GODIYMODULES ZK-SMC04

User Manual: Stepper Motor Driver Controller Integrated Board

Model: ZK-SMC04
Brand: GODIYMODULES

1. Product Overview

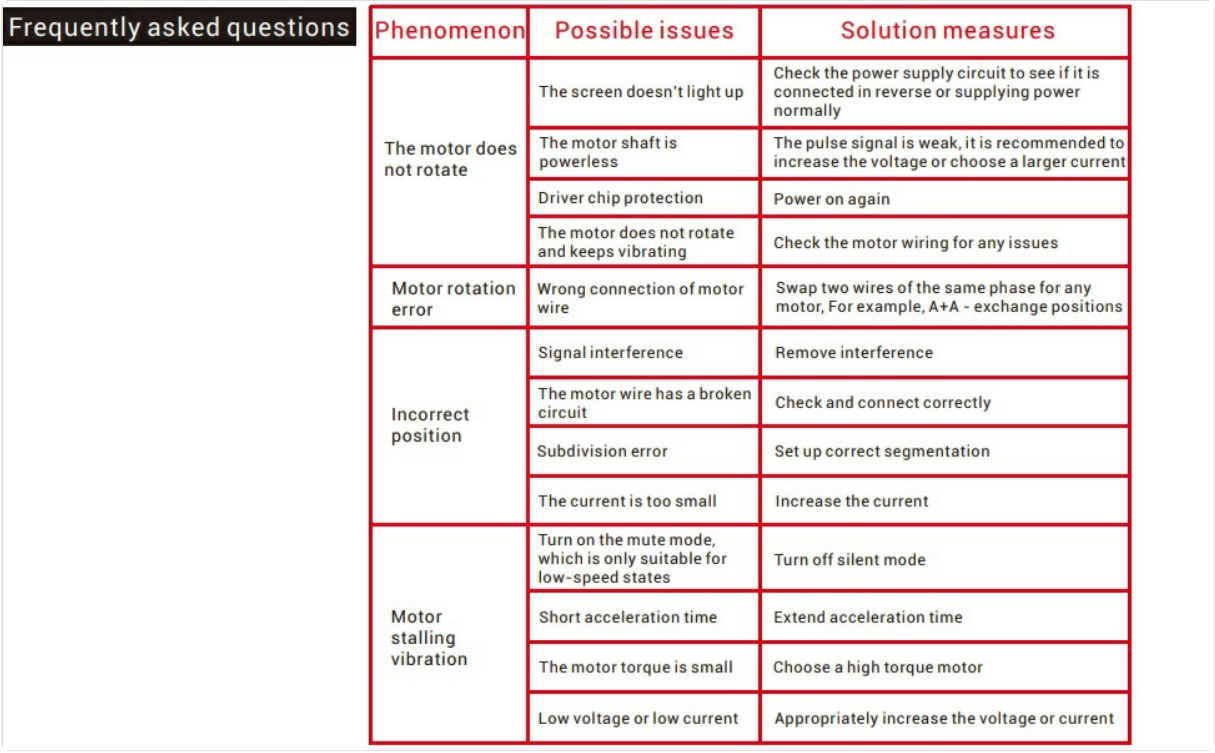
The ZK-SMC04 is a versatile DC 10-30V 6.6A Stepper Motor Driver Controller Integrated Board designed for precise control of 42, 57, and 86 series stepper motors. This integrated unit combines driving and control functionalities, offering forward/reverse operation, pulse speed adjustment, and angle control. It supports PLC serial communication for advanced applications.

Figure 1.1: ZK-SMC04 Stepper Motor Controller highlighting features such as liquid crystal display, large current capability (2.4A-6.6A), support for high-power 57 and 86 motors, TTL serial communication, scalable control interface, and 15 automatic/manual control modes.

Key features include:

- **Wide Power Supply Range:** DC 10-30V universal.
- **High Driving Capability:** Peak 6.6A.
- **High Pulse Frequency:** Up to 200KHZ.
- **Motor Compatibility:** Adaptable for 42, 57, and 86 stepper motors.
- **Control Modes:** 15 automatic/manual control modes.
- **Communication:** TTL serial port for remote communication control.
- **Compact Design:** Product size 79x43x41mm, recommended hole size 75x39mm for mounting.

2. Specifications



Phenomenon	Possible issues	Solution measures
The motor does not rotate	The screen doesn't light up	Check the power supply circuit to see if it is connected in reverse or supplying power normally
	The motor shaft is powerless	The pulse signal is weak, it is recommended to increase the voltage or choose a larger current
	Driver chip protection	Power on again
	The motor does not rotate and keeps vibrating	Check the motor wiring for any issues
Motor rotation error	Wrong connection of motor wire	Swap two wires of the same phase for any motor, For example, A+A - exchange positions
Incorrect position	Signal interference	Remove interference
	The motor wire has a broken circuit	Check and connect correctly
	Subdivision error	Set up correct segmentation
	The current is too small	Increase the current
Motor stalling vibration	Turn on the mute mode, which is only suitable for low-speed states	Turn off silent mode
	Short acceleration time	Extend acceleration time
	The motor torque is small	Choose a high torque motor
	Low voltage or low current	Appropriately increase the voltage or current

Figure 2.1: Detailed specifications of the ZK-SMC04 Stepper Motor Driver Controller.

