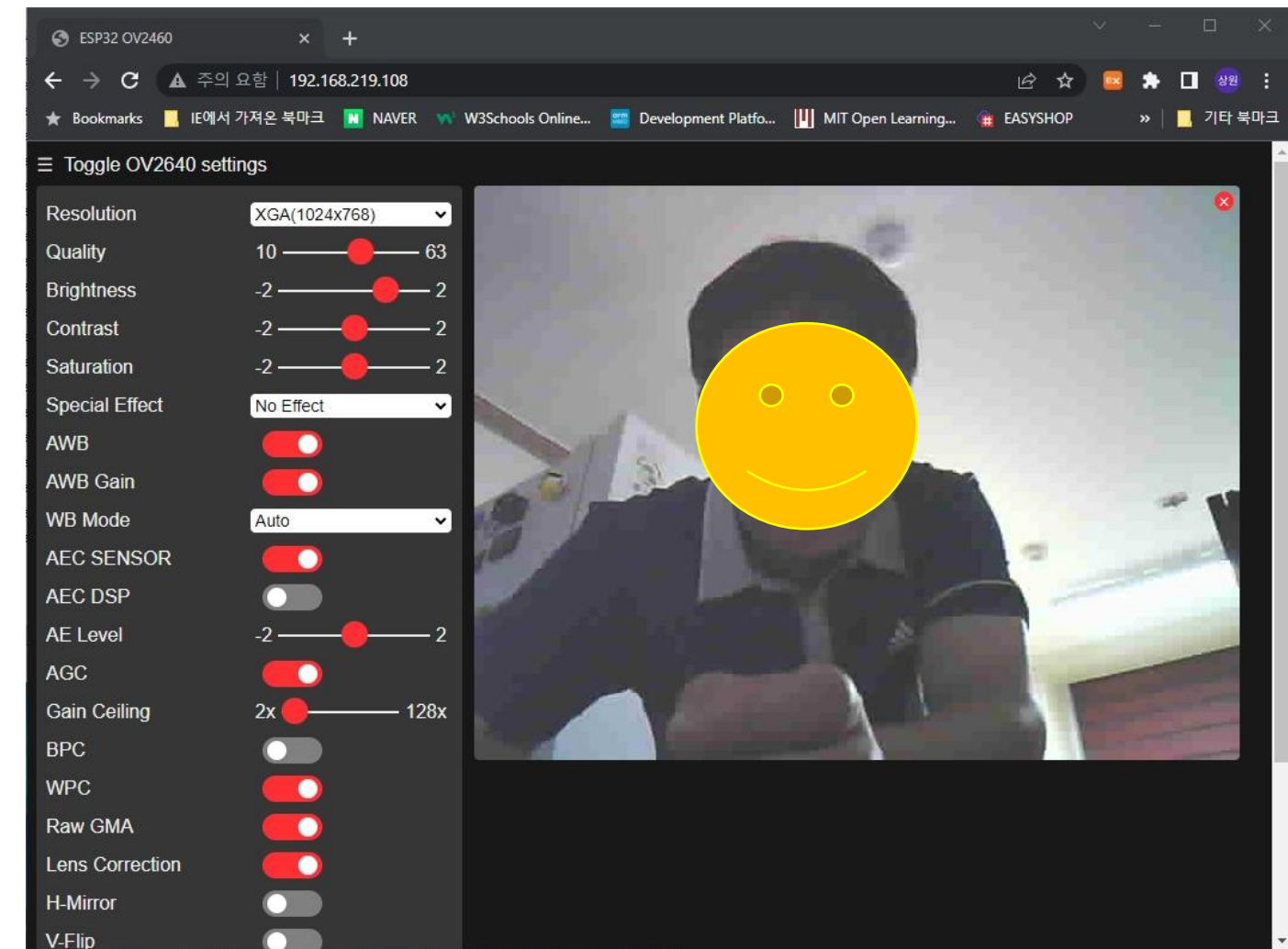


ESP32-CAM 카메라 웹서버 예제



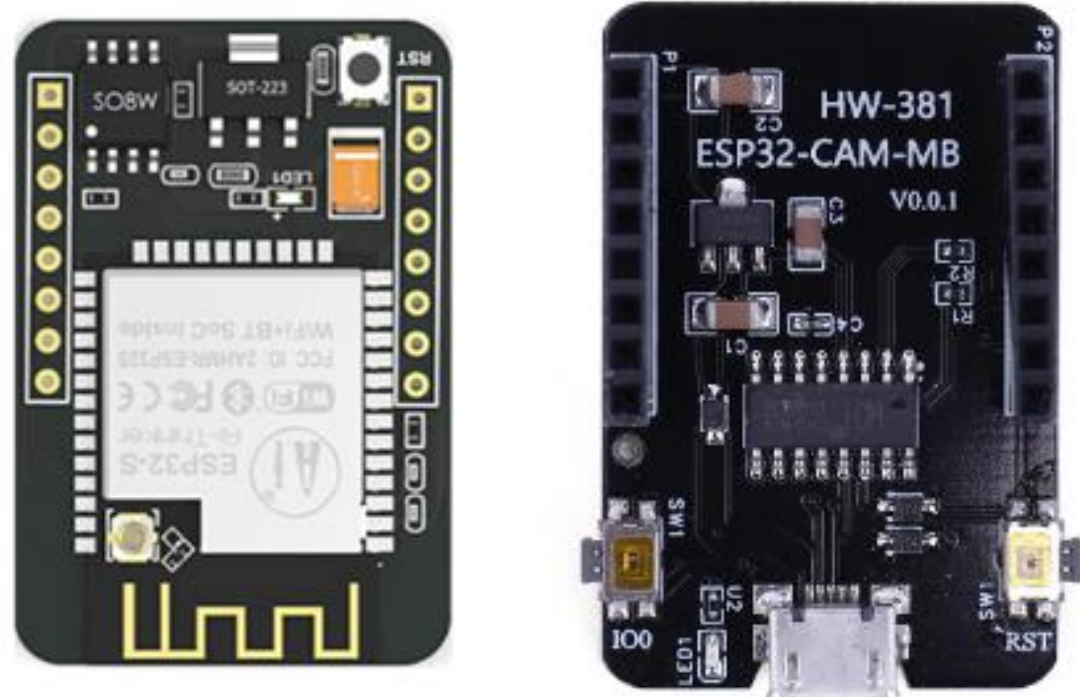
7/6/2023

Sangwon Lee

List

- ☐ ESP32-CAM Introduction
- ☐ Setup Arduino IDE
- ☐ Camera Web Server Example
- ☐ Antenna Performance Test

