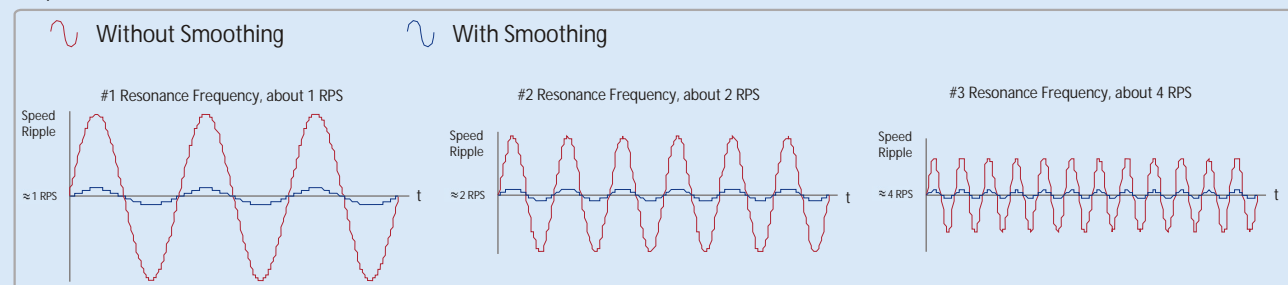


DM Series Digital Stepper Drives

Innovative Technologies

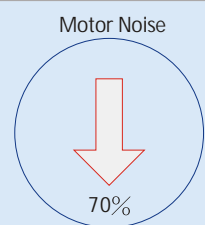
Low-speed Ripple Smoothing

Electronic damping for 3 major resonance frequencies for stepper motors at low speed range, eliminating undesirable motor speed oscillation and delivering unique level of smoothness.



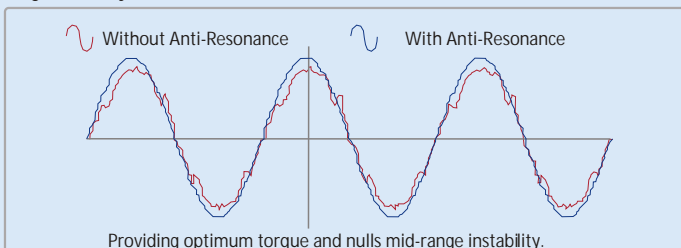
Super Low Noise

Precision current control technology and multi-stepping technology can reduce about 70% motor noise, making the EM series to be an ideal solution for the applications require low motor noise.



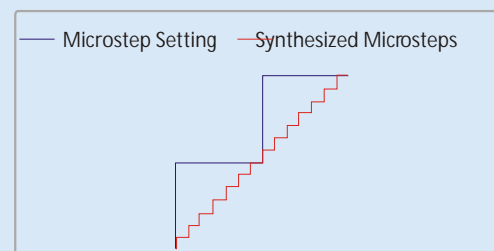
Anti-Resonance at Mid-range

Most stepper systems resonate at mid-range speed between 10 to 18 rps. EM stepper drives can calculate natural frequency of the stepper system and apply damping in control algorithm for anti-resonance, Providing optimizing torque and nulling mid-range instability.



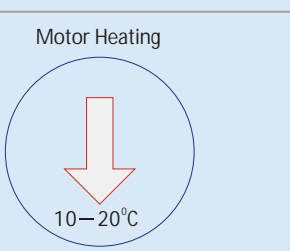
Multi-Stepping Technology

Multi-stepping allows a low resolution input to produce a higher microstep output for smoother system performance. This function can improve smoothness of the stepper systems without upgrading your motion controllers.



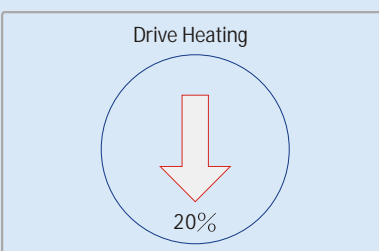
Lower Motor Heating

Due to DSP precision current control algorithm, motor heat is 10–20 °C lower compare to a traditional stepper drive. Longer motor lifetime can be achieved, reducing maintenance cost.



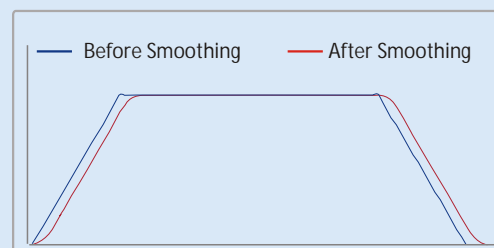
Lower Drive Heating

Drive heat is also 20% lower, offering higher drive stability and energy efficiency.



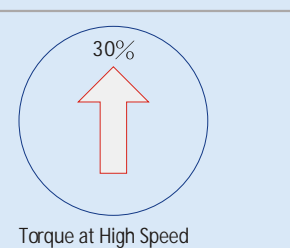
Command Signal Smoothing

Command signal smoothing can soften the effect of sudden changes in velocity and direction, thus delivering smoother performance and improving system lifetime.