Parameter	Value
Product Model	ZK-SMC04
Product Name	Drive Control Integrated Machine
Supply Voltage	DC 10-30V (>3A recommended)
Output Current	2.4A - 6.6A (Peak)
Adaptable Motors	42, 57, 86 Stepper Motors
Pulse Frequency	Up to 200KHZ
Control Mode Selection	15 options (customizable)
Operating Environment	-10 ~ 60 °C (non-condensing)
Shell Size	79x43x41mm
Opening Size	75x39mm
Item Weight	3.52 ounces

3. Setup and Installation

3.1 Wiring Diagram

Proper wiring is essential for the correct operation of the ZK-SMC04. Refer to the diagrams below for power, motor, and control signal connections.

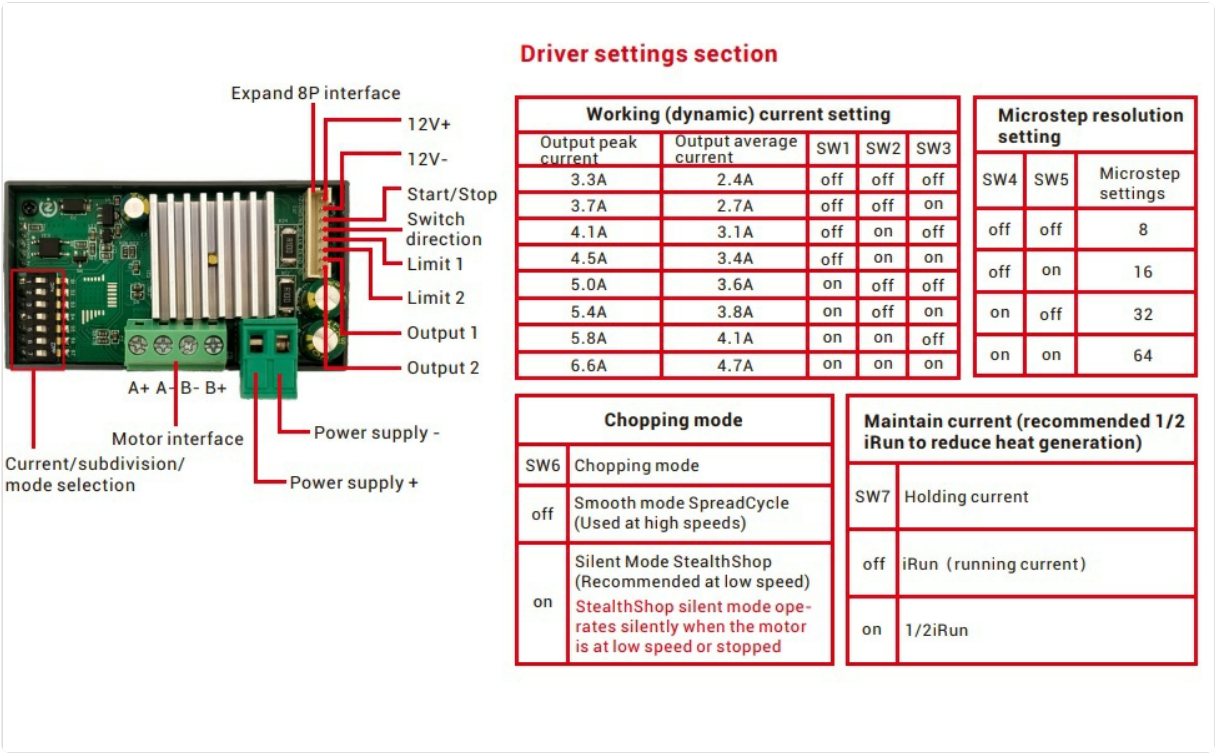


Figure 3.1: Basic product wiring diagram. Connect the DC power supply to the "Power supply +" and "Power supply -" terminals. Connect the stepper motor phases to A+, A-, B+, B- terminals.

