TURTLEBOT3

Burger

1부

OpenCR Setup

OpenCR Setup with ROS1

- 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 OPENCR_PORT=/dev/ttyACM0
$ export OPENCR_MODEL=burger
$ rm -rf ./opencr_update.tar.bz2
```

- 펌웨어 다운로드와 업로드

```
$ wget https://github.com/ROBOTIS-GIT/OpenCR-Binaries/raw/master/turtlebot3/ROS1/latest/opencr_update.tar.bz2
$ tar -xvf opencr_update.tar.bz2
$ cd ./opencr_update
$ ./update.sh $OPENCR_PORT $OPENCR_MODEL.opencr
```

OpenCR Setup with ROS2

- 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

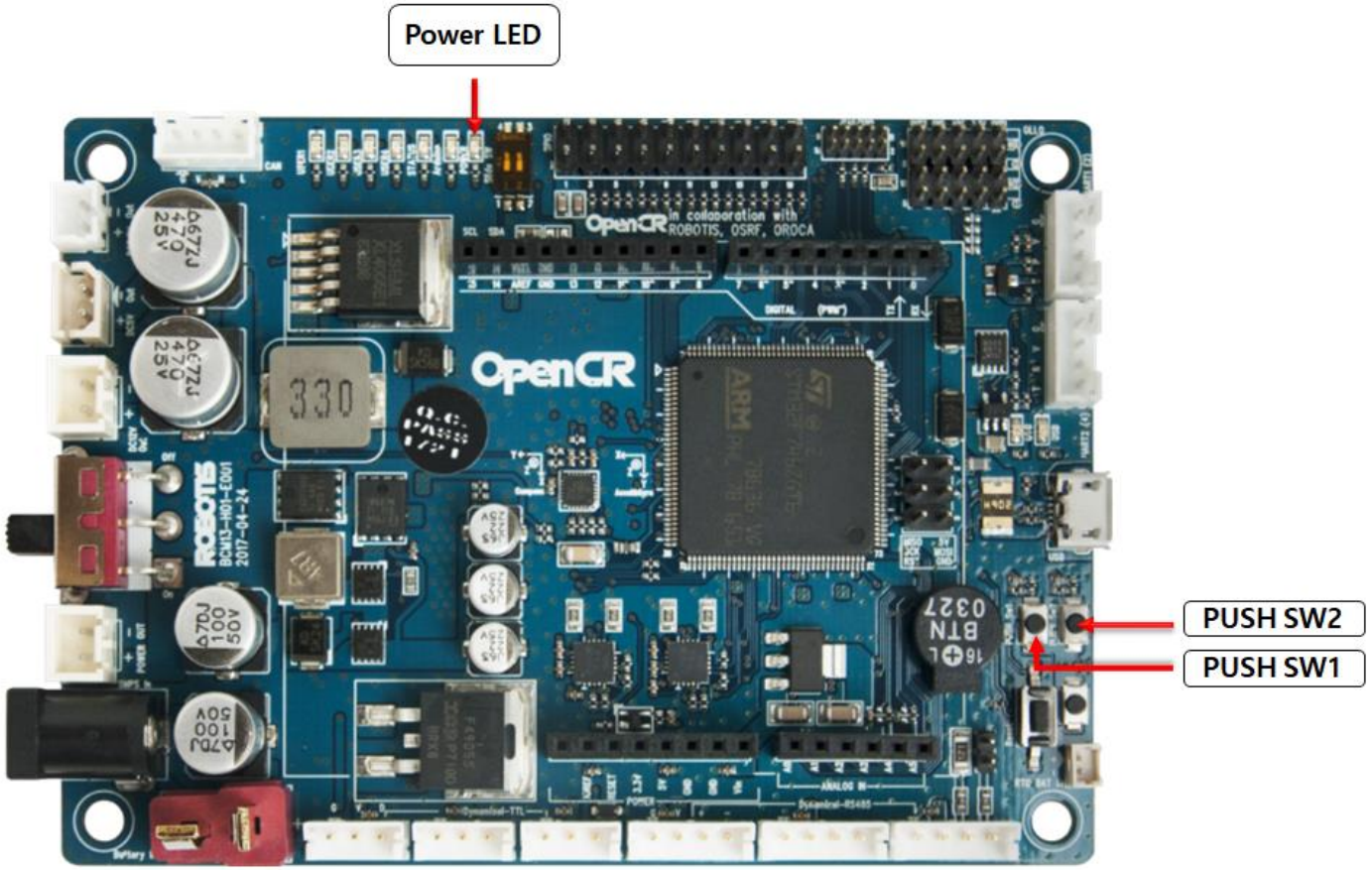
```
$ export OPENCR_PORT=/dev/ttyACM0
$ export OPENCR_MODEL=burger
$ rm -rf ./opencr_update.tar.bz2
```

- 펌웨어 다운로드와 업로드

