METASYS
BUILDING MANAGEMENT SYSTEM
2021

The power behind **your mission**

Johnson Controls

METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISOR SOFTWARE AND TOOLS

METASYS SOFTWARE

METASYS CONFIGURATION TOOLS

METASYS PRODUCTIVITY & INTEGRATION TOOLS

METASYS PACKAGED SOLUTIONS & ADD-ONS

SUPERVISORY NETWORK CONTROLLERS

METASYS SUPERVISORY NETWORK CONTROLLERS

PROGRAMMABLE CONTROLLERS

METASYS CONTROLLERS

CONFIGURABLE FIELD CONTROLLERS

TERMINAL UNIT CONTROLLERS

NETWORK DISPLAYS, WEBSERVER AND GATEWAYS

MAP GATEWAYS

FIELD ADVANCED DISPLAY

TOUCH ADVANCED DISPLAY

METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISOR SOFTWARE AND TOOLS

METASYS SOFTWARE

ADX / ADS

METASYS SERVER

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 systemrelated faults in order of severity to help operators quickly fix issues and avoid equipment issues, energy waste, and comfort complaints.
- Fault triage: is an add-on to fault detection that provides fault duration, occurrence information, and corrective action recommendations to improve fault prioritization that assists less experienced building operators with problem solving.
- Building Network tree allows for faster delivery of the Metasys User Interface (UI) by enabling its deployment prior to the spaces and equipment configuration process. It also provides a familiar navigation experience for Metasys operators who have previous experience using the All Items tree of the Site Management Portal.
- Advanced Search and Reporting in the Metasys UI allows Metasys operators to find and report on operational data and make bulk commands to restore order more quickly. The Advanced Search and Reporting feature provides Metasys users the ability to quickly search Metasys objects by Building Network, equipment, equipment type, or space.
- Custom Dashboards for the Metasys User Interface. Custom dashboards enable Metasys UI designers to create dashboards that provide the most relevant and critical information to Metasys operators for enhanced productivity and creates an experience that mimics users operational styles for ease of use.
- Graphics Custom Behaviors provide Metasys UI designers the flexibility to use custom symbols that are required for their individual building or campus needs or their local standards.
- Trend widget updates allow users to identify patterns including outliers, using an intuitive candlestick chart that displays min, max, and averages.
- Cyber Health Dashboard provides a Metasys administrator with a centralized view of potential security-related issues or system issues which are detectable by an ADS/ADX/OAS, 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 ODBCcompliant 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.

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 cloudbased 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 cloudbased applications and features.
To learn more, please visit the ***Building Management*** page located on the Johnson Controls® website.

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 in exceeds the capacity of a single network engine. The ADS supports up to 5 simultaneous users, and up to 10 to 14 SNE/SNC/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, Energy Essentials, or the Metasys for Validated Environments (MVE), Extended Architecture application is required.
- You need to support more than 5 simultaneous users. The ADX supports up to 10, 25, 50, or 100 users, and up to 1,000 SNE/SNC/NxE engines. *Refer to the Metasys System Configuration Guide (LIT-12011832).*
- Any one 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.

ORDERING INFORMATION

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

NEW OR UPGRADE SOFTWARE

CODES	DESCRIPTIONS	NEW SOFTWARE CODES	UPGRADE SOFTWARE CODES	MIGRATION SOFTWARE CODES
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 2014 software with core license	MS-ADX10SQL-0	MS-ADX10SQL-6	MS-ADX10SQL-8
MS-ADXS25U	Extended Application and Data Server	MS-ADXS25U-0	MS-ADXS25U-6	MS-ADXS25U-8
MS-ADX25SQL	Extended Application and Data Server Includes Microsoft SQL Server 2014 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 2014 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 2014 software with core license	MS-ADX50SQL-0	MS-ADX50SQL-6	MS-ADS50SQL-8
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 2014 software with core license	MSADX100SQL2-0	MSADX100SQL2-6	MS-ADX100SQL2-8

Note

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

ORDERING INFORMATION

OPTIONAL FEATURES ADD-ON LICENSES

CODES	DESCRIPTION
M4-APIMOCMD-0	License enabling the Monitoring and Commanding API for new site.
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). [2] **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).

Notes

1 The OAS must meet minimum requirements.

2 The OAS must meet minimum requirements.

ADS CONCURRENT USERS

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

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
	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
	10	50
	25	50
	50	50
	75	25
	100	0

For example, 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 10 Metasys UI users are supported if 40 SMP users are logged in.

The only Metasys UI user restriction applies to a 50-user or 100-user ADX: no more than 50 Metasys UI users are supported, regardless of the number of SMP users.

TECHNICAL SPECIFICATIONS

APPLICATION AND DATA SERVER (ADS) SYSTEM REQUIREMENTS (5 USERS)

Recommended computer platform [1]	Intel i7 processor latest version with at least four cores or better 2 x 500 GB hard disk (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:** 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 time. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	Up to 14
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 1903, 1909, and 2004 (64-bit).** For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support. Supports: • SQL Server® 2019 Express (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** • SQL Server® 2017 Express with CU17 (64-bit) • SQL Server® 2016 Express with SP2 CU10 (64-bit) • SQL Server® 2014 Express with SP3 CU4 (64-bit)
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit) Supports: • SQL Server® 2017 Express with CU17 (64-bit) • SQL Server® 2016 Express with SP2 CU10 (64-bit) • SQL Server® 2014 Express with SP3 CU4 (64-bit)
Supported operating systems for Metasys site management portal client computer	**Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit).** For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)
	Apple® macOS® 10.15 Catalina **Apple® macOS® 10.14 Mojave** **Apple® macOS® 10.13 High Sierra** **Apple® macOS® 10.12 Sierra**
Supported web browser software for Metasys site management portal client computers	Apple® Safari® 11 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.

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TECHNICAL SPECIFICATIONS

APPLICATION AND DATA SERVER (ADS) SYSTEM REQUIREMENTS (5 USERS)

Supported web browser software for Metasys UI client devices	Microsoft® Edge® version 44 or later
	Google® Chrome™ version 78 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® 11 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 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

Notes

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.*

TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (UNIFIED ADX SYSTEMS, 10 OR 25 USERS)

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

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 time. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	**For small sites:** Up to 25 **For small to medium sites:** Up to 50
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 1803 or later) (64-bit)** Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)
	Windows® Server® 2016 with Update (KB4512495) (64-bit) Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)

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TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (UNIFIED ADX SYSTEMS, 10 OR 25 USERS)

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

Supported operating systems for Metasys site management portal client computer	**Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit).** For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)
	Apple® macOS® 10.15 Catalina **Apple® macOS® 10.14 Mojave** **Apple® macOS® 10.13 High Sierra** **Apple® macOS® 10.12 Sierra**
Supported Web Browser Software for Metasys Site Management Portal Client Computers	Apple® Safari® 11 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 44 or later
	Google® Chrome™ version 78 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® 11 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	SQL Server® 2017 Express with CU17 (64-bit) Microsoft .NET Framework 4.7.2 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software **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

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TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (UNIFIED ADX SYSTEMS, 10 OR 25 USERS)

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

Optional software	Energy Essentials [5] Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

Notes

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.*

5 SQL Server 2017 has a separate installation for SSRS.
For more information, refer to the SQL Server Update and Installation Guide (LIT-12012240.)

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: ***SQL Server 2019***, ***SQL Server 2017***, ***SQL Server 2016***, and ***SQL Server 2014***.

TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (UNIFIED ADX SYSTEMS, 50 OR 100 USERS)

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

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 time. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	**For medium to large sites:** Up to 100 **For large sites:** Up to 100 **Note:** To ensure best performance of sites with 100 or more engines use split configuration.
Number of Site Management Portal users supported	**For medium to large sites:** Up to 25 **For large sites:** Up to 50
Number of Metasys UI users supported	**For medium to large sites:** Up to 50 **For large sites:** Up to 50
Supported Operating Systems [4] and Database Software	**Windows® Server® 2019 (version 1803 or later) (64-bit)** Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)
	Windows® Server® 2016 with Update (KB4512495) (64-bit) Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)

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TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (UNIFIED ADX SYSTEMS, 50 OR 100 USERS)

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

Supported operating systems for Metasys site management portal client computer	**Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit).** For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)
	Apple® macOS® 10.15 Catalina **Apple® macOS® 10.14 Mojave** **Apple® macOS® 10.13 High Sierra** **Apple® macOS® 10.12 Sierra**
Supported web browser software for Metasys site management portal client computers	Apple® Safari® 11 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 44 or later
	Google® Chrome™ version 78 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® 11 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	SQL Server® 2017 Express with CU17 (64-bit) Microsoft .NET Framework 4.7.2 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software **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

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TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (UNIFIED ADX SYSTEMS, 50 OR 100 USERS)

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

Optional software	Energy Essentials [5] Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

Notes

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.*

5 SQL Server 2017 has a separate installation for SSRS.
For more information, refer to the SQL Server Update and Installation Guide (LIT-12012240)

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: ***SQL Server 2019***, ***SQL Server 2017***, ***SQL Server 2016***, and ***SQL Server 2014***.

TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (SPLIT ADX SYSTEMS, 10 OR 25 USERS)

Use the following recommendations for medium to large sites.

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 and Energy Essentials 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 time. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	Up to 100 **Note:** To ensure best performance of sites with 100 or more engines use split configuration.
Number of Site Management Portal users supported	Up to 25
Number of Metasys UI users supported	Up to 50

...Continued...

TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (SPLIT ADX SYSTEMS, 10 OR 25 USERS)

Use the following recommendations for medium to large sites.

Supported operating systems [5,6] with supported database software	**Windows® Server® 2019 (version 1803 or later) (64-bit)** Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)
	Windows® Server® 2016 with Update (KB4512495) (64-bit) Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)
Supported operating systems for Metasys site management portal client computer	**Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit)**. For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)
	Apple® macOS® 10.15 Catalina **Apple® macOS® 10.14 Mojave** **Apple® macOS® 10.13 High Sierra** **Apple® macOS® 10.12 Sierra**
Supported web browser software for Metasys site management portal client computers	Apple® Safari® 11 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 44 or later
	Google® Chrome™ version 78 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® 11 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.

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TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (SPLIT ADX SYSTEMS, 10 OR 25 USERS)

Use the following recommendations for medium to large sites.

Supported virtual environments	Microsoft Hyper-V™ VMware®
Supported user interfaces	Site Management Portal (SMP) Metasys UI
Additional software included with the ADX software download	SQL Server® 2017 Express with CU17 (64-bit) Microsoft .NET Framework 4.7.2 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software **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	Energy Essentials [7] Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

Notes

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.*

7 SQL Server 2017 has a separate installation for SSRS.
For more information, refer to the SQL Server Update and Installation Guide (LIT-12012240)

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: ***SQL Server 2019***, ***SQL Server 2017***, ***SQL Server 2016***, and ***SQL Server 2014***.

TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (SPLIT ADX SYSTEM, 50 OR 100 USERS)

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

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 and Energy Essentials 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

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TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (SPLIT ADX SYSTEM, 50 OR 100 USERS)

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

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 time. When you configure the VM, do not select the enable dynamic memory option.
Number of engines supported	**For large to extra large sites:** Up to 300 **For extra large sites:** Up to 1,000 **Note:** To ensure best performance of sites with 100 or more engines use split configuration.
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 1803 or later) (64-bit)** Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)
	Windows® Server® 2016 with Update (KB4512495) (64-bit) Supports: · SQL Server® 2019 (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2017 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 with CU17 (64-bit) · SQL Server® 2016 with SP2 CU10 (64-bit) · SQL Server® 2014 with SP3 CU4 (64-bit)
Supported operating systems for Metasys site management portal client computer	**Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit).** For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)
	Apple® macOS® 10.15 Catalina **Apple® macOS® 10.14 Mojave** **Apple® macOS® 10.13 High Sierra** **Apple® macOS® 10.12 Sierra**

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TECHNICAL SPECIFICATIONS

EXTENDED APPLICATION AND DATA SERVER SYSTEM REQUIREMENTS (SPLIT ADX SYSTEM, 50 OR 100 USERS)

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

Supported web browser software for Metasys site management portal client computers	Apple® Safari® 11 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 44 or later Google® Chrome™ version 78 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® 11 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	SQL Server® 2017 Express with CU17 (64-bit) Microsoft .NET Framework 4.7.2 Launcher Software Metasys Database Manager software Metasys Advanced Reporting System software **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	Energy Essentials [7] Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

Notes

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.*

7 SQL Server 2017 has a separate installation for SSRS. For more information, refer to the SQL Server Update and Installation Guide (LIT-12012240)

For SQL Server software, you must purchase SQL Server software licenses per the guidelines listed here: ***SQL Server 2019***, ***SQL Server 2017***, ***SQL Server 2016***, and ***SQL Server 2014.***

ADS LITE-E

METASYS **SERVER LITE**

The Application and Data Server (ADS) Lite-E is an optional component of the Metasys system that manages the collection and presentation of large amounts of trend data, event messages, operator transactions, and system configuration data. As Site Director, the ADS-Lite-E provides secure communication to a network of SNE, SNC, NAE, NCE, and NIE series engines. The ADS-Lite-E is available for purchase and use in Europe and Latin America. For more information on the NIE29, NIE39, and NIE49, contact Johnson Controls® Systems Integration Services (SIS).

