ADS-Lite-A Introduction

With the ADS-Lite-A, Johnson Controls has combined the latest industry-standard software with more than 130 years of control experience to create a powerful information management tool. The ADS-Lite-A is the point of access into a building automation system (BAS) and archives historical and configuration data.

The Metasys UI has been designed to encourage system use and reduce training needs with intuitive operating procedures. Operators quickly learn to use the system effectively and take full advantage of the ADS-Lite-A capabilities, which include user graphics, alarm and event management, trend data presentation, system summaries, and reports.

The integration of IT and Internet communication and security technologies enables the ADS-Lite-A to be used within the existing networking infrastructure of buildings and enterprises. The ADS-Lite-A can be accessed by multiple client computers from any location on the network, and enterprise systems can read the data in the ADS-Lite-A database for business planning and energy management purposes.

The Metasys system bridges the gap between the building control systems and enterprise networks to enable a more integrated approach to facility management. The ADS-Lite-A and Metasys system are wise investments that yield returns to the building owner and operator well into the future.

Use this document to discover the capabilities of the ADS-Lite-A and its supported network engines.

ADS-Lite-A Overview

The ADS Lite-A manages the collection and presentation of large amounts of trend data, event messages, operator transactions, and system configuration data. As Site Director, the ADS-Lite-A provides secure communication to a maximum of four network of engines from the following models: the NAE45-Lite, SNE110L and NIE29/NIE39/NIE49.

The ADS-Lite-A supports robust features and capabilities that continue to position the Metasys system as the leading building automation system in the industry, including:

- Fault detection: identifies and lists building system-related faults in order of severity to help operators quickly fix issues and avoid equipment issues, energy waste, and comfort complaints.
- Fault triage: is an add-on to fault detection that provides fault duration, occurrence information, and corrective action recommendations to improve fault prioritization that assists less experienced building operators with problem solving.
- Building Network tree allows for faster delivery of the Metasys User Interface (UI) by enabling its deployment prior to the spaces and equipment configuration process. It also provides a familiar navigation experience for Metasys operators who have previous experience using the All Items tree of the Site Management Portal.
- Advanced Search and Reporting in the Metasys UI allows Metasys operators to find and report on operational data and make bulk commands to restore order more quickly. The Advanced Search and Reporting feature provides Metasys users the ability to quickly search Metasys objects by Building Network, equipment, equipment type, or space.
- Custom Dashboards for the Metasys User Interface. Custom dashboards enable Metasys UI designers to create dashboards that provide the most relevant and critical information to Metasys operators for enhanced productivity and creates an experience that mimics users operational styles for ease of use.

- Graphics Custom Behaviors provide Metasys UI designers the flexibility to use custom symbols that are required for their individual building or campus needs or their local standards.

- Trend widget updates allow users to identify patterns including outliers, using an intuitive candlestick chart that displays min, max, and averages.

- Cyber Health Dashboard provides a Metasys administrator with a centralized view of potential security-related issues or system issues which are detectable by an ADS-Lite, but which may not surface as part of general system alarms.

- User Management facilitates the creation and management of users and their roles, category-based permissions, and privileges directly in Metasys UI Online, without the need to install software on client machines.

- Historical data management, including an ODBC-compliant database package for storage of trend data, event messages, operator transactions, and system configuration data.

- RESTful APIs: the Metasys API provides easy access for you to pull raw data from the server into your processing and analytic mechanisms, such as PowerBI® and Tableau®, and supports both historical data fetching and gathering information about the site and all of its child elements. Additionally, the new Metasys Monitoring and Commanding API enables reading, writing, and commanding of one or more Metasys objects and properties to provide a secure and cost-effective way to bi-directionally integrate with third party applications.

Figure 1: ADS-Lite-A Site Management UI

Figure 2: Metasys UI

Note: In this document, the term engine refers to NAE45-Lite, SNE110L, and NIEs, unless otherwise noted.
ADS-Lite features and benefits

**FIPS 140-2 compliant**

FIPS 140-2 uses cybersecurity techniques to prevent unauthorized access to systems and data.

**Flexible system navigation and dynamic user graphics**

Allow customization of system presentation for different users to enhance information access and facilitate system operation. User graphics created with standard graphics, the Advanced Graphics Application, and the Graphics+, and Metasys UI graphics are all supported. Metasys UI graphics are only viewable in the Metasys UI.

**Alarm and event management**

Routes event messages to building operators for rapid fault diagnosis and response. Creates an audit trail for later detailed analysis.

**Long-term historical data storage**

Enables the analysis of building system performance to identify opportunities for efficiency improvements and the development of predictive strategies.

**RESTful APIs**

The Metasys API provides easy access to pull raw data from the server into your processing and analytic mechanisms, such as PowerBI® and Tableau®, and supports both historical data fetching, and gathering information about the site and all of its child elements. Additionally, the new Metasys monitoring and commanding API enables reading, writing, and commanding of one or more Metasys objects and properties to provide a secure and cost-effective way to bi-directionally integrate with third party applications.

Features and Benefits of the ADS-Lite-A with an SNE110L

**Communication using commonly accepted IT standards**

Allows you to install a system on your existing IT infrastructure within a building or enterprise and use standard IT communication services over the company intranet, WAN, or public Internet with firewall protection.

**Secure, encrypted communication**

Protects the system from unauthorized users and computer hackers with the implementation of the Hypertext Transfer Protocol Secure (HTTPS) application protocol and Transport Layer Security (TLS 1.2) to encrypt communications between the ADS-Lite-A, network engines, and clients.

**Web-based user interface**

Allows you to access system data from any supported web browser device connected to the network, including remote users connected by an Internet Service Provider (ISP).

**UI support for five users**

Allows up to five users to access the ADS-Lite-A UI at one time.

**Support for up to four engines**

Enables flexibility and scalability on your network.
Support for MS/TP Bus, BACnet Protocol, and Third-Party Communication

Allows you to leverage standard communication formats on your network: MS/TP and BACnet/IP communication to third-party devices, and third-party communication with the SNE110L and NIE29/NIE39/NIE49.

Support for the Language Installation Program (LIP)

Installs language resources and makes the needed configuration changes so that the ADS-Lite-A system supports one or more locales.

