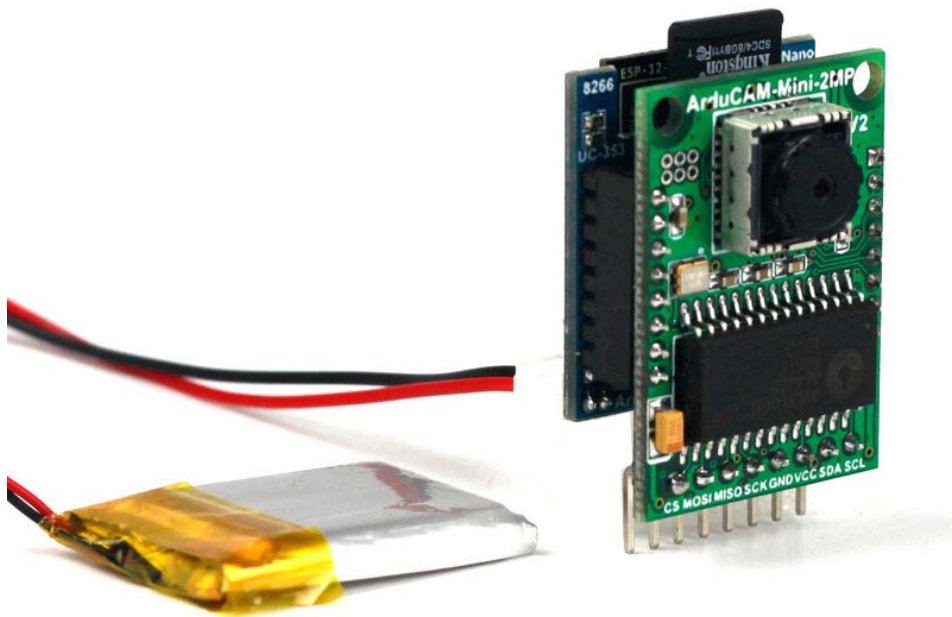




# ArduCAM-M-2MP ESP8266 Evaluation Kit User Guide

Rev 1.0, July 2016



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# 1 Introduction

The evaluation kit is designed for low cost WIFI IoT camera based on ArduCAM-Mini-2MP-V2 and ArduCAM-ESP8266-Nano modules. User can implement a 2MP WIFI camera using HTTP or WebSocket protocol on ESP8266, and the camera can be acted as an AP and mobile phone/PC can connect to the camera directly or acted as a Station which connected to the home router. The kit can take 2MP full resolution JPEG still image, but streaming low resolution low frame rate video due to the limitation of ESP8266. The kit can be USB powered or battery powered with buildin charging circuits. The kit can also be used separately, it is identical to an ArduCAM-Mini-2MP camera and a ESP8266 module.

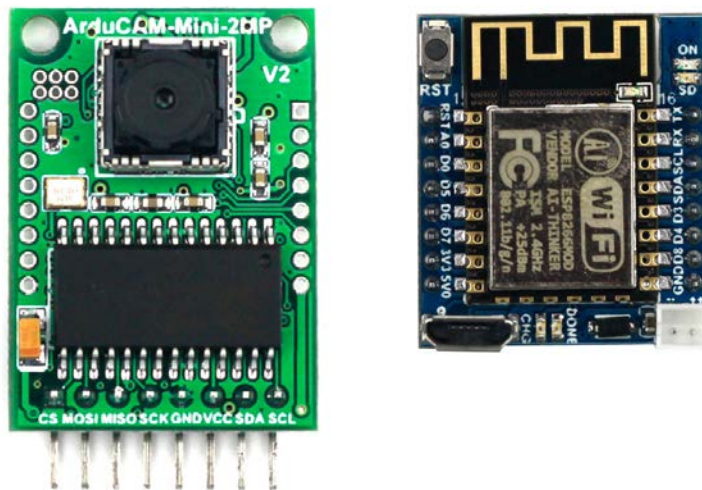


Figure 1 ArduCAM-Mini-2MP-V2 and ESP8266-Nano

## 2 Kit Content

- ArduCAM-Mini-2MP-V2           x1
- ArduCAM-ESP8266-Nano       x1
- Battery power cable           x1

