



DM SERIES
DM320C
DM422C
DM442
DM556
DM870
DM1182
DM2282
3DM683
DM805-AI
M SERIES
M542
M550
M760
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M880A
MA860
MA860H

# DM Series Fully Digital Stepper Drives

## 9 Innovative Technologies

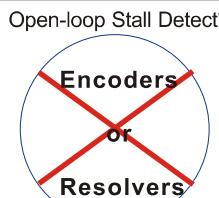
### Sensorless Stall Detection

By detecting motor voltage, current, and back-emf signal, Leadshine digital drives can detect loss-of- and multi-stepping technology synchronization of stepper motors without encoders. The sensorless stall detection eliminates cost of feedback devices and time of cable connection.

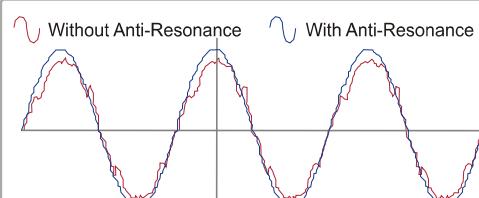
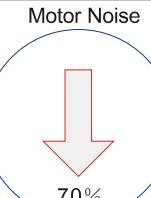
### Super Low Noise

Precision current control technology Most stepper systems resonate at mid-range speed between 10 to 18 rps. DM stepper drives can calculate natural frequency of the stepper system and apply anti-resonance solution for the applications require optimizing torque and nulling mid-range instability.

### Anti-Resonance at Mid-range



\* Available on the AM882 and other EMxxx drives.

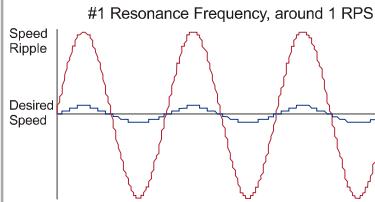


Providing optimum torque and nulls mid-range instability.

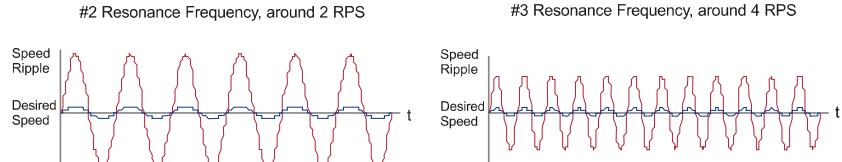
### Low-speed Ripple Smoothing

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.

Without Smoothing



With Smoothing



### 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.

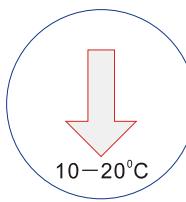
### Lower Motor Heating

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.

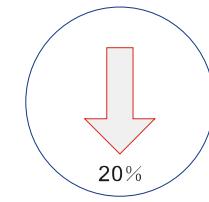
### Lower Drive Heating

Input Microstep Setting  
Synthesized Microsteps

Motor Heat



Drive Heat



### Command Signal Smoothing

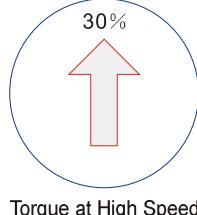
Command signal smoothing can soften the effect of sudden changes in velocity and direction, thus delivering smoother performance and improving system lifetime.

### Torque Improving

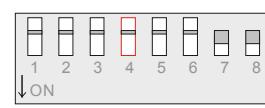
Torque improvement increases torque up to 30% for stepper motor to 3000 RPM or even higher, and different motors. It is easier for users to significantly increase production efficiency.

### Self-test and Auto-configuration

Before Smoothing  
After Smoothing



Torque at High Speed



Turn SW4 2 times switch in 1 second.



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## Features

- **Sensorless stall detection** eliminates cost of feedback devices and time of cable connection\*
- **Super-low motor noise** offers excellent quietness
- **Anti-Resonance** optimizes torque and nulls mid-range instability technology
- **Self-test and Auto-configuration** offers optimum performance for different motors
- **Multi-stepping** allows a low resolution input to produce a higher microstep output for smoother system performance
- Command source include step/direction and analog (0 - 5 V)
- Output current, microstep resolutions, standstill current programmable
- Built-in motion controller for self-test or some simple applications
- Options to set output current and microstep resolutions via DIP switch or software
- Drives for 2-phase and 3-phase stepper motors are available
- 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 super-low motor noise, extra smoothness and excellent high speed performance make DM stepper drives deliver servo-like performance at the cost of stepper drives. Leadshine DM series stepper drives are able to drive 2-phase or 3-phase stepper motors from NEMA8 to NEMA51.