```
$ wget https://github.com/ROBOTIS-GIT/OpenCR-Binaries/raw/master/turtlebot3/ROS2/latest/opencr_update.tar.bz2
$ tar -xvf opencr_update.tar.bz2
$ cd ./opencr_update
$ ./update.sh $OPENCR_PORT $OPENCR_MODEL.opencr
```

TURTLEBOT3 OpenCR Test with ROS1 & ROS2

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



TURTLEBOT3 OpenCR Test with ROS1 & ROS2

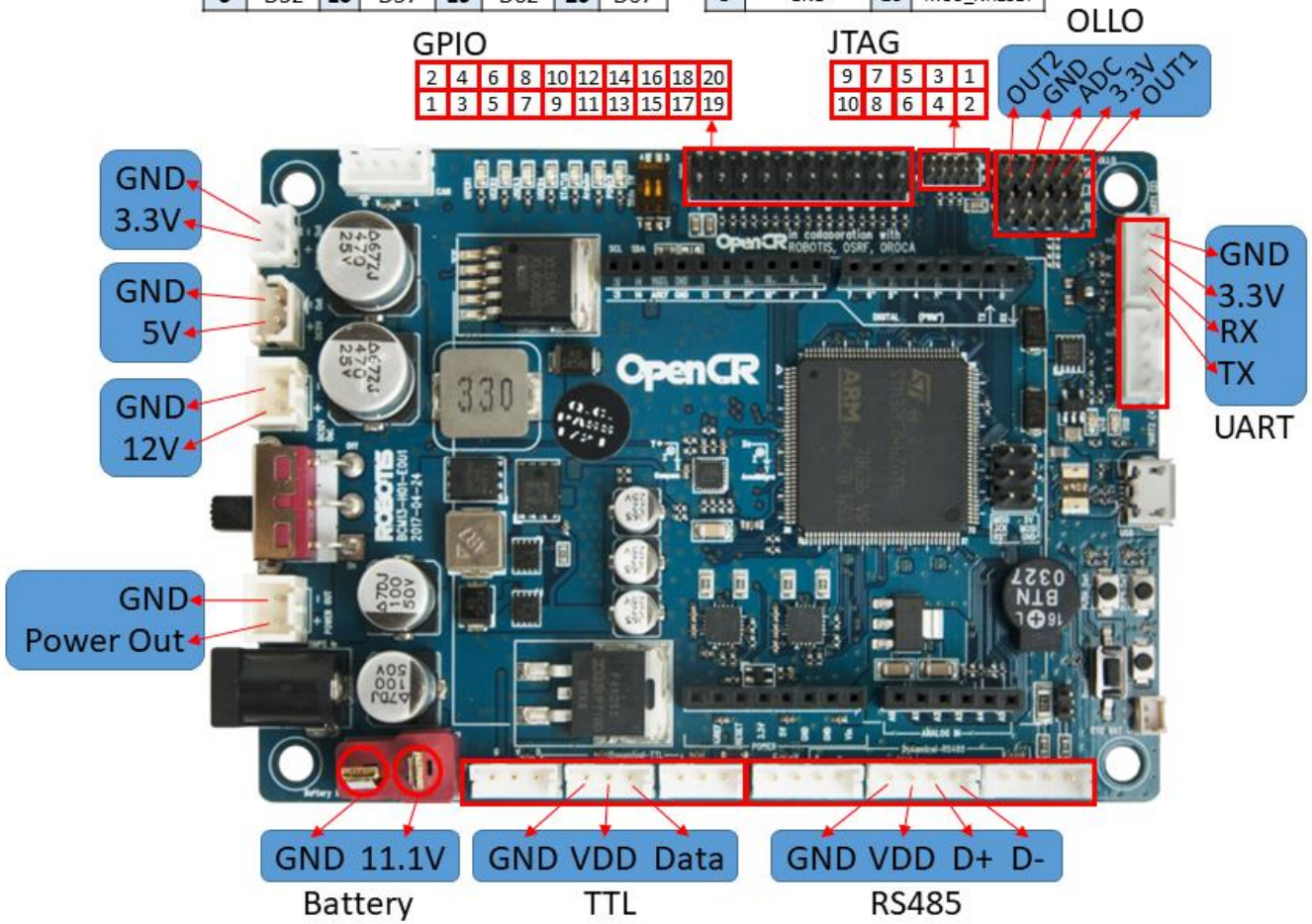
- **Pin Map**

GPIO

1	3.3V	6	D53	11	D58	16	D63
2	GND	7	D54	12	D59	17	D64
3	D50	8	D55	13	D60	18	D65
4	D51	9	D56	14	D61	19	D66
5	D52	10	D57	15	D62	20	D67

JTAG

1	3.3V	6	JTDO_SWO
2	JTMS_SWDIO	7	GND
3	GND	8	JTDI
4	JTCK_SWCLK	9	GND
5	GND	10	MCU_NRESET



Arduino IDE with ROS1 & ROS2

- **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
```

