Troubleshooting ROBOTC with Cortex

This guide is to designed to be used by a student or teacher as a reference for help troubleshooting ROBOTC software issues.

Troubleshooting Topics
- Computer will not Recognize the VEX Cortex
- Not able to Download my ROBOTC program over USB
- Not able to Download ROBOTC Firmware over USB
- Not able to Download Master CPU Firmware over USB
- Program will not Compile
- Program compiles, but does not behave as desired
- Not able to open the ROBOTC Debugger
- Motors and/or Sensors Debug windows not functioning correctly
- Program does not immediately run when Cortex is turned on

Problem: Computer will not Recognize the VEX Cortex
1. Was the correct startup sequence followed when connecting the Cortex to the computer?
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On

2. Is the connected battery sufficiently charged?
- Swap in a fully charged battery

3. Does the Cortex need to be power cycled?
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On

4. Try another USB port on the computer.
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On

5. Try putting the Cortex into "Bootload" mode
- Start with the Cortex turned OFF (but with a battery connected)
- Push and hold Config button in on the Cortex.
- Attach the USB cable between the PC and Cortex.
- Wait for the Robot, VEXnet and Game lights to blink green.
- Release Config button.
- Turn the Cortex ON.
- Then in ROBOTC, click "Robot", "Download Firmware", "Master CPU Firmware", "Standard File".
- After the Master CPU Firmware finishes downloading, click "Robot", "Download Firmware", "ROBOTC

Firmware", "Standard File".
Additional Note: This step may be necessary if the Master CPU Firmware was corrupted and/or only partially downloaded to the Cortex. Also possible, if the wrong firmware (VEXnet Joystick) was downloaded to the Cortex, this step may be necessary.

Troubleshooting ROBOTC with Cortex

6. Make sure that your computer allows for "new hardware" to be connected. Extremely locked down computers may prohibit new hardware such as the VEX Cortex from being connected.
•   Contact your Tech Support for additional priviledges

7. Some SmartBoard software causes a conflict with the Cortex. The SMART Virtual TabletPC device can be disabled to resolve the conflict.
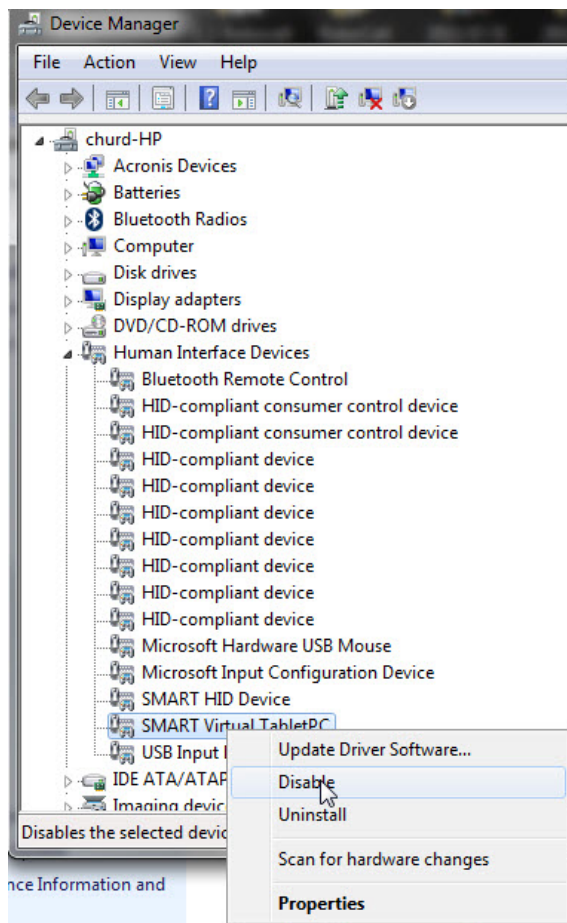
Troubleshooting ROBOTC with Cortex

Problem: Not able to Download my ROBOTC program over USB

1. Was the correct startup sequence followed when connecting the Cortex to the computer?
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the program

2. Does the program compile?
- Fix any errors (red x's)
- Retry downloading the program

3. Is the correct Platform Type Selected?
- Verify that the correct platform type is selected under Robot > Platform Type
- Retry downloading the program

4. Is the connected battery sufficiently charged?
- Swap in a fully charged battery
- Retry downloading the program

5. Does the Cortex need to be power cycled?
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the program

6. Have the Master CPU and ROBOTC Firmware been downloaded successfully to the Cortex?
- Do they need to be re-downloaded?
o Download the Master CPU Firmware.........................
o Download the ROBOTC Firmware
o Power Cycle the Cortex
o Retry downloading the program

7. Try another USB port on the computer.
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the program

8. Restart ROBOTC.
- Close ROBOTC
- Open ROBOTC
- Retry downloading the program

9. Restart the computer.
- Restart your computer
- Open ROBOTC
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the program

Troubleshooting ROBOTC with Cortex

10. Additional Steps
- Try using the same program on another computer, with the same Cortex.
- Try using the same program on the same computer, with a different Cortex.
- Try using a different USB A-to-A cable.

