PlantQuest Case Study - SLD Studio

PLANTQUEST

Clarity & Control — Bringing single line diagrams to life for electrical safety and commissioning

PlantQuest's SLD Studio turned static drawings into a live, simulated model, allowing switching operations to be simulated before execution, whilst ensuring anyone on site can see what rooms and panels are energised and secured.

Data Center Campus Finland

The Challenge

The electrical system for the data hall is spread across more than 30 Single Line Diagrams. None shows the full picture, and nothing connects them leaving no practical way to see the state of the network as a whole, or what a switching operation would do to it.

- The live picture lived in people's heads. With energisation & commissioning running in parallel with ongoing construction, the live, isolated and secured status of the network changed daily.
- Switching could not be tested first. SAPs had no way to simulate the impact of an operation before carrying it out in the field. Decisions relied on experience and interpretation rather than a verified system-wide view.
- No single source of truth. Commissioning status, lock status and device state were tracked separately from the drawings that described them.
- Safety awareness stopped at the electrical team. Cleaners, fabric trades, logistics teams and visiting contractors cannot read an SLD, and had no dependable way of knowing if a room or panel was energised or not.

The Solution - SLD Studio

PlantQuest deployed SLD Studio which was adopted by the Electrical and commissioning teams. By connecting every drawing into a single simulation graph, SLD Studio provided the client with one continuous electrical model of the data hall. A change made on one drawing propagates across all other site drawings.

Each device carries its real operational state (Open, Closed, Secured, Racked Out), its commissioning status and level, lock status and type, and its room or panel location. Conductors and devices are colour-coded live by energy status, with device state rolling up to room or panel state. The interactive facility map highlights the areas that are energized and secured, with these been broadcasted to screens in every area and COLO — putting current conditions where the work is happening.

One Model, Four Ways of Working

The value of the deployment comes from a single connected model serving four very different groups at the same time.

1. Safe switching and isolation planning. Senior Authorised Persons plan and validate isolations in the model before execution. Breaker operations, switch isolations and secured states are simulated across the full network, so the consequences of a switching sequence are understood, not assumed.
2. Commissioning coordination. Commissioning status and level sit alongside device state and lock status on the same model, reconciling electrical reality with the programme in one view: what has been energised, what is secured, and what is ready to progress.
3. Lock and LOTO visibility. Locks are recorded against devices with their type — controlled or personal — making the isolation position visible on the diagram itself. Teams can see what is locked, and what remains safe but unlocked.
4. Room safety for the whole site. The state of the devices in a space determines the status of the space. Broadcast to screens in every area and COLO, this gives every worker on site — electrical or not — a clear read on whether a room is safe to enter.

The Outcome

- Switching is simulated, not assumed. SAPs and the commissioning team can change a device state in the model, see the full downstream and cross-diagram impact, and confirm the outcome before touching anything in the field.
- Impact assessment is immediate. What previously took significant time and expertise is now available at a glance — and to everyone who needs it, not only those able to trace an SLD.
- Electrical safety awareness extends across the whole workforce. Non-electrical teams can judge whether a space is safe to enter without reading a diagram.
- Information reaches the field, not just the office. Live views on screens throughout the site deliver current conditions at the point of work.
- Operational risk is reduced on a live, energised site where construction, energisation and commissioning run concurrently.
- The model outlasts the project. A structured electrical model carries forward from construction and commissioning into operations, and provides a repeatable framework that can be standardised across a portfolio of data centre projects.

Building on Success

Following the success of the deployment, PlantQuest is in discussion with electrical and commissioning teams on further data centre projects across Europe, building connected, visual, simulation-driven models for electrical safety and commissioning across the organisation.