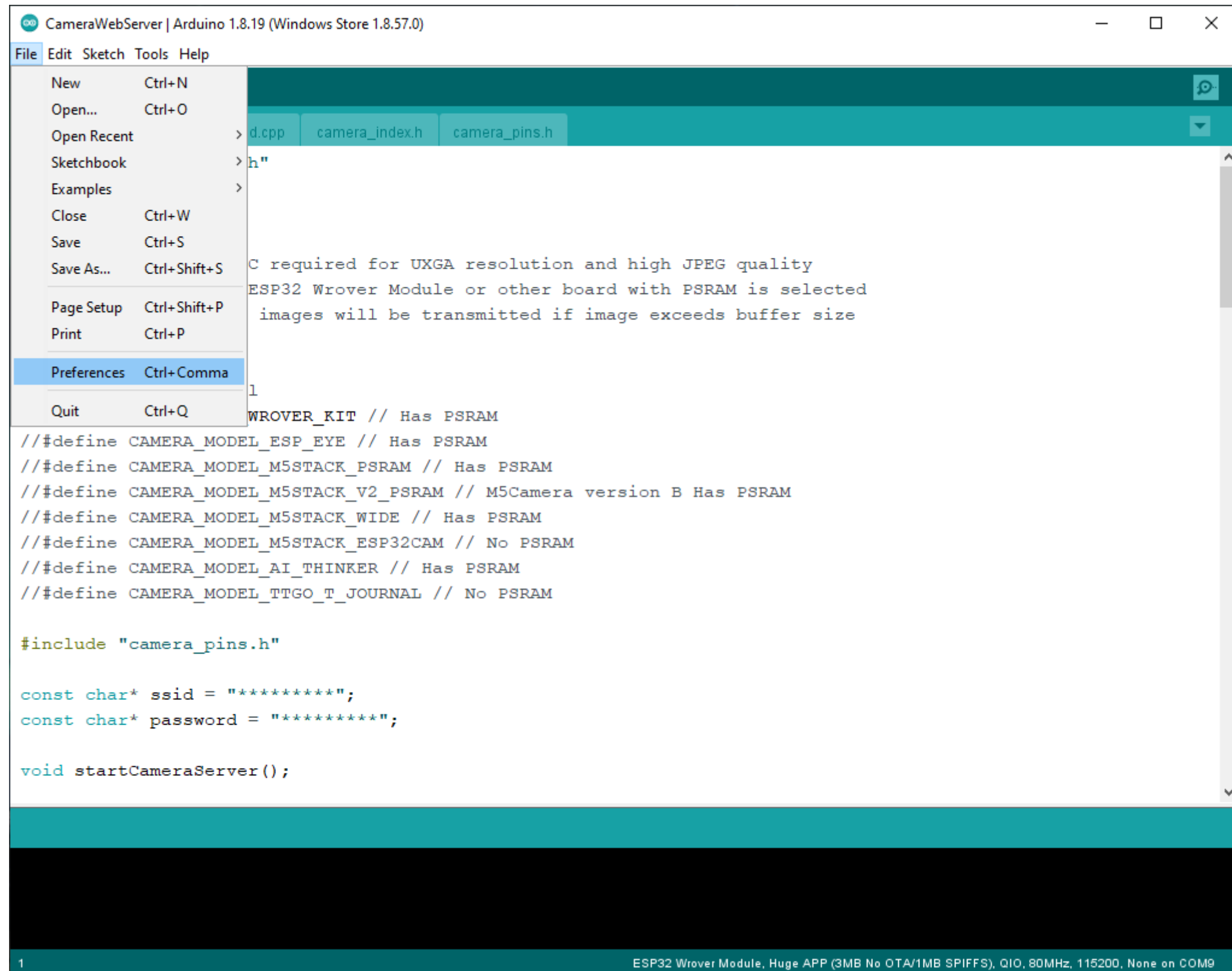
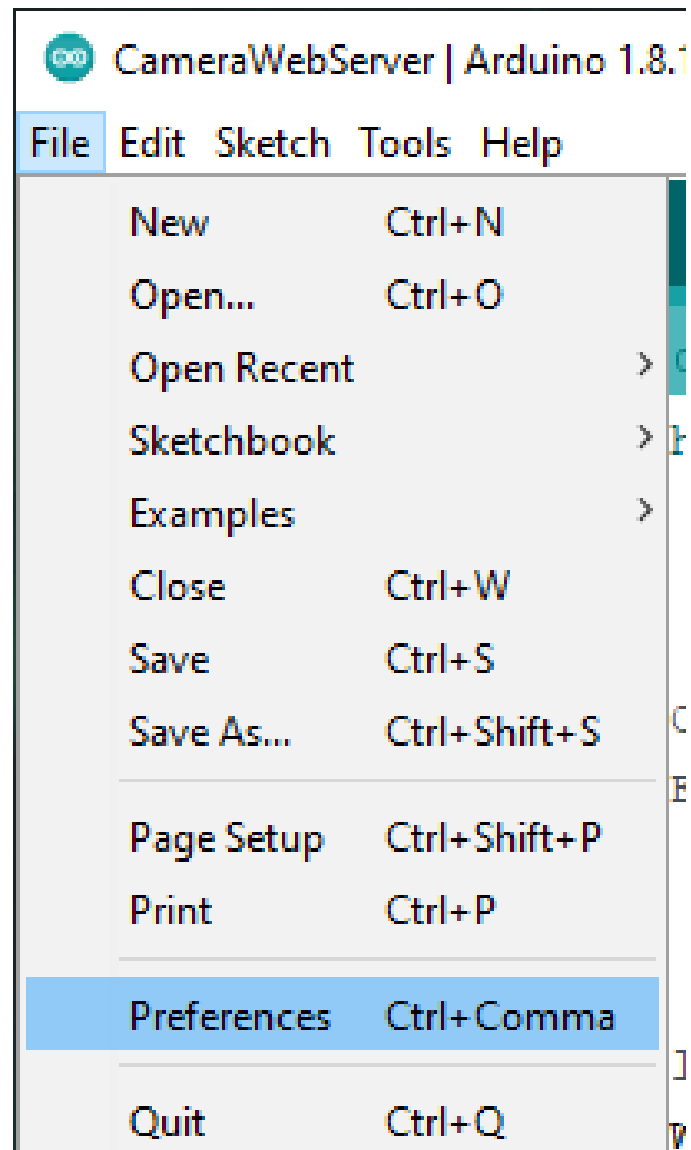
ESP32-CAM Introduction



