Arducam ESP32 UNO board

User Guide

Rev 1.0, Jun 2017
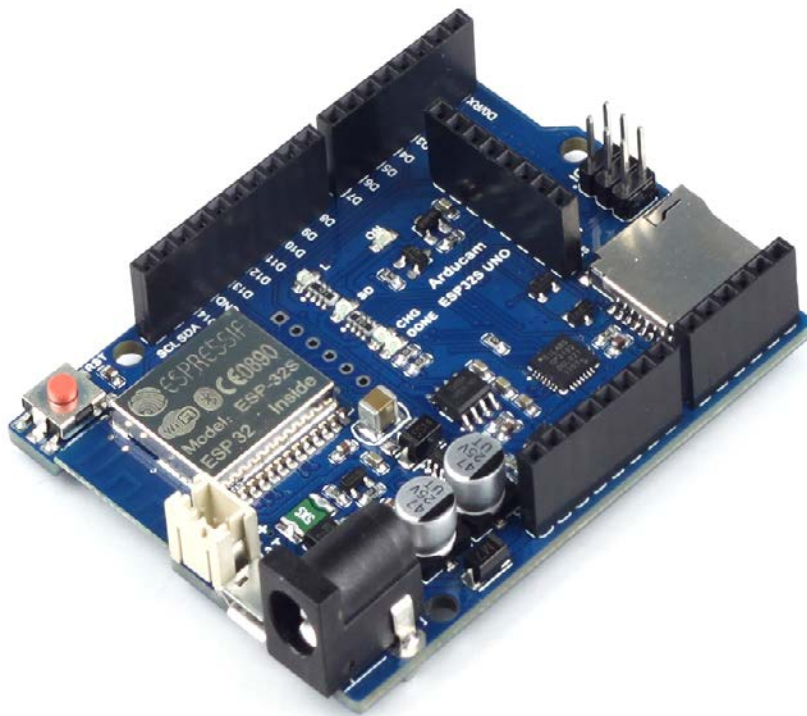
Table of Contents

1 Introduction

Arducam now released a ESP32 based Arduino board for Arducam mini camera modules while keeping the same form of factors and pinout as the standard Arduino UNO R3 board. The high light this ESP32 board is that it well mates with Arducam mini 2MP and 5MP camera modules, supports Lithium battery power supply and recharging and with build in SD card slot. It can be an ideal solution for home security and IoT camera applications.

Figure 1 Arducam ESP32 UNO Kit

2 Features

➢ Build in ESP-32S Module

➢ 26 digital input/output pins, IO ports are 3.3V tolerant

➢ Arducam Mini 2MP/5MP camera interface

➢ Lithium battery recharging 3.7V/500mA max

➢ Building in SD/TF card socket

➢ 7-12V power jack input

➢ Build in micro USB-Serial interface

➢ Compatible with Arduino IDE
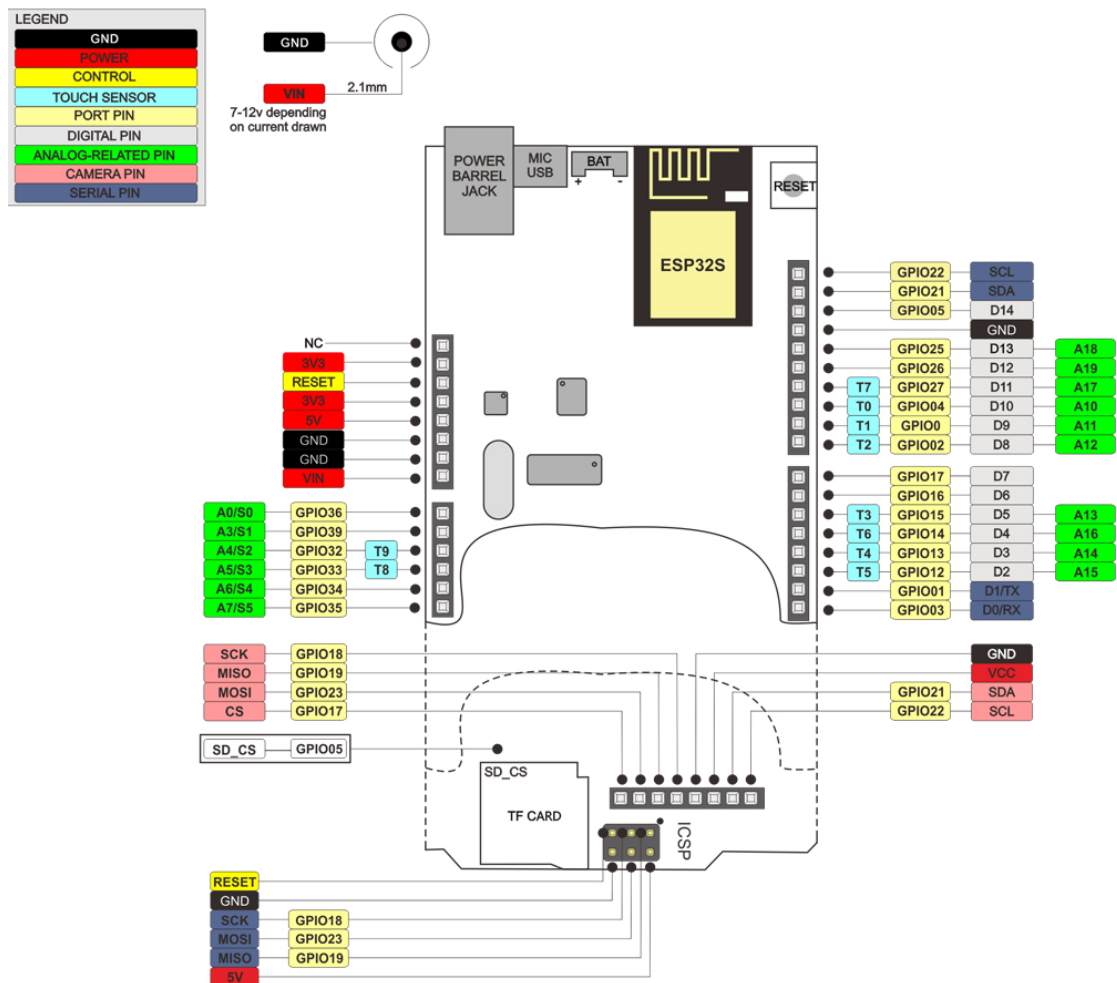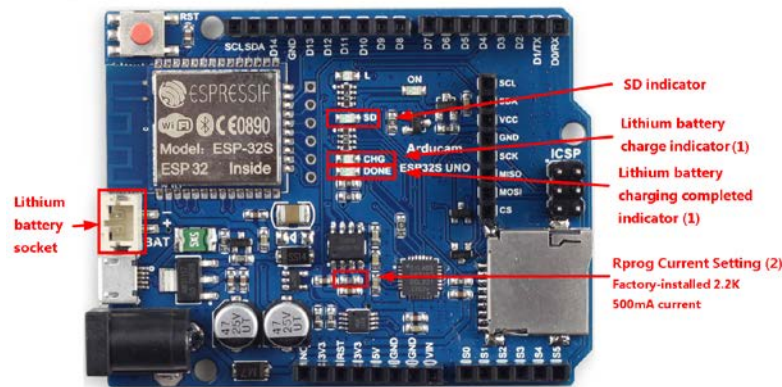
3 Pin Definition

