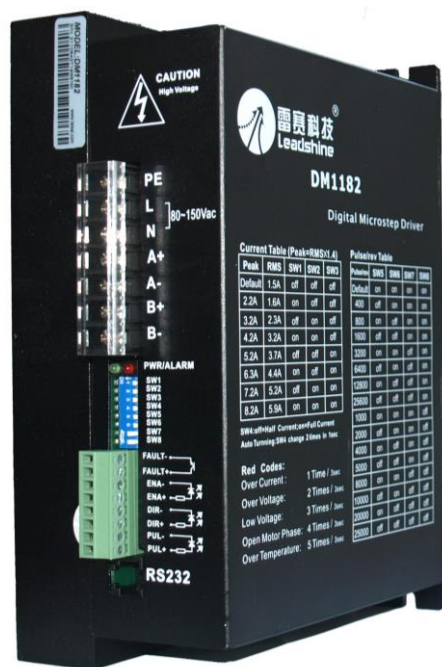


Datasheet of the Digital Stepper Drive

NM-12082-AC



80-150VAC, 8.2A Peak, Ultra Smoothness, Fault Output

Version 0.0.1

Features

- Super-low motor noise offers excellent quietness
- Anti-Resonance optimizes torque and nulls mid-range instability
- Self-test and Auto-configuration technology offers optimum performance for different motors
- Multi-stepping allows a low resolution input to produce a higher micro step output for smoother system performance
- Options to set output current and micro step resolutions via DIP switch
- Automatic idle-current reduction
- Over-current, over-voltage, under-voltage, over-temperature and phase-error protections
- Fault out prevents damages to your machines or the materials
- Soft-start with no “jump” when powered on

Descriptions

The NM-12082-AC is a high voltage, fully digital stepper drive developed with advanced DSP control algorithm based on the latest motion control technology. It has achieved a unique level of system smoothness, providing optimal torque and nulls mid-range instability. Its motor auto-identification and parameter auto-configuration feature offers quick setup to optimal modes with different motors. Compared with traditional analog drives, NM-12082-AC can drive a stepper motor at much lower noise, lower heating, and smoother movement. Its unique features make NM-12082-AC an ideal choice for high requirement applications.

Applications

NM-12082-AC can drive a wide range of 2-phase stepper motors, from NEMA size 34 to 51. It can be implemented in various OEM applications such as laser cutters, laser markers, high precision X-Y tables, labeling machines, CNC router, CNC milling, etc. Its unique features make the NM-12082-AC an ideal choice for applications that require excellent performance in both low-speed and high speed movements.