The Site Management Portal UI of the ADS-Lite-E provides a flexible system to change online configuration of the Metasys system, optimize control strategies, and perform administrative tasks. The ADSLite-E includes an Open Database Connectivity (ODBC) compliant database package for secure storage of historical and configuration data.

FEATURES

- Support of IT Standards and Internet Technologies
- Secure User Access
- Flexible System Navigation and Dynamic User Graphics
- Alarm and Event Management
- Long-Term Trend Data Storage

ORDERING INFORMATION

CODES [1]	DESCRIPTION
MS-ADSLE5U-0	ADS-Lite-E New project software: for up to five users, on new sites
MS-ADSLE5U-6	ADS-Lite-E Upgrade project software: for up to five users, on sites with a previous version of the Metasys ADS-Lite-E software
MS-ADS05U-8	ADS-Lite-E to full ADS Migration project software: for up to five users, on sites migrating from a previous major release of ADS-Lite-E, to the current release of full ADS

Note

1 Availability: The ADS-Lite-E is available for purchase and use in Europe and Latin America.
For information on the NIE29, NIE39, and NIE49, contact Johnson Controls® Systems Integration Services (SIS).

ORDERING INFORMATION

OPTIONAL FEATURE ADD-ON LICENSES

CODE	DESCRIPTION
M4-APIMOCMD-0	License enabling the Monitoring and Commanding API for new site.
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). [2] **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).

Notes

1 The OAS must meet minimum requirements.

2 The OAS must meet minimum requirements.

TECHNICAL SPECIFICATIONS

RECOMMENDED OPERATING SYSTEM AND SQL SERVER COMBINATIONS

OPERATING SYSTEM		DATABASE SOFTWARE							
		Desktop Computer Platform				Server Computer Platform			
		SQL Server 2019 Express (64-bit)	SQL Server 2017 Express (64-bit)	SQL Server 2016 Express SP2 (64-bit)	SQL Server 2014 Express SP3 (64-bit)	SQL Server 2019 (64-bit)	SQL Server 2017 (64-bit)	SQL Server 2016 SP2 (64-bit)	SQL Server 2014 SP3 (64-bit)
Desktop	Windows® 10 OS Pro and Windows 10 Enterprise Editions (64-bit) with Anniversary Update (version 1809)	■	■	■	■				
	Windows 8.1 OS Pro and Windows 8.1 Enterprise Editions (64-bit) with Update KB2919355		■	■	■				
Server	Windows Server 2019 OS (64-bit) at version 1903					■	■	■	■
	Windows Server 2016 OS (64-bit) with Update KB4512495					■	■	■	■

TECHNICAL SPECIFICATIONS

Recommended Computer Platform [1]	Intel i7 processor latest version with at least 6 cores or better 2 x 500 GB hard disk (RAID 1) [2] with 40 GB free space after installation of all prerequisite software and before installation of ADS-Lite software. Configure RAID 1 (mirroring) with disk write-caching turned on. **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 adapter (1 GB RAM, ATI® Technologies or NVIDIA® Corporation, 64-bit compatible [for 64-bit operating systems], Small Form Factor [SFF] if required)
Required Minimum Memory [3]	8 GB minimum, 16 GB recommended For VM hosts, allocate a minimum of 8 GB of RAM
Supported Operating Systems and Database Software [4]	**Windows® 10 Pro and Windows 10 Enterprise Editions (version 1903) (64-bit)** Supports: · SQL Server® 2019 Express (64-bit) **Note:** SQL Server 2019 may cause the configuration service cache that builds stored procedures to time out. This causes the user's log in to Metasys UI to fail. To resolve this issue, set SQL Server 2019 to run in 2018 compatibility mode. *For more information, refer to* ***docs.microsoft.com*** · SQL Server® 2017 Express with CU17 (64-bit) · SQL Server® 2016 Express with SP2 CU10 (64-bit) · SQL Server® 2014 Express with SP3 CU4 (64-bit) **Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)** Supports: · SQL Server® 2017 Express with CU17 (64-bit) · SQL Server® 2016 Express with SP2 CU10 (64-bit) · SQL Server® 2014 Express with SP3 CU4 (64-bit)
Supported Virtual Environments	Microsoft Hyper-V™ VMware®
Supported User Interfaces	Site Management Portal (SMP) Metasys UI
Additional Software Included with the ADS-Lite Software Download	Microsoft .NET Framework Version 4.7.2 Launcher Software
Optional Hardware	Any network or local printer supported by the qualified Windows operating system
Optional Software	Graphic Generation Tool CCT Software SCT Software Metasys Device Manager Metasys Export Utility

Notes

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

2 For best performance, use Serial Attached SCSI (SAS) hard drives, not Small Computer System Interface (SCSI) hard drives.

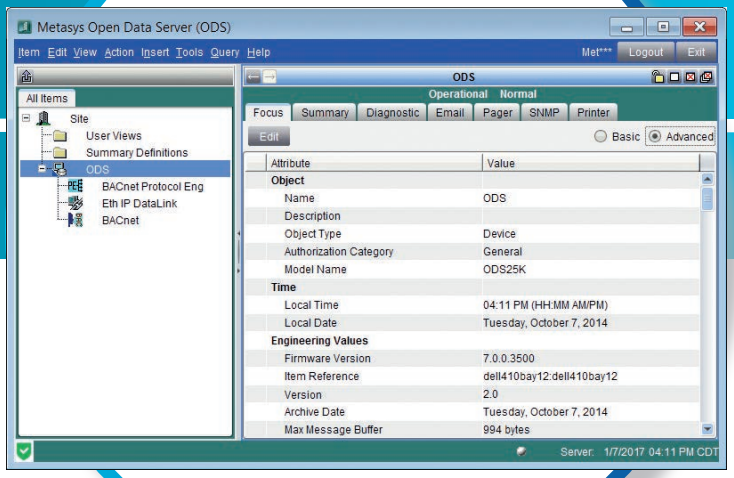
3 It is recommended to use RAM that the computer supports.

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.*

METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISOR SOFTWARE AND TOOLS

METASYS SOFTWARE



ODS

METASYS OPEN DATA SERVER

The Metasys® Open Data Server (ODS) is a BACnet® Testing Laboratories™ (BTL) Listed BACnet Operator Workstation (OWS). It conforms to the B-OWS profile. The ODS supports up to 25,000 local objects and up to five concurrent users. The ODS can be configured in three different ways to best fit the needs of your facility:

- In a **BACnet Workstation** configuration to leverage the BACnet protocol
- In a **Site Manager Workstation** configuration to leverage web services
- In a **Combined** configuration using both BACnet Workstation and Site Manager Workstation

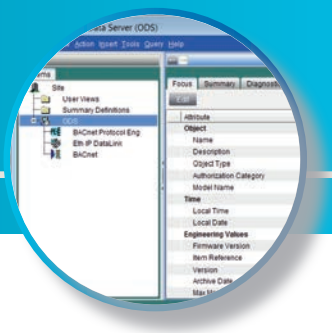
The ODS functions on either a desktop computer platform or a full server platform to manage the collection and presentation of large amounts of trend data, event messages, operator transactions, and system configuration data. When the ODS operates on a server platform, the Metasys Advanced Reporting System and Energy Essentials may be used to report on system configuration performance, energy usage, demand, and cost.

The Site Management Portal (SMP) UI of the ODS provides flexible system navigation, user graphics, comprehensive alarm management, summary reporting capabilities, and trend analysis when the ODS is configured as a Site Manager. With the SMP UI, you can efficiently manage occupant comfort and energy usage, quickly respond to critical events, and optimize control strategies. The ODS includes an Open Database Connectivity (ODBC) compliant database package for secure storage of historical and configuration data.

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

FEATURES

- **Support of IT Standards and Internet Technologies -** Enables you to install the Open 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.
- **Secure, Encrypted Communication -** Protects the system from unauthorized users and computer hackers with the implementation of the Hypertext Transfer Protocol Secure (HTTPS) application protocol and Transport Layer Security (TLS 1.2) to encrypt communications between the ODS, network engines, and clients.
- **Remote Authentication Dial-In User Service (RADIUS) Server -** Authenticates your identity as an authorized user of the system.
- **Flexible System Navigation and Dynamic User Graphics -** Enables 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.



FEATURES

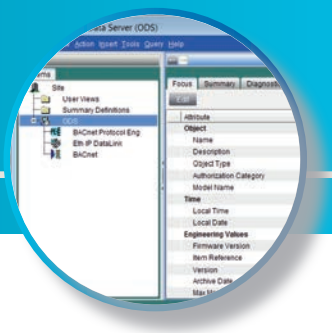
- **Long-Term Trend Data Storage -** Enables the analysis of building system performance to identify opportunities for efficiency improvements and the development of predictive strategies.
- **Optional** Metasys **Advanced Reporting System and Energy Essentials -** Offers a separate login and user interface for running and viewing reports on system configuration, performance, energy usage, demand, and cost.

ORDERING INFORMATION

BASE PRODUCT CODE	PRODUCT DESCRIPTION	NEW SOFTWARE PRODUCT CODE NUMBER	UPGRADE SOFTWARE PRODUCT CODE NUMBER	SITE SUBSCRIPTION SERVICE PRODUCT CODE NUMBER (1yr)=1 YEAR (3yr)=3 YEARS
MS-ODS25K	Open Data Server for up to **5** users and up to 25,000 local objects Operates on a desktop computer platform or a full server platform	MS-ODS25K-0	MS-ODS25K-6	MS-ODS25K-SCS (1yr) MS-ODS25K-SC3 (3yr)
MSODS25KSQL	Open Data Server for up to **5** users and up to 25,000 local objects Operates on a desktop computer platform or a full server platform Includes Microsoft® SQL Server® 2012 software with core license	MS-ODS25KSQL-0	MS-ODS25KSQL-6	---
MS-COPY-ODS25K	DVD reproduction of base ODS25K product for **5** users; does not include SQL Server	---	---	---

ODS COMPATIBILITY WITH METASYS PRODUCTS

PRODUCT OR FEATURE		ODS COMPATIBILITY WITH METASYS FEATURE
ODS	Site Management Portal User In terface	Supported
	Metasys Advanced Reporting System	Supported
	Metasys Database Manager	Supported
	Energy Essentials	Supported
	User Graphics Tool (UGT)	Supported
NxE/SNx Network Engines		Supported
FEC/FAC/IOM/CGM/CVM		Supported
Graphics+ and Graphic Generation Tool Release 1.3		Supported
System Configuration Tool (SCT)		Supported
Controller Configuration Tool (CCT)		Supported
Metasys UI		**Not Supported**



TECHNICAL SPECIFICATIONS

OPEN DATA SERVER SYSTEM REQUIREMENTS FOR UP TO 25,000 OBJECTS AND UP TO 5 USERS

Recommended Platform [1]	**Full Server Platform:** 2.20 GHz E5 Series Intel® Xeon® Quad Core single processor or better 2 x 600 GB hard disk (RAID 1) [2] with 40 GB free space after installation of all prerequisite software and before installation of ODS software. Configure RAID 1 (mirroring) with disk write-caching turned on. **Note:** ODS prerequisite software includes the Windows operating system, SQL Server software, Windows .NET Framework, and any other software or SPs required by your ODS configuration.
	Desktop Computer Platform: 2.8 GHz Intel® Core™ 2 Duo processor Graphics card (1 GB RAM, ATI® Technologies or NVIDIA® Corporation, Small Form Factor [SFF] if required) 2 x 500 GB hard disk (RAID 1)[2] with 40 GB free space after installation of all prerequisite software and before installation of ODS 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 ODS configuration.
Recommended Memory [3]	16 GB RAM (full server) 8 to 16 GB RAM (desktop computer, 64-bit systems)
Supported Operating Systems for Full Server Platforms and Database Software [4]	**Windows® Server® 2016 with Update (KB4489890) (64-bit)** Supports: · SQL Server® 2017 (64-bit) · SQL Server® 2016 with SP2 (64-bit) · SQL Server® 2014 with SP3 (64-bit) · SQL Server® 2012 with SP4 (64-bit)
	Windows® Server® 2016 with Update (KB4489890) (64-bit) [5] Supports: · SQL Server® 2017 (64-bit) · SQL Server® 2016 with SP2 (64-bit) · SQL Server® 2014 with SP3 (64-bit) · SQL Server® 2012 with SP4 (64-bit)
	Windows® Server® 2012 with Update (KB3172614) (64-bit) [5] Supports: · SQL Server® 2017 (64-bit) · SQL Server® 2016 with SP2 (64-bit) · SQL Server® 2014 with SP3 (64-bit) · SQL Server® 2012 with SP4 (64-bit)

