

Trap mini-Workshop

control

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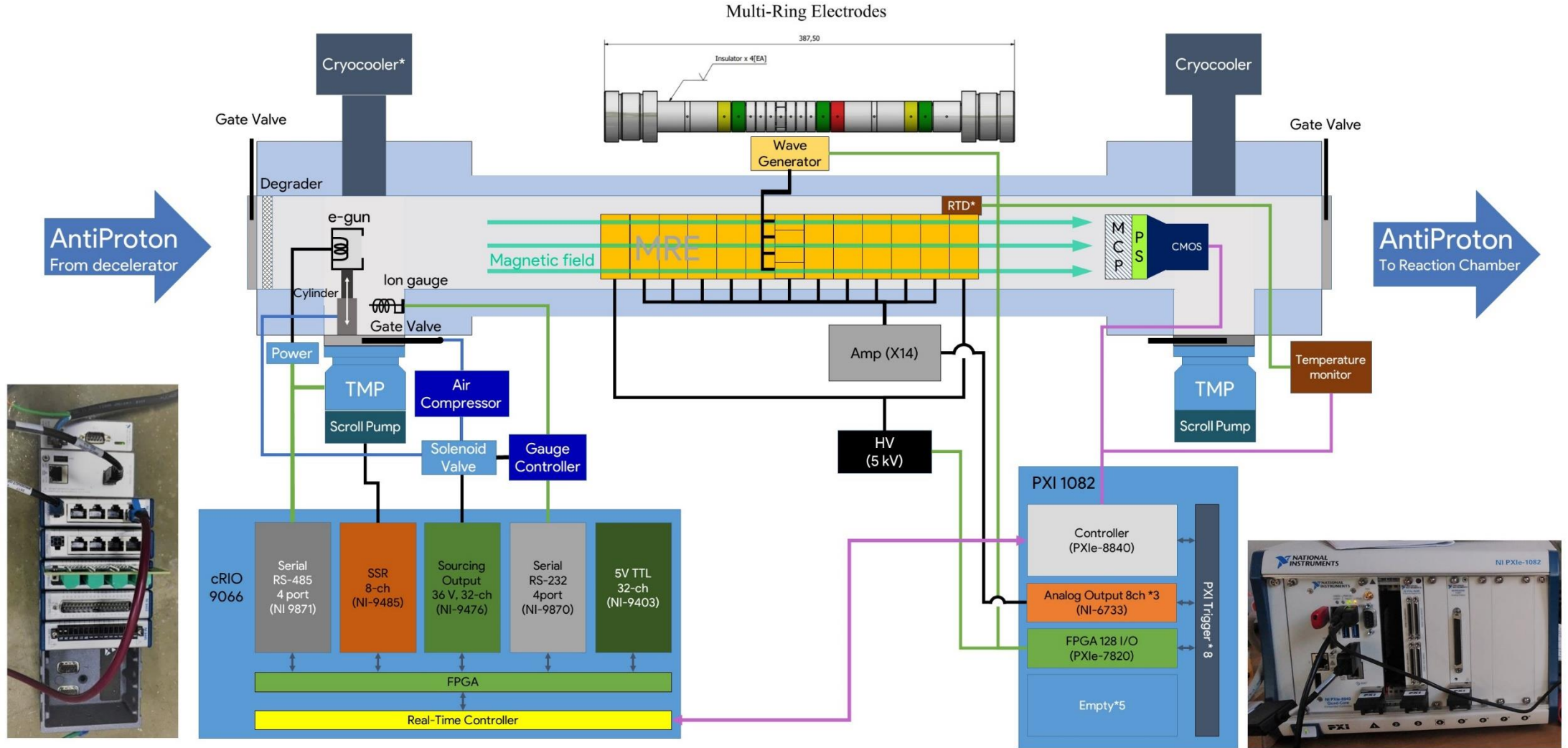
SNU

