

Dual-Arm Mobile Manipulator RB-Y1



Rainbow Robotics' newly released Dual-Arm 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 dual-arm 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	<table border="0"> <tr><td>Ankle roll</td><td>120°/s,</td><td>-20° ~ 20°</td></tr> <tr><td>Ankle pitch</td><td>120°/s,</td><td>-60° ~ 70°</td></tr> <tr><td>Knee</td><td>180°/s,</td><td>-140° ~ 45°</td></tr> <tr><td>Hip pitch</td><td>180°/s,</td><td>-45° ~ 90°</td></tr> <tr><td>Hip roll</td><td>180°/s,</td><td>-30° ~ 30°</td></tr> <tr><td>Hip yaw</td><td>180°/s,</td><td>-90° ~ 90°</td></tr> <tr><td>Shoulder pitch</td><td>180°/s,</td><td>-135° ~ 135°</td></tr> <tr><td>Shoulder roll</td><td>180°/s,</td><td>0° ~ 180°</td></tr> <tr><td>Shoulder yaw</td><td>180°/s,</td><td>-120° ~ 120°</td></tr> <tr><td>Elbow pitch</td><td>180°/s,</td><td>-150° ~ 0°</td></tr> <tr><td>Wrist yaw1</td><td>360°/s,</td><td>-360° ~ 360°</td></tr> <tr><td>Wrist pitch</td><td>360°/s,</td><td>-100° ~ 115°</td></tr> <tr><td>Wrist yaw2</td><td>360°/s,</td><td>-170° ~ 170°</td></tr> </table>	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,	-170° ~ 170°	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
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Power Supply Voltage and Frequency	48 VDC	Arm Repeatability	< ±0.05mm																																							
Exterior Materials	Aluminum	Ambient Operating Temperature	40°C																																							
		Mobile Operation Velocity	1.5m/s																																							

■ Dimensions

Overall

Key dimensions: 1470 (total height), 662.62 (base width), 505 (base width), 350 (arm length), 140° (shoulder angle), 566.67 (torso width), 440 (torso width), 276.100 (torso height), 256 (torso height), 101 (base height), 353 (base width), 531 (base width), 580 (base width).

Backpack

*EXT POWER: 24/12/5V, 8A

Wrist options

Standard: 108.7 mm
Gripper: 195.4 mm
FT Sensor & Gripper: 227.8 mm

Tool flange

8 poles I/O Connector A FT Sensor (F)
 1 Din 1
 2 Din 0
 3 SV
 4 Dout 1
 5 Dout 0
 6 CAN L
 7 CAN H
 8 GND

Color coding:
 1 = White
 2 = Brown
 3 = Green
 4 = Yellow
 5 = Grey
 6 = Pink
 7 = Blue
 8 = Red

I/O Connector B Gripper (M)
 1 BYPASS 0
 2 BYPASS 1
 3 BYPASS 2
 4 BYPASS 3
 5 24V
 6 BYPASS 4
 7 BYPASS 5
 8 GND

Gripper

Stroke : 100mm
 Finger movement speed : 40mm/s
 Weight : 530g
 Size(L x W x H) : 126 x 55 x 133 mm

*Dimensions are in millimeters (mm).

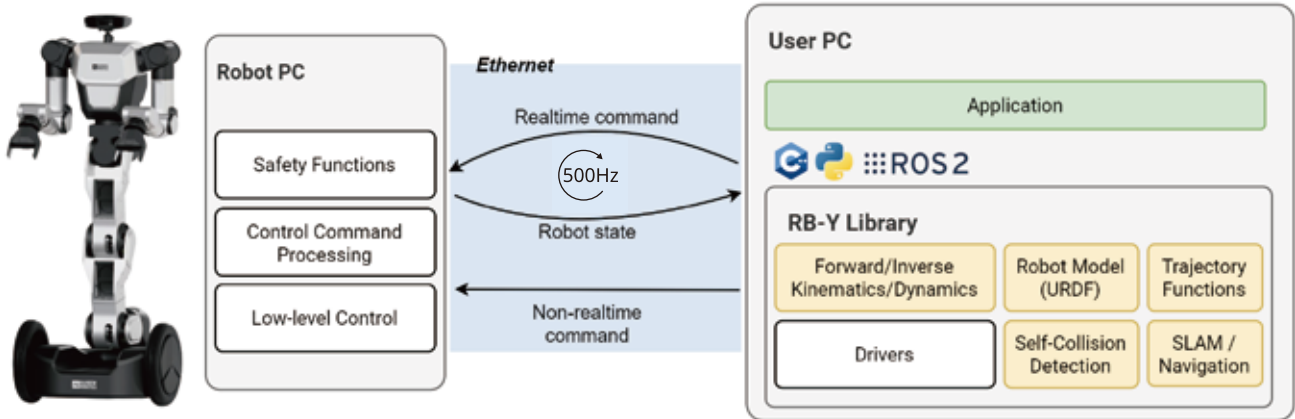
■ Master Arm

Master Arm is a teaching device for RB-Y1 which has multiple degrees of freedom. It's a device that can create various and sophisticated manipulation of RB-Y1. Through using this device, you can easily obtain the motion data set needed for imitation learning.

