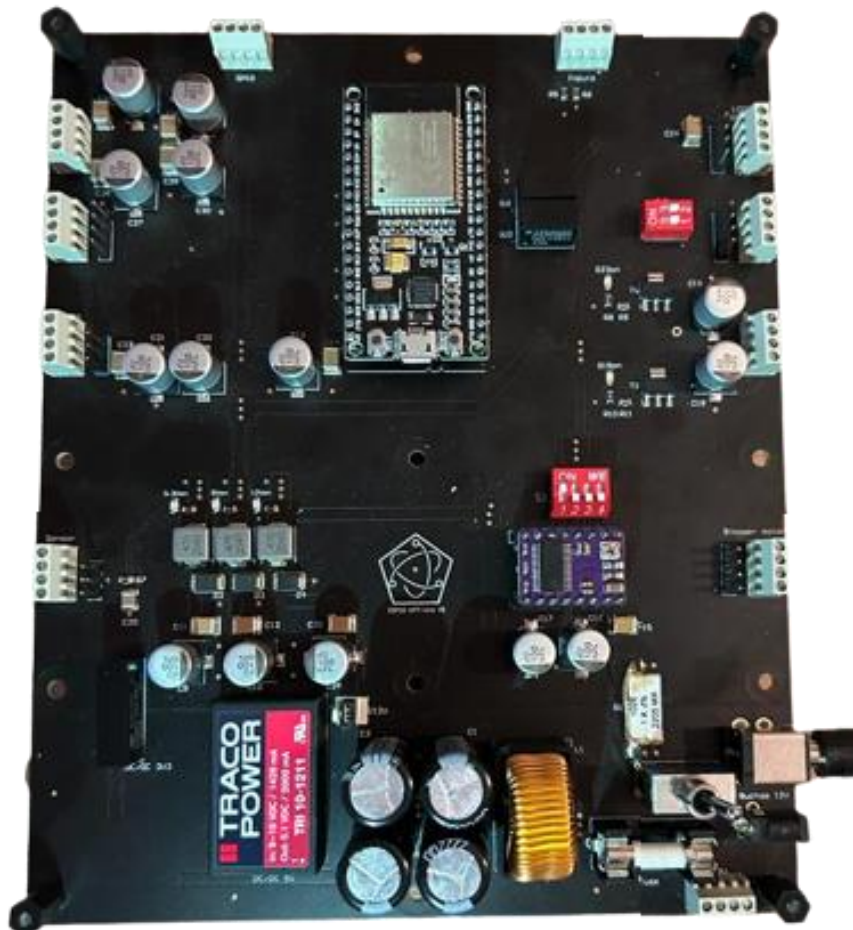


Penta Electronics

ESP32 KIT-Unit v2

Datasheet



Contents

- Included
- Features
- Pinout
- Connectors
- Specifications
- Mechanics

Included

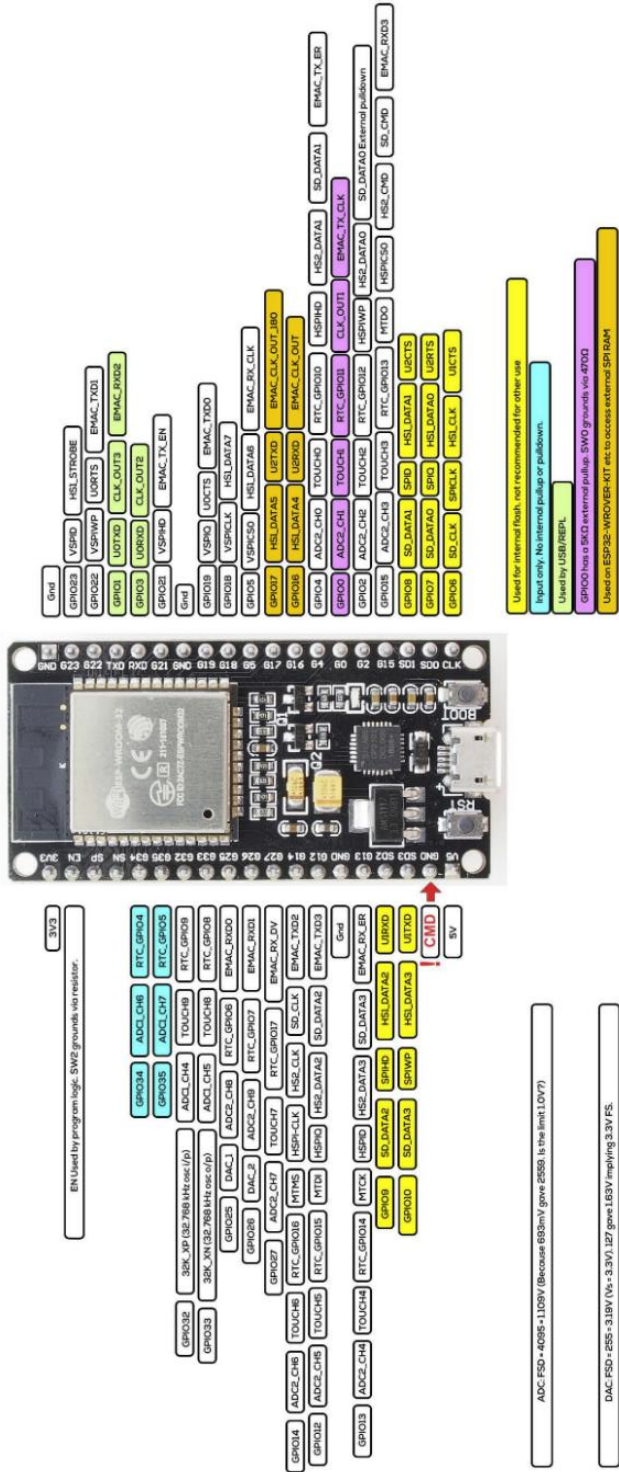
- PCB with all parts soldered
- microcontroller ESP32 WROOM32 v2
- stepper driver DRV8825
- display LCD 16x2 with a I2C interface
- servo motor MS18
- power adapter EEFISH 230Vac – 12Vdc
- datasheet
- example codes

Features

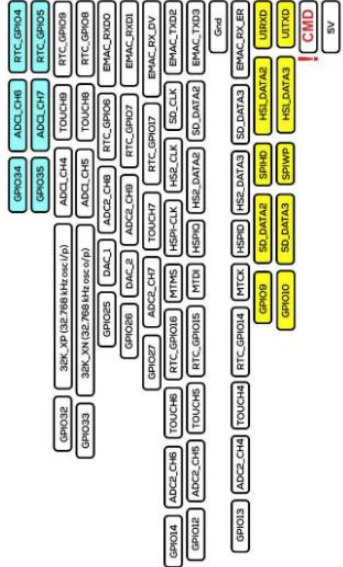
- With the power adapter you can directly connect the board with the power outlet.
- A 2.5A Fuse for safety and for easy replacement.
- For 3V3 and 5V there is an isolated DC/DC converter (stable power supply on the μ C site).
- **For using the 12V supply voltage R1 (1kOhm) has to be shorted!**
- A plugged ESP32 WROOM32 v2.
- Connector for a sensor with 3V3.
- Connector for a servo motor with 5V.
- Connector for a LCD 16x2 display with I2C interface.
- Connector for a TTL interface, switchable between 3V3 and 5V.
- Connector for a output circuit, one with 5V and one for 12V.
- Connector for a stepper motor, with the DRV8825 stepper driver (for stable 12V the R1 has to be shorted). Full step, half step... can be set with the dip switch.
- Connector for four GPIO I/O.
- Connector for two GPIO inputs.
- Connector for output voltage 1x12V 2x5V 1x3V3.
- Connector for 4xGND.

