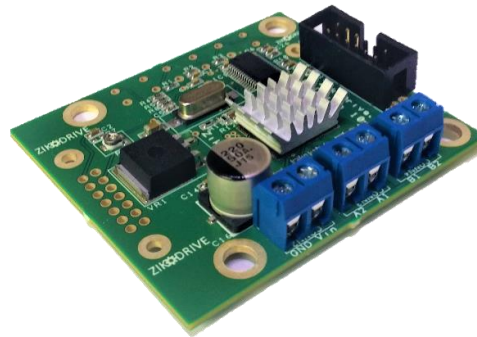


Zikodrive ZD Series Stepper Motor Analogue Control User Guide



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Specifications

General Overview

- 6-30Vdc
- Up to 10A
- Up to 128 Microsteps/Step
- Modular design, can connect to external Break Out Boards for various inputs variations
- Overtemperature protection
- Microprocessor controlled
- Designed for use with stepper motors up to NEMA 24 size.

Customisable options

- **Microstep Resolution**
 - Generally set to 1/16 microsteps per step. However for very high speed applications this can be reduced to full or half steps, for low speed or quiet applications this can be increased up to 128 microsteps / step.
- **Max and Min speed Limits**
 - The motor can stall if the torque and speed of the application exceeds the capability of the motor. Typically, the min speeds is set to 0, however this can be changed as required.
- **Acceleration and deceleration rates**
 - If the acceleration is set too high, it may not be possible for the motor to accelerate to the required speed as a result of inertia. Slowing the acceleration helps prevent potential stalls during acceleration.
 - In high load applications, an abrupt stop or rapid deceleration will put stress on mechanical components and produce surge currents back into the controller (and/or power lines). For positioning applications this may also lead to inaccuracy and overshooting.
- **Interface and GUI Options**
 - The ZD Series can operate with a range of user interfaces including LCD screens and more.

Like all Zikodrive Motor Controllers there are a large range of options which can be customised on the ZD Series of Stepper Motor Controllers. If you need a customised programme or require any special features please call us on 0333 123 7130 or visit www.zikodrive.com to contact us.

Analogue Control

The controller will take an analogue signal in the form of a 0-5V input. The controller reads the analogue signal with a 10bit resolution to drive the motor with a proportional frequency. The speed resolution output is proportional to the max speed set within the controller.

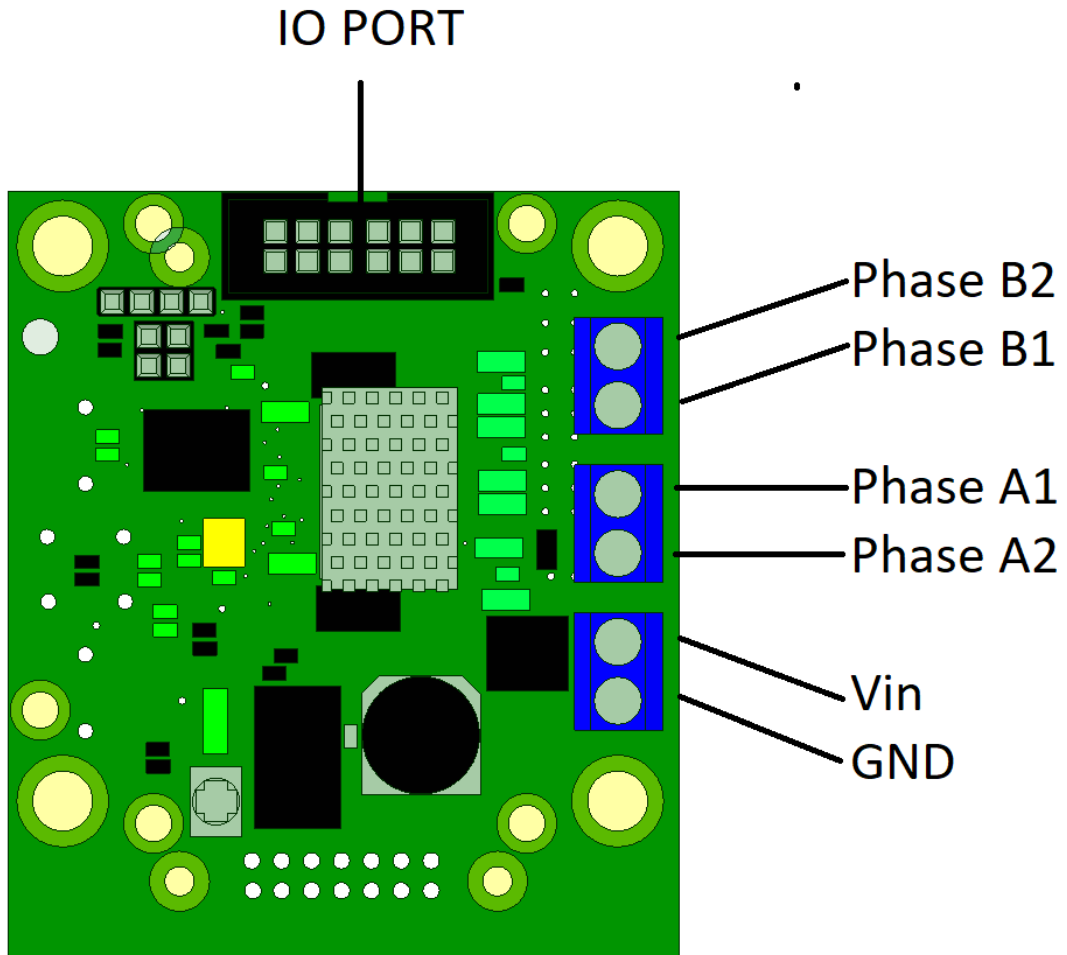
Please note that the higher the preset max speed, the coarser the speed resolution will be. Conversely, the lower the maximum speed the finer the speed resolution will be. If you're not sure or have any questions please call us.

