CNCTOPBAOS DMA860S

CNCTOPBAOS DMA860S Digital Stepper Motor Driver Instruction Manual

Model: DMA860S | Brand: CNCTOPBAOS

1. Product Overview

The CNCTOPBAOS DMA860S is a high-performance digital stepper motor driver designed for controlling 2-phase stepper motors. It incorporates a PI control algorithm, which contributes to low noise, reduced vibration, and minimal heat generation during operation. This driver is suitable for a wide range of applications requiring precise motor control.

Key features include:

- Input Voltage: 20-110V AC or 20-160V DC.
- Output Peak Current: Adjustable from 2.2A to 8.2A.
- Subdivision Settings: 16 types, allowing for 400-51200 pulses per circle.
- Optical isolation differential signal input with a pulse response frequency up to 300KHz.
- Integrated protection functions: Overvoltage, undervoltage alarm, phase current overcurrent, and motor phase open circuit detection.
- Signal Input Modes: Single-ended, pulse+direction, and dual pulse.
- Automatic current halving at rest to reduce heat and power consumption.
- Compatible with 4, 6, and 8-wire two-phase stepper motors, including Nema23, Nema24, Nema34, and Nema42 series.

2. Safety Information

To ensure safe and proper operation, please observe the following precautions:

- Always read this instruction manual thoroughly before operating the driver.
- Do not apply power to the driver before all motor connections are securely made.
- Avoid plugging or unplugging connecting terminals while the power is on, as this may damage the driver.
- This product complies with CE and RoHS certification standards.

3. Product Specifications

Specification	Value
Input Voltage	20-110V AC or 20-160V DC
Output Peak Current	2.2A - 8.2A
Pulse Response Frequency	Up to 300KHz
Subdivision Settings	16 types (400-51200 pulses/circle)
Applicable Motors	4, 6, 8-wire two-phase stepper motors (Nema23, Nema24, Nema34, Nema42)
Control Algorithm	PI control
Protection Features	Overvoltage, undervoltage, phase current overcurrent, motor phase open circuit detection
Signal Input Modes	Single-ended, pulse+direction, dual pulse
Current Reduction	Automatic halving at rest
Item Weight	2.65 pounds
Package Dimensions	7.99 x 5.51 x 3.58 inches

For detailed dimensions, refer to the product size diagram below.

