

Bimanual Mobile Manipulator

# RB-Y1



## ■ Product introduction

Rainbow Robotics' newly released Bimanual Mobile Manipulator RB-Y1 is equipped with both arms with 7 degrees of freedom per arm and a single leg with 6 degrees of freedom.

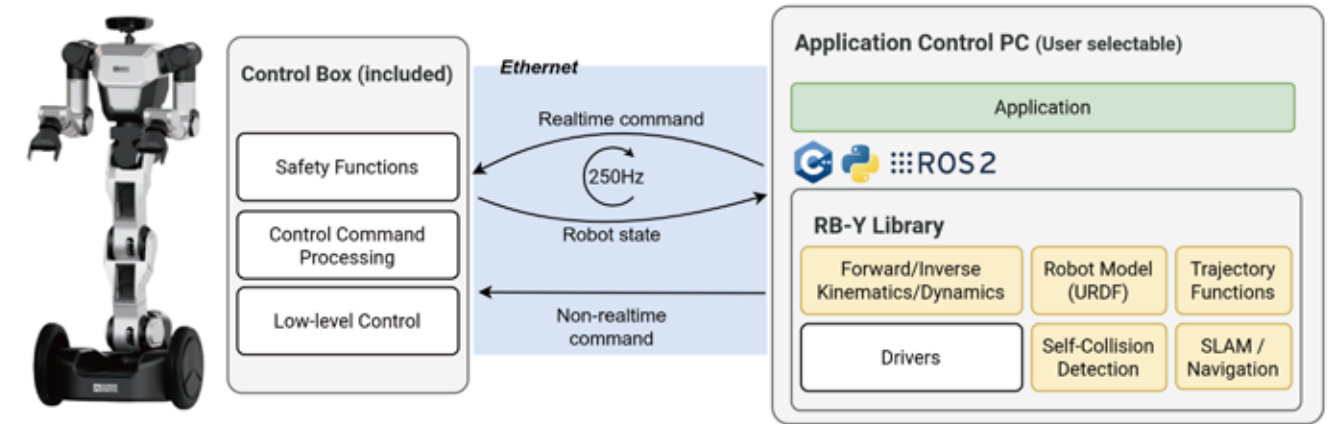
This humanoid-shaped robot is mounted on a wheel-type high-speed mobile platform. By solving the limitations of one-armed collaborative robots and fixed industrial robots at once, repetitive and precise work is possible in various industrial sites.

Rainbow Robotics has core robot technology accumulated while developing humanoid robots. Based on this technology, we developed RB-Y1, a bimanual mobile manipulator that is in line with the generative AI era. We also plan to provide a development environment or sensors for various AI solutions.

## ■ Technical specifications ※Specifications may change to improve performance.

Size	600 x 690 x 1,400mm (W x D x H)		
Battery Capacity	50V, 25Ah (1,270Wh)		
Degrees of Freedom	Total 24 DOF Arm 7 DOF x 2 Leg 6 DOF Gripper 1 DOF x 2 Wheel 1 DOF x 2		
Weight	Total: 131kg Upper body: 38kg (Arm 11kg x 2, Torso 16kg) Lower body: 42kg Mobile: 51kg		
Arm Payload	3kg (per arm)		
Arm Reach	600 (to wrist) + hand [mm]		
Joint Maximum Speed, Angle Range	Ankle roll	120°/s,	-20° ~ 20°
	Ankle pitch	120°/s,	-60° ~ 70°
	Knee	180°/s,	-140° ~ 45°
	Hip pitch	180°/s,	-45° ~ 90°
	Hip roll	180°/s,	-30° ~ 30°
	Hip yaw	180°/s,	-90° ~ 90°
	Shoulder pitch	180°/s,	-135° ~ 135°
	Shoulder roll	180°/s,	0° ~ 180°
	Shoulder yaw	180°/s,	-120° ~ 120°
	Elbow pitch	180°/s,	-150° ~ 0°
	Wrist yaw1	360°/s,	-360° ~ 360°
	Wrist pitch	360°/s,	-100° ~ 115°
	Wrist yaw2	360°/s,	-360° ~ 360°
Power Supply Voltage and Frequency	48 VDC		
Ambient Operating Temperature	40°C		
Safety Functions	Low Level Controller (Motor Controller) - Position Reference Continuity Error - Position Tracking Error - Temperature Error - Overcurrent Error - Communication Error  High Level Controller - Current Limit		
Arm Repeatability	< ±0.05mm		
Exterior Materials	Aluminum		
Mobile Operation Velocity	1.5m/s		