Size	350 x 100 x 600mm (W x D x H)
Degrees of Freedom	Total: 14 DOF Shoulder: 3 DOF x 2 Elbow: 1 DOF x 2 Wrist: 3 DOF x 2
Weight	3.86kg
Operating Range	Shoulder Pitch -360° ~ 360° Shoulder Roll -146° ~ 8° Shoulder Yaw -155° ~ 155° Elbow -180° ~ 6° Wrist Yaw1 -155° ~ 155° Wrist Pitch -137° ~ 123° Wrist Yaw2 -155° ~ 155°
Actuator	Shoulder: XM540-W150-R Others: XM430-W120-R
Input Voltage	12 VDC
Interface	RS-485



■ RB-Y1 Software



Based on RB-Y1's excellent performance and safety, RB-Y1 has a flexible and scalable structure that allows the system to be quickly and easily configured to meet various customer needs. The RB-Y1 software architecture is structured as follows.

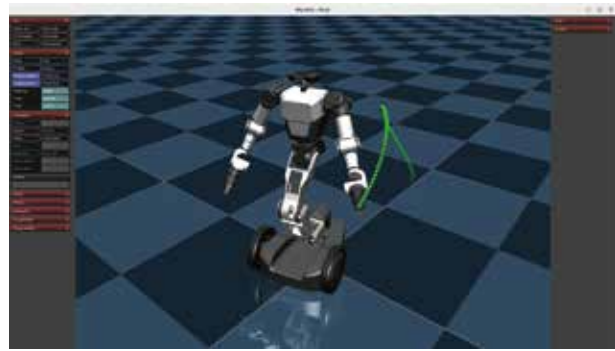
- **Robot PC:** Real-time control PC to ensure stable performance and safety functions
- **User PC:** A PC that can build a development environment to suit various customer needs and run applications
- **Non-real-time communication channel:** Can transmit abstracted higher-level control commands (MoveJ, MoveL, etc.) that do not require real-time or perform various system settings
- **Real-time communication channel:** Can transmit low-level control commands (motor position tracking, motor current control, etc.) that require short cycle time and real-time and receive the robot's status
- **Robot model library:** You can obtain robot kinematics and dynamics information necessary for building a simulation environment
- **Dynamics and motion library:** Provides various libraries necessary for higher-level control development

■ Simulation

Providing models (URDF/MJCF) for building simulation environment



Isaac Sim

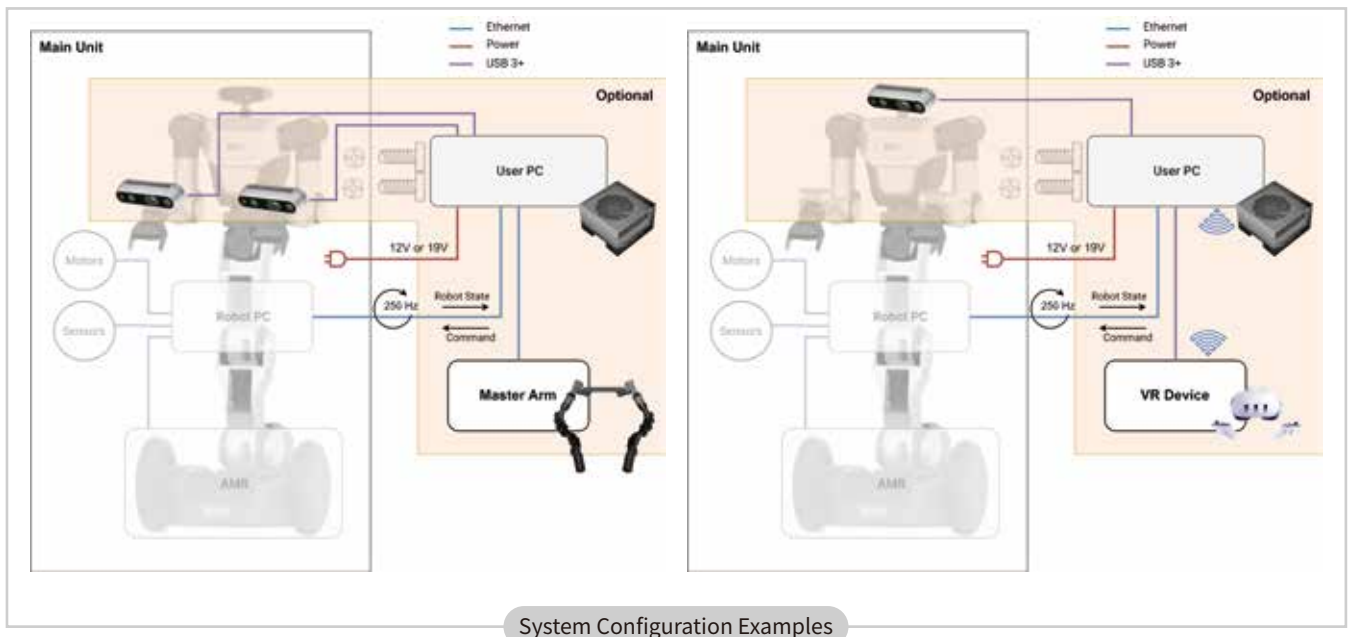


MuJoCo Simulator

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

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

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



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

- 1) Name
- 2) Company / Institution
- 3) Number of Units
- 4) Preferred delivery date
- 5) E-mail
- 6) Phone number
- 7) Usage (optional)



RB-Y1 LOI
QR Code