

WITHROBOT Inc.

oCamS-1CGN-U
ROS Application Guide
GridMap

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www.withrobot.com

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1. Linux Installation

- Refer the following guide to install the Ubuntu 16.04 LTS version.

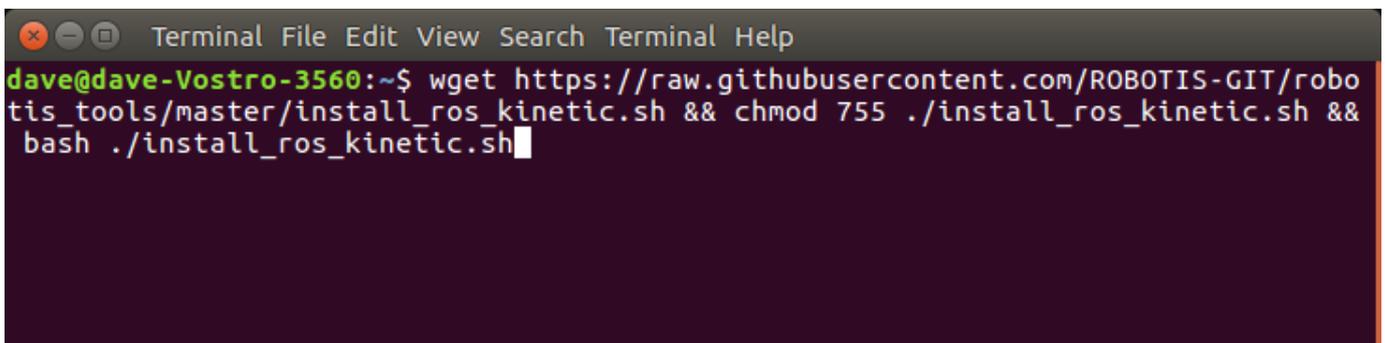
https://tutorials.ubuntu.com/tutorial/tutorial-install-ubuntu-desktop?_ga=2.268754162.2070293869.1505711601-305972367.1479833539

Note: This guide is for installing the Linux on a disk with a single partition. If the Windows OS needs to be installed separately, the disk should be partitioned before. Many guides are available and can be found by using a keyword, “Windows Ubuntu Dual Booting”.

2. ROS Installation

- Use the following commands in a Terminal to install the ROS Kinetic version.

```
$ wget https://raw.githubusercontent.com/ROBOTIS-GIT/robotis_tools/master/install_ros_kinetic.sh && chmod 755 ./install_ros_kinetic.sh && bash ./install_ros_kinetic.sh
```

A terminal window with a dark background and light text. The title bar reads "Terminal File Edit View Search Terminal Help". The prompt is "dave@dave-Vostro-3560:~\$". The command entered is "wget https://raw.githubusercontent.com/ROBOTIS-GIT/robotis_tools/master/install_ros_kinetic.sh && chmod 755 ./install_ros_kinetic.sh && bash ./install_ros_kinetic.sh". The cursor is at the end of the command.

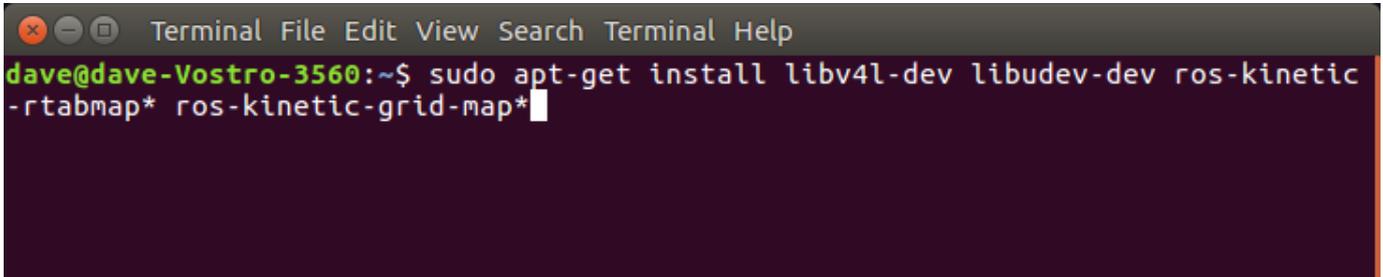
```
dave@dave-Vostro-3560:~$ wget https://raw.githubusercontent.com/ROBOTIS-GIT/robotis_tools/master/install_ros_kinetic.sh && chmod 755 ./install_ros_kinetic.sh && bash ./install_ros_kinetic.sh
```

Note: In the installation process, a password is required. The same password used for Ubuntu 16.04 installation can be used. After that, choose “y” on (y/n) selection.

