ZIKODRIVE
OPTIMISED MOTOR CONTROL

ZIKOSTEP 1 QUICK START GUIDE

ZIKODRIVE MOTOR CONTROLLERS

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1. Introduction

This quick start guide provides an overview of how-to setup and operate the Zikostep 1 stepper motor controller. Please read this document carefully before setting up the controller and for any queries feel free to contact our customer service team via our website (www.zikodrive.com) and we will be happy to help.

NOTE: ENSURE THAT THE POWER AND VOLTAGE SETTINGS ARE ACCURATE. EXCEEDING THESE LIMITS WILL DAMAGE THE CONTROLLER PERMANENTLY AND VOID ANY WARRANTIES.

2. Product Specifications

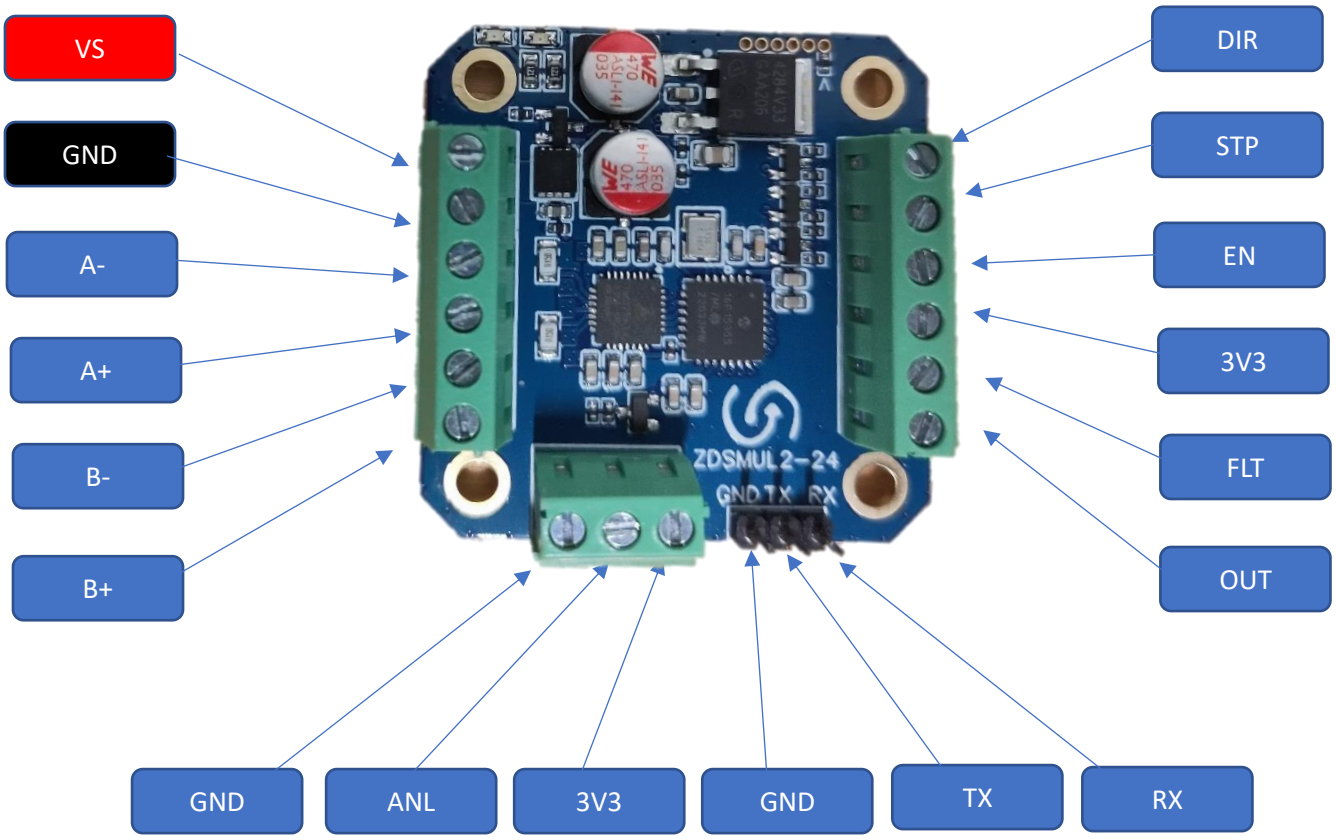
PARAMETER	VALUE
Operational Voltage	5VDC – 24VDC
Peak Current	Up to 2 A **
Microstep Resolution	1 to 256 Steps
UART Connectivity	Yes
Programmable Output	Yes
Analogue /UART Speed Control	Yes
Analogue / UART Direction Control	Yes
Temperature Range	-20C to 60C

