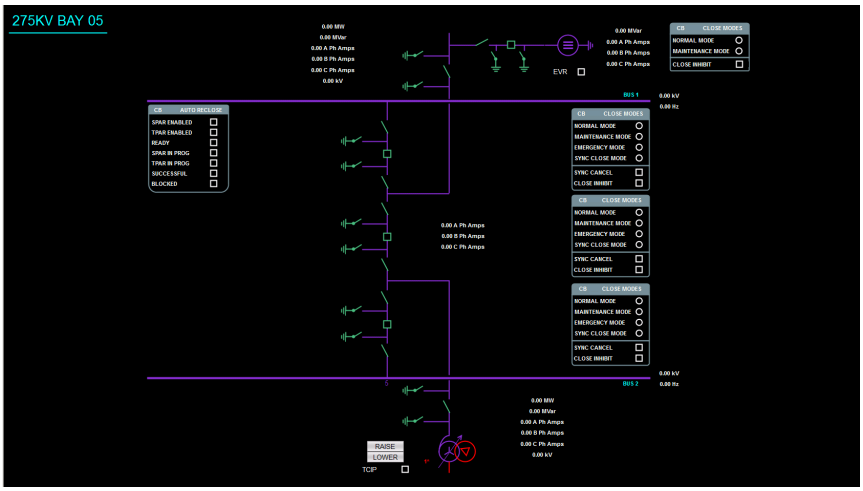
COPA-DATA energizes Powerlink Queensland's HMI systems

zenon is the power behind major upgrade project

Queensland's high-voltage electricity transmission network provider chose zenon to carry out a major upgrade to its HMI. COPA-DATA's commitment to 'parameterization instead of programming' enabled a cost-effective and highly-functional solution without the need for an expensive recommissioning effort.

Powerlink Queensland operates, develops and maintains Queensland's high-voltage electricity transmission network. The transmission network extends along almost half of Australia's eastern seaboard; it stretches 1,700km south from north of Cairns to the New South Wales border. It includes more than 15,000 high-voltage transmission circuits, 132 substations and employs over 1,000 people.

In 2011, it was identified that Powerlink's HMI platform needed replacing. The existing hardware had become obsolete and there was no simple solution for maintaining or expanding this



While immediately recognizable (by Powerlink) as an IEC 61850 design, it is similar in look and feel to the legacy systems.

platform. An alternative solution was required and an automated conversion process to a new HMI platform was needed.

At the same time, Powerlink needed a new HMI solution for its in-house IEC 61850 station bus system, which included protection, bay control, network, gateway, and HMI design, configuration and testing.

SELECTING ZENON AS THE CENTRAL HMI PLATFORM

Powerlink began evaluating HMI software in 2011 and selected COPA-DATA's zenon software as its preferred HMI solution. zenon was selected due to the:

- ease of engineering
- built-in IEC 61850 and DNP3 process drivers
- XML import/export of all design objects
- VSTA and VBA programming interfaces
- zenon Logic IEC 61131-3 capabilities

Powerlink also found COPA-DATA's close relationship with Microsoft an attractive reason to select zenon as its preferred HMI solution.

Powerlink Queensland's goal was to find a single HMI solution which would meet all of their requirements – both in terms of a replacement to their legacy system and as an HMI for their IEC 61850 station bus system.

A NEW IEC 61850 HMI SOLUTION

Powerlink's internal design standards team develops and maintains the secondary systems design standards. This enables Powerlink to take advantage of external design resources as required while ensuring a consistent design state-wide and maintaining internal design expertise. The new system needed to meet the team's requirements in terms of performance, control features and functions, alarms, events, security, user administration, remote access, internal logic and graphical display functionality as well as being cost-effective.

zenon's design capabilities have enabled a similar look and feel to the existing HMI solutions. With over 100 installations of the previous generation HMI, this was vital for Powerlink Queensland to ensure consistency and ease of use.

zenon has subsequently been used to visualize Powerlink's GOOSE isolation implementation, its station bus network and for monitoring the status of buffered reports on all server IEDs.

