2009 Field Controller System – Team Test Guide

2009 Field Controller System – Revision History of FCS Code and this document

FCS Release Notes and Known Issues

August 31, 2009

- On Vista 64-bit, an installer failure has been reported, when an older version of LabVIEW (FRC 2009) is present on the machine. If you encounter an installer problem, install LabVIEW 2009, NXT Module and FTC module using the instructions and files provided by National Instruments. Then, download, extract, and run Windows EXE.
- If you disconnect from NXT Brick while using a Mac, you can not reconnect until the pass key information is deleted from the computer. Do this by clicking on the bluetooth menu in the system bar at the top of the screen, then selecting the brick in question, then clicking the '-' sign to delete. This is a known issue and National Instruments is working on a solution.
- Bluetooth USB adapter must be attached to the computer, and fully installed before launching the FCS.

September 2, 2009

- The sound made when you start TeleOp is the sound that is supposed to be made when starting Autonomous and vice-versa.
- Windows Vista sometimes sees a single joystick gamepad as two gamepads.

September 4, 2009

- Installation instructions clarified.

2009 Field Controller System – Team Test Guide

This inspection manual includes a complete set of instructions on how to test your code using the FTC Field Controller System to ensure it will work in competition

Contents

Team Field Controller System Guide – Setup Instructions

Hardware List – to test your software you will need to meet the following specifications:

	Minimum	Recommended
Windows		
Processor	Pentium III/Celeron 866 MHz or equivalent	Pentium 4/M or equivalent
RAM	256MB	1 GB
Screen Resolution	1024 x 768 pixels	1024 x 768 pixels
Operating System	Windows Vista/XP/2000	Windows Vista/XP
Disk Space	1.6 GB	1.6 GB
Mac OS X		
Processor	Intel-based processor	Intel-based processor
RAM	563 MB	1.2 GB
Screen Resolution	1024 x 768 pixels	1024 x 768 pixels
Operating System	Mac OS X 10.4 or later	Mac OS X10.4 or later
Disk Space	262 MB	828 MB for the complete installation
Linux		
Processor	Pentium III/Celeron 866 MHz or equivalent	Pentium 4/M or equivalent
RAM	256 MB	1 GB
Screen Resolution	1024 x 768 pixels	1024 x 768 pixels
Operating System	Linux kernel 2.2.x, 2.4.x, or 2.6.x, for the Intel x86 architecture, GNU C Library (glibc) Version 2.2.4 or later	Red Hat Enterprise Linux WS 3, MandrakeLinux/Mandriva 10.0, SuSE Linux 9.1
Disk Space	630 MB	835 MB for the complete installation

The following equipment is needed to test and use the FCS:

1. USB A/B Cable
2. Abe Bluetooth adapter provided in FTC kit
3. Logitech Dual Action USB Game Gamepads

Preparation for using the FCS

1. Set up your computer
   1.1. Connect Abe Bluetooth adapter from FTC kit (disable internal Bluetooth adapter(s))
   1.2. Attach up to two Logitech Dual Action USB Game Gamepads
2. Installing LabVIEW
   2.1. Install LabVIEW 2009 NXT Module and FTC Module using media and instructions from National Instruments
   2.2. Upgrade the firmware of your NXT brick to 1.28 or higher using the NXT Terminal
   2.3. Write robot code using the templates supplied by National Instruments, then deploy them to the NXT brick
3. Downloading the FCS
   3.1. http://ftcmastery.com/ftcbeta
   3.2. Download **Windows EXE Only** or **Mac Application** (choose based on system)

      ***NOTE: When to download the Windows Installer: only download the installer when you will be running on a PC which does not have the full LabVIEW development installed on it. Possible such scenarios are when you are temporarily running scrimmages and need a spare computer to run matches.**

   3.3. Save the file to a folder of your choosing
   3.4. Unzip the downloaded File
4. Load your Autonomous, TeleOp, and Program Chooser Code onto your NXT Brick

Program Chooser

In order to use your TeleOp program on your robot during competition, you will need to use the dual program setup with Program Chooser:

