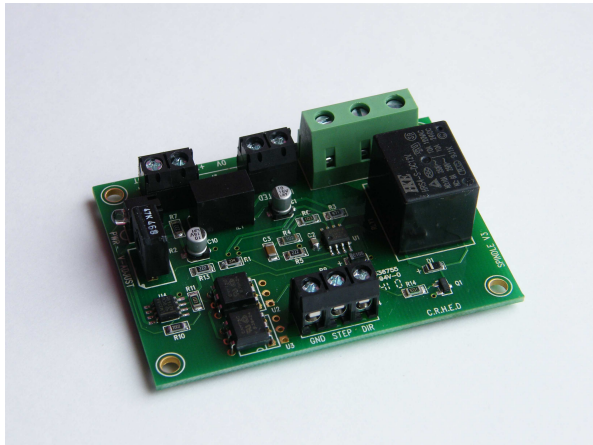


# SPINDLE V3

C R H Electronics Design



# SPINDLE V3

## Opto Isolated Digital to Analogue convertor board

### C R H Electronics Design

### Specifications

- Two way Stop/Start 240V AC 10A Relay.
- 3KV Opto isolation
- 0-10 volt buffered output.
- Board size 72 X 51 mm, FR4, RoHS compliant.
- Can be driven direct from parallel port.
- 12 Volt operation, consumption <100mA
- Adjustable output level
- Uses Step and Direction signals
- Surface mount design with optional power isolator
- Easily mounted in close proximity to the spindle motor removing high voltages away from computer and low voltage circuits.

**Hardware V3.0 July 10**

**Manual V3.0 July 10**

The latest version of the popular board is able to take signals from a standard parallel port or a buffered parallel board to drive a spindle motor board that normally uses a potentiometer to control spindle speed. This is achieved by converting stepper pulses from the A Axis output into a voltage level suitable for the spindle drive board. There is also a relay with contacts rated at 2400 Watts or 240V AC at 10 Amps suitable for switching power to the motor that is controlled by the forward, backward signal. Some motor control boards allow full reverse features, others are single direction only. The pins normally used to drive Spindle 2 are the A Axis outputs, pin 8 for direction which controls the relay and pin9 for step which gives a voltage level proportional to pulse

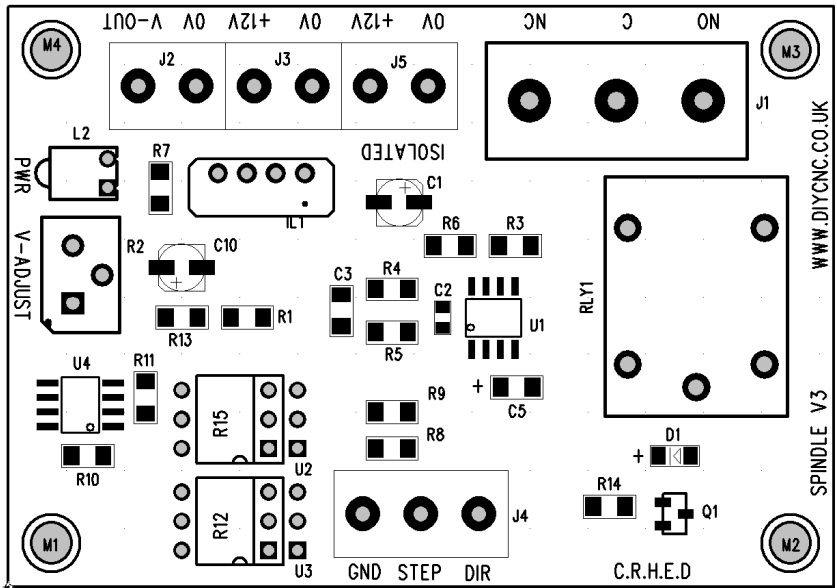
frequency. These pins are easily configured in software such as Mach 3 for this purpose. Most motor control boards have provision for an e-stop button and if not used there is a link on the PCB. This is also an ideal place to connect the relay to control the board as this only requires switching a low current circuit. A new optional feature is the ability to link to a common 12V circuit using a DC/DC power isolator, eliminating the need for a separate 12V supply.