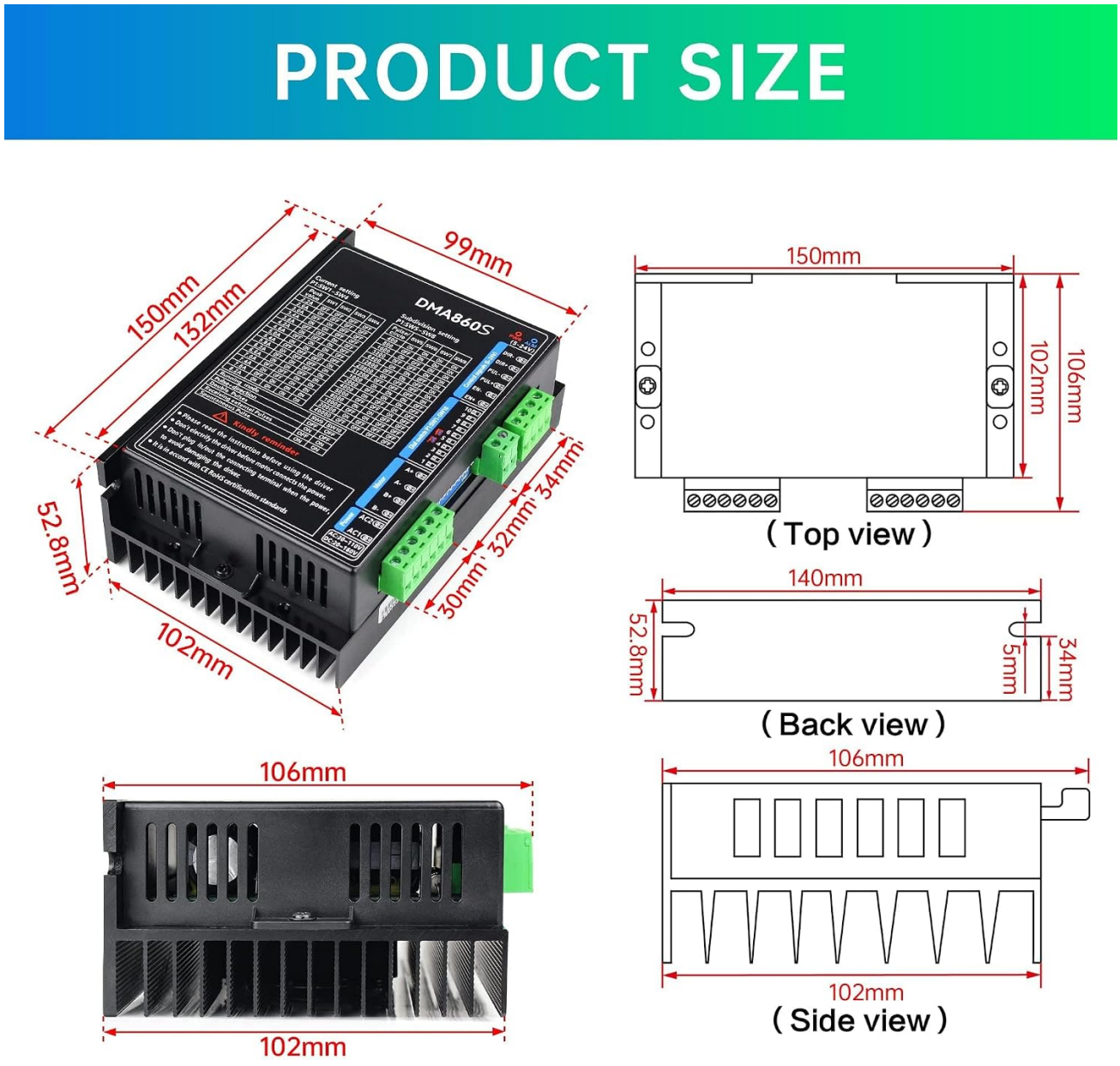

Figure 3.1: DMA860S Driver Dimensions

4. Wiring and Connections

Proper wiring is crucial for the functionality and safety of the stepper motor driver. Refer to the diagrams and instructions below for connecting the driver to the motor, control signals, and power supply.

