The purpose of the Y9 Multiple LV SST System demonstration is intended to showcase FREEDM GEH hardware components as well as Distributed Grid Intelligence.

Figure 1 shows a multiple LV SST testbed.

Project Goals

- Integrate DGI Dispatch and DGI Volt/VAR control for LV SSTs and DESDs
- Monitor system demonstration in real-time with SCADA system
- Develop test cases to simulate various generation and loads

In order to implement a Volt/VAR control, the line impedances $Z_1$, $Z_2$, and $Z_3$ must be significant. A grid impedance emulator was designed to create a voltage drop across each LV SST. The enclosure of the grid impedance emulator is represented in Figure 2.

The FREEDM HEM system and external loads were used to create significant load profiles to test the multiple LV SST system.

The communication among all of the FREEDM components is essential to system operation. All of the GEH components are able to communicate via MQTT. In addition, A LabVIEW program was created to provide a visual display of the GEH testbed.

Future Work will include:
- Completion of three LV SSTs
- Integration of DGI Dispatch and DGI Volt/VAR Control
- All communication implemented via MQTT
- Complete System testing