

The first step is to install MPLAB; this should be relatively straight forward. Follow the on-screen installation instructions.

Next you need to copy the contents of the “MPLAB-AUTONOMOUS-CODE RevX.zip” file into: c:\mcc18\VexCode\  
(Note: you may need to make a new directory)

Now open up MPLAB, and then open up the VRC competition workspace:

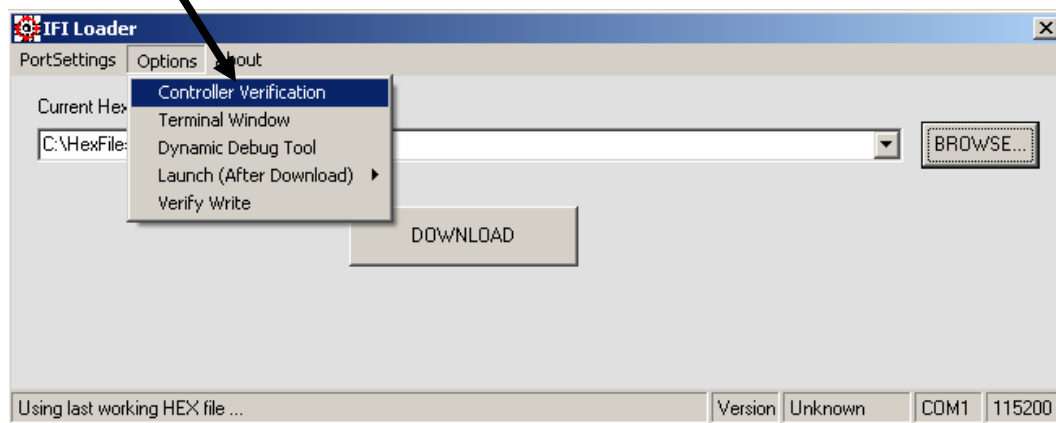
- Click “File” – “Open Workspace”
- Navigate to the “VexCode” directory
- Open “VexUserCode.mcw”

You are now in the necessary VEX workspace, and can proceed to the next step.

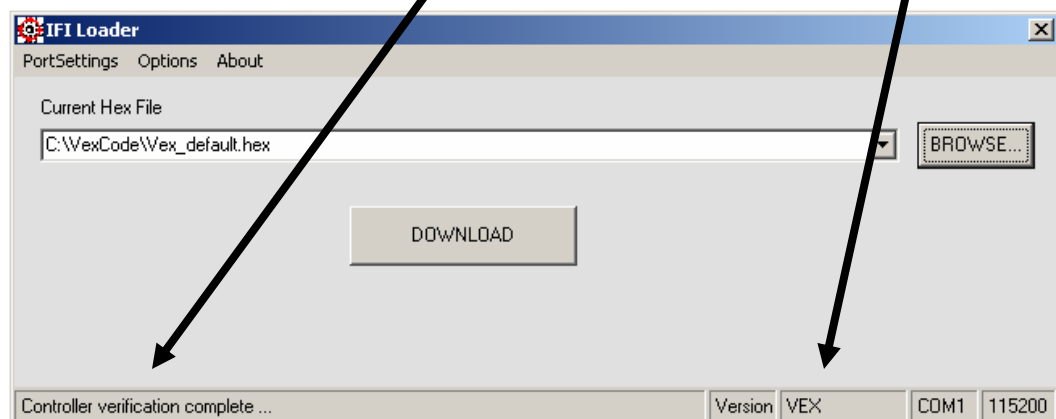
The next step is to update the master firmware in the Vex controller.

Install and open up the IFI\_Loader and then see below for instructions on updating the firmware:

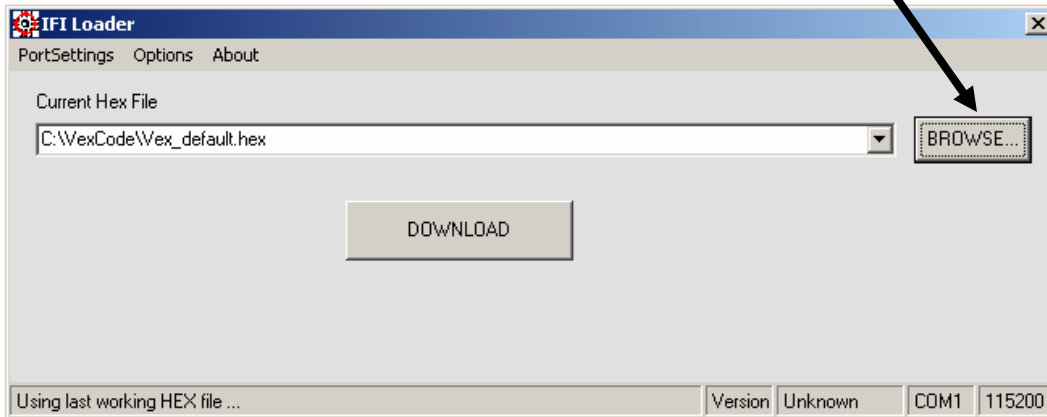
The **1st Step** is to make sure that the robot controller has been verified first. Make sure a serial cable has been attached from the PC to the programming board prior to this operation. The IFI-Loader supports many different robot controllers. The verification allows the Loader to select the appropriate protocol used during the download process. To do this click here. (This only needs to be done once).



