

VEXnet Firmware Upgrade Utility Instructions

This document will guide you through the VEXnet Firmware Upgrade Utility Operating Instructions and Installation. Also the Installation of the required VEX Programming Driver is covered. The Upgrade Utility Tool is for updating Firmware (Master Code) in the VEX ARM® Cortex®-based Microcontroller and VEXnet Joystick Units.

The Upgrade Utility Tool is used for updating Master Code in the VEXnet Cortex or Joystick units. When the Tool is used on the Cortex, not only will Master Code be downloaded but the Default Code will also be downloaded restoring your unit to factory settings. The Tool can also find problems with the ID in either unit if one exists. This document has 3 main sections: (A) Components Needed, (B) Instructions for the Upgrade Utility Tool for use with the Cortex Microcontroller and Joystick Units and (C) the PC Installation Instructions for the VEX Programming Driver and the Upgrade Utility Tool.

A. Components Needed:

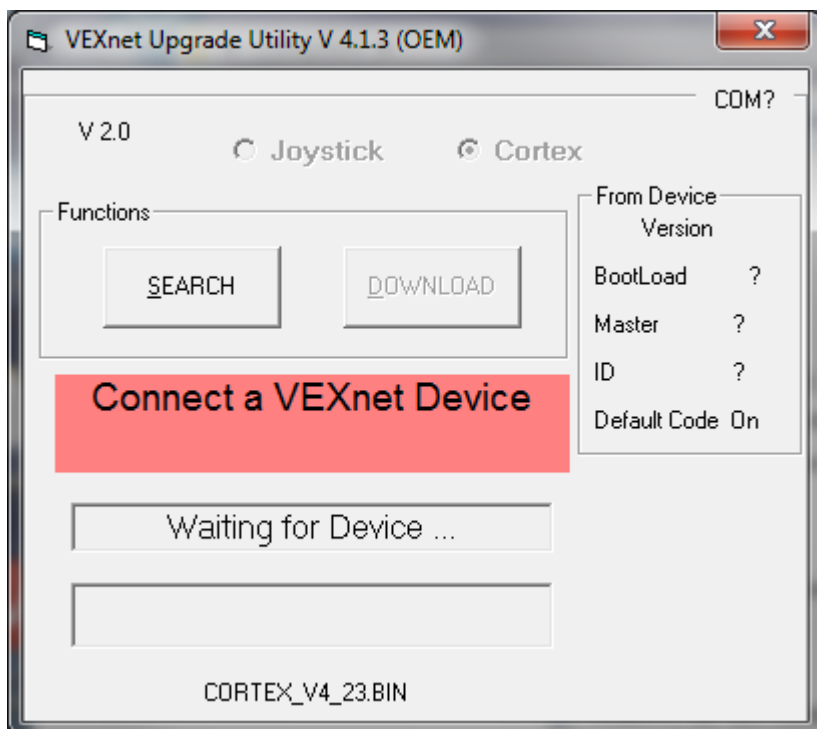
1. PC running Windows XP or Windows 7 – only operating systems tested.
2. USB Port on PC.
3. A VEXnet Module for upgrading: VEXnet Cortex Microcontroller (P/N: 276-2194), or VEXnet Joystick Unit (P/N: 276-2192).
4. A VEX Allen Wrench or similar tool (a paper clip).
5. A USB A-A Male Cable (P/N: 276-1403).

B. Operating Instructions for the VEXnet Upgrade Utility Tool for use with the Cortex Microcontroller and Joystick Units.

1. Install the VEX Programming Driver and VEXnet Upgrade Utility Tool on your PC if you have not already done so. Refer to Section C for the Installation Procedures.

