

Control and Monitor Chiller Software for the Neutral Particle Spectrometer

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This note presents details of the LabVIEW code written to control and monitor the chillers of the Neutral Particle Spectrometer (NPS).

LabVIEW code was written to control and monitor the front and back crystal zones, the electronics zone, the detector frame, and the chillers of the NPS [1].

To control and monitor the crystal zone and the electronics zone chillers, Fig. 1, drivers were written using command protocol provided by the chiller manufacturer. For each driver, a string of code is sent to the chiller to write a specific command, which is then read by the chiller a byte at a time, until the end of the command or an error is sent. Only one command is accepted by a chiller at a time.

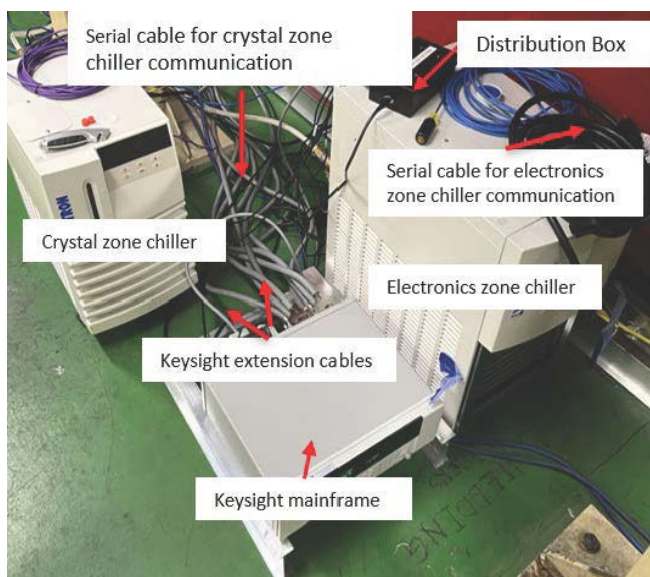


FIG. 1. Crystal zone and cooling zone chillers with cables and peripherals.

Figure 2 is a flowchart of the commands sent to the chillers. After configuring the communication between the chiller and LabVIEW, the temperature of the chiller coolant and the under-temperature and the over-temperature limits are set for the alarms. After the chiller temperature and limits are set, the chiller is turned on and the pressure, setpoint temperature, and chiller coolant temperature are read.

To conclude, a section of the LabVIEW code that controls and monitors the NPS contains drivers that were developed to communicate with the chillers, which have been installed in Hall C and are operating as expected.

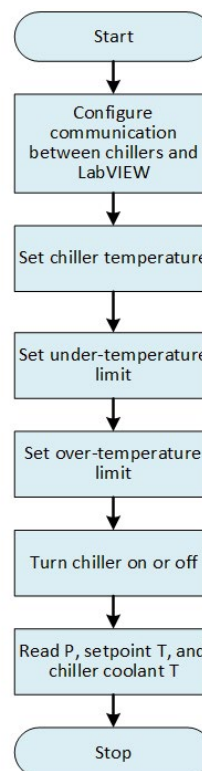


FIG. 2. Flowchart of the code to control and monitor the chillers.

[1] M.A. Antonioli, et al., *Overview of Control and Monitoring Software for the Neutral Particle Spectrometer*, DSG-Note 2023-36, 2023.