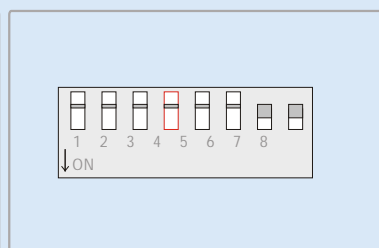
Torque Improving

Torque improvement increases torque up to 30% at high speed, therefore they can drive a normal stepper motor to 3000 RPM or even higher, and significantly increase production efficiency.



Self-test and Auto-setup

Motor-self-test and parameter-auto-configuration technology offers optimum performance for different motors. It is easier for users to configure different axes or build different machines.



Features

- Anti-Resonance optimizes torque and nulls mid-range instability
- Self-test and Auto-configuration technology offers optimum performance for different motors
- Multi-stepping allows a low resolution input to produce a higher microstep output for smoother system performance
- 2-phase and 3-phase stepper drives are available
- Options to set output current and microstep resolutions via DIP switch or software
- Command input of PUL/DIR and CW/CCW
- Over-current, over-voltage, short-circuit protections

Introduction

By implementing the latest motion control technologies, Leadshine's DM series DSP-based stepper drives deliver excellent performance not available before. Unique features of extra smoothness and excellent high speed performance make DM stepper drives deliver servo-like performance at the cost of stepper drives. They are capable of delivering high performance without damages to your machines or the materials. Leadshine DM series stepper drives are able to drive 2-phase or 3-phase stepper motors from NEMA8 to NEMA42.

Applications

Leadshine DM stepper drives are suitable for driving a wide range of stepper motors, from NEMA frame size 8 to 42. Typical applications include CNC routers, laser cutters, laser markers, medical equipments, X-Y tables, measurement equipments, etc.

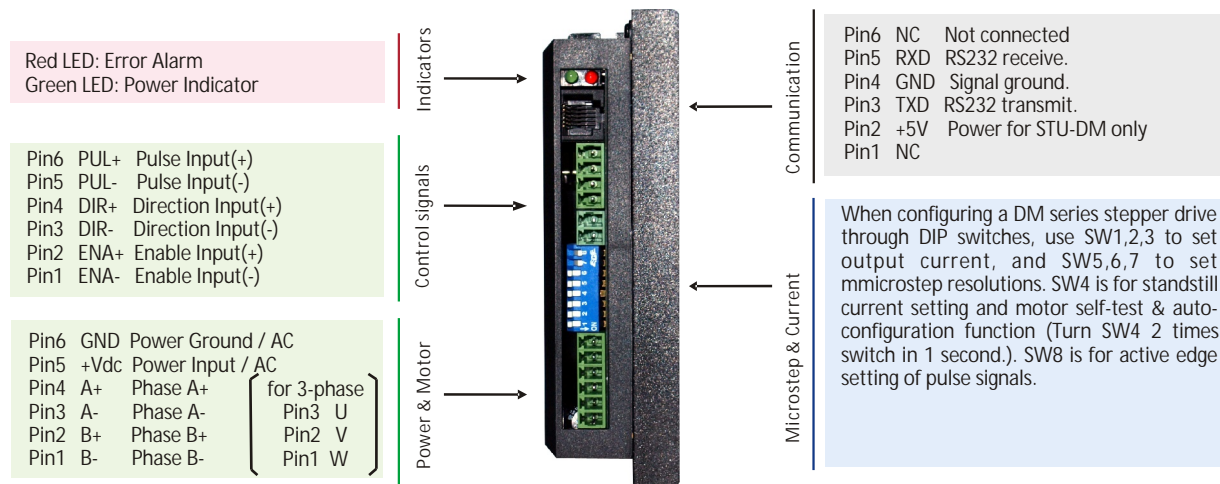
Electrical Specifications

Parameters	Input Voltage (VDC)			Output Current (A)					
	Min	Typical	Max	Min	Typical	Max			
Model									
DM320C	+18	+24	+30	0.3	-	2.0			
DM422C	+18	+24	+40	0.3	-	2.2			
DM442	+18	+36	+40	0.5	-	4.2			
DM556	+18	+36	+50	0.5	-	5.6			
DM870	+18	+60	+80	0.5	-	7.0			
DM1182	80 (VAC)	110 (VAC)	150 (VAC)	0.5	-	8.2			
DM2282	80 (VAC)	120 (VAC)	220 (VAC)	0.5	-	8.2			
3DM683	+18	+48	+60	0.5	-	8.2			
DM805-AI	+18	+60	+80	0.5	-	7.0			
Parameters	Pulse Input Frequency (kHz)			Logic Signal Current (mA)			Isolation Resistance (MΩ)		
	Min	Typical	Max	Min	Typical	Max	Min	Typical	Max
Model									
DM Series	0	-	300**	7	10	16	500	-	-

* This model has UL approved version and non-UL approved version.
 ** Those of the DM320C and DM422C are 75 kHz, and that of the DM442 is 200 kHz.

