



IEC 61850

Leveraging IEC 61850 for Optimum Substation Reliability

The IEC 61850 standard defines the architecture for designing, integrating, and maintaining substation equipment for protection, control, and communications. The standard addresses much more than just communications protocol, which not only influences panel layout and communications design, but also impacts the fundamental engineering process. Quanta Technology understands how to leverage IEC 61850 technology to achieve optimum substation refurbishment, encompassing engineering processes, tools, application standardization, and advanced system engineering testing to ensure maximum reliability and IEC 61850 compliance.

Service Offerings

Quanta Technology provides tailor-made services, including:

IEC 61850 Strategy Development

- Vision, Strategy, Roadmap, and Business Case
- Technology Evaluation and Process Bus Application Impact Study
- Cross-Dep't Involvement: Deployment & Acceptance
- Protection & Control, Asset Management, Operations, Planning, IT/Communication, Cyber-Security

IEC 61850 Implementation Support

- System Design & Architecture
- RFP, Specifications, Vendor Evaluation, Project Support, and Processes
- Application Standardization

IEC 61850 Knowledge Transfer

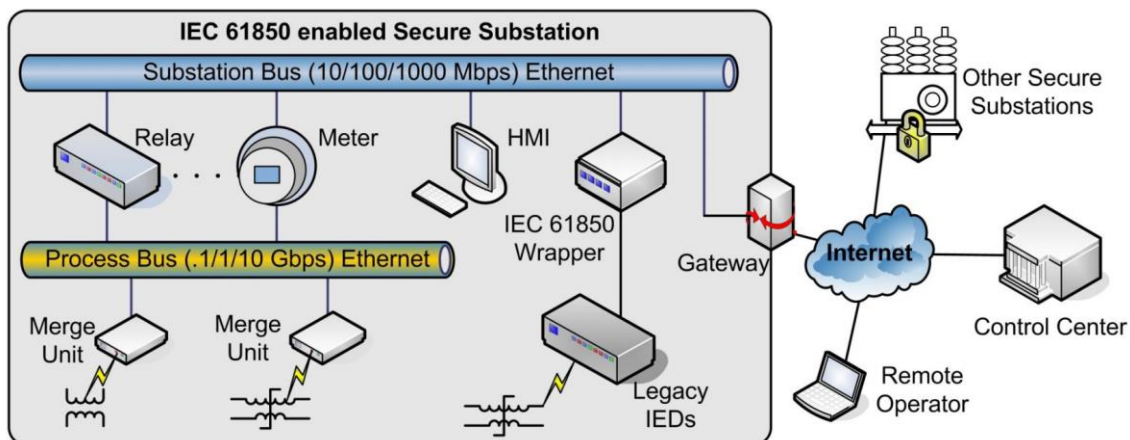
- On-site Training on the Basics, the Tools, Applications, GOOSE Messaging, Process Bus, and Mobile Mapping Systems (MMS) Mapping
- Communication, Network Design, and Security
- How to Build the Business Case
- Testing
- Hands-on Training on Selected Equipment

IEC 61850 Testing

- Single-Device Tests, Performance, Compliance, Tools, Calibration (PMU 90-2)
- System Design Tests: IEC 61850-based Protection System using the Quanta Technology RTDS Lab

Why Quanta Technology

Quanta Technology's experts have participated in the development of the IEC 61850 protocol since its inception in 1995, and through its absorption of EPRI UCA in 2000, to yield the single, international, multi-vendor standard for substation protection and data integration. As a starting point for utilities seeking to engage with IEC 61850, our engineers have a full understanding of the features, services, applications and risks, and can lay the groundwork for development of a plan for a field trial or practical utilization.





Single Standard Advantages

There are many advantages to the new IEC 61850 single standard:

- Provides a framework to describe all automation and protection functions of a substation
- Standardizes language and allows you to describe what you need to do
- Standardizes engineering based on vendor-independent function descriptions
- Ethernet-based GOOSE messaging
- Allows interoperability between different vendors
- Non-hardwired inter-device communication providing protection coordination

Long-Term Strategy

In order to optimize long-term return on investment for IEC 61850 integration programs, consider these elements:

- Technical roadmap to assist with vendor independent products/technologies, new regulations, paradigm shifts, and industry trends
- Cross-departmental involvement to improve deployment and acceptance
- Business case development to obtain financial and managerial support
- Implementation support for RFP/RFQ/RFI documents, evaluation, and project support

Automated configuration of networked devices from multiple vendors based on IEC 61850-6 substation configuration language (SCL) is just emerging. As the industry absorbs these developments, the standards-writing teams continue with new features and services including objects for new applications, such as hydropower plants, distributed energy resources (DER), and new communications applications reaching outside the substation to control centers and to other substations for protection applications.

Quanta Technology engineers are experienced in mapping data and information needs to unified substation integration architectures, including add-on systems and support of legacy systems.

More Than a Protocol

The IEC 61850 standard is so much more than a protocol for communications within substations. It is also an architecture applicable for external communications systems such as substation to substation, substation to control center, and distributed automation communications, as well as metering, electrical equipment condition monitoring and diagnosis, and intelligent electronic device (IED) to engineering systems communications.

IEC 61850 unifies requirements for vendors to supply compatible IEDs to ensure interoperability. Single device and system design testing are an important part of the engineering process in order to ensure conformance and interoperability.

About Quanta Technology

Quanta Technology is an independent technology, consulting, and testing company providing business and technical expertise, along with advanced methodologies and processes, to utilities and others in the power and energy industries. Our mission is to provide unparalleled value to our clients in every engagement across the value chain by using advanced software and hardware, laboratories, and custom tools for a holistic approach to practical service and the most insightful thought leadership in the industry.

For Additional Information Contact:

Northeast (USA) and Québec

Mike Longrie: MLongrie@Quanta-Technology.com

South/Southeast (USA) and Ontario

Diana Prkacin: DPrkacin@Quanta-Technology.com

Central (USA and Canada)

Evan Estes: EEstes@Quanta-Technology.com

West (USA and Canada)

Reza Nasri: RNasri@Quanta-Technology.com

International (outside USA and Canada)

David Elizondo: DElizondo@Quanta-Technology.com

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