

C7 - STEPPER MOTOR DRIVER CARD (DOUBLE MOTOR)

Opto-isolation Interface with PC/mP/mC

The circuit of Stepper Motor Driver Card described here can control two motors up to 6Kg Torque. It converts 8 level signals into an equal number of outputs with a drive capability of 2A each. It is suitable for any other project where up to two unipolar stepper motors are to be driven. It is generally assigned to work with the PC interface, the power driver card can be connected to any other type of computer that provides 8-bit wide I/O port.

About the Circuit:

The operation of the circuit is shown in figure is identical for all 8 channels. The input is connected to the PC card or any other port. Each signal drives a LED D1 to D8 and also drives an optocoupler IC1 to IC8. LED D1 to D8 indicates the status of input signal from PC interface. Each optocoupler is followed by an inverter consists in IC9 and IC10, which passes the signal to a driver contained in IC11. This IC is capable of supplying the necessary base current for the power transistors T1 to T8.

The logic level applied to pin1 of IC11 defines the data direction. The bit pattern supplied by the inverters is fed to the power transistors. The active low input of the bus drivers in IC11 are taken logic high by pull-up resistors, but can be made low by fitting a jumper (J1,J2). When J1 or J2 is removed, the relevant IC11 is switched to its high-impedance output mode(three-state), so that all eight power transistors driven by it are switched off.

The base currents of the eight driver transistors T1 to T8 are limited by 1K resistors R26 to R33. When transistors are switched on, the associated LED D17 to D24 lights. The LED arrays are intended mainly to assist you while running an initial test on the stepper motor control. The LED bars shows the status of all eight motors at a glance, and will be found much more handy. Each collector-emitter junction of the power transistors is shunted by diodes D9 to D16, which suppress back emf pulses generated when inductive loads are switched.

The circuit requires DC power supply of 5V, which is designed using regulator IC12.