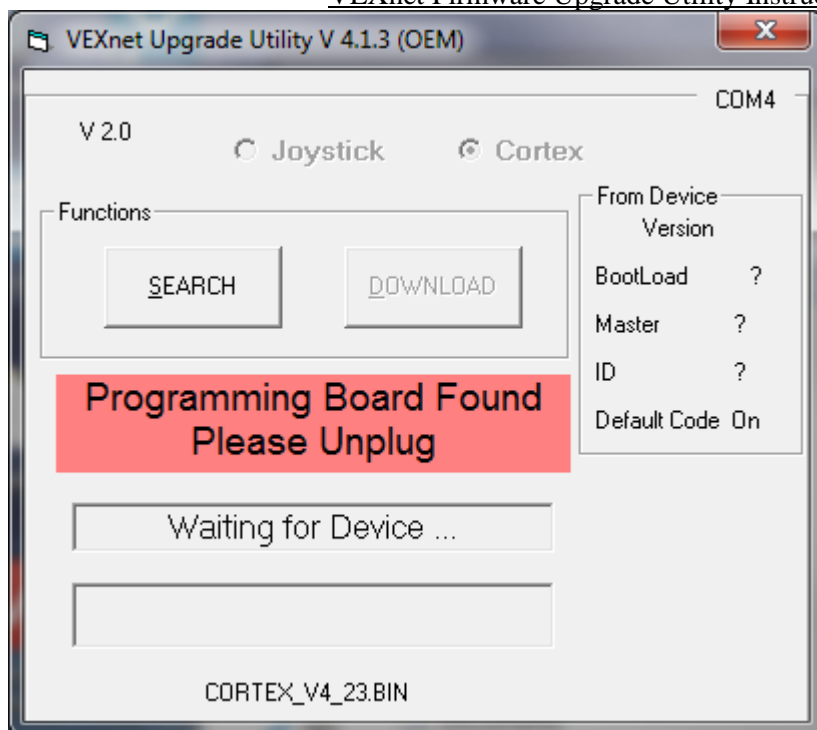
NOTE: The VEXnet Upgrade Utility Tool 3.x or higher requires the VEX Programming Driver and will not work until the driver has been installed.

2. Open the Upgrade Tool – navigate to: “All Programs”, “InnovationFirst”, and then the “VEXnet Firmware Upgrade Utility”.
3. One of the following Windows should be displayed: “Connect a VEXnet Device” or “Programming Board Found / Please Unplug”.



- a. If the above Window is displayed, continue at Step B.4. The Version Number displayed will vary but you should always be using the latest version available (unless instructed otherwise) – refer to the VEX wiki Downloads web page for the current version located at http://www.vexrobotics.com/wiki/Software_Downloads.

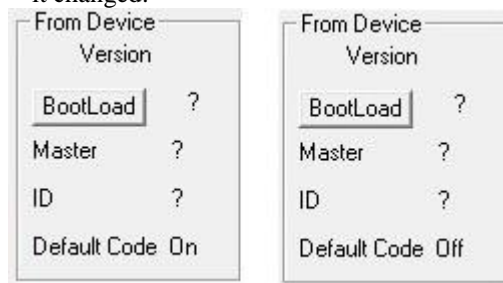
VEXnet Firmware Upgrade Utility Instructions



b. If the window inside the VEXnet Upgrade Utility displays “Programming Board Found / Please Unplug”, the tool has detected that some Vex Programming Hardware is also connected to your PC. You must disconnect your Vex Programming Hardware from your PC before continuing. The COM Port the VEX Programming Hardware is connected to is displayed in the top right corner. When the Vex Programming Hardware has been disconnected from your PC, you should see the screen shown in Step B.3.a. When you see the screen shown in B.3.a, continue at Step B.4.

4. Be sure the Module to be upgraded is OFF.

a. If you do not want to download user Default Code to the Cortex unit, double click “Default Code On” to change it to “Default Code Off”. This is useful if you have custom code installed in the Cortex and do not want it changed.



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. There are 2 different ways to use the Upgrade Tool, Option 1 and Option 2 listed below. Option 1 can possibly check versions of Master Code before upgrading or downloading the Master Code. Option 2 forces the unit into a download Mode and thus, no checking is done. Option 1 can be used on most VEXnet units but if you have problems, try Option 2.

