

Graphics+ Product Bulletin

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Graphics+ is a data visualization software package designed for Metasys® system customers who are looking for a quick way to create interactive building data representations, thus empowering them to visualize, analyze, and respond to problems faster. The Graphics+ software package comprises two components: the Graphic Generation Tool (GGT) and the Graphics+ Viewer.

The Graphic Generation Tool is a simple yet powerful diagramming tool that helps designers create compelling representations of their building equipment and floor plans and bind them to Metasys data objects. The tool includes an extensive library of pre-built symbols and templates, shortcut keys, and right-click functions, giving designers the ability to assemble graphics faster. The tool also provides flexibility to create customized graphics using a rich set of effects known as behaviors. Behaviors allow users to command, navigate, change color, apply flash, set visibility, and display a context menu for bound Metasys objects. You can save these graphics directly to a supported Metasys Host, such as a Site Director or a System Configuration Tool (SCT) archive database.

With the GGT, you can easily create a graphic of status summaries for each monitored system or space (for example, building, floor, or floor group). The graphic uses color to summarize the overall condition of monitored points. In one quick glance, you can view the number of warnings, alarms, or offline items across your entire facility or campus. By clicking any one of these spaces or systems, you can see a detailed view of the monitored equipment. You can also open historical data for any trended point within the graphic using the Trend Module. The Trend Module can show trend data for up to four points at once for system diagnosis and comparison purposes. Additionally, using the predefined set of gauges, you can create an energy dashboard graphic that quickly conveys the current state of energy savings in your facility.

Figure 1: Graphics+ Example



The Graphics+ Viewer is integrated with the Site Management Portal (SMP), SCT, and Ready Access Portal, allowing users to show, command, or update in real time all the data linked objects that were created in the GGT. The graphical display gives you a three-dimensional view of your facility, offering an intuitive way to manage the daily events of your buildings or campus.

Features and Benefits

Features	Benefits
Thermographic Display of Temperature Conditions of a Floor	Summarizes in a glance the status of the monitored space. Specific colors, customizable by the user, convey each status.
Easy and Consistent Access to Room Information	Provides information critical to controlling a space in a single graphical window. View information without ever leaving the floor plan graphic.

Features	Benefits
Summary Data of Multiple Buildings in a Single Graphical View with Navigational Aids	Lets you easily assess the status of the entire complex, with the ability to investigate specific buildings or floors in need of attention.
Ability to Quickly and Easily Switch from Tabular to Graphical Views	Satisfies the viewing preferences of any user. The graphic view lets you send commands to a specific zone or room, while the tabular view lets you send global commands to an entire floor.
Stand-Alone Graphic Generation Tool	Lets users create graphics offline using an archive database, or online when connected to the Metasys® Site Director. Saving and opening a graphic is a seamless process. Graphic elements are bound directly to Metasys items.
Extensive Library of Prebuilt Dynamic Symbols and Templates	Enables fast and cost-effective graphic development and implementation using a set of dynamic elements and templates in a contemporary, photorealistic design.
Dynamic Symbol Capabilities, Including Commanding, Flashing, Changing Color, Showing and Hiding Elements, Navigation, and Context Menus, for Enhanced User Experience	Provide the ability to create dynamic building data representations using a rich set of effects in order to communicate more information in the same amount of space on a graphic.
HVAC Library Elements Pre-Populated with Aliased Binding Strings	Improves productivity for creating graphics when standard naming conventions are used. Any Metasys item defined in the database can be bound to a graphic element.
Historical Trend Information Available Directly within a Graphic	Allows a faster and more complete diagnosis of building and system conditions.
Computer Aided Drafting (CAD) File Import Capability	Provides an automated method of importing and converting industry-standard building elevation and floor plan files for use in graphics.
Right-Click Functions, Short-Cut Keys, and User-Configurable Symbols Properties	Reduce the number of mouse clicks required for some of the simple operations in assembling high-quality graphics.
Comprehensive Representation of Facility Support Systems	Allows building operators to easily monitor the condition of the facility using a real-world, intuitive interface.
Multiple Language Support	Enables the sale of the product to many different markets throughout the world.
Optimal Graphics Display Performance	Allows users to view data-linked equipment and floor plan graphics within seconds in the Site Management Portal (SMP) and the Ready Access Portal.

