Installation Instruction

Please note- The firmware only works with the ESP32S3 Lilygo t-displayS3 Touch.

Here are some links to related videos on YouTube.

https://youtu.be/HgioXrjpPSk?feature=shared

https://youtu.be/gyk2eq8ZymM?feature=shared

https://www.youtube.com/watch?v=cFctgusRfhY

Here is a link to the Espressif Flash Download Tools required for uploading the firmware:

https://www.espressif.com/en/support/download/other-tools

To upload the firmware please follow the following steps:

1. Download the Espressif Flash Tool or alternatively use the online tool
   https://espressif.github.io/esptool-js/
2. Choose Chip Type: ESP32-S3, WorkMode Develop and LoadMode USB
3. Press the tree dots to select the files as follows:

My_Radio.bin   0x0000

Make sure that all the lines are marked green. If not green use the check mark on the left side.

Here is a screenshot of the flash tool:

Make sure to select the right com port (located at the right bottom side)
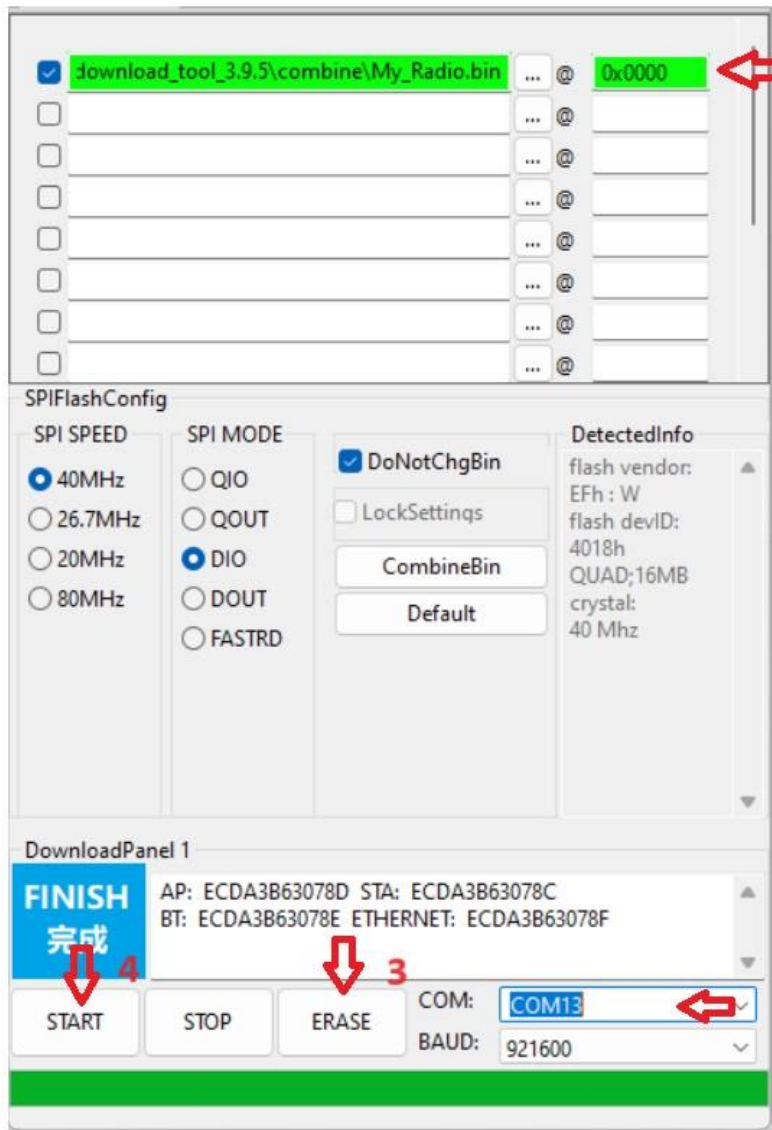
It is recommended to press first on Erase to clean the memory (not mandatory).

To upload the firmware, press the start button for uploading the firmware.

One time connecting process:

1. After successful upload press the reset button on the ESP32 or disconnect the USB cable and reconnect it.

2. Wait for around 3 min until network scanning is completed.

3. Open the Wi-Fi settings in your phone or computer browser and search for My_Radio network.

4. **Go to the following address 192.168.4.1.**

5. Press "Configure Wi-Fi", Find your network and connect to that network using your internet password and press the "Save" button. This will connect the radio permanently to your home network.

