Overview

PowerLink™ Advantage (PLA) has been a robust and versatile energy distribution and substation management solution for many years. It is utilized around the globe and has served customers tirelessly and reliably. However, technology doesn’t stand still and GE Digital Energy has been working hard to improve upon PowerLink’s capabilities as well as the underlying technology, reliability, and performance.

Effective November 1st 2015, PowerLink Advantage will be obsoleted and replaced by PowerLink Connect. GE will no longer support PowerLink Advantage even if components such as upgrade options may still be orderable. PLA users are encouraged to migrate to PowerLink Connect.

PowerLink™ Connect offers substantial improvements in functionality, ease of use, performance, data management, equipment control, security and more.

Migration

Upgrading to the new PowerLink Connect database is available as an automated service using proven software conversion tools, delivering a level of accuracy and confidence that is unachievable by any process requiring manual data manipulation.

Why Migrate to PowerLink™ Connect?

Upgrading to PowerLink Connect allows you to access many new features and benefits. For more details, see:

- PowerLink Connect Features
- Benefits and Migration Planning Guide for PowerLink Advantage Customers
- PowerLink Connect vs PowerLink Advantage - Key Differences

How to Migrate to PowerLink™ Connect?

Migration from PowerLink Advantage to PowerLink Connect is easy and can be performed with confidence as an automated service available from GE Digital Energy. For more details see:

- Migration Process
- Automated Migration Results
- Not Included in the Automated Migration
## PowerLink Connect Features

<table>
<thead>
<tr>
<th>Solution</th>
<th>Description</th>
<th>Key Features</th>
<th>Outcomes</th>
<th>Key Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-Time Equipment Monitoring</td>
<td>• Real-time, dynamic data collection and display (one-line / 3D graphics)</td>
<td>• Unlimited device connections &amp; communication</td>
<td>• Secure oversight of facility operations &amp; energy usage</td>
<td>• High availability, reliable services</td>
</tr>
<tr>
<td></td>
<td>• Supports: meters / PLC / generators / PDU / trip units &amp; more</td>
<td>• Monitors: RMS current &amp; voltage / KW &amp; KWh / events / alarms &amp; more</td>
<td>• Scalability to add equipment as required without additional costs, &amp; freedom to choose your preferred supplier</td>
<td>• Flexibility to monitor &amp; control operations from anywhere</td>
</tr>
<tr>
<td></td>
<td>• Widescreen, multi-monitor support, mobile device and Web-enabled operator interfaces</td>
<td>• Secure, supervisory control of devices &amp; operations</td>
<td>• Proven solution backed by industry-leading support and consulting services for dependable peace-of-mind</td>
<td>• Easy-to-use, familiar and intuitive operator interfaces enhance efficiency and improve day-to-day operations</td>
</tr>
<tr>
<td></td>
<td>• Prioritized alarms, precision sequence of events, centralized monitoring of operations</td>
<td>• Monitors: RMS current &amp; voltage / KW &amp; KWh / events / alarms &amp; more</td>
<td>• Active, ongoing system development ensures future-proof operations and real return on investment (ROI)</td>
<td>• Scalable system architecture ensures reliable operations</td>
</tr>
<tr>
<td></td>
<td>• Vendor agnostic equipment support</td>
<td>• Widescreen, multi-monitor support, mobile device and Web-enabled operator interfaces</td>
<td>• High availability, reliable services</td>
<td>• Proven solution backed by industry-leading support and consulting services for dependable peace-of-mind</td>
</tr>
<tr>
<td></td>
<td>• Redundant system architecture ensures reliable operations</td>
<td>• Secure, supervisory control of devices &amp; operations</td>
<td>• Easy-to-use, familiar and intuitive operator interfaces enhance efficiency and improve day-to-day operations</td>
<td>• Active, ongoing system development ensures future-proof operations and real return on investment (ROI)</td>
</tr>
<tr>
<td></td>
<td>• Wide range of supported device communication protocols, including: Modbus, IEC 61850, DNP3</td>
<td>• Prioritized alarms, precision sequence of events, centralized monitoring of operations</td>
<td>• Active, ongoing system development ensures future-proof operations and real return on investment (ROI)</td>
<td>• Scalable system architecture ensures reliable operations</td>
</tr>
</tbody>
</table>

