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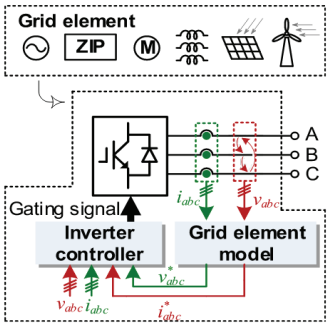
RESEARCH

Hardware Testbed (HTB)

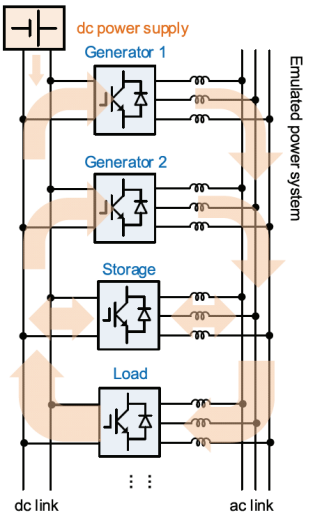
Overview

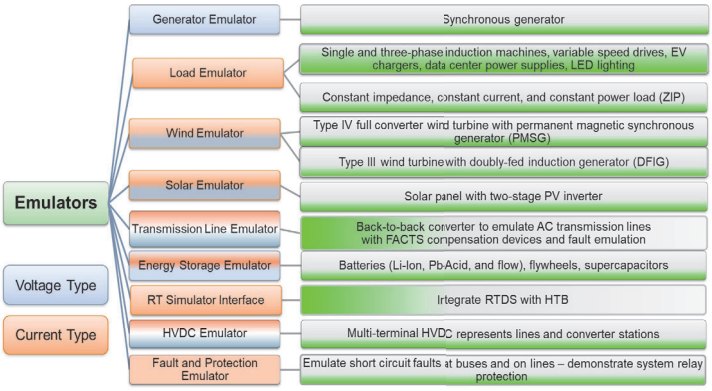
The CURENT Hardware Testbed (HTB) is a power electronics-based reconfigurable real-time grid emulator platform, which uses power electronics inverters to emulate the external properties of typical grid elements, including sources, loads, energy storage, and transmission/ distribution equipment. The HTB system contains real elements of power flow, measurement, communication, protection, and control that mimic what would be seen in an actual electric grid, providing realistic system scenarios to evaluate proposed new systems and controls with sufficient details and multiple time-scales.

Emulation Principles



Emulator operating principle

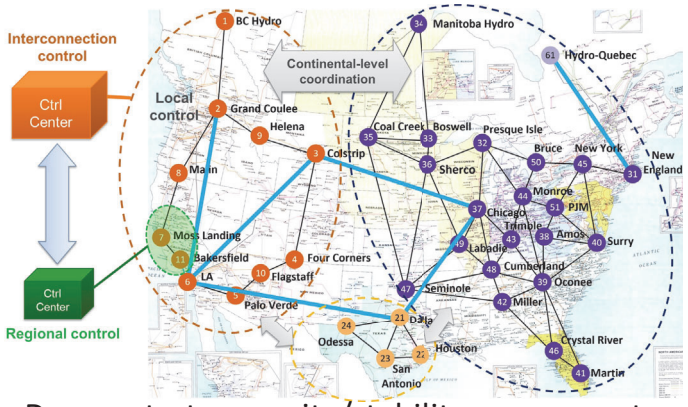




Available emulator modules

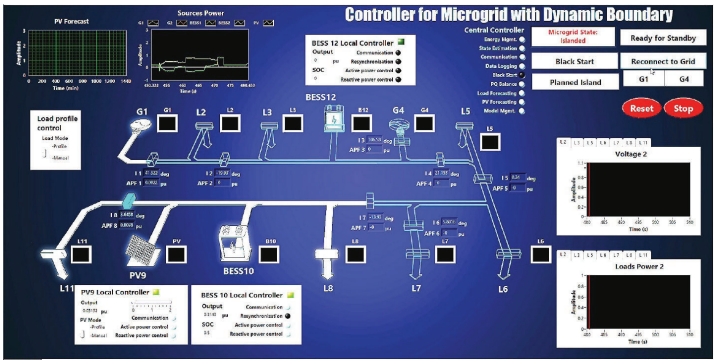
Demonstration Scenarios

North America Grid with HVDC Overlay



- Demonstrate security/stability assessment
- Demonstrate ability of HVDC overlay to provide continent-level coordination between the three grids: EI, ERCOT, WECC
- Evaluate high penetration (>80%) of renewables

Microgrid with Dynamic Boundary



- Demonstrate an actual microgrid in the Electric Power Board (EPB) system in Chattanooga, TN
- Test control schemes for black start, islanded operation, re-synchronization, system protection

Point of Contact

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