There is an enable input pin. This pin must be held low (connected to GND) for the motor to be enabled. If the pin is released while the motor is running, the motor will decelerate to a stop. When held low, it will accelerate to the speed proportional to the analogue input

There is a directional input pin. If this pin is switched to GND the motor will decelerate to a stop, reverse direction and then accelerate back up to the speed proportional to the analogue input.

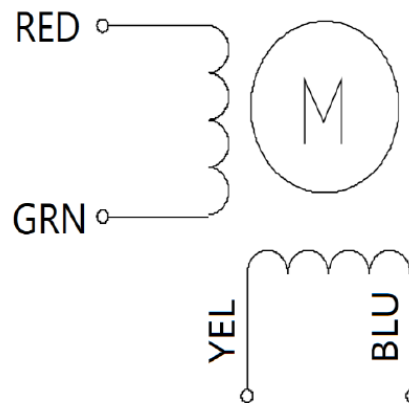
The change in speed from one value (or when one of the digital inputs are switched) to the other will be ramped according to acceleration and deceleration variables. These can be adjusted to suite application requirements.

Board Overview



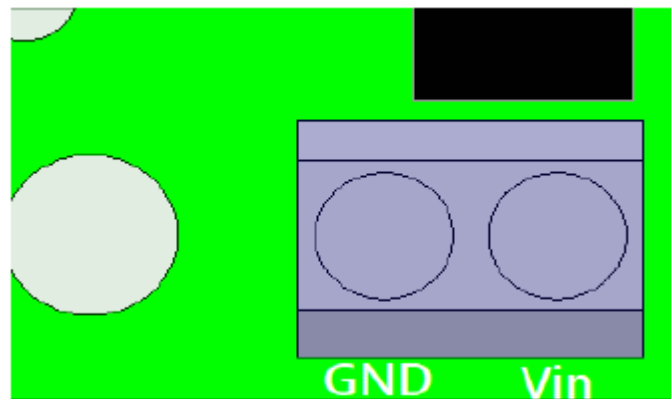
Motor Phase Connections

Terminal	Wire
A2	Green
A1	Red
B1	Yellow
B2	Blue



These are typical motor connections and colours; however, wire colours may change between various manufacturers. If you're not 100% sure please consult the motor manufacturer or distributor.

Controller Power Connections



You must connect input power of 6-30Vdc to the Vin and GND screw terminals. You should ensure that the PSU has the correct current carrying capability required for the selected stepper motor. Failure to match these correctly will cause poor or no performance and can potentially damage your power source, motor or controller.

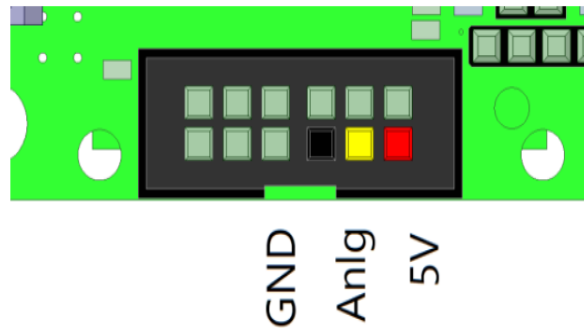
The controller is protected against reverse polarity; however, care should always be taken to ensure correct orientation and ensure no shorting or other issues when connecting the controller.

If batteries are used, you must ensure they are fully charged prior to powering up the controller.

The higher the voltage applied (up to the stated maximum), the greater the motor speeds before the motor stalls under load. For help on power supply and/or motor selection to meet your application requirements please contact us and we will be happy to help.