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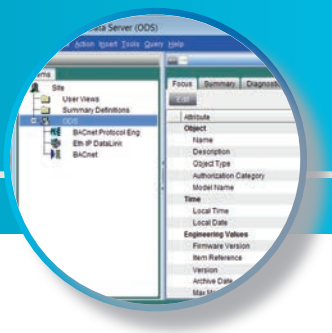

TECHNICAL SPECIFICATIONS

OPEN DATA SERVER SYSTEM REQUIREMENTS FOR UP TO 25,000 OBJECTS AND UP TO 5 USERS

Supported Operating Systems for Desktop Computer Platforms and Database Software [6]	**Windows® 10 Pro and Windows 10 Enterprise Editions (version 1809 or later) (64-bit)** Supports: · SQL Server® 2017 Express (64-bit) · SQL Server® 2016 Express with SP2 (64-bit) · SQL Server® 2014 Express with SP3 (64-bit) · SQL Server® 2012 Express with SP4 (64-bit)
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit) Supports: · SQL Server® 2017 Express (64-bit) · SQL Server® 2016 Express with SP2 (64-bit) · SQL Server® 2014 Express with SP3 (64-bit) · SQL Server® 2012 Express with SP4 (64-bit)
	Windows® 7 Professional, Enterprise, and Ultimate Editions with SP1 (64-bit) Supports: · SQL Server® 2014 Express with SP3 (64-bit) · SQL Server® 2012 Express with SP4 (64-bit)
Antivirus Software	Symantec® Endpoint Protection version 12 McAfee® VirusScan® Enterprise version 8.8 with patch 3 or patch 5
Supported Operating Systems for Metasys Site Management Portal Client Computer	**Windows 10 Pro or Windows 10 Enterprise**
	Windows 8.1 Pro or Windows 8.1 Enterprise
	Windows 7 Professional, Enterprise, or Ultimate Edition with SP1 (32-bit or 64-bit)
	Apple® OS X® 10.10 Yosemite
	Apple® OS X® 10.9 Mavericks
	Apple OS X 10.8 Mountain Lion
	Notes: · In OS X, you cannot view Graphics+ graphics in the Site Management Portal UI. · Apple operating systems are supported for Metasys client computers only.
Supported Web Browser Software for Metasys Site Management Portal Client Computers	**Windows® Internet Explorer® 11.0.9600.18816 Update version 11.0.47 or later** **Note:** In Internet Explorer 11, select the **Use Microsoft compatibility lists** option, found under **Tools > Compatibility View Settings**, to ensure that websites appear and function correctly. **Apple® Safari® 11 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. · Other browsers, such as Google® Chrome® and Mozilla® Firefox®, may also be used but are not fully supported.
Supported Virtual Environments	Microsoft Hyper-V™ VMWare®

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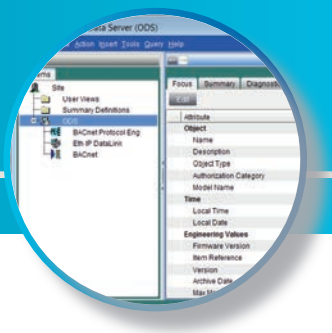

TECHNICAL SPECIFICATIONS

OPEN DATA SERVER SYSTEM REQUIREMENTS FOR UP TO 25,000 OBJECTS AND UP TO 5 USERS

Network Communication	Ethernet network interface card (100 or 1000 Mbps)
Supported User Interfaces	Site Management Portal
Additional Software Included in the ODS download	Launcher software Microsoft .NET Framework Version 4.6.1 Microsoft SQL Server 2014 SP3 Metasys Advanced Reporting System is available on an ODS with SQL Server Reporting Services (SSRS) installed
Optional Hardware	Any network or local printer supported by the qualified Windows operating system
Optional Software	Energy Essentials [7] Graphic Generation Tool SCT software CCT software Metasys Database Manager

Notes

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 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 ODS with 16 GB RAM has much greater performance than an ODS with only 4 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.*

5 For SQL Server 2014 or SQL Server 2012 software, you must purchase a SQL Server software license for each individual processor core (with a minimum of four core licenses). For example, if you have a single processor with dual cores, purchase four core licenses (the minimum) for SQL Server 2014 or SQL Server 2012 software.

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.*

7 SQL Server 2017 and SQL Server 2016 are not compatible with Energy Essentials. If the customer plans to install Energy Essentials, use SQL Server 2012 or SQL Server 2014.

OAS

OPEN APPLICATION SERVER

The Open Application Server (OAS) is a product of the Metasys system that combines Metasys server and engine capabilities in a single software offering, with optional, add-on features. There are two licensing options available for the OAS, the OAS minimum and the OAS standard. *For more information about their features, see "Features" table.* As a Site Director, the OAS Standard supports up to 2 supervisory devices, 200 field devices, and 20,000 objects using BACnet/IP and Remote Field Bus integrations.
The OAS supports integration with the following devices and systems: ZFP Pro wireless system, C Cure 9000 Access Control, Modbus, M-Bus, and KNX, OPC Unified Architecture (UA). *For more information, refer to the Open Application Server (OAS) Installation Guide (LIT-12013222).*

OAS provides database software options for archiving licensed historical data using the Microsoft® SQL Server software database, and enables secure communication to a range of network engines, including the NAE, NCE, SNE and SNC series engines.

OAS is available from Metasys Release 10.1 onwards. You can purchase it as a software-only solution, which you install on a virtual machine, or as a combined hardware and software turnkey solution. OAS supports Metasys UI and the Site Management Portal (SMP).

OAS VERSIONS

FEATURES	OAS MINIMUM	OAS STANDARD
Supports Metasys UI	Yes	Yes
Supports engines	No	Two
Can license add-ons	Yes	Yes
Direct support for field devices	200	200

FEATURES

- **Fault detection and triage databases -**
  - Fault detection: identifies and lists building system related faults in order of severity to help operators quickly fix issues and avoid equipment issues, energy waste, and comfort complaints.
  - Fault triage: 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.
- **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 Open Application Server on your existing IT infrastructure within the building or enterprise and is compatible with industry-standard firewalls.

FEATURES

- **Secure user access -** Authenticates users and authorizes access privileges to protect system integrity, and is fully compatible with the Microsoft Active Directory® service.
- **Flexible system navigation and dynamic user graphics -** Compatability with Metasys UI enables the customization of system presentation for different users to enhance information access and facilitate system operation.
- **Alarm and event management -** Generate alarms based on user-defined criteria; send alarm and event messages to web browsers, email servers, and Network Management Systems; and store and view alarm and event logs on the OAS. The OAS also creates an audit trail for later detailed analysis.
- **Field equipment network management and integration -** The OAS provides multiple methods to integrate field devices:
  - Remote Field Bus: Using a BACnet/IP to MS/TP router, the OAS can integrate BACnet MS/TP devices such as Metasys FEC, FAC, VMA, TEC, CVM, and CGM series equipment controllers as well as third-party BACnet MS/TP devices.
  - BACnet/IP: using a switch or hub, the OAS can integrate BACnet/IP devices, including Metasys FAC4911 and VMA1930 series IP equipment controllerss, Simplex Fire System controls, as well as third-party BACnet/IP devices like Cree or Molex lighting systems.
  - VND: the OAS can integrate the following:
    - Modbus TCP devices using a switch or hub.
    - OPC UA devices using a switch or hub.
    - KNX devices using a KNX IP router.
    - M-Bus devices using an M-Bus IP level converter.
- **Enhanced scheduling -** Automatically command mechanical or electrical equipment to a desired operational state, for example, On/Off, Occupied/Unoccupied, Economy/Comfort, etc. based on a user-defined schedule. Operating parameters can be set according to time of day, days of the week, holidays, or calendar dates.
- **Fire panel and lighting control integration -** Enables access to and control over lighting groups in Cree or Molex lighting systems, and monitored points in Simplex fire alarm systems, enabling more efficent interactions without overwhelming the engine with a massive number of points.
- **Network-wide system interlocking -** Enables the OAS to collect data from field devices, make logical comparisons between the data, and issue relevant commands to other field devices, anywhere on the network.
- **Transaction recording -** Audits and logs all user actions performed through the OAS. Operators can review these logs to understand what changes have been made to the system, who made them, and when.
- **Totalization -** Calculate rolling sums of any monitored data point value stream. Operators can use this information to monitor runtime information useful for service, maintenance, and early identification of building system problems.
- **Optimal start -** Automatically determine the best time to start heating and cooling systems to ensure that the facility is conditioned for occupancy. It adjusts to seasonal variations and reduces energy use.
- **Demand limiting load rolling (DLLR) -** Monitor energy meters (electricity, gas, steam, or water) and automatically shed equipment loads according to user-defined levels. Demand Limiting helps manage utility demand charges, and Load Rolling controls equipment operating levels to reduce total energy consumption. Comfort overrides prioritize equipment shedding.
- **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.

OAS TURNKEY

OAS Turnkey uses Advantech's fanless embedded system, the EPC-U2117. The computer comes pre-configured with all prerequisite and Johnson Controls® software installed, has many recommended performance settings enabled, and has been tested and verified for proper functionality prior to shipment.

The system measures only 170 x 117 x 52.6mm for mounting as a desktop PC, or using a wall or DIN-Rail mount. It uses the latest Intel® Atom® E3900 processor technology and is designed with dual display output and wide range 12-24V DC power inputs. The EPC-U2117 has an onboard embedded MultiMedia Card, but supports multiple storage mediums, so sites with larger storage requirements can utilize mSATA and 2.5" SSD/HDD storage options. The EPC-U2117 also comes with Advantech's WISE-PaaS DeviceOn software, which offers remote management, system monitoring for better device performance, security, and reliability, and predictive maintenance. WISE-PaaS also supports BIOS/FW OTA to upgrade the system and devices with latest firmware to keep everything running at peak performance.

ORDERING INFORMATION

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

CODE	DESCRIPTION
M4-OASMIN-0	License enabling OAS Mini software for new site.
M4-OASMIN-6	License enabling OAS Mini software for upgrading existing site.
M4-OASMIN-SCS	1-year site subscription service for OAS Mini software.
M4-OASMIN-SC3	3-year site subscription service for OAS Mini software.
M4-OASSTD-0	License enabling OAS software.
M4-OASSTD-6	Upgrade for license enabling OAS software.
M4-OASSTD-8	License enabling OAS software for migrating OASMIN to OASSTD.
M4-OASSTD-SCS	1-year subscription for OAS software.
M4-OASSTD-SC3	3-year subscription for OAS software.
M4-COPY-OAS	DVD copy of OAS software.
M4-OASPPA-0	License enabling the Potential Problem Areas widget.
M4-OASSCHRPT-0	License enabling the Scheduled Reports feature.
M4-OASHIST-0	License enabling this Historical Data feature.
M4-APIMOCMD-0	License enabling the Monitoring and Commanding API.
M4-OASTK-0	Unlicensed OAS software and hardware turnkey solution. **Note:** The OAS Turnkey does not meet the minimum requirements to run the fault detection and fault triage features.

OPTIONAL FEATURES ADD-ON LICENSES

CODE	DESCRIPTION
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). [2] **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).

Notes
1 OAS must meet minimum requirements.
2 OAS must meet minimum requirements.

TECHNICAL SPECIFICATIONS

OAS TURNKEY HARDWARE AND SOFTWARE SPECIFICATIONS

The OAS Turnkey does not meet the minimum requirements to run the fault detection and fault triage features.

Processor	Intel® Atom® E3900
Operating system	Windows 10 LTSB version 1607
Database software	SQL Server® 2017 Express with CU17 (64- bit)
Memory	8 GB
Power input	12-24 VDC input
RS-232-C serial ports	1
USB serial ports [1]	4 x USB 3.0 ports
Ethernet ports [1]	2
Wireless card [1]	M.2
Storage	128 GB eMMC

Note

1 Although the USB ports are active on the OAS Turnkey hardware, the OAS does not support using them as an integration method. For example, you cannot connect a trunk of field devices using the USB port. You must use a remote field bus or BACnet/IP field devices.

