UNITREE

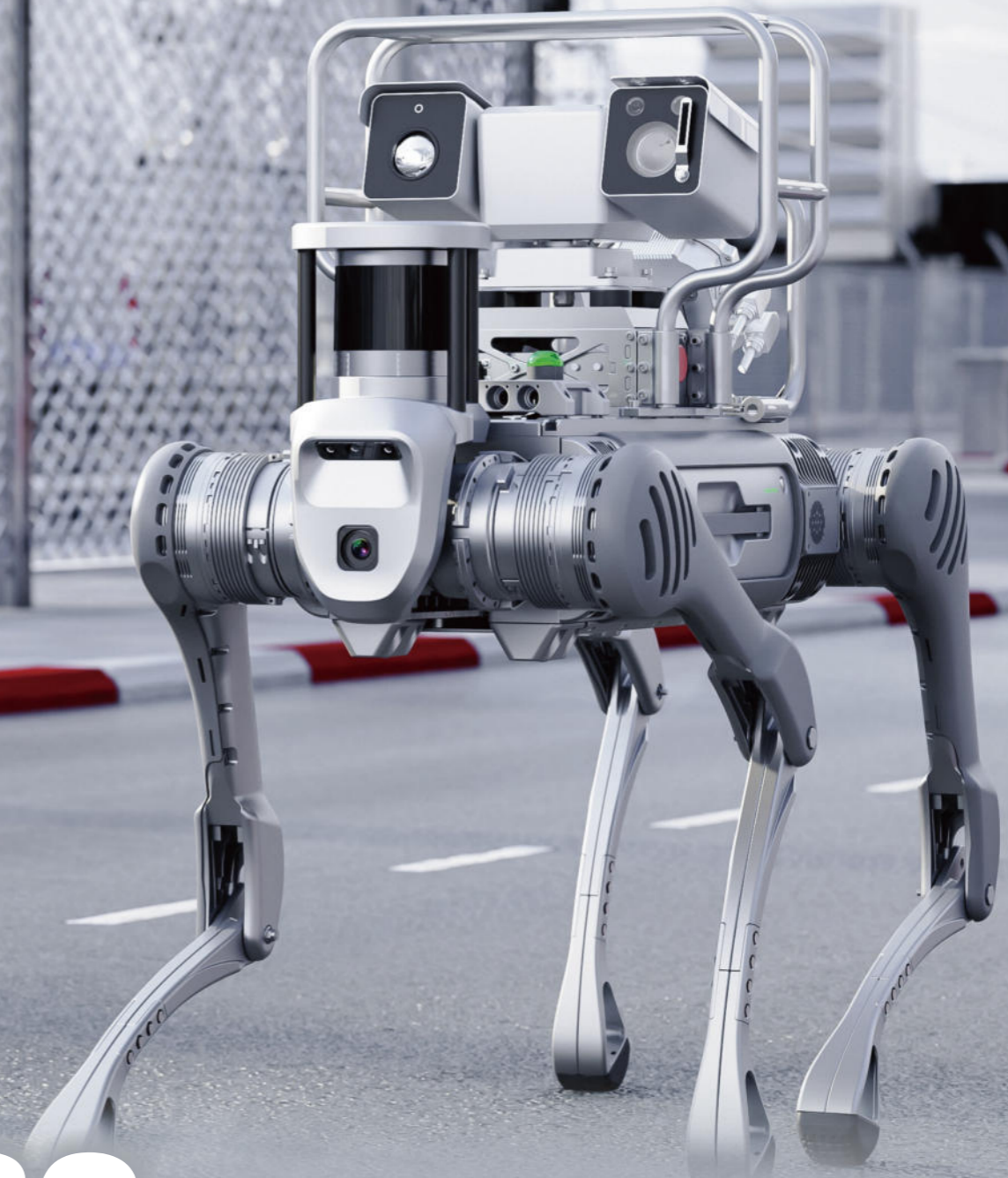**Contact Us**

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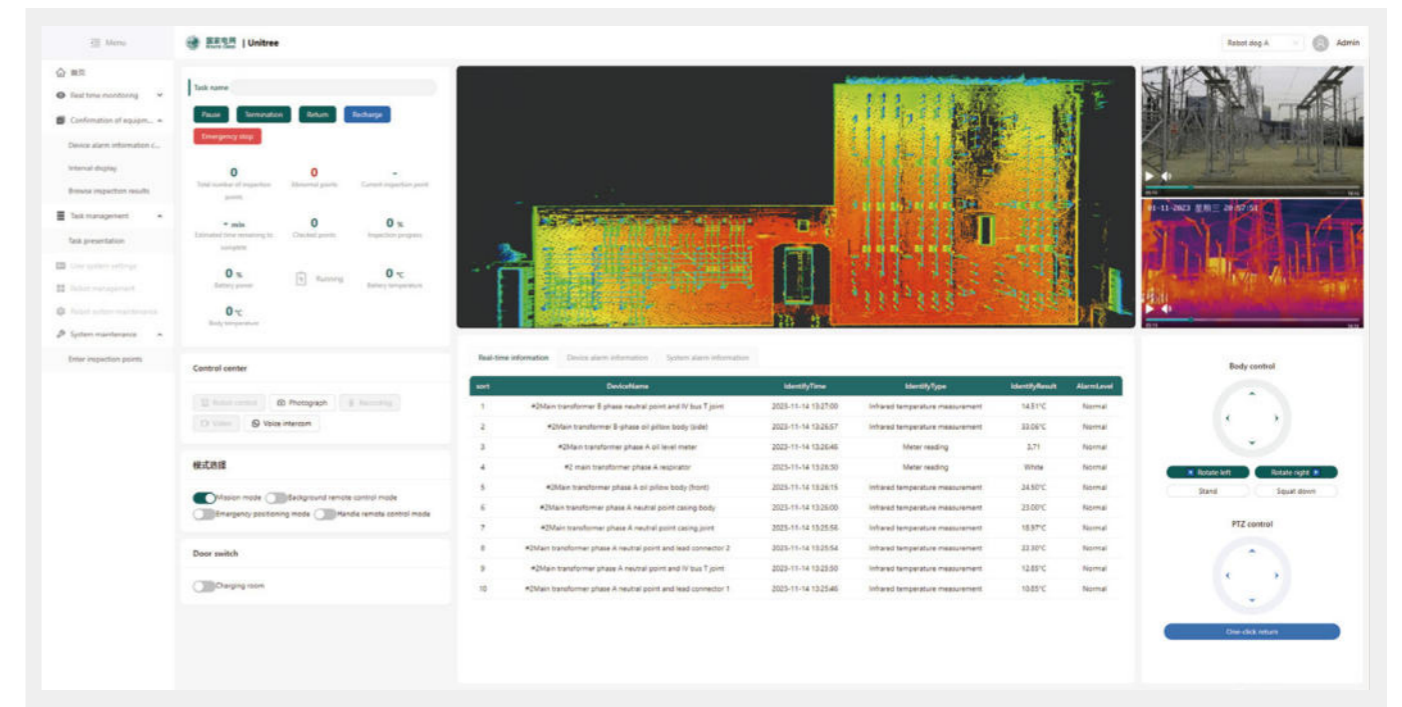
📍 693 Blue Rock Court
   Winston-Salem, NC 27103