Figure 2 Arducam ESP32 UNO Pin Out

The board has build in Lithium battery charger, which accepts default 3.7V/500mA Lithium battery. The charging indicator and charging current setting can be found from the Figure 3.

(1) indicator light state

Charge state	Yellow LED $\overline{CHRG}$	Greed LED $\overline{STDBY}$
charging	bright	extinguish
Charge Termination	extinguish	bright
Vin too low; Temperature of battery too low or too high; no battery	extinguish	extinguish
BAT PIN Connect 10u Capacitance; No battery	Greed LED bright，Yellow LED Coruscate T=1-4 S	

(2) Rprog Current Setting

R_{PROG} (k)	I_{BAT} (mA)
10	130
5	250
4	300
3	400
2	580
1.66	690
1.5	780
1.33	900
1.2	1000

Figure 3 Battery Charging Indicator and Current Settings

4 Getting Started ESP32 with Arduino IDE

This chapter shows you how to develop an application for Arducam ESP32 UNO board using Arduino IDE. (Tested on 32 and 64 bit Windows 10 machines)

4.1 Steps to install Arducam ESP32 support on Windows

➢ Starting Download and install the latest Arduino IDE Windows Installer from arduino.cc

➢ Download and install Git from git-scm.com

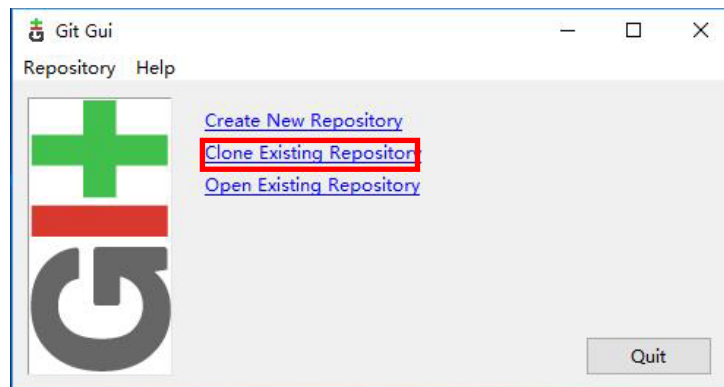➢ Start Git GUI and run through the following steps:

Select Clone Existing Repository:

Figure 4 Select Clone Existing Repository

Select source and destination:

Source Location: *https://github.com/ArduCAM/ArduCAM_ESP32S_UNO.git*

Target Directory: C:/Users/[YOUR_USER_NAME]/Documents/Arduino/hardware/ ArduCAM/ArduCAM_ESP32S_UNO
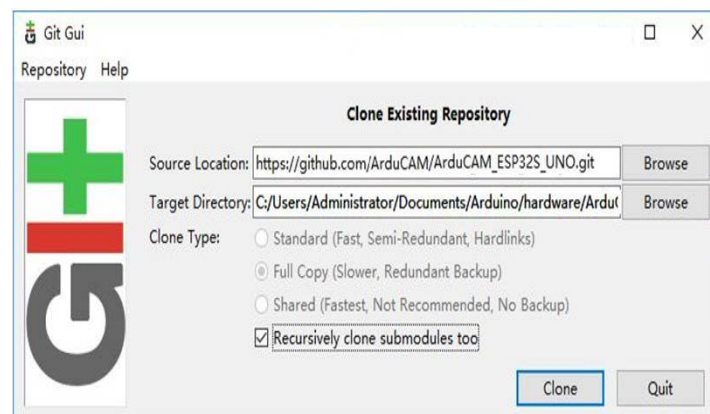
Click Clone to start cloning the repository:

