

Moving Into Fully Digital Age

—Leadshine DM Series Fully Digital Stepping Drives



Leadshine's DM series fully digital stepping drives are DSP-based and innovative products employing the latest achievement in stepping control technology. These drives deliver the same level of features and performance as what global leading brands can achieve. The DM series drives include DM422C, DM432C, DM556, DM856 for the moment, covering a broad supply voltage and output current ranges. Unique level of system smoothness and high speed performance make them deliver servo-like performance at the cost of a analog stepping drive.

8 Innovative Technologies

- Anti-Resonance Technology
- Low-speed Ripple Smoothing
- Command Signal Smoothing
- Multi-stepping Technology
- Torque increasing Technology
- Low Noise Technology
- Low Heating Technology
- Self-test and auto-setup

Specifications

Model	Input	Output	Description
DM422C*	18-40VDC	0.3-2.2A	Micro size, (86×55×20.5mm) Unique level of smoothness
DM432C*	18-40VDC	0.5-3.2A	Unique level of smoothness
DM556	18-50VDC	0.5-5.6A	Unique level of smoothness and high speed performances
DM856	18-80VDC	0.5-5.6A	Unique level of smoothness and high speed performances

● Over voltage, Over current and Phase error protections.

*"C": Low Cost



DM Series Fully Digital Stepping Drivers

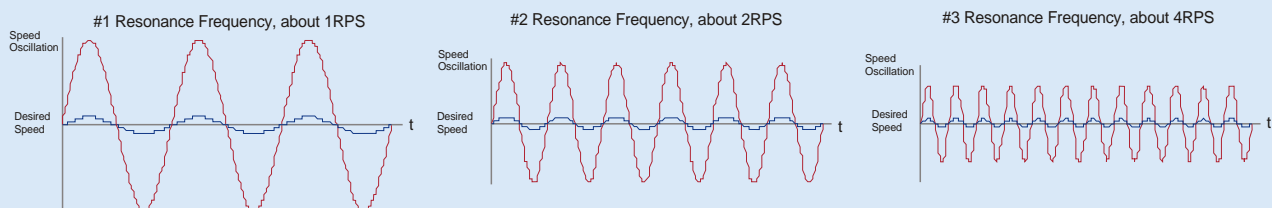
8 Innovative Technologies

Low-speed Ripple Smoothing

Electronic damping for 3 major resonance frequency at low speed range, eliminating undesirable motor speed oscillation and making the DM series deliver unique level of smoothness.

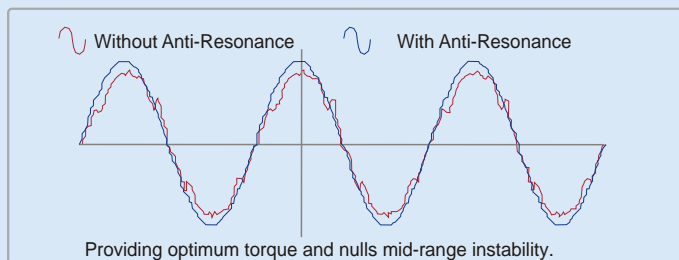
Without Smoothing

With Smoothing



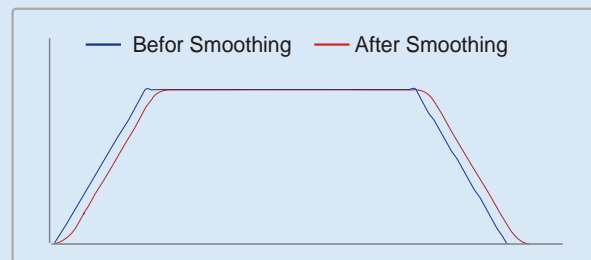
Anti-Resonance at Mid-range

Stepping systems resonate at mid-range. The DM series drives can calculate the system's natural frequency and apply damping to control algorithm for anti-resonance.



