



UPDATING FIRMWARE FOR THE CHAOS DIVIDER MODULE

NOTE: These instructions show the screens for the MPLAB X IPE, both v2.35 and v3.35

You will also need to have a Microchip PICkit 3 ICSP [In-Circuit Serial Programmer]. More information on that device here:
<http://www.microchip.com/developmenttools/productdetails.aspx?partno=ppl64130>

The PICkit 3 is available from many retailers such as Mouser, Digi-Key, Farnell, Spark Fun, etc. and usually costs less than \$50USD.

1) Download the desired firmware file from the Tsyklon Labs Product Support Page at:
<http://tsyklon.com/product-support/>

2) Download and install the MPLAB X IDE software suite. Download from microchip.com. Once installed, run the MPLAB X IPE program. Note, the MPLAB X IDE is the full blown "Integrated Development Environment" - you want to use the IPE, "Integrated Programming Environment":

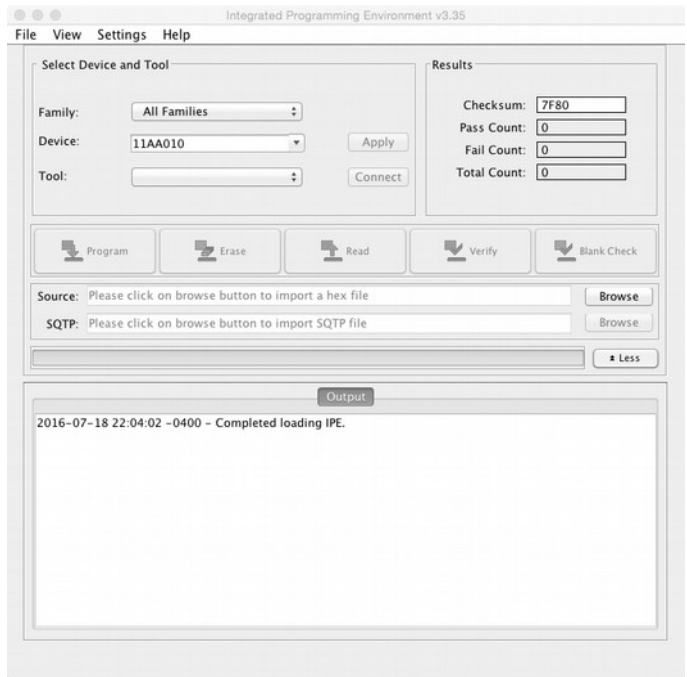
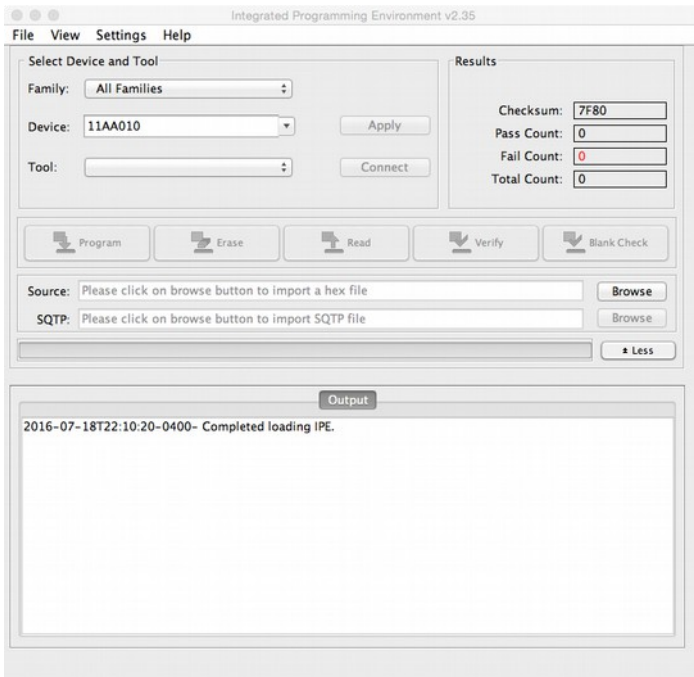


