VEX Robot Troubleshooting Flowcharts

1. General Robot Troubleshooting Flowchart

![Flowchart Image]

- **Start**
- **Check batteries and power connections. The battery connectors on the Cortex can become bent open over time. If necessary, bend the connectors back in to ensure a solid power connection.**
- **Is the Game LED flashing?**
  - **YES**
    - **Is the Robot LED on the Cortex consistently red?**
      - **YES**
        - **Is the Robot LED blinking?**
          - **YES**
            - **Fast or slow blink?**
              - **YES**
                - **Fast**
                  - **Low or missing 9v backup battery. If in a competition setting, install a fully charged 9v backup battery before continuing.**
              - **NO**
                - **Slow**
                  - **Programming error. Try switching to the Default Code which can be found within your programming software. If this fixes the issue, return to your user code and attempt to isolate the issue to a particular line of code. The best way to do this is to comment out various sections at a time and test after each change.**
          - **NO**
            - **No Blink**
              - **Robot battery is dead. Charge or replace batteries before continuing.**
        - **NO**
          - **No Blink**
            - **Robot battery is dead. Charge or replace batteries before continuing.**
      - **NO**
        - **Is Cortex VEXnet LED on?**
          - **YES**
            - **Is the VEXnet LED green?**
              - **YES**
                - **Update the VEXnet Firmware (Master CPU Firmware for ROBOTC users) on both the Cortex and the Joystick using the Firmware Upgrade Utility included with your programming software. If you do not have programming software this utility is available on the Downloads page at vexrobotics.com.**
              - **NO**
                - **Wait 20 second…**
                  - **If the units are still not correctly linked, refer to the VEXnet Troubleshooting Flowchart in Section 3.**
          - **NO**
            - **Is the VEXnet LED green?**
              - **YES**
                - **The Cortex is currently running an Autonomous Only user code. If you want to use the VEXnet Joystick, download a VEXnet Enabled project such as the Default Code using the USB A-A Cable.**
              - **NO**
                - **Is the robot lagging or slow to respond?**
                  - **YES**
                    - **Refer to the Motor Troubleshooting Flowchart in Section 4.**
                  - **NO**
                    - **Do all motors work correctly?**
                      - **YES**
                        - **For questions regarding a competition robot, see the Competition Robot Troubleshooting Flowchart in Section 2. If you need further assistance, you can refer to the other guides or post a question on the VEX Forum (vexforum.com). You can also contact VEX Technical Support by phone at +1-903-453-0802 or email support@vexrobotics.com. Please note: for programming questions contact the developer of your programming software.**
                      - **NO**
                        - **Refer to the Motor Troubleshooting Flowchart in Section 4.**
2. Competition Robot Troubleshooting Flowchart

1. Start
   - Did your robot stop working during a match?  
     - NO
     - YES

2. When this happened, did all motors not connected to a Power Expander completely stop moving?  
   - NO
   - YES

3. Did the Robot LED on The Joystick turn red?  
   - NO
   - YES

4. Did the VEXnet LED on the Joystick turn red?  
   - NO
   - YES

5. Did it stay red for the remainder of the match?  
   - NO
   - YES

6. Does your autonomous code start correctly?  
   - NO
   - YES

7. Did your competition code (written in a competition template) execute at all?  
   - NO
   - YES

8. Was the Game LED green?  
   - NO
   - YES

9. When this happened, did all motors not connected to a Power Expander completely stop moving?  
   - NO
   - YES

10. Check the Initialize or pre_auton function in your code for an infinite loop or anything that might cause the controller to stay in this function instead of Moving on to the Autonomous and Driver Control functions.

11. The robot was disabled by the Field Controller. If this happened while the match was in progress it may have been caused by a loose connection to, or possibly an issue with, the Field Controller. Verify that the Competition Cable is correctly plugged into the main VEXnet Joystick. See the Field Technician for further assistance.

12. It is likely that one or both of the 4 amp circuit breakers on the Cortex were tripped. This is usually a result of the motors being stalled or placed under too high of a load. See the Motor Troubleshooting Flowchart in Section 4 for further assistance. Please note that the Power Expander also has one 4 amp circuit breaker.

13. Refer to the VEXnet Troubleshooting Flowchart in Section 3.

14. If this is a reoccurring issue, it may necessary to move the VEXnet key to a better location on your robot. Please note that the key should be mounted at least 2 inches (5 cm) away from anything metal.