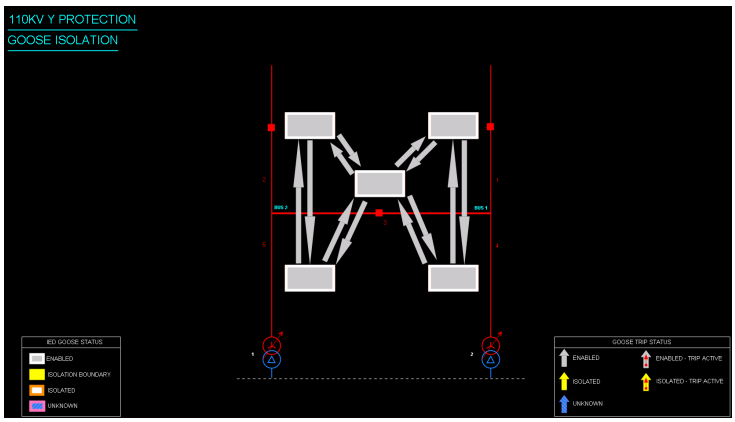
RAPID COMPLETION OF THE DNP3 LEGACY PROJECT

zenon also provided Powerlink with a fully-tested and automated way of converting from an existing, legacy and no longer supported HMI into a completely new platform without the need for a time-consuming and expensive recommissioning effort.

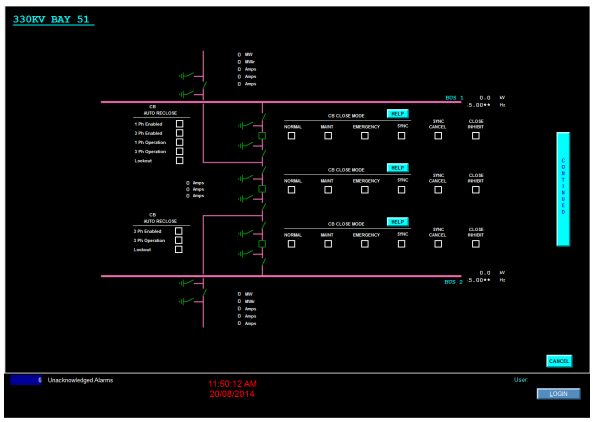
zenon is simple and quick to engineer, with many possibilities to automate design inputs. With basic automation, Powerlink has been able to reduce design time and the associated costs.

These time savings were achieved through a number of key zenon features:

- zenon's parameterization enabled the simple re-use of standard objects and functions with minimal engineering,



Remote access via Web Client has no difference to the local substation interface.



With little to no compromise, the converted legacy systems look and feel identical to the original system.

- the zenon Logic IEC 61131-3 interface to the zenon Runtime allowed for the simple emulation of functions that were specific to the legacy HMI, and the creation of new functions,
- VSTA allowed for the creation of simple import wizards that automated the import of files and project-specific settings using a proven, consistent process that required minimal user input,
- zenon's XML import/export for data points, screens, functions and alarm groups, facilitated simple process automation within rapid development timeframes and with high levels of consistency.

