

Control System Status (2011)

Where they all are and what they all mean.
Listen to what the system is saying...



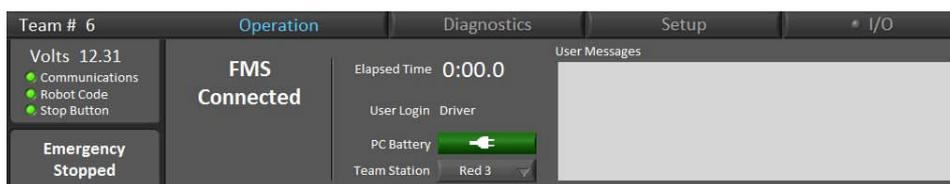
cRIO

The most common failure is a power drop that causes the cRIO to reboot. The green power light will go out, then both the Power & Status lights will come on, finally the Status light will go out leaving only the Power light on.



- Green Power LED (normally should be the only LED on)
- yellow STATUS LED
 - SAFE MODE = a repeating sequence of three flashes
 - Booting = a solid light for a few moments
 - No image = a constant solid light
 - Crash & reboot = 4 flashes
 - Off = all other conditions (normal operation)
- Ethernet port status lights (both ports)
 - No lights – no connection, bad connection or crossover cable required
 - Solid green – hardware connected and responding
 - Yellow – software communicating
 - Solid Yellow – communications but nobody is saying anything
 - Blinking Yellow – active traffic
- FPGA LED – on=FPGA not communicating, off=normal operation
- USER1 – for user code use. Turn it on/off when you will.

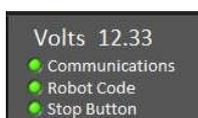
Driver Station



Located by default at the bottom of the Classmate screen, it is divided into:

- General status in the left column
- Four tabs with a variety of useful diagnostic information and controls

General – the leftmost status boxes



- Volts – the on-board robot battery voltage if feedback is setup and working correctly and communications are established
- Communications - **green** indicates the DS is receiving valid response packets from the robot (doesn't mean your code is running though)
- Robot Code – **green** means that the robot code is actively providing updates to the response packets, **red** means nothing in the robot code is providing updates to the response packets

- Stop Button – green=USB or field Estop button is detected, red=not detected, yellow=bypassed by user (via Diagnostics Tab)
- Status Message (displayed in lower left corner under the General status)



- No Robot Communication – Not so much as a peep from the robot (probably off or rebooting)
- Autonomous Enabled/Disabled – match play, auto or practice match running
- Teleoperated Enabled/Disabled – match play, teleop or practice match running
- Emergency Stopped – When the Estop has been pressed (robot must be reset to get out of this state)
- Watchdog Not Fed – User Watchdog is active but unfed by your code. Obsolete, but still available

Operation Tab

This has two states:

1. On the field the first box (you might think of it as the second column) displays the status of the connection with the Field Management System (FMS). These are described under FMS State below.

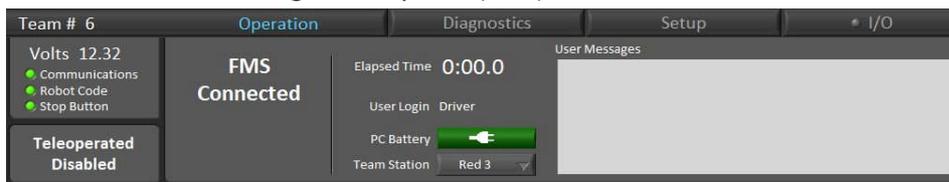


Figure 1: FMS Controlled Operations Tab

2. In the pits (if you Exit & re-login) and at home the first box instead has controls for built-in match controls.

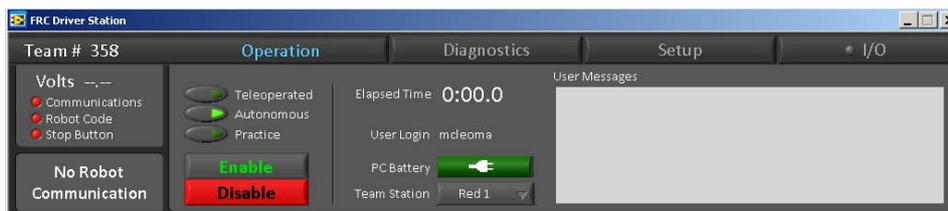
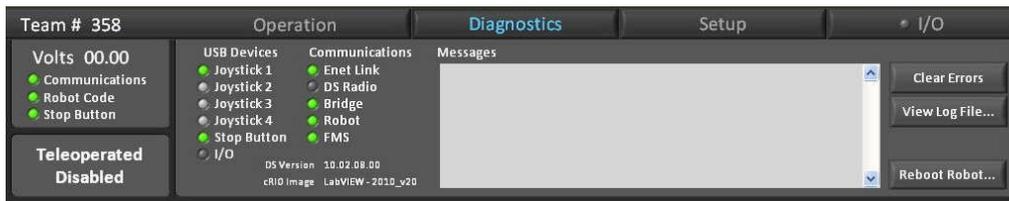


