

# ESP Cam

## Hardware

hier siehst du die Hardware die ich verwende

[ESP Cam](#)

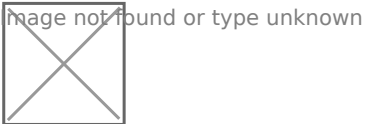
[FTDI Adapter](#)

[Jumpwire](#)

## Software

 **Download**

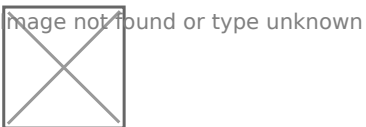
Hier muss noch etwas vorbereitet werden:



Gehe in die Einstellungen und füge:

[https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package\\_esp32\\_index.json](https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json)

in den additional board managern hinzu.



Jetzt kannst du noch den Board Manager installieren:

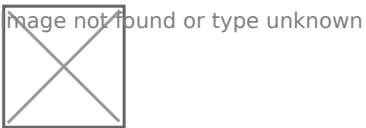


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## Sketch Code

```
#include "esp_camera.h"
#include <WiFi.h>
#include "esp_timer.h"
#include "img_converters.h"
#include "Arduino.h"
#include "fb_gfx.h"
#include "soc/soc.h" //disable brownout problems
#include "soc/rtc_cntl_reg.h" //disable brownout problems
#include "esp_http_server.h"

//Replace with your network credentials
const char* ssid = "WLAN NAME";
const char* password = "WLAN PASSWORT";

#define PART_BOUNDARY "1234567890000000000000987654321"

// This project was tested with the AI Thinker Model, M5STACK PSRAM Model and M5STACK WITHOUT PSRAM
#define CAMERA_MODEL_AI_THINKER
// #define CAMERA_MODEL_M5STACK_PSRAM
// #define CAMERA_MODEL_M5STACK_WITHOUT_PSRAM

// Not tested with this model
// #define CAMERA_MODEL_WROVER_KIT

#if defined(CAMERA_MODEL_WROVER_KIT)
#define PWDN_GPIO_NUM    -1
#define RESET_GPIO_NUM  -1
#define XCLK_GPIO_NUM    21
#define SIOD_GPIO_NUM    26
#define SIOC_GPIO_NUM    27

#define Y9_GPIO_NUM      35
#define Y8_GPIO_NUM      34
```

```
#define Y7_GPIO_NUM    39
#define Y6_GPIO_NUM    36
#define Y5_GPIO_NUM    19
#define Y4_GPIO_NUM    18
#define Y3_GPIO_NUM     5
#define Y2_GPIO_NUM     4
#define VSYNC_GPIO_NUM 25
#define HREF_GPIO_NUM   23
#define PCLK_GPIO_NUM   22
```

```
#elif defined(CAMERA_MODEL_M5STACK_PSRAM)
```

```
#define PWDN_GPIO_NUM  -1
#define RESET_GPIO_NUM 15
#define XCLK_GPIO_NUM   27
#define SIOD_GPIO_NUM   25
#define SIOC_GPIO_NUM   23
```

```
#define Y9_GPIO_NUM    19
#define Y8_GPIO_NUM    36
#define Y7_GPIO_NUM    18
#define Y6_GPIO_NUM    39
#define Y5_GPIO_NUM     5
#define Y4_GPIO_NUM    34
#define Y3_GPIO_NUM    35
#define Y2_GPIO_NUM    32
#define VSYNC_GPIO_NUM 22
#define HREF_GPIO_NUM   26
#define PCLK_GPIO_NUM   21
```

```
#elif defined(CAMERA_MODEL_M5STACK_WITHOUT_PSRAM)
```

```
#define PWDN_GPIO_NUM  -1
#define RESET_GPIO_NUM 15
#define XCLK_GPIO_NUM   27
#define SIOD_GPIO_NUM   25
#define SIOC_GPIO_NUM   23
```

```
#define Y9_GPIO_NUM    19
#define Y8_GPIO_NUM    36
#define Y7_GPIO_NUM    18
```

```

#define Y6_GPIO_NUM    39
#define Y5_GPIO_NUM    5
#define Y4_GPIO_NUM    34
#define Y3_GPIO_NUM    35
#define Y2_GPIO_NUM    17
#define VSYNC_GPIO_NUM 22
#define HREF_GPIO_NUM  26
#define PCLK_GPIO_NUM  21

#elif defined(CAMERA_MODEL_AI_THINKER)

#define PWDN_GPIO_NUM  32
#define RESET_GPIO_NUM -1
#define XCLK_GPIO_NUM   0
#define SIOD_GPIO_NUM  26
#define SIOC_GPIO_NUM   27

#define Y9_GPIO_NUM    35
#define Y8_GPIO_NUM    34
#define Y7_GPIO_NUM    39
#define Y6_GPIO_NUM    36
#define Y5_GPIO_NUM    21
#define Y4_GPIO_NUM    19
#define Y3_GPIO_NUM    18
#define Y2_GPIO_NUM    5
#define VSYNC_GPIO_NUM 25
#define HREF_GPIO_NUM  23
#define PCLK_GPIO_NUM  22

#else

#error "Camera model not selected"

#endif

static const char* _STREAM_CONTENT_TYPE = "multipart/x-mixed-replace;boundary=" PART_BOUNDARY;
static const char* _STREAM_BOUNDARY = "\r\n--" PART_BOUNDARY "\r\n";
static const char* _STREAM_PART = "Content-Type: image/jpeg\r\nContent-Length: %u\r\n\r\n";

httpd_handle_t stream_httpd = NULL;

static esp_err_t stream_handler(httpd_req_t *req){
    camera_fb_t * fb = NULL;

