

# KIT 149 (version B) USB PIC PROGRAMMER

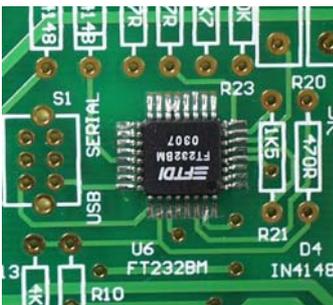
This documentation written may 9, 2003.

Kit 149B supersedes Kit 149A. It reduces the number of components on the board. It adds ICSP capability.

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 top of the PCB. This is a FT232BM chip and details about what it does can be found at

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



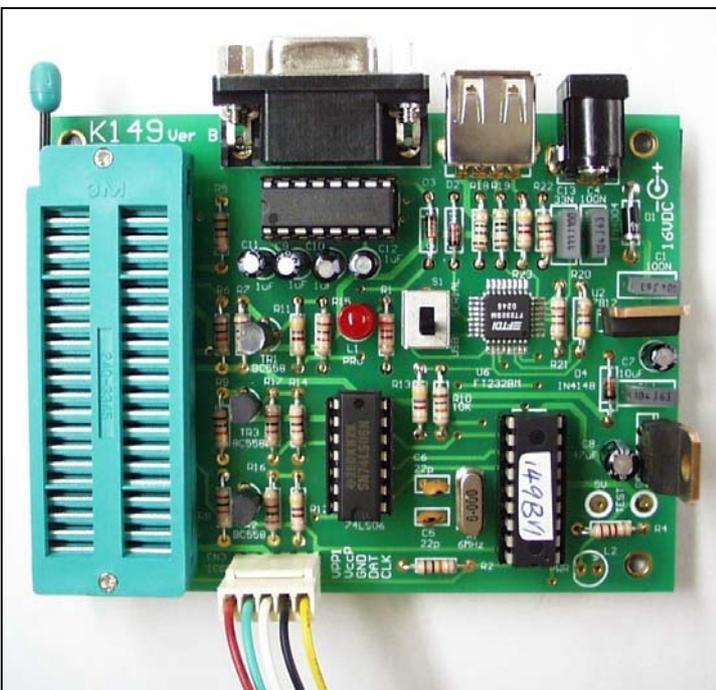
**NOTE:** the two adjacent pins 13 & 14, (3<sup>rd</sup> & 4<sup>th</sup> pins from the top left) are connected together. If you see a solder bridge between these pins is OK and not a mistake. Pins 3, 13, 14, & 26 are connected to Vcc.

## Software

Download the User Interface from

<http://www.kitsrus.com/zip/diypack7.zip>

Run setup.exe. The program will unpack into C:\diypgmr. Make a desktop icon for MicroPro.exe. This is the User Interface software to run with K149B. (It is also used for our other PIC Programmers: Kits 128, 149 and (the not released yet) 150.) MicroPro.exe will auto detect the Kit 149B so long as the correct COM port is selected. Pre-programmed firmware is supplied with the kit in the PIC16F628-04/P IC.



## Assembly

Disregard the other txt and pdf files in C:\diypgmr. Tony Nixon has not yet had time to write k149b.pdf. This file which will include the schematics will come shortly. For the moment follow the instructions here.

Check the components against the Component Listing below. Solder the lowest height components first: the resistors, diodes and IC sockets. Do not put in any of the ICs. (Note component designators C2 C3 and R3 were omitted.)

Make sure you do the 5V check at the TEST points in the lower right-hand side of the board before putting in the ICs. Make sure the ICs are around the correct way. (The notch on the firmware and the 74LS06 ICs are in the 6 o'clock position.)

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

**USB drivers.** These can be downloaded for free from the website. The ftdichip.com website keeps changing its format. Currently, go to

<http://www.ftdichip.com/FTWinDriver.htm>

and download the second option, the XP Certified Version, P8002104.zip of the drivers.