**Note: not battery is included, need to buy from local.**

## 3 Features

- 2MP image sensor OV2640, support JPEG
- Standard FOV 60° stock lens
- I2C interface for the sensor configuration
- SPI interface for camera commands and data stream
- Onboard ES8266-12F module
- Build in Lithium battery recharging 3.7V/500mA max
- Build in SD/TF card socket
- Build in micro USB-Serial (CH340g) convertor
- Compatible with Arduino IDE
- Small form of factor

## 4 Pin Definition

There are two connectors on ArduCAM-Mini-2MP camera module, the 8 pin connector on the down side is standard ArduCAM connector. The other dual line 16 pin connector is dedicate connector for ArduCAM-ESP8266-Nano module, it can be well mated with ESP8266 Nano module directly.

Table 1 ArduCAM-M-2MP Standard Connector Pin Definition

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	CS	Input	SPI slave chip select input
2	MOSI	Input	SPI master output slave input
3	MISO	Output	SPI master input slave output
4	SCLK	Input	SPI serial clock
5	GND	Ground	Power ground
6	VCC	POWER	3.3V~5V Power supply
7	SDA	Bi-directional	Two-Wire Serial Interface Data I/O
8	SCL	Input	Two-Wire Serial Interface Clock

Table 2 ArduCAM-ESP8266-Nano Pin Definition

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	RST	Input	ESP8266 reset input
2	A0	Input	Analog input
3	GND	Ground	Power ground
4	D0/GPIO16	Input	Chip select for camera
5	D5/SCK	Ground	Hardware SPI SCLK
6	D6/MISO	Input	Hardware SPI MISO
7	D7/MOSI	Output	Hardware SPI MOSI
8	3.3V	POWER	3.3V Power supply
9	GND	Ground	Power ground
10	D8/GPIO15	INOUT	GPIO
11	D4/GPIO2	INOUT	GPIO
12	D3/GPIO0	INOUT	Chip select for SD card
13	SDA/GPIO04	Bi-directional	Two-Wire Serial Interface Data I/O
14	SCL/GPIO05	Output	Two-Wire Serial Interface Clock
15	Rx/GPIO03	Input	Hardware UARTTX
16	Tx/GPIO01	Output	Hardware UARTRX

## 5 Wiring Diagram

Figure 2 shows the wiring diagram between the ArduCAM mini 2MP and ESP8266 Nano module.

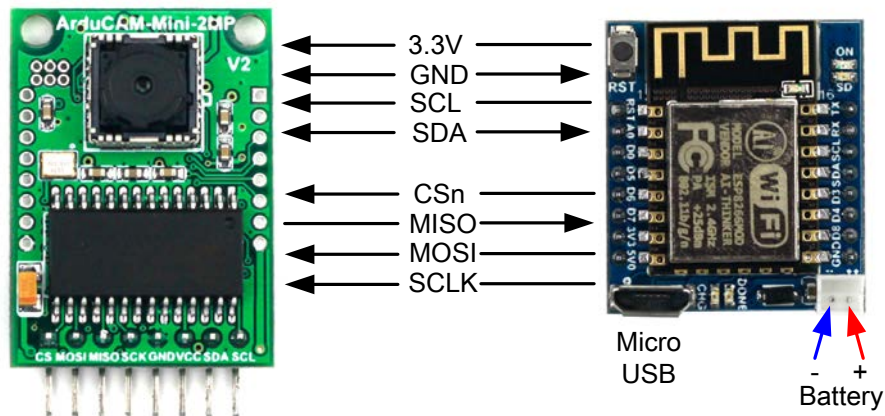


Figure 2 Wiring Diagram

## 6 Getting Started ESP8266 with Arduino IDE

This chapter shows you how to develop an application for ArduCAM ESP8266 Nano board using Arduino IDE.

