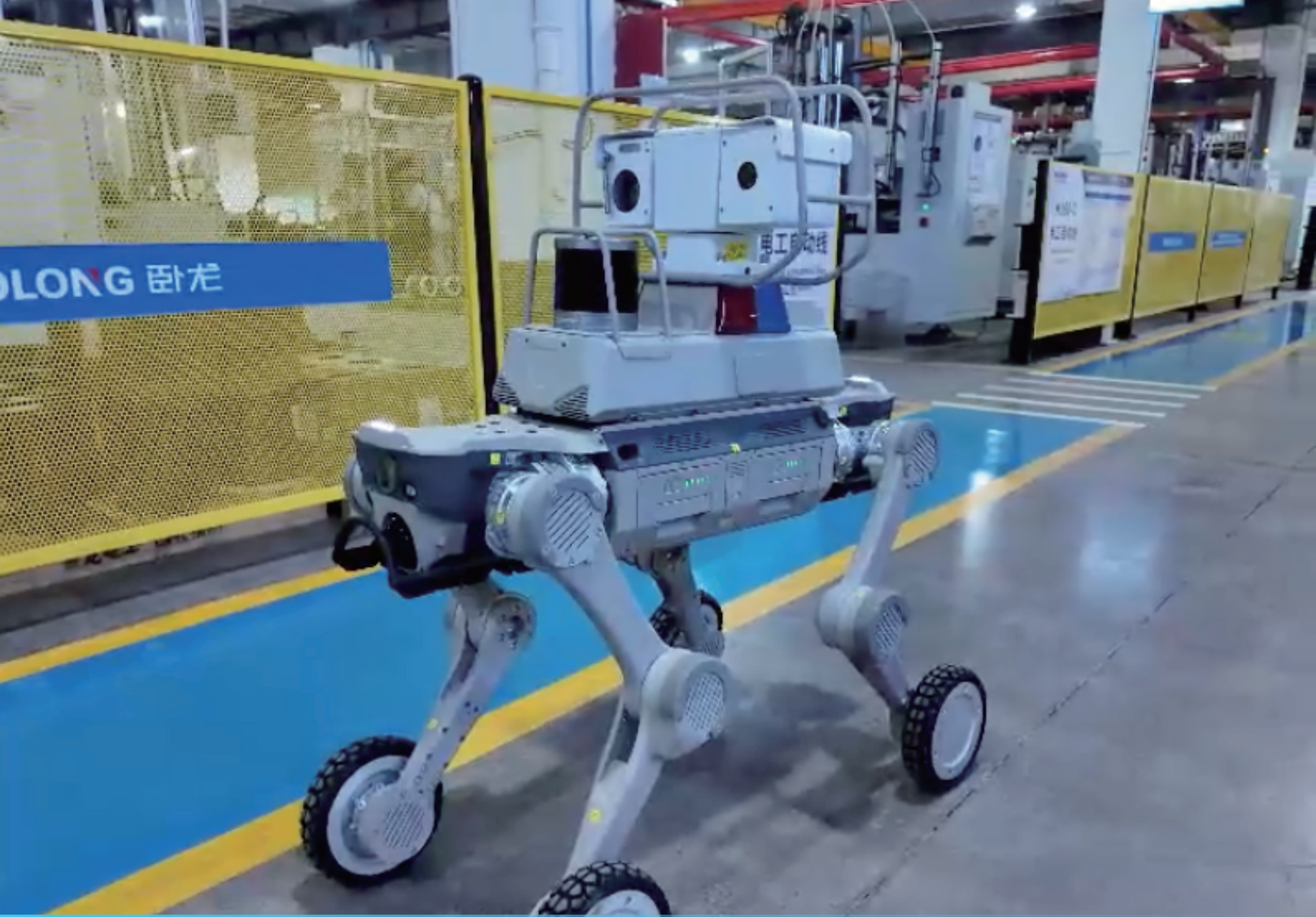
High-speed railway station and bus station



Event Security

International summits and sport events





Case Study

Wolong Group's Factory Patrol

Due to frequent personnel movement, high demand for nighttime patrols, blind spots in traditional manual patrol, manpower shortages, and delayed response times, security efficiency has significantly reduced. To address these challenges, the factory has deployed a quadruped patrol robot equipped with LiDAR, HD night vision camera, a voice module, and an infrared thermal imager, creating an intelligent patrol system. The robot supports autonomous patrol and obstacle avoidance, detection of humans and vehicles, recognition of abnormal behaviors, voice interaction and early warning, as well as customizable patrol routes, enabling it to adapt flexibly to complex factory environments.

