

Microgrid Lab - PI: Dr. Reinaldo Tonkoski



The Microgrid Lab has 23 kWp of rooftop solar panels, weather station, inverters for grid connected and off-grid applications, generators, programmable load banks, battery chargers, and a variety of batteries and ultra-capacitor banks. The heart of the microgrid lab is the OPAL-RT real-time digital simulator. This provides 10 controllable nodes in one actual microgrid. The power electronics specifically includes three Sunny Boy grid-tied inverters, three Sunny Island inverter/chargers, six Xantrex XW6048 hybrid inverters/chargers, and five Semikron inverter modules. The energy storage systems include 200 kWh of lead acid batteries, 8kWh lithium iron phosphate battery, and 3000 F of ultra-capacitors. All the equipment can be controlled using the real-time digital simulator. Specific research projects include power electronics, microgrids, and renewable energy systems integration and forecasting.