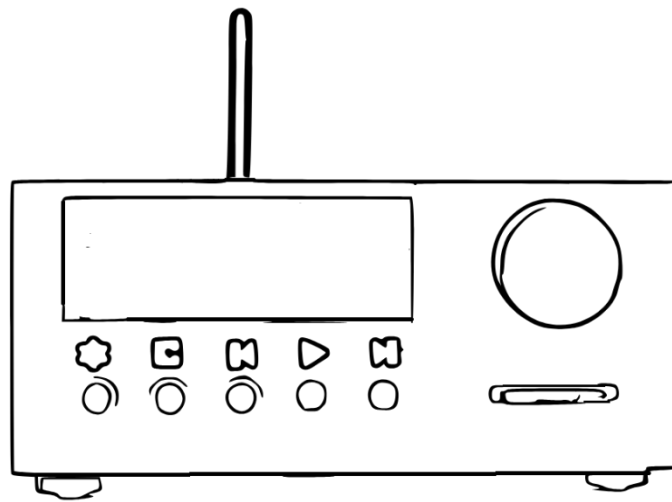


# ESP32\_MP

## Digital Audio Player and Streamer

### User Manual Hardware

Version ENG july 2025



#### **CD Quality Digital Audio Player and Streamer**

Streaming from Internet Radio

Streaming from UPnP media server

Streamin from Bluetooth

Play from SD Card

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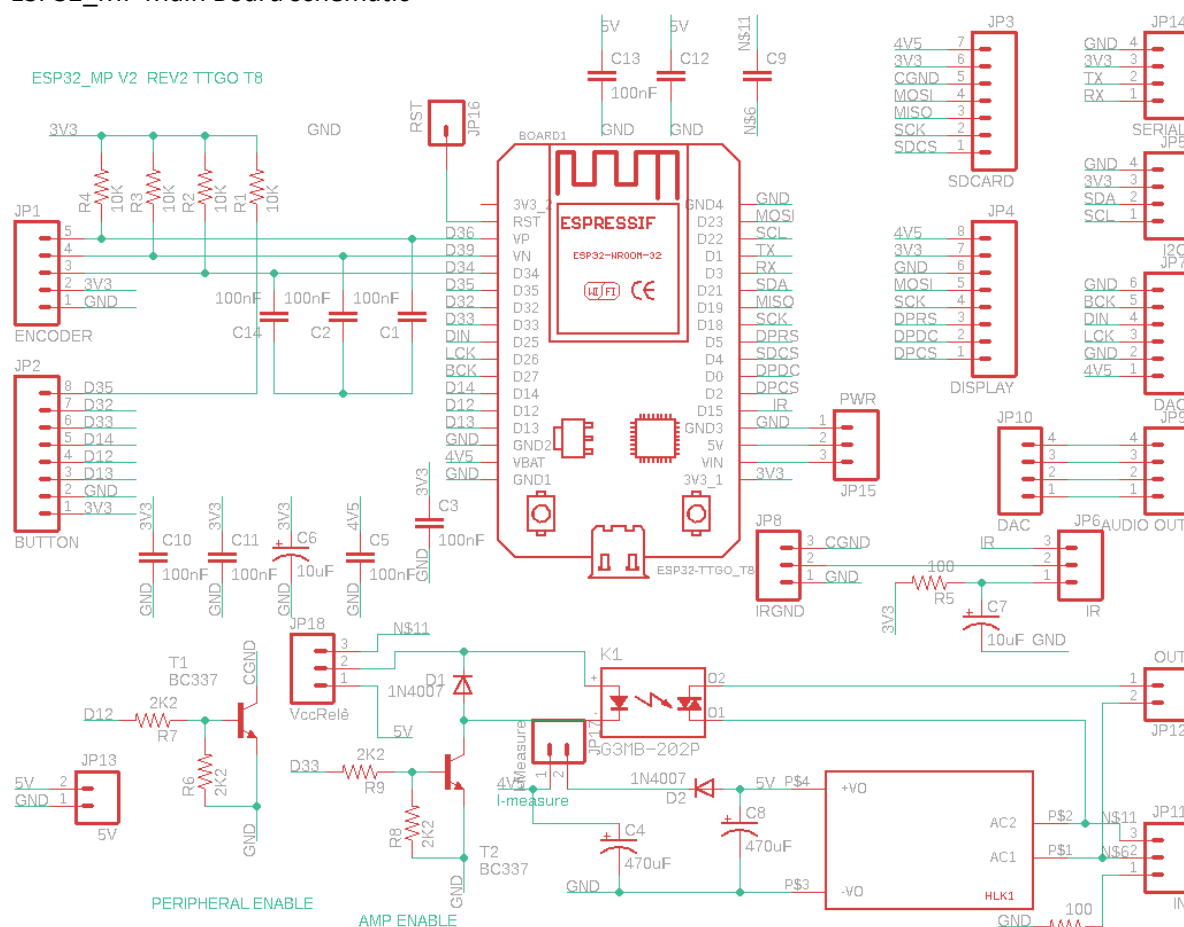
## 1. Introduction and disclaimer