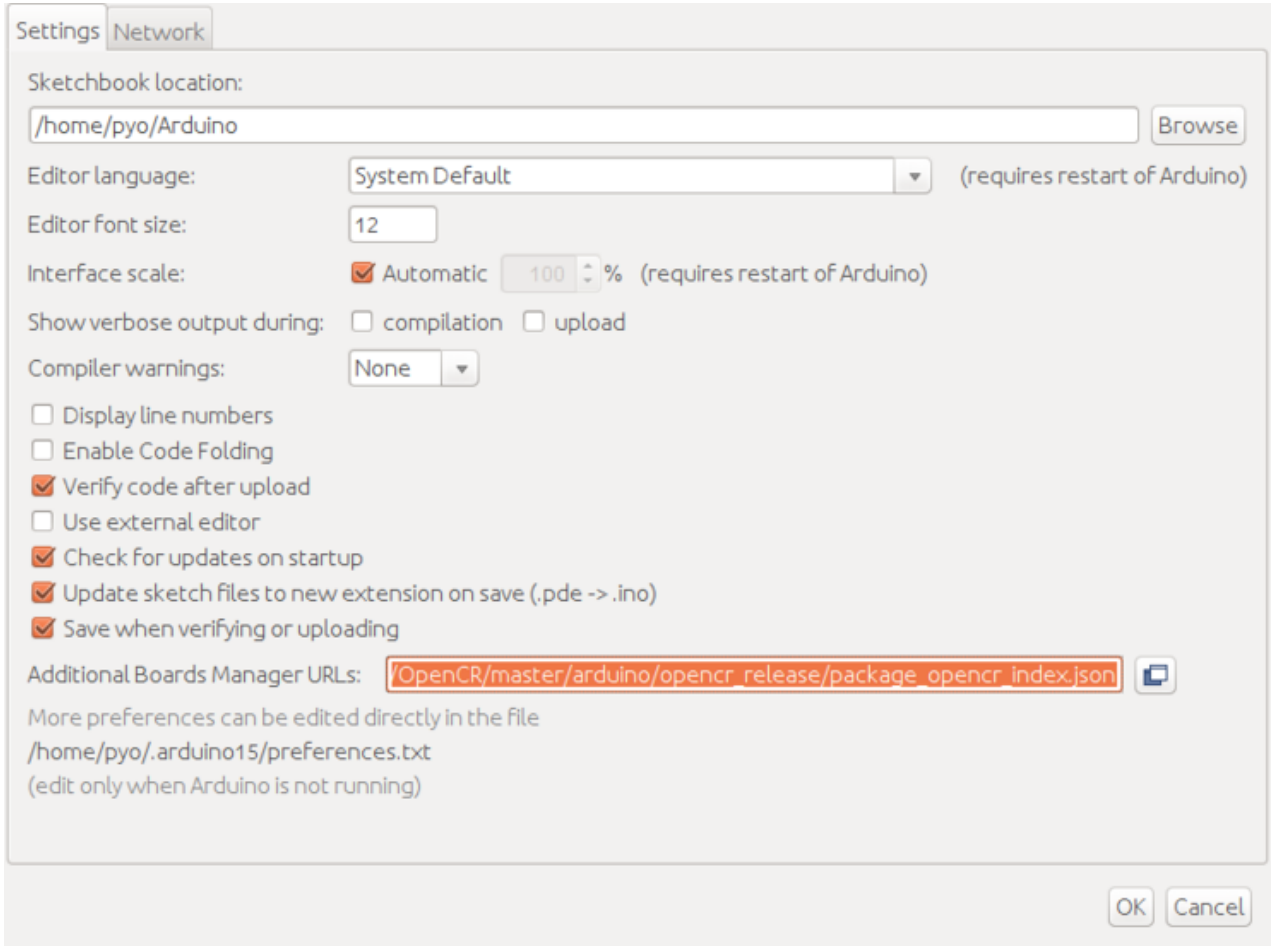
- **Arduino IDE Install**

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



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

