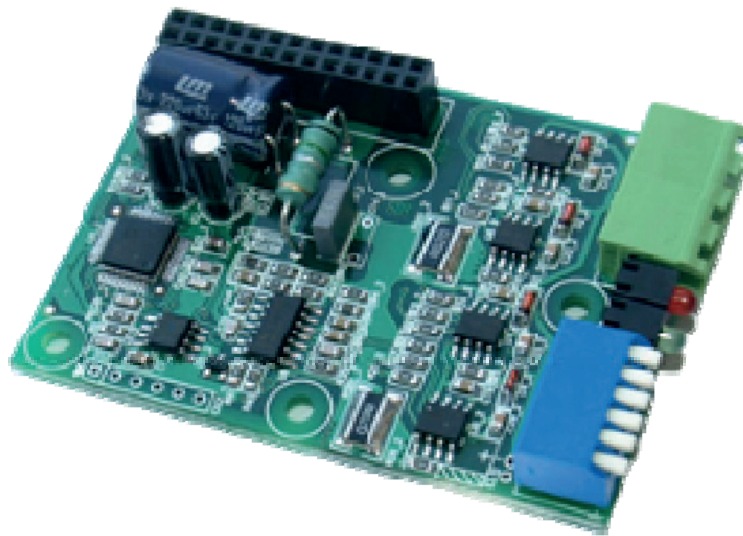




Leadshine

SDM660

2 / 4 Phase Stepper Drive Module



Version 2.0

<http://www.leadshine.com> / <http://www.leadshineusa.com>

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Notice

Read the datasheet before any assembling and using. Incorrect handling of products in this manual can result in injury and damage to persons and machinery. Strictly adhere to the technical information regarding installation requirements.

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Record of Revisions

| Revision | Date | Description of Release |
|----------|---------|--|
| 1.0 | 10/2013 | Initial Release. |
| 2.0 | 11/2014 | Use new output current settings/table. |

1. Features

- Specially designed to be integrated into custom OEM motion control systems
- Step & direction control
- Input voltage of 20-60VDC
- Maximum output current of 6.0Amp
- Capable of powering 2 or 4 phase NEMA 17, 23, 24, 34 stepper motors
- 8 output current settings of 1.45A to 6.0A via DIP switches
- 8 micro step resolution settings of 200 – 12800 via DIP switches
- Anti resonance
- High precision, extra low motor heating, low noise, smooth motor movement
- Built-in short circuit, over-current and over-voltage protection
- Compact size
- 50% auto idle current reduction

2. Description

The Leadshine SDM660 is a stepper drive module specially designed to be integrated into custom motion control systems of OEM applications. When supplied with 5VDC and 15 VDC power, the SDM660 step drive module can function as a high performance single axis stepper drive to power 2 (1.8°) or 4 (0.9°) phase stepper motors of frame sizes NEMA 17, 23, 24, and 34. It can take 20-60 VDC input voltage and output up to 6.0A current. With the simple-to-use DIP switches, a user can easily configure the output current or micro step resolution to one of the 8 preset settings, which is 1.41-6.0A and 200-12,800 (full step to 1/64 microstep).

By adopting Leadshine's advanced stepper motor control algorithm based on the latest DSP technology, the SDM660 is featured with high precision, compact size, anti resonance, excellent performance in all speed range, extra low motor heating & noise, anti resonance, smooth movement.

The SDM660 is easy to implement by taking step & direction. Due to its compact size and high flexibility to be implemented, the SDM660 is ideal for OEM customers to build their own custom motion control systems for stepper motor controls. The SDM660 is also used in Leadshine multiple axis stepper drives such as the MX3660 3-axis stepper drive and MX4660 4-axis stepper drive. When one of the stepper drive modules is broken or malfunction, a user can simply replace it with a SDM660.

