Loading New Firmware

The GPS Car Computer includes a small program which is called a bootloader. This enables you to reprogram (sometimes called "flashing") the GPS Car Computer using nothing more than a normal Windows computer with an USB port.

To make it easy for us the GPS Car Computer pretends to be a Microchip PICDEM FS USB board when it is in the bootload mode. That means we can program the GPS Car Computer using software developed by Microchip to program their own products.

Both the device driver and software described here are compatible with Windows 2000, XP, Vista and Windows 7 - all in either 32 or 64 bit modes. There also may be Linux and Mac versions on the Internet – check the Microchip website or Google for "MCHPUSB Bootloader" or "MCHPUSB Driver".

Invoking the Bootloader

To start the bootloader, hold down the Set button on the GPS Car Computer <u>while</u> you plug it into a USB port on your computer. If you have not installed a jumper on JP1 you will then have to connect an external 12V power source and hold down the Set button while you plug that in. You can release the button a second or two after.

Your computer should make a sound to signal that it has recognised the GPS Car Computer. Note that when it is in the bootloader mode the display will remain blank or may show some random lines, this is normal.

Loading the Device Driver

If you have not used the bootloader before on your computer you will be prompted to install a driver for it. This driver is different from the virtual serial port driver used to receive GPS data from the GPS Car Computer.

Your computer may attempt to find a driver currently on your computer or the Internet. When this fails select the option to choose your own driver. This screen shot from Windows XP shows you what to expect.

The device driver is in the directory WinDriver which should have been created when you unpacked the zip file. Navigate to this directory and tell Windows to search there.
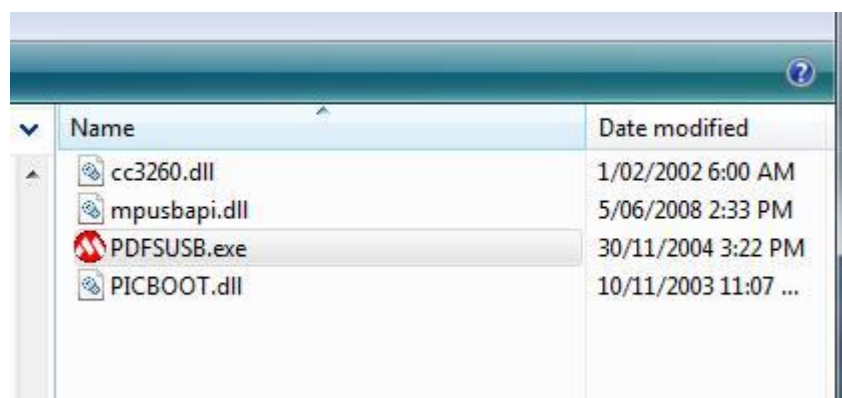

When the driver is correctly installed you should see it listed in Device Manager as a "Microchip Custom USB Device".