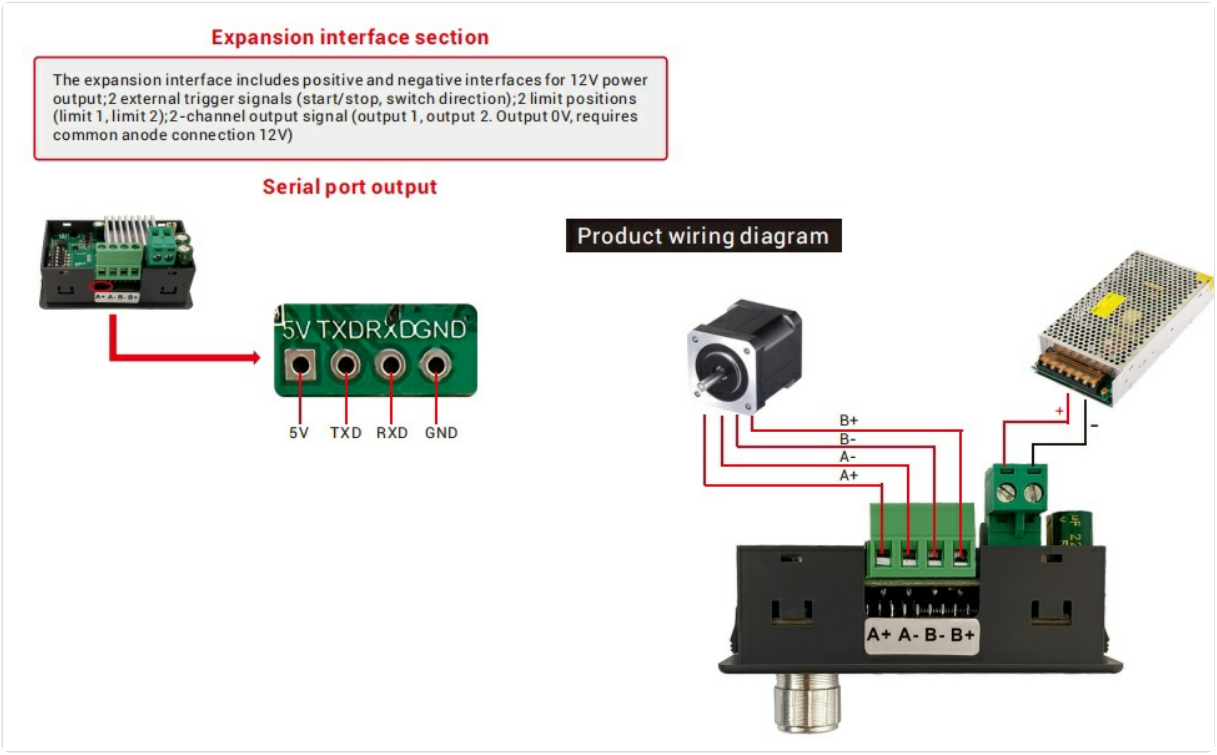


Figure 3.2: Expansion interface and serial port output. The 8-pin expansion interface provides connections for external triggers (start/stop, switch direction), limit switches, and output signals. The serial port allows for TTL communication.

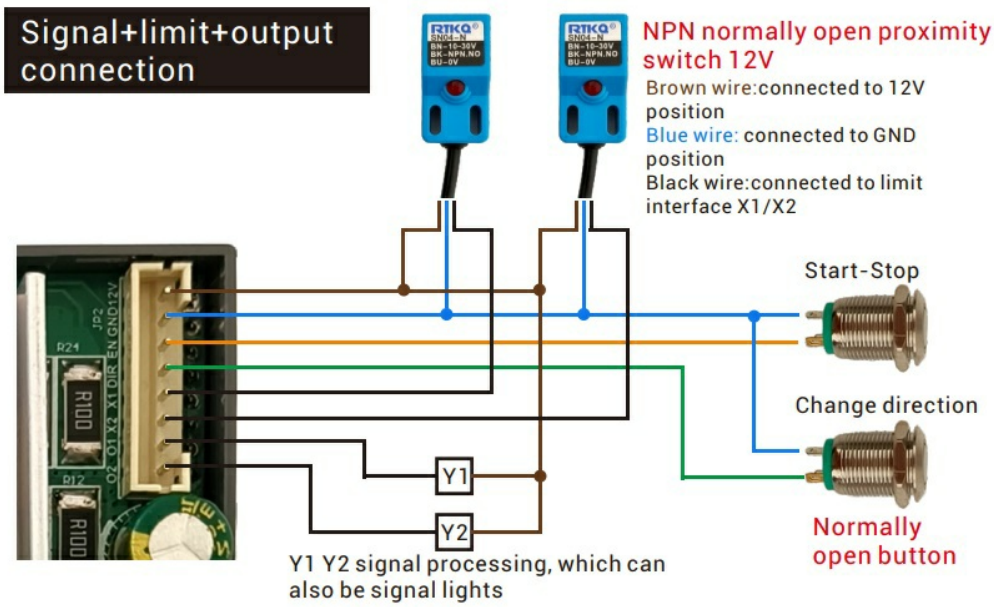


Figure 3.3: Example connection for signal, limit switches, and output. This diagram illustrates how to connect NPN normally open proximity switches for limit detection and push buttons for start/stop and direction change functions.

3.2 Driver Settings (DIP Switches)

The ZK-SMC04 features DIP switches on the board for configuring output current and microstep resolution. Ensure the power is off before adjusting these switches.

Figure 3.4: Driver settings via DIP switches. This image details how to set the output peak current, microstep resolution, chopping mode (Smooth mode SpreadCycle or Silent Mode StealthChop), and holding current (1/2 Run or iRun).

Current Setting:

Output Peak Current	Output Average Current	SW1	SW2	SW3
3.3A	2.4A	off	off	off
3.7A	2.7A	on	off	off
4.1A	3.1A	off	on	off
4.5A	3.4A	on	on	off
5.0A	3.6A	off	off	on
5.4A	3.8A	on	off	on
5.8A	4.1A	off	on	on
6.6A	4.7A	on	on	on

Microstep Resolution Setting:

SW4	SW5	Microstep Settings
off	off	8
on	off	16
off	on	32
on	on	64

Chopping Mode (SW6):

- **off:** Smooth mode SpreadCycle (Used at high speeds)
- **on:** Silent Mode StealthChop (Recommended at low speed, operates silently when the motor is at low speed or stopped)

Maintain Current (SW7):

- **off:** iRun (running current)
- **on:** 1/2 iRun (reduces heat generation)

4. Operating Instructions

The ZK-SMC04 features an intuitive interface with a rotary encoder and buttons for easy operation and parameter adjustment.