3. Electrical Specifications

| Parameter | Min | Typical | Max | Unit |
|-----------------------|------|---------|-----|------|
| Input Voltage | 20 | 48 | 60 | VDC |
| Output Current | 1.45 | - | 6.0 | A |
| Pulse Input Frequency | 0 | - | 200 | kHz |
| Pulse Voltage | 0 | 5 | 5 | V |
| Logic Signal Current | 7 | 10 | 16 | mA |
| Isolation Resistance | 100 | - | - | MΩ |

4. Mechanical Specifications

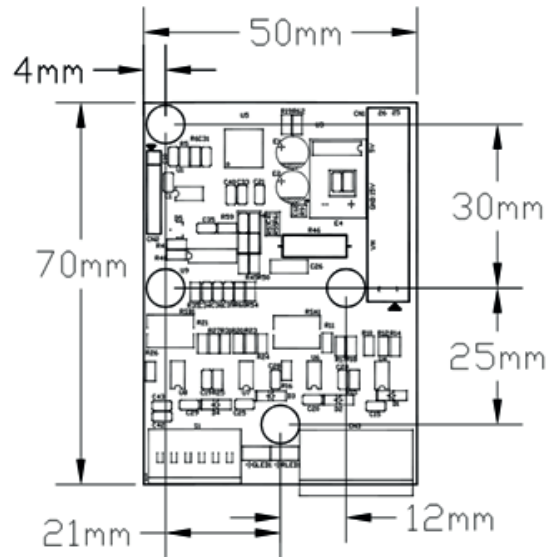


Figure 1

5. Operating Environment

| | | |
|------------------------------|-----------------------------------|---|
| Cooling | Natural cooling or forced cooling | |
| Operating Environment | Environment | Avoid dust, oil fog and corrosive gases |
| | Ambient Temperature | 0—40° C (32 — 104° F) |
| | Humidity | 40—90% RH |
| | Operating Temperature | 70° C (158° F) Max |
| Storage Temperature | -20—65° C (-4—149° F) | |

6. Connectors and Pin Location

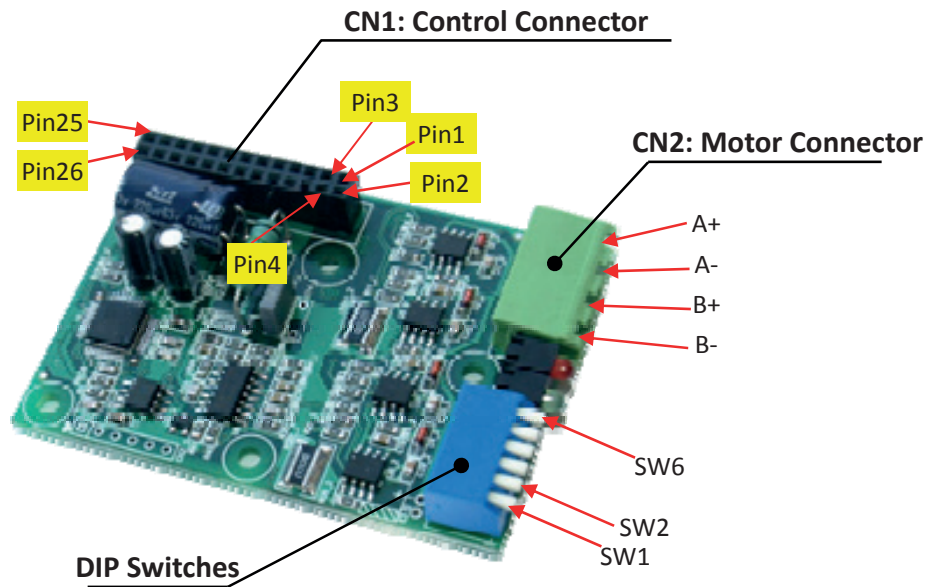


Figure 2

6.1 CN1: Control Connector

| Pin | Name | I/O | Description |
|-----|------|-----|--|
| 1 | GND | - | Ground |
| 2 | GND | - | Ground |
| 3 | NC | - | No connection |
| 4 | NC | - | No connection |
| 5 | +VM | - | Motor power Input, 20-60VDC, MAX 48V recommended |
| 6 | +VM | - | |
| 7 | +VM | - | |
| 8 | +VM | - | |
| 9 | NC | - | No connection |
| 10 | NC | - | No connection |
| 11 | GND | - | Ground |
| 12 | GND | - | Ground |
| 13 | GND | - | Ground |
| 14 | GND | - | Ground |
| 15 | GND | - | Ground |
| 16 | +15V | I | +15V logic power input, 200mA at the least. |
| 17 | GND | | Ground |
| 18 | GND | | Ground |


