

# Microstepping Driver

## KL9082

### Feature

- Patented technology
- Pure-sinusoidal precise current control technology
- High performance, low cost
- Supply voltage up to +90VDC
- Peak current to 8.2A (RMS 5.86A)
- Optically isolated differential input
- Pulse frequency up to 300 KHz
- Automatic idle-current reduction
- Suitable for 2-phase and 4-phase stepper motors
- 16 selectable resolutions up to 10000 steps/rev
- DIP switch current setting with 8 different values
- PUL/DIR & CW/CCW mode optional
- Short-circuit, over-voltage, short-voltage protection

### Introduction

The KL9082 is a high performance microstepping driver using pure-sinusoidal wave current control technology. It is particularly suitable for applications desired with extremely low noise and low heating. Currently most of the microstepping drivers in the market apply pseudo-sinusoidal current control technology, which makes the output current to be a distorted sine wave, or makes much current ripple, both cause the motor higher noise and bigger vibration, furthermore cause serious motor heating, so when the motor works long time, the torque decrease, motor aging and the use life shorted. However the pure-sinusoidal precise current control technology (domestic patented technology) applied by the KL9082 can solve above problems very well and offer servo-like performances.

### Applications

Suitable for a wide range of stepping motors of Nema 17, 23 and 34, and usable for various kinds of machines, such as X-Y tables, labeling machines, laser cutters, engraving machines, and pick-place devices. Particularly useful in applications with low vibration, high speed and high precision are desired

### Electric Specifications ( $T_j=25^{\circ}\text{C}$ )

Parameters	KL9082			Unit
	Min	Typical	Max	
Output current	1.8	-	8.2 (5.86A RMS)	A
Supply voltage	24	68	90	VDC
Logic signal current	7	10	16	mA
Pulse input frequency	0	-	300	KHz
Isolation resistance	500			MΩ

