

This document will guide you through the VEXnet Firmware Upgrade Utility Operating Instructions and Installation. The Tool is for updating firmware (Master Code) in the VEXnet 1.5 TX and RX Units and the CORTEX Microcontroller and Joystick Units.

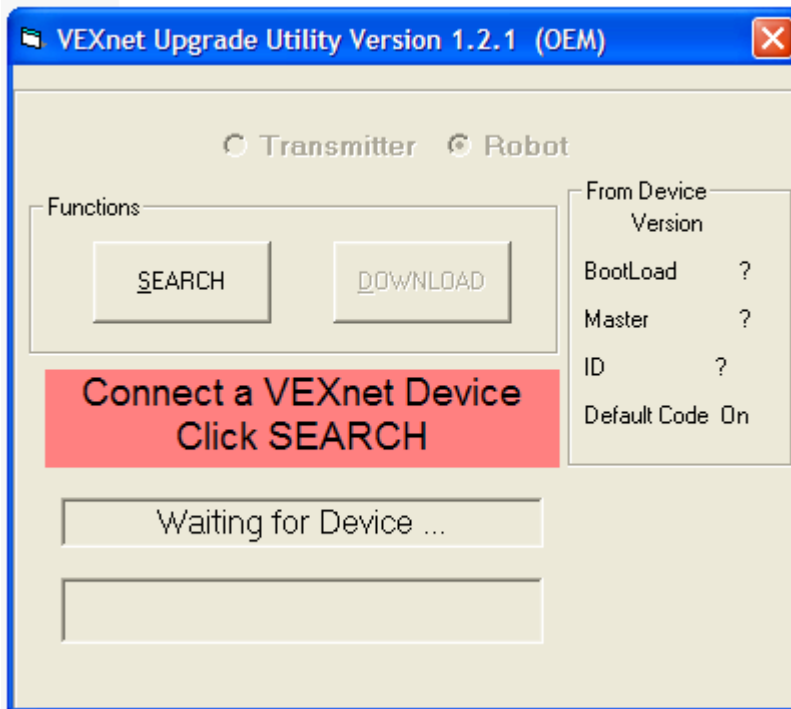
This document has 4 main sections: (A) Components Needed, (B) Instructions for the Upgrade Utility for use with the VEXnet 1.5 Tx and Rx Modules, (C) Instructions for the Upgrade Utility for use with the CORTEX Microcontroller and Joystick Units and (D) the PC Installation Instructions for the Tool.

A. Components Needed:

1. PC running Windows XP – only operating system tested.
2. USB Port on PC.
3. A VEXnet Module for upgrading (any of the following):
 - a. VEXnet 1.5 Transmitter Upgrade Module
 - b. VEXnet 1.5 Robot Upgrade Module
 - c. VEXnet CORTEX Microcontroller
 - d. VEXnet Joystick Unit
4. A small Allen Wrench (1/16”) or similar tool (a paper clip).
5. A USB A-A Male Cable.

B. Operating Instructions for use with the VEXnet 1.5 TX and RX Modules.

1. Install the VEXnet Utility on a XP Windows PC if you have not already done so. Refer to Section D for the Installation Procedure.
2. Open the Upgrade Tool – on the Windows XP computer configured above, Click on “Start”, “All Programs”, “InnovationFirst”, and then the “VEXnet Firmware Upgrade Utility”.
3. The following Window should be displayed:



- a. The Version Number displayed will vary but you should always be using the latest version available (unless instructed otherwise) – refer to the VEX Wiki for the current version.
4. Turn the Module to be upgraded OFF.
5. Verify there are no LEDs illuminated on the Module to be upgraded.
6. Connect one end of the USB A-A Male Cable to a USB Port on the PC.
7. Before connecting the VEXnet 1.5 Module (TX or RX) to the other end of the USB A-A Cable (from Step B.6), follow the Steps outlined below:
 - a. Before connecting to the VEXnet Module, locate the CONFIG Access Hole in the plastic cover. Refer to Step 1 below for the VEXnet 1.5 Transmitter Module or Step 2 below for the VEXnet 1.5 Receiver Module.

