Version 3 of the Neutral Particle Spectrometer's Control and Monitoring LabVIEW Code

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This note discusses the streamlining of the Neutral Particle Spectrometer's (NPS) LabVIEW control and monitoring code.

A third version of the LabVIEW code to control and monitor the NPS is being written. This version will use more sub-VIs and less arrays to allow a more streamlined version than version 2.

Figure 1 shows some code from version 2. In Fig. 1(a), the Keysight data acquisition unit's channels are set up and bundled into a cluster, the Keysight connection is checked in 1(b), the Keysight multiplexer modules are configured and read in 1(c), and Keysight voltages are converted to relative humidity for the Hall and detector frame, and to temperature, pressure, and flow for the flow meters in the crystal zone and electronics zone in 1(d).

Figure 2 shows the code in version 3 that completes the same functions as in Fig. 1, using subVIs that result in the use of less screen space. The purpose of 1(b) is performed by the subVI called Keysight connected?, enclosed in the red box and 1(a) is performed by subVI bundle Keysight cluster, blue box. The function of 1(d) was moved into the subVI Keysight read, yellow box, and together with 1(c), was reduced to code shown in the green box. The code in Fig. 2 also checks for Keysight errors.

All code from Fig. 2 was then consolidated into the one subVI called Keysight, Fig. 3, resulting in less code and less screen space.
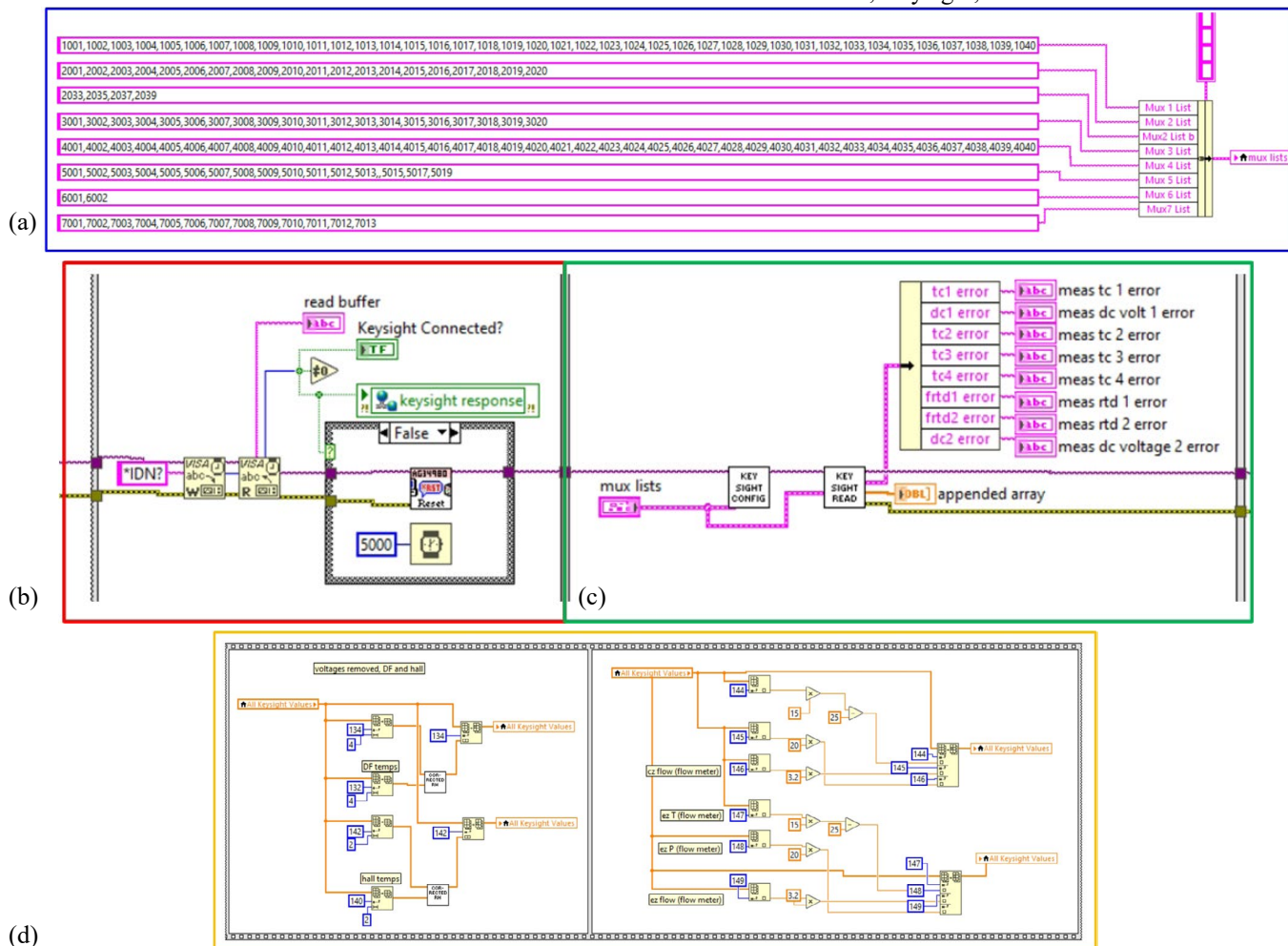
The final subVI, Keysight, has been tested.

FIG. 1. LabVIEW code from version 2 of the control and monitor program. (a) Setup and bundling of Keysight channels, (b) checking Keysight connection, (c) Keysight multiplexers are configured and channels are read, and (d) Keysight values are converted to relative humidity and temperature, pressure, and flow.
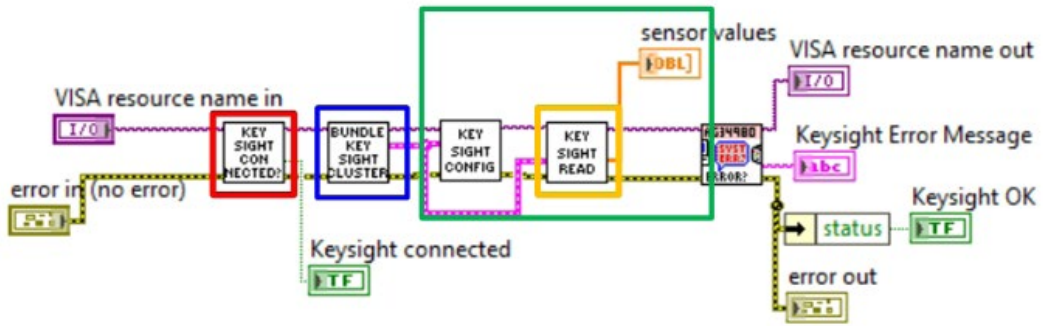
FIG. 2. LabVIEW code in version 2 that functions as the code shown in Fig. 1. The colored boxes are subVIs that function the same as the code in the corresponding colored boxes in Fig. 1.

FIG. 3. The final subVI that performs all functions related to the Keysight data acquisition unit.