

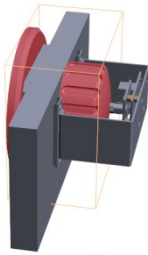
EZ GOTO LITE KIT



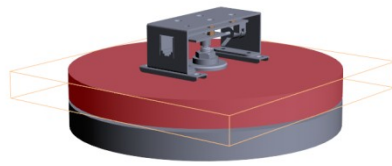
1. AZ main board and encoder
2. ALT encoder module
3. ALT bearing cover with encoder magnet
4. 6P6C RJ 12 data cable
5. DC- USB cord (5~15V DC)
6. Main bolt with AZ encoder magnet
7. Screws and Pads
8. Spare parts

Inspecting the installation to improve the encoder accuracy

We apply the contactless magnet encoder in our system. The encoder magnets are specially selected one by one. The magnet must be centered extremely precisely (less than 0.1mm) to perform as its specification. We manufacture the every drilling hole by CNC matching the selected screw to make sure encoder aligned plate tightly and centered well. However, there is a very little gap left between holes and screws.



Altitude (Alt)

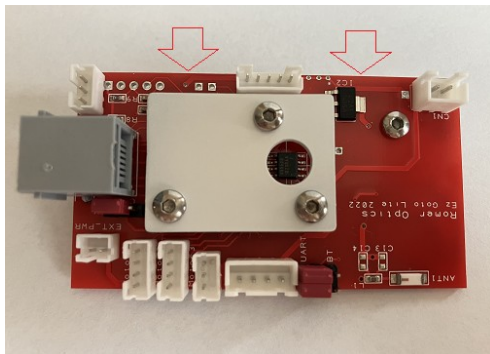


Azimuth (Az)



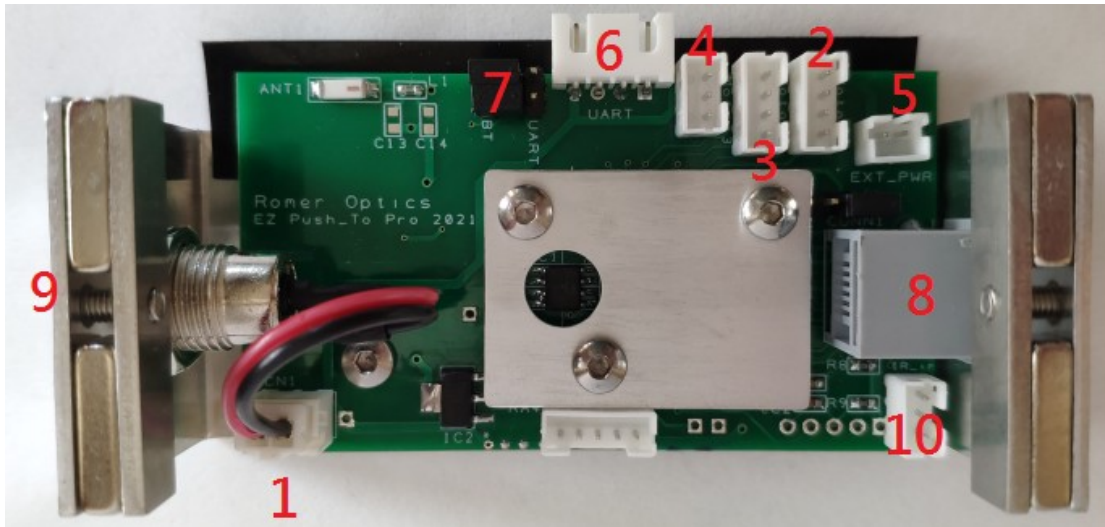
1. Inspect the border of the aligned plate from a view angle.
The visual inspection could recognize a spacing of 0.05mm.

