



Orion Automation Platform



Typical Applications



Orion Smart RTU

The Orion Automation Platform can be configured as a “Smart” electrical substation RTU. Equipped with SCADA and IED communication protocols, modular communication cards and software features, Orion can obtain nearly all of the discrete and analog data from Intelligent Electronic Devices (IEDs) and present it to one or more SCADA masters. Rugged Orion Distributed I/O modules are available to connect to inputs and outputs not available from IEDs.

Orion Smart RTU Software features include:

- ◆ Support of multiple SCADA Masters – up to six in one western installation – enabling one Orion to serve as multiple virtual RTUs
- ◆ Integrated Local / Remote to ensure operator safety
- ◆ Redundant DNP3 Ethernet/serial communications for critical applications
- ◆ Primary/Backup IEDs to enable points to be alternately read from two sources without affecting SCADA

Orion Secure Substation Gateway

The OrionLX and Orion5rL models are equipped with powerful security features, including user password groups with varying privileges, firewall, secure protocols, key management and logging – all engineered to meet or exceed emerging NERC CIP requirements. This secure Orion front end can replace expensive secure routers and firewalls.

Orion Math and Logic Controller

Orion offers a toolkit to logically and arithmetically manipulate any data point retrieved from any IED, adding intelligence to alarming schemes and reducing the need to process data downstream. The optional Orion LogicPak module provides five preconfigured logic operations: And, Or, Negate, Primary-Secondary, and LocalRemote. Configuration is accomplished using drag-and-drop without any scripting.

Orion Distribution Automation (DA) Controller

The Orion DA Logic option enables Orion to function as an independent DA Controller in a single or multi-feeder, single or multi-substation Distribution Automation (DA) System. Orion DA Logic polls substation IEDs and feeder-mounted IEDs for system information, analyzes the data, and initiates trip-close commands to isolate permanent faults and restore service to unfaulted feeder sections.

Orion Relay Communication Processor

Orion offers “port switch” and “communication processing” features to enable engineers and asset managers to directly access critical data from protective relays, recorders and monitoring equipment, including: relay settings, fault records, oscillography records, and breaker and transformer health. Orion offers keystroke-by-keystroke emulation of SEL® communication processors.

Orion Local Substation HMI

Orion WEBserver provides web-based visualization of substation data via a standard web browser. Users can create custom screens to display animated substation one-line diagrams, alarm summaries, sequence of events records and trends. Password-protected drill-down screens can also be set up to control breakers, view IED data and pass through to IEDs.

Orion Sequence of Events Recorder and Alarm Annunciator

The Orion Alarm/Archive/Retentive option enables any IED point to be archived in a resident SQL database. Archive and alarm parameters can be configured for each point, creating a flexible Alarm Annunciator and Sequence of Event Recorder (SER). Alarm and SER points can be easily viewed with any browser, or users can directly access using SQL queries.

Multiple Functions, Minimal Headaches

The Orion Family of Automation Platforms – OrionLX, Orion5r (upgradable to Orion5rL), and Orion5 – are designed to perform a range of automation applications in electrical substations. A single Orion may be configured to replace multiple legacy boxes in a substation – reducing hardware, design, wiring, and panel costs.

Preconfigured “point pick lists” for most vendors’ Intelligent Electronic Devices (IEDs), extensive diagnostic LEDs and a built-in communications analyzer reduce integration time and errors. In contrast to other automation processors, Orion software features and configurations are seamlessly transferable from one generation to the next.

Orion’s balance of versatility and ease of use have made it the leading flexible substation automation platform* and the choice of 100 new utility customers in the past five years.

* Newton Evans 2008

Key Design Features

Rugged Like a Relay

- ◆ Meets ANSI C37.90.1 2002 Fast Transient on I/O and power supplies and ANSI C37.90.2 1995 RFI to 35 volts per meter
- ◆ Direct fiber optic available on serial communication ports and Ethernet port
- ◆ Designed to operate over -40°C to 70°C, without heaters or fans

Flexible and Modular Like a PLC

- ◆ Complete logic suite for local control and intelligent alarming
- ◆ Modular and expandable I/O
- ◆ Modular and expandable ports
- ◆ Non-volatile memory

Standard PC Tools

- ◆ Large, expandable solid state memory
- ◆ Built-in 10/100MB Ethernet
- ◆ A variety of communication options such as webpages, FTP, telnet and PPP

Utility-Specific

- ◆ Complete Cyber Security package
- ◆ Built-in breaker control, counter and accumulator functions
- ◆ Momentary-Change-Detect function
- ◆ Full suite of utility protocols
- ◆ Support for bit synchronous communications



“Thanks again for a product that keeps the simple things virtually effortless and makes the hard things pretty easy too.”

