STEPPERONLINE 24HS34-5004D-E1000 & CL57T V4.1

STEPPERONLINE Closed Loop Stepper Motor 1 Axis CNC Kit User Manual

Model: 24HS34-5004D-E1000 & CL57T V4.1

1. Product Overview

This manual provides instructions for the STEPPERONLINE Closed Loop Stepper Motor 1 Axis CNC Kit. This kit is designed for applications requiring precise motion control, such as 3D printers, CNC machines, carving machines, dispensers, and other automation applications. It combines a high-torque Nema 24 closed-loop stepper motor with a compatible closed-loop stepper driver for enhanced performance and reliability.

Image 1.1: Overview of the STEPPERONLINE Closed Loop Stepper Motor 1 Axis CNC Kit components.

2. Kit Contents

The STEPPERONLINE Closed Loop Stepper Motor 1 Axis CNC Kit includes the following items:

- 1 x 24HS34-5004D-E1000: 3.0Nm Closed Loop Stepper Motor
- 1 x CL57T: Nema 23/Nema 24 Closed Loop Stepper Motor Driver V4.1
- 1 x RS232 Debugging Cable
- 1 x CE2-M2-20: 1.7m Motor and Encoder Extension Cables

Image 2.1: CL57T Closed Loop Stepper Driver.

Image 2.2: Nema 24 Closed Loop Stepper Motor.

Image 2.3: RS232 Debugging Cable.

3. Specifications

3.1. Motor Specifications (24HS34-5004D-E1000)

- **Torque:** 3.0 Nm (424.92 oz.in)
- **Frame Size:** Nema 24
- **Speed:** 100 RPM
- **Voltage:** 5 Volts
- **Material:** Metal
- **Shaft Diameter:** 15 Millimeters
- **Item Weight:** 5.19 pounds

Image 3.1: Dimensional drawing of the Nema 24 Stepper Motor.

3.2. Driver Specifications (CL57T V4.1)

- **Input Voltage:** 24-48VDC
- **Output Current:** 0-8.0A
- **Compatible Motors:** Nema 23, Nema 24 Closed Loop Stepper Motors

4. Setup and Installation

4.1. Wiring Connections

Ensure all connections are secure and correctly aligned before applying power. Refer to the diagrams below for proper wiring.

Motor and Encoder Connection:

PIN	1	2	3	4
Motor	A+	A-	B+	B-

PIN	2	3	1	13	11	12
Encoder	VCC	EGND	EA+	EA-	EB+	EB-

Motor Extension Cable Connection

PIN	1	2	3	4
Color	Black	Green	Red	Blue

Encoder Extension Cable Connection

PIN	2	3	1	13	11	12
Color	Red	White	Black	Blue	Yellow	Green

PLEASE NOTE: The thick black wire can be used for shielding, but it is not required, so you can leave it unconnected.

Image 4.1: Pin assignments for Motor and Encoder connections.

Note: The thick black wire on the extension cables can be used for shielding, but it is not required. It can be left unconnected if not needed for your application.

4.2. System Wiring Diagram

The following diagram illustrates a typical connection setup for the closed-loop stepper motor kit, including the driver, motor, controller, and power supply.

