Application and Data Server (ADS) and Extended Application and Data Server (ADX) Product Bulletin

Background

The Application and Data Server (ADS) and Extended Application and Data Server (ADX) are optional components of the Metasys system that manage the collection and presentation of large amounts of trend data, event messages, operator transactions, and system configuration data. The ADS is an entry-level server that runs on personal computers and supports up to five concurrent users. The ADX is a larger scale system that runs on a server operating system to provide extended historical archiving and reporting capabilities. The ADX is offered in several models to support up to 10, 25, 50, or 100 concurrent users. As Site Director, the ADS/ADX provides secure communication to a network of NAE, NIE, NCE, SNE and SNC series engines.

The ADS/ADX supports robust features 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 you 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.
- Use Advanced Search and Reporting in the Metasys UI to find and report on operational data and make bulk commands to restore order more quickly. The Advanced Search and Reporting feature provides the ability to quickly search Metasys objects by Building Network, equipment, equipment type, or space.
- Use Custom Dashboards for the Metasys User Interface 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 the flexibility to use custom symbols that are required for their individual building or campus needs or their local standards.
- Use trend widget updates to identify patterns including outliers, using an intuitive candlestick chart that displays min, max, and averages.
- Cyber Health Dashboard provides a centralized view of potential security-related issues or system issues which are detectable by an ADS/ADXOAS, 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.

The Site Management Portal UI of the ADS/ADX provides a flexible system to change the online configuration of the Metasys system, optimize control strategies, and perform administrative tasks.

The ADS/ADX includes an Open Database Connectivity (ODBC) compliant database package for secure storage of historical and configuration data.

Note: SMP requires a license at Release 12.0. The license is only available for existing sites upgrading to Release 12.0.

The ADS and ADX support virtual environments, including VMware® and Microsoft® Hyper-V™. Refer to the *Network and IT Guidance Technical Bulletin (LIT-12011279)* for more information.

The Metasys system can communicate with cloud-based applications easily and securely. To make this connection, the Metasys system requires minor programming and setup by Johnson Controls. When you are connected, you can access multiple cloud-based applications and features. To learn more, visit the Building Management page located on the Johnson Controls® website.

Figure 1: Metasys UI

For the ADX, the Metasys Advanced Reporting System reports on system configuration performance, energy usage, demand, and cost.

Features and Benefits

FIPS 140-2 compliant

The ADS/ADX is FIPS 140-2 compliant. FIPS 140-2 uses cybersecurity techniques to prevent unauthorized access to systems and data.

Support of IT Standards and Internet Technologies

Enables you to install the Application and Data Server on the existing IT infrastructure within the building or enterprise and is compatible with industry-standard firewalls.

Secure User Access

Authenticates users and authorizes access privileges to protect system integrity.

BACnet Secure Connect

It is a secure, encrypted datalink layer that is specifically designed to meet the requirements, policies and constraints of IP infrastructures.

Flexible System Navigation and Dynamic User Graphics

Enable customization of system presentation for different users to enhance information access and facilitate system operation.

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 Trend Data Storage

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

Optional Metasys Advanced Reporting System

Offer a separate login and UI for running and viewing reports on system configuration, performance, energy usage, demand, and cost.

RESTful APIs

The Metasys API provides easy access for you to pull raw data from the server into your own 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/properties to provide a secure and cost-effective way to bi-directionally integrate with third party applications.

Application and Data Server Platform

ADS/ADX Introduction

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

The Metasys UI is designed to encourage system use and reduce training needs with intuitive operating procedures. You can quickly learn to use the system effectively and take full advantage of the ADS/ADX capabilities, which include user graphics, alarm and event management, trend data presentation, system summaries, and reports.

You can use the ADS/ADX within the existing networking infrastructure of buildings and enterprises through the integration of IT and Internet communication and security technologies. You can access the ADS/ADX through multiple client computers, from any location on the network, can access the ADS/ADX and enterprise systems read the data in the ADS/ADX database for business planning and energy management purposes.

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

The ADS and ADX connect to the Ethernet IP network running at the automation and enterprise level of your system and perform the role of the Site Director that coordinates access to the system for all users.

The ADS and ADX communicate with supported network engines over the IP network. You can use a VPN over a WAN for communication to devices in other buildings or on remote sites. You can also access remote sites through the Internet and an ISP, or by a leased line using Remote Access Service (RAS) or the Point-to-Point Protocol (PPP).

Use this document to discover the capabilities of the ADS/ADX and its supported network engines.

Application and Data Server (ADS)

The ADS platform provides basic historical data management, including an ODBC-compliant database package for storage of trend data, event messages, operator transactions, and system configuration data. The ADS supports up to five concurrent users connected to the Site Management Portal UI or to the Metasys UI and provides manual archiving of historical data and standard reporting capabilities. Multiple ADSs can be deployed for long-term, historical data storage.

The ADS supports the following Microsoft operating systems for installations:

- Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (64-bit). For all future Windows 10 updates after version 21H2, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.
- Windows® 10 Enterprise LTSC (21H2) (64-bit)

It supports the following SQL Server software:

- SQL Server® 2019 Express with CU14 (64-bit)
- SQL Server® 2017 Express with CU27 (64-bit)
- SQL Server® 2016 Express with SP2 CU17 (64-bit)

It supports virtual environments, including VMware® and Microsoft Hyper-V™. For more information, refer to the *Network and IT Guidance Technical Bulletin (LIT-12011279)*.

Extended Application and Data Server (ADX)

The ADX provides more advanced historical data management. The ADX supports up to 10, 25, 50, or 100 concurrent users connected to the Site Management Portal UI. The ADX offers manual, automatic, and scheduled archiving of historical data and offers extended reporting capabilities using SQL Server software or third-party software. For more information on supported concurrent users, see ADS/ADX concurrent users

Note: SMP requires a license at Release 12.0. The license is available to existing customers only.

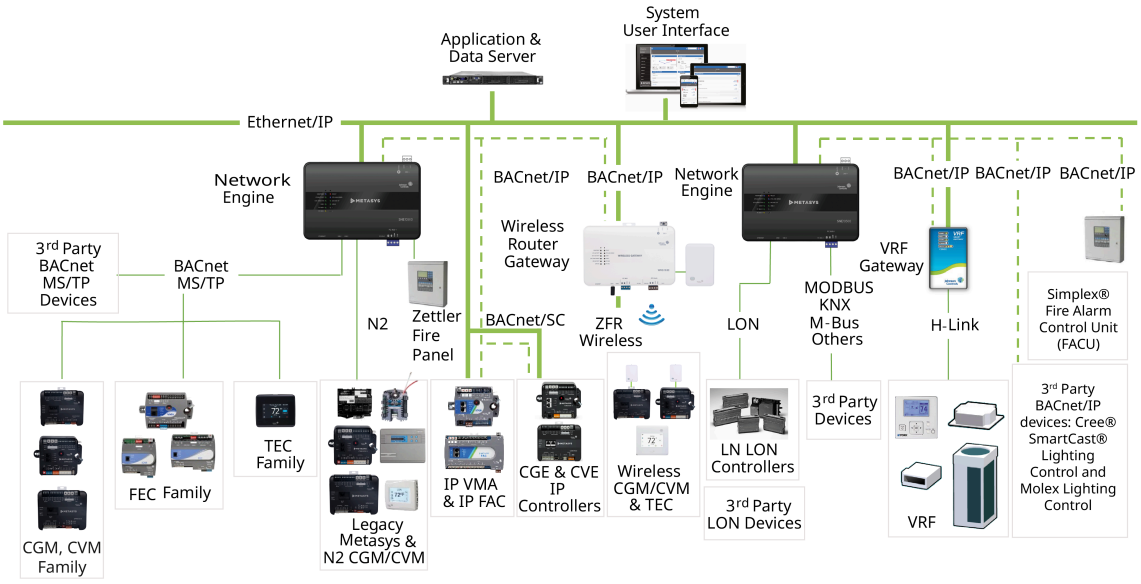
The ADX supports the following Microsoft operating systems and SQL Server software versions:

- Microsoft operating systems: Windows® Server® 2019 (version 1809 or later) (64-bit) Windows® Server® 2016 (version 1607 or later) (64-bit).
- SQL Server software: SQL Server® 2019 with CU14 (64-bit)SQL Server® 2017 with CU27 (64-bit), SQL Server® 2016 with SP2 CU17 (64-bit), ADXs using SQL Server software with SQL Server Reporting Services installed also support the Metasys Advanced Reporting system. See ADX with the Metasys Advanced Reporting System.
- Supports virtual environments, including VMware® and Microsoft Hyper-V™. Refer to the *Network and IT Guidance Technical Bulletin (LIT-12011279)* for more information.

The ADX may be installed in a split configuration. Splitting provides enhanced security for historical data. The ADX software and Site Management Portal UI are installed on one computer (the web/application server computer), and the historical trend, audit, and event data on another computer (the database server computer) running Microsoft SQL Server software.