1. VEXnet Transmitter CONFIG Switch Access Hole



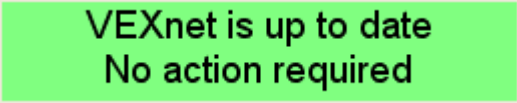
2. VEXnet Receiver CONFIG Switch Access Hole



- b. Depress and Hold the CONFIG Switch using the 1/16" Allen Wrench or similar tool. You should feel and hear a "Click" when the Switch is depressed properly.
- c. While the Switch is depressed, connect the other end of the USB Cable from Step B.6 to the VEXnet Module (TX or RX).
- d. When all 3 LEDs on the Module are solid Green, quickly release the CONFIG Switch and remove the Allen Wrench or tool.
 1. An error reading the USB Device can occur if the CONFIG Switch is held depressed for more than about 1-2 sec after the 3 LEDs on the Module are solid Green.
 2. If this occurs, only the Robot LED will be blinking Green. Remove the USB Cable from the VEXnet Module and repeat starting at Step B.7.b.
- e. After releasing the CONFIG Switch, the Robot LED should be blinking Green and the Game LED should be flickering Green. If not, try repeating – starting at Step B.7.b; otherwise, contact VEX Robotics Tech Support (903-453-0802).
8. Click on the SEARCH button on the VEXnet Upgrade Utility Window, refer to Step B.3.
 - a. The SEARCH Button only needs to be selected on the first module upgraded after the Utility Tool was started.
9. The VEXnet Upgrade Utility Message Window will show:

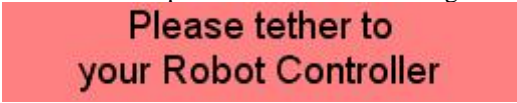
Update Firmware
Click DOWNLOAD now.

10. Click on the “DOWNLOAD” Button on the Upgrade Utility Window.
 - a. During the download process the VEXnet LED on the Module will blink Red in addition to the Robot LED blinking Green and the Game LED flickering Green.
 - b. When the download has been completed, the VEXnet Module will be re-set and must re-link which will be done automatically for you.
 - c. Disregard any screens or messages on the VEXnet Upgrade Utility Window until the re-link has been completed.
 - d. The re-link has completed when VEXnet LED on the Module is Solid Green.
11. When the re-link has been completed, the VEXnet Utility Window will display one of the following Message Windows a, b, c or d below:
 - a. Continue at Step 12 below if the following Message Window was displayed:



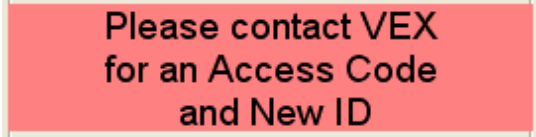
**VEXnet is up to date
No action required**

- b. Continue at Step 13 below if the following Message Window was displayed:



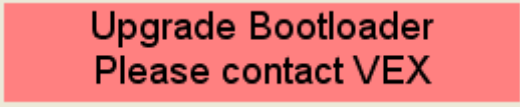
**Please tether to
your Robot Controller**

- c. Continue at Step 14 below if the following Message Window was displayed:



**Please contact VEX
for an Access Code
and New ID**

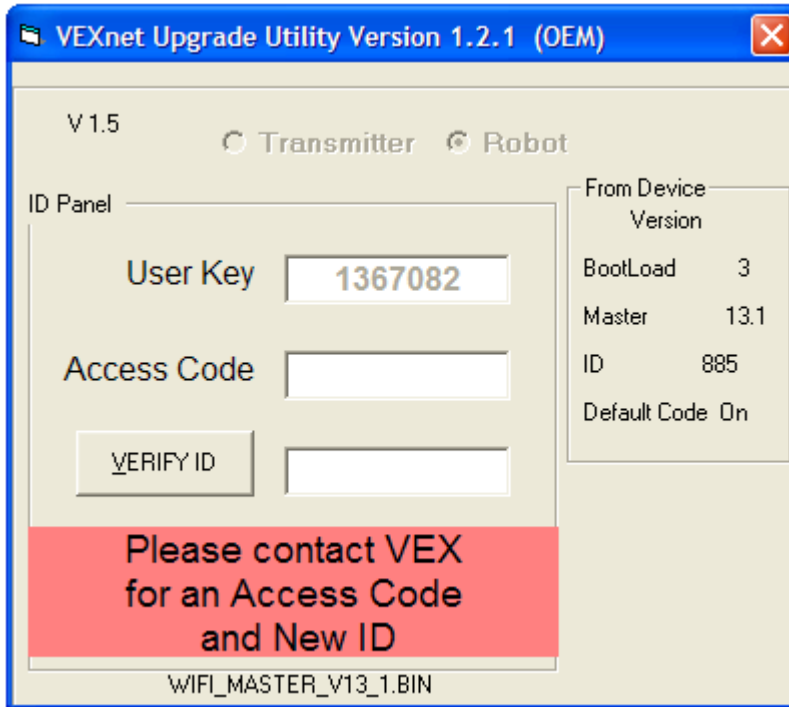
- d. Continue at Step 14.n.2 below if the following Message Window was displayed:



**Upgrade Bootloader
Please contact VEX**

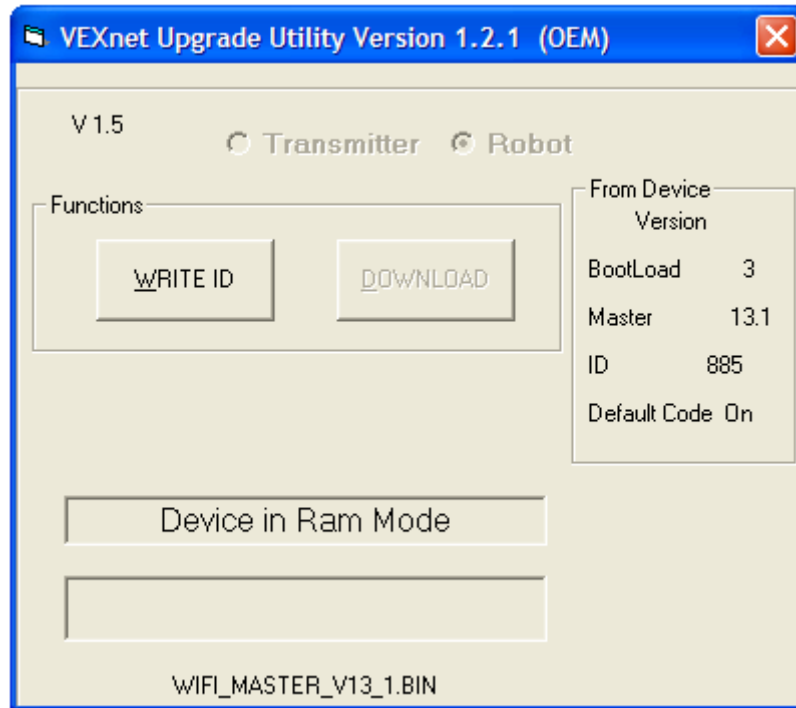
12. If the VEXnet Utility Message Window displayed the “VEXnet is up to date / No action required”, the update for the VEXnet Module is now complete.
 - a. With the Update completed, disconnect the VEXnet Module from the USB Cable.
 - b. The update of additional Modules can now be started by continuing at Step B.4.
13. If the VEXnet Utility message Window displayed the “Please tether to your Robot Controller”, your TX needs the ID downloaded from the RX.
 - a. Disconnect the USB cable from the PC.
 - b. Locate an “up to date” RX unit and verify the TX and RX are both OFF.
 - c. Connect the USB cable between the TX and the RX.
 - d. Connect a battery to the TX unit and turn ON the TX. The ID download has completed when VEXnet LED on the Modules are Solid Green for several seconds.
 - e. Disregard the other LEDs on the Modules.
 - f. The update is now complete. The update of additional Modules can now be started by continuing at Step B.4

14. If an Invalid ID is detected, the following VEXnet Utility Window will be displayed.



- a. The Version Number, Bootload, Master, ID, and BIN file displayed will vary but you should always be using the latest version available (unless instructed otherwise) – refer to the VEX Wiki for the current version.
- b. The User Key displayed will vary for each Module connected.
- c. Note the User Key number displayed in the Window.
- d. Leave the VEXnet Utility Tool open and running.
- e. Do not disconnect the Module from the USB A-A Cable.
- f. If either “d” or “e” above happens, the User Key that was displayed will no longer be valid. You will need to repeat steps, starting at Step B.7, to obtain a new User Key.
- g. Before continuing, you will need to contact VEX Robotics Tech Support (903-453-0802) to obtain an Access Code and Verification ID Number. You need to give the Tech Support Representative the User Key displayed on the Upgrade Utility Tool.
- h. After receiving the Access Code and New ID Number, click in the Access Code Window and type the Access Code given to you by the Tech Support Representative.
- i. Click in the VERIFY ID Window and type the New ID Number given to you by the Tech Support Representative.
- j. Click on the VERIFY ID Button in the window.
 1. If the Access Code or the VERIFY ID Number were typed incorrectly, a window will pop-up stating Invalid Access Code – otherwise continue at Step B.14.k.
 2. Click on the OK button to close the Pop-Up Error Window.
 3. Verify/Correct the Access Code and/or the ID Number by typing in the appropriate numbers.
 4. Continue at Step B.14.j.