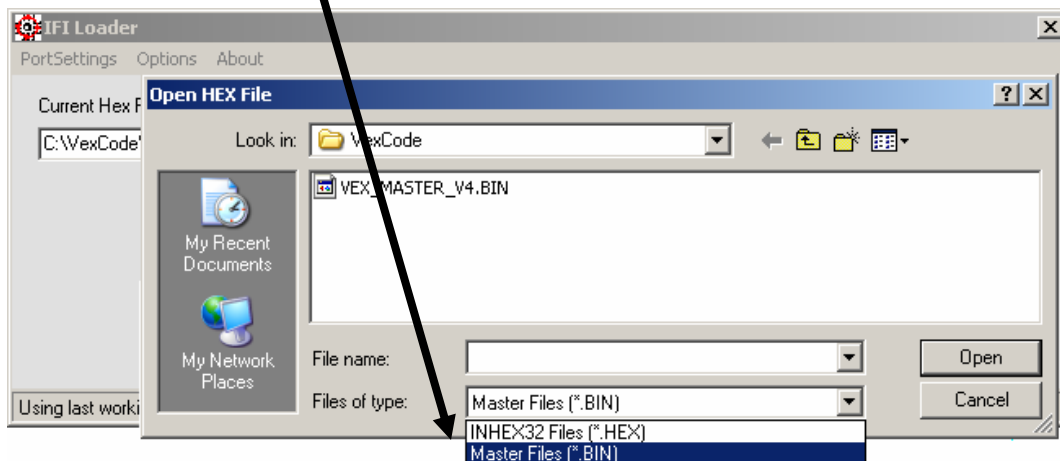
Now you should see 'Controller verification complete ...' on the lower left and 'VEX' in the lower right of the status window.



The **2nd Step** is to download the BIN file. To do this, click on the browse button.



**Next**, select “Master Files (\*.BIN)” in the combo box.



IFI Loader

PortSettings Options About

Current Hex File

C:\WexCode\WEX\_MASTER\_V4.BIN

BROWSE...

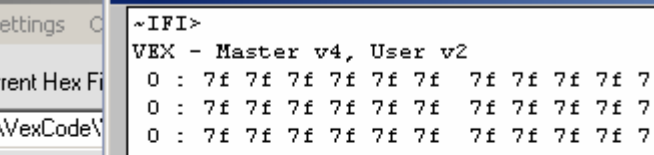
DOWNLOAD

Total Bytes 2590 ,Erase Size E8, Flash 800 - 39C0, Mem Size 31C0

Version Unknown

COM1 115200

To verify that the master code and user code is downloaded correctly, make sure the RC is turned off then open the terminal window (from the options menu of the IFI Loader). Turn the RC unit on for a second then turn it off. On the terminal window, you should see the proper master version number and user version number (note: the user has the ability to change the user version number—the default is “User v2”).

