Manual of 2-phase hybrid stepper motor driver DM856

DM856 digital low voltage stepper motor driver, using the latest 32 bit DSP technology, suitable for driving the Nema 23 and Nema 34 stepper motors, with excellent medium and low speed performance. It can set any subdivision within 256 and any current value in rated current, which can meet the needs of most small equipment. With the built-in micro technology, even under low subdivision conditions, it can achieve the effect of high subdivision. The medium and low speed operation is very smooth, and the noise is very small.

Functional Property

- Be capable of driving two phase stepper motor with 4 lines and 8 lines.
- Supply voltage from 24VDC to 80VDC.
- Maximum current: 5.6A, resolution: 0.1A.
- Micro step resolution range: 200~51200ppr.
- Signal input: differential / single ended, PUL / DIR or double pulse.
- Pulse response frequency: 200KHz.
- Configuring parameters through the serial port is available.
- Built in micro step resolution.
- Parameter automatic setting function.
- Offline command input terminal.
- Reduce the heating of motor when under the precision current control.
- At rest the current is automatically halved.
- With light isolation signal input, with anti-interference ability.
- It has over-voltage, over-current and other protection functions.

Technical Parameter

1. Electric Index

Instructions	DM856			Unit
	Minimum value	Typical value	Maximum value	
Output current	2.1	-	5.6	A
Input voltage	24	48	80	VDC
Control signal input current	7	10	16	mA
Step pulse frequency	0	-	200	KHz
Insulation resistance	500			MΩ

2. Interface description

1) Connector Pins   Configurations

	Function
PUL+	Pulse input signal：
PUL-	The pulse is adjustable along the rising edge of the default pulse; in order to respond reliably to the pulse signal, the pulse width should be greater than 1.2 s. If +12V or +24V is used, series resistance is required. Double pulse mode：CW
DIR+	Directional input signal：
DIR-	High / low level signal, in order to ensure the reliable commutation of the motor, the directional signal should be established at least 5μs prior to the pulse signal. The initial running direction of the motor is related to the wiring of the motor winding. Exchanging any phase winding (such as A+ and A- switching) can change the direction of the initial operation of the motor. If +12V or +24V is used, series resistance is required. Double pulse mode：CCW
ENA+	Enable control signals is used to enable or disable drive output.
ENA-	When the ENA is connected to a low level (or an internal optocoupler), the driver will cut off the current of each phase of the motor so that the motor is in a free state and does not respond to step pulses.

	When the function is not needed, the signal can be left vacant. If +12V or +24V is used, series resistance is required.

2) power interface

	Function
GND	DC power ground
+VDC	DC power is positive, range +18V - +70V, recommended +48V
A+ A-	Motor A phase winding
B+ B-	Motor B phase winding

3. Function choice
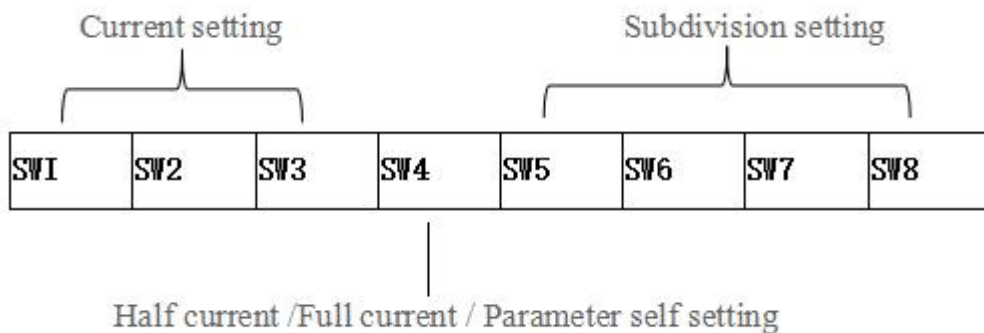
1) Current setting

Output peak current	RMS output current	SW1	SW2	SW3
Default		off	off	off
2.1A	1.5A	on	off	off
2.7A	1.9A	off	on	off
3.2A	2.3A	on	on	off
3.8A	2.7A	off	off	on
4.3A	3.1A	on	off	on
4.9A	3.5A	off	on	on
5.6A	4.0A	on	on	on

When SW1, SW2 and SW3 are all off, they can be set to the required current

through the PC software. The maximum value is 5.6A, and the resolution is 0.1A. If not set, the default peak current is 1.4A.