OAS APPLICATION HARDWARE AND SOFTWARE REQUIREMENTS

Recommended computer platform	Intel Core i7-8700 Processor, Six Cores, 3.20 GHz or better **Note:** Match the specs of the ADS/ADX recommendations that correspond to the site characteristics. For example, the number of users, the number of engines and objects, and site traffic. If you host the OAS on a virtual machine, *match the recommendations listed in the Network and IT Guidance Technical Bulletin (LIT-12011279).* 128 GB hard disk with 40 GB free space after you install all prerequisite software and before installation of OAS software. Configure RAID 1 (mirroring) with disk write caching enabled **Note:** Prerequisite software includes the supported operating system, database software, and .NET Framework.
Memory [1]	**Minimum:** 8 GB **Note:** 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.
Supported desktop operating systems and database software	**Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit). For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.**
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit)
	Supports: • SQL Server® 2019 Express (64-bit) • SQL Server® 2017 Express with CU17 (64-bit) • SQL Server® 2016 Express with SP2 CU10 (64-bit) • SQL Server® 2014 Express with SP3 CU4 (64-bit)

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OAS METASYS SOFTWARE

OAS APPLICATION HARDWARE AND SOFTWARE REQUIREMENTS

Supported server operating systems and database software	**Windows® Server® 2019 (version 1803 or later) (64-bit)**
	Windows® Server® 2016 with Update (KB4512495) (64-bit)
	Supports: • SQL Server® 2019 (64-bit) • SQL Server® 2017 with CU17 (64-bit) • SQL Server® 2016 with SP2 CU10 (64-bit) • SQL Server® 2014 with SP3 CU4 (64-bit)
Supported user interfaces	Metasys User Interface Site Management Portal (SMP)
Supported virtual environments	Microsoft Hyper-V™ VMware®
Additional software included with the OAS software download	Microsoft .NET Framework Version 4.7.2 Launcher Software
Optional software	Metasys Database Manager Language Installation Program

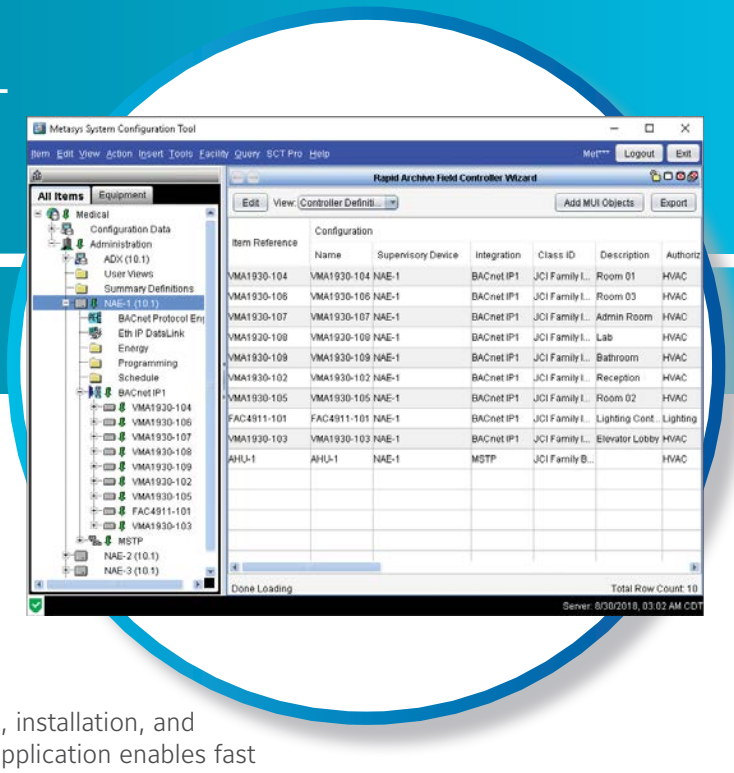
Note

1 For best performance, use the maximum amount of memory that the computer allows.

METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISOR SOFTWARE AND TOOLS

METASYS CONFIGURATION TOOLS



SCT

SYSTEM CONFIGURATION TOOL

The System Configuration Tool (SCT) supports the engineering, installation, and commissioning of your building automation system. The SCT application enables fast offline generation and Metasys UI configuration of the complete site, including point naming and the following integrations:

- N1, N2, BACnet®, and LonWorks® networks
- Modbus, M-Bus, and KNX third-party protocols
- Integration of local and remote MS/TP devices; definition of tailored summaries and user views; the creation of custom control logic using a graphical user interface
- Integration of building systems such as C•CURE 9000 access control, victor video management, Simplex® fire, Zettler® fire, and connected lighting systems from preferred vendors.

The SCT also includes the SCT Pro web application. SCT Pro includes a subset of the features that are available in the SCT. With each release, features from the SCT are incorporated into SCT Pro and optimized to significantly streamline workflows and simplify tasks. For example, SCT Pro features a single, automated process to upgrade network engines. SCT Pro also includes features that are not available in the SCT. *For a summary of the main differences between SCT and SCT Pro, see "Features".*

SCT and SCT Pro use the same databases and share the same job scheduling system, named the Action Queue. Therefore, you can use the SCT and SCT Pro interchangeably and select the most appropriate application for the current task.

You can use SCT or SCT Pro to manage a mixed release site of devices at Release 5.2 and lower that include the SNE, SNC, Network Automation Engine (NAE), Network Control Engine (NCE), Network Integration Engine (NIE), Application and Data Server/Extended Application and Data Server (ADS/ADX), Open Application Servers (OAS), Open Data Server (ODS), and the Metasys UI. To keep the archive database current, you can schedule regular uploads from the devices on the site.

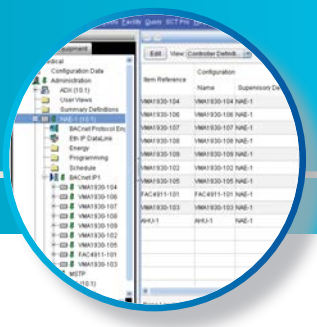
SCT has a simple, one-click installation. The SCT installer installs the required software prerequisites, such as Internet Information Services (IIS) and Microsoft® .NET Framework 4.6.1. If no SQL Server® is present, the SCT installer installs SQL Server 2016 Express software.

The SCT installation includes additional applications. You use the Launcher application to access both the SCT and the SMP. You can use the Metasys UI Offline software to configure Metasys UI graphics and the display of data without a live connection to devices. You can use the Software Manager to manage licenses for Johnson Controls® software and features. For example, you can apply or remove licenses for the SCT software and field controller packages.

IT SECURITY COMMITMENT

Metasys uses secure HTTP with Transport Layer Security (TLS) 1.2 between the SCT computer, all Metasys servers, and network engines that are upgraded to Metasys Release 8.1 and later. The encrypted HTTPS communications apply to the Metasys servers, Metasys UI, network engines, and SCT. This ensures that unauthorized users and computer hackers cannot view the contents of communications sent between Metasys equipment. By default, self-signed certificates are installed on supported products, with the option of configuring trusted certificates configured by an internal IT department or a Certificate Authority. To indicate the active security level (trusted, self-signed, or untrusted), three small security shield icons appear on the SCT login and SCT UI screens.

To provide even higher security, the Metasys system employs signed resource files and the pairing of supervisory devices with the site director to ensure encrypted communication.



FEATURES

	SCT	SCT Pro
SECURITY		
Forced change of default password - Provides improved security by forcing default passwords to be changed as part of the workflow when interacting with network engines.	■	■
Signed resource files - Provides improved security to identify resource files that are created by Johnson Controls, and to check that they have not been modified.	■	■
Site Director pairing - Provides improved security in the communication between network engines and site directors through use of a unique password for each pairing.	■	---
Certificate management - Provides privacy with built-in certificate management options to regulate trusted certificates for network engines.	■	---
Advanced Security upgrade management workflow - Provides real time information on how to manage and communicate the Advanced Security setup during the offline upgrade process, rather than interrupting the site's behavior after the upgrade has been performed.	---	■
RAPID ARCHIVE CREATION PROCESS		
Rapid Archive creation - Provides a quick and simple way to configure archives from a Rapid Archive Schedule spreadsheet. You can create controller templates and equipment definitions in one step, add third-party devices, and also create Metasys UI spaces and equipment information for existing sites.	■	---
Controller and equipment template master files - Provides a comprehensive list of common points to easily generate and tailor specific equipment definitions for the equipment creation process.	■	---
Auto-discovery of serving relationships through Equipment Discovery - Provides existing sites with faster Metasys UI and navigation tree configuration.	■	---
Mass relabeling - Provides a more efficient process to update labels and descriptions for devices, equipment, equipment definitions, spaces, and controller templates.	■	---
FIRMWARE MANAGEMENT		
Supervisory device migration - Provides support to easily migrate configuration settings between network engines when you replace the hardware.	■	---
Single step upgrade - Provides support to easily upgrade network engines and Metasys servers to a later Metasys release.	---	■
Reflash engine firmware - Search for devices on the same subnet and reflash with selected firmware, either as part of a new installation or to factory reset devices.	---	■

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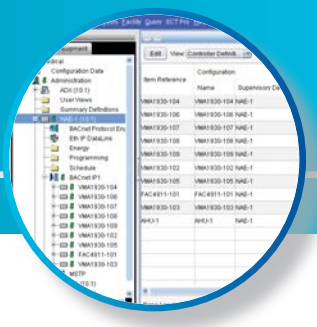

FEATURES

	SCT	SCT Pro
ARCHIVE DATABASE MANAGEMENT		
Create backups of archives - Provides the ability to create backups and recover a complete site. You can also download backups for off-site storage and transfer between SCT installations. SCT Pro provides additional functionality that includes the ability to easily schedule recurring backups and access the full list of past backups.	■	■
Security Database and Metasys UI spaces and equipment in manage archive options - Provides improved upload and download of supervisory devices and the option to download spaces and equipment.	■	■
View and modify object attributes - Provides the ability to modify the attributes of objects stored in the archive database; for example, Metasys servers, network engines, field controllers, and field points.	■	■
Enable/Disable and deferred switchover - Provides more control over the start-up of an application in a field controller that has 8.0 or later firmware.	■	■
Background file transfer - Provides the ability to stage a new image and database archive for a network engine while the engine is fully operational. This new feature minimizes device downtime, provides a more reliable transfer method, and ensures greater security. The SCT 14.0 uses Background File Transfer with Metasys Release 11.0 network engines.	■	■
Integrated SCT and CCT workflow for SNC - Establishes a single, integrated workflow to manage the application file that is applied to the hardware points on the SNC.	■	---
Discover devices on same subnet - Allows users to search for devices and view device attributes. SCT Pro provides additional functionality to listen for devices to come online and to launch SMP from discovered devices.	■	■
DEVICE SUPPORT FEATURES		
Simplified building system integrations - Provides an automated integration process for systems through an updated Mass Change Tool utility and the Rapid Archive feature.	■	---
Expanded network engine support - Provides the integration and support for the Metasys Release 10.1 network engines, which includes the SNE and the SNC.	■	■
OTHER FEATURES		
User definable attribute IDs and child item field syntax for summary definitions - Provides advanced system searching capabilities.	■	---
Tailored summary definition templates - Provides the ability to quickly view, mass copy, edit, or delete any extensions on points or devices.	■	---

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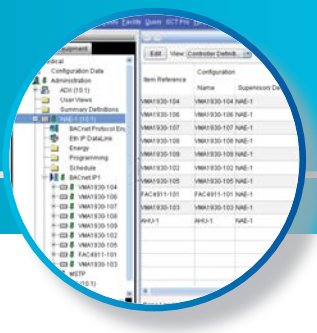


FEATURES

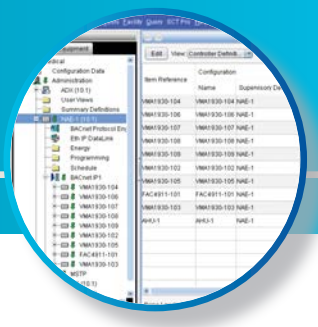
	SCT	SCT Pro
Integrated trunk utilities with parameter sheets – Provides the ability to transfer Controller Application Files (CAFs) between controllers and the SCT system through NxE Passthru, Direct Ethernet, or MAP 4.2 and later Router connections. In addition to the file transfer options, the feature also supports viewing and editing device parameters per field controller trunk.	■	---
Drag and drop functionality – Provides the ability to transfer information and create relationships without the need to copy and paste or manually enter information. For example, you can use drag and drop in SCT for the mass creation of spaces and equipment relationships.	■	■
Integrated Multi-language support – Presents the SCT with translated content without the need for extra steps after you install the tool.	---	■

ORDERING INFORMATION

CODES	DESCRIPTION
TL-SCT-0	System Configuration Tool software for local installations. New project software for sites where a previous version of SCT installed.
TL-SCT-6	System Configuration Tool software for local installations. Upgrade software for previous SCT versions being upgraded to the latest release.

Note

The SCT software and Trunk Utility features require license activation at SCT Release 13.0 and later. Use the Software Manager to license Metasys software and features. The Software Manager is installed with the SCT software.
For more information on software licensing, refer to the Software Manager Help (LIT-12012389).