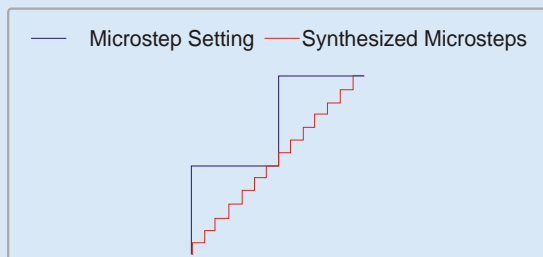
Command Signal Smoothing

Command signal smoothing can soften the effect of immediate change in velocity and direction, delivering smoother system performance.



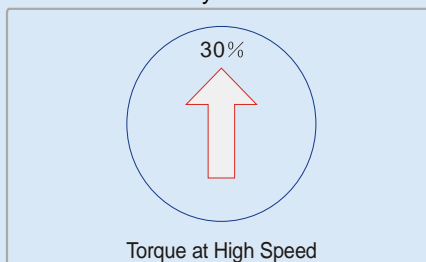
Multi-Stepping Technology

Multi-Stepping allows a low resolution step input to produce a higher microstep output for smooth system performance.



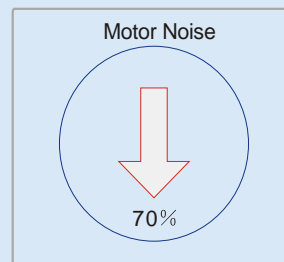
Torque improving Technology

Increase torque up to 30% at high speed. 3000RPM or even higher speed can be achieved by a normal motor.



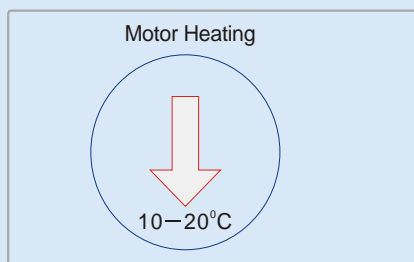
Super Low Noise

Dramatically reduces about 70% motor noise.



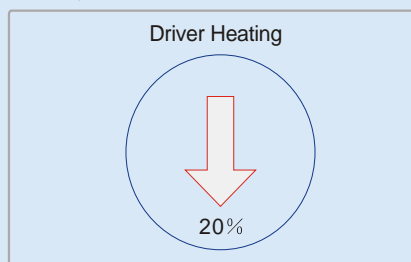
Lower Motor Heating

Motor heating is 10–20°C lower than using a normal drive, longer motor lifetime can be achieved.



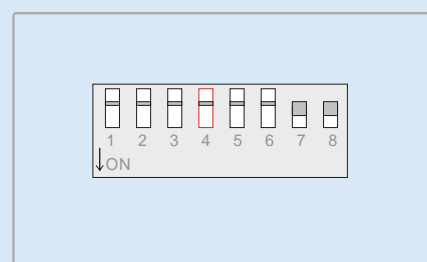
Lower Drive Heating

Drive heating is up to 20% lower than a normal driver, offering higher system stability.



Self-test and Auto-setup

Motor self-test and parameter auto-setup technology, offers optimum responses with different motors.





Features

- * **Anti-Resonance**, provides optimum torque and nulls mid-range instability
- * **Self-test and Auto-setup** technology, offers optimum responses with different motors
- * **Multi-Stepping** allows a low resolution step input to produce a higher microstep output for smooth system performance
- * Input voltage up to 80 VDC and Output current up to 5.6A
- * Output current programmable, from 0.5A (The DM422 is 0.3A) to the Maximum values.
- * Microstep resolutions programmable, from full-step to 51,200 steps/rev
- * Opto-isolated inputs, support single-ended and differential signals
- * Support PUL/DIR and CW/CCW modes
- * Built-in motion controller for self-test with trapezoidal velocity profile
- * PC based and handheld configuration and tuning tools, including ProTuner and STU-Step.
- * Over-current, over-voltage, phase error protections
- * 10 latest errors self-record function

Introduction

Leadshine's DM series fully digital stepping drives are DSP-based and innovative products adopting the latest achievement in stepping control technology. The DM series drives include DM422C, DM432C, DM556, DM856 for the moment. These drives deliver the same level of features and performance as what global leading brands can achieve, and can significantly improve the performance of stepping systems.

