

Puma M20 | Powered by EMOS



Product Overview

The Puma M20 is a heavy-duty, IP66-rated industrial quadruped designed for rugged environments and high-payload applications. By integrating the **EMOS (Embodied OS)**, this robust platform becomes an intelligent Physical AI Agent capable of long-range autonomous patrol, complex inspection, and outdoor logistics. It combines superior environmental adaptability with intelligent reasoning and GPU-accelerated navigation.

1. System Specifications

Physical & Power	Value
Dimensions (Standing)	820mm × 430mm × 570mm
Total Weight	33 kg (Including Battery)
Battery Endurance	3.0h (Unloaded) / 2.5h (15kg Load)
Max Range	15 km (Unloaded)
Protection Rating	IP66 (Water & Dust Proof)
Operating Temperature	-20°C ~ 55°C
External Interfaces	72V Power Input, Gigabit Ethernet

Locomotion & Dynamics	Value
Rated Payload Capacity	15 kg
Max. Load Capacity	50 kg
Max Slope Gradient	45°

Obstacle Clearance	25 cm (Continuous Stair) / 80 cm (Single Step)
Operating Speed	2.0 m/s (Standard) / 5.0 m/s (Lab Max)

2. Perception & Compute

Component	Specification
Dual LiDAR System	2× 96-Line 3D LiDARs (360°×90° FOV, ~860,000 pts/s)
Visual Feed	2× Wide-Angle Industrial Cameras
Data Transmission	RF Image Transmission System
Core Computing	3× Dual Octa-core 64-bit Industrial Processors (Distributed Architecture, 16GB RAM + 128GB Storage per node)
Lighting	Front/Rear Bidirectional Lighting

3. Autonomy & Intelligence Capabilities (Powered by EMOS)

The system software stack transforms raw sensor data into actionable physical intelligence. These capabilities are native to the bundled EMOS runtime.

Navigation & Mobility

- **Architecture:** GPU-accelerated, event-driven navigation stack (*Kompass*).
- **Modes:** Supports both Semantic Map-based planning and Map-less "follow" modes.
- **Dynamic Obstacle Avoidance:** Real-time dynamic path replanning using fused Dual-LiDAR data, with highly responsive "slow down" and "emergency stopping" behaviors.
- **Self-Healing:** Event-driven recovery maneuvers (e.g., auto-unblocking logic) to handle navigation failures without human intervention.

Cognitive Reasoning

- **Multi-Modal Intelligence:** Native support for LLMs and VLMs allows the robot to "see" and "understand" natural language commands (e.g., "*Inspect the perimeter fence*").
- **Semantic Memory:** Spatio-temporal mapping allows the robot to remember object locations and context for recall during its operation.
- **Hybrid Inference:** Routing of inference tasks between on-board Edge Compute (for speed) and Cloud/Local Network (for complex reasoning).

4. Application Ecosystem & Development

EMOS standardizes the development lifecycle, allowing users to focus on business logic rather than low-level control.

- **Pre-Made Apps:** Utilize pre-made apps as templates for use-case specific automation, reducing time-to-deployment from months to days.
 - **Application Framework:** Develop custom automation behaviors as "Recipes" (Apps), written as simple Python scripts using the high-level EMOS API.
 - **Compatibility:** Fully compatible with ROS2 middleware and standard Linux tools, ensuring seamless integration with legacy robotic stacks and third-party drivers.
 - **User Interface:** Web Dashboard automatically generated from active Apps; requires no frontend development.
 - **Interoperability:** Standard web-component widgets for integration into external Fleet Management Systems (FMS) or other Control Center software.
 - **Software Support:** Comprehensive developer resources including extensive documentation, step-by-step tutorials, and direct online support access to dedicated EMOS technical experts.
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5. Software License Configurations

The robot hardware is sold with the **Expert License** as standard. Upgrade options are available for fleet integrators and enterprise deployments.

License Tier	Target Audience	Key Features
Expert License <i>(Standard Bundle)</i>	Developers, R&D, Single-Robot Prototyping	<ul style="list-style-type: none">• Commercial Use: Full one-time license.• App Access: Full access to automation "Recipe" library and UI templates.• Updates: Lifetime free software updates.• Support: 6-months professional support.
Pro License <i>(Upgrade Option)</i>	Service Providers, Small Fleets	<ul style="list-style-type: none">• All Expert Features plus:• Integration Hooks: Third-party software hooks.• Deployment Report: Infrastructure design (Edge vs Cloud), parameter tuning, and health baselines.
Enterprise License <i>(Custom)</i>	Large-Scale Industrial Infrastructure	<ul style="list-style-type: none">• Custom Features: Tailored to project requirements.• Pricing: Project-based custom engagement.