Pin Assignment and Description

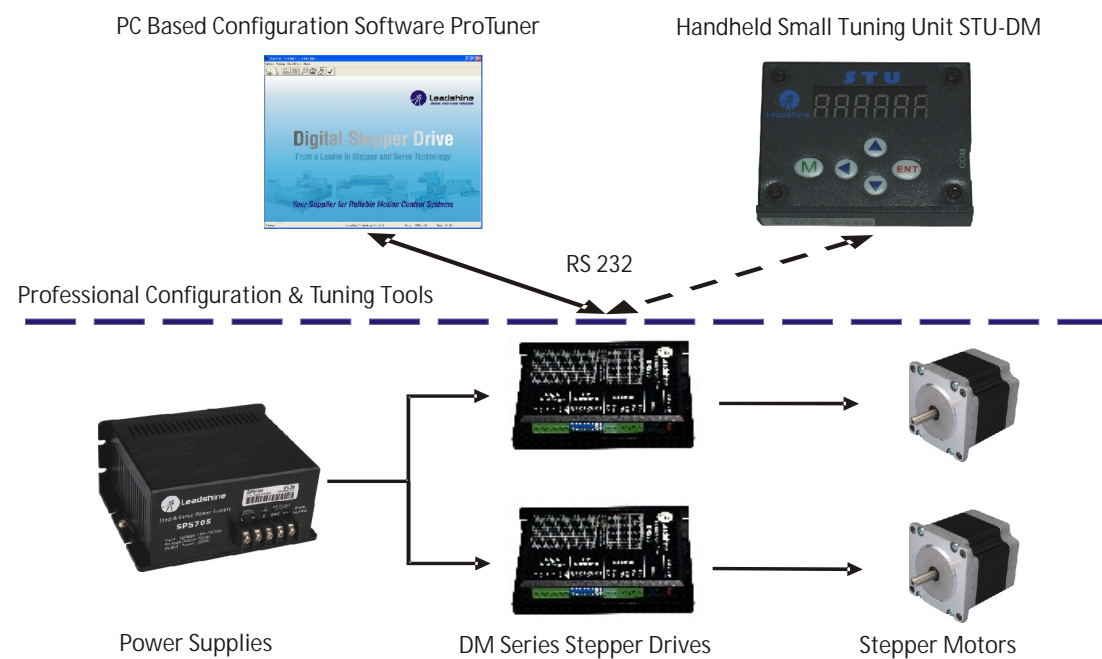
There are two connector types for a DM stepper drive. Connector type P1 (See figure below.) is for control signal connections, and connector type P2 is for power and motor connections. The RS232 communication port is for parameter configurations via computer. See brief descriptions for these connectors and interface below.



- Tips:
- Users are suggested to use motor self-test and auto-configuration function when powering up the system (with the motor) for the first time, or replacing a new motor.
 - To operate at current and microstep settings configured by software or STU, DIP switch must set to default mode.
 - Only software ProTuner can be used to configure anti-resonance parameter settings.
 - How many times the RED light blinks on in a periodic time indicates what protection has been activated. See manuals for detail.

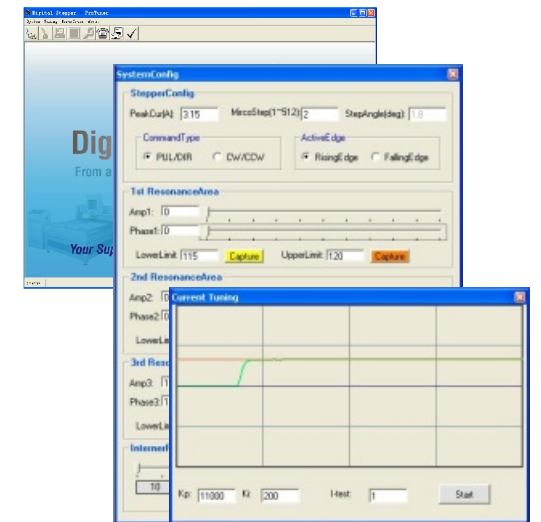
PC Based and Handheld Configuration & Tuning Tools

For most of applications, configurations set by self-test and auto-configuration function should be good enough to meet the application requirements. However, a user can also configure the advanced features such as anti-resonance and advanced current loop tuning through software or STU-DM, a simple device specially designed for easy tuning.