3. GridMap ROS Package Installation

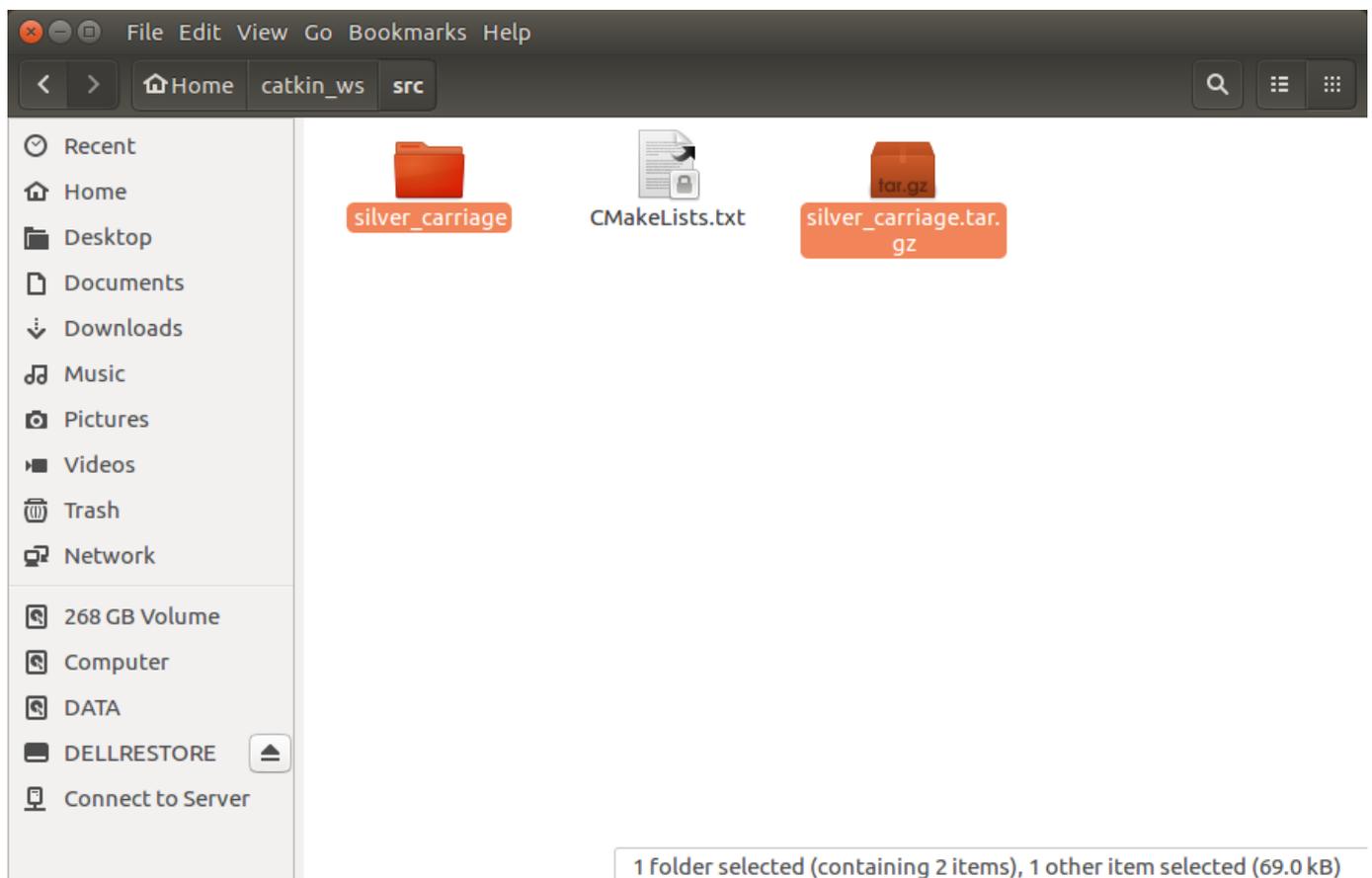
- Get the required libraries and install them by using the following command.

```
$ sudo apt-get install libv4l-dev libudev-dev ros-kinetic-rtabmap* ros-kinetic-grid-map*
```



```
Terminal File Edit View Search Terminal Help
dave@dave-Vostro-3560:~$ sudo apt-get install libv4l-dev libudev-dev ros-kinetic-rtabmap* ros-kinetic-grid-map*
```

