

Status of the Forward Tagger

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FT Setup

- FT was moved to the hall July 2017.
- Hardware interlocks cRIO installed July 11.
- Electronics cabled July 12.
- Gas and chiller connected and running.



Calorimeter in Clas12

FT Setup



Hardware Interlock System installed in rack beside CAEN HV crate

FT Setup

FT Hard Interlocks

FT Hardware Interlock System User Interface

Calorimeter Interlock Status

Any Calorimeter Interlocks Above Limit? **OK**

Calorimeter Chiller Enable Status **Chiller Enabled**

Calorimeter Mpod LV Enable Status **LV Enabled**

Calorimeter CAEN HV Enable Status **HV Enabled**


Hodoscope Interlock Status

Any Hodoscope Interlocks Above Limit? **OK**

Hodoscope Mpod LV Enable Status **LV Enabled**

Hodoscope CAEN HV Enable Status **HV Enabled**

Summary of Interlocks | **Interlock Status and Signal Monitoring** | (EXPERT) Thresholds and Enable Control Settings

 FT cRIO Heartbeat 17 cRio CPU Usage

Interlock Status

High Status	Low Status	
OK	OK	Calorimeter Temp #1
OK	OK	Calorimeter Temp #2
OK	OK	Calorimeter Temp #3
OK	OK	Calorimeter Temp #4
OK	OK	Calorimeter Temp #5
OK	OK	Calorimeter Temp #6
OK	OK	Hodoscope Temp #1
OK	OK	Hodoscope Temp #2
OK	OK	Calorimeter Humidity #1
OK	OK	Calorimeter Humidity #2
OK	OK	Calorimeter Gas Flow

Signal Monitoring

10.93	(°C) Calorimeter Temp #1
10.32	(°C) Calorimeter Temp #2
10.94	(°C) Calorimeter Temp #3
6.79	(°C) Calorimeter Temp #4
6.35	(°C) Calorimeter Temp #5
17.71	(°C) Calorimeter Temp #6
22.05	(°C) Hodoscope Temp #1
21.97	(°C) Hodoscope Temp #2
12.9	(%) Calorimeter Humidity #1
14.3	(%) Calorimeter Humidity #2
125.3	(SCCM) Calorimeter Gas Flow

Latched Interlock Errors

High Errors	Low Errors	
OK	OK	Calorimeter Temp #1
OK	OK	Calorimeter Temp #2
OK	OK	Calorimeter Temp #3
OK	OK	Calorimeter Temp #4
OK	OK	Calorimeter Temp #5
OK	OK	Calorimeter Temp #6
OK	OK	Hodoscope Temp #1
OK	OK	Hodoscope Temp #2
OK	OK	Calorimeter Humidity #1
OK	OK	Calorimeter Humidity #2
OK	OK	Calorimeter Gas Flow

Reset Latched Errors **OFF**

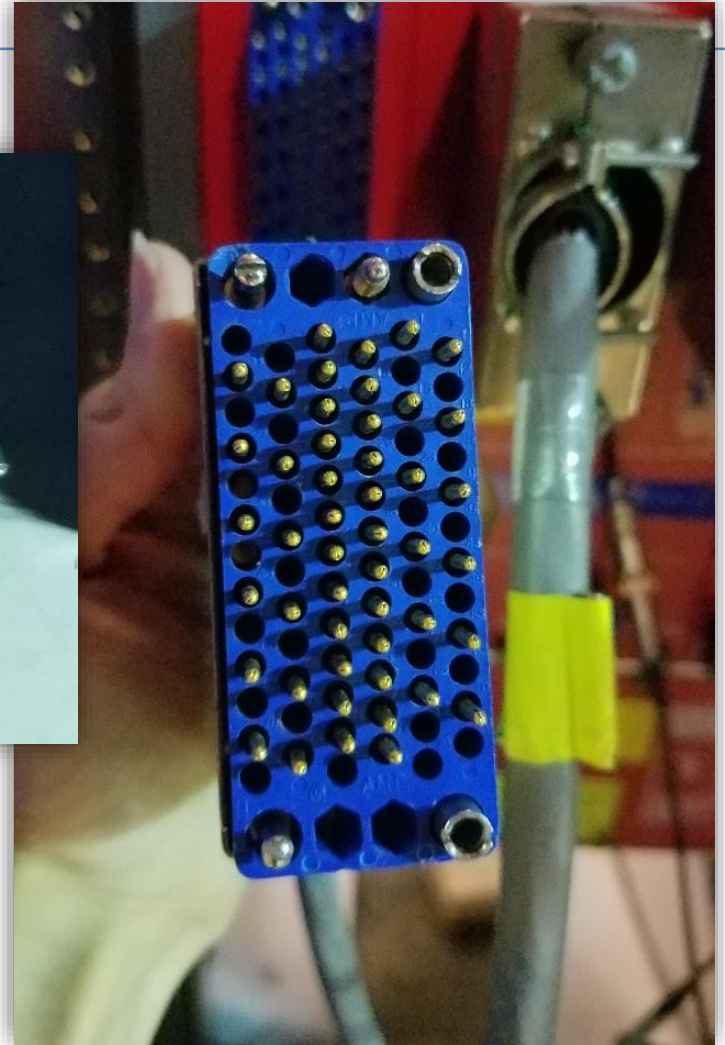
Additional Work

- Pins added to HV cable to allow for interlocks.
 - Pins 79 and 80 added to enable interlocks.
 - Pins did not exist previously. During interlocks testing, a jumper was used.
 - HV works properly.

