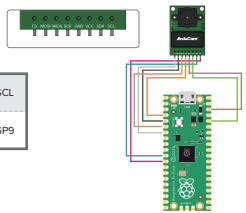
User Guide For Raspberry Pi Pico

As an alternative to Arduino, Raspberry Pi Pico lacks processing power, memory, and a CSI interface, which makes it impossible for Pico to work with the official or any MIPI CSI-2 camera modules. Thankfully, Pico has a wide range of flexible I/O options includes SPI, which enables the Arducam SPI camera to work with Pico. Now, the Arducam team has solved the compatibility of our SPI camera with Raspberry Pi Pico. Getting started here!

Pinout & Typical Wiring

CAMERA	CS	MOSI	MISO	SCK	GND	VCC	SDA	SCL
PICO	GP5	GP3	GP4	GP2	GND	3V3	GP8	GP9



Software Setup

To facilitate copying, please refer to doc page:
https://www.arducam.com/docs/pico/arducam-camera-module-for-raspberry-pi-pico/spi-camera-for-raspberry-pi-pico/

We will keep online up-to-date continuously.

1. Get the driver

```
git clone https://github.com/ArduCAM/PICO_SPI_CAM.git
```

2. How to access SPI Camera using C

2.1 Cameras supported by the driver

- OV2640 2MP_Plus JPEG format
- OV5642 5MP_Plus JPEG format

2.2 Demos provided

- ArduCAM_Mini_2MP_Plus_4CAM_VideoStreaming
- Arducam_MINI_2MP_Plus_Videostreaing
- ArduCAM_Mini_5MP_Plus_4CAM_VideoStreaming
- Arducam_MINI_5MP_Plus_Videostreaing

2.3 Compile the driver library

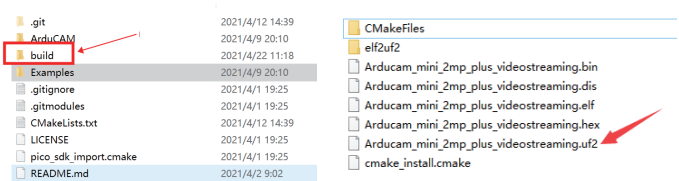
Note: Refer to the official manual for the development environment:
https://www.raspberrypi.org/documentation/rp2040/getting-started/#getting-started-with-c

Choose the demo and input the following code to compile it. (default is Arducam_MINI_2MP_Plus_Videostreaing)

```
mkdir build
cd build
cmake ..
make
```

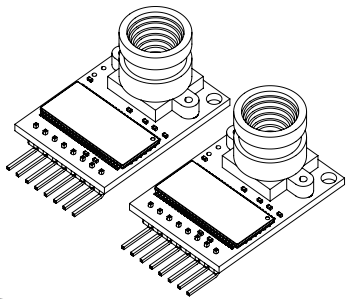
2.4 Run the .uf2 file

Copy the PICO_SPI_CAM/C/build/Examples/Arducam_MINI_2MP_Plus_Videostreaing/Arducam_mini_2mp_plus_videostreaming.uf2 file to Pico to run the test.



ArduCam

SPI Camera Modules for Arduino UNO Mega2560 Board & Raspberry Pi Pico



Introduction

ArduCAM-2MP-Plus (B0067) is an optimized version of ArduCAM shield Rev. C, and is a high-definition 2MP SPI camera, which reduces the complexity of the camera control interface. It integrates 2MP CMOS image sensor OV2640 and provides miniature size, as well as an easy-to-use hardware interface and open source code library.

Arducam-Mini-5MP-Plus (B0068) is a performance-improved version compared to its predecessor Arducam-M-5MP. It not only can add a camera interface that doesn't have some low-cost microcontrollers but also can add multiple cameras to a single microcontroller. Capturing decent 5MP JPEG images and taking 5MP full-resolution image captured, making it to be the ideal solution for IoT and scientific image processing applications. Even more, it can record short movie clips as well.

Application

1. IoT cameras
2. Robot cameras
3. Wildlife cameras
4. Other battery-powered products
5. Can be used in MCU, Raspberry Pi, ARM, DSP, FPGA platforms

Features

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- M 12 mount or CS mount lens holder with changeable lens options
- Small form factor
- IR sensitive with proper lens combination
- I2C interface for the sensor configuration
- SPI interface for camera commands and data stream
- All IO ports are 5V/3.3V tolerant
- Support JPEG compression mode, single and multiple shoot mode, one time capture multiple read operation, burst read operation, low power mode and etc.
- Well mated with standard Arduino boards
- Provide open source code library for Arduino, STM32, Raspberry Pi

Key Specification

SKU	B0067	B0068
Sensor	1/4″ 2MP OV2640	1/4″ 5MP OV5642
Shutter type	rolling shutter	rolling shutter
Active array size	1600X 1200	2592X1944
Output format	JPEG RGB	JPEG RGB RAW8
Power consumption (Normal)	5V/70MA	5V/390MA
Low power mode	5V/20MA	5V/20MA
Resolution support	UXGA, SVGA, VGA, QVGA, CIF, QCIF	5MP, 1080P, 720P, VGA, QVGA
SPI speed	MAX 8MHZ	MAX 8MHZ
Frame buffer	8MBYTE	8MBYTE
Temperature	-10℃～+55℃	-10℃～+55℃
Lens specification	EFL:4.9MM; F/N:2.2; BFL:1.2MM; HFOV: 60°	EFL:4.9MM; F/N:2.2; BFL:1.2MM; HFOV: 60°

More Information

The Arducam SPI cameras can be used in any platforms like Arduino, Raspberry Pi, Raspberry Pi Pico, Maple, Chipkit, Beaglebone black, as long as they have SPI and I2C interface and can be well mated with standard boards. For SPI Camera Software Application Note, Tutorial videos for Arduino & RPi Pico, and more information, please refer to our official website: https://www.arducam.com to search for B0067/B0068 or contact us via support@arducam.com.

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User Guide For Arduino

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	+5V	POWER	5V Power supply
7	SDA	Bi-directional	Two-Wire Serial Interface Data 1/0
8	SCL	Input	Two-Wire Serial Interface Clock

Typical Wiring

The typical connection between Arducam SPI cameras and Arduino or etc platform is shown in the Figure 1.

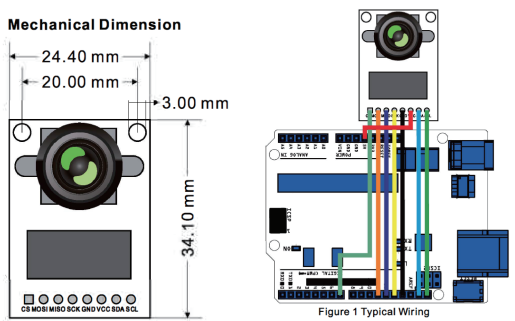

Figure 1 Typical Wiring

More information for operation guide of Arduino here: https://www.arducam.com/docs/spi-cameras-for-arduino