TechTalk

2013 UTILITY TECHNICAL SYMPOSIUM SERIES

This year's focus will be customer application papers and tutorials on Cyber Security, IEC 61850, IEC 61131-3, PRC-002 Recording and web-based SCADA and HMI. Certificates will be provided to attendees for the non-commercial application and training portion of each symposium; typically four to six hours.
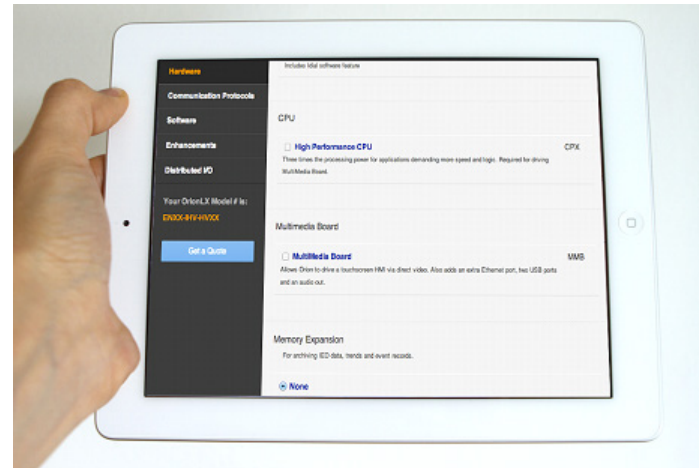
Mark your calendars for these symposium:
August 13 @ Lakeland, FL / **Sept 19** @ New England
Sept 24 @ Golden, CO / **Oct 10** @ Owings Mills, MD

Register for these and all events and classes online
http://www.novatechweb.com/events/

LATEST SOFTWARE

Orion5/5r Firmware Version: 1.41.0

OrionLX Release: 7.6

Orion NCD3 Version: 3.24

Bitronics M87x firmware: 4.03

Bitronics 70 Series Configurator: 4.02

Bitronics M57x firmware: 3.09

Bitronics 50 Series Firmware: 3.08

BiView: 3.03

Is that an OrionLX RFQ on your iPad?
Yes. Yes it is.

The popular "Build Your Orion" feature on our website is now available for offline use on your iPad in the App store.

http://www.novatechweb.com/ipad

Cochran Marine, OrionLX and Bitronics - Automated Shore Power

Cochran Marine Cable Positioning Device

Cochran Marine has been delivering Automated Shore Power Systems to cruise ships for nearly a decade. Ports up and down the North American West Coast are benefiting from the Cochran Marine Shore Power System. Seven systems are currently in operation, with two more port cities on the east coast scheduled to be online by 2014. With the recent incorporation of a frequency converter into its standard line-up, the Cochran Marine Shore Power System is now a global solution, able to be implemented anywhere ocean-going vessels dock.

Shore-side monitoring systems utilize protection relays and NovaTech equipment, as well as redundant safety systems, to ensure the safety of ship and shore electrical systems. Once connected, all of the ship's systems run on shore electricity instead of its diesel engines, virtually eliminating fuel emissions from the ship while in port.

