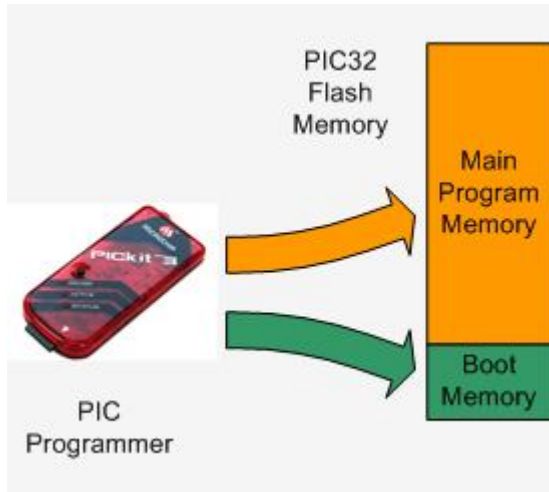


# Loading New Firmware

For new firmware and other updates go to <http://geoffg.net/maximate.html>

Loading a new version of MMBasic is controlled by a boot loader. This is a small program which has the ability to reprogram the PIC32 program memory using data sent to it over the USB interface. It is located in a reserved section of the PIC32's program memory and is always there regardless of what program is loaded into the main memory.

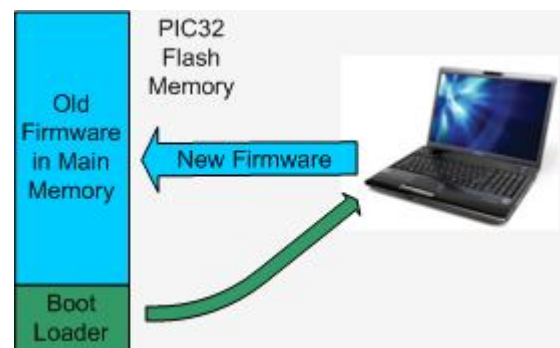


The boot loader was automatically installed when the PIC32 was programmed with the original version of MMBasic. This must be loaded by a PIC programmer such as the PICKit 3 and this will have been done by the supplier or yourself if you built you used a virgin PIC32 chip (this is illustrated in the diagram on the left).

Once the boot loader is installed all future upgrades are done over the USB interface under control of the boot loader (see the diagram below). No programmer is required.

Because the boot loader is located in

a protected area of memory it is completely unaffected by failures when programming the main memory. For example, if you loose power or accidentally unplug the USB cable while programming you can just go back to the beginning and restart the boot load process – the boot loader will never be corrupted or lost.



You can load whatever version of MMBasic that you want (ie, you can go back to an old version as well as load a recent version). There will also be special versions of the firmware and you can also try them out (for example RetroBSD).

## Universal Bootloader V1.1 for Windows

The program BootLoader.exe supplied with this upgrade will load MMBasic onto a Maximate, a DuinoMite or the UBW32 board. Previously the last two required their own special program but now the universal bootloader will work with all three.

On Windows 7 this program can be run directly (installation is not required). On earlier versions you should try running it first but you may need to install Microsoft's .NET V2.0 (use Google to find it).