6. Press the reset button of the ESP32 controller and wait until the Spiff file system formatting is completed (you will get a message on the LCD Screen).

   a. When completed, looking at the RADIO LCD, you should be able to see the IP address that was assigned to your radio by your home router.

   b. Open your computer web browser and type that IP address.

   c. Upload a single station or list of stations using the following format:

(example file with various stations can be found in the documentation folder, for testing just copy and paste that list).

Station Name 1, Station Address 1

Station Name 2, Station Address 2

Radio Ibiza, http://ibiza-smooth-jazz.vip-radios.fm:8033/stream-128kmp3-IbizaSmooth

Roma Radio, http://nr9.newradio.it:9371/stream

You can find and copy station URL's in the following web site: https://streamurl.link/ , https://fmstream.org/ , https://www.radio-browser.info/ , or alternatively search YouTube for instruction video on how to get live radio streaming URLs. You can also have a look at https://radio.garden/ .

7. The last step - Open the web page. At the bottom left corner of the page, you will see the following.

Your Internet Radio ID:

153963357526764

License Key

Enter your key Here: [   ]

[Authenticate]

Please send me your RADIO ID to the following email **themicromaker@yahoo.com**

I will email you back the required License Key

Radio Station Manager

Play Station

Enter Station Number: [＿＿＿＿＿＿]

PLAY

Play Previous   **Play Next**

Current Station

Station Number: 114

Station Name: Exclusively Italy

Volume Control

Volume: ——————○—— 79

Audio Equalizer

Bass (dB): —————————○— -1
Mid (dB): —————————○— -1
Treble (dB): ——————————○ 6

Save

Audio Mode

◉ Mono
○ Stereo

Apply

Screen Saver

☐ Enable Screen Saver

Save

Total Stations Stored: 115

Enter Station Name: [＿＿＿＿＿＿]
Enter Station Address (URL): [＿＿＿＿＿＿]

Save

Enter Station Number to Erase: [＿＿＿＿＿＿]

Erase

Station 149
Station Name: Classical Music
Station Address: https://stream.epic-classical.com/classical-n

Station 150
Station Name: WFMT Classical
Station Address: https://wfmt.streamguys1.com/main-mp3

Station 151
Station Name: Radio Italy
Station Address: https://sphera.fluidstream.eu/rpd_hita.mp3

Station 152
Station Name: Top Italia
Station Address: http://streaming.cst98.com:8000/tir320.mp3

Station 153
Station Name: Nostalgia Italia
Station Address: https://scdn.nrjaudio.fm/adwz1/fr/30663/mp

Enter Station List (one entry per line in the format 'Station N

Use the following format:
Station Name 1,Station Address 1
Station Name 2,Station Address 2
My Favorite Station,http://123.456.789.0/stream
Awesome Hits Radio,http://stream.awesomehitsradio.com

