STEPPERONLINE CL57T V4.1 / 24HS40-5004D-E1000 Kit

STEPPERONLINE CL57T V4.1 Closed Loop Stepper Motor Driver and 24HS40-5004D-E1000 Motor Kit User Manual

Brand: STEPPERONLINE | Model: CL57T V4.1 / 24HS40-5004D-E1000 Kit

1. Introduction

This manual provides instructions for the installation, configuration, and operation of the STEPPERONLINE Closed Loop Stepper Motor Kit. This kit includes a CL57T V4.1 Closed Loop Stepper Driver and a 24HS40-5004D-E1000 Nema 24 Stepper Motor. It is designed for applications requiring precise motion control, such as 3D printers, CNC machines, carving machines, dispensers, and other automation systems.

Figure 1: Overview of the STEPPERONLINE Closed Loop Stepper Motor Kit, showing the CL57T driver, 24HS40-5004D-E1000 motor, and connecting cables.

2. Kit Contents

The following items are included in your STEPPERONLINE Closed Loop Stepper Motor Kit:

- 1 x 24HS40-5004D-E1000: 4.0Nm 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

Figure 2: CL57T Closed Loop Stepper Driver.

Figure 3: 24HS40-5004D-E1000 Nema 24 Stepper Motor.

Figure 4: RS232 Debugging Cable.

3. Specifications

3.1. CL57T V4.1 Closed Loop Stepper Driver

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

3.2. 24HS40-5004D-E1000 Nema 24 Stepper Motor

- Holding Torque: 4.0 Nm (566.56 oz.in)
- Frame Size: Nema 24
- Encoder Resolution: 1000 CPR (Counts Per Revolution)

4. Setup and Installation

4.1. Driver DIP Switch Settings

The CL57T driver features DIP switches for configuring pulse/revolution, current/gain, and mode settings. Refer to the diagram below for proper configuration.

