OUANTA TECHNOLOGY

INNOVATIVE TESTING CAPABILITIES, PRACTICAL SOLUTIONS, AND CONSULTING SERVICES TO SUPPORT UTILITY AND ELECTRIC INDUSTRY PROJECTS

QT-STIL[™] Sustainable Technology Integration Laboratory Capabilities

Help utilities and vendors with finalizing design, development, prototyping and testing of Distributed Energy Resources (DER) integration.

Capabilities

Quanta Technology's laboratory provides innovative testing capabilities, practical solutions, and consulting services to support utilities and electric industry projects in the areas of sustainable energy integration and emerging technology evaluation and deployment. Our practical experience and deep understanding of various power system applications comes from involvement in the design, technology selection, field deployment and operational analysis of several state-of-art utility- and government-funded projects. Quanta Technology's experts have helped utilities and developers perform technical studies and real-time testing for proof-of-concept projects and implementation of functional specifications and control requirements in several innovative microgrid and advanced automation applications.

The Sustainable Energy Technology Integration Laboratory (QT-STIL) can help utilities and vendors with finalizing design, development, prototyping and testing of Distributed Energy Resources (DER) integration in the distribution automation systems, controls, communications, and operation. The aim is to move from the proof-of-concept design stage to proof-of-value performance evaluation of the integrated DER control and aggregation systems (renewable generation and energy storage) in a controlled lab environment.



PICTURED: QT-STIL laboratory services offer smart and flexible solutions with practical results for your business needs

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RTDS Testing at QT-STIL

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Real-time digital simulation (RTDS) is a real-time power system simulation platform for precise modeling and analysis of transient phenomena, utilizing simulation time close to the time frame of actual events. RTDS is primarily developed and utilized for Hardware-in-Loop (HIL) testing of protective relays, digital controllers, and process control devices for performance evaluation and pre-commissioning testing under close to real-world conditions.

Protective Relay Close-loop Testing

At QT-STIL, the RTDS testing facility together with its modeling and protective relay experts provide customers with the unprejudiced testing capabilities in the area of relay performance evaluation, setting validation, compliance testing, and communication interface testing. Quanta Technology can help utility, vendor, and consulting engineering companies:

- Create accurate and representative models of the power system components under study such as generators, transformers, transmission lines, DERs, serial and shunt capacitors, SVC and HVDC filter banks.
- Develop detailed test plans based on the protection systems/schemes to be tested, identify deliverables required from each participant, and detail the individual tests to be performed in the lab.
- Perform batch testing to permit analysis and troubleshooting efficiently. Quanta Technology has developed the tools necessary to allow expeditious review/analysis of the large quantity of data produced by the batch tests.

IEC 61850 Solution and Full-scope Testing of an IEC 61850 Substation

Quanta Technology, with advanced IEC 61850 testing facility and top expertise on substation protection and automation, offers a full range of services including interoperability testing, proof-of-concept testing, communication architecture design, system integration, functional testing, and system level testing. At QT-STIL, IEC 61850 is used for day-to-day testing of protective relays and DER controllers. Quanta Technology has the capabilities of developing customized system integration tools to help the deployment of an IEC 61850 station in an efficient and effective way.



Advanced Testbeds

Compliance Testing and Evaluation of Power Electronics Quanta Technology has built a multiple inverter testbed to evaluate and demonstrate advanced control and protection schemes and communication methods for remote control and dispatching of DERs, more specifically photovoltaic (PV) inverters and battery energy storage systems, for utility applications. The testbed is used to integrate various DER functions in distribution system operation, and evaluate smart inverter functions. We are able to perform integration testing of control and monitoring systems for multiple DER devices with different communication protocols (IEC 61850 GOOSE, SAP2, DNP3 and Modbus over serial or TCP/IP), incorporating PV and energy storage converters and relays.

QT-STIL Monitoring, Control, Communication, and Measurement

Advanced Automation System Testbed for Scheme Evaluation

Quanta Technology, through our RTDS-CHIL simulation and testing setup, offers a unique environment for evaluating various distributed automation applications such as integrated voltage and VAR control schemes (IVVC). As part of utility pilot projects, Quanta Technology has developed and tested unique design for IVVC to effectively coordinate the operation of all the voltage regulating devices on a circuit, such as load-tap changes (LTCs), line voltage regulators (VRs), switched capacitors, PV inverters, battery energy storage system (BESS), and any other power electronic devices with reactive power control capability (e.g., dynamic VAR controllers (DVC)).



PICTURED: Power hardware-in-the-loop (PHIL)



PICTURED: IVCC test bed



PICTURED: Smart inverter functional testbed



PICTURED: Electric-vehicle sub-metering accuracy testbed

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3



Simulators and Testers for Device / Application Performance Evaluation

BESSTI[™] Battery Energy Storage Simulator and Testing Instrument

BESSTI is a state-of-the-art device specifically designed for evaluation of the controls and applications of energy storage system (ESS). The unique and portable structure of BESSTI makes it an ideal tool for verifying the performance requirements of any ESS and facilitating the factory acceptance test (FAT), site acceptance test (SAT), and commissioning test. The tester also has the ability to act as a site controller or a battery management system (BMS) for new applications.

EVMT[™] Electric-Vehicle Meter Tester

EVMT is a cutting-edge device developed for sub-metering testing and validation of Level 2 AC electric-vehicle supplying equipment (EVSE). The traceable standard is one of the characteristics that makes EVMT distinctive from other devices available in the market. Due to the compact and portable design of the tester, the device can easily be transferred and utilized in any condition.

PEV-SIM[™] Plug-In Electric-Vehicle Simulator

Quanta Technology has developed a PEV simulator for evaluation of electric-vehicle charging and control infrastructure. Using our custom designed PEV simulators, we are able to simulate the charging effects of common electric vehicles such as the Nissan Leaf, the Chevrolet Volt and high-charging current of Tesla. Additional profiles can be easily uploaded to expand the tests to include prototype or hypothetical vehicles.





PICTURED: Portable BESSTI

PICTURED: EVMT testing unit



PICTURED: PEV-SIM simulator

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4