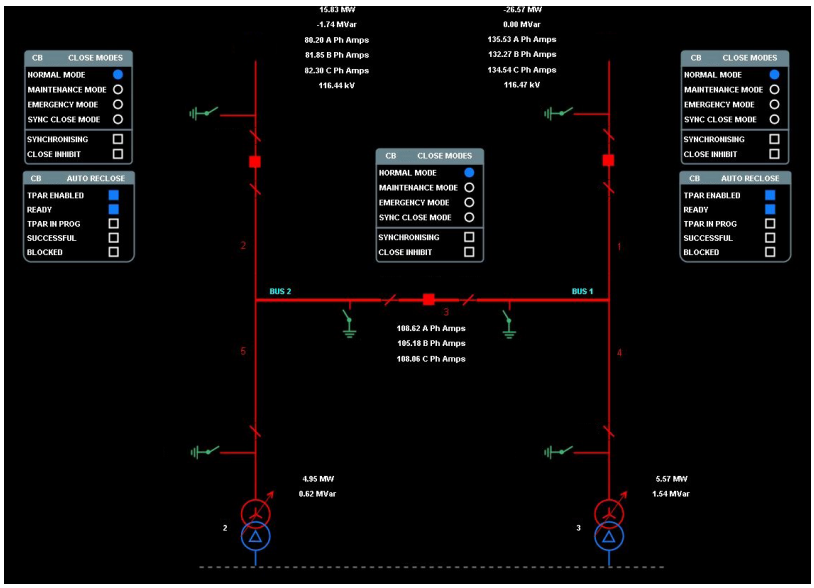
Powerlink Queensland can see these savings increasing further. Project and file management is simple and flexible, depending on the requirements. Local management of the Runtime files with or without the zenon Editor enables them to work to their current processes. Remote project and file management options provide them with scope to streamline their processes as confidence with the product and surrounding infrastructure grows. They will no longer need to send two people driving for six hours to a remote site to make minor changes or fix defects as these can now be performed remotely. This would potentially provide cost savings, allow resources to be used elsewhere and have obvious safety benefits.

A SINGLE, EFFECTIVE SOLUTION

In addition to the individual requirements of each project, both applications had to support:

- running the Runtime on a virtual machine,
- local access (within the substation) to the Runtime visualization with a Thin Client (WYSE terminal) via substation LAN,
- remote access to the Runtime visualization over WAN,
- automatic daily exports of events in a text format,
- automatic activation of external audible alarm when a new alarm is generated,
- project comparison utilities to identify the exact changes between projects so a complete scope of work for testing/retesting can be established,
- project change logging capability to provide complete audit trail of project development,
- diagnostic tool to investigate communication errors.

Finding a single HMI solution which could meet these common requirements and both sets of project requirements will be a huge advantage for Powerlink Queensland. Choosing zenon allowed them to settle on a single product for both their new IEC 61850 systems and legacy DNP3 systems. This has reduced the incline of Powerlink's learning curve, enabled rapid project delivery and saved money. With the legacy systems, their choice to use zenon has avoided the need for recommissioning, redesign and outages.



Powerlink's first in-house developed, designed, tested, and commissioned IEC 61850 station bus solution.

A GREAT PARTNERSHIP

Over the course of the project, Powerlink identified some areas where some of zenon's existing drivers were not able to fulfill in full the application requirements. In response, the COPA-DATA support team provided a driver update for the zenon IEC 61850 driver and an enhanced DNP3 driver within a short period. This close collaboration and the support provided to date by COPA-DATA has been well received by the Powerlink team.

COPA-DATA TECHNOLOGY IN USE

- zenon Energy Edition
- zenon Logic
- Web Server
- Web Client
- Drivers: IEC 61850, DNP3, SNMP
- Gateway: OPC UA Server, DNP3 Outstation, IEC 61870 Slave, Modbus Slave, SNMP Server/Agent

ONE HMI FOR ALL APPLICATIONS

- Simple, flexible engineering which reduces costs of development and enables rapid project delivery
- Concise visualization for screens including: high-level substation line diagram, voltage-level line diagram, switching plant and bay-specific visualization, device health summary overview and secondary system connectivity.
- Supports multiple instances of DNP3 including combinations of Serial and IP
- Automated conversion from the database format of the legacy system to the zenon database format
- Automated conversion of SAMMI screens to equivalent zenon screens, functions and frames
- Reuse of standard symbols from the legacy HMI
- Supplemented by standard symbols in zenon (circuit breakers, isolators, earth switches, etc.)
- Provides essential control functions and operator feedback
- Alarm, event and off-normal displays, including link to external audio alarm.