ADS-Lite-A Ordering Information

Table 1: ADS-Lite-A

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-ADSLA5U-0</td>
<td>ADS-Lite-A New project software: for up to five users, on new sites</td>
</tr>
<tr>
<td>MS-ADSLA5U-6</td>
<td>ADS-Lite-A Upgrade project software: for up to five users, on sites with a previous version of the Metasys software</td>
</tr>
</tbody>
</table>

SNE110L Ordering Information

Table 2: SNE110L

<table>
<thead>
<tr>
<th>Code number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-SNE110L0-0</td>
<td>Supports one field bus device integration with a maximum of 100 devices on the trunk. This model is intended for use with Metasys Server Lite (ADS-Lite-A) software in select regions of Australia, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Taiwan, Thailand, Vietnam, and select branches.</td>
</tr>
<tr>
<td>M4-SNE110L1-0</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** This model does not support the N2 Bus or LonWorks network interface, but does support up to 10 IP device integrations.
### Table 3: Optional feature add-on licenses

<table>
<thead>
<tr>
<th>Code number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-APIMOCMD-0</td>
<td>License enabling the Monitoring and Commanding API for new site.</td>
</tr>
<tr>
<td>M4-FAULT-0</td>
<td>License enabling Fault Detection feature for one Metasys server (ADS, ADS-Lite, ADX, or OAS series).&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>M4-TRIAGE-0</td>
<td>License enabling Fault Triage feature for one Metasys server (ADS, ADS-Lite, ADX, or OAS series).&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> M4-FAULT-0 is also required as a prerequisite.</td>
</tr>
<tr>
<td>M4-ADFS-0</td>
<td>License enabling Active Directory Federation Services (ADFS) feature for one Metasys server (ADS, ADS-Lite, ADX or OAS series).</td>
</tr>
<tr>
<td>M4-FIPS-0</td>
<td>License enabling Federal Information Processing Standard 140-2 (FIPS 140-2 Level 1 compliance) for one Metasys server (ADS, ADS-Lite, ADX, or OAS series), or for one software network engine (NAE85 or LCS85 series).</td>
</tr>
</tbody>
</table>

<sup>1</sup> The OAS must meet minimum requirements.

<sup>2</sup> The OAS must meet minimum requirements.

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**Network Diagram: Metasys Network with an ADS-Lite-A**

**Figure 3: Metasys Network with an ADS-Lite-A**

[Network Diagram: Metasys Network with an ADS-Lite-A](#)
User experience

The Metasys system user interface is a portal into a site that can be tailored to fit the needs of all potential system users. The UI can evolve and scale to match the needs of any single facility or campus of multiple buildings. The UI experience includes the Site Management Portal UI and the mobile-optimized Metasys UI.

Metasys UI

The Metasys UI is an HTML5-compliant web interface that provides device-agnostic access to Metasys from smartphones, tablets, and computers. The Metasys UI is an intuitive interface that reduces learning time, maximizes productivity of operators, and provides a seamless user experience no matter what type of client device is used to access the system. The client device does not require any additional software installation—no Java™, Microsoft Silverlight®, or Adobe® Flash® or other software from an online app store. The Metasys UI is included with any Metasys server: ADS, ADX (unified and split), ADS-Lite and OAS.

Note: The server software must be licensed in order to log in to the Metasys UI.

Figure 4: Metasys UI

Dashboards and widgets

A dashboard organizes data in the Metasys UI to help operators see a complete picture of what is happening in a space, with a piece of equipment, or within a system such as a central plant. Within each dashboard, widgets provide specific operator interaction features. Operators can customize dashboards to suit specific needs, by allowing the selection of viewable widgets, widget order, and widget appearance, as well as being assigned by client device type.
The **Space Dashboard** provides a cohesive summary of the selected space, including the equipment that serves the space and potential problem areas in the space. The widgets shown in the Space Dashboard include the following:

- **Graphics** provide a visual representation of the selected space, enabling operators to quickly check the status of that space, uncover unusual system conditions, make relational comparisons between nearby spaces at-a-glance, and issue commands to improve performance or restore order. The Graphics widget displays digital representations of equipment or systems, with graphical symbols and animations created using the Graphics Manager.

- **Equipment Serving Space** identifies the equipment serving the selected space and then provides details about that equipment, including other equipment or systems that may be affecting that piece of equipment.

- **Potential Problem Areas** provides a single display showing all items that are in alarm, warning, overridden, out of service, and offline statuses within a space. This display also enables operators to filter and view data that is important to them. Operators can use the Potential Problem Areas widget as a daily punch list to manage buildings more efficiently.

- **Equipment Summary** is a table view listing all similar equipment that directly serves the selected space, and any downstream spaces. The Equipment Summary shows the most important information for each equipment and provides links to the equipment for even more detailed information. Users can define which data to include in an Equipment Summary with the new custom columns selection feature.

- **Schedule** widget lists all schedules affecting the selected space, and displays if the schedules are enabled or disabled. Operators can then select, view, and edit specific schedules associated with a space. The Schedule widget summarizes how a space is affected by a scheduling strategy so that operators can understand the complete picture. The Schedule widget also provides a way to view effective schedule information for a specific date in the future, so that you can ensure it is set up correctly. Furthermore, the bulk scheduling feature allows operators to add exceptions to several schedules at once and to assign weekly schedules in bulk.

The **Equipment Dashboard** provides a cohesive summary of a selected piece of equipment. The widgets shown in the Equipment Dashboard include the following:

- **Graphics** provide a visual representation of the selected space, enabling operators to quickly check the status of that space, uncover unusual system conditions, make relational comparisons between nearby spaces at-a-glance, and issue commands to improve performance or restore order. The Graphics widget displays digital representations of equipment or systems, with graphical symbols and animations created using the Graphics Manager.

- **Trend** widget is a chart showing up to ten points of historical data for a single piece of equipment at the same time. This widget enables operators to view historical equipment data, compare performance changes over time, and easily create PDF or CSV reports. Operators can identify patterns in equipment operation, including performance outliers using an intuitive candlestick chart that displays min, max, and averages. The user can view trended data points on up to three different charts at once. This helps operators visualize trended points of drastically different ranges by enabling them to be placed on separate charts.

- **Equipment Activity** enables operators to view alarm activity, network controller offline events, user changes, and annotations made within a date range of up to one year within the last five years for the selected piece of equipment. This widget enables operators to easily see and understand the correlation between disparate activities occurring within the system.
• **Equipment Relationships** identifies all relationships a piece of equipment has with other equipment, spaces, and network field controllers.

• **Equipment Data** lists all points and their real-time values for the selected piece of equipment, providing operators with detailed information about the operational status of the equipment.