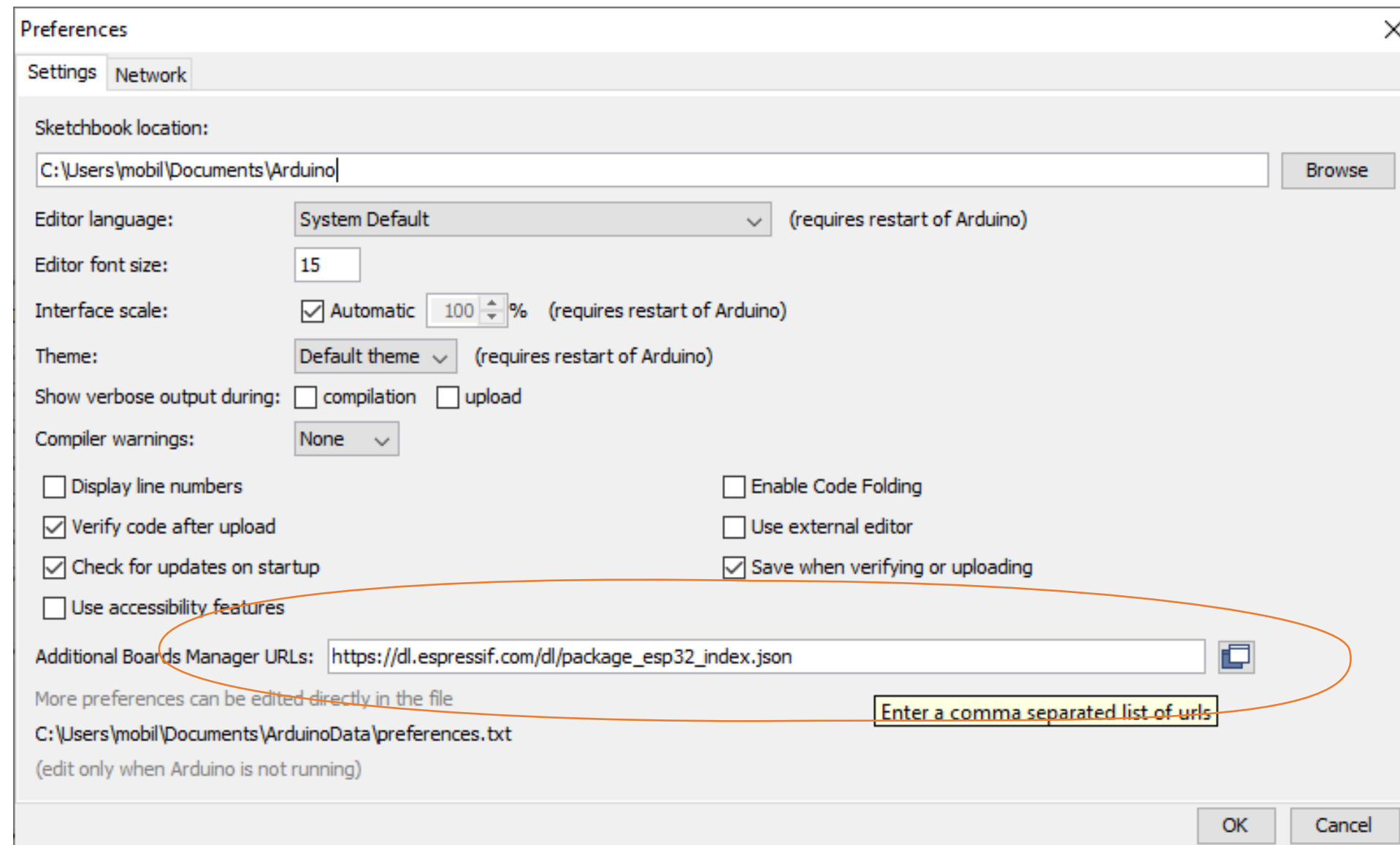
- ❑ ESP32-S 를 사용한 저가형 카메라 모듈
- ❑ OV2640 기본 카메라
- ❑ 2.4 GHz WIFI/BT 지원
- ❑ 4MB PSRAM, 520 KB SRAM
- ❑ GPIO 8 pin, UART 2 pin
- ❑ 5VDC supply, DIO 3.3VDC
- ❑ ESP32-CAM-MB를 이용하여 PC에 연결



Arduino IDE Setup 1



Arduino IDE Setup 2



Additional Boards Manager URLs: https://dl.espressif.com/dl/package_esp32_index.json

Arduino IDE Setup 3

Server | Arduino 1.8.19 (Windows Store 1.8.57.0)

ToolsHelp

Auto FormatCtrl+T

Archive Sketch

Fix Encoding & Reload

Manage Libraries...Ctrl+ Shift+I

Serial MonitorCtrl+ Shift+M

Serial PlotterCtrl+ Shift+L

WiFi101 / Wi-Fi NINA Firmware Updater

Board: "ESP32 Wrover Module"Boards Manager...

Upload Speed: "115200"Arduino AVR Boards

Flash Frequency: "80MHz"ESP32 Arduino

Flash Mode: "QIO"

Partition Scheme: "Huge APP (3MB No OTA/1MB SPIFFS)"

Core Debug Level: "None"

Port

Get Board Info

Programmer

Burn Bootloader

gh JPEG quality

ce

ze

>

>

>

>

>

>

Has PSRAM

CAMERA MODEL AI THINKER // Has PSRAM

Boards Manager

TypeAll

Arduino AVR Boards

Built-In by Arduino version 1.8.3 INSTALLED

Boards included in this package:

Arduino Yún, Arduino UNO, Arduino UNO Mini, Arduino UNO WiFi, Arduino Diecimila, Arduino Nano, Arduino Mega, Arduino Mega ADK, Arduino Leonardo, Arduino Leonardo Ethernet, Arduino Micro, Arduino Esplora, Arduino Mini, Arduino Ethernet, Arduino Fio, Arduino BT, Arduino LilyPad USB, Arduino LilyPad, Arduino Pro, Arduino ATmegaNG, Arduino Robot Control, Arduino Robot Motor, Arduino Gemma, Adafruit Circuit Playground, Arduino Yún Mini, Arduino Industrial 101, Linino One.