Figure 5 Clone the Repository

www.ArduCAM.com

Open C:/Users/[YOUR_USER_NAME]/Documents/Arduino/hardware/
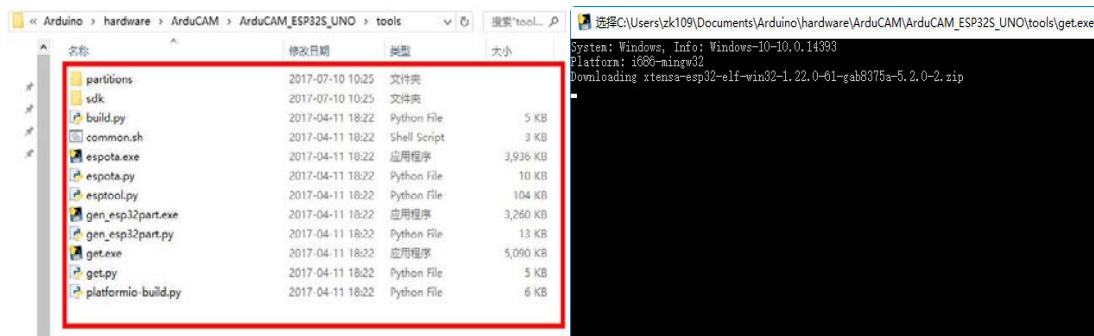
ArduCAM/esp32/tools and double-click get.exe

Figure 6 Install ESP32 board

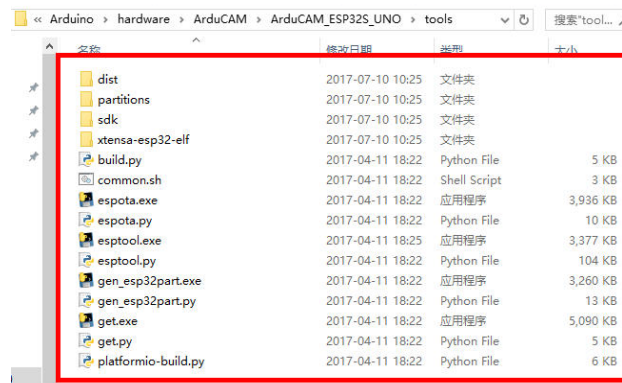When get.exe finishes, you should see the following files in the directory

Figure 7 ESP32 board directory

➢ Plug your ESP32 board and wait for the drivers to install (or install manually

any that might be required)

4.2 Using Arduino IDE

After installation of Arducam ESP32UNO board, 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.

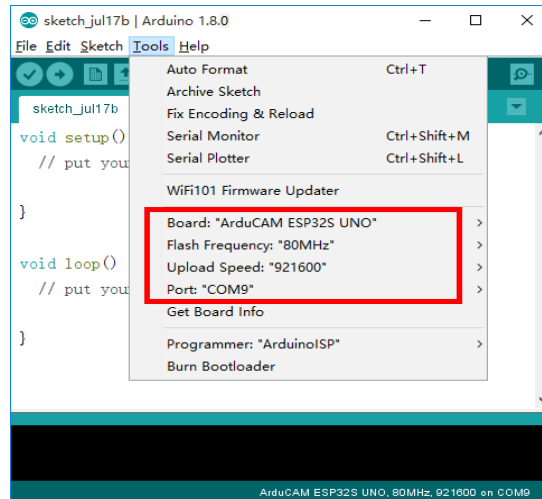➢ Start Arduino IDE, Select your board in Tools > Board menu>

Figure 8 Board Selection

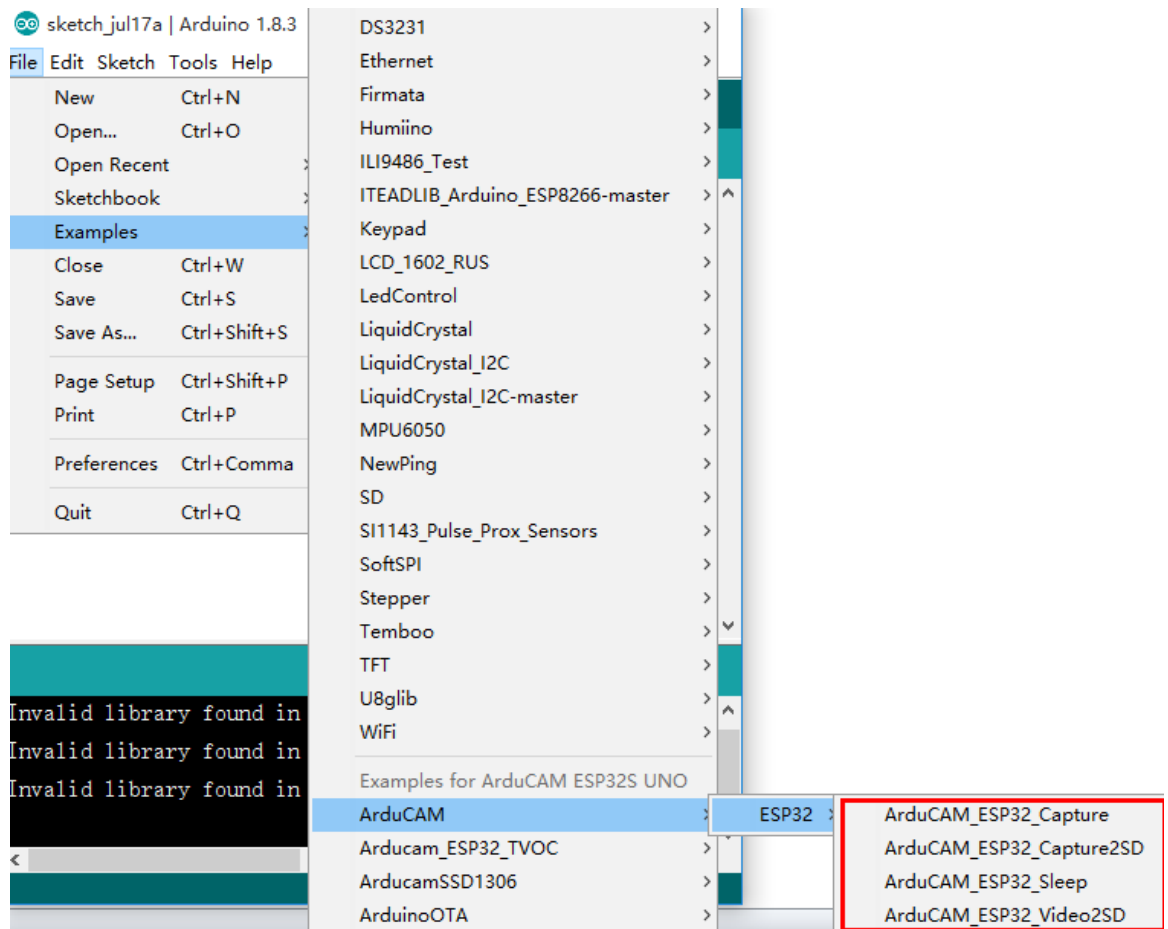➢ Select the example from File->Examples->ArduCAM