- Copy 'silver_carriage.tar.gz' to "~/catkin_ws/src/" folder and uncompress it (right mouse click, and choose "Extract Here").



- Build the package by 'cm' command.

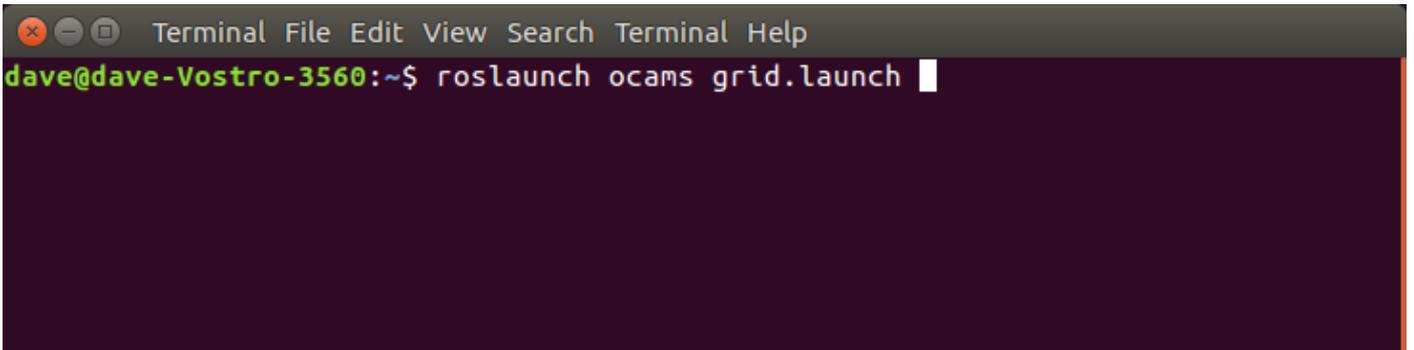
```
Terminal File Edit View Search Terminal Help
dave@dave-Vostro-3560:~/catkin_ws/src$ cm
Base path: /home/dave/catkin_ws
Source space: /home/dave/catkin_ws/src
Build space: /home/dave/catkin_ws/build
Devel space: /home/dave/catkin_ws/devel
Install space: /home/dave/catkin_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/dave/catkin_ws/build"
####
####
#### Running command: "make -j8 -l8" in "/home/dave/catkin_ws/build"
####
[ 8%] Generating dynamic reconfigure files from cfg/cam.cfg: /home/dave/catkin_ws/devel/include/ocams/camConfig.h /home/dave/catkin_ws/devel/lib/python2.7/dist-packages/ocams/cfg/camConfig.py
Generating reconfiguration files for cam in ocams
[ 16%] Building CXX object silver_carriage/elevation_mapping/CMakeFiles/elevation_mapping_library.dir/src/ElevationMapping.cpp.o
[ 25%] Building CXX object silver_carriage/elevation_mapping/CMakeFiles/elevation_mapping_library.dir/src/ElevationMap.cpp.o
[ 33%] Building CXX object silver_carriage/elevation_mapping/CMakeFiles/elevation_mapping_library.dir/src/sensor_processors/SensorProcessorBase.cpp.o
[ 41%] Building CXX object silver_carriage/elevation_mapping/CMakeFiles/elevation_mapping_library.dir/src/sensor_processors/KinectSensorProcessor.cpp.o
Wrote header file in /home/dave/catkin_ws/devel/include/ocams/camConfig.h
[ 41%] Built target ocams_gencfg
Scanning dependencies of target ocams
[ 50%] Building CXX object silver_carriage/ocams/CMakeFiles/ocams.dir/src/withrobot_utility.cpp.o
[ 58%] Building CXX object silver_carriage/ocams/CMakeFiles/ocams.dir/src/oCamS.cpp.o
[ 66%] Building CXX object silver_carriage/ocams/CMakeFiles/ocams.dir/src/withrobot_camera.cpp.o
[ 75%] Linking CXX executable /home/dave/catkin_ws/devel/lib/ocams/ocams
[ 75%] Built target ocams
[ 83%] Linking CXX shared library /home/dave/catkin_ws/devel/lib/libelevation_mapping_library.so
[ 83%] Built target elevation_mapping_library
[ 91%] Building CXX object silver_carriage/elevation_mapping/CMakeFiles/elevation_mapping.dir/src/elevation_mapping_node.cpp.o
[100%] Linking CXX executable /home/dave/catkin_ws/devel/lib/elevation_mapping/elevation_mapping
[100%] Built target elevation_mapping
dave@dave-Vostro-3560:~/catkin_ws$
```

