

LabVIEW Hardware Interlock Program for NPS

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I am currently working on portions of the LabVIEW hardware monitoring and interlock program for NPS that will monitor temperature, humidity, and dew points, and will take appropriate actions to ensure the safety of the detector, depending upon temperature and humidity alarm limits.

This month I have worked on averages, standard deviations, interlocks, and trip delays for the sensor readings in the areas being monitored—crystal zones, crystal zone cooling circuit, detector frame, electronics zone, and chillers.

For average and standard deviation, I first made a sub-routine to calculate both, and then added eleven copies of this sub-routine to the main program in the eleven instances of monitoring. Figure 1 is the LabVIEW code for the sub-routine.

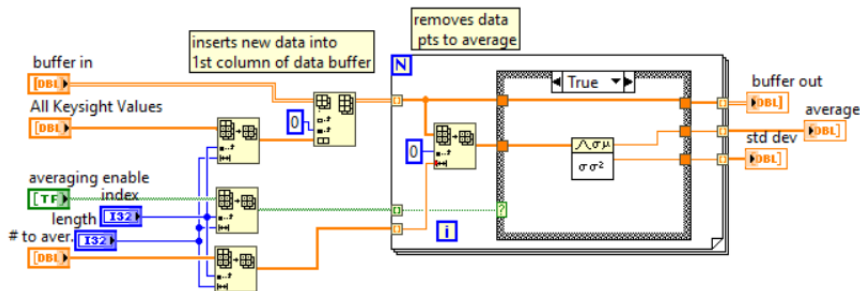


FIG. 1. LabVIEW code for averaging and standard deviation sub-routine.

Each average is then compared to high and low limits set for each sensor. If the average is out of limit, a high or low latch is indicated. If the sensor stays out of limit over a set trip delay value, a status indicator turns red.

- **A sub-routine was written in LabVIEW to compute array average and standard deviation**
- **Sub-routine used for each detector area being monitored**
- **Code written to indicate if a sensor is out of limit**

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When testing the program, only one sensor of each area was indicating a value and the rest of the array was grayed out because the indicator arrays had not been initialized. Code was added to set up the size of each array resulting in the expected results.

Next month I will continue with portions of this LabVIEW program and the Phoebus screens that it will communicate with.