[Online Help](#)

[More Info](#)

Arduino Mbed OS Edge Boards

by Arduino

Boards included in this package:

Arduino Edge Control.

[Online Help](#)

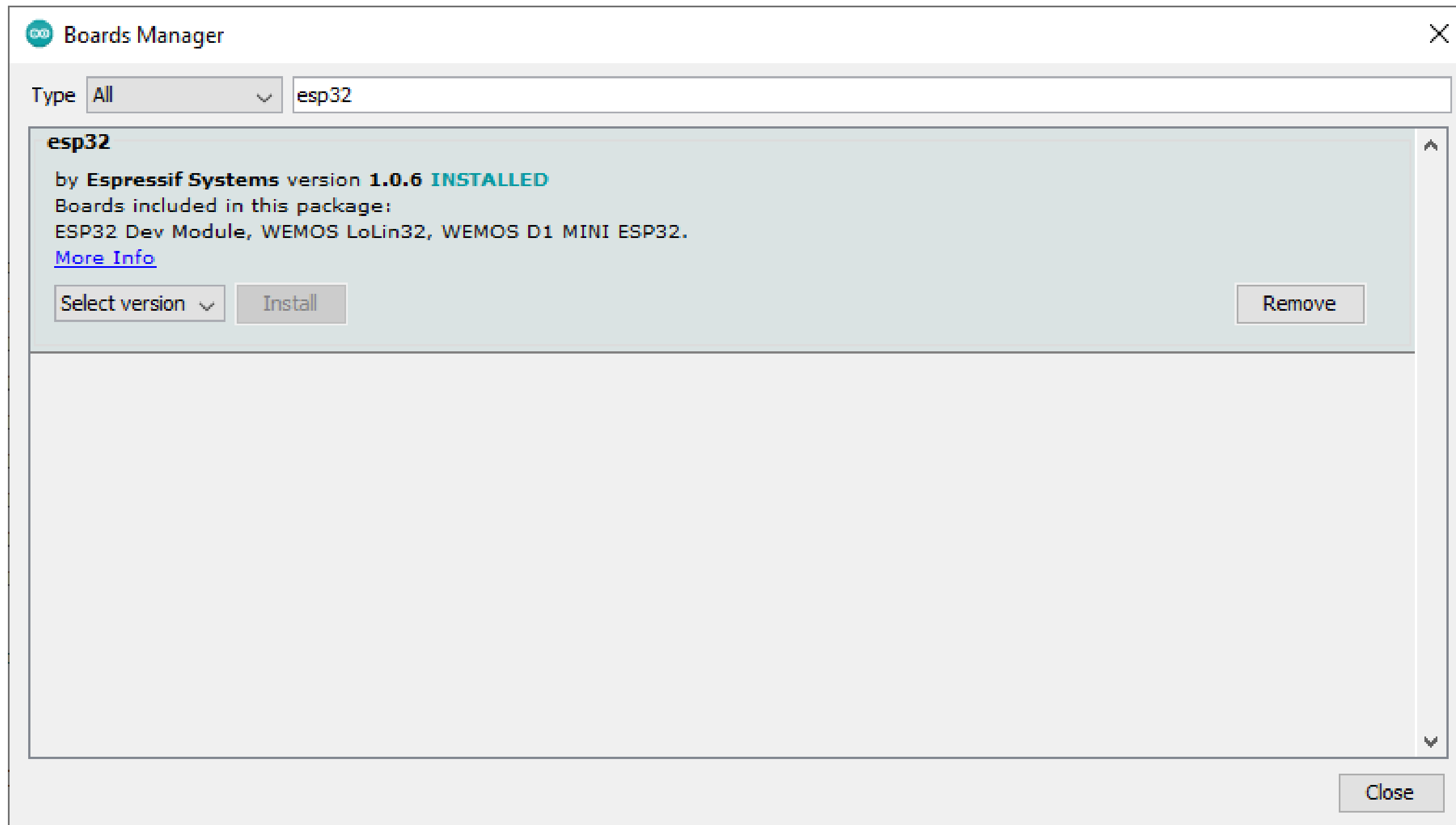
[More Info](#)