Metasys Network Diagram

Figure 2: Metasys Network



Applications

Use an ADS in the following situations:

- When the number of network engines becomes larger than a single network engine can handle efficiently as Site Director.
- The long-term historical data storage needs exceed the capacity of a typical network engine.
- The number of simultaneous users logging on to SMP or Metasys UI exceeds the capacity of a single network engine. The ADS supports up to five simultaneous users, and up to 10 to 14 SNx/NxE engines. Refer to the *Metasys System Configuration Guide (LIT-12011832)*.

Use an ADX when any of the following criteria apply:

- The Metasys Advanced Reporting System or the Metasys for Validated Environments (MVE), Extended Architecture application is required.
- You need to support more than five simultaneous users logging on to SMP or Metasys UI. The ADX supports up to 10, 25, 50, or 100 users, and up to 1,000 SNx/NxE engines. Refer to the *Metasys System Configuration Guide (LIT-12011832)*.
- Any of your data storage or access requirements is not met by an ADS.

To further help you decide whether an ADS or ADX is right for your facility, consider their respective data storage and data access capabilities.

User experience

The Metasys system user interface is a portal into a site that you can 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.

Note: Site Management Portal (SMP) requires a license at Release 12.0. The license is available for existing sites only.

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®, Adobe®, Flash® or any other software from an online app store. The Metasys UI is included with any Metasys server: ADS, ADX (unified and split), OAS, and ADS-Lite.

ⓘ **Note:** At Release 12.0, an NAE85/LCS85 can act as a Site Director only. Do not upgrade any child NAE85/LCS85 to 12.0.

ⓘ **Note:** You must license the server software to log on to the Metasys UI.

Dashboards and widgets

A dashboard organizes data in the Metasys UI to help you 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. You can customize dashboards to suit specific needs by allowing the selection of viewable widgets, widget order, and widget appearance, as well as assign 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 Space Dashboard includes the following widgets:

- **Graphics** provide a visual representation of the selected space, which you can use 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 you to filter and view data that is important to them. you can use the Potential Problem Areas widget as a daily punch list to manage buildings more efficiently.

  ⓘ **Note:** For an OAS, you require the **Metasys Potential Problem Areas** license to access Potential Problem Areas Points. You require the **Metasys Fault Detection** and the **Metasys Fault Triage** licenses to access both Fault Detection and Fault Triage. You can use Fault Detection without a Fault Triage license, but you require both licenses for Fault Detection and Fault Triage to use Fault Triage.

- **Equipment Summary** is a table view that lists 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. You 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. You 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 you 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, use the bulk scheduling feature to add exceptions to several schedules at once and to assign weekly schedules in bulk.
- From Release 11.0, the Space Dashboard also supports the **Trend** widget. For details about the Trend widget see the section below.

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. You can 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 that shows up to ten points of historical data for a single piece of equipment at the same time. Use this widget to view historical equipment data, compare performance changes over time, and easily create PDF or CSV reports. You can identify patterns in equipment operation, including performance outliers using an intuitive candlestick chart that displays min, max, and averages. From Release 11.0, you can also select an un-trended point, and see its real-time present value plotted on a Trend chart. This feature is called Live trending. In addition, the Trend feature is enhanced from Release 11.0 to include the ability to choose to view raw or aggregated data, regardless of duration. Furthermore, the sample limit is increased to 50,000 samples and the individual trend sample limit was removed. This provides you with more visibility into historical data.
- **Equipment Activity** enables you 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 you 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 you 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. You can 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 you 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 you 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 you to view and take action on Metasys system alarms. The Alarm Manager rolls up occurrences of alarms to help you 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. You 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. Use this widget to see and compare performance changes over time. You can identify patterns in equipment operation, including performance outliers using an intuitive candlestick chart that displays min, max, and averages.
- The **Trend Study Manager** is the single point of entry for creating and editing Metasys UI trend studies. With this feature, you can easily access custom trends configured in a previous Metasys UI session, and also view and manage space and equipment associations with all supported trend studies.
- **Cyber Health dashboard** provides a Metasys administrator with a centralized view of potential security-related issues or system issues which are detectable by a Metasys Server, but which may not surface as part of general system alarms. You 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, without the need to install software on client machines. You can create and manage user details for Active Directory, and Metasys local users. This feature is also available in the SMP, but over time it will be available in Metasys UI only.
- **System Activity** provides a combined view of Audits and Alarms, as well as disparate views of Audits or Alarms for authorized users. Authorized users can filter, export, and act on Audits and Alarms.
- **Device Pairing** provides you with the ability to pair supported engines to the Metasys server for additional security.
- **BACnet/SC Management** enables you to manage BACnet Secure Connect (BACnet/SC) certificates. BACnet/SC is a secure, encrypted datalink layer that is specifically designed to meet the requirements, policies, and constraints of IP infrastructures.

Certain widgets are connected with Advanced Search and Reporting, which you can use 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 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 find information easily and quickly 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.
- **Views Tree** provides access to objects using an alternative navigation tree to the Spaces Tree.
- **Tailored Summaries** are supported within Views to display user-defined tables of system data.

Fault Detection and Fault Triage

Fault Detection

- Fault Detection is a licensed add-on feature to the Metasys Server software products, including ADS, ADX, and OAS.

  Note: At a minimum, you require 8 GB of RAM and four virtual cores to support the Fault Detection and Fault Triage features on an OAS.

- This feature identifies building system-related faults and lists them in order of severity, whereby it leverages Johnson Controls-defined rules and a semantic data model to ease configuration.
- Fault Detection helps operators identify issues of building systems that are not operating correctly, prevent energy waste, and avoid comfort complaints. The feature is delivered in a way that minimizes configuration workflows.

Fault Triage

- Fault Triage is a licensed add-on feature to Fault Detection and the Metasys Server software products, including ADS, ADX, and OAS.

  Note: At a minimum, you require 8 GB of RAM and four virtual cores to support the Fault Detection and Fault Triage features on an OAS.

- Fault Triage improves the fault list order by adding fault duration and occurrence to the sorting logic, which improves driving the biggest problems to the top of the list.
- Fault Triage leverages the Johnson Controls Field Support Knowledge Database to suggest possible causes, their likelihood, and appropriate corrective actions.
- The feature captures corrective action activity that includes not tried, tried, and solved issues with the ability to add notes.
- In addition, Fault Triage offers automatically generated, multi-stacked charting of fault data for each fault occurrence.
- Fault Triage provides an assisted experience for less experienced HVAC controls technicians.

Note: No significant feature additions were made to Fault Detection and Fault Triage at Release 12.0. The **Metasys Fault Detection** license and **Metasys Fault Triage** license remain at 11.x and continue to work at 12.x.

The functionalities of Fault Triage and Fault Detection are documented in detail in the *Potential Problem Areas widget* section of *Metasys UI Help (LIT-12011953)*.

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. You can quickly search for data across the Building Network tree or by spaces or equipment. Using a series of filters, that includes 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 do the following:

- Create reports that shows historical activity, alarms, audits, and trend data based on a defined time range, or create reports that shows the present values of selected objects. This provides Metasys administrators with real-time information without requiring a log in.
- 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: You do not need to configure spaces and equipment 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.

From Release 12.0, you can use the Advanced Search and Reporting feature to run Base Reports. The reports show you a snapshot view of the current exception situations and summary data in the entire site or selected engines of the site, and locate points that might need attention.

The following reports are available:

- Alarm: Lists all items with a non-Normal alarm state in the site or selected devices.
- Offline: Lists all items whose offline state is True in the site or selected devices.
- Disabled: Lists all items whose Enabled attribute value is set to False in the site or selected devices.
- Operator Override: Lists all items currently being written to at a command priority value of **8**.

- Supervisory Override: Lists all items whose Overridden attribute value is set to True. The meaning of Overridden is dependent on the integration and point type.
- Trouble: Lists all items that have the Trouble attribute value set to True.
- Out of Service: Lists all items that have the Out of Service attribute value set to True.

User Management

The User Management feature facilitates the creation and management of users and their roles, category-based permissions, and privileges directly in Metasys UI, without the need to install software on client machines. Administrators can create and manage user details for Active Directory and Metasys local users. From Release 11.0, Active Directory includes Microsoft® Active Directory Federation Services (ADFS), including two-factor authentication (2FA) when the ADFS Server is configured for 2FA. This single sign-on solution helps prevent unauthorized access to Metasys, which, if not prevented, could result in data, financial, and reputational loss, system disruption, and other negative consequences.

This feature is also available in the SMP, but over time it will be available in Metasys UI only.

Building network

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

Users can add, delete, and configure objects directly from the Building Network tree in Metasys UI. This reduces the need for Metasys operators to use a different UI to perform these configuration tasks.

Each item integrated into the Metasys system has a dashboard, where you 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 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 you can use 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** enables 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. Use this widget to view historical data, compare changes over time, and easily create PDF or CSV reports. You can identify patterns including outliers, using the intuitive candlestick chart that displays min, max, and averages. View trended data points on up to three different charts at once. This helps you to visualize trended points of drastically different ranges by enabling them to be placed on separate charts.
- **Involvement** identifies what is currently attempting to control an object. The widget provides a visual depiction of what is involved with the object including what is serving it and what it is serving. The widget includes real-time values at every connection point in the involvement. The widget also distinguishes between operator commands and references; for example, logic connections. Involvement helps you to identify the root cause of system issues more quickly.