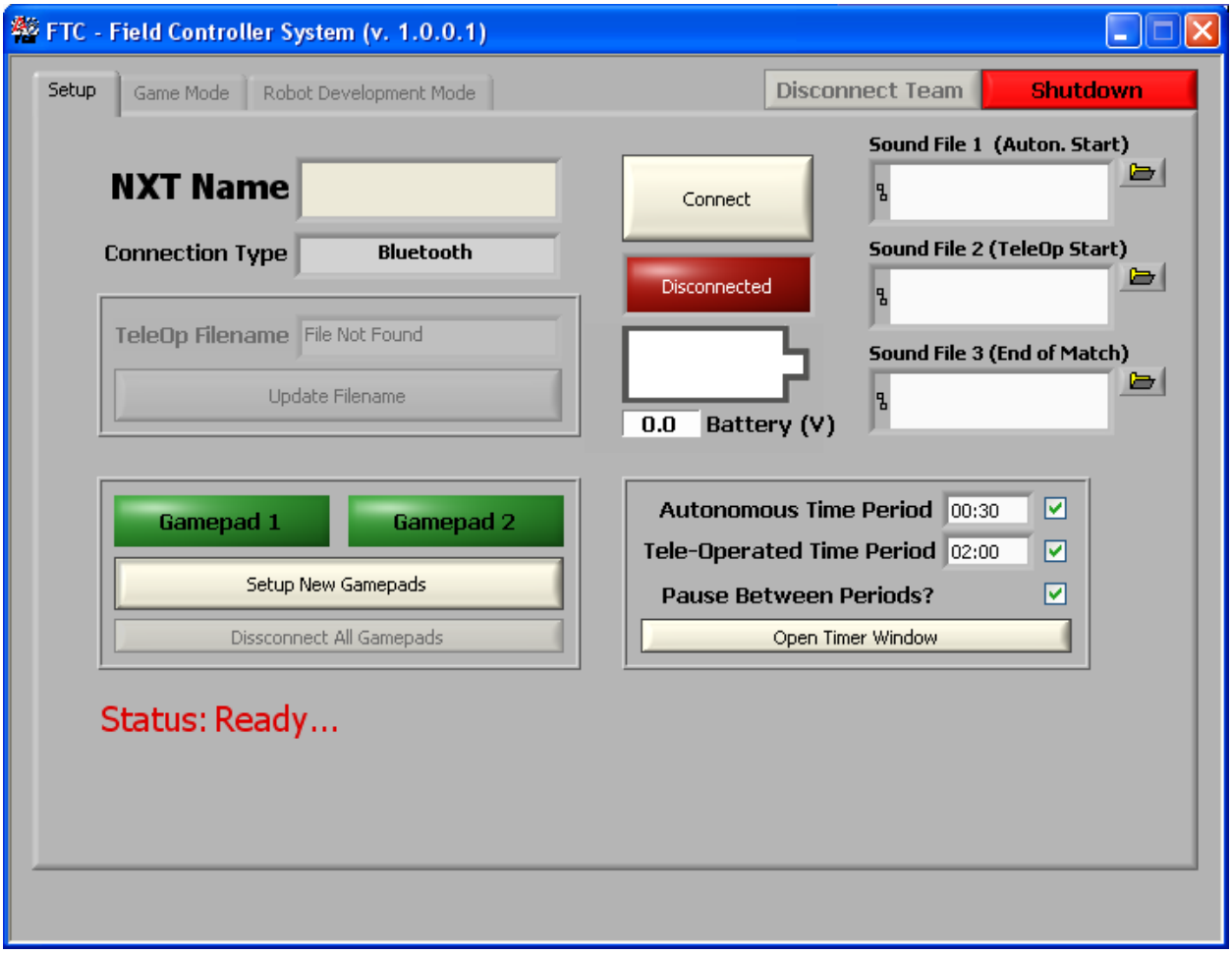
1. Load the Program Chooser onto your NXT Brick
2. Run the Program Chooser on your NXT Brick

3. Choose your Teleop program by scrolling through the list using the arrow keys and pressing the orange button to select.
4. Press the orange button on the NXT brick one more time.

*Note: If you are using ROBOTC, go to Appendix A to learn how to load your TeleOp program

Setting up the FCS

This process will allow you to set up your NXT on the FCS. This process can be used for testing purposes as well as during competition



1. Start the FCS by clicking on the icon located on the desktop
2. Turn on NXT Brick
3. Enter the NXT name

4. Select Connection Type

    4.1. If you select USB, make sure that the NXT Brick is connected to the computer via the USB A/B cable

    4.2. If you select Bluetooth make sure the Bluetooth adapter is connected and working

5. Press the Connect button and wait for connection to complete

6. Upon Connection:

    6.1. Disconnect button will become available

    6.2. Connection Indicator will read connected (located below disconnect button)

    6.3. The battery indicator will be updated

    6.4. You will be able update your TeleOp filename

    6.5. Status indicator will update (it will update with all actions taken)

    6.6. Game Mode and Robot Development Mode become available

    6.7. Disconnect Team button available

7. Click “Update Filename” to load the TeleOp program filename from your NXT into the FCS

    7.1. Name of TeleOp file will appear in the box

8. Press “Setup New Controllers”

    8.1. If one gamepad is attached press button 1 on the gamepad and then button 3.

    8.2. If two gamepads are attached to computer, you will have to press button 1 on the gamepad and button 2 on the other. This will assign gamepads to 1 and 2 respectively in the FCS.