PRODUCT DESCRIPTION

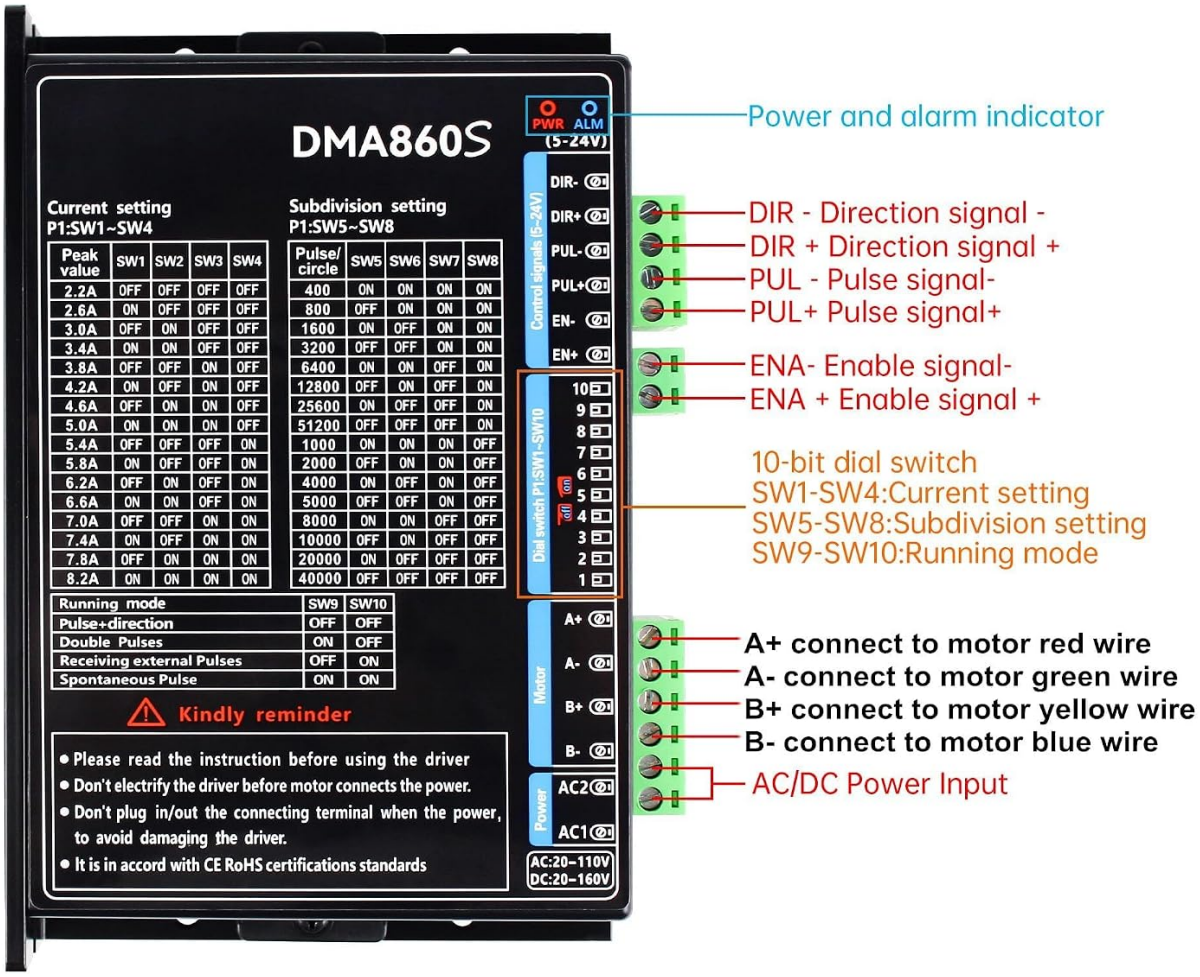

Figure 4.1: DMA860S Driver Connection Diagram

The driver features clearly labeled terminals for easy connection:

- **Signal Input (P1-SW1-SW10):** DIR+, DIR-, PUL+, PUL-, EN+, EN- for direction, pulse, and enable signals.
- **Motor Connections:** A+, A-, B+, B- for connecting to the stepper motor windings.
- **Power Input:** AC1, AC2 for AC power (20-110V AC) or DC power (20-160V DC).

Figure 4.2: Stepper Motor to Driver Wiring Example

The motor wires typically correspond as follows:

- A+ to motor red wire
- A- to motor green wire
- B+ to motor yellow wire
- B- to motor blue wire

Ensure all connections are tight and correct before applying power.

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Video 4.1: Test video demonstrating the DMA860S stepper motor driver in operation, showing wiring and motor movement.

5. Configuration (DIP Switch Settings)

The DMA860S driver features a 10-bit DIP switch for configuring operating current, subdivision settings, and running mode. The switches are labeled SW1-SW10.

