FRC Driver Station

This document describes the new driver station for the 2012 *FIRST* competition season. Read through it to learn about new features and functionalities introduced with this software-based driver station.

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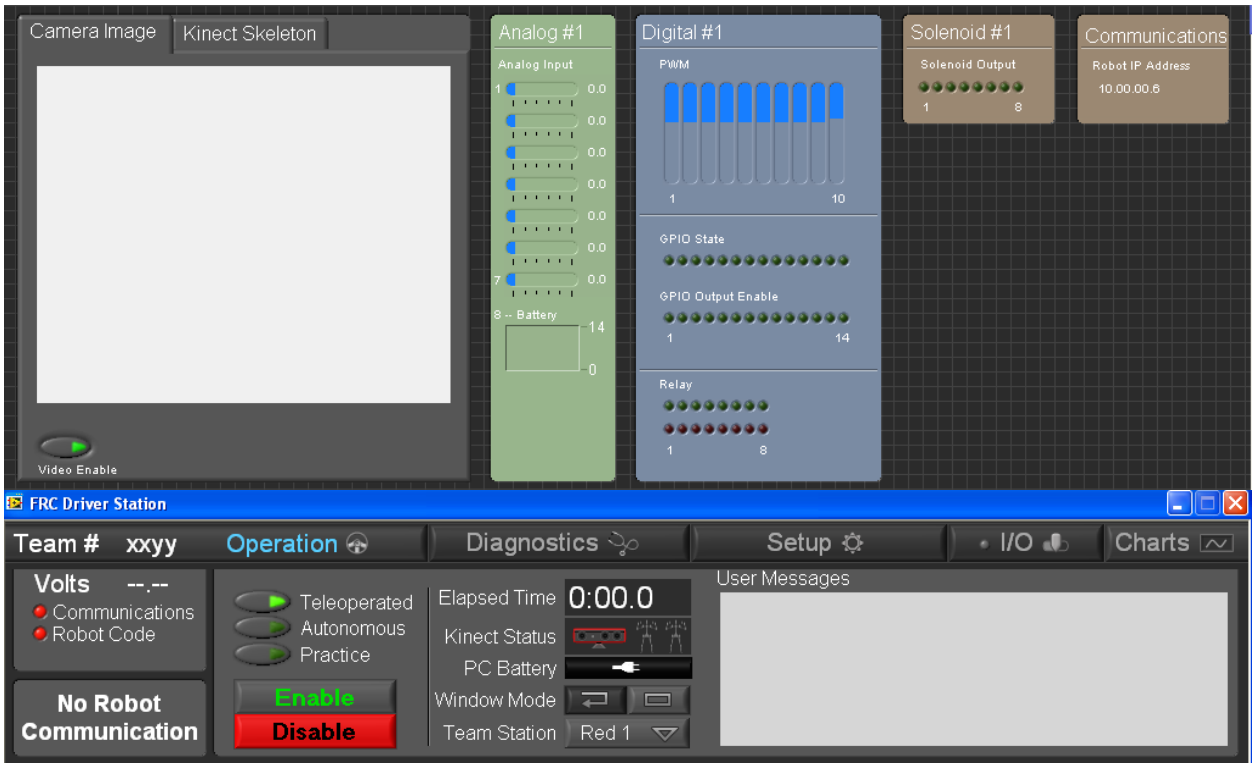
Overview

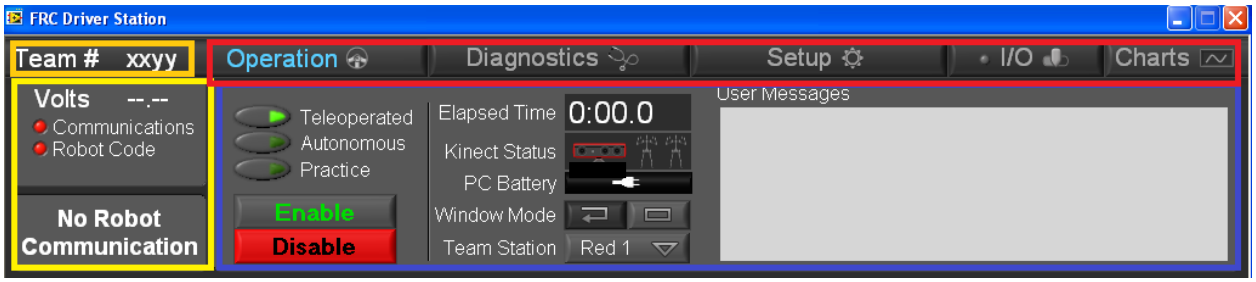
When you run the Driver Station Executable on a PC or start up your Classmate, you should see the following screens. These are the default Dashboard and Driver Station windows.