TECHNICAL SPECIFICATIONS

For instances where the SCT is installed on the same computer as the ADS/ADX software, *refer to the specifications in the Application and Data Server (ADS/ADX) Product Bulletin (LIT-1201525).*

For applications where the SCT is installed on an ODS, *refer to the specifications in the Open Data Server (ODS) Product Bulletin (LIT-12011943).*

Notes:

- *Refer to the Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-1201279) for specific Microsoft Windows OS settings that may be required for your Metasys system configuration.*
- *For information on licensing Microsoft SQL Server, refer to the Microsoft SQL Server Licensing Guide for the edition of Microsoft SQL Server that you installed.*

Codes	
TL-SCT-0	New project software
TL-SCT-6	Upgrade software
Full server platform	Intel® Core™ i7 processor, latest version with at least four cores, or better 20 GB minimum free hard disk space available. Use a Solid State Drive (SSD) to significantly improve performance compared to other types of hard disks. 16 GB RAM (4 GB RAM minimum)
Desktop computer platform	Intel Core 2 Duo E6700 or better (Intel Core 2 Duo E4300 minimum) 20 GB minimum free hard disk space available. Use a Solid State Drive (SSD) to significantly improve performance compared to other types of hard disks. 16 GB RAM (4 GB RAM minimum) Windows Server 2019
Supported full server platform operating systems and database software **Note:** If you install the SCT on a standalone server and not on a Metasys server, you can also use the Express versions of Microsoft SQL Server.	**Windows Server 2019 (version 1803 or later) (64-bit)** Supports Microsoft SQL Server 2019 (64-bit), SQL Server 2017 with CU17 (64-bit), Microsoft SQL Server 2016 with SP2 CU10 (64-bit), or Microsoft SQL Server 2014 with SP3 CU4.
	Windows Server 2016 with update KB4489890 (64-bit) Supports Microsoft SQL Server 2019 (64-bit), SQL Server 2017 with CU17 (64-bit), Microsoft SQL Server 2016 with SP2 CU10 (64-bit), or Microsoft SQL Server 2014 with SP3 CU4 (64-bit)
Supported desktop computer platform operating systems and database software	**Windows® 10 Professional or Enterprise with version 1903 update (64-bit)** Supports Microsoft SQL 2019 Express (64-bit),SQL Server 2017 Express with CU17 (64-bit), Microsoft SQL Server 2016 Express with SP2 CU10 (64-bit) or, Microsoft SQL Server 2014 Express with SP3 CU4 (64-bit). **Note:** The Windows 10 version 1903 update is required for any Windows 10 computer that runs Metasys 11.0 software, including the ADS, ADX, ODS, and any Metasys software application. Verify this update **before** installing Metasys 11.0 software. If you are upgrading to Metasys Release 11.0 and do not have this update, **uninstall** the previous release of all Metasys software, apply the Windows 10 version 1903 update, then proceed with the Metasys 11.0 upgrade.
	Windows 8.1 Pro and Windows 8.1 Enterprise Editions with update KB2919355 (64-bit) Supports Microsoft SQL Server 2017 Express with CU17 (64-bit), Microsoft SQL Server 2016 Express with SP2 CU10 (64-bit), or Microsoft SQL Server 2014 Express with SP3 CU4 (64-bit).

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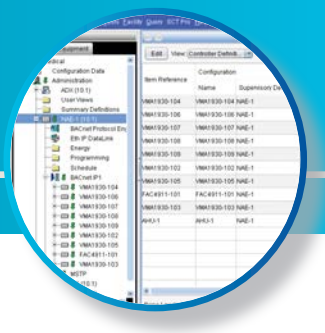


TECHNICAL SPECIFICATIONS

Supported web browser software for Metasys client computers	Microsoft® Edge® version 44 or later, Apple® Safari® 11 or later, and Google® Chrome™ version 78 or later. Other browsers, such as Mozilla® Firefox®, may also be used but are not fully supported. **Note:** Use a web browser to download the Launcher application. After you install the Launcher application, you can use the Launcher to log in to the SCT UI. You can also use the web browsers to access the Site Management Portal (SMP) UI, Metasys UI, Metasys UI Offline, and SCT Pro sites. You can also add a bookmark to the Metasys UI, Metasys UI Offline, and SCT Pro sites.
Network communication for Metasys System Configuration Tool client computers	Ethernet network interface card 10/100/1000 Mbps (100 Mbps network or better)
Optional software packaging	**Note:** A license for the SCT 14.0 **is not** included with Metasys server software. Obtain a license for each installation of the SCT and obtain a license for Field Controller packages to upload and download .caf files.

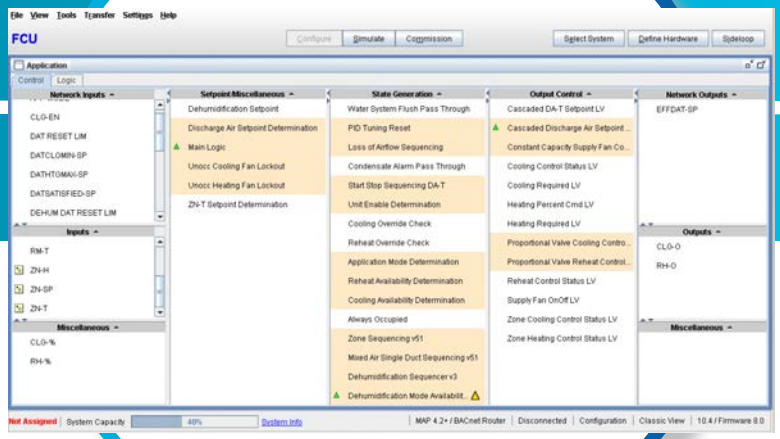
METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISOR SOFTWARE AND TOOLS

METASYS CONFIGURATION TOOLS

CCT

CONTROLLER CONFIGURATION TOOL



You can use the Controller Configuration Tool (CCT) to configure, simulate, commission, and transfer application files to the following:

- Advanced Application Field Equipment Controllers (FACs)
- Advanced Application Programmable Controllers (PCAs)
- Expansion Input/Output Modules (PCXs)
- Field Equipment Controllers (FECs)
- General Purpose Application Controllers (CGMs)
- General Purpose Programmable Controllers (PCGs)
- Input/Output Modules (IOMs)
- Programmable Variable Air Volume Box Controllers (PCVs)
- SNC Series Controllers
- Variable Air Volume Controllers (VAVs)
- Variable Air Volume Modular Assembly Controllers (VMAs)
- Variable Air Volume Terminal Equipment Controllers (CVMs)
- Expansion Modules (XPMs)

CCT operates in the following three modes that provide key functionality for your system:

- Use the **Configuration** mode to select mechanical and control logic options for typical air handling, terminal unit, central plant, and VAV box mechanical systems. You can customize the standard logic provided by the system selection process to meet your specialized control logic requirements.
- Use the **Simulation** mode to review the application logic as if you were commissioning the system. You can make adjustments to setpoints, inputs, or sensors during a simulation session to validate the logic before assigning the configuration to a specific controller. A simulation debugging console is also available to setup break points that pause the simulation session based on criteria that you set up. While viewing a simulation session, transitions taking place in the logic are highlighted for a few seconds to help you quickly identify where the changes occur.
- Use the **Commissioning** mode to connect to a device and view actual data from that device. You can use this mode to monitor your device and set offsets, COVs, and polarity in addition to other parameter and detail changes.

For VAV applications, CCT includes an optional box flow test to automatically exercise all the VAV boxes to ensure correct mechanical installation and correct configuration of the key flow setup parameters.

The ZFR Checkout Tool (ZCT) is available to validate the wireless connectivity and health of your wireless mesh network. *Refer to the ZFR Checkout Tool Help (LIT-12012292) for details.*

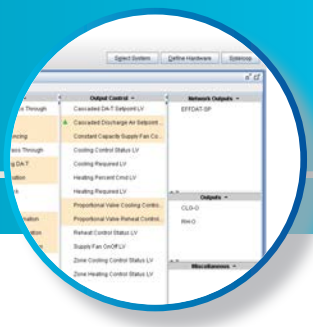
Controller Application Files (CAFs) can be transferred and commissioned to a device through a wide variety of connection interfaces including: NxE Passthru, MAP 4.2+ / BACnet® router, ZigBee® and Direct Ethernet.

CCT AND FIELD CONTROLLER PACKAGE LICENSING

CCT software and field controller package files require license activation. You can license CCT and field controller packages using the Software Manager, which is installed through the CCT installation wizard.
For more information about software licensing, refer to the Software Manager Help (LIT-12012389).

Field controller package files are bundled separately starting at release 13.0. You can use the licensing infrastructure to download package files, and the Package Importer wizard to install them.

For information about licensing and how to install field controller package files, refer to CCT Installation Instructions (LIT-12011529).



CCT AND FX-PCT

CCT and the Facility Explorer® Programmable Controller Tool (FX-PCT) are no longer separate software tools. Users of CCT and FX-PCT at Release 10.2 must first uninstall the previous version before installing 13.0 or later. Users of CCT and FX-PCT software at Release 10.3 can upgrade directly to Release 13.0 or later.
For more information about upgrading or installing CCT, refer to CCT Installation Instructions (LIT-12011529).

FEATURES

THE FOLLOWING FEATURES ARE AVAILABLE AT RELEASE 14.0

- **Support for new Tier 4 Sensor/Actuator (SA) bus devices –** You can add new Tier 4 SA Bus devices to CCT as package files. Use the Import option in the **Define Hardware > Packages tab**. When the Tier 4 SA Bus device is imported as a package file, you can add it as an SA Device in the **Define Hardware > Controller Selection** tab.
- **Update notifications –** You can choose when you update your software with the new CCT update feature.
- **Support for BACnet Protocol Revision 18 –** A new MS/TP Controller Network Port object displays for supported devices in the Device Information folder in the Advanced tab.

THE FOLLOWING FEATURE IS AVAILABLE AT RELEASE 13.1

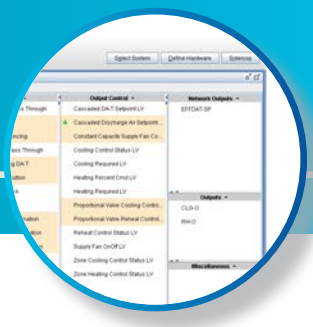
- **SNC Support –** Provides you with the ability to commission and configure the applications of SNC devices.

THE FOLLOWING FEATURES ARE AVAILABLE FROM RELEASE 13.0

- **FSM Explorer –** Provides a new way of viewing the Finite State Machine (FSM) in Configuration, Simulation and Commissioning mode.
- **New CAF Workflow –** Helps you pick the correct Release Mode for your application.
- **Transfer to Device (Download) Enhancements –** You can control when to activate transferred files on a controller and enable and disable the logic of applications in a device.
- **Online Library –** With this feature you can download, publish and share CAF files, Controller Templates, Equipment Definitions and CCT Modules. This feature is only available to Technican licensed users.
- **Support for SA Bus Provisioning –** Provides the ability to update the firmware of all devices attached on the SA Bus. You can check the status of SA Bus devices in the Transfer Wizard.
- **BBMD Functionality –** Provides you with the ability to configure IP controllers with BACnet Broadcast Management Device (BBMD) enabled
- **N2 Application Transfer –** Facilitates the transfer of N2 applications to N2 capable devices without requiring explicit communication switching.

ORDERING INFORMATION

CODES	DESCRIPTION
TL-CCT-0	New project software for sites that do not have a previous version of CCT installed.
TL-CCT-6	Upgrade software for previous CCT versions being upgraded to the latest release.
MS-FCP-0	Metasys Field Controller Packages
FX-FCP-0	FX Field Controller Packages