Specifications

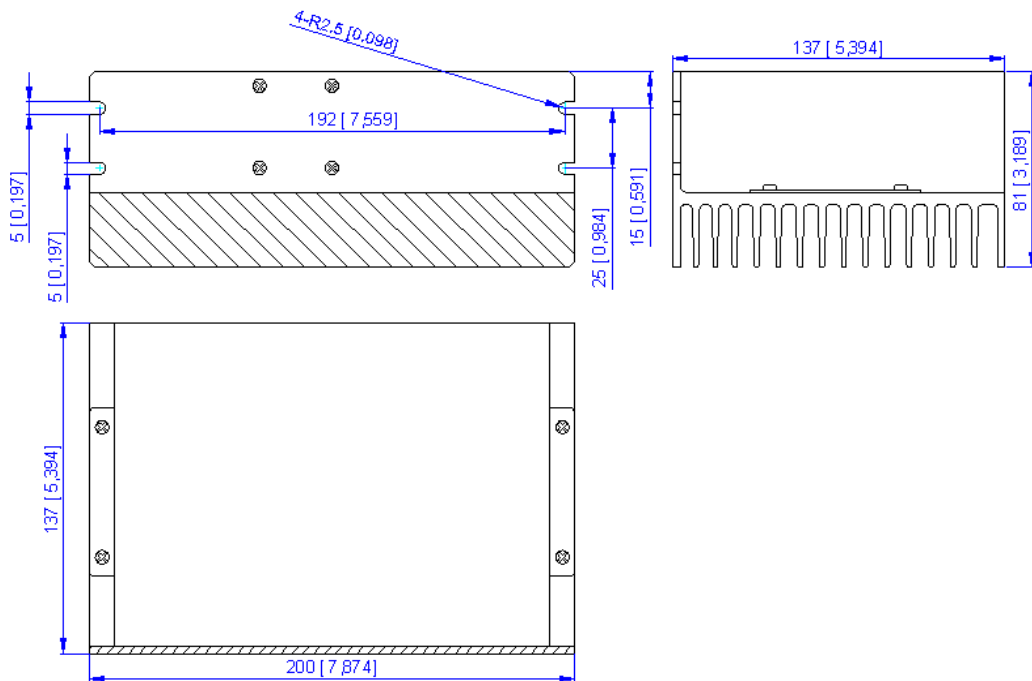
Electrical Specifications

| Parameter | Min | Typical | Max | Unit |
|-----------------------|-----|---------|------------|------|
| Input Voltage | 80 | 110/120 | 150 | VAC |
| Output Current | 0.5 | - | 8.2 (Peak) | A |
| Pulse Input Frequency | 0 | - | 200 | kHz |
| Logic Signal Current | 7 | 10 | 20 | mA |
| Isolation Resistance | 500 | - | - | MΩ |

Operating Environment

| Cooling | Natural Cooling or Forced cooling | |
|-----------------------|-----------------------------------|---|
| Operating Environment | Environment | Avoid dust, oil fog and corrosive gases |
| | Storage Temperature | -20°C – 65°C (-4°F – 149°F) |
| | Ambient Temperature | 0°C – 50°C (32°F – 122°F) |
| | Humidity | 40%RH – 90%RH |
| | Operating Temperature (Heat Sink) | 70°C (158°F) Max |
| Storage Temperature | -20°C – 65°C (-4°F – 149°F) | |
| Weight | 1000 g (35 oz) | |

Mechanical Specifications



Protection Indications

The green indicator turns on when power-up. When drive protection is activated, the red LED blinks periodically to indicate the errors.

| Priority | Time(s) of Blink | Sequence wave of RED LED | Description |
|----------|------------------|--------------------------|-----------------------------|
| 1st | 1 | ● ● ● ● ● ● ● ● | Over-current protection |
| 2nd | 2 | ● ● ● ● ● ● ● ● | Over-voltage protection |
| 3rd | 3 | ● ● ● ● ● ● ● ● | Under-voltage protection |
| 4th | 4 | ● ● ● ● ● ● ● ● | Phase-error protection |
| 5th | 5 | ● ● ● ● ● ● ● ● | Over-temperature protection |

Connectors and Pin Assignment

The NM-12082-AC has two connectors, connector for control and status signals connections and connector for power and motor connections.

| Power and Motor Connector- Screw Terminal | | | |
|---|------|-----|--|
| Pin | Name | I/O | Description |
| 1 | PE | I | Recommend connect this port to the ground for better safety. |
| 2 | AC | I | AC Power Supply Input, 80-150VAC |
| 3 | AC | I | |
| 4 | A+ | O | Motor Phase A+ |
| 5 | A- | O | Motor Phase A- |
| 6 | B+ | O | Motor Phase B+ |
| 7 | B- | O | Motor Phase B- |

Connectors and Pin Assignment (Continued)

| Control Signal Connector – Screw Terminal | | | |
|---|--------|-----|---|
| Pin | Name | I/O | Description |
| 1 | PUL+ | I | <u>Pulse Signal</u> : This input represents pulse signal, each rising or falling edge active. 4.5-5V when PUL-HIGH, 0-0.5V when PUL-LOW. For reliable response, pulse width should be longer than 2.5 μ s. |
| 2 | PUL- | I | |
| 3 | DIR+ | I | <u>Direction Signal</u> : This signal has low/high voltage levels, representing two directions of motor rotation. For reliable motion response, DIR signal should be ahead of PUL signal by 5 μ s at least. 4.5-5V when DIR-HIGH, 0-0.5V when DIR-LOW. Please note that rotation direction is also related to motor-driver-encoder wiring match. Exchanging the connection of two wires for a coil to the driver will reverse motion direction. |
| 4 | DIR- | I | |
| 5 | ENA+ | I | <u>Enable Signal</u> : This signal is used for enabling/disabling the driver. In default, high level (NPN control signal) for enabling the driver and low level for disabling the driver. Usually left UNCONNECTED (ENABLED). Please note that PNP and Differential control signals are on the contrary, namely Low level for enabling. The active level of ENA signal is software configurable. |
| 6 | ENA- | I | |
| 5 | FAULT+ | O | <u>Fault Signal</u> : OC output signal, active when one of the following protection is activated: over-voltage and over current. This port can sink or source 20mA current at 24V. In default, the resistance between FAULT+ and FAULT- is low impedance in normal operation and become high when drive goes into error. |
| 6 | FAULT- | O | |

