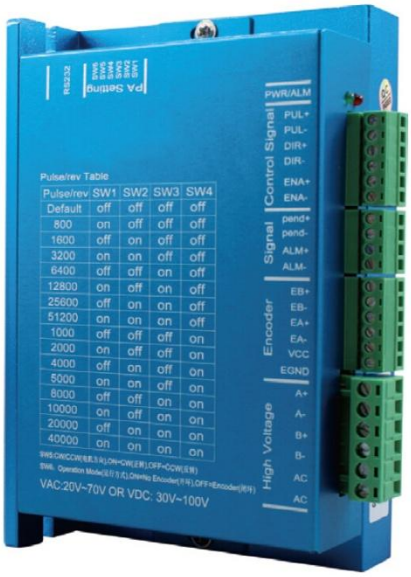
SL2780A-E 2 Phase Close-loop Hybrid Stepper Drives

Manual

【*Please read the user's manual carefully before using, in order to avoid damage to the drive*】



1.Introduction

1.1 Overview

SL2780A-E Driver is the new hybrid servo driver, adopting latest DSP chip and Vector closed loop control technology in order to overcome the step loss problem completely . At the same times to heighten motor performance, to reduce heat and vibration so as to raise the speed and precision, to decline the consumption of machine. In addition, when the machine is in the continue overload, the driver will alarm. So it is of the same reliability as AC servo system.

1.2 Technology Feature

- Adopting 32 bit special DSP chip;
- Advanced Vector closed-loop control technology;
- Be of trapezoidal wave testing function.
- Arbitrarily setting static current and dynamic current (range from 0-8.2A).
- Be suitable for Nema34 series Hybrid servo motor.
- Optically coupled isolated differential signal input.
- Max impulse response frequency up to 200KHZ.
- subdivision setting (within 800-51200)
- Be of the protection of over-current, over-voltage and tracks of deviation.

1.3 Applications

The driver is applicable to various large and medium automation equipment and instruments, including engraving machines, stripping machine, labeling machines, cutting

machines, laser phototypesetting , graph plotter, numerical control machine tools, auto assemble equipments and so on. It is the best choices for users pursuing low vibration, low noise, high accuracy, and high speed.

2.Electrical，mechanical and environment parameters

2.1 Electrical parameters

parameters	SL2780A-E			
	Min.	Typical	Max	Unit
Continue output Current	0	-	8.2	A
Input Voltage	+18	60	+80	VAC
Logic input current	7	10	20	mA
Impulse frequency	0	-	200	KHz
Insulation resistance	500	-	-	MΩ
Encoder current	-	-	50	mA

2.2 Operation environment parameters

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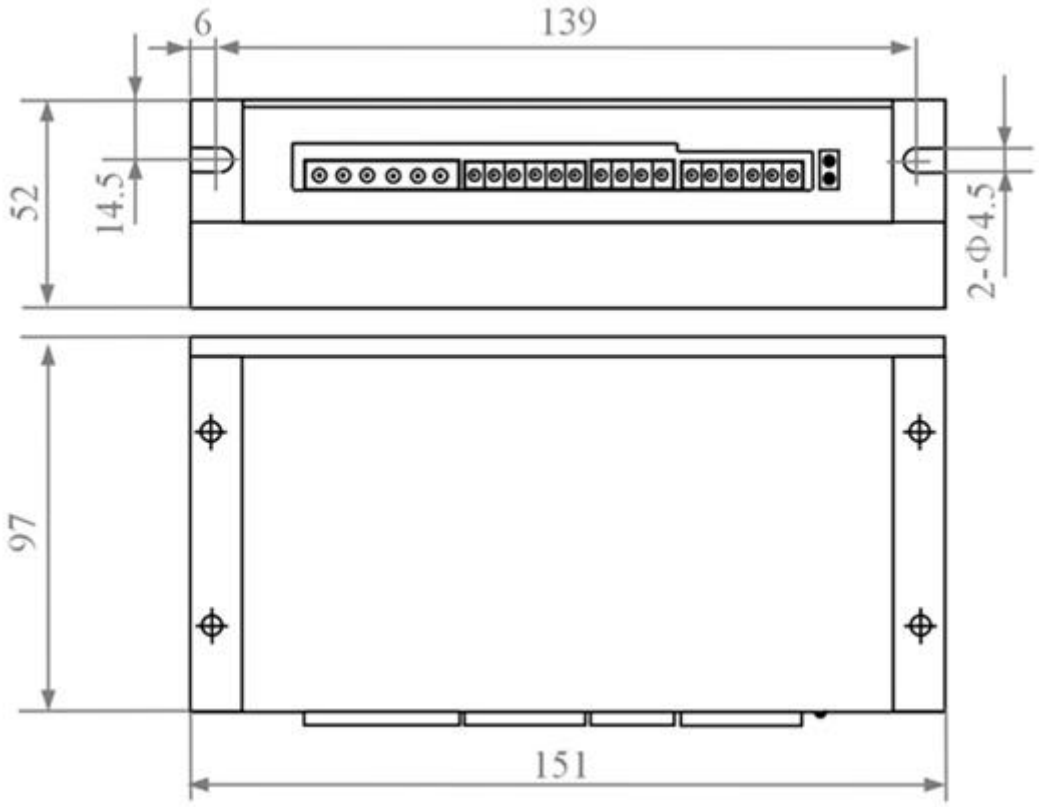
Cooling method		Natural cooling or forced air cooling
Environment	situation	Avoid the dust, oil mist and erosive gases.
	temperature	0-+50℃
	humidity	40-90%RH
	vibration	10-55Hz/0.15mm
Storage temperature		-20℃～65℃
Weight		about 570g
Operation temperature		within 50℃ for driver, within 50℃ for motor.