| Mobile Device & Web-Based Operations | • Real-time operational intelligence (RtOI) accessible anytime, anywhere | • Secure operator login access from any location via any Web-enabled mobile device | • Place key information in the right hands at the right time | • Enhance decision making and improve operations |

| Big Data Energy Analysis & Trending | • High performance, ‘Big Data’ archiving and reporting solution          | • Collection, archival and storage of large volumes of data from multiple sources into workable database structures | • Delivers meaningful context for vast amounts of raw data from across your operations | • Aggregates islands of information for true process visibility and feeds higher-level operations management systems with accurate, real-time information |
|                                   | • Collection, archival and storage of large volumes of data from multiple sources into workable database structures | • Collation and formatting of disparate data structures into a single framework - turns big data volumes into meaningful, actionable information | • Enterprise performance & scalability | • Easy-to-use, familiar and intuitive operator interfaces enhance efficiency and improve day-to-day operations |

| Intelligent Process Automation    | • Automated control of devices and services                              | • Open/close breakers                                                        | • High availability services with near-zero downtime                    | • Streamlined operations in complex environments                              |
|                                  | • Intelligent load management                                           | • Intelligent load management                                               | • Millisecond response to ‘off-normal’ situations with prescribed automatic procedures | • Optimal operations efficiency, sustainable competitive advantage, improved return on investment and advanced cost savings |
|                                  | • Automated shutdown or startup processes                               | • Specialist GE consulting and development services to customize automations processes | • High availability services with near-zero downtime                    | • Streamlined operations in complex environments                              |

|                                  |                                                                            | • Specialist GE consulting and development services to customize automations processes | • High availability services with near-zero downtime                    | • Millisecond response to ‘off-normal’ situations with prescribed automatic procedures | • Optimal operations efficiency, sustainable competitive advantage, improved return on investment and advanced cost savings |
Benefits and Migration Planning Guide for PowerLink Advantage Customers

Introduction
This section provides an overview of the key differences, advantages and benefits provided by the new PowerLink Connect.

PowerLink Connect is a substantial improvement over PowerLink Advantage in terms of functionality, ease of use, performance and reliability. This is in part due to major advancements in the underlying Proficy Cimplicity 9.0 software platform, and in part to major new facilities provided by the new PowerLink Connect.

Upgrading from PowerLink Advantage to PowerLink Connect requires migration of the database, screens and other configuration details to the latest supported standards.

Automated migration tools are currently offered as a service only, making this process as fast and cost-effective as possible. Most importantly, this migration process preserves the integrity of the existing PowerLink Advantage database.

PowerLink Connect Overview
PowerLink Connect is an intelligent solution designed for organizations in need of safe, efficient and reliable power delivery. PowerLink Connect enables real-time electrical infrastructure, data collection and display with standards-based communication and secure operator supervisory control.

PowerLink Connect enables centralized monitoring and management for distributed electrical infrastructure. PowerLink Connect connects and communicates with all equipment and smart power devices in your facility and brings together display, control and reporting functions under one easy-to-use interface, providing a dynamic window into your electrical network.

PowerLink Connect is an open, standards-based solution that is intuitive to configure. It is scalable from smaller point count systems (5,000 to 10,000 points) to larger, complex electrical networks (100,000+ points). With intuitive operations and simplified maintenance, PowerLink Connect enables you to ensure optimal operational and electrical performance.

