

The background features a dark blue gradient with faint, light blue technical diagrams. On the left, a large circular scale with numerical markings from 140 to 260 is visible. Several circular diagrams with arrows and dashed lines are scattered across the page, suggesting a technical or engineering context.

HARDWARE IN THE LOOP SIMULATION

SIMULATION SAGES

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PURPOSE OF THE PROJECT

- Develop a model of a distribution system with multiple photovoltaic inverters.
- Implement external controls to coordinate real and reactive power output from the inverters.
- Condense our findings into a lab exercise for future engineering students.

WHY?

- Inverter based renewable energy sources are becoming more common.
- The introduction of these sources into the grid can cause instability in the system.
- Better understanding the effects on the power system can help us find innovative solutions to these issues.



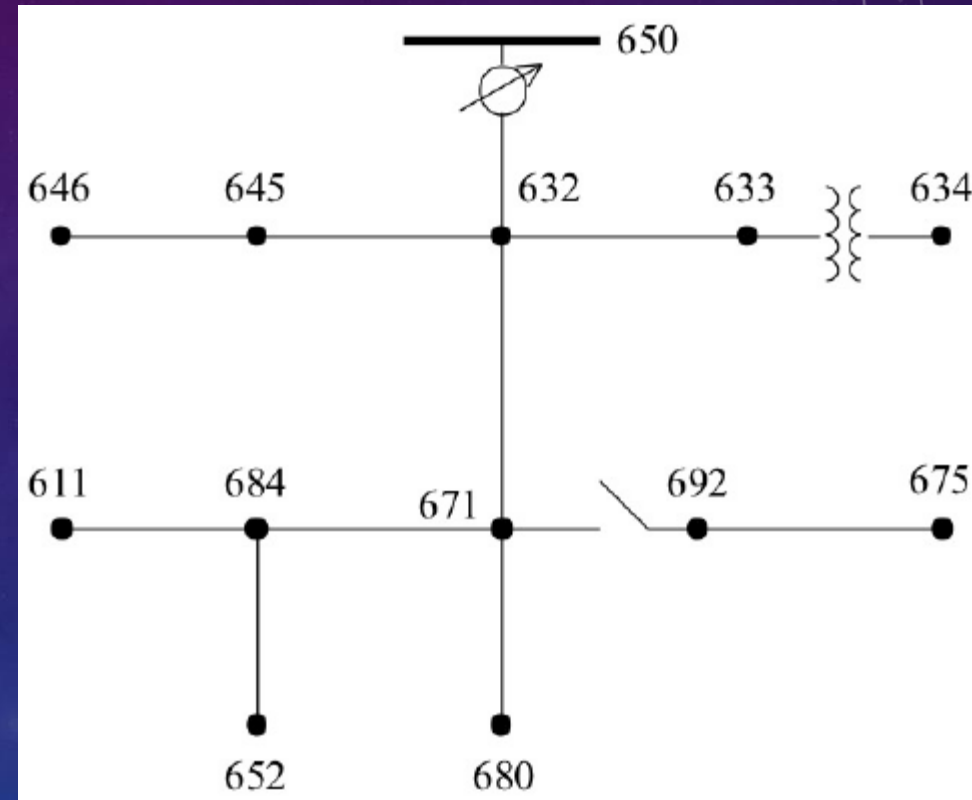


TOOLS

- RTDS (Real Time Digital Simulator)
 - Allows for real time simulation of power systems.
- RSCAD
 - Design tool for creating power system models to be simulated through an RTDS.
- SEL RTAC (Real Time Automation Controller)
 - Robust, all-purpose control unit used to communicate with and control PV inverters for this project.