The robot supports 24/7 uninterrupted operation, replacing manual patrols. It can climb slopes and traverse obstacles, adapting to complex scenarios. With IP66 water and dust protection and wide temperature range operation, it ensures 100% stable attendance even in harsh weather. With long battery life and autonomous battery swapping, the robots enable continuous operation and improve inspection efficiency by 20%. The robot also features low positioning error, high repeatability, precise anomaly detection, and a low missed detection rate.

The system is now operating stably and has become a core pillar of the factory's intelligent security, setting a benchmark for intelligent factory management.

Challenges in Modern Intelligent Inspection Scenarios

Current Status of Traditional Inspections



Manual inspection



Drone inspection



Wheeled robot inspection



Fixed-camera inspection

Challenges in Traditional Inspection Methods

Manual Inspection Issues

- Low efficiency, operator fatigue, high risk, and inaccurate judgment

Drone Usage Limitations

- Short battery life, weather sensitivity, limited range, and difficult landing

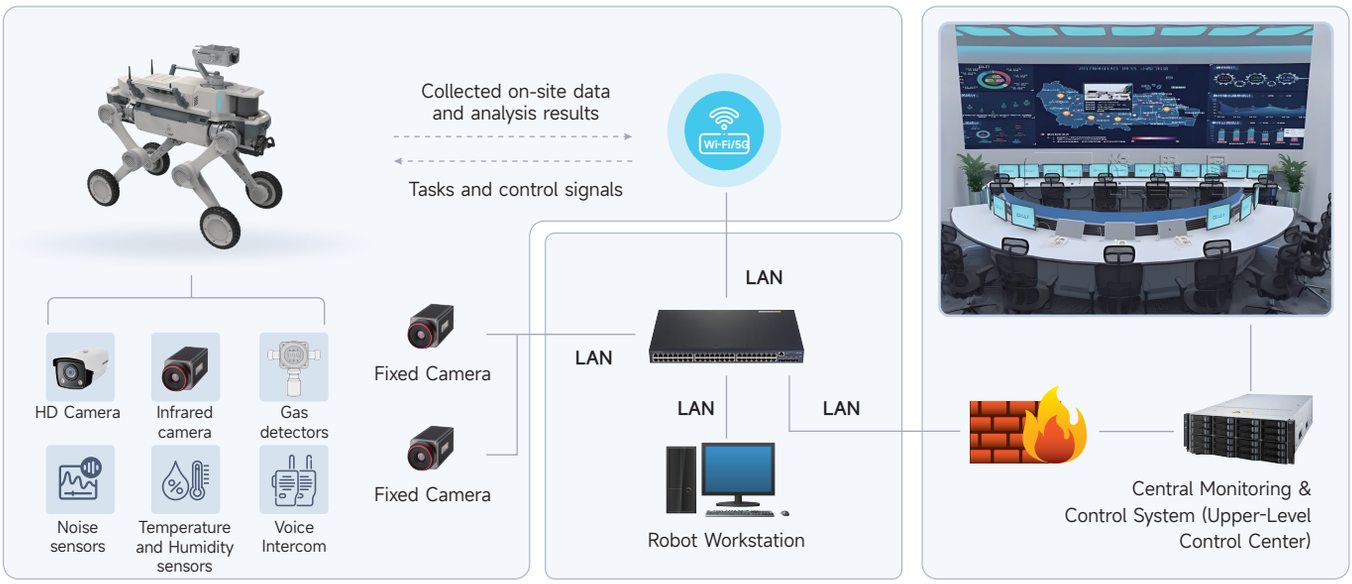
Limitations of Video Surveillance

- Blind spots, insufficient flexibility, poor interference immunity, and passive operation

Wheeled Robots Limitations

- Poor terrain adaptability, prone to getting stuck, and limited obstacle traversal capability

