



A Rockwell Automation Company

TeckCominco – Trail Operations DNP 3.0 SCADA Interface

The Client:

TeckCominco's Trail Operations are the world's largest fully-integrated zinc and lead smelting and refining complex. Production capacities are approximately 300,000 metric tons/year of zinc and 120,000 metric tons/year of lead. The Trail complex is also a significant producer of silver, gold, indium, germanium, bismuth,

and copper products, including copper sulfate and copper arsenate. Trail also produces a large volume of sulfur products including ammonium sulfate fertilizer, sulfuric acid, liquid sulfur dioxide and elemental sulfur.

The Requirement:

Power for the metallurgical operations is generated by the company's Waneta Hydroelectric Dam located nearby on the Pend d'Oreille River. Surplus power is sold to U.S. customers via a company-owned transmission line that is tied to the US power grid. This access to the grid is provided through Utilicorp Networks Canada who are also contracted to operate and maintain the Waneta dam for TeckCominco.

Part of the delegated consumption of power by the process facilities is a 10 megawatt "buffer" for use by the

Electrolytic and Melting Plant (E&M Plant). This 10 MW buffer is set aside by Utilicorp and is made available to Cominco to deal with any fluctuations in operation. The buffer is quite large as Utilicorp has no indications of power consumption and must provide for the worst case scenario to ensure they will not upset production. This setting aside of 10 MW for possible use by the plant is lost revenue that could be sold on the power grid. If it were monitored more closely the buffer could be reduced in magnitude thereby freeing up more power for export.

The Design Solution:

In order for Utilicorp to reduce the power buffer it needed to have a way of tracking power consumption to determine how much power would be available for resale. The problem is that the Utilicorp Communication Network is not directly tied into the TeckCominco Plant Communication system, and the communication protocols are different.

The solution was to physically tap into the Utilicorp network which runs through the on site firehall at TeckCominco. The network is in place for safety reasons in order to allow both parties to monitor critical safety systems. The Utilicorp system is a Quindar Scada System which supports the use of the DNP3.0 Protocol. In order to connect to their Scada system Hinz tapped into the Utilicorp Network Switch in the firehall with a single device server from Lantronix. The device server converts the signal transmission from 10BaseT Cat 5 connection to Serial DB25.

From the DB25 connection Hinz installed an asynchronous modem from Blackbox which would convert the outgoing signal for transmission over Half Duplex 62.5 Multimode Fiber cable to the E&M plant (approx 1 km away). Once the fiber enters E&M it is then

converted back to serial cable through the use of another asynchronous modem. This serial cable is then connected directly into a Modicon Quantum 434-12 Programmable Logic Controller to the first modbus port on the processor.

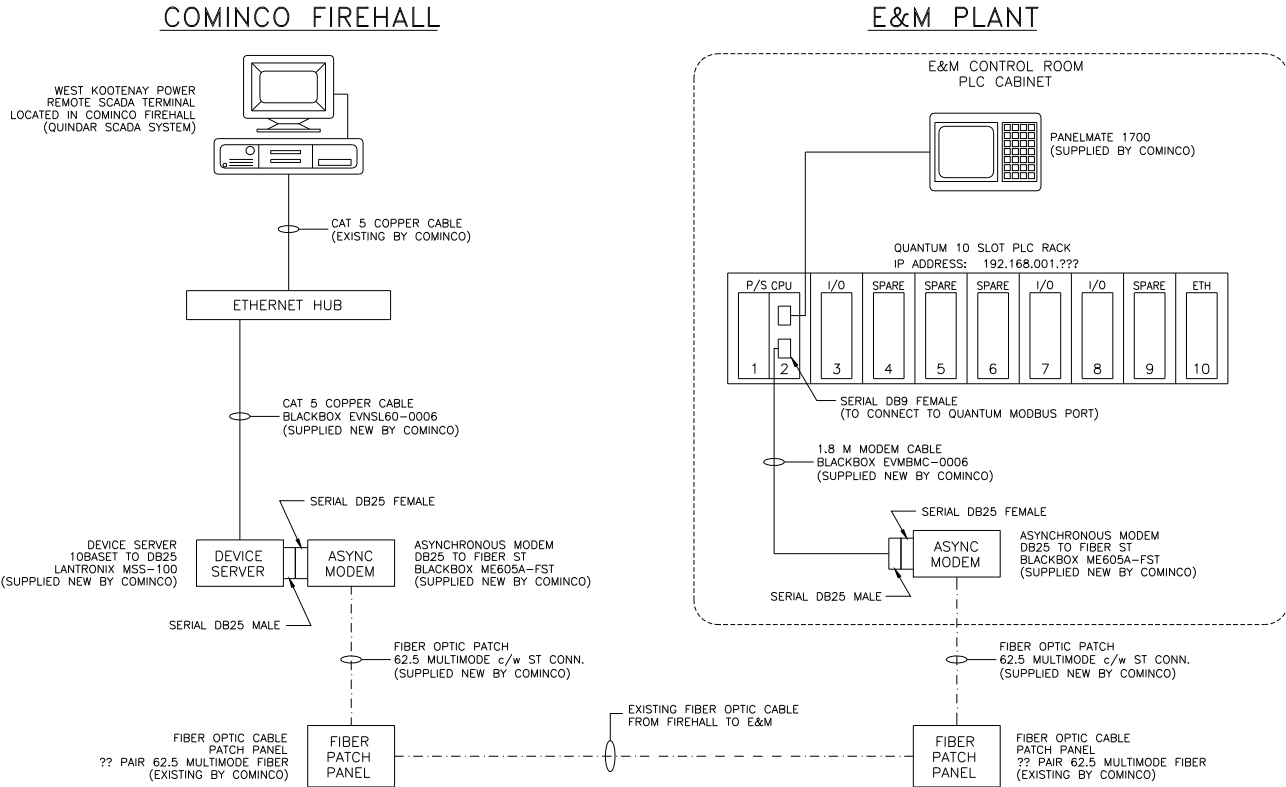
The Quantum PLC is able to communicate to the Quindar system through the use of third party gateway DNP3.0 software from Novatech. The Novatech Software provides the ability to connect port 1 of a Modicon Quantum PLC to a DNP 3.0 master station. The PLC acts as a single DNP 3.0 RTU with regard to the master station. At the same time, the PLC maintains all of its standard functionality, such as I/O, Modbus Plus communication (for PLCs that have a Modbus Plus port, (xx5), ladder logic, etc. The mapping of the DNP 3.0 points and addresses to the PLC is done in ladder logic using Concept Ver2.5 and 984 language.

Once initialized by both Utilicorp and TeckCominco, the control center at Utilicorp was able to retrieve power consumption data from the E&M Plant and control their power demands more accurately. This then enabled them to reduce their 10 MW buffer to a 1 MW buffer, thereby releasing 9 MW-hours for sale on the power grid.



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System Specifications:

- Modicon Quantum 434
- Blackbox Asynchronous Modems
- Lantronix MSS-100 Device Server
- Quindar Scada System
- Novatech DMP3.0 Loadable Software

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com