

KIT 149. USB PIC PROGRAMMER

Parallel ports are slowly disappearing from PC's and laptops which means that our current PIC programmers are all facing extinction. So this is our first PIC programmer using the USB port. It can also accept input from a serial port at the flick of a switch.

Note the PCB has a presoldered surface-mount IC on the solder-side of the PCB. See the photo below. Four rubber feet are already attached to protect it. This is a FT232BM chip and details about what it does can be found at <http://www.ftdichip.com/>

NOTE: two of the pins (13 & 14) of the FT232 are connected together. The solder bridge on these pins is deliberate. The kit schematic indicates that pins 3, 13, 14, & 26 are connected.

Full documentation about assembly details, installation of software, parts list and schematics can be downloaded at <http://www.crowcroft.net/kitsrus/k149disk.zip>

Unzip the files into a temporary subdirectory and run setup. It dumps into C://diyk149. Print out k149.pdf and follow the instructions.

PLEASE make sure you do the 5V check before putting in the ICs. Do **NOT** put in the LK1 link until you have done this. Otherwise you might blowup the FT232 chip. Make sure the ICs are around the correct way. Follow the overlay on the PCB. Note that the diode D3 has a via under it. Do not feed one leg of the diode into the via by accident. (Some people have. We will move that via next production.)

There is on-board firmware in the PIC16F628 IC.

Details about how to install the USB drivers are in the documentation. Download the required files as directed. Currently the software runs under W9x/NT/2000.

Note that if you switch between USB & serial modes you will have to reset the COM port. If you forget which USB com port is installed you can always look it up at

Start>Settings>Control Panel>System>Device Manager >Ports In testing several K149 programmers under W98SE2 we have found that the USB COM port changes from 3 to 4 for different programmers. We have not worked out why. You will need a Type A – Type A USB cable (readily available) to connect the PC to the Kit.

18VDC is needed to power the programmer. Since the FT232 draws about 50mA this means that the 7805 will get a little warm. We have provided a small heatsink for this. Note that the FT232BM will turn off when it is not in use to save power.

Note the 'Fly Window' under Options which allow K149 to be used with MPLAB when a new hex file is compiled.

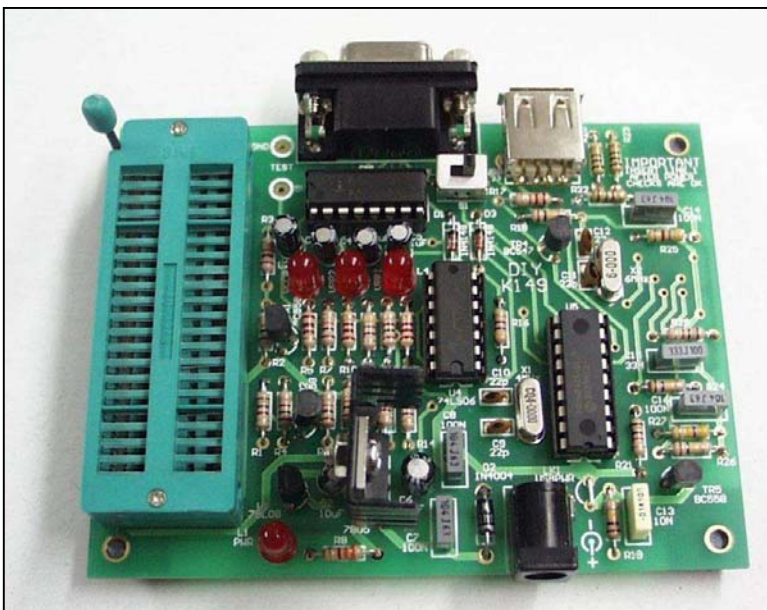
Programming Socket. If you do not do a lot of programming then use the 3 x 20 pin IC sockets provided. Break one of the sockets to make pins 21-40 of the 0.6" wide socket as shown in the photo in k149.pdf docs.

However, if you program a lot then please buy a wide-slot 3M ZIF socket. We sell them at \$US12 plus \$US3 postage. You can order it direct from me at peter@kitsrus.com

Or buy the socket from one of my distributors. If you use an Aries ZIF socket with smaller pins then do not feed too much solder into the pin/pads when soldering. You will just short-circuit to an adjacent pad with excess solder.

Firmware. The firmware supplied with this kit is the jan 15, 2003 version. If and when new firmware is released in future all you have to do is download the upgrade file, put in a blank 16F628 in the programming socket, and run Options/Upgrade in the MicroPro software user interface. Then swap the newly programmed firmware for the old firmware.

User Interface. Download the latest version (V110103) of the User Interface as outlined above. It has the Options /Upgrade in it. It looks for the file **pgmupgde.hex** in C://diyk149.



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24LC256 programming. If you want to program the EEPROM 24LC256 you need to add a 10K resistor to the underside of the PCB. See the file **k149mod.pdf** in the downloaded **k149disk.zip** for position details.

chipinfo.dat This is just a text file and you can add your own PIC chips to it if you understand and conform to the format. Note only one blank line between different PICs.

PIC Supported. These PIC's are currently supported
12C508 12C509 12C671 12C672 12CE673
12CE674 12F675 15C505 16C554 16C558
16C61 16C62 16C62A 16C62B 16C63
16C63A 16C64 16C64A 16C65 16C65A
16C65B 16C66 16C66A 16C67 16C711
16C71A 16C710 16C711 16C72 16C72A
16C73 16C73A 16C73B 16C74 16C74A
16C74B 16C83 16C84 16F627 16F628
16F74 16F83 16F84 16F84A 16F870
16F871 16F872 16F873 16F874 16F876
16F877 18F242 18F252 18F442 18F452
18F242 18F258 93LC46B 93C56 93C66
24LC256 (with 10K resistor addition – see text)

The programmer hardware, firmware and user interface were designed by Tony Nixon. See his other projects at <http://www.bubblesoftonline.com/>

Kit 150. A smaller, mostly surface mount version of K149 is currently being prototyped. It will only have the USB port, no serial port. It will be Kit 150. Out end February.

Kit 128. An all PIC Flash USB programmer is also being developed. Power for the kit will be taken from the USB port itself so no external power supply will be needed. It will be mounted in a plastic box. A 5-pin ISP socket will be on-board. It will be Kit 128. Out end February.

Both these Kits will use the FT232BM surface mount IC. All surface mount components will be presoldered in China. Users will not have to solder any surface mount components for themselves.

You may email me at peter@kitsrus.com with any questions. See my website at

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

For design questions email Tony Nixon direct at Tony.Nixon@eng.monash.edu.au

(Documentation, january 22, 2003.)