Note: At any time during Option 1 or 2, if the ROBOT LED is the only LED blinking Green, you need to disconnect the USB A-A Cable from the unit and then reconnect the unit to the USB A-A Cable. Continue the connect/disconnect process until this condition is no longer displayed and then continue at B.4.

a. Option 1

1. Connect the other end of the USB Cable from Step B.6 to the VEXnet Module to be checked/upgraded and then wait about 5-10 seconds for the unit to be properly read then continue to the next Step B.7.a.2. Note exceptions below:

VEXnet Firmware Upgrade Utility Instructions

- b. If only the ROBOT LED is blinking Green, you need to disconnect the USB A-A Cable from the unit and then reconnect the unit to the USB A-A Cable. Continue the connect/disconnect process until this condition is no longer displayed when the USB A-A cable is connected.

Note: if the ROBOT LED is blinking Green and the Game LED is Flicking Green, this is a valid state – please continue.

- c. The unit may go through several reset cycles before a connection to the PC is established. Leave the unit connected and wait for the LEDs to stabilize. An unstable unit that is resetting is indicated when all the LEDs turn OFF and then Flash Red; various patterns can occur after the LEDs Flash Red but you only need to verify the unit is no longer resetting before moving to the next Step – should take less than a minute.

2. Depending on the Firmware or Master Code in the unit connected to the PC, one of the following windows (a, b, c, or d) should be displayed. If the Unit has been connected for at least 5 -10 seconds and the screen from B.3.a has not change to one of the following screens, the VEX Programming Driver may have not been installed properly. Try re-installing the Driver, please refer to section C, and then try testing again starting at Step B.4.

**Update Master Code
Click DOWNLOAD now.**

- a. If the above Window is displayed, the Firmware or Master Code in the unit needs to be upgraded. Continue at Option 2 Step 7.

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

- b. If the above Window is displayed, the Firmware or Master Code in the unit is the most current version and no further action is required. If you want to download Master Code into the unit even though it appears to be up-to-date, continue at Option 1.2.d.i. Otherwise, disconnect the unit from the USB A-A Cable. You can now check other units by continuing at Step B.4. See the Steps below to download Default Code to the unit.

- i. If you want to download only Default Code to the Cortex unit, double click on the text “Default Code Off” located under the “From Device” section inside the VEXnet Upgrade Utility.
- ii. Click “Download Default”.
- iii. Click Yes to “Download Slave Default Code Now?”.
- iv. After the Default Code has been download successfully, the following window will be displayed:

**Cortex Default Code
Download Complete**

- v. Disconnect the unit from the USB A-A Cable. You can now check other units by continuing at Step B.4.

**Please tether to
your Robot Controller**

- c. If the above Window is displayed, a Joystick has been detected that has an invalid ID. Please Tether or Pair the Joystick to a Cortex with a valid ID number and then re-check the Joystick using the VEXnet Upgrade Utility Tool. The Pairing procedure can be found in the Cortex Microcontroller and VEXnet Joystick User Guide located at - <http://www.vexrobotics.com/276-2194.html>. You can now check other units by continuing at Step B.4.

**Upgrade required
Click BootLoad now.**

- d. If the above Window is displayed, the Firmware or Master Code in the unit needs to be upgraded.
- i. Click on the Bootload button located under the “From Device” section inside the VEXnet Upgrade Utility.

VEXnet Firmware Upgrade Utility Instructions

ii. Click Yes to “Start Boot Loader”.

**Update Master Code
Click DOWNLOAD now.**

iii. The above Window should be displayed. Continue at Option 2 Step 7.

b. Option 2

1. Before connecting the VEXnet Unit (Cortex Microcontroller or Joystick) 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 i below for the VEXnet Joystick Module or Step ii below for the VEXnet Cortex Module.



i. VEXnet Joystick CONFIG Switch Access Hole



ii. VEXnet Cortex CONFIG Switch Access Hole

2. Depress and Hold the CONFIG Switch using the VEX Allen Wrench or similar tool (on older units, a VEX Allen Wrench is too large to fit through the Access Hole). You should feel and hear a “Click” when the Switch is depressed properly.
3. While the Switch is depressed, connect the other end of the USB Cable from Step B.6 to the VEXnet Module.
4. When 3 LEDs on the Module are solid Green, quickly release the CONFIG Switch and remove the Allen Wrench or tool.
 - a. An error reading the USB Device can occur. If this occurs, only the Robot LED will be blinking Green. Remove the USB Cable from the VEXnet Module and repeat starting at Option2 Step 2.
5. 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 Option2 Step 2; otherwise contact VEX Robotics Tech Support (903-453-0802).