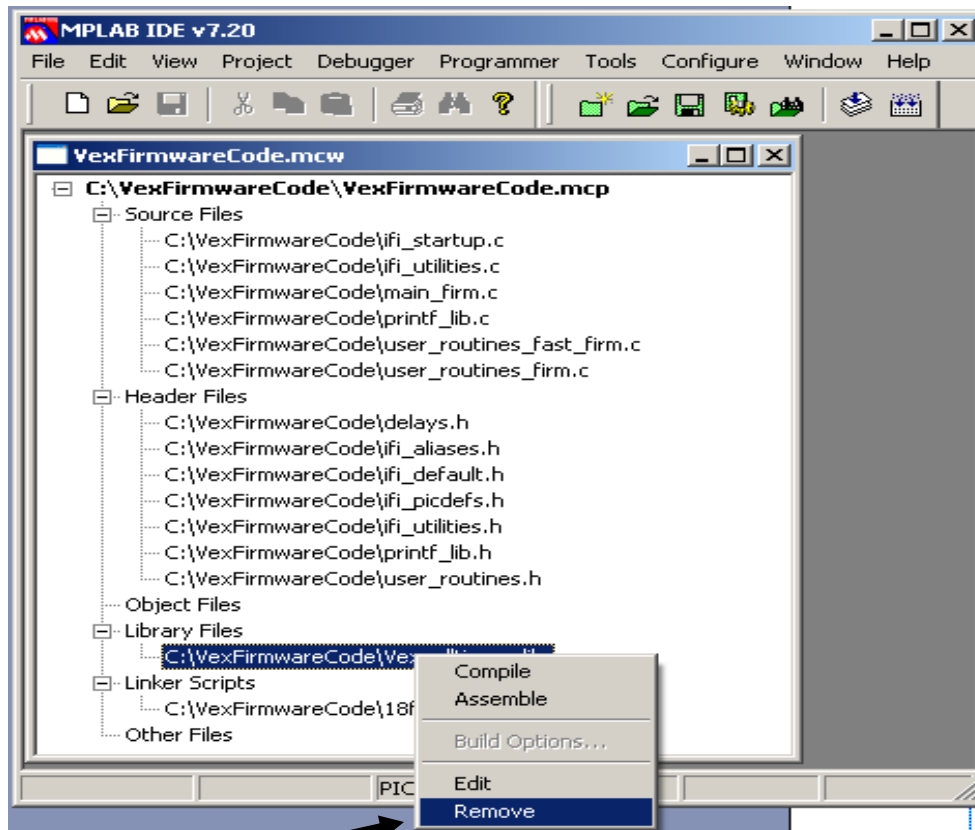


The screenshot shows the VEX-RT1000 IFI Loader application. On the left, there is a sidebar with options: 'PortSettings' and 'Current Hex File'. The 'Current Hex File' field contains the path 'C:\VexCode\'. The main area is a 'COM1 Terminal Window' with a baud rate of 115200. The terminal displays the prompt '~IFI>' followed by the command 'VEX - Master v4, User v2'. Below this, a memory dump is shown, consisting of 16 lines of hexadecimal data. Each line starts with an address (00 to 0F) followed by a colon and 16 hex digits, which are grouped into four pairs of four by spaces.

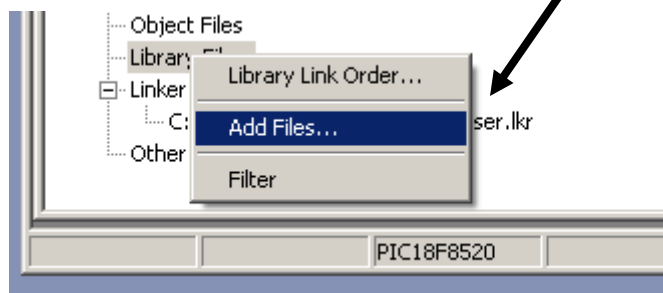
Address	Hex Data
00 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
01 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
02 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
03 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
04 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
05 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
06 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
07 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
08 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
09 :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
0A :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
0B :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
0C :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
0D :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
0E :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f
0F :	7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f 7f

Once you have updated the Master firmware, you must also add the appropriate library to your project file.

To do this, do the following (assuming you know how to open your workspace):



Remove the current library, then select 'Library Files->Add Files...' (after selecting, - a right mouse click will bring up the sub-menu)



Once the appropriate library file has been selected and added to your project file, recompile the project then download the user code to your controller.

Your controller will run the autonomous section of code (located in the user\_routines\_fast\_XXXX.c file) from **power-up along with a valid receiver signal**. The controllers' EYE will flash rapidly when autonomous mode is active.

**Make sure you are using the correct competition Library file:  
“Vex\_2008\_library.lib”**

When this library is used it allows for four different modes for competition & testing:

- Mode 1—When No Jumpers are used:  
Microcontroller will run 20 seconds of Autonomous, then 120 seconds of Operator Control.  
**This is the default configuration that should be used for VRC Tournament play.**

*Note: if you wish to test Autonomous without a 20-second time limit (continuously) use the following:*

txdata.user\_cmd |= 0x02 - invokes Autonomous mode

- Mode 2—When a jumper is placed in INT5:  
Operator Control Mode will run continuously.
- Mode 3—When a jumper is placed in INT6:  
Autonomous Mode will run for 60 seconds.  
**Use this Mode for the VRC Programming Skills Challenge.**
- Mode 4—When a jumper is placed in INT5 & INT6:  
Operator Control Mode will run for 60 seconds, then the robot will disable.  
**Use this Mode for the VRC Robot Skills Challenge.**

**The README.txt file (located in the project directory) contains additional important information!**

Once the correct libraries are loaded into the project, you can begin programming as normal. You can then download your code into the Vex robot using the IFI\_Loader software.

When using this code for:

- VRC Tournament Play – Place no jumpers in INT5 or INT6.  
This will cause the robot to run for 20 seconds in Autonomous then 120 seconds of Operator Control.
- Driver Training – Place a jumper in INT5.  
This will cause the robot to run in Operator Control mode continuously.
- VRC Programming Skills Challenge – Place a jumper in INT6.  
This will cause the robot to run for 60 seconds in Autonomous, then disable.
- VRC Robot Skills Challenge – Place jumpers in INT5 & INT6.  
This will cause the robot to run for 60 seconds in Operator Control, then disable.

For additional information & help concerning the C18 Compiler and MPLAB, refer to the MPLAB help files (included on the installation CD).

For additional information & help concerning C programming, refer to any C tutorial (online, textbook, etc).

For Official VEX Technical Support, refer to [www.vexforum.com](http://www.vexforum.com)  
Please note, the official VEX Tech Support can NOT help with programming questions.