2) quiescent current setting

The quiescent current can be set by the SW4 dial switch, and the off indicates that the quiescent current is set at half of the operating current. The on indicates that the quiescent current is the same as the running current. In general use, the SW4 shall be set to off to reduce the heating of the motor and drive, to reduce energy consumption, and to improve reliability. When the pulse is stopped for 0.4 seconds, the current is automatically halved, and the heat is reduced to 25% theoretically.

3) subdivision settings

	SW5	SW6	SW7	SW8
Default	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

When SW5~SW8 is on, the driver uses the internal default subdivision for 200ppr, the user can be through the upper computer software subdivision settings, the minimum is 200ppr, the maximum is 51200ppr.

4) parameter self-tuning function

If the SW4 be stirred round-trip within 1 second, driver can automatically

complete motor parameter identification and control parameter self-tuning; changes in condition of motor, the power voltage should be a self-tuning, otherwise, the motor may not function properly. Note that the pulse cannot be entered at this time and the directional signal should not be changed.
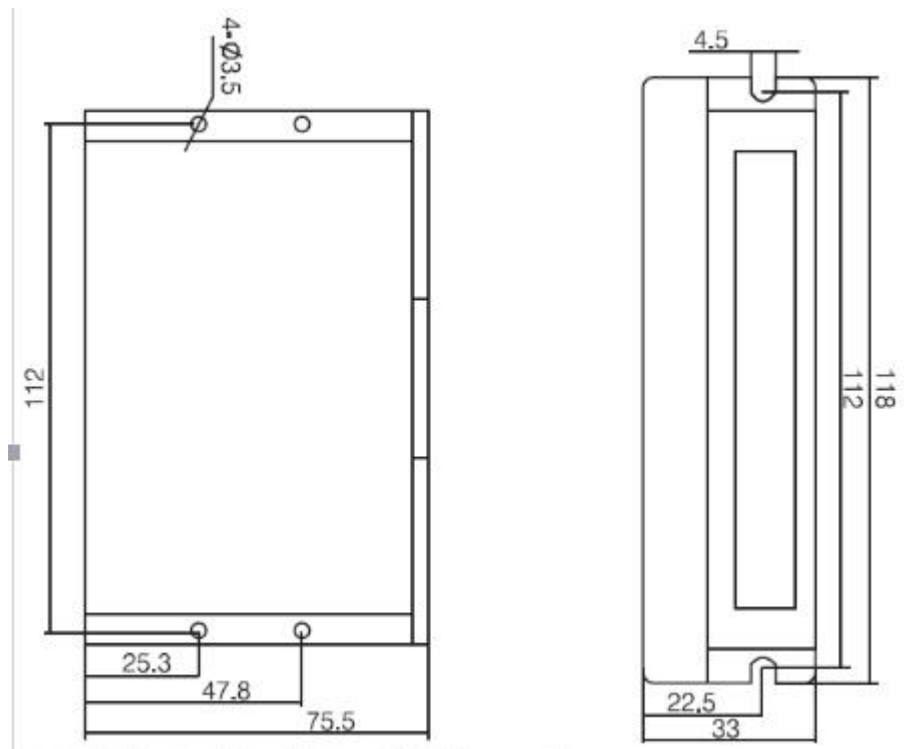Method 1) SW4 by on dial to off, then in one second by off back to on;
Method 2) SW4 by off dial to on, then in one second by on back to off.

4. use environment and parameters

Cooling method		Natural cooling or forced air cooling
Using nvironment	Occasion	Can not be placed in other heating equipment, to avoid dust, oil, corrosive gases, humidity and vibration strong places, prohibited flammable gas and conductive dust;
	Temperature	0——+50℃
	Humidity	40—90%RH
	Vibration	10~55Hz/0.15mm
Storage temperature		-20℃～65℃
weight		280g

Electrical instructions

Unit: mm

Electrical connection

1. common anode method in VCC=5V, the signal side does not need series resistance; VCC=12V, the signal needs to be connected in series about 1K resistance; R=1K/0.25W; VCC=24V, the signal needs to be connected in series about 2K resistance, R=2K/0.25W.

2. drive internal current limiting resistor 270 Ω .