Arduino Mbed OS Giga Boards

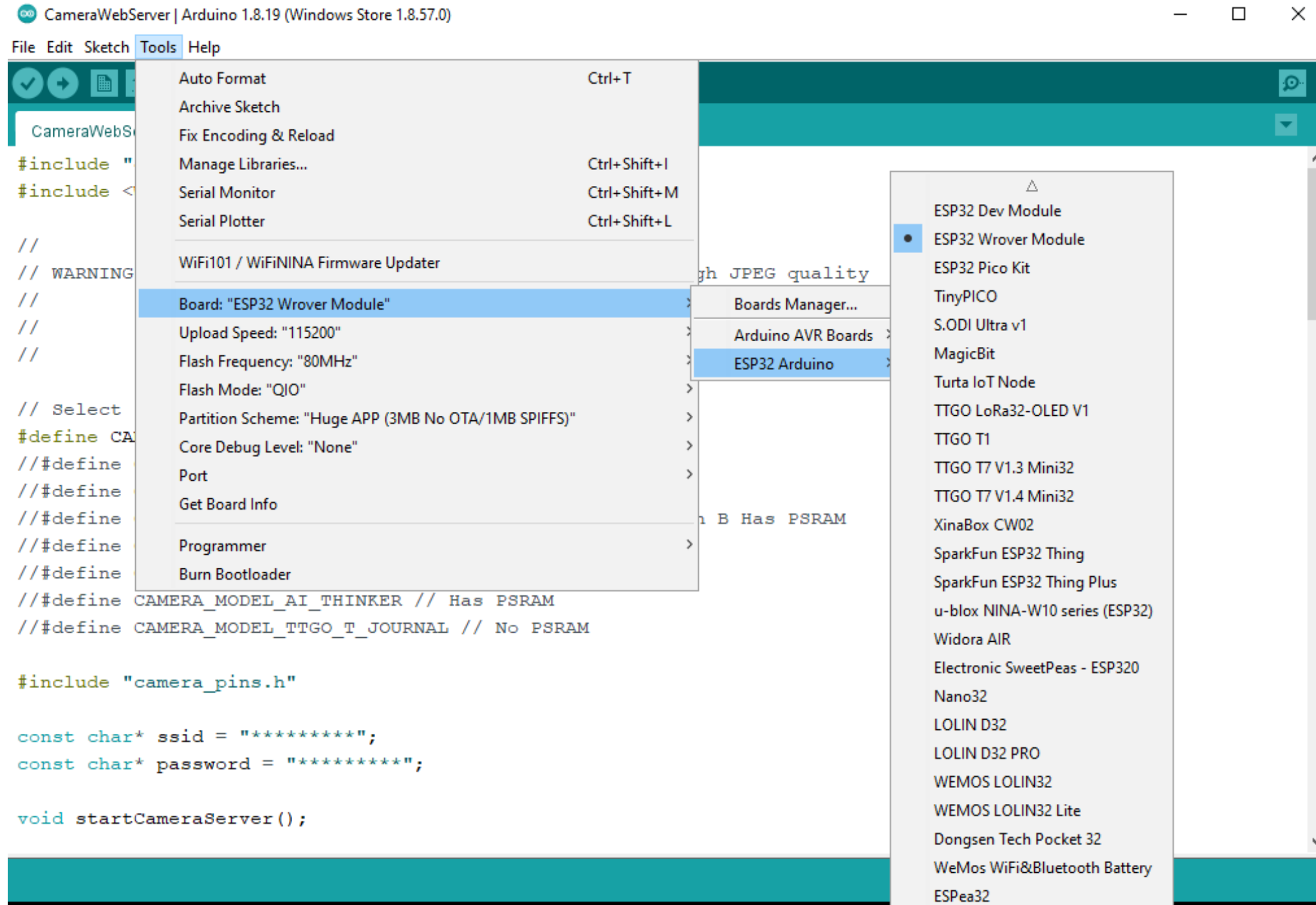
Downloading platforms index...Cancel

Downloading platforms index...

