

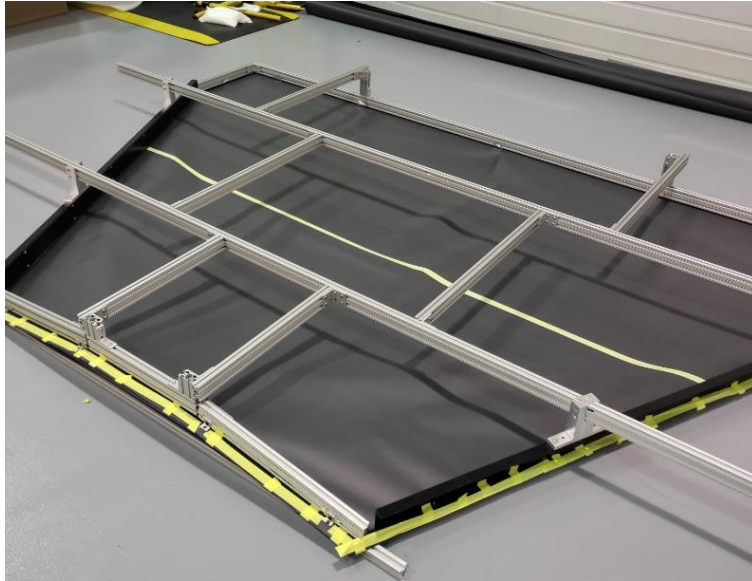
## DSG-RICH R&D Meeting

**Date: March 21, 2022**

**Time: 11:00 AM – 12:00 PM**

*Attendees: Mary Ann Antonioli, Aaron Brown, Pablo Campero, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, and Amrit Yegneswaran*

### 1. [Argonne collaborators have completed exit window](#)

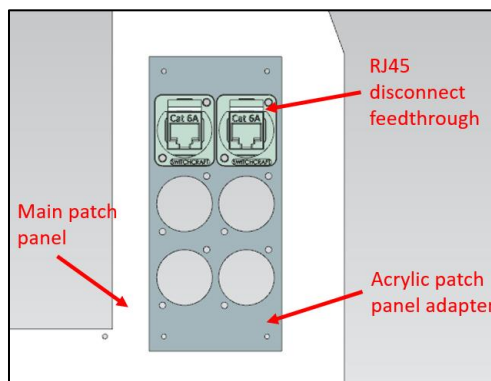


Completed exit window.

### 2. [Hardware interlock system chassis](#)

*Mindy Leffel and Tyler Lemon*

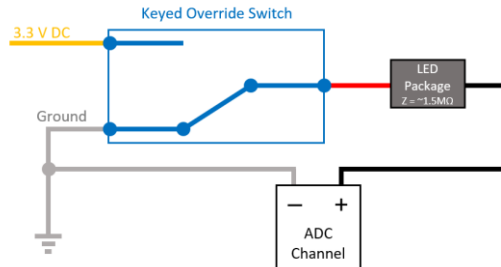
1. Adapter panel for electronic panel (EP) cabling's patch panel designed and ordered
  - Panel is a ~0.1" thick acrylic plate with cutouts for RJ45 feedthroughs that are fastened to EP cabling patch panel for hardware interlock cabling
  - Panel designed in NX12 and ordered
  - Estimated delivery date: March 23, 2022



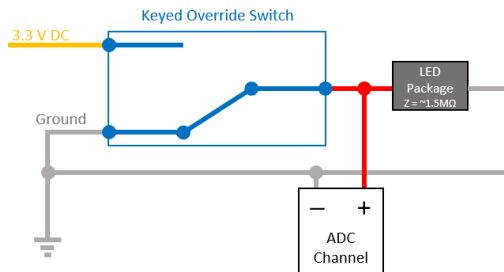
Screenshot of acrylic patch panel adapter in NX12.

