STEPPERONLINE
Motors&Electronics

User Manual for
Full Digital Stepper Drive

DM860T(I)

Version 2.0

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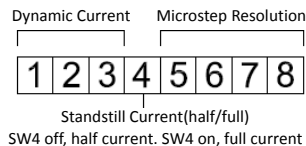Web: www.omc-stepperonline.com

Designed by STEPPERONLINE®
Manufactured by Leadshine®
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Attention: Please read this manual carefully before using the drive.

5 Setting Microstep and Current

This drive uses an 8-bit DIP switch to set microstep resolution and motor operating current, as below:

Dynamic Current   Microstep Resolution

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Standstill Current(half/full)
SW4 off, half current. SW4 on, full current

5.1 Microstep Resolution Selection

Microstep	Steps/rev.(for 1.8°motor)	SW5	SW6	SW7	SW8
2	400	on	on	on	on
4	800	off	on	on	on
8	1600	on	off	on	on
16	3200	off	off	on	on
32	6400	on	on	off	on
64	12800	off	on	off	on
128	25600	on	off	off	on
256	51200	off	off	off	on
5	1000	on	on	on	off
10	2000	off	on	on	off
20	4000	on	off	on	off
25	5000	off	off	on	off
40	8000	on	on	off	off
50	10000	off	on	off	off
100	20000	on	off	off	off
200	40000	off	off	off	off

5.2 Current Settings

Peak Current	RMS Current	SW1	SW2	SW3
2.40A	2.00A	on	on	on
3.08A	2.57A	off	on	on
3.77A	3.14A	on	off	on
4.45A	3.71A	off	off	on
5.14A	4.28A	on	on	off
5.83A	4.86A	off	on	off
6.52A	5.43A	on	off	off
7.20A	6.00A	off	off	off

2.2 Operating Environment and other Specifications(Tj = 25℃/77℉)

Cooling	Natural Cooling or Forced cooling	
Operating Environment	Environment	Avoid dust, oil fog and corrosive gases
	Ambient Temperature	0℃ - 65℃
	Humidity	40%RH - 90%RH
	Operating Temperature	−10℃ - 45℃
	Vibration	10 - 55Hz / 0.15mm
Storage Temperature	-20℃ - 65℃	
Weight	Approx. 580g[20.5oz] (DM860I 550g[19.4oz])	

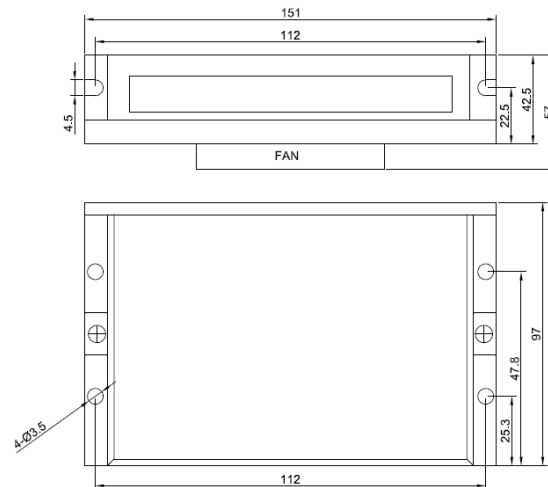### 2.3 Mechanical Specifications(unit: mm [1inch=25.4mm])

Figure 1: DM860T Mechanical specifications
Recommend use side mounting for better heat dissipation
(DM860I has no fans)

1 Introductions & Features

The DM860T is a fully digital stepper drive developed with advanced DSP control algorithm based on the latest motion control technology. It has achieved a unique level of system smoothness, providing optimal torque and nulls mid-range instability. Its motor auto-identification and parameter auto-configuration feature offers quick setup to optimal modes with different motors. Compared with traditional analog drives, DM860T can drive a stepper motor at much lower noise, lower heating, and smoother movement and below is its features:

- Anti-Resonance provides optimal torque and nulls mid-range instability
- Motor auto-identification and parameter auto-configuration when power on, offer optimal responses with different motors
- Multi-Stepping allows a low resolution step input to produce a higher microstep output, thus offers smoother motor movement
- 16 selectable microstep resolutions including 400, 800, 1600, 3200, 6400, 12800, 25600, 51200, 1000, 2000, 4000, 5000, 8000, 10000, 20000, 40000
- Soft-start with no "jump" when powered on
- Input voltage 18-80VAC or 36-110VDC(input voltage 20-80VDC for DM860I)
- 8 selectable peak current including 2.40A, 3.08A, 3.77A, 4.45A, 5.14A, 5.83A, 6.52A, 7.20A
- Pulse input frequency up to 200 KHz, TTL compatible and optically isolated input
- Automatic idle-current reduction
- Suitable for 2-phase and 4-phase motors
- Support PUL/DIR and CW/CCW modes
- Over-voltage, over-current protections

2 Specifications

2.1 Electrical Specifications

Parameters	DM860T(DM860I)			
	Min	Typical	Max	Unit
Output Peak Current	2.4	-	7.2	A
Input Voltage	18(36)	70(90)	80(110)	VAC(VDC)DM860T
	20	68	80	VDC(DM860I)
Logic Signal Current	7	10	16	mA
Pulse input frequency	0	-	200	kHz
Pulse Width	2.5	-	-	uS
Isolation resistance	100			MΩ

6 Frequently Asked Questions

Symptoms	Possible Problems
Motor is not rotating	No power
	Microstep resolution setting is wrong
	DIP switch current setting is wrong
	Fault condition exists
	The drive is disabled
Motor rotates in the wrong direction	Motor phases may be connected in reverse
The drive in fault	DIP switch current setting is wrong
	Something wrong with motor coil
Erratic motor motion	Control signal is too weak
	Control signal is interfered
	Wrong motor connection
	Something wrong with motor coil
	Current setting is too small, losing steps
Motor stalls during acceleration	Current setting is too small
	Motor is undersized for the application
	Acceleration is set too high
	Power supply voltage too low
Excessive motor and drive heating	Inadequate heat sinking / cooling
	Automatic current reduction function not being utilized
	Current is set too high

7 Warranty

STEPPERONLINE® warrants its products against defects in materials and workmanship for a period of 12 months from shipment. During the warranty period, StepperOnline will either, at its option, repair or replace products which proved to be defective. To obtain warranty service, a returned material authorization number (RMA) must be obtained before returning product for service.

Exclusions: The above warranty does not extend to any product damaged by reasons of improper or inadequate handlings by customer, improper or inadequate customer wirings, unauthorized modification or misuse, or operation beyond the electrical specifications of the product and/or operation beyond environmental specifications for the product.
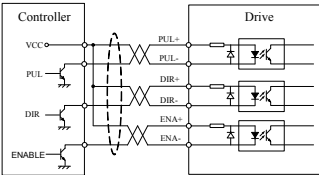
Figure 2: Connections to open-collector signal (common-anode)
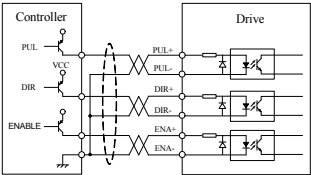
Figure 3: Connections to PNP signal (common-cathode)
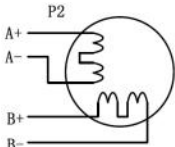
4.2 Connections of 4-lead Motor
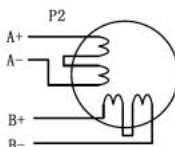

Figure 4: 4-lead Motor Connections

4.3 Connections of 6-lead Motor
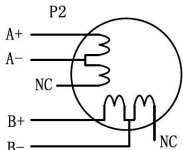
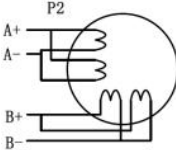Figure 5: 6-lead motor half coil (unipolar higher speed) connections
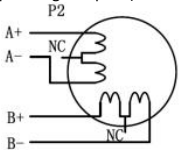

Figure 6: 6-lead motor full coil (bipolar higher torque) connections

4.4 Connections of 8-lead Motor

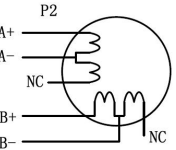
Figure 7: 8-lead motor series connections

Figure 8: 8-lead motor parallel connections

Figure 9: 8-lead motor unopolar connections