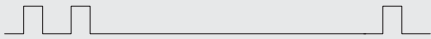
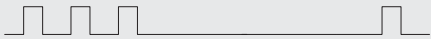
| | | | |
|----|-----------|---|---|
| 19 | GND | | Ground |
| 20 | SMOOTHER | I | Enable / disable step smoother. High level (2.2-3.3V): Enable, Low level(0-0.5V): disable |
| 21 | FAULT | O | Fault signal output, sink or source 4mA MAX. Low level: 0-0.5V, High level: 2.2-3.3V |
| 22 | +5V | I | +5V logic power input, 400mA at the least |
| 23 | E-STOP | I | Emergency stop, active high level. The power stage will be turned off when this input is active. Short it the GND if this function is not required. Low level: 0-0.5V, high level: 2.2-3.3V. |
| 24 | M-STOP | I | Motor stop, active low level. The motor still has holding torque when it is active. Connect it 3.3V if this function is not required. Low level: 0-0.5V, high level: 2.2-3.3V. |
| 25 | DIRECTION | I | Direction signal. Low level: 0-0.5V, high level: 2.2-3.3V. The DIR signal should be 5us ahead of the pulse signal. |
| 26 | STEP | I | Step signal. Low level: 0-0.5V, high level: 2.2-3.3V. Bandwidth: 200Khz. Minimum step width: >2.5uS. |

6.2 CN2: Motor Connector

| CN3-Motion Connector: Screw terminal | | | |
|--------------------------------------|------|-----|----------------|
| Pin | Name | I/O | Description |
| 1 | A+ | O | Motor phase A+ |
| 2 | A- | O | Motor phase A- |
| 3 | B+ | O | Motor phase B+ |
| 4 | B- | O | Motor phase B- |

7. Protection Indications

When a SDM660 stepper drive motor functions normally, the green LED light will be green when powered on. In any case that one of the following protections is activated, the red LED will blink periodically (every 4 seconds) to indicate the error type. For each blink, the red LED light will be on for 0.2 second and then off for 0.3 second.

| Priority | Time(s) of Blink | Sequence wave of red LED | Description |
|----------|------------------|---|-----------------------------------|
| 1st | 1 |  | Over-current protection activated |
| 2nd | 2 |  | Over-voltage protection activated |
| 3rd | 3 |  | Emergency stop activated |

8. DIP Switch Settings

The SDM660 stepper drive module has a 6-bit DIP switch (see figure 2), where bits 1-3 are used for output current configuration and bits 4-6 are used for micro step resolution configuration. See the following tables for their definition.

8.1. Current Setting (SW1-SW3)

| Peak | RMS | SW1 | SW2 | SW3 |
|-------|-------|-----|-----|-----|
| 1.41A | 1.00A | on | on | On |
| 2.12A | 1.50A | off | on | On |
| 2.83A | 2.00A | on | off | On |
| 3.54A | 2.50A | off | off | On |
| 3.96A | 2.80A | on | on | off |
| 4.24A | 3.00A | off | on | off |
| 4.95A | 3.50A | on | off | off |
| 6.0A | 4.25A | off | off | off |

8.2. Micro Step Resolution Setting (SW4-SW6)

| Steps / Rev | SW4 | SW5 | SW6 |
|-------------|-----|-----|-----|
| 200 | On | On | On |
| 400 | Off | On | On |
| 800 | On | Off | On |
| 1600 | Off | Off | On |
| 2000 | On | On | Off |
| 3200 | Off | On | Off |
| 6400 | On | Off | Off |
| 12800 | Off | Off | Off |

Typical Connections

When implemented properly, the SDM660 stepper drive module can be used to power 2 (1.8°) or 4 (0.9°) phase stepper motors of NEMA 17, 23, 24, and 34. The following picture illustrates a typical connection when it is used to power a 2 phase stepper motor.