Control system

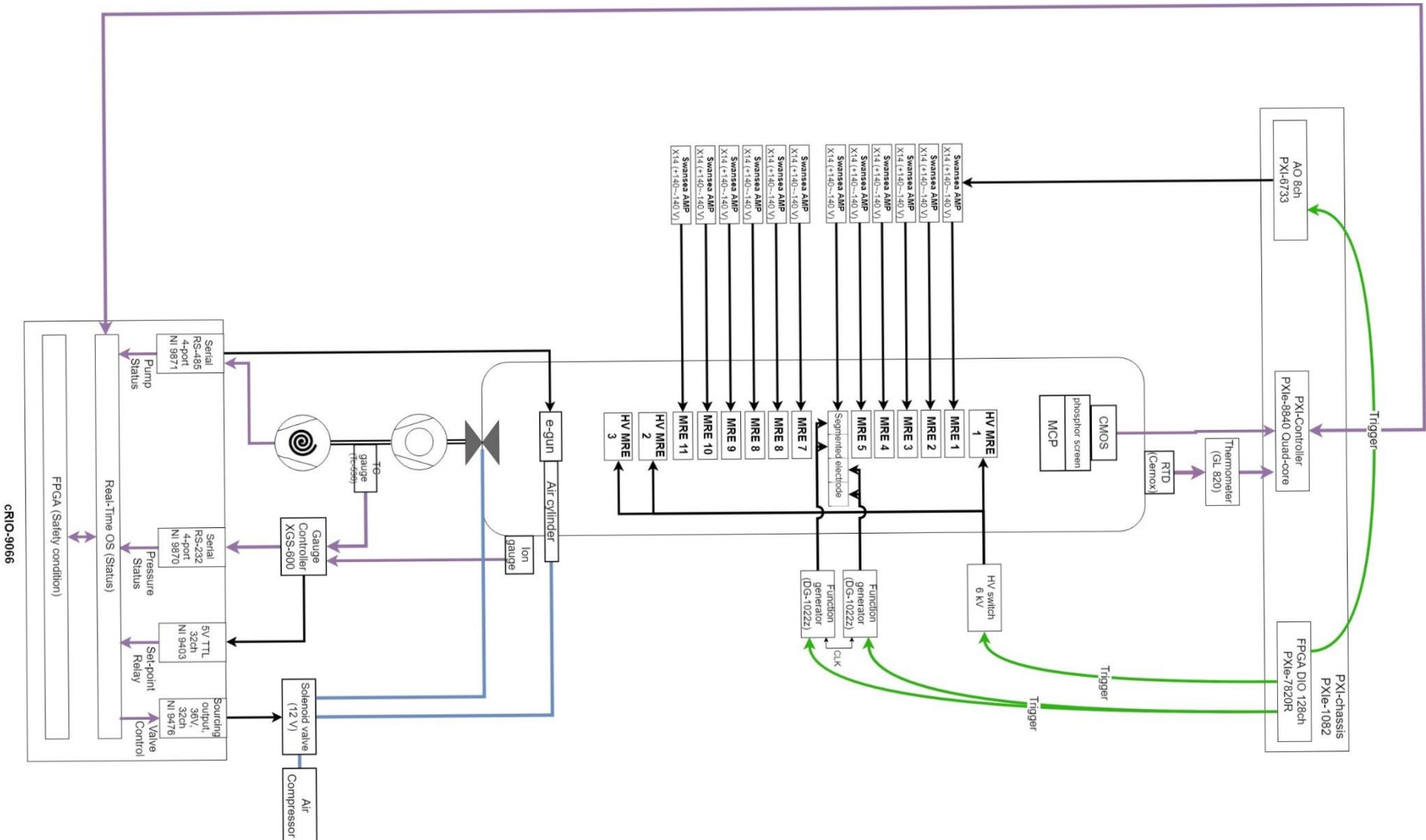
- Make trap operate as we want.
- Requirements
 - Fast & Precise timing
 - Scalability
 - Flexible & Easy sequence editing
 - Intuitive UX