Graphic Generation Tool Overview

The Graphic Generation Tool is a stand-alone software application that runs on a computer with a supported Microsoft® Windows® operating system. You use the tool to build the graphical representations of the monitored and controlled equipment in the facility.

Drawing Tools Help Create Graphics

A comprehensive set of drawing tools are provided with GGT to help you create a wide variety of lines and shapes. Standard drawing tool functions, such as zooming, panning, and resizing, are available.

Value Boxes Offer Distinct Functions

GGT offers four types of value boxes for showing Metasys items in a graphic ([Figure 2](#)). The Basic Value Box, the simplest form, shows the value or status with units. The Inline Command Box, similar to the Basic Value Box, includes an enhanced command capability that lets you type or select the new value directly from the value box. The Advanced Value Box shows one or two values and also includes command capability. Last, the Key Data item is an inline command box with a built-in label.

Figure 2: Examples of Value Boxes

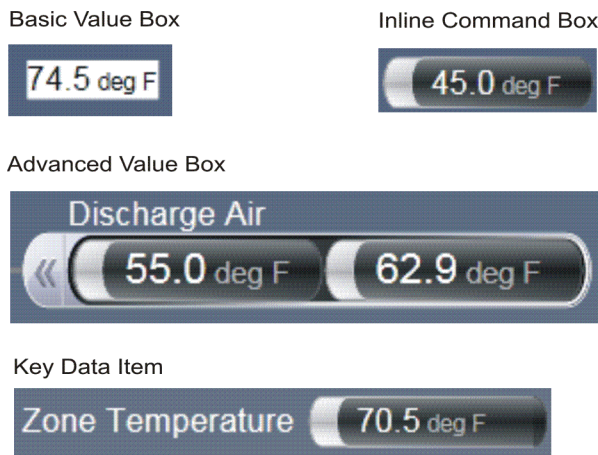
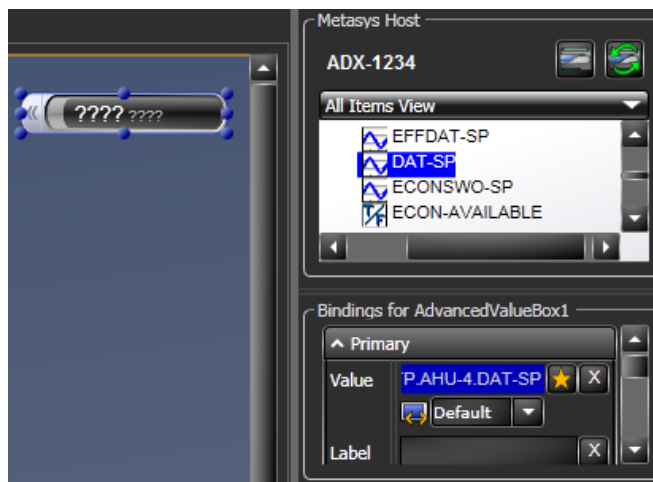


Figure 3: Binding a Metasys Value to a Graphic



Aliasing and Binding

GGT has powerful aliasing and binding capabilities for increased usability.

Aliases let you use a single graphic for multiple mechanical systems. The alias process changes the values that appear in the value boxes to represent the system that you want to monitor at the moment the graphic appears.

Binding attaches Metasys objects to elements on the graphic, so these elements show live data when viewed on the Site Management Portal or Ready Access Portal. The binding process is straightforward, much like selecting objects from the navigation tree or User Views.

You can bind elements to:

- Metasys system objects and/or attributes
- other graphics
- textual documents and spreadsheets
- applications
- website addresses

[Figure 3](#) shows an example of a Discharge Air Temperature Setpoint binding.

AutoDesk® AutoCAD® Import

GGT features an AutoCAD import function that provides a method of importing and converting industry-standard building elevation and floor plan files for use in graphics. This flexible import function lets you import the AutoCAD drawing as an image, floor, or individual elements. You can then drop in Room Status elements to create an interactive floor plan that provides information (for example, room temperature, humidity, and air quality) for each zone or room on the floor.

Trend Module

The Trend Module displays local trend data for up to four user-specified Metasys items simultaneously ([Figure 4](#)). This module optimizes end-user workflow by providing direct access to historical trend information within each graphic, letting you diagnose building and system conditions faster and more completely. The Trend Module is available from any Graphics+ graphic within the Metasys Site Management Portal and Ready Access Portal UIs.