What is Automated Shore Power?
Shore power systems, or cold ironing, serve the cruise ship and sea transportation industries by reducing/eliminating harmful emissions while in port. When an ocean transport vessel equipped to receive shore power docks in port, Cochran Marine's uniquely designed automation system determines the proper operating parameters. The shore-side operator simply selects the ship to be connected and the Cochran Marine Shore Power System does the rest.
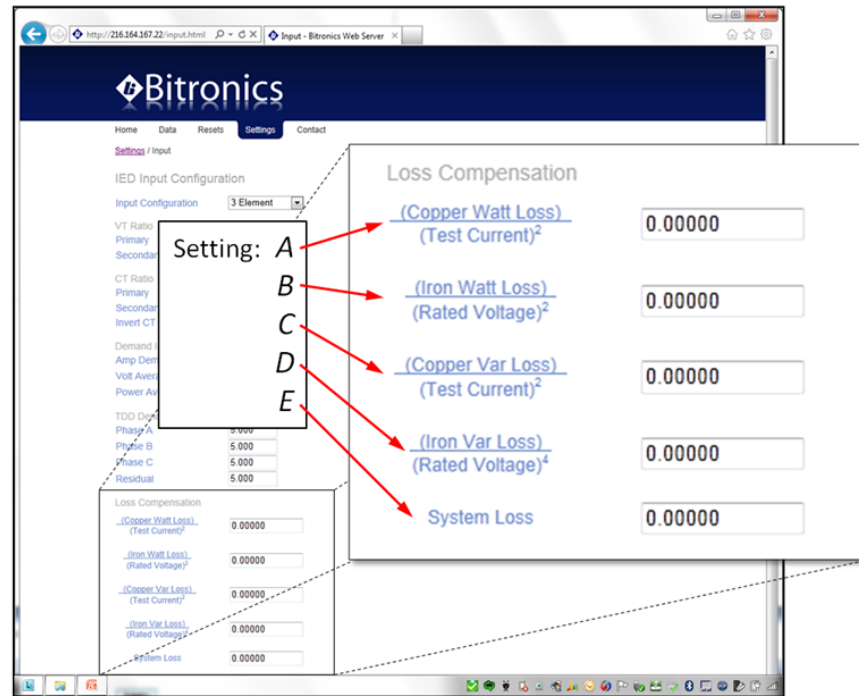
Five flexible power and control cables are lifted by a specially designed Cable Positioning Device (CPD) and connected to the ship's electrical system through marine-standard plugs and sockets. Based on the ship's specific voltage requirements, power is transferred to the ship and synchronized through a closed transition process monitored and controlled by the ship's systems.

NovaTech's Part
At the Port of Vancouver, NovaTech equipment plays a number of roles. The OrionLX monitors data values to be able to facilitate a safe and smooth transition from ship diesel power to shore (grid) power. Part of this process is automated using OrionLX Math & Logic but allows the operator full control of the breakers, thereby retaining control of exactly when the ship/shore transfer takes place. The OrionLX also collects data from Bitronics instruments which provide fast and precise electrical measurements, fault records, event records, and trend logs. These data are saved to the OrionLX's internal database and then used to generate usage reports which are emailed out from the OrionLX to the user.

Key Features:
- **Monitoring**: Orion collects data from IEDs, and in the future will serve as RTU, providing data to the SCADA/Ship Control Room.
- **Local and Remote Visualization**: Orion serves out customized web pages to HMI.
- **Interlocking and Control**: Orion checks voltage interlocks and sends commands to protective relays to change setting profiles.
- **Communications Processing**: Orion provides AcSELerator® passthrough access to SEL®relays.

Concurrently, the shore-side automation system maintains a precise record of the ship's power consumption for monitoring purposes.

Cochran Marine Shore Power Switchgear

Corporate Communications
11500 Cronridge Drive, Suite 110
Owings Mills, MD 21117

NovaTech®

Bitronics Adds Loss Compensation to 50 Series SCADA Meters

TLC/LLC Configuration in M65x via web interface

Q_{COM} Compensated three-phase Total VARs. Note the accumulators for +kVARh and –kVARh in the M650 are calculated by integrating the Q_{COM} measurement over time.

Q_{UNC} Uncompensated three-phase Total VARs measured at the point where the meter is connected.

I RMS line current measured at the point where the meter is connected.

V RMS line-line voltage measured at the point where the meter is connected.

A Meter setting that accounts for the sum of the full-load-watt-losses from all sources.

B Meter setting that accounts for the transformer's no-load-watt-losses.

C Meter setting that accounts for the sum of the full-load-VAR-losses from all sources.

D Meter setting that accounts for the transformer's no-load-VAR-losses.

E Meter setting that accounts for any "system" losses, proportional to the uncompensated power.

Bitronics 50 Series SCADA meters (M3 models) now include, in firmware v3.08, calculations for transformer and line loss compensation (TLC/LLC) providing compensated energy values (KWh and KVarh). Both compensated and uncompensated power values are provided for testing, and energy values can be reset to something other than zero to match billing meters. These loss compensation calculations provide a point of delivery measurement for substation operations at tie points where adding extra metering is difficult.