Solution Architecture

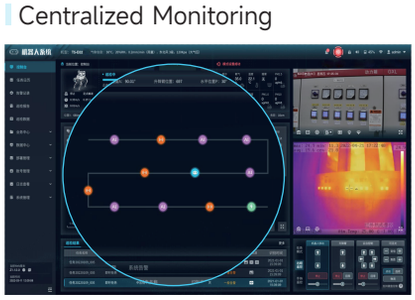


Platform Functions

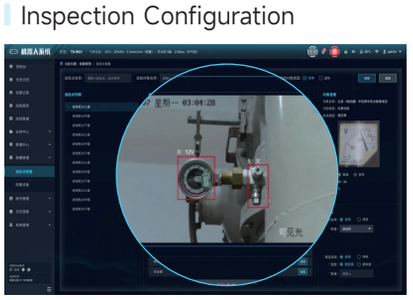
The AGIBOT quadruped inspection robot can move freely in complex environments and adapt to various terrains. As payload capacity increases, the robots can be equipped with multiple operational modules such as PTZ cameras, acoustic imagers, and gas sensors, better meeting inspection requirements and advancing inspection operations toward reduced manpower and full autonomy.

Visual Inspection and Control Center

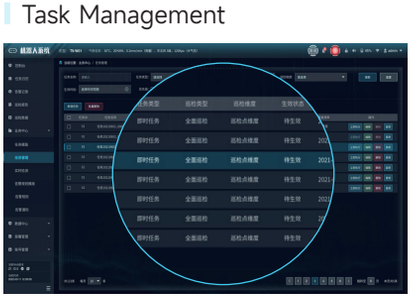
Centralized Monitoring



Inspection Configuration

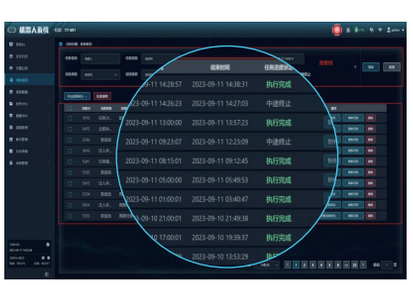


Task Management





AI-Powered Data Analysis



Real-time Alerts



Smart Analytics

01

Unified Control

A central monitoring hub for building an enterprise-level intelligent robot control system

02

Full Integration

Comprehensive integration of robots, drones, and various sensors

03

Smart Analysis

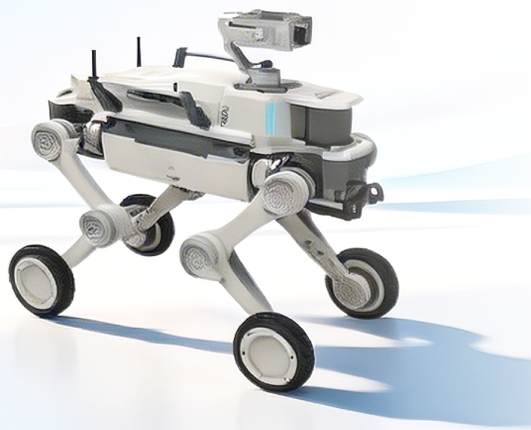
Proactive sensing, intelligent positioning, and early fault detection

04

Remote Operations

Intelligent support enabled by visualized and remote-controlled operations

Product Overview



Operational Range	**>20km**
Battery Life	**3.5h**
Patrol Speed	**4m/s (max)**
Minimum Passage Width	**80cm**
Minimum Passage Height	**50cm**
All-Terrain Adaptability	**Easily adapts to 22cm obstacles and stairs, 45° slopes, 80cm vertical obstacles, and complex terrains such as grass, gravel paths, and standing water, enabling seamless indoor-outdoor operation**
Strong Expandability	**Supports optional integration with dual-spectrum PTZ cameras, 5G communication, Beidou/GPS/ RTK, gas sensors, and partial discharge detection robotic arms**
Fully Autonomous Charging	**Autonomous recharging and continuous cycling operation**
Industrial-Grade Protection	**IP67 water/dust protection for uninterrupted operation**
High-Accuracy Autonomous Navigation	**Inspection positioning accuracy <3cm**

Product Functions

Inspection Functions

- Autonomous navigation: Route planning and obstacle avoidance
- Remote control: Remote operation and real-time video transmission
- Scheduled tasks: Preset inspection schedules with flexible execution

Perception Capabilities

- Visual Perception: HD camera, image recognition, and processing
- Infrared Perception: Infrared sensors and thermal detection
- Audio Perception: Microphone, speech recognition, and processing

