ROS 2 Model Quick Start

DR-xcobo 2.0 | v1.0 | ROS 2 Jazzy / RViz2

Build the robot description package, open the model in RViz2, and explore its joints with interactive sliders. The ZIP includes the URDF, all 10 STL meshes, a Python launch file, and an RViz2 configuration.

Environment

Ubuntu 24.04 LTS Desktop (Noble) + ROS 2 Jazzy Jalisco
Tools: RViz2, colcon, ament_cmake, and a Bash terminal.

Start with ROS 2 Jazzy Desktop and its package repository already configured. Use a fresh terminal that does not automatically source ROS 1 or another ROS 2 distribution. These instructions use a separate workspace at **~/ros2_ws**.

Target environment, not yet runtime-tested. Package metadata, launch syntax, model structure, mesh references, and RViz2 configuration are checked during packaging. This bundle provides model visualization; it does not include MoveIt, Gazebo, or hardware controllers.

1. Install the required tools

```
source /opt/ros/jazzy/setup.bash
sudo apt update
sudo apt install build-essential unzip python3-colcon-common-extensions \
  ros-jazzy-ament-cmake ros-jazzy-robot-state-publisher \
  ros-jazzy-joint-state-publisher ros-jazzy-joint-state-publisher-gui \
  ros-jazzy-rviz2
```

If /opt/ros/jazzy/setup.bash is missing, install ROS 2 Jazzy first using the official instructions linked on page 2. The commands above add the dependencies for this model package.

2. Download and build

Download the ROS 2 URDF ZIP and save it in **~/Downloads/**. Extract the complete package and build:

```
mkdir -p ~/ros2_ws/src
unzip ~/Downloads/dr-xcobo-2.0-ros2-urdf-v1.0.zip -d ~/ros2_ws/src
cd ~/ros2_ws
colcon build --symlink-install --packages-select dr_xcobo_description
source install/setup.bash
```

The package path should be **~/ros2_ws/src/dr_xcobo_description/**, with package.xml directly inside it. Keep the lowercase package name, URDF, and meshes together; extract the ZIP only once. Use a separate ROS 2 workspace rather than the ROS 1 catkin workspace.

Launch & Explore

DR-xcobo 2.0 | RViz2 visualization

3. Start RViz2 and the joint sliders

In a fresh Bash terminal, load ROS 2 and the workspace, then launch:

```
source /opt/ros/jazzy/setup.bash
source ~/ros2_ws/install/setup.bash
ros2 launch dr_xcobo_description display.launch.py
```

Two windows should open: **RViz2** and **Joint State Publisher GUI**. Robot State Publisher supplies the robot description and link transforms. ROS 2 does not require roscore.

To display a static pose without the slider window, stop the previous launch with Ctrl+C, then run:

```
ros2 launch dr_xcobo_description display.launch.py gui:=false
```

4. Inspect the model

Camera: use RViz2's Move Camera tool to orbit, pan, and zoom.
Joints: move the sliders in the separate GUI to inspect joint direction and range.
Frames: select **Add > TF** in RViz2 to show the link coordinate frames.
Stop: press **Ctrl+C** in the launch terminal.

The model has 10 links and 9 joints: 6 revolute, 2 prismatic, and 1 fixed. The finger joints are independent. The URDF geometry and joint properties are preserved; mesh resource paths use the new ROS 2 package name.

Troubleshooting

Package not found: check the package folder, rebuild with colcon, and source ~/ros2_ws/install/setup.bash in the current terminal.

No robot model: enable RobotModel; set Description Source to Topic and Description Topic to /robot_description. The topic durability should be Transient Local.

Frame or mesh errors: use base_link as the Fixed Frame, keep the full meshes folder, and check the launch terminal for errors.

Missing sliders: install ros-jazzy-joint-state-publisher-gui and launch without gui:=false. Start from a graphical Ubuntu desktop session.

Model scope: original movable joints have zero effort and velocity limits. Review these before motion planning, controller use, or physical simulation. This model display package does not command the physical robot.