** **NOTE**: Under certain operating conditions (for example high current, low speed at a relatively high ambient temperature and 100% duty cycle), the controller will get hot. Care must be taken to ensure the unit is adequately mounted and cooled in such circumstances. If you have a specific

requirement or application where this may be relevant, then please contact our team to discuss suitability and we will be happy to advise.

3. Connections on the Zikostep 1

NOTE: YOU MUST ONLY CONNECT THE MAIN POWER SUPPLY TO THE VS AND GND PINS ON THE TOP LEFT (MARKED RED AND BLACK). DO NOT CONNECT THE MAIN POWER SOURCE GND TO ONE OF THE OTHER GND CONNECTIONS.



4. Motor Phase Wiring

Please consult the stepper motor datasheet when wiring up the motor to ensure the right connections are in place. A typical stepper motor will have the following connections.

Terminal	Wire
A-	Green
A+	Black
B-	Red
B+	Blue

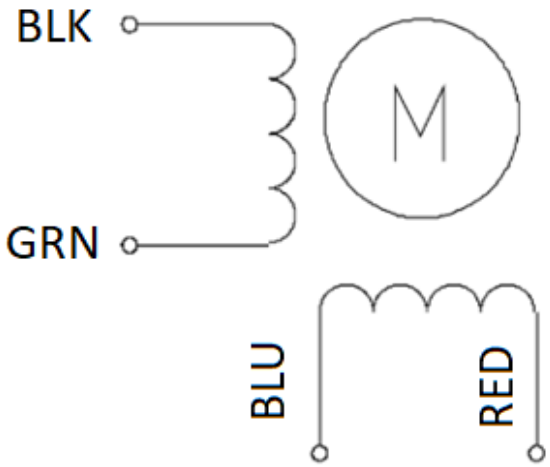


Figure 1: Wiring Diagram

5. Connecting to the ZikoSoft Software

5.1 Requirements

1. A computer or a laptop with a USB port.
2. The Zikostep 1 controller.
3. ZikoSoft software (the software can be downloaded from www.zikodrive.com)
4. A 3.3V FTDI cable (can be purchased from www.zikodrive.com)

5.2 Getting started.

a. Establish a connection between the controller and the PC or laptop using a 3.3V FTDI cable. The cable connections are as follows:
   - Receiver (Rx) – Orange
   - Transmitter (Tx) – Yellow
   - Ground (GND) – Black

b. Connect the power supply to controller and switch it on. Power to the controller will be established when a Green LED on the controller turns on.

c. Subsequently, launch the ZikoSoft software. Upon launch, you will be presented with a dialog box.

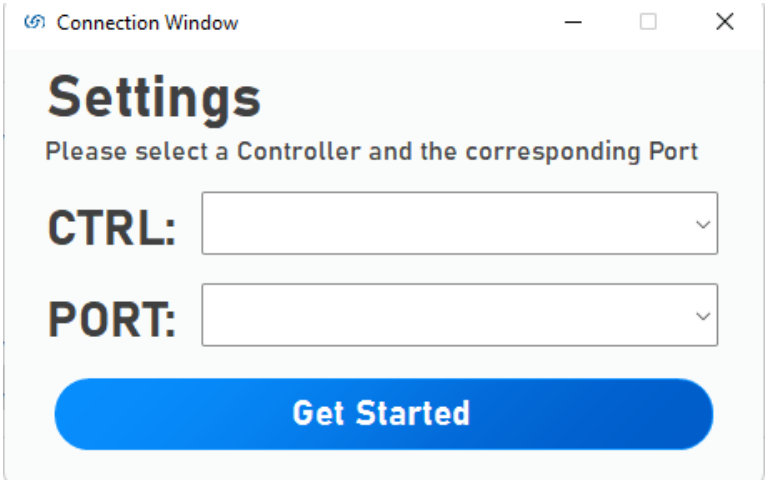


Figure 2: ZikoSoft Launch Window

d. Within the 'CTRL' (Controller) option, select the appropriate controller, and in the 'PORT' option, choose the correct communication port. Please note that only the correct port, identifiable by the cable name, will be displayed. All other ports will be labelled as 'unknown.'