        8.2.1. Note that the Disconnect All Controllers Button will become available

    8.3. When you push any button on a gamepad, the corresponding indicator will flash green

9. Selecting Sound Files

    9.1. Press on the folder next to find a sound file located on your computer

    9.2. The sound will be played at specified moment, ex. “TeleOp Start”

    9.3. Selecting a sound file will cause the path to the file to appear in the display box

    9.4. Once a Sound File is set, it stays the same until you delete the path or set a new one

10. Check off which game modes you want to run

    10.1. Note: Autohomous runs before Teleop

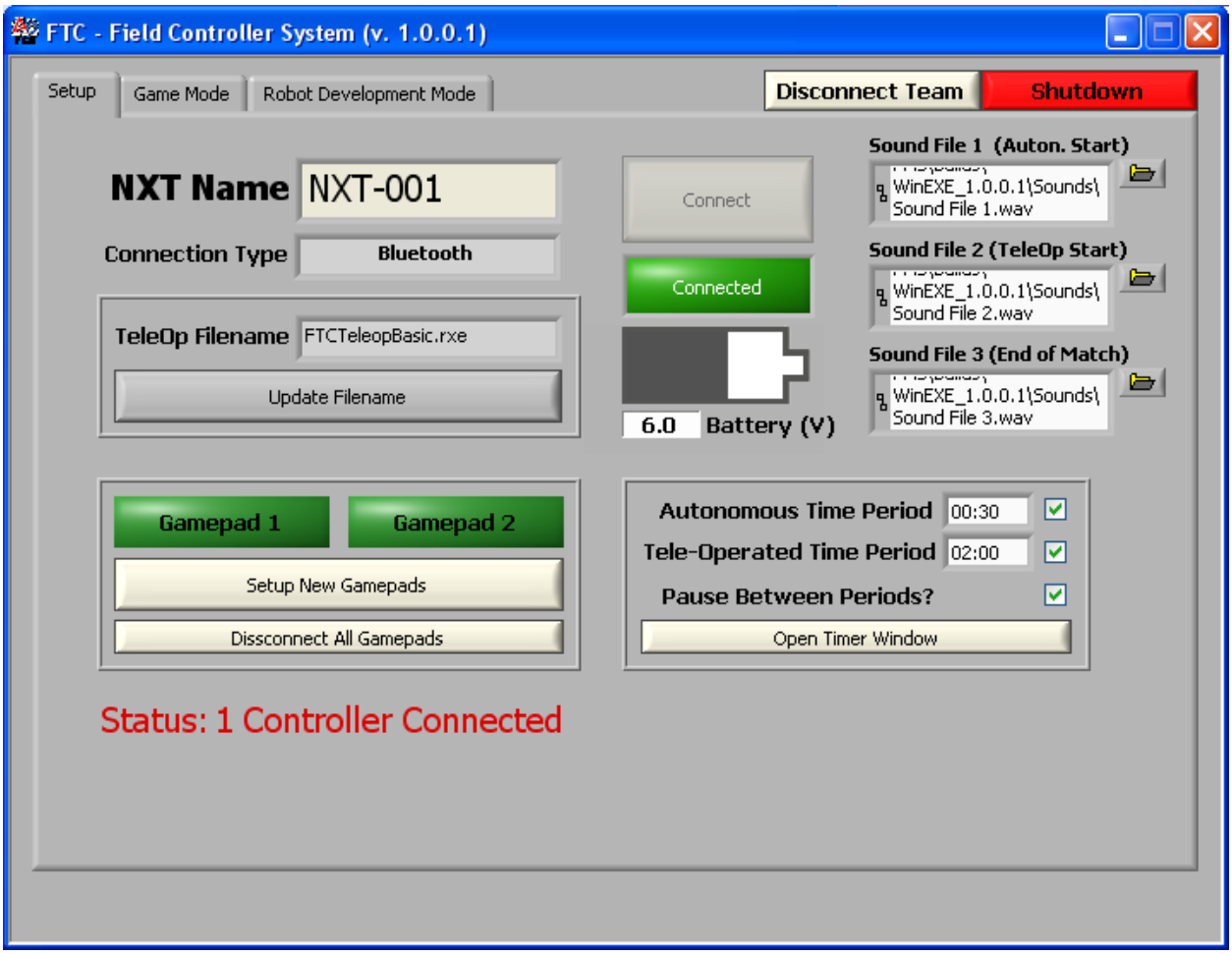
11. Check off Pause Between Periods, if you wish to start Teleop mode manually once Autonomous is finsihed.