ProTuner (Windows Based Setup Software)

- Upload and Download parameter settings
- PI parameter settings for current loop
- Microstep resolution and output current settings
- Operation mode configuration :PUL/DIR, CW/CCW, analog*
- DIR logic level setting
- Active edge of pulse signal setting
- Electronic damping coefficient setting
- Anti-resonance parameter settings for 3 resonance area
- Parameter settings for self motion test or a simple application
- Read the latest 10 failure events and clear these events



* 1 PC RS232 interface is necessary.
** Leadshine offers special cable for communication between ProTuner and the drive.

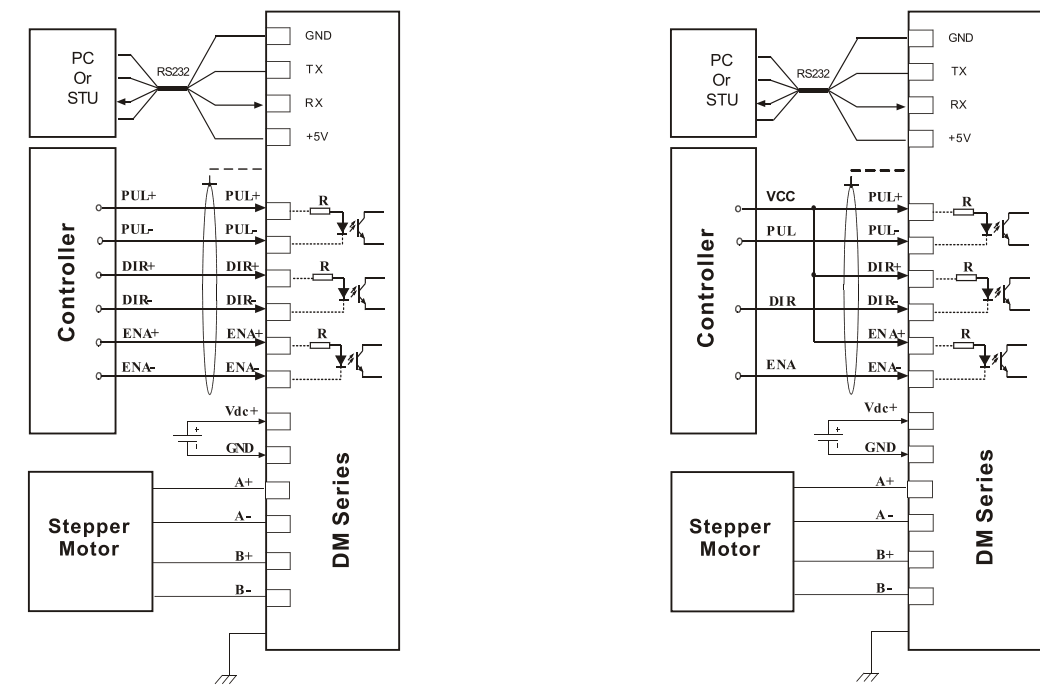
STU-DM (Handheld Configuration and Tuning Unit)

- Upload and Download parameter settings
- PI parameter settings for current loop
- Microstep resolution and output current settings
- Operation mode configuration :PUL/DIR, CW/CCW, analog*
- DIR logic level setting
- Active edge of pulse signal setting
- Parameter settings for self motion test or a simple application



* Leadshine offers special cable for communication between the STU-DM and the drive.

Typical Connections



(a) Differential control signals
* Only DM805-AI support analog command for the moment.

DM422C

Introduction

The DM422C is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque and nulls mid-range instability. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

Suitable for a wide range of stepper motors, from NEMA8 to NEMA23. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM422C an ideal solution for applications that require low-speed smoothness.

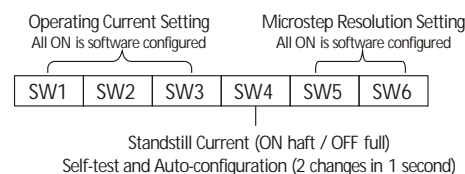


Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 2.2A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2 \cdot R$) of the original value.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	OPTO is for the opto-coupler power supply, typically+5V. PUL is for the pulse command signal. DIR is for the direction control signal. ENA is for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of 18 to 36 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses a 6-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

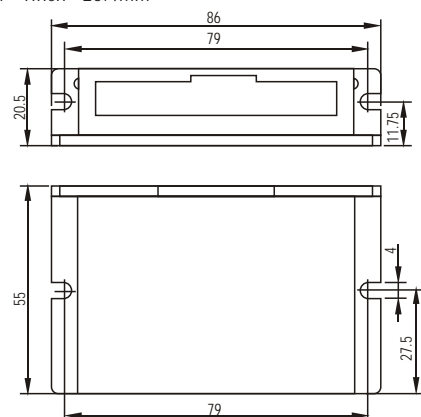


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.3-2.2 A)		on	on	on
0.5 A	0.35 A	off	on	on
0.7 A	0.5 A	on	off	on
1.0 A	0.7 A	off	off	on
1.3 A	0.9 A	on	on	off
1.6 A	1.2 A	off	on	off
1.9 A	1.4 A	on	off	off
2.2 A	1.6 A	off	off	off