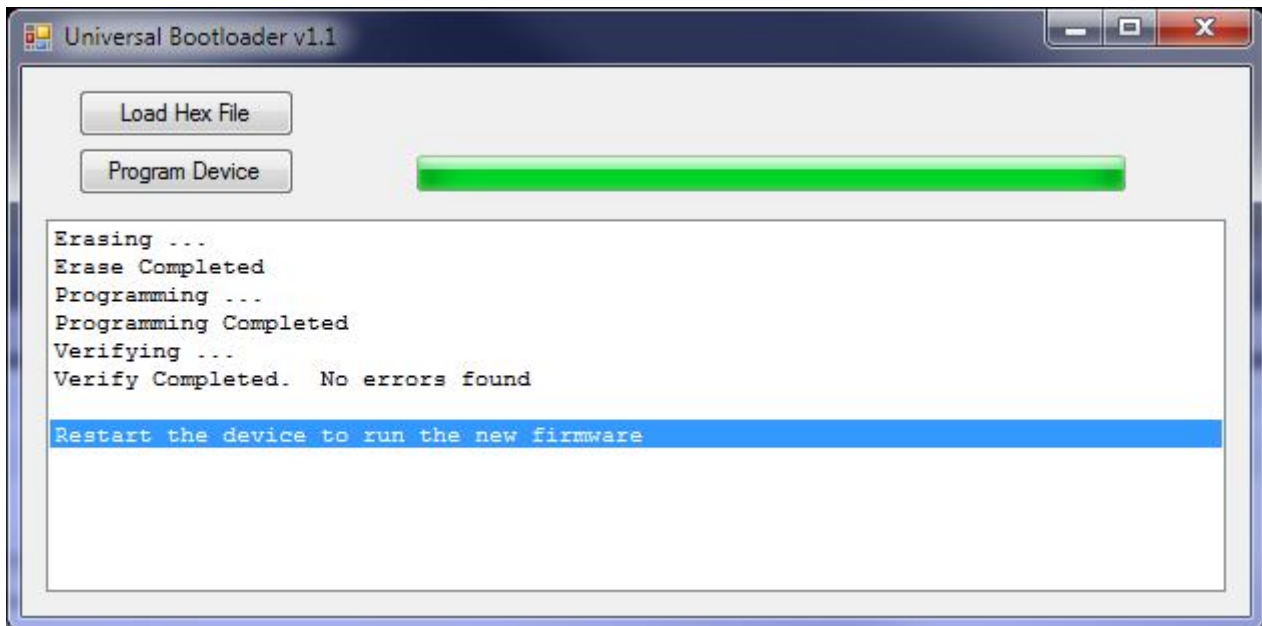
Macintosh and Linux users should use MPHidFlash instead (see the next page). This will also work with Windows XP if you cannot get the .NET framework installed.

## The Upgrade Process

To start the upgrade you should hold down the boot load button on the device while you apply power. On the Maximate the power LED will rapidly flash to indicate that the boot loader is in control. On the DuinoMite and UBW32 the LEDs will flash alternatively.

Plug the USB cable from the Maximate/DuinoMite/UBW32 into your computer and it should automatically recognise the device and load the appropriate driver (called a HID driver). The Maximate (in boot load mode) will show up in Device Manager as a “Human Interface Device”, “USB Input Device”.

Run BootLoader.exe and it will automatically detect the device and show the message “Device attached”. Click on the “Load Hex File” button and load the firmware upgrade file (it will have a .hex extension). Click on the “Program Device” button and the program will show the status as it progresses. It should finish with the screen shot shown below.



At the completion of the process the power LED on the Maximite will flash slowly to indicate that the new firmware is programmed and ready to run. On the DuinoMite and UBW32 the LEDs will resume their alternative flashing. The complete operation should take less than 60 seconds.

Remove and re apply the power and the device will start up running the new firmware.

## Possible Problems

If the “Load Hex File” button in BootLoader.exe is greyed out it means that the device is not connected or not in boot load mode. Check the USB cable and that the LED is flashing indicating bootload mode.

In some cases BootLoader.exe will not show "Verify Completed" after verifying the programming, instead it will simply print a second "Verifying ..." message and appear to hang. Despite this the programming has verified correctly and you can reset the device to start running the new firmware.

## Macintosh and Linux Users

You should download MPHidFlash from: <http://code.google.com/p/mphidflash/>

The program is run from the command prompt with the following parameters:

On the Maximite: `mphidflash -v 04D8 -p FA8D -n -w <filename>`

On the DuinoMite: `mphidflash -v 15BA -p 0032 -n -w <filename>`

On the UBW32: `mphidflash -v 04D8 -p 003C -n -w <filename>`

Where *<filename>* is the name of the MMBasic upgrade file (it will have a .hex extension). Be careful to use the correct file as mphidflash will overwrite the boot loader if given the wrong file. The correct file should have a name like `Maximite_MMBasic_Vx.xx.hex` where x.xx represents the version number.

The `-n` option (skip verify) is required because, for some reason, the verify function in MPHidFlash does not work with MMBasic upgrades. The file will still be written correctly and you can test it by cycling the power and checking that MMBasic runs OK.