

## Features

- Simultaneous engineering of control, database, and graphics through multiple windows
- Intuitive Developer Studio generates object-oriented graphics, system database, and control
- Easy configuration of the Ovation system through standard tools such as cut, paste, and drag-and-drop
- Offline configuration with export features to selectively bring items to the online environment
- Dual functionality as an operator workstation minimizes hardware costs
- Open database integrates with many third-party software programs, providing information management at the enterprise level
- Straightforward installation through standard Microsoft® Windows® procedures
- System management capabilities for backup, restore, troubleshooting, and status monitoring
- Comprehensive online help function



Ovation™ expert control system, a key component of Emerson's PlantWeb™ digital plant architecture, incorporates dynamic, Microsoft® Windows® -based software into its engineer workstation. This integrated workstation allows plant personnel to configure, maintain, and operate an Ovation system all from a single source. The intuitive graphical interface of the engineer workstation enables users to focus on the plant or control process at hand rather than the base program.

Engineer software can be implemented on various PC platforms, providing flexibility in processing performance to match budget needs. Compatibility with many third-party applications and components makes the engineer workstation ready for future upgrades.

## Ovation Developer Studio

At the heart of the engineer workstation is the Ovation Developer Studio, a comprehensive software application that manages configuration of the entire Ovation system. As a fully integrated advanced software program, the Developer Studio creates and maintains Ovation drop types, control strategies, process graphics, point records, and system-wide configurations, including security.

The Developer Studio is an intuitive graphical menu-driven interface using standard drag and drop functionality to easily move or copy elements from one application to another. The object-oriented approach to system configuration provides a familiar operating environment, thus reducing the learning curve, simplifying development, and ultimately saving significant engineering effort.

## Dual Functionality

Every engineer workstation package includes operator software, offering dual functionality when required. Operator software provides access to dynamic system points, process graphics, standard function displays, trending, and the sophisticated Ovation alarm management program. Communicating through the Ovation network, the operator displays real-time data through high-speed, high-resolution process graphics, alarm screens, and other GUI tools.

## Embedded System Database

Every Ovation system includes one engineer workstation with an embedded Ovation system database for maintaining software and configuring data for all drops throughout the system. The Ovation system database is the central repository for collecting, organizing, and distributing Ovation system data, securing it from unauthorized access.

The Ovation system database is distributed to all drops, thus coordinating all system configuration activities. The distributed design allows concurrent access to various engineering functions from multiple workstations.

As points are added, deleted, or modified in the Ovation system, validity checks for detecting errors are performed within the system database. Once the error has been corrected, the database simultaneously distributes the new information to each drop on the Ovation Network. The Ovation system database provides two types of integrity checking. Single-field checking verifies whether entered values are within an acceptable range. Multi-field checking verifies the acceptability of an entry based on contents of other related fields.

The Ovation database is fully compliant with industry standards (ODBC/SQL) for integration with third-party data systems, including other plant and business information sources. This allows integration of third-party products for information management at the enterprise level, uniting process control and corporate information sources.

## Developer Studio Main Functions

The Developer Studio is comprised of various functions, each aimed at configuring a different portion of the Ovation system.

- Control Building
- Graphics Building
- Security Definition
- General System Configuration Tools
- Trend/Diagram Group Building
- I/O Device Configuration
- Point Configuration
- Historian Configuration
- Alarm Strategy Configuration

## Control Building

The control building tool supports the use of advanced algorithms and smart control strategies that leverage technologies such as fuzzy logic, artificial intelligence and digital bus interfaces to help users maximize efficiency and lower operating costs. Unlike third-party packages, the drawing capabilities in the Ovation control building tool are tailored specifically for creating and editing control logic; thereby simplifying and streamlining the logic development process. The Ovation control building tool features a comprehensive and intuitive graphical user interface (GUI) for control building, as well as simplified navigation and reporting capabilities. The control building tool presents information in an industry-supported SAMA format, but can also utilize any other custom format via the use of an internal symbol builder. By utilizing the symbology and drawing capability of the graphical user interface, the user is automatically supplied with online/offline documentation of control strategies.

The Ovation control building tool provides an efficient method for developing Ovation control strategies and automatically generating executable code for download to Ovation controllers. Ovation control strategies can be saved as macros or algorithms in a library for future access and modification to fit a plant's ever-changing needs. Stored strategies can be re-applied to similar applications throughout the plant to minimize engineering time.

The control building tool displays logic execution in a standard, editable PDF environment. Rendering the logic in this format opens the door to file sharing not only within the user's organization, but also among EPC contractors, architect-engineering firms, and control system and equipment vendors. This type of engineering collaboration during the control design process allows all parties to stay informed while also maximizing productivity and efficiency.

