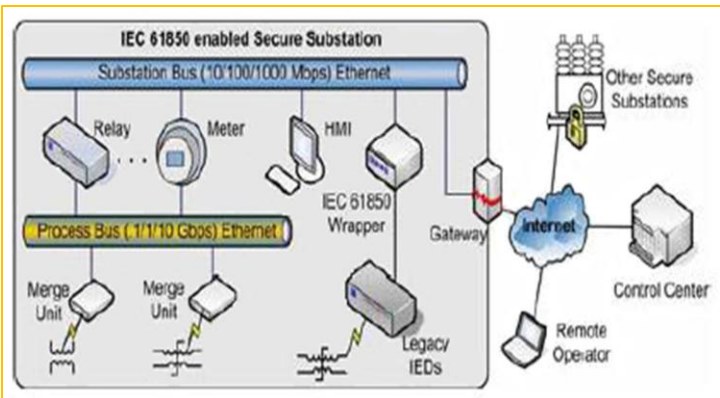


The IEC 61850 standard defines the architecture for designing, integrating and maintaining substation equipment for protection, control and communications. The standard addresses much more than just communications protocol that not only influences panel layout and communications design, but also impacts 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.

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 sub-station 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.

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 base, GOOSE messaging
- Allows interoperability between different vendors
- Non-hardwired inter-device communication providing protection coordination

Benefits of IEC 61850

- Hardware Savings & Improved Reliability
 - Reduction in substation wiring between relays
 - Reduction in panel hardware
 - Reduction in communications hardware
- Interoperability
 - Goal of IEC 61850 standard
 - Standard places vendors on a level playing field
 - Customers no longer locked into a single vendor
- Ease of Use
 - Object oriented software design approach
 - Drag-and-drop IED integration
 - Integrated software tools
- Time Savings
 - IEC 61850 standard places integration costs onto vendor
 - Purchasing variables are reduced to Price, Delivery and Support
 - Reduction in engineering time – Configure additional SS in ~2 hours
 - Customer are experiencing time and cost savings of 35% to 45%
- Reliability and Standards Based
 - Benefit from the experiences of an industry
 - Long term expandability
- Extensions to IEC 61850 and other standards are planned to address other utility applications:
 - Master stations
 - Power plants
 - Wind farms
 - Equipment condition monitoring
- Return on Investment
 - Migrate IED configuration information to future platforms via XML format
 - Long term expandability
 - Ability to integrate better with utility enterprise systems for applications like Asset Management and Equipment Condition Monitoring

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.

- IEC 61860 Strategy Development:
 - Vision – Strategy – Roadmap – Business case
 - Technology evaluation and process bus application impact study
 - Cross departmental involvements – Deployment & Acceptance
 - Prot + Ctrl – Asset management – Operations – Planning – IT/Communication – Cyber security
- IEC 61850 Implementation Support:
 - System design + Architecture
 - RFP – Specifications – Vendor evaluation – Project Support & Processes
 - Application standardization
- IEC 61850 Knowledge Transfer:
 - On-site training on the basics, the tools, applications, GOOSE messages, process bus, MMS mapping
 - Communication – Network design – 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

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 (hydro power plants, distributed energy resources) 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.

Quanta Technology, LLC provides expert-based management and technical consulting for utilities, heavy industry and related entities. Headquartered in Raleigh, NC, Quanta Technology has offices in the U.S., Canada and Europe and is a wholly-owned subsidiary of Quanta Services (NYSE: PWR), which employs about 18,000 people and is both the largest union contractor and non-union contractor for the electric utility industry in North America.

For further information regarding IEC 61850 Standard integration, please visit our website at www.quanta-technology.com or contact:

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