Key PowerLink Connect Features:
- Real-time, dynamic data collection and display
- Remote and secure operator supervisory control
- High availability architecture
- Scalable – add more device monitoring points as needed
- Manufacturer agnostic (non-GE) equipment integration (supports a range of IEDs)
- Alarm & event management
- Historical data storage, trending and reporting
- Mobile / Web-enabled operations

Key PowerLink Connect Benefits:
- Reliable, secure and auditable operations
- Enhanced operational decision making & safety
- Increased productivity & accountability
- Improved operations efficiency
- Extended equipment life
- Lower total cost of ownership
- Reduced configuration & training time
- Reduced downtime & equipment maintenance
PowerLink Connect vs PowerLink Advantage - Key Differences

Some of the fundamental ways that PowerLink Connect has improved upon PowerLink Advantage are described below.

Menu Navigation / Ease of Use
The intuitive menu provides familiar navigation functions such as “Home”, “Forward”, “Back” and “Favorites”. Highly configurable, PowerLink Connect Menu is easy to use and flexible. Integrated security links screen access to user authentication (only those screens which operators are authorized to access are visible).

Tab Displays
PowerLink Connect provides powerful, centralized equipment monitoring and control interfaces known as Tab Displays. These are one-stop containers for all relevant information and controls for substation equipment. They are consistent and familiar, making Connect substation operations more intuitive and easier to learn. Tab Displays are totally customizable to your operational standards and requirements.

Operator Dialogs
All SCADA operations such as issuing a control, placing a control tag, attaching an equipment note, disabling an alarm, etc., are achieved using Operator Dialogs. This provides consistent and intuitive operations. Each type of field device has an Operator Dialog specific to its operational needs. PowerLink Connect dialogs require no programming and are easily configured to meet all operational requirements.

Secure Control
PowerLink Connect provides enhanced security options and configurable user and group role-based security. Security configuration allows access and operational permissions to be set for individual users and for user groups. Furthermore, PowerLink Connect has an operator access and change log to audit operations and aid in security reporting.

Dynamic Configuration
PowerLink Connect provides the powerful ability to make maintenance changes on a running server without requiring a restart of the server. Standard operations such as adding new points, creating new objects, adding and modifying alarms, adding and modifying scripts can all be performed dynamically while the server is running. Screen changes can also be easily modified while the system is running. A deployment mechanism is provided to enable easy updating of the screens on remote viewers without impact to the system or the operator. The ability to perform these modifications on a running system for maintenance purposes contributes significantly to maintaining the high availability of PowerLink Connect.
Equipment Attributes

Attributes provide easy-to-understand, high-visibility indicators for equipment conditions. They are informative graphical cues that can be designed and configured to meet your operational preferences. Attributes can indicate the presence of control tags, information tags, off scan, local force applications or disabled alarms.

Control Interlocking

PowerLink Connect provides powerful logic-based control interlocking to prevent equipment operations when specific conditions are not met. Interlocking can be used to prevent harm to personnel on site when working on equipment by preventing operations that might make equipment live during maintenance. It also protects electrical hardware by ensuring it is not subject to undesirable electrical loads. Interlocking includes graphical logic diagrams to illustrate why operations are blocked and what steps are not aligned to enable operation.

Alarm Management

Central to the role of the operator is quickly identifying and addressing exception conditions within the system. PowerLink Connect provides a multitude of alarm notification and management functionality to increase operator awareness, decrease response time and improve system reliability.

- Visual and audible notification
- Historical logging
- Millisecond resolution time stamping
- Group, area and priority categories
- Advanced filtering and sorting

Events List

The Event List is a comprehensive and permanent record of management activity including:

- A permanent, searchable, chronological record of operator actions and activity
- Advanced filtering
- Quick filtering on location and device
- Display historical events from any period
- High resolution sequence of events with millisecond accuracy to determine the exact sequence in which critical changes have occurred
- Operators can record comments about events
- Operators can enter messages into events
- Auditing of operator actions for security and accountability
PowerLink Connect vs PowerLink Advantage - Key Differences (continued)