### WARNING

It should be noted that some motor controller boards have no mains isolation and instead rely on being self contained systems. Connecting other circuits to these boards present a possibility of hazardous voltage levels which may result in electrocution or severe damage to circuit boards. We strongly recommend using a separate 12 volt DC power supply to drive the Spindle3 board or the optional DC/DC isolator module. Do not handle the SpindleV3 board when power is present. They may be high voltages between various parts of the board.

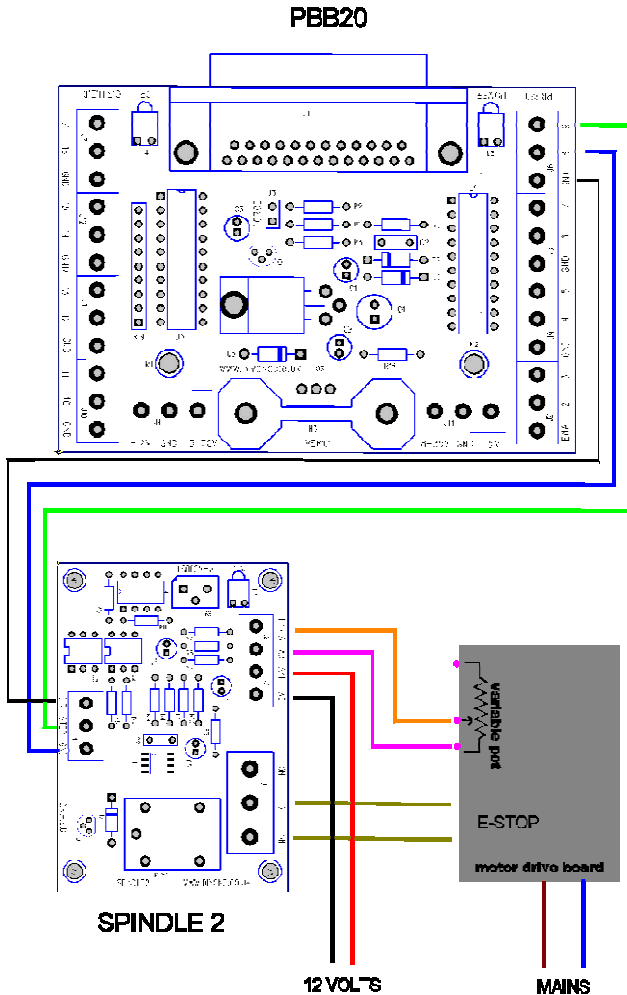
Fig1

### SPINDLEV3, DIGITAL TO ANALOGUE BOARD LAYOUT



## Output voltage adjustment

Preset resistor R2 gives a small range of output voltage adjustment to calibrate motor speed. This is normally trimmed to give 10 volts output for 2000 pulses per second. The board gives a good linear performance for converting the pulses into a voltage and should be better than 2% linearity. Fig2



## SPINDLE V3 SET-UP

Fig 2 shows connection details for a PBB20 interface to the Spindle 2 board and on to a motor control board that originally had a variable resistor control for speed. The output 0-10V connection from the spindle board goes to the centre or wiper of the pot/variable resistor.

### Notes:

Although you may use a basic breakout board to control the Spindle 2 board, this offers no protection of false triggering of the motor relay while the PC is being powered up or down or in a crash condition. The output pins of the parallel port are in unknown state unless under full software control and an interface board with a charge pump circuit enabling the output pins is recommended. A secondary manual power switch on the power feed to the spindle motor is also advised and only activated just before running the CNC program.

If using a separate 12V DC supply to power the Spindle V3 board.

The board has a built in regulator and can tolerate variations between 11-15V supplies.

### Contact Details

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