Arduino IDE Setup 4

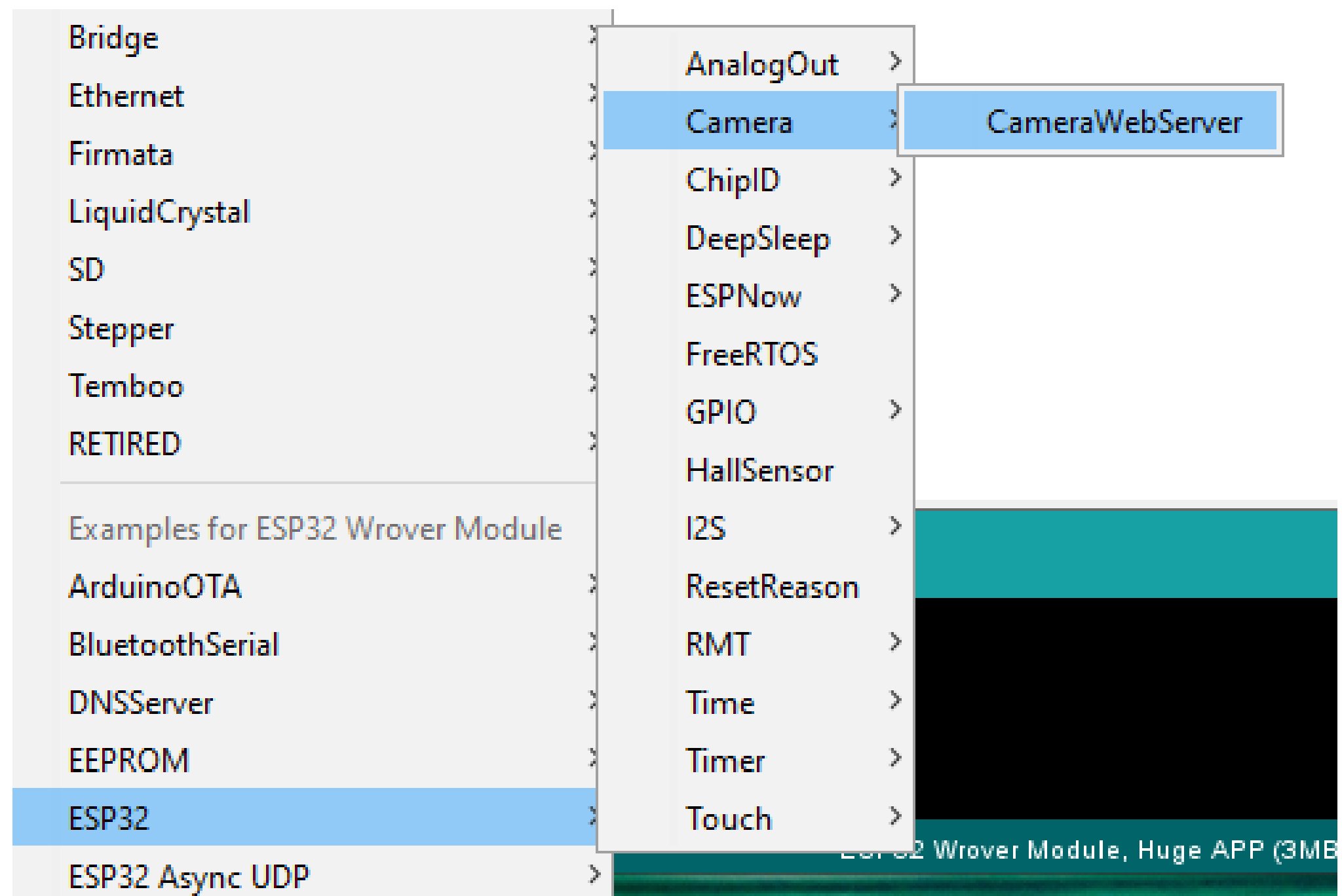