2. The edges of the plate are supposed to match the back PCB visually.



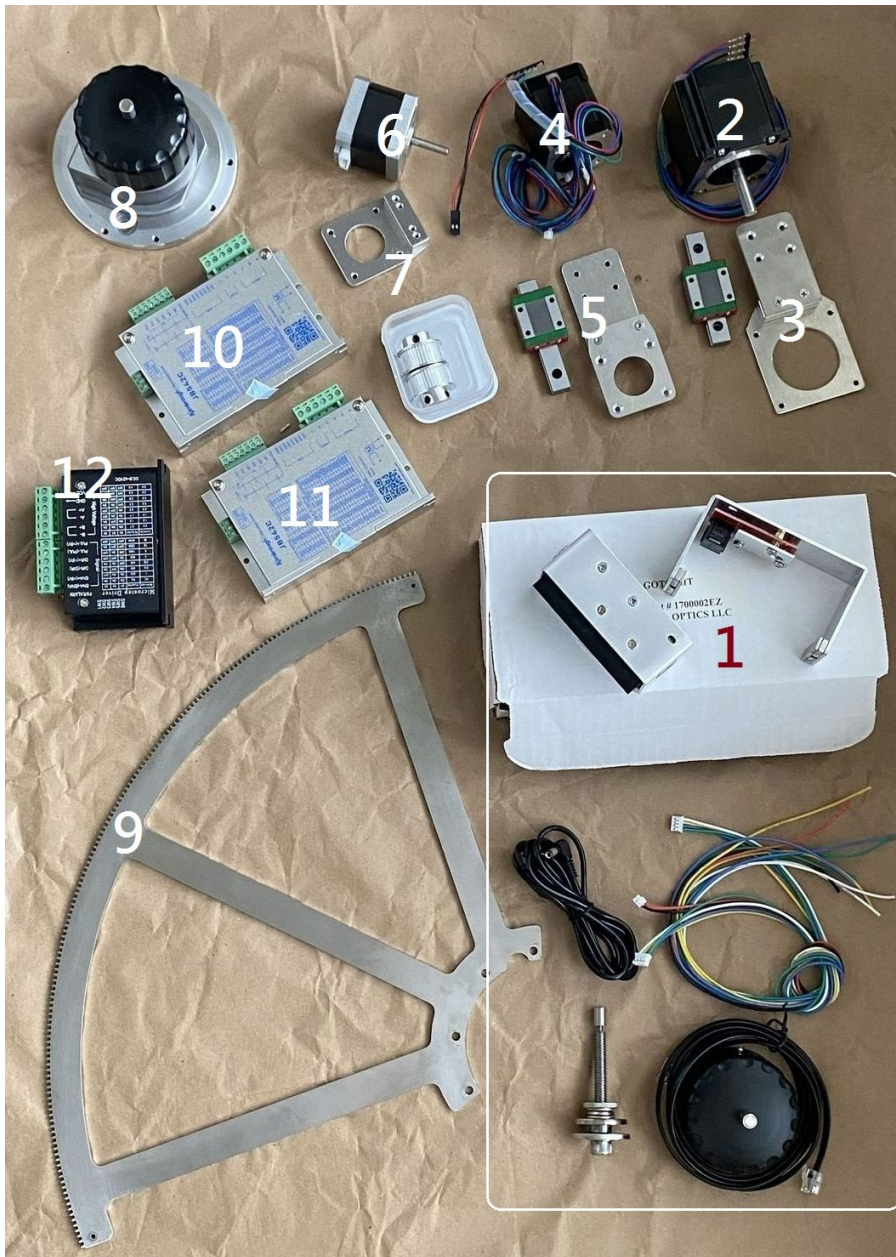
3. Adjust the plates by loose and tight the 3 screws if necessary.

The layout of Input & Output on Main Board



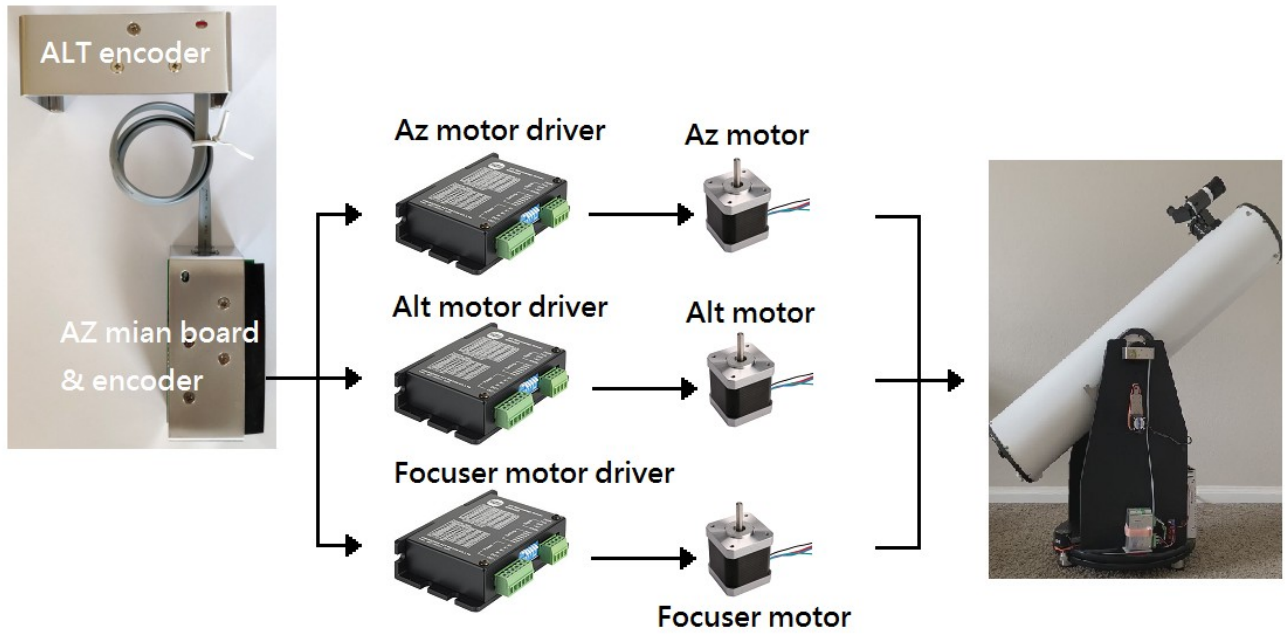
1. Power Input (5~15V DC)
2. AZ motor output (4 pins)
3. Alt motor output (4 pins)
4. Focuser Motor output (3 pins)
5. Motor Signal Reference Voltage
6. UART-USB (RS232 port)
7. Bluetooth / UART-USB option
8. RJ12 (data cable)
9. DC female plug
10. Dual Speeds Trigger Signal / +5 DCV output