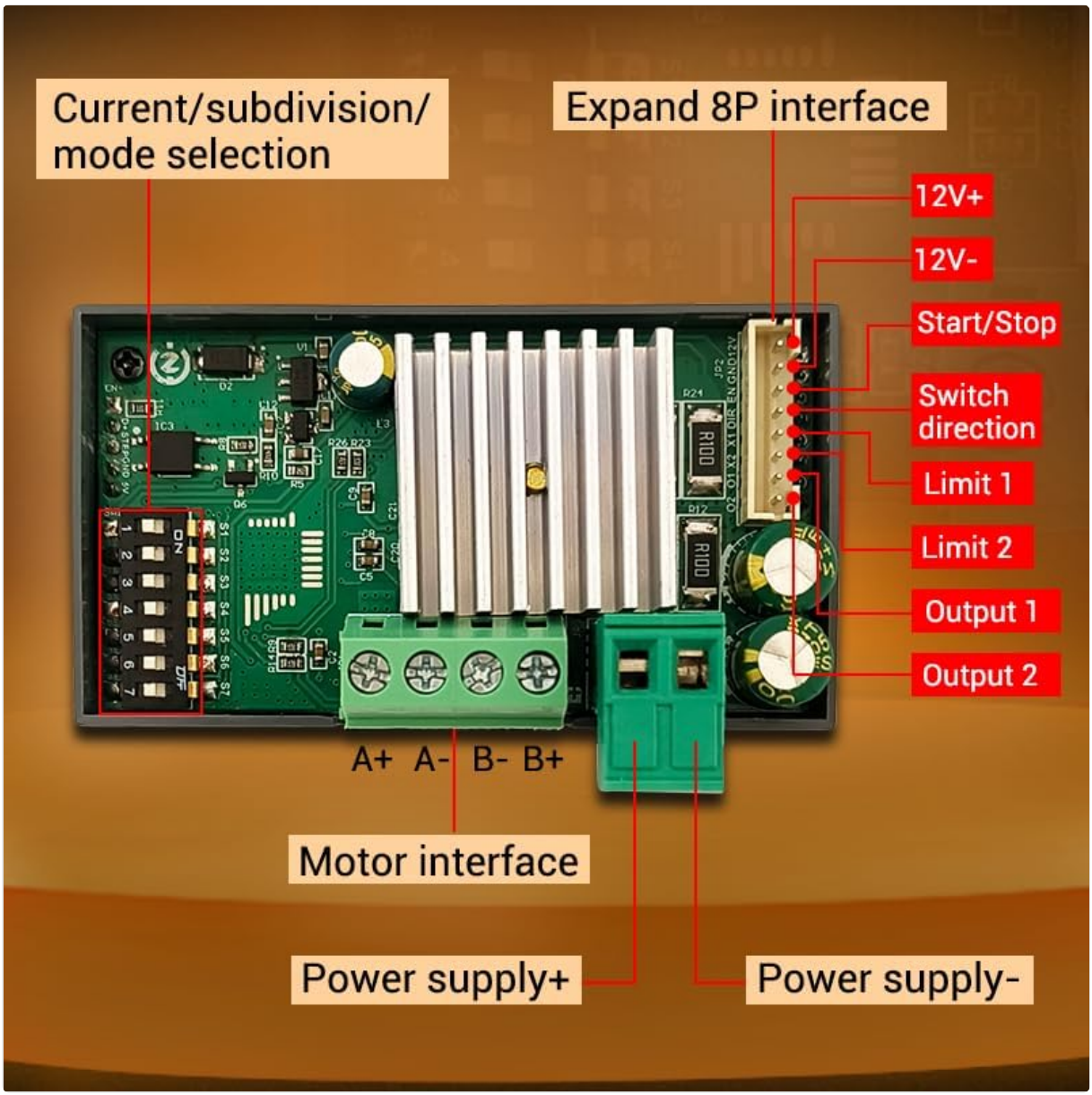


Figure 4.1: Front panel controls. The panel includes buttons for CW (Clockwise) and CCW (Counter-Clockwise) rotation, corresponding indicators, an encoder setting knob for adjustments, and a RUN/STOP button.

4.1 Basic Operation

- **Start/Stop:** Press the **RUN/STOP** button to start or stop the motor.
- **Direction Control:**
  - Press **CW** button for forward rotation.
  - Press **CCW** button for reverse rotation.
- **Speed/Angle Adjustment:** Rotate the encoder setting knob to adjust parameters such as speed or angle.

