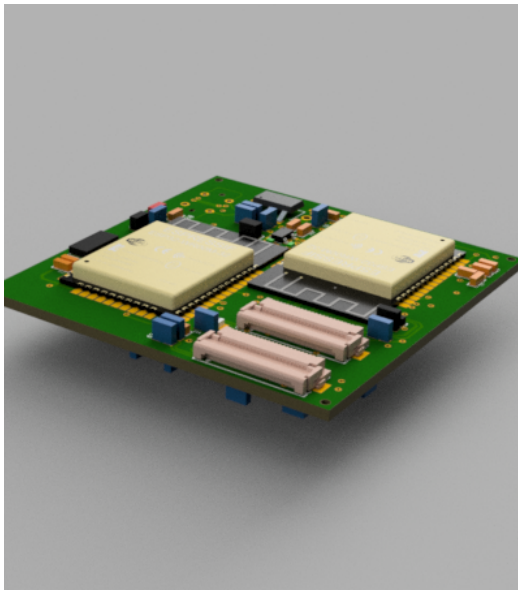
DASH CAM BOARD

September 02, 2020

Product Overview

This dash cam is designed to support both Audio and Video recording. It uses two cameras as video feeds (**OV2710**) and the **ICS-43432** for audio recording. It also supports wifi and bluetooth.



Features

(1). Dual camera setup

(2). Record h264

(3). Audio Video recording single file

(4). Bluetooth and WiFi

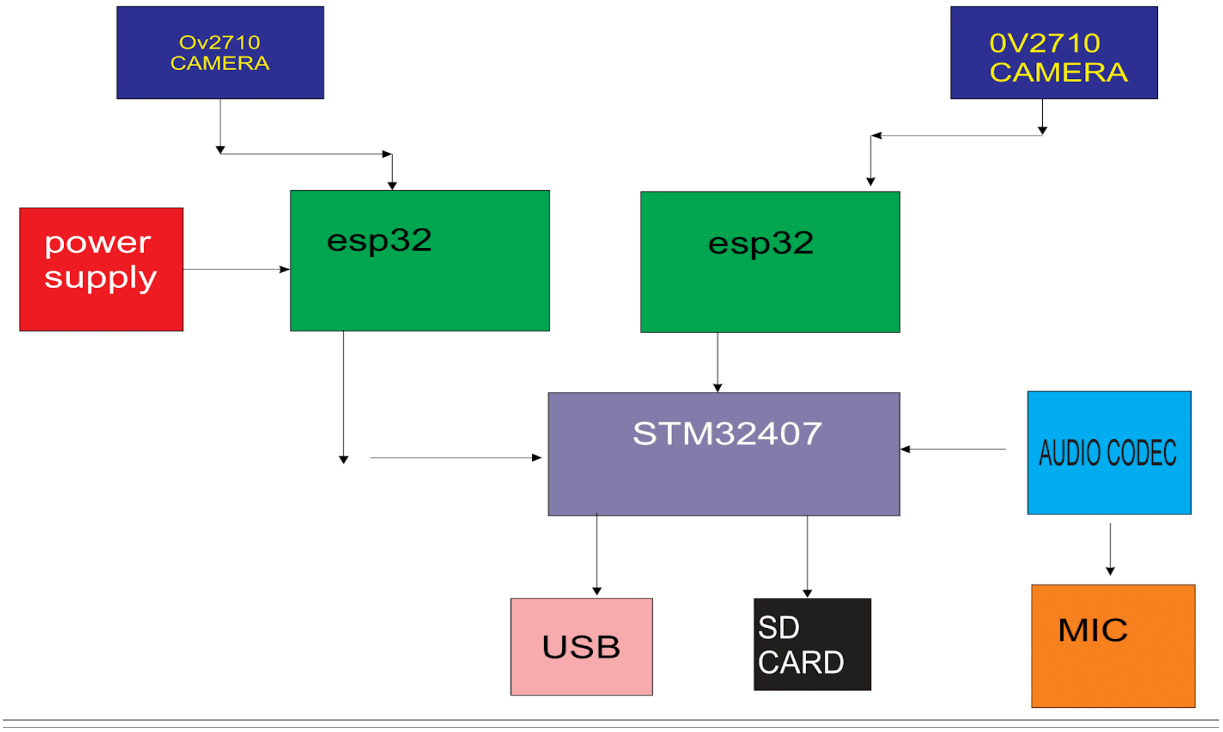
(5). 5V charging Voltage (USB 3.1 type C)