The list of the Ez Goto parts and modules



- 1 EZ GOTO KIT
- 2 ALT Stepper Motor
- 3 ALT motor bracket & slide
- 4 AZ Stepper Motor
- 5 AZ motor bracket & slide
- 6 Focuser Stepper Motor
- 7 Focuser motor bracket
- 8 ALT bearing
- 9 ALT Big Gear
- 10 AZ motor driver
- 11 ALT motor driver
- 12 Focuser motor driver

Flow Chart of the EZ GOTO KIT

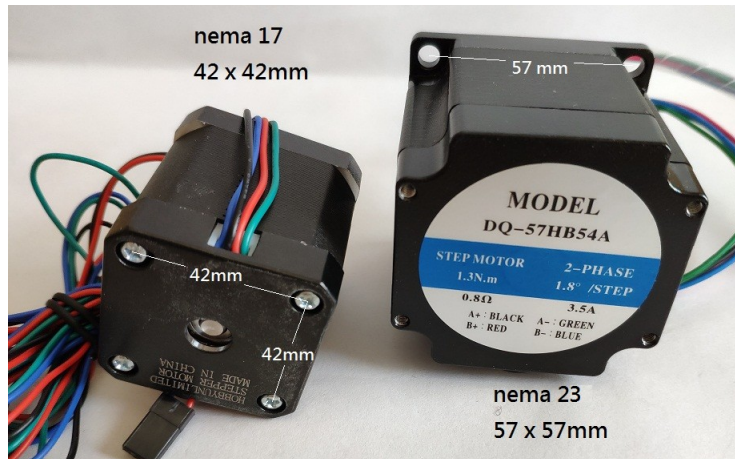


How to choose stepper motors and compatible drivers?

The nema 17 motor works from 8"~16" Dobsonian

The nema 23 is recommended on 12" or larger Dobsonian.

We sell customized bracket & slide for nema 17 and 23.

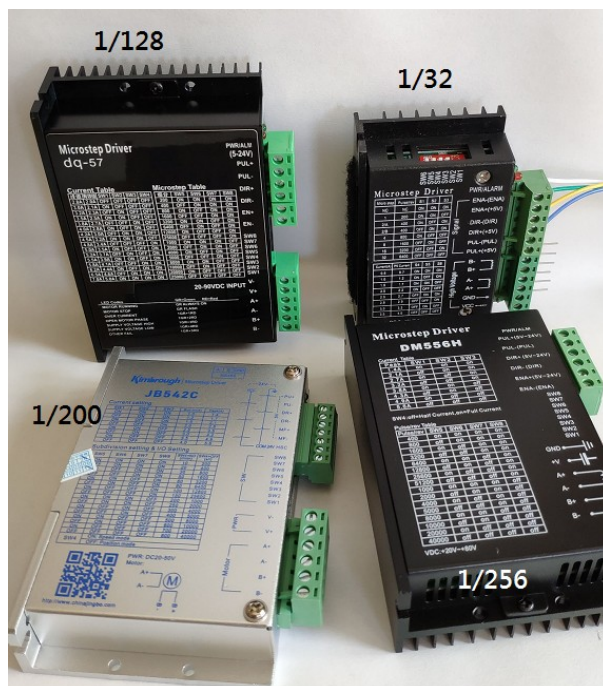


The motor driver delivers the current sequence to control the stepper motors.

