

SUBSEA SALES AND ENGINEERING PTE. LTD.

AI Quadruped Robot Dog Systems

Autonomous four-legged inspection, security and emergency-response platforms — engineered for the environments people should not have to enter.

PRODUCT BROCHURE · TECHNICAL SPECIFICATIONS · 2026



Integrated Land, Air & Sea Technologies

Subsea Sales and Engineering Pte. Ltd. is a Singapore-based technology and engineering solutions provider delivering integrated systems across the marine, land and air domains. We work with world-class technology partners to supply intelligent solutions that raise operational efficiency, safety and productivity.

Our expertise spans advanced robotics, autonomous systems, AI-powered inspection, digital transformation and full lifecycle engineering support.

MARINE

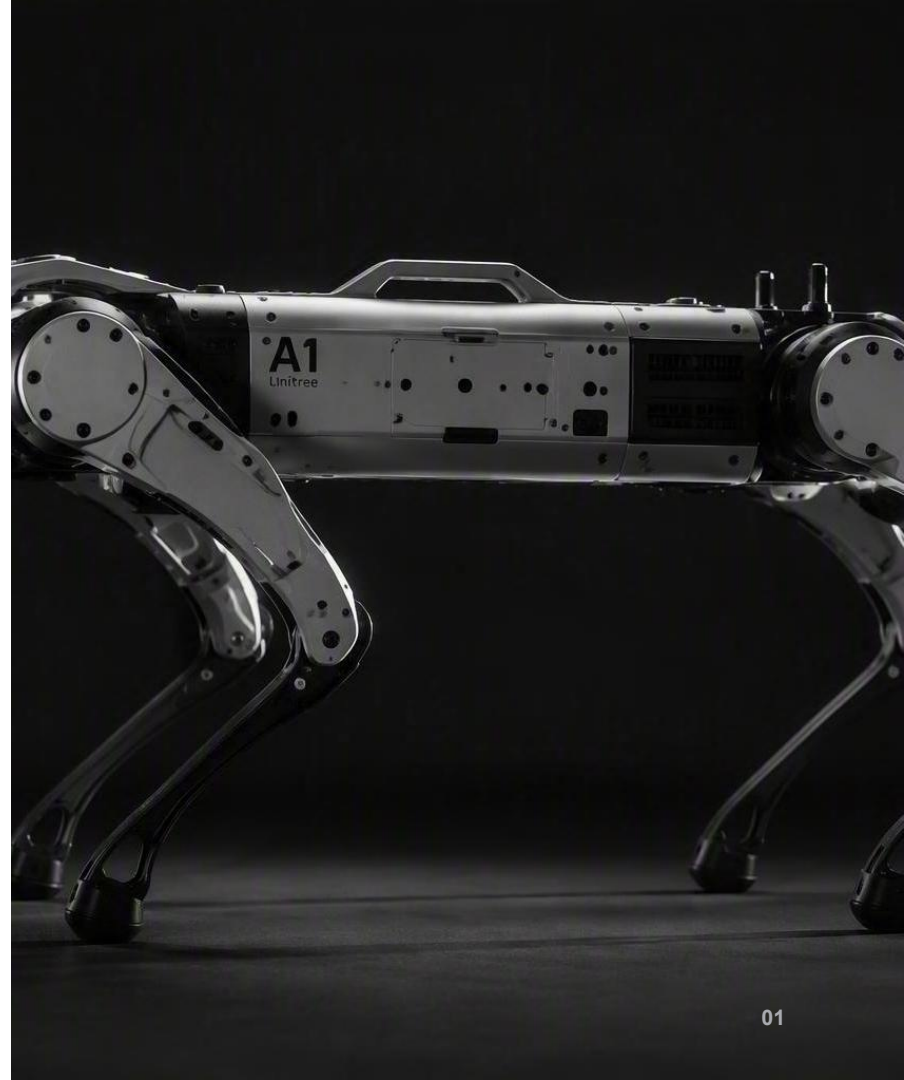
ROV · AUV · Survey

LAND

Robotics · AI Vision

AIR

UAV · LiDAR · Thermal



Why Choose SSAEPL

01

Integrated across domains

Land, air and sea technologies delivered under one engineering roof.

