Integrated Data Concentrator

Data concentrators in substations provide a vital interface with intelligent electronic devices (IEDs). Retrieving operational and non-operational IED data and communicating it to the corporate network, they provide users with the data required for faster, more informed business decisions.

Data Concentrators

Data concentrators (DCs) in substation automation systems decentralize network architecture to minimize network loads, helping avoid network failures. Segregating, with multiple networks – each with IEDs connecting to a separate DC – also allows incremental commissioning.

Data concentrators (DCs) address the problems of traditional methods of integrating IEDs from various manufacturers in IEC 61850 systems, which are expensive, time consuming and error prone. Data mapping to integrate the data with the main control center represents a significant challenge. Some solutions even require a separate HMI, separate historians, duplicated data acquisition and additional protocol converters. The result is an inconsistent user experience for operators and additional costs in engineering and maintenance.

Key Benefits

Data concentrators offer a more robust, user-friendly and efficient answer:

- **Simplified commissioning and maintenance** reduces the cost of ownership. DCs on the Experion platform seamlessly integrate with the control centre, with no need for data mapping. A single integrated system for both DCs and central control makes the solution simpler to install and maintain.

- **Improved availability** – the DCs typically run on industrial-grade hardware. EMC immunity, compliant to IEC 61850-3 requirements, meanwhile, allows them to work within substation environment constraints & hardware redundancy further enhances system availability.


- Increased system reliability through support for on board Industrial Redundancy protocols IEC 62439-3 (**Parallel Redundancy Protocol & High-availability Seamless Redundancy**).

Part of the Experion® PKS family, Honeywell Data Converter, provides a fast, reliable, scalable and easily integrated solution for industrial utility plant owners.

**Fig:1 Experion: One Platform Approach**

**Fully Scalable**

Experion DC is ideal for large-scale deployments.
Experion's Data Concentrator

Supporting up to 200 IEC 61850 devices on each DC, Up to 5 DCs can be used to support over 1000 IEDs with Honeywell’s patented distributed server architecture (DSA) technology.

Flexible Interfaces
A single line diagram (SLD) tool for auto HMI Graphic generation from SCD files enables a clear overview of the system and faster configuration.

Users are also free to select best in class devices across manufacturers, and fully leverage existing investments using Open Access protocols. High speed, high reliability redundant TCP communications significantly reduce engineering and installation cost and complexity while supporting compliance with IEC 61850 Edition 1 & Edition 2.

Experion DC features support faster installation and configuration, easier maintenance and low, long-term ownership costs:

- Auto generation of SLD graphics from substation specification and configuration descriptions
- Protocol support for IEC 61850 Ed1 & Ed2, IEC 60870-5-101 & 104, DNP TCP/IP, MODBUS Protocol (Master), OPC (DA,AE)
- Support for 3rd party distributed control systems (DCSs) interface over OPC and Honeywell Experion PKS over DSA
- Support for Windows Operating System.

Experion HMI for improved visibility
The Experion Data Concentrator provides both a direct control level interface and a direct HMI interface on the DC itself for local review and monitoring of alarms and events.

The Experion HMI delivers sophisticated data visualization, analytics and processing capability. With better visualization the system is transformed into a "smart grid", helping customers make better decisions to optimize the power system.

Incorporating human factors features developed with the Abnormal Situation Management® Consortium, its range of features promotes faster understanding and better decisions:

- Trends, HMI graphic displays, event summary and alarm summary listings
- Operator specific views
- History data logging for IED measurement reports
- An SLD tool for automatic HMI graphic generation from SCD files.

