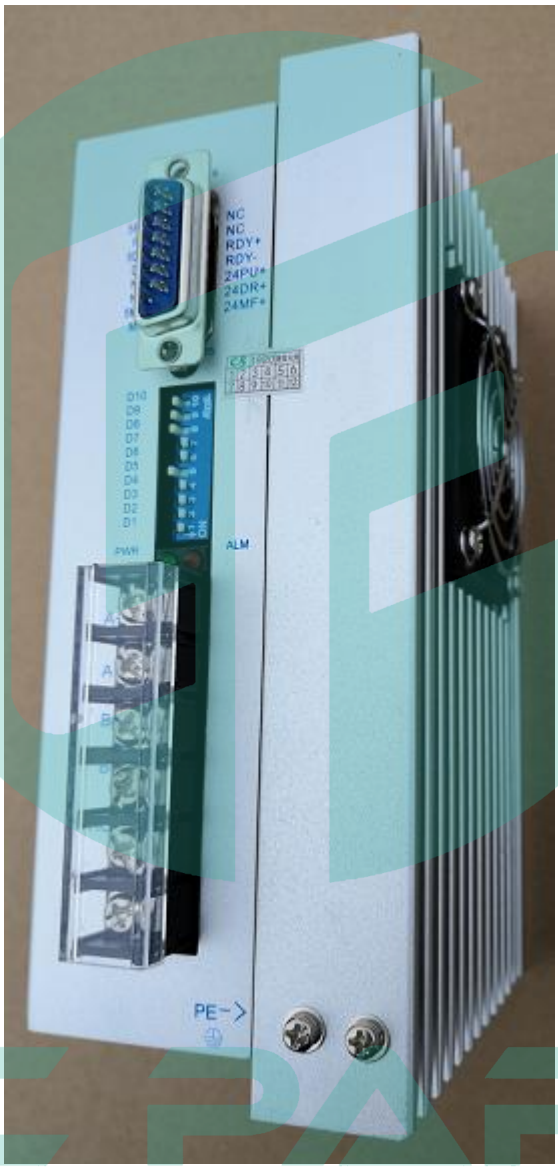
DH2522MC

2 Phase Step Driver(AC Input) User Manual
Rev.1.01



- DH2522MC is a high performance stepper driver which is based on new 32 bit of DSP technology. The driver voltage is 110-220VAC, the current is under 5A. It's suitable for 86mm/110mm flange size of 2 phase hybrid stepper motors. The driver internally applies the control technology which is similar to servo. The unique circuit design and excellent software algorithms make motor work more smoothly with lower noise and lower vibration. And the smooth and precise current control technology greatly reduces motor heat. Externally set 16-class of micro-step, the positioning accuracy can be 40000 pulse/ revolution. Photoelectric isolation differential signal input, strong anti-interference ability; over-voltage protection and over-current protection, etc.

Features

- Single power input, voltage range from AC110-240V；
- Adjustable drive current divided into 16 grades range from 2A/phase to 5A/phase；
- Provides 16 kinds of micro-step selection, the max resolution can be set to 40000 pulse/rev；
- The max pulse response frequency amounts to 200KHz(in fact, it can accept up to 600KHz);
- Phase memorize ： the Driver will memorize current phases automatically so that it can resume after restart, it is important in some application ；
- Protect circuit： Overheat protection; Over current, Over voltage protection；
- Idle Current: The running current of the driver is automatically reduced to 50% to reduced the temperature of the motor once the pulses stops for 100ms;
- Full isolation：the signal of the input and output, isolation of Power signal and control signal(it can effectively improve noise immunity)；
- 5V/24V control signal is selectable；
- Control Modes: Step/direction mode; or double pulse input mode；
- Self test： the motor can running at 0.5r/s by the driver, needn't extern pulse input signal;
- Dimension: 68x179x109(mm^3); net weight: 1Kg; Silvery white , recommend the fix Dimension at least:90x200x160(mm^3)；
- Operating temperature： －25 ˚～＋60 ˚(NOT freeze under 0 ˚)；
- Used the vector control and micro-subdivision control algorithm, improved obvious in the smoothly, noise and heat of the motor.；

Typical Application:

Mainly used on CNC router, engraving machine, packing machine, laser cutting machine, glass-making machine, embroidery machine, ceramic equipment, electronics equipment, etc.

Current Setting

The diver output current could be set by D1, D2, D3, D4 switches, there are 16 settings.

NOTE：RMS/A of the driver shell indicates the RMS of the driver output, and Peak/A indicates the peak current of the driver output. It could be changed online, needn't turn off the power.