• **Schedule** widget lists all schedules affecting the selected equipment, and displays if the schedules are enabled or disabled. Operators can then select, view, and edit specific schedules associated with a piece of equipment. The Schedule widget summarizes how a scheduling strategy affects the equipment so that operators can understand the complete picture. The Schedule widget also provides a way to view effective schedule information for a specific date in the future, so that you can ensure it is set up correctly. Furthermore, the bulk scheduling feature allows operators to add exceptions to several schedules at once and to assign weekly schedules in bulk.

Additional Metasys UI features are available that are not specifically located in the Space or Equipment Dashboard, including:

• **Alarm Manager** enables operators to view and take action on Metasys system alarms. The Alarm Manager rolls up occurrences of alarms to help operators prioritize the most important alarms and manage all occurrences of alarms in one operation. The Alarm Manager also displays an Alarm Summary that indicates how well the alarms are being managed. The Alarm Manager is accessible through the Metasys UI and full screen view, with a separate URL, well-suited for 24/7 operations centers. Spaces and equipment do not need to be configured for users to take advantage of the Alarm Manager. Users can navigate directly from the Alarm Manager to the Building Network through a link, without having to manually search the network tree after finding the root cause of an alarm.

• **Alarm Monitor** provides a similar view as the Alarm Manager, but does not require the user to log into the Metasys system. The Alarm Monitor is well-suited for the types of users who do not require or do not have authorization for full Metasys access, but who are responsible for viewing alarms from multiple integrated building systems. Spaces and equipment do not need to be configured for users to take advantage of the Alarm Monitor.

• **Custom Trend Viewer** is a chart showing up to ten points of historical data from multiple pieces of equipment at the same time. This widget enables operators to see and compare performance changes over time. Operators can identify patterns in equipment operation, including performance outliers using an intuitive candlestick chart that displays min, max, and averages.

• **Cyber Health dashboard** provides a Metasys administrator with a centralized view of potential security-related issues or system issues which are detectable by an ADS-Lite, but which may not surface as part of general system alarms. The administrator can also see out-of-date software at one glance. The information is grouped into critical issues, potential risks, and informational items.

• **User Management** facilitates the creation and management of users and their roles, category-based permissions, and privileges directly in Metasys UI Online, without the need to install software on client machines. Administrators can create and manage user details for Active Directory, and Metasys local users. This feature is also available in the Metasys Site Management Portal (SMP), but over time it will be available in Metasys UI Online only.

Certain widgets are connected with Advanced Search and Reporting, which enables users to quickly create even more powerful reports by leveraging the power of the dashboard with the Advanced Search feature. The widgets connected with Advanced Search include the Equipment Application and Data Server (ADS) Lite-A System Product Bulletin.
Summary widget, Equipment Serving Space widget, Equipment Data widget, Graphics widget, and the Summary View widget. See also Advanced search and reporting.

Intuitive navigation

The Metasys UI provides the following methods for operators to easily and quickly find information about their system:

- **Spaces Tree** is a set of links to each Space Dashboard. These links are intuitively organized by the site's physical hierarchy.
- **Building Network Tree** provides access to objects using an alternative navigation tree to the Spaces tree.
- **Bookmarking** provides a way for operators to quickly access favorite or most-frequently visited dashboards simply by bookmarking each location in the browser.
- **Search Bar** enables operators to quickly access specific dashboards by entering the first few letters of the name of the space or equipment.

Advanced search and reporting

The Advanced Search and Reporting feature brings powerful insights to all Metasys users by providing an intuitive and easy method to gather and analyze data. Users can quickly search for data across the Building Network tree or by spaces or equipment. Using a series of filters, including wildcards, you can refine your search results. For example, you can search for all zone temperature points in a specific space.

With the Advanced Search results, you can:

- Create reports showing historical activity, alarms, audits, and trend data based on a defined time range.
- Export report data to CSV or PDF file formats on an ad hoc basis or by scheduling a report.
- Issue bulk commands to selected points and bulk modify multiple objects or multiple attributes on a single object.
- Schedule the email delivery of reports to up to 10 specified recipients. Report templates can be saved and be executed "on-demand" in the future.
- Filter an Advanced Search to only include specific Equipment Definition short names.
- Launch directly from certain widgets into a pre-populated Advanced Search. The filters are populated based on the equipment, space, and object information included in the widget. Users can launch Advanced Search from the following widgets:
  - Equipment summary widget
  - Equipment serving Space widget
  - Equipment data widget
  - Graphics widget
  - Summary view widget

**Important:** Spaces and equipment do not need to be configured for users to take advantage of the Advanced Search and Reporting feature. Advanced Search is available on computer and tablet platforms, but it is not available on phone platforms. Additionally, the Reporting, Bulk Commanding, and Bulk Modifying features of Advanced Search are not available on tablet or phone platforms.
Building network

Metasys users with appropriate access can visualize the configuration of the Metasys network using the Building Network tree. Global status indicators enable users to visually identify network and operational issues for any item in the Metasys network. Spaces and equipment do not need to be configured for users to take advantage of the Building Network feature in Metasys UI.

Each item integrated into the Metasys system has a dashboard, where users can diagnose issues with the building network by viewing and editing detailed item information, as well as viewing historical trend data. The widgets shown in the Building Network dashboard include the following:

- **Detail** shows the user the current value and status of the item being viewed and allows the user to issue commands. The Detail widget contains the focus, diagnostic, and network views that allow the user to view and edit detailed information for each item integrated into Metasys.

- **Summary** widget allows the user to quickly identify operational issues with the network item by displaying a tabular rollup of data under the current network item. For instance, a listing of data points’ present value and status under a network field controller.

- **Relationships** allows the user to identify which space or equipment the network item serves.

- **Trend** widget is a chart showing up to ten points of historical data being collected on the Metasys network item at the same time. This widget enables users to view historical data, compare changes over time, and easily create PDF or CSV reports. Users can identify patterns including outliers, using the intuitive candlestick chart that displays min, max, and averages. The user can view trended data points on up to three different charts at once. This helps operators visualize trended points of drastically different ranges by enabling them to be placed on separate charts.

Some network dashboards, such as Schedules and Graphics, display the associated schedule summary or graphic widget, in addition to other widgets available in the Building Network dashboard.

Space authorization

Administrator users can assign user access permissions to specific spaces and the equipment serving those spaces with Space Authorization. This allows for segmented user access by physical space within the building or campus.