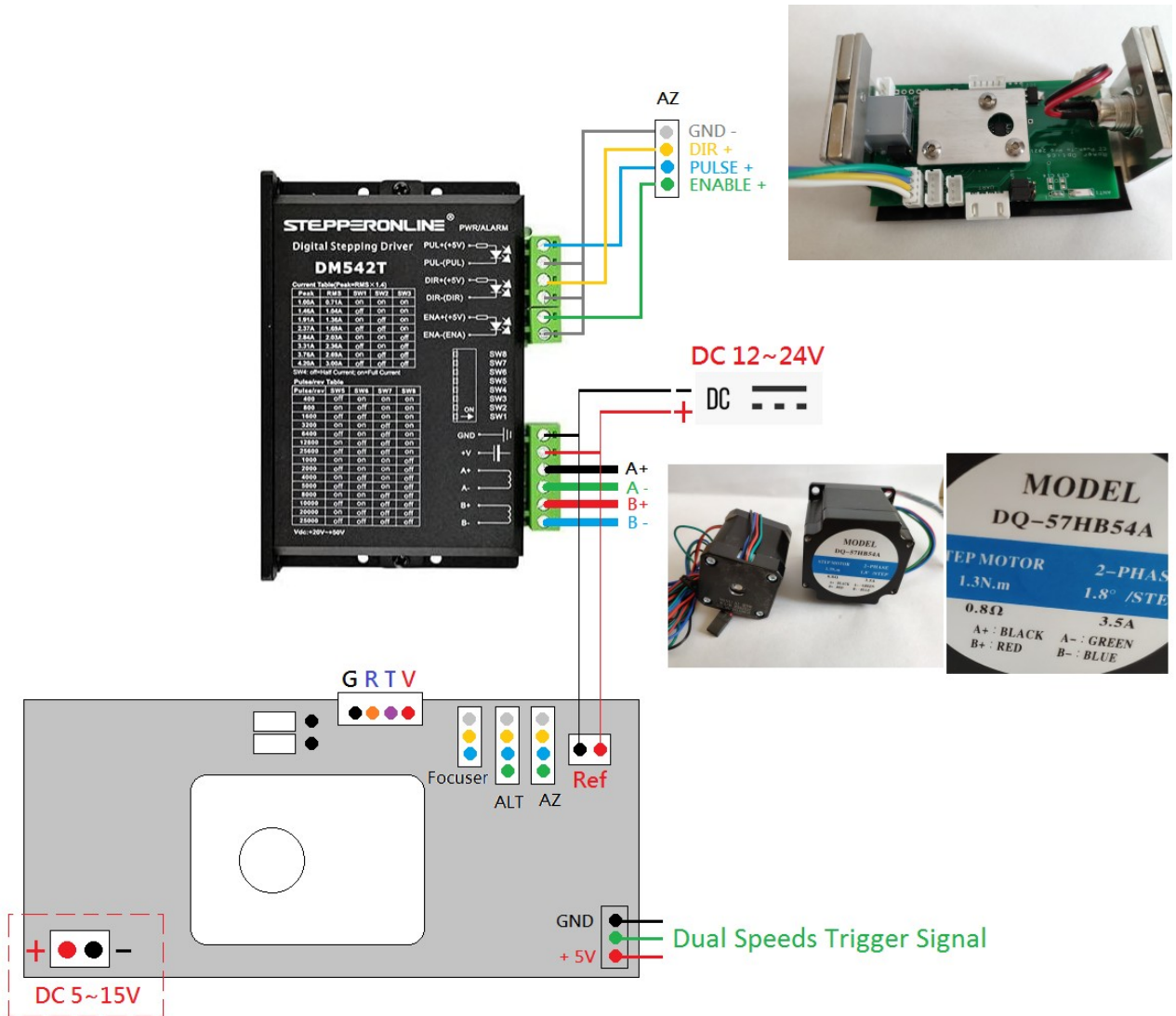
current: higher current to generate more torque

micro steppers: finer steps to improve precise movement

We advice the driver running at least **1/128** (1/200 or 1/256 is much better). The **1/256 drivers** are always quiet, less vibration but little costly.



AZ / ALT / FUCUSROR WIRING



Red (+), Black (-)

Pulse: motor moves a step every pulse

Dir: motor direction

Enable (MF): enable or disable motor (electric clutch)

GND: ground

Ref: must be the same power source as motors.

Depending on brands and models, motor wire colors (A+/A-/B+/B-) are changed.

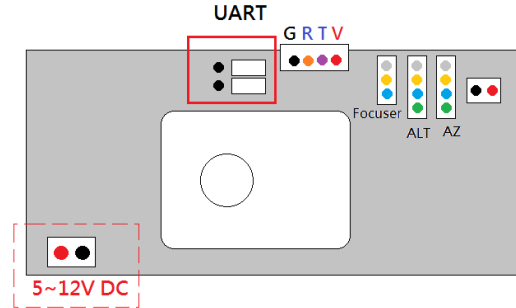
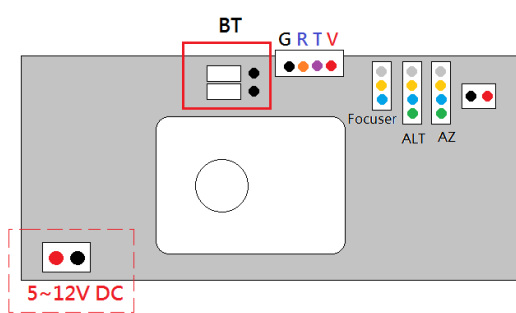
Repeat the other ALT/Focuser wiring by colors likewise.