### 6.1 Installing with Boards Manager

Starting with 1.6.4, Arduino allows installation of third-party platform packages using Boards Manager. We have packages available for Windows, Mac OS, and Linux (32 and 64 bit).

- Install Arduino 1.6.8 from the Arduino website.
- Start Arduino and open Preferences window.
- Enter the following link into Additional Board Manager URLs field. You can add multiple URLs, separating them with commas.

[http://www.arducam.com/downloads/ESP8266\\_UNO/package\\_ArduCAM\\_index.json](http://www.arducam.com/downloads/ESP8266_UNO/package_ArduCAM_index.json)

- Open Boards Manager from Tools -> Board menu and install ArduCAM\_ESP8266\_UNO addon package.

Note that the installed package source file is located in the C:\Users\*Your computer name*\AppData\Local\Arduino15\ folder, here is

C:\Users\zk109\AppData\Local\Arduino15\ for example.

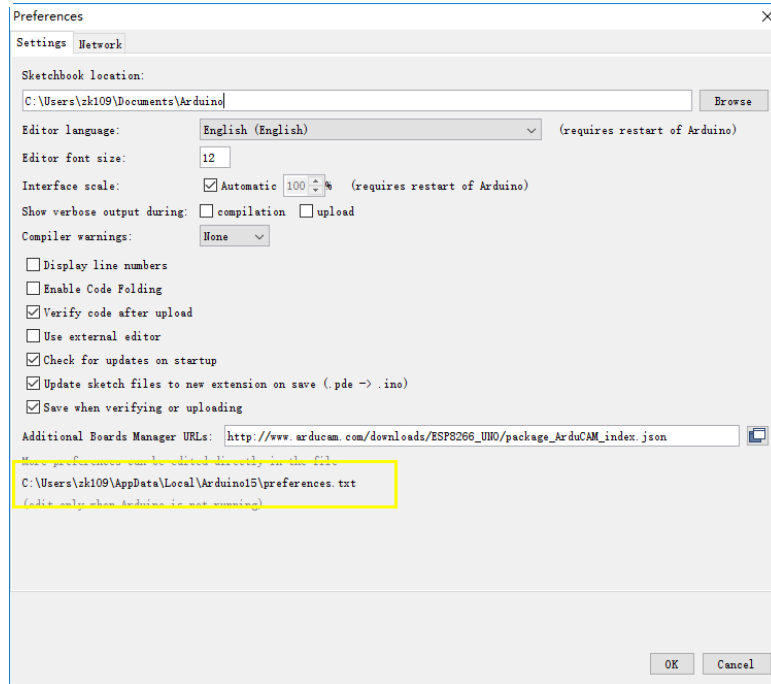


Figure 4 ArduCAM ESP8266 UNO addon package

## 6.2 Using Arduino IDE

After installation of ArduCAM ESP8266 Nano board add-on package, you can select this board from the Tool->Board menu. And there several ready to use examples from the File->Examples->ArduCAM. You can use these examples directly or as a starting point to develop your own code.

- Select ArduCAM\_ESP8266\_UNO board from Tool->Board menu.

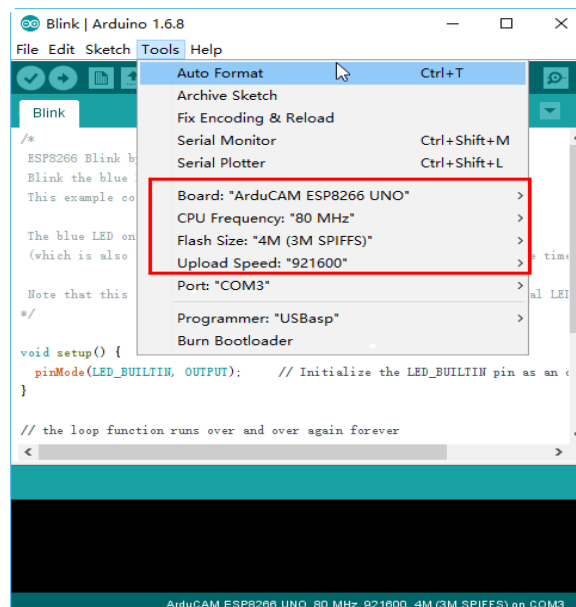


Figure 3 Board Selection

- Select the example from File->Examples->ArduCAM .