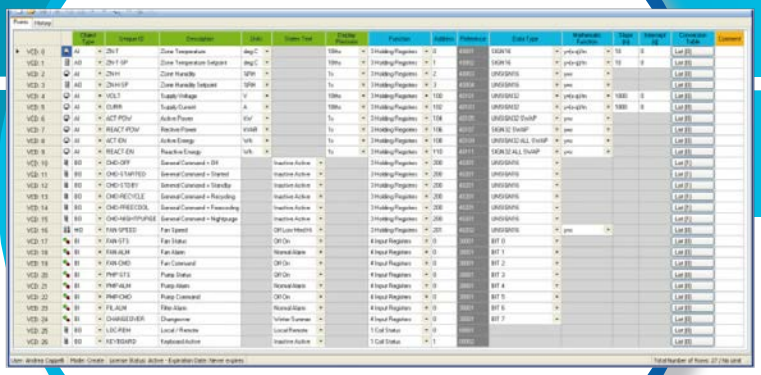
TECHNICAL SPECIFICATIONS

Recommended computer	Intel® Core® 2 Duo E6700 or better. Minimum Intel Core 2 Duo E4300. 20 GB free hard disk available. Minimum 600 MB.
Recommended memory	Computer Platforms: 16 GB RAM. Minimum 4 GB RAM.
Supported Operating System (OS) and database software	**Windows® 10 Pro and Windows 10 Enterprise Editions versions 1903, 1909, and 2004 (64-bit). For all future Windows 10 updates after version 2004, we will evaluate and certify that Metasys software can support the updates before we provide guidance on support.** Supports Microsoft SQL Server® 2019 Express (64-bit), SQL Server® 2017 Express with CU17 (64-bit), SQL Server® 2016 Express with SP2 CU10 (64-bit), or SQL Server® 2014 Express with SP3 CU4 (64-bit). **Note:** The OS and software must both be 64-bit.
	Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit) Supports Microsoft SQL Server® 2017 Express with CU17 (64-bit), SQL Server® 2016 Express with SP2 CU10 (64-bit), or SQL Server® 2014 Express with SP3 CU4 (64-bit). **Note:** The OS and software must both be 64-bit.
Supported full server platform operating systems and database software	**Windows® Server® 2019 (version 1803 or later) (64-bit)** Supports Microsoft SQL Server® 2019 (64-bit), SQL Server® 2017 with CU17 (64-bit), SQL Server® 2016 with SP2 CU10 (64-bit), or SQL Server® 2014 with SP3 CU4 (64-bit).
	Windows® Server® 2016 with Update (KB4512495) (64-bit) Supports Microsoft SQL Server® 2019 (64-bit), SQL Server® 2017 with CU17 (64-bit), SQL Server® 2016 with SP2 CU10 (64-bit), or SQL Server® 2014 with SP3 CU4 (64-bit).
Required web browser software for Metasys client computers	Microsoft® Edge® version 44 or later, Apple® Safari® 11 or later, and Google® Chrome™ version 78 or later. Other browsers, such as Mozilla® Firefox®, can also be used but are not fully supported. **Note:** *Web browser software is required if you want to view the Controller Tool Help (LIT-12011147) online. However, you can also access this help system as a PDF from the software.*
Network Communication for CCT Client Computer	Ethernet network interface card 10/100/1000 Mbps (100 Mbps network or better recommended)
Software optionally installed during CCT install	Microsoft .NET Framework version 4.7.2 Microsoft SQL Server 2016 Express software with SP2
Optional connection devices (Order separately)	Bluetooth Commissioning Converter (MS-BTCVT-1) **Important:** The BTCVT Bluetooth Commissioning Converter is no longer available (no longer in production), and is no longer a supported connection method at Metasys Release 11.0. Laptop with Bluetooth® wireless communications or a computer with a USB Bluetooth converter The USB Dongle with ZigBee® Driver (ZFR-USBHA-0) includes a wireless connection through the CCT for wireless commissioning of the wireless enabled FEC and VMA16 field controllers. It is also used in the ZCT. The Mobile Access Portal (MAP) Gateway (TL-MAP1810-0Px) at Release 4.2 and above includes BACnet routing functionality to allow the MAP Gateway to easily connect to the field controller and system tools through a WIFI connection to perform file transfers and commissioning function. *For further information, refer to the Mobile Access Portal Gateway Product Bulletin (LIT-12011884).* The Portable BACnet/Internet Protocol to MS/TP Router (TL-BRTRP-0) routes information between BACnet/IP and MS/TP networks. *For further information, refer to the Portable BACnet®.* IP to MS/TP Router (Part No. 24-10414-2) Adobe® Reader® software **Note:** A PDF reader software is required for the Print function in CCT.
Optional hardware	Any network or local printer supported by the qualified Windows operating system

METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISOR SOFTWARE AND TOOLS

METASYS PRODUCTIVITY & INTEGRATION TOOLS



VMD

GENERATOR EXPRESS

VMD Generator Express (VGE) is software designed to support the creation of the Vendor Model Definition (VMD) files, used by the Modbus® RTU and TCP integration on NxE/SNx (Metasys 10.0+) & NIEx9 for third party integrations platform.

VMD Generator Express supplies a user friendly user's interface to create, modify and view VMD files.

VMD Generator Express incorporates a version tracking system, storing user, date/time and comment, every time a VMD is saved (created or modified).

VMD Generator Express allows creating generic models for standard integrations, like meters, chillers, AHU, to optimize the engineering time and follow standardization approach.

FEATURES

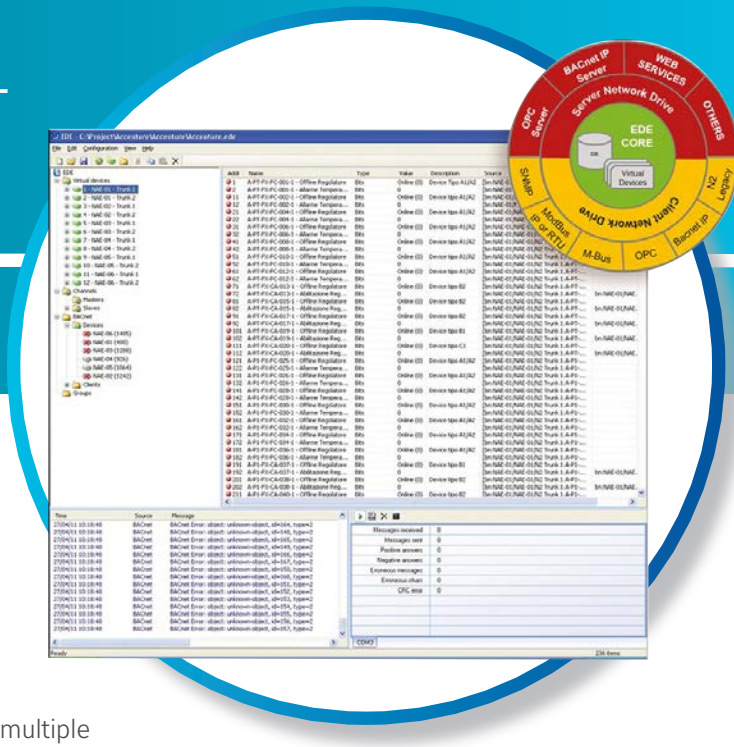
- User friendly UI
- Version Tracking
- User Target Behaviour
- Excel string Import
- Model / Standardization
- Points List Export

Note

The usage of the VMD Generator Express Tool requires a certification, which is achieved by attending a training course.
For more information please contact your local technical support team.

EDE SOFTWARE

EXTENDED DATA ENGINE



EDE is a powerful multiprotocol software application. It allows multiple connectivity with the most commonly used protocols with serial connections and over IP.

The EDE BACnet option now allows the EDE to be used with Metasys to meet many complex integration requirements.

FEATURES

- EDE manages the following protocols either as a Client or Server:
- OPC (Client and Server)
- Modbus®S RTU (Master and Slave)
- Modbus IP (Client and Server)
- MBUS (Client)
- MBUS IP (Client)
- BACnet IP (Client and Server)
- N2 (System 91, N2 Open and N2B)

In addition to the above EDE provides the following other features:

- Data Bridge between all the connectivity's above
- Applying Math Calculations to the values

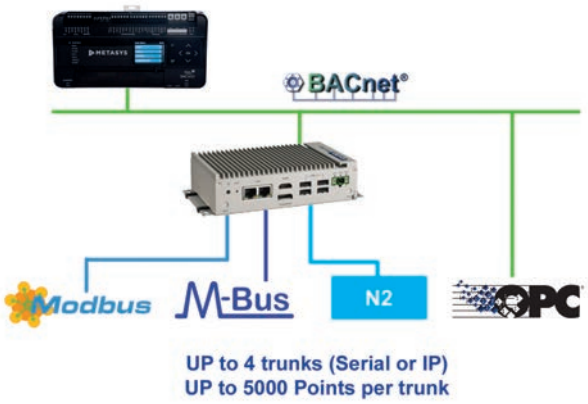
IMPORTANT

EDE must be installed on a suitable hardware platform, please consult the EDE Installation and Commissioning Application Note for details. On request EDE can be supplied pre-installed on an industrial PC, please contact SIS Europe for details and pricing. Microsoft Windows 10.0 is the latest OS version validated for EDE. To use EDE with later versions of Windows, please contact SIS Europe for advice.

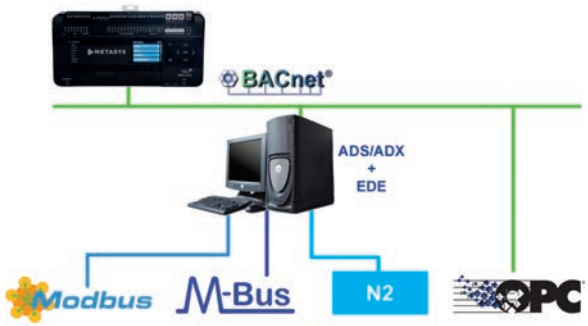
SUPPORTED ARCHITECTURE

The EDE software with BACnet supports several different architectures and can be installed on various hardware platforms.

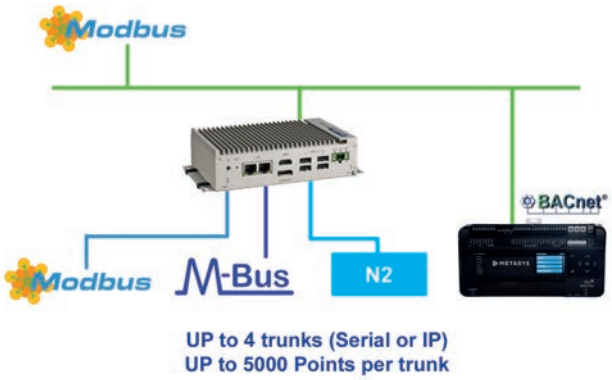
BACnet option – Standalone solution



Installed with ADS/ADX server



BACnet option with additional IP protocol

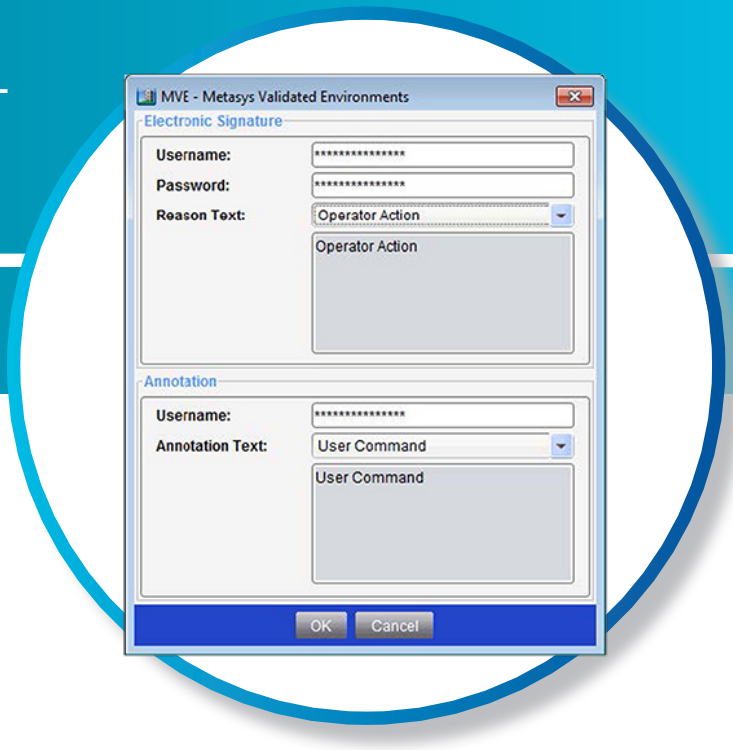


ORDERING INFORMATION

When ordering and applying the EDE it is necessary to order the Extended Data Engine software plus the protocol drivers required.
For example to use EDE to manage a Modbus® integration into Metasys you would need to order the product codes as follows: MW-EDE-0E and SIS-EDE-BAC-0E and MW-EDE-04-xx-0E.

EDE BASE SOFTWARE		EDE BACNET (REQD FOR METASYS)		INTEGRATION PROTOCOL DRIVERS (UP TO 4 TRUNKS, 5000 OBJECTS PER TRUNK)	
CODE		CODE		CODES	DESCRIPTION
MW-EDE-0E	+	SIS-EDE-BAC-0E	+	MW-EDE-02-05-0E	EDE N2 Protocol 500 N2 Objects
				MW-EDE-02-15-0E	EDE N2 Protocol 1500 N2 Objects
				MW-EDE-02-50-0E	EDE N2 Protocol 5000 N2 Objects
				MW-EDE-04-05-0E	EDE Modbus® Serial 500 Objects
				MW-EDE-04-15-0E	EDE Modbus Serial 1500 Objects
				MW-EDE-04-50-0E	EDE Modbus Serial 5000 Objects
				MW-EDE-05-05-0E	EDE Modbus IP 500 Objects
				MW-EDE-05-15-0E	EDE Modbus IP 1500 Objects
				MW-EDE-05-50-0E	EDE Modbus IP 5000 Objects
				MW-EDE-06-05-0E	EDE M-BUS IP 500 Objects
				MW-EDE-06-15-0E	EDE M-BUS IP 1500 Objects
				MW-EDE-06-50-0E	EDE M-BUS IP 5000 Objects

CODES	DESCRIPTION
SIS-EDE-BAC-0E	EDE Software only, BACnet IP Client/Server, 20,000 Objects
MW-EDE-0E	Standalone EDE Extended Data Engine Software with OPC server
MW-EDE-02-05-0E	EDE N2 protocol connectivity for System 9100 or N2Open devices for max. 500 N2 objects
MW-EDE-02-15-0E	EDE N2 protocol connectivity for System 9100 or N2Open devices for max. 1500 N2 objects
MW-EDE-02-50-0E	EDE N2 protocol connectivity for System 9100 or N2Open devices for max. 5000 N2 objects
MW-EDE-04-05-0E	EDE Modbus Serial Protocol RTU or ASCII connectivity for max. 500 points
MW-EDE-04-15-0E	EDE Modbus Serial Protocol RTU or ASCII connectivity for max. 1500 points
MW-EDE-04-50-0E	EDE Modbus Serial Protocol RTU or ASCII connectivity for max. 5000 points
MW-EDE-05-05-0E	EDE Modbus IP Protocol connectivity for max. 500 points
MW-EDE-05-15-0E	EDE Modbus IP Protocol connectivity for max. 1500 points
MW-EDE-05-50-0E	EDE Modbus IP Protocol connectivity for max. 5000 points
MW-EDE-06-05-0E	EDE M-BUS Serial Protocol connectivity for max. 500 points
MW-EDE-06-15-0E	EDE M-BUS Serial Protocol connectivity for max. 1500 points
MW-EDE-06-50-0E	EDE M-BUS Serial Protocol connectivity for max. 5000 points



MVE

METASYS FOR VALIDATED ENVIRONMENTS EXTENDED ARCHITECTURE

Metasys for Validated Environments (MVE), extended architecture is an offering from Johnson Controls for facilities that require regulatory compliance for their environmental systems. MVE brings the flexibility and convenience of a web interface to your regulated facility. The MVE application is ordered separately from the Metasys Extended Application and Data Server (ADX).