B2 QUADRUPED
INSPECTION UNIT

Introduction to Quadruped Robot Inspection Solution

Hardware

Quadruped Robot

Inspection System

Inspection Host — Analysis Host

Switch — Secure Access Platform — WIFI/5G Base Station
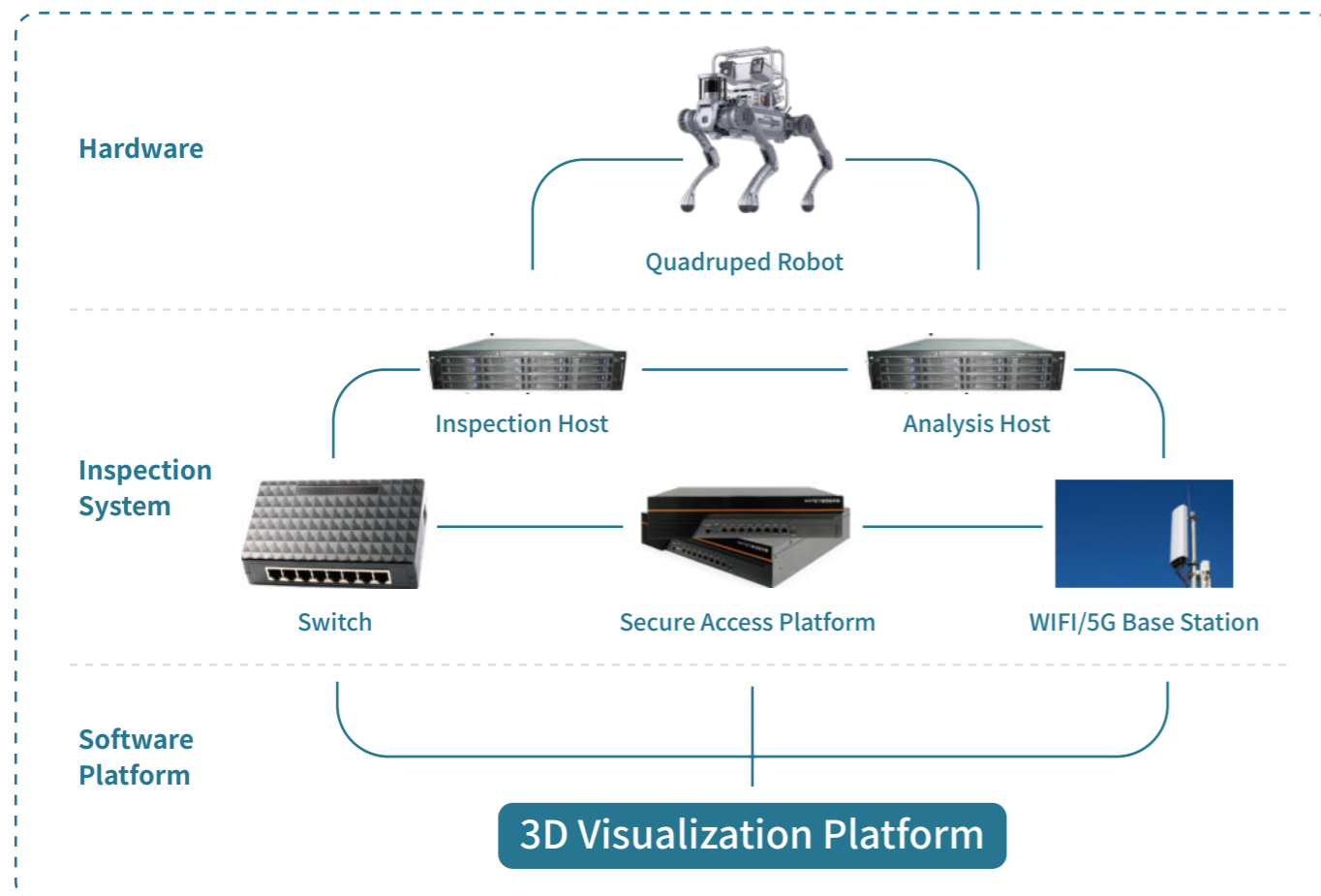
Software Platform

3D Visualization Platform

Unitree Intelligent Inspection Management Platform

Unitree intelligent inspection management platform is the core of the entire system.This platform aims at addressing the application requirements of unmanned, digital and intelligent equipment on-site inspection. It processes and analyzes the data collected by the robot in real time. Through methods such as comparison with historical data and fault mode identification, the status of the equipment can be evaluated and given early warning, potential faults and hidden dangers also can be discovered in a timely manner.At the same time, the platform can also uniformly manage and store inspection data to facilitate data tracing and analysis.The platform can be connected to multiple devices in a unified manner. On this platform, users can realize 3D data visualization, automatic inspection, intelligent analysis, intelligent early warning, intelligent linkage, intelligent decision-making, emergency response and other tasks, helping users achieve unmanned management and control of equipment.

Functions

Self Inspection

Multiple inspection contents including comprehensive inspection, routine inspection,project inspection and special inspection can be configured according to different requirements.

AI Intelligent Recognition

Meter readings, status identification, defect identification, precise infrared temperature measurement, partial discharge detection, etc.
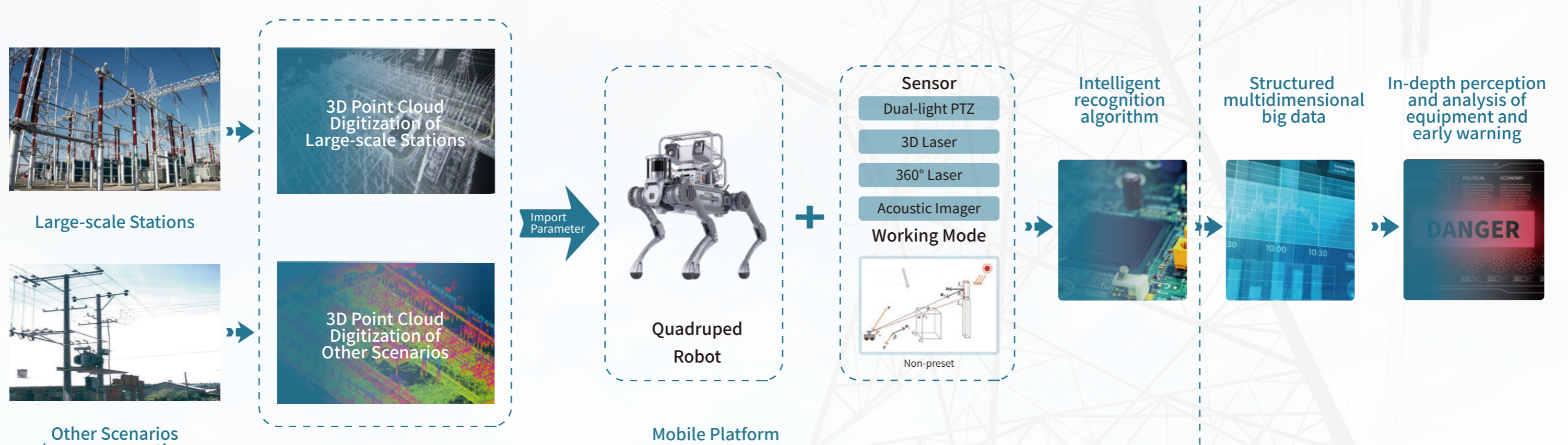
3D Visualization

This function is reflected in 3D inspection, fault diagnosis, equipment maintenance, safety management, 3D interaction, etc., improving station operation efficiency, reducing operation and maintenance costs, and helping users achieve comprehensive perception, intelligent analysis and precise control of the substation.
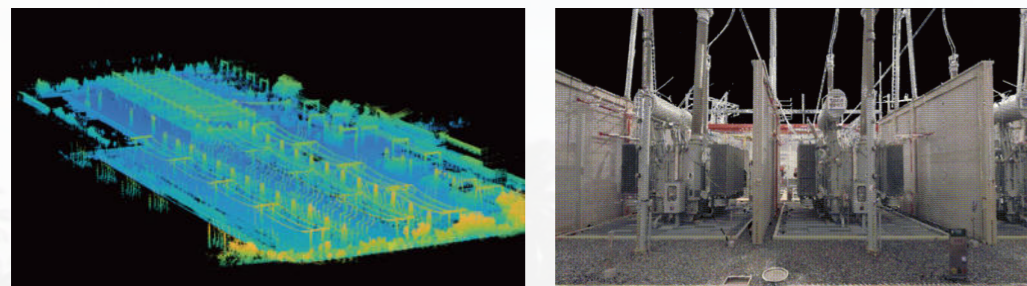
Data Analysis

Based on inspection data, historical curves, equipment life cycles, and risk assessments all can be conducted.

