OrionLX+ Automation Platform

The OrionLX+ is the latest offering in the Orion family of substation automation platforms. The OrionLX+ adds new power and flexibility for larger, more challenging applications, plus adds features to simplify usage and reduce costs of ownership.

As a member of the Orion family, the OrionLX+ shares the same operating system and configuration techniques of the other Orions: OrionLX CPX, OrionLXm and Orion I/O. Configurations from other Orions can run in the OrionLX+, and the same serial communication cards can be shared between the OrionLX CPX and OrionLX+.

New capabilities include hot swappable power supplies, expanded networking options, higher “Direct Video” performance, expanded application support and significantly more power. Each is described below:

**Hot Swappable Power Supplies**
Single or redundant supplies can be ordered, each removable under power from the front of the OrionLX+. For higher reliability, both power supplies share the load, and are health monitored by internal Orion diagnostics.

**Expanded Networking Options**
A new “NovaCard” Expansion Card adds three more Ethernet ports (separate NICs) to the standard two copper Ethernet ports on the OrionLX+, for a total of five Ethernet ports. Two of these three ports are of the “SFP” (Small Form-Factor Pluggable) design. NovaTech offers multimode, single mode and copper SFP transceivers to populate these two SFP receptacles.

**Higher Direct Video Performance**
A new “Display Port” video port with enhanced video support speeds up page load and supports both resistive and capacitive touch monitors for improved touch-screen performance.

**Expanded Application Support**
The power and flexibility enable the OrionLX+ to be applied in a broad range of applications, including:

- Substation RTU
- Security Gateway
- Terminal Server
- Math and Logic Controller
- Protocol and Media Converter
- Relay Communications processor
- FLISR Controller
- SCADA Master
- Substation HMI
- Tile Alarm Annunciator
- Sequence-of-Events Recorder
- Data Archival Appliance

**More Power**
Six times more processing power translates into the ability to handle more points (up to 40,000), store more points and operate with much lower CPU loadings in larger applications.

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Other Hardware Features
- Keyboard and mouse ports
- Modular, field-replaceable serial port cards

**Communications**

<table>
<thead>
<tr>
<th>Serial Cards</th>
<th>IED Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: RS-232 Standard w/ IRIG-B</td>
<td>ABB DPU</td>
</tr>
<tr>
<td>B: RS-422/485</td>
<td>Allen Bradley DF1</td>
</tr>
<tr>
<td>C: ST-Fiber Optic</td>
<td>Areva KITZ</td>
</tr>
<tr>
<td>D: Bit Card (bit-to-byte conversion)</td>
<td>Areva Optimho</td>
</tr>
<tr>
<td>E: RS-232 Isolated w/ IRIG-B</td>
<td>Basler DFPB</td>
</tr>
<tr>
<td>G: RS-485 w/IRIG-B</td>
<td>DNP3 Serial and IP</td>
</tr>
<tr>
<td>H: V-Pin Fiber Optic w/ IRIG-B</td>
<td>GE DLP</td>
</tr>
<tr>
<td></td>
<td>GE Moisture Meter</td>
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<td></td>
<td>GridSense PAC</td>
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<td></td>
<td>IEC 870-5-103</td>
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<td>IEC 61850</td>
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<td>Keithley Meter</td>
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<tr>
<td></td>
<td>Modbus Serial and TCP</td>
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<tr>
<td></td>
<td>PG&amp;E 2179</td>
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<td></td>
<td>RFL</td>
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<td>SEL® ASCII</td>
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<td>SEL® Fast Meter</td>
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<td>SEL® Fast Operate</td>
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<td>SEL® Fast SER</td>
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<tr>
<td></td>
<td>SPA Bus</td>
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<tr>
<td></td>
<td>TransData DTO</td>
</tr>
<tr>
<td></td>
<td>Plus Master versions of SCADA protocols: CDC, Conitel, Harris, IEC 60870, L&amp;G 8979 and Tejas</td>
</tr>
</tbody>
</table>

**Ethernet**
(2) 100/1000BaseT (std.)
On optional NovaCard:
(1) 100/1000BaseT
(2) SFP receptacles with available transceivers:
  - **Multimode**: LC conn., 550m, 850nm, 1Gb/s
  - **Single Mode**: LC conn., 10km, 1310nm, 1Gb/s

**IRIG-B**
Standard Built-In

**SCADA Protocols**
Betac/Getac
Conitel - 300/20x0
CDC - Type I and II
DNP3 – Serial and IP
Harris 5000
IEC 60870 Serial and TCP
L&G 8979
Modbus – Serial and TCP
REDAC 70H
SES-92
SPS
TejasV