## ■ RB-Y1 Software



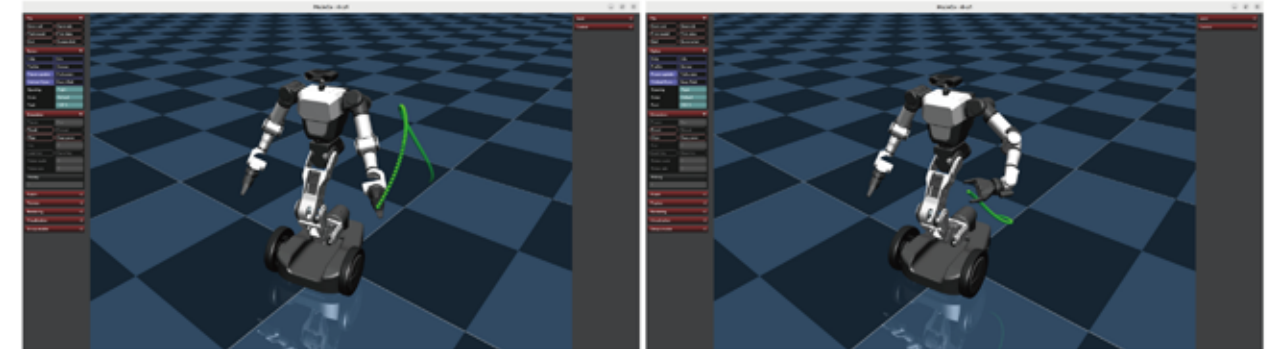
The software architecture allows full utilization of the robot's capabilities, covers various needs, and enables easy and fast application development with scalable software structures.

This software structure is composed as follows:

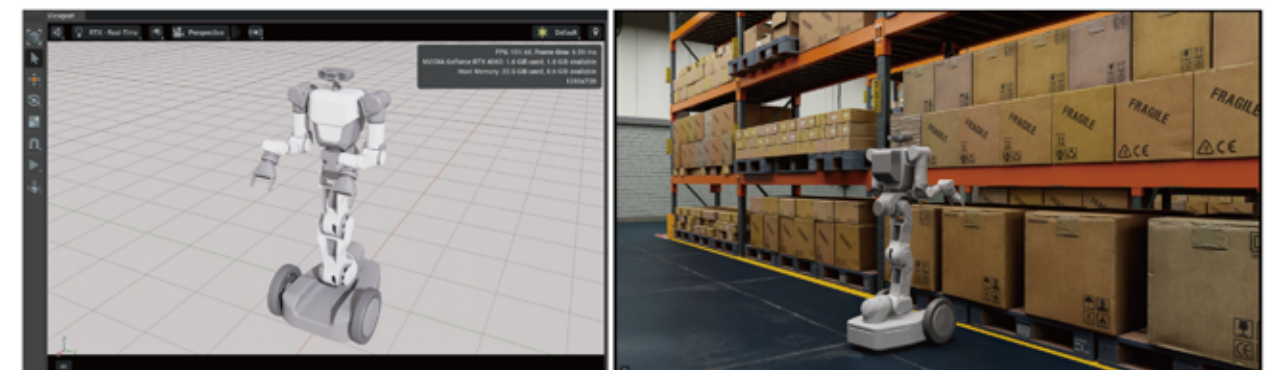
- Independent robot internal controllers (**control box**) guarantee stable performance/safety, and dualization with an **application control PC** for scalability.
- Non-realtime communication channels** for high-level commands (movej, movel, ...) that do not require real-time control and for robot settings.
- Realtime command channels** for low-level commands that require real-time response.
- A **robot model library** that allows for the building of simulation environments and provides access to the robot's kinematic and dynamic parameters
- Various libraries for implementing higher-level control (e.g., motion/task planner).