k. If the Access Code and ID are verified, the following screen will be displayed:



1. The Version Number, BootLoad, Master, ID numbers and BIN file in the above displayed window will vary and do not have to match your displayed window.
- l. Click on the WRITE ID Button in the Utility Window – this will begin a download process.
- m. When the download has been completed, the VEXnet Module will be re-set and must re-link which will be done automatically for you.
 1. Disregard any screens or messages on the VEXnet Upgrade Utility Window until the re-link has been completed.
 2. The re-link has completed when VEXnet LED on the Module is Solid Green for several seconds.
 3. Disregard the other LEDs on the Module.
- n. Also when the re-link has been completed, the VEXnet Utility Message Window will display one of the following messages, 1 or 2 shown below:
 1. If the following VEXnet Utility Message Window is displayed:

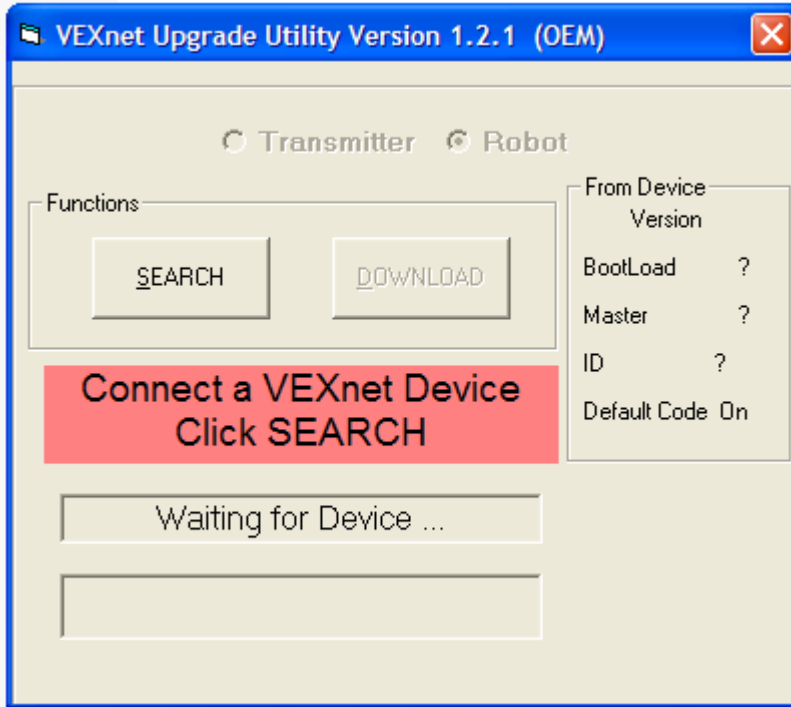
**VEXnet is up to date
No action required**

- a. The update for the VEXnet Module is complete.
- b. Disconnect the VEXnet Module from the USB Cable.
- c. The update of additional Modules can now be started by continuing at Step B.4.
2. If the following VEXnet Utility Message Window is displayed:

**Upgrade Bootloader
Please contact VEX**

- a. The BootLoader Code needs to be upgraded and you will need to return the Module to VEX Robotics to have the BootLoader upgraded.
- b. Please contact VEX Robotics Tech Support (903-453-0802) to obtain an RMA (Return Merchandise Authorization) Number and instructions for the return of the product.
- c. Disconnect the VEXnet Module from the USB Cable.
- d. The update of additional Modules can now be started by continuing at Step B.4.

- C. Operating Instructions for the VEXnet Upgrade Utility Tool for use with the CORTEX Microcontroller and Joystick Units.
 - 1. Install the VEXnet Upgrade Utility on a XP Windows PC if you have not already done so. Refer to Section D for the Installation Procedure.
 - 2. Open the Upgrade Tool – on the Windows XP computer configured above, Click on “Start”, “All Programs”, “InnovationFirst”, and then the “VEXnet Firmware Upgrade Utility”.
 - 3. The following Window should be displayed:



- a. The Version Number displayed will vary but you should always be using the latest version available (unless instruction otherwise) – refer to the VEX Wiki for the current version.
- 4. Turn the Module to be upgraded OFF.
- 5. Verify there are no LEDs illuminated on the Module to be upgraded.
- 6. Connect one end of the USB A-A Male Cable to a USB Port on the computer.
- 7. Before connecting the VEXnet Unit (CORTEX Microcontroller or Joystick) to the other end of the USB A-A Cable (from Step C.6), follow the Steps outlined below:
 - a. Before connecting to the VEXnet Module, locate the CONFIG Access Hole in the plastic cover. Refer to Step 1 below for the VEXnet Joystick Module or Step 2 below for the VEXnet CORTEX Module.
 - 1. VEXnet Joystick CONFIG Switch Access Hole



2. VEXnet CORTEX CONFIG Switch Access Hole



- b. Depress and Hold the CONFIG Switch using the 1/16” Allen Wrench or similar tool. You should feel and hear a “Click” when the Switch is depressed properly.
 - c. While the Switch is depressed, connect the other end of the USB Cable from Step C.6 to the VEXnet Module.
 - d. When 3 LEDs on the Module are solid Green, quickly release the CONFIG Switch and remove the Allen Wrench or tool.
 1. An error reading the USB Device can occur if the CONFIG Switch is held depressed for more than about 1-2 sec after the 3 LEDs on the Module are solid Green.
 2. If this occurs, only the Robot LED will be blinking Green. Remove the USB Cable from the VEXnet Module and repeat starting at Step C.7.b.
 - e. After releasing the CONFIG Switch, the Robot LED should be blinking Green and the Game LED should be flickering Green. If not, try repeating – starting at Step C.7.b; otherwise, contact VEX Robotics Tech Support (903-453-0802).
8. Click on the SEARCH button on the VEXnet Upgrade Utility Window, refer to Step C.3.
 - a. The SEARCH Button only needs to be selected on the first unit upgraded after the Utility Tool was started.
 9. The VEXnet Upgrade Utility Message Window will show:

**Update Firmware
Click DOWNLOAD now.**

10. Click on the “DOWNLOAD” Button in the VEXnet Firmware Upgrade Utility Window.
 - a. During the download process the VEXnet LED on the Unit will blink Red in addition to the Robot LED blinking Green and the Game LED flickering Green and the following message will be displayed:

**Downloading Master
Code - please wait**

- b. When the download has been completed, the VEXnet Module will be re-set. Disregard any screens or messages on the VEXnet Upgrade Utility Window until the re-set has been completed except as noted below:

Note: Continue at Step 14 below only if the following Message Window is displayed:

**Please contact VEX
for an Access Code
and New ID**

- c. If the unit is a Joystick, continue at Step C.11. Otherwise; after the re-set is complete, the downloading of Default Code will start automatically with a CORTEX unit. The VEXnet LED will blink Green during the Default Code download and the following Message will be displayed:

**Downloading Cortex Default
Code - please wait**

11. When the re-set or the downloading of Default Code for a CORTEX has been completed, the VEXnet Utility Window will display one of the following Message Windows a, b, or c below:

a. Continue at Step 12 below if the following Message Window was displayed:

**VEXnet is up to date
No action required**

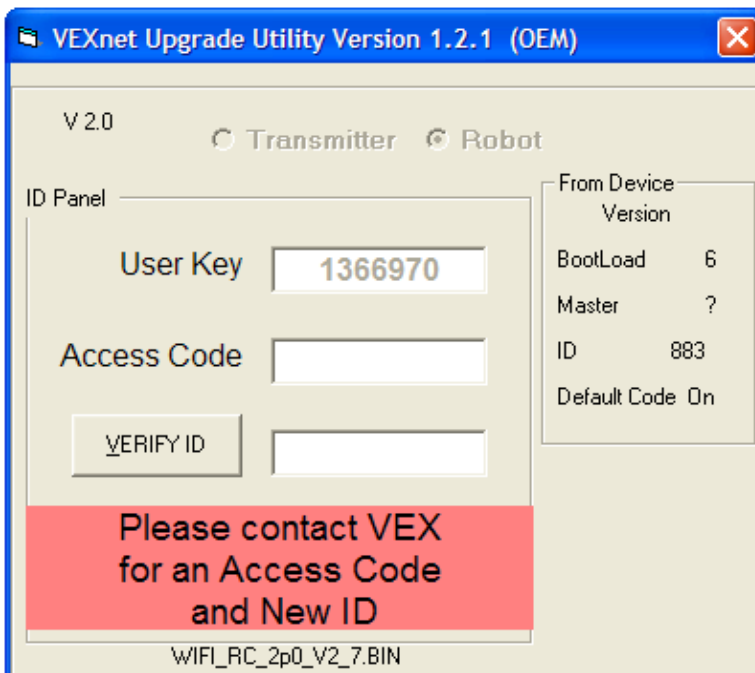
b. Continue at Step 12 below if the following Message Window was displayed:

**Default Download Complete
VEXnet is up to date**

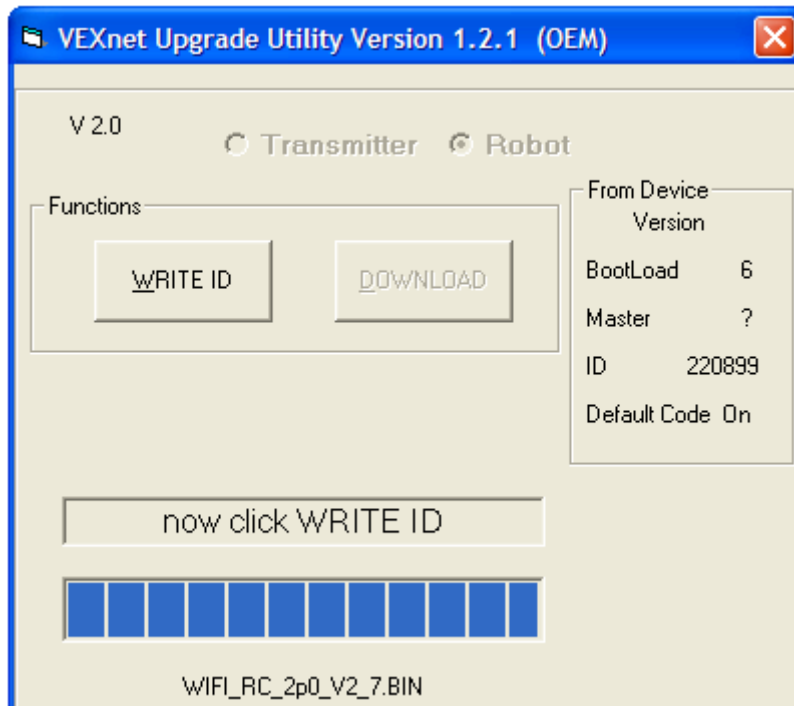
c. Continue at Step 13 below if the following Message Window was displayed:

**Please tether to
your Robot Controller**

12. If the VEXnet Utility Message Window displayed the “VEXnet is up to date / No action required” or “Default Download Complete VEXnet is up to date”, the update for the VEXnet Module is now complete.
- a. With the Update completed, disconnect the VEXnet Module from the USB Cable.
 - b. The update of additional Modules can now be started by continuing at Step C.4.
13. If the VEXnet Utility message Window displayed the “Please tether to your Robot Controller”, your Joystick needs the ID downloaded from the CORTEX.
- a. Disconnect the USB cable from the PC.
 - b. Locate an “up to date” CORTEX unit and verify the CORTEX and Joystick are both OFF.
 - c. Connect the USB cable between the CORTEX and Joystick.
 - d. Connect a battery to the CORTEX unit and turn ON the CORTEX. The ID download has completed when VEXnet LED on the both Modules are Solid Green for several seconds.
 - e. Disregard the other LEDs on the Modules.
 - f. The update is now complete. The update of additional Modules can now be started by continuing at Step C.4
14. If an Invalid ID is detected, the following VEXnet Utility Window will be displayed.