4.2 Menu Navigation and Parameter Settings

The ZK-SMC04 allows for detailed configuration through its menu system. Follow these steps to navigate and adjust parameters:

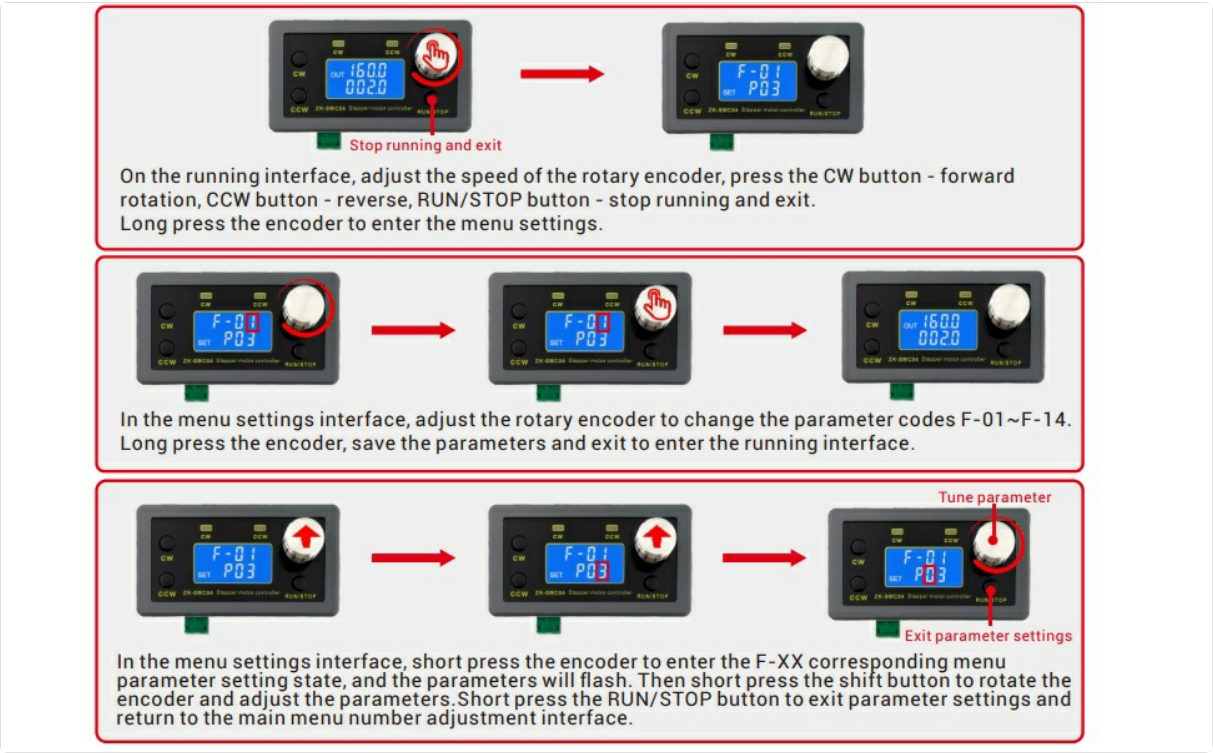
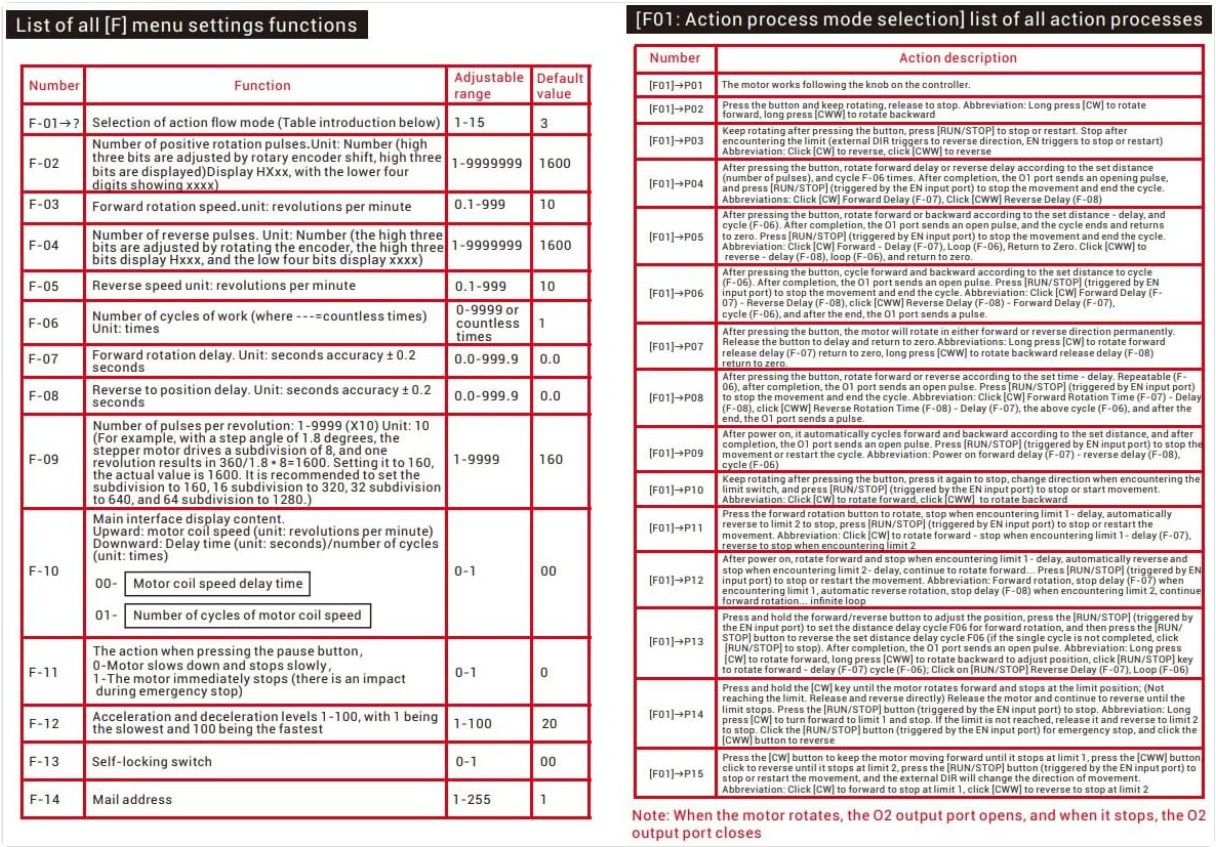