This document describe construction and assembly the ESP32\_MP multimedia player. This is a hobbyist, non-commercial project; therefore, no support is provided, nor is it guaranteed to work properly. It is recommended that you attempt this project only if you have some familiarity with electronics. The author assumes no responsibility for any damage or injury resulting from the realization of this project. This proposal is only one possible solution; everyone can make any changes and improvements they deem appropriate.

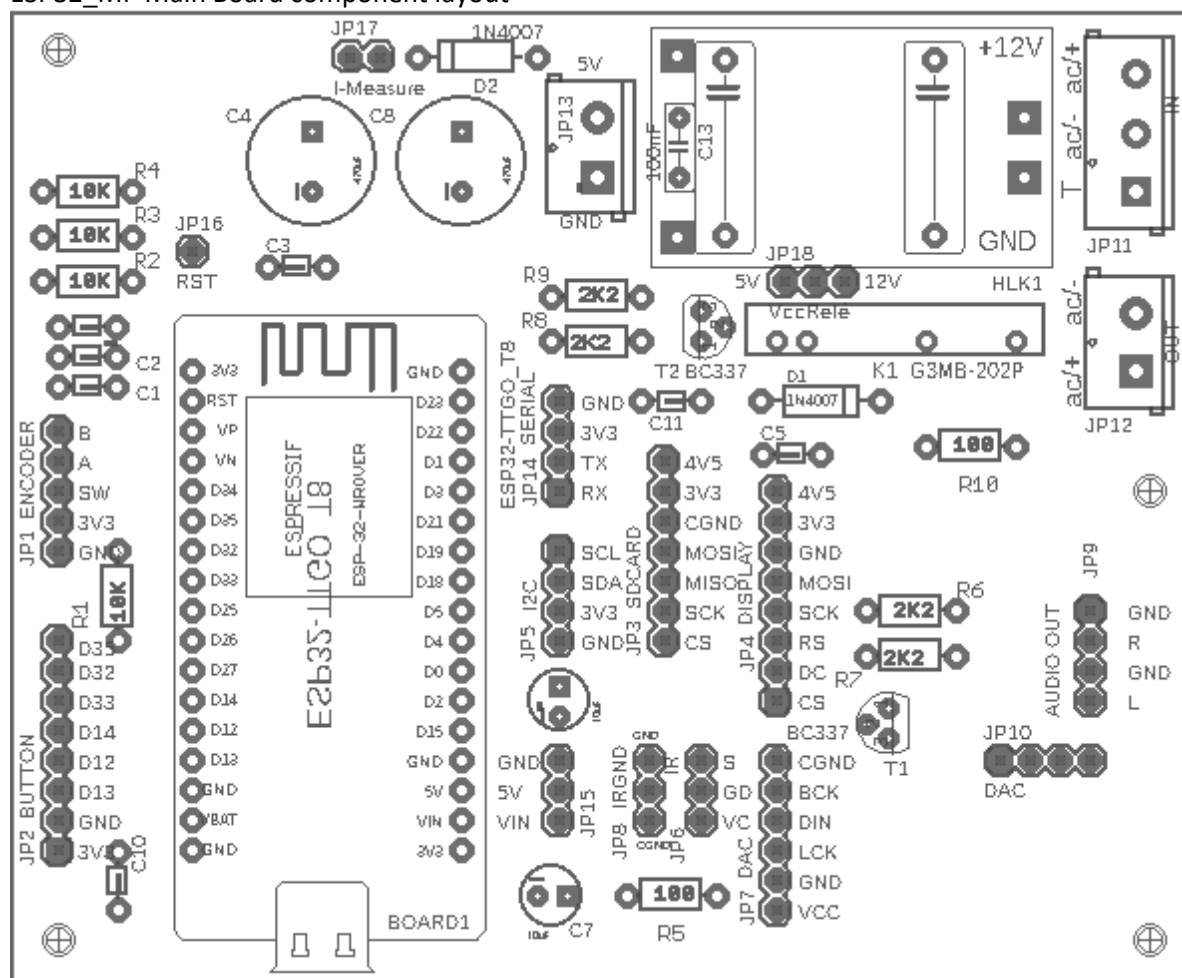
## 2. Main board

All the project files are available in the GitHub repository. Below is the wiring diagram of the main electronic board. The public version uses the ESP32\_MP\_PCB\_V2\_REV2 files; in my project, I used the ESP32\_MP\_PCB\_V2 files.

## ESP32 MP Main Board schematic








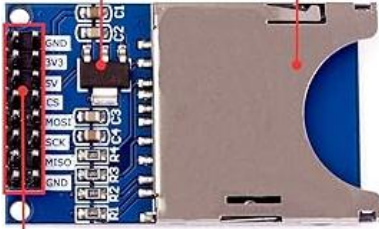
## ESP32 MP Main Board component layout



List of components:

name	Value	note
R1, R2, R3, R4	Not used	already present on encoder breakout