INSPECTION PROCESS

Large-scale Stations

3D Point Cloud Digitization of Large-scale Stations

Other Scenarios (power generation, transmission, distribution, etc.)

3D Point Cloud Digitization of Other Scenarios

Import Parameter

Quadruped Robot

Mobile Platform

+

Sensor

Dual-light PTZ

3D Laser

360° Laser

Acoustic Imager

Working Mode

Non-preset

Intelligent recognition algorithm

Structured multidimensional big data

In-depth perception and analysis of equipment and early warning

DANGER

Realize rapid remote deployment, operation and maintenance based on digital three-dimensional environment

New Working Mode:
Inspection Operations + Emergency Operations

Comprehensive Collection
+
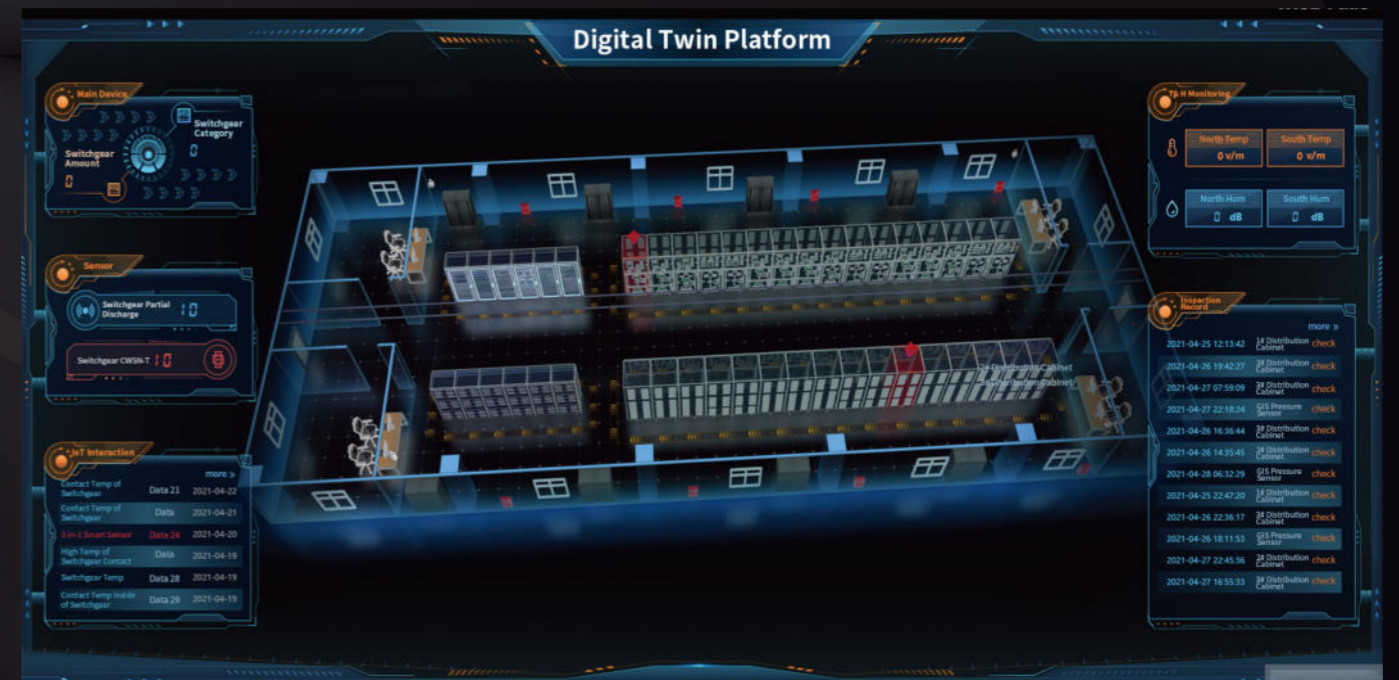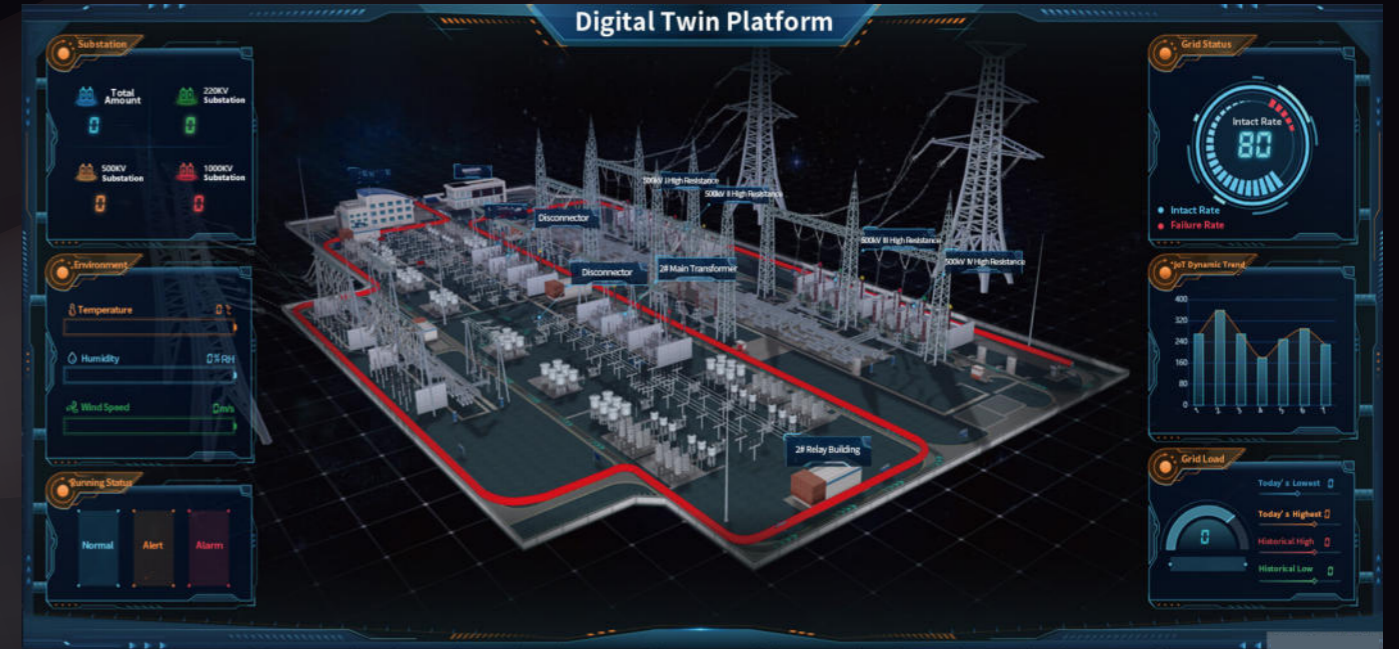Intelligent Algorithm Analysis
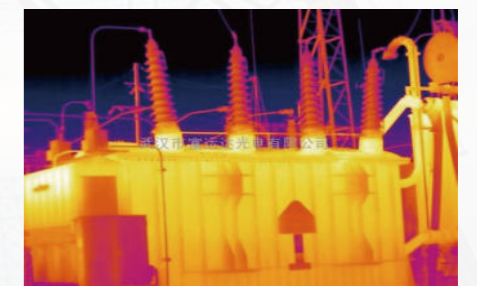
DIGITAL TWIN PLATFORM
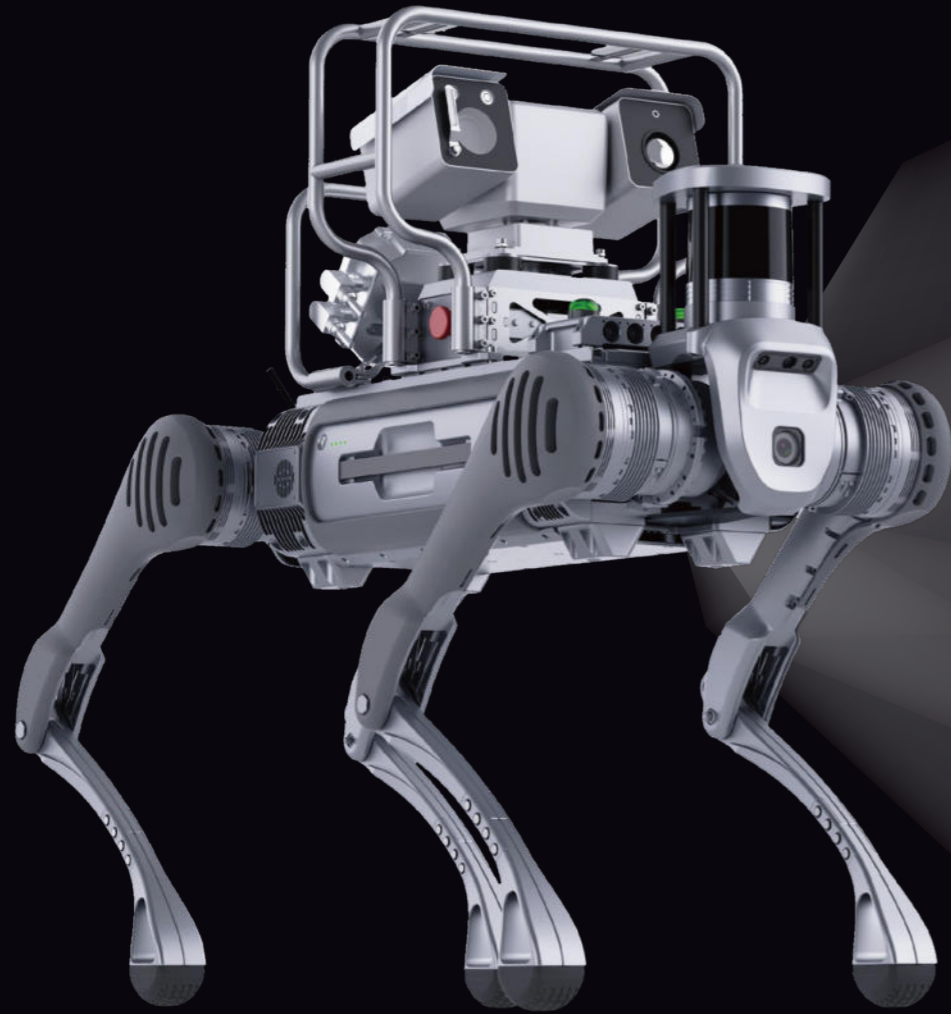
Real-time Data-driven

