

# 6-DOF Collaborative Robot Arm

1. **Structure:** Made of aluminum alloy, ensuring durability and robustness.
2. **Expansion Interfaces:** Multiple extension ports available, supporting peripherals such as vision, speech, end-effectors, and conveyor modules.
3. **Degrees of Freedom (DOF):** 6.
4. **Maximum Payload:** 3 kg.
5. **Net Weight:** 15 kg.
6. **Working Radius:** 680 mm.
7. **Repeatability:**  $\pm 0.02$  mm.
8. **Joint Motion Range:**
  - Joint 1:  $\pm 175^\circ$
  - Joint 2:  $\pm 120^\circ$
  - Joint 3:  $\pm 150^\circ$
  - Joint 4:  $\pm 175^\circ$
  - Joint 5:  $\pm 175^\circ$
  - Joint 6:  $\pm 175^\circ$
9. **End-Effector Interfaces:**
  - RS-485  $\times 1$
  - Combined IO input/output ports  $\times 2$
  - Drag-and-teach button  $\times 1$
10. **Base Interfaces:**
  - Ethernet ports  $\times 2$
  - USB ports  $\times 2$
  - IO inputs  $\times 4$
  - IO outputs  $\times 4$
  - Teaching/display extension port  $\times 1$



- Power supply port × 1
11. **Base Dimensions:** 120 mm × 120 mm.
  12. **Controller:** Integrated into the robot base, requiring no external control device or additional installation space.
  13. **Built-in Controller Features:** Graphical user interface, 4 GB memory, meeting the real-time control requirements of the robot arm.
  14. **Open Source Access:** Provides full access from low-level drivers to high-level motion modeling and control, supporting fundamental kinematic forward/inverse modeling and source code learning.
  15. **Wireless Remote Controller:** Provided, enabling remote operation within a 30 m range.
  16. **Gyroscope-based Teleoperation:** The wireless controller is equipped with a built-in gyroscope that synchronizes spatial orientation data with the robot' s end-effector, allowing real-time control via hand gestures.
  17. **Operating System:** ROS-based, supporting rapid development and deployment of vision, speech, and sensor applications on general platforms.
  18. **Programming Languages:** Supports C, C++, Python, as well as graphical programming.
  19. **Provided Training Modules:**
    - *ROS Robot Operating System* — 7 experimental/training projects.
  20. **Provided Training Modules:**
    - *Robot Kinematics* — 9 experimental/training projects.
  21. **Provided Training Modules:**
    - *Basic Robot Operations* — 5 experimental/training projects.