02

Global technology partners

Strategic partnerships with leading international robotics and sensor providers.

03

Turnkey project delivery

Consulting, integration, supply, commissioning and handover as a single scope.

04

Experienced engineering team

Regional specialists who size, deploy and support the system with you.

05

Advanced AI and robotics

Computer vision, defect detection, predictive maintenance and digital twin.

06

Lifetime support

Comprehensive after-sales service, operator training and spare-parts management.

Regional support across Southeast Asia · enquiry@ssaepl.com

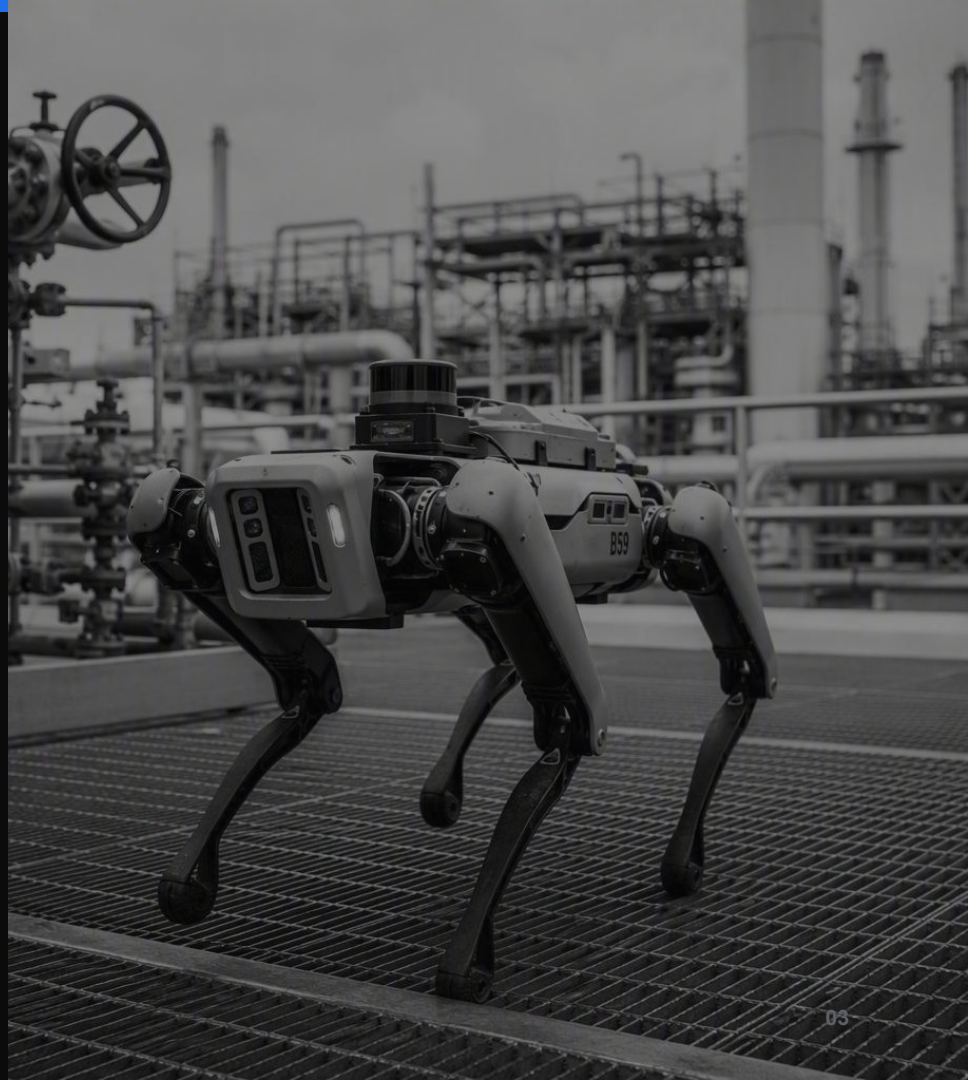
Why a Robot Dog

AI robot dogs are four-legged autonomous robots equipped with sensors, cameras and on-board intelligence that let them navigate complex environments, inspect facilities, patrol areas and interact with people — on terrain that defeats wheeled and tracked platforms.

Replaces manual routine inspection rounds

Removes personnel from high-risk zones

Runs 24/7 with consistent, auditable data



Autonomy Stack & Payloads

AI CAPABILITIES

- Autonomous navigation via LiDAR and cameras
- Simultaneous Localization and Mapping (SLAM)
- AI human, vehicle and object detection
- Dynamic obstacle avoidance
- Real-time video streaming
- Thermal imaging integration
- Voice command and remote control
- Automatic charging on supported models
- Cloud or edge AI processing
- Fleet management for multiple robots

TYPICAL PAYLOADS

- HD or 4K cameras
- Thermal cameras
- LiDAR scanners
- Gas detectors
- Radiation sensors
- Loudspeakers
- Two-way communication systems
- Robotic manipulator arms
- Environmental sensors
- AI edge computers (NVIDIA Jetson class)

MISSION PROFILES

- Autonomous perimeter patrol
- Intrusion detection and warehouse surveillance
- Critical infrastructure monitoring
- Oil and gas facility inspection
