
Microstepping Driver

KL11078

Feature

- High quality, low price
- Low heating for motor & driver
- Supply voltage AC80-220V
- TTL compatible inputs
- Automatic idle-current reduction
- Output current up to 7.8A peak
- Input frequency up to 400 kHz
- Opto-isolated inputs
- 16 selectable microstep resolutions up to 10000 *steps/rev*
- Suitable for any 2-phase and 4-phase stepping motors
- DIP switch current setting
- Support PUL/DIR and CW/CCW modes

Introduction

The KL11078 is a high performance microstepping driver developed with one of the most advanced technologies in the world today. It's suitable for driving any 2-phase and 4-phase hybrid step motors. By using advanced bipolar constant-current chopping technique, it can produce more motor torque under high speed condition than other drivers. The microstep capability allows stepping motors run at higher smoothness, less vibration and lower noise. The 3-state current control feature leads to lower motor heating.

Applications

Suitable for a wide range of stepping motors of NEMA 17, 23 and 34, and usable for various kinds of machines, such as air-driven inscription machines, labeling machines, cutting machines, laser engraving, plotter, medical instruments, pick-place devices, and etc. Particularly useful in applications desired with extremely low noise and low vibration, high speed and high precision.

Electronic Specifications (T_j=25°C)

Parameters	KL11078			
	Min	Typical	Max	Unit
Output current	0.42 (0.3A RMS)	-	7.8 (5.57A RMS)	A
Supply voltage	80	180	220	VAC
Logic signal current	7	10	16	mA
Pulse input frequency	0	-	400	KHz
Isolation resistance	500			MΩ

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

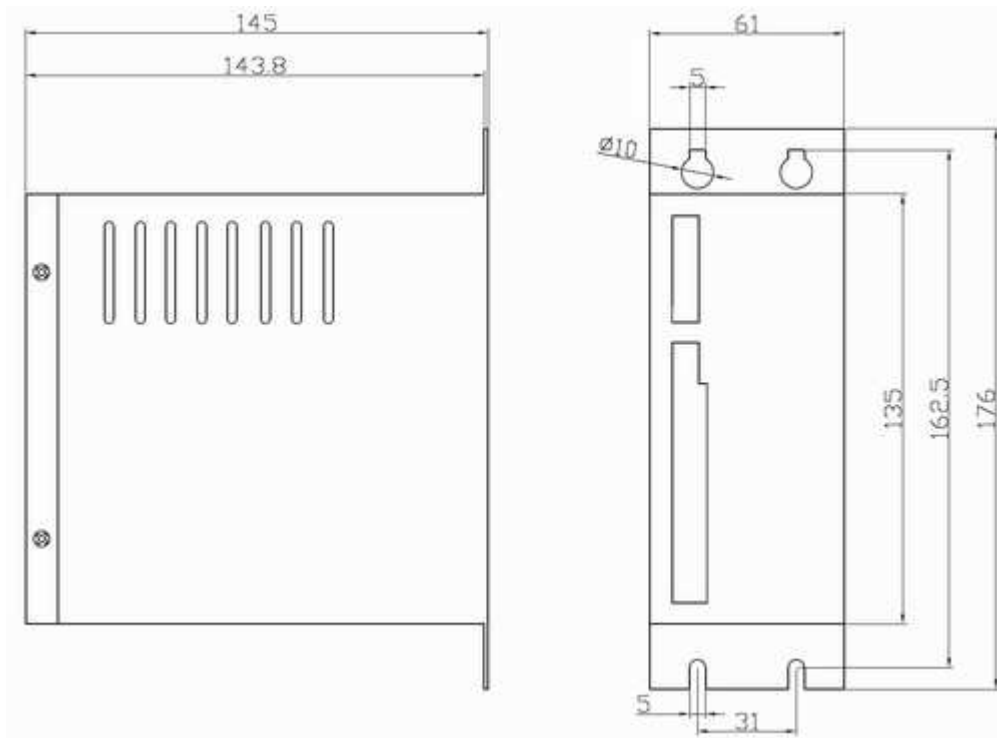


Figure 1: Mechanical Specifications

Pin Assignment and Description

Control Signal Connector P1 pins

Pin Function	Details
PUL+(+5V)	Pulse signal: In single pulse (pulse/direction) mode, this input represents pulse signal, effective for each rising edge; 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. For reliable response, pulse width should be longer than 1.2 μ s. Series connect resistors for current-limiting when +12V or +24V used.
PUL-(PUL)	
DIR+(+5V)	DIR signal: In single-pulse mode, this signal has low/high voltage levels, representing two directions of motor rotation; in double-pulse mode (set by SW5), this signal is counter-clock (CCW) pulse, effective for high level. For reliable motion response, DIR signal should be ahead of PUL signal by 5 μ 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)	Enable signal: 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)	
READY+	Alarm signal positive: READY+ is an optocoupler output from open-collector circuit, maximum permitted input voltage is 30VDC; maximum output current 20mA. It generally can be serial connected to PLC input terminal.
READY-	Alarm signal negative.

Notes: SW5 ON is CW/CCW (pulse/pulse) mode, and SW5 OFF is PUL/DIR mode.

Power connector P2 pins

Pin Function	Details
AC	AC power supply inputs. Recommend use isolation transformers with theoretical output voltage of 80~180 VAC, leaving room for power fluctuation and back-EMF.
AC	
A+, A-	Motor phase A.
B+, B-	Motor phase B.
PE	Ground terminal. Recommend connect this port to the ground for better safety.

Microstep Resolution Selection

Microstep resolution is specified by 1, 2, 3, 4 DIP switches as shown in the following table:

Steps/rev.(for 1.8°motor)	SW1	SW2	SW3	SW4
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)	SW6	SW7	SW8	SW9
0.45	0.32	OFF	OFF	OFF	OFF
0.63	0.45	OFF	OFF	OFF	ON
1.41	1.00	OFF	OFF	ON	OFF
1.88	1.34	OFF	OFF	ON	ON
2.33	1.66	OFF	ON	OFF	OFF
2.85	2.04	OFF	ON	OFF	ON
3.23	2.31	OFF	ON	ON	OFF
3.75	2.68	OFF	ON	ON	ON
4.26	3.04	ON	OFF	OFF	OFF
4.65	3.32	ON	OFF	OFF	ON
5.18	3.70	ON	OFF	ON	OFF
5.55	3.96	ON	OFF	ON	ON
6.15	4.39	ON	ON	OFF	OFF
6.60	4.71	ON	ON	OFF	ON
7.20	5.14	ON	ON	ON	OFF
7.80	5.57	ON	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