2.3 Installation dimension graph



3.Driver Interface and Wiring

3.1 Interface

3.1.1 Motor and power input port

Port	Sign	Meaning	Illustration
1	A+	A phase motor winding +	
2	A-	A phase motor winding -	
3	B+	B phase motor winding +	
4	B-	B phase motor winding -	
5	AC	input power supply	AC24V-80Vor DC 24V-110
6	AC	input power supply	

3.1.2 Encoder signal input port

Port	Sign	Meaning	Illustration
1	EB+	Motor encoder B phase positive input	
2	EB-	Motor encoder B phase negative input	
3	EA+	Motor encoder A phase positive input	
4	EA-	Motor encoder A phase negative input	
5	VCC	Encoder power supply	+5V
6	EGND	Encoder ground power supply	0V

3.1.3 Control signal port

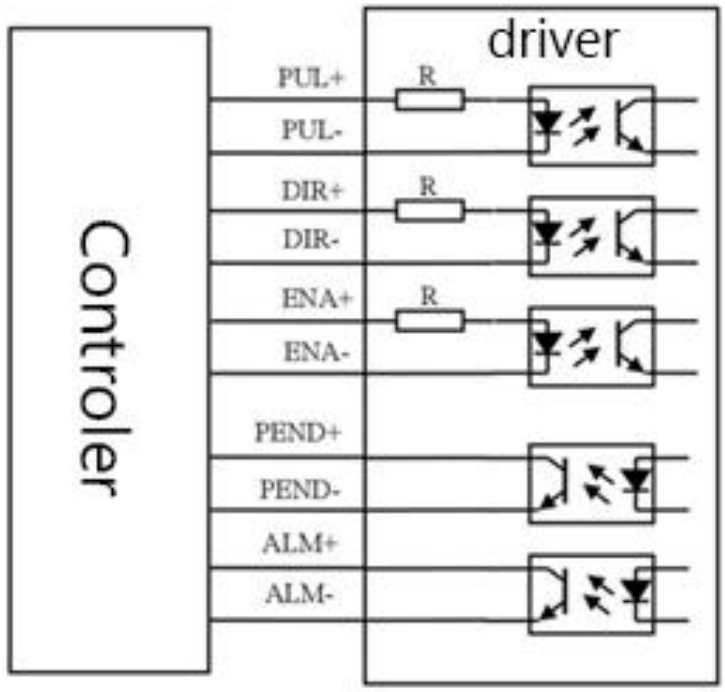
Port	Sign	Meaning	Illustration
1	PUL+	Impulse positive input	Universal signal:5-24V
2	PUL-	Impulse negative input	
3	DIR+	Direction positive input	Universal signal:5-24V
4	DIR-	Direction negative input	
5	ENA+	Enable positive input	Universal signal:5-24V
6	ENA-	Enable negative input	
7	Pend+	In-position positive input	Universal signal:5-24V
8	Pend-	In-position negative input	
9	ALM+	Alarm signal positive input	Universal signal:5-24V
10	ALM-	Alarm signal negative input	