Figure 6 Example Selection

➢ Configure the camera setting

You need to modify the *memorysaver.h* file in order to enable OV2640 or

OV5642 camera for ArduCAM Mini 2MP or 5MP camera modules. Only one

camera can be enabled at a time. The *memorysaver.h* file is located at

C:\Users\Your computer\Documents\Arduino\hardware\ ArduCAM

\ArduCAM_ESP32S_UNO\libraries\ArduCAM

```
//Step 1: select the hardware platform, only one at a time
#define OV2640_MINI_2MP
//#define OV5642_MINI_5MP
//#define OV5642_MINI_5MP_BIT_ROTATION_FIXED
//#define OV5642_MINI_5MP_PLUS
//#define OV5640_MINI_5MP_PLUS

//#define ARDUCAM_SHIELD_REVC
//#define ARDUCAM_SHIELD_V2
```

www.ArduCAM.com

Figure 7 Camera Configuration

➢ Compile and uploading

Click uploading the example will automatically flashed into the board.
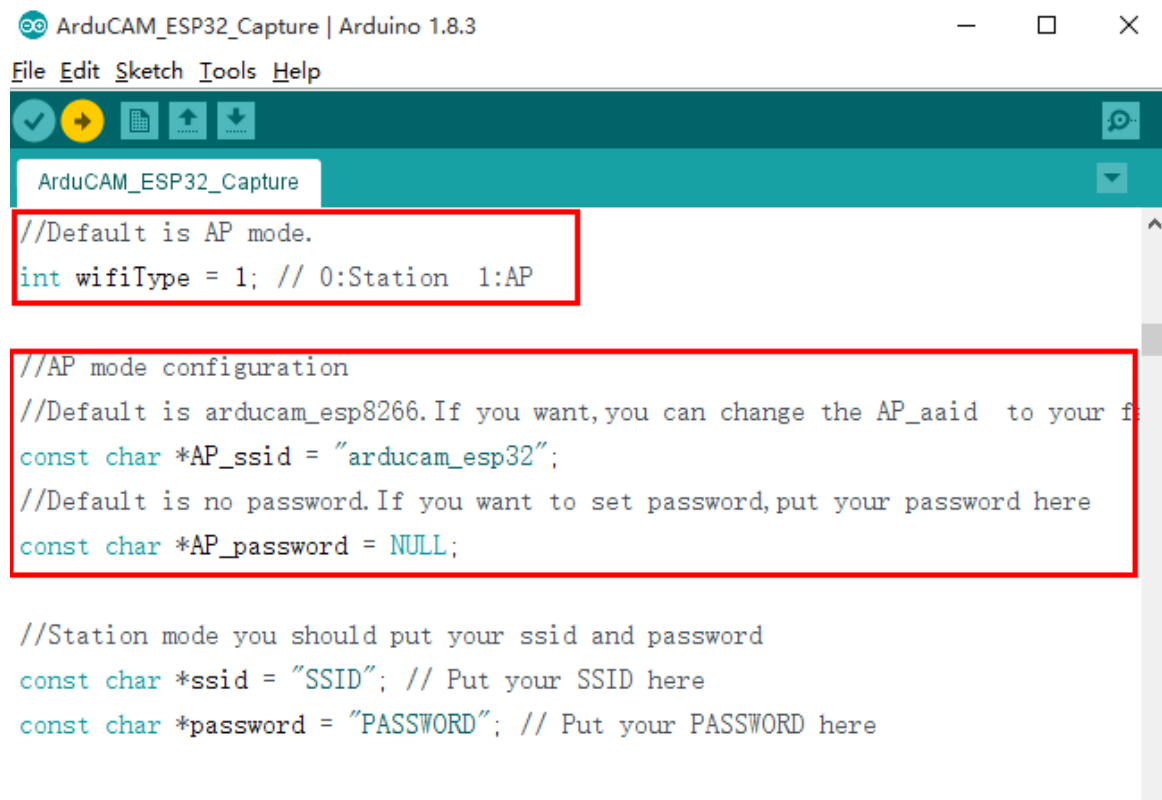
4.3 Examples

There are 4 examples for both 2MP and 5MP ArduCAM mini camera modules.