NOTE: The focuser motor defaults enabled all the time. NO "enable pin" in the Focuser output.

UART-USB / RS232 Wiring

You must set the jumper to use UART-USB.

DO NOT wire the V(power) to wrong pins

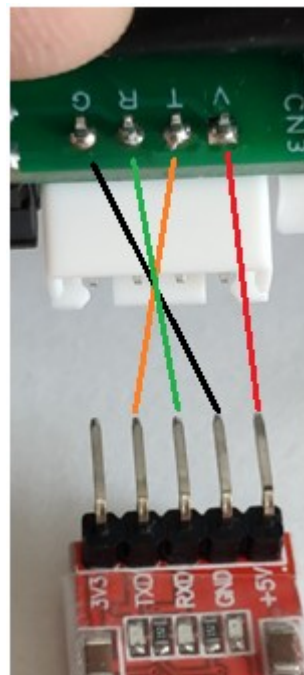
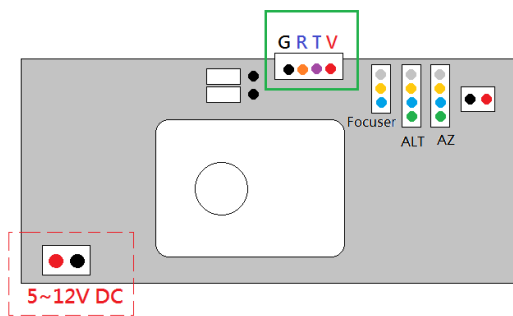


V: to 5V or 3.3V

T: to TXD

R: to RXD

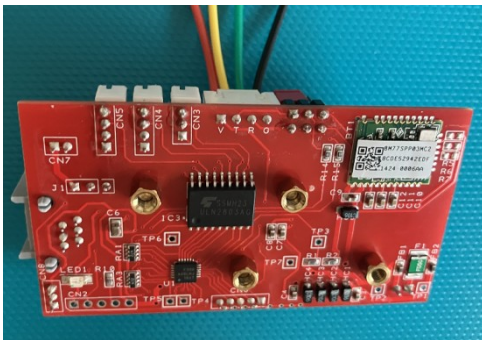
G: to GND



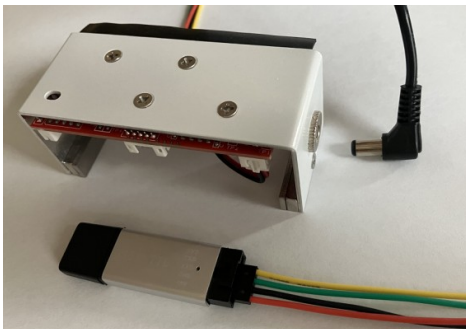
We enclose a high quality UART-USB (Silicon Labs CP2102) in Ez Goto kit. Wire type length and colors depends but could be handmade yourself.



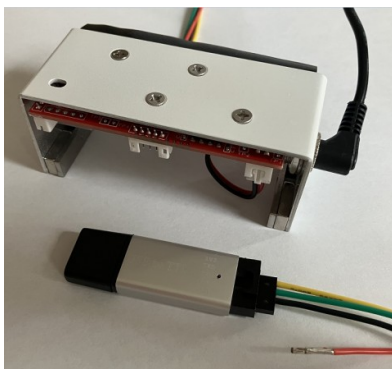
V: to 5V or 3.3V
T: to TXD
R: to RXD
G: to GND



Important Notice: The power supply between the UART-USB and Ez Goto kit



1. **Unplug external DC supply** to Ez Goto kit
2. Use the 5V (red in the photo) of UART-USB to power on entire Ez Goto kit via Laptop USB



1. Power on Ez Goto with external DC supply
2. **Remove the 5V (red in the photo)** out of UART-USB

DUAL SPEEDS

Why we need Dual Speeds?

