

# LabVIEW Hardware Interlock Program for NPS

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2022-06

## LabVIEW Hardware Interlock Program for NPS

I continued working on 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, two of the items I worked on are the calculation of the relative humidity from the voltages read from sensors, Fig. 1, and calculation of dew point, Fig. 2.

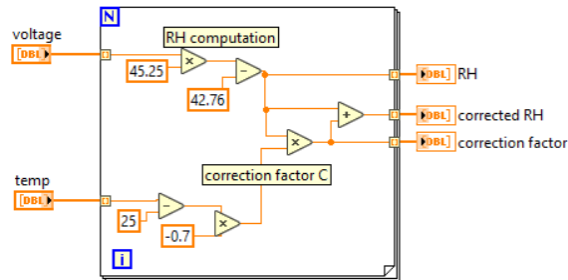


FIG. 1. LabVIEW code to calculate relative humidity.

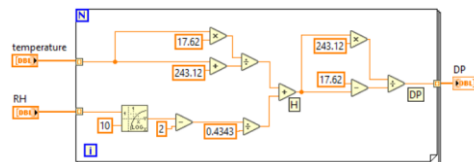


FIG. 2. LabVIEW code to dew point.

Using the equation  $RH = [45.25(V) - 42.76]$  provided by Ohmic Instruments, manufacturer of the sensors, the relative humidity is calculated using the voltage read from the sensor. If the temperature is not 25°C, then a correction factor  $C$  is computed with  $C = -0.7(T-25)$ ,  $T$  equal to temperature, and then  $C$  is added to  $RH$ .

- Code was written in LabVIEW to compute the corrected RH and the dew point
- Sub-routines were used for the 20 detector frame and two Hall sensors used to monitor humidity

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The relative humidity is used to calculate humidity, using  $H = (\log_{10}(RH)-2)/0.4343 + (17.62*T)/(243.12+T)$ , which is used to calculate the dew point  $DP = 243.12*H/(17.62-H)$ .

This code for calculating the relative humidity and the dew point was used for the 20 sensors in the detector frame and two in the Hall.

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