Pinout

Pinout ESP32 WROOM32 v2



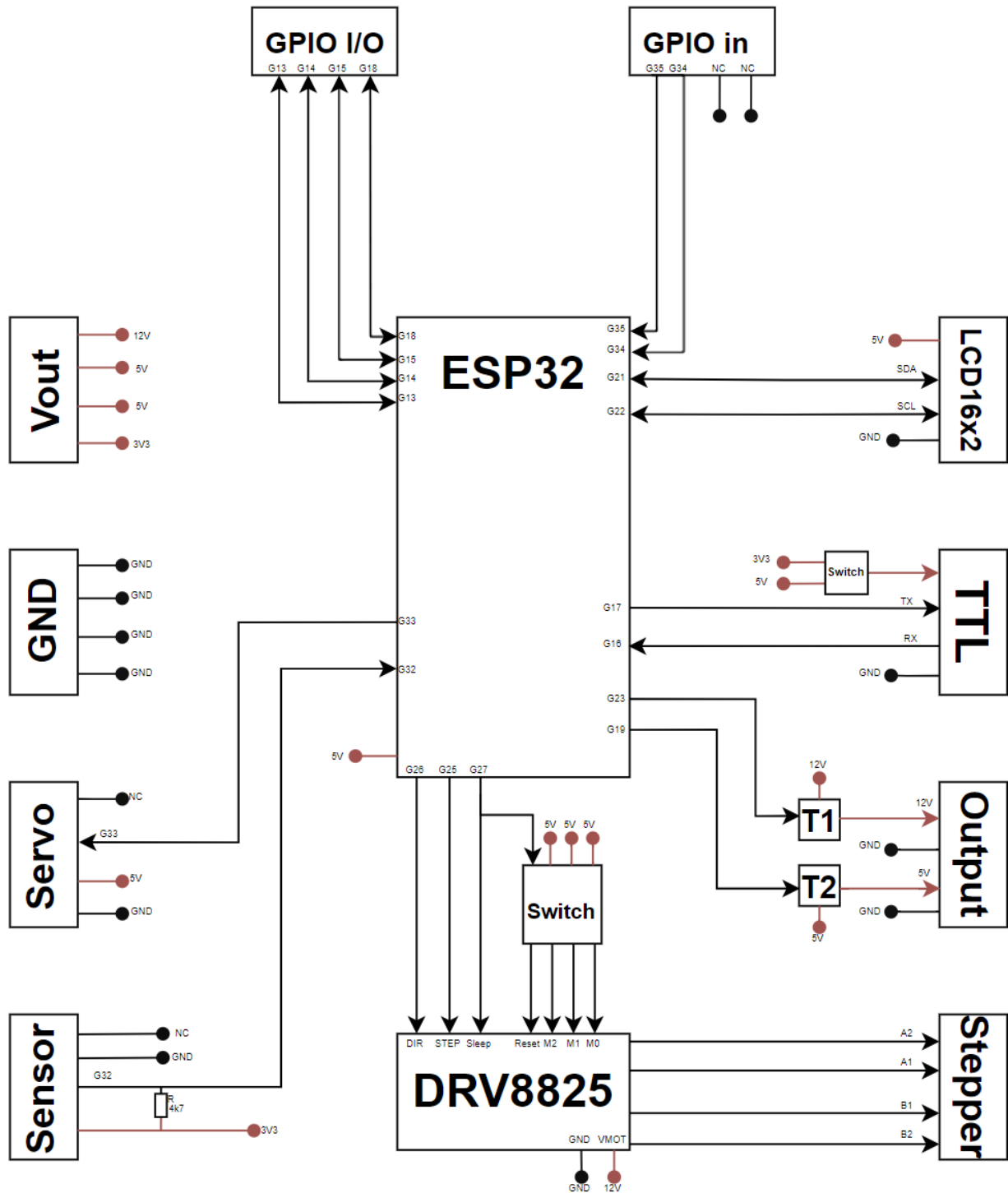
3V3
EN Used by program logic. SW2 grounded via resistor.