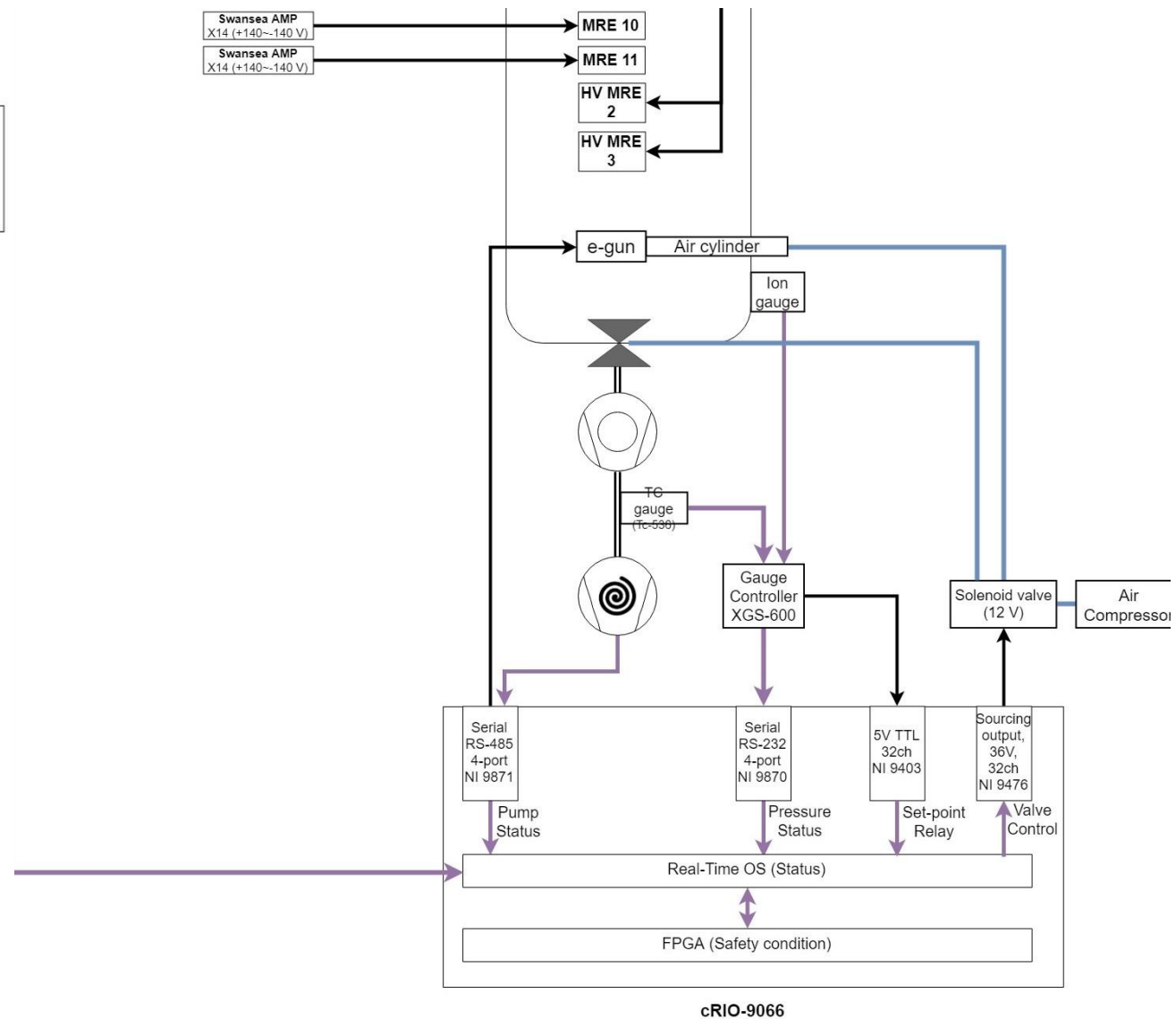
