## Product Highlights

**Natural Interaction**
A microphone array, speaker, interactive display, light effects and a head touch sensor let people interact by voice, gesture and touch

**Full Perception**
3D LiDAR, an RGB-D camera, front dual RGB cameras and a rear RGB camera give the robot a detailed view of its environment

**On-Board AI Computing**
A dedicated 157 TOPS computing unit runs perception and development workloads on the robot



# DLR H-Hapi
# Humanoid Robot

## Features

### Human-Like Movement

- 31 active degrees of freedom
- 7 degrees of freedom in each arm, with wrists
- 3 degrees of freedom in the waist: rotation, pitch and roll
- Knee peak torque of 120 N·m
- Walking speed up to 2 m/s

### Perception

- 3D LiDAR and RGB-D camera
- Interactive, front dual and rear RGB cameras
- Head touch sensor

### Power

- Approximately 500 Wh battery
- Approximately 2 hours of continuous walking at 0.5 m/s
- Direct charging or battery swap, 1.5 hours or less to charge

### Connectivity and Development

- Wi-Fi, Bluetooth, a 4G/5G module and GPS
- Smart OTA upgrades
- Handheld remote controller and mobile app
- Secondary development supported

The DLR H-Hapi from D-Link Robotics is a 1.31 m humanoid robot made for places where people and technology meet. With 31 active degrees of freedom it walks, turns, bends and gestures with precise control of movement and posture. A full set of sensors, a voice system and an interactive display let it greet visitors, answer them and guide them.

## Movement and Dexterity

Each arm has 7 degrees of freedom, including the shoulder, upper arm, elbow and wrist joints. Each leg has 6, the waist has 3 and the head has 2. A knee peak torque of 120 N·m supports walking at up to 2 m/s in laboratory conditions, and typically at 0.8 m/s or less in everyday use. The arms carry up to 3 kg in specific postures.

## Perception and Interaction

A 3D LiDAR on the chest collects high-precision environment data in real time and outputs high-resolution point cloud data. An RGB-D camera, front dual RGB cameras and a rear RGB camera add to the view. The interactive RGB camera supports visual recognition and response when the robot works with people. A microphone array, a wireless microphone and a speaker handle voice. The head display shows more than 30 expressions.