Default Screens: Dashboard (top) and Driver Station (bottom)

Main Viewing Areas

In the driver station window you can see four main areas. The four areas are outlined in colored boxes in the following image.



Driver Station: Main Areas

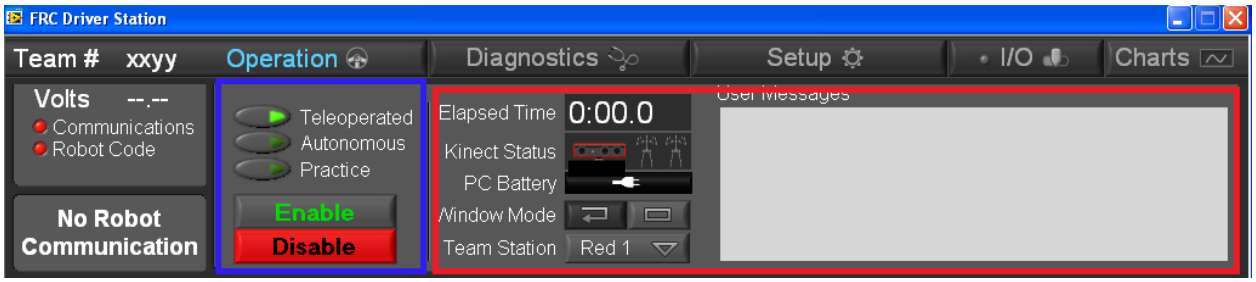
- Team Number (Orange Box) – This area indicates for which team the driver station is configured. You can configure the team number on the Setup page.

- Main Display (Yellow Box) – This section of the driver station gives you the battery voltage of the robot and has 3 LEDs that give you important information.

LED	Green	Red
Communications	The Driver Station is able to communicate with the DS Radio, Bridge, and cRIO-FRC.	The Driver Station is unable to communicate with the DS Radio, and/or the Bridge, and/or the cRIO-FRC.
Robot Code	The Driver Station is able to communicate with the Robot Code on the cRIO-FRC.	The Driver Station is unable to communicate with the Robot Code on the cRIO-FRC.

- Tab Selection (Red Box) – These are the sub-categories of the driver station that you can access. The default page is the Operation page. Click the different tabs to access the different pages. The selected tab's text is highlighted blue so you know which page you are on.
- Page Display (Blue Box) – This area shows the information and options available for the page currently being viewed.

Operation Page



Operation Page: Sections

The Operation page, shown above, contains all information about the current operation of the robot. On the left hand side of the operation page (blue box) you can choose the mode of your robot to be either Teleoperated, Autonomous, or Practice. After you select a mode, you can enable it by clicking the Enable button. After the mode of the robot has been chosen and enabled, you can then disable it by clicking the Disable button. If the robot is connected to the Field Management System (FMS), then this section will display information from the FMS.

Robot Operation Modes

- Teleoperated – This tests the teleoperated sections of your robot code.
- Autonomous – This mode runs the robot's autonomous code.
- Practice – This mode can be configured on the Setup page and allows you to simulate a full game by running first the autonomous code and then enabling teleoperated mode.

Robot Run Information

Information pertaining to the run state of the robot is given on the right-hand side of the Operation page (red box).

- Elapsed Time – This tells you how long the robot has been running once its mode has been enabled.
- User Login – This tells you the user name of the current user logged into the computer running the driver station.
- PC Battery – The PC battery section indicates either how much charge is left in the battery of the driver station or if the PC is receiving AC power.
- Team Station – This allows you to choose either the Red team or Blue team and whether you are station 1, 2, or 3, on that team.
- User Messages – Using the `Write User Message VI` you can send messages from the robot to the driver station. These messages are then displayed in this window.
- Window Mode –Either locks the FRC Driver Station window in place or allows it to move freely. The button on the left allows the window to move freely.

Kinect Status

The Kinect Status indicator has 4 possible states.

Status Image	Meaning
Red Kinect	No Kinect Connected
Green Kinect with no figures	A Kinect is detected
Green Kinect with one figure	The Kinect detects one person in front of it
Green Kinect with two figures	The Kinect detects two people in front of it. One person should move out of view of the Kinect

The Kinect driver being used with FRC will only follow one person so if two people are detected the Kinect will choose randomly which one to follow.

Diagnostics Page

Diagnostics Page: Sections

Above you can see that the diagnostics page has been selected. This page contains the diagnostic information for all the connections to the driver station along with error messages from the robot.

