

THE GATEWAY TO HUMANOID RL RESEARCH

# TRON1

BIPED ROBOT EMPOWER INNOVATORS



Modular Foot-End: Get 3 Modes with 1 Purchase

PRODUCT  
OVERVIEW

# TRON1

LimX Dynamics' TRON 1 is the first multi-modal biped robot, serving as a R&D platform that supports innovation in both robotic hardware and software across various disciplines and fields. TRON 1 features a unique and innovative "Three-In-One" modular design for multi-modal algorithm development, equipped with a fully open SDK and hardware interfaces to unlock the hardware's potential to meet the demands of high-complexity verification and validation (V&V). TRON 1 supports full-process development with Python, and one-click Sim2Real deployment, significantly accelerating reinforcement learning research. Boasting a wide range of practical ports, TRON 1 allows for various expansion accessories to maximize its applications in diverse research areas. The goal is to empower innovators in academic research, new technology development, industrial exploration, educational training, and more. In the AI era of general-purpose robots, TRON 1 serves as the best onboarding platform for humanoid robot motion control and a must-have testbed for Embodied Intelligence research.

INNOVATIVE  
CONFIGURATIONS

SPIN UP  
RL RESEARCH

SUPPORTS CROSS-FIELD  
RESEARCH

## "Three-in-One" Modular Foot-end Structure

TRON 1 features a modular design that allows for seamless switching among three different foot end configurations. With automatic hardware recognition and software adaptation, it provides a flexible and versatile platform for research.

WHEELED

UNLEASH THE FULL POTENTIAL FOR  
ALL-TERRAIN MOBILITY



SOLE

STAND AND WALK IN HUMANOID  
LEGGED FORM FACTOR

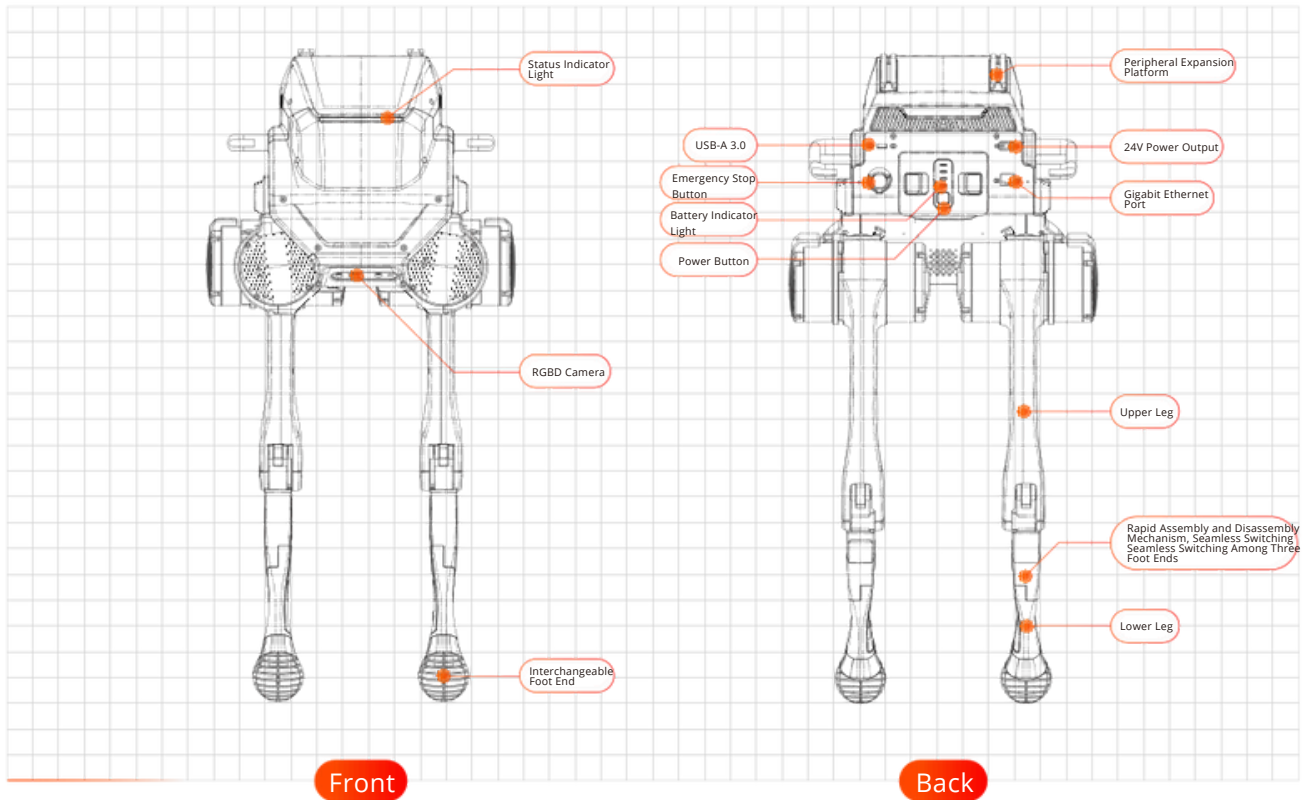


POINT-FOOT

EASY TO CONTROL IN THE SIMPLEST  
LEGGED FORM FACTOR

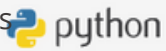


## Diagram



## Spin up RL Research

Compatible with full-process development in Python, C++ not required



Comprehensive URDF to minimize the Sim2Real gap



Detailed user manual, professional secondary development guide and code examples



Mainstream Simulation Platforms NVIDIA Isaac, Mujoco, Gazebo, etc.