Enhanced commanding

The Metasys UI includes the following features that enhance the practice of commanding or changing values, enabling operators to restore order quickly and efficiently and avoid unplanned rework.

- **Timed Operator Commands** enable operators to easily set time limits on the manual commands, such as issuing an override or taking a point out of service, to ensure the system reverts to automatic control. This can help reduce energy costs and reduce comfort complaints caused by the system staying in manual control for too long.

- **The Annotations on Commands feature** provides a means for operators to add a note when issuing a command, such as issuing an override or taking a point out of service. The note appears in the Equipment Activity widget to help operators trace system behavior back to manual commands and why they were issued.

- **An updated commanding dialog view with integrated Priority Array** identifies the current command priorities. This helps operators troubleshoot issues faster by making it easier for them to determine what command priority is currently active on a point object.
Users can navigate directly from the Commanding Dialog to the Building Network through a link, without having to manually search the network tree after finding the root cause of an alarm or other issue.

**Metasys UI tools**

Several tools are available to help you create the Metasys UI. The System Configuration Tool (SCT) allows you to quickly define the spaces hierarchy, equipment definitions, and serving relationships. The Rapid Archive Creation streamlines the generation of the entire Metasys database for new or retrofit Metasys installations.

Metasys UI comes with an embedded graphics package to enable system designers to create the Graphics widgets using photo-realistic graphical representations of equipment and spaces. No separate software or license is required to use the Graphics Manager and Editor. An extensive library of graphic templates, symbols, and controls is provided with the Metasys UI, simplifying the task of graphic creation. Customized graphics symbols can be created using the Custom Behaviors feature. The following table summarizes some of the main Metasys UI graphics features:

**Table 4: Metasys UI Graphics features**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom Symbols Library</td>
<td>Users can import and export custom symbols into the graphics palette with the new Custom Symbols Library. Custom Symbol Libraries integrate seamlessly with the base graphics package.</td>
</tr>
<tr>
<td>Building Network Tree in Graphics Editor</td>
<td>Users can bind Network Tree items to graphics with the Building Network Tree binding option in the Graphics Editor.</td>
</tr>
<tr>
<td>Context-sensitive Binding Tree</td>
<td>The binding tree is context-sensitive, which ensures that the binding tree opens to the appropriate space or equipment when the user launches the Graphics Editor from a particular space or equipment.</td>
</tr>
<tr>
<td>Path Tool Editing</td>
<td>Users can edit an existing path that was drawn with the drawing tool with the Path Tool editing feature.</td>
</tr>
<tr>
<td>Graphics Association Manager for Aliased Graphics</td>
<td>Users can bind graphics to an equipment definition with the Graphics Association Manager for Aliased Graphics feature, so that all equipment associated with that definition will be assigned the graphic automatically.</td>
</tr>
</tbody>
</table>

The Metasys UI also supports viewing of graphics that were created with earlier versions of Metasys graphics tools. Standard graphics created with the User Graphics Tool (UGT) and Graphics + graphics created with the Graphics+ Generation Tool (GGT) can be associated with spaces, equipment, and field controllers and be viewable in the Metasys UI without manual conversion.

The Metasys UI Offline offers the ability to view how the Metasys UI looks in order to validate the UI’s configuration. You can view the spaces and equipment configuration and view the graphics associated with the space and equipment. The Metasys UI Offline leverages the SCT archives instead of the live site. The Metasys UI Offline is automatically installed along with the SCT.

**Access through the Launcher Application**

You use the Launcher application to connect to the Site Management Portal UI of the ADS-Lite-A by using a desktop, laptop, or other type of computer connected to a corporate intranet, dedicated BAS, Internet, or telephone line from remote sites. Multiple users can communicate simultaneously with the server, and access is based on the authorization level assigned to individual users.

Launcher is a software application that you download when you browse to any Release 9.0 Metasys or later server or network engine on the building network. After you install the Launcher software, use it to launch the Site Management Portal UI. In addition, you can configure the Launcher to
browse to any website, such as the Metasys UI. For more details, refer to the Launcher Tool Help (LIT-12011742).

Site Management Portal UI

The Site Management Portal UI also provides high-resolution color graphics that allow you to move through buildings, floors, and areas, while viewing building systems and control processes. Standard graphics provide a visual representation of the monitored systems and allow you to check status and recognize any unusual conditions quickly. Standard graphics may include animation such as rotating symbols to indicate the status of fans and pumps, and analog gauge and bar symbols to indicate the values of analog points.

Navigating through the network

The Site Management Portal UI provides a network navigation tree that allows you to quickly browse through the hierarchy of the entire system. The navigation tree supports color-coded symbols that allow you to identify alarms or other exception conditions that may require your attention.

Figure 5: System Navigation

The basic navigation tree represents the physical structure of the network. To further facilitate network navigation, you can create additional user navigation trees called User Views with different system perspectives.

For example, you can assemble all the room temperature values in the building into groups and display them in a series of graphic floor diagrams using the area or zone names. These different navigation trees enable users to view and analyze operating conditions according to their particular responsibility, which may include building security, occupancy management, technical services, energy management, and others.
Graphics+

The Graphics+ feature provides an intuitive way to interact with your facility by dynamically highlighting the information that requires immediate attention, and providing multiple layers of meaningful facility data in an uncluttered, focused visual display. Data is presented using values, colors, and dynamic motion to represent current activity in the facility, and to quickly and easily indicate potential problems. Navigation from a high-level view of the facility to increasing levels of detail is just a click away. Commanding equipment to new states or changing setpoints is also simplified for authorized users.

Figure 6: Graphics+ Example

Graphics are integrated with the Site Management Portal UI and the System Configuration Tool (SCT) UI on client computers that have installed Microsoft Silverlight® plug-in technology. These graphics can also be viewed in the Metasys UI and Metasys UI Offline on client devices. The authoring component of the Graphics+ feature is called the Graphics Generation Tool, a software application that can be installed on a computer with the Metasys system or on a stand-alone computer. The Graphics Generation Tool:

- allows you to create system graphics using any combination of HVAC, Fire, Lighting, Security, and Network symbols
- allows you to create Floor Plan graphics containing information about overall buildings, floors, and rooms within a floor
• enables you to import AutoCAD® drawings that become Floor Plan graphics
• integrates with the Metasys archived site database and the online Site Management Portal to create bindings in dynamic shapes that represent monitored and controlled equipment
• offers 30-plus templates that serve as starting points for creating new graphics
• provides thermodynamic floor plans that display snapshots of all zone temperatures and use color to help you quickly identify temperature deviations

For more details, refer to the Graphics+ Product Bulletin (LIT-12011698).