Reliable and Robust
Offering full system compliance with IEC 61850, Experion DCs ensure secure, reliable operation to minimize the chance of failures:

- DC Hot-Standby (redundancy)
- Parallel Redundancy Protocol support
- High-availability Seamless Redundancy protocol (R440 release)
- History backfill for IED data to prevent data loss
- KEMA certified IEC 61850 client driver
- IEC 61850-3 compliant hardware
- Industrial grade conformance for harsh environments.
A Single Solution

Part of the Experion® PKS family, Experion DC provide fast, reliable, easy integration. Offering a single process and power automation solution and integration for a wide range of switchgear devices over IEC 61850 it promotes faster, more efficient projects:

- Seamless integration with the Experion Electrical Control Systems (ECS) through the Honeywell DC, with no significant engineering required for data transfer
- Re-engineering or changes to field device and integration to the DC or ECS/DCS requires minimum engineering effort
- Standard Experion point detail displays and faceplates for IEC 61850 devices
- Lower training costs and more efficient maintenance with the same environment, look and feel as the existing ECS
- A single point of contact for all electrical automation needs
- Easy interoperability between IEDs and any switchgear vendor, especially in a multi-vendor environment
- Experion Equipment Display will better organize and display data in both summary and detail across hundreds of power devices
- DC supports PRP or HSR for redundancy avoid any kind third party box for PRP or HSR network

Honeywell DC reduces effort maintaining multiple databases, and eases integration to help meet tight project execution schedules. Any re-engineering or changes for field device and integrating to DC or ECS/DCS can be done with minimum engineering efforts

Typical DC Applications

Experion DCs are used to integrate large quantities of IEDs in industrial plants, grid substations or power plant auxiliary systems.

Particularly useful for large applications with more than 1000 integrated devices, Experion DC enables the central system to collect information from IEDs and provide the required tools for analysis, monitoring, planning and control of key parameters

- Effective use and customization of data sets for data concentration within the IEDs
- Correct use of information reports
- Traffic simulations
- Network topology (number of sub networks, segregation and subdivision)

- Requirements for front-end processors and tag servers.

Industrial Plant Substation

Experion provides an integrated solution for plants with an industrial load management system (ILMS). Monitoring and controlling electrical energy across the plant it can ensure reliable and stable supply for energy-intensive industries, such as oil & gas, petrochemical, metals, and pulp & paper, in highly-demanding, hazardous or extreme environments.

With Experion integrating substations into a single platform, Honeywell DCs ensure reliable collection of critical data from IEDs spread across the plant.

High Voltage (HV) Substation Automation Systems

HV Substation Automation Systems (SAS) integrate data from different substation equipment, such as incoming feeders, transformers and outgoing feeders. With a local HMI, Honeywell DCs ensure optimization of capital assets, enhancing operation and maintenance efficiencies with minimal human intervention.

Medium Voltage Automation Systems

All medium- and low-voltage switchgears have numerical relays that communicate using IEC 61850. These include protection features, control, measurements, and monitoring. Breaker control is performed by the distributed control system. In addition, modern numerical relays also capture feeder data, report events, monitor the equipment, and keep records of energy consumption.

![Fig 4: Traditional Bay Controls in a Substation](image)
Capturing this near real-time and displaying it on the HMI, users to monitor the complete auxiliary system from remote locations and integrate the information into a number of DCs. Honeywell’s flexible architecture means adding a redundant Experion server to each substation provides independent standalone functionality for local substation maintenance and seamless integration of the DC into the broader Experion system through DSA.

### Experion DC Hardware

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>19” Rack mountable Industrial System</td>
</tr>
<tr>
<td>Industrial Grade 400W Power Supply</td>
</tr>
<tr>
<td>Intel Core i5-3450 @3.5Ghz, CPU quad core</td>
</tr>
<tr>
<td>8GB DDR3 RAM @ 1333Mhz</td>
</tr>
<tr>
<td>500GB HDD SATA</td>
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<tr>
<td>-10° to 50°C Min. Operation Temperature</td>
</tr>
<tr>
<td>20 to 80% (non-condensing) Operating Relative Humidity</td>
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</tbody>
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### Optional
- Compliance with IEC61850-3,
- Compliance with G3 Conformal coating

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**For More Information**

Learn more about how Honeywell’s Data Concentrator, visit our website [www.honeywellprocess.com](http://www.honeywellprocess.com) or contact your Honeywell account manager.

**Honeywell Process Solutions**

Honeywell
1250 West Sam Houston Parkway South
Houston, TX 77042

Honeywell House, Arlington Business Park
Bracknell, Berkshire, England RG12 1EB UK

Shanghai City Centre, 100 Junyi Road
Shanghai, China 200051

[www.honeywellprocess.com](http://www.honeywellprocess.com)

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