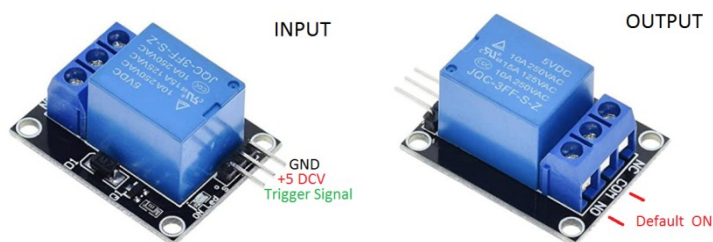
The traditional stepper motor runs 200 full steps each revolution. In the other words, the motor rotates 1.8 degree every full step.

The new micro stepper technology let the traditional motor run 256 micro steps instead of one full step (1.8 degree), or 51200 micro steps in one revolution. The micro stepper technology becomes one of the friendly solutions to add the tracking function on our telescopes.

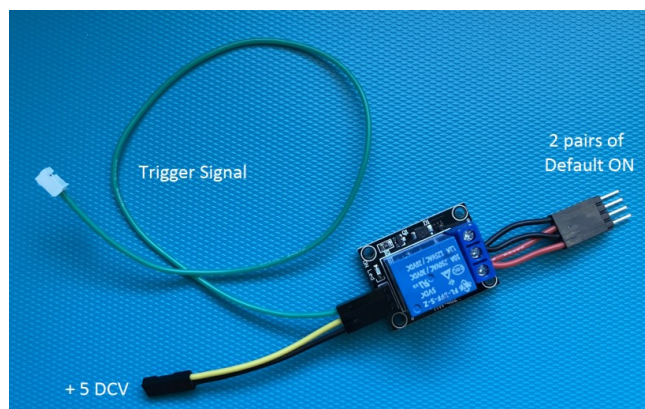
However, there is a dilemma in real application. The high resolution of the micro stepper motor enhances the tracking ability but slows down the GOTO efficiency. That is why we design the dual speeds trigger output on our GOTO board. For example, we can set 256 micro stepper in tracking and switch to 64 micro stepper when GOTO via the dual speeds trigger signal.

How to install the Dual Speeds hardware?

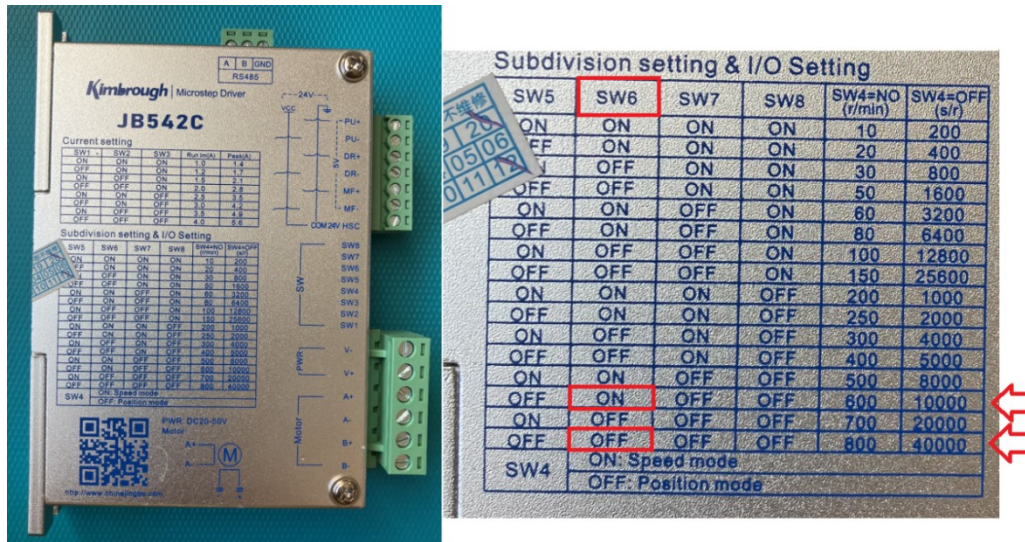
Relay module wiring:



One channel relay requires 5V/12V/18V/24V to turn on/off the switch when receiving a trigger signal. The relay is ON without any trigger (default ON), and becomes OFF when receiving the trigger signal.



