RICH-II LabVIEW Remote Interface

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Overview

- LabVIEW remote interface for RICH-II will allow users to monitor detector's interlocks from a PC with LabVIEW, on the same subnet as the sbRIO

- Features of LabVIEW remote interface will be based on RICH-I LabVIEW remote interface, but with a few changes in how data gets to interface
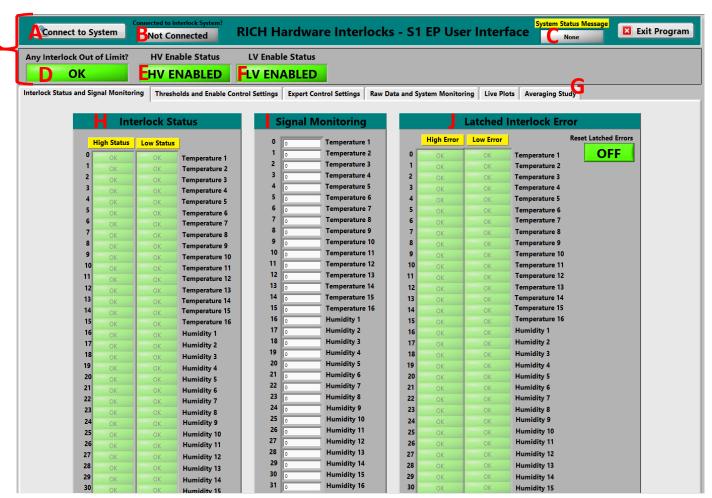
RICH-I LabVIEW Remote Interface

- Each cRIO in interlock system has its own remote interface

- Remote interface connects to cRIO using messaging
  - RICH program was based on SVT program
    - At time of SVT development, messaging was the standard to remotely connect to cRIOs
  - Messaging uses two first-in, first-out (FIFO) data buffers to write or read to another device
    - One FIFO buffer for PC-to-cRIO communication
    - Second FIFO buffer for cRIO-to-PC communication
  - FIFO buffers are uniquely made upon start of cRIO program or remote interface
    - Only one PC can connect to cRIO at a time

RICH-I LabVIEW Remote Interface – Interlock Status Tab

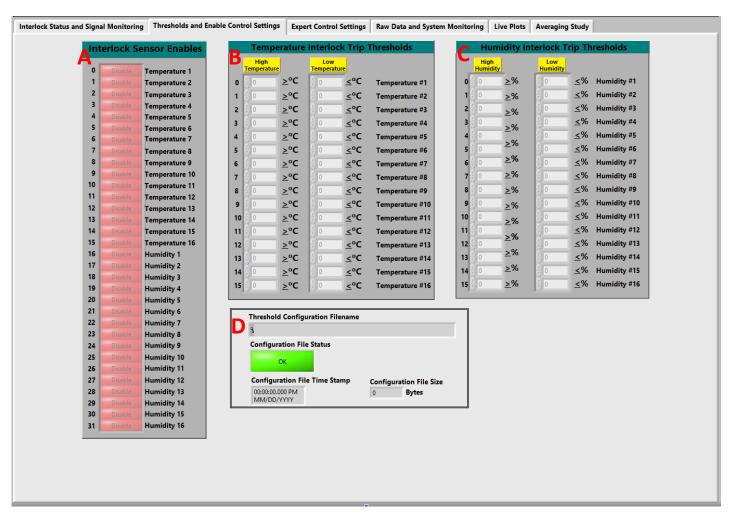Header is displayed for all pages of screen

A. Control to connect to cRIO

B. Connection status indicator

C. System status message indicator

D. Interlock Boolean sum indicator

E. High voltage interlocks status

F. Low voltage interlock status

G. Tabs for other pages

H. Immediate interlock status indicators

I. Present sensor values

J. Latched interlock indicators

Note: Indicators appear greyed out because screen is not running.

RICH-I LabVIEW Remote Interface – Interlock Control Tab
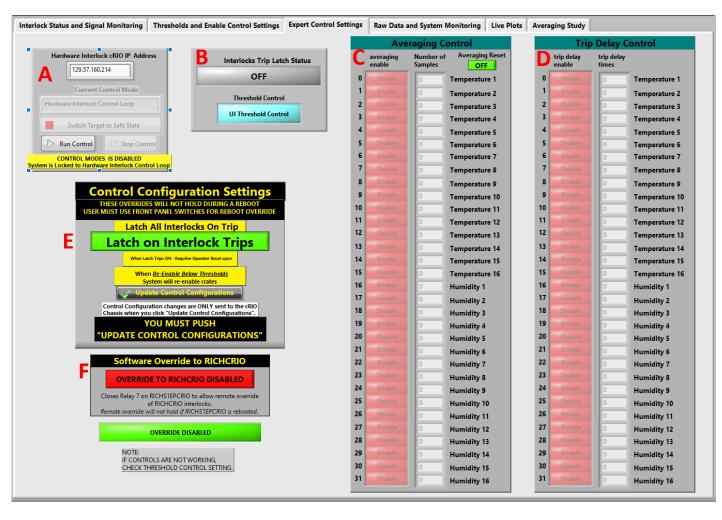