Additional Work



Pin modifications to HV cables



Additional Work

- Three temporary LV cables modified for Tracker.
 - LV Tracker cables had plastic connectors.
 - FT group wanted cables that would not disconnect when connected to Tracker in Clas12 assembly.
 - Plastic connector removed and replaced with bolt and heat shrink, for each cable.
- Third humidity sensor to be fabricated and added to hardware interlocks.

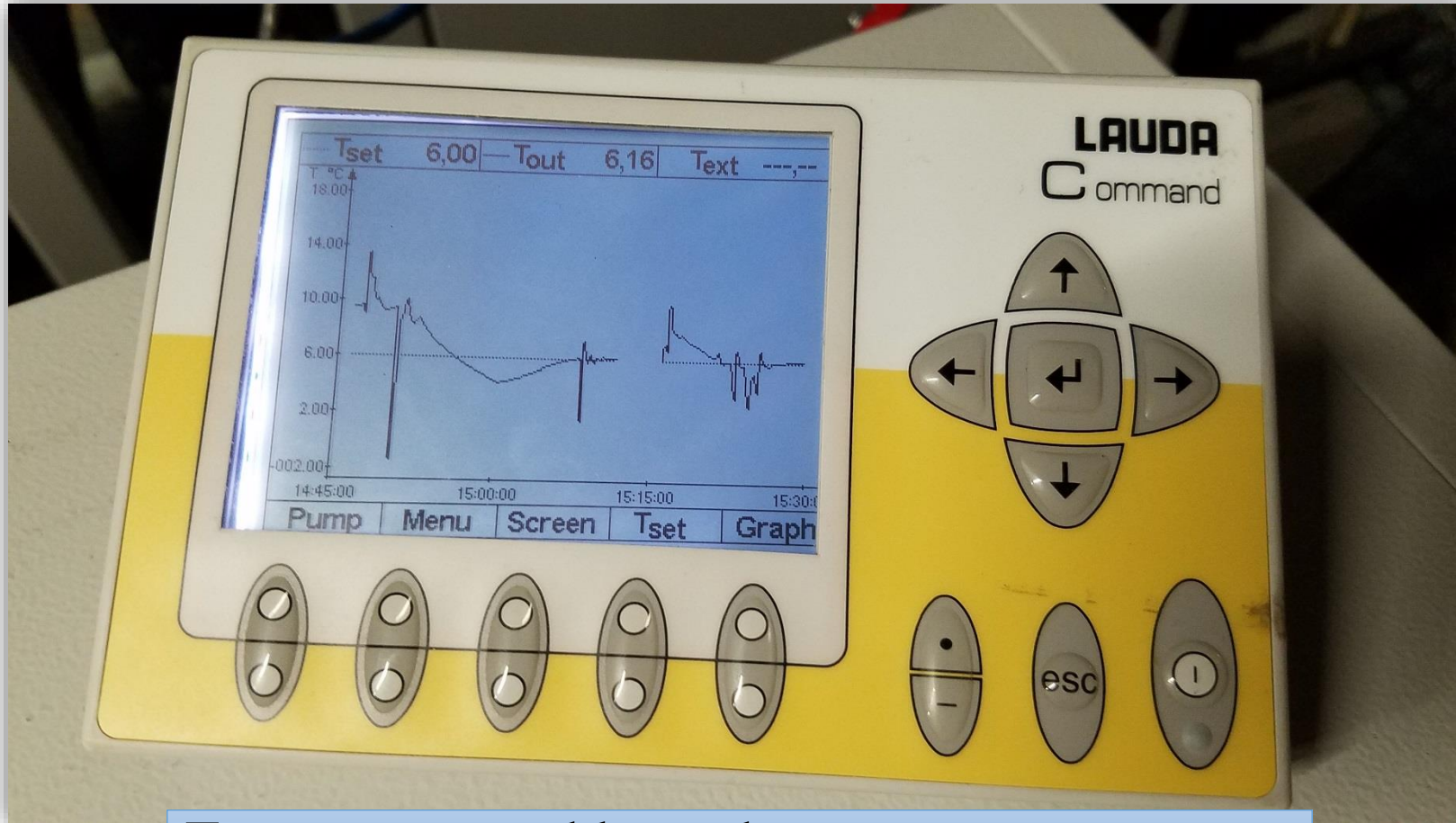
Chiller Temperature Problem

- Chiller has been having problems when Analog Input 1 from analog card is enabled.
 - Analog Input 1 allows for hardware interlocks to turn on and off pump.
 - When Input 1 is enabled, temperature of chiller will either rise rapidly or fall rapidly.



Chiller in the Hall

Chiller Temperature Problem



Temperature problems shown on remote screen

Chiller Temperature Problem

- Troubleshooting
 - Switched analog card to other connector.
 - Power-cycled chiller.
 - Used DMM to check signal input from cRIO.
 - Measures either 0mA or 20mA, as expected.
 - Changed “Maximum value” percentage using remote screen.
 - Analog output 1 relays pump status information to cRIO only if max value is set to 60% or lower.
 - Analog input 1 “rapid heat” or “rapid cool” depends on percentage value.



Analog card used for connection between hardware interlocks and chiller

Chiller Temperature Problem

- Conclusion:
 - Chiller or analog card wiring was damaged during transportation.
 - Firmware could have stopped behaving properly.
 - Chiller should be replaced.

Thank you