## Applications

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

## Electrical Specifications

Parameters	Input Voltage (VDC)			Output Current (A)		
	Model	Min	Typical	Max	Min	Typical
DM320C	+18	+24	+30	0.3	-	2.0
DM422C <small>AV</small>	+18	+24	+40	0.3	-	2.2
DM442	+18	+36	+40	0.5	-	4.2
DM556	+18	+36	+50	0.5	-	5.6
DM870 <small>AV</small>	+18	+60	+80	0.5	-	7.0
DM1182 <small>AV</small>	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)		
Model	Min	Typical	Max	Min	Typical	Max
DM Series	0	-	300**	7	10	16
					500	-
						-

\*This function is available on the AM882 and other EMxxx stepper drives. Visit Leadshine's website for the latest information about our digital stepper drives .

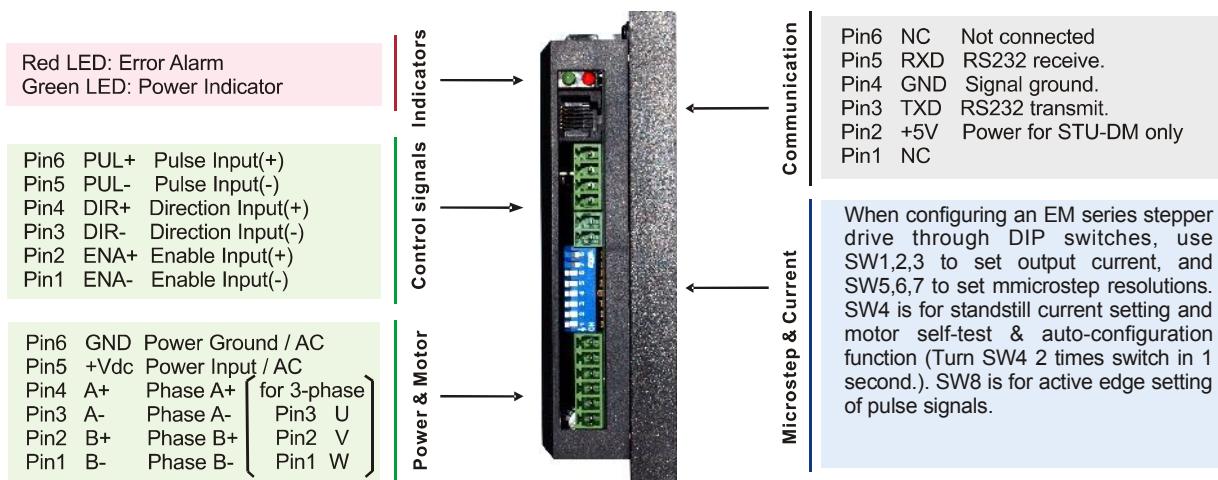
\*\* Those of the DM320C and DM422C are 75 kHz, and that of the DM442 is 200 kHz .



## Pin Assignment and Description

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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.