R5, R10	Resistor 100 1/4W	
R6, R7, R8, R9	Resistor 2k2 1/4W	
D1, D2	Diode 1N4007	
T2	BJT BC337	
T1	Not used	
C1, C2, C3, C5, C9, C10, C11, C12, C13	Capacitor 100nF 63V	
C4, C8	Capacitor 470uF 25V	
C6, C7	Capacitor 10uF 25V	
JP7, JP9, JP10, MCU	Strip Female 2,54mm	
JP1, JP2, JP3, JP4, JP6, JP8, JP12, JP15, JP17, JP18	Strip Male 2,54mm	
JP5, JP13, JP14, JP16	Not used	Expansion connector
JP11, JP12	Connector screw 5mm	
K1	See next	

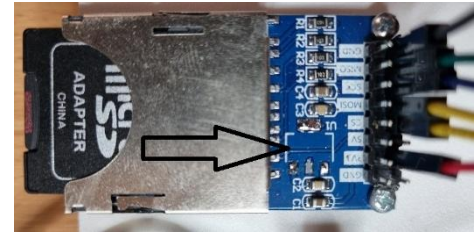
Additional components and break out board:

name		Value	SKU Futuranet.it
Main MCU		LILYGO TTGO T8 V1.8	
DAC		PCM5102A	2846- I2SPCM5102A
Encoder W/button		Encoder breakout 12mm YC093	8300-YC093
IR Sensor		IR38DM	8220-IR38DM
Display		OLED SPI 2,08" 256x64 HM25664A208W02	2846-SPIOLED208
SD Card Reader		MH-CD Card Module	

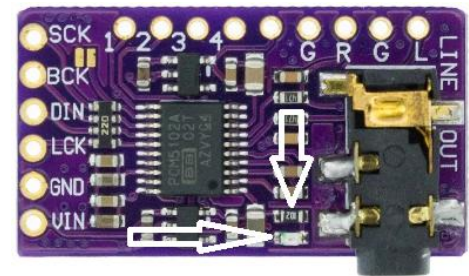
### 3. Components modify

For optimise system consumption and functionality It is recommended (but not necessary) some modify to components.

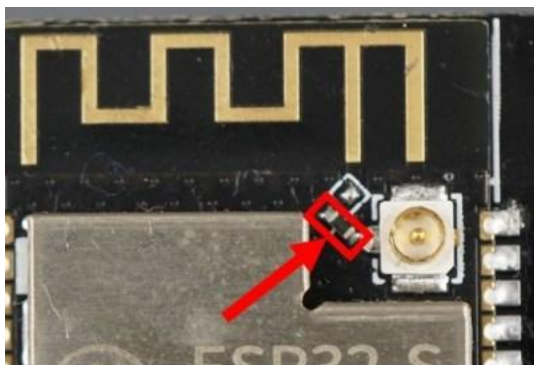
1. Remove LDO from SD Card Module.