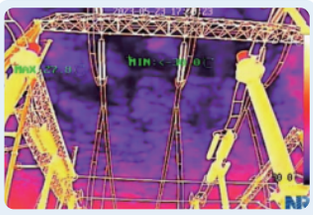
Data Analysis and Reporting

- Data acquisition: Data acquisition via various sensors
- Data Analysis: Data processing, analytical algorithms, and anomaly detection
- Report Generation: Automatic inspection report generation, anomaly alerts, and logging

Additional Functions

- Battery Management: Battery status monitoring and automatic charging
- Communication: Wireless communication, data synchronization, and data transfer
- Durability: High-strength materials, adaptive design, and suitability for various environments

Routine Inspection Functions



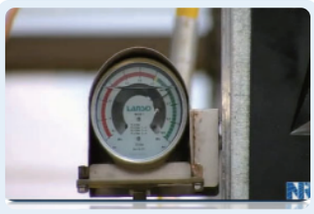
Infrared Temperature Measurement

Non-contact thermal imaging with high temperature-measurement accuracy, enabling visualization of equipment hot spots and fault diagnosis



Acoustic Signature Detection

Equipped with an acoustic imager to capture specific acoustic signatures, enabling detection of partial discharge and abnormal equipment noise



Condition Assessment

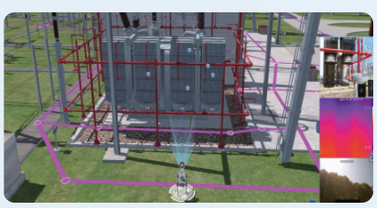
Monitors device operating conditions and intelligently recognizes meter readings, indicator light status, switch positions, and external defects



Dynamic Environmental Monitoring

Monitors ambient temperature, humidity, and concentrations of toxic and harmful gases, enabling accurate environmental change detection and timely risk identification

Innovative Inspection Functions



Inspection of Non-Preset Points

Go wherever you tap | Inspect wherever you tap | No preset required

- Powered by digital twin technology and spatial computing algorithms
- Enables rapid deployment, emergency inspection, and initial response at unattended or remote stations



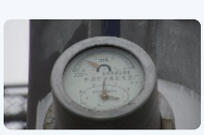
Continuous Inspection

Infrared Temperature Measurement | Fast and Efficient | Wide-Area Coverage

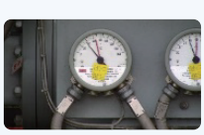
- Merges nearby inspection points to minimize interruptions
- Infrared thermal imaging enables rapid, wide-area detection of temperature anomalies

AI-Based Gauge Reading





Surge Arrester Dial Gauge



Dual Dial Gauge



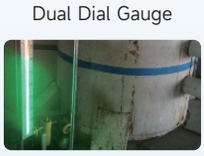
Oil Level Dial Gauge



Breather Color Indicator and Range



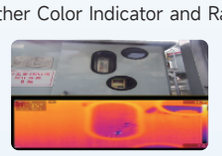
Indicator Light Color



Liquid Level Gauge Color and Range



Knife Switch Status Detection



Infrared Temperature Measurement

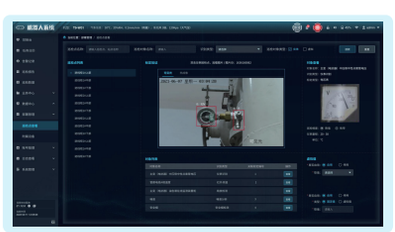
Integrated Software Platform

The backend system provides an integrated operations and maintenance (O&M) platform, covering the full lifecycle of inspection tasks, data management, and intelligent analysis. The core functions include inspection workflows and task management, covering target point configuration and route planning, deployment and validation, task template creation, review, execution, and report generation, as well as flexible definition of inspection types (such as routine, special, project-based, and custom inspections). The system features advanced AI-powered recognition and analysis capabilities, including image recognition for defect detection, meter reading, and personnel safety monitoring, as well as infrared thermal analysis. In terms of data visualization, the system provides a centralized management interface, including modules such as the system dashboard, video management, inspection data query, alert data query, and event log query. This enables unified visual monitoring of equipment status and centralized oversight of all systeminformation, aiming to improve operational efficiency and emergency response capabilities.