VEXnet Firmware Upgrade Utility Instructions

6. The VEXnet Upgrade Utility Message Window will show the following window:

**Update Master Code
Click DOWNLOAD now.**

7. Click on the DOWNLOAD button located inside the Upgrade Utility Tool.

**Downloading Master
Code - please wait**

a. The above Window will be displayed during the downloading process. Also, the VEXnet LED on the Unit will blink Red in addition to the Robot blinking Green and the Game LED flickering Green.

8. When the Master Code 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 Option2. Step 11 below only if the following Message Window is displayed :

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

9. 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**

10. 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 or b below:

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

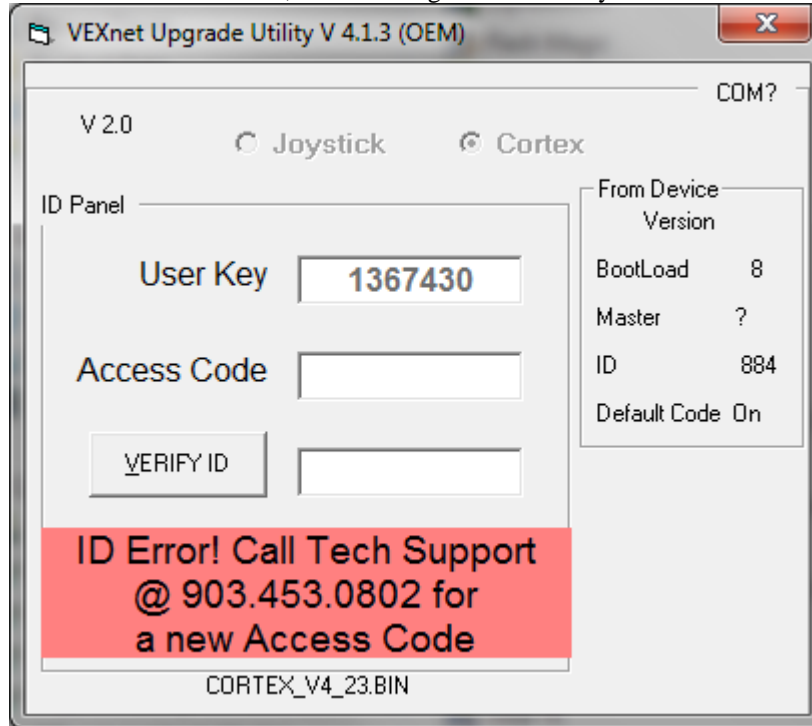
a. If the above Window is displayed, the Firmware or Master Code has successfully been updated in the unit to the most current version and no further action is required. Disconnect the unit from the USB A-A Cable. You can now check other units by continuing at Step B.4.

**Please tether to
your Robot Controller**

b. If the above Window is displayed, a Joystick has been detected that has an invalid ID. Please Tether or Pair the Joystick to a Cortex with a valid ID number and then re-check the Joystick using the VEXnet Upgrade Utility Tool. The Pairing procedure can be found in the Cortex Microcontroller and VEXnet Joystick User Guide located at - <http://www.vexrobotics.com/276-2194.html>. The update of additional Modules can now be started by continuing at Step B.4.

