

Technical specifications

Reachy 2 is a highly modular, open-source humanoid robot designed for research and education. It combines **advanced vision, audio,** and **actuator systems** for **cutting-edge AI interaction** and **teleoperation**.



GENERAL FEATURES

- **Hardware :**
 - Height : 136-166cm, Weight : 45kg
 - 7-DoF bio-inspired arm
 - ~3kg/6.6lbs payload arm
 - Parallel torque controlled gripper
 - Multiple cameras for stereo vision and depth perception
 - High-quality audio system for immersive teleoperation and AI-based interactions
 - Omnidirectional mobile base
- **Software :**
 - Safe Rust-based firmware
 - Low level control loop uses EtherCAT and runs at 500Hz
 - Core software based on ROS2
 - Python SDK
 - OTA software upgrades
 - Intuitive VR teleoperation with 3D vision and spatialized audio



PERCEPTION

Vision Module (Head)

RGB Cameras 2x IMX296 global shutter cameras

Depth FoV: H107° V91°

ToF Module

Between Reachy's eyes for depth measurement and 3D mapping of reachy's surroundings

Luxonis OAK-FFC ToF 33D sensor
Depth range: 0.20 to 5m

Depth resolution: up to 640x480 @45fps

Depth FoV: H90° V65°

Depth accuracy: <1%

Video Encoding

On-chip support for h264/h265 video encoding for real-time streaming

Vision Module (Torso)

RGB-D Camera

Fixed in Reachy's torso for accurate depth sensing in Reachy's manipulation working space

Orbecc Gemini 336 RGB-D camera

Depth range: 0.26 to 3m

Depth resolution: up to 1280x800 @30fps

Depth FoV: H90° V65°

Depth accuracy: <1.5%

Audio System

Microphones

2x Lavalier Go professional microphones fitted in Reachy's antennas for immersive stereo perception



INTERACTION

Audio System	Speakers	Custom-built with high-quality amplifier (located in the abdomen)
	Audio Interface	Rode AI-Micro for dual-channel audio

Expressions	Antennas	Reachy's motorised antennas for enhanced human-robot interaction
	Head	Expressive head powered by patented orbita system allowing the robot to mimick human's expression



MANIPULATION

Actuators	Orbita 3D	3-DOF parallel mechanisms used in Reachy's neck and wrists <ul style="list-style-type: none">- Maxon DC brushless motors (90W)- Nominal speed: 50rpm
	Orbita 2D	2-DOF patented parallel mechanisms used in Reachy's shoulders and elbows <ul style="list-style-type: none">- Maxon DC brushless motors (120W)- Nominal speed: 50rpm

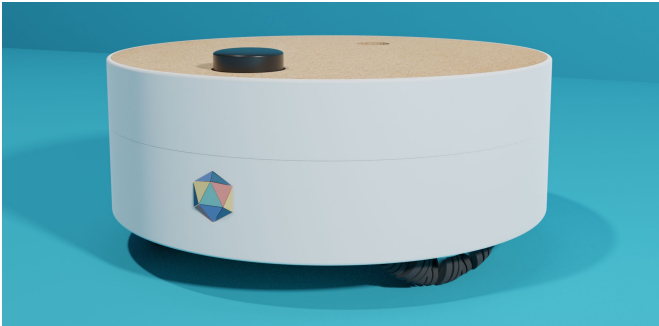
Gripper	Parallel gripper	- Dynamixel-based <ul style="list-style-type: none">- Torque control
	Alternative end-effector	Alternative grippers can be integrated (e.g. Aloha grippers, Inspire "Dexterous hand")

CONTROL

Computer system	Processing Unit	Solidrun Bedrock v3000 - fanless, CPU-based industrial PC
	AI Processing	AI processed on external hardware (e.g., cloud, user's GPU/TPU)
Usability	Quick startup Time	The robot becomes fully operational in about 1 minute and 30 seconds after powering on
	Docker	The Docker-based software stack is straightforward to install and use
Python SDK	Easy robot programming	
ROS2 Middleware	<ul style="list-style-type: none">- Exposes standard ROS2 interfaces (ROS2 control, TFs, states)- Simple access to kinematics services (DK and symbolic IK)	
VR Teleoperation	Control Reachy 2 via VR headset for immersive teleoperation: <ul style="list-style-type: none">- PC-Based App- Compatible Devices :<ul style="list-style-type: none">- Meta Quest 2 and 3 (Recommended)- HTC Vive and Valve Index	
Dashboard	<ul style="list-style-type: none">- OTA software upgrades- Service control- Real-time robot monitoring	
Visualization	Rviz (default), also supports FoxGlove and rerun.io.	
Simulation	Gazebo, MuJoCo (<i>in progress</i>)	



MOBILE BASE



- Dimension: 50*25cm
- Weight: 25kg
- Payload: 80kg

Sensors

Hall sensors & IMU on each wheel

RP Lidar S2 (30m radius distance, 32k measurements/s, 0.12° angle resolution, resistance to sunlight)

Wheels

3x Omnidirectional wheels

300W Max power

No-load speed: 210 rpm

Stall Torque: 13Nm - 13A

Rated load, speed and current : 5Nm, 115rpm, 5A

Battery

LiFePO₄, OlenBox M : 24V, 35Ah

19.5 x 17.2 x 13.4cm, 6.5kg

5 years warranty

Equipped with a BMS for safety