Figure 4: Trend Module



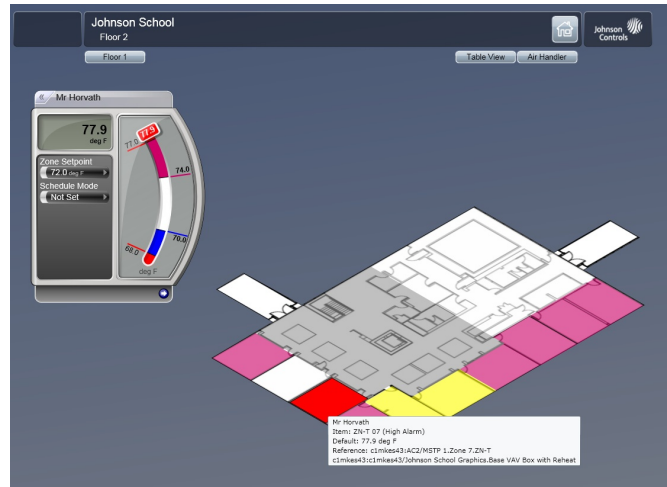
Standard features of the Trend Module include:

- display of a historical trend chart directly from within the graphic
- display of up to four Metasys trend items at the same time, with the ability to show or hide each trend
- show the values for all samples that occurred in the same moment in time
- zoom in and out within the chart to more closely inspect problem areas
- navigate directly to the trended item when further analysis is required

Graphic Enterprise Library

The Graphic Enterprise Library (GEL) provided with the GGT includes an extensive set of three-dimensional photorealistic elements that represent HVAC, security, floor plan, and Metasys network components, plus entire systems that you can customize. For example, the Floor element with the Room Control Module lets you graphically represent the temperature, humidity, and air quality for each room on a floor (Figure 5). You can change the Room Control Module by clicking a room. This module provides an analog gauge that shows alarm limits, setpoints, and current temperature along with other key information for the room. A single-room version of the Room Control Module is also available to display room conditions consistently between system and floor plan graphics. In addition to these modules, the GEL provides hundreds of elements for use in your graphics.

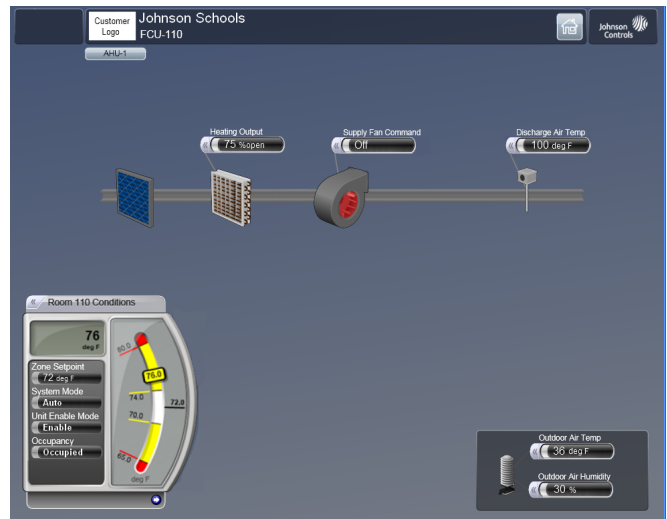
Figure 5: Floor Element with Room Control Module Example



Select elements in the GEL have dynamic capabilities such as color changes and animation settings.

In addition to the elements, a large set of standard templates are provided with GGT to assist in the creation of new graphics. Examples include Mixed Air Dual Path, Fan Coil Unit (Figure 6), and Cooling Tower. After you select a template, if you use standard naming conventions, you can use pre-bound alias strings to speed graphic development.

Figure 6: Fan Coil with Heating/Cooling Coil Template Example



Behaviors

The behaviors feature in the GGT lets you add a rich set of effects to symbols created using the drawing tool or the GEL library, as well as imported image files, thus enhancing the dynamic capabilities of the overall graphic. These capabilities provide an enhanced user experience and more effectively communicate the status of monitored equipment.