Mechanical Specifications

Units: mm 1inch= 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6
Default (software configured, 1-512)	on	on
1600	off	on
3200	on	off
6400	off	off

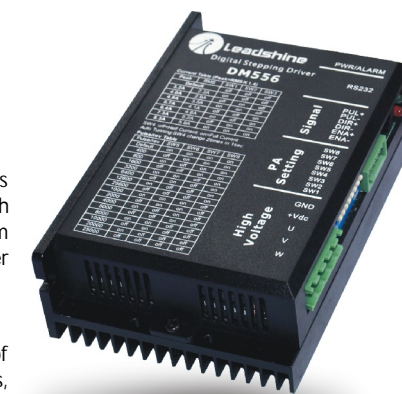
DM556

Introduction

The DM556 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

Suitable for a wide range of stepper motors, from NEMA17 to NEMA34. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM556 an ideal solution for applications that require low-speed smoothness and good high speed performance..

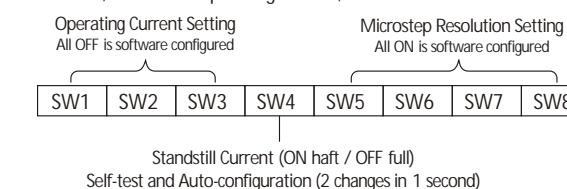


Function Description

Function	Description
Microstep Setting	Microstep resolutions is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When it's not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 5.6 A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2 \cdot R$) of the original value.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/disable control signal. Series connect resistors for current-limiting when +12V or +24V is used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of 20 to 45 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

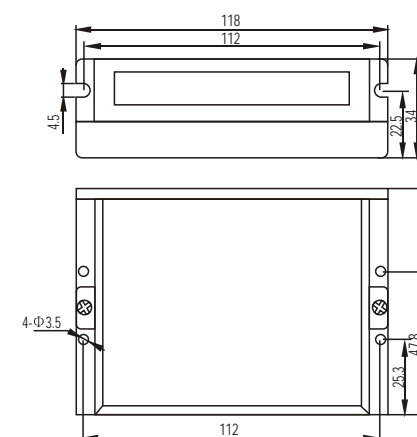


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-5.6 A)		off	off	off
2.1 A	1.5 A	on	off	off
2.7 A	1.9 A	off	on	off
3.2 A	2.3 A	on	on	off
3.8 A	2.7 A	off	off	on
4.3 A	3.1 A	on	off	on
4.9 A	3.5 A	off	on	on
5.6 A	4.0 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)	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

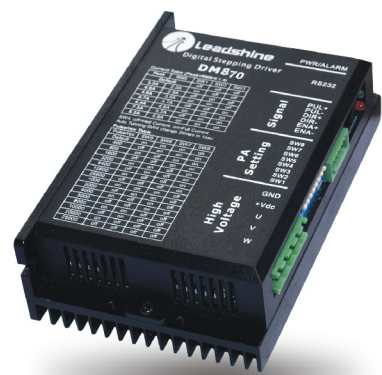
DM870

Introduction

The DM870 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

Suitable for a wide range of stepper motors, from NEMA17 to NEMA34. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM870 an ideal solution for applications that require low-speed smoothness and good high speed performance.

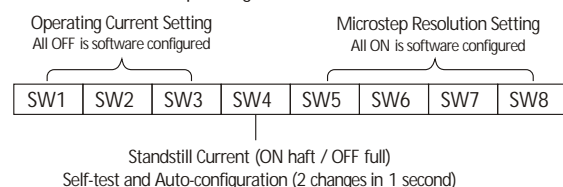


Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 7.0 A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2 \cdot R$) of the original value.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of 20 to 68 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

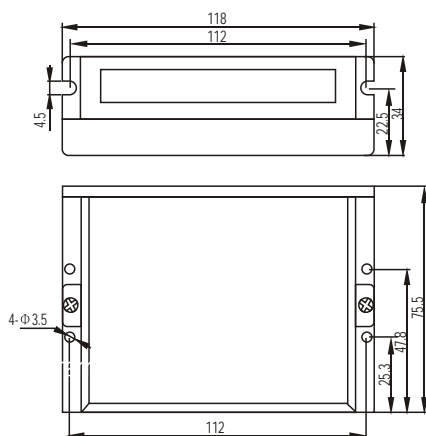


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-7.0 A)				
2.6 A	1.8 A	off	off	off
3.4 A	2.4 A	off	on	off
4.0 A	2.8 A	on	on	off
4.8 A	3.4 A	off	off	on
5.4 A	3.8 A	on	off	on
6.1 A	4.3 A	off	on	on
7.0 A	5.0 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)				
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

DM1182

Introduction

The DM1182 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

Suitable for a wide range of stepper motors, from NEMA34 to NEMA51. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM1182 an ideal solution for applications that require low-speed smoothness and good high speed performance.