Once [100%] appears without red error message, the build is done successfully.

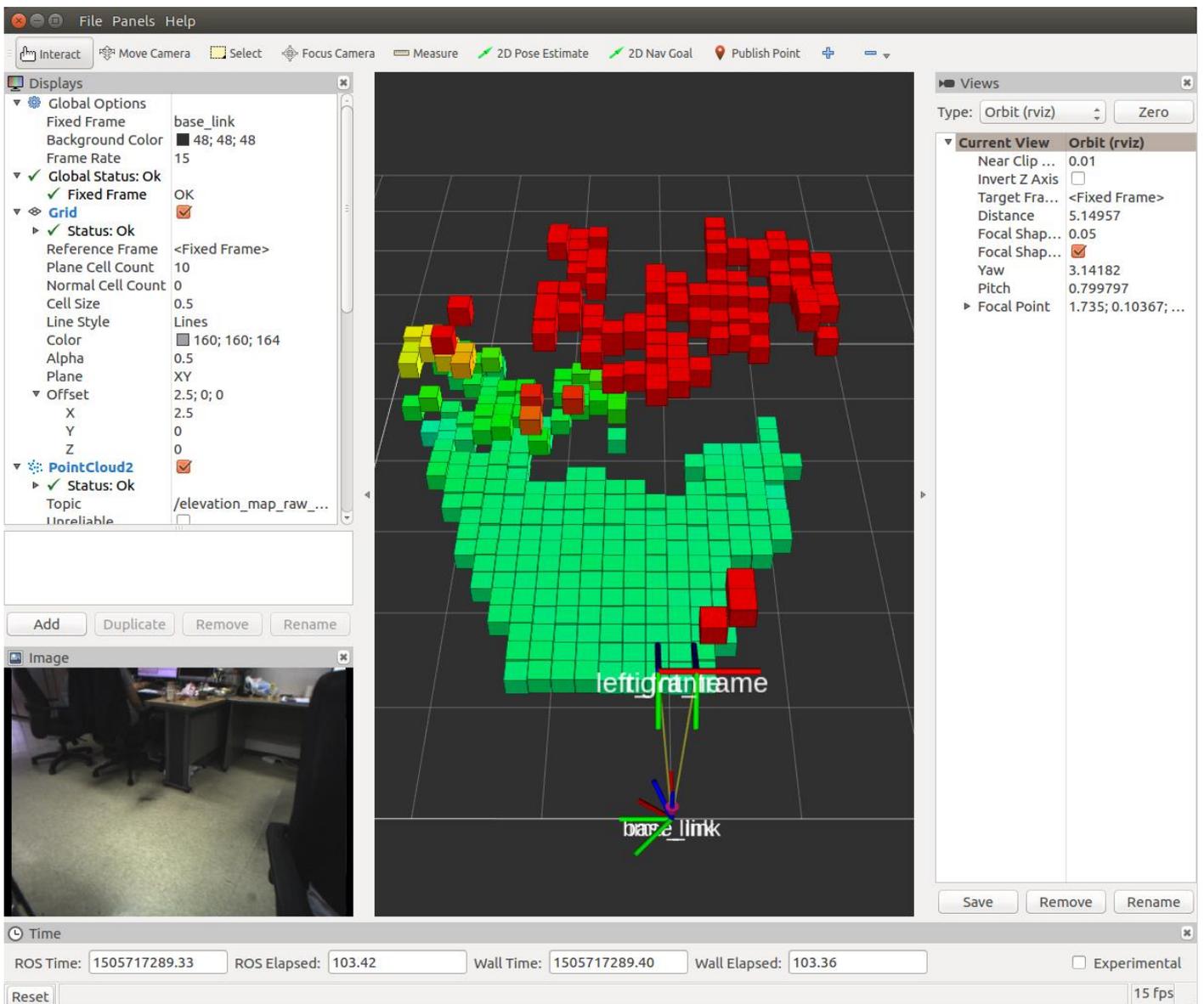
4. Execution

- Use the following command to execute.

```
$ roslaunch ocams gridmap.launch
```



- "rviz" will be started as shown below.



- If too many blanks appear on viewing a floor, in many cases the calibration was not performed properly. Refer the following video to calibrate the stereo camera.

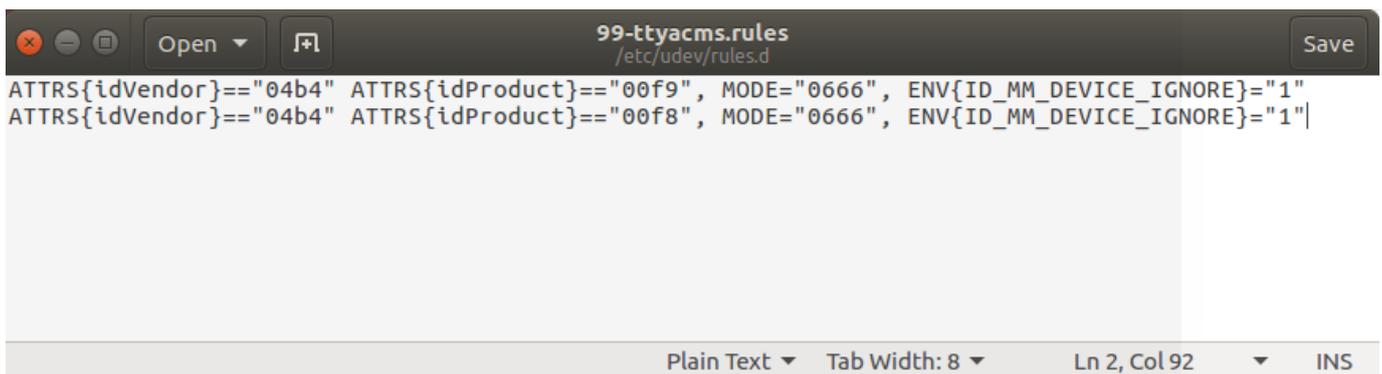
<https://youtu.be/veahVVHA8H4>

- The package can be terminated by pressing 'Ctrl+c'.
- To use IMU, a rule file for COM port needs to be created. Use the following command to open gedit editor (password required).

```
$ sudo gedit /etc/udev/rules.d/99-ttyacms.rules
```

- Enter the followings and save the file.

```
ATTRS{idVendor}=="04b4" ATTRS{idProduct}=="00f9", MODE="0666",  
ENV{ID_MM_DEVICE_IGNORE}=1"  
ATTRS{idVendor}=="04b4" ATTRS{idProduct}=="00f8", MODE="0666",  
ENV{ID_MM_DEVICE_IGNORE}=1"
```



```
ATTRS{idVendor}=="04b4" ATTRS{idProduct}=="00f9", MODE="0666", ENV{ID_MM_DEVICE_IGNORE}=1"  
ATTRS{idVendor}=="04b4" ATTRS{idProduct}=="00f8", MODE="0666", ENV{ID_MM_DEVICE_IGNORE}=1"
```

- Use the following command to reload the rule.

```
$ sudo udevadm control -reload-rules
```