Ovation™ Enterprise Data Solutions (EDS)

Benefits

- Collects plant information from disparate systems to form a single data source for secure, remote visualization and monitoring
- Provides staff with read-only access to near real-time and archived plant information, regardless of geographic location
- Presents comprehensive views of assets to all levels of an organization
- Enables proactive response to process changes, operational abnormalities or equipment issues
- Scalable from a single unit to widely dispersed plants with numerous deployment options
- Measures, monitors and reports Key Performance Indicators (KPIs)
- Fully supported through Emerson’s lifecycle services programs

Introduction

Managing the large amounts of data generated by power, water or wastewater operations can be challenging.

Important process and business information is often provided by numerous systems from different vendors in varying formats which are often dispersed throughout a single unit, plant, district or fleet.

Immediate access to key data for local plant personnel as well as remote management or corporate staff is essential for efficient operation, especially during emergency events.

Effective decision making can be hindered if that information is not readily available. Plant personnel need a centralized solution for presenting actionable data that enables the right people to quickly and accurately make decisions.

Enterprise Data Solutions

Emerson’s Ovation™ enterprise data solutions (EDS) provide secure plant monitoring from any location with access to an organization’s network. EDS uses a centralized server to collect insightful plant data from multiple sources and present the high-fidelity information in near-real time to authorized personnel and systems.

Scalable single or multi-plant deployment along with mobile capabilities provide flexible and economical options to meet organizational objectives. Authorized users can view process graphics, control diagrams, alarm lists and graphic trends, as well as generate reports that track operating performance or fulfill other regulatory reporting requirements.

Remote visualization of critical data allows plant staff to monitor asset health and proactively troubleshoot issues before they become serious problems.
Applications

In today’s IIoT-connected world, plants are generating more data than ever before – but they often lack the structure to transform that data into actionable insights. EDS is a powerful tool that simplifies information management by consolidating data from disparate systems into a single source for remote monitoring and analysis.

EDS delivers increased awareness of plant operations by securely connecting staff to near-real time and archived data, regardless of geographic location.

Timely and accurate representation of plant performance enables more informed decision-making to enhance operations and streamline maintenance.

For example, severe weather events pose many forms of danger to any industrial process site, which could require plant staff, both on and off duty, to quickly troubleshoot problems before they escalate. EDS provides critical process data to the right people at the right time, helping to mitigate emerging issues.

Using EDS data and tools, power generators can assess abnormal conditions that could lead to infrastructure damage or widespread power outages. Water plants can monitor increased flows within distribution networks to better predict flooding, thus helping to prevent overflows and associated environmental impact.

As an option, Ovation EDS can be enhanced to automate operator round activities, including customized route and data collection templates along with interfaces to computer maintenance or lab information systems.

EDS data can also be used to monitor key performance indicators (KPIs) for measuring against objectives and generating required performance reports. Example KPIs include:

- Power generation: fuel usage, plant availability, emissions, generation revenue or efficiency (heat rate)
- Water and wastewater plants: quality, compliance, energy usage, chemical usage or O&M expenses

As an integrated information source, EDS provides valuable insights to all levels of an organization:

- Executives or corporate management can obtain a complete view of district- or fleet-wide operations
- Plant management can view and trend information to make informed operating or maintenance decisions
- Plant supervisors, engineers and technicians can easily evaluate process or plant status

Deployments

Secure and flexible EDS solutions can be deployed in various configurations depending upon user needs.

Individual Unit or Plant

An EDS server monitors processes within a single unit or plant by collecting data from different systems and presenting the consolidated information in standard formats including process diagrams, alarm lists, trends and reports. The data is also archived within the EDS server.

Enterprise

EDS can be scaled to an enterprise level by securely integrating data provided by individual unit or plant EDS servers. EDS enterprise deployment provides a single, centralized platform for a comprehensive view of district- or fleet-wide assets.

As with individual servers, EDS enterprise can report on and trend data provided by the individual unit or plant EDS servers.

Mobile

All EDS data can be remotely viewed, trended and managed through the EDS mobile application using a 4G or Wi-fi signal.

Authorized users can view a high-fidelity representation of what the operator sees in the control room from a hand-held device such as a smart tablet or smart phone. Additionally, EDS mobile can be synchronized to an Apple Watch®.
The EDS mobile application is available for download from:
- The Apple App Store® for iOS devices
- The Google Play™ e-store for Android devices
- Microsoft™ Marketplace for Windows™ devices

**Web Portal**

The EDS web portal application interfaces the EDS data server to customer-approved browsers such as Internet Explorer™, Mozilla® Firefox®, Google Chrome™ and Opera for view-only access to EDS functions. The portal is delivered with a preconfigured dashboard equipped with trend, alarm, point list, graphic modules and gauge widgets. The dashboard can be customized by adding user-defined tabs to the browser.

**Architecture & Functions**

EDS deployment configurations adhere to the ANSI/ISA-95 international standard for developing an automated interface between enterprise and control systems, specifically level 3 for manufacturing operations management and level 4 for business planning & logistics.

Various security techniques such as firewalls, a demilitarized zone (DMZ), data diodes and one-way communication to data sources ensure operating system data stays unaltered and protected. Access control and authentication features assure only validated users can view EDS information. The EDS configuration supports server clustering, parallel servers and virtualization for redundancy and high availability. Additionally, virtualization allows scaling to accommodate large system applications with high point counts.