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

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.

Remote Notifications

The Remote Notifications feature in the Metasys UI replaces the Server Destination Delivery Agents (DDAs) in the SMP. DDAs facilitate the routing of event and audit messages generated on the Metasys Server or engine.

With the Remote Notifications feature, you can configure the routing and filtering of event and audit messages directly in the Metasys UI for each Metasys Server or engine, without the need to install software on client machines.

ⓘ **Note:** From Metasys Release 10.1, SMP management of Server DDAs is removed. Management of Server DDAs is available with the Remote Notifications feature in Metasys UI only. However, SMP management of Server DDAs is still available for MVE sites.

The main Remote Notification features are as follows

- **Space and Equipment filters**: Specify spaces and equipment to receive remote notifications, which improves the existing remote notification configuration workflow, as existing users are required to create numerous custom categories in order to achieve this level of functionality today.
- **Test email**: Send out a test email to confirm that the remote notifications are configured correctly and that recipients are able to receive them. This prevents missed notifications due to misconfiguration.
- **Alarm Escalation**: If an alarm has not been acknowledged or discarded by recipients in a specified period of time, an additional set of recipients will be notified.

  ⓘ **Note:** If the alarm clears before the specified period of time expires and without being acknowledged, the alarm escalation is still sent.

  This provides Metasys administrators with a way to reduce the risk of operators missing critical alarms that could lead to compliance issues in critical spaces. This also ensures that alarm notifications reach the appropriate recipients, to prevent issues from becoming major breakdowns.
- **Send Announcement**: The Send Announcement feature provides the ability to send announcements to selected users. The announcement can be delivered by email, on a login banner, and on a home page banner. This feature enables information sharing and collaboration between multiple Metasys operators on a single site.

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.

- Use Timed Operator Commands 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. Administrators can choose to apply a setting to force users to add Annotations. This prevents confusion and clarifies understanding of why a Metasys operator made a change in the system.
- The 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.
- 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 supports all existing SMP commands. Perform all SMP commands on objects that are supported in Metasys UI.

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 1: Metasys UI Graphics features

Feature	Description
Custom Symbols Library	Import and export custom symbols into the graphics palette with the Custom Symbols Library. Custom Symbol Libraries integrate seamlessly with the base graphics package.
Building Network Tree in Graphics Editor	Bind Network Tree items to graphics with the Building Network Tree binding option in the Graphics Editor.
Context-sensitive Binding Tree	The binding tree is context-sensitive, which ensures that the binding tree opens to the appropriate space or equipment when you launch the Graphics Editor from a particular space or equipment.
Path Tool Editing	Edit an existing path that was drawn with the drawing tool with the Path Tool editing feature.
Graphics Association Manager for Aliased Graphics	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.

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 Johnson Controls System Configuration Tool (JCT), formerly called 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. JCT leverages the SCT archives instead of the live site. JCT is automatically installed along with SCT.

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 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.

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.

You can configure Tailored Summaries in SMP and SCT but not in Metasys UI.

Site Management Portal UI

The Site Management Portal UI provides system administrators or building operators online user and system configuration capabilities along with real-time views into their site. The Site Management Portal UI transforms raw data from the site and organizes it into a comprehensive set of information management tools and reports.

The Site Management Portal UI framework features a multiple panel layout that displays different aspects of your building control system at one time. For example, you can display a graphic diagram of an air handling plant along with a multiple point trend graph and the control system logic. This multi-panel layout allows you to identify the cause of an alarm condition from the plant quickly. In another panel, you can display a detailed focus view of a point and monitor the effects of changes to its value on the system graphic in the other panel.

ⓘ **Note:** SMP requires a license at Release 12.0. The license is available to existing customers only.

Access through the Launcher Application

Use the Launcher application to connect to the Site Management Portal UI of the ADS/ADX 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 and the Metasys Advanced Reporting System. For more details, refer to the *Launcher Tool Help (LIT-12011742)*.

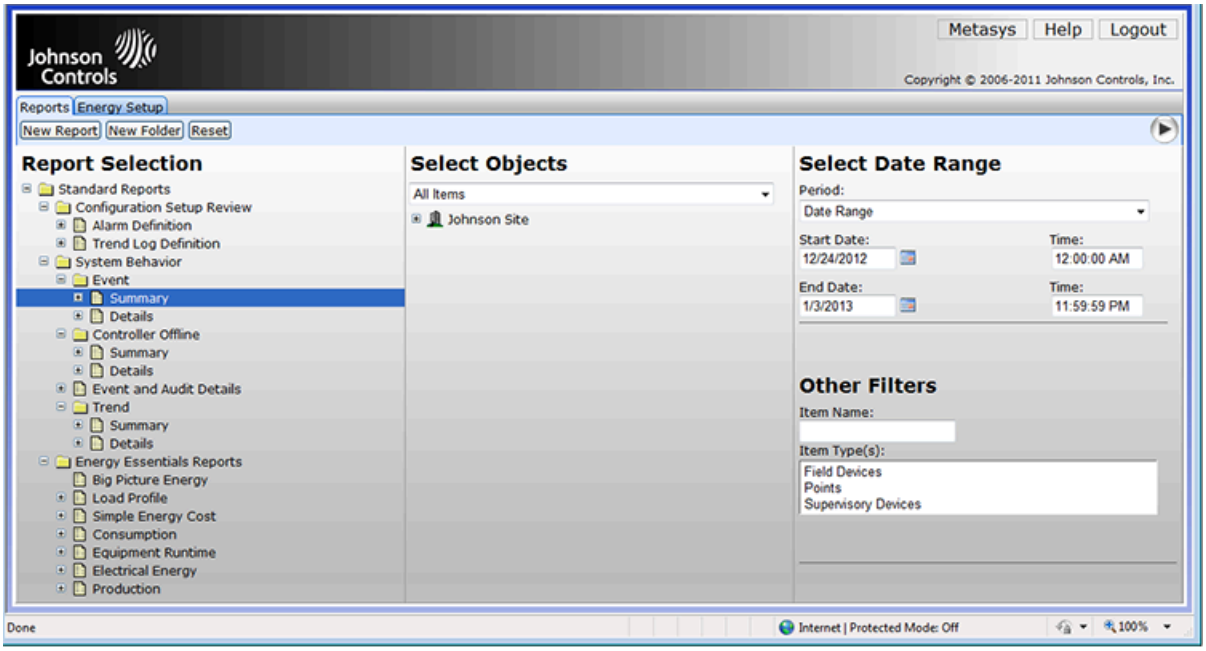
ADX with the Metasys Advanced Reporting System

The Metasys Advanced Reporting System provides historical and configuration data reporting capabilities in a UI that is separate from the Site Management Portal UI. This system allows

authorized users to run reports to review the configuration and performance of the Metasys system.

The Metasys Advanced Reporting System UI allows you to run reports easily and immediately view them in a web browser.