icon for v2.35 mlab_ipe



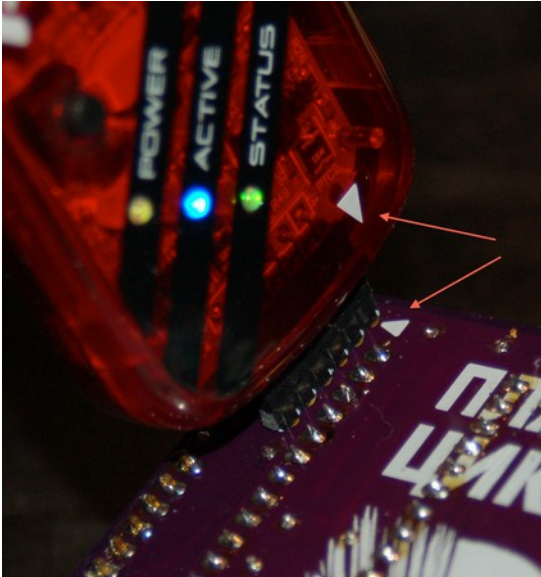
icon for v3.35 mlab_ipe

3) You should now be looking at the IPE application window:

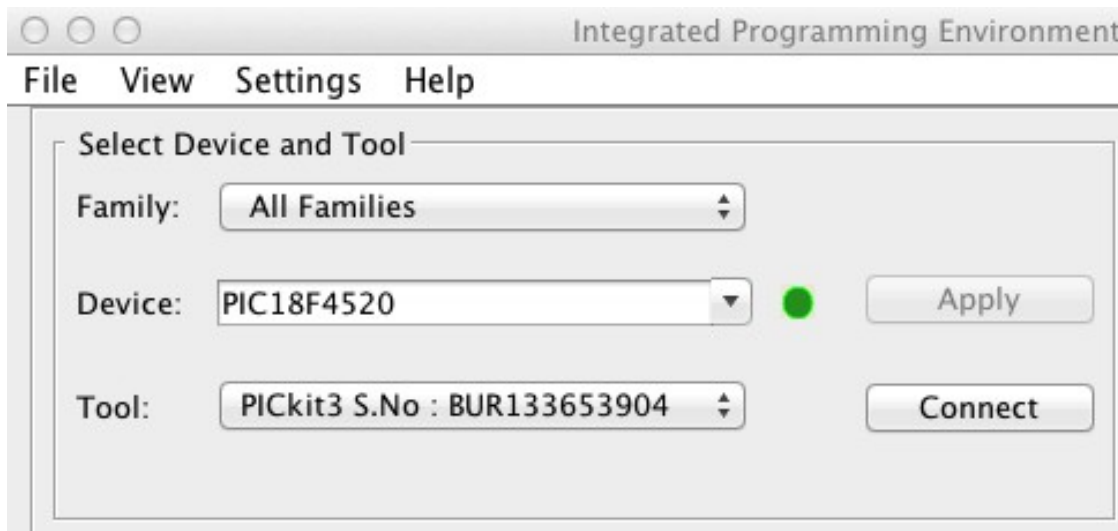


4) In the Device list box, select PIC18F4520 and click the "Apply" button.

5) Plug the PICkit 3 into the back of the chaos divider – be sure to line up pin 1 on the PICkit 3 [white arrow] to pin 1 on the Chaos Divider's MHDR_ICSP 6 pin header [it also has an arrow pointing to that pin].