Update Stations

Connection Diagram

Following is the connection diagram for using the Max98357a chip (if you use pin header you don't need to connect wires as the pins are arranged correctly). Connect the I2S DAC to the following pins as shown in the picture: BCLK to pin 12, LRC to pin 11, DOUT to pin 13, VCC to 5V, GND to GND
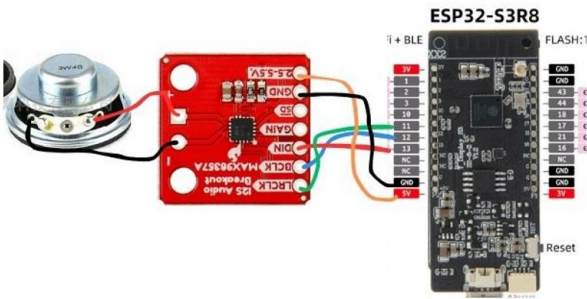
Refer to the below photo: it is possible to solder the DAC directly to the ESP32 in the following way (the pins are already aligned)
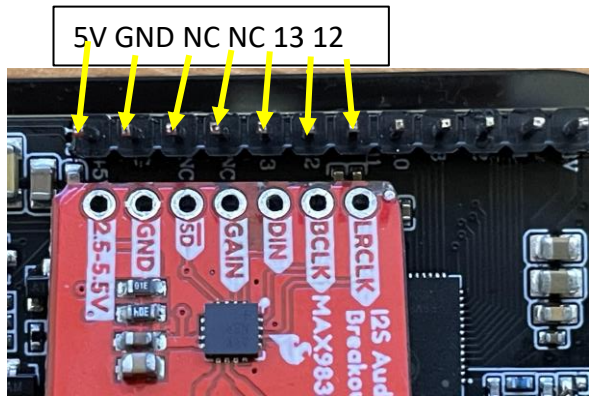
After soldering the DAC to the pins you only need to connect a speaker to the + and - signs (speaker pins) on the DAC module.
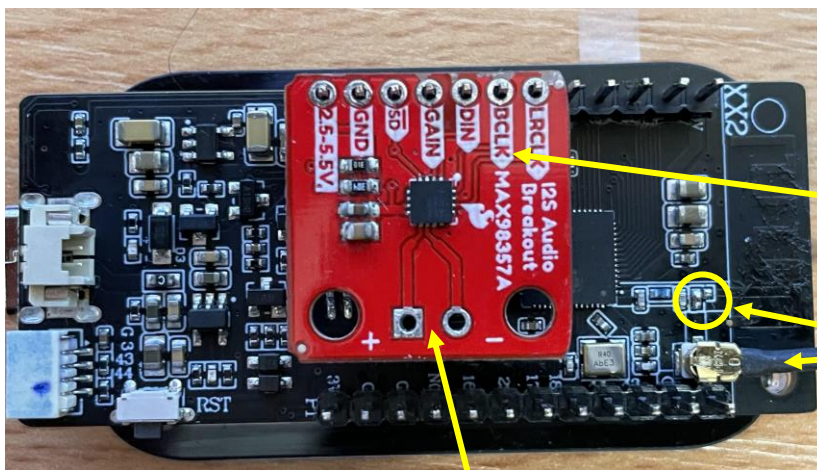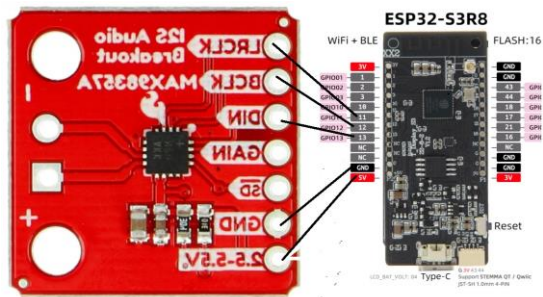

DAC+AMP Solder that way, no need for wires

External Antena - Optional requires switching jumper to external antena

Speaker 5W Preferable

5V GND NC NC 13 12

Note:

Notes:

1. The boot_app0.bin file is included with the Lilygo flash tool in the bin directory.
2. An I2S DAC is required for this project, Amplifier is optional. In general, all 16 bit DACs that have the DIN, BLCK and LRC pins. PCM5102A delivers good results.
3. For some stations that don't play, and their URL starts with https:// try changing it to http:// and check if it is working.
4. To reset Wi-Fi settings, press the reset button and IO14 button together. Release the reset button while keep pressing IO14 for at least 3 seconds until you get a message on the LCD that Wi-Fi setting has been erased (The IO14 button is located on the left bottom side- see photo).

ESP32-S3R8

WiFi + BLE

FLASH:16MB

ADC1_CH0	TOUCH01		GPIO01	**1**		
ADC1_CH1	TOUCH02		GPIO02	**2**		
ADC1_CH2	TOUCH03		GPIO03	**3**		
ADC1_CH9	SPI_CS	TOUCH10	GPIO10	**10**		
ADC2_CH0	SPI_D	TOUCH11	GPIO11	**11**		
ADC2_CH1	SPI_CLK	TOUCH12	GPIO12	**12**		
ADC2_CH2	SPI_Q	TOUCH13	GPIO13	**13**		

3V

GND
GND

43	GPIO43	CLK_OUT1	
44	GPIO44	CLK_OUT2	
18	GPIO18	U1 RXD	ADC2_CH7
17	GPIO17	U1 TXD	ADC2_CH6
21	GPIO21		
16	GPIO16		ADC2_CH5

NC
NC
GND
GND
3V

ST7789

LCD_BL 38
LCD_D0 39
LCD_D1 40
LCD_D2 41
LCD_D3 42
LCD_D4 45
LCD_D5 46
LCD_D6 47
LCD_D7 48
LCD_WR 08
LCD_RD 09
LCD_DC 07
LCD_CS 06
LCD_RES 05
LCD_Power_On 15

Boot   IO14
170*320 IPS LCD
Basic Version

NC
NC
GND
5V

Reset

Type-C

Support STEMMA QT / Qwiic
JST-SH 1.0mm 4-PIN

Touch Chip: CST816

Boot   IO14
170*320 IPS LCD
Touch Glass Version
SDA--IO17 SCL--IO18
INT--IO16 RES--IO21

IO14 Button

To reset WiFi settings press button IO14 for 3
seconds button while touching the screen

LILYGO T-Display ESP32-S3
1.9 inch ST7789 170*320 IPS LCD (Basic & Touch)