Problem: Not able to Download ROBOTC Firmware over USB

1. Was the correct startup sequence followed when connecting the Cortex to the computer?
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the ROBOTC Firmware

2. Has the Master CPU Firmware been successfully downloaded?
- Download the Master CPU Firmware ....
- Retry downloading the ROBOTC Firmware

3. Is the correct Platform Type Selected?
- Verify that the correct platform type is selected under Robot > Platform Type
- Retry downloading the ROBOTC Firmware

4. Is the connected battery sufficiently charged?
- Swap in a fully charged battery
- Retry downloading the ROBOTC Firmware

5. Does the Cortex need to be power cycled?
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the ROBOTC Firmware

6. Try another USB port on the computer.
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the ROBOTC Firmware

7. Restart ROBOTC.
- Close ROBOTC
- Open ROBOTC
- Retry downloading the ROBOTC Firmware

8. Restart the computer.
- Restart your computer
- Open ROBOTC
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the ROBOTC Firmware

Troubleshooting ROBOTC with Cortex

9. Additional Steps
• Try downloading the ROBOTC Firmware using another computer, with the same Cortex.
• Try downloading the ROBOTC Firmware using the same computer, with a different Cortex.
• Try using a different USB A-to-A cable.

10. Slow down the firmware download by inserting delays.
• Go to Window > Menu level > and select Super User
• Go to View > Preferences > Detailed Preferences...
• Go to the VEX Cortex Tab
• - The box next to "Delay Between HID Write" allows you to specify a number of milliseconds to insert as delays.
• Add a 5 millisecond delay
• Retry downloading the ROBOTC Firmware
• Continue to add short delays up until 100 milliseconds.
• Retry downloading the Master CPU firmware until success.

Problem: Not able to Download Master CPU Firmware over USB
1. Was the correct startup sequence followed when connecting the Cortex to the computer?
• Start with the Cortex Turned OFF
• Connect the Cortex to the computer over USB
• Turn the Cortex On
• Retry downloading the Master CPU Firmware

2. Is the correct Platform Type Selected?
• Verify that the correct platform type is selected under Robot > Platform Type
• Retry downloading the Master CPU Firmware

3. Is the connected battery sufficiently charged?
• Swap in a fully charged battery
• Retry downloading the Master CPU Firmware

4. Does the Cortex need to be power cycled?
• Start with the Cortex Turned OFF
• Connect the Cortex to the computer over USB
• Turn the Cortex On
• Retry downloading the Master CPU Firmware

5. Try another USB port on the computer.
• Start with the Cortex Turned OFF
• Connect the Cortex to the computer over USB
• Turn the Cortex On
• Retry downloading the Master CPU Firmware

6. Restart ROBOTC.
• Close ROBOTC
• Open ROBOTC
• Retry downloading the Master CPU Firmware

7. Restart the computer.

Troubleshooting ROBOTC with Cortex

- Restart your computer
- Open ROBOTC
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the Master CPU Firmware

8. Additional Steps
- Try downloading the Master CPU Firmware using another computer, with the same Cortex.
- Try downloading the Master CPU Firmware using the same computer, with a different Cortex.
- Try using a different USB A-to-A cable.

9. Slow down the firmware download by inserting delays.
- Go to Window > Menu level > and select Super User
- Go to View > Preferences > Detailed Preferences...
- Go to the VEX Cortex Tab
- - The box next to "Delay Between HID Write" allows you to specify a number of milliseconds to insert as delays.
- Add a 5 millisecond delay
- Retry downloading the ROBOTC Firmware
- Continue to add short delays up until 100 milliseconds.
- Retry downloading the Master CPU firmware until success.