A. Controls for enabling interlock

B. Limit controls for temperature interlocks

C. Limit controls for humidity interlocks

D. Configuration file status readback

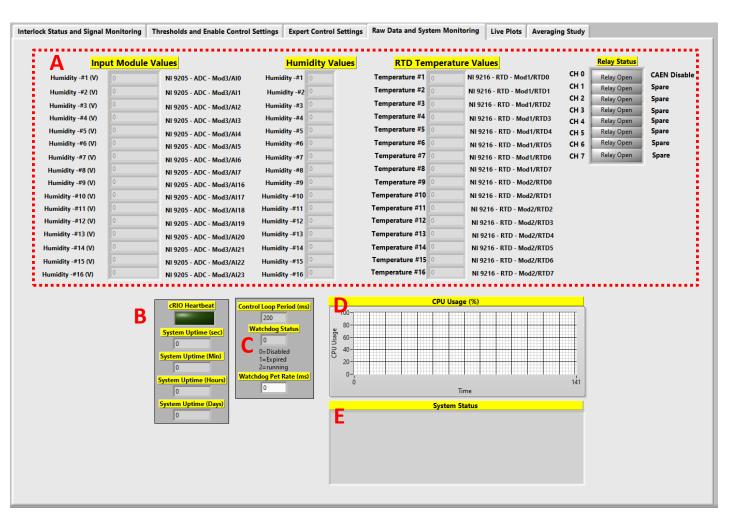Note: Indicators appear greyed out because screen is not running.

A. Configuration settings for which cRIO connects

B. EPICS-LabVIEW mode control

C. Averaging control

D. Trip delay control

E. Interlock latching behavior control
   - Not used but left in program

F. Software override to other RICH interlock cRIO
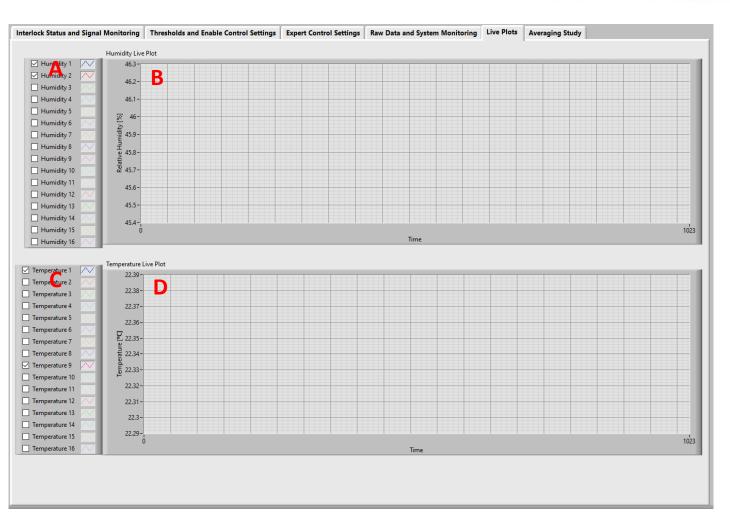
Note: Indicators appear greyed out because screen is not running.

A. Raw data monitoring from cRIO modules
B. cRIO health readback
C. Watchdog status
   • Not used but left in program
D. CPU usage plot
E. System status messages

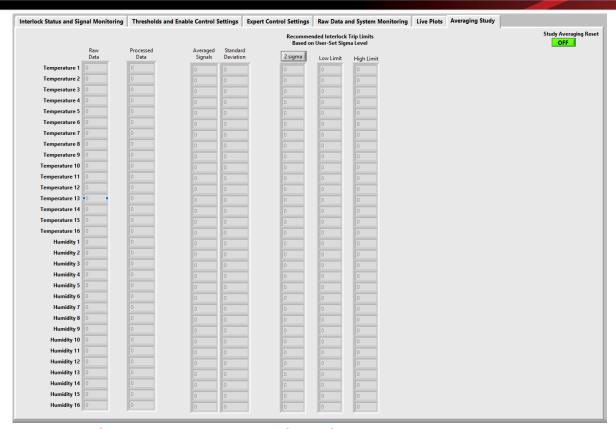Note: Indicators appear greyed out because screen is not running.

RICH-I LabVIEW Remote Interface – Live Plots Tab

A. Control to select humidity sensors to plot

B. Humidity data live plot
- Plotted data is not saved and only exists in LabVIEW

C. Control to select temperature sensors to plot

D. Temperature data live plot
- Plotted data is not saved and only exists in LabVIEW

Note: Indicators appear greyed out because screen is not running.

RICH-I LabVIEW Remote Interface – Averaging Study Tab

Note: Indicators appear greyed out because screen is not running.

- Tab was added for investigation into whether averaging subVI worked correctly; not needed for RICH-II
  - LabVIEW code for indicators on tab was used to verify results from LabVIEW's built-in averaging subVI

Changes in Remote Interface for RICH-II

- Network variables will be used instead of messaging
  - Similar to all Hall B Gas System GUIs
  - Simplifies LabVIEW block diagram
  - Will allow multiple users to use remote interface at same time

- Unneeded features will be removed
  - Watchdog monitoring
  - Interlock latching behavior control
  - Averaging Study tab

Conclusion

- RICH-II LabVIEW remote interface will have the same features as RICH-I's, but the LabVIEW code to get data will be different
  - Network variables will be used instead of messaging

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