Figure 3: Metasys Advanced Reporting System

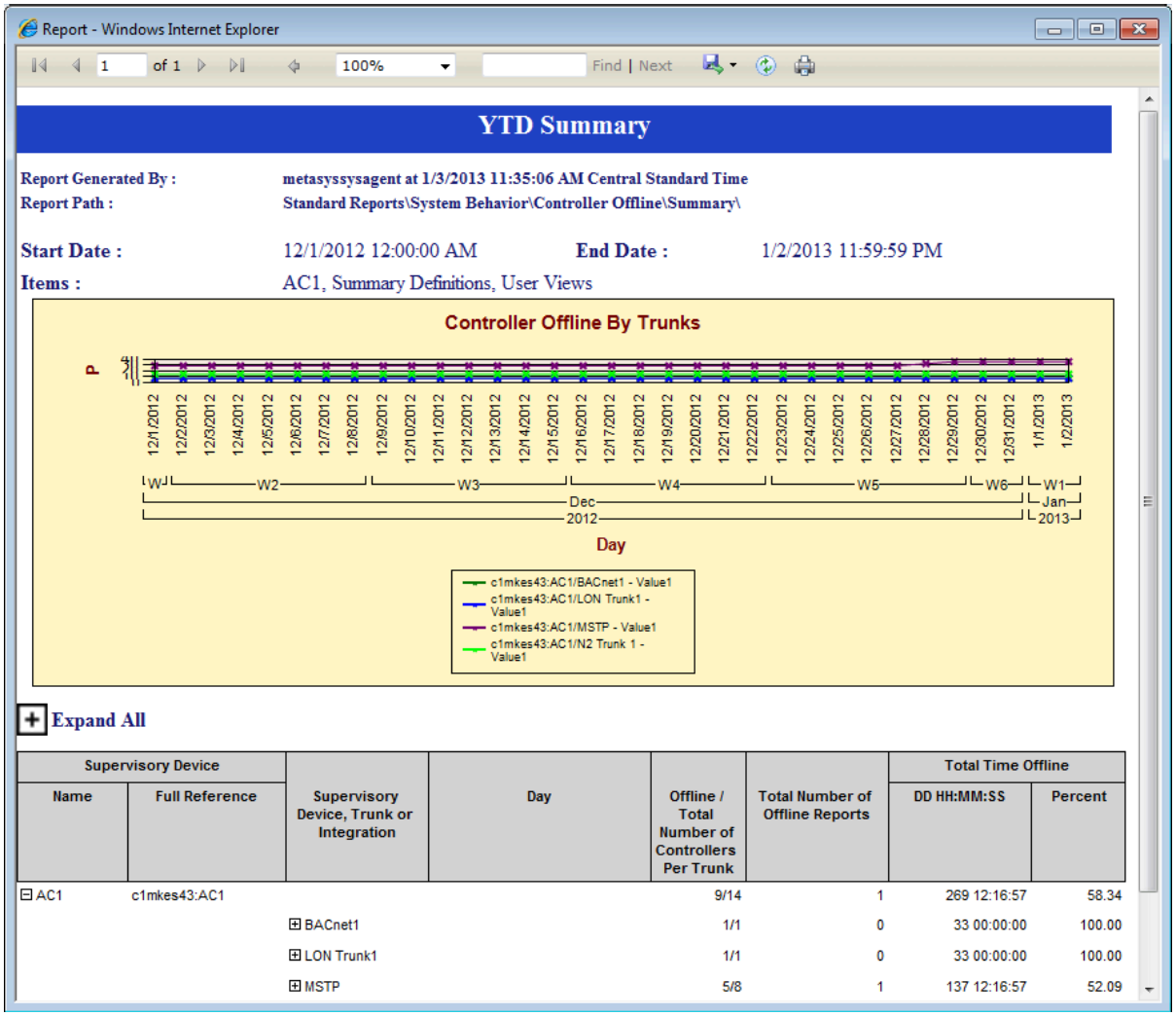


The following reports are available for the points included in the reporting system user views:

- Configuration Setup Review
- System Behavior
- Trend Report — statistical calculations and Mean Kinetic Temperature (MKT)
- Trend Detail Report — summary data

You can export a report and save it in a variety of formats, such as Microsoft Excel® or PDF, for later use.

Figure 4: Metasys Advanced Reporting System Example Report



Supervisory Device		Supervisory Device, Trunk or Integration	Day	Offline / Total Number of Controllers Per Trunk	Total Number of Offline Reports	Total Time Offline	
Name	Full Reference					DD HH:MM:SS	Percent
AC1	c1mkes43:AC1			9/14	1	269 12:16:57	58.34
		BACnet1		1/1	0	33 00:00:00	100.00
		LON Trunk1		1/1	0	33 00:00:00	100.00
		MSTP		5/8	1	137 12:16:57	52.09

The Metasys Advanced Reporting System is available on ADXs running SQL Server software with SQL Server Reporting Services. The Metasys Advanced Reporting System is an option during the ADX installation. Users are authorized with the Advanced Reporting option in the Security Administrator System. For details, refer to the *Metasys Advanced Reporting System and Energy Essentials Help (LIT-12011312)*

ADX split configuration

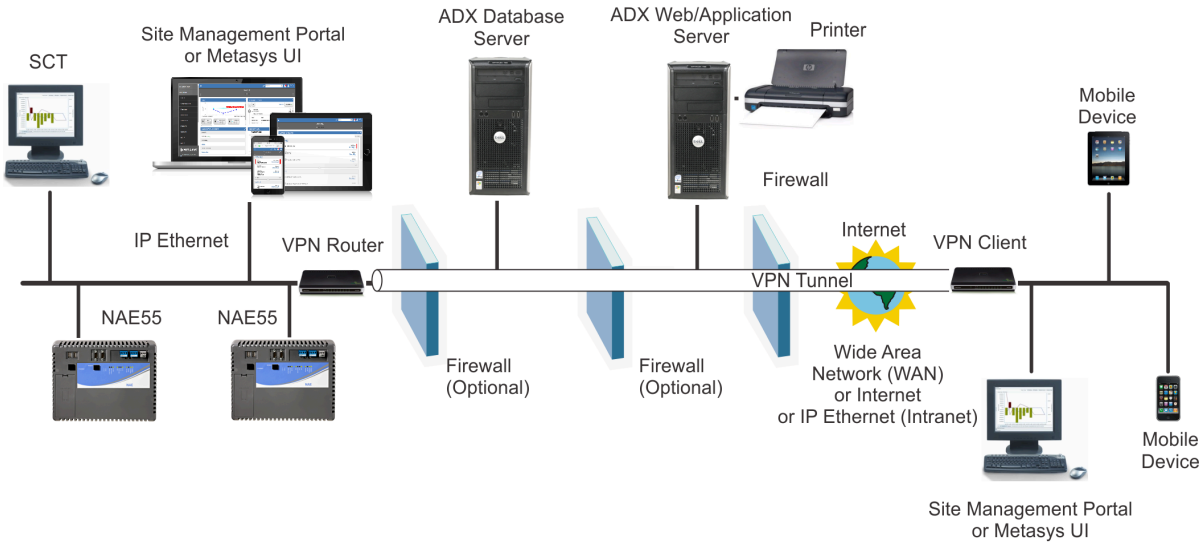
The ADX software and its associated database software are often installed on one computer (a unified ADX). However, the ADX also can be installed in a split configuration, which involves installing ADX-related software on two computers. Splitting provides enhanced security for historical data. Using the ADX in a split configuration allows you to locate the Metasys system databases behind a firewall, which reduces the risk of exposing Metasys system data to unauthorized users on the Network. The split configuration also allows you to locate Metasys system databases on an existing SQL Server computer using existing resources (hardware, software, and technical personnel), potentially lowering the cost of installing and monitoring the Metasys system.

In an ADX split configuration, the computer running SQL Server software is known as the database server computer, and it stores historical Metasys system data. The ADX software itself and all required ADX prerequisites reside on a second computer, known as the web/application server

computer. In a split configuration, the SCT must reside on a third computer. Users browse to the web/application server computer to see system data. The database server computer cannot be used as a historical data repository by more than one web/application server computer.

Metasys Network with an ADX

Figure 5: Metasys Network with an ADX in Split Configuration



Note: Cloud-based applications are not available for all sites.

ADS/ADX concurrent users

Use the following table to help you determine the ADS/ADX user product that you need to order. The table provides examples of the total number of supported users who can be simultaneously logged on the SMP and Metasys UI.

Note: The following information provides the supported concurrent user limitations. Usage beyond the supported limitations may yield system or server performance issues.

Table 2: Examples of ADS/ADX/ADS-Lite concurrent users

ADS/ADX type	Examples of ADS/ADX concurrent users	
	SMP UI	Metasys UI
5-user ADS/ADS-Lite	0	5
	2	3
	5	0
10-user ADX	0	25[1]
	5	20
	8	17
	10	15
25-user ADX	0	25
	10	15
	20	5
	25	0
50-user ADX	0	50
	10	40
	25	25
	50	0
100-user ADX	5	50[2]
	10	50[2]
	25	50[2]
	50	50[2]
	75	25
	100	0

1 The 10-user ADX has an SMP 10 concurrent user limitation. The Metasys UI concurrent user limitation is 25.
2 The 100-user ADX has an SMP 100 concurrent user limitation. The Metasys UI concurrent user maximum is 50.

For example, as shown in Table 2, with a 5-user ADS or ADS-Lite, 5 Metasys UI users are supported if no SMP users are logged in, or 3 Metasys UI users are supported if 2 SMP users are logged in. Similarly, with a 50-user ADX, 50 Metasys UI users are supported if no SMP users are logged in, or 40 Metasys UI users are supported if 10 SMP users are logged in. The only Metasys UI user restriction applies to a 100-user ADX: no more than 50 Metasys UI users are supported, regardless of the number of SMP users.

Extended Application and Data Server (ADX) Split Configuration Guidelines

Table 3: ADX Split Configuration Guidelines

Product	Guideline
ADX Web/Application Server	Must be loaded on a Windows server-class operating system . ⓘ **Note:** • ADX software and all required ADX prerequisites reside on a web/application server. Users browse to the web/application server to see system data. • You may install Metasys Advanced Reporting System on this server.
ADX Database Server	Must be loaded on a Windows server-class operating system. ⓘ **Note:** SQL Server software resides on the ADX database server. The database server stores historical Metasys system data and serves as a historical data repository for the web/application server.
System Configuration Tool (SCT)	Must be loaded on a third server that is separate from the ADX web/application server and ADX database server.

Optional software tools

Beginning at Release 10.0 optional Metasys software components such as the Metasys Export Utility (MEU), System Configuration Tool (SCT), and Controller Configuration Tool (CCT) are no longer included with ADS/ADX software.

These components must be purchased and licensed separately. Refer to the *Metasys System Software Purchase Options Product Bulletin (LIT-12011703)* for more information on the software included in the Metasys offerings.