Applications

Suitable for a wide range of stepping motors, from NEMA frame size 14 to 34. Can be used in various kinds of machines, such as pneumatic markers, laser cutters, laser markers, high precision X-Y tables, measurement devices, medical equipments and so on. Their unique features make them an ideal solution for applications desired with low noise, high smoothness, high precision and high speed performance.

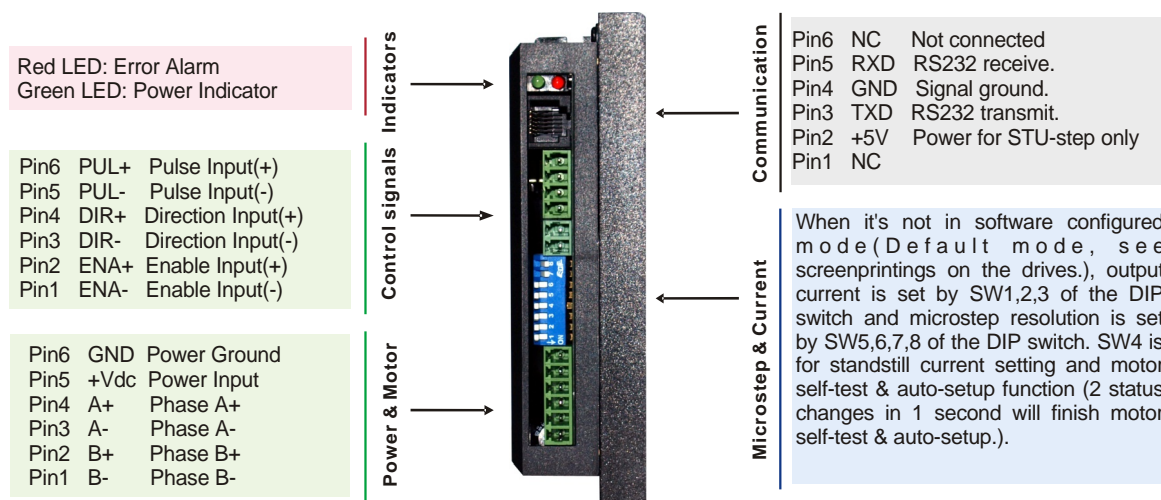
Electrical Specifications

Parameters	Model	Min	Typical	Max
Peak Current (A)	DM422C	0.3	-	2.2
	DM432C	0.5	-	3.2
	DM556	0.5	-	5.6
	DM856	0.5	-	5.6
Input Voltage (VDC)	DM422C	+18	+24	+40
	DM432C	+18	+24	+40
	DM556	+18	+36	+50
	DM856	+18	+60	+80
Logic Signal Current (mA)		7	10	16
Pulse Input Frequency (kHz)		0	-	300
Isolation Resistance (M Ω)		500	-	-



Pin Assignment and Description

Similar to Leadshine's other drives, the DM series drives also have two connectors. Connector P1 for control signal connections, and connector P2 for power and motor connections. The users do not need to change wirings when upgrading control system. An additional RS232 communication interface of the DM series drives is used for parameter configuration or setting. The follow figure shows a brief description of these connectors and interface.

