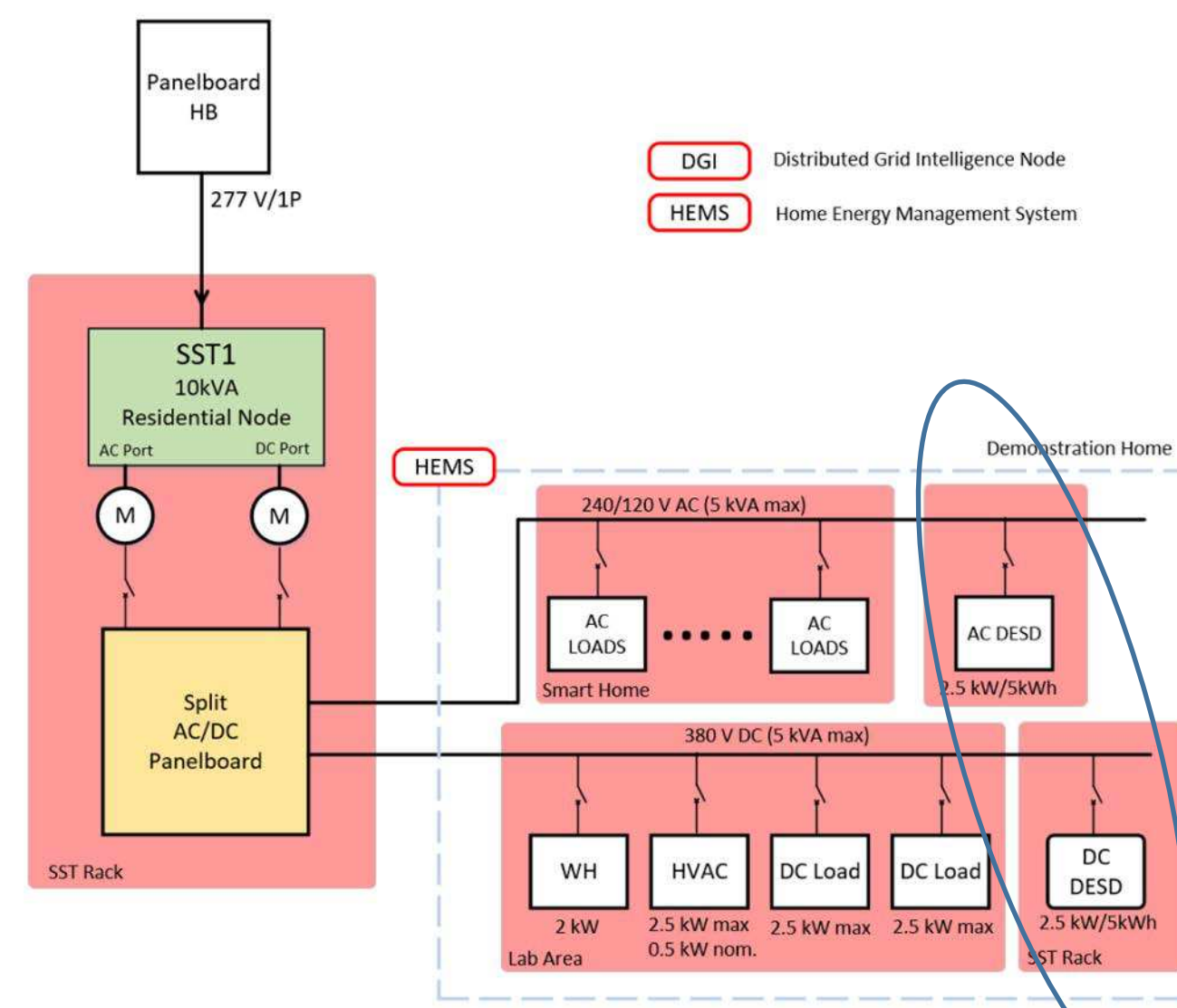


Overview



5kVA Current controlled AC and DC Energy Storage Devices connected to 120V split-phase AC port and 380V DC port of LV-SST respectively.