The workflow for defining behaviors is a four-step simple approach that does not require any prior programming experience. First, the user names the behavior and then assigns either a mouse-click action or Metasys value change to the selected graphic object. Then, the user defines either one or more of the five available effects to the object ([Table 1](#)). Finally, the user assigns a rule, if necessary, to limit the results of a behavior to certain instances.

Overview of Effects for Behaviors

Table 1: Overview of Effects for Behaviors

Effects	Description
Flash	Causes one of the colors of the element to alternate with another color at a static frequency at runtime. The Flash effect can be bound to an analog (AV), binary (BV), or multi-state (MV) object. The Flash effect does not support rules. The Flash effect requires that you select the property of the element that alternates colors. At configuration in the GGT, a list of valid Color (or Brush) Properties are given, and you can select one color per element.
Navigate	Allows you to navigate to a Metasys object, URL, or application or file at run time. You must configure the Navigate effect to navigate to one of the following options or the effect is not configured properly: • a Metasys Item (also referred to in this document as object) • a URL (HTTP, HTTPS, FTP) • an application or file The Metasys Value Change trigger is not recommended for the Navigate effect.
Set Color	Causes one of the colors of the element to change at runtime. The Set Color effect can be bound to an analog (AV), binary (BV), or multi-state (MV) object. The Set Color effect requires that you select the property of the element that can change color. When you configure the element in the GGT, you see a list of valid Color (or Brush) Properties and you can select one color per element. Note: If an element already supports color change, it does not support the Set Color effect via custom behaviors. Also, the Set Color effect is not available on elements that do not have exposed fill or stroke properties.
Set Visibility	Causes the element to show or hide. The Set Visibility effect can be bound to an analog (AV), binary (BV), or multi-state (MV) object. For Set Visibility, the best trigger choice is Metasys Value Change. We recommend that you configure an element with the Set Visibility effect to have two behaviors. An example of a high-level configuration for an element with two behaviors is as follows: • A behavior configured with the Metasys Value Change trigger, the Set Visibility effect set to Hide, and a rule (to bind the effect to an object), such that if the objects value does or does not equal a given state or value, the element is hidden. • One behavior configured with the Metasys Value Change trigger, the Set Visibility effect set to Show, and a rule (to bind the effect to an object), such that if the objects value does or does not equal a given state or value, the element is shown.

Table 1: Overview of Effects for Behaviors

Effects	Description
Show Command Dialog	Causes a command dialog box to display, allowing you to command the bound point at runtime. The Show Command Dialog effect can be bound to an analog (AV), binary (BV), or multi-state (MV) object. For the Show Command Dialog effect, the best trigger choice is a mouse action (double click, left click, or right click). You can view a graphic with the Command effect in SCT, but command functionality is not available in the SCT UI.
Show Context Menu	Causes a context menu (also known as a user action panel) for a bound object to appear at runtime. The Show Context Menu effect can be bound to analog (AV), binary (BV), or multi-state (MV) values. The Show Context Menu only supports the right-click trigger. If an element already has built-in Right Click properties, then it does not support a Show Context Menu effect via behaviors. The Show Context Menu effect does not support rules.

System Requirements

To create graphics, you need the Graphic Generation Tool software and Microsoft .NET Framework 4.0 software. If you want access to the Metasys navigation tree, you also need access to the SCT database or access to the Metasys Site Director.

To view graphics, you need the Windows Internet Explorer® web browser to access the Site Management Portal UI, and Microsoft Silverlight 5.0 or later must be installed on the client computer. For performance enhancements to take effect in the Site Management Portal, the Site Director must be at Metasys® Release 6.5 or later.

Note: Apple operating systems are supported for Metasys client computers only.

Note: In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI.

Saving Graphics

GGT has a built-in communication interface that lets you conveniently save graphics files as Metasys Graphics+ objects directly to the Metasys Host (either an SCT archive database or a Metasys supervisory device).

Note: If you need to store Graphics+ objects in the Network Automation Engine (NAE) 45/35, Network Control Engine (NCE), or Network Integration Engine (NIE), refer to the *Graphics+ Style Guide (LIT-12011705)* for important limitations.

Graphics Viewing

Graphics created with GGT and saved to a location on the Metasys navigation tree appear just like any other graphic object. When you open the graphic, it appears directly in the SCT, Metasys server, or supervisory device. When you view the graphic on the server or supervisory device, you can see real-time controller field point data within the graphic and you can command and update points from the graphic. [Figure 1](#) shows a graphic displayed in the Site Management Portal UI.