Quadruped Robot Inspection

Reproduce the inspection trajectory of the quadruped robot in real time in the digital twin scene to find out whether the inspection route is reasonable and whether there are any omissions.
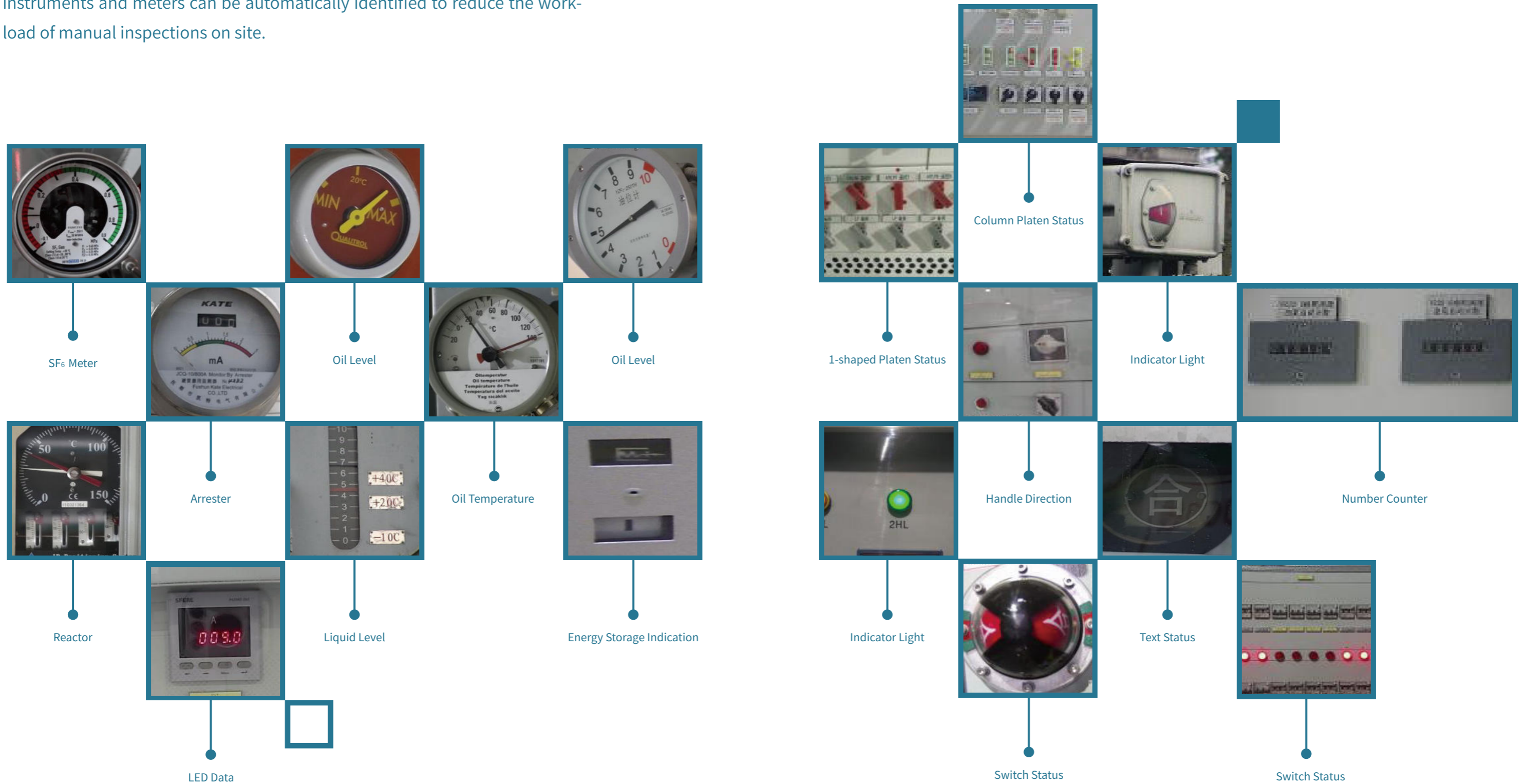
First Person Perspective Inspection