Y9 Objectives

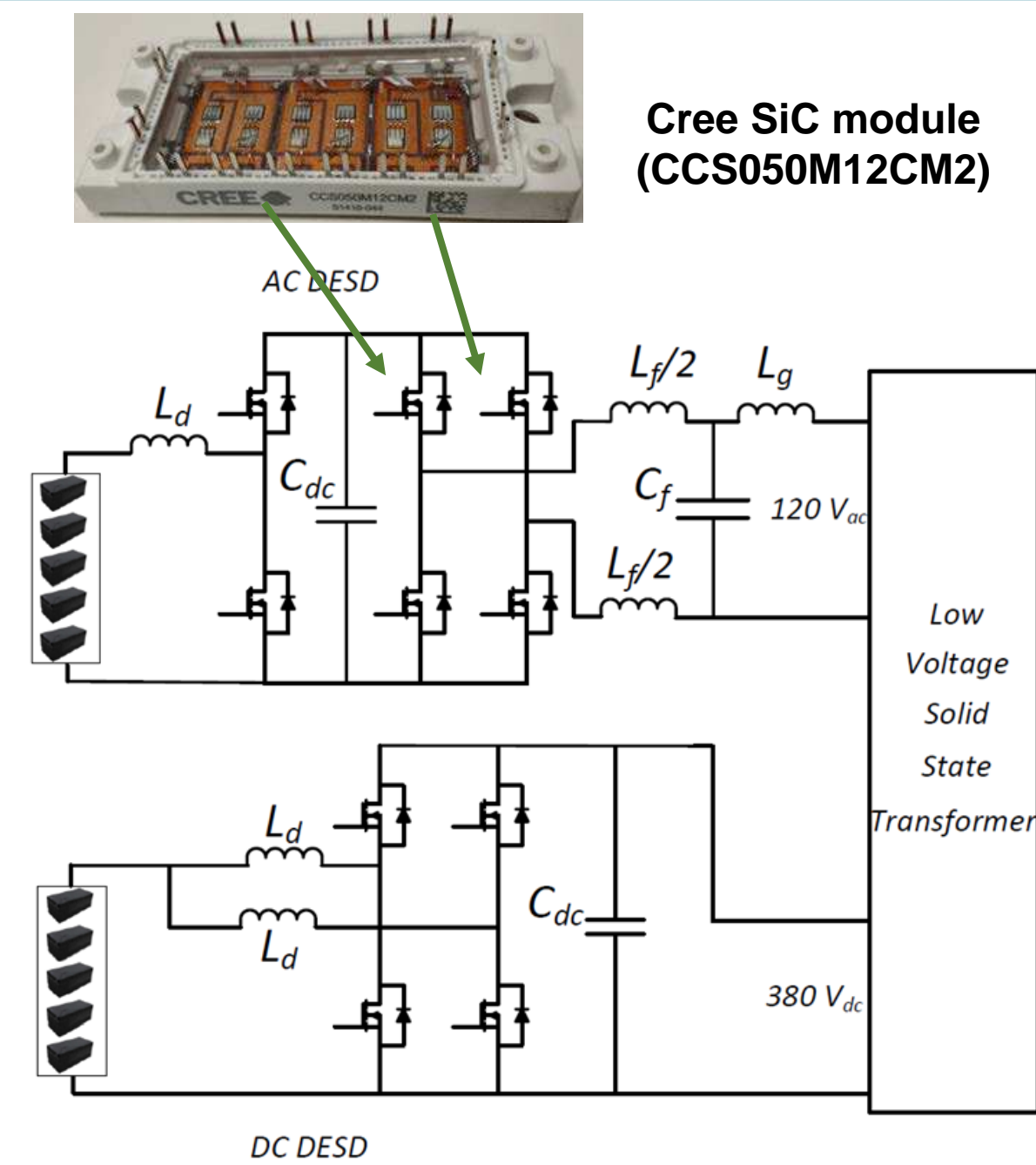
Standalone DESD Operation

- Design and build a 5kVA AC DESD and a 5kVA DC DESD with Toshiba LTO Batteries as the storage unit.