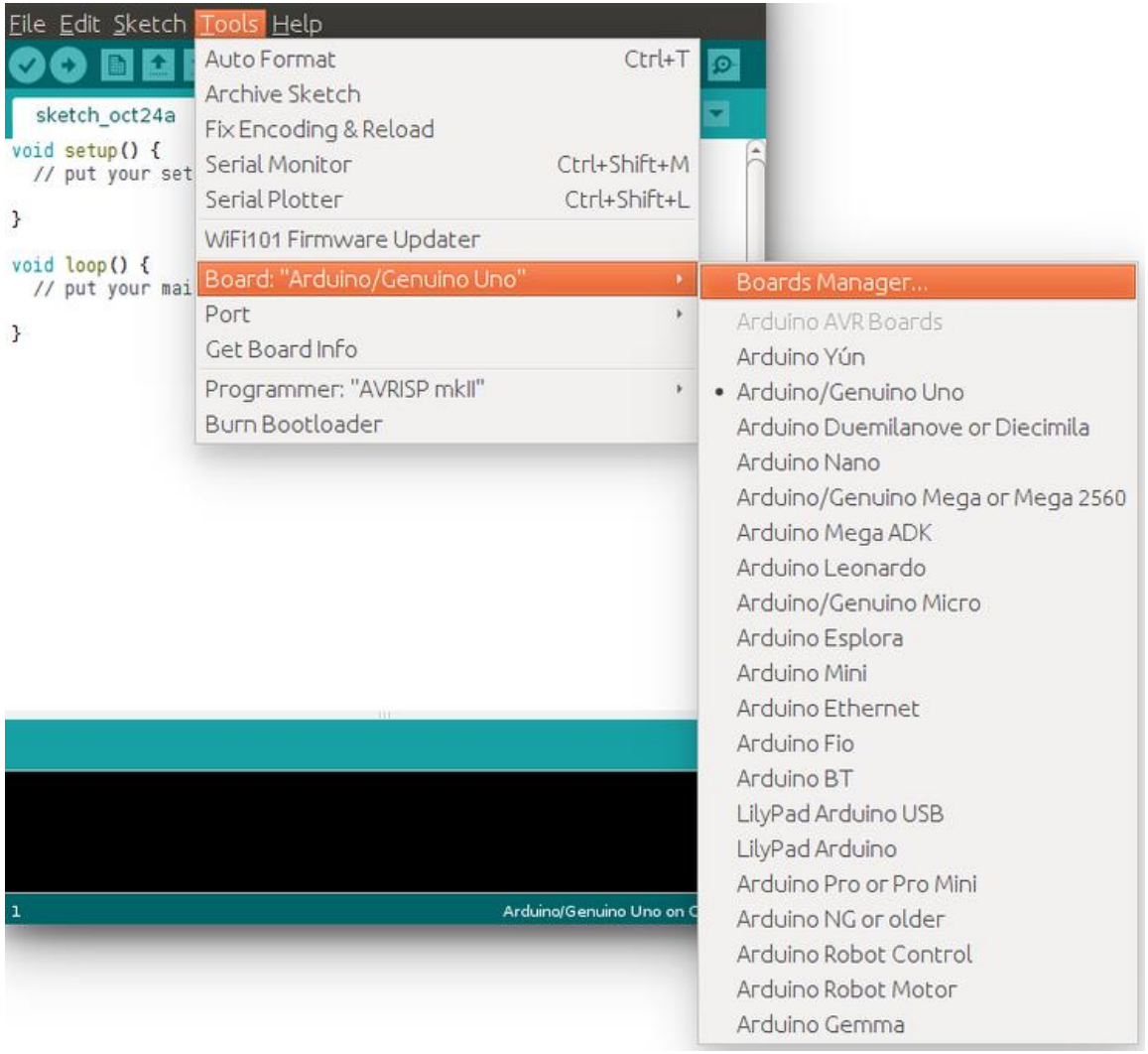
Arduino IDE with ROS1 & ROS2

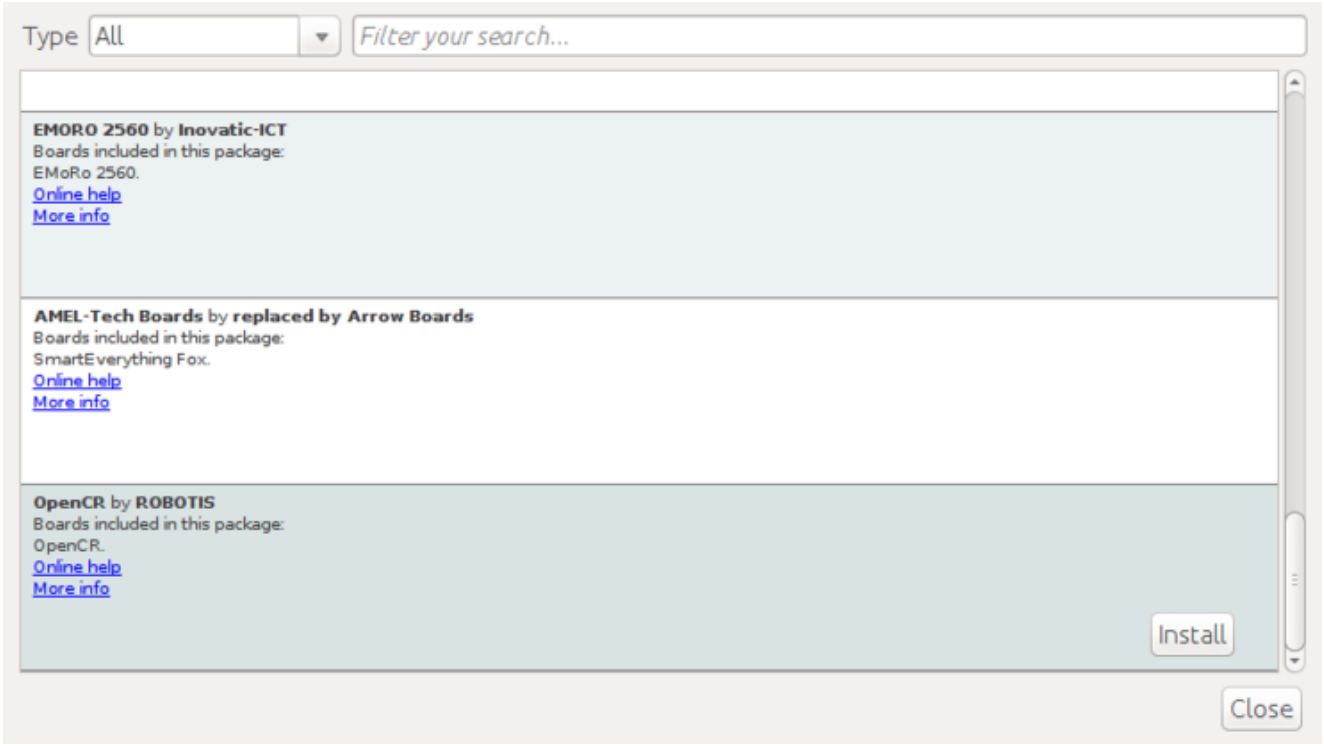
- **Preferences**

```
https://raw.githubusercontent.com/ROBOTIS-GIT/OpenCR/master/arduino/opencr_release/package_opencr_index.json
```



Arduino IDE with ROS1 & ROS2





Arduino IDE with ROS1 & ROS2