➢ ArduCAM_ESP32_ Capture

This example uses HTTP protocol to capture still or video over home wifi network from ArduCAM mini 2MP/5MP and display on the web browser.

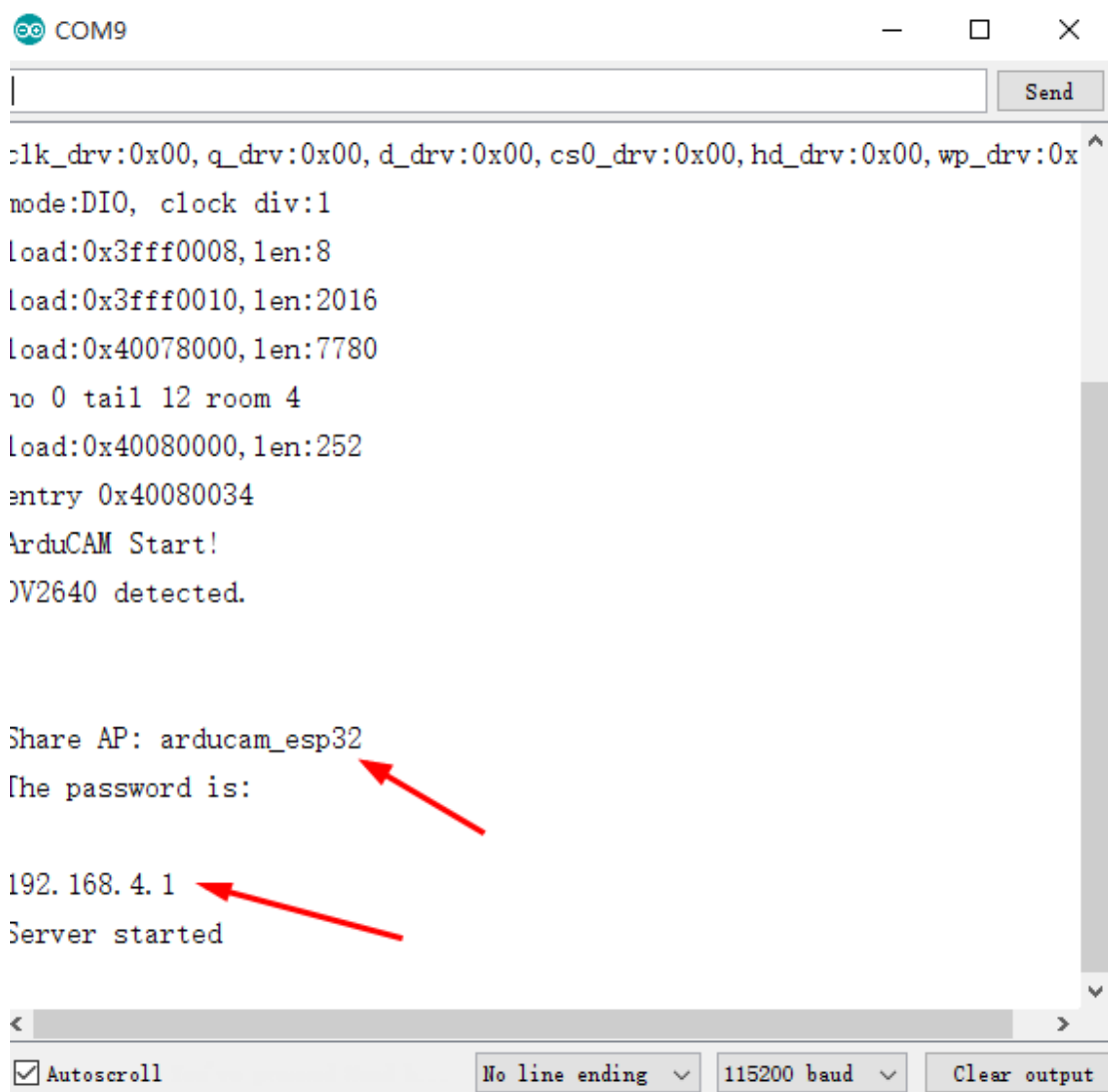The default is AP mode, after uploading the demo, you can search the 'arducam_esp32' and connect it without password.

Figure 8 Mode Configure

Figure9 Identifying IP address

If you want to use STA mode, you should change 'int wifiType = 1' to 'int wifiType =0'.Tthe ssid and password should be modifies before uploading.

10

Figure10 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 9 shown. The default serial monitor baudrate setting is 115200bps.
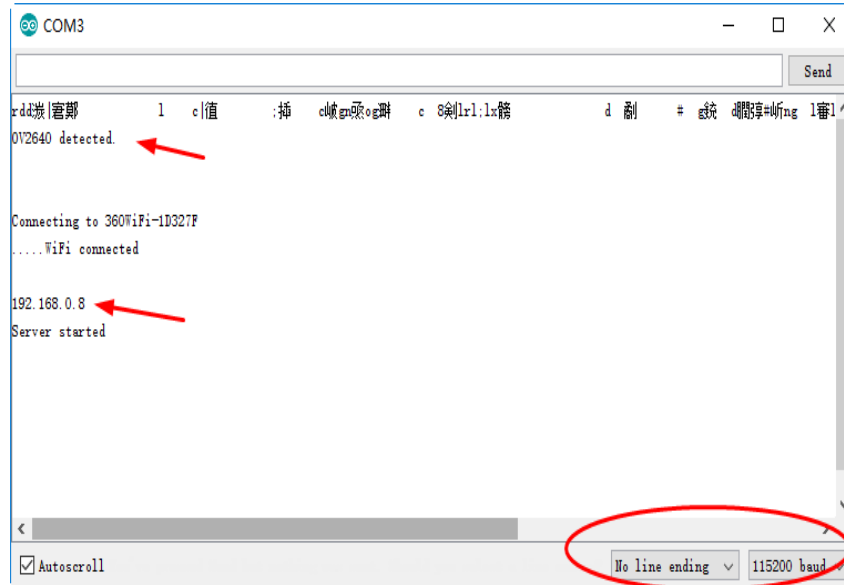
Figure 10 Identifying IP address