Integration with GEH Testbed

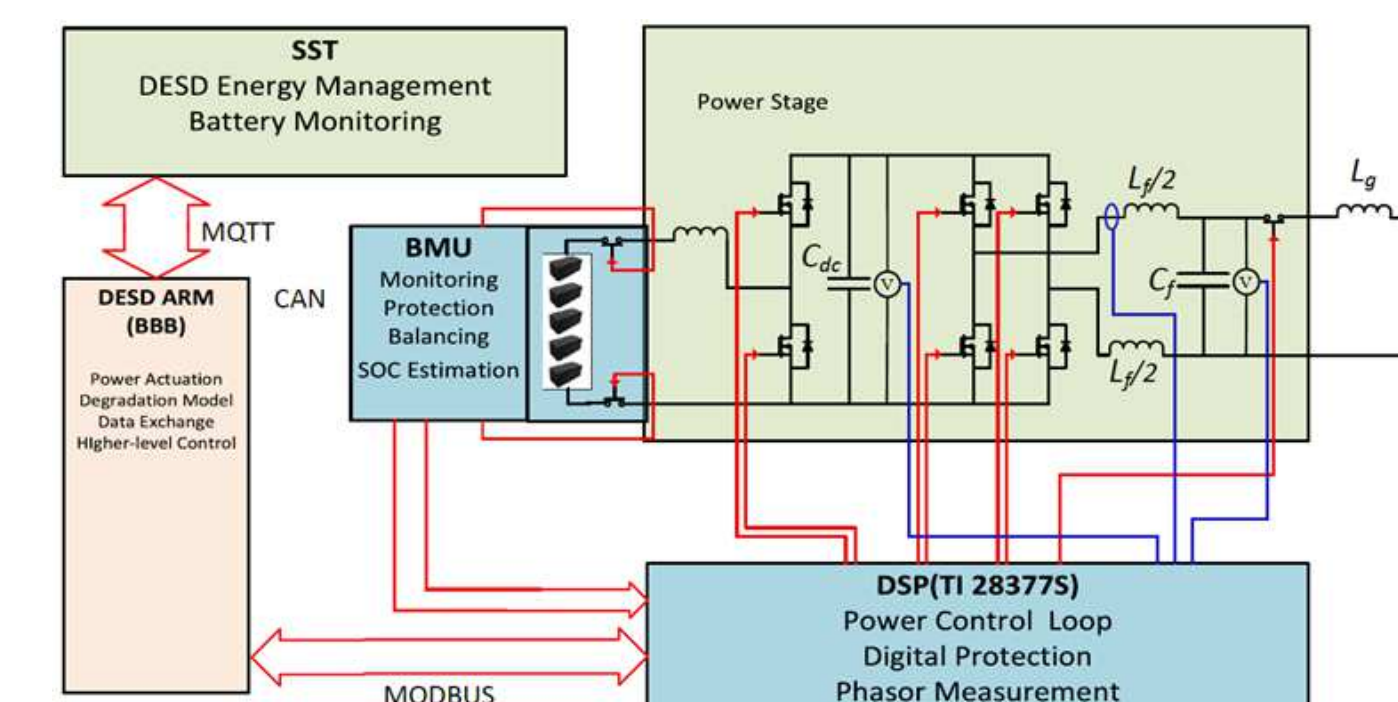
- Connect the DESDs with HEMS.
- Research the interaction between DESDs and Low Voltage-SST.
- Optimize home energy use with the help of DESDs.