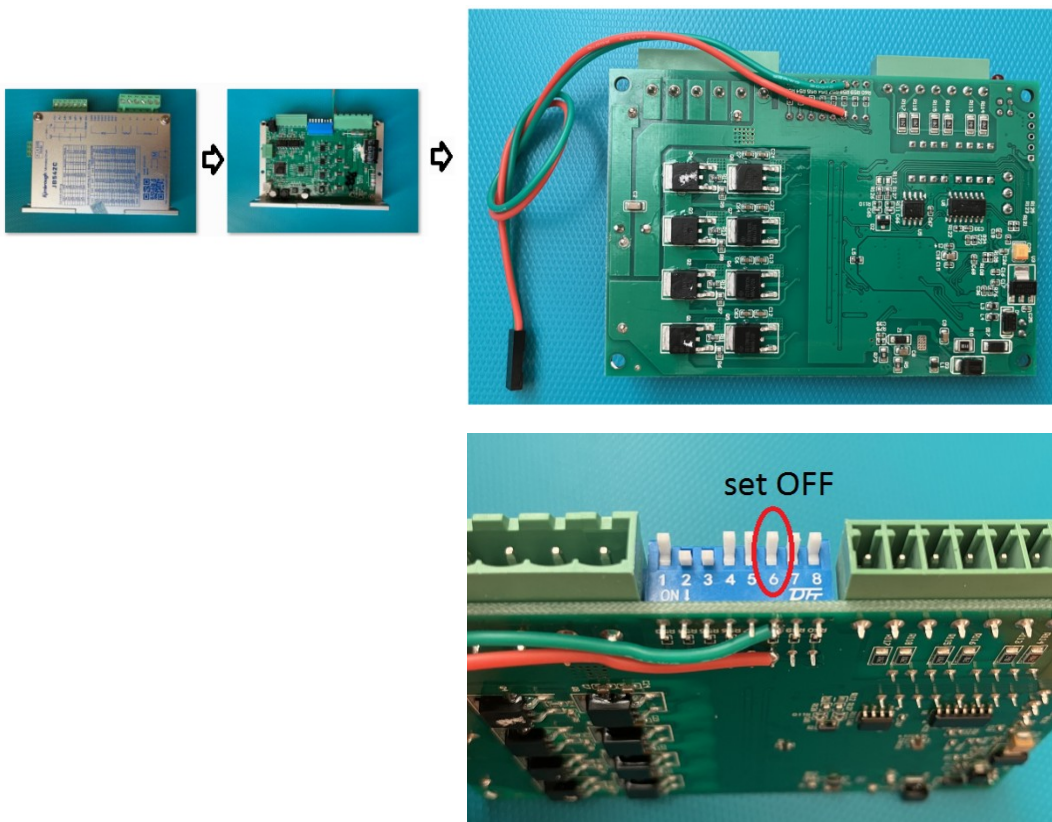
Motor driver modification:



Check the micro stepper jumper table on the case. For example, the jumper

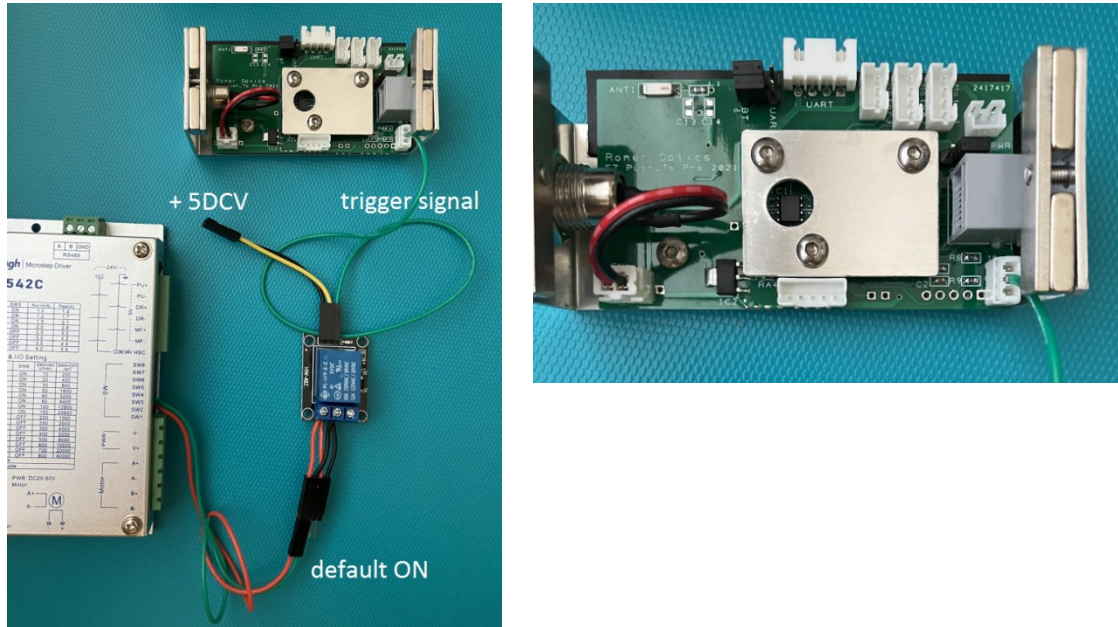
SW5	SW6	SW7	SW8	Micro Stepper
OFF	ON	OFF	OFF	10000
OFF	OFF	OFF	OFF	40000
OFF	ON	ON	OFF	2000

We are going to set sw6 to ON in GOTO (10000) and OFF when tracking (40000). Open the case; solder two "control wires" on the back of jumper sw6; and set SW6 to OFF always.