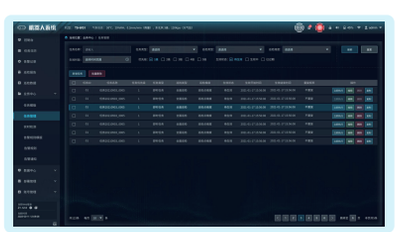




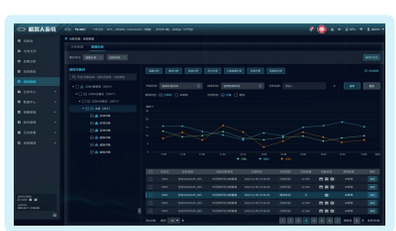
Integrated Software Platform Modules



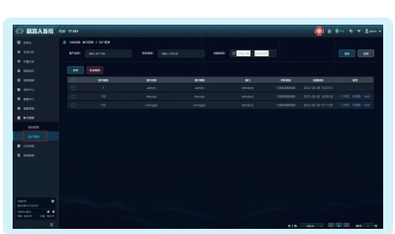
Patrol Point Configuration



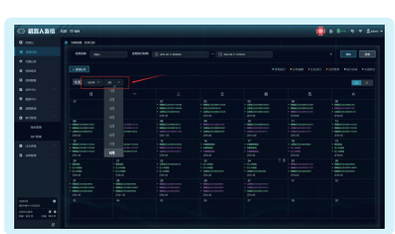
Patrol Task Management



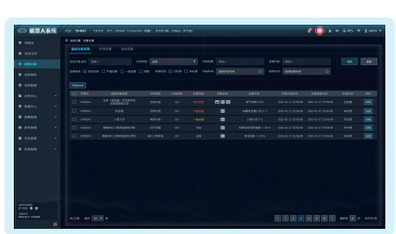
Data Analysis



Register Configuration Table



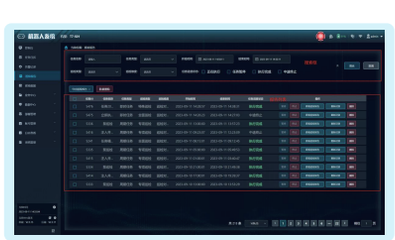
Patrol Tasks



Patrol Alert List