    11.1. If you do not check it off, Teleop will start as soon as Auotonomous is finished

12. If you click on the Timer Window button, a large timer the size of your screen will appear when you push the Update Timer button or Start a match

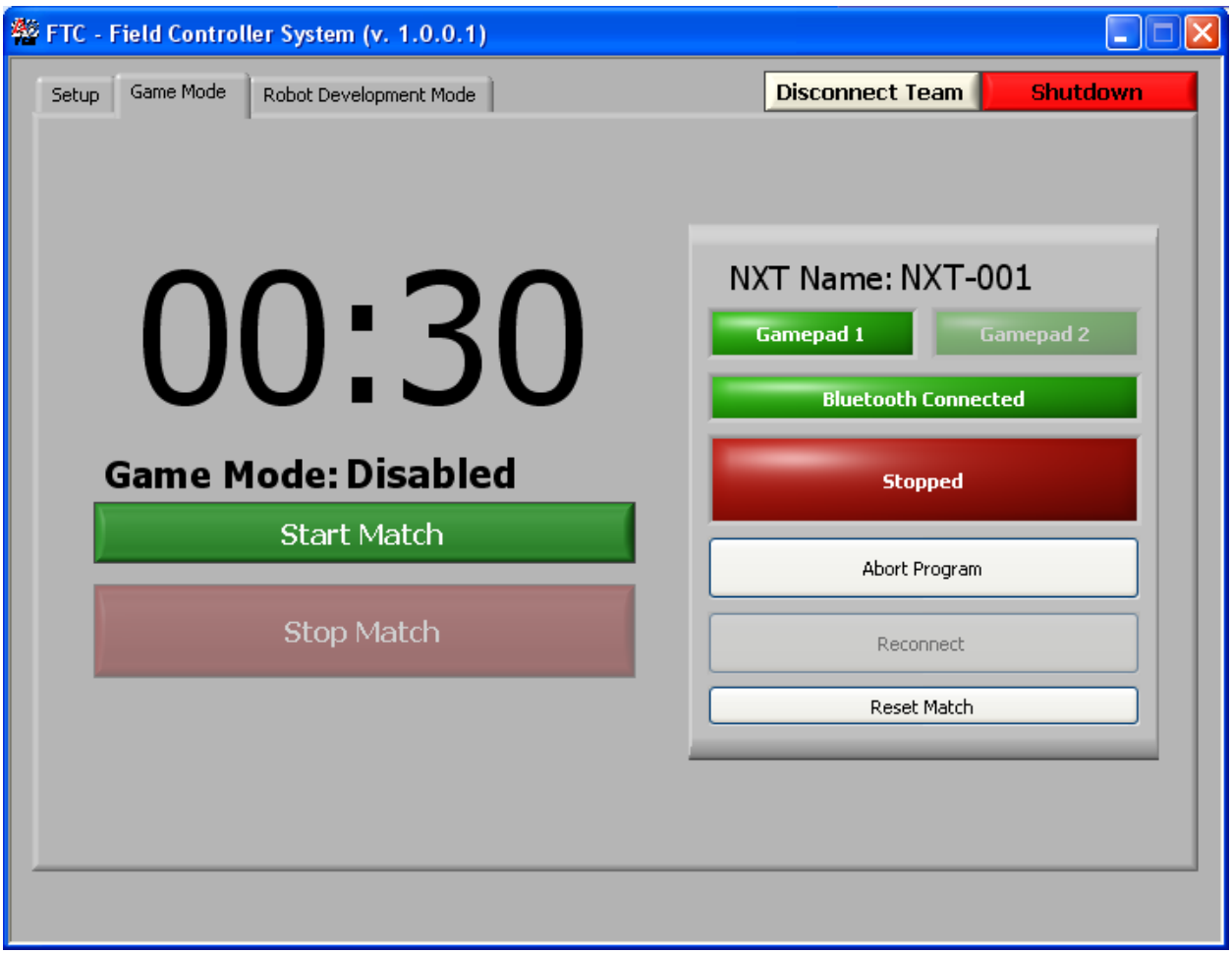
13. To disconnect from the NXT press the Disconnect button or the Disconnect Team button

14. To turn off the FCS press Shutdown button



Using Game Mode

Game Mode is the section of the FCS that is used to run your robot during competition



1. Click on the Game Mode tab
    1.1. Note: you must connect to NXT before this can be done
2. To start match
    2.1. Press the Start Match Button
    2.2. The Stop Match Button will be available
    2.3. The “Game Mode:” indicator will update based on what part of the match you are in
    2.4. The clock will count down
3. To stop the match and reset the timer
    3.1. Press the Stop Match