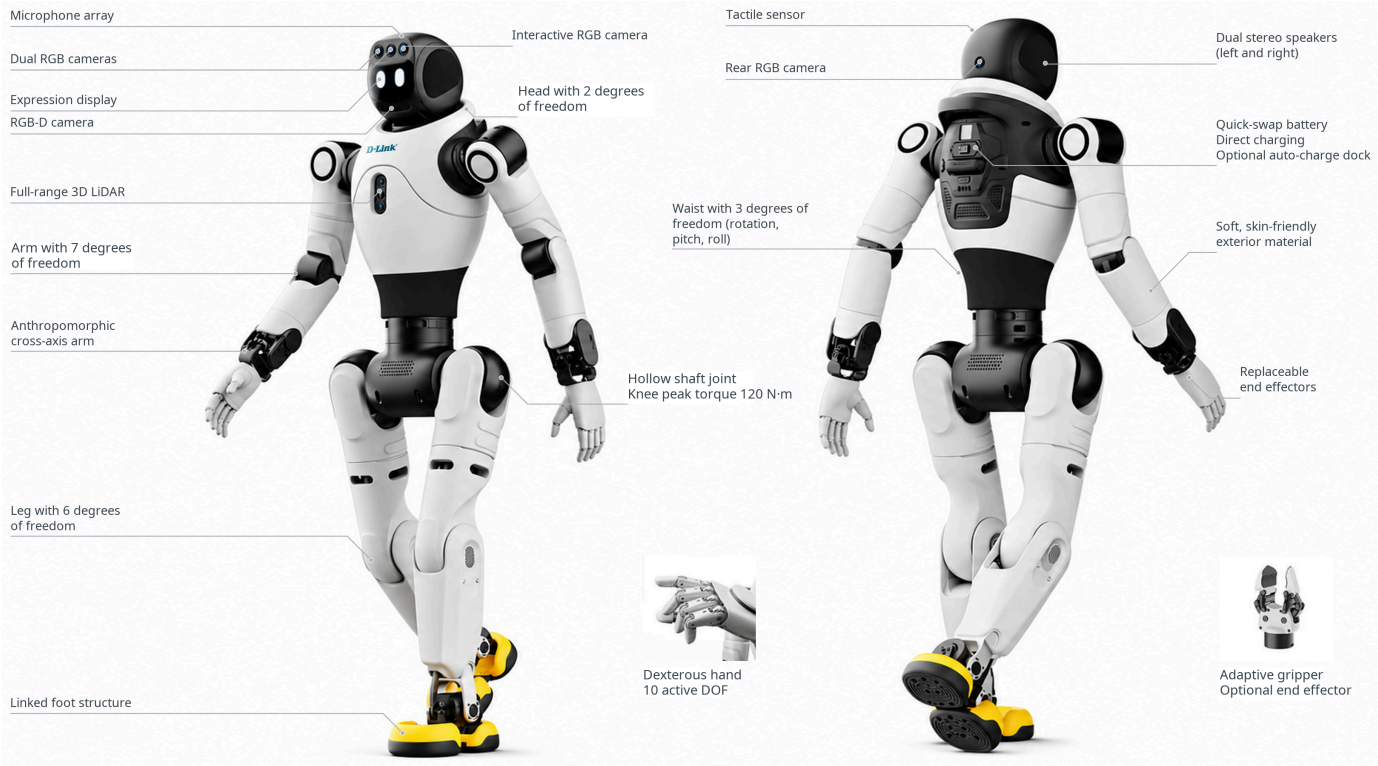
## Computing and Connectivity

Two main compute boards run the robot. A high-performance computing module with 157 TOPS of AI performance and 16 GB of memory is available for development. Wi-Fi, Bluetooth and a 4G/5G module keep the robot connected, and upgrades arrive over the air.

## Applications

Showroom and reception host, visitor guide, events and exhibitions, and education and research.

## Hardware Overview




## Technical Specifications

| Physical | |
|---|---|
| Dimensions (H x W x L) | 1310 x 460 x 210 mm (height approximately 1.31 m) |
| Weight | Approximately 39 kg |
| Active Degrees of Freedom | 31 in total: neck 2, each arm 7, waist 3, each leg 6 |
| Single Arm Span | 558 mm (without end effector) |
| Operating Temperature | -10 to 40 °C |
| **Performance** | |
| Knee Peak Torque | 120 N·m |

## Technical Specifications

| | |
|---|---|
| **Performance (continued)** | |
| Walking Speed | Up to 2 m/s (laboratory), typically 0.8 m/s or less |
| Payload | • Maximum in specific postures: 3 kg (without end effector)<br>• Full workspace: 1 kg or less (without end effector) |
| **Perception and Interaction** | |
| Cameras | • Interactive RGB camera, front dual RGB cameras, rear RGB camera<br>• RGB-D camera |
| Sensors | 3D LiDAR, head touch sensor |
| Voice | Microphone array, wireless microphone, speaker |
| Display | Interactive head display with more than 30 expressions, lighting effects |
| **Power** | |
| Battery Capacity | Approximately 500 Wh |
| Operating Time | Approximately 2 hours of continuous walking at 0.5 m/s |
| Charging Method | Direct charging or replaceable battery |
| Low-Battery Return | Automatic return to the charging point, threshold 5% to 30% |
| Charging Time | 1.5 hours or less (10% to 100%) |
| Charger | Input 100 to 220 V, output 54.6 V 10 A |
| **Computing and Connectivity** | |
| Main Compute Boards | 2 x RK3588 |
| High-Performance Computing | Orin NX 16 GB, 157 TOPS |
| Communication | Wi-Fi, Bluetooth, 4G/5G module, GPS |
| Hardware Interfaces | • Minimum 3 x USB Type-C, 2 x RJ45 Ethernet<br>• Power: 1 x 12 V/3 A, 1 x 48 V/5 A |
| Other | Smart OTA upgrade, handheld remote controller, mobile app, secondary development |
| **Ordering Information** | |
| DLR H-Hapi | Humanoid Robot |

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