

# TURTLEBOT3

## Burger



1부

OpenCR Setup



# OpenCR Setup with ROS1

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- 라즈베리파이에 OpenCR 펌웨어 다운로드에 필요한 패키지 설치

```
$ sudo dpkg --add-architecture armhf  
$ sudo apt-get update  
$ sudo apt-get install libc6:armhf
```

- 버거에 맞는 네임 설정 및 준비

```
$ export OPENCNCR_PORT=/dev/ttyACM0  
$ export OPENCNCR_MODEL=burger  
$ rm -rf ./opencnrcr_update.tar.bz2
```

- 펌웨어 다운로드와 업로드

```
$ wget https://github.com/ROBOTIS-GIT/OpenCR-Binaries/raw/master/turtlebot3/ROS1/latest/opencnrcr_update.tar.bz2  
$ tar -xvf opencnrcr_update.tar.bz2  
$ cd ./opencnrcr_update  
$ ./update.sh $OPENCNCR_PORT $OPENCNCR_MODEL.opencnrcr
```



# OpenCR Setup with ROS2

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- 라즈베리파이에 OpenCR 펌웨어 다운로드에 필요한 패키지 설치

```
$ sudo dpkg --add-architecture armhf  
$ sudo apt update  
$ sudo apt install libc6:armhf
```

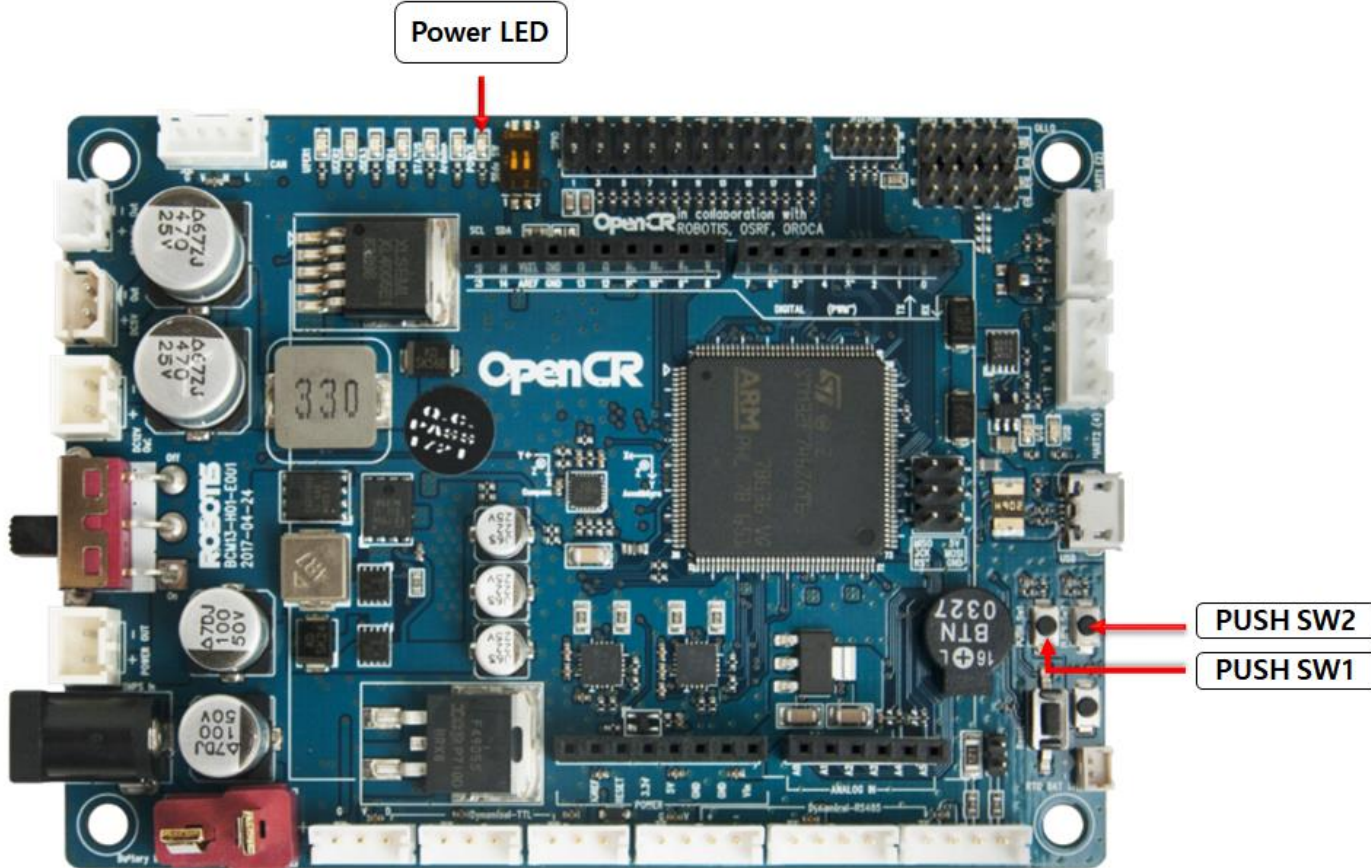
- 버거에 맞는 네임 설정 및 준비

```
$ export OPENCNCR_PORT=/dev/ttyACM0  
$ export OPENCNCR_MODEL=burger  
$ rm -rf ./opencnrcr_update.tar.bz2
```