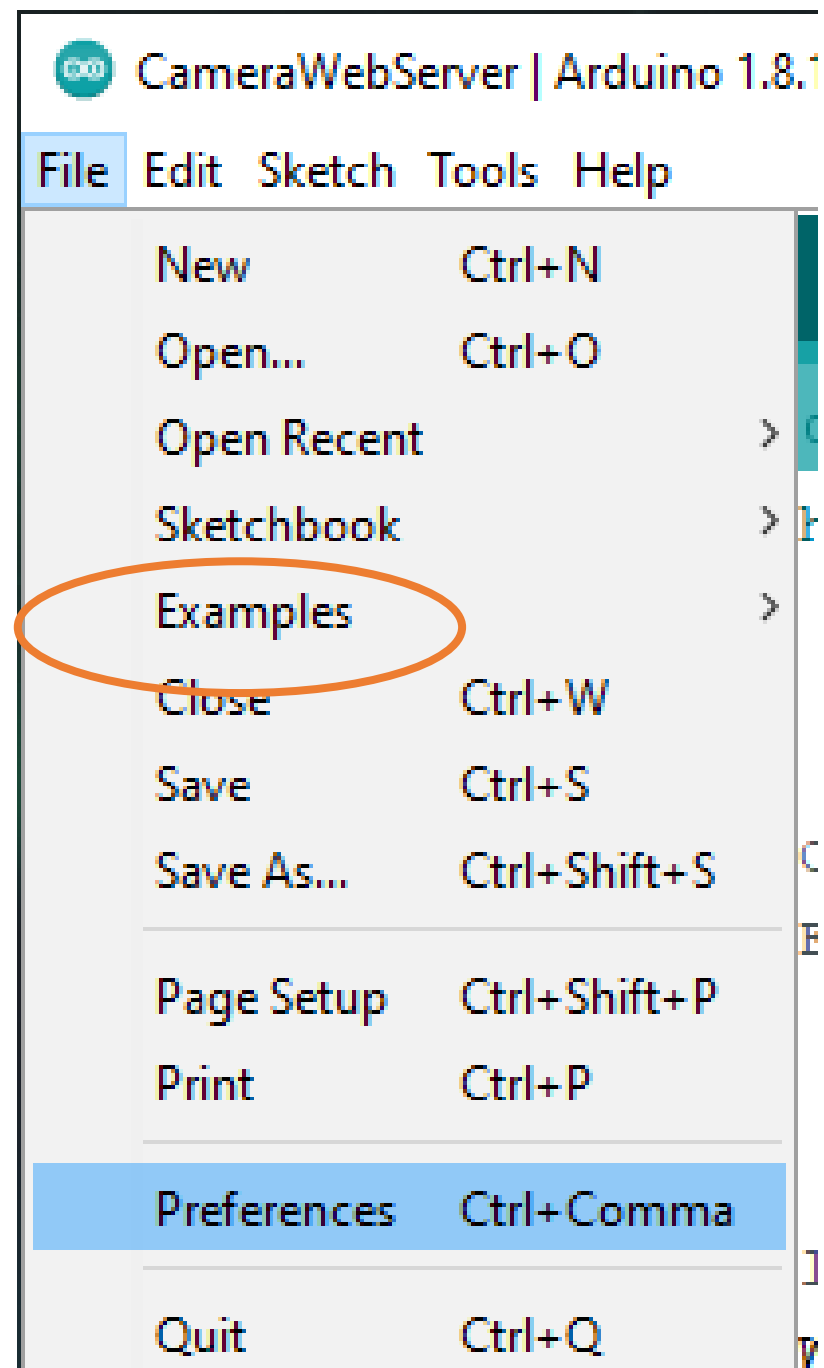