The control building tool automatically generates default points that are associated with algorithms, permitting creation of newly calculated points during control configuration. The Ovation system includes a library of over 135 built-in standard algorithms and the ability to embed advanced control algorithms. Additionally, the Ovation system provides a mechanism for creating user-defined algorithms to meet the challenging applications found in today's industry processes. Advanced algorithms take control to a higher level by incorporating fuzzy logic, neural networks, model predictive control, and industry specific advanced applications to reduce variability and optimize performance over a full range of processes.

Online control tuning and viewing facilities, also known as the signal diagram display system, exhibit floating and dockable windows in a user definable layout. Windows for control navigation, changing and viewing algorithm details, viewing tracking details and input/output details provide extra flexibility while navigating through information required for control visualization and tuning activities.

Additional features include:

- Configurable color schemes for background
- Signal animation
- Configurable state and value display of control signals
- Display of the signal name activated by a hovering cursor
- Quick access and maintenance of previously visited control drawings
- Shading current algorithm selection

Size, format, and style of all control drawings are user definable for customization to fit particular operating philosophies. Custom title block, border configuration, and numbering schemes simultaneously prepare the control drawings for documentation as control is developed.

The Developer Studio control building tool also incorporates control strategy management that eases the administration of multiple control strategies. Management capabilities include revision of document parameters such as titles, import/export control, global system point changes, reorder control execution, and duplication of strategies.

## Graphics Building

The Developer Studio graphics building tool creates and edits crisp, full-color Ovation system displays, with a resolution of 16,000 pixels. Standard click-and-drag features (such as draw, move, and resize objects) and drawing attributes (such as color, line width, fill pattern, and text size) are available from scrolling menus for customizing displays to fit particular plant process needs. Interactive features can be built into the graphics including buttons, check boxes, choice items, event menus, and sliders. An extensive symbol editor creates, defines, and stores up to 256 custom shapes. A shape library keeps symbols for quick recall when building a new graphic or editing an existing one.

The graphics building tool supports the use of conditional logic, such as IF and LOOP commands, and mathematical calculations. Most importantly, existing source code files can be reused, eliminating the need to re-create graphics that reference the same component. Cutting and pasting from an existing graphic into a new one saves significant development time and effort.

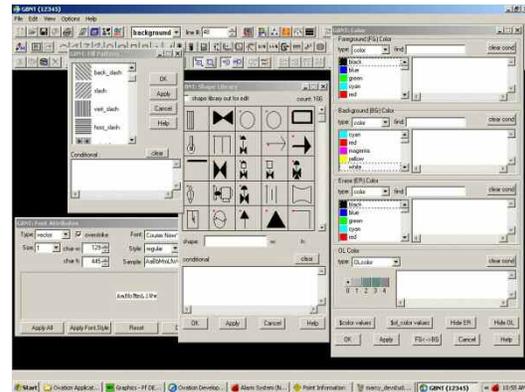
## Graphics Building Specifications

<b>Virtual Canvas Resolution</b>	16K x 16K
<b>Colors</b>	256 configurable from color menu of one million choices.
<b>Line Widths</b>	16 configurable

<b>Character Sizes</b>	Non-scalable text with 8 configurable character sizes and scalable text with no fixed configurable character sizes.
<b>Fill Patterns</b>	8 standard 256 configurable
<b>Line Patterns</b>	8 standard 256 configurable
<b>Shape/Symbol Editor</b>	Defines up to 256 shapes
<b>Fill-Pattern Builder/Editor</b>	Included
<b>Macro Support</b>	Included
<b>Click and Drag Point Names</b>	Included
<b>Error Detection</b>	Included
<b>Maintain Aspect Ratio on Resize</b>	Included
<b>Rotation</b>	Clockwise & counterclockwise
<b>Inversion</b>	Top/bottom and Right/left
<b>Copies of an Item</b>	Up to 10
<b>Group/Ungroup</b>	Included
<b>Save Comments in Graphics</b>	Included
<b>Edit</b>	Undo/redo last
<b>Auto-Save</b>	Included
<b>Pan/Zoom</b>	Included
<b>Snap to Grid</b>	Included

### Drawing and Configuring Shapes and Symbols

Various shapes, such as lines, rectangles, circles, dots, arches, polygons, and ellipses are created, edited or deleted through the graphics building tool. Shapes are drawn, moved, or resized using click-and-drag actions. A scrolling pictorial list displays all defined shapes for sharing with other diagrams at program start-up. Shape attributes such as color, line width, fill pattern, and text size are selected from menus or scrolling lists.