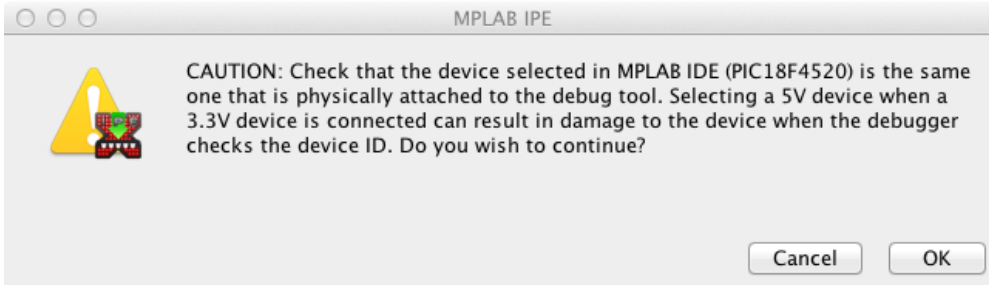
5) Next, plug the usb cable of the PICkit 3 into your computer. After a few moments, the IPE should find the PICkit 3 and show you that it is ready to connect [but **DO NOT** click **Connect** yet]:



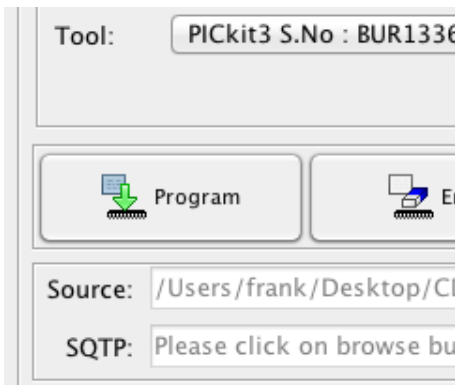
6) Before clicking the **Connect** button, click on the **Browse** button on the line with the "Source" path [in the middle of the IPE app]. Use the file dialog box to select the *.hex firmware file that you have downloaded.

7) Once all of the connections have been made, power up your Chaos Divider. It may appear to be dead because the Nixie tube is not lit, but this is normal behaviour until the PICkit 3 connects to the onboard Microcontroller.

8) OK, now you can click the **Connect** button to the right of the tool line. You will be presented with the following warning. This screen may take a few moments to appear, so please be patient. Since the PIC18F4520 is a 5V device, you can click the **OK** button to continue:

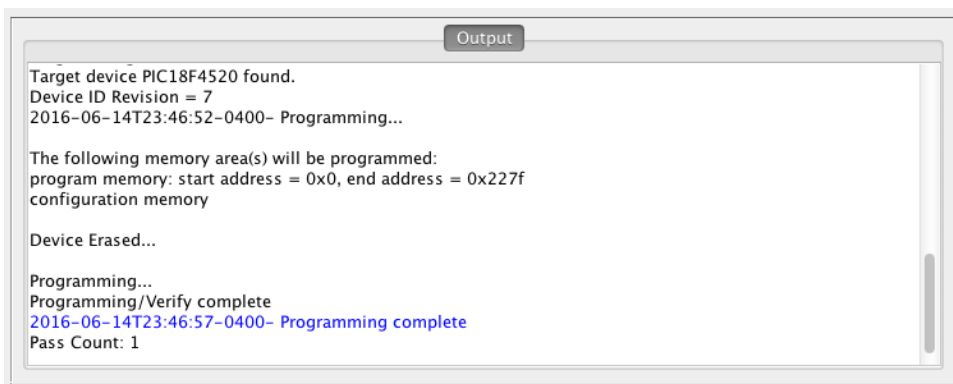


9) At this point your Chaos Divider should be powered up and waiting to accept the new firmware file. Click the **Program** button to download your desired firmware to the Chaos Divider:



DO NOT UNPLUG THE PICKIT 3 FROM THE CHAOS DIVIDER OR TURN OFF POWER TO THE CHAOS DIVIDER WHILE THE FIRMWARE IS BEING WRITTEN!! UNRECOVERABLE DAMAGE MAY OCCUR TO THE MICROCONTROLLER. IF THAT HAPPENS, IT WILL NEED TO BE REPLACED AND REFLASHED. Thankfully, this is only a \$5 chip, so there isn't a large cost to failure, but it is not an ideal situation. The Microchip part number for the Microcontroller is **PIC18F4520-I/P** – They are also available from many retailers.

10) Once the firmware download has been completed, you should see the following information in the **Output** window of the IPE:



If so, that is it – you are ready to enjoy your new firmware. Job well done, Udarnik!!