Figure 4.2: Menu navigation and parameter adjustment. This diagram shows how to stop running and exit, enter menu settings, tune parameters, and exit parameter settings using the rotary encoder and buttons.

1. **Stop Running and Exit:** On the running interface, adjust the speed using the rotary encoder. Press the CW button for forward rotation, CCW button for reverse. Long press the RUN/STOP button to stop running and exit.
2. **Enter Menu Settings:** From the running interface, long press the encoder to enter the menu settings interface.
3. **Navigate Menu:** In the menu settings interface, rotate the encoder to change the parameter codes from F-01 to F-14. Long press the encoder to save the parameters and exit to enter the running interface.
4. **Tune Parameters:** In the menu settings interface, short press the encoder to enter the F-XX corresponding menu parameter setting state. The parameters will flash. Short press the shift button to rotate the encoder and adjust the parameters. Short press the RUN/STOP button to exit parameter settings and return to the main menu number adjustment interface.

4.3 Menu Functions List

The following table provides a detailed description of each menu function (F-01 to F-14) and their adjustable ranges and default values.



List of all [F] menu settings functions

Number	Function	Adjustable range	Default value
F-01→?	Selection of action flow mode (Table introduction below)	1-15	3
F-02	Number of positive rotation pulses.Unit: Number (high three bits are adjusted by rotary encoder shift, high three bits are displayed)Display HXxx, with the lower four digits showing xxxx)	1-9999999	1600
F-03	Forward rotation speed.unit: revolutions per minute	0.1-999	10
F-04	Number of reverse pulses. Unit: Number (the high three bits are adjusted by rotating the encoder, the high three bits display Hxxx, and the low four bits display xxxx)	1-9999999	1600
F-05	Reverse speed unit: revolutions per minute	0.1-999	10
F-06	Number of cycles of work (where ---=countless times) Unit: times	0-9999 or countless times	1
F-07	Forward rotation delay. Unit: seconds accuracy ± 0.2 seconds	0.0-999.9	0.0
F-08	Reverse to position delay. Unit: seconds accuracy ± 0.2 seconds	0.0-999.9	0.0
F-09	Number of pulses per revolution: 1-9999 (X10) Unit: 10 (For example, with a step angle of 1.8 degrees, the stepper motor drives a subdivision of 8, and one revolution results in 360/1.8 * 8=1600. Setting it to 160, the actual value is 1600. It is recommended to set the subdivision to 160, 16 subdivision to 320, 32 subdivision to 640, and 64 subdivision to 1280.)	1-9999	160
F-10	Main interface display content. Upward: motor coil speed (unit: revolutions per minute) Downward: Delay time (unit: seconds)/number of cycles (unit: times) 00- Motor coil speed delay time 01- Number of cycles of motor coil speed	0-1	00
F-11	The action when pressing the pause button, 0-Motor slows down and stops slowly, 1-The motor immediately stops (there is an impact during emergency stop)	0-1	0
F-12	Acceleration and deceleration levels 1-100, with 1 being the slowest and 100 being the fastest	1-100	20
F-13	Self-locking switch	0-1	00
F-14	Mail address	1-255	1