Open and Connected Communications

PowerLink Connect enables you to leverage your existing investments as well as future-proofing the new devices you may choose tomorrow. PowerLink Connect is built on an open, layered SCADA architecture. With support for hundreds of drivers off-the-shelf, including, DNP 3.0, IEC 61850 and many others; and full OPC client and server support, PowerLink Connect is a truly open, vendor-independent solution that is flexible and interoperable – translating into real value. PowerLink Connect provides:

- Proven communications software for hundreds of brands of RTUs, IEDs, PLCs and other I/O devices
- Industry standard communications protocol compatibility for DNP 3.0, IEC 870-5-101, 870-5-104, ICCP, IEC 61850
- Full OPC server and client support
- Multiple simultaneous serial and/or Ethernet communications channels
- VisiconX SQL wizard

Migration

Migration of existing PowerLink Advantage databases to the new class/object-based PowerLink Connect database structures is available as a service from GE Digital Energy.

Migration Process

You perform the tasks listed in the below process.

1. Supply a copy of your existing PowerLink Advantage system to GE for review.
2. Receive a quotation for automated conversion.
3. Finalise naming convention for automated conversion. Finalise requirements of other engineering services required to complete the upgrade.
4. Receive the new database, DNP3 configuration, Interlock definitions and migration reports.
5. Complete the migration process using your preferred mix of in-house, third party and GE services.
6. Install, test and commission the upgrade.

Standard Lists and Reports

- Alarms
- Events
- Sequence of Events
- Off-Normal
- Dynamic database display
- Control tag
- Information tag
- Local Force
- Off-Scan
- Disabled alarms
- Operator notes
Automated Migration Results

The automated database conversion service available from GE Digital Energy uses software tools which deliver a very high level of confidence in the updated system, minimizing the cost of the upgrade process.

Migration is done using proven software migration tools, that deliver a level of accuracy and confidence that is unachievable by any process requiring manual data manipulation. Automated conversion provides:

- A new database with your chosen structured point name formulation. PowerLink Connect supports point names up to 132 characters long, with up to five part names. An example of a naming structure with four names parts is: Location_Device_Type_ID; for example, SUB5_CB3_AI_AMPSA

- Classes for common point types such as Analog Input or Digital Output. The Class/Object database structures within the new PowerLink Connect system facilitate the fast production of well-structured and consistent systems. The classes delivered by automated conversion will facilitate your ability to extend your system in the future in a consistent and reliable manner.

- Conversion of existing DNP3 driver configuration definition

- Conversion of existing Interlock definitions

- Conversion Reports:
  - Log showing mapping of each old point name to each new point name, and all old and new attributes and their values.
  - List of points where conversion encountered an error. For example an invalid alarm limit, such as a limit outside engineering range, or a HI limit lower than a LOW limit.
  - Lists of points not converted.
  - A summary of the total number of each type of point converted and number of points not converted

Not Included in the Automated Migration

The automated migration service does not convert existing screens. However PowerLink Connect provides tools to quickly and easily produce a powerful Connect environment, including for example:

- A single navigation menu for the entire system.
- Tabular lists for alarms, events, data summaries and more
- Tab displays for complex devices

Finishing Your Migration

Some important HMI features require minor configuration within the new PowerLink Connect environment. For example, you will set up the many dialog messages needed for safe and secure operator control. Other configuration components not covered by automated migration are:

- Scripts
- Security database containing user logons
Migration – Frequently Asked Questions

Q: What is required to get a fixed price quote for automated conversion?
A: GE Digital Energy needs to review a copy of your current PowerLink Advantage system to assess its suitability for conversion. This can be provided either as a current Cimplicity project and PLA project export, or a VMWare image of the complete system.