Finally, open the index.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\Documents\Arduino\hardware\ArduCAM\ArduCAM_ESP32S_UNO

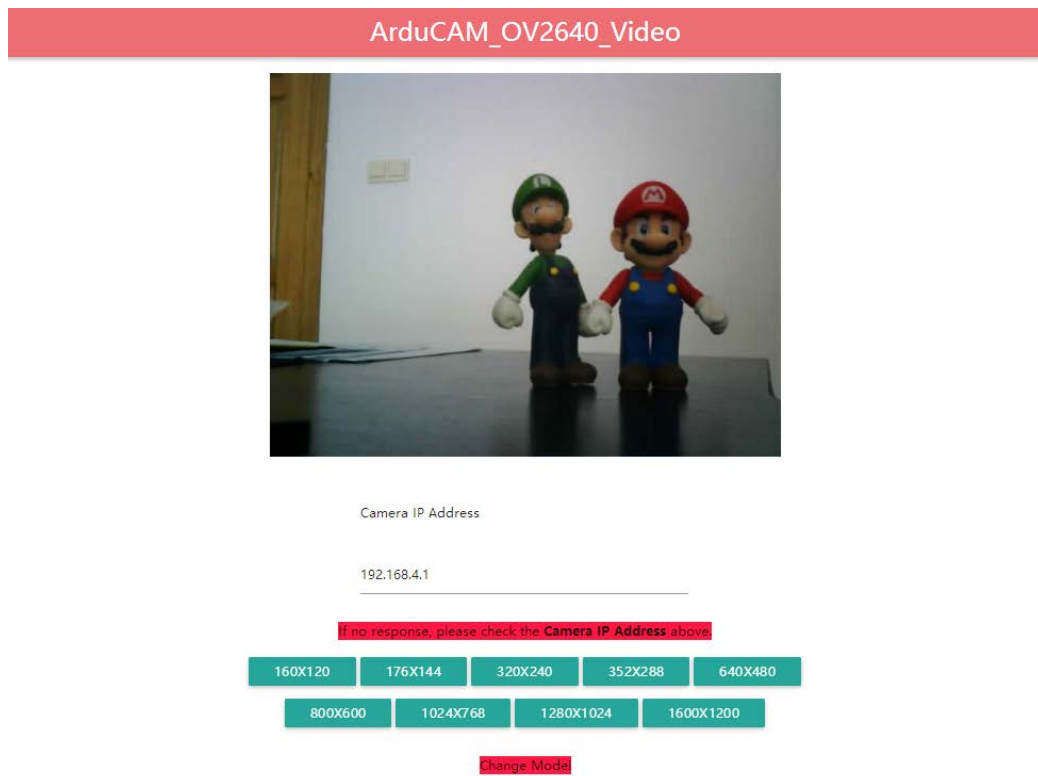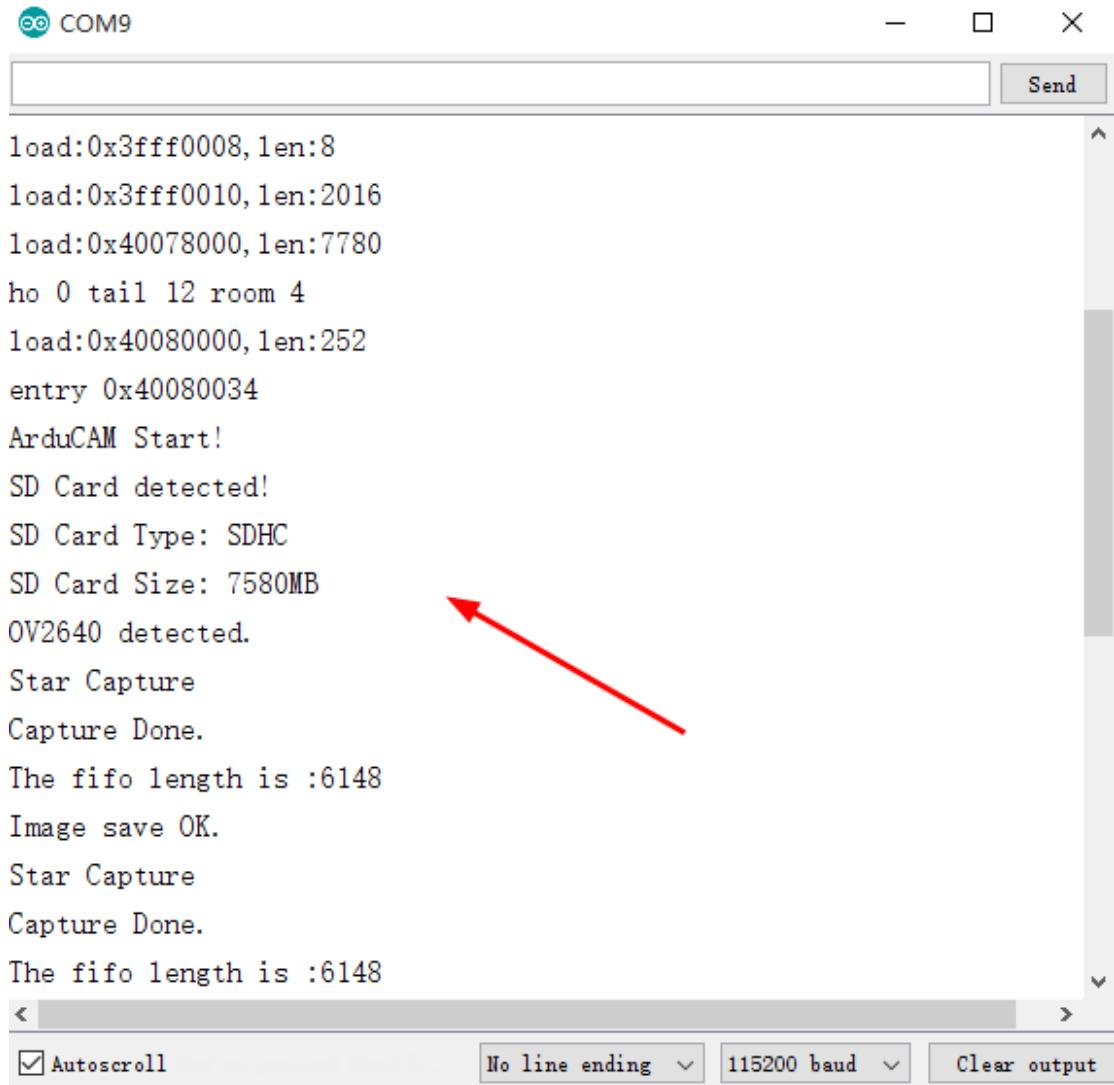\libraries\ArduCAM\examples\ESP32\ArduCAM_ESP32_Capture\html