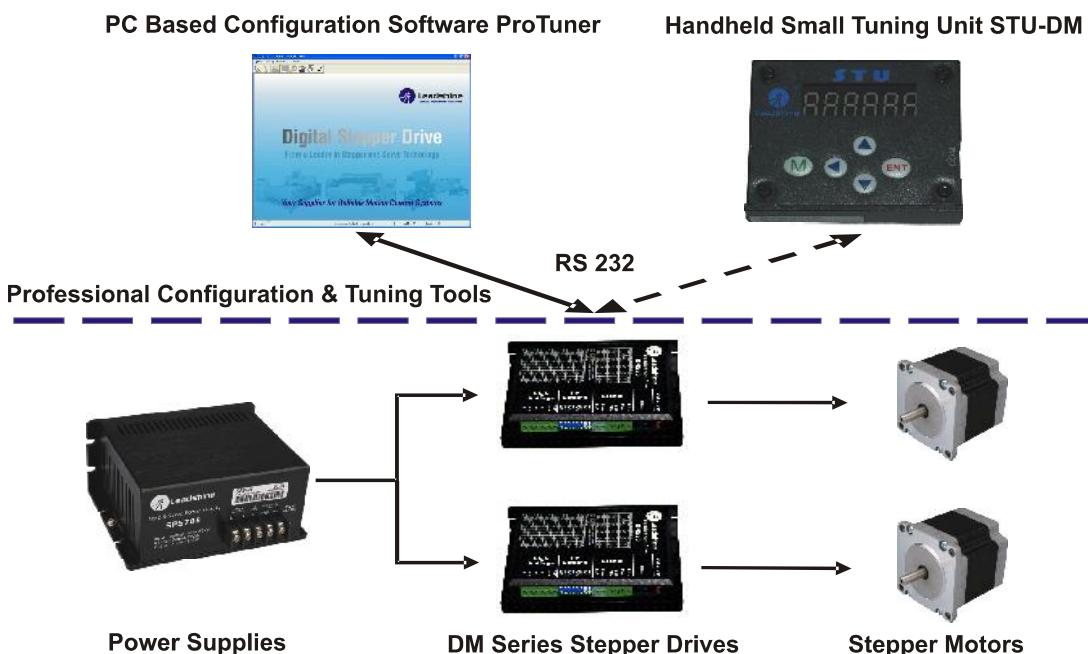


### Tips:

1. 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.
2. To operate at current and microstep settings configured by software or STU, DIP switch must set to default mode.
3. Only software **ProTuner** can be used to configure anti-resonance parameter settings.
4. 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.

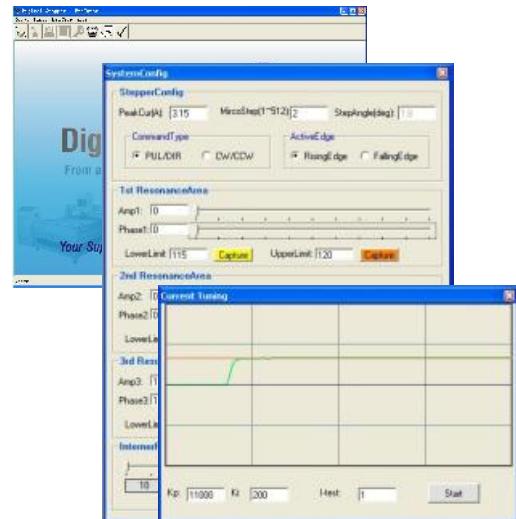


## ProTuner (Windows Based Setup Software)

- 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.



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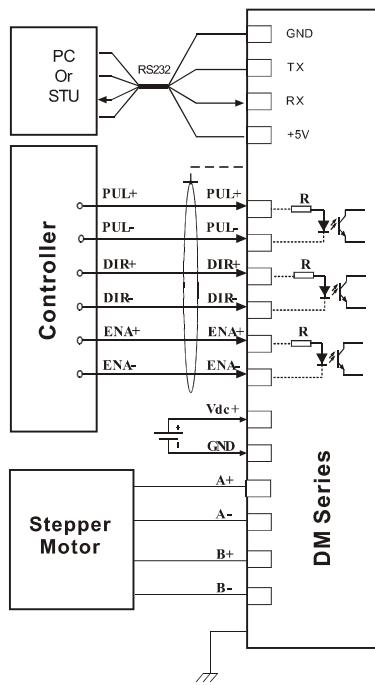
## STU-DM (Handheld Configuration and Tuning Unit)

- 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

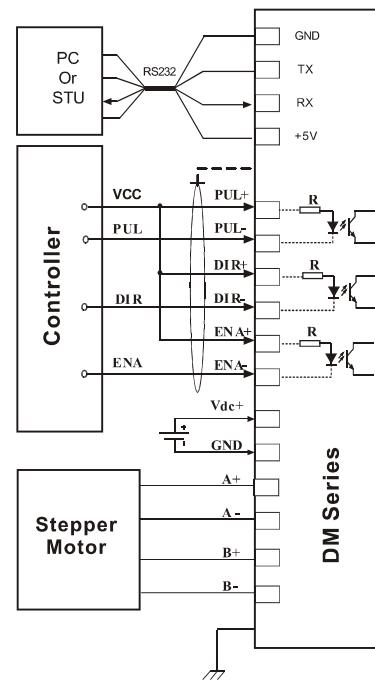
\* Leadshine offers special cable for communication between the STU-DM and the drive.



## Typical Connections



(a) Differential control signals



(b) Single-ended (NPN) control signals



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# DM320C

## Introduction

The DM320C 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 DM320C an ideal solution for applications that require low-speed smoothness.