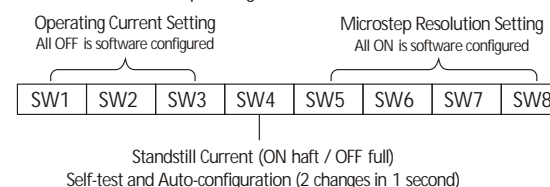


Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.2 A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2 \cdot R$) of the original value.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of 90 VAC to 120 VAC, leaving room for power fluctuation and back-EMF.
Indicators/ Fault Out	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free and fault out (OC) will be pulled to low. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

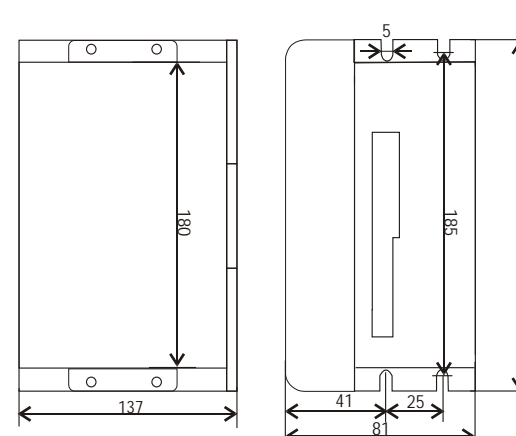


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-8.2 A)				
2.2 A	1.6 A	off	off	off
3.2 A	2.3 A	off	on	off
4.5 A	3.2 A	on	on	off
5.2 A	3.7 A	off	off	on
6.3 A	4.4 A	on	off	on
7.2 A	5.2 A	off	on	on
8.2 A	5.9 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)				
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

DM2282

Introduction

The DM2182 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

Suitable for a wide range of stepper motors, from NEMA34 to NEMA51. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM2182 an ideal solution for applications that require low-speed smoothness and good high speed performance.

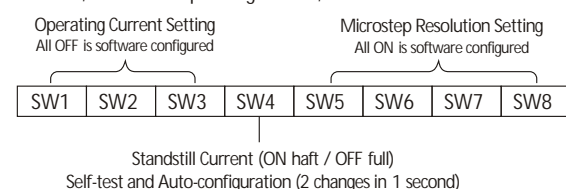


Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.2 A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2 \cdot R$) of the original value.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of 90 VAC to 200 VAC, leaving room for power fluctuation and back-EMF.
Indicators/ Fault Out	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free and fault out (OC) will be pulled to low. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

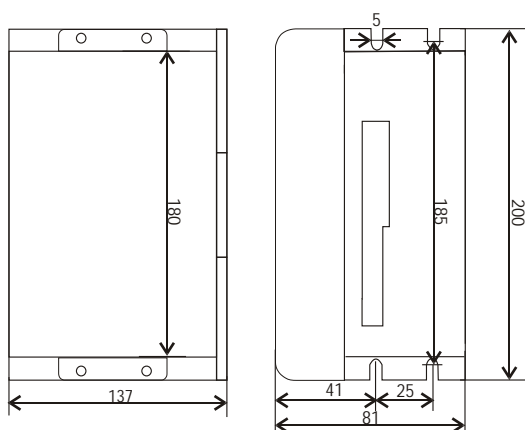


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-8.2 A)		off	off	off
2.2 A	1.6 A	on	off	off
3.2 A	2.3 A	off	on	off
4.5 A	3.2 A	on	on	off
5.2 A	3.7 A	off	off	on
6.3 A	4.4 A	on	off	on
7.2 A	5.2 A	off	on	on
8.2 A	5.9 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)	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

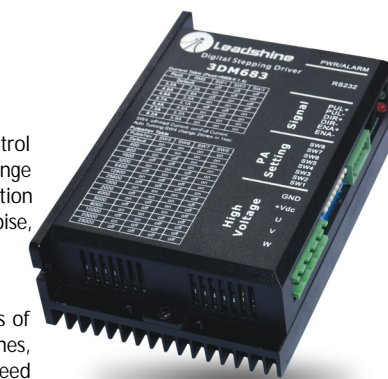
3DM683

Introduction

The 3DM683 is a versatility fully digital 3-phase stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

Suitable for a wide range of stepper motors, from NEMA17 to NEMA34. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the 3DM683 an ideal solution for applications that require low-speed smoothness and good high speed performance.