Figure 11 Example Html page

➢ ArduCAM_ESP32_Capture2SD

www.ArduCAM.com

This example takes time elapse still photos using ArduCAM mini 2MP/5MP and then stored on the TF/SD card. The LED indicates when the TF/SD card is writing.
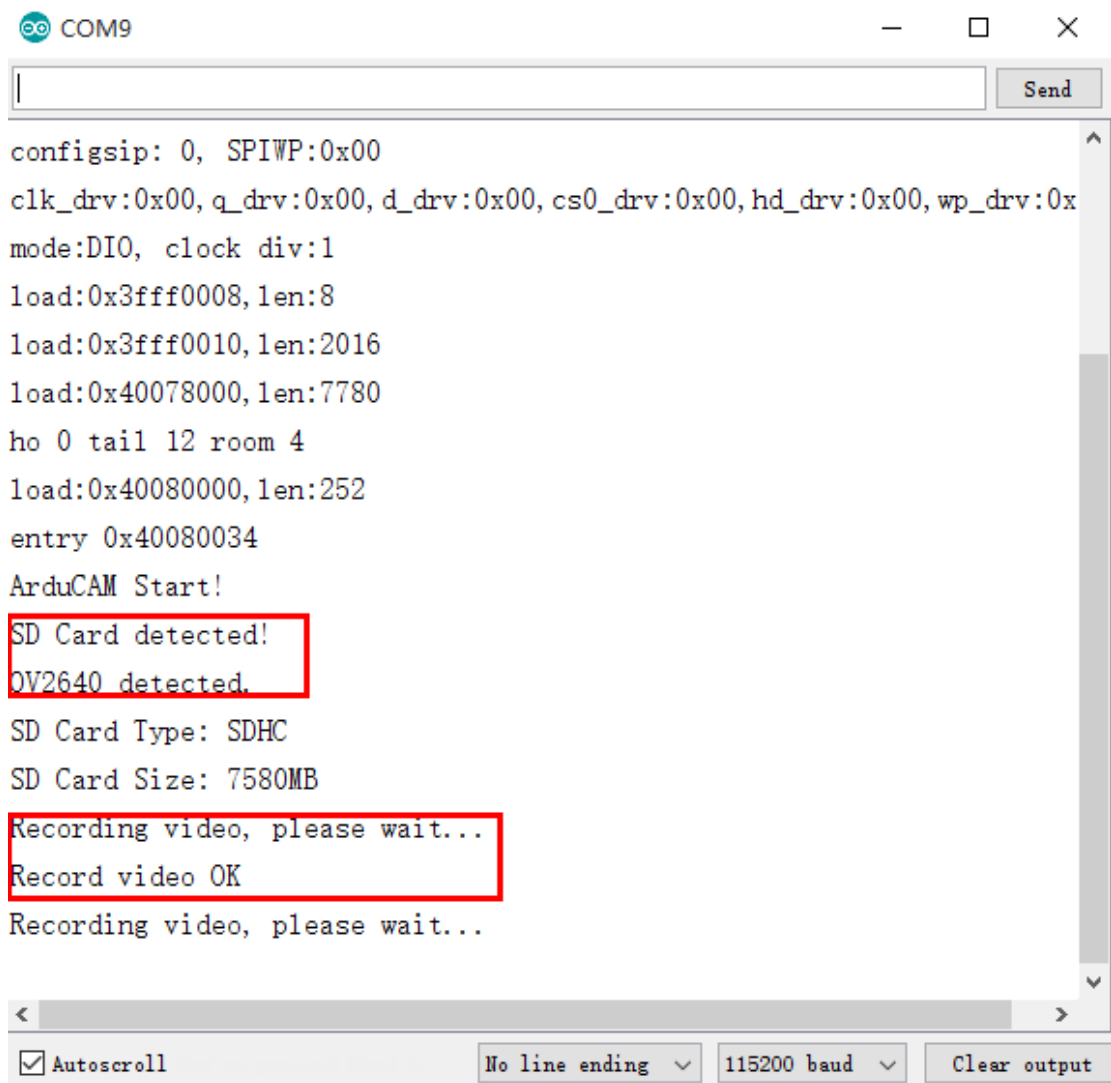

