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## TRON 2 Technical Specifications

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### Mechanical Parameters

- **Material:** Aluminum Alloy, Plastic
- **Degrees of Freedom (DOF) per Leg:** 5
- **Degrees of Freedom (DOF) per Arm:** 7
- **Head Degrees of Freedom (DOF):** 2

### Standard Functions

- **Secondary Development:** Supported
- **Bipedal / Wheel-Leg Remote Control:** 4-way movement, steering, static standing, height adjustment (crouch/stand), fall recovery, lift-off detection
- **Dual-Arm Teleoperation:** VR equipment (Oculus Quest 3)
- **Data Logging:** Supported
- **Dual-Arm Safety Boundary Protection:** Supported

### Dual-Arm Performance

- **Max End-Effector Payload (Arm Extended):** 5 kg (11.0 lbs)
- **Rated End-Effector Payload:** 3 kg (6.6 lbs)
- **Max End-Effector Speed:** 5 m/s (16.4 ft/s)
- **Max End-Effector Acceleration:** 36 m/s<sup>2</sup> (118.1 ft/s<sup>2</sup>)
- **Repeatability:** ±0.5 mm (±0.02 in)
- **Teleoperation Latency:** 100 ms (0.1 sec)
- **End-Effector:** Gripper / Dexterous Hand
- **Gripping Force:** 20 N (4.5 lbf)
- **Max Gripper Stroke:** 85 mm (3.35 in)

## Bipedal / Wheel-Leg Mobility

### Max Speed:

- **Bipedal:** 2–3 m/s (6.6–9.8 ft/s)
- **Wheel-Leg:** 3–5 m/s (9.8–16.4 ft/s)

### Max Incline:

- **Bipedal:** 15°
- **Wheel-Leg:** 30°

### Max Step Height:

- 20 cm (7.9 in)

### Max Payload:

- **Level Ground:** 30 kg (66.1 lbs)
- **Stairs:** 20 kg (44.1 lbs)

## Electrical Parameters

- **Battery Output Voltage:** 46.8 V
- **Max Battery Power:** 2800 W (2.8 kW / ~3.75 hp)
- **Battery Type:** Ternary Lithium Battery, 9 Ah (Swappable)
- **Charging Power:** 542 W (0.54 kW)
- **Charging Input:** 100–240 V / 8 A
- **Charging Output:** 54.275 V / 10 A
- **Charging Time:**
  - 20% → 80%: 30 minutes
  - 20% → 100%: 54 minutes

## Standard Sensors

- **Waist:** RGB-D Camera
- **IMU:** Inertial Measurement Unit
- **Head:** RGB-D Camera
- **Wrist:** RGB-D Camera

## Communication Interfaces (Standard)

- **Ethernet:** ×1
- **USB 3.0:** ×1
- **RS485:** ×1
- **EtherCAT:** ×2

## Power Supply Interfaces (Standard)

- **External Power Input:** ×1
- **12V Output:** ×1
- **24V Output:** ×1
- **48V Output:** ×1

## Computing Module

- **CPU:** 11th Gen Intel® Core™ i7-1165G7 @ 2.80 GHz
- **Storage:** 2 TB
- **External Interfaces:** 4 × Ethernet, 4 × USB 3.0, 1 × 24V Input, 1 × 12V Output

## Software & Developer Tools (Standard)

- **SDK:** Python, C++
- **Management:** Robot Management Platform
- **Data:** Data Platform
- **Simulation:** Simulation Platform
- **OS Compatibility:** ROS1 / ROS2