Real-time Monitoring Interface



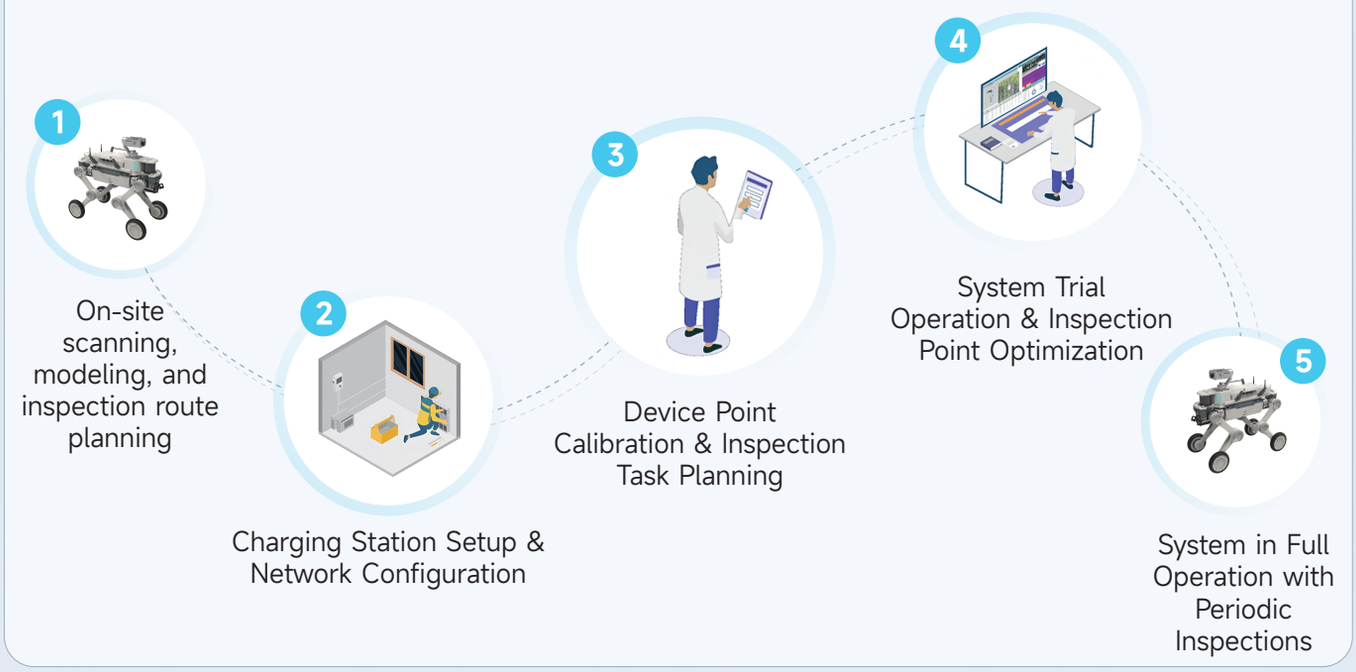
Patrol Results Overview



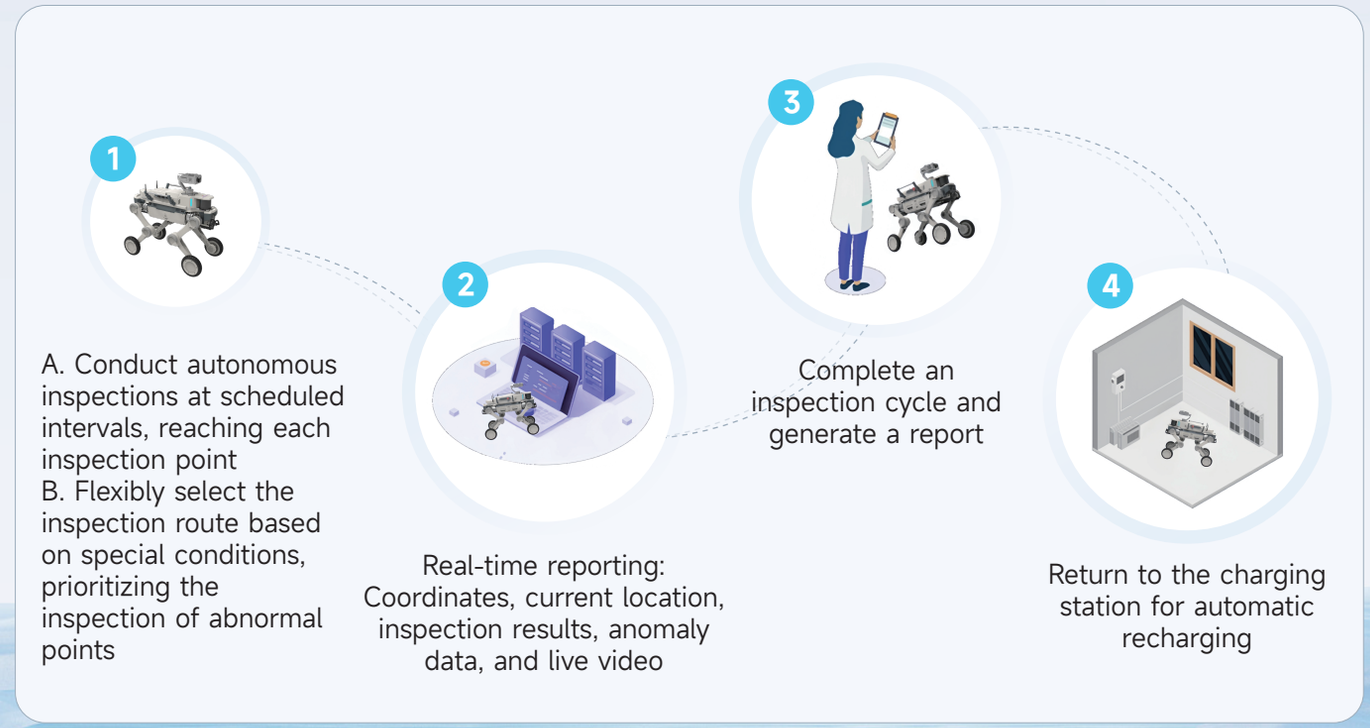
Alert Acknowledgment

System Workflow Overview

Deployment Process



Inspection Process





Solution Value

01

Improved inspection efficiency

- Supports 24/7 uninterrupted inspection, enabling continuous equipment monitoring
- Can inspect large volumes of equipment in a short time, outperforming manual inspection