Inspection paths can be manually planned in the digital twin scenario, allowing the screen to present the automatic inspection process from a first-person perspective, allowing users to view equipment status, parameters, and whether there are faults and abnormalities.
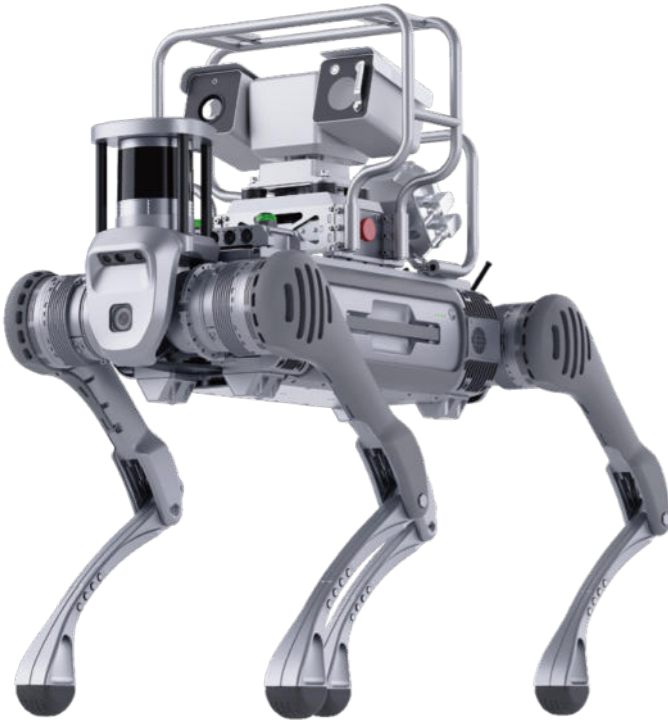
Intelligent Inspection System
Intelligent Identification

Based on image recognition technology, the operating status of various instruments and meters can be automatically identified to reduce the workload of manual inspections on site.

SF₆ Meter

Oil Level

Oil Level

Arrester

Oil Temperature

Reactor

Liquid Level

Energy Storage Indication

LED Data

Column Platen Status

1-shaped Platen Status

Indicator Light

Handle Direction

Number Counter

Indicator Light

Text Status

Switch Status

Switch Status

Introduction to Hardware Platform

CONTINUOUS LOAD

≥40kg

WEIGHT

≤65kg

BATTERY

45Ah, 58V

ENDURANCE

4-6h

Size	1098×450×950mm
Obstacle Crossing	40cm
Climbing Angle	45°
Stair Climbing	Stairs of 25cm
Working Temperature	-40°C~55°C
Inspection Speed	≤3m
Laser	32 line

32-line Lidar

70° vertical field of view, 55° overhead view, eliminating blind spots
Used for navigation, positioning and terrain detection.

Ultra-wide-angle 360° Lidar

32-line laser fusion navigation, adaptable to all terrains.

Dual-light PTZ

Combined with AI intelligent recognition algorithm, it can realize functions such as substation equipment detection and infrared temperature measurement.

128 Microphone Arrays Integrated

Partial discharge fault monitoring for transformers, switch cabinets and other equipment.

Flexible Deployment

Dual-light PTZ

Acoustic Imager

Four-in-one UV PTZ

Robotic Arm

Gas Sensor

Partial Discharge Sensor

Basic Version

Enhanced Version

Simplified Version
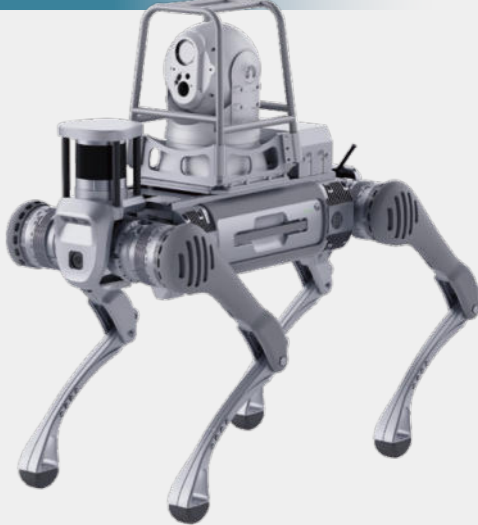
**Collaborative Version**

Ascending Version

APPLICATION SCENARIOS

Unitree quadruped robot inspection solution is industry-oriented and used for inspection of various environmental equipment above and below ground. Compared with traditional inspection robots (wheeled and crawler-type), quadruped robots can adapt to different terrains, such as stairs, Stairs, slopes, mountains, etc.

Equipped with various testing equipment, it can complete a series of tasks like intelligent inspection, security patrol, search and rescue, smart construction, etc., providing services for the power, coal, mining, steel, railway, and petrochemical industries.

Outdoor Application
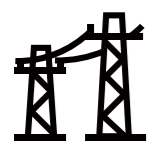
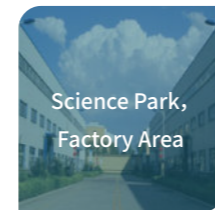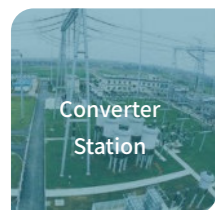| Power Grid	Power Station	Petrochemical	Railway/coal Mine	Pipe Gallery	Factory
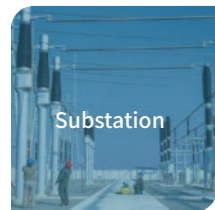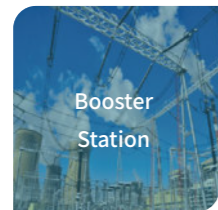
- Substation
- Booster Station
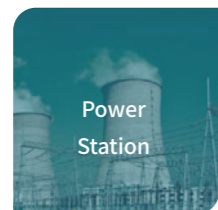- Oil Plant
- Traction Substation
- Integrated Pipe Gallery
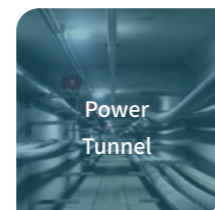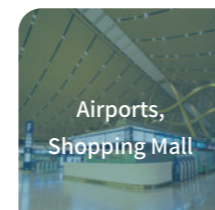- Science Park, Factory Area
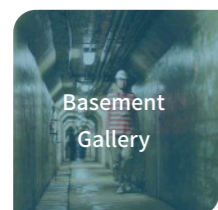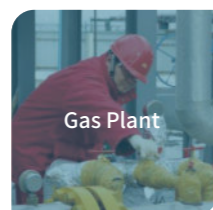- Converter Station
- Power Station
- Well Site
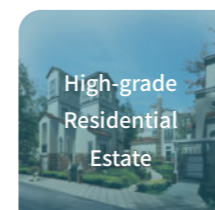- Power Station In Coal Mine
- Power Tunnel
- Airports, Shopping Mall
- Basement Gallery
- Gas Plant
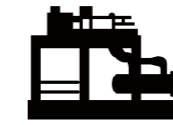- High-grade Residential Estate
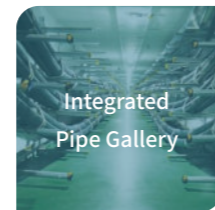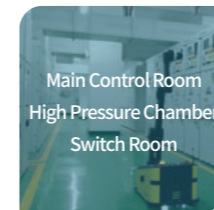
Indoor Application
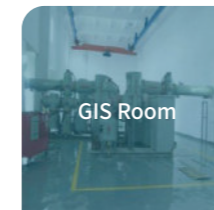
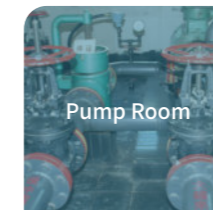| Power Grid	Power Station	Petrochemical	Network Operator	Railway/Subway	Substation/Coal Mine