Then go to

<http://www.ftdichip.com/FTApp.htm>

Download the required application note which describes how to install the driver for your particular system. For example, AN232-03.pdf for Windows 98; AN232-05.pdf for W2000/XP.

**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 on p5 of the k149a.pdf docs. However, if you program a lot then please buy a wide-slot 3M ZIF socket as shown in the photo to the left. We sell them at \$US12 plus \$US3 postage. You can order it direct from me at [peter@kitsrus.com](mailto: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.

**Power.** When you connect power the Power LED will light up. Plug in a USB or serial cable. The USB cable needed is an A-A extension cable. Select the DPDT switch accordingly. Then start the program. Make sure the correct COM port is selected. Note that if you switch between USB & serial modes you will have to reset the COM port.

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Exit the program to reselect 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

Note the 'Fly Window' under Options which allow K149B to be used with MPLAB when a new hex file is compiled.

**No-Keypress Programming.** Flash chips are automatically erased in this mode if they are not blank.

**Known Bug.** Switching between USB & Serial modes may indicate an error when the COM port is reset. However, the port, if correct, will in fact be properly Reset. We are trying to fix this bug.

**PIC Supported.** For the list of PIC's supported (which is changing all the time) go to Options/Edit Chip List. Or just click on the Chip Selector drop-down box and run through the list.

**ICSP.** Click Options/ICSP Mode.

**jpg's.** The color versions of the two photos used in this Documentation may be downloaded from

[http://www.kitsrus.com/jpg/k149b\\_1.jpg](http://www.kitsrus.com/jpg/k149b_1.jpg)

[http://www.kitsrus.com/jpg/k149b\\_2.jpg](http://www.kitsrus.com/jpg/k149b_2.jpg)

**chipinfo.cid** 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 (not two or more) blank line between different PIC definitions. (In early versions of the micropro.exe this file was called chipinfo.dat but this cause compilation problems in W2000 so the name was changed.)

Because new PIC's are being released almost every month look regularly for new versions of the **chipinfo.cid** in

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

You may email me at [peter@kitsrus.com](mailto: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](mailto:Tony.Nixon@eng.monash.edu.au)

but note he is away until mid-june, 2003.

## COMPONENTS

Resistors 5%, carbon		
27R red violet black	R18 R19	2
470R yellow violet brown	R20	1
1K brown black red	R14 15 16 17	4
1K5 brown green red	R21	1
2K2 red red red	R1 R4	2
4K7 yellow violet red	R11 R12 R13 R23	4
10K brown black orange	R2 5 6 7 8 9 10 22	8
1N4148	D2 D3 D4	3
IN4004	D1	1
22p Ceramic	C5 C6	2
100N MKT Box Poly	C1 C4 C14	3
33N MKT Box Poly	C13	1
10uF Electro 16V	C7	1
47uF Electro 25V	C8	1
1uF Electro 50V	C9 C10 C11 C12	4
3mm Red LED	L1 L2	2
7805	U1	1
7812	U2	1
BC558B	TR1 TR2 TR3	3
6.000 MHz Xta	X1	1
DPDT PCB switch	S1	1
3 pin power jack	JK1	1
20 pin IC socket		3
18 pin IC socket		1
16 pin IC socket		1
14 pin IC socket		1
ICL232 or equivalent	U3	1
16F628-04/P preprogrammed	U5	1
SN74LS06 TI brand	U4	1
DB9 RA Female	CN1	1
USB connector	CN2 A type	1
rubber feet		4
5 pin Header and harness		1 set
K149B PCB with FT232BM presoldered		1

**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 have ICSP. A 40 pin wide-slot ZIF socket will be supplied as standard.

**Kit 128.** An all PIC Flash USB programmer has been developed. Power for the kit is taken from the USB port itself so no external power supply will be needed. It is mounted in a plastic box. 40 pin wide-slot ZIF socket is standard. See [http://www.kitsrus.com/jpg/k128\\_sc.jpg](http://www.kitsrus.com/jpg/k128_sc.jpg)

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

(Documentation, may 21, 2003.)