Figure 12 Example　ArduCAM_ESP32_Capture2SD

➢ ArduCAM_ESP32_Video2SD

This example takes motion JPEG video clips using ArduCAM mini 2MP/5MP and then stored on the TF/SD card as AVI format.

```
configsip: 0, SPIWP:0x00
clk_drv:0x00, q_drv:0x00, d_drv:0x00, cs0_drv:0x00, hd_drv:0x00, wp_drv:0x
mode:DIO, clock div:1
load:0x3fff0008,len:8
load:0x3fff0010,len:2016
load:0x40078000,len:7780
ho 0 tail 12 room 4
load:0x40080000,len:252
entry 0x40080034
ArduCAM Start!
SD Card detected!
OV2640 detected.
SD Card Type: SDHC
SD Card Size: 7580MB
Recording video, please wait...
Record video OK
Recording video, please wait...
```

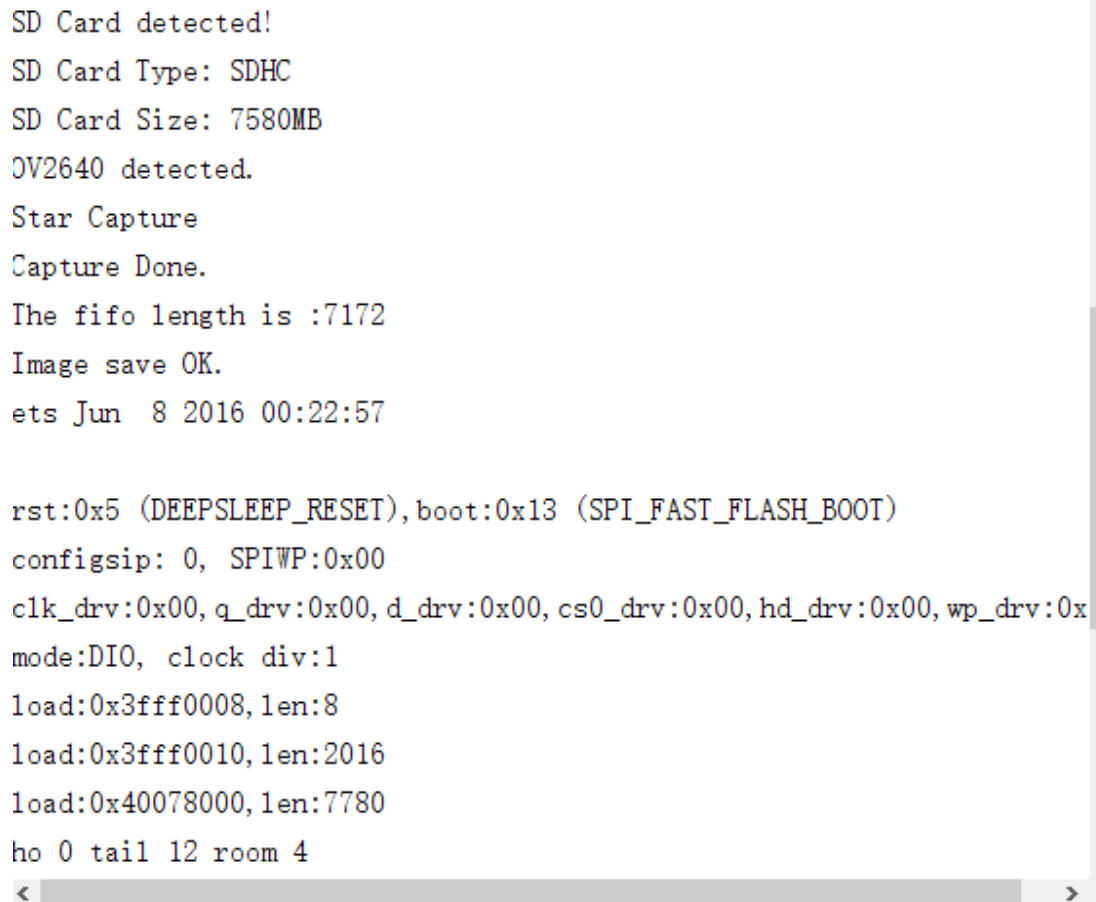Figure 13 Example　ArduCAM_ESP32_Video2SD

➢ ArduCAM_ESP32_Sleep

To reduce power consumption,calling the interface function immediately goes into the

Deep - sleep mode.In this mode, the chip will disconnect all wi-fi connections and

data connections and enter the sleep mode. Only the RTC module will still work and

be responsible for the timing of the chip. This demo is suitable for battery power

www.ArduCAM.com

Figure 14   Normal mode

Figure 15 DeepSleep mode

www.ArduCAM.com

```
SD Card detected!
SD Card Type: SDHC
SD Card Size: 7580MB
OV2640 detected.
Star Capture
Capture Done.
The fifo length is :7172
Image save OK.
ets Jun  8 2016 00:22:57

rst:0x5 (DEEPSLEEP_RESET),boot:0x13 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0x00
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x
mode:DIO, clock div:1
load:0x3fff0008,len:8
load:0x3fff0010,len:2016
load:0x40078000,len:7780
ho 0 tail 12 room 4
```

Figure 16 Example   ArduCAM_ESP32_Sleep

www.ArduCAM.com