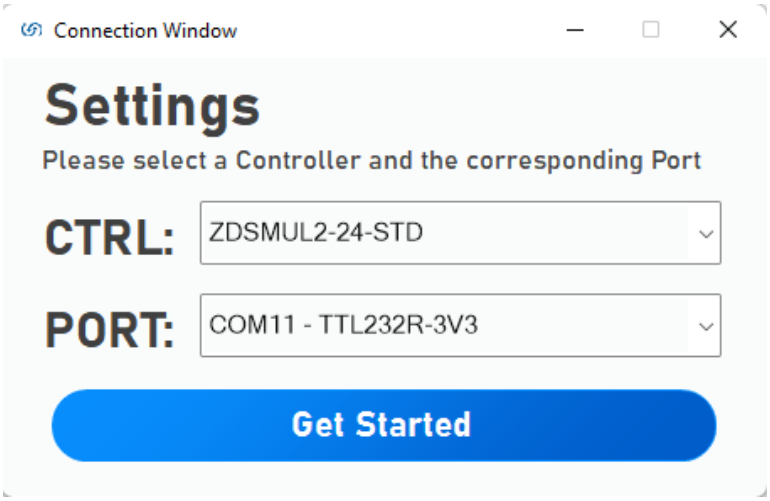


Figure 3: ZikoSoft Launch Window

e. Once these configuration options have been appropriately chosen, press the 'Get Started' button. This action will establish a connection between the controller and your PC or laptop.

f. A successful connection will be indicated when the topmost section of the dialog box turns green, and the message 'connected' will be displayed as shown in the image below.

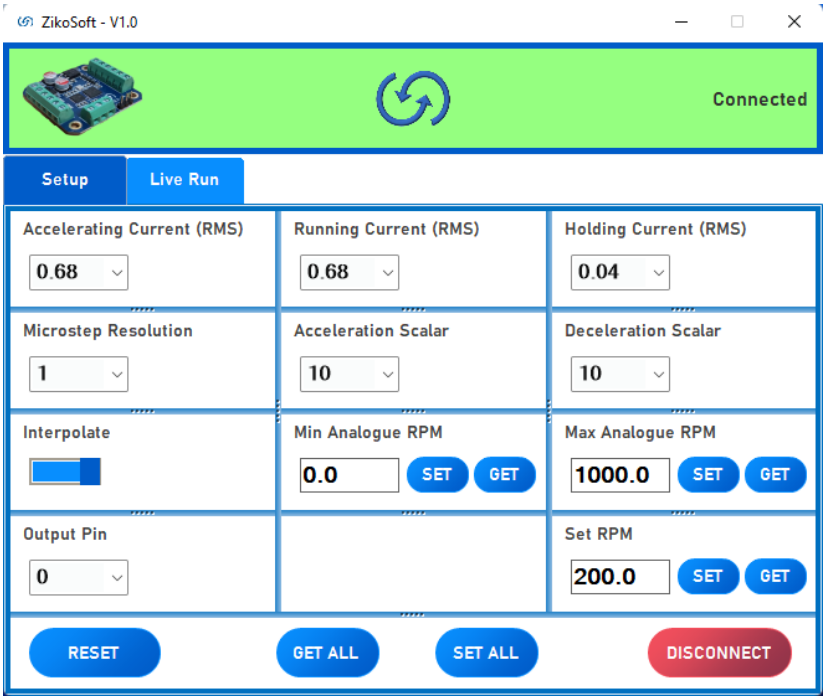


Figure 4: ZikoSoft Main Page

g. A disconnection will be indicated when the topmost section of the dialog box turns red, and the message 'disconnected' will be displayed as shown in the image below.