- Chris Nowakowski. Wisconsin Public Service Corporation, Green Bay, WI

“WOW! My data is going all the places I wanted it. I have been doing SI systems for nine years now and by far, bar none, [Orion] is the unit to have aboard. All I can say is ‘GOOD JOB’”

- Willie Willis. Lakeland Electric, Lakeland, FL

iPower SCADA

The iPower SCADA system provides complete visualization, alarming, trending, apparatus control and IED access for small and medium sized utilities. Orion RTU setup in iPower is simplified with an auto-configuration feature.



Typical iPower screen showing connected relays and other IEDs

Engineering Workstation

Protective relay settings, fault records, oscillography and apparatus health can be accessed through Orion. Archived data in the Orion SQL database simplifies access of non-operational data.



Data accessed from SEL® relay through Orion

Packaging and Engineering Services

The NovaTech Systems and Services group works with customers to design, package and commission Orion and Bitronics substation automation systems.

Areas of specialty include:

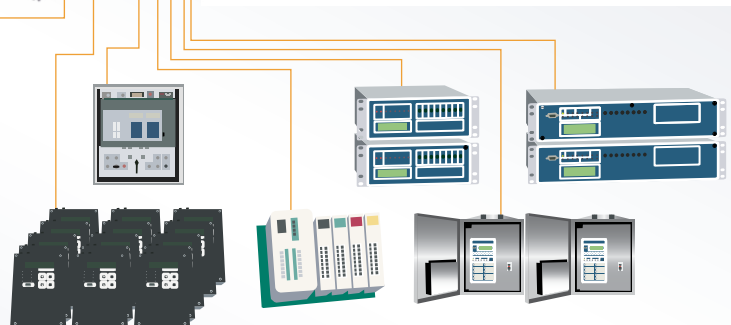
- ◆ RTU packaging and configuration
- ◆ iPower SCADA configuration and commissioning
- ◆ Distribution Automation systems engineering
- ◆ Orion configuration services for webpages, security settings and math and logic

Orion Distributed I/O

In addition to Orion's built-in discrete I/O, remote analog and digital I/O modules are available. Modules connect to Orion or any PLC or RTU with RS-232, RS-485, Fiber Optic or Ethernet connections using DNP3 protocol. Changes are time-stamped to 1ms resolution.

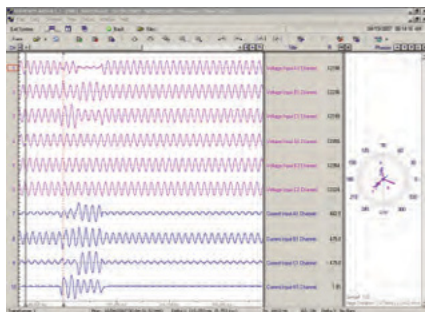


Cyber Secure Connection



Distributed Digital Fault Recording with Bitronics® IEDs

Bitronics 70 Series IEDs can be combined with Orion to create a distributed digital fault recording system. Orion can retrieve records and disseminate via email or secure FTP systems.



Wavewin® Bitronics Event Viewer

Extensive Protocol Library

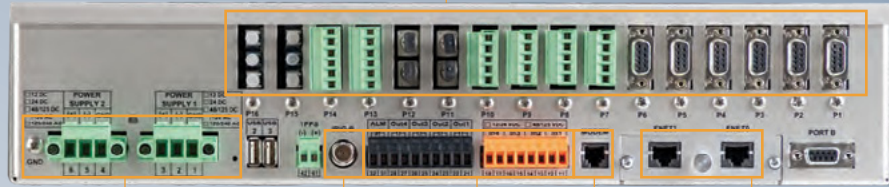
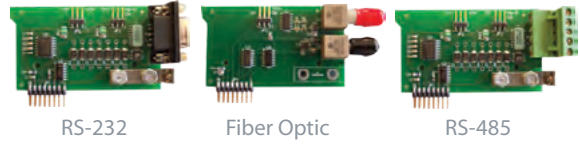
Orion simplifies integration with other substation IEDs via preconfigured "point pick lists" and an extensive protocol library, including:

- ◆ ABB DPU
- ◆ Allen Bradley DF1
- ◆ Areva KITZ
- ◆ Areva Optimho
- ◆ Basler DFPR
- ◆ DNP3 Serial and TCP
- ◆ GridSense PAC
- ◆ IEC 60870-5-103
- ◆ Modbus - Serial and TCP
- ◆ PG&E 2179
- ◆ RFL
- ◆ SEL® Fast Meter
- ◆ SEL® Fast Operate
- ◆ SEL® Fast SER
- ◆ SPA
- ◆ TransData DTO
- ◆ SEL® ASCII

Modular Serial Communication Cards

Sixteen ports can be populated with a combination of any of eight different serial cards:

- ◆ RS-232 standard and isolated
- ◆ RS-485 w/ and w/o IRIG-B
- ◆ Fiber optic w/ and w/o IRIG-B
- ◆ Bit synchronous
- ◆ HDLC (special meter interface)



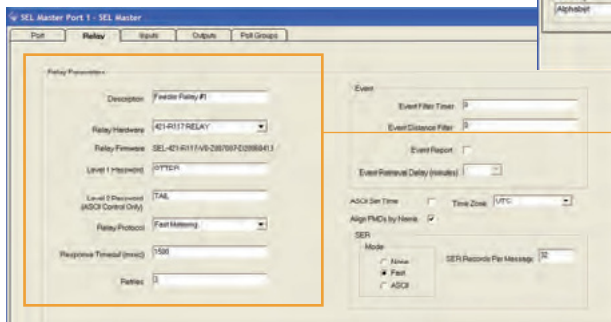
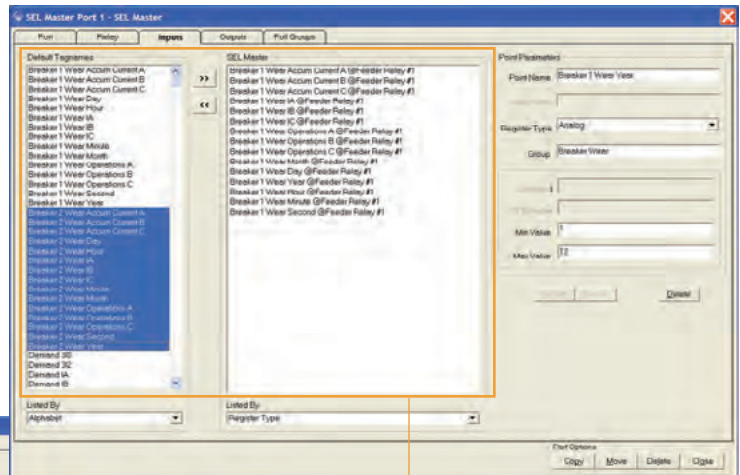
- Redundant Wide-Range Power Supplies
- Built-In IRIG-B
- Built-In Discrete I/O
- Modem Port
- Modular Redundant Ethernet
- Front Serial and USB Connections
- Extensive Diagnostic LEDs



Point-and-Click Configuration

Orion NovaTech Communications Director (NCD) software enables users to rapidly configure the communications and logic of any Orion. NCD uses drop-down menus to select the protocols, makes, and models of the attached IEDs as well as the specific data types desired from the IEDs.

Simple naming structures organize all data without the need for tedious register entry. In many applications, configuration can be completed with minimal typing.



1. Select make and model of IED.
2. Select desired data points from master list.
3. Set up communication port parameters. IED setup complete.

Other NovaTech Products and Services



Bitronics Electric Power Measurement and Recording Products

From traditional SCADA monitoring to distributed event recording, Bitronics Power Measurement and Recording Products have set the gold standard for reliability in the electric utility substation for decades. 70 Series IEDs are IEC 61850-compliant and ideal for integrating intermittent renewables like wind.



Education and Training

NovaTech offers Utility Training Courses, Utility Webinars and Utility Technical Symposiums. Courses are designed to train engineers and technicians in the application of NovaTech products and technologies. Twenty courses currently available. Schedules posted on our website.



D/3® DCS

Open, configurable, and highly reliable, the D/3® Distributed Control System (DCS) provides continuous and batch process automation worldwide. The D/3 DCS combines state-of-the-art features like Online Upgrades with a guaranteed migration path unmatched by any other process automation supplier.



NCare Support Agreements

NCare is a comprehensive support program for NovaTech Utility products including the Orion Automation Platform, Distributed I/O, iPower SCADA for Orion, Distribution Automation and Cyber Security products. Flex Hours can be used for a variety of on-site or in-office engineering services.



How Can We Help?

For more detailed information on NovaTech products, services, or electric utility customer references, contact the NovaTech representative in your area, email info@novatechweb.com or call us at **800.253.3842**

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