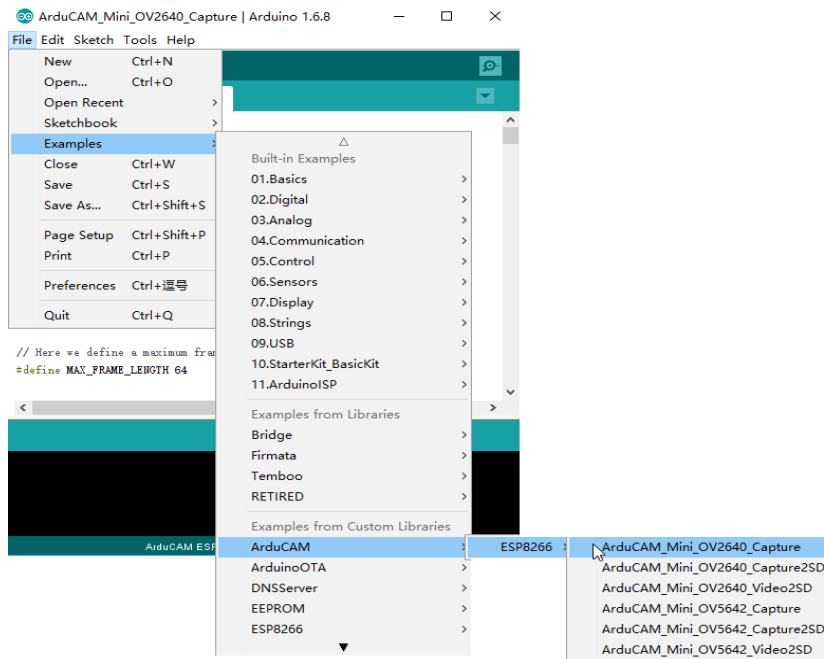


Figure 4 Example Selection

- Configure the camera setting

You need to modify the *memorysaver.h* file in order to enable OV2640 camera for ArduCAM Mini 2MP camera modules. Only one camera can be enabled at a time. The *memorysaver.h* file is located at C:\Users\*Your computer name*\AppData\Local\Arduino15\packages\

ArduCAM\_ESP8266\_UNO\hardware\ArduCAM\_ESP8266\_UNO\2.1.0\libraries\ArduCAM

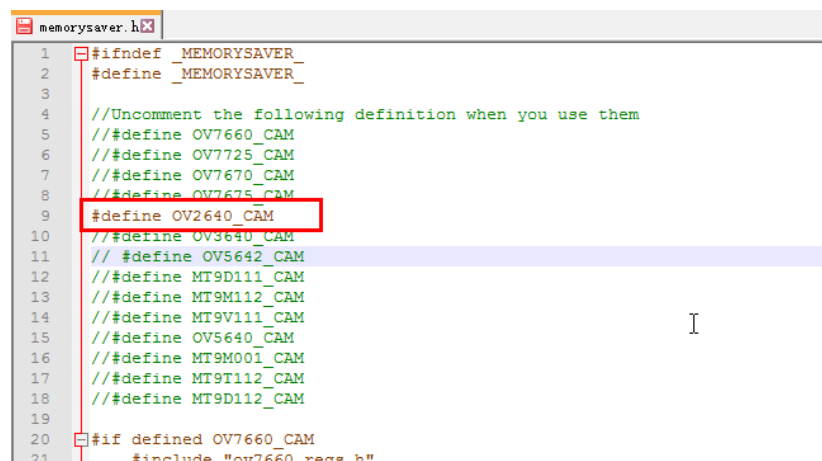


Figure 5 Camera Configuration

- Compile and uploading

Change the SSID and password if needed with your own network environment before compile the example. Click uploading the example will automatically flashed into the board.