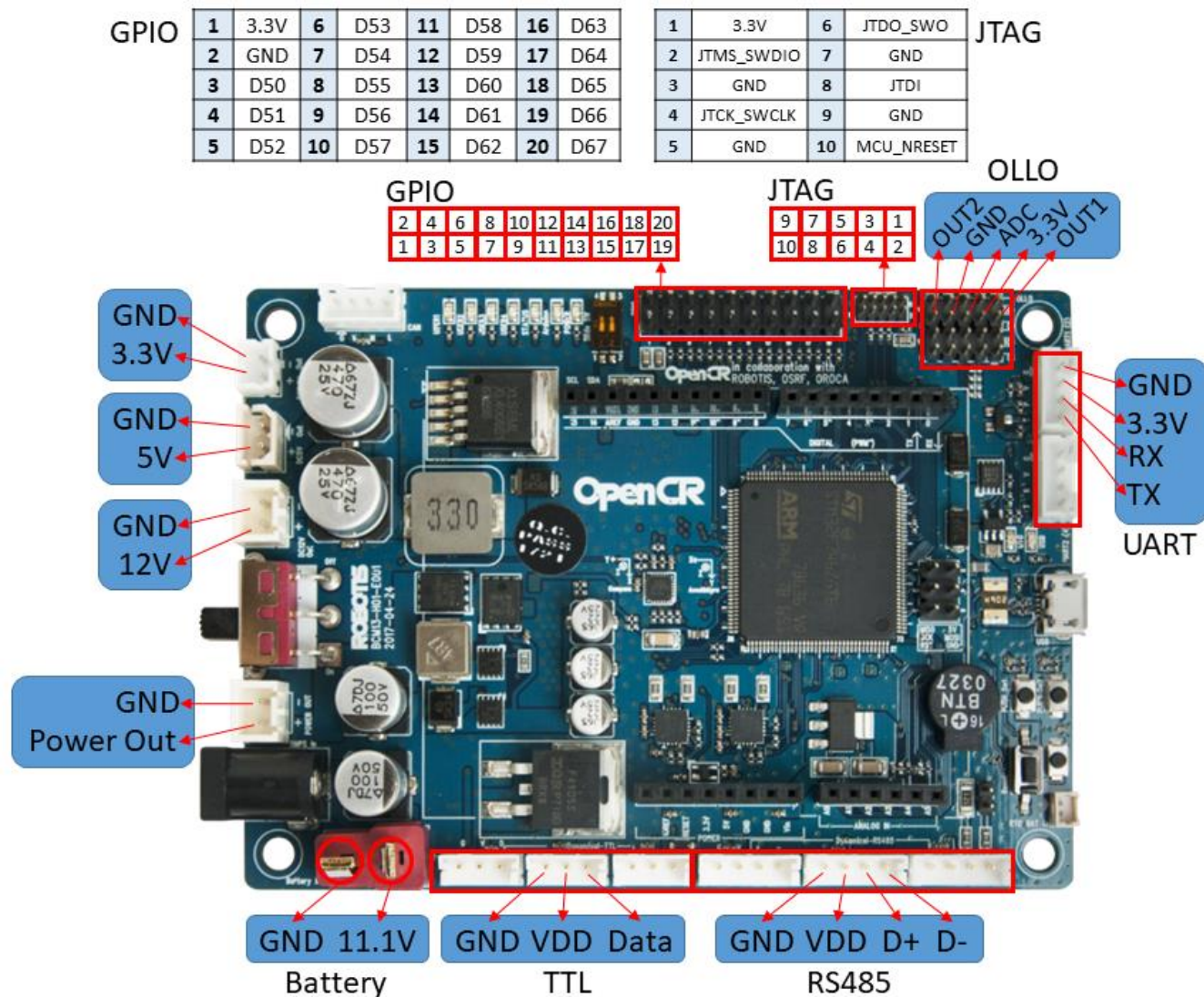
- 펌웨어 다운로드와 업로드

```
$ wget https://github.com/ROBOTIS-GIT/OpenCR-Binaries/raw/master/turtlebot3/ROS2/latest/opencnrcr_update.tar.bz2  
$ tar -xvf opencnrcr_update.tar.bz2  
$ cd ./opencnrcr_update  
$ ./update.sh $OPENCNCR_PORT $OPENCNCR_MODEL.opencnrcr
```