ADC_FSD = 4095 ~ 1.09V (Because 693mV gene 2550 is the limit LOV7)

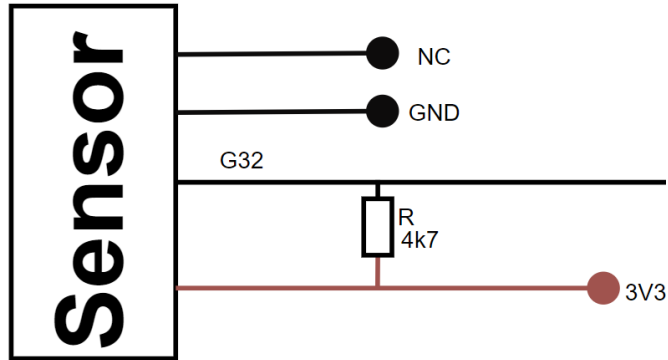
DAC_FSD = 255 ~ 3.19V (Vs = 3.3V). 127 gene 1.63V implying 3.3V FS.

Pinout KITT-Unit v2



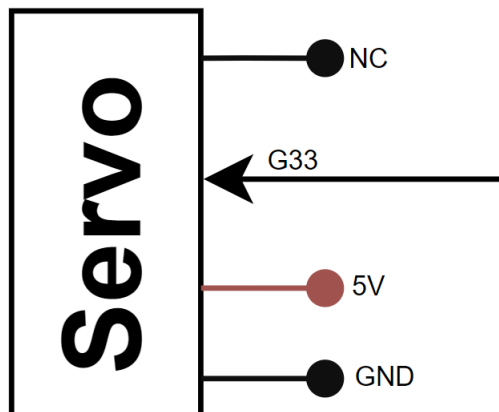
Connectors

Sensor



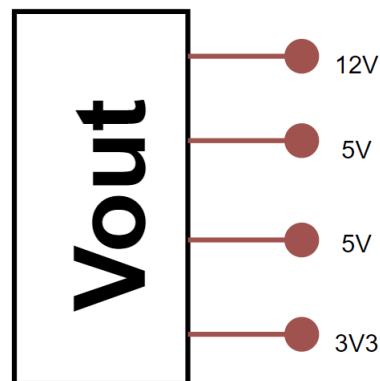
For the Sensor there is GPIO pin G32 to send the data to the ESP32. Its connected to a pullup resistor with 4k70hm (it can be unsoldered and be replaced with a other value). The supply voltage is set to 3V3 but there is also the possibility to take a other voltage from the voltage output connector (Vout). One Pin is on GND and one pin is not connected (NC).

Servo motor



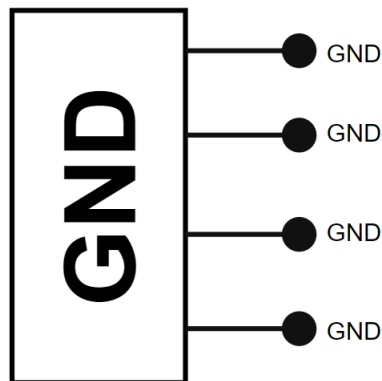
For the Servo there is GPIO pin G33 to receive the data from the ESP32. The supply voltage is set to 5V but there is also the possibility to take a other voltage from the voltage output connector (Vout). One Pin is on GND and one pin is not connected (NC).

Vout



The Vout connector is for using external sensors and motors. With the GPIO I/O connector and the GND connector there is the possibility to use another 4 sensor or motors. The voltage is set to 1x12V 2x5V and 1x3V3. There is enough capacitance to use motors on these voltages.