Global search

This enhanced search feature allows you to search the Metasys system for multiple objects that meet specific criteria based on naming and object type. Using the global search, you can manage lists of objects, which can be used by other features for commanding, trending, reporting, and object selection.

Global command

This additional command feature allows you to send a single command to multiple objects and view a log of the command results.

Managing alarm and event messages

To make sure you are notified immediately of important alarms and events, the Site Management Portal UI alerts you with a pop-up window showing the most recent highest priority alarm message detected by the system. This window presents all important data pertaining to the alarm message.

For a system-wide overview of alarms and events, the Site Management Portal UI provides an Event Viewer that displays all system events in chronological order.

The Event Viewer allows you to identify the most recent conditions in the building, determine possible relationships between events, and locate the source of error conditions. The Event Viewer also allows you to acknowledge and annotate any of the displayed event messages.

All event messages detected by network engines are routed to the ADS-Lite-A for archiving on the ODBC-compliant database. You can configure the server to route event and transaction messages to printers, pagers, or e-mail destinations, or other servers.

To display operator transactions, the Site Management Portal UI provides an Audit Viewer. The Audit Viewer is sortable so only those transaction messages of particular interest to you appear.

Trend analysis

For optimal performance and to fine-tune the building control systems, current and historical data can provide useful diagnostic information. The Site Management Portal UI provides comprehensive trend recording and trend display capabilities. Trend data is collected from the field points and buffered temporarily in the network engines. The trend data can be uploaded automatically and periodically to the ADS Lite-A and archived in the ODBC-compliant database.

Metasys software supports both Interval (for example, every 10 minutes) and Change-of-Value (for example, when a temperature changes 0.5˚) sampling methods for storing trend samples. Data from both methods can be combined in a single graph.

You can view and analyze trend data as a graph or a table in a display panel of the Site Management Portal UI. The trend values give an indication of system performance, allowing you to identify opportunities for efficiency improvements and develop predictive maintenance strategies. All trend features support copying to the clipboard for use in another program.

For a more detailed analysis of system-wide operational performance, you can create a Trend Study. Trend Studies provide a powerful management tool to analyze and compare current and historical operational data. Trend Studies also help you identify potential problems before they occur, diagnose current and past alarm conditions, optimize energy consumption, and reduce maintenance costs.
The Trend Viewer allows you to view multiple trend extensions based on the ad hoc selection of items from the results of a global search or from the navigation tree. This feature provides another option in trending.

User views and tailored summaries

User views are user-defined navigation trees that contain references to selected items found in the All Items navigation tree. You can create user views to group commonly used items and graphics together. You can also assign user views to particular user groups, such as building security and energy management.

Expanding the capability of user views further, Tailored Summaries use table-based user views to provide summary views of Metasys system items.

Figure 7: Tailored summary

These summaries consist of sortable rows and columns tailored to contain information of your choosing. Tailored Summaries allow you to view, modify, and command large quantities of similar data in tabular format. Similar data, for example, may be all VAV boxes on a floor of a building, showing current temperatures, setpoints, flows, and minimum and maximum settings. Using this information, you can quickly analyze facility operation and troubleshoot for possible problems.

To help you get started with Tailored Summaries, a set of pre-built Summary Definitions can be imported into your site. These summary definitions fit into three categories: Configuration, Diagnostic, and Monitoring. The Device and Network Diagnostics definitions are intended for site administrators. The Mechanical Equipment definitions with links to graphics and Key Point definitions are useful for service professionals.

Tailored Summaries are configurable in the Site Management Portal UI.
Reports
Reports offer a snapshot view of the current exception situations and summary data in the entire site or selected area of the site and allow you to locate points that need attention. You define the reports, and the ADS-Lite-A displays the resulting data in the Report Viewer on the Site Management Portal UI.

The following reports are available:

- Alarm Report—points in the alarm state
- Offline Report—devices that do not respond
- Disabled Report—alarming that has been disabled
- Override Report—operator overridden points
- Supervisory Override Report—points with the Override flag set to True

Reports list all points in the given condition within the selected area or group of points. Conditions can be alarm, offline, disabled, or overridden. The following figure shows an example of an Alarm Report. You can refresh the completed report to find any new points since the report was run, and you can cancel a report query at any time.

The Scheduled Reports feature provides a reporting service on a server that generates summary reports based on object lists and report schedules.

ADS-Lite-A concurrent users

The following table shows examples of the total number of supported users who can be simultaneously logged in to the SMP and Metasys UI.

Table 5: Examples of ADS/ADX/ADS-Lite concurrent users

<table>
<thead>
<tr>
<th>ADS/ADX type</th>
<th>Examples of ADS/ADX concurrent users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMP UI</td>
</tr>
<tr>
<td>5-user ADS/ADS-Lite</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

System security

The Metasys system offers secure user access by authenticating the user name and password of any user who attempts to connect to the system.

The Site Management Portal UI also supports authentication using the Microsoft Active Directory® directory service. Refer to the Security Administrator System Technical Bulletin (LIT-1201528) for details.

When a valid user account has been identified, the connection is authorized and system access is granted based on the access privileges defined by the Metasys security administrator system for the user account.

Access privileges are assigned by system categories and action sets to individual users or to a group of users with the same role. System categories define the type of building equipment and points accessible when operating the system. Action sets define the authorized operation level. Users may be authorized to only view items or may be allowed to also acknowledge alarms and issue commands. At the highest level, users are authorized to modify system configuration parameters.

In addition to system access privileges assigned to users, you can also assign access to spaces and equipment serving spaces with the Space Authorization feature in the Metasys UI.
The Audit Trail on the ADS-Lite-A records user activities such as alarm acknowledgment, sending commands, and point modification.

In addition to user authentication, standard IT security technologies (including firewall programs and encoding protocols) protect the building automation system and network from unauthorized access.

Hypertext Transfer Protocol Secure (HTTPS) with TLS 1.2 is now implemented between Metasys components, including the ADS-Lite-A, Metasys UI, System Configuration Tool (SCT), and network engines. This enhancement ensures the highest level of security to protect your building automation system from unauthorized users and computer hackers.