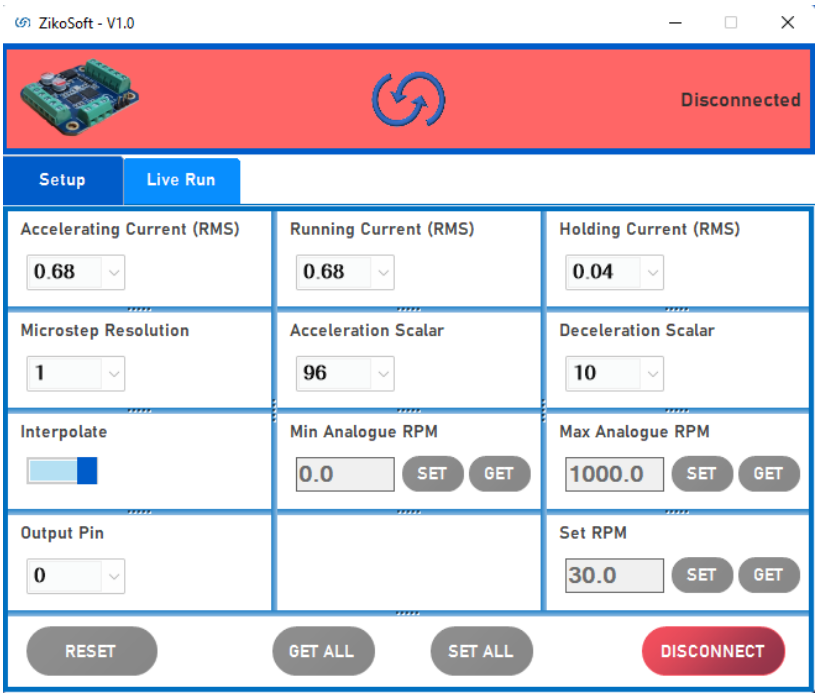


Figure 5: ZikoSoft when disconnected.

These steps ensure a secure and verified connection between the controller and your computer, facilitating proper communication and operation.

6. Setting key parameters using the ZikoSoft software

- Please be aware that the specific configuration settings may be subject to adjustments depending on the .ini file in use. However, the general concept remains the same. Some of these settings have a G (Get) and an "S" (Set) function and some of them have a dropdown menu to choose the exact value to set for the parameter.
- To retrieve information about a particular variable while the motor is operational, initiate a "G" command. The software will then transmit a request to the controller to obtain the information and subsequently display it within the designated window.
- Conversely, to establish or modify the value of a variable, input the desired value, and employ the "S" command. This action will transmit the specified value to the controller, effectively setting the variable to the value entered.
- For parameters with the dropdown option, simply select one of the values in the dropdown menu and it will be set as the value for that variable.
- Please note that each parameter has its preset limits. If a value exceeding those limits is entered, the software will give an error warning as shown in the image below which will stop the user from entering a value outside the preset limits for the parameter.

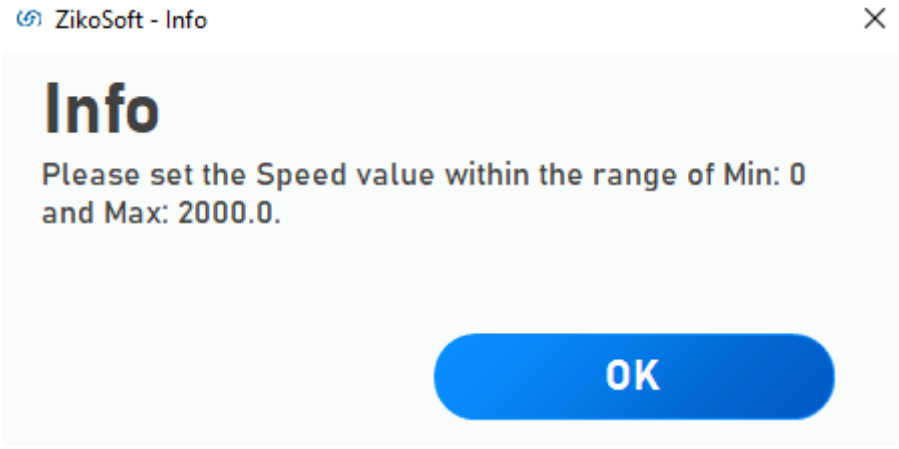


Figure 6: Error Window

In the software, the parameters are divided into two tabs viz. Setup and Live Run.

Here is an example setup for the of Zikostep 1 stepper motor controller to run a stepper motor at 400 RPM at full step:

a. Once a connection is established between the controller and the laptop or PC, the key parameters will be set based on the application.
b. For this example, the motor needs to run at 400 RPM.
c. The following will be the values for the key parameters:
   Accelerating Current: 0.68
   Running Current: 0.38
   Holding Current: 0.04
   Acceleration Scalar: 10
   Deceleration Scalar: 10
   Interpolate: On
d. This will ensure that the motor run at 400RPM on Full Step.
e. If the application requires a different motor speed, modify the parameter values accordingly. For example, if the speed needs to be higher than 400 RPM, increase the Running Current and adjust the Acceleration and Deceleration Scalars.