3.1.4 Status indication

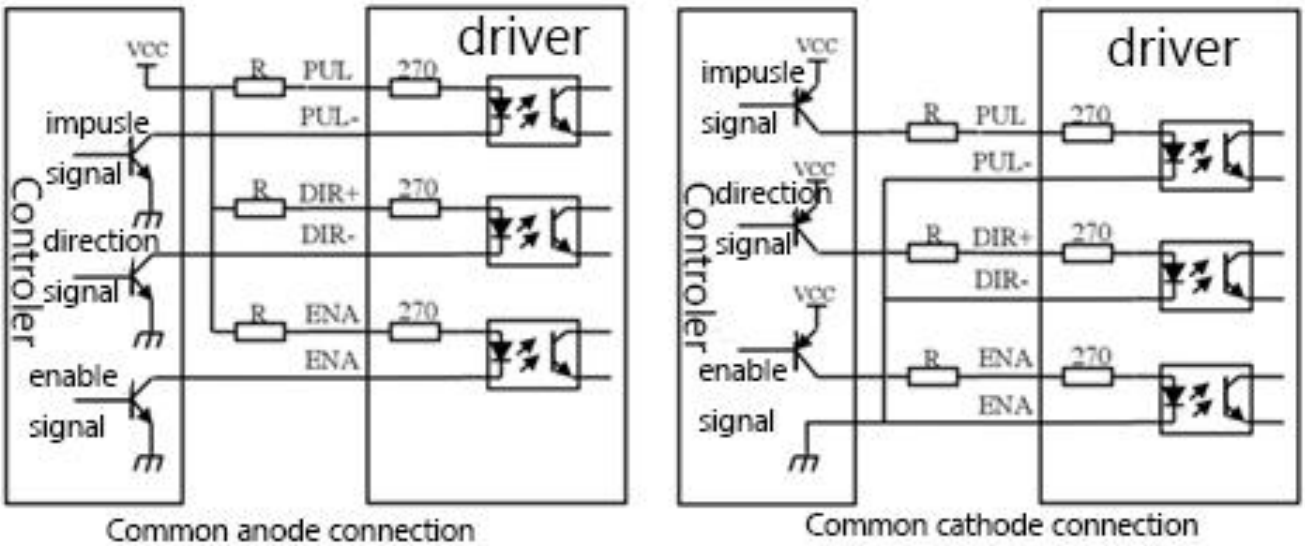
Green LED light is the power light, when driver is on power, green LED light is on; when is off, the green LED light is off.

Red LED light is the failure light, when there is failure, it blinks each 5 seconds. The blinks frequency is 2Hz, LED light is on for 200ms and off for 300ms. When there is no failure, the red LED light is off.

3.2 Control signal port circuit diagram



Differential control signal port wiring



Common anode connection

Common cathode connection

Signal end control signal port wiring

Illustration

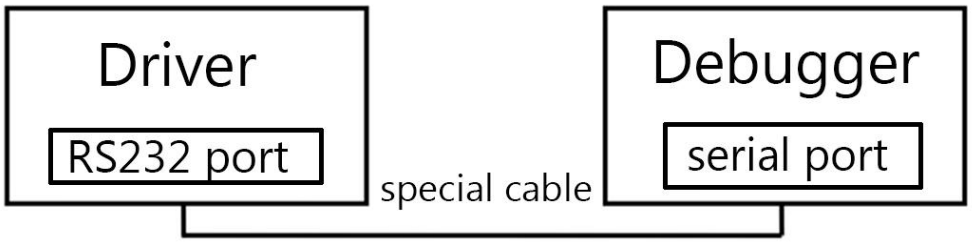
(1) ENA(Enable signal) should at least ahead of time for 5μs more than DIR. To make sure that it is high. Generally , It's ok when both ENA+ and ENA- are hanging.

(2) DIR should at least ahead of time for 5μs more than declining edge. To make sure that it is high or low.

(3) Impulse width isn't at least less than 2.5μs.

(4) Low level width isn't at least less than 2.5μs.

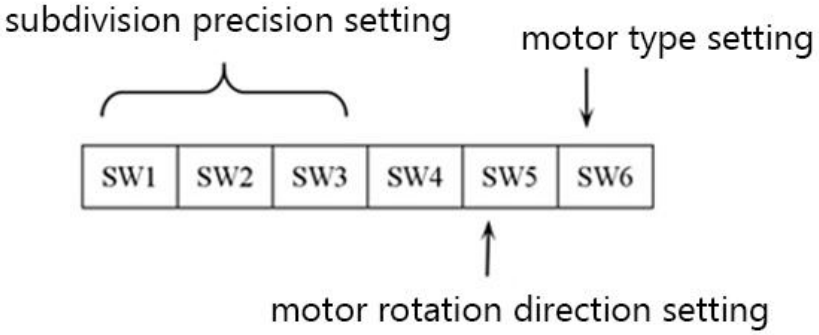
3.3 Serial wiring



parameter debugger wiring schematic diagram

4. Current and subdivision settings

Adopting 10 DIP to set the subdivision precision, control signal effective edge and motor rotation direction , as the following graph:



Subdivision settings

steps/circles	SW1	SW2	SW3	SW4
Default	on	on	on	on
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	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
40000	off	off	off	off

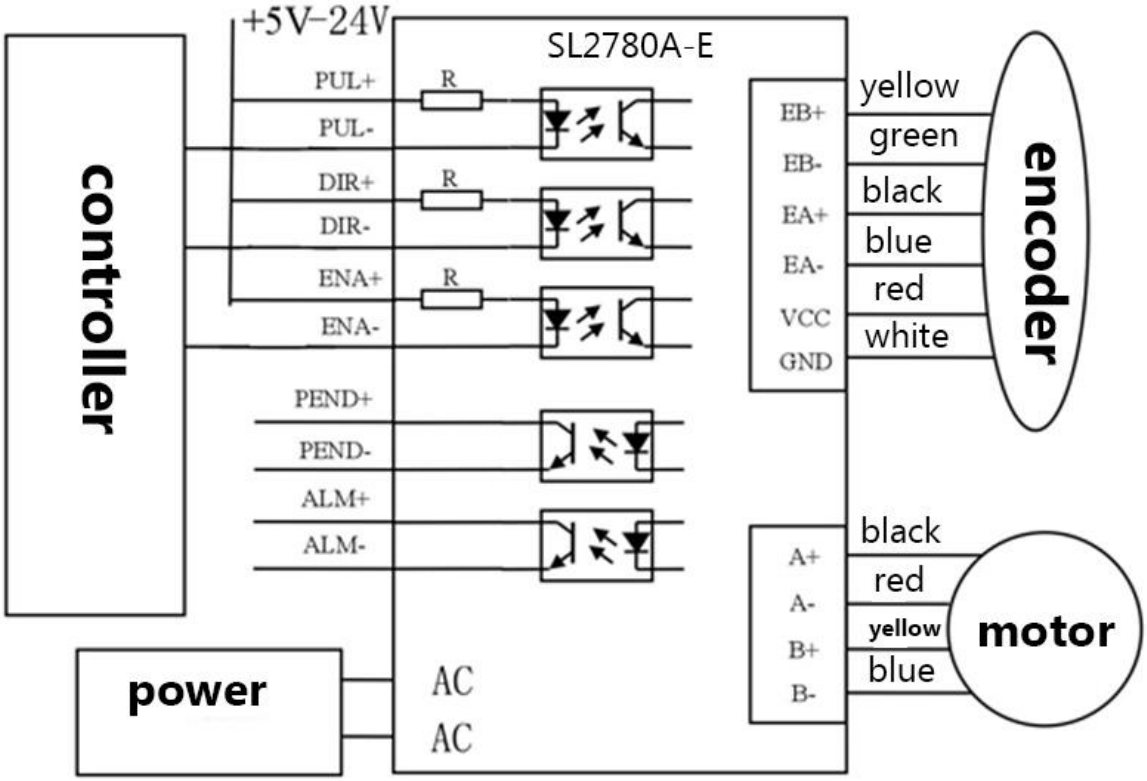
5. Driver parameters setting

The parameters setting of SL2780A-E driver should be modified by the special debugger and RS232 serial communication port connection. Inside the driver, there is a set of best default factory configuration parameters for motor. User can run the driver just adjust the inside subdivision according to the detailed requirements. For more details, please refer the debug instructions

Notes: The parameters of factory default of the current ring, position ring and speed ring are the best values. They needn't be modified. That's ok only through adjusting the motor subdivision and open or closed loop current percentage according to the need of system control. If it is the belt transmission, please adjust motor rigidity, current ring, position ring and speed ring to improve the efficiency.

6. Typical application wiring

The typical wiring of DC servo system including of SL2780A-E driver is shown as the following graph. The power is within the recommended range. The best the high speed performance is , the highest the voltage is.



Typical wiring

6.1 Hybrid servo motor encoder lead wire color and description

Pin	Color	Signal	Description
1	yellow	EB+	encoder B channel positive input
2	green	EB-	encoder B channel negative input
3	black	EA+	encoder A channel positive input
4	brown	EA-	encoder B channel negative input
5	red	VCC	encoder+5V power input
6	white	GND	encoder GND input

6.2 Hybrid servo motor wire color and description

Pin	Color	Signal	Description
1	red	A+	A phase motor winding +
2	white	A-	A phase motor winding -
3	black	B+	B phase motor winding +
4	green	B-	B phase motor winding -