



## UNIPOLAR STEPPER DRIVER

This paper answers these questions about FIPUSD2 ;

### HOW TO

- 1- Connect the supplies of the card ?
- 2- Connect control signals ?
- 3- Connect the stepper motor ?
- 4- Set the operation mode ?
- 5- Adjust the motor current ?
- 6- Understand the LED indications ?

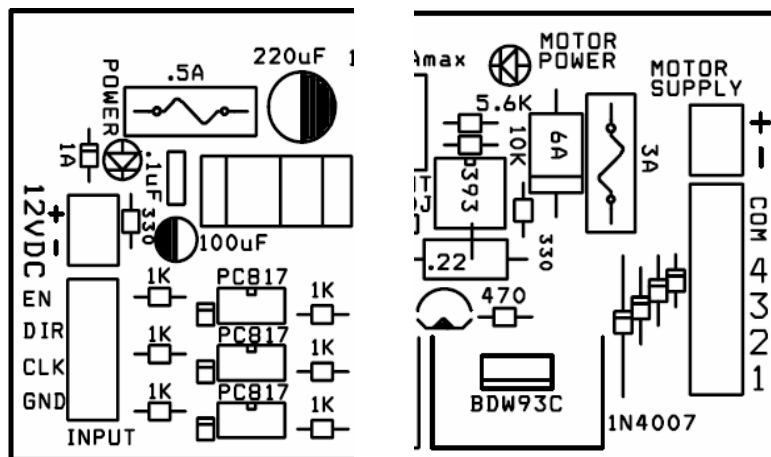
### Driver supplies

The driver card requires two supplies have the same ground.

One for control circuit(from +9VDC to +16VDC),and labeled 12VDC with polarity

The other for stepper motor (nominal motor voltage),and labeled MOTOR SUPPLY with polarity.

The card is protected against the reverse of polarity.



### Control signals

There are three input signals to control the stepper motor

#### 1-EN enable signal

A (5V to 12V) to this input put the motor in enable state. i.e.It will respond to the other two inputs.

A (ground or float) to this input put the stepper motor in the disable state. i.e. it will not respond to the other two inputs.

#### 2-CLK clock signal

A transition from high to low on this input let the motor to turn one step.

High means (5V to 12V) and low means (ground or float).

#### 3-DIR direction signal

A (5V to 12V) to this input make the stepper turn in some direction (according to the motor winding connections). A (ground or float) to this input let the motor turn the other direction.

NOTE: control signals are optoisolated from the driver card so keep the ground of the signals separated from the ground of the supplies.

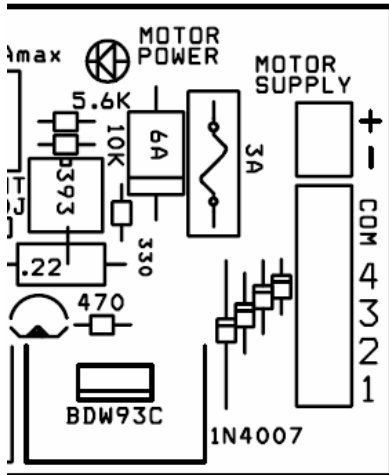


**Stepper motor connections**

The unipolar stepper motor may have five or six terminals. However, there are always four terminals of two windings, and one terminal (for five terminals motor) or two terminals (for six terminals motor) as a common.

The inputs of motor on the driver card are labeled 1,2,3,4 and COM.

Two terminals of one winding are connected to 1,3. Two terminals of the other winding are connected to 2,4. COM is connected to the common terminal.



**Operation mode setting**

DIP SW POSITION				OPERATION MODE
4	3	2	1	
OFF	OFF	OFF	ON	TEST OPERATION
OFF	OFF	ON	OFF	SINGLE WAVE OPERATION
OFF	ON	OFF	OFF	DOUBLE WAVE (TOW PHASE) OPERATION
ON	OFF	OFF	OFF	HALF STEP OPERATION

The stepper driver can operate in four modes. see table

1-Test mode

In this mode the driver does not require any external signal. It is only for motor testing.

The steps of the test operation is ;

- 1- Complete turn in some direction with high speed.
- 2- Stop for 0.4 sec delay.
- 3- Complete turn in the reverse direction with high speed.
- 4- Stop for 0.4 sec delay.
- 5- 3/4 turn in some direction with medium speed.
- 6- Stop for 0.4 sec delay.
- 7- 3/4 turn in the reverse direction with medium speed.
- 8- Stop for 0.4 sec delay.
- 9- 1/2 turn in some direction with low speed.
- 10- Stop for 0.4 sec delay.
- 11- 1/2 turn in the reverse direction with low speed.
- 12- Stop for 0.4 sec delay.

2-Single wave operation (minimum current and less torque)

3-Two phase operation (more current and more torque)

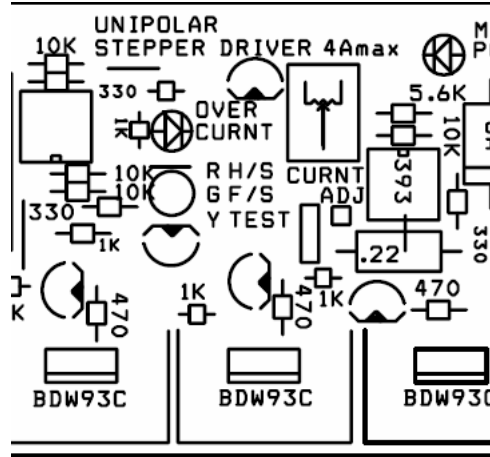
4-Half step operation (moderate current and torque with half the step angle).



### Adjusting maximum current

To control the maximum current supplied to motor adjust the voltage at the pin header labeled CURNT ADJ to the required value according to the equation

$$V=0.18 I_{max}$$



### LED indicators

There is an indicator LED for control supply input and another for motor supply input.

There is a LED indicator for over current alarm.

There is a three color LED indicator for operation modes

- 1- Off means motor is turned off.
- 2- Red means half step operation mode.
- 3- Green means full step operation mode.
- 4- Yellow means test operation mode.



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FARES INDUSTRIAL PRODUCTS

Unipolar Stepper Driver

MODEL: FIPUSD2

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