The Total Watt and Var losses can be calculated using five user entered parameters and measured current and voltage values. These losses are added or subtracted to/from the measured Total Watts and Total Vars when accumulating Energy.

Loss compensation on the M650 takes the following general form:

$$P_{COM} = P_{UNC} + A\bullet I^2 + B\bullet V^2 + E\bullet P_{UNC}$$
$$Q_{COM} = Q_{UNC} + C\bullet I^2 + D\bullet V^4 + E\bullet Q_{UNC}$$

Where:

P_{COM} Compensated three-phase Total Watts. Note the accumulators for +kWh and –kWh in the M650 are calculated by integrating the PCOM measurement over time.

P_{UNC} Uncompensated three-phase Total Watts measured at the point where the meter is connected.

Configuring the meter to perform loss compensation simply requires the user to calculate the coefficients *A, B, C, D,* and *E* defined above, and enter them in the appropriate fields in the M650's web interface on the Settings/Input page as shown in the screen shot (left).

The *sign* of the settings *A, B, C, D,* and *E* determines whether losses will be added to or subtracted from the uncompensated measurements in order to determine the compensated power and energy. To add losses, be sure the settings are all positive. To subtract losses, be sure the settings are all negative. Settings should always have the same sign. Making all of the settings equal to zero turns off loss compensation.

System losses (*E*) are a fixed percentage, mutually agreed upon between two electric utilities, about an interchange point that lies on a branched line. As such, *E* is not a physical property of any particular line, transformer or the meter, so no further guidance on how best to calculate the coefficient *E* can be provided here. Users who do not intend to use system losses should simply set E equal to zero.

A detailed application note on loss compensation in the 50 Series, as well as a spreadsheet to assist in calculating the coefficients, can be found in the documentation library of the NovaTech website, www.novatechweb.com. And for a live overview, check out the webinar.

Webinar:
"Loss Compensation in 50 Series SCADA Meters"
July 23rd, 2013; 12:30 - 1:30 (EST). Register online:
http://www.novatechweb.com/events/

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www.novatechweb.com

LDAP Centralized and Remote Authentication for OrionLX

The Lightweight Directory Access Protocol (LDAP) is an application protocol for accessing and maintaining distributed directory information services over an Internet Protocol (IP) network. LDAP enables OrionLX user passwords and privileges to be set up on an enterprise server – instead of in the OrionLX – to simplify password management. Note that before LDAP can be configured in the OrionLX, the System Security Services Daemon (SSSD) package must first be installed in the OrionLX. Because the SSSD package requires a large amount of internal OrionLX memory, the High Performance OrionLX CPU (-CPX) is recommended.

1. User physically connects to Orion and makes access attempt.

2. Over an encrypted link, Orion connects to Active Directory Server to check user credentials and access group.

3. Checks made. Access OK.

4. "Connection OK" and level of access determined from Active Directory Server.