## ■ Simulation

Providing models (URDF/MJCF) for building simulation environment.



MuJoCo Simulator

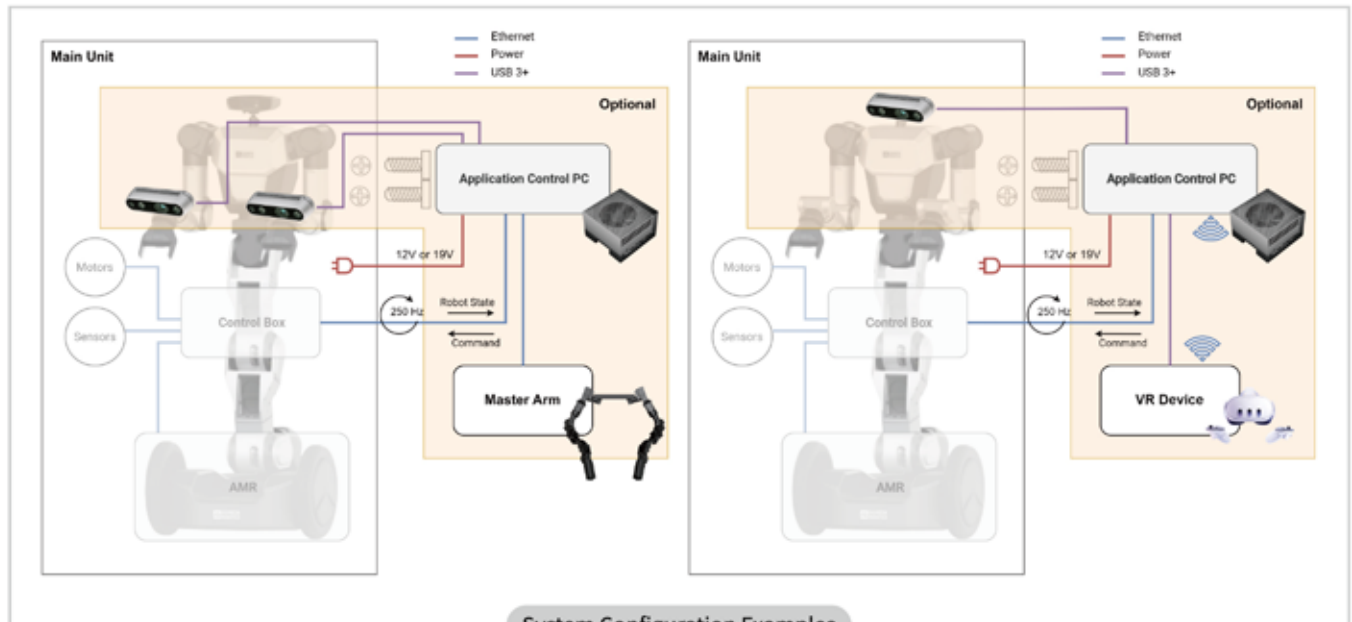


Isaac Sim

## ■ Data Collection via Master Device (Master Arm or VR Device)

Building a **data collection system** necessary for conducting machine learning research, including Learning from Demonstration (LfD)

- Master device
  - Master arm (available as an accessory)
  - VR Device (third party)
- Sample code for bi-(uni-)directional teleoperation



### Pre-Order: AI Professional Research Platform, Bimanual Mobile Manipulator RB-Y1

Period	May 8 2024 ~
Price	Research ver. <b>\$80,000</b> / Commercial ver. <b>\$120,000</b>
Delivery	Sequential delivery from October

If you would like to pre-order RB-Y1, please fill the information below through the QR code or send an e-mail to [rby@rainbow-robotics.com](mailto:rby@rainbow-robotics.com)

- 1) Name
- 2) Company / Institution
- 3) Quantity
- 4) Desired delivery date
- 5) E-mail
- 6) Phone number
- 7) Use (optional)