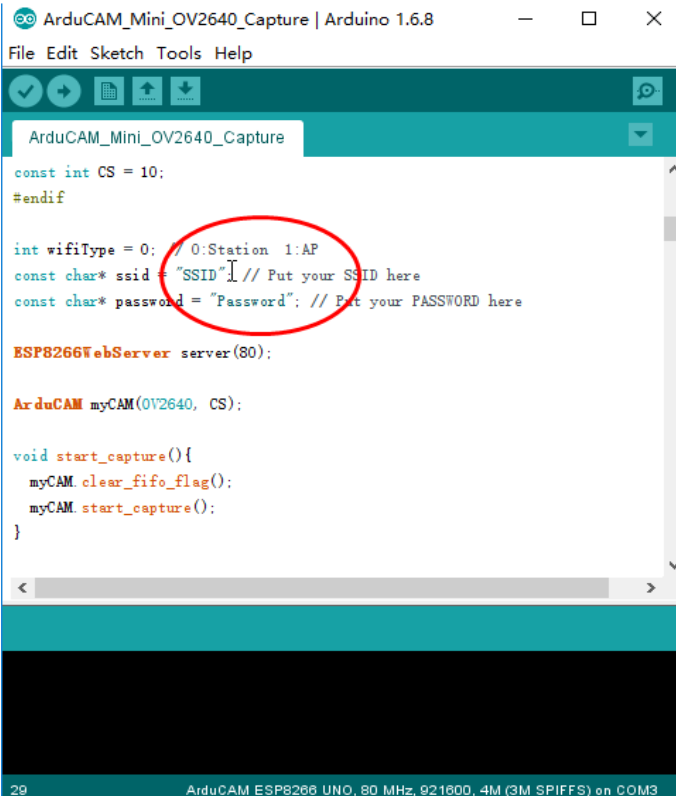
### 6.3 Examples

There are 3 examples for both 2MP ArduCAM mini camera modules.

#### ➤ ArduCAM\_Mini\_OV2640\_Capture

This example uses HTTP protocol to capture still or video over home wifi network from ArduCAM mini 2MP and display on the web browser.

Using this example the ssid and password should be modifies before uploading.



```
ArduCAM_Mini_OV2640_Capture | Arduino 1.6.8
File Edit Sketch Tools Help

ArduCAM_Mini_OV2640_Capture

const int CS = 10;
#endif

int wifiType = 0; // 0:Station 1:AP
const char* ssid = "SSID"; // Put your SSID here
const char* password = "Password"; // Put your PASSWORD here

ESP8266WebServer server(80);

ArduCAM myCAM(OV2640, CS);

void start_capture(){
  myCAM.clear_fifo_flag();
  myCAM.start_capture();
}

29 ArduCAM ESP8266 UNO, 80 MHz, 921600, 4M (3M SPIFFS) on COM3
```

Figure 6 Wifi Camera Example

After uploading, the board IP address is obtained via DHCP protocol. You can figure out the IP address through the serial monitor as Figure 7 shown. The default serial monitor baudrate setting is 115200bps.