- 전원을 공급하면, Power LED가 점등 된다.
- SW1를 누르면, 30센치 앞으로 전지
- SW2를 누르면, 180도 회전



- Pin Map





# Arduino IDE with ROS1 & ROS2

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- **USB Port Settings**

```
$ wget https://raw.githubusercontent.com/ROBOTIS-GIT/OpenCR/master/99-opencr-cdc.rules
$ sudo cp ./99-opencr-cdc.rules /etc/udev/rules.d/
$ sudo udevadm control --reload-rules
$ sudo udevadm trigger
```

- **Compiler Settings**

```
// Since the OpenCR libraries is built for 32 bit platform, 64 bit PC needs the 32 bit compiler relevants for the ArduinoIDE.

$ sudo apt-get install libncurses5-dev:i386
```

- **Arduino IDE Install**

```
$ cd ~/tools/arduino-1.6.4
$ ./install.sh

$ gedit ~/.bashrc
$ export PATH=$PATH:$HOME/tools/arduino-1.6.4
$ source ~/.bashrc
```





# Arduino IDE with ROS1 & ROS2

- Preferences

[https://raw.githubusercontent.com/ROBOTIS-GIT/OpenCR/master/arduino/opencr\\_release/package\\_opencr\\_index.json](https://raw.githubusercontent.com/ROBOTIS-GIT/OpenCR/master/arduino/opencr_release/package_opencr_index.json)

The screenshot shows the 'Settings' dialog box in the Arduino IDE, with the 'Network' tab selected. The 'Sketchbook location' is set to '/home/pyo/Arduino'. The 'Editor language' is 'System Default'. The 'Editor font size' is '12'. The 'Interface scale' is 'Automatic' at '100%'. The 'Show verbose output during' section has 'compilation' and 'upload' both unchecked. The 'Compiler warnings' are set to 'None'. There are several checkboxes: 'Display line numbers' (unchecked), 'Enable Code Folding' (unchecked), 'Verify code after upload' (checked), 'Use external editor' (unchecked), 'Check for updates on startup' (checked), 'Update sketch files to new extension on save (.pde -> .ino)' (checked), and 'Save when verifying or uploading' (checked). The 'Additional Boards Manager URLs' field contains the URL 'https://raw.githubusercontent.com/ROBOTIS-GIT/OpenCR/master/arduino/opencr\_release/package\_opencr\_index.json', which is highlighted in orange. At the bottom, there is a note that more preferences can be edited in the file '/home/pyo/.arduino15/preferences.txt' and a warning to edit only when Arduino is not running. The 'OK' and 'Cancel' buttons are at the bottom right.