IM/A	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0
D1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
D2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
D3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
D4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON

Micro-step Resolution

The Micro-step resolution (abbreviation DIV) could be set by D5, D6, D7, D8 switches. There are 16 settings. the DIV setting of the driver usually define the pulses of the stepper motor run a revolution， the Pulse/rev of the driver shell indicates the pulses/revolution。

DIV	200	400	800	1600	3200	6400	12800	25600	1000	2000	4000	5000	8000	10000	20000	40000
D5	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
D6	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF
D7	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
D8	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

note：the DIV setting should be change offline, means it must turn off the power and restart.

Pulse Input Mode

The pulse input mode could be set by D9 switch；

Setting D9 to ON, the drivers will work in double pulse input mode (the PU+/- input signal correspond to the forward to the driver, the DR+/- input signal correspond to the reverse to the driver);

Setting D9 to OFF, the drivers will work in pulse + direction input mode(the PU+/- input signal correspond to the pulse input to the driver , the DR+/- input signal correspond to the direction input to the driver);

NOTE：the Pulse Input Mode should be change offline, means it must turn off the power and restart.

Self Test Mode

The Self Test mode could be set by D10 switch

Setting D10 to ON , the drivers will work in Self Test mode , the motor can running at 0.5r/s by the driver after the driver is powered up , needn't extern pulse input signal, the Current setting is still availability , but the Div setting isn't availability ,this function is useful to test the Driver availability;

Setting D10 to OFF, the drivers will work in normal function mode, the driver will accept external signal.

NOTE: when Setting D10 to ON, it should ensure no extern pulse signal input to the driver before power up.

Connecting the Inputs and Outputs

All the signal of the inputs and output are isolated between the extern interface signal and the MCU process signal.

There are two high speed optically isolated inputs of the drivers called PULSE(abbreviation PU , there are 24PU+,5PU+,PU- signals**) AND DIRECTION(**abbreviation DR , there are 24DR+ , 5DR+ , DR-**).**

The Driver has one low speed optically isolated inputs called Motor Free (abbreviation MF, there are 24MF+, 5MF+, MF- signals**).**

Terminal Assignment table specification

IO ports	Abbreviation mark			function	specification
DB15 Signal interface connector	Inputs signal	Pin 13	24PU+	Pulse input signal (5V/24V selectable); it is the forward control signal when double pulse input mode	Reference the Pulse Input Mode instruction, and the appendix about the signal interface scheme. Note the signal input timing sequence.
		Pin 1	5PU+		
		Pin 2	PU-		
		Pin 14	24DR+	Direction input signal (5V/24V selectable); it is the reverse control signal when double pulse input mode	
		Pin 3	5DR+		
		Pin 4	DR-		
		Pin 15	24MF+	Motor free control signal (5V/24V selectable); when it is active, the motor axis is free; when it is not active, the motor axis is hold or run status.	Reference the appendix about the signal interface scheme. Note the signal input timing sequence.
		Pin 7	5MF+		
		Pin 8	MF-		

	Outputs signal	Pin 11	RDY+	Ready signal of the driver， it is the C/E outputs of the optical coupler (collector abbreviation C， emitter abbreviation E)	Reference the appendix about the signal interface scheme. when the diver power on , the system self test will trigger the optical coupler on about 500ms， the ALM red led indicator will twinkle a moment，that mean the ALM LED is normal , also give a status indicator to the upper monitor.
		Pin 12	RDY-		
6 PIN Barrier connector	MOTOR LINE	PIN 1、2、3、4	A+、A-、B+、B-	Connect to the stepper motor A+、A-、B+、B-	Usually , the 86mm flange size of 2 phase hybrid stepper motors only outputs A+/A-/B+/B- wire，and the 110mm/130mm flange size of 2 phase hybrid stepper motor outputs A+/A-/B+/B-/PE, the PE wire must connect to the ground where have 2 M4 screws marked PE on the radiator . the motor wire to the driver as far as possible short , normally less than 3 meters 。
	POWER INPUT	PIN 5、6	~AC、～AC	AC:110-220V	Maximum operation voltage 265V，if the voltage is too high or not stability of the supply voltage , recommend add a isolation transformer , and the ratio is about 220:180， the power is about 0.5-1.5KW (according the work current of the driver)。

NOTE:

1.The N pin of the DB15 signal interface connector is no use pin, it is reserved ， must be left unconnected.

2. The signal wire and the power wire must use shielded cable, and the shielded layer should connect to the ground where have 2 screw marked PE on the radiator.

3. The power wire recommend use 16 AWG or above.

Led specification

PWR: Green Led, the power LED indicator, it mean the power system of the driver is normal when the driver power up, it is abnormal when it off or twinkle.