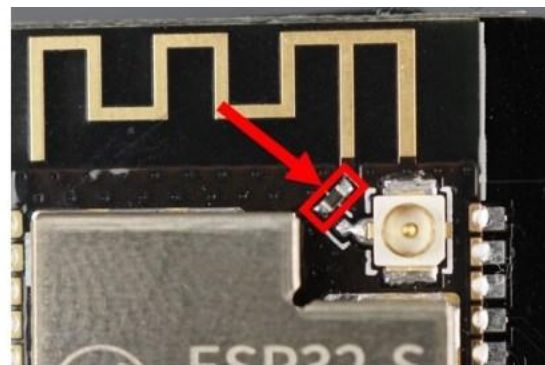
2. Cut wire of LED or remove LED or Remove resistor from DAC Module.



3. Most ESP32 boards come with an internal antenna. If you use a metal case, this may affect the WiFi signal. In this case, you'll need to add an external antenna to the ESP32 module using the appropriate antenna pads. You need to get an antenna with the corresponding IPX connector compatible with ESP32 board. Very carefully solder the ipx connector on the esp32 board and move the resistor that switches from internal to external antenna.



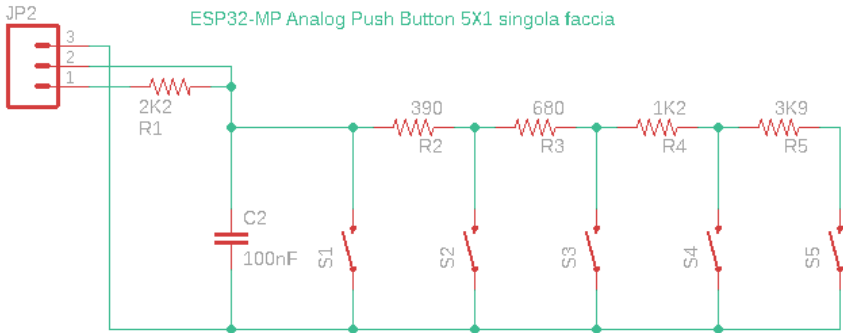
**External Antenna**



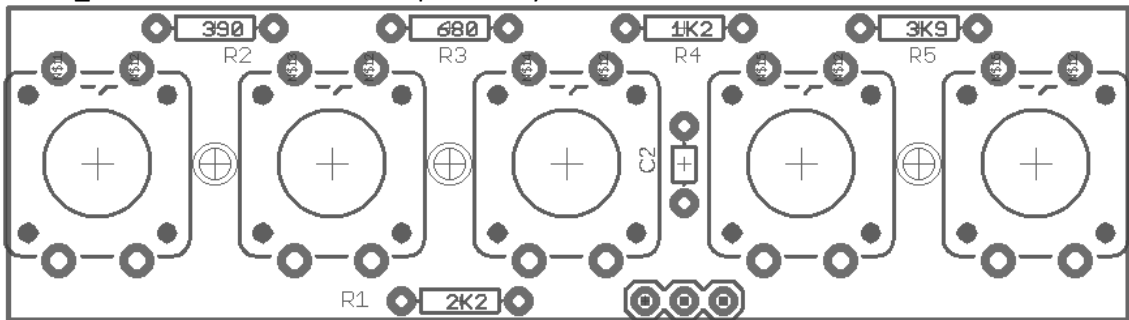
**On-board Antenna**

# 4. Push button board

ESP32\_MP Push button board schematics



ESP32\_MP Push button board component layout



List of components:

name	Value	note
R1	Resistor 2k2 1/4W	
R2	Resistor 390 1/4W	
R4	Resistor 1k2 1/4W	
R5	Resistor 3k9 1/4W	
C2	Capacitor 100nF	
JP2	Strip Male 2,54mm	
P1, P2, P3, P4, P5	Push button 12x12mm	

## 5. Assembly options #1

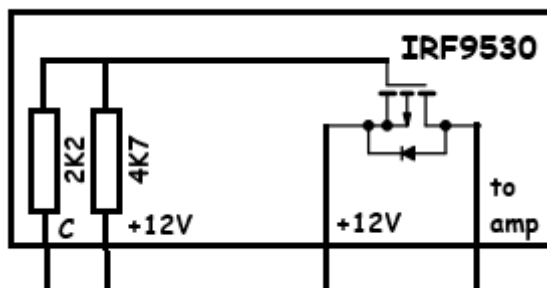
There are two possible configurations based on the type of power supply and amplifier. In option #1 use a 12VDC power supply by AC/DC Wall power adapter for powered the player. The amplifier is powered by 12VDC ( the power of amplifier is limited by this voltage).