3.2. Start Match button becomes active

4. To stop running the program running on the NXT brick and place buttons, but continue running the timer, press the Abort Program Button

5. To reconnect to a robot:

   5.1. If USB connection is dropped, make sure the USB A/B cable is still connected, and press reconnect

   5.2. If Bluetooth connection is dropped, press the reconnect button

6. Indicators

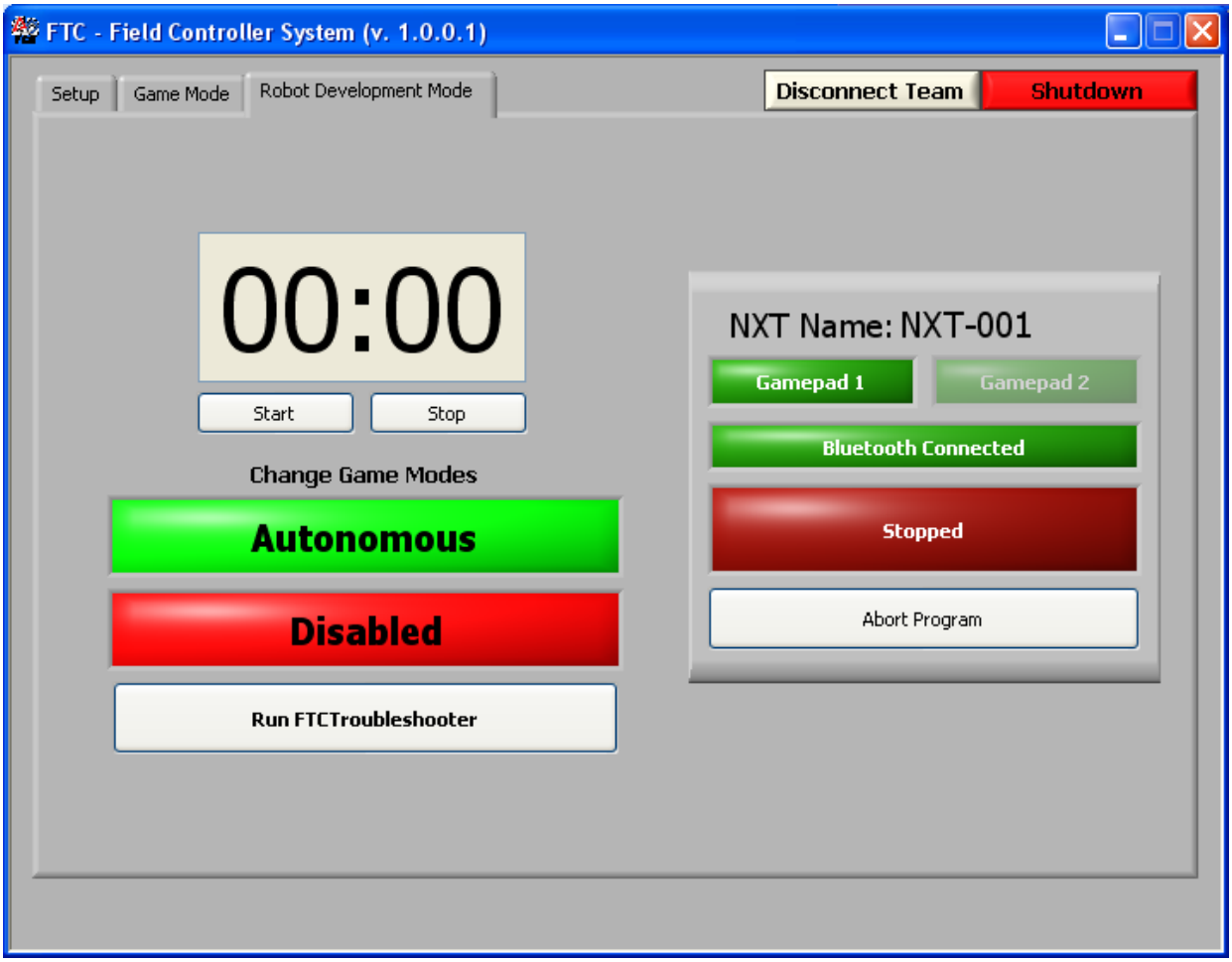
   6.1. The controller indicators will light up when you touch buttons on the corresponding gamepad

   6.2. "The Bluetooth indicator will be red and read "Disconnected" when Bluetooth is not connected and be green and read "Connected" when connected."

   6.3. The status indicator will read “Running” and be green when the robot is able to perform actions, will read “Stopped” and be red when it is disabled

Using Robot Development Mode

Robot Development Mode may be used to test your programs.