- Power plant and mining operations
- Construction site inspection
- Search and rescue
- Hazardous environment assessment
- Disaster response and firefighting support
- Reconnaissance and tunnel inspection

Core Advantages of the Quadruped

All-terrain operation

Surmounts obstacles over 40 cm and full stair flights, navigates 45° inclines, and operates freely on unstructured ground — rubble, gravel, grass and mud.

All-weather durability

IP-rated protection sustains performance in dense smoke, toxic gas, heavy rain and hailstorm, across -20 °C to 55 °C.

Expandable interfaces

Ethernet ×2, USB Type-C ×2, and 12 V / 24 V DC power inputs for mission-specific payload integration.

Extended endurance

Up to 6 hours unloaded, 4 hours carrying a 30 kg payload, with optional autonomous docking and recharge.

Remote control & cloud

Integrated 5G and fusion navigation enable real-time remote operation and cloud-stored data for post-mission analysis.

Where Wheels Stop

Legged locomotion decouples the platform from the floor plan. Stairs, catwalks, cable trays, kerbs and rubble become routine — no rails, no ramps, no site modification.

$\leq 45^\circ$

Slope climbing angle

$\leq 50 \text{ cm}$

Obstacle surmounting height

$\leq 30 \text{ cm}$

Stair climbing height

$\leq 4 \text{ m/s}$

Maximum running speed



Sensor & Compute Suite

SENSING

- 16-line automotive-grade LiDAR
- HD camera + depth / stereo vision module
- Optional dual-spectrum thermal gimbal
- Auto-recharging dock connector

COMMUNICATIONS

- Wi-Fi 5 dual-band (2.4 / 5 GHz)
- Bluetooth 5.2 Low Energy
- Optional 4G / 5G and RTK module
- Self-organizing fusion navigation network

INTERFACES & POWER

- Ethernet RJ45 ×2, USB Type-C 3.1 Gen 2 ×2
- 12 V DC and 24 V DC power inputs
- 32 Ah high-capacity lithium-ion pack
- 250 Nm high-torque precision joint motors