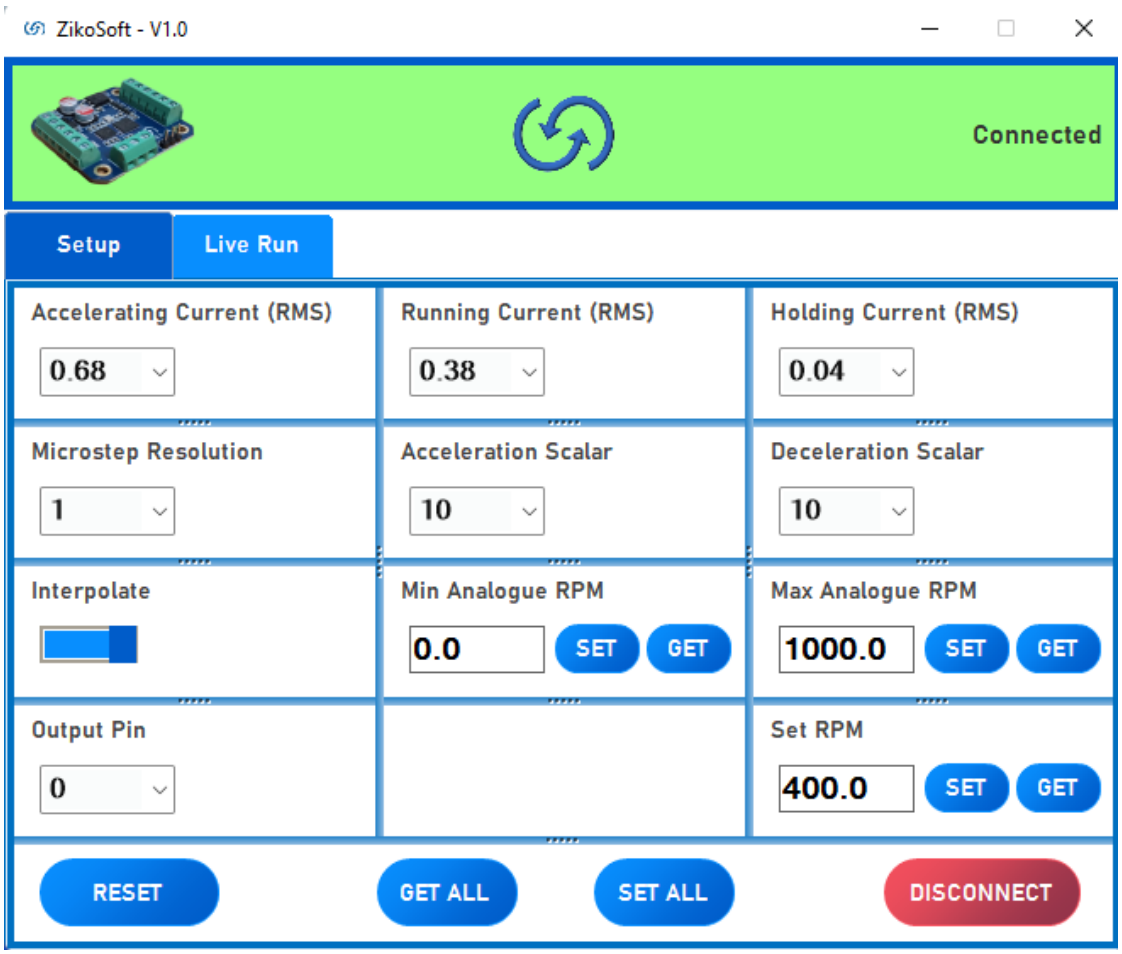


Figure 7: Values of Key Parameters to run the motor at 400 RPM.

f. Refer to the ZikoStep 1 stepper motor controller documentation for specific details on parameter meanings and units.

g. Test the setup with the provided parameters and fine-tune as needed based on the actual performance of the stepper motor.

Remember, the optimal parameter values may vary based on the specific stepper motor model and mechanical setup. Always consult the documentation provided with your equipment for accurate and model-specific information.