(6). Backup battery (10 - 30 mins)

(7). RTC (for time and date)

(8). Loop recording

How it works



Preview

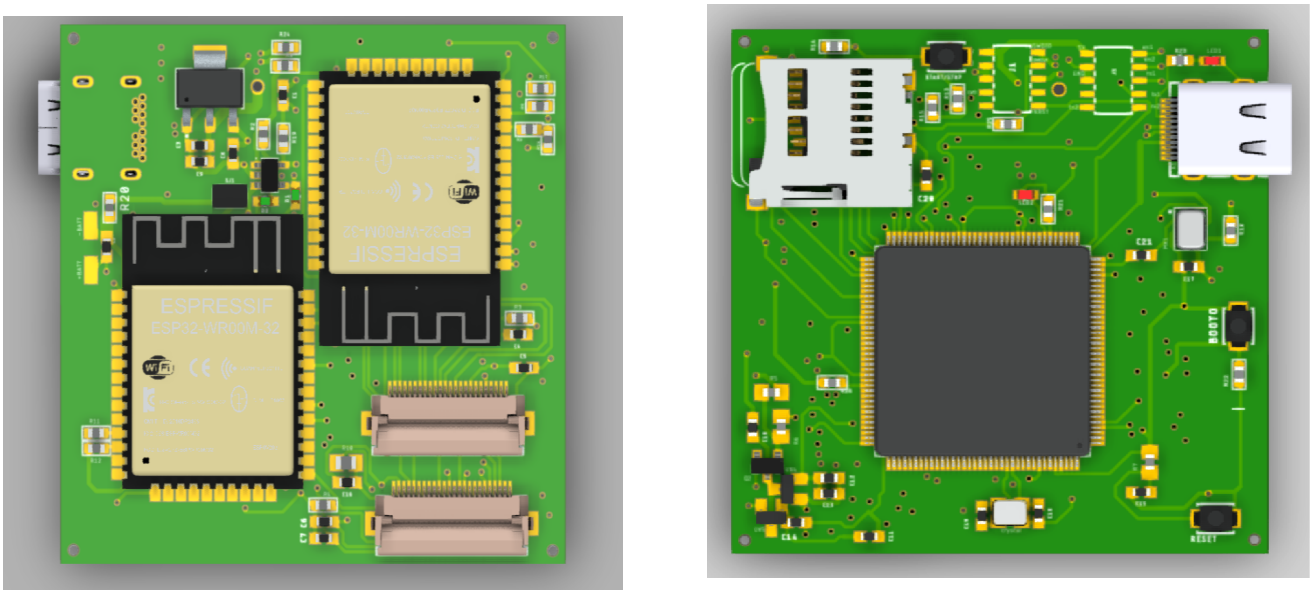
Video streams are received from the cameras, processed by the **esp32** (s2 ai-thinker) and sent to the **stm32407** (error *STM32F407) where they are combined with the audio streams from the **Audio CODEC** and stored to the **SD CARD.** The data from the sd card can be retrieved optionally through WiFi or by directly accessing the sd card.

Technical Details

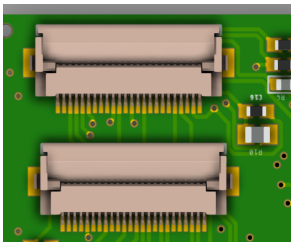
Communication between the esp32 (esp32 s2 ai-thinker) and stm32f407zgt6(Just being specific here) is through SPI. The audio codec(ICS-43432) utilizes I2S to communicate with the stm324f07zgt6. Communication to the SD card is done through the SDIO port of the stm32f407zgt6. The USB is mainly for power supply but can be used to upload firmware to the

stm32f407zgt6. The power supply is handled mainly by the AMS1117-3.3(voltage regulator) and MCP73831(battery management).