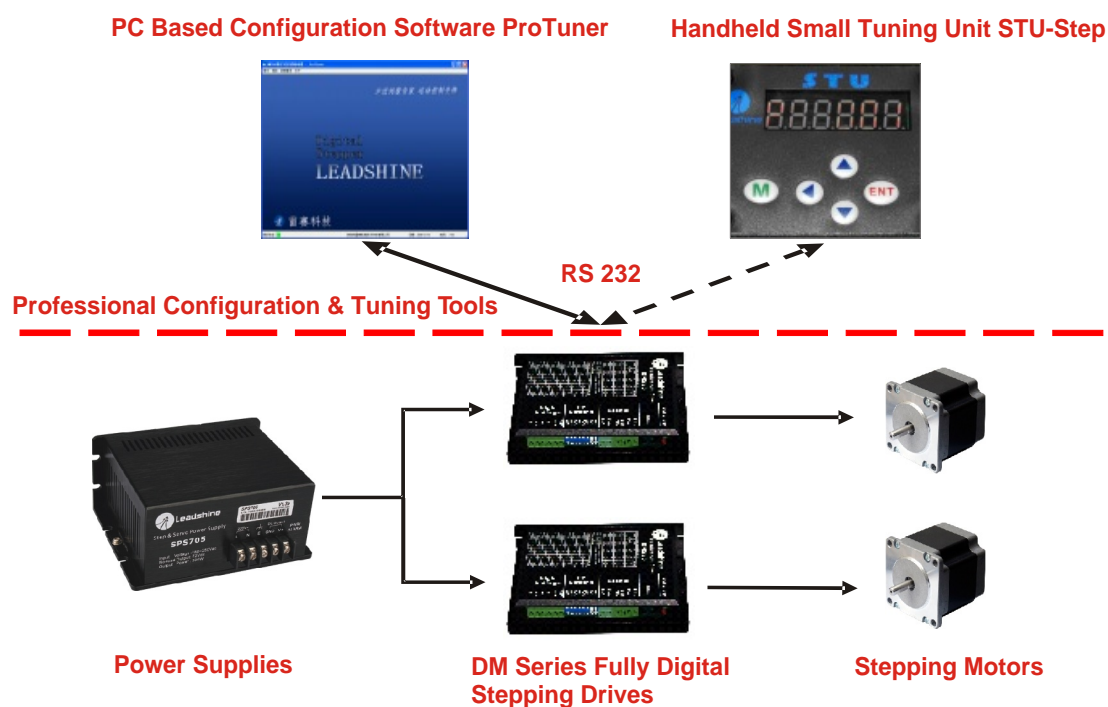


Using Tips:

1. The user should use motor self-test and auto-setup function when powering up the system (with motor) for first time or changing a new motor different from the old one.
2. The SW switches of the DIP switch should be in **DEFAULT** mode if needs the drives operate at software configured mode, including output current and microstep settings. ProTuner and STU-step can be used for these settings.
3. **ONLY ProTuner** can be use to configure advanced settings, i.e. anti-resonance parameter settings.
4. How many times the RED led turns on in one periodic time indicates what protection has been activated. See their manuals.

PC Based and Handheld Configuration & Tuning Tools

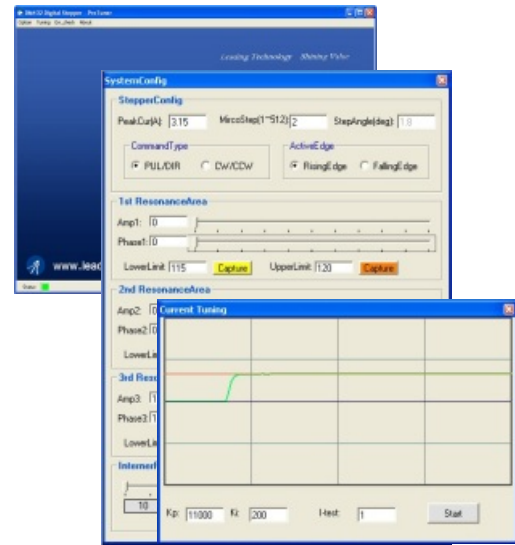
The DM series drives have motor self-test and auto-setup function, and this function can manage most of applications. However, if the user want to configure advanced settings for better performances, i.e. anti-resonance parameters, PC based and handheld configuration & tuning tools, including ProTuner and STU-step can meet different requirements and configuration & tuning environments.





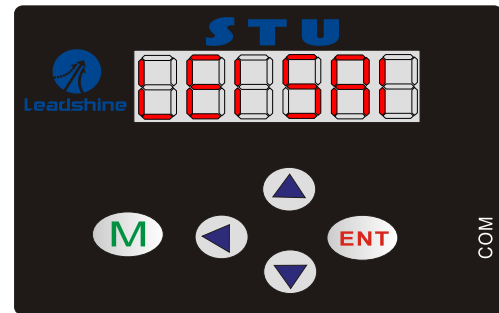
ProTuner (Windows Based Setup Software)

- Upload & Download parameter settings
- PI parameter settings for current loop
- Output current setting
- Microstep resolution setting, from 1 to 512
- PUL/DIR or CW/CCW mode configuration
- 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 (with trapezoidal velocity profile)
- 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.