USB Devices

On the left hand side of the Diagnostics page you'll see the USB Devices section (Green Box). This section shows which devices have been connected via USB to the driver station and their connection status. If a joystick has been plugged in, it will light up green and when you operate one of the buttons on that joystick it will turn the indicator light blue. The I/O indicator lights up when the driver station I/O device has been connected to the driver station. The Kinect LED specifies if the Kinect server is connected. Below the Kinect LED, is a string what will specify the version of the server if it is connected.

Communications

In the center of the Diagnostics page you'll see the Communications section (Yellow Box). This section allows you to see with what portions of your control system the driver station is able to communicate. If the driver station is able to communicate with the listed item, then the item's indicator lights up green and then remains grayed out. For troubleshooting communications issues, mouse over the item with which you are not able to communicate, and the driver station will provide troubleshooting tips in the Messages section.

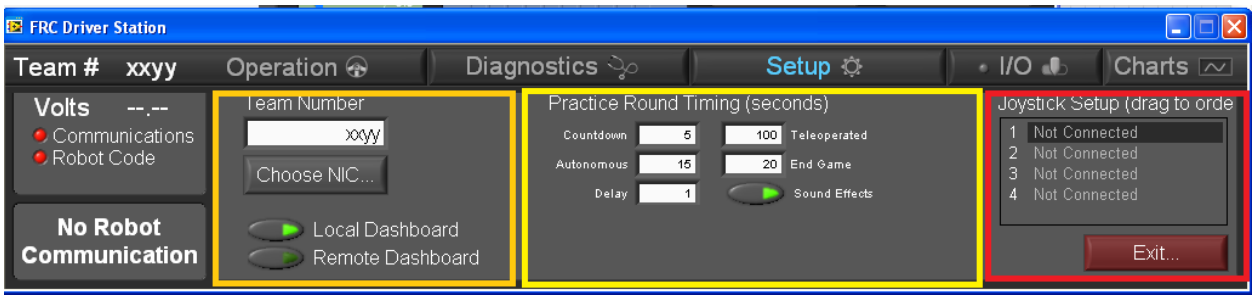
Messages

On the right hand side of the Diagnostics page is the Messages section (Purple Box). This section displays error messages from the robot's code. These errors are logged on the cRIO, and you can view this log by clicking the View Log File button. You can clear the messages in the Messages window by clicking the Clear Errors button. Also, you can reboot the robot by clicking the Reboot Robot button in this section.

Version Information

Versioning information for the driver station and cRIO image can be seen in the Version Information Section (Red Box). This information is important for troubleshooting and maintenance of the robot to ensure that the cRIO and driver station have the latest updates.

Setup Page

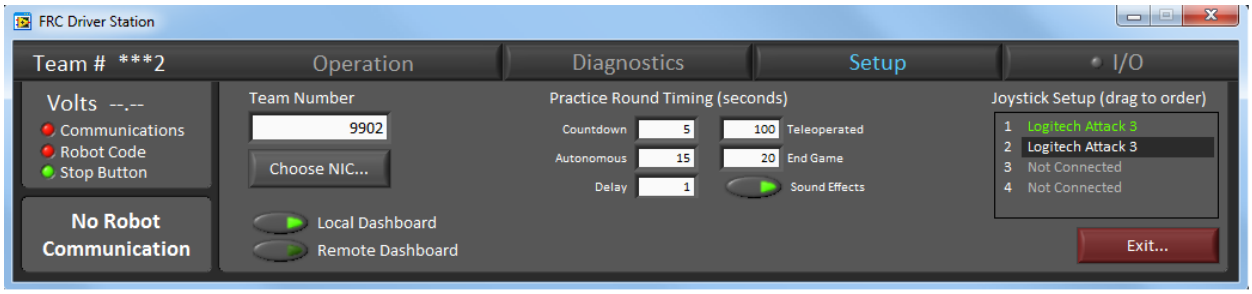


Setup Page: Sections

The Setup page is the third tab in the driver station. On this page you can configure the driver station for your team number, choose to view a local or remote dashboard, configure the practice round parameters, and configure your joysticks.

Configuring Team Number

Configuring the team number (orange box) also configures the driver station to be 10.xx.xx.5 and the computer to be 10.xx.xx.6 automatically (where xx.xx is your team number). This is done by simply typing your team number into the Team Number text box. You'll know that the driver station is making these changes by looking in the top left corner where it says Team # xxxx. That number scrolls with asterisks (*) while it configures the IP addresses (see image below). When it finishes, it will list your team name in the top left corner. You can also configure which network you want to use by clicking the Choose NIC… button.