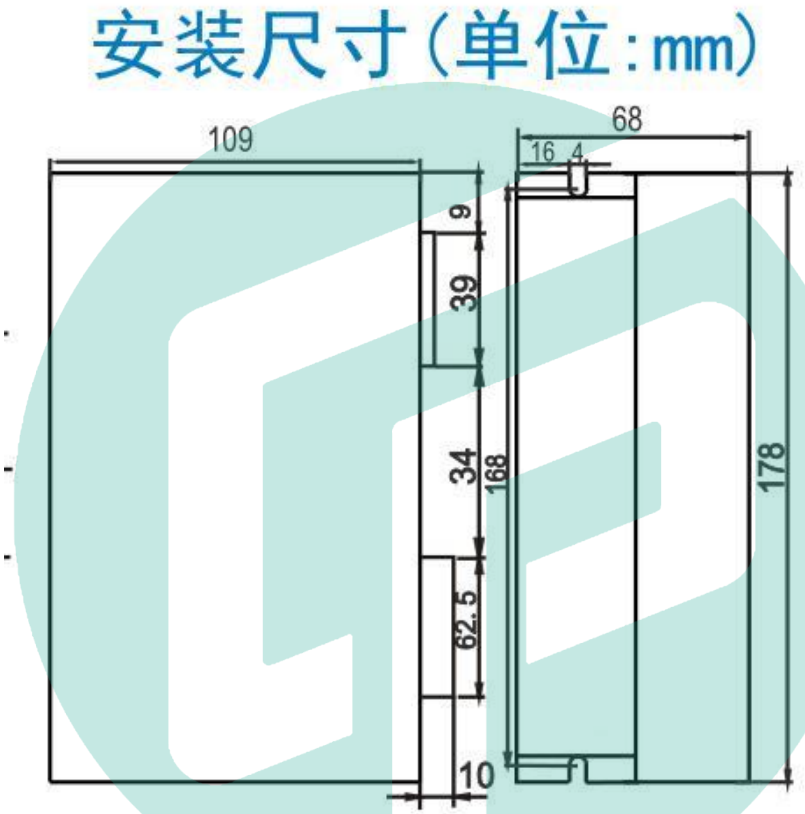
ALM: Red Led, the alarm led indicator , when power up , the ALM red will twinkle a moment，that mean the ALM LED is normal , also give a status indicator to the upper monitor. It is off when the driver work normal. When the protect circuit is active, such as overheat protection, over

current protection, over voltage protection, the ALM LED will on.