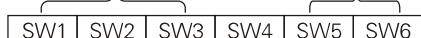
## Function Description

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 2.0 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 functions. 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. ALM+ and ALM- are for the alarm 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 VDC to +24 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**    All ON is software configured    **Microstep Resolution Setting**    All ON is software configured



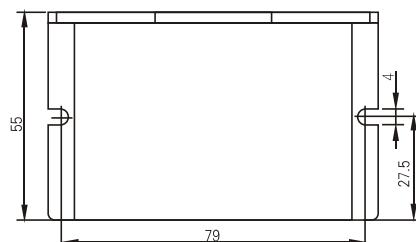
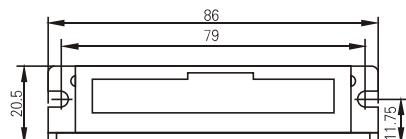
Standstill Current (ON half / OFF full)  
Self-test and Auto-configuration (2 changes in 1 second)

## Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.3-2.0 A)	on	on	on	on
0.5 A	0.35 A	off	on	on
0.7 A	0.50 A	on	off	on
1.0 A	0.71 A	off	off	on
1.2 A	0.86 A	on	on	off
1.5 A	1.07 A	off	on	off
1.7 A	1.21 A	on	off	off
2.0 A	1.43 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
800	off	on
3200	on	off
12800	off	off

# 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.



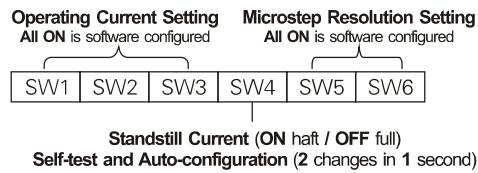
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M SERIES
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## Function Description

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 $P=i^2R$ ) 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 VDC 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:

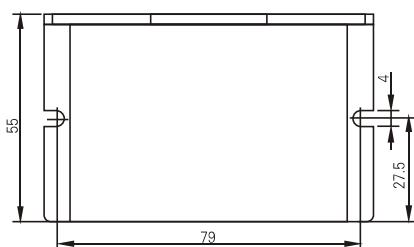
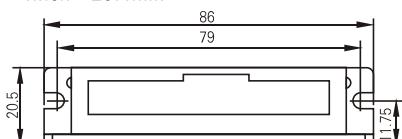


## Operating Current Setting

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



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# DM442

## Introduction

The DM442 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 NEMA10 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 DM442 an ideal solution for applications that require low-speed smoothness and good high speed performance..

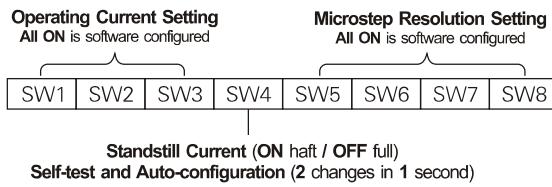


## Function Description

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 it's not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 4.2 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 the for 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 +18 VDC 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 an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

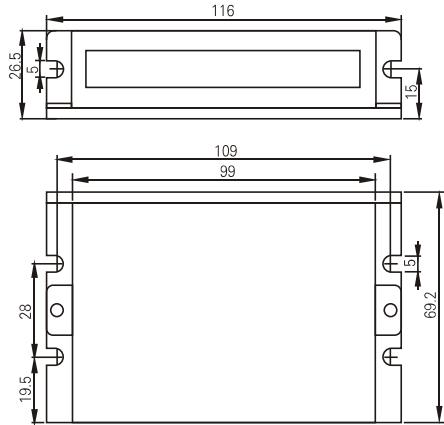


## Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-4.2 A)	0.5-4.2 A	on	on	on
1.46 A	1.04 A	off	on	on
1.91 A	1.36 A	on	off	on
2.37 A	1.69 A	off	off	on
2.84 A	2.03 A	on	on	off
3.31 A	2.36 A	off	on	off
3.76 A	2.69 A	on	off	off
4.20 A	3.00 A	off	off	off

## 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

# 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..



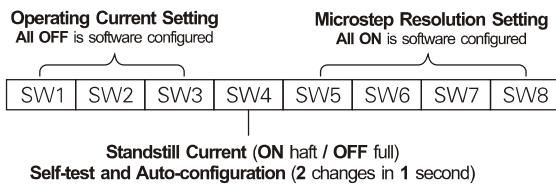
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## Function Description

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 $P=I^2R$ ) 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 VDC 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:

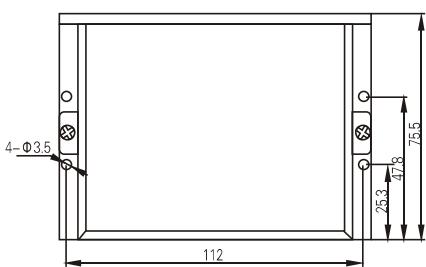
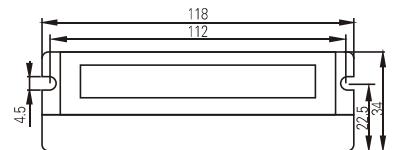


## Operating Current Setting

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

# DM856

## Introduction

The DM856 is a versatility fully digital stepping 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 stepping drives on the market.