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

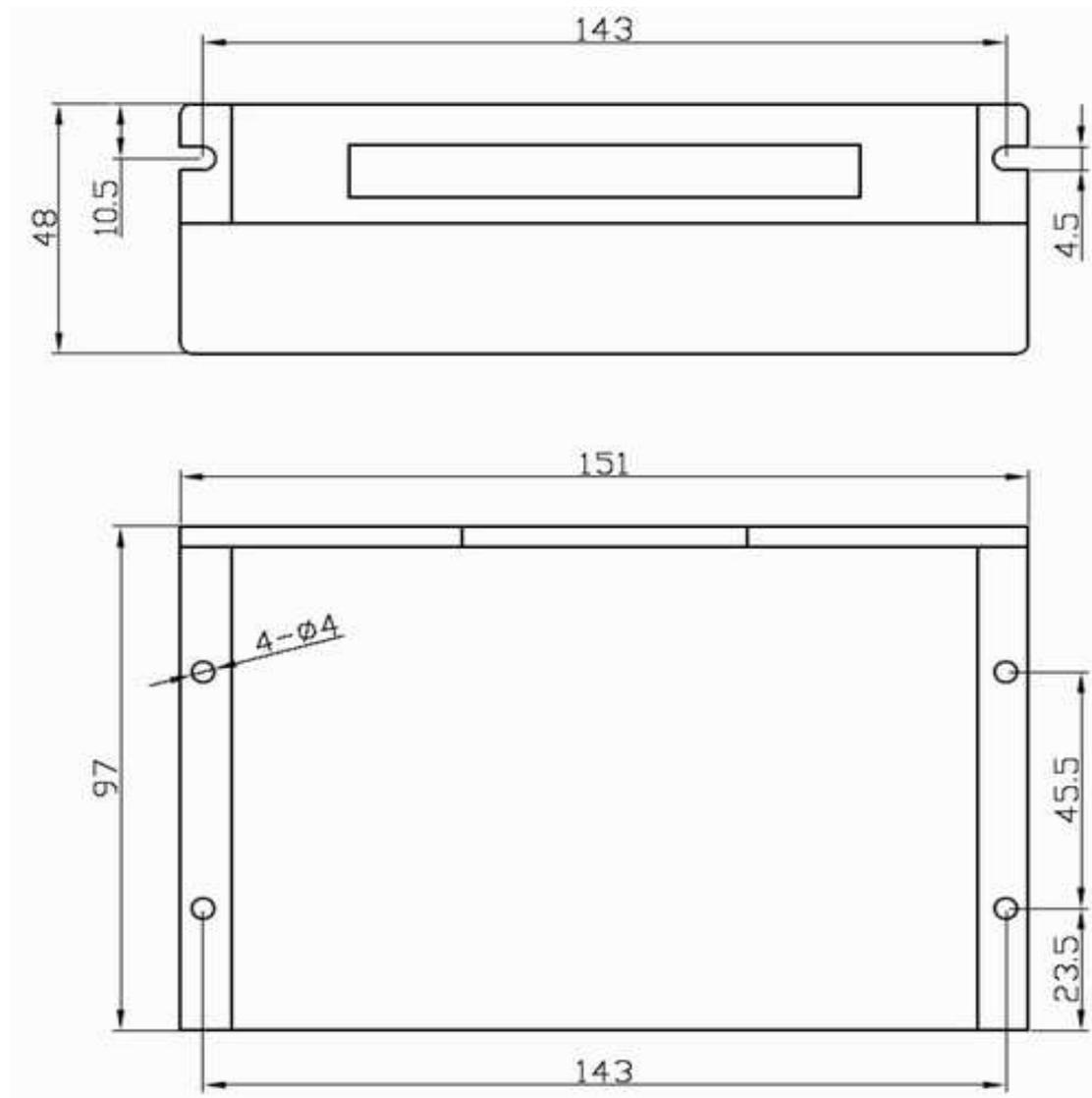


Figure 1: Mechanical Specifications

## Pin Assignment and Description

Control Signal Connector P1 pins

Pin Function	Details
PUL+(+5V)	<b>Pulse signal:</b> In single pulse (pulse/direction) mode, this input represents pulse signal, effective for each rising or falling edge (set by inside R13&R14); 4-5V when PUL-HIGH, 0-0.5V when PUL-LOW. In double pulse mode (pulse/pulse), this input represents clockwise (CW) pulse, effective for high level or low level (set by inside R13&R14). For reliable response, pulse width should be longer than 1.2 $\mu$ s. Series connect resistors for current-limiting when +12V or +24V used.
PUL-(PUL)	
DIR+(+5V)	<b>DIR signal:</b> In single-pulse mode, this signal has low/high voltage levels, representing two directions of motor rotation; in double-pulse mode (set by inside R31&R32), this signal is counter-clock (CCW) pulse, effective for high level or low level (set by inside R13&R14). For reliable motion response, DIR signal should be ahead of PUL signal by 5 $\mu$ s at least. 4-5V when DIR-HIGH, 0-0.5V when DIR-LOW. Please note that motion direction is also related to motor-driver wiring match. Exchanging the connection of two wires for a coil to the driver will reverse motion direction.
DIR-(DIR)	
ENA+(+5V)	<b>Enable signal:</b> This signal is used for enabling/disabling the driver. High level (NPN control signal, PNP and Differential control signals are on the contrary, namely Low level for enabling.) for enabling the driver and low level for disabling the driver. Usually left UNCONNECTED (ENABLED).
ENA-(ENA)	

## Power connector P2 pins

Pin Function	Details
Gnd	DC power ground
+V	DC power supply, 24~90VDC. Including voltage fluctuation and EMF voltage.
A+, A-	Motor Phase A
B+, B-	Motor Phase B

## Microstep Resolution Selection

Microstep resolution is specified by 5, 6, 7,8 DIP switches as shown in the following table:

Steps/rev.(for 1.8°motor)	SW5	SW6	SW7	SW8
400	ON	ON	ON	ON
500	OFF	ON	ON	ON
600	ON	OFF	ON	ON
800	OFF	OFF	ON	ON
1000	ON	ON	OFF	ON
1200	OFF	ON	OFF	ON
1600	ON	OFF	OFF	ON
2000	OFF	OFF	OFF	ON
2400	ON	ON	ON	OFF
3200	OFF	ON	ON	OFF
4000	ON	OFF	ON	OFF
5000	OFF	OFF	ON	OFF
6000	ON	ON	OFF	OFF
6400	OFF	ON	OFF	OFF
8000	ON	OFF	OFF	OFF
10000	OFF	OFF	OFF	OFF