Uploading New Firmware

If you unpacked the zip file correctly you should also have a directory titled WinLoader and in that directory will be PDFSUSB.exe. This is the program that uploads new firmware to the GPS Car Computer. Its associated .dll files should be in the same directory as shown in this screen shot.
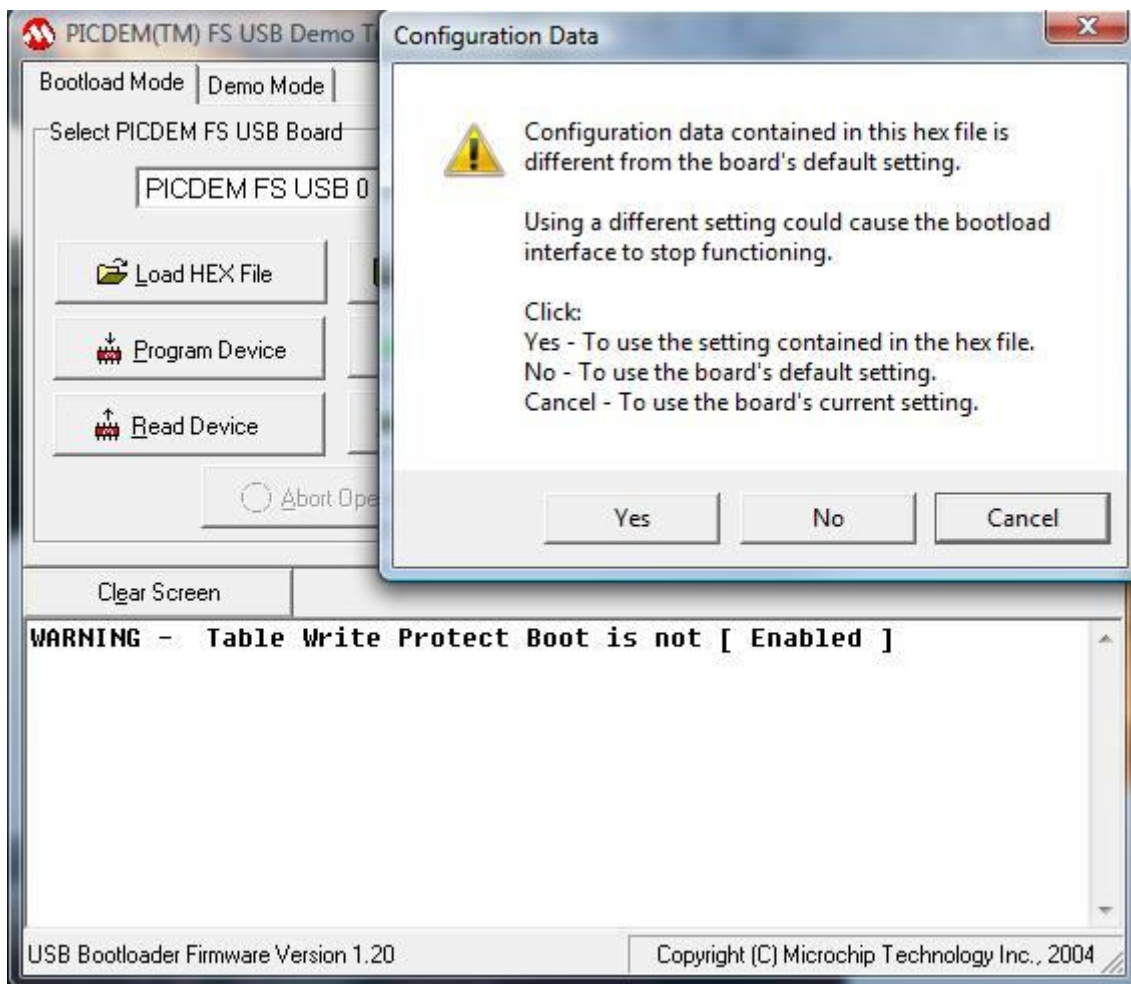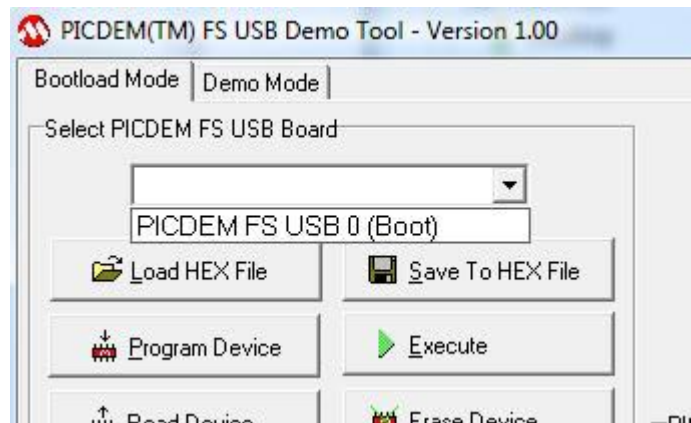
Double click on PDFSUSB.exe to run the loader. This program is actually intended for use with the Microchip PICDEM FS USB board and includes many features that we will not be using and can safely ignore.