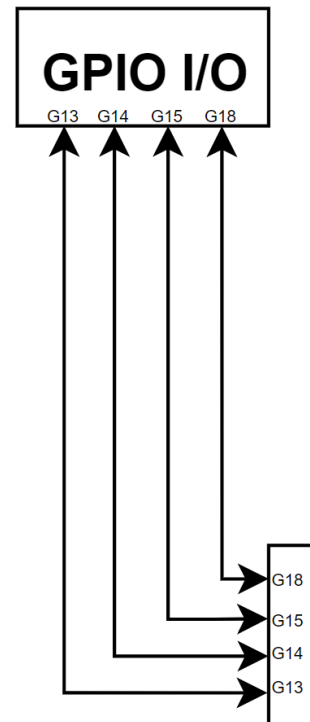
GND



The GND connector is for using external sensors and motors. With the GPIO I/O connector and the Vout connector there is the possibility to use another 4 sensor or motors. There are four GND connections.

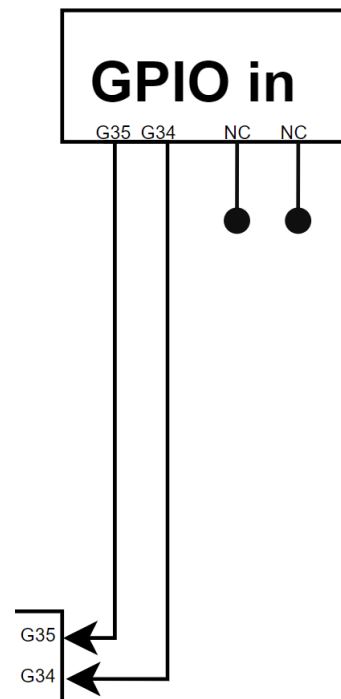
GPIO I/O

For the GPIO I/O there is GPIO pin G13 G14 G15 and G18 to receive and send the data to the ESP32. There is no supply voltage but there is also the possibility to take a other voltage from the voltage output connector (Vout).

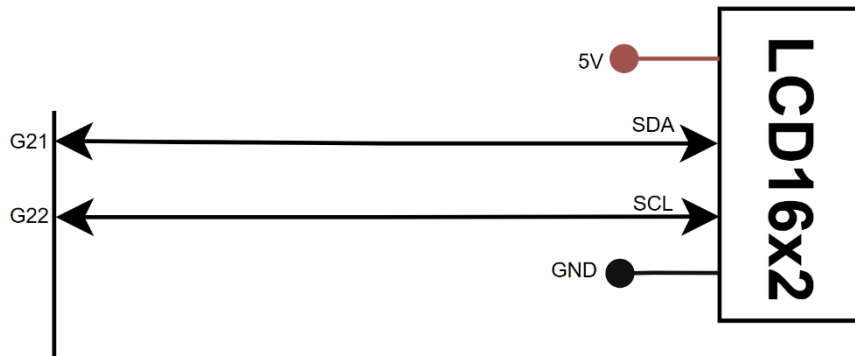


GPIO in

For the GPIO in there is GPIO pin G34 and G35 to send the data to the ESP32. It can only send data from the connector to the ESP32! PIN 3 and 4 are not connected (NC). There is no supply voltage but there is also the possibility to take a other voltage from the voltage output connector (Vout).