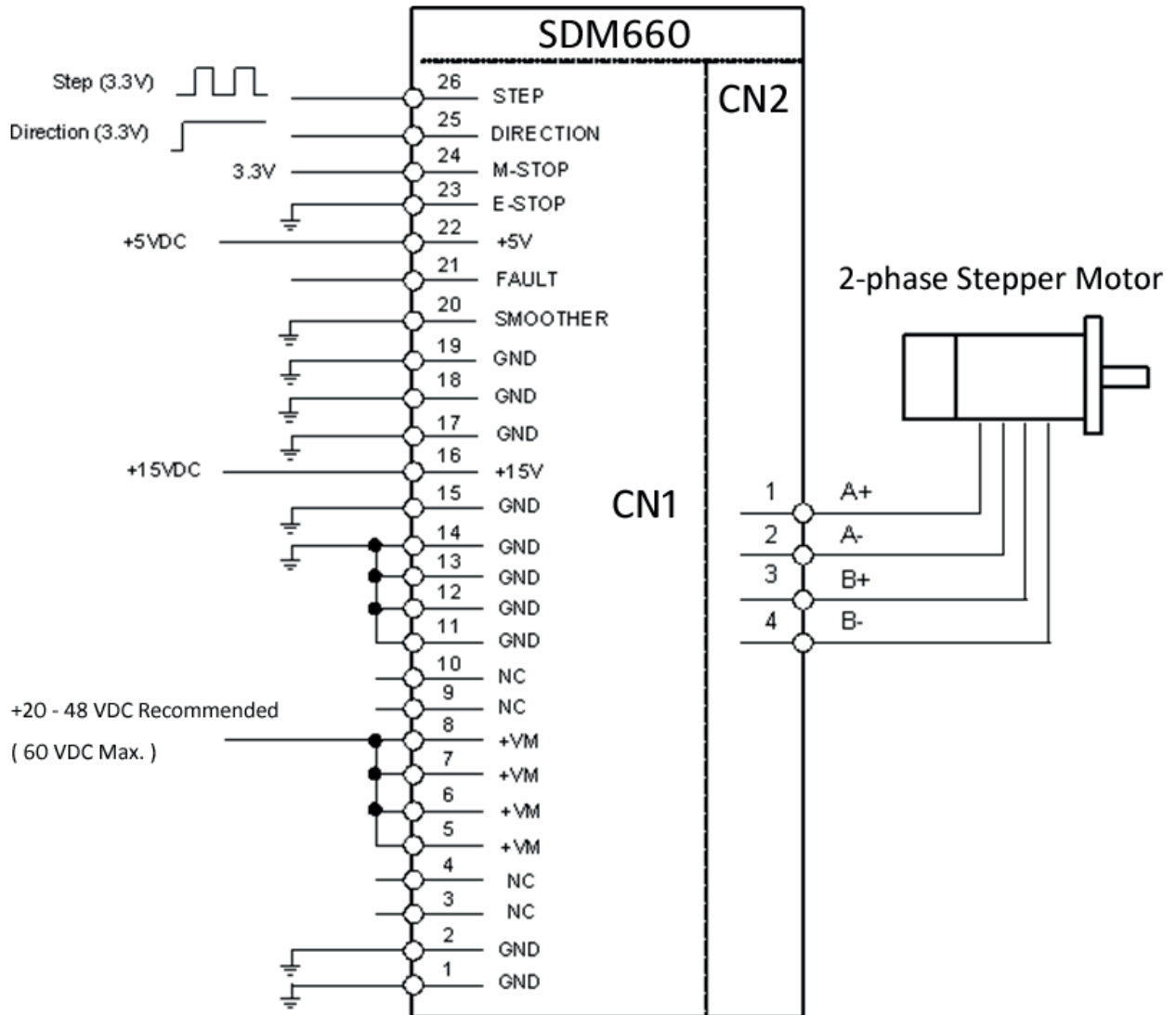


Figure 3