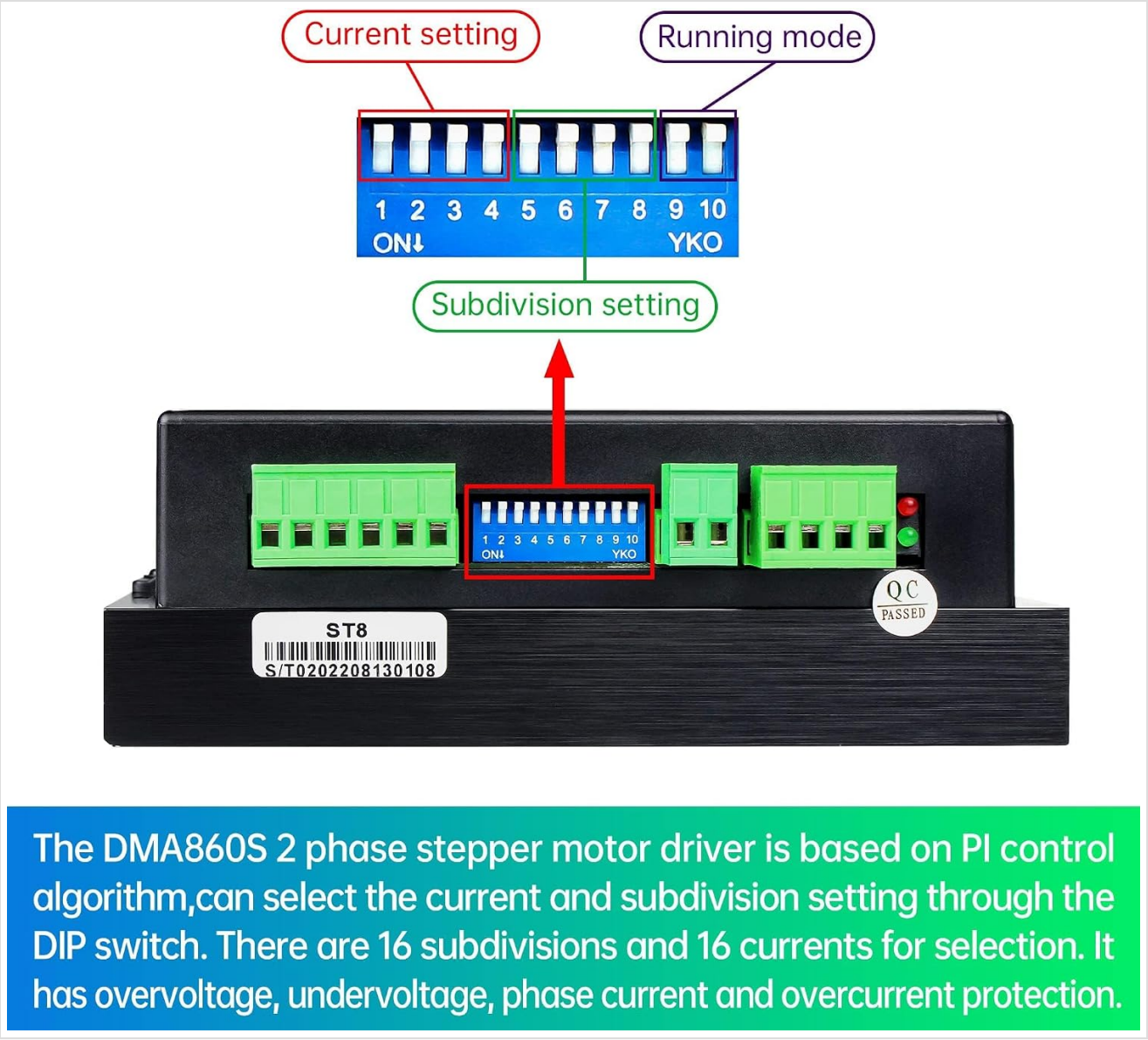

Figure 5.1: DIP Switch Layout

5.1 Current Setting (SW1-SW4)

Use switches SW1-SW4 to set the desired peak output current for the motor. Refer to the table below for specific configurations.