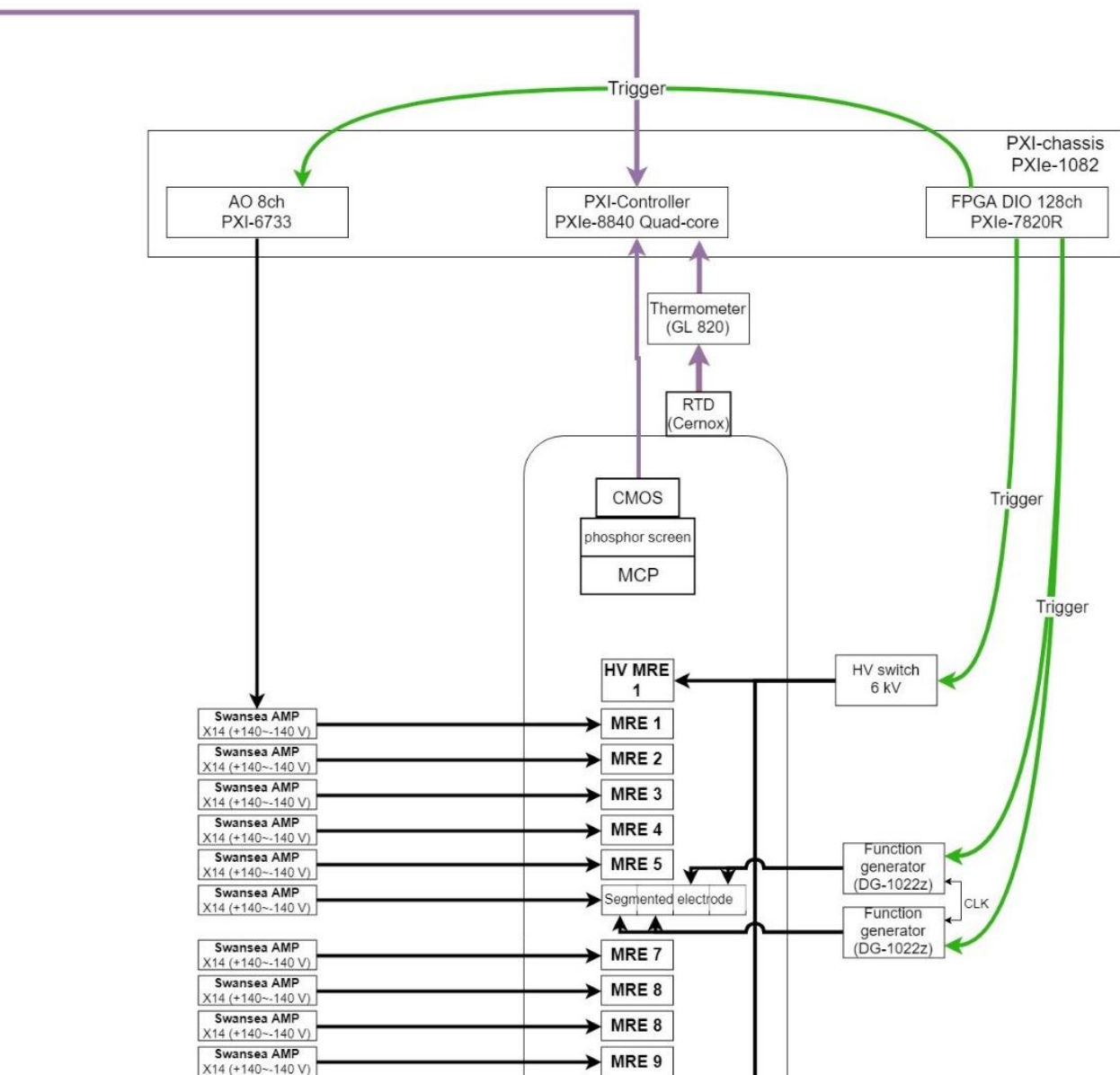
Control system