Topology & Features



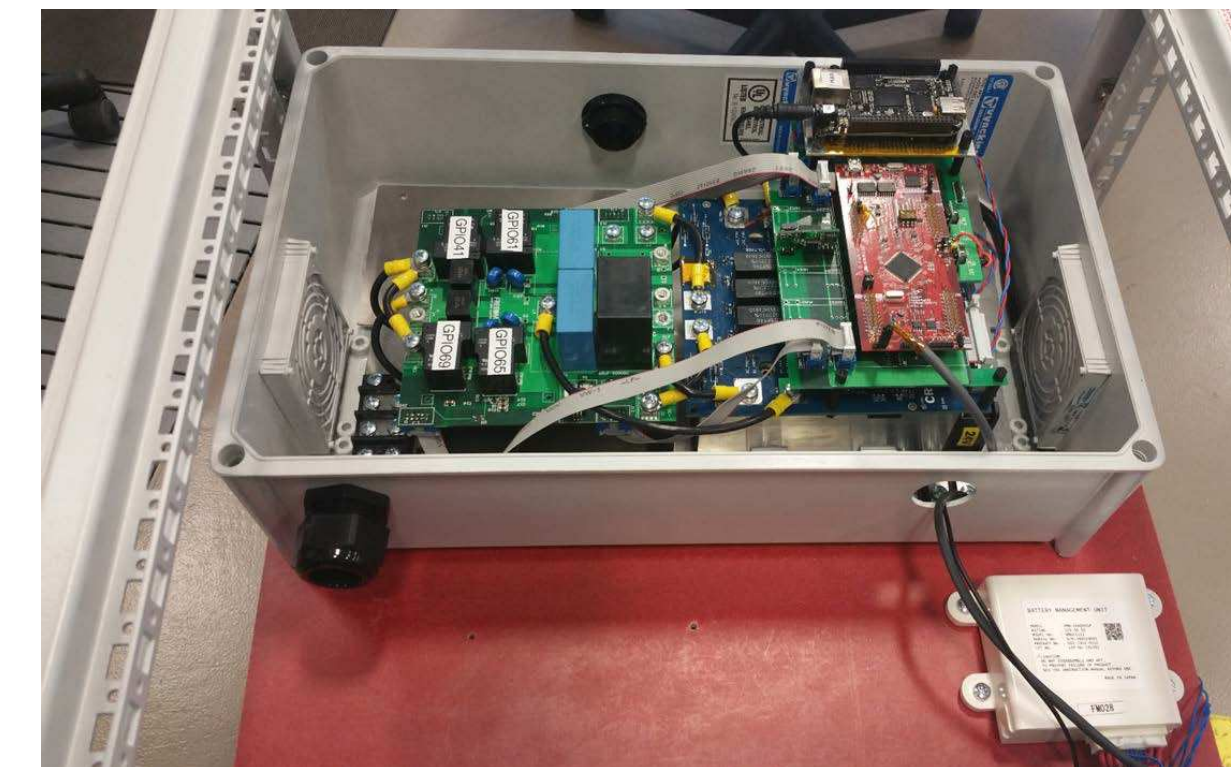
- Seamless charging and discharging.
- Black-start operation enabled.
- Robust controller to maintain proper operation during system-level integration.

Communication Protocols:



- CAN between BMU and local controller for protection and measurements.
- Modbus between the local controller and DGI for measurements and commands.
- MQTT between DGIs for higher level control algorithm implementation.

