

Industrial-Grade Self-Evolving Embodied AI Robot

Phi-Bot X1



Product Overview

Phi-Bot X1 is an industrial-grade self-evolving embodied AI robot developed by Sunrising AI for flexible industrial manufacturing scenarios. It integrates high-precision dual-arm, waist with lift, forward tilt, and twist, a swerve drive omnidirectional chassis, multiple flexible end effectors, and edge AI computing power. Phi-Bot X1 possesses the embodied capabilities required for intelligent patrol inspection, quality inspection, high-precision complex assembly, and material handling in unstructured environments.

Mechanical Specifications & Physical Parameters

Item	Specification	Remarks
Overall Height	160 cm ~ 200 cm	Height adjustable
Overall Width	55 cm	---
Overall Weight	165 kg	Includes battery pack; excludes end effectors
Total Degrees of Freedom	27 DoF (Total)	Whole-body control
DoF Distribution	Single arm 7 DoF × 2 Waist 3 DoF Chassis 8 DoF Head 2 DoF	---
Arm Span	220 cm	---
Vertical Working Range	0~250 cm	---

Manipulation Performance & Robotic Arm Parameters

The system adopts a dual-arm collaborative configuration, specifically optimized for flexible, high-precision operations

- ◆ **Single-Arm Payload:** Rated 6 kg
- ◆ **Control Mode:** Hybrid Force-Position Control
- ◆ **Positioning Repeatability:** ±0.05 mm
- ◆ **Force Control Capacity:** Force repeatability ≤ 0.15 N, torque repeatability ≤ 0.05 N·m, full-joint torque feedback
- ◆ **Control Frequency:** Full-joint coordinated control at 1 kHz
- ◆ **Extreme Safety:** Supports compliant control and collision detection, ensuring human-robot interaction safety
- ◆ **Arm End-Effector Interface:** Equipped with a universal flange, allowing end effectors to be swapped based on specific tasks

Mobility & Navigation

Designed for narrow factory aisles and complex floor conditions, the mobility and navigation system has been precision-optimized for flexible, high-precision operations

- ◆ **Motion Mode:** 4-wheel swerve drive, supporting omnidirectional movement, in-place rotation, crab-like walking, and other flexible mobility modes
- ◆ **Positioning Accuracy:** ±10 mm
- ◆ **Maximum Speed:** 1.5 m/s
- ◆ **Obstacle Clearance Ability:** Vertical obstacle height up to 2 cm
- ◆ **Gradeability:** 10°
- ◆ **Navigation Method:** 3D SLAM Navigation
- ◆ **Obstacle Avoidance Perception:** 3D LiDAR, vision cameras, and ultrasonic sensors

Perception & Compute Platform

The system is equipped with a high-performance edge computing unit, enabling large models and vision algorithms to run without an external IPC

- ◆ **Sensors:** 3D LiDAR × 3, RGB-D Camera × 3(x5 optional), Stereo Camera × 1, Ultrasonic Sensors × 8
- ◆ **Compute Unit:** NVIDIA Jetson AGX Orin 64GB (275 TOPS)
- ◆ **Communication Interfaces:**
 - WiFi
 - 1/10 GbE port

Electrical & Endurance

- ◆ **Battery Specifications:** 48V / 17.2Ah * 2 (dual batteries)
- ◆ **Typical Runtime:** 4 hours (depending on workload), sustained by 1-minute hot-swap battery exchange
- ◆ **Charging & Battery Swapping:** Wired charging, dual-battery design, supports hot-swappable rapid battery exchange, optional independent charging dock

Teleoperation Device(Optional)

- ◆ **High-Precision Control:** Seamless position/impedance mode switching; 500 Hz control and sampling frequency
- ◆ **VR Teleoperation:** Immersive passthrough control with multi-mode switching and force feedback
- ◆ **Multimodal Data Acquisition:** Synchronized video and robotic arm data alignment; supports LeRobot training format conversion

Contact Us



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