

# K158. BI-POLAR STEPPER MOTOR DRIVER

This kit will drive a bi-polar stepper motor driver using externally supplied 5V levels for stepping and direction. These usually come from software running in a computer.

Google 'Stepper Motor Software' and will see a range of controller freeware available. Also go to

- <http://www.metalworking.com/>
- <http://www.kellyware.com/>
- <http://www.thegallows.com/stepster.htm>
- <http://www.stepperworld.com/>
- <http://www.ams2000.com/>

**Construction.** Follow the overlay on the PCB. Add the lowest height components first – the resistors and diodes. Note there are seven links to add to the board. For the six short links use offcuts from the resistor legs. For the longer link we have provided a 1 1/2" of tinned copper wire. There are 4 pins you can place in the DIR and STEP positions if you wish to use the pins.

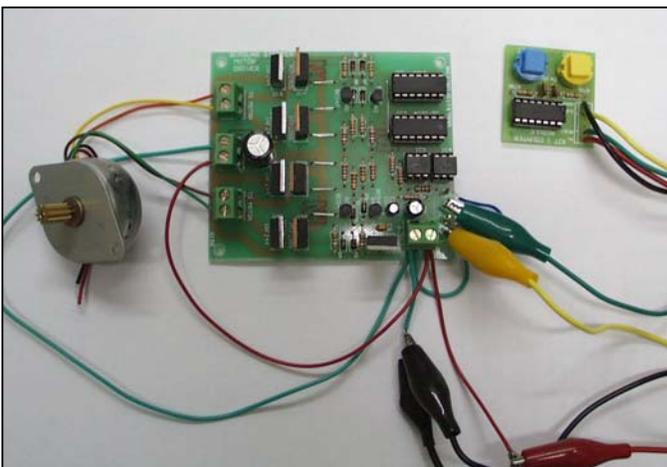
We have assumed that the operation of stepper motors is known to you. If not google the topic and also see our Kits 109, 113 and 179.

**Operation.** Attach a bi-polar stepper motor to the TO MOTOR terminals. Power to the Kit can be the same or different depending on the stepper motor being driven.

The **DIR**ection and **STEP** inputs are opto-isolated by the 4N25 IC's.

**DIR**ection. This is controlled by a 0V or 5V applied between the pins.

**STEP.** A 5V to 0V transistion between the pins will step the motor one position. The step direction will be according to the voltage applied to the DIRection pins.



We used the debounced Counter Module of our Kit 1 to test Kit 158. You can get the schematic for it here <http://www.kitsrus.com/pdf/k1.pdf>

The unipolar stepper motor is connected as a bipolar motor (the 2 center wires of the 6 wire motor are unused.)

9V was used. The STEP and DIRection negative input pins were tied together and connected to system ground.

## COMPONENTS

Resistors 5%, 1/4W, carbon		
150R brown green brown	R9 R10 R15 R16	4
1K brown black red	R1 R2	2
2K2 red red red	R7 R8 R13 R14	4
10K brown black orange	R3 R4	2
12K brown red orange	R5 R6 R11 R12	4
100uF/35V ecap	C1	1
10uF mini ecap	C2	1
100uF/63V ecap	C4	1
1N4148 diode	D1 – D8	8
104 mono	C3	1
Pins		4
4013 IC	IC1	1
4030 IC	IC2	1
4N25 IC	IC3 IC4	2
7805 IC	IC5	1
BC547B transistors	Q1 Q2 Q3 Q4	4
IRFZ44	Q1B Q2B Q3B Q4B	4
MTP2955	Q1A Q2A Q3A Q4A	4
6 pin IC socket		2
14 pin IC socket		2
2 pole terminal block		4
tinned copper wire		1 1/2"
K158 PCB		1

All the power inputs were connected together. The CLOCK was connected to STEP, and the RESET was connected to DIRection. Pushing the CLOCK button then advanced the motor one notch. Pressing CLOCK with the RESET button also depressed and pressed down advanced the motor one notch the other way.

Software does the same thing but using a PC.

The full color photo can be downloaded from [http://www.kitsrus.com/jpg/k158\\_1.jpg](http://www.kitsrus.com/jpg/k158_1.jpg)

This kit is based on a kit from Oatley Electronics, Australia. It is adapted here with permission.

You can read about about other stepper motor kits:

<http://www.kitsrus.com/pdf/k109.pdf>

<http://www.kitsrus.com/pdf/k113.pdf>

<http://www.kitsrus.com/pdf/k179.pdf>

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