1. Press on the Robot Development Mode Tab to enter

    1.1. Note: must be connected to NXT Brick for the Tab to be available

2. Change Game Mode Tools

    2.1. You can switch between Autonomous and Teleop by pressing the green indicator under Change Game Modes.

    2.2. To disable robot

        2.2.1. Press Enabled button

        2.2.2. The Disabled button will appear

        2.2.3. Note: disabling robot does not stop the timer

2.3. To enable robot

2.3.1. Press the Disabled button

2.3.2. The Enabled button will appear

2.4. When you try to enable Autonomous from Teleop mode it will give a message that tells you to load program first, load Autonomous program and then Enable

3. Indicators

3.1. The controller indicators will light up when you touch buttons on the corresponding gamepad

3.2. "The Bluetooth indicator will be red and read "Disconnected" when Bluetooth is not connected and be green and read "Connected" when connected."

3.3. The status indicator will read “Running” and be green when the robot is able to perform actions, will read “Stopped” and be red when it is disabled

4. To stop testing and place buttons back to default press the Abort Program Button

5. FTCTroubleshooter

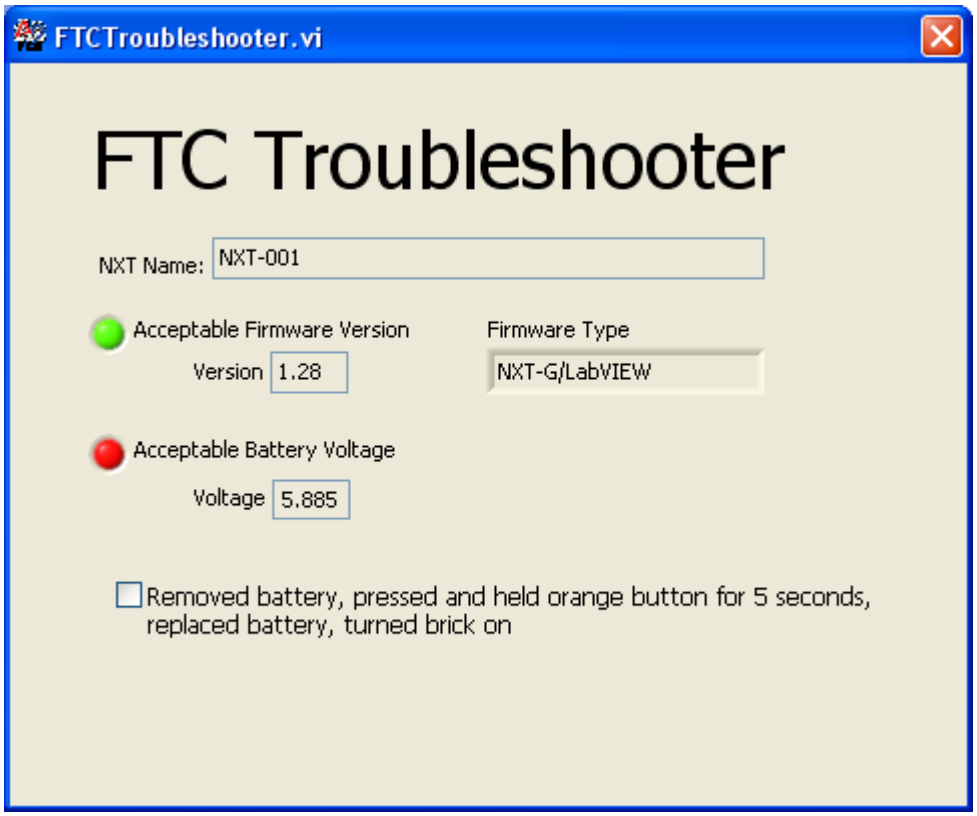
5.1. Connect USB cable fom the computer to the NXT module

5.2. Press Run FTCTroubleshooter Button to Open

5.3. NXT name will be displayed

5.4. If battery level and firmware version are acceptable, the indicator will be green, if not red

5.5. Follow the instructions located at the bottom of the window to trouble shoot Bluetooth connectivity problems



Troubleshooting Bluetooth

General Troubleshooting

1. Use the FTC Troubleshooter
2. Is the Bluetooth adapter connected to the computer?
   2.1. Connect the Bluetooth adapter to the computer. If this is the first ever use of this Bluetooth adapter, make sure only the Microsoft driver is being used
3. Is the NXT Brick powered ON?
   3.1. Turn on the power to the NXT Brick
4. Is the battery in the NXT Brick fully charged?
   4.1. If not, charge or replace the battery(ies)
5. Is there Bluetooth connection with the NXT controller, already established through another program on our computer (Mindstorms NXT-G application, etc?)