## Practical Peripheral Expansion Ports for Diverse Research Goals



Radars



Robotic Arm



Camera



Dual-Spectrum Gimbal



# Product Specifications

Category	Details	Std. Ed.	EDU Ed.
Mechanical Parameters	Dimensions	≤392mm x 420mm x 845mm	≤392mm x 420mm x 845mm
	Material	Aluminum Alloy + Industrial Plastic	Aluminum Alloy + Industrial Plastic
	Net Weight	≤20kg	≤20kg
Battery Parameters	Battery Supply Voltage	48V	48V
	Maximum Battery Power	1000W	1000W
	Battery Swapping	☑	☑
	Battery Type	Ternary Lithium	Ternary Lithium
	Battery Capacity	240Wh (48v/5Ah)	240Wh (48v/5Ah)
	Battery Range	≥2h (At Rated Operational Conditions)	≥2h (At Rated Operational Conditions)
	Charging Methods	Battery Charging Quick Battery Swap	Battery Charging Quick Battery Swap
	Charger	Battery Charging Dock	Battery Charging Dock
	Charging Time	<1h (20%-80%) 1.5h (100%)	<1h (20%-80%) 1.5h (100%)
	Load Capacity	10kg (Maximum 15kg)	10kg (Maximum 15kg)
Performance Parameters	Movement Speed	<ul style="list-style-type: none"> <li>Point-Foot: &lt;1m/s</li> <li>Sole: &lt;1m/s</li> <li>Wheeled ≥5m/s</li> </ul>	<ul style="list-style-type: none"> <li>Point-Foot: &lt;1m/s</li> <li>Sole: &lt;1m/s</li> <li>Wheeled ≥5m/s</li> </ul>
	Maximum Climbing Angle	≥15°	≥15°
	Maximum Obstacle Height Limitation	15cm	15cm
	Computer Specification	12th Gen i3 / 16GB RAM / 512GB (CPU/Memory/Storage)	12th Gen i3 / 16GB RAM / 512GB (CPU/Memory/Storage)
	Operating Environment	-5°C to 40°C Operates in favorable weather conditions	-5°C to 40°C Operates in favorable weather conditions
Actuator Parameters	Rated Voltage (V)	48V	48V
	Rated Torque (Nm)	30Nm	30Nm
	Peak Torque (Nm)	80Nm	80Nm
	Peak Motor Speed (rad/s)	15rad/s	15rad/s

Category	Details	Std. Ed.	EDU Ed.
Sensor Configuration	RGBD Camera	—	☑ (Optional)
	IMU	☑	☑ (IMU Data Access for Developers)
Extensibility	Peripheral Expansion Ports	—	<ul style="list-style-type: none"> <li>1*USB3.0</li> <li>1*GbE</li> </ul>
	Peripheral Power Supply Port	—	24V, Output Power: 100W (Peak 200W)
	Peripheral Mounting Point	☑	☑
Developer Tools	Handheld Remote Controller	1 Pcs	1 Pcs
	Remote Controller Communication Range	50m	50m
	Software Upgrade	Supported	Supported
	Remote E-Stop	☑	☑
	E-Stop Button	☑	☑
	Secondary Development	—	Supported
	SDK	—	☑
Foot End Extension	Data Visualization Tools	—	☑
	Data Recording and Playback	—	☑
	Joint Control Algorithm	—	☑
	Simulation Platforms	—	☑
Others	Point-Foot	Four-directional Movement, Turning, In-place Stepping, Squatting Up and Down In-place	Four-directional Movement, Turning, In-place Stepping, Squatting Up and Down In-place
	Sole	Four-directional Movement, Turning, In-place Stepping, Squatting Up and Down In-place	Four-directional Movement, Turning, In-place Stepping, Squatting Up and Down In-place
	Wheeled	Four-directional Movement, Differential Steering, Turning, In-place Stepping, Static Standing, Squatting Up and Down In-place	Four-directional Movement, Differential Steering, Turning, In-place Stepping, Squatting Up and Down In-place
Others	Spare Battery	1 (Optional)	1 (Optional)
	RGBD Camera	—	1 (Optional)
	Roll Cage	1 (Optional)	1 (Optional)
	Accessories: Point-Foot	1 Pair	1 Pair (Optional)
	Accessories: Wheeled	1 Pair	1 Pair (Optional)
Accessories: Sole	1 Pair	1 Pair (Optional)	