Self-signed certificates are installed by default on the ADS-Lite-A. As an option, the customer can apply or purchase trusted certificates on the ADS-Lite-A.

One of three new security shield icons are displayed in the Site Management Portal (SMP) to indicate the current level of a connection: trusted, self-signed, or untrusted.

Lastly, you can configure the use of an external Syslog server to capture messages from the Metasys system. Network engines send audit log entries and event notifications to an external, customer-provided industry-standard Syslog server destination.

Optional Software Tools

System Configuration Tool (SCT)

SCT enables you to define and modify Metasys system databases offline, supported by wizards that guide you through the entire process. SCT uses the same Metasys user interface used with all other components of the system, so you do not have to learn a different mode of operation when working with SCT.

With SCT, you can perform all configuration features required to set up an automation system, including:

- Defining all ADS-Lite-As and network engines.
- Defining field controllers.
- Configuring field points and operating parameters.
- Setting up the navigation tree structure including user navigation trees.
- Configuring system features such as user graphics, programmed logic control sequences, alarms, trends, and event message destinations.
- Configuring spaces and equipment and associating graphics for the Metasys UI and Metasys UI Offline.
- Configuring Demand Limit and Load Rolling (DLLR) to monitor energy meters for electricity, gas, steam, or water, and automatically shed equipment loads according to user-defined levels. Demand Limit helps manage utility demand charges. Load Rolling controls equipment operating levels to reduce total energy consumption.
- Creating optimal start logic.
- Simulating control logic.
- Configuring spaces and equipment, including using the Rapid Archive Creation process.
- Downloading, uploading, and archiving network engine configuration databases and controller .caf files.

The Metasys UI Offline is installed with SCT.
Metasys Export Utility (MEU)

The Metasys Export Utility extracts historical trend, alarm, and audit data from the system and presents the data in a variety of formats. Using these flexible formats, in programs such as Microsoft Excel® and Access, users can easily sort, compare, and archive data in spreadsheets and databases. For more detailed information regarding Metasys Export Utility, refer to the Metasys Export Utility Product Bulletin (LIT-1201800).

Metasys Database Manager (MDM)

The Metasys Database Manager enables you to monitor, manage, purge, and back up Metasys system historical databases on an ADS-Lite-A. For details, refer to the Metasys Database Manager Help (LIT-12011202).

SNE110L Network Engine

The Metasys® SNE Series network engines are a new family of Ethernet-based, network engines that connect BAS networks to IP networks. The SNE110L succeeds the NAE45-Lite network engine.

Network engines provide building control scheduling, alarm and event management, energy management, data exchange, historical data storage and management, and custom control logic. Network engines include an embedded user interface called the Site Management Portal (SMP). Users access the SMP for system navigation and operation using web browser connections. Network engines use password protection, permission access control, and IT security best practices to secure them from unauthorized access.

The SNE110L provides network management and system-wide control coordination over one or more networks of equipment controllers. These devices monitor and control networks of field-level building automation devices, including HVAC equipment, lighting, security, and fire safety equipment.

SNE110L Features and Benefits

- **Linux® operating system**
  Provides a robust, widely-accepted, and readily-supporting operating system.

- **Internet connection for data access**
  You can connect a web browser through the IP network using the Ethernet port.

- **Memory**
  The SNE110L has 2 GB RAM and 16 GB Flash non-volatile memory. This memory provides capacity for further upgrades and a longer operational life.

- **Supports background file transfer**
  You can transfer files such as firmware upgrades, archive databases, or security transfers from the SCT to the SNE110L while it operates.

- **Device security**
  Ensures device integrity while the system is rebooting and during normal operation. Embedded technology provides trusted boot operation, firmware protection, secure storage, secure communications, and secure firmware updates complying with strong cyber security practices.
Smaller, modularized packaging

The size of the SNE110L is smaller than the NAE45-Lite. This reduces the amount of space you need to mount the SNE110L, and can potentially reduce the size and cost of control panels.

Diagnostic multi-color LEDs

The use of multi-color LEDs can decrease installation and troubleshooting time.

Removable terminal blocks

The use of removable terminal blocks facilitates the installation and servicing.

Supervision of controller networks including Johnson Controls devices and third-party protocol devices

Supports connectivity to open network standards for complete flexibility in the selection of field devices. They include BACnet MS/TP, BACnet/IP, N2 Bus, LonWorks, Modbus RTU, Modbus TCP/IP, M-Bus, KNX, OPC Unified Architecture (UA), and other third-party protocols.

No battery

The SNE110L uses a supercapacitor, not a battery, to provide temporary power for data backups during shutdown due to AC power loss. This design is more environmentally friendly and saves the eventual cost of replacing the battery.

Field Networks and Protocols

The NAE45-Lite and the SNE110L communicate data from one field network to another, and from the field network level to the enterprise and automation network level, enabling your system to operate as one virtual control network.

Automation Level Communication

Network engines communicate internal system data using peer-to-peer messaging over the IP Ethernet network. Each NAE45-Lite or SNE110L shares data and has access to information on the other engines connected on the network, which enables coordination and control of the entire building management system.

BACnet Protocol

The automation level communication supports the BACnet protocol and facilitates the network integration of other systems and devices that use BACnet.

The NAE45-Lite and the SNE110L support the BACnet services and objects typically used by a workstation and a field controller device, including BACnet alarm and event services.

Refer to the NAE/NCE Protocol Implementation Conformance Statement (LIT-1201532) and SNE/SNC Protocol Implementation Conformance Statement (LIT-12013355) for detailed information on BACnet conformance and the supported BACnet Interoperability Building Blocks.

MS/TP Field Controller (FC) Bus

The BACnet MS/TP FC Bus is a standard peer-to-peer, multiple-master protocol in which each master device takes turns originating messages to pass to any device on the bus.

NAE45-Lites and SNE110Ls can communicate over the MS/TP FC Bus with the Metasys controllers, including FEC16, FEC25, and FEC26; FAC25, FAC26 and FAC36; VMA16; IOM17, IOM27, IOM37, and IOM47; CGMs; and CVMs.
Engines can also communicate over the FC Bus with third-party MS/TP devices that comply with the BACnet standard protocol based on American National Standards Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 135-2004.

**Engine Feature Summary**

Table 6 contains a brief summary of the features of the NAE45-Lite and SNE110L.