02

Enhanced inspection quality

- Ensures high-quality inspections with no missed detections
- Enables close-range inspection for precise equipment data capture
- Accurately records detailed data for each inspection
- Supplements and completes gaps in existing platform data

03

Reduced labor costs

- Reduces labor costs by 50%
- Supports additional applications such as safety behavior detection and personnel inspection, reducing overall operating costs

04

Enhanced personnel safety

- Replaces manual operations in hazardous environments to reduce the risk of work-related injuries
- Reduces labor intensity in daily operations

05

Data value extraction

- Uploads inspection data to build data assets
- Supports data analysis, querying, and intelligent insights to optimize inspection and maintenance operations, enabling digitalized management

APPLICATION CASE

Robot Application Case

A 750kV Substation of the State Grid Corporation of China

Project Outcomes:

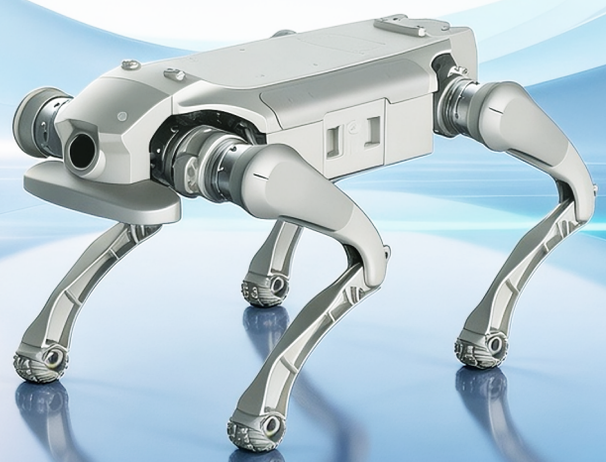
Based on project requirements and on-site conditions, the quadruped robot is equipped with 3D LiDAR, a three-axis stabilized PTZ camera, an acoustic imager, and a wireless module. This enables visible-light gauge reading, liquid leak detection, and infrared-based temperature monitoring, while the acoustic imager supports gas leak detection. This creates an integrated operations–data loop that improves efficiency and reduces costs. It enables a full workflow from anomaly detection and response to summarization and analysis, supports multi-layer monitoring within GIS systems, and addresses the high management and maintenance costs of traditional robotic solutions.



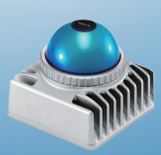
D1 Ultra
Small-sized Quadruped Robot

AGIBOT D1 Ultra: An industry-leading compact, industrial-grade quadruped robot.
Excels in moving across complex terrains: capable of running at 3.7m/s, jumping up to 35cm high, climbing 30° slopes, and navigating 16cm-high stairs (top-tier motion performance for a small-sized quadruped robot). Rated IP54 for dust and water resistance and built to be rugged, durable, and impact-resistant, with 2-hour runtime under a rated 5kg load.

- Features autonomous patrol
- Equipped with a top-mounted payload, including a PTZ camera and loudspeaker
- Supports security patrol, investigation and evidence collection, A/V warning, and audio deterrence and dispersal



Accessories (some optional)



LiDAR (for positioning, autonomous navigation, and obstacle avoidance)



Infrared thermal imager (for temperature monitoring and vital sign detection)



GPS (for real-time positioning and anti-theft)



Omnidirectional microphone (two-way voice communication)



High-power speaker (60W)