15. Check user code and redownload. Also check all motor and battery connections.

If you’re still having issues with your competition robot, you can refer to the other guides or get help from the Technical Support staff available at your competition. You can also contact VEX Technical Support by phone at +1-903-453-0802 or email support@vexrobotics.com. Please note: When preparing for a competition, the VEXnet Competition Switch (276-2335) is an excellent tool for testing your robot’s autonomous code and verifying that your robot will correctly respond to the Competition Field Controller.
3. VEXnet Troubleshooting Flowchart

Start

Do both units turn on?

Check batteries and power connections.

YES

Is the Joystick LED solid?

Joystick batteries are dead. Replace batteries before continuing.

NO

Is the Joystick LED red?

Update the VEXnet Firmware (Master CPU Firmware for ROBOTC users) on both the Cortex and the Joystick using the Firmware Upgrade Utility included with your programming software. This utility is also available on the Downloads Page at vexrobotics.com.

YES

Are both VEXnet LEDs on?

Pair Cortex and Joystick. For instructions, refer to Section 1 of the Cortex User Guide.

NO

Are both VEXnet LEDs on?

Units are correctly linked. If the problem persists, check user code or try using the Default Code which is available from within your programming software.

NO

Single or double blink?

Units are establishing VEXnet link. No action required.

YES

What color is the VEXnet LED?

Pair Cortex and Joystick. For instructions, refer to Section 1 of the Cortex User Guide.

Red

For longer than 20 seconds?

Units are establishing VEXnet link. No action required.

NO

Other

Flashing Yellow

Lost VEXnet link.

No VEXnet key detected. Check key connection and replace key if necessary. Powercycle unit when finished.

Single

Poor signal strength.

Signal may be blocked or units may be out of range. Consider moving key to a better location or consider moving the Cortex closer to the Joystick.

Flashing Multiple Colors?

Yes

No

If the issue is still present after following this guide, update both the Cortex and Joystick with the most recent version of the VEXnet Firmware (Master CPU Firmware for ROBOTC users). If this does not resolve the problem, try using a different set of VEXnet keys. If you need further assistance you can post a question on the VEX Forum (vexforum.com) or contact VEX Technical Support by phone at +1-903-453-0802 or email support@vexrobotics.com.
4. Motor Troubleshooting Flowchart

**Start**

**Do the Motors spin at all?**

**Are you using Motor Controller 29 Modules on all 2-wire motors plugged into ports 2-9 on the Cortex?**

**Do motors intermittently lose power or stop working?**

**Are your motors drifting?**

**Are you having issues with using your Power Expander?**

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In order to run a 2-Wire Motor off a 3-Wire PWM motor port you must use a Motor Controller 29 Module (276-2193) for each 2-wire motor. This motor controller acts as a converter between a 2-wire motor and a 3-wire motor port. Ports 1 and 10 on the Cortex are equipped with built-in Motor Controllers, allowing you to directly control a 2-Wire Motor on these ports.

This could be a programming issue. Try switching to the Default Code to isolate the problem.

The Cortex is equipped with two 4 amp circuit breakers that may trip if the motors pull too much current. Motor ports 1-5 on the Cortex share one 4 amp circuit breaker. Ports 6-10 share a second 4 amp circuit breaker. It’s recommended that you balance the load from your motors across these two breakers to prevent the circuit breaker from tripping unnecessarily.

If any motors are still not responding, try switching out motors, motor controllers and motor ports in order isolate the issue to a particular piece of hardware. For additional help, you can post a question on the VEX Forum (vexforum.com) or contact VEX Technical Support by phone at +1-903-453-0802 or email support@vexrobotics.com.

If a motor still loose necessary power it is likely that the motor’s internal thermal breaker is tripping. This is almost always attributed to the motor being stalled or placed under too high of a load. First check your drivetrain or mechanism for any unnecessary friction. The best way to do this is to disconnect the motor from your mechanism and then turn the shaft by hand. Ideally, your mechanism or drivetrain should spin relatively freely.

You may also need to add additional motors to your application or switch to a slower and less aggressive gear ratio. If you have a high-load application and are using 2-wire Motor 269 modules, it may be a good idea to change them out for 2-wire Motor 393 Modules, which, in their factory setting, can output 60% more torque.

Refer to the Power Expander Inventor’s Guide which is available at the Product Page at vexrobotics.com.

If you’re still having problems with motors you can refer to the other guides or contact VEX Technical Support by phone at +1-903-453-0802 or email support@vexrobotics.com. You may also want to post a question on the VEX Forum and someone in the VEX community will assist you.

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The Joystick may need to be recalibrated. For instructions, see section 6 of the Cortex User Guide or refer to the help files included with your programming software.