MVE is essential to facilities in which regulatory management is key to successful production. The system controls environmental conditions and audits user management for critical environments, such as clean rooms, research facilities, food production centers, and other production environments where tight control is key to product success. Whether your focus is meeting regulatory demands or reducing business risk, MVE is designed to deliver.

Some of the many important MVE capabilities include flexible system navigation, powerful user graphics, comprehensive alarm management, trend analysis, and advanced reporting.

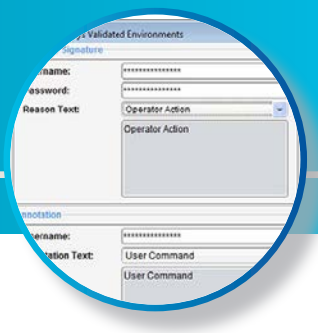
In addition, complex passwords and message encryption secure the system from unauthorized access and data tampering. The system uses Internet protocols and IT standards and is compatible with enterprise-level communication networks.

MVE is specifically designed to help customers address United States Federal Drug Administration (FDA) Title 21, Code of Federal Regulation (CFR) Part 11 compliance. MVE is also compliant with similar agencies around the world that deal with electronic records and electronic signature requirements, such as Annex 11 of the European Union Good Manufacturing Practice (EU GMP) regulations (European Medicines Agency [EMEA] 1998).

MVE software is installed on Metasys ADX, which provides the ability to configure supervisory engines as validated devices. MVE software is purchased and licensed separately from the ADX.

FEATURES

- **Advanced Reporting -** Metasys Advanced Reporting System provides preconfigured reports that assist with high-level data analysis.
- **Secured Data Protection -** At Release 11.0 you cannot use the MVE system to log on to an MVE validated engine to remove or clear events.
- **Secure User Access -** Authenticates users and authorizes access privileges to protect system integrity. Requires a unique username and complex password for each user.
- **Microsoft Active Directory (AD) LDAP Integration -** Authenticates your identity against AD for Metasys access as a user of the system.
- **MVE Electronic Signatures and MVE Required Annotations -** All system changes can be configured to require MVE electronic signatures, or MVE required annotations, or both.
- **Dynamic Data Access (DDA) -** Access to the email DDA, Syslog DDA, Printer DDA, and Simple Network Management Protocol (SNMP) DDA.



FEATURES

- **Time-Stamped Audit and Event Trails -** Generate traceable alarm and event transactions in chronological order. This is with the MVE electronic signature symbol and information and/or with the MVE Required Annotations.
- **Simplified User Interface -** Provides a shared set of users and user views between the real-time Metasys Site Management Portal user interface and the historical Metasys Advanced Reporting System.

ORDERING INFORMATION

Use the following table to order MVE products. *For additional ordering information, refer to the Metasys System Software Purchase Options Product Bulletin (LIT-12011703).*

CODE	DESCRIPTION
MS-MVE-0	MVE new project software
MS-MVE-6	MVE upgraded software
MS-MVE-SCS	MVE Site Subscription Service - 1 Year
MS-MVE-SC3	MVE Site Subscription Service - 3 Years
MS-COPY-MVE	DVD reproduction of MVE product, unlicensed

The user capacity of the MVE software is determined by the user capacity of the purchased ADX software.
For example, if you purchase a 25-user ADX, ordering MS-MVE-0 supports a 25-user MVE site.

Note: MVE cannot be used with APIs because there is no authentication, no authorization, no MVE Electronic Signatures, no MVE Required Annotations, no Audits, and no Event acknowledgements for APIs auditing in Metasys.

Note: MVE cannot be used with Metasys UI or Mobile Access Portal (MAP).

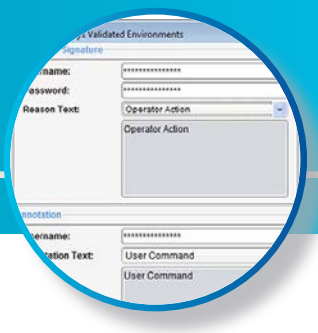
Important: You can only install MVE software on a Metasys ADX. The MVE software, the ADX and the validated network engines on the Metasys network must all be at Release 11.0. The following table lists the existing upgradeable MVE Release 10.1 validated engines as well as the Release 11.0 MVE supported validated engines.

MVE VALIDATED ENGINES

RELEASE 10.1	RELEASE 11.0
MS-NAE5510-2	MS-NAE5510-2
MS-NAE5510-3	MS-NAE5510-3
M4-SNE22000-0	M4-SNE22001-0
M4-SNC25150-0	M4-SNC25151-0
M4-SNC25150-04	M4-SNC25151-04
M4-SNC16120-0	M4-SNC16121-0
M4-SNC16120-04	M4-SNC16121-04

The built-in features of these products facilitate Part 11 compatibility.

Validated engines are only supported with N2 or BACnet MS/TP devices. MVE is not supported on IP devices.



TECHNICAL SPECIFICATIONS

Required Server Platform [1]	*Refer to the Technical Specifications in the Application and Data Server (ADS) and Extended Application and Data Server (ADX) Product Bulletin (LIT-1201525).* **Note:** MVE is only tested with the ADX.
Required Memory	• Unified 10 or 25 User ADX: 16 to 32 GB • Unified 50 or 100 User ADX: 32 GB • Split 10 or 25 User ADX: 16 GB (web/application server and database server for 10 or 25 user ADX) • Split 50 or 100 User ADX: 32 GB • For VM hosts, allocate a minimum of 8 GB of RAM
Supported Operating Systems and Database Software [2]	**Windows® Server® 2019 (version 1803 or later) (64-bit)** SQL Server® 2019 (64-bit) SQL Server® 2017 with CU17 (64-bit) SQL Server® 2016 with SP2 CU10 (64-bit) SQL Server® 2014 with SP3 CU4 (64-bit) **Windows® Server® 2016 with Update (KB4512495) (64-bit)** SQL Server® 2017 with CU17 (64-bit) SQL Server® 2016 with SP2 CU10 (64-bit) SQL Server® 2014 with SP3 CU4 (64-bit) **3, 4**
Supported Virtual Environments	Microsoft Hyper-V™ VMware®
Network Communication	Ethernet network interface card (100 or 1000 Mbps)
Supported User Interfaces	Metasys Site Management Portal
Additional Software Included in the ADX download	Metasys Database Manager Microsoft .NET Framework Version 4.7.2 Launcher Software SQL Server® 2017 Express with CU17 (64-bit) Metasys Advanced Reporting System software **Notes:** • The Metasys Advanced Reporting System requires an ADX. The SCT must be online and accessible to the ADX at all times. • Windows Server 2016 includes Microsoft .NET Framework Version 3.5/3.5.1. No separate software installation is necessary.
Optional Hardware	Any network or local printer supported by the qualified Windows operating system.
Optional Software	Energy Essentials Graphic Generation Tool CCT Software SCT Software Metasys Export Utility

Notes

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 and server recommendations.

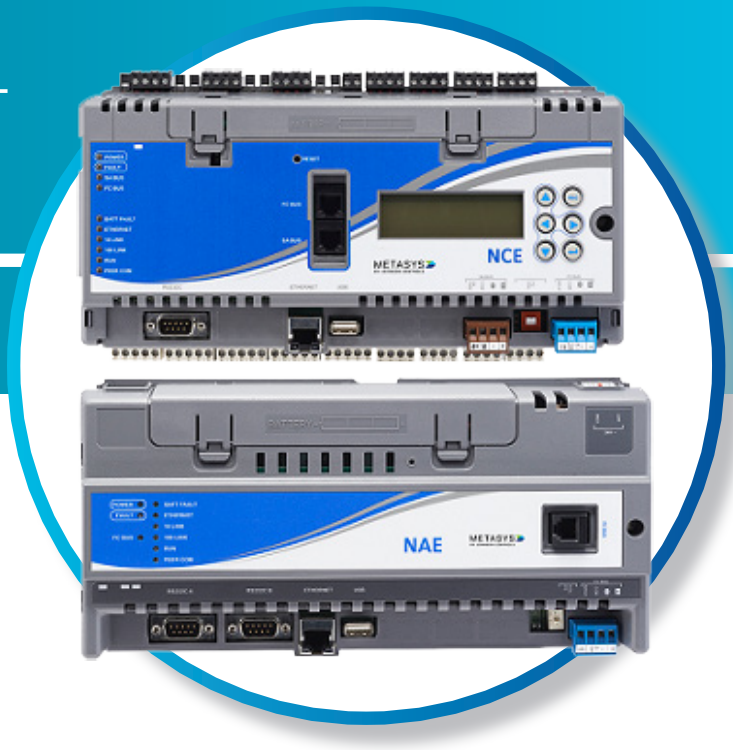
2 *Refer to the Network and IT Guidance Technical Bulletin (LIT-12011279) for specific Microsoft Windows operating system settings that may be required for your Metasys system configuration.*

3 For SQL Server software, you must purchase a core license for each individual processor core (with a minimum of four core licenses). For example, if you have a single processor with dual cores, purchase four core licenses (the minimum) for SQL Server software.

4 To use SQL Server 2014 with Metasys products, you must install Microsoft cumulative update package 3 (KB2984923) for SQL Server 2014. To download the update package, visit ***http://support.microsoft.com/kb/2984923/***.

SUPERVISORY
NETWORK CONTROLLERS

METASYS SUPERVISORY
NETWORK CONTROLLERS



NCE25, NAE35, AND NAE45

NETWORK AUTOMATION ENGINE

The NCE25, NAE35, and NAE45 are specific series of Metasys network engines that perform a key role in the Metasys system architecture. These engines provide network management and system-wide control and coordination over one or more networks of Metasys equipment controllers, including the following:

- General Purpose Application MS/TP Controllers (CGMs)
- VAV Box Equipment MS/TP Controllers (CVMs)
- Field Equipment Controllers (FECs) and Advanced Application Field Equipment Controllers (FACs)
- Terminal Equipment Controllers (TECs)
- LN (LonWorks® Network) series equipment controllers
- Legacy Metasys controllers, such as Unitary (UNT) controllers, Variable Air Volume Assembly (VMA14xx) controllers, and DX-9100 controllers
- Third-party equipment controllers

These network engines can be networked together for scaling up on large projects, and they can be networked with an Application and Data Server (ADS), an Extended Application and Data Server (ADX), or an Open Application Server (OAS) for additional functionality and site unification.

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

Network engines provide network supervisor capabilities, IP network connectivity, and thirdparty device integration capabilities. NCEs also provide these three capabilities, but also feature the I/O point connectivity and direct digital control capabilities of an FEC.

In addition to providing general comprehensive equipment monitoring and control, network engines also offer specialized capabilities by series, model, and software release to meet a variety of application requirements. The network engines are identified by two types:

- Network Control Engine: NCE25
- Network Automation Engines: NAE35 and NAE45

For information about the newest family of network engines that are available at Release 10.1 or later, refer to the SNE/SNC Product Bulletin (LIT-12013296).

For information about other network engine models, refer to the NAE55 Catalog Page (LIT-1900195) and NCE85 Catalog Page (LIT-1901148).

Lastly, refer to the Metasys for Validated Environments, Extended Architecture Product Bulletin (LIT-12011326) for information about which network engines are approved for use at facilities that require regulatory compliance.

SUPERVISORY NETWORK CONTROLLERS

NCE25, NAE35, AND NAE45 METASYS SUPERVISORY NETWORK CONTROLLERS

FEATURES

NETWORK ENGINES

The following features and benefits are applicable to all network engines, with specific features that vary by model and software release.