### Macros

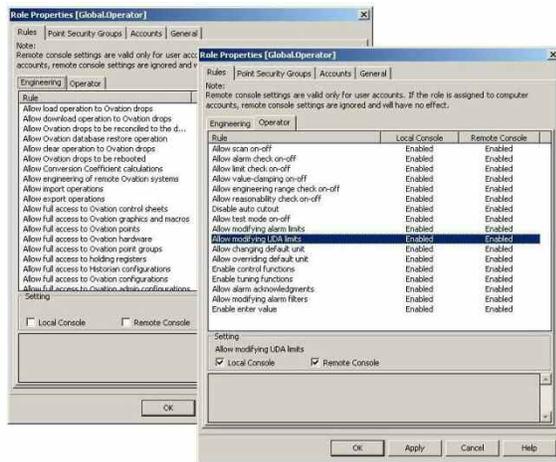
The graphics building tool supports macros for automating the tedious and repetitive task of redrawing diagrams. Macros are graphic files containing display items and control logic used to predefine or pre-build a pictorial element, such as a template for a control station or graphic items such as pumps and valves. Elements are saved as a diagram for later use as building blocks in other graphic diagrams. Macros simplify construction of multiple control stations resulting in reduced graphics building time.

Unmacro support provides the ability to replace a specific macro in a graphic with the individual commands that make up the macro. This allows the user to edit/copy the macro graphic commands to the main display code.

### Source Editor

A line-by-line source editor simplifies the graphic modification process, allowing graphics editing in text mode. Changes made to a graphic object (text, shape, etc.) can be viewed in the source code. Additional features of the source editor include global edits and online modifications. The Integrated Source Editor will scroll to the middle of the window so commands immediately preceding the selected item command are visible without manually scrolling the source editor window

### Security Definition



Ovation system security is designed to meet the requirements imposed by NERC (North American Electric Reliability Council) CIP standards. By taking a proactive role in addressing the increasing concerns in protecting cyber assets Ovation incorporates a strong security model with user accounts management, strong password encryptions, and a robust engineering and operation environment managed from a central location to prevent unauthorized transactions and increase system reliability and availability.

The Developer Studio incorporates a security definition tool that protects Ovation engineering and operating environments. The security tool defines a set of functions that can be enabled or disabled based on user rights and local or remote access privileges. Additionally, access and rights can be granted for the whole plant or an isolated area.

Samples of functions that can be configured through the security tool for both engineering and operations include:

<b>Engineering Functions</b>	Download Import Export Graphics building Control building Point building Hardware modifications System configurations
<b>Operator Functions</b>	Scan on/off Control Tuning Alarm limit modifications Alarm acknowledgements Value inputs

The Ovation security model has been designed to meet stringent regulations and provide a safe environment that prevents use or misuse of the system resources.

### General System Configuration Tools

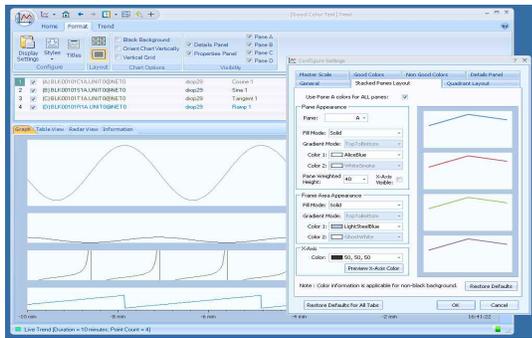
General system configuration tools within the Developer Studio define and maintain the configuration data of all Ovation system drops. Building an Ovation system can be done without connection to the actual system hardware; the entire system configuration can be defined prior to its assembly.

Installation routines are included with every Developer Studio module. These routines incorporate a set of default configuration values and a set of derived values that are based on the system configuration, allowing installation to run automatically. Configurations can be modified or added at any time, even when the system is active.

Ovation's open system architecture allows configuration of devices outside of the Ovation system, such as field devices, select third-party I/O modules, and external interfaces using OPC or MODBUS.

## Trend/Diagram Group Configuration

A Trend Group is a previously defined set of points with the same trend display parameters. A trend group can consist of up to thirty-two different points and all points in a trend group will have identical group parameters. However, each point in a trend group may have unique point parameters.

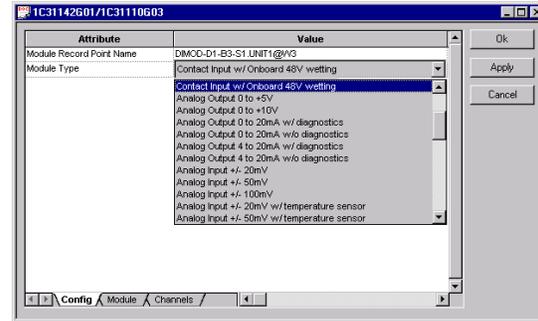


The Trend/Diagram group configuration tool allows you to select and display global trend or diagram groups or to create, modify, select and display local trend/diagram groups. The list of trend/diagram groups appears in the scrollable list. A “G” in front of the group number indicates a global group, while an “L” indicates a local group.