- PXI
 - Analog Output
 - FPGA
 - Trigger I/O with peripherals
- Vacuum control (CompactRIO)
 - Pressure, Pump status check (+Valve status)
 - Valve control
 - Safety condition



Control system





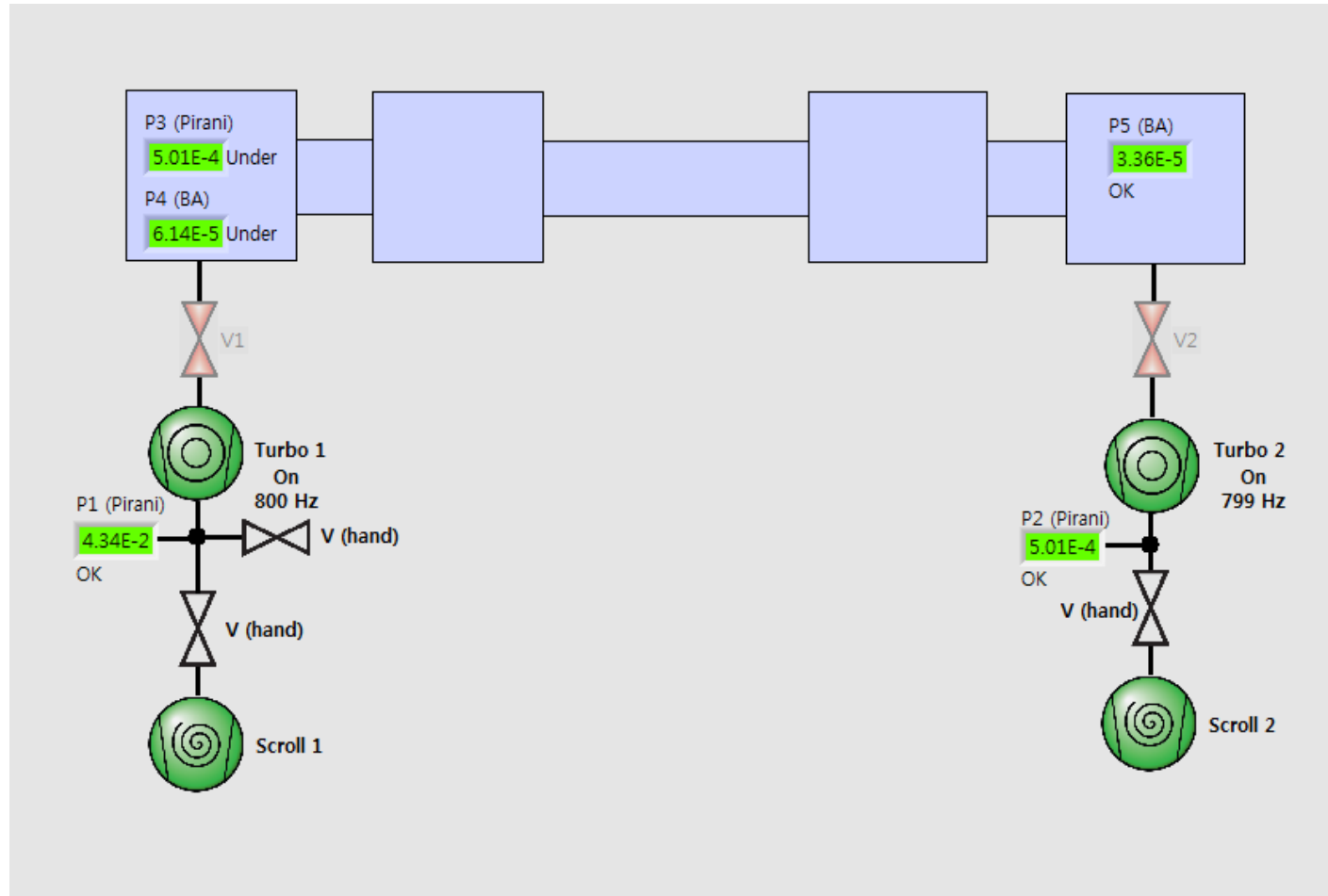
PXI control-AO

The screenshot displays the PXI control-AO software interface, which is used for configuring and executing timing sequences. The main window is divided into several sections:

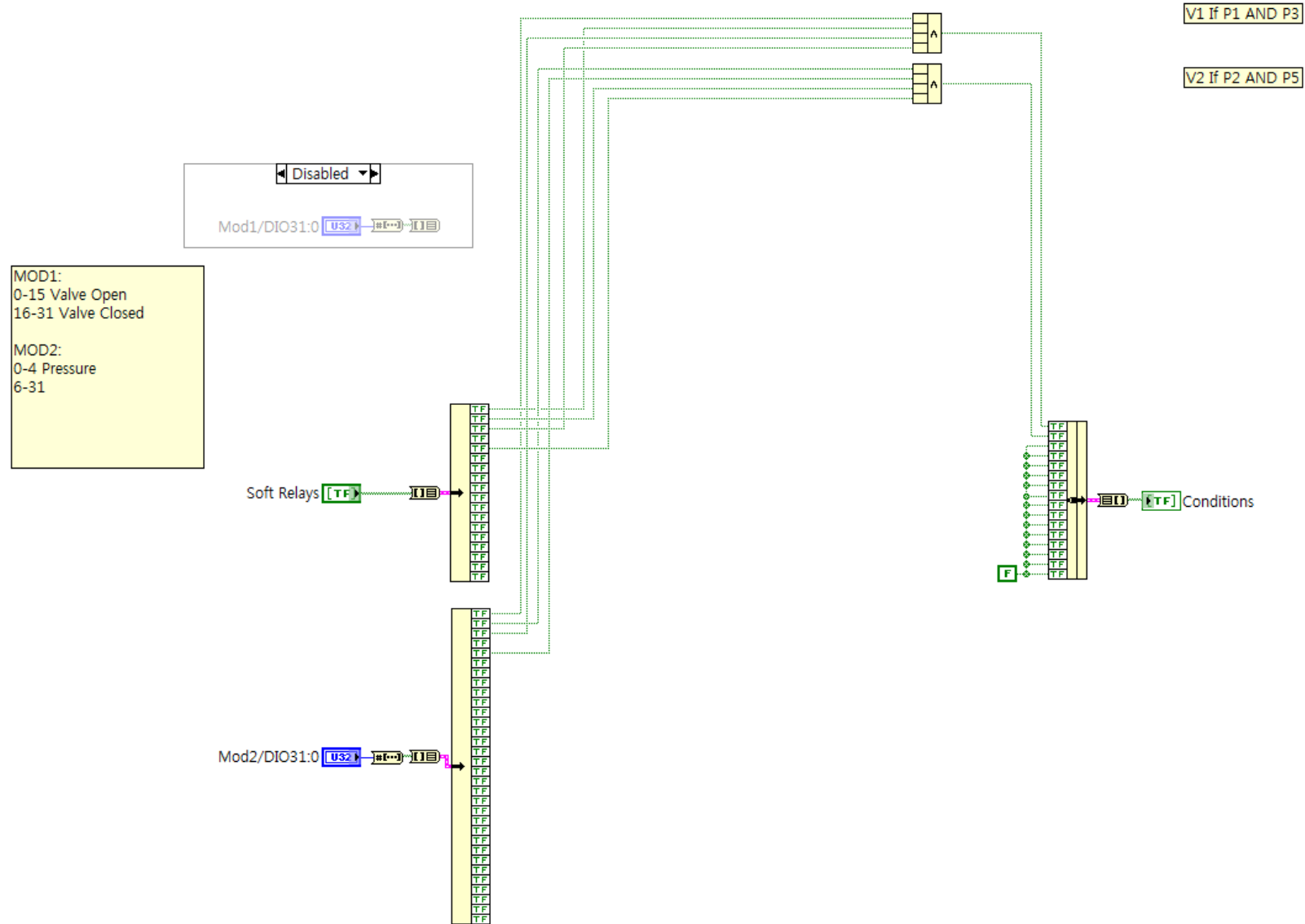
- Top Panel:** Contains buttons for **Stop**, **Load File**, **Save**, and **ItemTag** (with a **Delete** button). It also shows the **Total time (s)** as 0.000027125 and a **selected path** field.
- Timing Section:** This section contains a series of timing blocks, each with a **Ramp Points** control and a **Trig** (Trigger) control. The blocks are numbered 0, 1, 2, 3, and 4. Each block has a **Total t** (Total time) field and a **Wait Trig** (Wait for Trigger) field. The timing blocks are arranged in a grid, with columns labeled 1, 4, 8, 12, and 16. The **Ramp Points** control is a slider that can be set to 0 or 1. The **Trig** control is a green indicator light that is lit when the trigger is active.
- Command Panel:** Located on the right side of the interface, it contains a **Command** dropdown menu (set to **Default**), a **File** field (containing the path **C:\Users\Gbar_trap\Desktop\LabVIEW#Sequences_Antiproton#**), and a **Number of runs** field (set to 0). It also features **Ready** and **Loaded** status indicators (green circles) and a **Timing 2** section with a **Run Counter** (0), **Loop Counter** (1), and **Elapsed Time** (12.5n).
- Comments Section:** Located at the bottom right, it contains a **Comments** field and a **Timing 2** section with a **Run Counter** (0), **Loop Counter** (1), and **Elapsed Time** (12.5n).

The interface is designed for configuring and executing timing sequences, with a focus on precision and ease of use. The **Timing** section allows for the creation of complex sequences, while the **Command** panel provides a way to execute these sequences and monitor their progress.

cRIO-Safety



cRIO-Safety



cRIO-Safety

- Need RT-OS and FPGA programming
- More like protocol change & adaptation

Conclusion

- PXI parts (AO, Trig I/O) is working
- cRIO (Vacuum control) need more work to be done
 - Hopefully in 2 weeks

backup