### Table 6: Features of NAE45-Lite

<table>
<thead>
<tr>
<th>Features</th>
<th>NAE45-Lite</th>
<th>SNE110L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of BACnet MS/TP (RS-485) Trunks</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Maximum Number of MS/TP Devices per Trunk</td>
<td>100 (FEC and TEC3000 family of devices) or 64 (third-party controllers)</td>
<td>100 (FECs) or 64 (third-party controllers)</td>
</tr>
<tr>
<td>Maximum Number of Objects</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Model with Internal Modem</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>RS-232-C Serial Ports</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>USB Serial Ports</td>
<td>1</td>
<td>2 USB A</td>
</tr>
<tr>
<td>Graphics</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Lonworks</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Modbus</td>
<td>Not Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>N1 Migration</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>N2 Bus</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Vendor (VND) Integration</td>
<td>Not Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>Honeywell® XL5K Integration</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Ethernet Ports</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Supported Site Director</td>
<td>ADS-Lite-A Only</td>
<td>ADS-Lite-A Only</td>
</tr>
<tr>
<td>Can Be Promoted to Site Director Status</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
</tbody>
</table>

**Accessories**

See Table 7 for accessories available for the SNE110L.

### Table 7: NAE45-Lite Accessories Ordering Information

<table>
<thead>
<tr>
<th>Product Code Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS-XFR100-1</td>
<td>Power transformer (Class 2, 24 VAC, 92 VA maximum output), with enclosure</td>
</tr>
<tr>
<td>AS-XFR010-1</td>
<td>Power transformer (Class 2, 24 VAC, 92 VA maximum output), no enclosure</td>
</tr>
</tbody>
</table>
# Technical Specifications

## Application and Data Server-Lite system requirements

**Table 8: Application and Data Server-Lite system requirements**

| **Recommended Computer Platform**
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel i7 processor latest version with at least 6 cores or better</td>
</tr>
<tr>
<td>2 x 500 GB hard disk (RAID)(^1) with 40 GB free space after installation of all prerequisite software and before installation of ADS-Lite software. Configure RAID 1 (mirroring) with disk write-caching turned on.</td>
</tr>
<tr>
<td><strong>Note:</strong> Prerequisite software includes the supported operating system, database software, .NET Framework, and any other software or service packs required for your ADS configuration.</td>
</tr>
<tr>
<td>Graphics adapter (1 GB RAM, ATI Technologies or NVIDIA Corporation, 64-bit compatible [for 64-bit operating systems], Small Form Factor [SFF] if required)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Required Minimum Memory</strong>(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 GB minimum, 16 GB recommended</td>
</tr>
<tr>
<td>The VM host must have at least 8 GB of allocated RAM at all time. When you configure the VM, do not select the enable dynamic memory option.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Supported Operating Systems and Database Software</strong>(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit). For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.</td>
</tr>
<tr>
<td>Supports:</td>
</tr>
<tr>
<td>• SQL Server® 2019 Express (64-bit)</td>
</tr>
<tr>
<td>(\text{Note:} ) SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user’s log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2018 compatibility mode. For more information, refer to docs.microsoft.com</td>
</tr>
<tr>
<td>• SQL Server® 2017 Express with CU17 (64-bit)</td>
</tr>
<tr>
<td>• SQL Server® 2016 Express with SP2 CU10 (64-bit)</td>
</tr>
<tr>
<td>• SQL Server® 2014 Express with SP3 CU4 (64-bit)</td>
</tr>
<tr>
<td>Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)</td>
</tr>
<tr>
<td>Supports:</td>
</tr>
<tr>
<td>• SQL Server® 2017 Express with CU17 (64-bit)</td>
</tr>
<tr>
<td>• SQL Server® 2016 Express with SP2 CU10 (64-bit)</td>
</tr>
<tr>
<td>• SQL Server® 2014 Express with SP3 CU4 (64-bit)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Supported Virtual Environments</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Hyper-V™</td>
</tr>
<tr>
<td>VMware®</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Supported User Interfaces</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Management Portal (SMP)</td>
</tr>
<tr>
<td>Metasys UI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Additional Software Included with the ADS-Lite Software Download</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft .NET Framework 4.7.2</td>
</tr>
<tr>
<td>Launcher Software</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Optional Hardware</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Any network or local printer supported by the qualified Windows operating system</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Optional Software</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic Generation Tool</td>
</tr>
<tr>
<td>CCT Software</td>
</tr>
<tr>
<td>SCT Software</td>
</tr>
<tr>
<td>Metasys Device Manager</td>
</tr>
<tr>
<td>Metasys Export Utility</td>
</tr>
</tbody>
</table>

---

\(^1\) 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 Technical Bulletin (LIT-12011279)*\(^1\) for more information regarding computer/server recommendations.
For best performance, use Serial Attached SCSI (SAS) hard drives, not Small Computer System Interface (SCSI) hard drives.

It is recommended to use RAM that the computer supports.

Refer to the Network and IT Guidance Technical Bulletin (LIT-12011279) for specific Microsoft Windows operating system settings that may be required for your Metasys system configuration.

---

### SNE110L Technical Specifications

#### Table 9: SNE110L network engines

| Power Requirement                  | Dedicated nominal 24 VAC, Class 2 power supply (North America), SELV power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)  
|                                  | Alternate: Dedicated nominal 24 VDC, Class II power supply input; North America: ACC-PWRKIT-1A24; Europe: ACC-PWRKIT-1E24 |
| Power Consumption                  | 38 W maximum |
| Ambient Temperature Conditions     | Operating: 0°C to 50°C (32°F to 122°F)  
|                                  | Operating Survival: -30°C to 60°C (-22°F to 140°F)  
|                                  | Non-Operating: -40°C to 70°C (-40°F to 158°F) |
| Ambient Humidity Conditions        | Storage: 5% to 95% RH, 30°C (86°F) maximum dew point conditions  
|                                  | Operating: 10% to 90% RH, 30°C (86°F) maximum dew point conditions |
| Processor                         | NXP i.MX6 DualLite processor, dual core Cortex-A9 processor at 1.0 GHz with 512 KB of L2 cache |
| Memory                            | 16 GB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup  
|                                  | 2 GB SDRAM for operations data dynamic memory |
| Operating System                  | Wind River® Linux LTS 17 (LTS=long-term support) |
| Transmission Speeds               | Optically isolated, Serial Communication (FC Bus): 9600, 19,200, 38,400, or 76,800 bps  
|                                  | Ethernet Communication: 1000, 100, or 10 Mbps |
| Network and Serial Interfaces     | One Ethernet port; 1000/100/10 Mbps; 8-pin RJ45 connector  
|                                  | One FC port (RJ12 6-pin port; connects with 1.5 m [4.9 ft] RJ-12 field bus cable, and one Screw terminal plug, 4-pin)  
|                                  | Three USB ports (one Micro-B port, and two USB A ports). All support USB 2.0 and Open Host Controller Interface [Open HCI] specification; Micro-USB port currently inactive |
| Supported Integrations            | BACnet/IP, BACnet MS/TP, Modbus, M-Bus, KNX, and OPC UA. |
| Housing                           | Black Polycarbonate and Acrylonitrile butadiene styrene (ABS) blend |
| Mounting                          | On flat surface with screws on three mounting clips or a single 35 mm DIN rail |
Table 9: SNE110L network engines