Arduino IDE Setup 5



Auto Format	Ctrl+T
Archive Sketch	
Fix Encoding & Reload	
Manage Libraries...	Ctrl+Shift+I
Serial Monitor	Ctrl+Shift+M
Serial Plotter	Ctrl+Shift+L
WiFi101 / WiFinINA Firmware Updater	
Board: "ESP32 Wrover Module"	>
Upload Speed: "115200"	>
Flash Frequency: "80MHz"	>
Flash Mode: "QIO"	>
Partition Scheme: "Huge APP (3MB No OTA/1MB SPIFFS)"	>
Core Debug Level: "None"	>
Port	>
Get Board Info	
Programmer	>
Burn Bootloader	

Camera Web Server Example 1



Camera Web Server Example 2

```
// Select camera model
//#define CAMERA_MODEL_WROVER_KIT // Has PSRAM
➡ //#define CAMERA_MODEL_ESP_EYE // Has PSRAM
//#define CAMERA_MODEL_M5STACK_PSRAM // Has PSRAM
//#define CAMERA_MODEL_M5STACK_V2_PSRAM // M5Camera version B Has PSRAM
//#define CAMERA_MODEL_M5STACK_WIDE // Has PSRAM
//#define CAMERA_MODEL_M5STACK_ESP32CAM // No PSRAM
➡ #define CAMERA_MODEL_AI_THINKER // Has PSRAM
//#define CAMERA_MODEL_TTGO_T_JOURNAL // No PSRAM

#include "camera_pins.h"

➡ const char* ssid = "*****";
➡ const char* password = "*****";
```

Camera Web Server Example 3

Auto Format
Archive Sketch
Fix Encoding & Reload
Manage Libraries...
Serial Monitor
Serial Plotter
WiFi101 / Wi-Fi NINA Firmware Updater
Board: "ESP32 Wrover Module"
Upload Speed: "115200"
Flash Frequency: "80MHz"
Flash Mode: "QIO"
Partition Scheme: "Huge APP (3MB No OTA)"
Core Debug Level: "None"
Port
Get Board Info
Programmer
Burn Bootloader

```
COM9

ets Jul 29 2019 12:21:46

rst:0x1 (POWERON_RESET),boot:0x13 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0xee
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff0018,len:4
load:0x3fff001c,len:1216
ho 0 tail 12 room 4
load:0x40078000,len:10944
load:0x40080400,len:6388
entry 0x400806b4

.....
WiFi connected
Starting web server on port: '80'
Starting stream server on port: '81'
Camera Ready! Use 'http://192.168.219.108' to connect
```

☒ Autoscroll ☐ Show timestamp Newline 115200 baud Clear output

Camera Web Server Example 4

ESP32 OV2460

주의 요함 | 192.168.219.108

Bookmarks IE에서 가져온 북마크 NAVER W3Schools Online... Development Platfo... MIT Open Learning... EASYSHOP 기타 북마크

Toggle OV2640 settings

Resolution XGA(1024x768)

Quality 10 — 63

Brightness -2 — 2

Contrast -2 — 2

Saturation -2 — 2

Special Effect No Effect

AWB ☒

AWB Gain ☒

WB Mode Auto

AEC SENSOR ☒

AEC DSP ☐

AE Level -2 — 2

AGC ☒

Gain Ceiling 2x — 128x

BPC ☐

WPC ☒