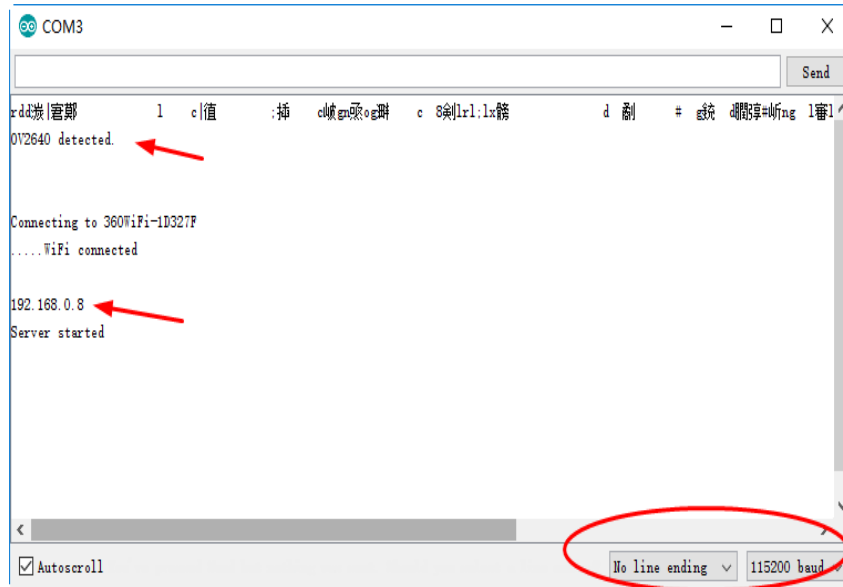


Figure 7 Identifying IP address

Finally, open the index.html or video.html, input the IP address obtained from the serial monitor then take pictures or videos. The html files are located at

C:\Users\Your computer name\Local\Arduino15\packages\

ArduCAM\_ESP8266\_UNO\hardware\ArduCAM\_ESP8266\_UNO\2.1.0\libraries\ArduCAM\examples\ESP8266\

ArduCAM\_Mini\_OV2640\_Capture\html

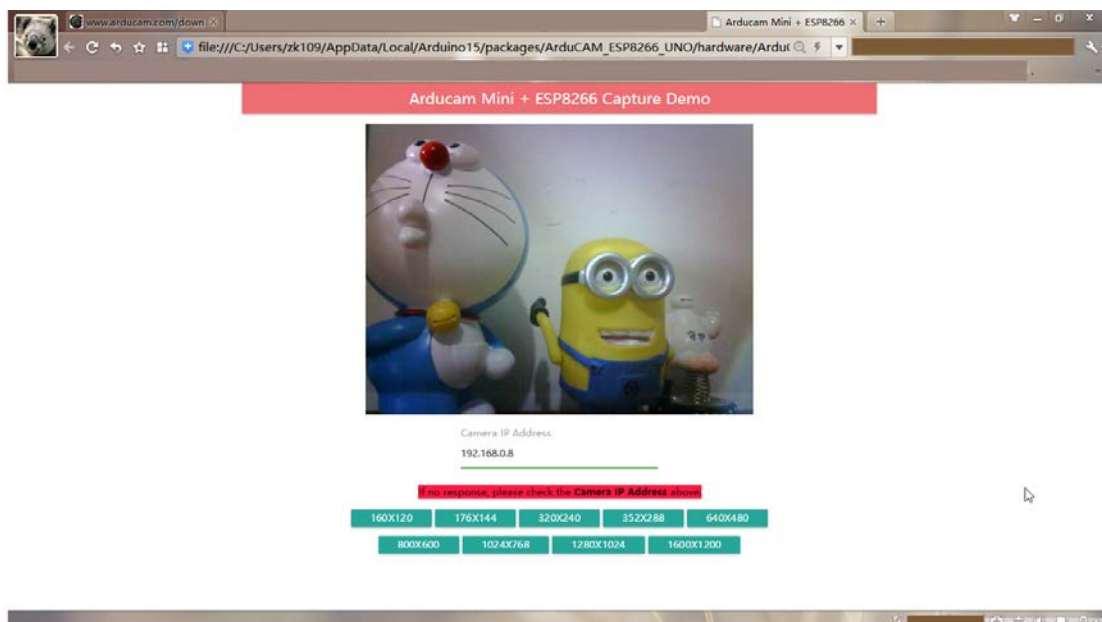


Figure 8 Example Html page

- ArduCAM\_Mini\_OV2640\_Capture2SD

This example takes time elapse still photos using ArduCAM mini 2MP and then stored on the TF/SD card. The LED indicates when the TF/SD card is writing.

➤ ArduCAM\_Mini\_OV2640\_Video2SD

This example takes motion JPEG video clips using ArduCAM mini 2MP and then stored on the TF/SD card as AVI format,about 4 minutes to complete.