Leadshine

Stepping Drives

Leadshine 2-phase Digital Stepper Drives

Leadshine has been an industry leading motion control supplier since 1997, and is one of the largest stepper drive manufacturers in the world. Leadshine steppers offer high quality products (Leadshine factories are ISO9001 certified) at very affordable prices. Leadshine steppers are simple, easy to use, long-lasting, and reliable.

AutomationDirect sells a wide range of linear and switching power supplies, stepper motors, cables, and PLCs with hi-speed outputs that are compatible with Leadshine stepper drives.

Features

- 2-phase digital stepper drives
- Anti-resonance for optimal torque, extra smooth motion, low motor heating and noise
- Motor auto-config on power up
- All drives support step and direction control, some models support CW/CCW as well
- Micro-stepping for smooth motor movement
- DIP switch configurable
- Wide range of input voltages supported (12-110 VDC, 18-80 VAC)
- Pulse input frequency up to 200kHz
- Soft-start with no "jump" when powered on
- Automatic idle-current reduction
- Protections for over-voltage and over-current
- NEMA 11, 14, 17, 23, 24, 34 and 42 frame size step motors supported

Leadshine Series – Drives Features Comparison1

Drive Model	DM322E	DM542E	DM556E	DM860E	DMA860E	DM805-AI	EM542S	EM556S
Price	$27.50	$39.00	$43.00	$53.00	$69.00	$113.00	$50.00	$61.00
Drawing	PDF	PDF	PDF	PDF	PDF	PDF	PDF	PDF
Drive Type	2-phase digital stepper drive							
Supply Voltage	12–30 VDC (24 VDC typical)	20–50 VDC (24–48 VDC typical)		24–74 VDC (48–68 VDC typical)	24–110 VDC (48–90 VDC typical) or 18–80 VAC (36–70 VAC typical)	20–80 VDC (30–60 VDC typical)	20–50 VDC (24–48 VDC typical)	
Pulse Input Type	Single-ended2	Differential, Single-ended				Single-ended2	Differential, Single-ended	
Step Input Modes	Step & Direction			Step & Direction, CW & CCW		Step & Direction, Analog input	Step & Direction, CW & CCW	
Digital Input Voltage	5V (add a 1K resistor to accept +12V input, or a 2K resistor to accept +24V input)						DIP switch selectable for 5V or 24V	
PPR Range	400–12800	400–25600		400–51200		200-12800	200–25600	
Motor Output Current Range	0.3–2.2 A peak (0.2–1.6 RMS)	1.0–4.2 A peak (0.7–3.0 RMS)	1.8–5.6 A peak (1.3–4.0 RMS)	2.4–7.2 A peak (1.7–5.1 RMS)		2.6–7.0 A peak (0.3–5.0 RMS)	0.5-4.2A peak (0.4-2.9 RMS)	0.5-5.6A peak (0.4-3.9 RMS)
Digital Output	No						+24VDC (Brake and Fault Detection)	
Self-test Capable	No	No	No	No	No	Yes	Yes	Yes
Special Features	Soft-start, motor auto-config				Accepts a DC or an AC power supply, soft-start, motor auto-config	Built-in pulse generator, command source	Auto-tuning, soft-start, fault and brake outputs, shaft lock	

1 - Refer to Specifications Tables for detailed specifications.
2 - See the User Manual or Quick Start Guide for instructions on wiring Single-Ended drives to a Differential (Line Driver) controller.

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Stepping Drives

DM542E

DMA860E

DM542E, DM556E, DM860E, DMA860E

The DM542E and DM556E drives are capable of pulse and direction operation, with auto-motor config on power up.

The DM860E and DMA860E drives possess the same capabilities but can also do CW and CCW pulse operation. The main difference between these models are output current range to the motor and supply voltage.

