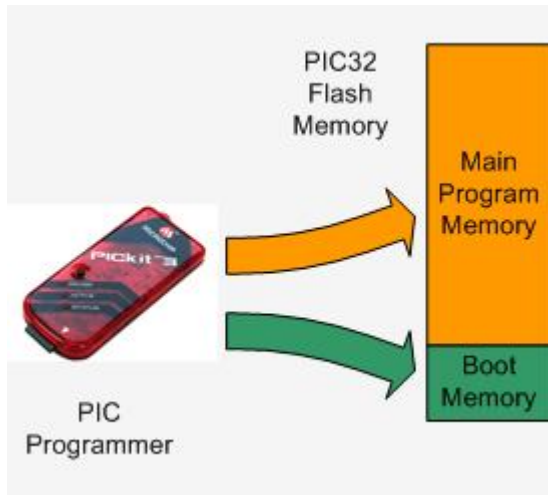


# Loading New Firmware

Loading new firmware into the Maximite 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.

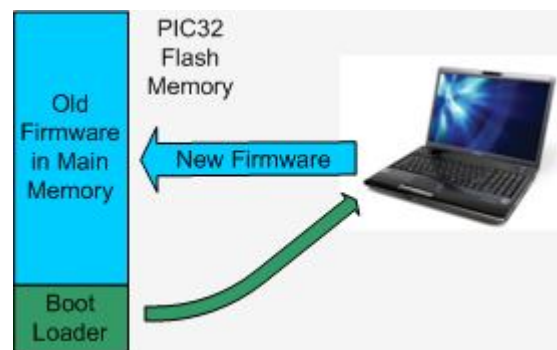


The boot loader was automatically installed when the PIC32 was programmed with the original firmware for the Maximite (version 2.1). This original firmware must be loaded by a PIC programmer such as the PICKit 3 and this will have been done by the kit supplier or yourself if you built the Maximite using 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.

To avoid confusion all upgrades will be marked as an upgrade and you can load whatever version 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 Maximite firmware and you can also try them out.



## Windows Software

To load the new firmware you need to run the program `BootLoader.exe` on your Windows computer (this will be supplied with the upgrade). This program is used to send the new firmware over USB to the boot loader running on the Maximite.

This program can be run directly (installation is not required) but, depending on the version of your operating system, you may need to load some run time components.

If your computer is running Windows XP or earlier you should install Microsoft's .NET V2.0 or later runtime. This is done by downloading and installing the file `dotnetfx.exe` (22.4MB) from: <http://www.microsoft.com/downloads/en/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&displaylang=en>

Regardless of your operating system you may also need to download and install the file `vc redistrib_x86.exe` (1.7MB) from: <http://www.microsoft.com/downloads/en/details.aspx?FamilyID=9B2DA534-3E03-4391-8A4D-074B9F2BC1BF&displaylang=en>

You should try running `BootLoader.exe` first as other software on your computer may have already installed these components as part of their installation.

## The Upgrade Process

To upgrade the firmware in the Maximite you should hold down the boot load button on the Maximite while you apply power. The power LED will rapidly flash to indicate that the boot loader is in control.

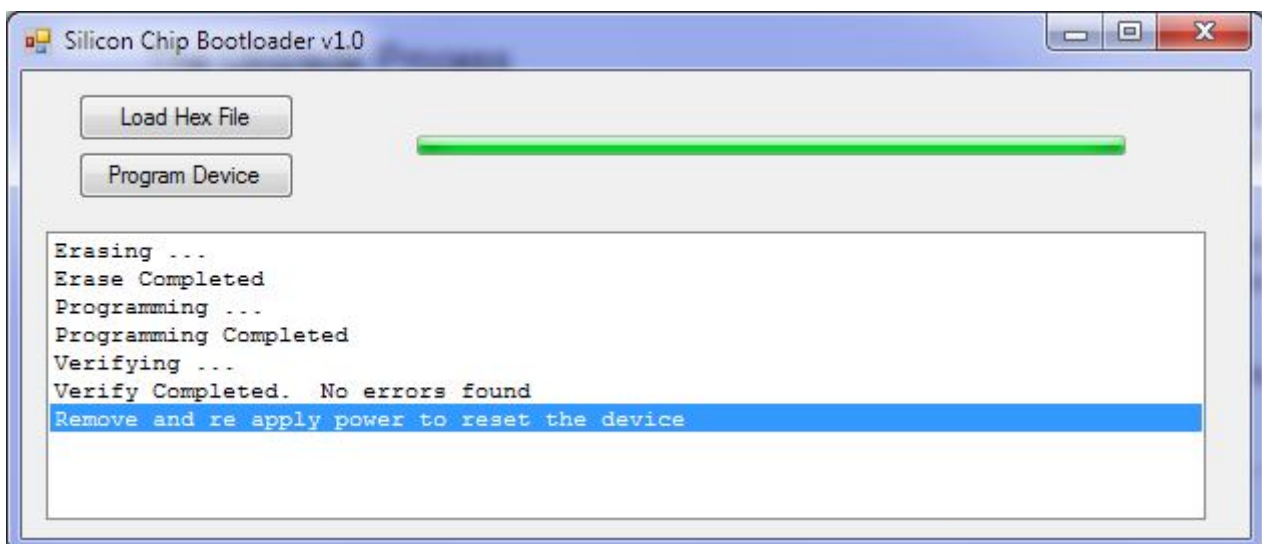
Plug the USB cable from the Maximite into your Windows computer which will automatically recognise the Maximite and load the appropriate driver. The Maximite (in boot load mode) will show up in Device Manager as a “Human Interface Device”, “USB Input Device”.

Run `BootLoader.exe`. It will automatically detect the Maximite and show the message “Device attached”.

Click on the “Load Hex File” button and navigate to the firmware upgrade file (it will have a `.hex` extension).

Click on the “Program Device” button. The program will show the status as it progresses and 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. The complete cycle (erase, program and verify) should take less than 60 seconds.

Remove and re apply power (without holding down the boot load button) and the Maximite will start up running the new firmware.



## Possible Problems

If the “Load Hex File” button in the Windows program is greyed out it means that the Maximite is not connected or not in boot load mode. Check the USB cable and that the power light on the Maximite is flashing.

In some cases the boot loader 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 then recycle the power on the Maximite to start running the new firmware.

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