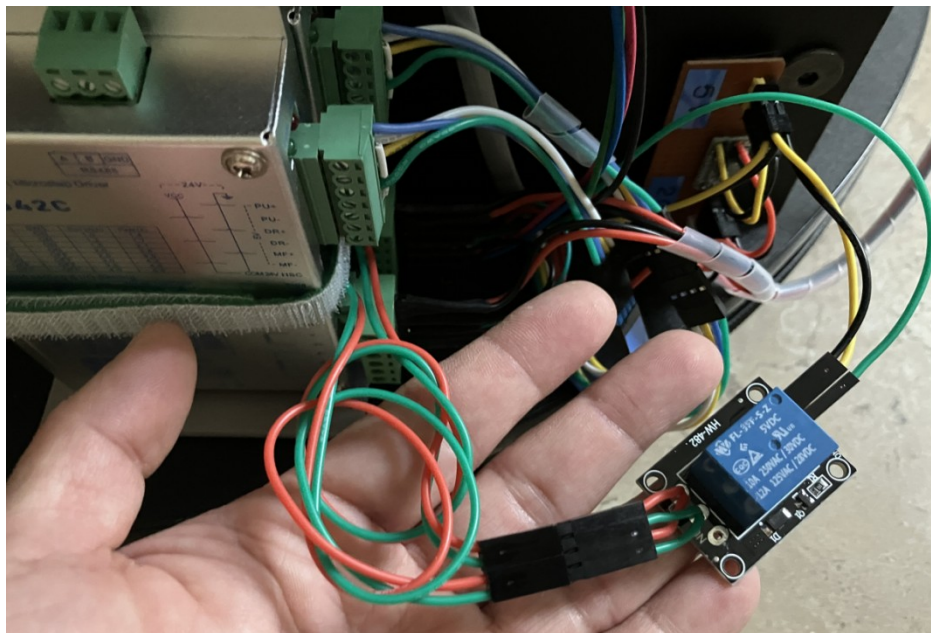


Note: You can set both sw6 & sw7 to ON in GOTO (2000) and OFF when tracking (40000), if you can solder **FOUR** “control wires” on the back of jumper.

Now, we can connect or disconnect the control wires to set the sw6 to ON or OFF (change micro stepper) by an external one channel relay module.



We can wire AZ and ALT motor drivers together on the “one” channel relay if the control wires are the same color.



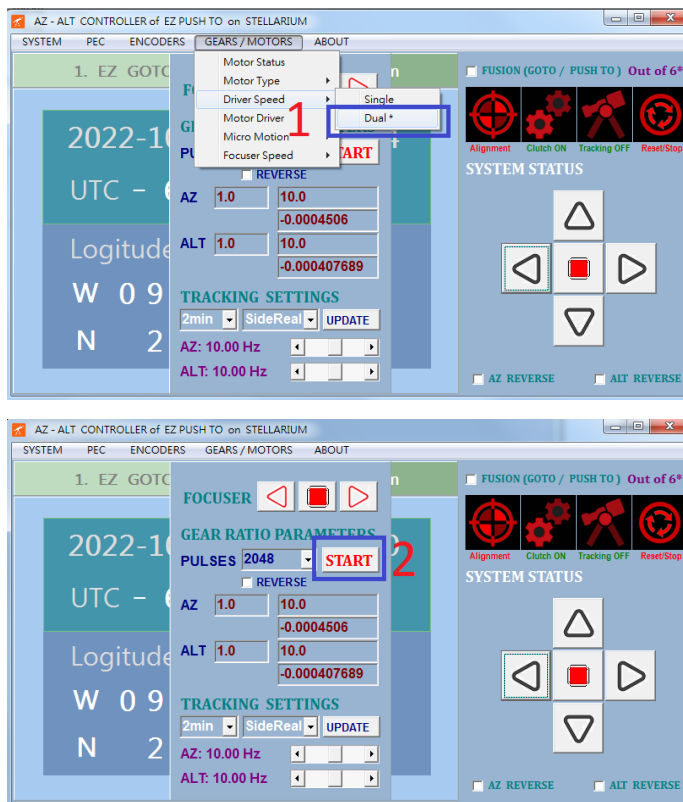
How to use the Dual Speeds software?

In dual speeds mode, the motors lean **“GOTO” (faster speed) first**, then **tracking (slow speed) later**.

For example, the motor drivers set 64 micro stepper first, and then set to 256 micro stepper later.

You have to swap the control wires to the **“default OFF”** on the relay if yours runs the reverse order.

The plugin app on the Windows Laptop:



The Ez Goto app on Android Handset

Watch the demo clip at <https://youtu.be/4RE8-DOUO14>