[F01: Action process mode selection] list of all action processes

Number	Action description
[F01]→P01	The motor works following the knob on the controller.
[F01]→P02	Press the button and keep rotating, release to stop. Abbreviation: Long press [CW] to rotate forward, long press [CWW] to rotate backward
[F01]→P03	Keep rotating after pressing the button, press [RUN/STOP] to stop or restart. Stop after encountering the limit (external DIR triggers to reverse direction, EN triggers to stop or restart) Abbreviation: Click [CW] to reverse, click [CWW] to reverse
[F01]→P04	After pressing the button, rotate forward delay or reverse delay according to the set distance (number of pulses), and cycle F-06 times. After completion, the O1 port sends an opening pulse, and press [RUN/STOP] (triggered by the EN input port) to stop the movement and end the cycle. Abbreviations: Click [CW] Forward Delay (F-07), Click [CWW] Reverse Delay (F-08)
[F01]→P05	After pressing the button, rotate forward or backward according to the set distance - delay, and cycle (F-06). After completion, the O1 port sends an open pulse, and the cycle ends and returns to zero. Press [RUN/STOP] (triggered by EN input port) to stop the movement and end the cycle. Abbreviation: Click [CW] Forward - Delay (F-07), Loop (F-06), Return to Zero. Click [CWW] to reverse - delay (F-08), loop (F-06), and return to zero.
[F01]→P06	After pressing the button, cycle forward and backward according to the set distance to cycle (F-06). After completion, the O1 port sends an open pulse. Press [RUN/STOP] (triggered by EN input port) to stop the movement and end the cycle. Abbreviation: Click [CW] Forward Delay (F-07) - Reverse Delay (F-08), click [CWW] Reverse Delay (F-08) - Forward Delay (F-07), cycle (F-06), and after the end, the O1 port sends a pulse.
[F01]→P07	After pressing the button, the motor will rotate in either forward or reverse direction permanently. Release the button to delay and return to zero.Abbreviations: Long press [CW] to rotate forward release delay (F-07) return to zero, long press [CWW] to rotate backward release delay (F-08) return to zero.
[F01]→P08	After pressing the button, rotate forward or reverse according to the set time - delay. Repeatable (F-06), after completion, the O1 port sends an open pulse. Press [RUN/STOP] (triggered by EN input port) to stop the movement and end the cycle. Abbreviation: Click [CW] Forward Rotation Time (F-07) - Delay (F-08), click [CWW] Reverse Rotation Time (F-08) - Delay (F-07), the above cycle (F-06), and after the end, the O1 port sends a pulse.
[F01]→P09	After power on, it automatically cycles forward and backward according to the set distance, and after completion, the O1 port sends an open pulse. Press [RUN/STOP] (triggered by EN input port) to stop the movement or restart the cycle. Abbreviation: Power on forward delay (F-07) - reverse delay (F-08), cycle (F-06)
[F01]→P10	Keep rotating after pressing the button, press it again to stop, change direction when encountering the limit switch, and press [RUN/STOP] (triggered by the EN input port) to stop or start movement. Abbreviation: Click [CW] to rotate forward, click [CWW] to rotate backward
[F01]→P11	Press the forward rotation button to rotate, stop when encountering limit 1 - delay, automatically reverse to limit 2 to stop, press [RUN/STOP] (triggered by EN input port) to stop or restart the movement. Abbreviation: Click [CW] to rotate forward - stop when encountering limit 1- delay (F-07), reverse to stop when encountering limit 2
[F01]→P12	After power on, rotate forward and stop when encountering limit 1 - delay, automatically reverse and stop when encountering limit 2 - delay, continue to rotate forward. . . Press [RUN/STOP] (triggered by EN input port) to stop or restart the movement. Abbreviation: Forward rotation, stop delay (F-07) when encountering limit 1, automatic reverse rotation, stop delay (F-08) when encountering limit 2, continue forward rotation.... infinite loop
[F01]→P13	Press and hold the forward/reverse button to adjust the position, press the [RUN/STOP] (triggered by the EN input port) to set the distance delay cycle F06 for forward rotation, and then press the [RUN/STOP] button to reverse the set distance delay cycle F06 (if the single cycle is not completed, click [RUN/STOP] to stop). After completion, the O1 port sends an open pulse. Abbreviation: Long press [CW] to rotate forward, long press [CWW] to rotate backward to adjust position, click [RUN/STOP] key to rotate forward - delay (F-07) cycle (F-06); Click on [RUN/STOP] Reverse Delay (F-07), Loop (F-06)
[F01]→P14	Press and hold the [CW] key until the motor rotates forward and stops at the limit position; (Not reaching the limit. Release and reverse directly) Release the motor and continue to reverse until the limit stops. Press the [RUN/STOP] button (triggered by the EN input port) to stop. Abbreviation: Long press [CW] to turn forward to limit 1 and stop. If the limit is not reached, release it and reverse to limit 2 to stop. Click the [RUN/STOP] button (triggered by the EN input port) for emergency stop, and click the [CWW] button to reverse
[F01]→P15	Press the [CW] button to keep the motor moving forward until it stops at limit 1, press the [CWW] button click to reverse until it stops at limit 2, press the [RUN/STOP] button (triggered by the EN input port) to stop or restart the movement, and the external DIR will change the direction of movement. Abbreviation: Click [CW] to forward to stop at limit 1, click [CWW] to reverse to stop at limit 2

Note: When the motor rotates, the O2 output port opens, and when it stops, the O2 output port closes

Figure 4.3: Comprehensive list of menu functions and their corresponding actions and settings.

Number	Function	Adjustable Range	Default Value
F-01	Selection of action flow mode (Table introduction below)	1 - 15	3
F-02	Number of positive rotation pulses/unit (High three bits by rotary encoder, low four bits by display)	1 - 999999	1600
F-03	Forward rotation speed unit: revolutions per minute	0.1 - 999	10
F-04	Number of reverse pulses/unit (High three bits by rotary encoder, low four bits by display)	1 - 999999	1600
F-05	Reverse speed unit: revolutions per minute	0.1 - 999	10
F-06	Number of cycles of work (where 0 = countless times)	0 - 9999 or countless	1
F-07	Forward time delay unit: seconds (accuracy ±0.2 seconds)	0.0 - 999.9	0.0
F-08	Reverse time delay unit: seconds (accuracy ±0.2 seconds)	0.0 - 999.9	0.0
F-09	Number of pulses per revolution (1-9999, x10) Unit: 10 (e.g., for 1.8° stepper motor, 8 subdivision = 160, 16 subdivision = 320, 32 subdivision = 640, 64 subdivision = 1280)	1 - 9999	160
F-10	Main interface display content (Up: motor coil speed, Down: revolutions per minute)	0 - 1	00
F-11	The action when pressing the pause button (0: motor slows down and stops slowly, 1: motor immediately stops)	0 - 1	0