Mechanical Outline

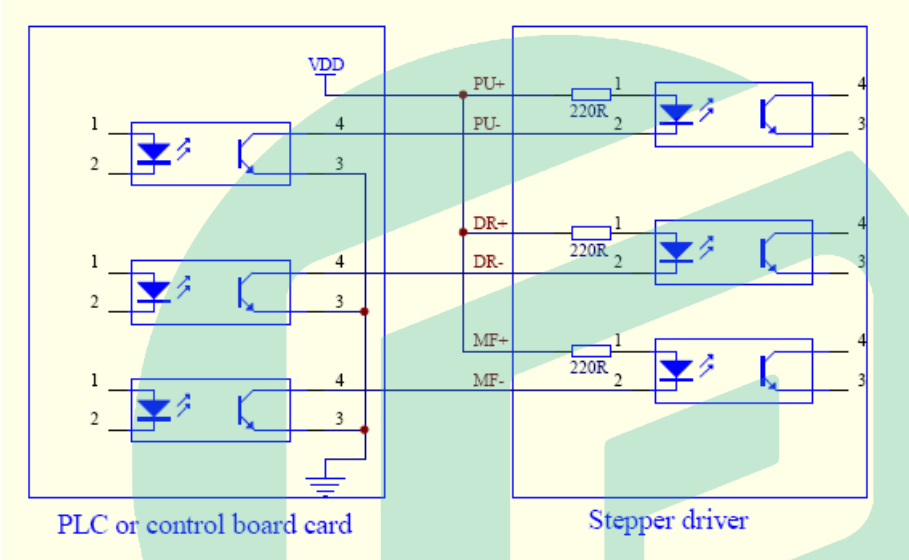
NOTE：

Unit ： mm

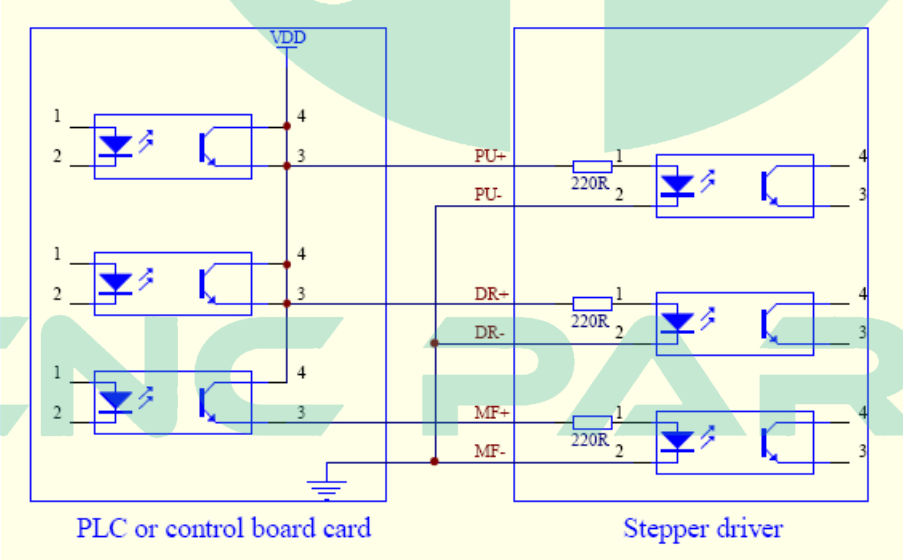


appendix: I/O port interface and the control timing sequence

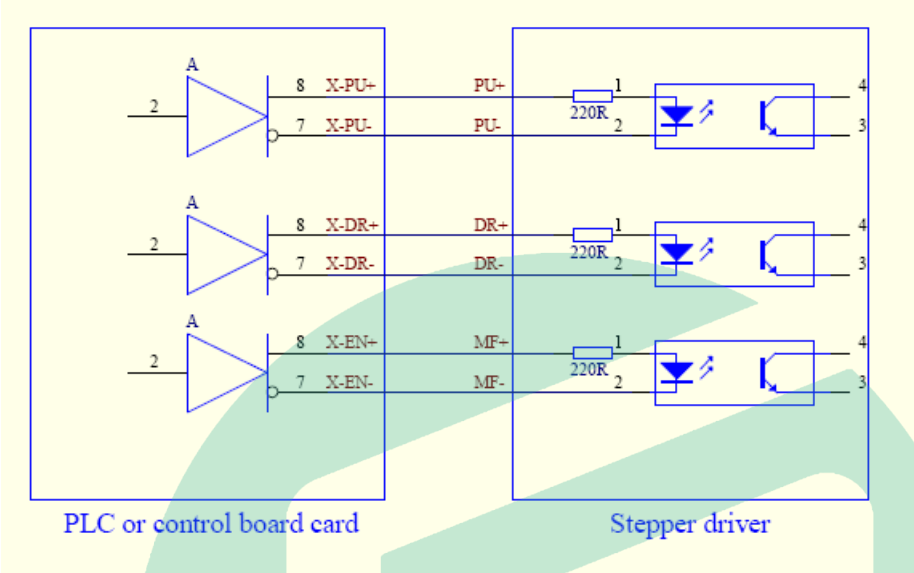
- **Input signal Common anode connection**



- **Input signal Common cathode connection**

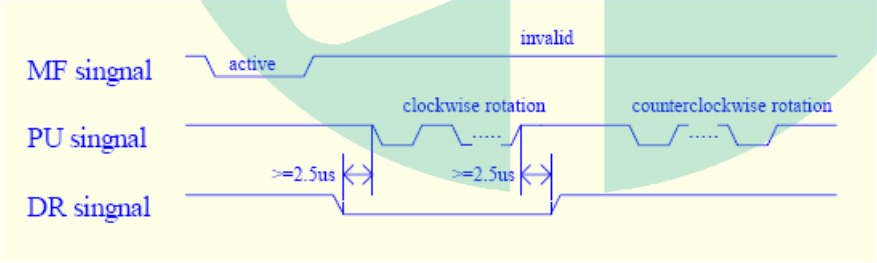


➢ Input signal difference connection



➢ Input signal timing sequence

Here show the timing sequence of MF-、PU-、DR- when the input signal Common anode connection (low level active)。



➢ Output signal connection

Ready signal of the driver，it is the C/E outputs of the optical coupler(collector abbreviation C，emitter abbreviation E) , when the diver power on , the system self test will trigger the optical coupler on about 500ms，the ALM red led indicator will twinkle a moment，that mean the ALM LED is normal , also give a status indicator to the upper monitor. At the same time, the C/E will connect. when the driver work normal , the RDY+/RDY- (C/E of the optical coupler) is disconnect , when the driver work abnormal , or the Protect circuit is active , the RDY+/RDY- (C/E of the optical coupler) is connected.