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. Use these flexible formats, in programs such as Microsoft Excel® and Access, to 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)

Use the Metasys Database Manager to monitor, manage, purge, and back up Metasys system historical databases on an ADS/ADX. For details, refer to the *Metasys Database Manager Help (LIT-12011202)*.

System Configuration Tool (SCT)

Use SCT 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/ADXs 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 Johnson Controls System Configuration Tool (JCT).
- 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 Johnson Controls System Configuration Tool (JCT) is installed with SCT.

Ordering information

For complete ordering information, refer to the *Metasys System Software Purchase Options Product Bulletin (LIT-12011703).*

Table 4: ADS/ADX Ordering Information for New or Upgrade Software

Base Product Code	Product Descriptions	New Software Product Code Number	Upgrade Software Product Code Number	Migration Software Product Code Number
MS-ADS05U	Application and Data Server	MS-ADS05U-0	MS-ADS05U-6	MS-ADS05U-8
MS-ADX10U	Extended Application and Data Server	MS-ADX10U-0	MS-ADX10U-6	MS-ADX10U-8
MS-ADX10SQL	Extended Application and Data Server Includes Microsoft SQL Server 2017 software with core license	MS-ADX10SQL-0	MS-ADX10SQL-6	MS-ADX10SQL-8
MS-ADX25U	Extended Application and Data Server	MS-ADX25U-0	MS-ADX25U-6	MS-ADX25U-8

Table 4: ADS/ADX Ordering Information for New or Upgrade Software

Base Product Code	Product Descriptions	New Software Product Code Number	Upgrade Software Product Code Number	Migration Software Product Code Number
MS-ADX25SQL	Extended Application and Data Server Includes Microsoft SQL Server 2017 software with core license	MS-ADX25SQL-0	MS-ADX25SQL-6	MS-ADX25SQL-8
MS-ADX50U	Extended Application and Data Server	MS-ADX50U-0	MS-ADX50U-6	MS-ADX50U-8
MS-ADX50SQL2	Extended Application and Data Server For use on server with dual processors or 8 cores[1] Includes Microsoft SQL Server 2017 software with core license	MS-ADX50SQL2-0	MS-ADX50SQL2-6	MS-ADX50SQL2-8
MS-ADX50SQL	Extended Application and Data Server For use on server with single processor or 4 cores Includes Microsoft SQL Server 2017 software with core license	MS-ADX50SQL-0	MS-ADX50SQL-6	MS-ADS50SQL-8

Table 4: ADS/ADX Ordering Information for New or Upgrade Software

Base Product Code	Product Descriptions	New Software Product Code Number	Upgrade Software Product Code Number	Migration Software Product Code Number
MS-ADX100U	Extended Application and Data Server	MS-ADX100U-0	MS-ADX100U-6	MS-ADX100U-8
MS-ADX100SQL2	Extended Application and Data Server For use on server with dual processors or 8 cores[1] Includes Microsoft SQL Server 2017 software with core license	MS-ADX100SQL2-0	MS-ADX100SQL2-6	MS-ADX100SQL2-8

1 Servers with dual processors or 8 cores are **recommended** for ADX 50 user and 100 user software.

Table 5: Optional features add-on licenses

Code number	Description
M4-APIMOCMD-0	License enabling the Monitoring and Commanding API for new site.
M4-APIMOCMD-6	License enabling the upgrade of the Monitoring and Commanding API for existing sites. ⓘ **Note:** Existing sites upgrading to Release 12.0 must purchase this upgrade to continue using the API.
M4-FAULT-0	License enabling Fault Detection feature for one Metasys server (ADS, ADS-Lite, ADX, or OAS series). [1]
M4-TRIAGE-0	License enabling Fault Triage feature for one Metasys server (ADS, ADS-Lite, ADX, or OAS series). ⓘ **Note:** M4-FAULT-0 is also required as a prerequisite.
M4-ADFS-0	License enabling Active Directory Federation Services (ADFS) feature for one Metasys server (ADS, ADS-Lite, ADX or OAS series).
M4-FIPS-0	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).

Table 5: Optional features add-on licenses

Code number	Description
MS-SMP-6	License enabling SMP for existing sites.
M4-BACNETSC-0	License enabling BACnet Secure Connect.

1 The OAS must meet minimum requirements.

ADS and ADX Application Tables

Table 6: Data Access Ability on an ADS and ADX

Characteristic	ADS	ADX	Questions to Ask
Before Archiving Data			
Standard Reports	**Yes** • Trend Studies • Export Utility	**Yes** • Trend Studies • Export Utility • Metasys Advanced Reporting system	**Which kind of standard reporting do you need?** • If you need only historical values for selected points, install an ADS. • If you need historical point values, offline conditions, audits, events, and more, install an ADX with the Metasys Advanced Reporting system.
Custom Reports	**Yes - with Third-Party Tools** Various third-party tools	**Yes - with Third-Party Tools** Various third-party tools	**Do you need custom reporting?** • If you do not need custom reporting, install an ADS. • If you need custom reporting, install an ADX and plan for any necessary expert help to create and interpret custom reports using third-party tools.

Table 6: Data Access Ability on an ADS and ADX

Characteristic	ADS	ADX	Questions to Ask
After Archiving Data			
Merging of Archives for Data Access and Reporting	**Yes - with Third-Party Tools** Various third-party tools	**Yes - with Third-Party Tools** • SQL Server software • Microsoft Reports software	**Do you need to access or query data from more than one archive at a time?** • If you would like to access data from each archive separately, install an ADS. • If you would like to access data from several archives or all your archives, use third-party tools to merge the archives, install an ADX, and query the complete merged archive file. Plan for any necessary expert help.

Data storage characteristics of the ADS and ADX

Table 7: Data storage characteristics of the ADS and ADX

Characteristic	ADS	ADX	Questions to Ask
Database Capacity[1]	10 GB	**40 GB** (minimum free space required on the computer after ADX installation) The database can expand until all hard disk space is used.	**How far back do you need to collect data before archiving?** • In a typical system[2], the ADS database reaches the database capacity in approximately 3.5 years. • In a typical system[3], the ADX database reaches the 40 GB capacity in approximately 2.5 years.
Archive Type Available	Manual	• Manual • Automatic • Scheduled	**Do you need automatic or scheduled archiving?** • If you do not need automatic or scheduled archiving, an ADS may be appropriate. You must archive manually when the database is full to avoid offline Metasys server conditions. • If you require automatic or scheduled archiving, install an ADX. Automatic archiving prevents offline Metasys server conditions.
Archiving Tools	• Metasys Database Manager • SQL Server Management Studio Express software	• Metasys Database Manager • Microsoft SQL Server software	**Do you have experienced Information Technology specialists on hand?** If you have experienced IT specialists on site, they may require specific third-party archive management tools or prefer the powerful SQL Server software capabilities of the ADX.

1 Be aware of the physical limitations of hard disk space available on the computer. You must have room for all installed programs, the active database, archives, temporary database files, and other supporting files. Automatic archiving does not take place if no free disk space is available.
2 A typical system consists of an ADS and 4 to 5 NAEs with approximately 20% of points trended at 30-minute intervals.
3 A typical system consists of an ADX and 15 NAEs with approximately 20% of points trended at 15-minute intervals.

Table 8: Client computer requirements for Site Management Portal UI, SCT, Metasys UI, and Johnson Controls System Configuration Tool (JCT)

	Site Management Portal UI System Configuration Tool (SCT) System Configuration Tool Pro (SCT Pro)	**Metasys UI Johnson Controls System Configuration Tool (JCT)**
Recommended processor[1]	Intel® Core™ i5 Processor	Intel® Core™ i5 Processor
Recommended Random Access Memory (RAM)	8 GB (4 GB minimum)	8 GB (1 GB minimum)
	ⓘ **Note:** If you use graphics intensively, you may experience better computer performance with additional RAM.	
Hard disk capacity	40 GB hard disk (minimum)	40 GB hard disk (minimum)
Supported operating systems	**SMP** Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 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. **SCT and SCT Pro** Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2. Windows® Server® 2019 (version 1809 or later) (64-bit) Windows® Server® 2016 (version 1607 or later) (64-bit)	**Metasys UI and Johnson Controls System Configuration Tool (JCT)** Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (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. Apple® macOS® 11 Big Sur Apple® macOS® 10.15 Catalina Apple® macOS® 10.14 Mojave
Supported web browsers	Google® Chrome™ version 91 or later Microsoft® Edge® version 91 or later Apple® Safari® 13.1 [2]	Microsoft® Edge® version 91 or later Google® Chrome™ version 91 or later [3] Apple® Safari® 13.1 or later[4] Other web browsers, such as Mozilla® Firefox®, are not officially supported by the UI. However, the Metasys UI may appear and function appropriately in these web browsers.
Supported mobile phone operating systems	N/A	Android phone 5.1 or later iPhone iOS 13.0 or later
Supported tablet operating systems	N/A	Android tablet 5.1 or later iPad iOS 13.0 or later

Table 8: Client computer requirements for Site Management Portal UI, SCT, Metasys UI, and Johnson Controls System Configuration Tool (JCT)

	Site Management Portal UI System Configuration Tool (SCT) System Configuration Tool Pro (SCT Pro)	Metasys UI Johnson Controls System Configuration Tool (JCT)
Network communication	Ethernet network interface card 10/100/1000 Mbps	Ethernet network interface card 10/100/1000 Mbps Follow these guidelines and recommendations: • For optimal performance, use a wired connection for computers browsing to the Metasys UI. • Alternatively, for mobile phones and tablets, you can use a wireless IEEE 802.11 connection on a 4G network. Browsing to the Metasys UI over a 3G communications network is possible, but it is not recommended or supported. • High latency (also called lag or wait time) can cause the Metasys UI to disconnect from the ADS or ADX. • To avoid high latency, we recommend a network with 20 mpbs upload speed. • Signal strength impacts the overall performance of the Metasys UI. For the best results, ensure you have a strong signal for your wireless connection.
Monitor	1024 x 768 or higher resolution and 16-bit or higher color depth	1024 x 768 or higher resolution and 16-bit or higher color depth Other features may require 1600 x 900 resolution. Additionally, you may need to set your monitor display at Small 100% setting (**Control Panel** > **All Control Panel Items** > **Display**).