Connectivity to data sources and a data server equipped with software applications comprise the base EDS solution for collecting, managing and displaying data. The solution can be customized to meet user requirements for point size or functionality.

**Connectivity**

Two types of connectivity are employed within an EDS system for data collection and communication. Data feeders are used to collect information from one or more Ovation systems depending upon the installed deployment. System interfaces gather data from other non-Ovation sources using standard protocols such as OPC-UA and Modbus/TCP-IP. Analog, digital, packed and time point types are all supported.
Ovation EDS Data Server

The EDS data server is a centralized repository for process tags and values, scalable to accommodate application size and staff needs.

The server manages current, archived and alarmed point values used in EDS displays, calculations, reports and trends.

Additionally, the data server is equipped with applications that manage system interfaces, data feeders, system configuration and data visualization functions.

The data server simplifies EDS administration by continuously monitoring system interfaces and Ovation data feeders to detect new or revised process graphics or points. The server interface only captures value changes, thus minimizing network traffic.

Unique to the EDS data server is its ability to display original control system process graphics and control logic sheets for viewing. This feature provides Ovation users with a consistent view of plant information regardless of device and eliminates the expense of recreating displays in other formats.

A dedicated EDS data server toolbar provides access to the following standard functions:

- Graphics & data replay
- Tag & point list
- Event list
- Report editor
- Report monitor
- Trends
- Control viewer
- Message log
- Workspace profiles

Customized applications such as the configuration utility, calculation editor, graphic builder and shade editor can also be added to the toolbar.

Excel Plug-In Package

An optional Microsoft Excel® plug-in can be added to the data server for exporting EDS process point values to a spreadsheet.

The plug-in embeds an EDS tab within the Excel application that includes functions such as connecting or disconnecting from the server, status, recalculate, start, stop, show point list, edit workbook autorun and save workbook copy.

EDS Web Scraper

The EDS web scraper pulls data from informational websites, such as those for weather or government reporting, for use in analysis or forecasting. For example, information from weather websites can be combined with EDS data to anticipate energy usage or water flows as a result of rain events.

Support

Emerson lifecycle programs include a dedicated Ovation EDS support modules. Users can select between two levels of support modules depending upon needs and budget.

EDS support modules can be included as part of an overall Ovation maintenance contract for easier tracking and implementation.
# Ovation EDS Applications

<table>
<thead>
<tr>
<th>Icon</th>
<th>Application</th>
<th>Description</th>
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<tbody>
<tr>
<td><img src="graphics" alt="Icon" /></td>
<td>Graphics</td>
<td>Displays up to four windows of process diagram replicas that include dynamic process value updates in numeric or graphic form.</td>
</tr>
<tr>
<td><img src="tag-point-list" alt="Icon" /></td>
<td>Tag - point list</td>
<td>Provides views of available point information from any source.</td>
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<tr>
<td><img src="events-list" alt="Icon" /></td>
<td>Events list</td>
<td>Lists current and past occurrences of alarmed points from Ovation and non-Ovation data sources with original time stamps.</td>
</tr>
<tr>
<td><img src="report-editor" alt="Icon" /></td>
<td>Report editor</td>
<td>Defines report layouts in a spreadsheet-like application window with the ability to save reports locally, on the server or in the archived history. Reports can be created using picture, HTML or CSV file formats.</td>
</tr>
<tr>
<td><img src="report-monitor" alt="Icon" /></td>
<td>Report monitor</td>
<td>Enables periodic scheduling of report execution (e.g. hourly, daily, weekly) based on a process condition or upon demand.</td>
</tr>
<tr>
<td><img src="trend" alt="Icon" /></td>
<td>Trend</td>
<td>Trends current and past data for up to sixteen process points. Special features allow changing trend time, value ranges and viewing process values at the time indicated by the cursor. Users can annotate trend and point values to assist with data analysis. Trend groups can be imported from Ovation systems, with the ability to create and save new groups from a client station. All trends are saved in equipment folders.</td>
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<tr>
<td><img src="control-viewer" alt="Icon" /></td>
<td>Control viewer</td>
<td>An exclusive Ovation feature that allows secure remote troubleshooting and control logic reviews.</td>
</tr>
<tr>
<td><img src="message-log" alt="Icon" /></td>
<td>Message log</td>
<td>Displays messages and internal status of errors or detected communication issues with data sources.</td>
</tr>
<tr>
<td><img src="workspace-profile-editor" alt="Icon" /></td>
<td>Workspace (profile) editor</td>
<td>Captures window and trend views in a shortcut as a named profile. Unlimited profile definitions can be saved for quick access to preferred displays and trends.</td>
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# Custom Applications

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<tr>
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<tbody>
<tr>
<td><img src="configuration-utility" alt="Icon" /></td>
<td>Configuration utility</td>
<td>Manages EDS server configuration.</td>
</tr>
<tr>
<td><img src="calculations-editor" alt="Icon" /></td>
<td>Calculations editor</td>
<td>Embedded calculation tools for creating and storing custom formulas.</td>
</tr>
<tr>
<td><img src="graphic-builder" alt="Icon" /></td>
<td>Graphic builder</td>
<td>Creates and edits EDS process diagrams.</td>
</tr>
<tr>
<td><img src="shade-editor" alt="Icon" /></td>
<td>Shade editor</td>
<td>Manages shade, shadow or substitution values. Defined processes point replacement values have specific time ranges that can replace point data when no data is found. These values are archived independently from process point values history.</td>
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