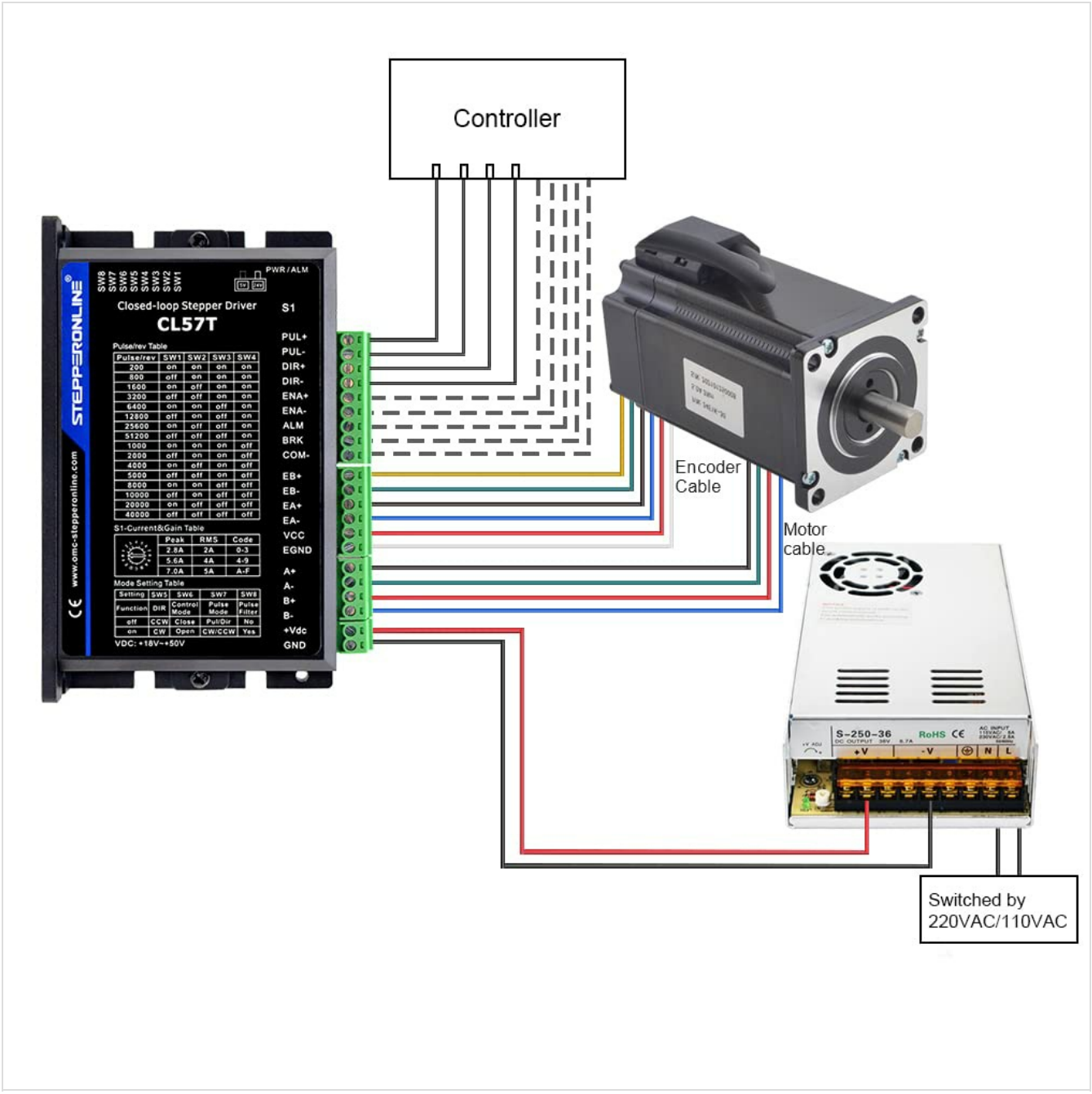


Image 4.2: Comprehensive wiring diagram for the closed-loop stepper system.

4.3. Driver DIP Switch Settings (CL57T)

The CL57T driver features DIP switches (SW1-SW8) for configuring pulse/revolution, current/gain, and operating modes. Refer to the tables below for proper configuration.

