FRC 2012 Driver Station Charts and Logs

Beginning in 2012 a charting and logging capability is provided by the Driver Station which may be useful to help debug robot issues or in post-match analysis of connection or control issues. The Driver Station logs the following data:

- Battery Voltage
- Trip Time (for the radio link)
- Lost Packets
- CPU % (of the cRIO)
- Robot mode (Disabled, Teleop or Auto)
- DS mode (Disabled, Teleop or Auto)

The Charts of this data can be viewed in real-time by selecting the Charts tab of the Driver Station. The Viewer for the log files is located in the FRC Driver Station folder in Program Files and can be used to review data from previous time periods (including matches). A list of stored logs appears on the left side of the Viewer, locate the appropriate log using the timestamp and click it to display it on the chart (note that the logs are in alphabetical not chronological order).
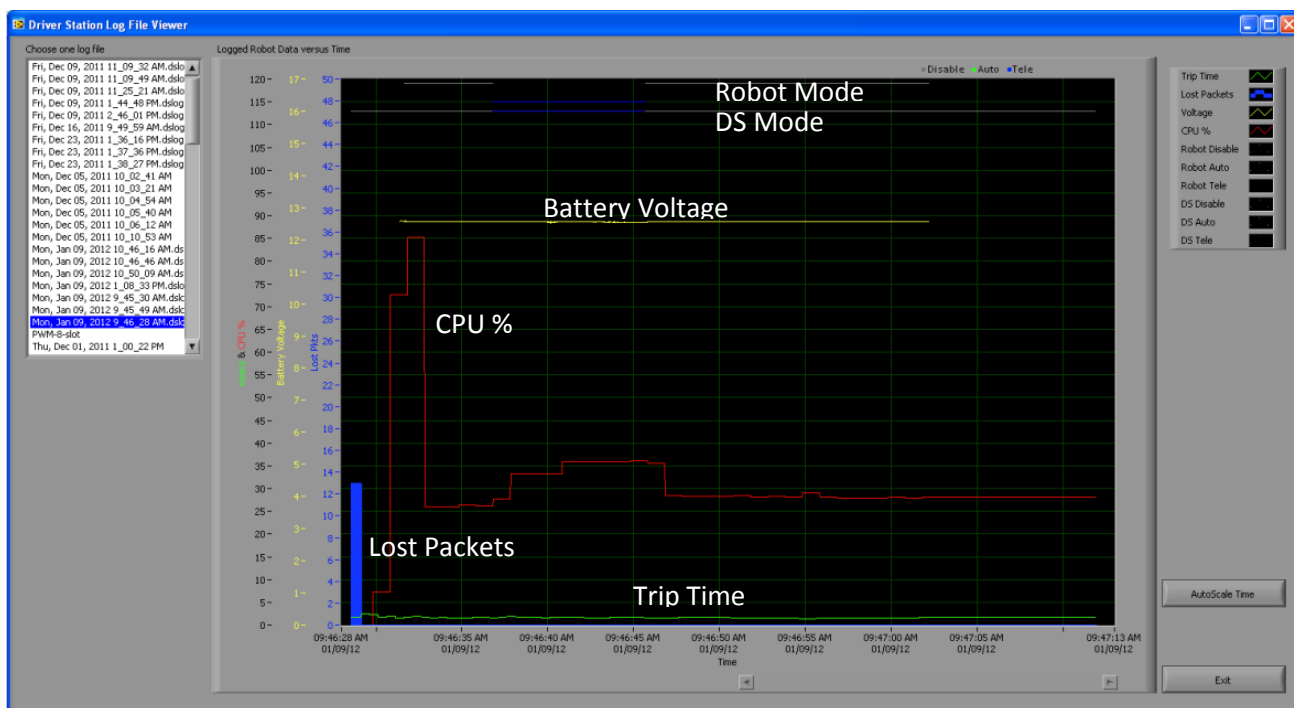

Figure 1 - A normal Log file chart

- The Battery Voltage is indicated on the chart in yellow. Extreme voltage dips may result in reset of the cRIO or bridge,
- Lost packets are indicated by Blue bars. This chart shows a wired setup, so the only lost packets were before the connection was made. Lost packet numbers under approximately 100 for a match are fairly normal.

- Trip time is shown in green. Excessive trip time (>20ms) should be investigated, trip times >75ms indicate a significant issue. The primary causes are high cRIO CPU usage, high Driver Station computer CPU usage, large amounts of other network traffic (eg. SmartDashboard) and poor radio placement on the robot (radio should be placed away from motors and as exposed as safely possible).
- cRIO CPU usage is shown in red. CPU usage pegged at 100% could cause lag in control response. If the cRIO CPU is maxed out and trip time is noticeably high (above 75ms) and/or there are significant amounts of dropped packets, the cRIO CPU issue is likely the root cause of the communications problem.
    - If you are performing vision processing on the cRIO you may need to reduce the frame rate, image size or both.
    - If you are not doing image processing on the cRIO look for any loops with no wait to delay them. In LabVIEW these would likely be in Periodic Tasks. In C++ and Java, look at what you may be running in the XXXContinuous() methods for the Iterative templates or make sure your loops have delays at the beginning or end if using the Simple templates. Large amounts of SmartDashboard calls have also been associated with high CPU usage.
- The DS mode is shown across a single line near the top of the screen. This is primarily useful for comparing to the robot mode
- The robot mode is shown above the DS mode on different lines. The robot mode transitions should approximately match up with the DS mode transitions. A robot that does not transition appropriately is likely caused by a loop in the user code that is preventing the robot from changing state. The robot mode transitions are only logged for code that is "instrumented". Currently all default templates in the 3 supported languages are instrumented with the exception of the Simple Template in Java.