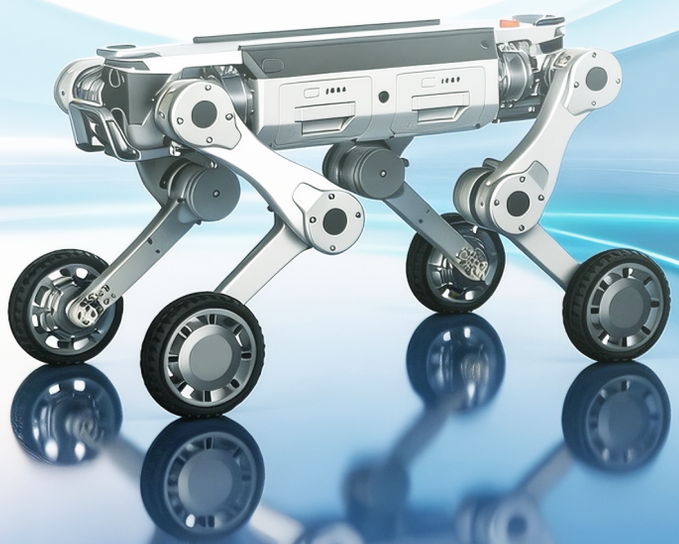
Warning light

D1 Max

Medium-sized quadruped robot

With its versatile payload capabilities and excellent mobility, D1 Max ensures rapid on-site response, enabling proactive safety interventions, intelligent task execution, and complete operational workflows.

- Supports autonomous patrol and self-charging
- Supports simultaneous integration of dual-spectrum PTZ, acoustic detection, and gas detection modules
- Supports security patrol, investigation and evidence collection, A/V warning, and safety interventions (e.g., fire-extinguishing ball launch, capture net deployment)



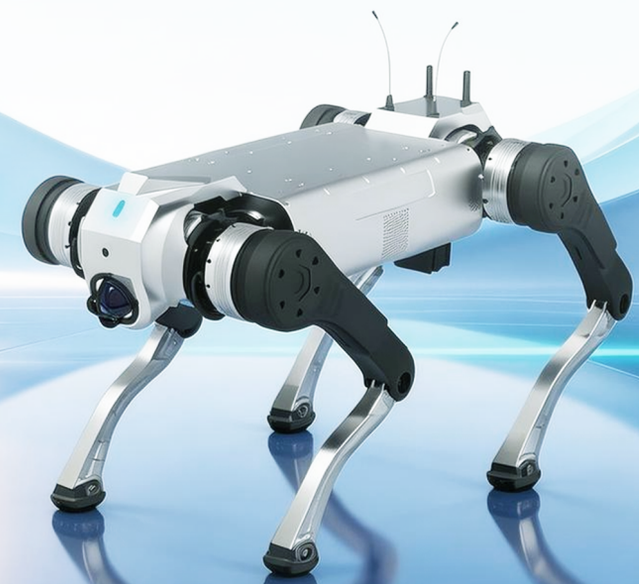
Technical Specifications

93 x 48 x 58 (cm) Standing Dimensions	**93 x 63 x 20 (cm)** Folded Dimensions	**41kg (including batteries)** Weight	**54V, 20Ah (dual batteries)** Battery
25kg Continuous Movement Payload Capacity	**>25cm** Continuous Stair-Climbing Capability	**45°** Slope-Climbing Capability	**4m/s** Normal Walking Speed
8m/s Max Speed	**80cm** Obstacle Clearance Height	**80cm** Gap-Crossing Width	**Automatic Gait Adjustment** Wheel/Leg Switching
> 3.5h Full-load Runtime	**-20°C to 55°C** Operating Temperature	**IP67** Ingress Protection (IP) Rating	**Gigabit Ethernet port, USB interface, serial port, power connector (12/24V)** External Expansion Interfaces

D1 MaxPro
Large Quadruped Robot

AGIBOT D1 MaxPro is a large quadruped robot with superior payload capacity and exceptional locomotion capabilities. Powered by a reinforcement learning-based motion algorithm, it offers true all-terrain adaptability. It also features built-in modules for autonomous patrol and environmental perception, enabling it to handle industrial inspection and emergency response scenarios with ease.

- Features autonomous inspection
- Supports simultaneous integration of dual-spectrum PTZ, acoustic detection, and gas detection modules
- Supports autonomous inspection, charging, and alerting



Platform



Accessories (provided by partner)


3D LiDAR


Dual-spectrum PTZ thermal camera


Acoustic imager (optional)


Gas sensor (optional)

Technical Specifications

123 x 53 x 73 (cm) Standing Dimensions	68kg Net Weight	45Ah Battery Capacity	Supported Autonomous Recharging	5.5h No-Load Runtime

2.5h Full-load Runtime	50kg Continuous Movement Payload Capacity	100kg Max Payload Capacity When Standing	30cm Stair-Climbing Capacity	IP67 Waterproof Rating	-20°C to 55°C Operating Temperature

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Office/R&D Center
Shanghai: Kangqiao Business Oasis, Caohejing, Pudong New Area
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