RoboLang v1 — ROS2 Integration & Hardware Setup Guide

Version 1.0.0
Author: Robert Konecny (@rokorobot)
License: Apache 2.0

Overview

This guide explains how to deploy and run RoboLang on real robotic systems using ROS2. It covers integration of the runtime and adapter with robot controllers, MoveIt2, and simulations.

System Requirements

OS: Ubuntu 22.04 LTS
ROS2: Humble Hawksbill or Iron Irwini
Python: ≥3.11
Robot Stack: MoveIt2 + ROS2 Control
Optional: Gazebo / Isaac Sim

Architecture Overview

RoboLang Runtime (Python) → RobotAdapterROS2 (rclpy) → Robot Controller / Drivers
- Parses and executes .rob tasks
- Sends FollowJointTrajectory, GripperCommand, and other ROS2 actions

Cloning RoboLang into a ROS2 Workspace

cd ~/ros2_ws/src
git clone https://github.com/rokorobot/RoboLang.git robolang

Creating package.xml

Add inside ~/ros2_ws/src/robolang/package.xml:
<package format='3'>
<name>robolang</name>
<version>1.0.0</version>
<description>RoboLang — AI-readable DSL for robots using ROS2</description>
<maintainer email='rokorobot@users.noreply.github.com'>Robert Konecny</maintainer>
<license>Apache-2.0</license>
<exec_depend>rclpy</exec_depend>
<exec_depend>control_msgs</exec_depend>
<exec_depend>trajectory_msgs</exec_depend>
<exec_depend>std_msgs</exec_depend>
</package>

Building and Running

```
cd ~/ros2_ws
colcon build
source install/setup.bash
ros2 run robolang ros2_runtime examples/pick_and_place.rob
```

ROS2 Mapping Summary

```
move r to src → FollowJointTrajectory (control_msgs/action/FollowJointTrajectory)
grasp r box → GripperCommand (control_msgs/action/GripperCommand)
place r box at dst → GripperCommand (open)
inspect r box → SensorStatus (my_msgs/srv/SensorStatus)
communicate r to 'fleet' → std_msgs/String
```

Simulation Options

Test in Gazebo, MoveIt2, or using Fake Joint Drivers before real deployment.

Safety Guidelines

- Always test in simulation first
- Use @safety annotations in RoboLang
- Keep physical E-stop available
- Validate limits in ROS2 controller configs

Contact

Author: Robert Konecny
GitHub: @rokorobot
Project: https://github.com/rokorobot/RoboLang