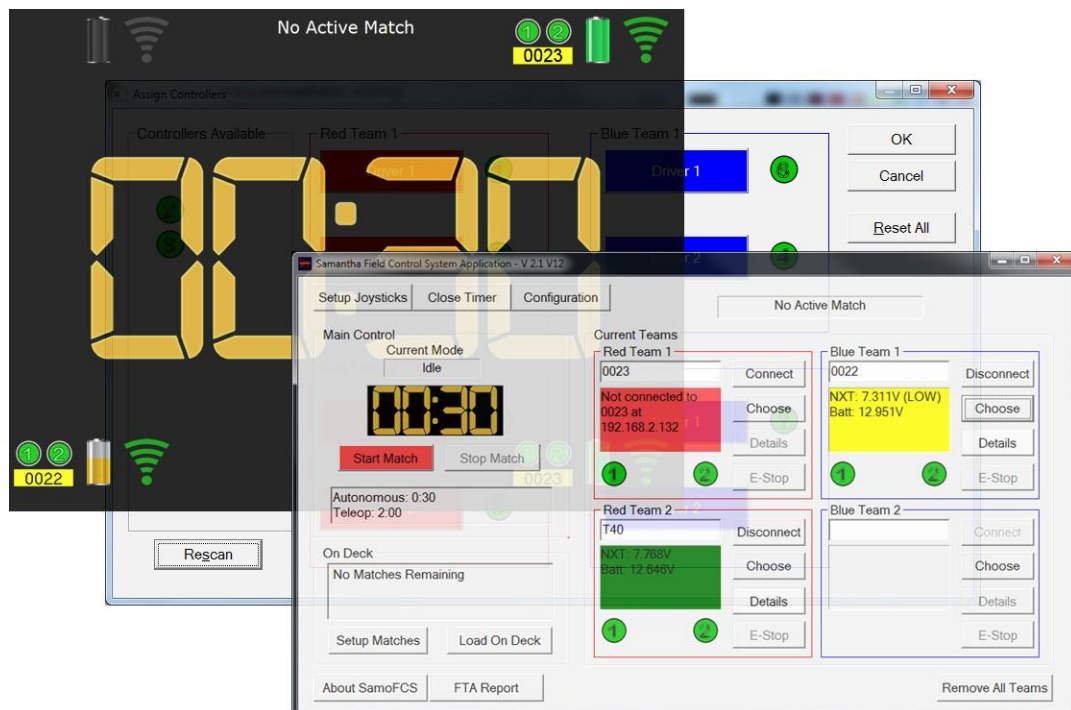


FTC
FIRST® Tech Challenge

Field Control System User Guide For Teams



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Revision History		
Rev	Date	Description
1	10/19/2011	Initial Release
2	10/15/2012	Updated Router Configuration to refer to New Document: Page 3

Introduction

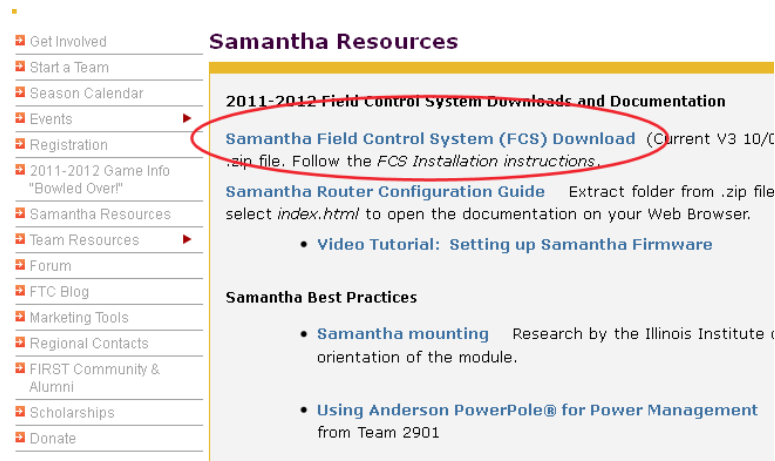
This document is intended for teams to become familiar with the Samantha Field Control System (FCS) and to use for practice and scrimmage events.