DIP Switches

Current Settings (SW1-SW3)

| Peak | RMS | SW1 | SW2 | SW3 |
|---------|------|-----|-----|-----|
| Default | | on | on | on |
| 2.8A | 2.0A | off | on | on |
| 3.1A | 2.2A | on | off | on |
| 4.9A | 3.5A | off | off | on |
| 5.6A | 4.0A | on | on | off |
| 7.0A | 5.0A | off | on | off |
| 7.8A | 5.5A | on | off | off |
| 8.2A | 5.9A | off | off | off |

Notes: Due to motor inductance, the actual current in the coil may be smaller than the dynamic current setting, particularly under high speed condition.

DIP Switches (Continued)

Full Current (SW4)

| | On | Off |
|------------|--|--|
| SW4 | Full current is on or auto-current-reduction is turned off when motor is stop. | Full current is off or auto-current-reduction is turned on when motor is stop. The standstill current is half of the current setting. Set it on when lower motor heating is preferred. |

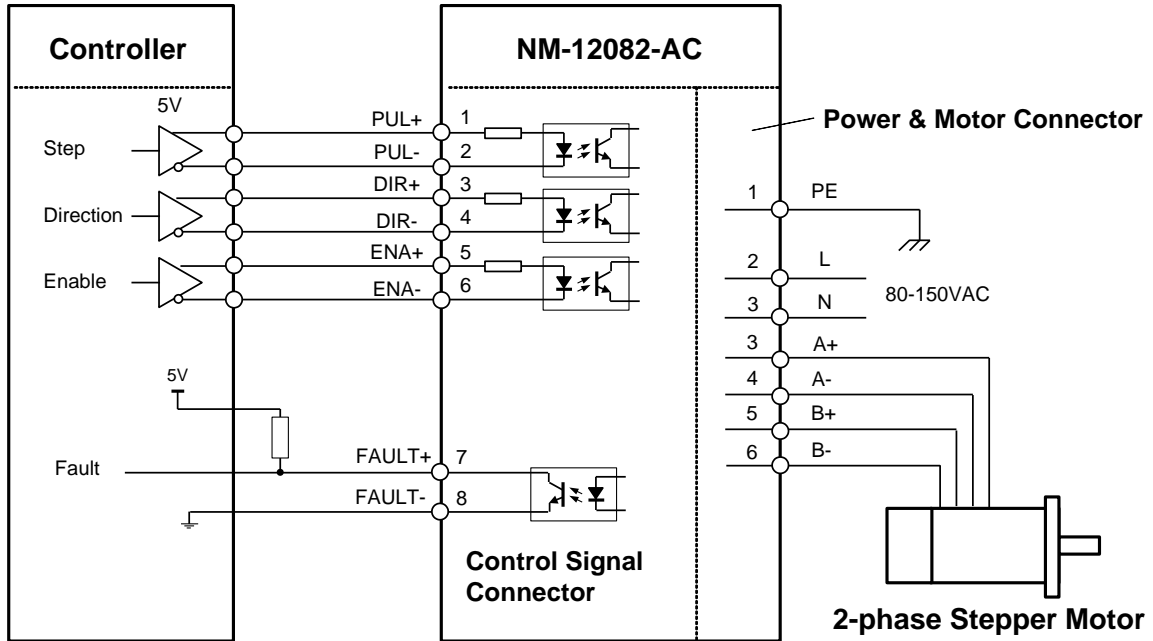
Auto-configuration (SW4)

To activate auto-configuration, switch SW4 two times in two seconds. That is, OFF-ON-OFF or ON-OFF-ON. The current loop Kp and Ki will be calculated during auto-configuration.