If you click on the dropdown list you should see listed PICDEM FS USB which is what the GPS Car Computer masquerades as while it is in the bootload mode. Click on PICDEM FS USB to select it.
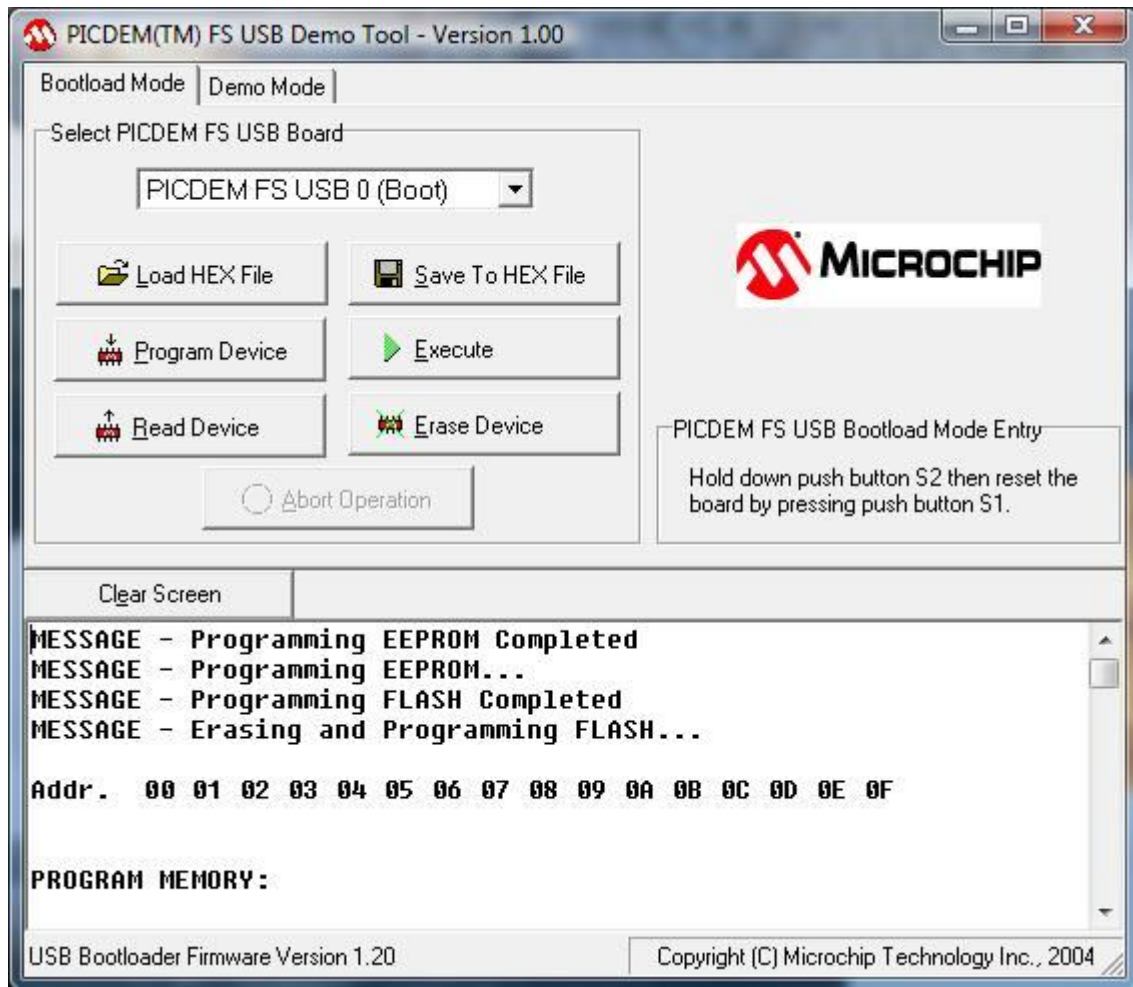
Then click on "Load HEX File" and navigate to and select the new firmware that you want to load.

When you load the HEX file you should see a warning message as shown below.

Click on Cancel – do not select any other choice otherwise your firmware will not load correctly.

Finally, click on "Program Device". You will see a series of messages and after about 20 seconds it should display the messages shown below, which indicate that the GPS Car Computer has been successfully reprogrammed. You can then unplug the GPS Car Computer and use it as you would normally do.

PICDEM(TM) FS USB Demo Tool - Version 1.00

Bootload Mode | Demo Mode

Select PICDEM FS USB Board

PICDEM FS USB 0 (Boot)

Load HEX File   Save To HEX File

Program Device   Execute

Read Device   Erase Device

Abort Operation

PICDEM FS USB Bootload Mode Entry

Hold down push button S2 then reset the board by pressing push button S1.

Clear Screen

MESSAGE - Programming EEPROM Completed
MESSAGE - Programming EEPROM...
MESSAGE - Programming FLASH Completed
MESSAGE - Erasing and Programming FLASH...

Addr.   00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

PROGRAM MEMORY:

USB Bootloader Firmware Version 1.20   Copyright (C) Microchip Technology Inc., 2004

Don't worry about a power failure or accidently unplugging something while it is programming. If something does goes wrong you can always restart (ie, unplug, then plug back in while holding down the Set button).