Resources

Course resources | ROS 2 URDF ZIP
Official Jazzy installation guide | Official documentation source
Robot State Publisher | RViz2

ROS 2 模型快速入门

DR-xcobo 2.0 | v1.0 | ROS 2 Jazzy / RViz2 | 中文版

编译机器人描述功能包，在 RViz2 中打开模型，并通过交互式滑块查看关节运动。ZIP 包含 URDF、全部 10 个 STL 网格文件、Python 启动文件和 RViz2 配置。

运行环境

Ubuntu 24.04 LTS 桌面版（Noble）+ ROS 2 Jazzy Jalisco
所需工具：RViz2、colcon、ament_cmake 和 Bash 终端。

开始前，请先安装并配置好 ROS 2 Jazzy Desktop 及其软件源。使用新的终端，确保不会自动加载 ROS 1 或其他 ROS 2 发行版环境。本指南使用独立工作空间 ~/ros2_ws。

此为目标环境，尚未进行实际运行测试。打包时已核对包信息、启动文件语法、模型结构、网格引用和 RViz2 配置。本包仅用于模型可视化，不含 MoveIt、Gazebo 或硬件控制器。

1. 安装所需工具

```
source /opt/ros/jazzy/setup.bash
sudo apt update
sudo apt install build-essential unzip python3-colcon-common-extensions \
  ros-jazzy-ament-cmake ros-jazzy-robot-state-publisher \
  ros-jazzy-joint-state-publisher ros-jazzy-joint-state-publisher-gui \
  ros-jazzy-rviz2
```

若找不到 /opt/ros/jazzy/setup.bash，请先按第 4 页的官方说明安装 ROS 2 Jazzy。以上命令用于安装本模型功能包所需的依赖。

2. 下载并编译

下载 ROS 2 URDF ZIP，保存至 ~/Downloads/，然后解压完整功能包并编译：

```
mkdir -p ~/ros2_ws/src
unzip ~/Downloads/dr-xcobo-2.0-ros2-urdf-v1.0.zip -d ~/ros2_ws/src
cd ~/ros2_ws
colcon build --symlink-install --packages-select dr_xcobo_description
source install/setup.bash
```

功能包路径应为 ~/ros2_ws/src/dr_xcobo_description/，其目录内直接包含 package.xml。请保留小写包名，将 URDF 与 meshes 文件夹放在同一功能包中；ZIP 只需解压一次。使用独立的 ROS 2 工作空间，不要混入 ROS 1 的 catkin 工作空间。

启动与操作

DR-xcobo 2.0 | RViz2 可视化 | 中文版

3. 启动 RViz2 和关节滑块

新建一个 Bash 终端，加载 ROS 2 和工作空间环境，然后启动：

```
source /opt/ros/jazzy/setup.bash
source ~/ros2_ws/install/setup.bash
ros2 launch dr_xcobo_description display.launch.py
```

正常情况下会打开两个窗口：RViz2 和 Joint State Publisher GUI。Robot State Publisher 提供机器人描述及各连杆的坐标变换。ROS 2 无需启动 roscore。

若只需显示静态姿态、不打开滑块窗口，请先按 Ctrl+C 停止上一次启动，再运行：

```
ros2 launch dr_xcobo_description display.launch.py gui:=false
```

4. 查看与操作模型

视角：使用 RViz2 的 Move Camera 工具旋转、平移和缩放视图。
关节：在独立 GUI 窗口移动滑块，观察关节方向和运动范围。
坐标系：在 RViz2 中选择 Add > TF，显示各连杆的坐标系。
退出：在执行启动命令的终端按 Ctrl+C。

模型包含 10 个连杆和 9 个关节：6 个转动关节、2 个移动关节、1 个固定关节。两侧手指关节独立控制。URDF 的几何与关节属性保持不变，网格资源路径已改为新的 ROS 2 包名。

常见问题

提示找不到功能包：检查功能包目录，使用 colcon 重新编译，并在当前终端加载 ~/ros2_ws/install/setup.bash。

机器人模型未显示：启用 RobotModel，将 Description Source 设置为 Topic，Description Topic 设置为 /robot_description；话题的 Durability Policy 应设为 Transient Local。

坐标系或网格报错：将 Fixed Frame 设置为 base_link，保留完整 meshes 文件夹，并查看启动终端中的错误信息。

没有滑块窗口：安装 ros-jazzy-joint-state-publisher-gui，启动时去掉 gui:=false，并使用有图形界面的 Ubuntu 桌面会话。

模型使用范围：原始可动关节的力/力矩（effort）及速度限制值均为 0。用于运动规划、控制器或物理仿真前，须另行核对这些参数。本包仅显示模型，不会控制真实机器人。

参考资料

课程资源页 | ROS 2 URDF ZIP
Jazzy 官方安装指南 | 官方文档源文件
Robot State Publisher | RViz2