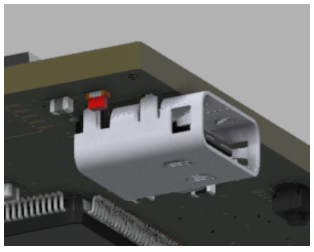
Setting up the board



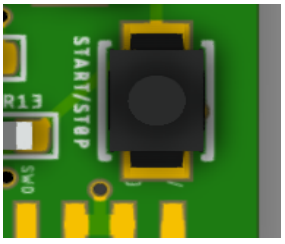
A 3D Top and Bottom view of the board



For connecting the camera (OV2710)



USB 3.1 TYPE C Receptor



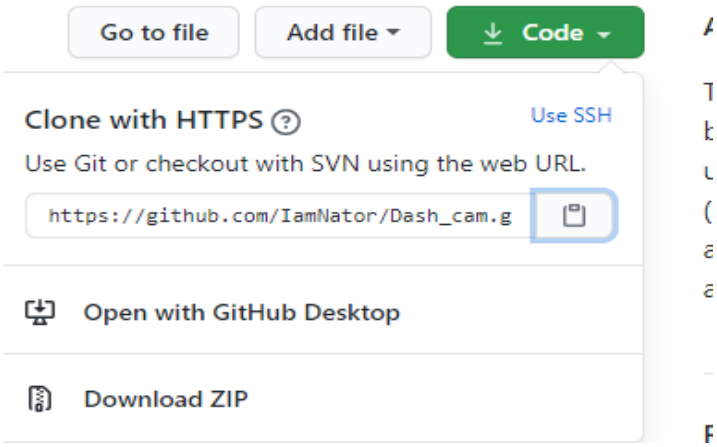
Start/Stop button

Procedure (First time power Up)

- Plug in the OV2710 camera module in the slots shown in the diagram above.
- Install the firmware (check below).
- Plug in a USB TYPE C to power the board.
- Press the **start/stop** button to start recording.
- When you are done recording, press the start/stop button to stop recording.
- LED 2 comes on when recording and goes off when recording has stopped.

Installing the Firmware

- Set up the Hardware (as will be shown below)
- Go to https://github.com/IamNator/Dash_cam.git



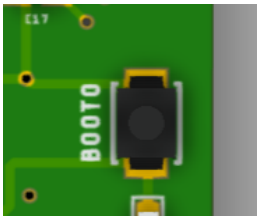
- Click on **Code** (the green box). In the drop down dialogue box that appears , select **Download Zip.**
- Extract the downloaded zip file and navigate to the subfolder **Binaries**
- Select the **install_firmware.bash**. (This will require administrative privileges to run). Follow the instruction prompts to complete the process.
- (For additional information check https://github.com/IamNator/Dash_cam.git)

Setting up Hardware for Uploading Firmware

There are three Microcontrollers on the Board. We have to upload a firmware for each microcontroller (i.e the **STM32F407** and the two **esp32**).

STM32F07

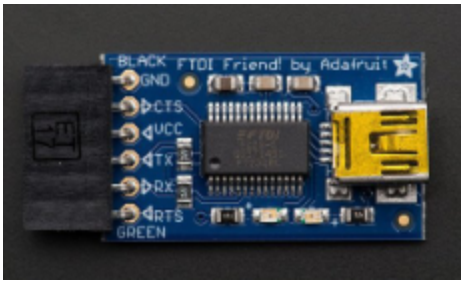
For this you only need to connect a USB cord to your laptop. Make sure the **BOOT0** button is accessible to you during this process.



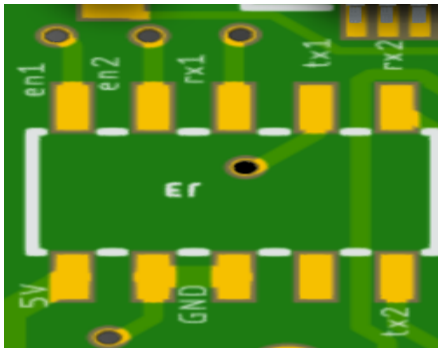
BOOT0 Button

ESP32

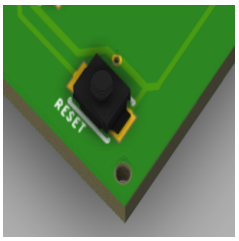
You will require an [FTDI programmer] for this. (We are assuming the ESP32 comes with a bootloader pre-installed). [Check out this tutorial].



FTDI programmer



ESP32 Connector on board



Reset button (for all the MCU)

- Connect the pins **Tx, Rx, GND, VCC** pins of the FTDI programmer to the **rxn, txn, GND, 5V** pins on the dash cam board **respectively**. (**n** could either be **1** or **2** … but not both)
- Run the **install_firmware.bash** and follow the prompts to complete the process on one esp32
- Redo the whole procedure for the second esp32

Reminder: The **install_firmware.bash** will need some drivers installed**.** Driver list with links to download them can be found in the text file **driverlist.txt** in the **Binaries** folder.