Analogue Control Connections

Pin Colour	Function
Black	GND
Yellow	Analogue Input
Red	+5V Supply



External Power Supply Control

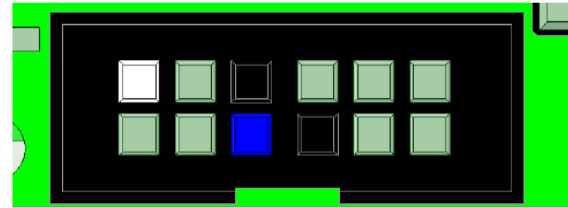
If the analogue input is controlled via an external power source, the 5V pin is not needed. The only connections required will be the GND (must be kept common with no additional components) and the power source required for the analogue input.

Potentiometer Control

Alternatively, a potentiometer can be used with the GND and 5V connected to each end of the variable resistor and the wiper connecting to the Analogue input pin.

Digital connections

Pin Colour	Function
Black	GND
Blue	Reverse
White	Enable



Stop/Go Direction GND

Digital input functions

For the inputs to work, they must be taken down to GND (they have an internal pull up resistor). There are two GND's supplied to help simplify connections.

White – Enable Input

When the Enable input is taken down to GND for the motor will accelerate up to the speed selected on the analogue input pin, when released the motor will decelerate down to a stop. This input implements the pre-programmed acceleration and deceleration variables.

Blue – Reverse Input

The default direction is CCW when viewing the motor into the shaft. When the reverse input is taken down to GND the motor will decelerate to a stop, then accelerate up to the selected analogue input speed in the CW direction. When the Reverse pin is then released, it will decelerate to a stop then accelerate back up to speed in the CCW direction. This input implements the pre-programmed acceleration and deceleration variables.

It is possible for ZikoDrive to vary the acceleration and deceleration variables to the customer's requirements. It is also possible to stop the motor immediately if the enable input is released, however if the motor has a large inertia and/or high speed this can cause an undesirable audible bang and can also potentially damage the controller.

Custom Programmes

If you have purchased a ZD Series Stepper Motor Controller with a customised programme requested on it then please refer direct to the documentation supplied with your controller as this guide will not necessarily be accurate as IO Locations and power limits may have been altered in the controller firmware. As always, if you have any doubt please contact us directly.

Conditions of Sale and Use

Zikodrive Controllers are designed to be a component incorporated within equipment manufactured by our customers and are not suitable for use by an end user. As such, it is not CE marked. It is entirely the buyer's responsibility to ensure that Zikodrive Motor Controllers and related products meet the required specification for applications in which they are used.

The use of Zikodrive products in safety critical applications is entirely at the buyers risk, and the buyer agrees to defend, indemnify and hold harmless Round Bank Engineering Ltd from any and all damages, claims, suits, or expenses resulting from such use. Round Bank Engineering Ltd. is not responsible for injury or damage of any kind, including but not limited to, injury, death, damage, property damage/loss or any other type of loss which may arise in whole or in part from the use of Zikodrive motor controllers.

Zikodrive Motor Controllers warrants to the original purchaser that any part of its controller/accessory purchased will be free of defects in workmanship and parts for a period of twelve (12) months from the date of delivery (hereinafter "Warranty Period"). During the Warranty Period, Zikodrive Motor Controllers will, at its option: (1) provide replacement parts necessary to repair the product; (2) replace the product with a comparable product; or (3) refund the amount Customer paid for the product upon its return.

Replacement parts or products will be new or serviceably used, comparable in function and performance to the original part or product, and warranted for the longer of thirty days or the remainder of the warranty period. Any additional purchases or upgrades will not extend this warranty. This product warranty covers normal use only. This product warranty does not cover damage caused during shipment and any damage caused by: actions that are beyond Zikodrive Motor Controller's control, including (but not limited to) impacts, fluids, fire, flood, wind, earthquake, lightning or similar disaster, war, revolution, foreign invasion, alien invasion, terrorist incidents, lockout, epidemic, plague, destruction or significant damage of production facilities, riot or other forms of civil unrest, insurrection, or material unavailability; unauthorized modifications, attachments or peripherals; improper use, environment, installation or electrical supply; improper maintenance; any other misuse, abuse or mishandling.

EXCEPT FOR THE WARRANTIES EXPRESSED IN THIS AGREEMENT, ZIKODRIVE MOTOR CONTROLLERS DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THOSE WARRANTIES IMPLIED BY AND INCAPABLE OF EXCLUSION, RESTRICTION OR MODIFICATION UNDER THE APPLICABLE LAW. THE TERM OF ANY IMPLIED WARRANTIES THAT CANNOT BE DISCLAIMED ARE LIMITED TO THE TERM OF THIS AGREEMENT.