ZYNCUE ZK-SMC02

ZK-SMC02 Stepper Motor Driver Controller User Manual

Model: ZK-SMC02

1. Introduction

The ZK-SMC02 Stepper Motor Driver Controller is an integrated board designed for precise control of single-axis stepper motors. This module features a variety of built-in fixed operating modes, allowing users to quickly select the appropriate motion trajectory for their application. It supports saving and setting parameters such as distance, speed, delay, and number of cycles, even after power-off. The ZK-SMC02 can operate independently or be integrated with other systems, making it suitable for general industrial control applications.

Figure 1: Front view of the ZK-SMC02 Stepper Motor Driver Controller, showing the LCD display, CW/CCW buttons, and rotary encoder.

2. Setup

Before operating the ZK-SMC02, ensure proper connections for power and the stepper motor.

2.1 Power Supply Connection

Connect a DC power source within the range of 5V to 30V to the power input terminals. Observe polarity: connect the positive terminal of the power supply to the 'VIN' or '+' terminal and the negative terminal to the 'GND' or '-' terminal on the controller board.

2.2 Stepper Motor Connection

The ZK-SMC02 supports common cathode stepper motors. Connect the motor's phase windings to the corresponding terminals (A+, A-, B+, B-) on the controller. Refer to your stepper motor's datasheet for correct winding identification.

Figure 2: Rear view of the ZK-SMC02, highlighting the power input (green terminal) and motor connection terminals (blue terminal).

2.3 External Control Connections (Optional)

The module can be controlled via external buttons or UART serial communication. Consult the detailed wiring diagram for specific pinouts if utilizing these advanced control methods.

3. Operating Instructions

The ZK-SMC02 offers intuitive control through its LCD display and physical buttons/rotary encoder.

3.1 LCD Display Overview

The LCD screen clearly displays operational parameters such as speed, delay times, and cycle counts. This allows for high-precision motor control and real-time monitoring of the current settings.

3.2 Control Buttons and Rotary Encoder

- **CW / CCW Buttons:** These buttons are typically used to initiate clockwise (CW) or counter-clockwise (CCW) rotation, or to navigate menu options.
- **RUN/STOP Button:** Toggles the motor's operation between running and stopped states.
- **Rotary Encoder:** Used for adjusting numerical parameters such as speed, distance, delay, and cycle times. Pressing the encoder often confirms a selection or enters a setting mode.

3.3 Operating Modes and Parameter Setting

The module has multiple fixed operating modes. Users can select the desired mode to achieve specific motion profiles. Parameters like speed (0.1-999 circles/minute), forward/reverse pulses (1-9999), cycle times (1-9999), and delay times (0.0-999.9 seconds) can be set and stored. The controller parameters support a memory function, meaning settings are retained even after power is removed.

3.4 System Functions

The system supports various control methods:

- **Automatic Mode:** Executes pre-programmed motion sequences.
- **Manual Mode:** Allows direct control of motor movement.
- **Setting Mode:** For configuring operational parameters.
- **Serial Port Control:** Enables remote control via TTL serial interface.

4. Maintenance

To ensure the longevity and optimal performance of your ZK-SMC02 controller, follow these general maintenance guidelines:

- **Operating Environment:** Operate the module within the specified temperature range of -5°C to 60°C. Avoid environments with high humidity or condensation.
- **Cleanliness:** Keep the module clean and free from dust, dirt, and debris. Use a soft, dry cloth for cleaning. Do not use liquid cleaners or solvents.
- **Connections:** Periodically check all electrical connections to ensure they are secure and free from corrosion.
- **Storage:** When not in use for extended periods, store the module in a dry, cool place away from direct sunlight and extreme temperatures.

5. Troubleshooting

If you encounter issues with your ZK-SMC02 controller, consider the following common troubleshooting steps:

- **No Power/Display:**

- Verify that the power supply is connected correctly and provides the specified voltage (DC 5-30V).
- Check for loose connections or damaged wires.

- **Motor Not Moving:**
  - Ensure the stepper motor is correctly wired to the A+, A-, B+, B- terminals.
  - Check if the motor is compatible with the common cathode signal type.
  - Verify that the 'RUN/STOP' button is in the 'RUN' state.
  - Review the set parameters (speed, pulses, delay) on the LCD to ensure they are appropriate for your motor and application.
- **Erratic Motor Movement:**
  - Check for electrical noise or interference in the environment.
  - Ensure the power supply is stable and provides sufficient current (up to 4A drive power).
  - Verify the subdivision selection is appropriate for your motor and desired smoothness.
- **Parameters Not Saving:**
  - Ensure that parameters are correctly confirmed after adjustment (e.g., by pressing the rotary encoder). The module has a memory function, so settings should persist.

If problems persist after following these steps, please refer to the support section for further assistance.

6. Specifications

Feature	Specification
Model	ZK-SMC02
Compatible Motor	Stepper Motor
Number of Control Axes	Single-axis
Motor Signal	Common Cathode
Power Supply Range	DC 5-30V universal
Drive Power	4A
Acceleration/Deceleration Control	Yes
Input Reverse Polarity Protection	Yes
Remote Communication Control	TTL Serial Interface
Main System Functions	Automatic, Manual, Setting, Serial Port Control
Speed Range	0.1 - 999 circles/minute
Number of Forward Rotation Pulses	1 - 9999 Pulses
Number of Reverse Pulses	1 - 9999 Pulses

Feature	Specification
Cycle Times	1 - 9999 times
Forward Rotation Delay	0.0 - 999.9 seconds
Inversion Delay Time	0.0 - 999.9 seconds
Subdivision Selection Range	1 - 32 subdivisions
Product Usage Environment	-5°C to 60°C (no condensation)
Product Dimensions	8 x 5 x 3 cm

7. Warranty Information

Specific warranty details for the ZK-SMC02 Stepper Motor Driver Controller are typically provided by the seller or manufacturer at the time of purchase. Please retain your proof of purchase and contact the vendor from whom you acquired the product for information regarding warranty coverage, terms, and conditions.

8. Support

For technical assistance, operational queries, or troubleshooting beyond the scope of this manual, please contact the seller or manufacturer directly. Provide your product model (ZK-SMC02) and a detailed description of the issue to facilitate efficient support.