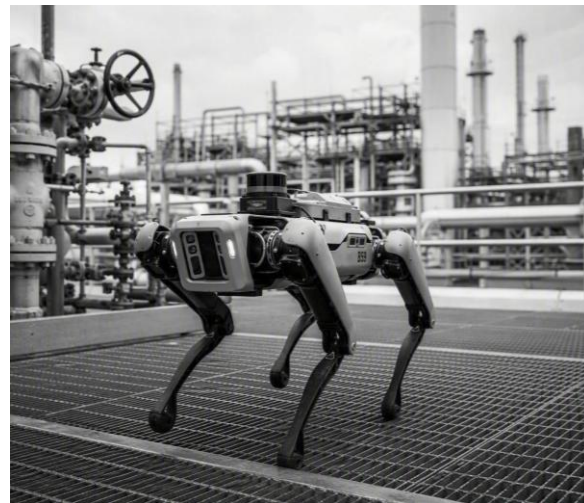
Model Line-Up at a Glance

	LINGRUI P1	M20 EXPLOSION-PROOF	A10 WHEEL-LEG
Positioning	Heavy-duty industrial inspection flagship	Class II Ex-rated for petrochemical and power	Medium-sized hybrid for light industrial
Max payload	≤ 120 kg (≤ 40 kg continuous)	≤ 40 kg working load	20 kg working load
Max speed	≤ 4 m/s	1.2 m/s	6 m/s
Endurance	≤ 6 h	4 h	7 h
Protection rating	IP67	IP66 · Ex IIB T4 Gb	IP65
Best suited to	Large sites, heavy sensor stacks, swarm ops	Flammable and explosive atmospheres	Civilian, park, property and factory rounds

All three platforms accept the same modular payload family and connect to a single inspection and control platform.

Lingrui P1 — Basic Parameters

PARAMETER	SPECIFICATION
Maximum running speed	≤ 4 m/s
Maximum load capacity	≤ 120 kg
Continuous load capacity	≤ 40 kg
Maximum endurance time	≤ 6 h
Max stair climbing height	≤ 30 cm
Max slope climbing angle	$\leq 45^\circ$
Max obstacle surmounting height	≤ 50 cm
Protection rating	IP67
LiDAR	16-line automotive grade
Cameras	HD camera + depth / stereo vision module
Wireless	Wi-Fi 5 dual-band · Bluetooth 5.2 LE
External interfaces	Ethernet RJ45 $\times 2$ · USB-C 3.1 Gen 2 $\times 2$
Power inputs	12 V DC $\times 1$ · 24 V DC $\times 1$
Compute core	Jetson Xavier NX class AI edge computer
Battery	32 Ah high-capacity lithium-ion pack
Joint actuation	250 Nm high-torque servo motors



The flagship chassis. Highest payload and the broadest interface set — the platform of choice when the sensor stack grows or a fleet operates as a swarm.