Hardware Recommendation

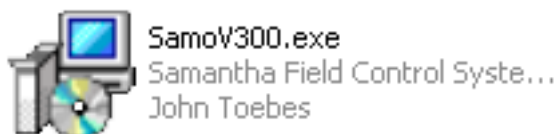
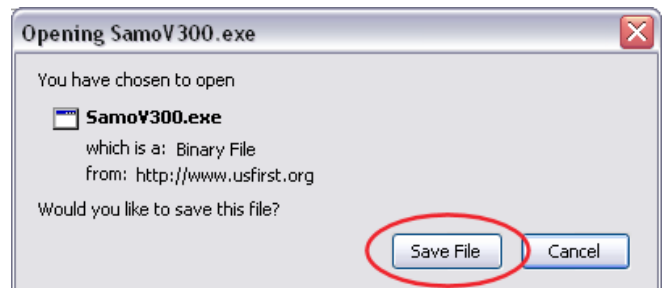
- ◇ PC Laptop running Windows XP or better
- ◇ A LAN port (WAN not recommended)
- ◇ CAT5 Ethernet cable to connect laptop to router
- ◇ Linksys E1000 or E1200 Router (recommended for teams)
- ◇ USB 2.0 Flash drive (4GB MAX capacity)

Download and Installation

1. Go to **www.usfirst.org/ftc/samantha** and click in “Samantha FCS Download” for the most current version of the FCS software.



2. When prompted, choose “Save File” to begin the download.
3. Double click on the SamoV3xx.exe file to install the program. (version number may be different from what is shown here).



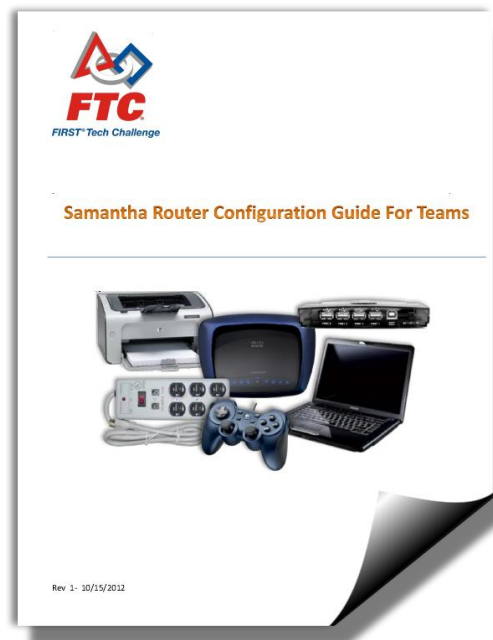
- Click “Next” to install the program. Follow the prompts.



Configure Your Router

For detailed downloadable instructions on how to properly configure your router, go to:
www.usfirst.org/ftc/samantha

Click “Router Configuration For Teams” to download the PDF.

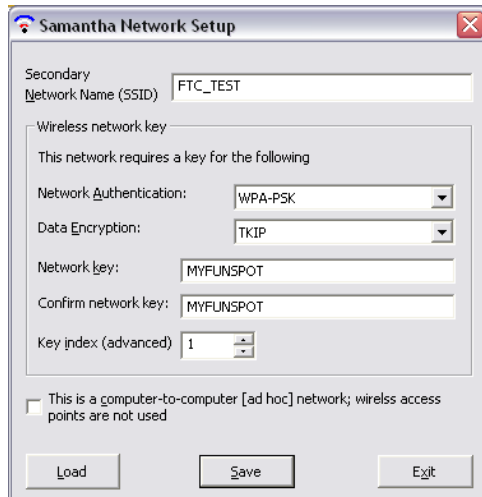


Configure WiFi Network

Connect the USB flash drive to your computer.

From the Start Menu, choose **Samantha Network Config** from the Samantha Field Control System folder.

Enter the Network Information you established when you configured your router.

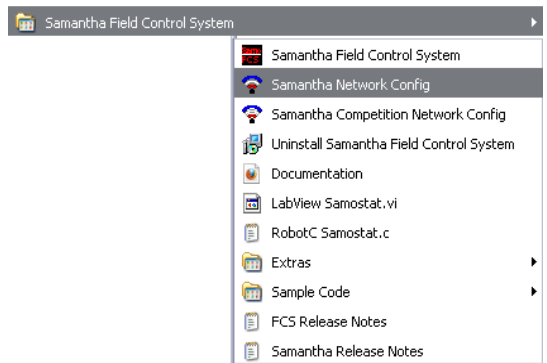


Enter:

Network Name (SSID)
Network Authentication [WPA-PSK]
Data Encryption [TKIP]
Network Key and Confirm Network Key

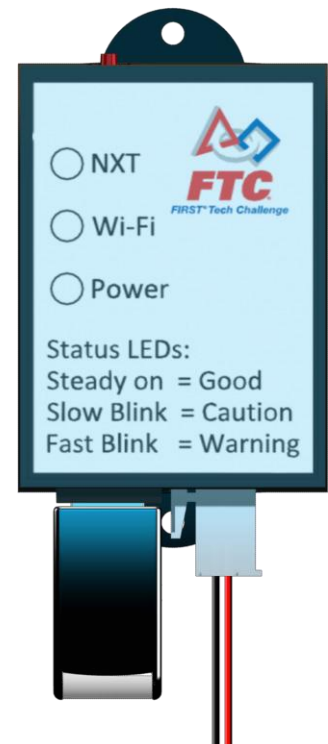
Select the “Save” button. Two message boxes will appear. Click “OK” for both. Notice the network keys have been transfigured to hex code. Click “Exit” to close.