List of components:

name		Value	SKU Futuranet.it
Power adapter		230VAC/12V 1A	8260-PSSE1210
HLK1 DC/DC Converter		12VDC to 5VDC step down converter	3085-MP1584ADJ
Power plug		Panel plug 5,5 x 2,1 mm	1606-DCPLUG
K1		Finder 34.51 12V OR Finder 34.81.7.012.9024 OR HF41F 12-ZS OR HF41F 12-HS OR DIY MOSFET RELAY	For power amplifier
Power amplifier		TDA7297 Amplifier board 12VDC power supply 8+8W @12V	If you want only preamplifier output this isn't necessary.



## K1 DIY MOSFET RELAY



Alternatively the 230Vac/12VDC power supply can be inserted inside the case:

### Assembly schematics Please Note:

JP17 it's a useful connector to measure absorbent current. Short circuit the pins in normal operation.  
JP13 it's used to measure ESP32 board power voltage.

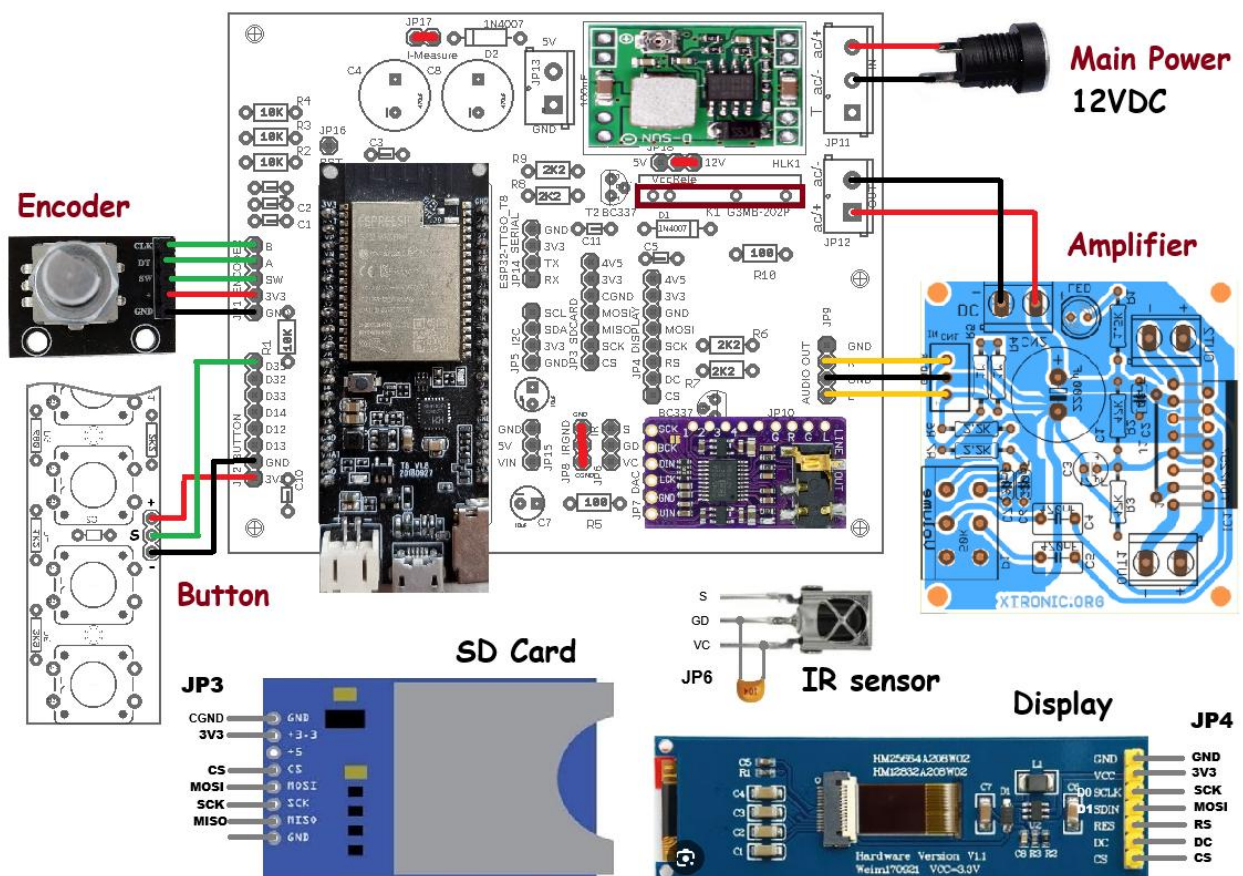
JP8 it's possible to reduce current consumption in standby mode disable gnd power from SD card, DAC and IR sensor by T1. But not great advantage, in normal use short circuit the three pins.