5.1. Disconnect the connection and close the program

6. Is any computer connected to the NXT controller via Bluetooth?

   6.1. Have connection terminated or use the other computer

7. Remove Pass Key information from the computer

8. If none of these steps above have solved the problem

   8.1. Restart the FCS

   8.2. Reboot the computer

   8.3. Retry establishing a Bluetooth connection upto 4 times, if necessary

Trouble Shooting – Mac Users

1. Remove Pass Key information from the computer

   1.1. This fixes the problem most of the time

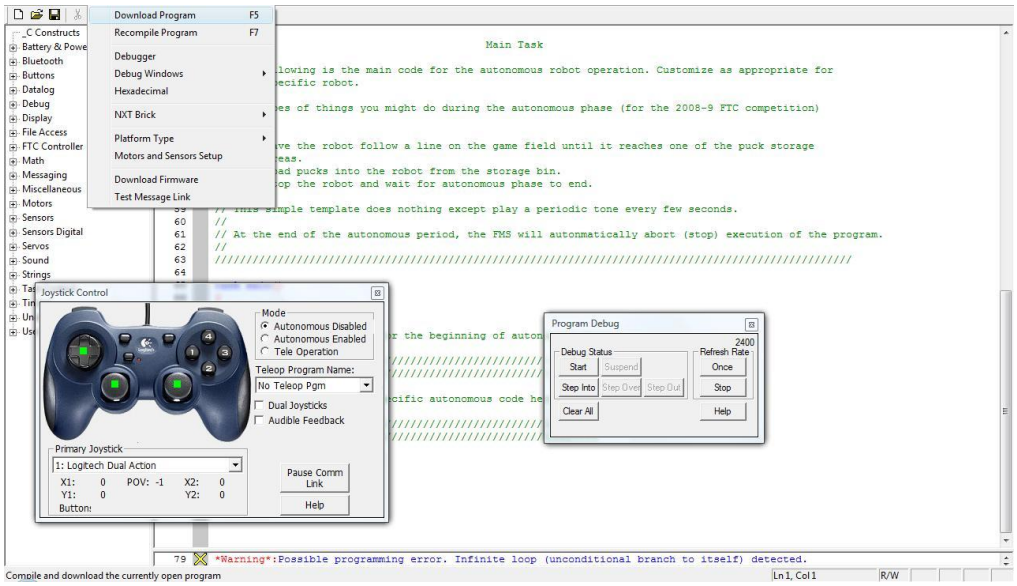
Instructions to Removing Passkey

1. Click on the Apple Logo on the top left corner of the screen to open a drop down menu.
2. From the drop down menu, click on System Preferences.
3. Under the category Internet & Wireless, click on Bluetooth.
4. This will bring up the Bluetooth Preferences.
5. Find and Select the NXT Brick you want to remove.
6. While you have your NXT Brick selected, click the - button to remove device.
7. When the message appears, asking if you want to remove the device, click Remove.

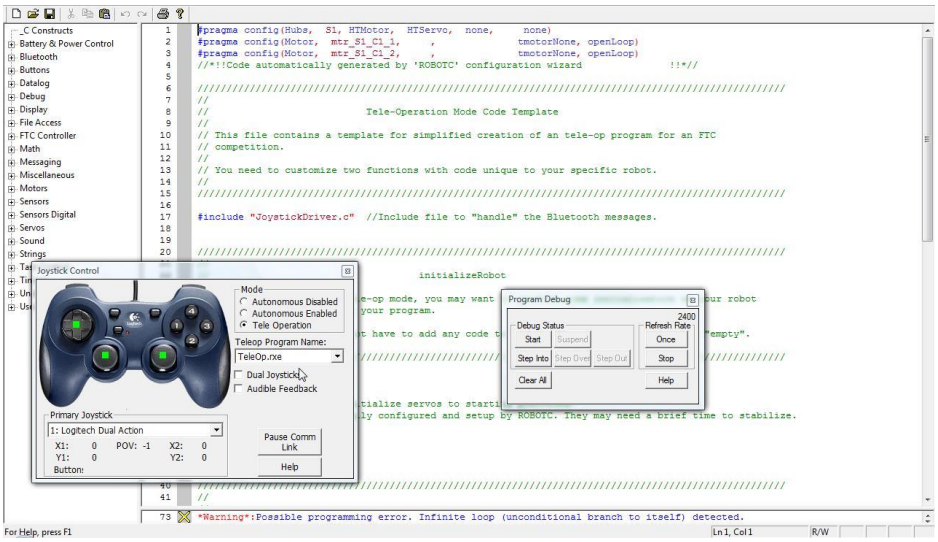
Appendix A - ROBOTC

Teams with ROBOTC should select their TeleOp program from their pit station, using the following process.