Your network information has now been saved to the USB drive.



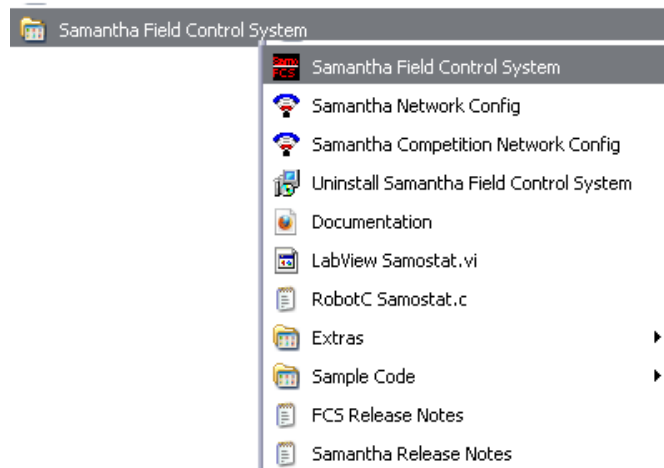
Flashing the Samantha with the Network Keys

1. Insert the USB drive you just created into the USB port on the Samantha Module.
2. Turn the power to the Samantha Module ON while pressing the red button on top of the Samantha module.
3. Wait for the Power-on LED sequence (red, white, blue, white, red) to occur twice.
4. Remove the USB drive from the Samantha Module.
5. Power cycle (turn OFF then turn ON) the Samantha Module.
6. The white LED will flash when it recognizes your network.
7. When all the above steps are completed, remove the USB flash drive and connect the Samantha Module to the NXT via a USB cable.



Launch the FCS Program

From the Start Menu, choose **Samantha Field Control System** from the Samantha Field Control System folder.



Setup Joysticks (Game Controllers)

NOTE: FCS launches, you will be prompted to configure your joysticks. If your joysticks are not connected to your computer, close the FCS, connect the joystick, then re-launch the program.

The Controller Selection screen will appear when you start the program.

Follow the audio prompts to configure associated the controller. In the illustration below, the FCS has detected four controllers available. The “?” indicates the system is waiting to know which controller will be associated with Red Team 1, Driver 1. Press any button on the appropriate control to configure.



The FCS will then prompt for each additional joystick.

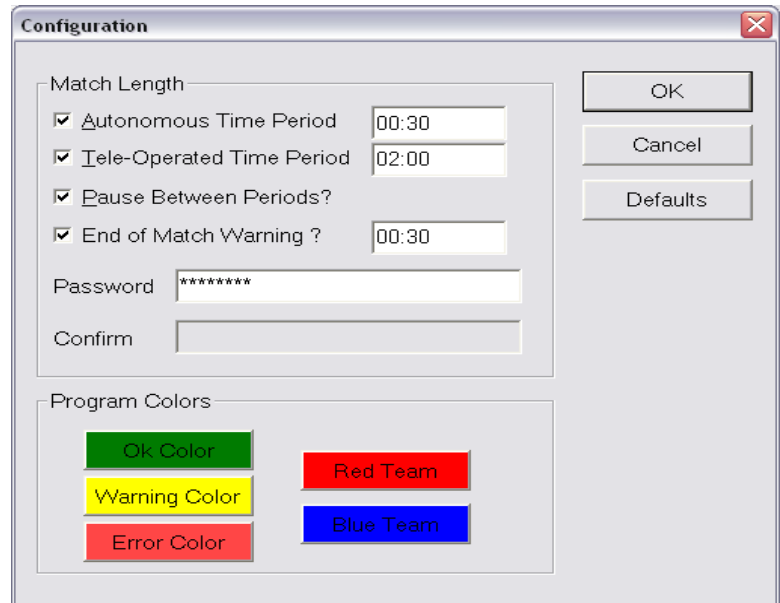
When each joystick has been selected, click the “OK” button. The main control panel will then be displayed.