The point group configuration tool creates process diagram groups and trend groups through a common interface.

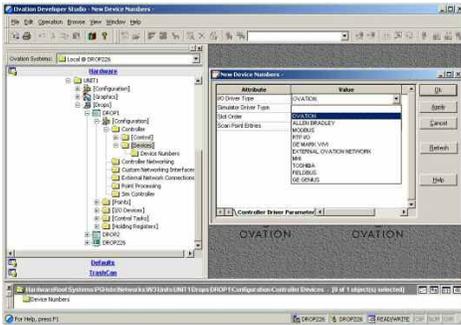
Point/Trend Group Configuration Specifications	
Process Diagram Groups	Maximum of 5,000
Trend Groups	Maximum of 1,000 groups made up to 32 points

## I/O Device Configuration



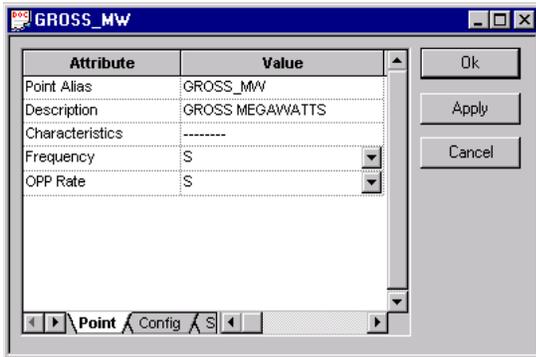
The Developer Studio I/O device configuration tool uses a hierarchical format for adding and maintaining I/O modules within Ovation Controllers and numerous types of I/O interfaces. Ovation I/O and an increasing number of third party I/O data can be consolidated and managed from a single Ovation system, saving countless hours when configuring and changing system I/O. A pull-down list of all available I/O makes the addition of new modules to a controller quick and easy.

<b>Ovation (Hard) I/O Types</b>	WDPF Q-Line I/O Ovation I/O
<b>Ovation I/O Bus Modules</b>	FUNDATION™ Fieldbus Profibus DP DeviceNet
<b>Third-party I/O Types</b>	Allen Bradley Modbus Master/Slave GE Mark IV/V/VI OPC RS232 MHI Toshiba IEC 60870 IEC 61850 DNP3



I/O Configuration is performed through various windows and pull-down menus that change context based on the type of I/O. Additionally, as a standard feature, Ovation provides a large area to configure ancillary information that can be used to document and identify a piece of equipment from anywhere in the Ovation Network. The configured ancillary data can be used for P&ID references, cable numbers, color labels and any other pertinent data.

## Point Configuration



Process points are added, deleted or modified through the Developer Studio point configuration module. This tool defines each point parameter such as I/O type, card type, hardware address, termination information, sensor type, calibration, and conversion coefficients. To prevent name duplication, the point configuration tool performs an immediate system-wide consistency check of any added points, validating the attributes of each process point, and verifying that deleted points are not required in other areas.

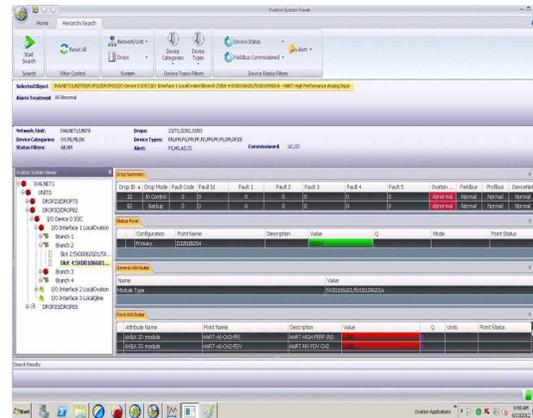
## Historian Configuration

The Developer Studio historian configuration tool allows you to establish and manage important historical functions such as archival time, retry periods, disk criteria, scanners, scan groups, historian points, and collection of alarm operator, and sequenced events.

## Alarm Strategy Configuration

The Developer Studio alarm configuration tool is used to build and implement an alarm strategy that quickly alerts plant staff of operations outside of normal limits and provides them the ability to swiftly remedy the situation. This tool enables configuration of important alarm criteria such as filters, collectors, audio, historical storage, iconic, printing, colors, bitmaps, and blinking.

## System Viewer I/O Graphic



This application automatically generates a real-time, live display of a drop's I/O from the controller to the individual points or channels on modules. This allows technicians, project engineers, installation engineers, and plant operators to more effectively monitor their I/O at a glance when operating, performing maintenance, and commissioning the plant.

## **Summary**

As a single integrated software package, the Ovation engineer workstation provides powerful tools for configuring and maintaining the Ovation control system. The multiple functionality of the engineer workstation, combined with the Developer Studio, make it one of the industry's most technologically advanced tools for managing graphics, process points, and control strategies.

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