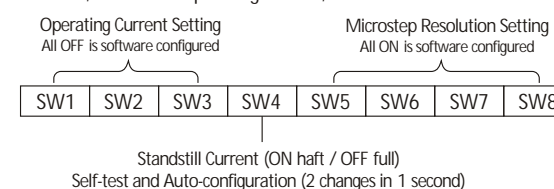


Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.3 A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2 \cdot R$) of the original value.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is used.
Motor Connector	U, V, W are for motor connections. Exchanging the connection of two wires to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of +20 VDC to +48 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

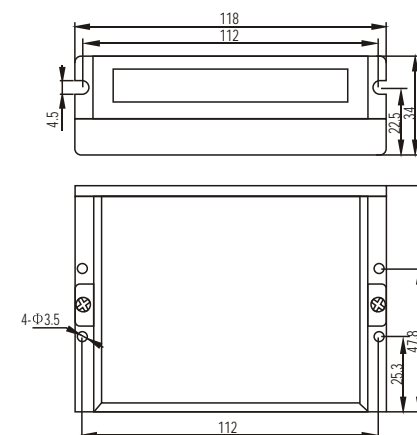


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-8.3 A)		off	off	off
3.2 A	2.3 A	on	off	off
4.0 A	2.9 A	off	on	off
4.9 A	3.5 A	on	on	off
5.7 A	4.1 A	off	off	on
6.4 A	4.6 A	on	off	on
7.3 A	5.2 A	off	on	on
8.3 A	5.9 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

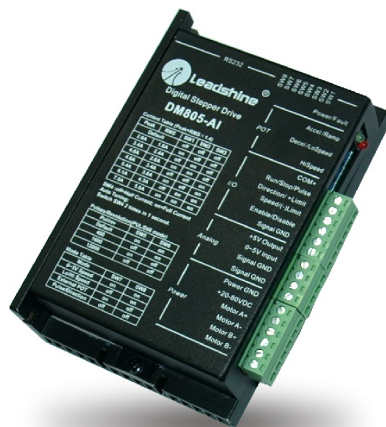
Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured)	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

DM805-AI

Introduction

The DM805-AI is a multi-function digital stepper drive and it belongs to DM series stepper drives. It has all the features that other DM drives have. The DM805-AI is distinguished from other DM series drives by its operating modes. The DM805-AI can be operated in 4 different modes. They are 0-5V speed, low/high speed, external POT and pulse/direction modes.

Three built-in potentiometers can be used to set the velocity, acceleration and deceleration. In 0-5V speed mode, the motor speed follows the analog 0-5V input. In Low/HIGH speed mode, the motor speed is selected by the digital input and adjusted by the high/low speed potentiometers. In pulse/direction mode, the DM805-AI acts as a traditional stepper drive. There is a 5V auxiliary output for customer use. The user can run the motor with the least configuration and connection, without buying a expensive motion controller.

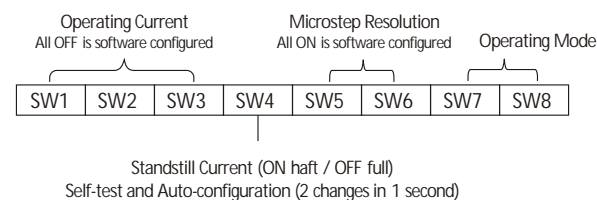


Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.2 A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2 \cdot R$) of the original value.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors.
Control Signals	The DM805-AI is a multi-function digital stepper drive. It can be operated in 0-5V speed, low/high speed, externalPOT and pulse/direction modes. There are 3 potentiometers, 4 digital inputs and 1 analog input can be configured to control the acceleration, speed, position and direction in different modes.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of 20 to 80 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution, output current and operating mode are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:



Operating Current Setting

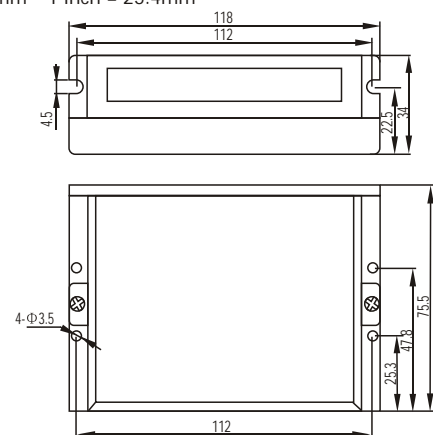
Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-7.0 A)		off	off	off
2.6 A	1.8 A	on	off	off
3.4 A	2.4 A	off	on	off
4.0 A	2.8 A	on	on	off
4.8 A	3.4 A	off	off	on
5.4 A	3.8 A	on	off	on
6.1 A	4.3 A	off	on	on
7.0 A	5.0 A	on	on	on

Microstep Resolution Setting

Steps/rev.	SW5	SW6
Default (software configured, 1-512)	on	on
400	off	on
1600	on	off
12800	off	off

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Applications

Particularly suitable for the applications which need to adjust the velocity via the potentiometer or analog 0-5V command. Owing to high torque and super-low motor noise at low speed, stepper solution based on the DM805-AI can be used to replace the brushless motor and gearbox solution, which is used in various kinds of machines, such as rotary heat exchange, conveyor belts, transport vehicle, offering longer life time and lower cost than the later.