## Applications

Suitable for a wide range of stepping 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 DM856 an ideal solution for applications that require low-speed smoothness and good high speed performance.



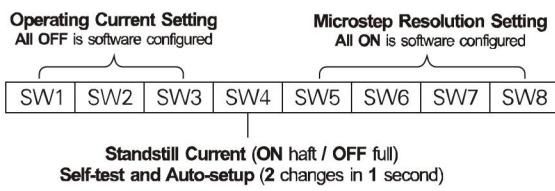
DIM SERIES
DM320C
DM422C
DM432C
DM442
DM556
DM856
DM870
3DM683
M SERIES
M550
M760
M880 V5.0
M880A
MA860
MA860H
MA15B
ND2282

## 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 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-setup 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 $P=I^2R$ ) of the original value.
Self-test and auto-setup	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-setup 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 VDC 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:

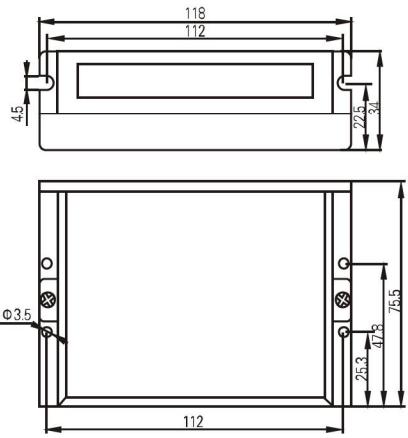


## Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-5.6 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

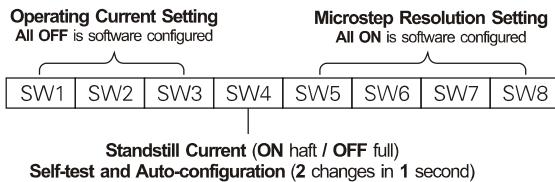
Suitable for a wide range of stepper motors, from NEMA17 to NEMA34. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM870 an ideal solution for applications that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

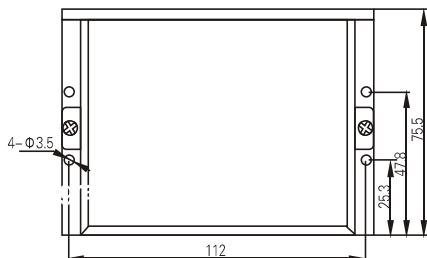
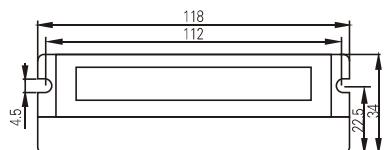


## Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-7.0 A)		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

## 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



DM SERIES
DM320C
DM422C
DM442
DM556
DM870
DM1182
DM2282
3DM683
DM805-AI
M SERIES
M542
M550
M760
M860
M880A
MA860
MA860H

# DM2282

## Introduction

The DM2282 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 DM2282 an ideal solution for applications that require low-speed smoothness and good high speed performance.

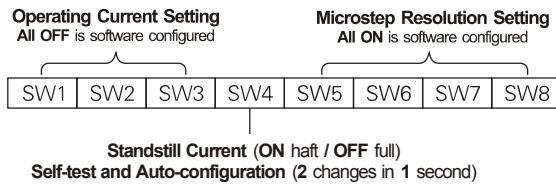


## Function Description

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:

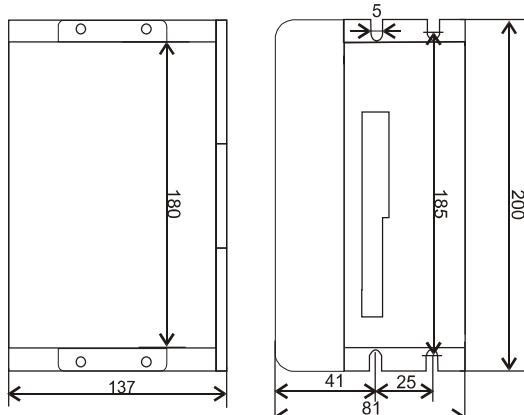


## Operating Current Setting

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
4.2 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