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)* for more information regarding computer/server recommendations.

2 In macOS, you cannot view Graphics+ graphics in the Site Management Portal UI. You use the web browser to download the Launcher application. After you install the Launcher application, you use the Launcher, not the web browser, to log in to the Site Management Portal (SMP) UI.

3 Metasys UI does not support incognito mode. To exit incognito mode, click or tap the **X** icon of the browser window or tab and then open a new browser window or tab. For more information on incognito mode in Google Chrome, click here.

4 Metasys UI does not support private browsing. To exit private browsing, click or tap **Private** in the browser window.

Technical Specifications

Application and Data Server (ADS) system requirements

Table 9: Application and Data Server (ADS) system requirements (5 Users)

Recommended Computer Platform[1]	Intel Core i7-8700 Processor (Six Core, 3.20GHz) 2 x 500 GB 7200 rpm SATA 3.5 in. drive[2] with 40 GB free space after installation of all prerequisite software and before installation of ADS software. Configure RAID 1 (mirroring) with disk write-caching turned on. **Note:** Prerequisite software includes the supported operating system, database software, .NET Framework, and any other software or service packs required for your ADS configuration.
	Graphics card (1 GB RAM, ATI® Technologies or NVIDIA® Corporation, 64-bit compatible, Small Form Factor [SFF] if required)
Required Minimum Memory[3]	16 GB RAM The VM host must have at least 8 GB of allocated RAM at all times. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	For information about the number of engines supported, refer to the table labeled *Maximum number of network engines supported based on Metasys Server type and Server size* in the *Metasys System Configuration Guide (LIT-12011832)*.
Number of Site Management Portal users supported	Up to five
Number of Metasys UI users supported	Up to five
Supported Operating Systems[4] **and Database Software**	Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (64-bit). For all future Windows 10 updates after version 21H2, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support. Windows® 10 Enterprise LTSC (21H2) (64-bit) Supports: • SQL Server® 2019 Express with CU14 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 Express with CU27 (64-bit) • SQL Server® 2016 Express with SP2 CU17 (64-bit)
	Supports: • SQL Server® 2017 Express with CU27 (64-bit) • SQL Server® 2016 Express with SP2 CU17 (64-bit)
Supported Operating Systems for Metasys Site Management Portal Client Computer	Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (64-bit). For all future Windows 10 updates after version 21H2, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support. Apple® macOS® 11 Big Sur Apple® macOS® 10.15 Catalina Apple® macOS® 10.14 Mojave
Supported Web Browser Software for Metasys Site Management Portal Client Computers	Apple® Safari® 13.1 or later **Notes:** • In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI. • You use the web browser to download the Launcher application. After you install the Launcher application, you use the Launcher, not the web browser, to log in to the Site Management Portal (SMP) UI.

Table 9: Application and Data Server (ADS) system requirements (5 Users)

Supported Web Browser Software for Metasys UI Client Devices	Microsoft® Edge® version 91 or later Google® Chrome™ version 91 or later ⓘ **Note:** Metasys UI does not support incognito mode. To exit incognito mode, click or tap the **X** icon of the browser window or tab and then open a new browser window or tab. For more information on incognito mode in Google Chrome, click here. Apple® Safari® 13.1 or later ⓘ **Note:** Metasys UI does not support private browsing. To exit private browsing, click or tap **Private** in the browser window. Other web browsers, such as Mozilla® Firefox®, are not officially supported by the UI. However, the Metasys UI may appear and function appropriately in these web browsers.
Supported Virtual Environments	Microsoft Hyper-V™ VMware®
Supported User Interfaces	Site Management Portal (SMP) Metasys UI ⓘ **Note:** SMP requires a license at Release 12.0. The license is available only to existing Metasys customers.
Additional Software Included with the ADS Software Download	Launcher software, Network Engine images, Summary Definition Examples, Microsoft .NET Framework (multiple versions), SQL Server Management Studio, Metasys Database Manager, Toggletunnel, SNMP Management Information Base example files (MIBs), Report Viewer 2010 and Report Viewer 2012.
Optional Hardware	Any network or local printer supported by the qualified Windows operating system
Optional Software	Graphic Generation Tool CCT software SCT software Metasys Export Utility software

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)* for more information regarding computer/server recommendations.
2 For best performance, use Serial Attached SCSI (SAS) hard drives, not Small Computer System Interface (SCSI) hard drives.
3 For best performance, use the maximum amount of memory that the computer allows.
4 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.

Extended Application and Data Server system requirements (Unified 10 or 25 User ADX)

Use the following recommendations for small sites and small to medium sites.

Table 10: Extended Application and Data Server system requirements (Unified ADX Systems, 10 or 25 Users)

Recommended Server Platform[1]	**Processor for small sites:** Intel® Xeon® Gold 5222 3.8 GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 **or** Intel® Xeon® Gold 6244 3.6 GHz, 8 cores/16 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2933 **Processor for small to medium sites:** Intel® Xeon® Gold 5222 3.8 GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 and recommended second processor type is Intel® Xeon® Gold 5222 3.8 GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 **Hard drive:** 2 x 960 GB SSD SATA Mix Use 6Gbps 512 2.5in Hot-plug Drive (RAID 1)[2] with 40 GB free space after installation of all prerequisite software and before installation of ADS software. Configure RAID 1 (mirroring) with disk write-caching turned on. ⓘ **Note:** ADX prerequisite software includes the Windows operating system, SQL Server software, Windows .NET Framework, and any other software or SPs required by your ADX configuration.
Required Minimum Memory[3]	32 GB RDIMM, 2933MT/s, Dual Rank The VM host must have at least 8 GB of allocated RAM at all times. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	For information about the number of engines supported, refer to the table labeled *Maximum number of network engines supported based on Metasys Server type and Server size* in the *Metasys System Configuration Guide (LIT-12011832)*.
Number of Site Management Portal users supported	**For small sites:** Up to 10 **For small to medium sites:** Up to 10
Number of Metasys UI users supported	**For small sites:** Up to 15 **For small to medium sites:** Up to 25
Supported Operating Systems[4] **and Database Software**	Windows® Server® 2019 (version 1809 or later) (64-bit) ⓘ **Note:** Metasys Advanced Reporting System does not support SQL Server 2019. Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
	Windows® Server® 2016 (version 1607 or later) (64-bit) Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
Supported Operating Systems for Metasys Site Management Portal Client Computer	Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (64-bit). For all future Windows 10 updates after version 21H2, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support. Apple® macOS® 11 Big Sur Apple® macOS® 10.15 Catalina Apple® macOS® 10.14 Mojave

Table 10: Extended Application and Data Server system requirements (Unified ADX Systems, 10 or 25 Users)

Supported Web Browser Software for Metasys Site Management Portal Client Computers	Apple® Safari® 13.1 or later ⓘ **Notes:** • In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI. • You use the web browser to download the Launcher application. After you install the Launcher application, you use the Launcher, not the web browser, to log in to the Site Management Portal (SMP) UI.
Supported Web Browser Software for Metasys UI Client Devices	Microsoft® Edge® version 91 or later Google® Chrome™ version 91 or later ⓘ **Note:** Metasys UI does not support incognito mode. To exit incognito mode, click or tap the **X** icon of the browser window or tab and then open a new browser window or tab. For more information on incognito mode in Google Chrome, click here. Apple® Safari® 13.1 or later ⓘ **Note:** Metasys UI does not support private browsing. To exit private browsing, click or tap **Private** in the browser window. Other web browsers, such as Mozilla® Firefox®, are not officially supported by the UI. However, the Metasys UI may appear and function appropriately in these web browsers.
Supported Virtual Environments	Microsoft Hyper-V™ VMware®
Supported User Interfaces	Site Management Portal (SMP) Metasys UI
Additional Software Included with the ADX Software Download	Microsoft .NET Framework 4.7.2 Microsoft .NET Core 3.1.17 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software RabbitMQ Server 3.8.16 Erlang OTP 23.2 (11.1.4) ⓘ **Note:** The Metasys Advanced Reporting System requires an ADX. The SCT computer must be online and accessible to the ADX at all times.
Optional Hardware	Any network or local printer supported by the qualified Windows operating system
Optional Software	Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

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)* for more information regarding computer/server recommendations.
2 For best performance, use SSD (preferred) or SAS hard drives (not SATA hard drives) that use RAID controllers with write-caching enabled.
3 For best performance, use the maximum amount of memory. An ADX with 32 GB RAM has much greater performance than an ADX with only 16 GB RAM.
4 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.