Leadshine DM542E, DM556E, DM860E, DMA860E Specifications					
Drive Model		***DM542E***	***DM556E***	***DM860E***	***DMA860E***
Output Current		1.0–4.2 A peak (0.7–3.0 RMS)	1.8–5.6 A peak (1.3–4.0 RMS)	2.4–7.2 A peak (1.7–5.1 RMS)	2.4–7.2 A peak (1.7–5.1 RMS)
Input Voltage		20–50 VDC (24–48 VDC typical)		24–74 VDC (48–68 VDC typical)	24–110 VDC (48–90 VDC typical) or 18–80 VAC (36–70 VAC typical)
Logic Signal Current		7–16 mA (10mA typical)			
Pulse Input Frequency		0–200 kHz			
Minimal Pulse Width		2.5 µs			
Minimal Direction Setup		5.0 µs			
Isolation Resistance		500mΩ			
Connector P1 Functions	***PUL+***	Pulse signal: 5V signal, differential input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1kΩ resistor for +12V signals, 2kΩ for +24V signals.			
	PUL-				
	DIR+	Direction signal: 5V signal, differential input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1kΩ resistor for +12V signals, 2kΩ for +24V signals. Direction Function: requires 5µs setup time. CW/CCW Function (DM860E and DMA860E only): see DIP switch SW14.			
	DIR-				
	ENA+	Enable signal: 5V signal, differential input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1kΩ resistor for +12V signals, 2kΩ for +24V signals. Enable Function: Close (pull low) to disable the drive.			
	ENA-				
Replacement Connectors		Power = DN-6PLUG, I/O = DN-4PLUG, Enable = DN-2PLUG			
Cooling		Natural cooling or forced cooling			
Ambient Temperature		0°C to 65°C (32°F to 149°F)			
Humidity		40–90% relative humidity			
Operating Temperature		0°C to 50°C (32°F to 122°F)			
Vibration		10–50 Hz / 0.15 mm			
Storage Temperature		-20°C to 65°C (-4°F to 149°F)			
Self Test		No			
Weight		227g (8 oz)	300g (10.6 oz)	510g (1.13 lbs)	510g (1.13 lbs)

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Stepping Drives

DM332E

The DM322E is a compact drive capable of pulse and direction operation, with motor auto-configuration on power up.

DM322E

Leadshine DM322E Specifications		
Drive Model		***DM322E***
Output Current		0.3–2.2 A peak (0.2–1.6 RMS)
Input Voltage		12–30 VDC (24 VDC typical)
Logic Signal Current		7–16 mA (10mA typical)
Pulse Input Frequency		0–70 kHz
Minimal Pulse Width		7.5 µs
Minimal Direction Setup		7.5 µs
Isolation Resistance		100mΩ
Connector P1 Functions	***PUL***	Pulse signal: 5V signal, single-ended input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1kΩ resistor for +12V signals, 2kΩ for +24V signals.
	DIR	DIR signal: 5V signal, single-ended input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1kΩ resistor for +12V signals, 2kΩ for +24V signals. Direction Function: requires 5µs setup time. CW/CCW Function: see DIP switch SW14.
	OPTO	This input is the voltage supply for the Pulse, Direction, and Enable opto-couplers. Connect 5VDC (or +12V, +24V with appropriate resistors on Pulse, Direction, and Enable inputs).
	ENA	Enable signal: 5V signal, single-ended input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1kΩ resistor for +12V signals, 2kΩ for +24V signals. Enable Function: Close (pull low) to disable the drive.
Replacement Connectors		Power = 6-pin from STP-CON-4; I/O = 4-pin from STP-CON-5
Cooling		Natural cooling or forced cooling
Ambient Temperature		0°C to 65°C (32°F to 149°F)
Humidity		40–90% relative humidity
Operating Temperature		0°C to 50°C (32°F to 122°F)
Vibration		10–50 Hz / 0.15 mm
Storage Temperature		-20°C to 65°C (-4°F to 149°F)
Self Test		No
Weight		90g (3.5 oz)

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Stepping Drives

DM805-AI

The DM805-AI is capable of pulse and direction as well as analog input and speed control, with motor auto-configuration on power up and motor self-test capability. Comes with built in potentiometers for adjusting accel and decel rates and can be controlled via an external potentiometer.

DM805-AI

Leadshine DM805-AI Specifications		
Drive Model		***DM805-AI***
Output Current		2.6–7.0 A peak (0.3–5.0 RMS)
Input Voltage		20–80 VDC (60VDC typical)
Logic Signal Current		7–16 mA (10mA typical)
Pulse Input Frequency		0–200 kHz
Minimal Pulse Width		2.5 µs
Minimal Direction Setup		5.0 µs
Isolation Resistance		500mΩ
Pin Functions	***Run/Stop or Pulse***	Pulse signal: 5V signal, single-ended input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1 resistor for +12V signals, 2k for +24V signals. Run/Stop Function: Close (pull low) to enable the motor.
	Direction or +Limit	DIR signal: 5V signal, single-ended input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1k resistor for +12V signals, 2k for +24V signals. Direction Function: requires 5µs setup time. (+)Limit Function: Close (pull low) to stop motor movement in the positive direction.
	Speed or (-)Limit	Speed: 5V signal, single-ended input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1k resistor for +12V signals, 2k for +24V signals. Speed Function (Low Speed/High Speed Mode): Close (pull low) to select Lo Speed pot setpoint. Open (float high) to enable Hi Speed pot setpoint. (-)Limit Function: Close (pull low) to stop motor movement in the negative direction.
	Enable/Disable	Enable signal: 5V signal, single-ended input. High input is 4-5V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Add a 1k resistor for +12V signals, 2k for +24V signals. Enable Function: Close (pull low) to disable the drive.
Replacement Connectors		Power = 6-pin from STP-CON-4; I/O = 6-pin from STP-CON-4; Analog = 4-pin from STP-CON-4
Cooling		Natural cooling or forced cooling
Ambient Temperature		0°C to 50°C (32°F to 122°F)
Humidity		40–90% relative humidity
Operating Temperature		70°C (158°F) max
Vibration		4.9 m/s2 max
Storage Temperature		-20°C to 65°C (-4°F to 149°F)
Self Test		Yes
Configuration Cable		1.4.4-0609505-B3
Weight		264g (9.3 oz)