Configuration Tab

Select the Configuration tab on the main screen to display the Match Length and Program Color options. Use this tab to change the time duration of the Autonomous or Tele-Operated (Driver controlled) time periods.

To change default colors, click on each colored block and choose a different color. Click on “Defaults” to set back to the original color configuration.

Note: Do not touch the password setting.
Click “OK” to return to the main control panel.



The Configuration dialog box is divided into two main sections: Match Length and Program Colors. The Match Length section includes four checked options: Autonomous Time Period (00:30), Tele-Operated Time Period (02:00), Pause Between Periods?, and End of Match Warning? (00:30). There are input fields for Password (masked with asterisks) and Confirm. The Program Colors section features five color-coded buttons: Ok Color (green), Warning Color (yellow), Error Color (red), Red Team (red), and Blue Team (blue). On the right side of the dialog are three buttons: OK, Cancel, and Defaults.

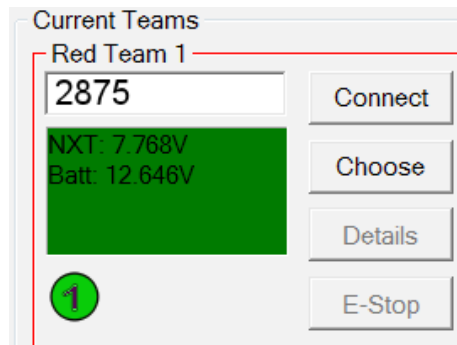
Connecting Samantha to the FCS

Ensure the Samantha module is powered on and connected to the NXT.

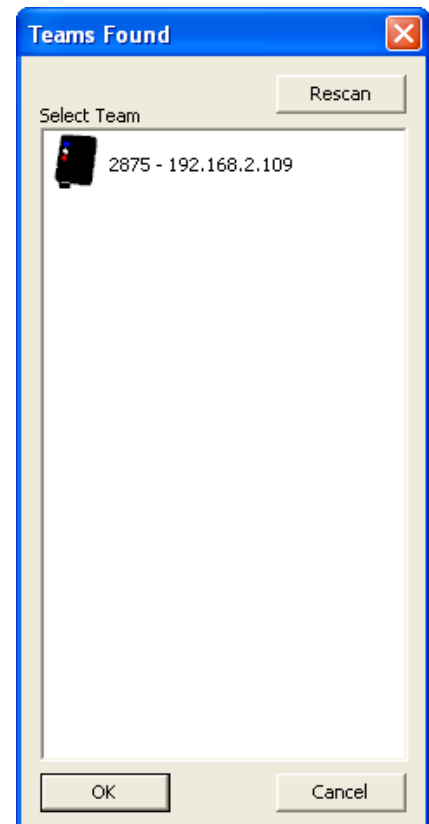
From the main control panel. The “Teams Found” Dialog will appear. Choose your robot from “Select Team” and click “OK” to continue.

Your robot should now appear in the Current Teams box.

If you do not see your robot on the list, check that the module is powered up and connected, and click “Rescan” to display available robots.



The Current Teams dialog box displays information for Red Team 1. It shows the team number 2875 in a text field, followed by a green rectangular block containing the text "NXT: 7.768V" and "Batt: 12.646V". Below this is a green circular icon with a white exclamation mark. To the right of these elements are four buttons: Connect, Choose, Details, and E-Stop.



The Teams Found dialog box has a blue title bar and a "Rescan" button at the top right. Below the title bar is a "Select Team" label and a list of available teams. The first entry is "2875 - 192.168.2.109" next to a small robot icon. At the bottom of the dialog are two buttons: OK and Cancel.

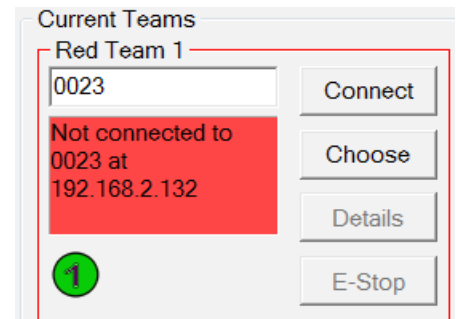
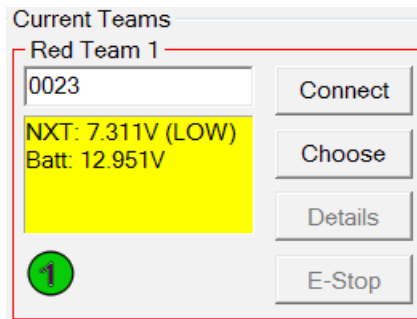
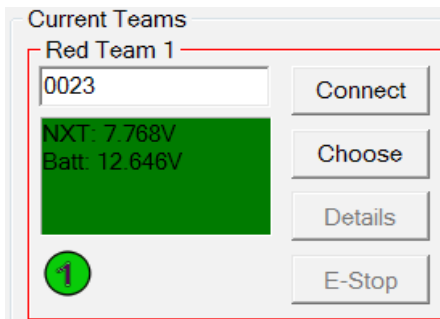
Status Panel