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: SQL Server 2019, SQL Server 2017, and SQL Server 2016.

Extended Application and Data Server system requirements (Unified 50 or 100 User ADX)

Use the following recommendations for medium to large sites and large sites.

Table 11: Extended Application and Data Server system requirements (Unified ADX Systems, 50 or 100 Users)

Recommended Server Platform [1]	**Processor for medium to large sites:** Intel® Xeon®Gold 5222 3.8GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 and the recommended second processor type is Intel® Xeon® Gold 5222 3.8GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 **Processor for large sites:** Intel® Xeon® Gold 6244 3.6GHz, 8 cores/16 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2933 and the recommended second processor type is Intel® Xeon® Gold 5222 3.8GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 **Hard drive for medium to large sites:** 2 x 960GB SSD SATA Mix Use 6Gbps 512 2.5in Hot-plug Drive (RAID 1)[2] with 50 GB free space after installation of all prerequisite software and before installation of ADS software. Configure RAID 1 (mirroring) with disk write-caching turned on **Hard drive for large sites:** 2 x 960GB SSD SAS Mixed use 12Gbps 512e 2.5in Hot-Plug PM5-V Drive, 3 DWPD, 5256 TBW (RAID 1) [2] with 50 GB free space after installation of all prerequisite software and before installation of ADS software. Configure RAID 1 (mirroring) with disk write-caching turned on PERC H730P RAID Controller, 2GB NV Cache, Minicard **Note:** ADX prerequisite software includes the Windows operating system, SQL Server software, Windows .NET Framework, and any other software or SPs required by your ADX configuration.
Required Minimum Memory[3]	64 GB RDIMM, 2933MT/s, Dual Rank The VM host must have at least 8 GB of allocated RAM at all times. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	For information about the number of engines supported, refer to the table labeled *Maximum number of network engines supported based on Metasys Server type and Server size* in the *Metasys System Configuration Guide (LIT-12011832)*.
Number of Site Management Portal users supported	**For medium to large sites:** Up to 25 **For large sites:** Up to 100
Number of Metasys UI users supported	**For medium to large sites:** Up to 50 **For large sites:** Up to 50

Table 11: Extended Application and Data Server system requirements (Unified ADX Systems, 50 or 100 Users)

Supported Operating Systems[4] and Database Software	Windows® Server® 2019 (version 1809 or later) (64-bit) ⓘ **Note:** Metasys Advanced Reporting System does not support SQL Server 2019. Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
	Windows® Server® 2016 (version 1607 or later) (64-bit) Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
Supported Operating Systems for Metasys Site Management Portal Client Computer	Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (64-bit). For all future Windows 10 updates after version 21H2, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support. Apple® macOS® 11 Big Sur Apple® macOS® 10.15 Catalina Apple® macOS® 10.14 Mojave
Supported Web Browser Software for Metasys Site Management Portal Client Computers	Apple® Safari® 13.1 or later ⓘ **Notes:** • In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI. • You use the web browser to download the Launcher application. After you install the Launcher application, you use the Launcher, not the web browser, to log in to the Site Management Portal (SMP) UI.
Supported Web Browser Software for Metasys UI Client Devices	Microsoft® Edge® version 91 or later Google® Chrome™ version 91 or later ⓘ **Note:** Metasys UI does not support incognito mode. To exit incognito mode, click or tap the **X** icon of the browser window or tab and then open a new browser window or tab. For more information on incognito mode in Google Chrome, click here. Apple® Safari® 13.1 or later ⓘ **Note:** Metasys UI does not support private browsing. To exit private browsing, click or tap **Private** in the browser window. Other web browsers, such as Mozilla® Firefox®, are not officially supported by the UI. However, the Metasys UI may appear and function appropriately in these web browsers.

Table 11: Extended Application and Data Server system requirements (Unified ADX Systems, 50 or 100 Users)

Supported Virtual Environments	Microsoft Hyper-V™ VMware®
Supported User Interfaces	Site Management Portal (SMP) Metasys UI
Additional Software Included with the ADX Software Download	Microsoft .NET Framework 4.7.2 Microsoft .NET Core 3.1.17 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software RabbitMQ Server 3.8.16 Erlang OTP 23.2 (11.1.4) ⓘ **Note:** The Metasys Advanced Reporting System requires an ADX. The SCT computer must be online and accessible to the ADX at all times.
Optional Hardware	Any network or local printer supported by the qualified Windows operating system
Optional Software	Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

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)* for more information regarding computer/server recommendations.

2 For best performance, use SSD (preferred) or SAS hard drives (not SATA hard drives) that use RAID controllers with write-caching enabled.

3 For best performance, use the maximum amount of memory. An ADX with 64 GB RAM has much greater performance than an ADX with only 32 GB RAM.

4 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.

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: SQL Server 2019, SQL Server 2017, and SQL Server 2016.

Extended Application and Data Server system requirements (Split 10 or 25 User ADX)

Use the following recommendations for medium to large sites.

Table 12: Extended Application and Data Server system requirements (Split ADX Systems, 10 or 25 Users)

Recommended Server Platform[1]	**Web/Application Server** Intel® Xeon® Gold 5222 3.8GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 and the recommended second processor type is Intel® Xeon® Gold 5222 3.8GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 2 x 960GB SSD SATA Mix Use 6Gbps 512 2.5in Hot-plug Drive (RAID 1)[2] with 50 GB free space after installation of all prerequisite software[3] and before installation of ADS software. Configure RAID 1 (mirroring) with disk write-caching turned on ⓘ **Notes:** • Metasys Advanced Reporting System must reside on the ADX web/application server. • Metasys UI must reside on the ADX web/application server.
	Database Server Intel® Xeon® Gold 5222 3.8GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 and the recommended second processor type is Intel® Xeon® Gold 5222 3.8GHz, 4 cores/8 threads, 10.4GT/s, 16.5M Cache, Turbo, HT (105W) DDR4-2933 2 x 960GB SSD SATA Mix Use 6Gbps 512 2.5in Hot-plug Drive (RAID 1) [2] with 50 GB free space after installation of all prerequisite software[3] and before installation of ADS software. Configure RAID 1 (mirroring) with disk write-caching turned on
	SCT Computer In a split configuration, you cannot install SCT on either the ADX web/application server computer or the ADX database server computer. Refer to the *System Configuration Tool Catalog Page (LIT-1900198)* for current SCT computer requirements.
Required Minimum Memory[4]	64 GB RDIMM, 2933MT/s, Dual Rank (web/application server and database server for 10 or 25 user ADX) The VM host must have at least 8 GB of allocated RAM at all times. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	For information about the number of engines supported, refer to the table labeled *Maximum number of network engines supported based on Metasys Server type and Server size* in the *Metasys System Configuration Guide (LIT-12011832)*.
Number of Site Management Portal users supported	Up to 25
Number of Metasys UI users supported	Up to 25

Table 12: Extended Application and Data Server system requirements (Split ADX Systems, 10 or 25 Users)

Supported Operating Systems[5,6] with Supported Database Software	Windows® Server® 2019 (version 1809 or later) (64-bit) ⓘ **Note:** Metasys Advanced Reporting System does not support SQL Server 2019. Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
	Windows® Server® 2016 (version 1607 or later) (64-bit) Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
Supported Operating Systems for Metasys Site Management Portal Client Computer	Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (64-bit). For all future Windows 10 updates after version 21H2, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support. Apple® macOS® 10.15 Catalina Apple® macOS® 10.14 Mojave
Supported Web Browser Software for Metasys Site Management Portal Client Computers	Apple® Safari® 13.1 or later ⓘ **Notes:** • In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI. • You use the web browser to download the Launcher application. After you install the Launcher application, you use the Launcher, not the web browser, to log in to the Site Management Portal (SMP) UI.
Supported Web Browser Software for Metasys UI Client Devices	Microsoft® Edge® version 91 or later Google® Chrome™ version 91 or later ⓘ **Note:** Metasys UI does not support incognito mode. To exit incognito mode, click or tap the **X** icon of the browser window or tab and then open a new browser window or tab. For more information on incognito mode in Google Chrome, click here. Apple® Safari® 13.1 or later ⓘ **Note:** Metasys UI does not support private browsing. To exit private browsing, click or tap **Private** in the browser window. Other web browsers, such as Mozilla® Firefox®, are not officially supported by the UI. However, the Metasys UI may appear and function appropriately in these web browsers.
Supported Virtual Environments	Microsoft Hyper-V™ VMware®
Supported User Interfaces	Site Management Portal (SMP) Metasys UI

Table 12: Extended Application and Data Server system requirements (Split ADX Systems, 10 or 25 Users)

Additional Software Included with the ADX Software Download	Microsoft .NET Framework 4.7.2 Microsoft .NET Core 3.1.17 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software RabbitMQ Server 3.8.16 Erlang OTP 23.2 (11.1.4) ⓘ **Note:** The Metasys Advanced Reporting System requires an ADX. The SCT computer must be online and accessible to the ADX at all times.
Optional Hardware	Any network or local printer supported by the qualified Windows operating system
Optional Software	Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

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)* for more information regarding computer/server recommendations.
2 For best performance, use SSD (preferred) or SAS hard drives (not SATA hard drives) that use RAID controllers with write-caching enabled.
3 ADX prerequisite software includes the Windows operating system and SQL Server software, Windows .NET Framework, and any other software or service packs required for your ADX configuration.
4 For best performance, use the maximum amount of memory.
5 The web/application and database servers must have the same operating system installed.
6 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.