6.1 Setup Tab

The following are the Key Parameters in the setup tab:

a. Acceleration Current

The Acceleration current is the current drawn by the motor while it accelerates to achieve the desired speed. This is to make the motor run easier during start up.

b. Current Setting

This setting will determine the main running current for the controller. Care must be taken to match this to the motor being used. Setting this value too low can limit the performance of the motor. Setting it too high can risk overheating and damaging the motor. Refer to the motor datasheet for guidance on this.

c. Holding Current

This setting is used to enable the motor to hold itself in a certain position at 0rpm. The values for holding current are the same as the current settings above. As with the current above, it is important to make sure the settings for this are acceptable for the motor chosen. Setting this too high will overheat and ultimately damage the motor and controller.

PLEASE NOTE – HOLDING CURRENT WILL ONLY BE APPLIED AT 0 RPM – IT WILL NOT FUNCTION IF THE CONTROLLER IS NOT ENABLED.

d. Microstep Resolution

This setting is used to change the microstep resolution of the controller from anywhere between full step and 1/256 microsteps. For more information on the right microstep resolution for your project, please visit www.zikodrive.com

e. Acceleration & Deceleration Scalar

This setting accepts a value between 0 and 100 for both acceleration and deceleration. 100 will adjust the speed in the fastest time, 1 will make a slow change to the speed. This allows

the user to directly control the acceleration and deceleration in a range of situations. Whenever, the motor changes speed or direction it will reference the acceleration and deceleration values and operate accordingly.

f. Interpolate

The interpolate setting is used with a step input to determine whether the motor will operate at the step setting included. If set to 0, the motor will run at the Microstep resolution entered. If set to 1, the motor will interpolate the Microstep to 1/256 for smoother operation.

g. Minimum and Maximum Analogue RPM

The Minimum Analogue RPM is the lowest RPM value that the motor can run at while operating the motor using analogue inputs. The Maximum Analogue RPM is the highest RPM value that the motor can run at while operating the motor using analogue inputs.

h. Set RPM

This input will set a value in RPM which is the speed at which the motor will run. This parameter accepts any value between 0 and 2000. Please note, the controller does not accept decimal places.

i. Output

Any one of the following options can be chosen for the programmable output. This can be used to monitor the performance of the controller.

Output = 0: Output pin constantly on.

Output = 1: Output goes high for every step.

Output = 2: Output goes high every 4 steps.

Output = 3: Output goes high once every turn.

Output = 4: Output is constantly low.

Output = 5: On when running, off while stopped.

Parameter	Value/Range
Acceleration Current	0-31
Current Setting	0-31
Holding Current	0-31
Microstep Resolution	1-1/256
Acceleration and Deceleration Scalar	1-100
Interpolate	0/1
Minimum and Maximum Analogue RPM	0-2000
Set RPM	0-2000
Output	0-5

Setup Tab Options

6.2 Live Run

The following are the key parameters in the Live Run tab:

a. Start/Stop Toggle

This option can be used to turn the motor on and off.

b. Change Direction Toggle

This option can be used to change the direction of rotation (i.e., clockwise, or counterclockwise) of the motor.

c. Read Speed

This option can be used to get the real time speed of operation of the motor. Pressing the 'Get' button displays the real time speed of the motor in RPM.

d. Controller Temperature

Pressing the 'Get' button next to this option, displays the real time temperature of the controller. This is useful to monitor the temperature of the controller to avoid over temperature fault.

e. Fault Code

A fault will be indicated by a flashing Red LED on the controller. Pressing the 'Get' option displays the fault code. The fault code could be any one of the following:

1 = Over voltage limit (Gone above 30V)

2 = Under voltage limit (Gone below 5V)

3 = Overtemperature limit (60 degrees Celsius)

4 = Drive chip fault (Fault resets after short period)

Parameters	Value/Range (Read Only)
Start/Stop Toggle	0/1
Direction Toggle	0/1
Read Speed	0-2000
Controller Temperature	0-60C
Output	0-5

Troubleshooting

Issue	Things to Try
Motor judders but does not run.	1. Check current settings against datasheet of motor used. Incorrect current setting (high or low) can cause motor to not run.
Motor noisier than expected.	1. Increase microstep resolution.
Motor not able to reach desired speed.	1. Check microstep settings. Higher microstep resolution can limit top speed. Try increasing the microstep resolution to a higher level.