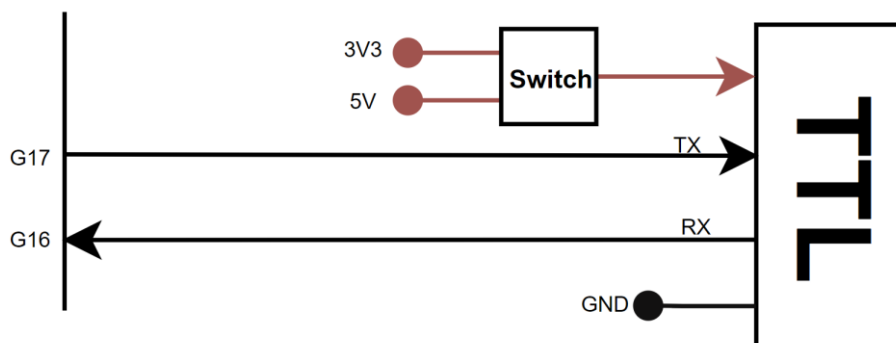


LCD 16x2 I2C



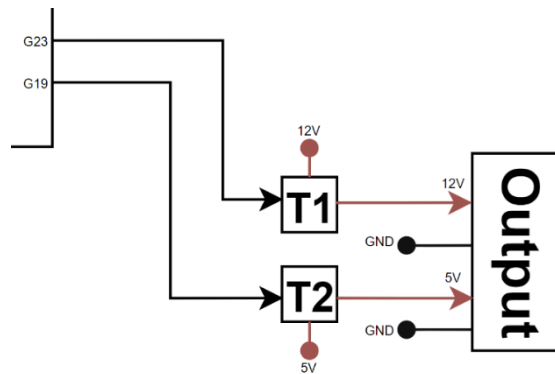
For the LCD 16x2 there is a SDA / SCL interface on GPIO pin G21 for SDA and GPIO pin G22 for SCL. To use the LCD with only these two GPIO's you need to connect the LCD with a I2C interface. With the I2C interface it's possible to send the data to the LCD from the ESP32. The I2C interface is included with the Display.

TTL



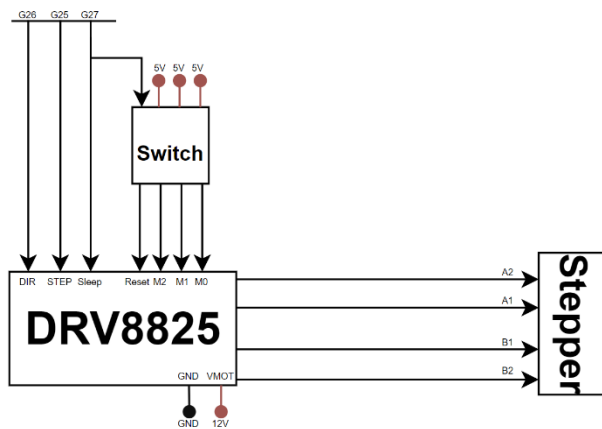
The TTL interface can be used for a serial communication or to connect a external Bluetooth device for the ESP32 (ESP32 has a BT device integrated). With a TTL to UART converter it is also possible to use a USB for serial communication with the ESP32. The supply voltage for the interface is either 5V or 3V3 it can be set with the switch. The TX pin is on GPIO G17 and the RX pin is on GPIO G16.

Output



The output connector is a transistor circuit which controls the voltage on the connector. If GPIO pin G23 is HIGH there is a 12V voltage on the output connector. If the GPIO pin G23 is LOW there is no voltage on the connector. Also for the GPIO pin G19, if its HIGH there is 5V voltage on the connector, if LOW there is no voltage on the connector. There are LED's on the PCB which indicates if the GPIO pins or HIGH or LOW.