Hardware prototype



DC-DC Boost Converter Hardware in enclosure

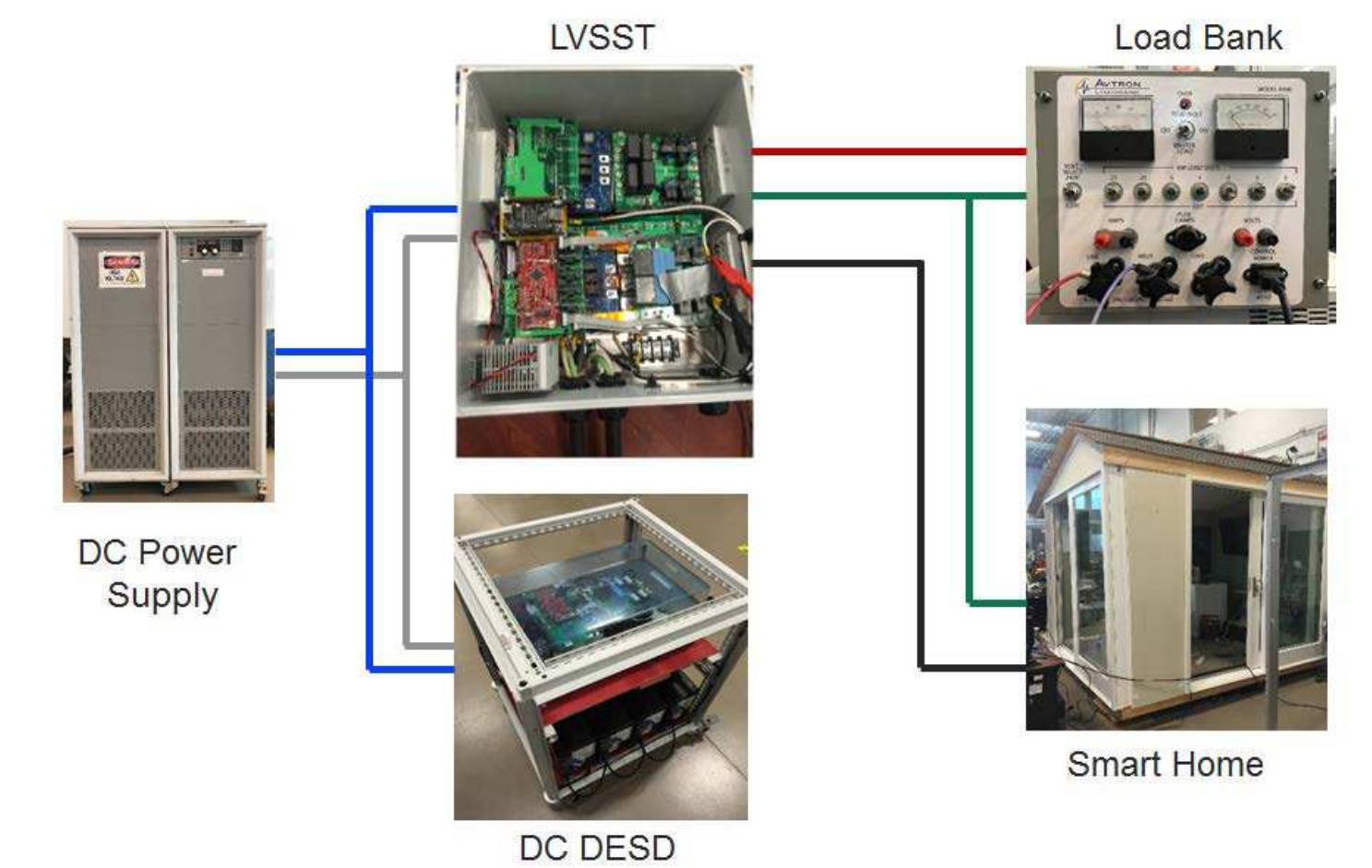


5 Toshiba LTO batteries connected in series with protection circuitry

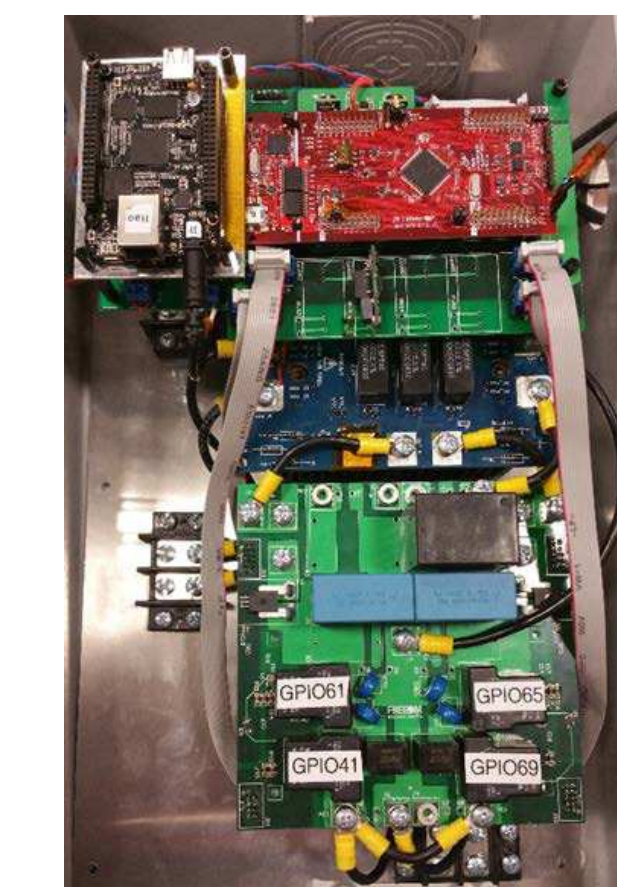


DESD System assembled into the rack