Setup Page: Team Number Configuring

If you select Remote Dashboard, you can have the driver station open a dashboard from a remote computer instead of the one on your current computer. When you select Remote Dashboard, a textbox will appear that will let you enter the IP address of the remote computer. To change the default remote IP and Dashboard executable path, navigate to **C:\Documents and Settings\All Users\Documents\FRC DS Data Storage.ini**, and change IP and path parameters within this file.

Practice Round Parameters

In the center of the Setup page is the practice round settings (yellow box). Here you can manipulate the parameters for when you run the robot in practice mode. A description of these options and what they change is listed below.

- **Countdown** – This field allows you to set how many seconds the driver station counts down before putting the robot in Autonomous mode.
- **Autonomous** – This field sets how long the driver station allows the robot to run in Autonomous mode.
- **Delay –** The delay setting configures how many seconds the driver station waits between disabling the Autonomous mode and enabling the Teleoperated mode.
- **Teleoperated –** This field sets how long the driver station allows your robot to run in Teleoperated mode.
- **End Game –** The End Game setting specifies the number of seconds the robot will keep running at the end of the game.
- **Sound effects –** This button enables the driver station to play sounds during the practice round.

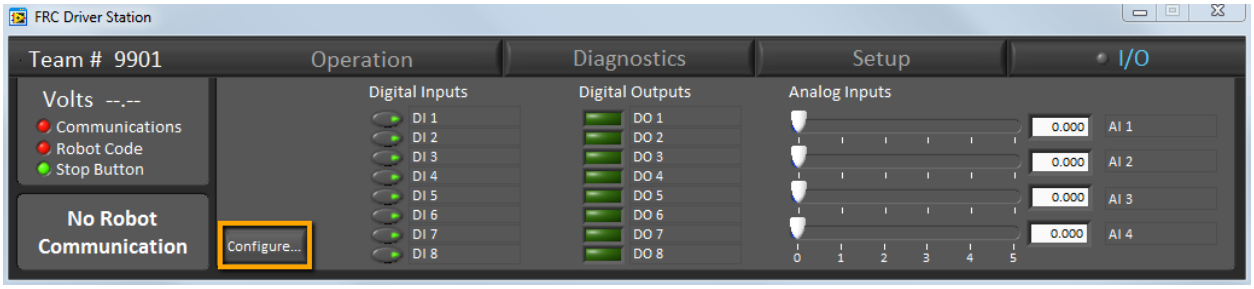
Joystick Setup

On the right hand side of the Setup page is the Joystick Setup section (Red Box). Up to four joysticks can be connected to the driver station at one time. To know which position a joystick is currently assigned, press a button on the joystick and see which text lights up blue with a trail of asterisks (*). To configure which joystick is assigned to a numeric index you can click on the joystick's name and drag it to a different position.