Figure 2: Non-FMS Controlled Operations Tab

- FMS State (the following messages or stand-alone controls appear)
 - FMS Locked – as a safety precaution, once connected to FMS and disconnected (most often at the end of a match) the controls for stand-alone (see below) will not reappear unless you Exit the Driver Station and log back into the Driver account. The robot can still be enabled/disabled for teleop in the pits using the F1/spacebar keys.
 - FMS Connected – the driver station is in communication and slaved to FMS
- Controls for stand-alone use (not visible if FMS State is displayed)– for running the different modes of a match in the pits or at home.
- User Messages – anything your robot code chooses to write to the driver station.

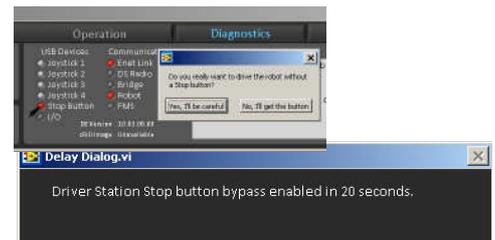
Diagnostics Tab



Special Note: Bypassing the at-home Estop button –

Suppose you don't have an Estop button for use in the pits or at home? The Driver Station won't allow you to run without it unless you bypass it via the Diagnostics Tab. Note: this has no effect on the field Estop button.

1. Under USB Devices double-click on the Stop Button light
2. A pop-up will ask if you are sure, then will count-down 20 seconds
3. The Stop Button indicators will turn yellow to indicate it has been bypassed and the Driver Station will now operate without it.



Now the rest of the story...

- USB Devices - The lights under USB Devices identify what's connected and detected through the PC USB ports, only includes FRC legal devices.
 - Joystick 1-4 – **green** for each USB game controller detected, **gray** if none is found. The order of these is controlled on the Setup Tab.
 - Stop Button – **green**=USB Estop button is detected, **red**=not detected, **yellow**=bypassed
 - I/O – **green** if the Cypress I/O board is detected, **gray** if not found
- Communications - The lights under communications represent simple ping results every few seconds.
 - Enet Link – **green** if you have an active Ethernet cable connection, **gray** otherwise.
 - DS Radio – **green** if you are using the optional at-home router setup, **gray** if not.
 - Bridge – **green** if the robot bridge is answering it's pings, **gray** if not.
 - Robot – **green** if the cRIO is answering pings, **gray** if not.
 - FMS – **green** if the FMS server can be seen, **gray** if not.
- DS Version – the FRC software version of the Driver Station. This must be the latest to be recognized by FMS.
- cRIO Image – the cRIO image version
 - LabVIEW-2010-v... – if the cRIO is setup as a LabVIEW platform
 - C-2010-v... – cRIO setup as a C++ platform
 - Java-2010-v... – cRIO setup as a Java platform
- Messages – important warning and error messages from both the Driver Station software and your robot code.
 - LabVIEW Safety vi's will warn if they aren't being called often enough.



- On the driver station Diagnostics Tab a robot light green but robot communication red, indicates the network is fine, but the libraries on the cRIO are not responding. Often caused by mis-matched versions of cRIO image/laptop LabVIEW Update. Could also be that the cRIO DIP switches for Safe or No App modes are set.

Setup Tab



- Team Number – must be set to match the cRIO. This automatically sets the default Classmate network Ethernet & wireless cards to the proper IP address/netmask.
- Local Dashboard (Remote Dashboard) – must be *Local Dashboard* for your Classmate hosted dashboard program to receive data from the robot. Remote asks for the IP of another machine running a dashboard, but it's not so simple in competition...
- Joystick Setup 1-4 – **green** with a name if a game controller is attached via USB, **grey Not Connected** otherwise. Position can be checked when pushing a controller button, the joystick entry will turn **blue**.

