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 Comparison

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$25.50</td>
<td>$36.00</td>
<td>$40.00</td>
<td>$49.50</td>
<td>$63.00</td>
<td>$105.00</td>
<td>$46.50</td>
<td>$57.00</td>
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<tr>
<td>Drive Type</td>
<td>2-phase digital stepper drive</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Step Input Modes</td>
<td>Step &amp; Direction</td>
<td>Step &amp; Direction, CW &amp; CCW</td>
<td>Step &amp; Direction, CW &amp; CCW</td>
<td>Step &amp; Direction, Analog input</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Digital Input Voltage</td>
<td>5V (add a 1K resistor to accept +12V input, or a 2K resistor to accept +24V input)</td>
<td>DIP switch selectable for 5V or 24V</td>
<td></td>
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</tr>
<tr>
<td>PPR Range</td>
<td>400–12800</td>
<td>400–25600</td>
<td>400–51200</td>
<td>200–12800</td>
<td>200–25600</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Motor Output Current Range</td>
<td>0.3–2.2 A peak (0.2–1.6 RMS)</td>
<td>1.0–4.2 A peak (0.7–3.0 RMS)</td>
<td>1.8–5.6 A peak (1.3–4.0 RMS)</td>
<td>2.4–7.2 A peak (1.7–5.1 RMS)</td>
<td>2.6–7.0 A peak (0.3–5.0 RMS)</td>
<td>2.4–7.2 A peak (1.7–5.1 RMS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Output</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Self-test Capable</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Accepts a DC or an AC power supply, soft-start, motor auto-config</td>
<td></td>
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</tr>
<tr>
<td>Special Features</td>
<td>Soft-start, motor auto-config</td>
<td>Built-in pulse generator, command source</td>
<td>Auto-tuning, soft-start, fault and brake outputs, shaft lock</td>
<td></td>
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</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>Drive Model</th>
<th>DM542E</th>
<th>DM556E</th>
<th>DM860E</th>
<th>DMA860E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output Current</strong></td>
<td>1.0–4.2 A peak (0.7–3.0 RMS)</td>
<td>1.8–5.6 A peak (1.3–4.0 RMS)</td>
<td>2.4–7.2 A peak (1.7–5.1 RMS)</td>
<td>2.4–7.2 A peak (1.7–5.1 RMS)</td>
</tr>
<tr>
<td><strong>Input Voltage</strong></td>
<td>20–50 VDC (24–48 VDC typical)</td>
<td>24–74 VDC (48–68 VDC typical)</td>
<td>24–110 VDC (48–90 VDC typical) or 18–80 VAC (36–70 VAC typical)</td>
<td></td>
</tr>
<tr>
<td><strong>Logic Signal Current</strong></td>
<td>7–16 mA (10mA typical)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pulse Input Frequency</strong></td>
<td>0–200 kHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimal Pulse Width</strong></td>
<td>2.5 µs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimal Direction Setup</strong></td>
<td>5.0 µs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Isolation Resistance</strong></td>
<td>500mΩ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connector P1 Functions</strong></td>
<td>Pulse signal: 5V signal, differential input. High input is 4.5V, Low input is 0.5V. Minimum pulse width = 2.5 µs. Add a 1kΩ resistor for +12V signals, 2kΩ for +24V signals.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Direction signal: 5V signal, differential input. High input is 4.5V, Low input is 0.5V. 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.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enable signal: 5V signal, differential input. High input is 4.5V, Low input is 0.5V. 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.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Replacement Connectors</strong></td>
<td>Power = DN-6PLUG, I/O = DN-4PLUG, Enable = DN-2PLUG</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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)

For the latest prices, please check AutomationDirect.com.

1-800-633-0405
DM332E
The DM332E is a compact drive capable of pulse and direction operation, with motor auto-configuration on power up.

<table>
<thead>
<tr>
<th>Connector P1 Functions</th>
<th>DM322E Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive Model</strong></td>
<td>DM322E</td>
</tr>
<tr>
<td><strong>Output Current</strong></td>
<td>0.3–2.2 A peak (0.2–1.6 RMS)</td>
</tr>
<tr>
<td><strong>Input Voltage</strong></td>
<td>12–30 VDC (24 VDC typical)</td>
</tr>
<tr>
<td><strong>Logic Signal Current</strong></td>
<td>7–16 mA (10mA typical)</td>
</tr>
<tr>
<td><strong>Pulse Input Frequency</strong></td>
<td>0–70 kHz</td>
</tr>
<tr>
<td><strong>Minimal Pulse Width</strong></td>
<td>7.5 µs</td>
</tr>
<tr>
<td><strong>Minimal Direction Setup</strong></td>
<td>7.5 µs</td>
</tr>
<tr>
<td><strong>Isolation Resistance</strong></td>
<td>100mΩ</td>
</tr>
</tbody>
</table>

**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)
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.

<table>
<thead>
<tr>
<th>Drive Model</th>
<th>DM805-AI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Current</td>
<td>2.6–7.0 A peak (0.3–5.0 RMS)</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>20–80 VDC (60VDC typical)</td>
</tr>
<tr>
<td>Logic Signal Current</td>
<td>7–16 mA (10mA typical)</td>
</tr>
<tr>
<td>Pulse Input Frequency</td>
<td>0–200 kHz</td>
</tr>
<tr>
<td>Minimal Pulse Width</td>
<td>2.5 µs</td>
</tr>
<tr>
<td>Minimal Direction Setup</td>
<td>5.0 µs</td>
</tr>
<tr>
<td>Isolation Resistance</td>
<td>500mΩ</td>
</tr>
</tbody>
</table>

**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 1kΩ resistor for +12V signals, 2kΩ 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 1kΩ resistor for +12V signals, 2kΩ 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 1kΩ resistor for +12V signals, 2kΩ 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 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 = 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**

<table>
<thead>
<tr>
<th>Optional Configuration Cable</th>
<th>Compatible With</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4.4-0609505-B3</td>
<td>DM805-AI</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

**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.
**Leadshine EM542S, EM556S Specifications**

<table>
<thead>
<tr>
<th>Drive Model</th>
<th><strong>EM542S</strong></th>
<th><strong>EM556S</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Current</td>
<td>2.4–7.2 A peak (1.7–5.1 RMS)</td>
<td>2.4–7.2 A peak (1.7–5.1 RMS)</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>20–50 VDC (24–48 VDC typical)</td>
<td></td>
</tr>
<tr>
<td>Logic Signal Current</td>
<td>7–16 mA (10mA typical)</td>
<td></td>
</tr>
<tr>
<td>Pulse Input Frequency</td>
<td>0–200 kHz</td>
<td></td>
</tr>
<tr>
<td>Minimal Pulse Width</td>
<td>2.5 µs</td>
<td>5.0 µs</td>
</tr>
<tr>
<td>Minimal Direction Setup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation Resistance</td>
<td>500Ω</td>
<td></td>
</tr>
</tbody>
</table>

**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 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)

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**Leadshine Series Drive Cables**

<table>
<thead>
<tr>
<th>Optional Configuration Cable</th>
<th>Compatible With</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4.4-0409505-B3</td>
<td>EM542S, EM556S</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

**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.

For the latest prices, please check AutomationDirect.com.