- Main Control Room High Pressure Chamber Switch Room
- GIS Room
- Pump Room
- IDC Data Room
- Dispatching Computer Room
- Power Distribution Room (airport/community/government unit)
- GIS Room Relay Building
- Turbine Floor (zero meter floor)
- Heat Exchange Unit
- Electrical Equipment Room Decompression Room
- Underground Mine, Low Voltage Distribution room
- Distribution Room Switching Station Panel Room
- Boiler Floor (zero meter floor)
- Compressor Unit
- Traction Substation
- Distribution Room in Mine
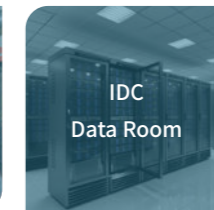
CASE INTRODUCTION
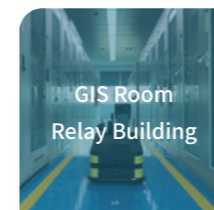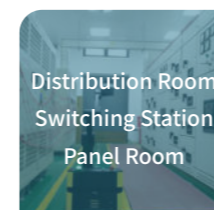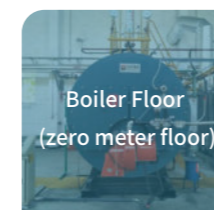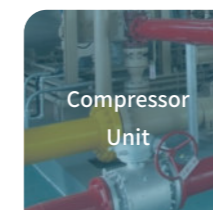
A Power Grid substation of 220kV in Inner Mongolia

Case:

This project is mainly performed in outdoor areas of 220KV and 110KV, the indoor 10KV power distribution room, the main control room and the relay protection room. The robot patrolling areas involve stair ramps, mouse guards and doors.

Effect：

According to the project requirements and the actual situation on-site, a quadruped robot B1, equipped with a 3D laser radar, a dual-light PTZ, a robotic arm, a charging room and a wireless module, etc., is selected to realize the robot walking and charging autonomously in the inspection area. The PTZ camera detects the data and status of instruments. And the robot identifies the abnormal status. The robot can also close the switch automatically through the added robotic arm. Through the wireless communication module, people in the control room can check the self-service operation and real-time inspection of the robot, fully realizing the self-service intelligent inspection on-site.

02

CASE INTRODUCTION

An UHV substation of 500KV in Hubei
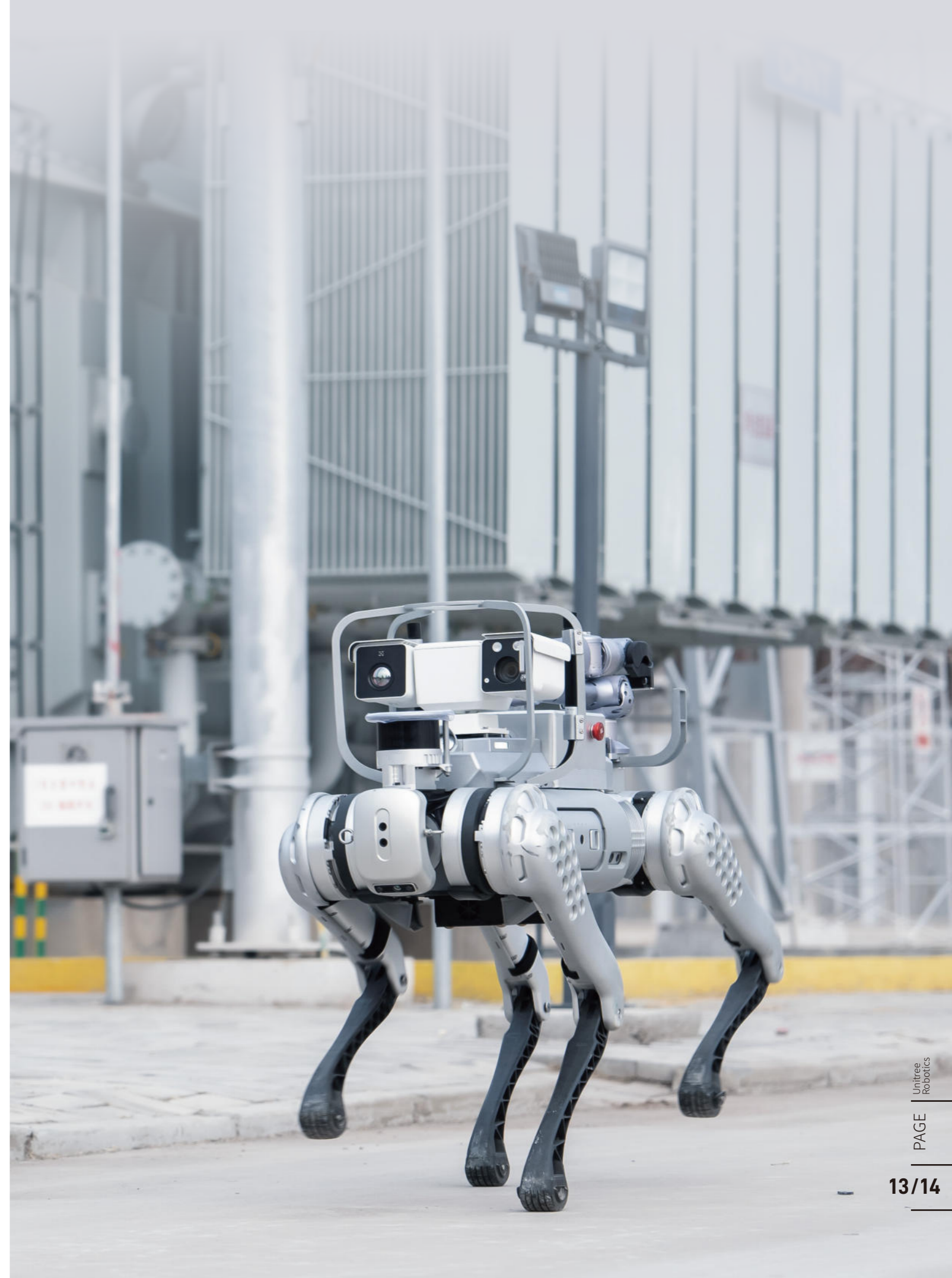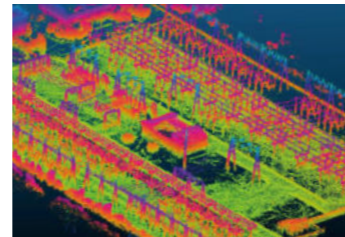
An UHV substation of 500KV in Hubei

Case:

This project is mainly performed in outdoor areas of 500kV.