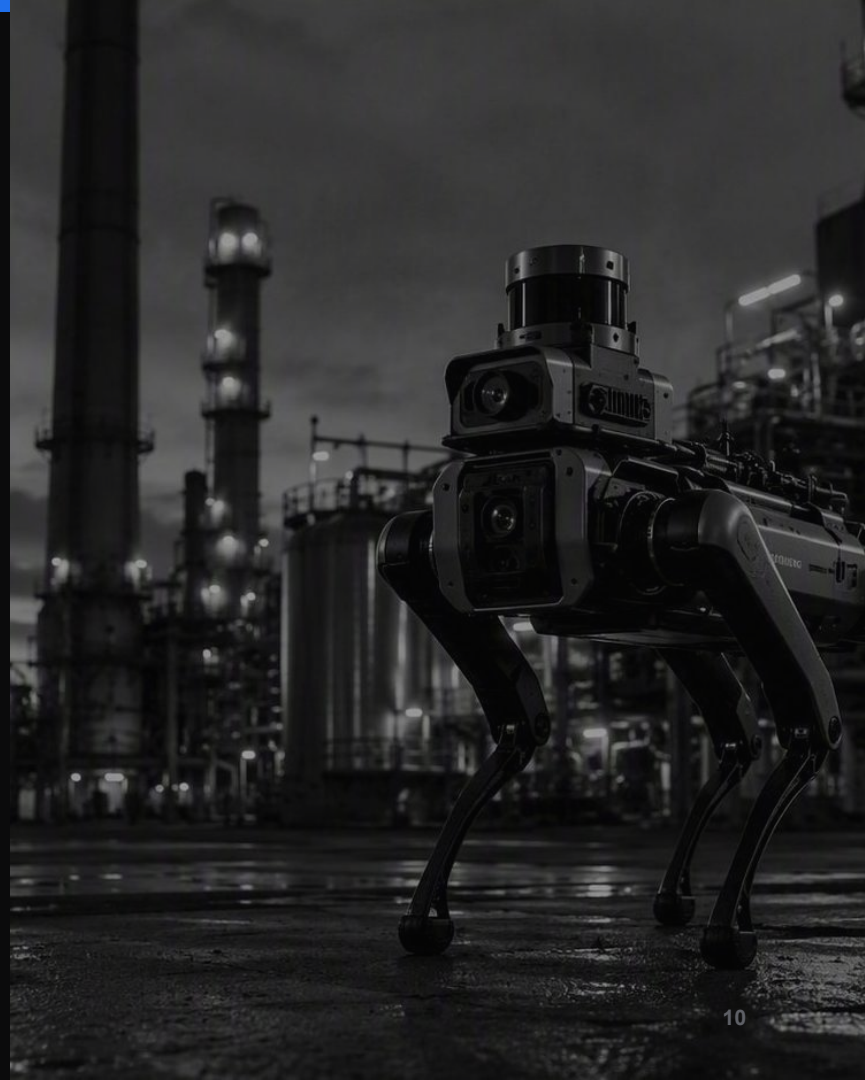
M20 Explosion-Proof Robot Dog

Class II explosion-proof equipment designed for high-risk environments such as power and petrochemical facilities. It replaces manual labour for routine inspection, equipment monitoring and emergency response — protecting production continuity and the people who run it.

High safety — Ex IIB T4 Gb standard with flameproof treatment applied to every key component.

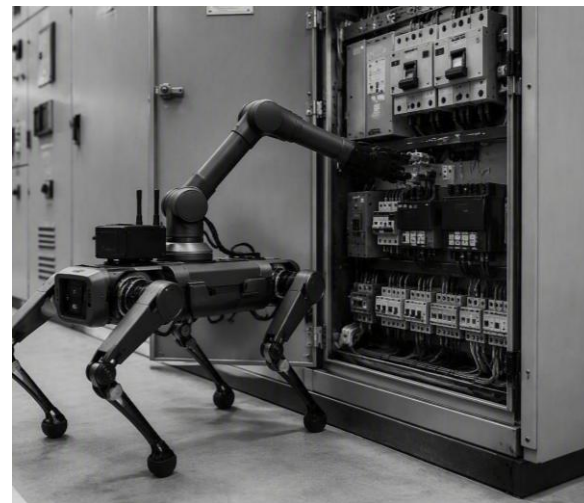
Risk reduction — Minimises personnel exposure in flammable and toxic atmospheres.

Efficiency — 24/7 uninterrupted inspection delivering more accurate data and broader coverage.



M20 Explosion-Proof — Parameter List

PARAMETER	SPECIFICATION
Standing dimensions	1200 mm × 610 mm × 700 mm (L × W × H)
Weight	100 kg (with battery)
Working load	≤ 40 kg
Endurance time	4 h
Maximum speed	1.2 m/s
Max obstacle-crossing angle	60°
Continuous stair-climbing height	20 cm
Max obstacle-climbing height	40 cm
Protection rating	IP66
Explosion-proof rating	Ex IIB T4 Gb
Operating temperature	-20 °C to 55 °C
LiDAR	2 units
Depth camera	2 units
Wireless & attitude	Wi-Fi / Bluetooth / IMU — standard configuration



Specified where a spark is not an option: refineries, tank farms, gas processing, chemical plant and power generation.