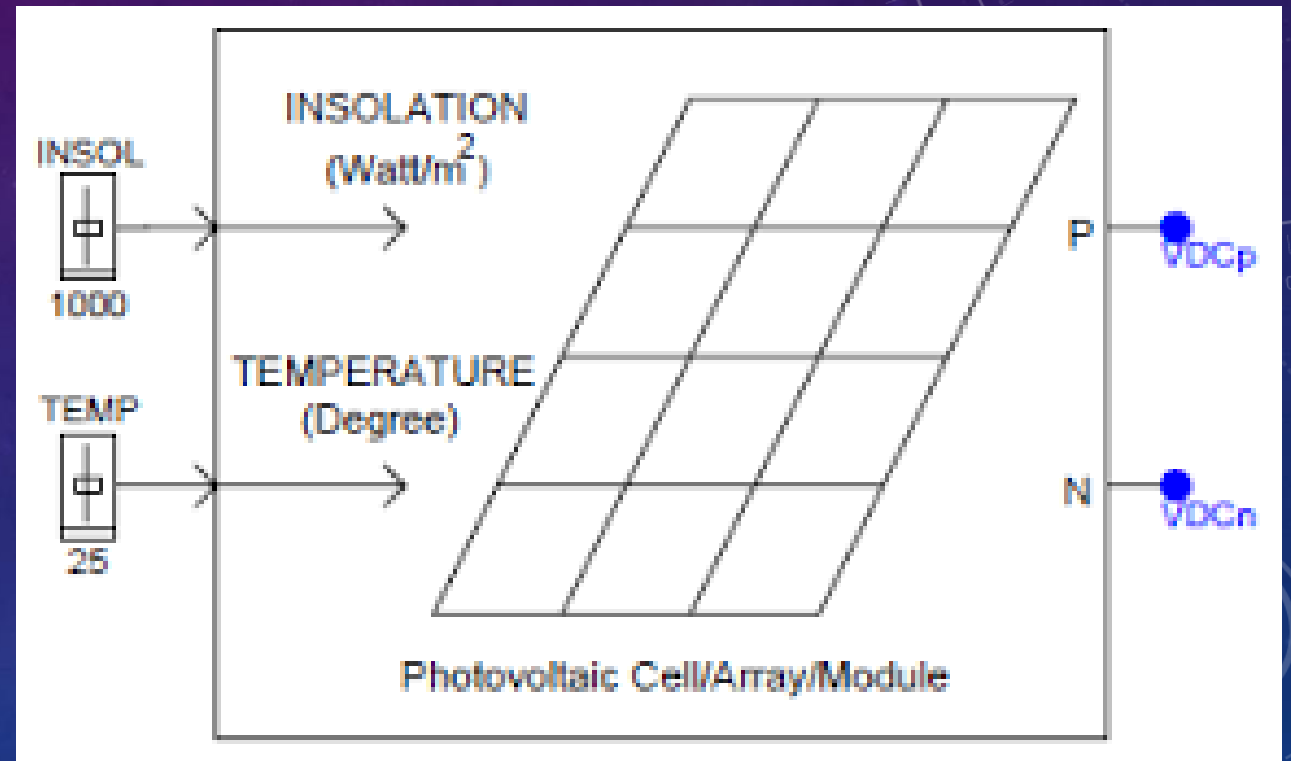
THE SYSTEM

- IEEE 13 bus power system model.
- 3 PV arrays connected to the busses.

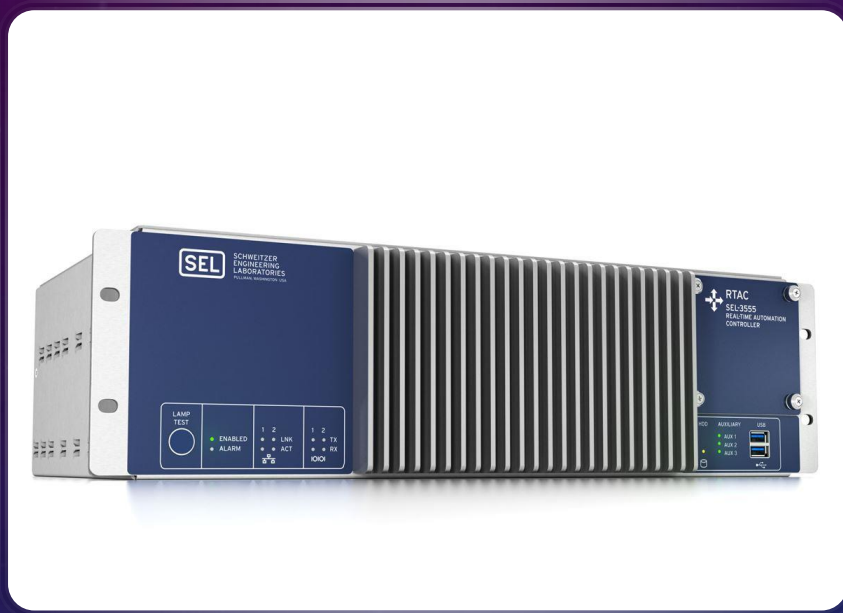


WHERE WE ARE NOW

- Learning RSCAD
- Finding and integrating PV array models into the IEEE 13 Bus system



WHAT'S NEXT?



1. Develop a fully integrated model of the 13 bus system with 3 PV inverters connected.
2. Develop a control scheme for the PV inverters using the SEL RTAC.
3. Create an HMI for the RTAC control system.
4. Create lab procedure documents