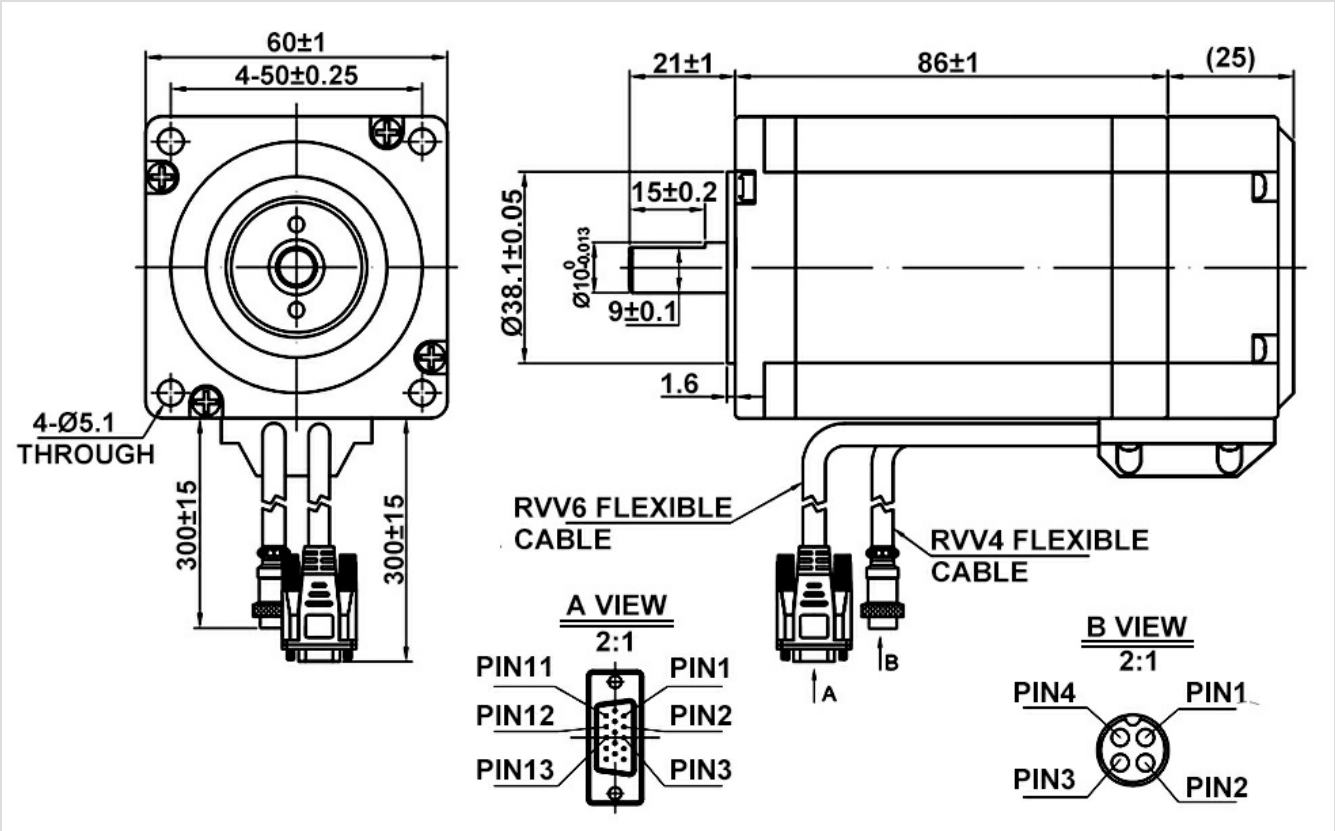
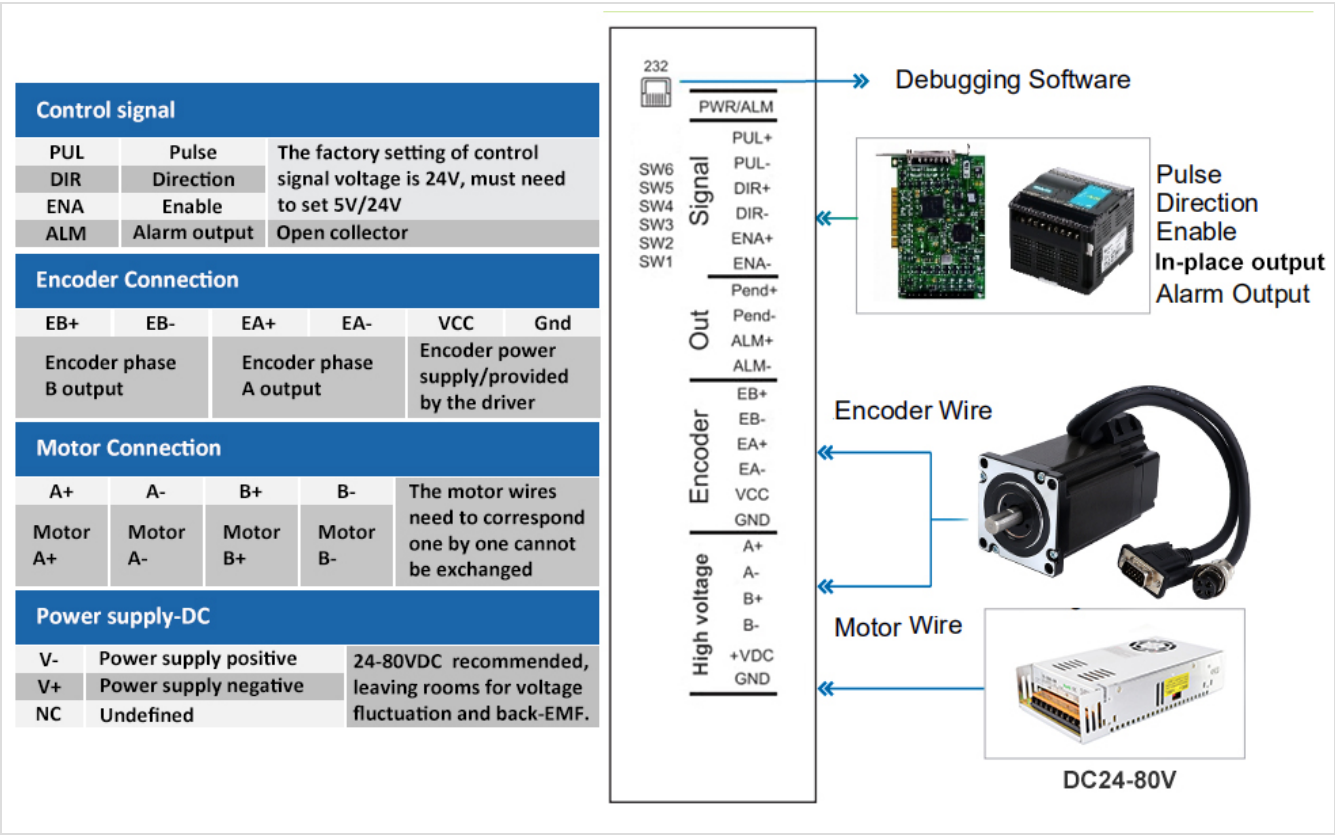