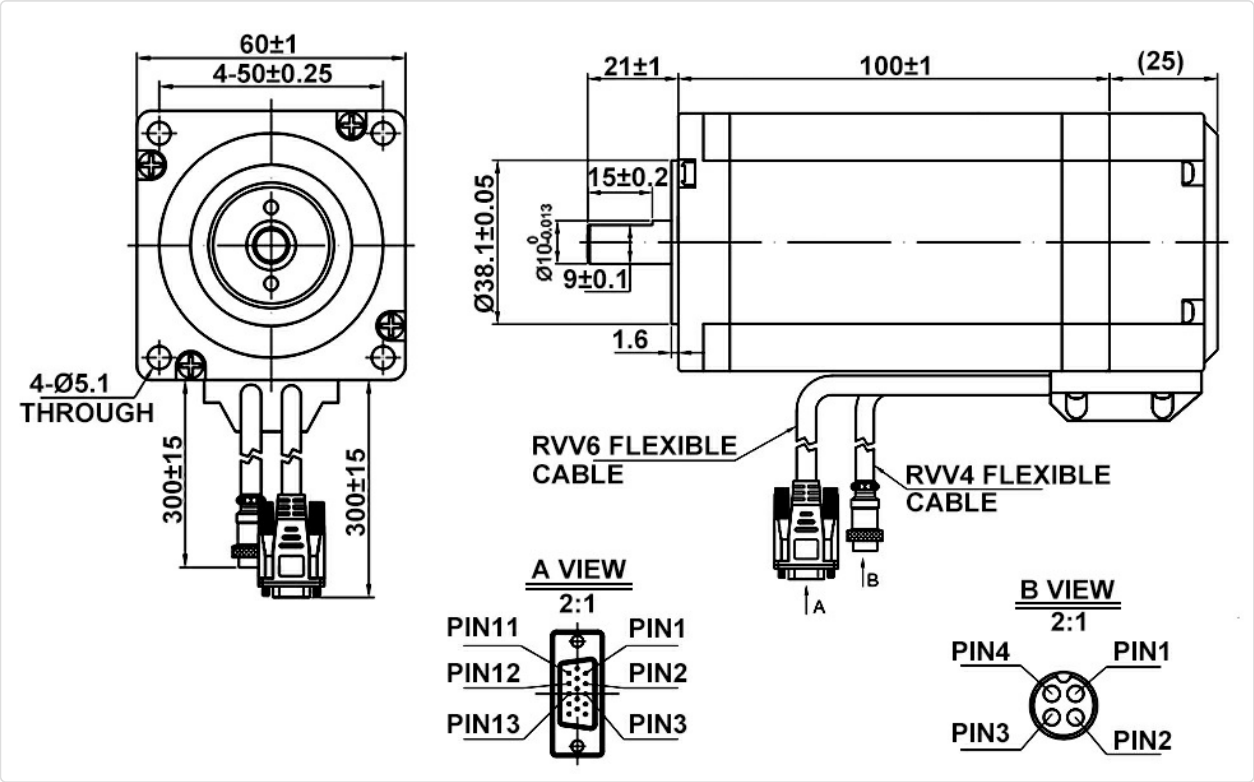

Figure 5: CL57T Driver DIP Switch settings. SW1-SW4 control Pulse/rev, SW5-SW6 control Current/Gain, and SW7-SW8 control Mode settings.

4.2. Wiring Connections

Ensure all connections are secure and correct before applying power. The thick black wire on the motor cable can be used for shielding but is not required; it can be left unconnected if not used for shielding.