Q: What is required from GE Digital Energy to undertake automated conversion?
A: You will provide GE Digital Energy with:
   ▪ A copy of your current project
   ▪ Agreement on your preferred naming convention for the new system

Q: What will be delivered to you from the automated conversion process?
A: GE Digital Energy will deliver to you:
   ▪ Your database, converted to be compatible with current PowerLink Connect
   ▪ New DNP 3.0 configuration files, generated from your existing DNP 3.0 configuration as supplied to us, compatible with our DNP3.0 driver for PowerLink Connect.
   ▪ Interlock definition files, generated from your existing interlock definitions as supplied to us, compatible with Interlock definitions for PowerLink Connect.
   ▪ Conversion process reports

Q: What happens if the automated conversion process finds errors?
A: You will be provided with reports produced by the conversion tools that details conversion errors. Common error types are:
   ▪ Systemic, repeated errors in the original PowerLink Advantage system. For example the A-phase current HI alarm will be zero in all cases.
   ▪ Inconsistent point names in the original system.
   ▪ Simulated points needed in PowerLink Advantage that are not required in PowerLink Connect.

Error correction is typically a straight-forward process that GE Digital Energy can provide as a service if required.

Q: What is not provided by the automated conversion process?
A: GE Digital Energy will not deliver:
   ▪ Screen updates
   ▪ Scripts
   ▪ Security database containing user logons

Q: Can we purchase a complete, turn-key migration?
A: Yes. GE or our qualified partners can provide a complete migration service. Please contact GE Digital Energy to discuss your requirements.

Q: What version of PowerLink Connect configuration will be provided?
A: Unless otherwise agreed upon, GE Digital Energy will supply the current released version of PowerLink Connect - this comprises PowerLink Connect version 9.0, running on Proficy Cimplicity 9.0, supported on the current releases of Microsoft operating systems.
# System Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
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<tbody>
<tr>
<td><strong>Supported Operating Systems</strong></td>
<td>Note: Computers can be 32-bit or 64-bit</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® Server 2012 R2</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® Server 2012</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® Server 2008 SP2 R2</td>
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<tr>
<td></td>
<td>Microsoft® Windows® 8.1</td>
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<tr>
<td></td>
<td>Microsoft® Windows® 8</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® 7 SP1</td>
</tr>
<tr>
<td><strong>Computer &amp; Processor</strong></td>
<td>CPU: Intel® Core 2 Duo 3.0 GHz (minimum)</td>
</tr>
<tr>
<td></td>
<td>Installation: DVD drive</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>RAM: 4 GB (minimum)</td>
</tr>
<tr>
<td><strong>Hard Disk</strong></td>
<td>HDD: 40 GB (minimum)</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>SVGA or better color graphics monitor, 24-bit graphics card capable of 800x600 resolution (minimum)</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>Free direct-connect USB port (for license keys)</td>
</tr>
</tbody>
</table>

**Note:** Actual systems requirements also depend on what features are included beyond the base system (for example, whether or not data logging is enabled, application size). Therefore, it is strongly recommended that you test your particular system for performance needs to determine what computer system is appropriate above the base system recommendations.
Contact GE Digital Energy

Quotation
To get a quote on PowerLink Connect, or on migrating, or for the automated conversion service (from PowerLink Advantage to PowerLink Connect), contact your local sales representative or email us at: sales.digitalenergyap@ge.com

For the automated conversion service, pricing will be determined after a final review of the existing PowerLink Advantage system is completed.

Technical Support
GE Digital Energy Technical Support is open from 9 am to 5 pm Eastern Time zone during business days, and available 24 hours a day, seven days a week, to manage emergencies.

To speak directly to a GE representative:
- In the U.S. and Canada, call toll-free: 1 800 547 8629.
- International customers, please call: +1 905 927 7070.

To log a technical support or customer service request, send an e-mail to: multilin.tech@ge.com.

For any questions regarding this notice or regarding how to migrate or convert from PowerLink Advantage to PowerLink Connect contact the Technical Support team at: multilin.tech@ge.com

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Document Revision History

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