JP6 for max stability connect 100nF capacitor as to close beetwin pin Vcc e GND of IR38DM IR sensor.

JP5, JP14 and JP15 are connectors for future expansion functions.

JP18 **connect the central pin to 12V**, this is a voltage to control relay.




Connect the power adapter 230Vac/12VDC at main power plug.



## 6. Assembly option #2

In option #2 use a 230Vac power supply and secondary AC/DC converter for powering amplifier. There is not limitation amplifier power.

List of components:

name		Value	SKU Futuranet.it
Power plug	 <p>OR</p>	VDE panel plug 250 VAC	8300-POWERSOCKET2
HLK1 AC/DC adapter		230Vac to 5VDC adapter	8420-IRM-10-5
K1		State solid Realy Omron G3MB-202P Input 5VDC Output 240Vac 2A	8300-YL051
For power amplifier (Example): Transformer 230Vac/24+24Vac Converter 2xAC/2xDC Power amplifier There are some options...			

### Assembly schematics Please Note:

JP17 it's a useful connector to measure absorbent current. Short circuit the pins in normal operation.  
JP13 it's used to measure ESP32 board power voltage.

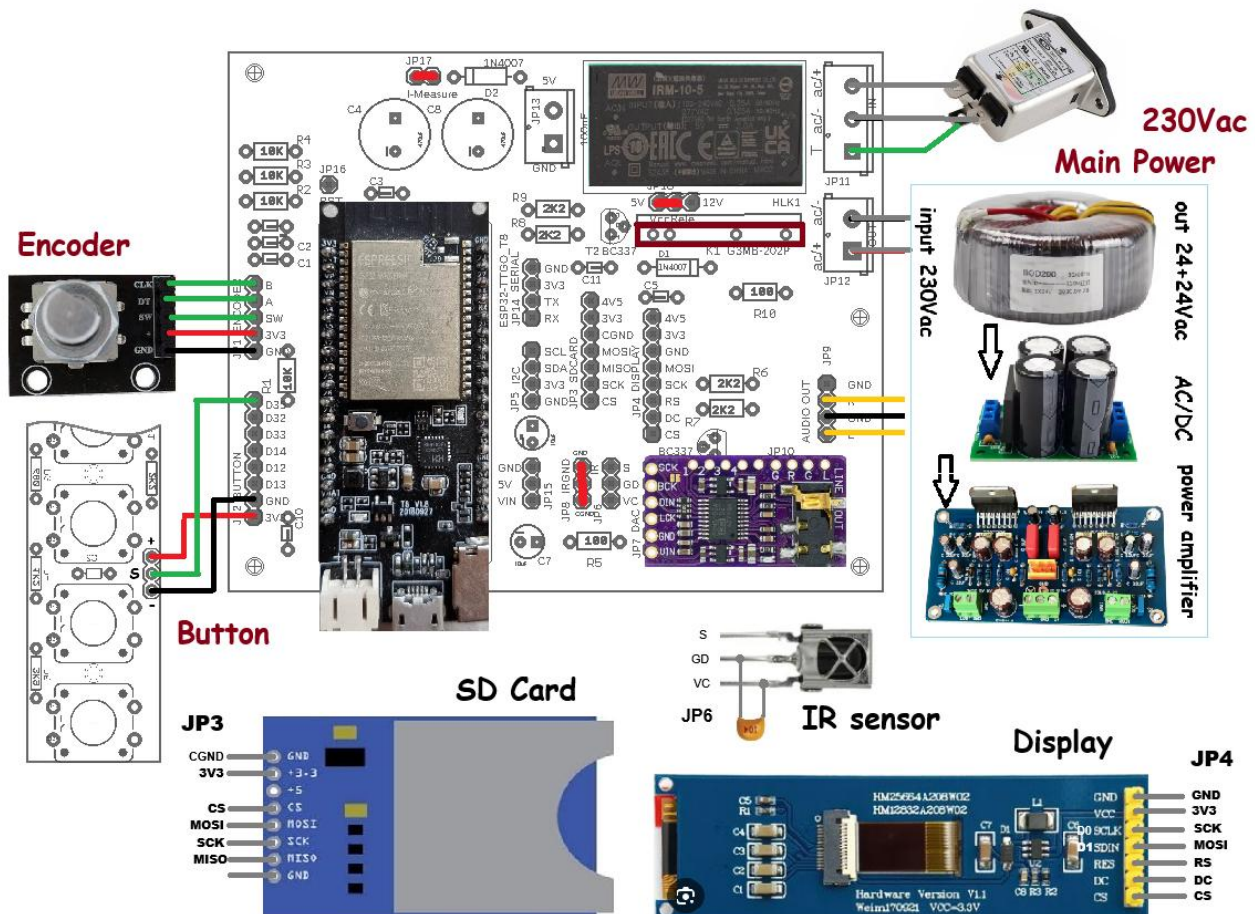
JP8 it's possible to reduce current consumption in standby mode disable gnd power from SD card, DAC and IR sensor by T1. But not great advantage, in normal use short circuit the three pins.