Leadshine Series Drive Cables		
Optional Configuration Cable	***Compatible With***	***Price***
1.4.4-0609505-B3	DM805-AI	$5.50

Note: *Configuration cable only required if using optional configuration software. Software configuration not necessary unless DIP switch settings and auto-tuning aren't sufficient for your application. Requires an RS232 port on your PC, or a USB to RS232 converter, like USB-RS232.*

1.4.4-0609505-B3

Note: ProTuner for DM805-AI is not officially supported by the manufacturer for Operating Systems newer than Windows 7. Some Win10 and Win11 PCs will still run the software, but there is no guarantee from the manufacturer. See a potential solution for newer OS compatibility in our Community Forum: https://community.automationdirect.com/s/question/0D5Dp00000WPRm8KAH/fix-for-dm805ai-protune

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Stepping Drives

EM542S, EM556S

The EM542S and EM556S are digital stepper drives capable of pulse and direction as well as CW and CCW operation, with motor auto-configuration on power up and self-test capability. EM542S and EM556S have a built-in current-limiting resistor (on a switch) to allow either 5V or 24V input pulses. They also include a fault and a brake output, and a shaft lock feature. The brake output can be used with an external holding brake to hold the motor in place if power fails or the drive is disabled - you lose power, the brake engages. The shaft lock is set via DIP switch and will lock the motor into position using phase current, but only works when the drive has power.

EM542S

Leadshine EM542S, EM556S Specifications

Drive Model		EM542S	EM556S
Output Current[1]		0.5-4.2A peak (0.4-2.9 RMS)	0.5-5.6A peak (0.4-3.9 RMS)
Input Voltage		20–50 VDC (24–48 VDC typical)	
Logic Signal Current		7–16 mA (10mA typical)	
Pulse Input Frequency		0–200 kHz	
Minimal Pulse Width		2.5 µs	
Minimal Direction Setup		5.0 µs	
Isolation Resistance		500mΩ	
Connector P1 Functions	PUL+	Pulse signal: 5V or 24V signal (Switch S3 determines voltage), differential input. High input is 4-5V or 22-24V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Switch S3 factory default = 24V position. WARNING! If switch S3 is in the 5V position and 24V is applied, the drive will be damaged.	
	PUL-		
	DIR+	DIR signal: 5V or 24V signal (Switch S3 determines voltage), differential input. High input is 4-5V or 22-24V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Direction Function: requires 5µs setup time. CW/CCW Function: see DIP switch SW14. WARNING! If switch S3 is in the 5V position and 24V is applied, the drive will be damaged.	
	DIR-		
	ENA+	Enable signal: 5V or 24V signal (Switch S3 determines voltage), differential input. High input is 4-5V or 22-24V, Low input is 0-0.5 V. Minimum pulse width = 2.5 µs. Enable Function: Close (pull low) to disable the drive. WARNING! If switch S3 is in the 5V position and 24V is applied, the drive will be damaged.	
	ENA-		
Fault and Brake Output Connector	ALM	Optional output connection. Maximum of 30V/100mA output, sinking or sourcing.	
	BR		
	COM-		
Replacement Connectors		Incoming Power = DN-2PLUG; Motor Power = DN-4PLUG; I/O = 6-pin from STP-CON-4	
Cooling		Natural cooling or forced cooling	
Ambient Temperature		0°C to 65°C (32°F to 149°F)	
Humidity		40–90% relative humidity	
Operating Temperature		0°C to 50°C (32°F to 122°F)	
Vibration		10–50 Hz / 0.15 mm	
Storage Temperature		-20°C to 65°C (-4°F to 149°F)	
Self Test		Yes	
Configuration Cable		1.4.4-0409505-B3	
Weight		250g (8.8 oz)	250g (8.8 oz)

1 - Output current ranges are for software settings which allow for a wider current range than DIP switches.

Leadshine Series Drive Cables

Optional Configuration Cable	Compatible With	Price
1.4.4-0409505-B3	EM542S, EM556S	$5.50

Note: Configuration cable only required if using optional configuration software. Software configuration not necessary unless DIP switch settings and auto-tuning aren't sufficient for your application. Requires an RS232 port on your PC, or a USB to RS232 converter, like USB-RS232.

1.4.4-0409505-B3