

QUASAR PROJECT 3149E – USB & SERIAL PIC PROGRAMMER

This documentation was written 20 Nov 2007.

PLEASE READ IN FULL BEFORE PROCEEDING!!

WARNING! To avoid damaging your programmer, please ensure devices are placed in the programming socket with the correct orientation and position as indicated by the Micropro software interface. The programming socket should be empty when powering the programmer up or down or applying a reset. Extreme caution should be exercised when using the ICSP header to avoid incorrect connection and damage to your programmer. Do not switch from USB to Serial when the programmer is connected.

Kit 3149E has an extra 10K resistor needed to program the 16F88 chips supported by MicroPro26b2. The programming transistors have been changed to BC327s for greater reliability and performance. It also has the 3 protection resistors, uses a USB 'B' connector and 6-pin header and harness for ICSP programming.

Parallel ports are slowly disappearing from PC's and laptops, which mean that our current PIC programmers are all facing extinction. So this is our first 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/>

Software

! PLEASE READ CAREFULLY !

Download the **MicroPro26b2** Programmer software from: <http://www.quasarelectronics.com/zip/MicroPro26b2.zip>

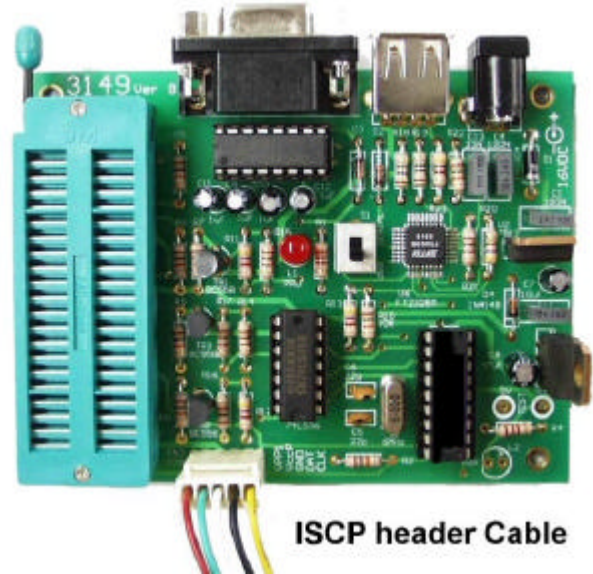
! DO NOT USE ANY OTHER VERSION YET !

Unzip and run MicroPro26b2.exe to install the software. The same is program is used to run all versions of the 3149. Please print the README and 3149B-E Manual (see Windows Start Menu >Quasar Electronics >MicroPro26b2) and read in conjunction with this document.

Photos - To aid assembly the colour version of the 3149B photo used in this documentation may be downloaded from: http://www.quasarelectronics.com/jpg/3149b_1.jpg

Note: 3149E changes a 10K resistor, adds three 3K3 resistors and changes to BC327 for TR1-3.

Assembly - Check the components against the Component Listing in the 3149BC User Manual noting the changed of one 10K resistor position, the addition of 3 off 3K3 protection resistors, USB 'B' connector and BC327 for TR1-3 in 3149E. Solder the lowest height thru-hole components first. Make sure the crystal is mounted 2-3mm above the



ISCP header Cable

PCB.

Do not put in any of the ICs. (Note component designators C2 and C3 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.)

Programming Socket - If you do not have 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 3149a.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 £15.00 plus postage. You can order direct on 0870 246 1826 or from our website at <http://www.quasarelectronics.com/zif40w.htm>

The 3M ZIF socket has spade style legs but if you use an Aries ZIF socket with smaller pins then **do not feed to much solder into the pin/ pads when soldering**. You will just short- circuit to an adjacent pad with excess solder.

USB VCP Driver Installation - You will need to download and install the FT232BM USB Virtual COM port (VCP) drivers from <http://www.ftdichip.com>. These drivers are being updated frequently. At this time they can be found at <http://www.ftdichip.com/Drivers/VCP.htm>.

Select the file for your Windows OS version. We downloaded the XP Certified Version [2.00.00](http://www.ftdichip.com/Drivers/VCP.htm) (CDM 2.00.00.zip) dated 19th May 2006. Unzip it to a new folder in a convenient location on your hard drive or an external disk. Connect the programmer and follow the driver installation program pointing it to the new driver's folder when asked. You can download a Help file AN232-05 from <http://www.ftdichip.com/FTApp.htm> to guide you through the USB driver installation if you are unsure of how to do it.

The first time MicroPro is run you must set the COM Port to the appropriate number (under File>Port). You can find the COM port number of the USB driver in the Control Panel

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under Ports (COM & LPT). In our system it is 4. MicroPro will auto detect the programmer once the correct COM port is selected.

NB Only COM PORT numbers 1 to 9 are supported by the programmer due to hardware limitations. If you find the driver is allocated a COM Port number higher than this you just need to plug the programmer into a different USB socket and a new number will be allocated.

Connecting Up - Use a USB type A-B cable (Order Code LDC644 @ £2.95. Order online at <http://www.quasarelectronics.com/lcd644.htm>) or a MF serial lead (Order Code LDC441 @ £4.95. Order online at <http://www.quasarelectronics.com/lcd441.htm>) to plug connect the programmer into the PC. Select the DPDT switch accordingly.

A centre positive 16-18VDC supply is needed to power the programmer (our Order Code [PSU010](#) is suitable). 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.

Remove any target devices from the programmer before powering it up or down.

Connect the programmer to the power supply and check the Power LED lights up. Next connect it to the USB port and start the MicroPro software. Make sure the correct COM port is selected (see above).

Note the 'Fly Window' under Options that allows the programmer 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.

ICSP - !! YOUR BOARD MAY USE DIFFERENT WIRE COLOURS TO THOSE SHOWN IN THE MICROPRO SOFTWARE – USE PCB OVERLAY TO DETERMINE CORRECT CONNECTIONS!!

ICSP is still a 'black' art for some PIC chips. It is not the purpose of this kit to teach ICSP. That is assumed.
Remember to proceed with caution at all times to avoid any damage!

Select Options>ICSP Mode in MicroPro. Does **not support** low voltage programming. The LOW pin is an open collector output, which will pull the LOW pin to ground. It can be used in ICSP to hold the LVP pin low while programming, or OSC1 pin, or any part of the target board which may need control in the manner) during programming. Click Options/ICSP Mode to use.

Refer to the MicroPro software help file for detailed operational and safety advice before using ICSP.

Software and Firmware Upgrades - The USB drivers and MicroPro software are frequently upgraded to add new features and extend the range of PICs supported. For the latest information look at

<http://www.quasarelectronics.com/micropro.htm>.

Build Number - MicroPro firmware now uses a build number and looks for the protocol number in the firmware. If they are the same version then the software and firmware are matched. The programmed firmware in this product release is version P018b2. You can perform a protocol check from the MicroPro Help menu.

Product Support

We offer Technical Support for a period of 12 months following the purchase of a new PIC Programmer or PIC Programmer Firmware Upgrade from us. Please submit your Support Questions to us via the form at <http://www.quasarelectronics.com/micropro.htm> ensuring that you provide the **invoice number** on which the product was purchased.

Mailing List - If you would like to receive the latest information on new products and software updates join our mailing list at:

http://www.quasarelectronics.com/mailling_list.htm

Please visit our website for details of our complete kit range: <http://www.QuasarElectronics.com>

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