When your robot is connected to the FCS it will be visible in the main control window status box.
Status Colors:

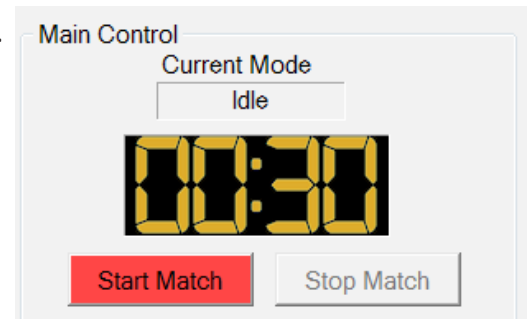
Green = Ready to go

Yellow = Indicates team may have a low battery - click on the “Details” button for more information.

Red = Robot not communicating with FCS or other failure (robot is turned off, for example) click on the “Details” button for more information.



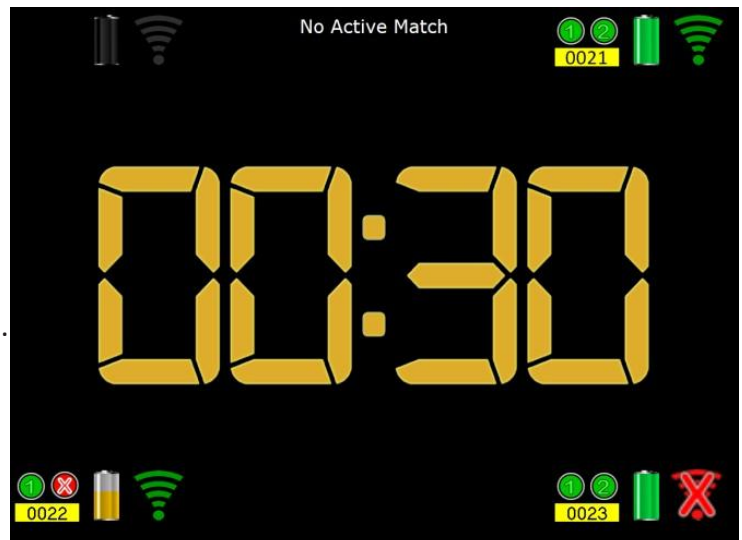
Click on “Start Match” to begin the autonomous portion of the match. The clock will count down from 30 seconds, and then stop. Click on “Continue” for the tele-operated portion of the match.



Timer Display

To open the time display, click the “Time Display” tab on the main control panel.

Notice the icons on the Timer Display. The top left indicates there is no team loaded in that slot. The top right corner indicates team 0021 has a full battery, both controllers are operating, and the FCS and Samantha are talking. The bottom right shows a dropped connection between Samantha and the FCS. Notice the controllers are still functioning correctly. The bottom left shows team 0022 functioning properly but with half battery remaining. It also indicates that a controller is missing or has become unplugged.



Glossary of Timer Icons

Battery Status



Full



Moderately
charged



Very Low/Dead



No Robot

Battery Status



WiFi Signal Good



No WiFi Signal



No Robot

Joystick Status



Joystick Configured



Joystick Activity



Joystick disconnected

Game Mode



Autonomous



Driver Controlled



End Game

Troubleshooting

Invalid Password shows on the control panel:

- ◇ Press the red button on the Samantha module to clear this message.

Robot can't be found:

- ◇ Ensure the robot is powered on and the NXT is running.
- ◇ Power cycle the robot: Click on "Choose" on the FCS Main display to locate the robot.

The FCS will display potential problems with the robots:

- ◇ No Program Running: Start the autonomous program.
- ◇ It will also display battery life.

The white light is blinking and the robot does not show up on the Choose tab:

- ◇ Use the Samostat program on the NXT to troubleshoot the problem.
- ◇ Power cycle the robot: Click on "Choose" on the FCS Main display to locate the robot.

Blue light is illuminated, white light is solid but not showing on the chooser:

- ◇ This indicates the robot is still connected on a secondary network. Power off and restart the robot. Press the red button on the Samantha if necessary.