



Field Management Status

- Alliance Station Light – one for each alliance driver station
- Alliance Team Number – one for each alliance driver station
- Arena Status Light Pole – located at the scorers table
- Field Access Point (field router) – located at the scorers table
- FMS Arena Status Display – located at the scorers table
- FMS Match Logs – available at scorers table when a match is not running

Alliance Station Team Sign



Located each of the alliance driver stations, these must display your team number before your Driver Station will be recognized by FMS. If you are in the wrong Alliance station or the field hasn't been preset for your match your Classmate will not connect to FMS. The team numbers don't change from the previous match until the scorer runs the match preset after scores from the previous match have been blessed by the Head Ref.

Alliance Station Status Lights

Located above each of the alliance driver stations.



- Solid – DS communicating and operating normally (see above photo)
- Rapid flashing – Disabled by Estop or User Watchdog (e.g., at end of Autonomous)
- Slow flashing (1 Hz) – no DS-FMS communication link
- Green – Estop has been pushed (left photo)

Arena Status Light



This is located at the Scorers table and is visible all over.

Red Light:

- OFF = Red Alliance not ready
- ON = Red Alliance ready

Blue Light:

- OFF = Blue Alliance not ready
- ON = Blue Alliance ready

Green Light:

- OFF = Blue or Red Alliance not ready
- ON = Field ready to start match

Field Access Point (field router)

This is located at the Scorers table.

Center Light:

- Solid Green = Power on, no device connected
- Solid Blue = at least 1 device connected
- Flashing = device fault

Ethernet Light = flashes when there is network traffic

Radio Light = flashes when there is network traffic



FMS Arena Status Display



This is located at the scorers table, The FTAA and FTA keep an eye on this all during a match. The separate parts are shown in close-up and described below.

Basic Arena Status



The information for each Alliance is broken down into three groups, FMS, Team, and Robot noted across the top of the display above. FMS will not allow a match to start if any of these are not green forcing the FTA to explicitly Bypass any inoperable robots before a match can start.

FMS –identifies the team supposed to be in the alliance station

- Bypass – FTA clicks this box to bypass this team, usually because they can't connect to the field for some reason, or they didn't show up for the match, it allows the match to proceed without them. Can also be used to disable a robot.
- DQ –disables a robot on the orders of the Head Ref and keeps track for scoring purposes.
- Team Number –The team that must play in this alliance station. FMS won't recognize them if they aren't connected to the correct alliance station.

Team –state of the DS

- Left bubble –status of the FMS-to-DS link. Green=good Ethernet connection and correct team number.
- Right bubble –status of the E-stop: green= not active, red=pushed.

Robot –state of the Robot

- Left bubble – DS-to-Robot link status. Green=DS and Robot are linked. If the station has been Bypassed by the FTA, a “B” will appear in this bubble.
- Right bubble – Mode and System state of the Robot. During the normal course of a match Green=enabled mode, Red=disabled mode, “A” indicates Autonomous Mode, “T” indicates Teleoperated mode.

Status Tab

The Status tab shows detailed information for each robot linked to FMS.

Station	Robot IP		Robot MAC		Status	
	FMS	DS	FMS	DS	DS	Robot
Red 1	10.0.0.2				Green	Green
Red 2	10.1.1.1				Red	Green
Red 3	10.1.2.2				Red	Green
Blue 1	10.0.0.6				Red	Green
Blue 2	10.1.2.2				Red	Green
Blue 3	10.1.2.2				Red	Green

The top half of the screen includes:

- Station: Alliance station – Red 1,2,3 & Blue 1,2,3
- Robot IP: FMS – The IP that FMS expects based on the team number entered.
- Robot IP: DS – The robot IP reported to FMS.
- Robot MAC: FMS – unused currently
- Robot MAX: DS – The MAC address of the robot reported to FMS.
- Status: DS – Indicates the status of the DS (link active, in competition mode, enable/disable, etc.)
- Status: Robot – Indicates the status of the Robot (link active, mode, enable/disable, and battery voltage).

Station	Team ID		DS Comm Version		Errors		Robot QOS		
	FMS	DS	FMS	DS	DS	Robot	Avg Trip	Missed Count	Total Counts
Red 1	20	0	1000000		Green	Green	0	0	0
Red 2	100	0	1000000		Green	Green	0	0	0
Red 3	175	0	1000000		Green	Green	0	0	0
Blue 1	3074	0	1000000		Green	Green	0	0	0
Blue 2	1759	0	1000000		Green	Green	0	0	0
Blue 3	1547	0	1000000		Green	Green	0	0	0

The bottom half of the Status Tab screen indicates:

- Team ID – Team number as indicated on FMS, and the status message from the DS.
- DS Comm Version – The communications protocol version as expected by FMS, and reported by the DS. If these do not match, FMS will not enable the Robot.
- Errors – Various errors as reported by the DS to FMS.
- Robot QOS – These fields indicate Quality-of-Service data. Upon power up, the DS starts a counter which FMS tracks.
 - Avg Trip – Indicates the average trip time (in milliseconds) to send a status packet from the DS-to-Robot-to-DS. This number is typically <15 ms during an FRC Regional event.
 - Missed Count – indicates the number of packets dropped in the DS-to-Robot link. Typically there are some lost packets. In a very tame wireless environment, this number will be less than 100. Important as a percentage of Total Count.

- Total Count – The total number of packets sent by the DS to the Robot.

FMS Match Logs

FMS automatically records this data during a match every 100-200ms for each team:

Timestamp	Avg Trip
Match #	Missed Packet
Team #	Total Packet
Time (elapsed in sec. – from beginning of period- Autonomous or Teleop)	Status Light
Alliance	Blue/Red/Spare SCCE
Mode	Battery
Competition	FPGA Cksum
DS Link	cRIO Cksum
Enabled	Team ID
Estop Pressed	Packet Loss
Robot Link	DS Software Image
PC Present	DS Err
	Comm links to all of the field hardware

Field Test

Field Test is used as an initial basic test of the field electronics. This FMS interface verifies that all the LED Displays, Team Lights, and goal scoring hardware are connected.

Understanding Status Interactions

Just one of the status lights is not enough to understand many problems that may be occurring on the field. For instance, a solid light above the Driver Station for instance can mean:

- DS-to-robot Communication & basic electronics are working (good)
- A non-moving robot with a solid DS light:
 - drivers just waiting (good)
 - mechanical problem (bad)
 - code problem (bad)
 - electrical problem (bad)
 - driver controls non-functional (bad)
 - drive team not moving to avoid penalty or potential mechanical damage (bad)

Anything could be the cause of a non-solid light - Estop, mechanical, electrical, code.