Parameters as published by the manufacturer. Final configuration confirmed at order.

A10 Universal Wheel-Leg Robot Dog

A medium-sized wheel-leg hybrid built for general civilian and light industrial duty. It takes over routine inspections, point check-ins, image reporting and simple handling — lightweight unmanned operation at a lower entry cost.

Wheel-leg hybrid — Fast and quiet on paved roads, legged when the ground breaks up.

Uninterrupted endurance — Hot-swappable batteries keep the platform continuously on task.

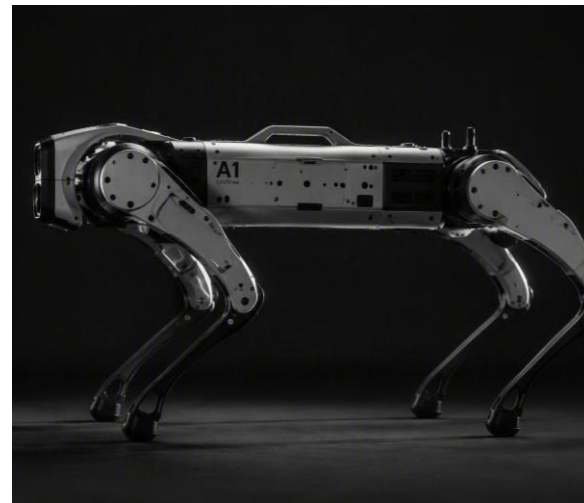
Full outdoor adaptation — IP65 protection sustains stable operation in rain and snow.

Light and easy to use — Suited to civilian, park, property and factory scenarios.



A10 Universal Wheel-Leg — Parameter List

PARAMETER	SPECIFICATION
Standing dimensions	850 mm × 472 mm × 570 mm (L × W × H)
Weight	35 kg (with battery)
Working load	20 kg
Endurance time	7 h
Maximum speed	6 m/s
Max obstacle-crossing angle	45°
Continuous stair-climbing height	25 cm
Max obstacle-climbing height	40 cm
Protection rating	IP65
Operating temperature	−20 °C to 60 °C
LIDAR	2 units
Depth camera	2 units
Wireless & attitude	Wi-Fi / Bluetooth / IMU — standard configuration
Battery handling	Hot-swappable pack for continuous operation



The fastest platform in the range at 6 m/s, and the longest endurance at 7 hours — ideal for large but benign patrol routes.

Parameters as published by the manufacturer. Final configuration confirmed at order.

Modular Add-Ons

COMMUNICATION & POSITIONING

- 4G / 5G module
- GPS / RTK module
- Remote communication link
- Indoor–outdoor positioning assistance

PERCEPTION TASK

- Temperature & humidity sensor
- Acoustic sensor · gas sensor
- Meter recognition
- Open flame detection
- Special gas concentration detection
- Transformer oil level detection
- Indicator and valve status detection

LINKED TASK

- Robotic manipulator arm
- Retractable storage mechanism
- Telescoping mechanism
- Load transport
- Complex-angle access

EXECUTION TASK

- Door / elevator control module
- Switch actuation
- Scenario-specific linked command communication
- Custom end-effectors

Hardware family: Robotic Arm · Infrared Thermal Imaging Night-Vision Camera · RTK Module · Onboard Quad-Module · Fusion Navigation Self-Organizing Network

Four Layers, One Command Loop

01

ROBOT PLATFORM

- Pre-programmed motion AI
- Locomotion & inspection training algorithms
- Contour imaging & scanning
- Laser navigation
- Swarm control

02

TASK MANAGEMENT

- Task planning & scheduling
- Fault localization
- Multi-sensor redundancy
- Sensor self-diagnostics
- Remote control

03

BUSINESS MANAGEMENT

- Event management strategies
- Proactive message push
- Anomaly handling workflows
- Status monitoring
- Report generation

04

AI ALGORITHM LAYER

- Latest AI algorithm updates
- Autonomous task allocation
- Physical–digital twin integration
- Data analysis
- Continuous model improvement

Field robots, the dispatching centre and the backend business system operate as one closed loop — from task issue to report generation.