F-12	Acceleration and deceleration levels (1-100, 1 being the slowest and 100 being the fastest)	1 - 100	20
F-13	Self-locking switch	0 - 1	0
F-14	Mail address	1 - 255	1

5. Maintenance

To ensure the longevity and optimal performance of your ZK-SMC04 Stepper Motor Driver Controller, follow these general maintenance guidelines:

- **Keep Clean:** Regularly clean the device with a soft, dry cloth to prevent dust accumulation, especially around ventilation openings and connectors.
- **Environmental Conditions:** Operate the controller within the specified temperature and humidity ranges (-10 ~ 60 °C, non-condensing) to prevent damage.
- **Secure Connections:** Periodically check all wiring connections to ensure they are secure and free from corrosion. Loose connections can lead to intermittent operation or damage.
- **Avoid Overload:** Ensure the connected motor and power supply are within the specified limits of the ZK-SMC04 to prevent overheating and damage to the driver.

6. Troubleshooting

This section provides solutions to common issues you might encounter with the ZK-SMC04 Stepper Motor Driver Controller.

Figure 6.1: Troubleshooting guide for common operational problems.

Phenomenon	Possible Issues	Solution Measures

The screen doesn't light up	The motor shaft is powerless	Check the power supply circuit to see if it is connected in reverse or supplying power normally.
	Driver chip protection	Power on again.
The motor does not rotate	The pulse signal is weak	It is recommended to increase the voltage or choose a larger current.
	The motor does not rotate and keeps vibrating	Check the motor wiring for any issues.
Motor rotation error	Wrong connection of motor wire	Swap two wires of the same phase for any motor (e.g., A+ and A- exchange positions).
Incorrect position	Signal interference	Remove interference.
	The motor wire has a broken circuit	Check and connect correctly.
	Subdivision error	Set up correct segmentation.
Motor stalling vibration	The current is too small	Increase the current.
	Turn on the mute mode, which is only suitable for low-speed states	Turn off silent mode.
	Short acceleration time	Extend acceleration time.
	Low voltage or low current	Appropriately increase the voltage or current.

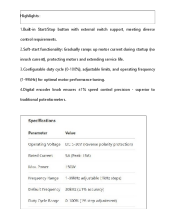
7. Warranty and Support

For warranty information, technical support, or any inquiries regarding the ZK-SMC04 Stepper Motor Driver Controller, please contact GODIYMODULES directly through their official channels or the retailer from whom the product was purchased.

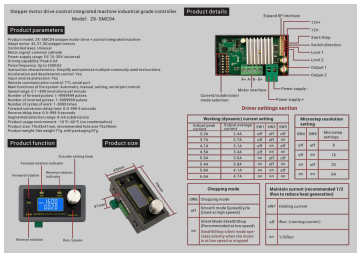
Please refer to the original purchase documentation for specific warranty terms and conditions.

Related Documents - ZK-SMC04

	ZK-SMC02 CNC Stepper Motor Driver User Manual Detailed guide for the ZK-SMC02 CNC Stepper Motor Driver, covering its description, features, parameters, setting methods, work modes, applications, and package contents. This document provides comprehensive information for operating and integrating the ZK-SMC02 with stepper motors.

	[PEMENOL PWM DC Motor Speed Controller and Signal Generator Driver Module] A guide to the PEMENOL PWM DC Motor Speed Controller and Signal Generator Driver Module, detailing its features, parameters, usage instructions, and troubleshooting.
	[ZK-SMC02 CNC Stepper Motor Driver: Features, Parameters, and Operation Guide] Detailed technical specification and operational guide for the ZK-SMC02 CNC Stepper Motor Driver. Learn about its features, parameters, setting methods, work modes, applications, and wiring.
	[CNC Stepper Motor Driver - Operation, Parameters, and Control] Detailed guide for the CNC Stepper Motor Driver, covering its description, parameters, various setting methods, work modes, and MODBUS control. Includes parameter tables and application examples.
	[ZK-SMC01 Single Axis Stepping Motor Controller Manual] Comprehensive manual for the ZK-SMC01 Single Axis Stepping Motor Controller, covering product introduction, parameters, functions, wiring, operation, and communication protocol.
	[ZK-MG DC Motor Controller: User Manual and Specifications] Comprehensive user manual for the ZK-MG DC Motor Controller, covering its highlights, technical specifications, operating instructions, and digital encoder knob functionality. Features include soft-start, configurable duty cycle and frequency, and external stop terminal support for 5-30V DC motors.

Documents - GODIYMODULES – ZK-SMC04



[pdf] User Manual Instructions

1 Administrator DC 10 30V 6 6A 42 57 86 Stepper Motor Driver Controller Integrated Board Forward Reverse Pulse Speed Angle Control Module PLC Serial Communication for NEMA 17 23 MotorUser Manual GODIYMODULES MotorA1t0EuePKpLm media amazon images I A1t0EuePKpL |||

Stepper motor drive control integrated machine industrial grade controller Mode**ZK-SMC04** Product parameters Product model: **ZK-SMC04** stepper motor drive control integrated machine Adapt motor: 42, 57, 86 stepper motors Controlled Axes: Uniaxial Motor signal: common cathode Power supply range: DC 10...

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