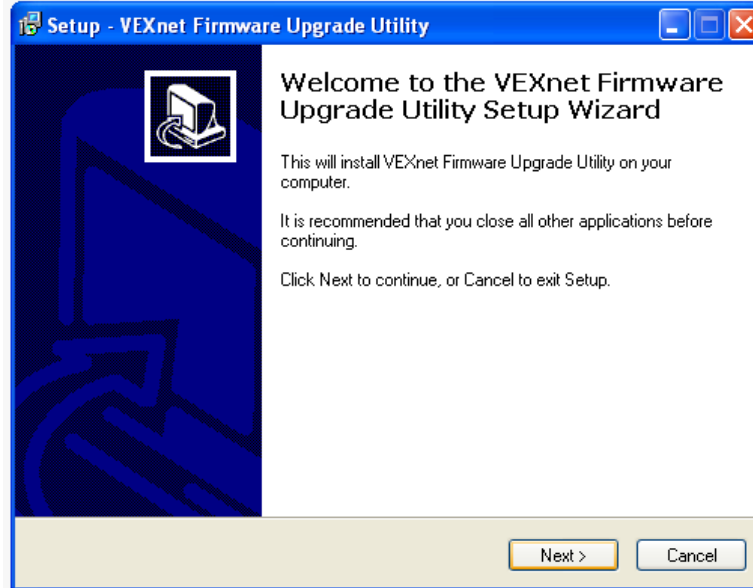
- a. The Version Number, Bootload, Master, ID, and BIN file displayed will vary but you should always be using the latest version available (unless instructed otherwise) – refer to the VEX WiKi for the current version.
- b. The User Key displayed will vary for each Module connected.
- c. Note the User Key number displayed in the Window.
- d. Leave the VEXnet Utility Tool open and running.
- e. Do not disconnect the Module from the USB A-A Cable.
- f. If either “d “or “e” above happens, the User Key that was displayed will no longer be valid. You will need to repeat steps, starting at Step C.7, to obtain a new User Key.
- g. Before continuing, you will need to contact VEX Robotics Tech Support (903-453-0802) to obtain an Access Code and Verification ID Number. You need to give the Tech Support Representative the User Key displayed on the Upgrade Utility Tool.
- h. After receiving the Access Code and New ID Number, click in the Access Code Window and type the Access Code given to you by the Tech Support Representative.
- i. Click in the VERIFY ID Window and type the New ID Number given to you by the Tech Support Representative.
- j. Click on the VERIFY ID Button in the window.
 1. If the Access Code or the VERIFY ID Number were typed incorrectly, a window will pop-up stating Invalid Access Code – otherwise continue at Step C.14.k.
 2. Click on the OK button to close the Pop-Up Error Window.
 3. Verify/Correct the Access Code and/or the ID Number by typing in the appropriate numbers.
 4. Continue at Step C.14.j.
- k. If the Access Code and ID are verified, the following screen will be displayed:



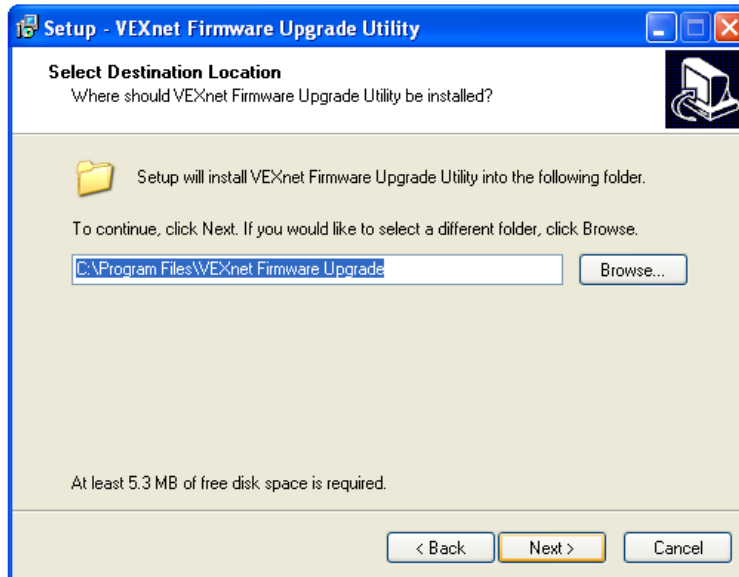
1. The Version Number, BootLoad, Master, ID numbers and BIN file in the above displayed window will vary and do not have to match your displayed window.
- l. Click on the WRITE ID Button in the Utility Window – this will begin a download process.
 - m. When the ID download has been completed, the Default Code download will start automatically for you. Continue at Step C.10.c.

D. VEXnet Firmware Upgrade Utility PC Installation Procedure.

1. Install the VEXnet Firmware Upgrade Utility on an XP Windows PC using the following steps.
 - a. Save the latest VEXnetUpgrade(VersionX.X.X)User.zip to a known directory.
 - b. Unzip the VEXnet Upgrade zip file and note the file location.
 - c. Locate the unzipped VEXnet Firmware Upgrade Utility (version)setup.exe and double click on the file.
 - d. The following screen should be displayed