2. Debugged override switch monitoring

- Found that high impedance ( $\sim 1.5 \text{ M}\Omega$ ) in LED indicator package was preventing channel from being pulled to ground when override switch is enabled
  - Channel behaved as if it's input was left open
- Moving analog input channel to be in parallel with LED resolved problem; override monitoring and indication work as intended now with RMC analog input monitoring



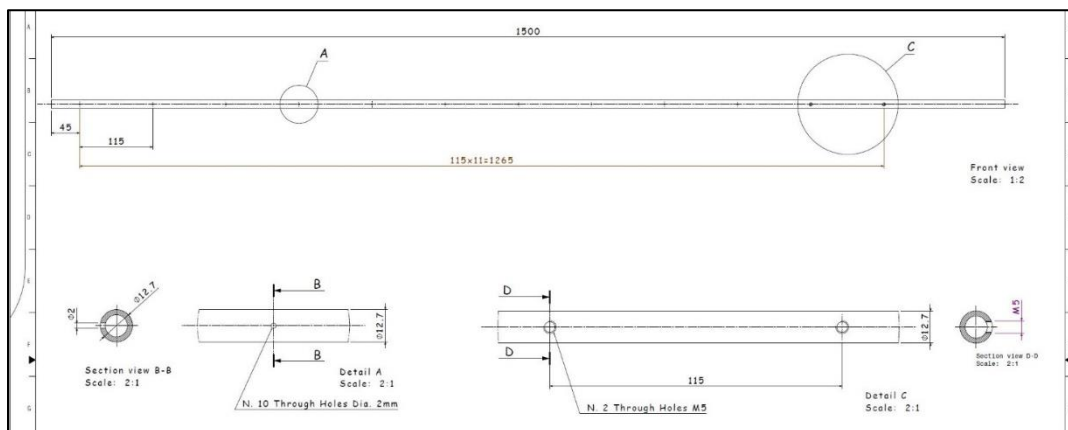
Original override switch monitoring and indication circuit that did not work as expected. In diagram, override is disabled and ADC channel floats to  $\sim 2 \text{ V}$ .



New override switch monitoring and indication circuit that works as expected. In diagram, override is disabled and ADC is pulled to ground.

### 3. [Gas system installation in EEL](#)

1. Hall B Engineering investigating whether there is building supply of nitrogen
  - If supply is available and it can be routed to EEL 124 or 125, that supply will be used instead of dewars
2. Bob Miller is modifying air-cooling manifold to allow it to supply air to two sectors

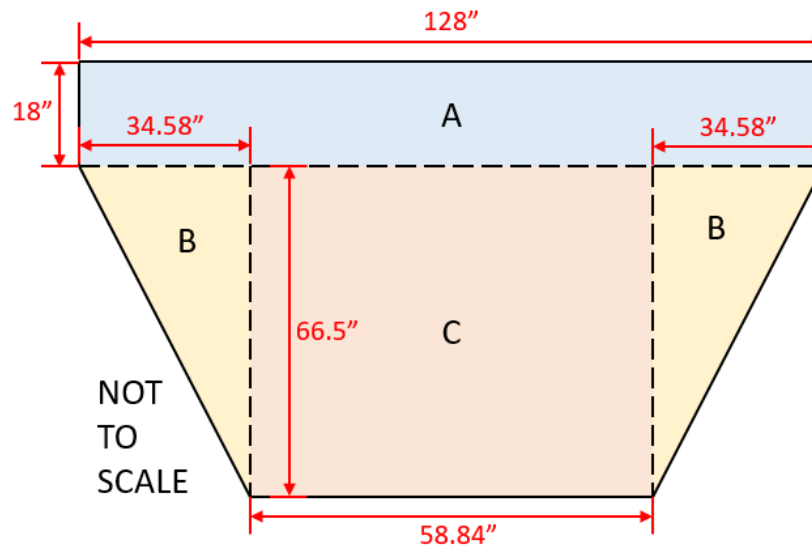


Stainless steel, interior distribution manifold for air-cooling system. Manifold has been modified to use two M5 threaded holes at outlets at top of EP that will allow tubes to be attached to manifold to better direct flow.

#### 4. Exit panel forces analysis

Tyler Lemon

1. Calculated overall force on panel from nitrogen purge pressure
  - For calculation, exit window assumed to be a two-dimensional panel
    - In reality, there is a curved portion at short edge near electronic panel
  - Total area of panel  $A = 8516.43 \text{ in}^2$
  - Differential pressure between nitrogen volume and atmosphere  $P = 0.08 \text{ psi}$
  - Force on panel  $F = P \cdot A = 681.31 \text{ lbf}$
2. Next step is to repeat calculation in Ansys



Section	Section Area [in <sup>2</sup> ]
A	2,304
B	1,149.785
C	3,912.86
Entire Window (A+2B+C)	8,516.43

**Differential Pressure Between  
N<sub>2</sub> Volume and Atmosphere**  
 $P = 0.08 \text{ psi}$

**Force on Exit Window**  
 $F = P \times \text{Area}$   
 $F = 681.31 \text{ lbf}$

Sketch of exit window with its dimensions and area and force calculation.