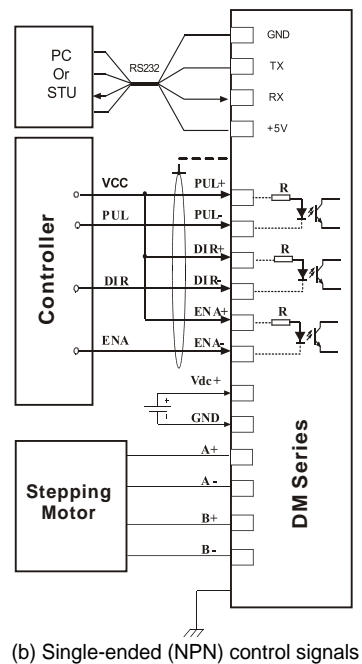
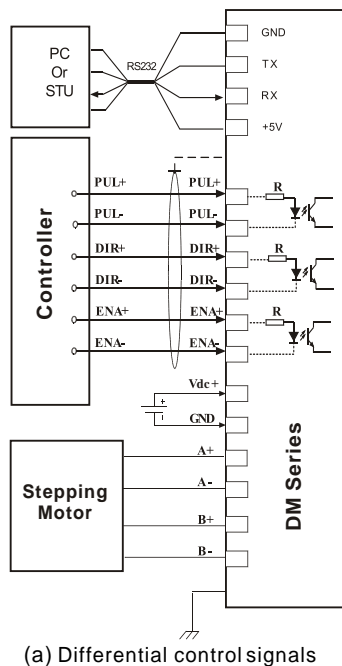


STU-step (Handheld Configuration and Tuning Unit)

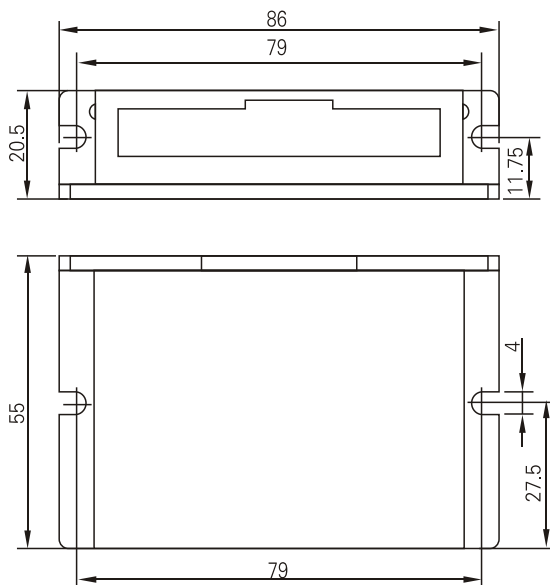
- Upload & Download parameter settings
- PI parameter settings for current loop
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- Microstep resolution setting, from 1 to 512
- PUL/DIR or CW/CCW mode configuration
- DIR logic level setting
- Active edge of Pulse signal setting
- Electronic damping coefficient setting
- Anti-resonance parameter settings for 3 resonance area
- Parameter settings for self motion test (with trapezoidal velocity profile)
- Read the latest failure event and clear the event
- * Leadshine offers special cable for communication between the STU-step and the drive.