```

```

esp_err_t res = ESP_OK;
size_t _jpg_buf_len = 0;
uint8_t * _jpg_buf = NULL;
char * part_buf[64];

res = httpd_resp_set_type(req, _STREAM_CONTENT_TYPE);
if(res != ESP_OK){
    return res;
}

while(true){
    fb = esp_camera_fb_get();
    if (!fb) {
        Serial.println("Camera capture failed");
        res = ESP_FAIL;
    } else {
        if(fb->width > 400){
            if(fb->format != PIXFORMAT_JPEG){
                bool jpeg_converted = frame2jpg(fb, 80, &_jpg_buf, &_jpg_buf_len);
                esp_camera_fb_return(fb);
                fb = NULL;
                if(!jpeg_converted){
                    Serial.println("JPEG compression failed");
                    res = ESP_FAIL;
                }
            } else {
                _jpg_buf_len = fb->len;
                _jpg_buf = fb->buf;
            }
        }
    }
    if(res == ESP_OK){
        size_t hlen = snprintf((char *)part_buf, 64, _STREAM_PART, _jpg_buf_len);
        res = httpd_resp_send_chunk(req, (const char *)part_buf, hlen);
    }
    if(res == ESP_OK){
        res = httpd_resp_send_chunk(req, (const char *)_jpg_buf, _jpg_buf_len);
    }
    if(res == ESP_OK){

```

```

    res = httpd_resp_send_chunk(req, _STREAM_BOUNDARY, strlen(_STREAM_BOUNDARY));
}
if(fb){
    esp_camera_fb_return(fb);
    fb = NULL;
    _jpg_buf = NULL;
} else if(_jpg_buf){
    free(_jpg_buf);
    _jpg_buf = NULL;
}
if(res != ESP_OK){
    break;
}

//Serial.printf("MJPEG: %uB\n", (uint32_t)(_jpg_buf_len));
}
return res;
}

```

```

void startCameraServer(){
    httpd_config_t config = HTTPD_DEFAULT_CONFIG();
    config.server_port = 80;

    httpd_uri_t index_uri = {
        .uri      = "/",
        .method    = HTTP_GET,
        .handler   = stream_handler,
        .user_ctx  = NULL
    };

    //Serial.printf("Starting web server on port: '%d'\n", config.server_port);
    if (httpd_start(&stream_httpd, &config) == ESP_OK) {
        httpd_register_uri_handler(stream_httpd, &index_uri);
    }
}

```

```

void setup() {
    WRITE_PERI_REG(RTC_CNTL_BROWN_OUT_REG, 0); //disable brownout detector

    Serial.begin(115200);
}