Effect:

According to the project requirements and the actual situation on-site, a quadruped robot B1, equipped with a 3D laser radar, a dual-light PTZ, a charging room and a wireless module, etc., is selected to realize the robot walking and charging autonomously in the inspection area. The PTZ camera detects the data and status of instruments. The robot can also close the switch automatically through the added robotic arm. Through the wireless communication module, people in the control room can check the self-service operation and real-time inspection of the robot, fully realizing the self-service intelligent inspection on-site.
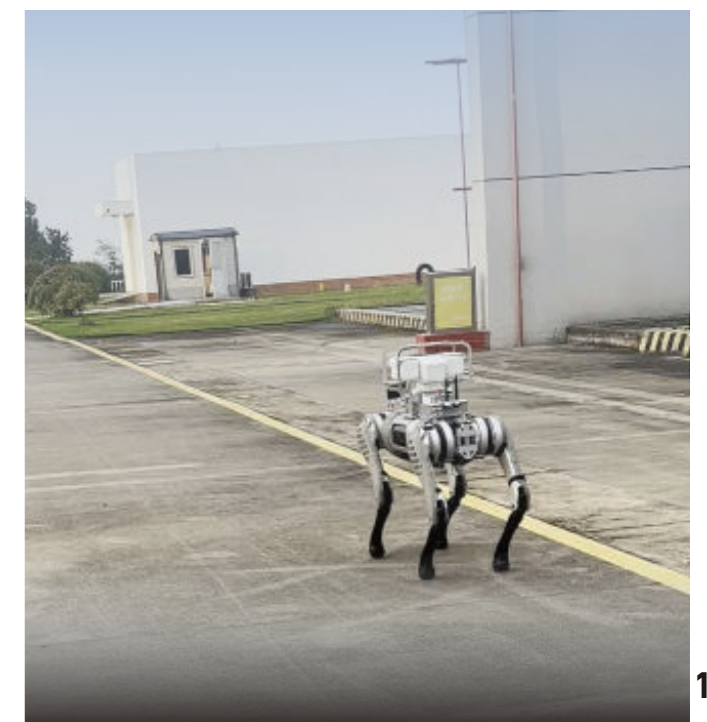
CASE INTRODUCTION

03

A thermal power plant in Hebei

Case:

This project is mainly performed in outdoor areas of 220kV booster station, boiler room, turbine room and other related facilities.
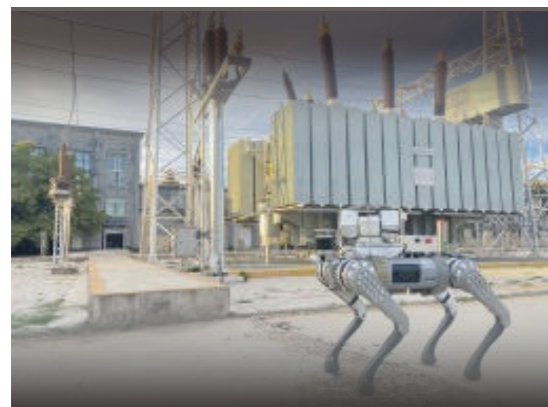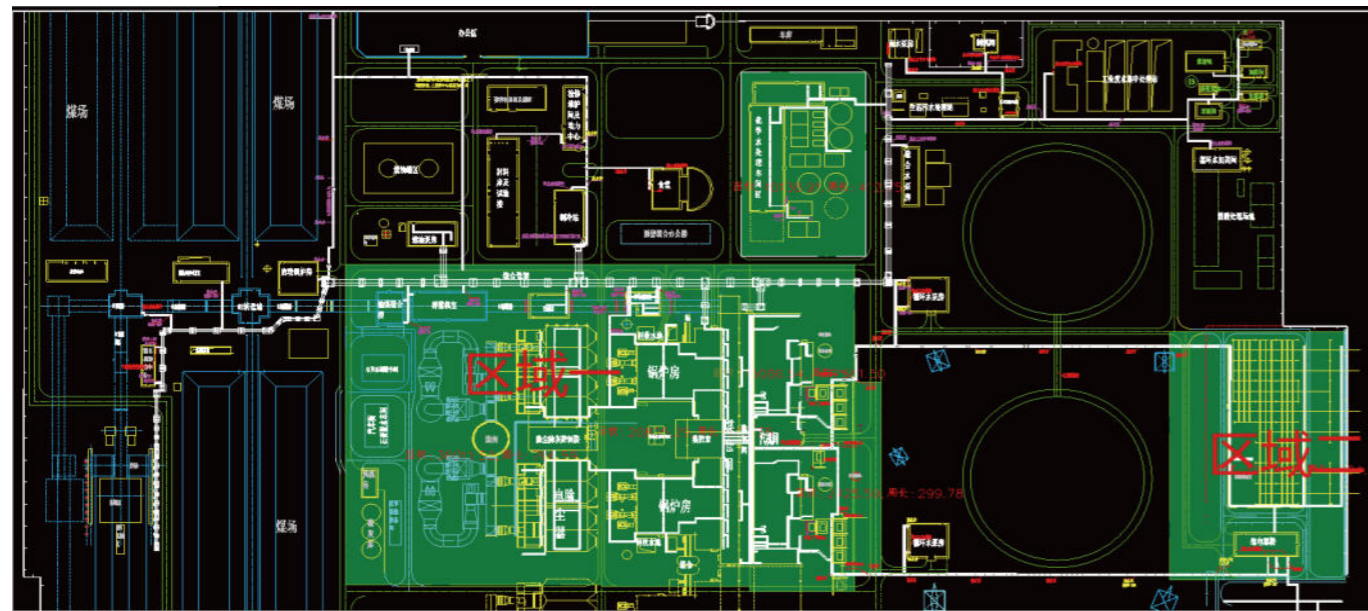
Effect:

According to the project requirements and the actual situation on-site, a quadruped robot B1, equipped with a 3D laser radar, a dual-light PTZ, an acoustic imager , a charging room and a wireless module, etc., is selected to realize the robot walking and charging autonomously in the inspection area. The PTZ camera detects instrument data and status of, partial discharge and gas concentration. Through the wireless communication module, people in the control room can check the self-service operation and real-time inspection of the robot, fully realizing the self-service intelligent inspection on-site.
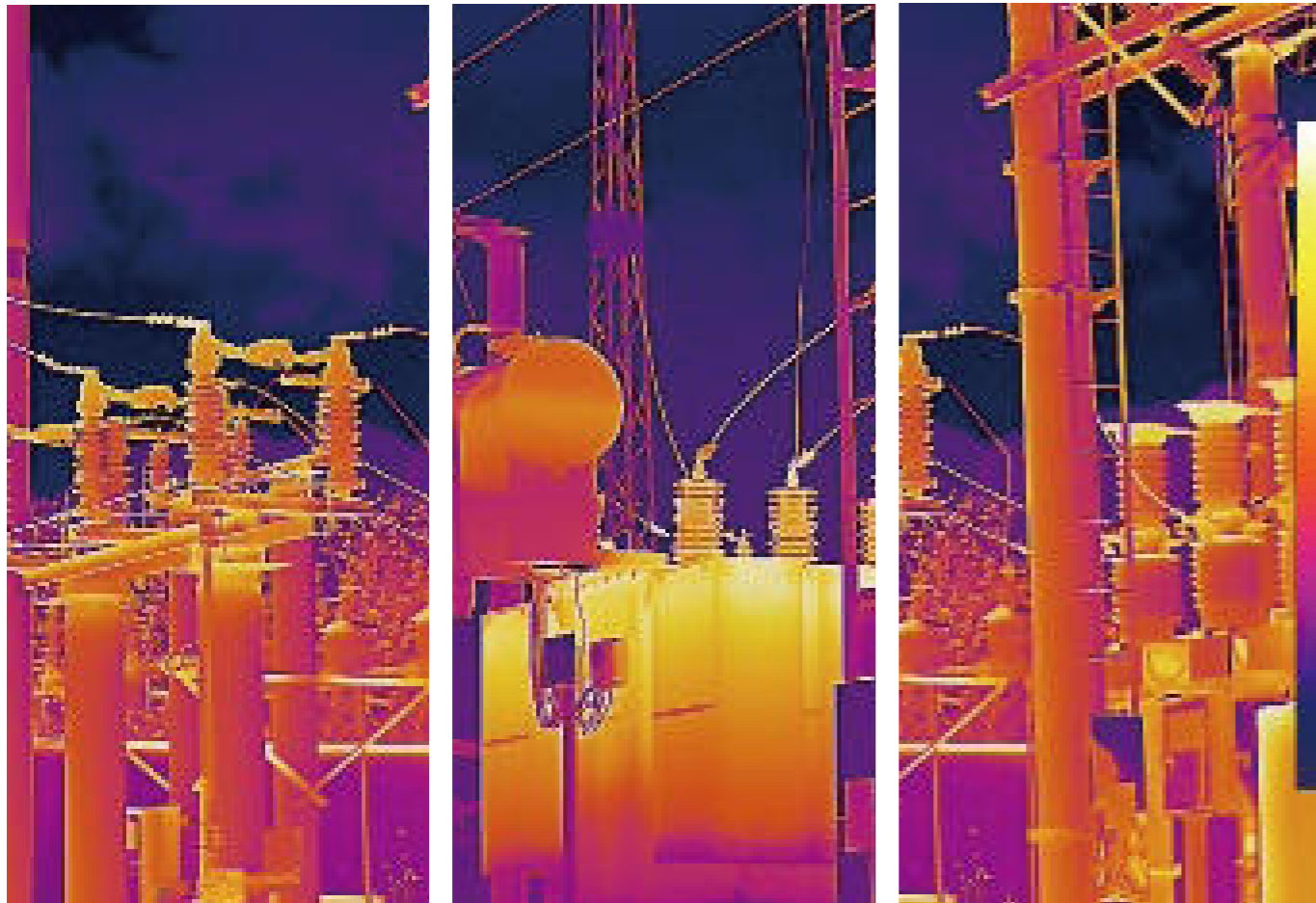
CASE INTRODUCTION

04

A power station of a petrochemical plant in Guangdong

Case:

The project is performed in the production area of #5/#6, #7/#8, #9/#10 generating units on the zero-meter floor of the power plant.

Effect：

According to the project requirements and the actual situation on-site, a quadruped robot B1, equipped with a 3D laser radar, a dual-light PTZ, an acoustic imager, a charging room and a wireless module, etc., is selected to realize visible light pointer reading, liquid drip monitoring, temperature detection by infrared thermal imaging, and gas leakage monitoring by acoustic imager. In this way, a closed loop of business and data is formed to reduce costs and increase efficiency. It manages the discovery, processing, summary, analysis of inspection anomalies, realizes multi-layer monitoring of GIS room, and improves the costs of management and maintenance of robot solutions.

CASE INTRODUCTION

05

A steel hot rolling mill in Shanghai

Case:

The project is mainly performed in the daily inspection of 1880 heating furnace area of the hot rolling mill, to monitor abnormal steam leakage at the bottom of the furnace.

Effect：

According to the project requirements and the actual situation on-site, a quadruped robot, equipped with a 3D laser radar, a dual-light PTZ, and a wireless module., is selected to complete the furnace bottom inspection. Through improving the inspection mode, enhancing the intelligent level, raising the inspection effectiveness and management efficiency, intelligent diagnosis of key equipment can be finally achieved based on the data model.
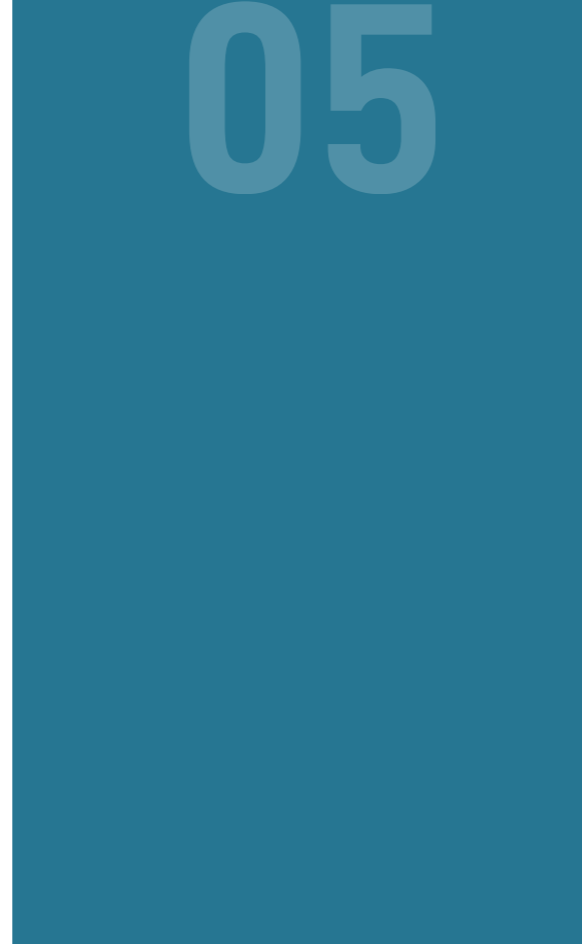
06

A brewery in Hubei

Case:

The project is mainly performed on instruments, pipes, valves, motors and other equipment in the power workshop on the zero-meter floor of the brewery.

Effect：

According to the project requirements and the actual situation on-site, a quadruped robot, equipped with a 3D laser radar, a dual-light PTZ, and a wireless module, etc., is selected to carry out autonomous inspection in the power workshop (BTS is not included in this issue). According to the actual layout of the workshop, autonomous navigation and obstacle avoidance are completed. And the inspection view is remotely transmitted to the user terminal in real time.
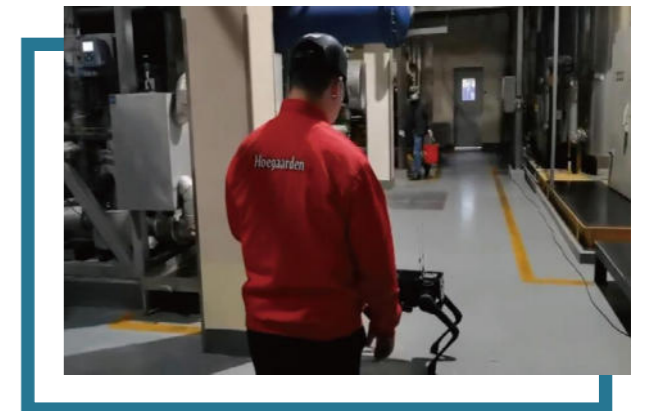
Partner Customers

With self-developed core components, control algorithms, perception systems and other technologies, Unitree has cooperated with many top universities and industry-leading technology companies.

It not only provides customers with technical support such as software development and mechanical programming, but also helps customers configure a lot of external equipment. Quadruped robots have been used in many application scenarios such as security inspection, ground exploration, and detection.

Robot technology has become an important force in promoting innovation and upgrading in various industries. Currently, hundreds of customers in petrochemical, security, electric power, education and other industries are using Unitree robots.

Unitree is committed to providing mature solutions and thoughtful technical services to empower industry development, to create an intelligent future with you together.