

Below are links to the parts required to make the ESP32 Triaxial clock electronics.

Links are valid now, but of course could become dead in the future.

Links are for AliExpress suppliers and are a guide only.

Use a supplier who ships to your country.

Note, often if buying from AliExpress, there is a 'Choice' free express shipping option, if buying parts over a set value. Where possible, the links chosen are for combined free shipping.

ESP32 NodeMcu board. 38 pin version. USB-C CP2102

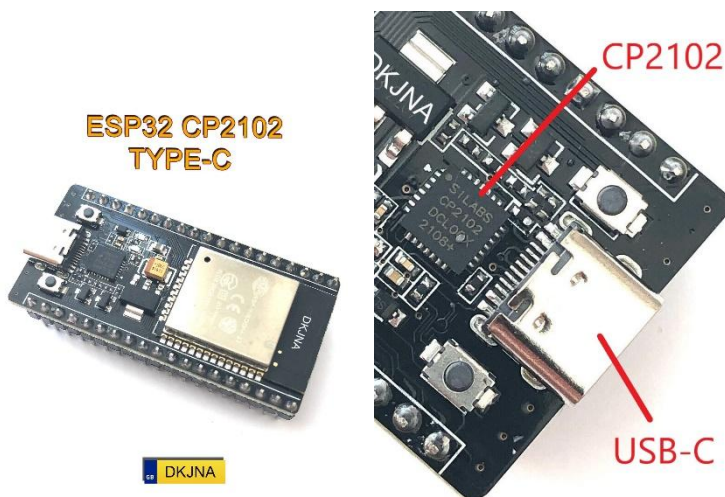
[1-10PCS/ESP32 Development Board Type-C CP2102 WIFI Bluetooth Module Dual Core Wireless Module ESP-WROOM-32 Expansion Board 38Pin - AliExpress 502](#)

IMPORTANT. There are multiple variants of this board. Get TYPE-C CP2102 38 Pin

Ensure it is 38 pin USB-C and CP2102 chip.

The board should not have mounting holes. Overall width is 25mm and pin spacing between the rows is 0.9" or 23mm, sometimes stated as 22.5mm

Note: - The guides have been written for this specific board type. Boards which differ with their USB chip and/or connector will still work, but the guides will not detail different driver installs or pin layout differences.



ESP32 CP2102 TYPE-C USB

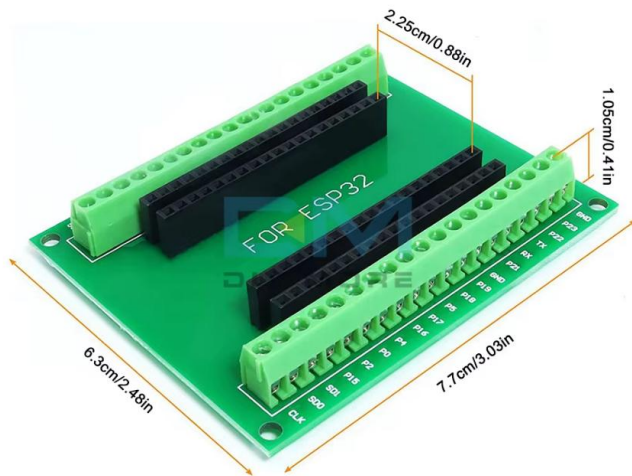
Screw-terminal Expansion Board.

ESP32 prototype/breakout board (38 pin screw-terminal version 2.25(23mm) 0.9" spacing) (note often listed as 2.25cm or 22.5mm or 23mm)

Link -not posted as despite ordering the correct 22.5mm board on the last few occasions from different suppliers, I was sent a 25mm board.

IMPORTANT. *There are multiple variants of this board. Ensure you select the green board with the correct pin spacing for your board. 22.5(23mm) 0.9"*

Note: - This screw type breakout board was originally only available in 38-pin form and 22.5 (23mm) 0.9". However, recently, both a 38 pin 25mm spacing and 30-pin 25mm spacing version has become available. This is causing confusion in China. My last few orders of this board have been incorrect. One time sending a purple board with pin headers and most recently a 30-pin board, blue in colour but in a sealed bag marked 38P



Very important update January 2026

There seems to be big issues with Aliexpress suppliers mixing up 22.5 and 25mm expansion boards.

My last three orders for 22.5mm boards have all been incorrect, with either a totally different, or a 25mm board, sent.

As an alternate, the link below is for a 25mm spaced ESP32 and expansion board set. Select **Color: 32D Type-C KIT**. This board has been ordered by myself from the link below and works perfectly.

[ESP32 Development Board with GPIO Expansion Board Kit ESP32-WROOM-32D BT Wifi Module USB Type-C 38PIN CP2102 ESP32-DevKitC - AliExpress 502](#)

Buttons. (12mm for large box or 7mm for smaller box).

Below is a link to buttons which may be purchased as a 6-pack. Note they melt very easily with a soldering iron, so one must be proficient & quick when making the soldered joints. Use 60/40 lead solder, not this horrible lead-free stuff.