Stepper motor



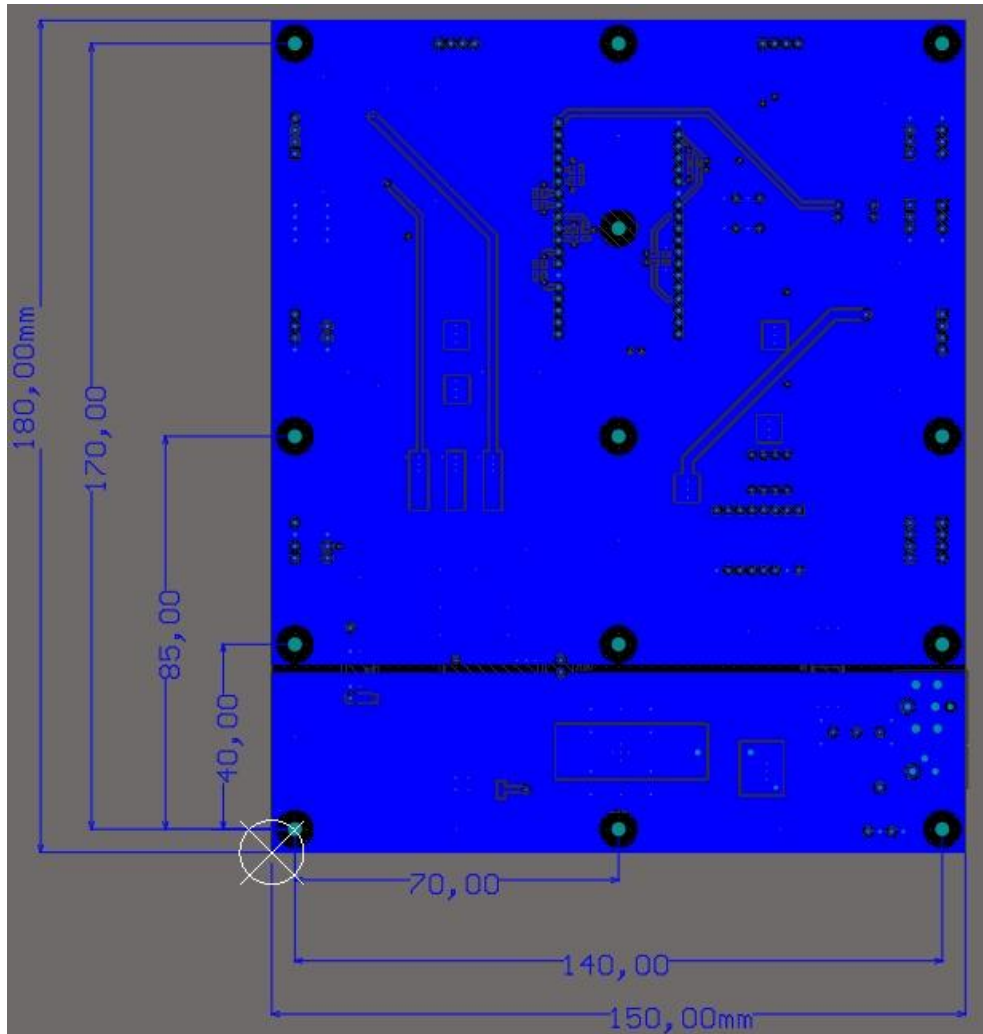
MODE0	MODE1	MODE2	Microstep Resolution
Low	Low	Low	Full step
High	Low	Low	Half step
Low	High	Low	1/4 step
High	High	Low	1/8 step
Low	Low	High	1/16 step
High	Low	High	1/32 step
Low	High	High	1/32 step
High	High	High	1/32 step

For using the stepper motor it's very important to **shorten the R1** on the PCB! Otherwise the stepper motor will not work due to not enough supply voltage. To be able to use a stepper motor there is a DRV8825 stepper driver on the PCB. With the GPIO pin G26 for controlling the directions (DIR). With the GPIO pin G25 for the STEP signal and for GPIO pin G27 for turning the Sleep on HIGH. The Switch is for setting the RESET on HIGH or LOW and for setting the step (full step, half step...) as you can see on table.

Specifications

Current	max current of 2.5A (Fuse)
Voltage input	12Vdc
Circuit voltage	3V3, 5V and 12V
SoC	ESP32 WROOM32
GPIO pins	17
Clock frequency	80MHz / 240MHz
RAM	512kB
Flash	4MB
Wi-Fi frequency	2.4 - 2.5 GHz
Bluetooth	V4.2 - BLE and classic Bluetooth
PCB	150mm x 180mm

Mechanics



width	150mm
length	180mm
PCB thickness	2mm
hole diameter	3,3mm
total height	35mm