4.2.1. Motor and Encoder Connection Pin Assignments

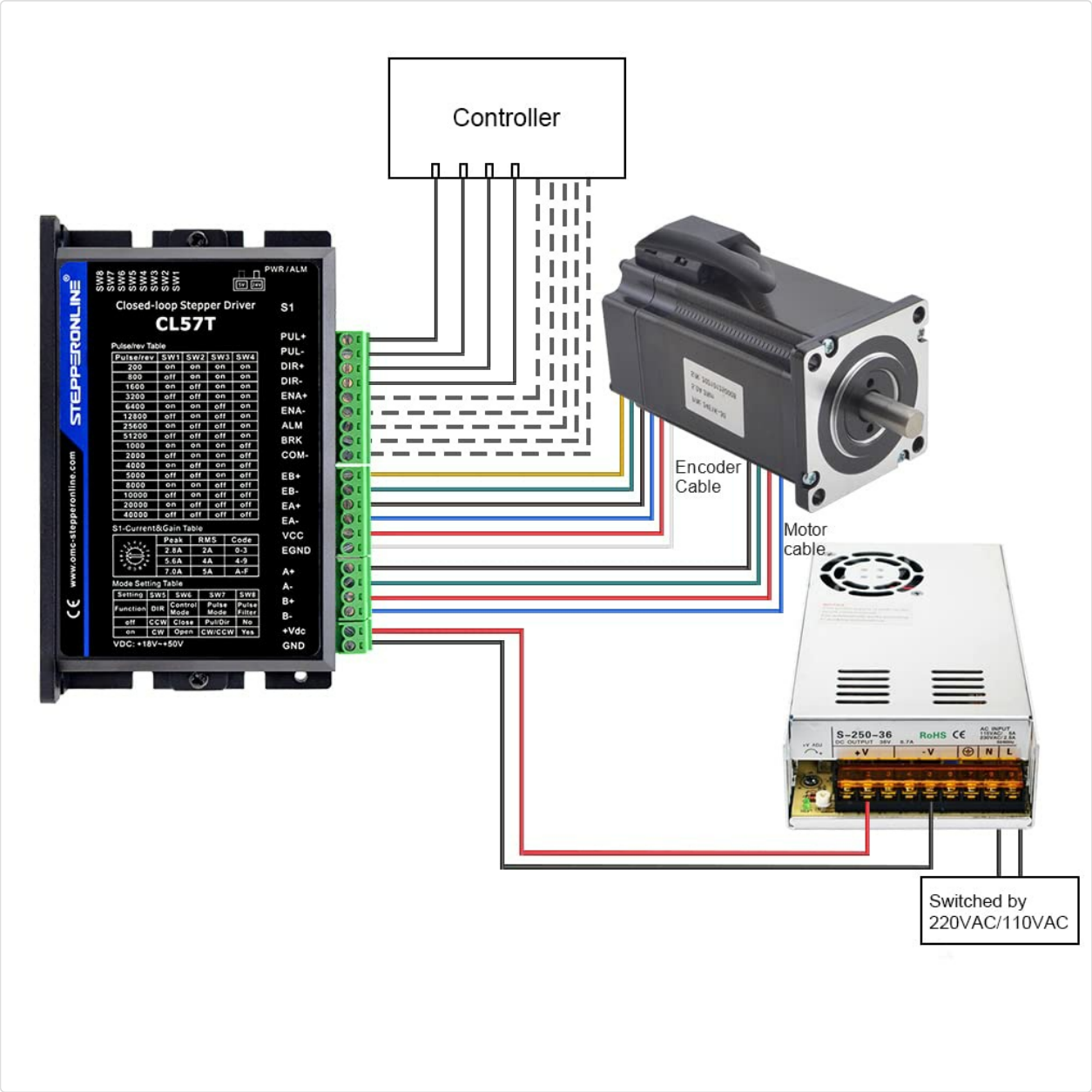

Figure 6: Pin assignments for motor and encoder connections. This diagram also shows the color coding for motor and encoder extension cables.

4.2.2. Detailed Connection Diagram

The following diagram illustrates the connections for control signals, encoder, motor, and power supply to the CL57T driver.

Figure 7: Detailed connection diagram for the CL57T driver. Note the control signal voltage setting (factory default 24V, can be set to 5V).

4.2.3. Overall System Wiring

This diagram shows the complete wiring of the closed-loop stepper system, including the controller, driver, motor, and power supply.

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.

Figure 8: Overall system wiring diagram, illustrating connections between the controller, CL57T driver, 24HS40-5004D-E1000 motor, and power supply.

5. Operating Instructions

Once the system is correctly wired and configured via DIP switches, apply power. The closed-loop system will automatically detect the motor position via the encoder, providing precise control and preventing step loss. Control signals (PUL, DIR, ENA) from your CNC controller or other motion control system will dictate the motor's movement.
The RS232 debugging cable can be used with compatible software for advanced configuration and monitoring of the driver's performance.

6. Maintenance

To ensure optimal performance and longevity of your stepper motor kit, consider the following maintenance guidelines:

- **Keep Clean:** Regularly clean the motor and driver to prevent dust and debris buildup, which can affect cooling and component lifespan.
- **Ventilation:** Ensure adequate ventilation around the driver to prevent overheating. Avoid obstructing cooling fins or fans.
- **Cable Integrity:** Periodically inspect all cables for signs of wear, fraying, or damage. Replace damaged cables immediately to prevent electrical issues.
- **Secure Connections:** Verify that all electrical connections remain tight and secure to prevent intermittent operation or damage.

7. Troubleshooting

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

Figure 9: Troubleshooting guide based on red LED blink sequences on the CL57T driver.

Common Troubleshooting Steps:

- **No Power:** Check power supply connections and voltage.
- **Motor Not Moving:** Verify control signal connections (PUL, DIR, ENA), ensure ENA is enabled, and check motor wiring.
- **Motor Vibrates/Stalls:** Check current settings, ensure motor is correctly matched to driver, and inspect for mechanical binding.
- **Alarm Output:** Refer to the LED blink codes in Figure 9 for specific error identification.

8. Warranty and Support

STEPPERONLINE provides the following warranty and support for this stepper motor kit:

- **Warranty:** 1-year warranty from the date of purchase.
- **Returns/Replacements:** 30 days free replacement or refund.
- **Customer Service:** Whole life customer service is provided.

For technical assistance or warranty claims, please contact STEPPERONLINE customer support through their official channels or the retailer where the product was purchased.