

# KIT 74V2. PC PARALLEL PORT RELAY BOARD

With the rapid progress in computer technology many people now have a surplus computer just gathering dust somewhere. Thus these computers are free to be used as dedicated controllers for a variety of uses: turning on/off lights or other devices around the home, office, laboratory or factory come to mind. All that is needed is the interface to connect it to the real world.

This Kit provides both the hardware and the software to do this. The hardware PCB plugs in directly to the parallel port of the computer. It carries 8 relays. Each relay is switched on or off by one bit of the output byte which usually goes to your printer to print a character. The relays **RWH-SH-112D** from [Goodsky](http://www.goodsky.com). They are rated to switch 250VAC at 12A. However, because of the PCB track thickness and width we do not recommend using the relay to switch more than 5A. If you want to switch more current then we suggest you solder some heavy duty wire links, on the bottom of the PCB, from the relay contacts to the screw terminal block (effectively in parallel with the PCB track).

You can download the relay data sheet from [http://www.kitsrus.com/pdf/rwh\\_relay.pdf](http://www.kitsrus.com/pdf/rwh_relay.pdf)

The terminals blocks are rated 300V / 10A. Connect 12VDC center positive to power the Kit.

## HARDWARE

The PCB contains eight identical switched relay positions, power input positions to the relays (either 2.5mm jack centre positive, or via the terminal block) and a DB25 connector to the parallel port of a PC. Use a straight-through 25 pin cable (DB25 male at one end, female at the other) cable from the PC to connect to the Kit. To keep the kit simple no input latches have been put on it. If your application is important then you should use a UPS to keep the computer operating in the case of a mains power supply failure.

Solder the resistors into place first. Make sure to get the right ones in the right place. The components for the first relay position are given in the Components listing. Add the relays last.

The relays are under direct control of the output byte (8 bits) from the parallel port. When a pin is high a nominal 5V is presented to the input of IC1, **ULN2803A** an 8 channel high voltage, high current darlington transistor array, used here as a relay driver.

There are a number of different types in the series – the 2803 is directly compatible with TTL and CMOS logic when operating at a supply voltage of 5V. The output is ‘open collector’ and features built in diode protection, making it ideal for use as a relay driver. Each relay is connected between the output pin and +12V. When the input is high the corresponding output goes low and the relay operates. For a discussion of ‘open collector’ see

[kitsrus.com/zip/opencol.txt](http://kitsrus.com/zip/opencol.txt)

This IC has replaced 8 transistors, 16 resistors and 8 diodes which were used to drive the relays in the previous version of this kit. This has greatly reduced the time and effort required in assembling the kit.

## SOFTWARE

Download the software from our website and unzip <http://kitsrus.com/zip/k74disk.zip>

**DOS Utilities.** The **k74\_dos.txt** file give full details on how to use these DOS files in batch files. Of course, you can write your own programs in any language to output a byte to the printer port and the bits which are high will turn on the corresponding relay. The overlay on the PCB shows which bit in the output byte turns that particular relay on. For example, output 00010001, or 11 in hex turns on relays 1 & 5. Each relay number is also marked on the overlay for easy reference.

**Windows 9x/2000/NT/XT.** After you run setup read the **drivers.txt** file and follow the instructions. Put an icon on your desktop of the **diy74.exe**. Play with the program and you will soon learn how it works. Time files can be saved. Read the Help file for more information.

**Linux software** for Kit 74 has been written by James Cameron. You may get it at Quozl's Open Source Work.

<http://quozl.netrek.org/>

## COMPONENTS

Resistors 5%, carbon, 1/4W:		
1K brown black red	R1,2,3,4,5,6,7,8	8
1N4004 diode	D1	1
5mm red LED	L1,2,3,4,5,6,7,8	8
2 pole terminal block	X10	1
3 pole terminal block	X1,2,3,4,5,6,7,8	8
100uF/25V ecap	C1	1
2803A relay driver IC	IC1	1
IC socket, 18-pin	for IC1	1
12V relay RWH-SH-112D	RL1,2,3,4,5,6,7,8	8
Power jack 2.5mm	X9	1
D25 connector,	CN1	1
Right angle, male, PCB mtg		
Kit 74V2 pcb		1

See our website for all our kits. If you like Kit 74 also look at kits 108 and 93.

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

(Documentation april 5, 2003.)

# KIT 74. PC PARALLEL PORT RELAY BOARD