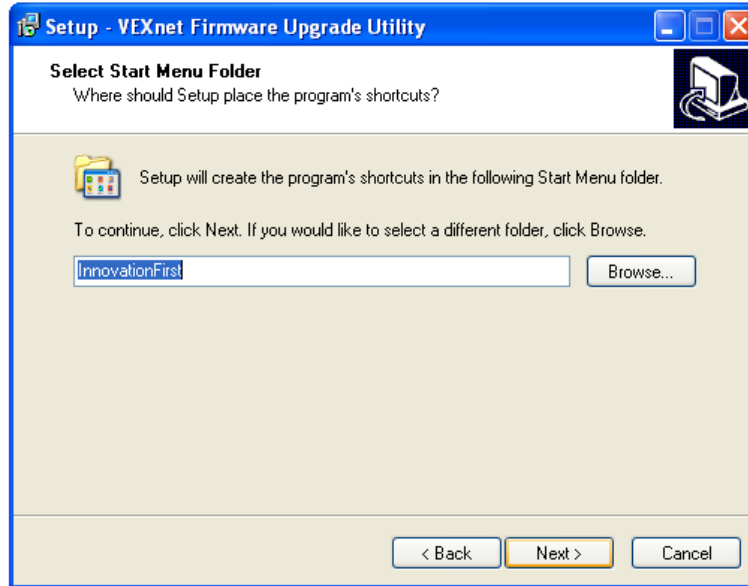


- e. You should close all other applications before continuing.
- f. Click on "Next >" to continue.
- g. The following screen should be displayed.



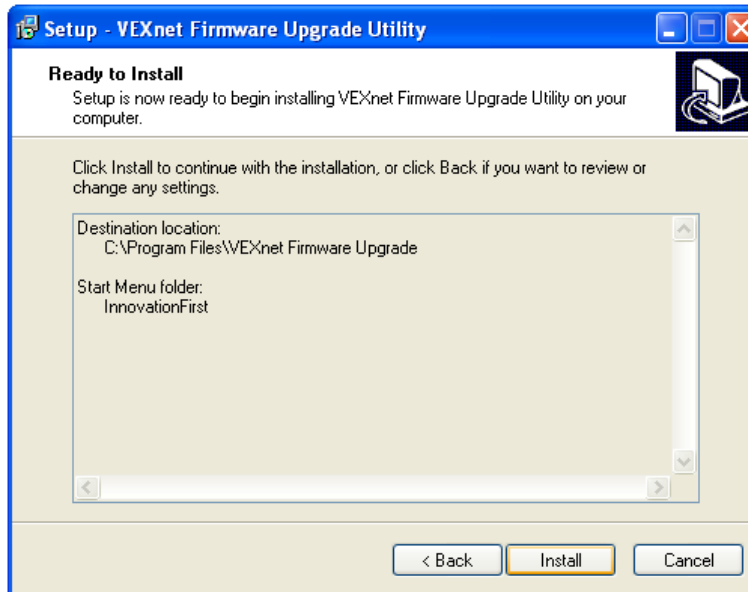
- h. To continue, Click on "Next >".

i. The following screen should be displayed.



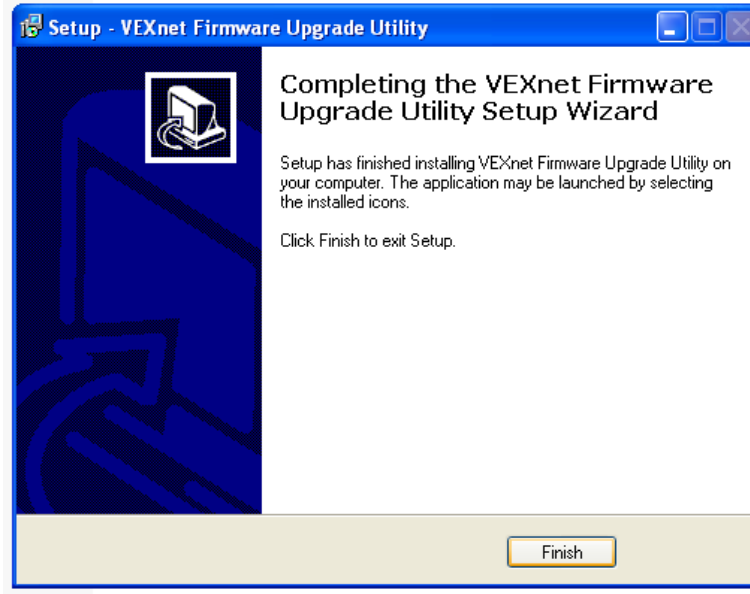
j. To continue, Click on "Next >".

k. The following screen should be displayed.



l. The Upgrade Utility is now ready to be installed. Click on "Install" to continue.

m. The following screen should be displayed.



n. Click on "Finish" to exit the Setup and close the window.