**FTP and sFTP**
**HTTP**
**HTTPS**
**NTP**
**PPP**
**SNMP**
**SNTP**
**telnet**
**XML**
**Plus suite of other Security protocols**

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Front View of OrionLX+
### Specifications

#### Environmental
- **Operating Temperature**: -40°C to +70°C
- **Storage Temperature**: -40°C to +85°C
- **Operating Humidity**: 5 to 95% non-condensing

#### Physical
- **Standard case (2U)**: 19W x 3.5H x 13D (in)
- **Weight**: 9.5 lbs

#### Connections
- **RS-232 w/IRIG-B**
  - DB9 (Female)
- **RS-422/485**
  - Screw Terminal
- **RS-485 w/IRIG-B**
  - Screw Terminal
- **Fiber Optic (serial)**
  - ST Multimode
- **Fiber Optic w/IRIG-B**
  - V-Pin Multimode
- **Bit Card**
  - RJ45 or SFP Receptacle
- **IRIG-B**
  - Phoenix type, #12-24AWG
- **I/O Terminals**
  - Phoenix type, #10-30AWG
- **Power Terminal**
  - Phoenix type, #10 stud

#### IRIG-B
- **Input**
  - Modulated or Unmodulated
- **Output (on serial ports)**
  - Unmodulated

#### Indication LEDs
- **Power Supply #1**
- **Power Supply #2**
- **Inputs on NovaCard (rear)**
- **Outputs on NovaCard (rear)**
- **RX/TX on 16 serial ports**
- **Ethernet Link and Activity**
- **IRIG B Present and Quality**
- **Redundancy Status**
- **Security (Firewall)**
- **Active Configuration**
- **Alarm**

#### Processor
- **Intel® Atom® Quad Core 1.9GHz**
- **Intel® Atom® Quad Core 1.9GHz**

### OrionLX+ vs OrionLX CPX Comparison Table

<table>
<thead>
<tr>
<th>Specification</th>
<th>OrionLX+</th>
<th>OrionLX CPX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>Intel® Atom® Quad Core 1.9GHz</td>
<td>Intel® Atom® 1.33GHz</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>8GB standard</td>
<td>4GB standard</td>
</tr>
<tr>
<td><strong>Max Ethernet Ports</strong></td>
<td>Two standard, +three more with NovaCard (five total NICs)</td>
<td>One standard, +one optional, +one more with MMB (three total NICs)</td>
</tr>
<tr>
<td><strong>Fiber Options</strong></td>
<td>Two SFPs for fiber adaptors: MM, SM or copper</td>
<td>One port can be MM fiber</td>
</tr>
<tr>
<td><strong>PRP/HSR</strong></td>
<td>Yes, in Phase 2 NovaCard. Uses NIC #3.</td>
<td>PRP only. Uses NIC #1 and #2.</td>
</tr>
<tr>
<td><strong>Video Port</strong></td>
<td>One “Display Port”</td>
<td>One VGA Port</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>Single or redundant, hot-swappable</td>
<td>Single or redundant</td>
</tr>
<tr>
<td><strong>Maximum Points</strong></td>
<td>40,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

### Performance/Capabilities
- **IED/SCADA Points**: 40,000; typical
- **Refresh Rate**: < 2 sec; typical

### Communications
- **Serial**: 1200bps-115kbps
- **Ethernet**: 100/1000BaseT
- **Copper**: Supports transceivers to 1Gb
- **SFP**: Bit or byte
- **Protocols**: Via file transfer

### Data Archiving & Storage
- **Memory**: 8GB SSD, plus 2GB DRAM
- **Database**: PostgreSQL

### Digital Inputs on NovaCard
- **Quantity**: 4 Std. Independent, Isolated
- **Input Range**: 12-24V dc / 48-125V dc
- **Optically Isolated**: 1ms time-stamped

### Digital Outputs on NovaCard
- **Quantity**: 4 Std. (2) Form A, (2) Form C
- **Contact Ratings**: 10A MOV Protected

### Alarm Output
- **Type**: Form C
- **Contact Ratings**: 10A MOV Protected

### Power Supplies
- **Input Voltage**
  - **HV Supply**: 125/250V dc nominal and 120/240V ac nominal +/- 20%
  - **LV Supply (Phase 2)**: 24/48V dc nominal +/- 20%
- **Power Required**
  - **HV Supply**: DC: Typical 30W, max: 50W
  - **AC**: Typical 60W, max: 75W
  - **LV Supply (Phase 2)**: DC: Typical 30W, max: 50W

### Warranty
- 10 Year Limited

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