10. Try the download using the VEXnet Firmware Upgrade Utility, supplied by VEX Robotics.
- Download the VEXnet Firmware Upgrade Ultility, available here:
- http://www.vexforum.com/wiki/index.php/Software_Downloads
- Unzip the utility and instructions
- Follow the instructions included with the utility to update the firmware

Problem: Program will not Compile
1. If you're using Natural Language functions, make sure you're in the Natural Language platform type.
- Go to Robot > Platform Type
- Select the Natural Language option
- Go to Robot > Compile Program to recompile your code

2. Is the correct Platform Type Selected?
- Verify that the correct platform type is selected under Robot > Platform Type
- Retry downloading the program

3. Check your code for mistakes.
- Are you missing any curly braces?
- Are you missing any semicolons?
- Are any of your commands or variables improperly capitalized?
- Do any of your commands or variables contain typos?
- Go to Robot > Compile Program to recompile your code

Troubleshooting ROBOT**C** with Cortex

4. Check the ROBOTC Errors window for hints.
- The ROBOTC Errors window (usually located at the bottom of the screen) will display
- a list of known errors, what line they're on, and some information about the error.
- Double-click errors in the ROBOTC Errors window to highlight the affected line in your
- program.
- Correct errors (keep in mind yellow x's are only warnings, and white x's are only information,
- not errors).
- Go to Robot > Compile Program to recompile your code.

5. Compare your code to programs you know work and compile.
- Compare your code t similar ROBOTC Sample Programs (File > Open Sample Program)

Problem: Program compiles, but does not behave as desired
1. Compare your code to programs you know work and compile.
- Compare your code t similar ROBOTC Sample Programs (File > Open Sample Program)

2. Think "like the robot". The robot does exactly what you tell it to do. Nothing more and nothing less.
- Is there an important step you're forgetting to tell the robot?
- Go back to your pseudocode plan. Does the sequence of steps make sense for the robot?

3. Use the ROBOTC Program Debug window to "Step" through your code line-by-line.
- Download the program to the robot.
- When the Program Debug window appears, repeatedly press the "Step" button to run the program line-by-line.
- Observe the robot's behavior. How does it compare to the desired behavior?
- Try to identify where the robot's behavior differs from the desired behavior.

4. Insert visual "flags" in your program.
- Insert optional wait statements or turn on different LED's at different parts of the program.
- When the robot reaches one of the wait statements or LED's, and behaved correctly, you know that the program was correct up until that point.
- Continue to insert and observe these optional flags until you identify the problem.

Problem: Not able to open the ROBOTC Debugger
1. Was the correct startup sequence followed when connecting the Cortex to the computer?
- Start with the Cortex Turned OFF
- Connect the Cortex to the computer over USB
- Turn the Cortex On
- Retry downloading the program to open the debugger

2. Has the program been downloaded to the Cortex?
- Download the program to open the debugger

3. Have the Master CPU and ROBOTC Firmware been downloaded successfully to the Cortex?
- Do they need to be re-downloaded?
- Download the Master CPU Firmware
- Download the ROBOTC Firmware
- Power Cycle the Cortex
- Retry downloading the program to open the debugger

Troubleshooting ROBOTC with Cortex

4. Check the VEX Cortex Download Method.
• Verify that the Robot > VEX Cortex Download Method is set to "Download using VEXnet or USB" or "Download using USB Only"
• If it was set for Competition:
o Download the program
o Turn Cortex OFF
o Disconnect the Cortex from the computer
o Reconnect the Cortex to the computer over USB
o Turn the Cortex On
o Retry downloading the program to open the debugger

Problem: Motors and/or Sensors Debug windows not functioning correctly

1. Is the Cortex turned on and connected to a charged battery?
• Swap in a fully charged battery
• Turn the Cortex on
• Observe the debug window data

2. Has a program that correctly configures the sensors been downloaded to the robot?
• Download a program that correctly configures the sensors on the robot.
• Run the program
• Stop the program
• Observe the sensor data

3. Is the Program Debug window set to provide "Continuous" updates?
• Download the program to the robot
• Under the "Refresh Rate" section, verify that a button is not labeled "Continuous"
• If a button is labeled "Continuous", press it to receive continuous updates
• Observe the sensor data

4. Have the Master CPU and ROBOTC Firmware been downloaded successfully to the Cortex?
• Do they need to be re-downloaded?
o Download the Master CPU Firmware..........................
o Download the ROBOTC Firmware
o Power Cycle the Cortex
o Re-download the program
o Observe the sensor data

5. Does the Cortex need to be power cycled?
• Start with the Cortex Turned OFF
• Connect the Cortex to the computer over USB
• Turn the Cortex On
• Re-download the program
• Observe the sensor data

6. Restart ROBOTC.
• Close ROBOTC
• Open ROBOTC
• Re-download the program
• Observe the sensor data

Troubleshooting ROBOTC with Cortex

Problem: Program does not immediately run when Cortex is turned on

1. Check the VEX Cortex Download Method.
- Go to Robot > VEX Cortex Download Method
- Select "Download using USB Only" to have the program start automatically
- Download the program
- Turn Cortex OFF
- Disconnect the Cortex from the computer
- Turn the Cortex On
- Program should start automatically