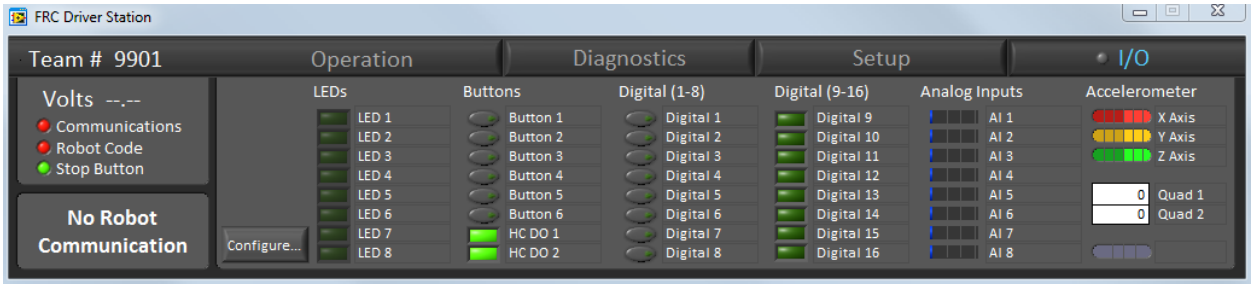
Setup Page: Joystick Active

I/O Page

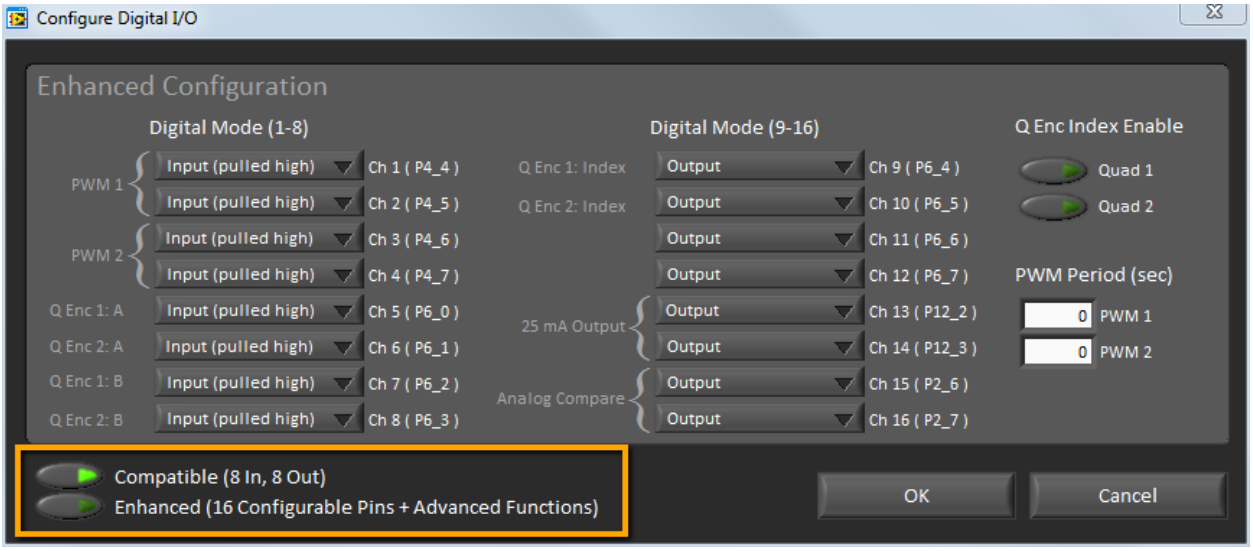
The I/O page displays information from the I/O device connected to the driver station. If the USB I/O device is not attached, then the outputs become simulated inputs that you can manipulate for testing purposes. The I/O page defaults to a view compatible with the driver station from the 2009 competition season; however, an enhanced view that interfaces with the additional inputs on the new USB I/O device is also available. These two views can be seen below. To enable the enhanced view, click the Configure button in the bottom left corner of the I/O page (yellow box) to display the Configure Digital I/O dialog box. In the bottom left corner of the Configure Digital I/O dialog box (orange box), you can choose between the Compatible and Enhanced views.



I/O Page: Compatible View



I/O Page: Enhanced View



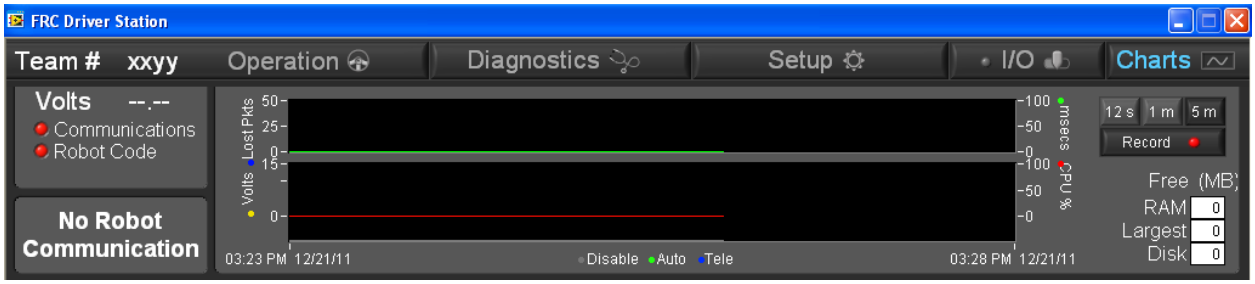
I/O Page: Configure Digital I/O

Item	Compatible View	Enhanced View
Digital Inputs	DI 1-8	DI 1-8
Digital Outputs	DO 1-8	DO 9-16
Analog Inputs	AI 1-4	AI 1-8
LEDs	N/A	LED 1-8
Buttons	N/A	Button 1-6
HC DO	N/A	HC DO 1-2
Accelerometer	N/A	X, Y, Z
Quadrature	N/A	Quad 1-2
Touch	N/A	Slider

I/O Page: Compatible and Enhanced View Comparison

Charts Page

The charts page displays information that can be used to debug robot behavior. It has charts for battery voltage, lost packets, loop time, and CPU usage. This view also displays how much memory is free in RAM and on Disk as well as the largest contiguous block of memory. You can also select how much history the charts have (either 12 seconds, 1 minute, or 5 minutes).



Charts Page