Subdivision Setting

Pulse/circle	SW5	SW6	SW7	SW8	rev/min
400	ON	ON	ON	ON	5
800	OFF	ON	ON	ON	10
1600	ON	OFF	ON	ON	15
3200	OFF	OFF	ON	ON	30
6400	ON	ON	OFF	ON	60
12800	OFF	ON	OFF	ON	90
25600	ON	OFF	OFF	ON	120
51200	OFF	OFF	OFF	ON	150
1000	ON	ON	ON	OFF	180
2000	OFF	ON	ON	OFF	210
4000	ON	OFF	ON	OFF	240
5000	OFF	OFF	ON	OFF	300
8000	ON	ON	OFF	OFF	400
10000	OFF	ON	OFF	OFF	500
20000	ON	OFF	OFF	OFF	650
40000	OFF	OFF	OFF	OFF	800

Running mode	SW9	SW10
Pulse+ direxion	OFF	OFF
Double pulses	ON	OFF
Receiving external Pulses	OFF	ON
Spontaneous Pulse	ON	ON

Figure 5.2: Current Setting Table

5.2 Subdivision Setting (SW5-SW8)

Switches SW5-SW8 control the micro-stepping subdivision. This allows for smoother motor operation and finer control. The driver utilizes built-in micro-subdivision technology to achieve high subdivision effects even at low settings. Refer to the table below for subdivision configurations.

Current setting

Current(peak)	Current(rms)	SW1	SW2	SW3	SW4
2.2A	1.6A	OFF	OFF	OFF	OFF
2.6A	1.9A	ON	OFF	OFF	OFF
3.0A	2.2A	OFF	ON	OFF	OFF
3.4A	2.4A	ON	ON	OFF	OFF
3.8A	2.7A	OFF	OFF	ON	OFF
4.2A	3.0A	ON	OFF	ON	OFF
4.6A	3.3A	OFF	ON	ON	OFF
5.0A	3.7A	ON	ON	ON	OFF
5.4A	3.9A	OFF	OFF	OFF	ON
5.8A	4.1A	ON	OFF	OFF	ON
6.2A	4.4A	OFF	ON	OFF	ON
6.6A	4.7A	ON	ON	OFF	ON
7.0A	5.0A	OFF	OFF	ON	ON
7.4A	5.3A	ON	OFF	ON	ON
7.8A	5.6A	OFF	ON	ON	ON
8.2A	6.0A	ON	ON	ON	ON

Figure 5.3: Subdivision Setting Table

5.3 Running Mode (SW9-SW10)

Switches SW9 and SW10 determine the running mode of the driver, including single/double pulse and spontaneous

pulse options.

Running Mode	SW9	SW10
Pulse + Direction	OFF	OFF
Double Pulses	ON	OFF
Receiving External Pulses	OFF	ON
Spontaneous Pulse	ON	ON

6. Typical Applications

The DMA860S digital stepper motor driver is versatile and widely used in various small and medium-sized automated equipment and instruments. Common applications include:

- Milling Machines
- Engraving Machines
- Marking Machines
- Cutting Machines
- Carving Machines
- CNC Router Machines
- Automatic Assembly Equipment

7. Maintenance and Troubleshooting

7.1 Maintenance

The DMA860S driver is designed for reliability and requires minimal maintenance. Keep the unit clean and free from dust and debris. Ensure adequate ventilation to prevent overheating. Regularly check all wiring connections for tightness and signs of wear.

7.2 Troubleshooting

If you encounter issues, consider the following general troubleshooting steps:

- **No Power:** Verify the input voltage and ensure all power connections are secure. Check for blown fuses if applicable.
- **Motor Not Moving:** Confirm control signals (PUL, DIR, EN) are correctly wired and active. Check motor wiring for correct phase connections. Verify current and subdivision settings are appropriate for your motor.
- **Overheating:** Ensure the driver has sufficient airflow. Check if the motor current setting is too high for the application.
- **Alarm Indicator:** If the alarm indicator is active, check for overvoltage, undervoltage, phase current overcurrent, or motor phase open circuit conditions as described in the product overview.

For persistent issues, refer to the detailed wiring diagrams and configuration tables, or contact CNCTOPBAOS technical support.

8. Warranty and Support

CNCTOPBAOS is committed to providing strong technical support and comprehensive after-sales service for its

products. For any technical assistance, troubleshooting guidance, or warranty inquiries, please contact CNCTOPBAOS customer service through their official channels.

While specific warranty details are not provided in this manual, general support is available to ensure customer satisfaction and product longevity.