VEXnet Firmware Upgrade Utility Instructions

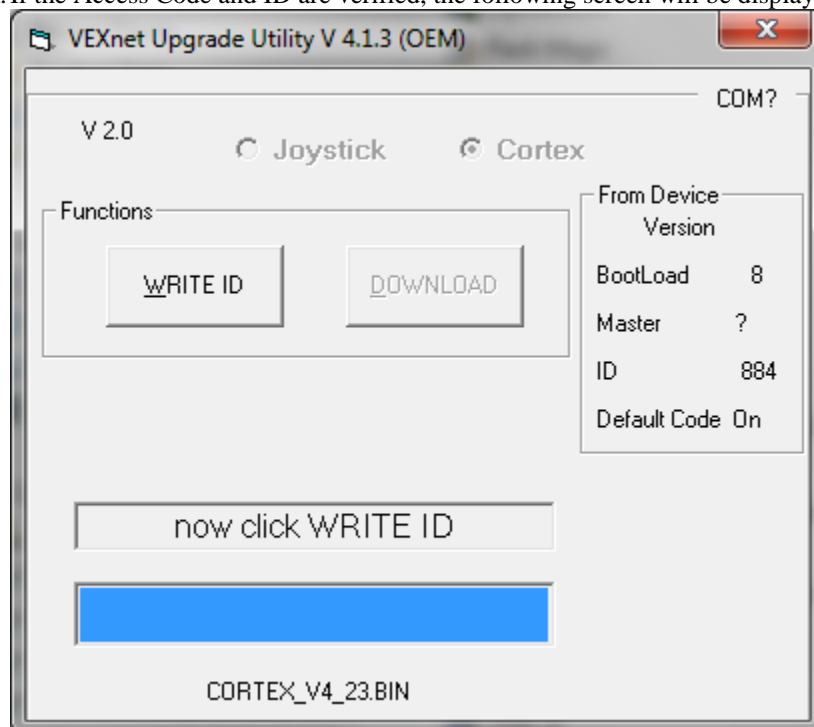
11. If an Invalid ID is detected, the following VEXnet Utility Window will be displayed:



- a. The Version Number, Bootload, Master, ID, and BIN file displayed will vary.
- b. The User Key displayed will vary each time a Module is connected to the Upgrade Tool.
- 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.4, 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.
 - i. If the Access Code or the VERIFY ID Number were typed incorrectly, a window will pop-up stating Invalid Access Code – otherwise continue at Option 2.11 Step.k.
 - ii. Click on the OK button to close the Pop-Up Error Window.
 - iii. Verify/Correct the Access Code and/or the ID Number by typing in the appropriate numbers.
 - iv. Continue at Option 2.11 Step.j.

VEXnet Firmware Upgrade Utility Instructions

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



i. 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.

1. 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 Option 2.10.

C. Driver Installation and VEXnet Firmware Upgrade Utility Installation.

1. Install the VEXnet Serial USB Driver “VEX_Driver_Installer_110111.zip” from on our wiki Downloads page at www.vexrobotics.com/wiki/Software_Downloads. Instructions are included.
2. If you have a solid orange programming cable (purchased prior to June 2012), install the Prolific USB Driver on your PC. Choose the Windows XP Prolific USB Driver, Windows 7 Prolific USB Driver or, Prolific USB Driver 3.2.0.0 (for Windows 8) as applicable.
3. Install the VEXnet Firmware Upgrade Utility on your PC using the following Steps.
 - a. Save the latest VEXnetUpgrade(VX.X.X)OEMwithInstr.zip to a known directory. The VEXnet Firmware Upgrade Utility can be found at www.vexrobotics.com/wiki/Software_Downloads. Instructions are included.
 - b. Unzip the VEXnet Upgrade zip file and note the file location.
 - c. Locate the unzipped “setup.exe” file and double click on the file.
 - d. Now complete the installation following the Window Installation Instructions - in general, just click “Yes”, “Next”, “Install” or “Finish” when necessary.
 - e. The program will create a folder called VEXnet Firmware Upgrade and all the files from the installation will be located in that folder.
 - f. In you have problems, try running the un-install program, unins000.exe, and then installing again. The un-install program will be located in the VEXnet Firmware Upgrade folder on your PC.

Revisions:

- Rev NC: first release of the operating instructions and installation procedures for the new 3.x VEXnet Firmware Upgrade Utility.
- Rev A: Upgrade to V3.2.8 screen-shots and added Default Code OFF instructions (paragraph B.4.a).
- Rev B: Upgrade to V3.2.9 screen-shots.
- Rev 4: Upgrade to V4.1.3 screen-shots. Updated Driver Installation and VEXnet Firmware Upgrade Utility Installation.