Smart Inspection & Control Platform

$\geq 95\%$

Inspection recognition
accuracy rate

$\leq 3 \text{ cm}$

Inspection point
positioning accuracy

$\geq 95\%$

All-terrain coverage
of the inspection zone

60%+

Operational efficiency gain
vs. manual workflows

All-terrain adaptation

Quadruped navigation technology enables all-weather operation and full-terrain mobility across steam, gravel and stairs.

Intelligent recognition

Edge analytics deliver high-resolution device images, thermal imaging video with temperature metrics and structured data over low-latency transmission.

Safety & efficiency

Remote operation eliminates on-site safety hazards for manual inspection while lifting operational efficiency by 60%+.

Convenience & sustainability

Automated meter reading, AI-generated inspection reports and cloud-based data dashboards streamline management review.

The Inspection Workflow

01

Task receiving

Inspection routes, checkpoints and tasks are configured on the backend platform against target areas and requirements.

02

Path planning

The system plans the optimal route according to equipment distribution and operational priorities.

03

Autonomous navigation

The robot navigates using environmental perception data, avoiding obstacles and reaching each checkpoint precisely.

04

Task execution

Inspections are performed along the planned route, collecting and transmitting data to the backend in real time.

05

Anomaly detection

The backend platform analyses received data to identify abnormalities such as overheating or leaks.

06

On-site handling

Predefined responses are triggered — alarms, photo documentation or emergency shutdown.

07

Inspection completion

The robot returns to its designated docking station or standby point.

08

Result processing

Operational reports are generated with trend analysis and maintenance recommendations.

Deployment Case Studies

01	Cangzhou Power Plant	Large thermal plant, Hebei. Dual-spectrum gimbal and LiDAR support autonomous all-weather rounds: equipment temperature monitoring, leakage detection, automatic meter reading and intelligent diagnosis of equipment status. Expected result — one robot replaces 3–4 inspection workers, raising efficiency by 200%.
02	Haiyan County Smart Grid	A "sea-land-air-ground" inspection system across 55.4 km of coastline in the Yangtze River Delta. Robot dog, drone and cloud command platform combine for geological inspection of transmission tower bases, high-definition line surveys and wind-farm monitoring.
03	Baowu Group Steel Plant	Safety production identification — helmet compliance, equipment meter recognition and temperature monitoring — with real-time voice broadcast reminders, anti-shake camera, ad-hoc networking and autonomous navigation between steel-frame structures.
04	Public Security EOD	The robot dog is equipped with a robotic arm and remotely operated by police officers to complete close reconnaissance, grasping and transfer of suspicious explosives — including narrow-space operation and multi-level obstacle climbing inside buildings.
05	Emergency Firefighting	Two customised models: a firefighting variant with water cannon, gas sensors and optical dual-spectrum camera for search, rescue and hazard removal in enclosed spaces; and a four-in-one fire rescue robot with searchlights, real-time voice broadcast and audio reception.



Let's Scope Your Deployment

INDUSTRIES WE SERVE

- Offshore oil & gas
- Offshore wind & renewables
- Marine construction
- Ports & harbours
- Defence & homeland security
- Government agencies
- Mining · utilities · infrastructure
- Water & wastewater · aquaculture

OUR SERVICES

- Technology consulting
- Engineering & system integration
- Equipment supply
- Installation & commissioning
- Operations & maintenance
- Technical training & lifecycle support
- Spare parts & project management
- 24/7 technical support

CONTACT US

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Engineering the Future Across Every Environment