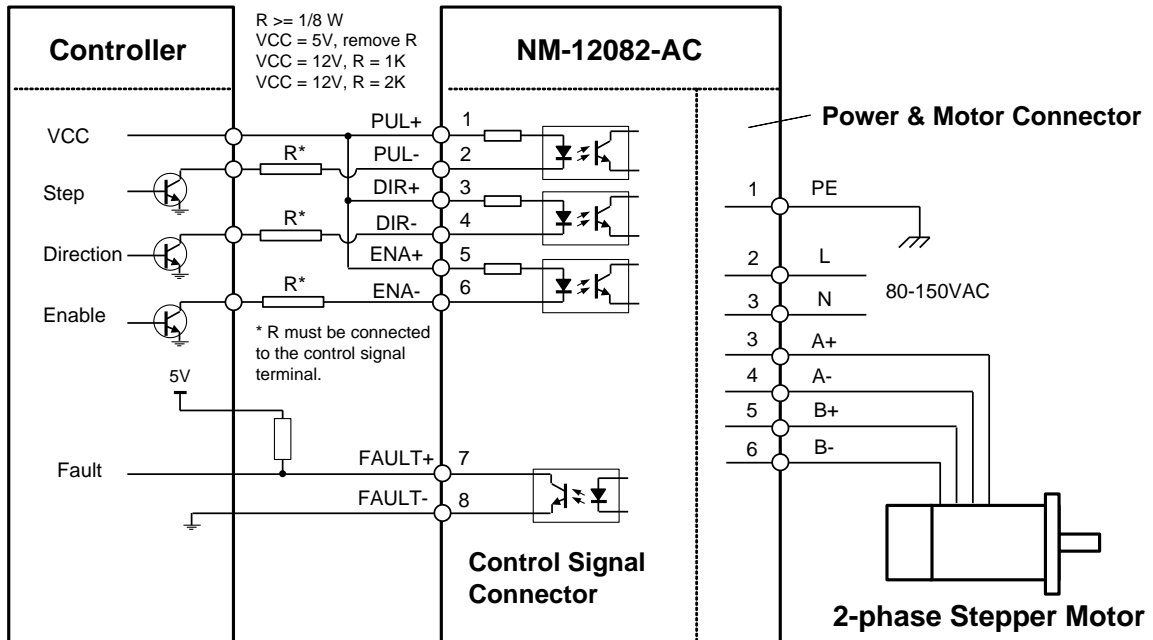
Micro Step Settings (SW5-SW8)

| Steps/Revolution | SW5 | SW6 | SW7 | SW8 |
|------------------|-----|-----|-----|-----|
| 200 | 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 |

Typical Connections

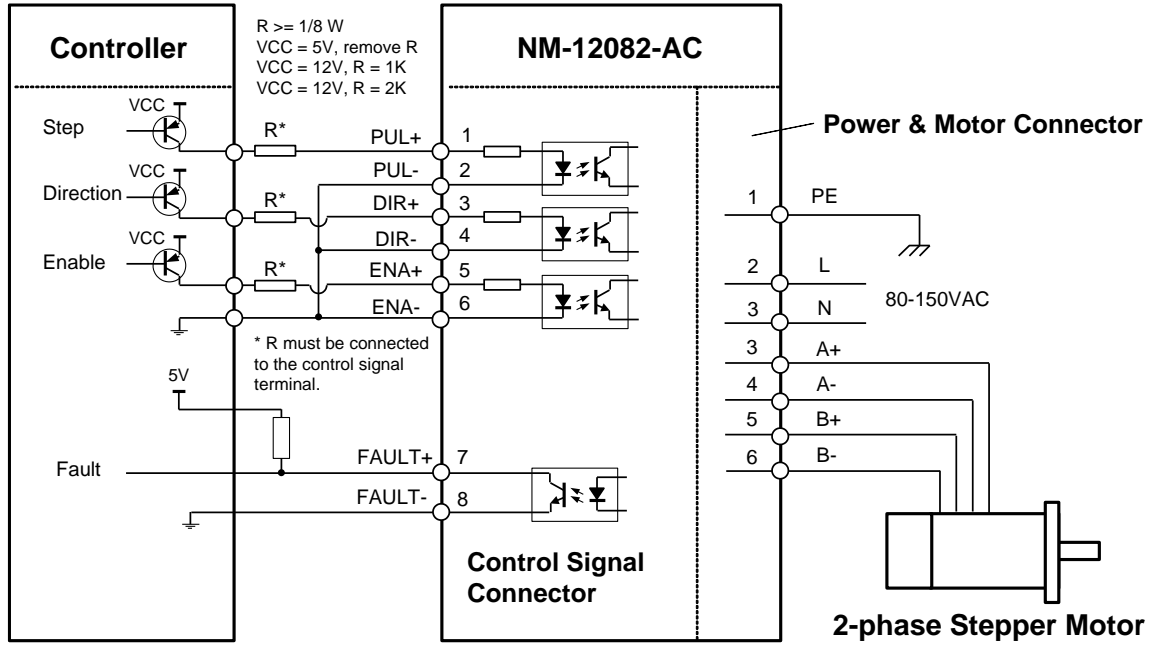


Connections to controller of differential output



Connections to controller of sinking output

Typical Connections (Continued)



Connections to controller of sourcing output