```

```
Serial.setDebugOutput(false);

camera_config_t config;
config.ledc_channel = LEDC_CHANNEL_0;
config.ledc_timer = LEDC_TIMER_0;
config.pin_d0 = Y2_GPIO_NUM;
config.pin_d1 = Y3_GPIO_NUM;
config.pin_d2 = Y4_GPIO_NUM;
config.pin_d3 = Y5_GPIO_NUM;
config.pin_d4 = Y6_GPIO_NUM;
config.pin_d5 = Y7_GPIO_NUM;
config.pin_d6 = Y8_GPIO_NUM;
config.pin_d7 = Y9_GPIO_NUM;
config.pin_xclk = XCLK_GPIO_NUM;
config.pin_pclk = PCLK_GPIO_NUM;
config.pin_vsync = VSYNC_GPIO_NUM;
config.pin_href = HREF_GPIO_NUM;
config.pin_sscb_sda = SIOD_GPIO_NUM;
config.pin_sscb_scl = SIOC_GPIO_NUM;
config.pin_pwdn = PWDN_GPIO_NUM;
config.pin_reset = RESET_GPIO_NUM;
config.xclk_freq_hz = 20000000;
config.pixel_format = PIXFORMAT_JPEG;

if(psramFound()){
    config.frame_size = FRAMESIZE_UXGA;
    config.jpeg_quality = 10;
    config.fb_count = 2;
} else {
    config.frame_size = FRAMESIZE_SVGA;
    config.jpeg_quality = 12;
    config.fb_count = 1;
}

// Camera init
esp_err_t err = esp_camera_init(&config);
if (err != ESP_OK) {
    Serial.printf("Camera init failed with error 0x%x", err);
    return;
```

```

}
// Wi-Fi connection
WiFi.begin(ssid, password);
while (WiFi.status() != WL_CONNECTED) {
  delay(500);
  Serial.print(".");
}
Serial.println("");
Serial.println("WiFi connected");

Serial.print("Camera Stream Ready! Go to: http://");
Serial.print(WiFi.localIP());

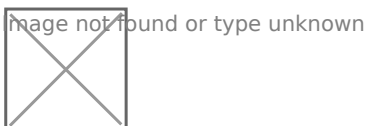
// Start streaming web server
startCameraServer();
}

void loop() {
  delay(1);
}

```

## Verkabelung

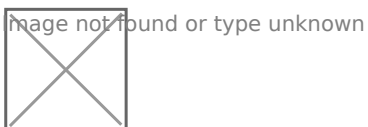
hier ist es nun wichtig alles richtig zwischen CAM und FTDI zu verbinden:



bitte vergess nicht die hier Grau eingezeichneten Brücke

## Flashing

Jetzt verbindest du deinen FTDI mit einem USB deines PCs und startest den Flashvorgang wiefolgt:



Board Typ auswählen (hier musste ich sehr weit runter scrollen)



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COM Port wählen

Starte nun den Flash Vorgang mit dem Pfeil

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Dein Ergebnis sollte wiefolgt aussehen:

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Öffne jetzt den Serial Monitor

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Jetzt musst du die Brücke entfernen und den RST Button auf der Cam drücken

Hier bekommst du dann folgende Ausgabe:

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IP Adresse notieren

## Einbinden in Homeassistant

Hier können wir die MJPEG Camera als Integration verwenden.

Also gehen wir zu unseren Integrationen und fügen diese hinzu:

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Bitte beachtet hier den SSL Haken zu entfernen und vergesst das HTTP vor der URL nicht.

## Alternative ESP Home

Als alternative kann man auch ESP Home verwenden hier ist die Kamera aber nicht ganz so flüssig:

```
esphome:
  name: cam-1
  platform: ESP32
  board: esp32dev

# Enable logging
logger:

# Enable Home Assistant API
api:
  reboot_timeout: 0s

ota:

web_server:
  port: 80

wifi:
  ssid: !secret wifi_ssid
  password: !secret wifi_password

# Enable fallback hotspot (captive portal) in case wifi connection fails
ap:
  ssid: "Esp32-Cam Fallback Hotspot"
  password: "C3FOhAPFtouw"

captive_portal:

# Example configuration entry
esp32_camera:
  external_clock:
    pin: GPIO0
    frequency: 20MHz
  i2c_pins:
    sda: GPIO26
    scl: GPIO27
  data_pins: [GPIO5, GPIO18, GPIO19, GPIO21, GPIO36, GPIO39, GPIO34, GPIO35]
  vsync_pin: GPIO25
  href_pin: GPIO23
```

```
pixel_clock_pin: GPIO22  
power_down_pin: GPIO32
```

```
# Image settings
```

```
name: Cam 1
```

```
# Flashlight
```

```
output:
```

```
- platform: gpio
```

```
pin: GPIO4
```

```
id: gpio_4
```

```
## GPIO_4 is the flash light pin
```

```
light:
```

```
- platform: binary
```

```
output: gpio_4
```

```
name: cam-1-flashlight
```

<https://www.youtube.com/embed/q7Q3XWDxNa0>

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