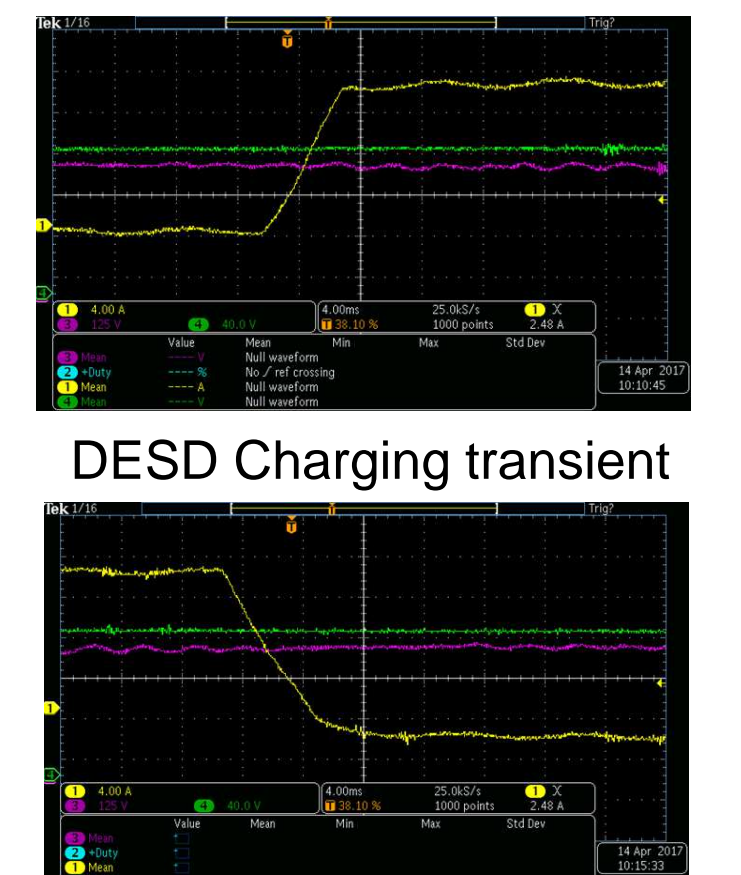
Integrated Test System



System emulating a microgrid scenario at test

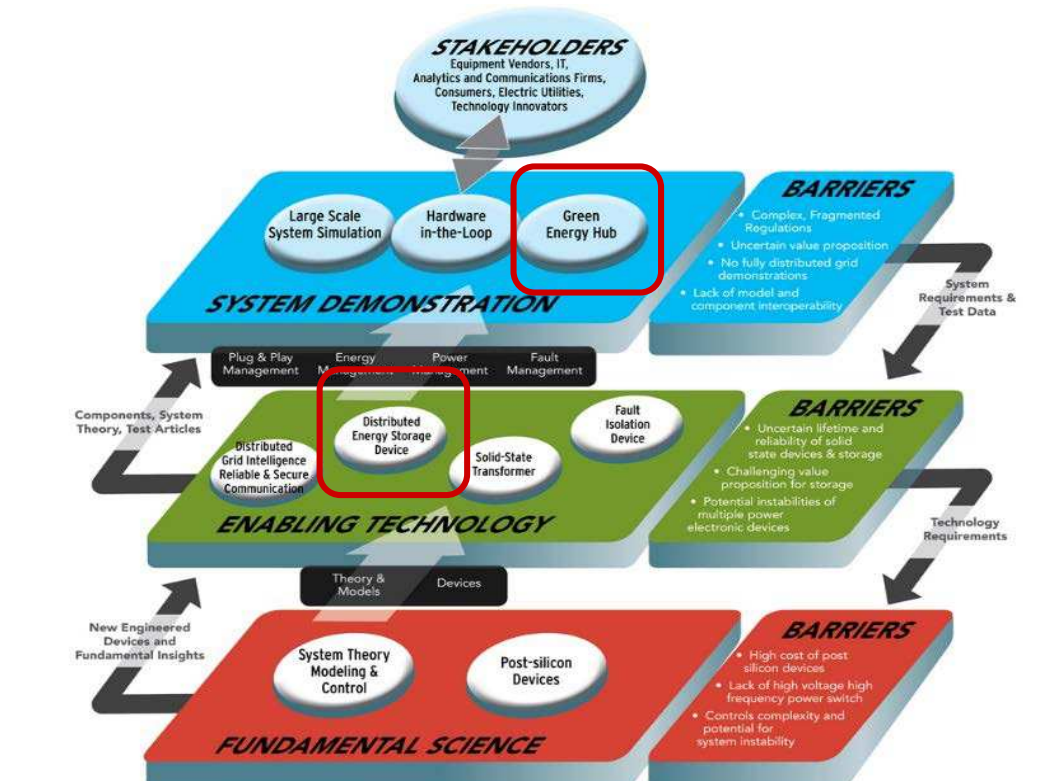


Boost Converter Hardware



DESD Charging transient

DESD Discharging transient



Partners