Note: We do not recommend viewing Graphics+ objects from an NAE45/35, NCE25, or NIE.

Full Language Support

The Graphic Generation Tool and Graphics+ Viewer support all languages that are supported by the Metasys system. For details, contact your local Johnson Controls® Product Sales Operation Team Member.

Related Documentation

See [Table 2](#) for more information on the Graphics+ feature.

Table 2: Graphics+ Related Documentation

For Information On	See Document
Installing the Graphic Generation Tool	<i>Graphic Generation Tool Installation Instructions (LIT-12011685)</i>
Creating Graphics Using the GEL	<i>Graphic Generation Tool Help (LIT-12011697)</i> ¹
Following Best Practices in Graphic Design	<i>Graphics+ Style Guide Help (LIT-12011705)</i> ¹
Using Graphics Online	<i>Graphics+ Runtime Help (LIT-12011708)</i> ¹ <i>Ready Access Portal Help (LIT-12011342)</i> ¹

¹ This LIT number represents a printer-friendly version of the Help.

Technical Specifications

Table 3: Graphic Generation Tool System Requirements

Product	MS-GGT-0 (new Graphic Generation Tool software) MS-GGT-6 (upgrade Graphic Generation Tool software)
Recommended Computer Platform ¹	Intel® Core™ 2 Duo E6700 or better (Intel Core 2 Duo E4300 minimum) 100 MB recommended free hard disk space available DVD drive
Memory	4 GB RAM recommended (2 GB RAM minimum)
Operating System	Windows 8.1 and Windows 8.1 Enterprise Editions (64-bit) Windows 8 and Windows 8 Enterprise Editions (64-bit) Windows® 7 Professional, Enterprise, or Ultimate Editions with SP1 (32-bit and 64-bit) Windows Server 2012 R2 (64-bit) Windows Server 2012 (64-bit) Windows Server 2008 R2 with SP1 (64-bit) Windows Server 2008 with SP2 (32-bit)
Other Software	Microsoft .NET Framework 4.0 (required for creating Graphics+ graphics; included on the GGT product disk) Note: We recommend you install the full version of Microsoft .NET Framework 4.0.
Communication	Ethernet network interface card 10/100/1,000 Mbps (100 Mbps network recommended) Note: We recommend a wired connection. Wireless 802.11 connection

¹ Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

Table 4: Graphics+ Viewer System Requirements

Product	Graphics+ Viewer built into Site Management Portal UI, SCT UI, and Ready Access Portal UI
Recommended Computer Platform ^{1 2}	Intel® Core™ 2 Duo E6700 or better (Intel Core 2 Duo E4300 minimum)
Memory	4 GB RAM recommended (2 GB RAM minimum)

Table 4: Graphics+ Viewer System Requirements

Operating System	Windows 8.1 and Windows 8.1 Enterprise Editions (64-bit) Windows 8 and Windows 8 Enterprise Editions (64-bit) Windows® 7 Professional, Enterprise, or Ultimate Editions with SP1 (32-bit and 64-bit) Windows Server 2012 R2 (64-bit) Windows Server 2012 (64-bit) Windows Server 2008 R2 with SP1 (64-bit) Windows Server 2008 with SP2 (32-bit) Apple® OS X® 10.8 Mountain Lion Apple® OS X® 10.9 Mavericks Note: Apple operating systems are supported for Metasys client computers only. Note: In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI.
Other Software	Windows Internet Explorer® Version 8, 9, 10, or 11 Note: In Internet Explorer 11, select the Use Microsoft compatibility lists option, found under Tools > Compatibility View Settings, to ensure that websites appear and function correctly. Microsoft Silverlight 5.0 or higher (available as a free download from Microsoft Corporation.) Apple® Safari version 6.0.5 and 7.0 (Other browsers, such as Google® Chrome and Mozilla Firefox, may also be used but are not fully supported.)
Communication	Ethernet network interface card 10/100/1,000 Mbps (100 Mbps network recommended) Note: We recommend a wired connection. Wireless 802.11 connection

- 1 For large graphics, rendering the image is CPU intensive. In general, a higher performing CPU with multiple cores is recommended.
- 2 Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.



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