I/O Tab



The default is called Compatibility Mode and if the Cypress I/O board is not attached it allows you to use the Digital/Analog Inputs from the screen. The Enhanced Mode cannot be used without the Cypress.

- Light on I/O tab label – **green** if the Cypress I/O board is detected, **gray** otherwise.
- Inputs & Outputs – buttons and lights are **green** in the inputs or outputs are on, dark otherwise. Analog input bars read the values of any attached pot-like devices, but unattached inputs float and follow the active inputs.

Digital Sidecar

- Power LEDs – must all be **green**: Bat (12v), 5V, 6V
- Relay LEDs – **green**= forward, **red**= backward, off=off (red & green should not normally be on at the same time)
 - RSL – Robot Status Light (this is echoed by the large yellow robot status beacon)
 - 2010 values:
 - **Solid ON** = Autonomous Enabled
 - **Solid ON, but blinks OFF every 1.5s** = Teleoperated Enabled
 - **Slow Blink** (900ms on / 900ms off) = System Disabled; disabled Driver's Station, Estop, watchdog, or communication failure
 - **Fast-Slow Blink** (200ms on / 900ms off) - Low battery (<12 Volts) or no user code **and** system disabled either by system watchdog, user watchdog, or Driver's Station set to disabled



- **Fast Blink** (200ms on / 200ms off) - System error: No driver's station communication, bad cRIO Image, bad team ID, extensive communication errors.
- **Flickering** (very rapid) – low battery cutting power to the Digital Sidecar from the Power Distribution Panel.
- **OFF** = cRIO has shutdown or rebooted

Jaguar Speed Controller

- Blinking yellow – no PWM communication / Disabled robot
- Solid Yellow – PWM communication & Enabled robot
- Solid Red – full reverse
- Solid Green – full forward
- Blinking green – partial forward
- Blinking red – partial reverse
- Fast blinking red – error fault (over current, over temp, back EMF)



Victor Speed Controller

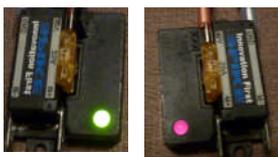
If the fan is wired properly it will spin if the 12v power is on.

- Blinking yellow – no PWM communication or Disabled robot
- Solid Yellow – PWM communication & Enabled robot & neutral
- Solid Red – full reverse
- Solid Green – full forward
- Off – partial forward or reverse or no power



Spike

This light should reflect what the Digital Sidecar Relay status indicators are doing.



- Solid yellow – power only, does not indicate a PWM signal
- Off – no power or blown fuse
- Red – reverse
- Green – forward

Analog Breakout

- Green - 12v power
- Off – no power



Solenoid Breakout

- Green - 12v power
- Off – no power



Solenoid Module

- Solenoid status LEDs
 - Green – associated solenoid is on
 - Off – associated solenoid is off



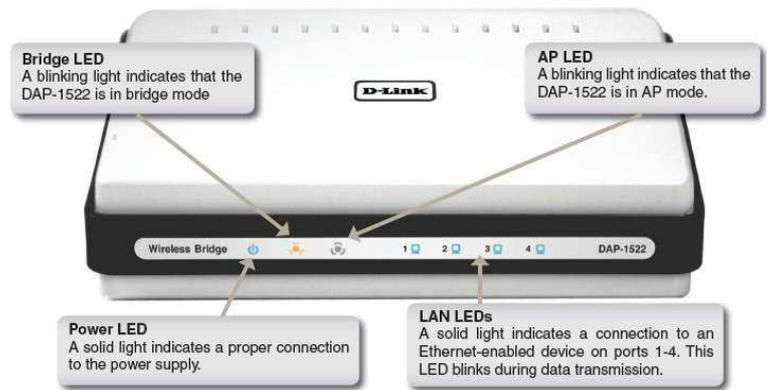
Power Distribution Panel



- Power LEDs: all should be green (12v, 24v, 5v) a dark 5v light usually indicates a very, very low main battery.
- Breaker LEDs: red means a missing circuit breaker or a wiring disconnect

DLink DAP-1522

- Power LED: on solid
- Bridge LED: competition=blinking yellow
- AP LED: competition=off
- LAN LEDs: on for each Ethernet cable connected, e.g., cRIO or tethered PC



Camera-Axis 206/M1011

Status light is the ring around the lens.

- No light – no power
- Yellow flashing – booting
- Green solid – running
- Red/green flashing – need to reset and re-setup camera