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: SQL Server 2019, SQL Server 2017, and SQL Server 2016.

Extended Application and Data Server system requirements (Split 50 or 100 User ADX)

Use the following recommendations for large to extra large sites and for extra large sites.

Table 13: Extended Application and Data Server system requirements (Split ADX System, 50 or 100 Users)

Recommended Server Platform[1]	**Web/Application Server** **Processor for large to extra large sites:** Intel® Xeon® Gold 6244 3.6GHz, 8 cores/16 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2933 and the recommended second processor type is Intel® Xeon® Gold 6244 3.6GHz, 8 cores/16 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2933 **Processor for extra large sites:** Intel® Xeon® Gold 6136 3.0GHz, 12 cores/24 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2666 and the recommended second processor type is Intel® Xeon® Gold 6136 3.0GHz, 12 cores/24 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2666 **Hard drive for large to extra large sites:** 960GB SSD SAS Mixed use 12Gbps 512e 2.5in Hot-Plug PM5-V Drive, 3 DWPD, 5256 TBW (RAID 5)[2] with 50 GB free space after installation of all prerequisite software[3] and before installation of ADS software. Configure RAID 5 with disk write-caching turned on. Use a minimum of three hard drives for RAID 5 or a minimum of four hard drives for RAID 10. **Hard drive for extra large sites:** 960GB SSD SAS Mixed use 12Gbps 512e 2.5in Hot-Plug PM5-V Drive, 3 DWPD, 5256 TBW (RAID 5) [2] with 50 GB free space after installation of all prerequisite software[3] and before installation of ADS software. Configure RAID 5 with disk write-caching turned on. Use a minimum of three hard drives for RAID 5 or a minimum of four hard drives for RAID 10. PERC H730P RAID Controller, 2GB NV Cache, Minicard ⓘ **Notes:** • Metasys Advanced Reporting System must reside on the ADX web/application server. • Metasys UI must reside on the ADX web/application server.
Recommended Server Platform	**Database Server** **Processor for large to extra large sites:** Intel® Xeon® Gold 6244 3.6GHz, 8 cores/16 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2933 and the recommended second processor type is Intel® Xeon® Gold 6244 3.6GHz, 8 cores/16 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2933 **Processor for extra large sites:** Intel® Xeon® Gold 6136 3.0GHz, 12 cores/24 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2666 and the recommended second processor type is Intel® Xeon® Gold 6136 3.0GHz, 12 cores/24 threads, 10.4GT/s, 24.75M Cache, Turbo, HT (150W) DDR4-2666 **Hard drive for large to extra large sites:** 960GB SSD SAS Mixed use 12Gbps 512e 2.5in Hot-Plug PM5-V Drive, 3 DWPD, 5256 TBW (RAID 5) [2] with 50 GB free space after installation of all prerequisite software[3] and before installation of ADS software. Configure RAID 5 with disk write-caching turned on. Use a minimum of three hard drives for RAID 5 or a minimum of four hard drives for RAID 10. **Hard drive for extra large sites:** 960GB SSD SAS Mixed use 12Gbps 512e 2.5in Hot-Plug PM5-V Drive, 3 DWPD, 5256 TBW (RAID 5) [2] with 50 GB free space after installation of all prerequisite software[3] and before installation of ADS software. Configure RAID 5 with disk write-caching turned on. Use a minimum of three hard drives for RAID 5 or a minimum of four hard drives for RAID 10. PERC H730P RAID Controller, 2GB NV Cache, Minicard
Recommended Server Platform	**SCT Computer** In a split configuration, you cannot install SCT on either the ADX web/application server computer or the ADX database server computer. Refer to the *System Configuration Tool Catalog Page (LIT-1900198)* for current SCT computer requirements.
Required Minimum Memory[4]	**For large to extra large sites:** 64 GB RDIMM, 2933MT/s, Dual Rank **For extra large sites:** 64 to 128 GB RDIMM, 2933MT/s, Dual Rank The VM host must have at least 8 GB of allocated RAM at all times. When you configure the VM, do not select the enable dynamic memory option.

Table 13: Extended Application and Data Server system requirements (Split ADX System, 50 or 100 Users)

Number of engines supported	For information about the number of engines supported, refer to the table labeled *Maximum number of network engines supported based on Metasys Server type and Server size* in the *Metasys System Configuration Guide (LIT-12011832)*.
Number of Site Management Portal users supported	**For large to extra large sites:** Up to 50 **For extra large sites:** Up to 100
Number of Metasys UI users supported	**For large to extra large sites:** Up to 50 **For extra large sites:** Up to 50
Supported Operating Systems and Database Software[5,6]	Windows® Server® 2019 (version 1809 or later) (64-bit) ⓘ **Note:** Metasys Advanced Reporting System does not support SQL Server 2019. Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
	Windows® Server® 2016 (version 1607 or later) (64-bit) Supports: • SQL Server® 2019 with CU14 (64-bit) ⓘ **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's login to Metasys UI to fail. To resolve this issue, set SQL Server 2019 databases to run in 2017 compatibility mode. For more information, refer to docs.microsoft.com • SQL Server® 2017 with CU27 (64-bit) • SQL Server® 2016 with SP2 CU17 (64-bit)
Supported Operating Systems for Metasys Site Management Portal Client Computer	Windows® 10 Pro and Windows 10 Enterprise Editions versions 2004, 21H1, and 21H2 (64-bit). For all future Windows 10 updates after version 21H2, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support. Apple® macOS® 11 Big Sur Apple® macOS® 10.15 Catalina Apple® macOS® 10.14 Mojave
Supported Web Browser Software for Metasys Site Management Portal Client Computers	Apple® Safari® 13.1 or later ⓘ **Notes:** • In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI. • You use the web browser to download the Launcher application. After you install the Launcher application, you use the Launcher, not the web browser, to log in to the Site Management Portal (SMP) UI.

Table 13: Extended Application and Data Server system requirements (Split ADX System, 50 or 100 Users)

Supported Web Browser Software for Metasys UI Client Devices	Microsoft® Edge® version 91 or later Google® Chrome™ version 91 or later ⓘ **Note:** Metasys UI does not support incognito mode. To exit incognito mode, click or tap the **X** icon of the browser window or tab and then open a new browser window or tab. For more information on incognito mode in Google Chrome, click here. Apple® Safari® 13.1 or later ⓘ **Note:** Metasys UI does not support private browsing. To exit private browsing, click or tap **Private** in the browser window. Other web browsers, such as Mozilla® Firefox®, are not officially supported by the UI. However, the Metasys UI may appear and function appropriately in these web browsers.
Supported Virtual Environments	Microsoft Hyper-V™ VMware®
Supported User Interfaces	Site Management Portal (SMP) Metasys UI
Additional Software Included with the ADX Software Download	Microsoft .NET Framework 4.7.2 Microsoft .NET Core 3.1.17 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software RabbitMQ Server 3.8.16 Erlang OTP 23.2 (11.1.4) ⓘ **Note:** The Metasys Advanced Reporting System requires an ADX. The SCT computer must be online and accessible to the ADX at all times.
Optional Hardware	Any network or local printer supported by the qualified Windows operating system
Optional Software	Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

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)* for more information regarding computer/server recommendations.
2 For best performance, use SSD (preferred) or SAS hard drives (not SATA hard drives) that use RAID controllers with write-caching enabled.
3 ADX prerequisite software includes the Windows operating system and SQL Server software, Windows .NET Framework, and any other software or service packs required for your ADX configuration.
4 For best performance, use the maximum amount of memory. An ADX with 64 GB RAM has much greater performance than an ADX with only 32 GB RAM.
5 The web/application and database servers must have the same operating system installed.
6 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.

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: SQL Server 2019, SQL Server 2017, and SQL Server 2016.

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/techterms. Your use of this product constitutes an agreement to such terms.

Patents

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