Operating Mode Setting

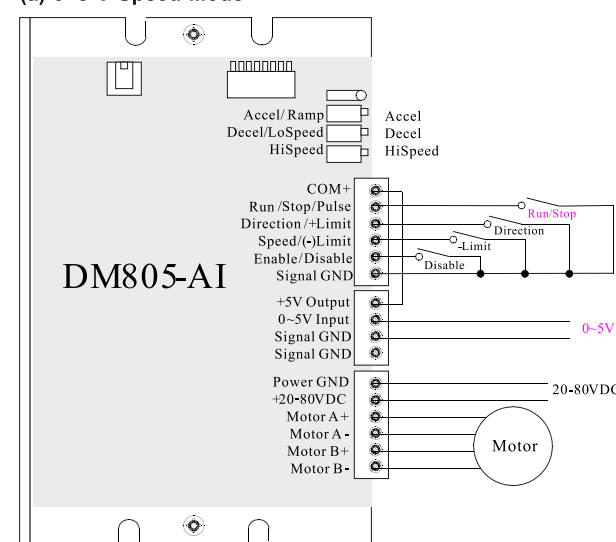
Operating Modes	SW7	SW8	Descriptions
0-5 V Speed	on	on	Speed controlled by the 0-5V, and direction controlled by the direction input.
Low/High Speed	off	on	Speed controlled by the preset low speed and high speed, and direction control by the direction input.
External POT	on	off	Both speed and direction are controlled by the 0-5V. 0-2.5 V, negative direction; 2.5-5V, positive direction.
Pulse/Direction	off	off	Speed and movement distance are controlled by the pulse, and direction controlled by the direction input.

Potentiometer Function in Different Operating Modes

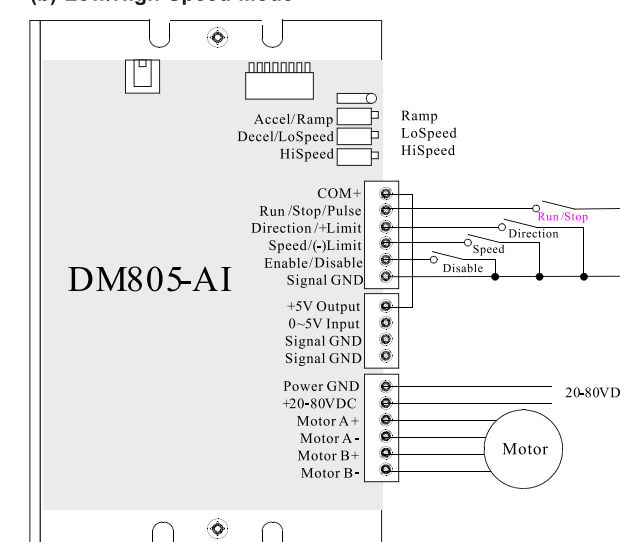
Potentiometers	0-5V Speed Mode	Low/High Speed Mode	External POT Mode	Pulse/Direction Mode
Accel / Ramp	Acceleration	Ramp	Acceleration	N/A
Decel / LoSpeed	Deceleration	Low Speed	Deceleration	N/A
HiSpeed	High Speed	High Speed	High Speed	N/A

Typical Connections

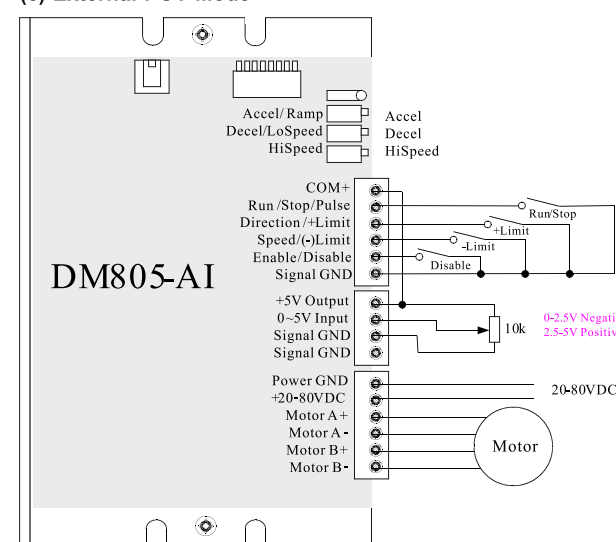
(a) 0-5 V Speed Mode



(b) Low/High Speed Mode



(c) External POT Mode



(d) Pulse/Direction Mode