<table>
<thead>
<tr>
<th>Dimensions (Height x Width x Depth)</th>
<th>190 mm x 125 mm x 45.5 mm (7.48 in. x 4.92 in. x 1.75 in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>0.387 kg (0.852 lbs)</td>
</tr>
<tr>
<td>Compliance</td>
<td>United States: UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class A</td>
</tr>
<tr>
<td></td>
<td>Canada: UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003</td>
</tr>
<tr>
<td></td>
<td>Europe: CE Mark – Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.</td>
</tr>
<tr>
<td></td>
<td>Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant</td>
</tr>
</tbody>
</table>

NAE45-Lite Specifications

Table 10: NAE45-Lite Specifications

<table>
<thead>
<tr>
<th>Power Requirement</th>
<th>Dedicated nominal 24 VAC, Class 2 Power Supply (North America), Safety Extra-Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Consumption</td>
<td>25 VA maximum</td>
</tr>
<tr>
<td>Ambient Operating Conditions</td>
<td>0 to 50°C (32 to 122°F); 10 to 90% RH, 30°C (86°F) maximum dew point</td>
</tr>
<tr>
<td>Ambient Storage Conditions</td>
<td>-40 to 70°C (-40 to 158°F); 5 to 95% RH, 30°C (86°F) maximum dew point</td>
</tr>
<tr>
<td>Data Protection Battery</td>
<td>Supports data protection on power failure. Rechargeable NiMH battery: 3.6 VDC 500 mAh, with a typical life of 5 to 7 years at 21°C (70°F) Product Code Number: MS-BAT1020-0</td>
</tr>
<tr>
<td>Processor</td>
<td>192 MHz Renesas® SH4 7760 RISC processor</td>
</tr>
<tr>
<td>Memory</td>
<td>128 MB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 128 MB Synchronous Dynamic Random Access Memory (DRAM) for operations data dynamic memory</td>
</tr>
</tbody>
</table>
Table 10: NAE45-Lite Specifications

| Operating System | Metasys 9.0 or earlier:  
Microsoft® Windows® CE embedded  
Metasys 9.0.7 or later:  
Linux® Buildroot 2017.08.2 |
|------------------|---------------------------------------------|
| Network and Serial Interfaces | One Ethernet port; 10/100 Mbps; 8-pin RJ-45 connector  
One optically isolated RS-485 port; 9600, 19.2k, 38.4k, or 76.8k baud (depending on protocol); with a pluggable and keyed 4-position terminal block  
One RS-232-C serial port with standard 9-pin sub-D connector that supports standard baud rates.  
A second serial port, on models without an internal modem, that supports an optional, user-supplied external modem.  
One USB serial port with standard USB connector that supports an optional, user-supplied external modem. |
| Housing | Plastic housing material: ABS + polycarbonate  
UL94-5VB  
Protection: IP20 (IEC 60529) |
| Mounting | On flat surface with screws on three mounting clips or a single 35 mm DIN rail |
| Dimensions (Height x Width x Depth) | 131 x 270 x 62 mm (5.2 x 10.6 x 2.5 in.)  
Minimum space for mounting NAE45-Lite:  
210 x 350 x 110 mm (8.3 x 13.8 x 4.3 in.) |
| Shipping Weight | 1.2 kg (2.7 lb) |
| Compliance | **United States:** UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment, FCC Compliant to CFR47, Part 15, Subpart B, Class A  
**Canada:** UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003  
**Europe:** CE Mark - Johnson Controls declares that the NAE45-Lite is in compliance with the essential requirements and other relevant provisions of the EMC Directive.  
**Australia and New Zealand:** RCM Mark, Australia/NZ Emissions Compliant |
The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

<table>
<thead>
<tr>
<th>European Single Point of Contact:</th>
<th>NA/SA Single Point of Contact:</th>
<th>APAC Single Point of Contact:</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOHNSON CONTROLS</td>
<td>JOHNSON CONTROLS</td>
<td>JOHNSON CONTROLS</td>
</tr>
<tr>
<td>WESTENDHOF 3</td>
<td>507 E MICHIGAN ST</td>
<td>C/O CONTROLS PRODUCT MANAGEMENT</td>
</tr>
<tr>
<td>45143 ESSEN</td>
<td>MILWAUKEE WI 53202</td>
<td>NO. 22 BLOCK D NEW DISTRICT</td>
</tr>
<tr>
<td>GERMANY</td>
<td>USA</td>
<td>WUXI JIANGSU PROVINCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>214142</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHINA</td>
</tr>
</tbody>
</table>

Recommended OS and SQL Server Combinations

The following table lists by operating system the Microsoft® SQL Server® Express software editions that have been fully qualified by Johnson Controls for the current release. You can select other combinations, but we recommend that you select from the following pairings.

**Table 11: Recommended Operating System and SQL Server Express Combinations**

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Database Software</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SQL Server® 2019 Express (64-bit)</td>
<td>SQL Server® 2017 Express with CU17 (64-bit)</td>
<td>SQL Server® 2016 Express with SP2 CU10 (64-bit)</td>
<td>SQL Server® 2014 Express with SP3 CU4 (64-bit)</td>
<td></td>
</tr>
<tr>
<td>Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit). For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.</td>
<td>x</td>
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<tr>
<td>Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)</td>
<td>x</td>
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</tbody>
</table>
North American emissions compliance

United States
This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the users will be required to correct the interference at their own expense.

Canada
This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Product warranty
This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Software terms
Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, open-source software information, and other terms set forth at www.johnsoncontrols.com/techtterms. Your use of this product constitutes an agreement to such terms.

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