[6piece Mini 12mm Waterproof Momentary On/off Push Button Round Switch Pbs-33b Kit White Black Red Yellow Blue Green - AliExpress](#)



[6PCS PBS-110 7mm Micro Momentary Switch - Normally Open Push Button for Instrument Panel & DIY Electronics](#)



Stepper motor & driver board. 5V version.

The motor and driver board operates the mechanical motion. The link provided is for the 5V motor AND driver board.

[1PCS 28BYJ-48 Stepper Motor 5V / 12V ULN2003 Driver Test Module Micro Mini Electric Step Motor, for Arduino - AliExpress 502](#)



**5V/12V
Stepper Motor**



ULN2003 Driver Test Module

Oled Display (optional). 1.3" OLED 128X64 IIC I2C

A small oled display is used to show the time and date. This is taken from the internet time and built in RTC, which corrects for daylight saving. This is most useful for ensuring the time is correct on the Triaxial mechanical movement.

Ensure you purchase the correct one, it must be 128X64 (this is the pixel size) and have the IIC or 2IC interface. Some versions have the VCC and GND pins reversed (this is set by soldered jumpers on the back), so check the legends when connecting 3.3V power.

[1.3" OLED Module 1.3 inch Display Module White/Blue 128X64SPI/IIC I2C Communicate Color 1.3 Inch OLED LCD LED Display Module - AliExpress](#)

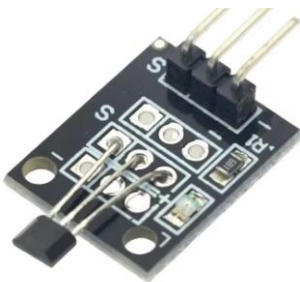


4pinIIC-White

Hall Sensor (Optional)

Used to sense the position of the 1-minute rotor within the code, which is then used to adjust the accuracy of the mechanical movement.

[1/5/10PCS KY-003 Hall Magnetic Sensor Module, For Arduino AVR Smart Cars DIY Starter Kit - AliExpress](#)



Magnets (Optional) 6mm x 3mm

Used in conjunction with the hall sensor.

[10/50/100 Pcs 6x3mm Neodymim Imans 6mm X 3mm N35 NdFeB Round Super Powerful Strong Permanent Imans Imanes Disc 6x3mm - AliExpress](#)



JST XH 2.54MM Connector kit.

This kit comes with connectors pre-crimped onto the wires, but not pushed into the white shells. This allows the connectors to simply be pushed into the plastic shell, allowing for different connector sizes and colour combinations to be made.

Also in the kit, there are a number of lengths of shrink tube. These can be cut into small lengths of around 3mm and slid over the wires, to hold them in a bunch, making wiring neater.

Note: - There are no brown wires in these kits. (see below) *

[2.54mm XH Connector Socket Kit with 22AWG Pre-Crimped Wire Cable JST XH 2/3/4/5/6/7 Pin Housing Male Female Adapter Cable - AliExpress 13](#)



ST XH 2.54mm wires. Single colours.

OPTIONAL – See below

Note: The schematic uses Brown colour to distinguish 3V power and 5V (Red).

There are plenty of wires for the project, in the kit. Extras are not needed.

If using the connector kit for other projects, you may run out of certain colours.

Additional pre-made wires can be purchased here, but be advised of the high shipping costs.

Ensure you select 2.54mm pitch.

[10Pcs SH1.0mm Jst 1.25mm PH2.0mm XH 2.54mm Terminal Wire Single / Double Head Electronic Connecting Cable Without Shell 10-30CM - AliExpress](#)

Additional useful parts

Glue Gun.

Cheap glue gun, but surprisingly it works ok.

[20W Hot Melt Glue Gun DIY Mini Household Industrial Guns Heat Temperature Thermo EU Electric Repair Tool Use 7mm Glue Sticks - AliExpress](#)

Don't forget the glue :o)

[T TOVIA 60pcs/120pcs Hot Melt Glue Sticks 7mm Hot Glue Sticks Rod for Craft Album Repair Tools Hot Glue Gun Sticks - AliExpress](#)

Wire Strippers. Model 3001D

The JST HX wires are very thin 22AWG. A good quality wire stripper will be required. An alternate is to use a sharp scalpel or Stanley knife blade

[Pro'sKit 8PK-3001D 8PK-3002D high quality electronic wire stripper cutting pliers \(AWG 30/28/26/24/22/20 precision pliers - AliExpress 1420](#)

Soldering Iron Kit.

Cheap soldering iron kits are available on Aliexpress. I found the tips are very loose & the internet mod is to wrap a strip of aluminium cooking foil around the ceramic heater, reducing the gap. However, it is far better to buy a genuine branded product, Weller or Antex (not a cheap knock off).

Solder. Ensure you buy a reel of Lead/Tin solder. Most solder supplied is the horrible lead-free stuff. Compared to traditional lead/tin solder, it has a higher melting point, does not flow as well and is brittle.

Buy a reel of traditional 60/40 flux cored lead/tin solder. It is much easier to work with.