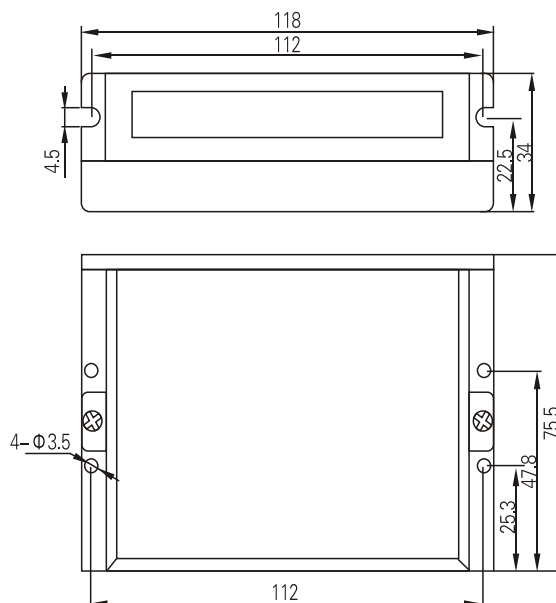
Typical Connections



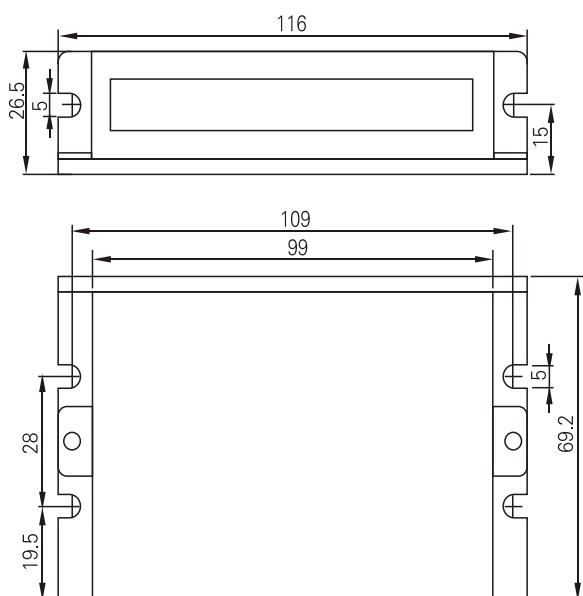
Mechanical Specifications (Unit: mm 1 inch=25.4mm)



(a) Mechanical specification of the DM422C



(b) Mechanical specification of the DM556 and DM856



(c) Mechanical specification of the DM432C

Order Information

Model	Description
DM422C	Input: 18 ~ 40 VDC, Output: 0.5 ~ 2.2 A, Suitable for NEMA 14 to NEMA 23 motors and low-medium speed applications desired with high smoothness.
DM432C	Input: 18 ~ 40 VDC, Output: 0.5 ~ 3.2 A, Suitable for NEMA 14 to NEMA 23 motors and low-medium speed applications desired with high smoothness.
DM556	Input: 18 ~ 50 VDC, Output: 0.5 ~ 5.6 A, Suitable for NEMA 14 to NEMA 34 motors and low, medium, high speed applications desired with high smoothness.
DM856	Input: 18 ~ 80 VDC, Output: 0.5 ~ 5.6 A, Suitable for NEMA 14 to NEMA 34 motors and low, medium, high speed applications desired with high smoothness.
STU-step	Handheld configuration and tuning unit for DM series drives, suitable for tuning the drives without computer.
ProTunner	PC based configuration software for DM series drivers, suitable for tuning the drives with computer, offering more settings, i.e. Anti-resonance tuning.

China Headquarters

Address: 3/F, Block 2, Nanyou Tianan Industrial Park,
Nanshan District Shenzhen, China

Web: www.leadshine.com

Sales Hot Line:

Tel: 86 755-2643 4369 (for All)

86 755-2641 7674 (for Asia, Australia, Africa areas)

86 755-2640 9254 (for Europe, America areas)

Fax: 86 755 2640 2718

Email: sales@leadshine.com

Technical Support:

Tel: 86 755 2647 1129 and 86 755 2641 8447

Fax: 86 755 2640 2718

Email: tech@leadshine.com and vic@leadshine.com

Leadshine HK

Address: Rm 3, 9/F, Block E, Wah Lok Industrial Center,
31-41 Shan Mei St., Fo Tan, Shatin, Hong Kong

Tel: 852-2952-9114

Fax: 852-2952-9395

Email: hk_sales@leadshine.com

Leadshine U.S.A

Address: 15209 Dufief Dr., Gaithersburg, MD 20878, USA

Tel: 1-301-433-3780

Email: usa_sales@leadshine.com and cli@leadshine.com