

ROS Build instructions for Ubuntu 18.04

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1. Update the package lists in the Application Package Manager and upgrade the existing packages.

```
sudo apt update
sudo apt upgrade -y
```

2. Create the required compilation directory structure in your home/USER directory

```
cd ~/.../home/USER
mkdir catkin_ws
cd catkin_ws
mkdir src
cd src
```

3. Clone the required unitree repositories

```
git clone https://github.com/unitreerobotics/unitree_ros.git
git clone https://github.com/unitreerobotics/unitree_legged_sdk.git
git clone https://github.com/unitreerobotics/unitree_ros_to_real.git
```

4. Revert packages to the required versions

```
# unitree_legged_sdk v3.4.2
cd unitree_legged_sdk
git checkout b5d6db22d08de59b0d1da835b40559b073fce415
cd ..

# unitree_ros_to_real v3.4.0
cd unitree_ros_to_real
git checkout 3c0fe3c97d048464869074c90719997731333841
cd..

# unitree_ros (Most recent at time)
cd unitree_ros
git checkout 2e8877329ccb3b5b24d71f04f8ee9df68b3372e9
cd ..
cd ..
```

5. Install the required dependencies as per unitree_ros readme.md

```
sudo apt install curl
sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc)
main" > /etc/apt/sources.list.d/ros-latest.list'
curl -s https://raw.githubusercontent.com/ros/rosdistro/master/ros.asc |
sudo apt-key add -
sudo apt update
sudo apt-get install ros-melodic-controller-interface
ros-melodic-gazebo-ros-control ros-melodic-joint-state-controller
ros-melodic-effort-controllers ros-melodic-joint-trajectory-controller
sudo apt-get install ros-melodic-desktop-full
sudo apt install liblcm-dev
```

6. Update Mesa which handles OpenGL, which is used by Gazebo

```
sudo add-apt-repository ppa:kisak/kisak-mesa -y
sudo add-apt-repository ppa:oibaf/graphics-drivers -y
sudo apt-get update
sudo apt -y install mesa-utils
sudo apt -y install libegl-mesa0
```

7. Update paths in package files

Change the include path of unitree_ros_to_real/unitree_legged_real/CMakeLists.txt of following lines to your current path of unitree_legged_sdk

```
cd unitree_ros_to_real/unitree_legged_real
nano CMakeLists.txt
```

For example, if using the suggested directory layout:

```
include_directories(/home/${ENV{USER}}/catkin_ws/src/unitree_legged_sdk/include)
link_directories(/home/${ENV{USER}}/catkin_ws/src/unitree_legged_sdk/lib)
...
add_executable(lcm_server
/home/${ENV{USER}}/catkin_ws/src/unitree_legged_sdk/examples/lcm_server.cpp)
```

CTRL+X to save and exit

Change the URI of the world file as per unitree_ros Readme

```
cd ~/../home/USER/catkin_ws/src/unitree_ros/unitree_gazebo/worlds
nano stairs.world
```

Now change the URI (Toward bottom of document) to your systems path

```
<uri>model:///home/USER/catkin_ws/src/unitree_ros/unitree_gazebo/worlds/building_edit
or_models/stairs</uri>
```

CTRL+X to save and exit

8. Build the packages

The first command sets up the catkin workspace (Catkin is included in the previously installed ROS packages)

```
cd ~/../home/USER/catkin_ws
source /opt/ros/melodic/setup.bash
cd catkin_ws
catkin_make
```

9. Launch Ros and Gazebo

```
source ~/../home/USER/catkin_ws/devel/setup.bash
roslaunch unitree_gazebo normal.launch rname:=go1 wname:=stairs
```