Image 4.3: DIP switch settings for Pulse/revolution and Current/Gain on the CL57T driver.

4.4. Control Signal and Pinout

Understanding the control signals and pin assignments is crucial for integrating the driver with your control system. The factory setting for control signal voltage is 24V.



Control signal		
PUL	Pulse	The factory setting of control signal voltage is 24V, must need to set 5V/24V
DIR	Direction	
ENA	Enable	
ALM	Alarm output	Open collector

Encoder Connection					
EB+	EB-	EA+	EA-	VCC	Gnd
Encoder phase B output		Encoder phase A output		Encoder power supply/provided by the driver	

Motor Connection				
A+	A-	B+	B-	The motor wires need to correspond one by one cannot be exchanged
Motor A+	Motor A-	Motor B+	Motor B-	

Power supply-DC		
V-	Power supply positive	24-80VDC recommended, leaving rooms for voltage fluctuation and back-EMF.
V+	Power supply negative	
NC	Undefined	

Image 4.4: Detailed pinout and connection information for the CL57T driver.

5. Operation

Once the kit is correctly installed and wired, ensure your control system is configured to send appropriate pulse and direction signals to the CL57T driver. The closed-loop system will monitor the motor's position via the encoder and adjust current to maintain accuracy, preventing step loss. Always verify DIP switch settings match your application requirements before initiating operation.

6. Troubleshooting

The CL57T driver incorporates built-in protection features to improve reliability. The red LED on the driver indicates operational status and can blink in specific sequences to signal errors. Refer to the table below for common error indications and their corresponding troubleshooting steps.

To improve reliability, the drive incorporates some built-in protections features.

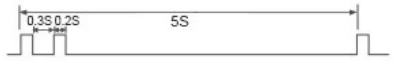
Blink Time(S)	Sequence wave of red LED	Description	Trouble shooting
1		Over-current	Turn off the power immediately. a) Check wiring is short-circuited or not; b) Check motor is short-circuited or not.
2		Over-voltage	Turn off the power immediately. a) Check if the power voltage is higher than 110VDC
3		Chip error	Restart the power supply, if the drive is still alarm, please contact us
4		Fail to lock motor shaft	a) The drive is not connected to a motor; b) If alarm is occurred when connect a motor , set DIP switch SW6 to 'on' and restart power supply; If it still alarm, please check the motor power cable.
5		EEPROM error	Restart the power supply, if the drive is still alarm, please contac us
6		Fail to auto tuning	Set DIP switch SW6 to 'on'
7		Position following error	a) The value of position following error is set too small; b) Motor torque is not enough or motor speed is too high; c) Motor wiring error, check wiring
Always	-	PCB board is burned out	Contact us a) Power supply connection is wrong

Image 6.1: Troubleshooting guide based on LED blink sequences on the CL57T driver.

7. Maintenance

This closed-loop stepper motor kit is designed for minimal maintenance. Periodically inspect all wiring connections for tightness and signs of wear. Ensure the operating environment is free from excessive dust, moisture, and extreme temperatures to prolong the lifespan of the components. Keep the motor and driver free from obstructions to allow for proper heat dissipation.

8. Warranty and Support

STEPPERONLINE provides a 30-day free replacement or refund policy from the date of purchase, along with a 1-year warranty for this stepper motor kit. Whole life customer service is available to assist with any inquiries or issues you may encounter. For support, please refer to the contact information provided with your purchase or visit the official STEPPERONLINE website.