JP6 for max stability connect 100nF capacitor as to close beetwin pin Vcc e GND of IR38DM IR sensor.

JP5, JP14 and JP15 are connectors for future expansion functions.

JP18 **connect the central pin to 5V**, this is a voltage to control relay.

Connect the power supply 230Vac at main power plug



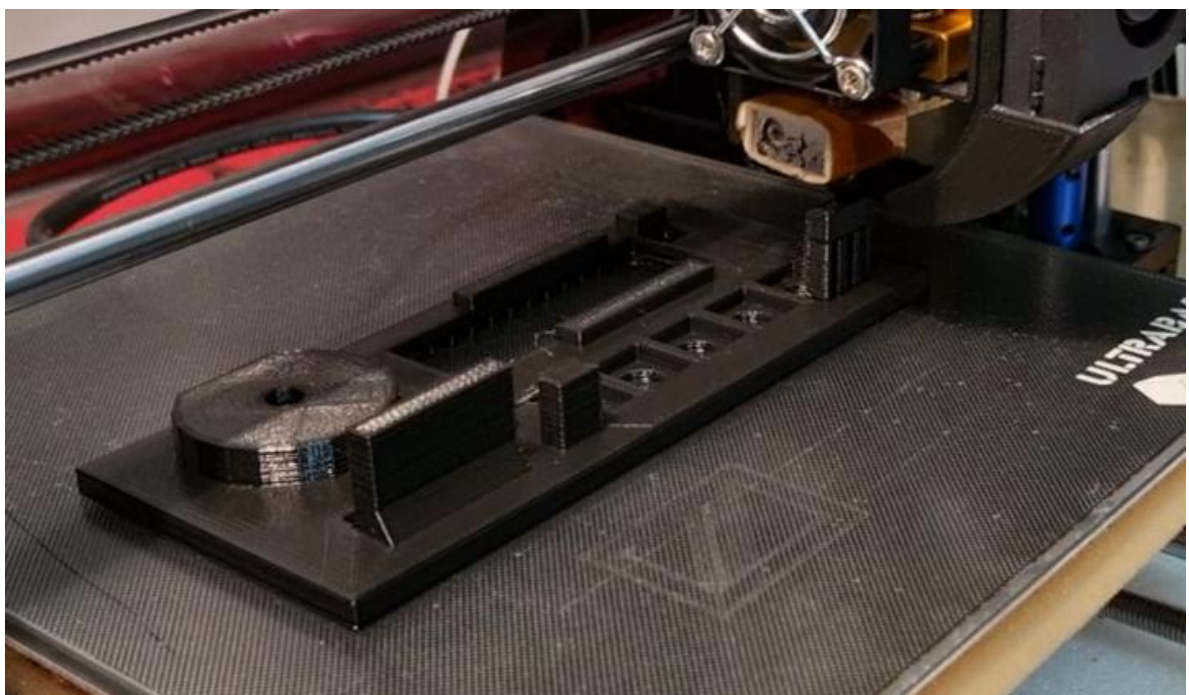


## 7. Assembly in case

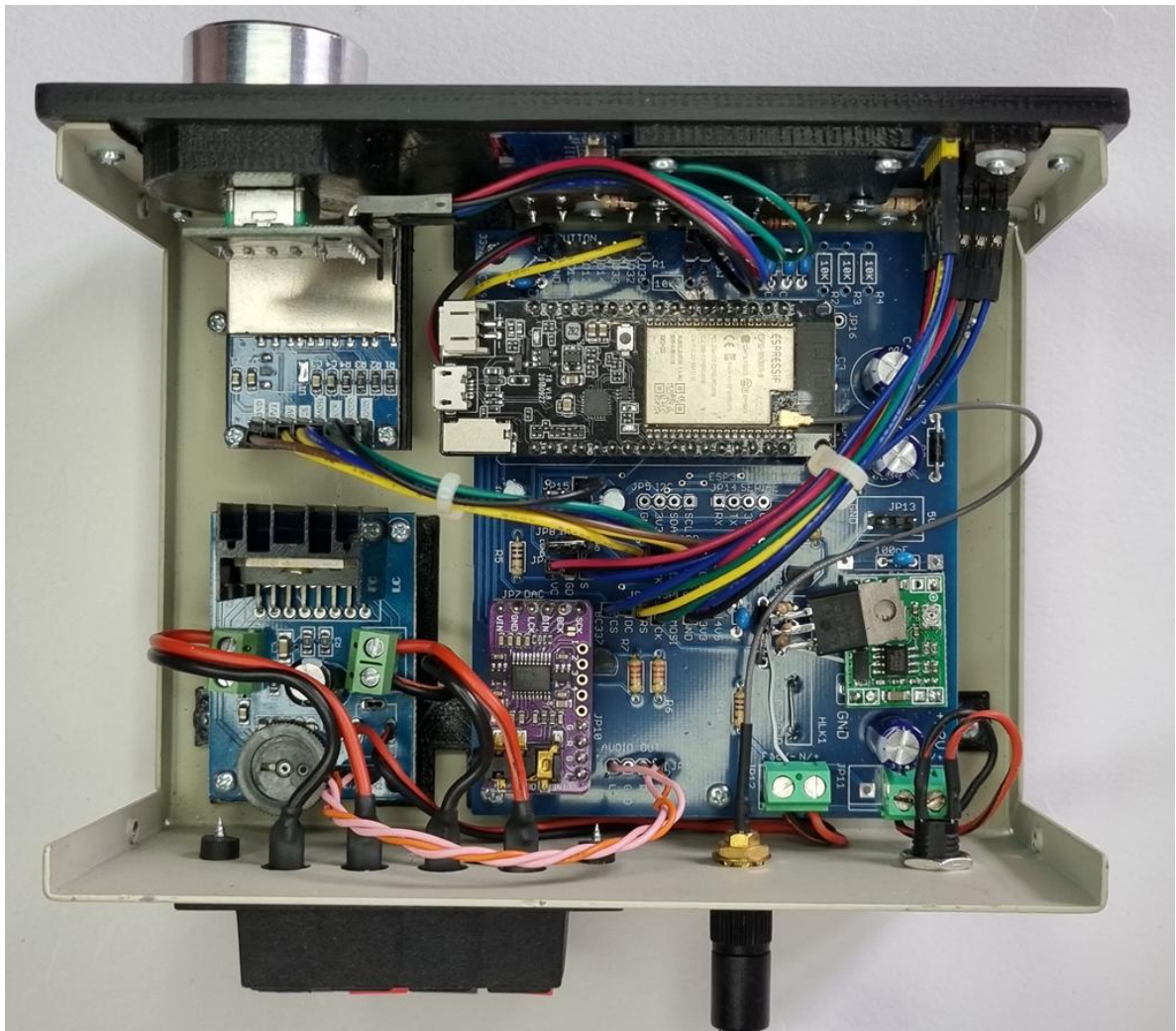
Prepare the case



3D printing front panel



Assembly components



Laser cutting serigraph



Final result front



Final result rear