Settings Network

Sketchbook location: /home/pyo/Arduino Browse

Editor language: System Default (requires restart of Arduino)

Editor font size: 12

Interface scale: ☒ Automatic 100 % (requires restart of Arduino)

Show verbose output during: ☐ compilation ☐ upload

Compiler warnings: None

☐ Display line numbers

☐ Enable Code Folding

☒ Verify code after upload

☐ Use external editor

☒ Check for updates on startup

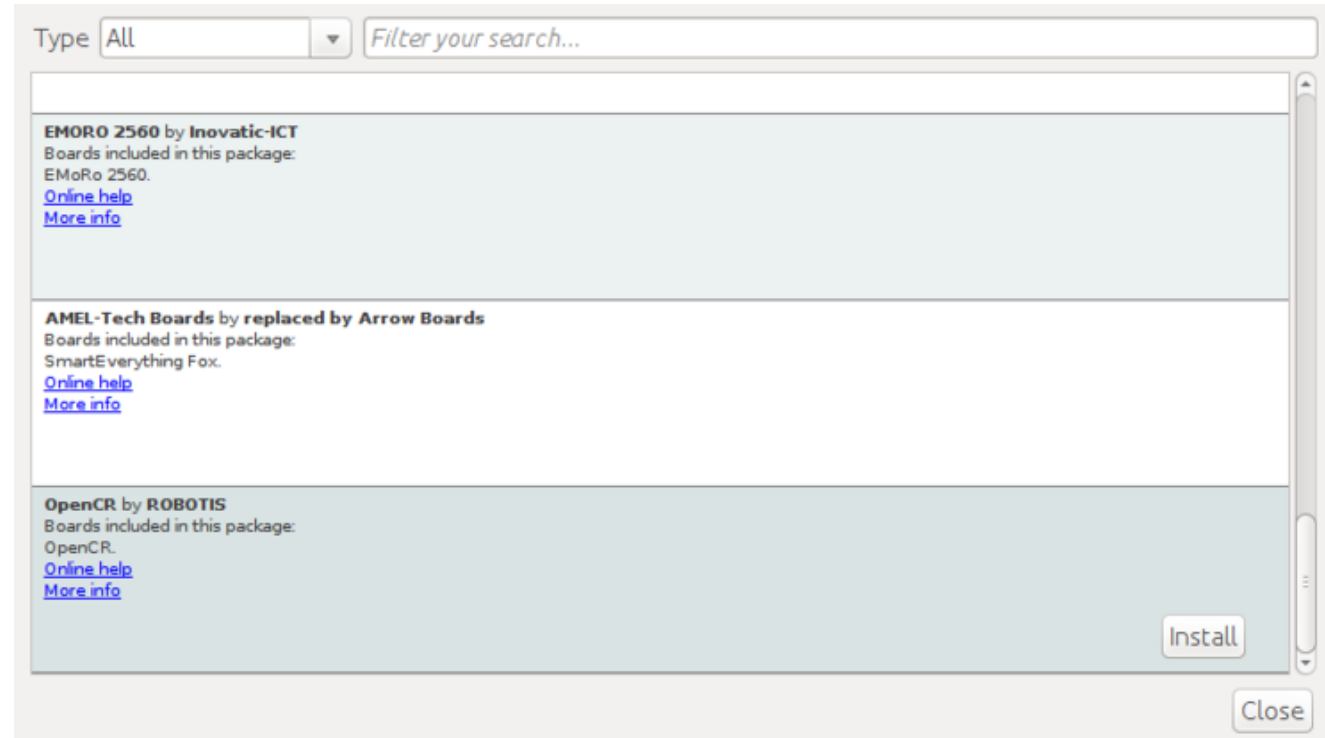
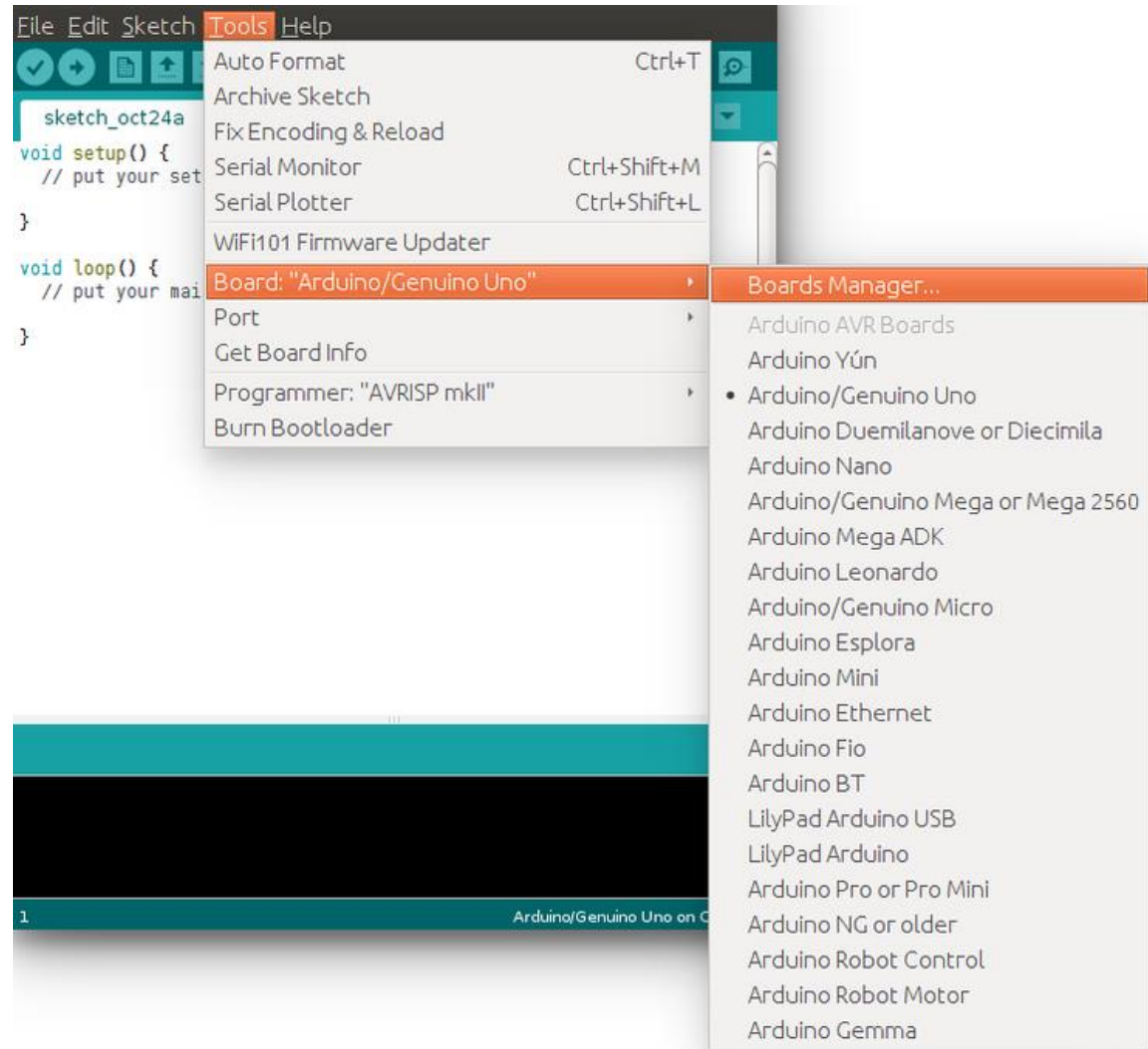
☒ Update sketch files to new extension on save (.pde -> .ino)

☒ Save when verifying or uploading

Additional Boards Manager URLs: [https://raw.githubusercontent.com/ROBOTIS-GIT/OpenCR/master/arduino/opencr\\_release/package\\_opencr\\_index.json](https://raw.githubusercontent.com/ROBOTIS-GIT/OpenCR/master/arduino/opencr_release/package_opencr_index.json)

More preferences can be edited directly in the file  
/home/pyo/.arduino15/preferences.txt  
(edit only when Arduino is not running)

OK Cancel







# Arduino IDE with ROS1 & ROS2