## Current Setting

Peak current (A)	RMS (A)	SW1	SW2	SW3
1.80	1.29	OFF	OFF	OFF
2.70	1.93	ON	OFF	OFF
3.60	2.57	OFF	ON	OFF
4.60	3.29	ON	ON	OFF
5.50	3.93	OFF	OFF	ON
6.40	4.57	ON	OFF	ON
7.30	5.27	OFF	ON	ON
8.20	5.86	ON	ON	ON

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

## Typical Connections

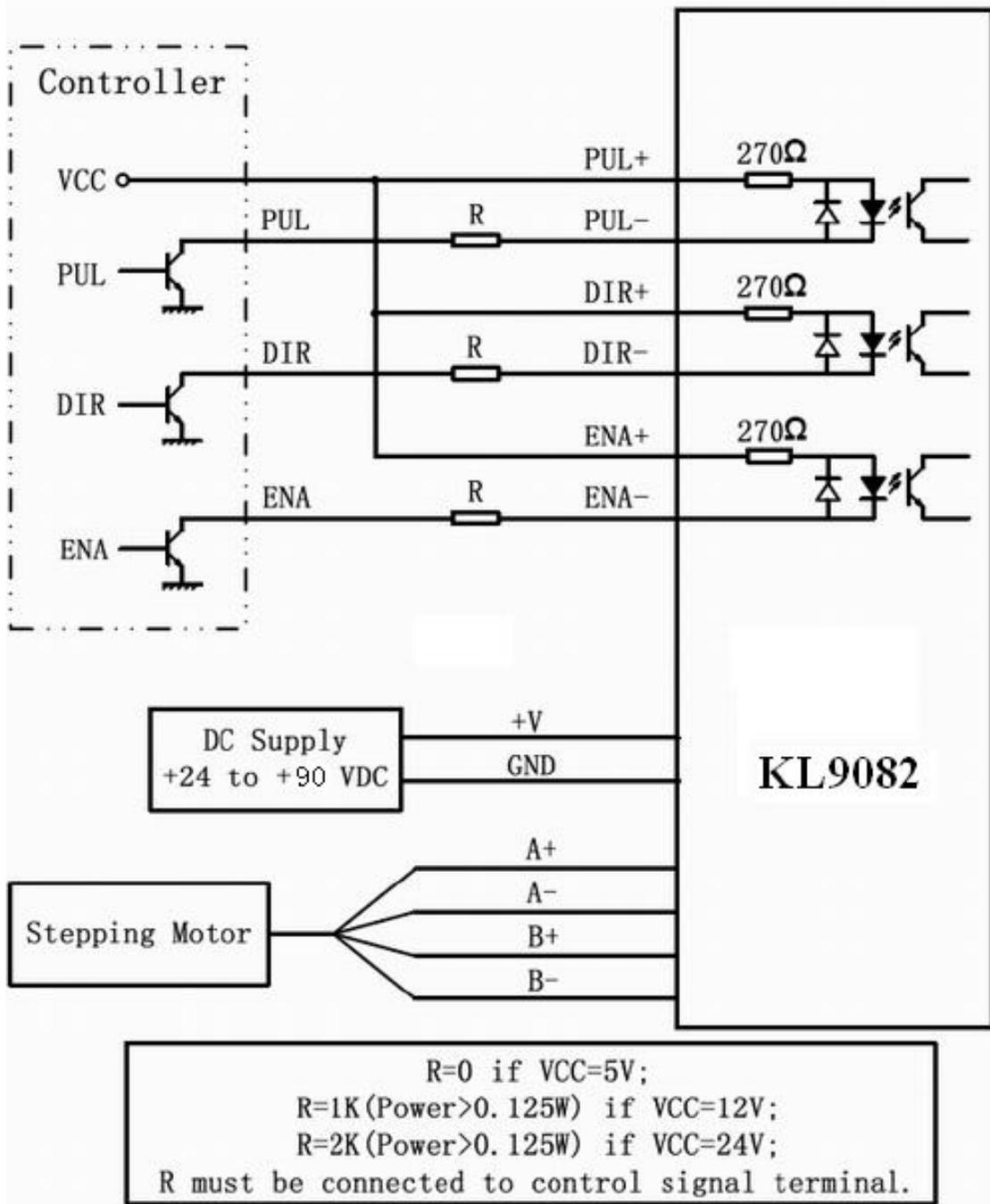


Figure 2: Typical Connections