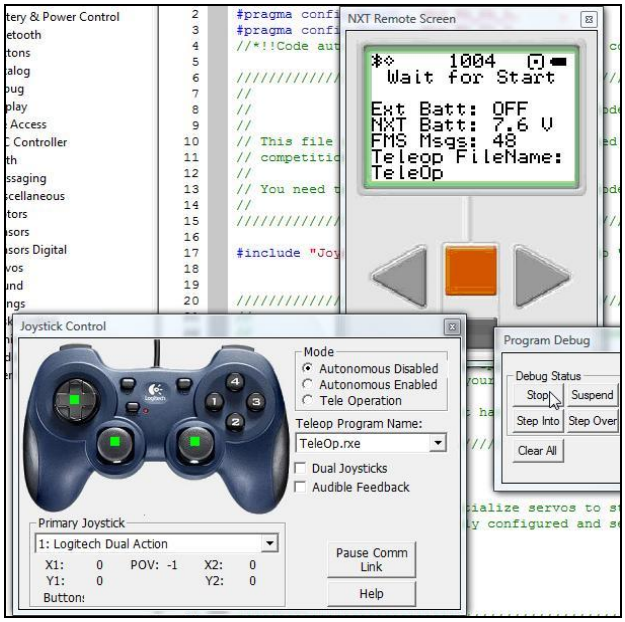
To select your TeleOp program in ROBOTC, follow the following steps.
Compile and Download your Autonomous program.



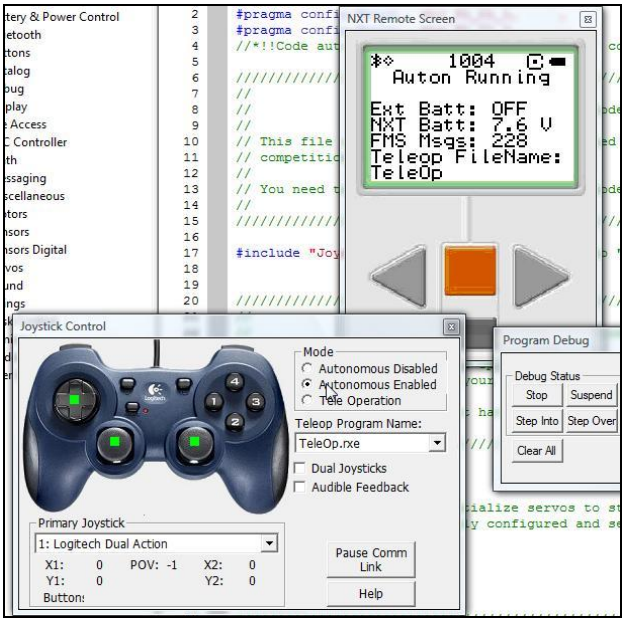
Compile and Download your TeleOp program. As you download this program, make sure that the name of the TeleOp program is selected in the "Teleop Program Name" dropdown list so that it gets written to the NXT.



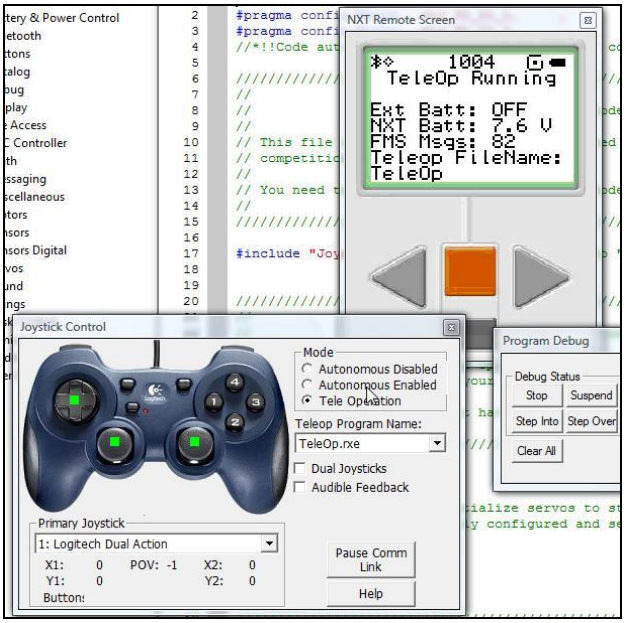
Run the autonomous and TeleOp programs from within the ROBOTC debugger. Look at the diagnostic information on the screen to see what it is happening.



A. Prior to Auto Running



B. Autonomous Program Running



C. TeleOp Program running