5. Connection established and level enforced. Access information logged.

Figure 1 (below) summarizes how the OrionLX interacts with the enterprise server when a remote substation user attempts access to an OrionLX in the substation.
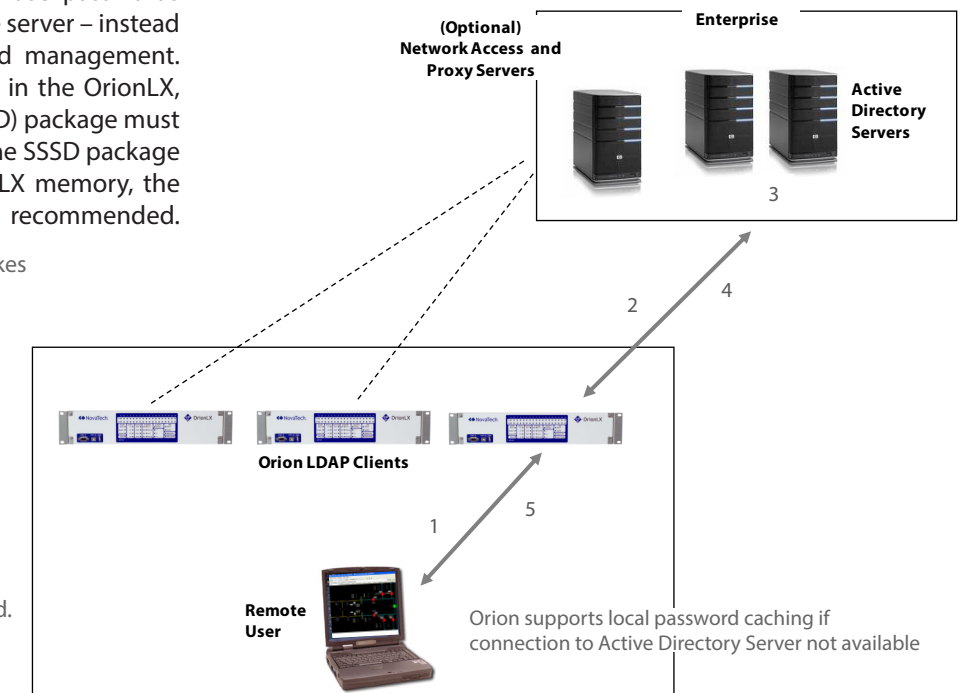

Figure 1. Remote user access attempt with LDAP

Did You Know?

You can use SEL® Fast SER points in OrionLX SOE (Sequence of Events) reports. "Fast SER" points are time-stamped discrete SER (Sequence of Events Recording) points generated by SEL® relays. When equipped with the SEL Master protocol, the OrionLX can capture these Fast SER points when they are automatically generated and sent out from the relay. Orion can archive these Fast SER points, along with other time-stamped points from DNP3 IEDs using the AAR (Alarm-Archive-Retentive) module and present all in a contiguous SOE report.
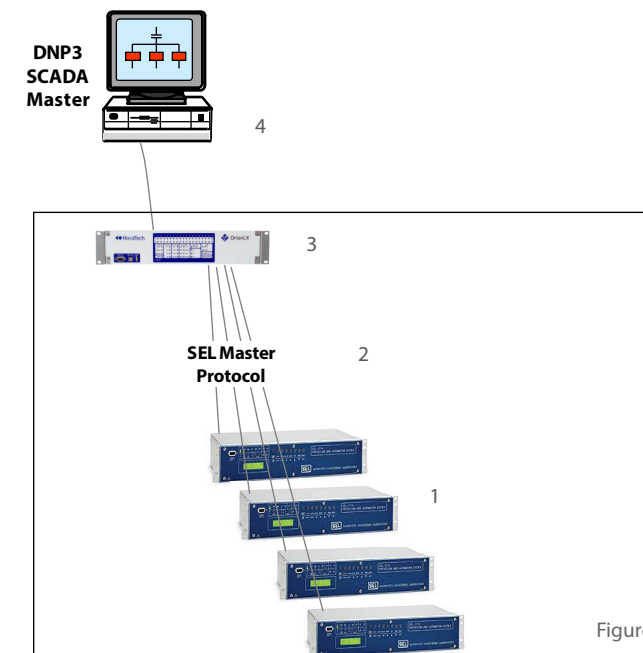
You can convert SEL Fast SER points to DNP3 points and send to SCADA. Orion can also convert Fast SER points to time-stamped DNP3 points and present to SCADA. The protocol to capture Fast SER points is included in the OrionLX SEL Master Protocol (code #14) which also supports protocols for Fast Meter, Fast Operate and SEL ASCII. The retrieval of Fast SER points is interleaved with other SEL protocol commands over a single physical serial connection. Figure 2 (left) summarizes how SEL Fast SER points are processed.

Figure 2

1. Fast SER-capable relays place time stamps on discrete events.

2. OrionLX captures unsolicited time-stamped FastSER events sent out from relays.

3. OrionLX archives Fast SER points along with time-stamped DNP3 points to create SOE reports.

4. Orion converts Fast SER points to time-stamped DNP3 points and presents to SCADA.