- **Supervision of controller networks including Johnson Controls and third-party protocol devices -** Connectivity to open network standards is supported for complete flexibility in the selection of field devices. Supported protocols are model and software release dependent. The NAE35, NAE45, and NCE25 series network engines support BACnet/ IP, BACnet MS/TP, LonWorks, N2 Bus, Modbus RTU, Modbus TCP, M-Bus (EN 13757-3) serial and IP, and KNX IP protocols.
- **Communication using commonly accepted IT standards at the automation and enterprise level -** The Metasys system is installed on your existing IT infrastructure within a building or enterprise and uses standard IT communication services over the company intranet, WAN, public Internet with VPN tunnel, or firewall protection. Network engines also support the ability to optionally authenticate non-local users through a Remote Authentication Dial-in User Services (RADIUS) server and Syslog Destination Delivery Agent (DDA) for network logging of Metasys audits and events.
- **Secure web-based user interface -** Access system data in the network engines from any supported web browser device connected to the network. All upgraded network engines have self-signed certificates that provide for encrypted communication. Optionally, you can deploy to the network engines trusted certificates that are provided and managed by the customer's IT department or a Certificate Authority (CA).
- **Site Director function -** You can set up one NAE35 or NAE45 as a Site Director with other network engines reporting to it as child devices. With this functionally, you can easily navigate, monitor, and control the entire facility by accessing a single device.
- **Embedded user interface and online system configuration software -** Use the password-protected software to enable, configure, commission, archive data, monitor, command, and perform system diagnosis from any device by using a web browser, without the need for separate workstation software.
- **Linux® operating system -** At Release 9.0.7 or later, the NAE35, NAE45, and NCE25 series network engines run on Linux, which is a robust, widely-accepted, and readily-supported operating system.

NCE

- **Integral field controller with 33 I/O Points -** The NCE provides field-level control of central plant and large air-handler applications combined with enterprise level IP network connectivity.
- **Expandable I/O point capacity, NS sensor connectivity, and VFD control on field controller SA Bus -** Connect multiple Input/Output Modules (IOMs), NS Series Network Sensors, and VFDs to the field controller SA Bus, greatly expanding the NCE's field level control capabilities.

NETWORK ENGINE LIMITS AND RECOMMENDATIONS

NETWORK ENGINE HARDWARE LIMITATIONS

MAXIMUM ALLOWED	NCE25	NAE35	NAE45
Total engines that can report to engine Site Director	1 [1]	3	3
Simultaneous SMP users	2	2	2
Local Field Buses (FBs)	1	1	1
Remote Field Buses (RFBs)	0	3	4
Total Field Buses (Local and Remote Field Buses)	1 (1 FB + 0 RFB)	4 (1 FB + 3 RFB)	5 (1 FB + 4 RFB)
MS/TP devices on FC Bus [2] **Note:** N2 devices follow the same rules as MS/TP devices, but performance varies based on controller mix (N2Open/Sys91/VMA).	Per trunk device limits if all devices are Metasys family devices, such as CGMs, CVMs, FACs, FECs, VMAs, IOMs, and TEC3600s:		
	32	50	100
	Per trunk device limits if one device is a non-Metasys family device, such as a Facility Explorer device, TEC2000, or third-party device:		
	32	50	50
Remote MS/TP devices on remote field bus [3]	N/A	16 or 32	16 or 32
Mapped N2 points per trunk [4]	2,500	2,500	2,500
LonWorks devices [5]	32	64	127
	Note: The LonWorks integration is only supported on NAE35s, NAE45s, and NCE25s with the Metasys Release 9.0 software or earlier. The Release 9.0.7 patch update is not supported for these LonWorks models; they remain at Release 9.0. However, the LonWorks integration is supported for NAE55s at Release 11.0.		
LonWorks network variables	1,500	1,500	1,500
Johnson Controls BACnet/IP devices and third-party BACnet/IP devices	50 [6,7,8]	50 [6,7,8]	50 [6,7,8]
Objects	2,500	2,500	2,500
Time on battery backup	1,024 seconds		

Notes

1 An NCE25 can only act as Site Director for itself.

2 Maximum 3 bus segments per FC Bus. Maximum 50 devices per bus segment. Bus segments on an FC bus are connected with repeaters (only). Up to two cascaded repeaters may be applied to an FC bus (to connect three bus segments).

3 The maximum device count is 32 if the bus contains all Johnson Controls devices, and 16 if the bus contains one or more non-Johnson Controls devices.

4 Performance varies based on the point mix (N2Open/Sys91/VMA). Recommend maximum for best performance is 1,000 points

5 Single sub-net LonWorks network; does not support routers; supports physical repeaters

6 Depends on the number of objects each BACnet device supports.

7 Johnson Controls IP controllers only work with NAEs (and site directors) at Release 9.0 or later.

8 Some sites may require manual mapping based on system architecture. They may also require system adjustments, such as BACnet communication adjustments, or firewall off.

ORDERING INFORMATION

NCE25 (RELEASES 9.0 AND 9.0.7 OR LATER)

CODE	RELEASE	DESCRIPTION
MS-NCE25xx-x (Base Features on Each NCE25)	N/A	Each NCE25 Series model requires a 24 VAC power supply and includes one RS-232-C serial port, one RS-485 optically isolated SA Bus port, one USB serial port, one Ethernet port, and an MS-BAT1020-0 Data Protection Battery. Each NCE25 Series model has 33 integral I/O points and supports up to 128 additional I/O points on the SA Bus. Supports BACnet IP network.
MS-NCE2500-0	9.0.7 or later	Base features with no physical field controller trunk connection.
MS-NCE2506-0	9.0.7 or later	Base features with no physical field controller trunk connection. Includes integral display screen.
MS-NCE2510-0	9.0.7 or later	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and one N2 Bus. The number of supported devices on the third-party trunk depends on the protocol. For the N2 Bus, up to 32 devices are supported.
MS-NCE2516-0	9.0.7 or later	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and one N2 Bus. The number of supported devices on the third-party trunk depends on the protocol. For the N2 Bus, up to 32 devices are supported. Includes integral display screen.
MS-NCE2520-0	9.0	Supports one LonWorks trunk with up to 32 LonWorks devices.
MS-NCE2526-0	9.0	Supports one LonWorks trunk with up to 32 LonWorks devices. Includes integral display screen.
MS-NCE2560-0	9.0.7 or later	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and one MS/TP Bus. The number of supported devices on the thirdparty trunk depends on the protocol. For the MS/TP bus, up to 32 devices are supported.
MS-NCE2566-0	9.0.7 or later	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and one MS/TP Bus. The number of supported devices on the thirdparty trunk depends on the protocol. For the MS/TP bus, up to 32 devices are supported. Includes integral display screen.

NAE35 (RELEASE 9.0 AND 9.0.7 OR LATER)

CODE	RELEASE	DESCRIPTION
MS-NAE35xx-x (Base Features of Each NAE35)	N/A	NAE35 Network Automation Engines: Requires a 24 VAC power supply. Each model includes one RS-232-C serial port, one USB serial port, one Ethernet port, and an MS-BAT1020-0 Data Protection Battery. Supports a BACnet IP network.
MS-NAE3510-2	9.0.7 or later	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and one N2 Bus or BACnet MS/TP (RS-485) trunk. The number of supported devices on the third-party trunk depends on the protocol. For the N2 Bus or MS/TP trunk, up to 50 devices are supported. **Note:** Modem functions are no longer available after this engine is updated with Metasys Release 9.0.7 or later.
MS-NAE3514-2	9.0.7 or later	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and one N2 Bus or BACnet MS/TP (RS-485) trunk. The number of supported devices on the third-party trunk depends on the protocol. For the N2 Bus or MS/TP trunk, up to 50 devices are supported. Engine is limited to Basic Access support. **Note:** Modem functions are no longer available after this engine is updated with Metasys Release 9.0.7 or later.
MS-NAE3520-2	9.0	Supports one LonWorks trunk; includes an additional RS-232-C serial port for optional external modem. Supports a maximum of 64 devices on the LonWorks port.
MS-NAE3524-2	9.0	Supports one LonWorks trunk; limited to Basic Access support; and includes an additional RS-232-C serial port for optional external modem. Supports a maximum of 64 devices on the LonWorks trunks.

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ORDERING INFORMATION

NAE35 (RELEASE 9.0 AND 9.0.7 OR LATER)

CODE	RELEASE	DESCRIPTION
MS-NAE45xx-x (Base Features of Each NAE45)	N/A	NAE45 Network Automation Engines: Requires a 24 VAC power supply. Each model includes one RS-232-C serial port, one USB serial port, one Ethernet port, and an MS-BAT1020-0 Data Protection Battery. Supports a BACnet IP network.
MS-NAE4510-2	9.0.7 or later	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and one N2 Bus or BACnet MS/TP (RS-485) trunk. The number of supported devices on the third-party trunk depends on the protocol. For the N2 Bus or MS/TP trunk, up to 100 devices are supported. **Note:** Modem functions are no longer available after this engine is updated with Metasys Release 9.0.7 or later.
MS-NAE4520-2	9.0	Supports one LonWorks trunk, includes an additional RS-232-C serial port for optional external modem; supports a maximum of 127 devices on the LonWorks trunk.

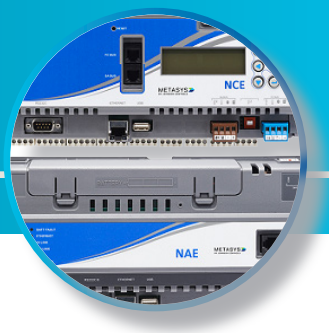
ACCESSORIES

NETWORK ENGINES ACCESSORIES

CODE	DESCRIPTION
MS-BAT1020-0	Replacement data protection battery for NAE35, NAE45, and NCE25. Rechargeable NiMH battery: 3.6 V 500 mAh, with a typical life of 5 to 7 years at 21°C
TL-MAP1810-xx	Pocket-sized web server that provides a wireless mobile user interface to Metasys field controllers, thermostats, and smart rooftop units. *Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.* **Note:** The MAP Gateway serves as a replacement for the BTCVT, which is no longer available but continues to be supported.
MS-MULTENGSW-6	DVD with Network Engine software images for all NAEs and NCEs; for upgrading existing, engine-only (no ADS/X) installations.
MS-EXPORT-0	License enabling Metasys Export Utility software for new installation. Software may be obtained by electronic download from the Licensing Portal or by ordering a DVD copy.
MS-COPY-EXPORT	DVD reproduction of Metasys Export Utility product, unlicensed
AS-XFR100-1	Power transformer (Class 2, 24 VAC, 92 VA maximum output), with enclosure
AS-XFR010-1	Power transformer (Class 2, 24 VAC, 92 VA maximum output), no enclosure

MODBUS

CODE	DESCRIPTION
IU-9100-8401	RS232-to-RS485 converter, 230 VAC
IU-9100-8404	RS232-to-RS485 converter, 24 VAC



ORDERING INFORMATION

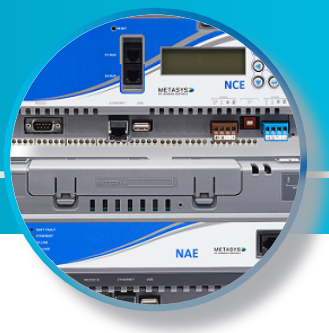
ACCESSORIES

M-BUS

CODE	DESCRIPTION
SIS-MBUSSCSL-1E	M-Bus level converter for up to 6 unit loads, 24V AC/DC (RS-232 connection)
SIS-MBUSSCLL-0E	M-Bus level converter for up to 100 unit loads, 24V AC/DC (RS-232 connection)
SIS-MBUSNCLL-0E	M-Bus level converter for up to 100 unit loads; 24 VAC/VDC (IP connection)
SIS-MBUSNCLH-0E	M-Bus level converter for up to 100 unit loads; 230 VAC (IP connection)
SIS-MBUSRPLL-0E	M-Bus repeater for up to 100 unit loads, 24V AC/DC
SIS-MBUSRPLH-0E	M-Bus repeater for up to 100 unit loads; 230 VAC
INT-DX-KAB01	Optional connection cable SUB-D to RJ-12 for use with SIS-MBUSSCLL-0E

KNX

CODE	DESCRIPTION
GRRIN01-KNX	KNX router interface to connect KNX line through Ethernet to a network engine.
GRIPIN01-S-KNX	Tunneling KNX secure interface module to connect KNX line through Ethernet to the network engine.



NCE25, NAE35, AND NAE45 METASYS SUPERVISORY NETWORK CONTROLLERS

TECHNICAL SPECIFICATIONS

NCE25

Power Requirement	Dedicated nominal 24 VAC, SELV power supply, at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	25 VA maximum for NCE25 only **Note:** The 25 VA rating does **not** include any power supplied by the NCE to devices connected at the NCE BOs. BO devices connected to and powered by an NCE can require an additional 125 VA (maximum).
Power Source	+15 VDC power source terminals provide 100 mA total current; quantity of inputs: five, located in Universal IN terminals; for active (3-wire) input devices
Ambient Conditions	
Operating	0°C to 50°C, 10% to 90% RH, 30°C maximum dew point
Storage	-40°C to 70°C, 5% to 95% RH, 30°C maximum dew point
Data Protection Battery	Supports data protection on power failure. Rechargeable NiMH battery: 3.6 VDC 500 mAh, with a typical life of 5 to 7 years at 21°C; Product Code Number: MS-BAT1020-0
Processors	
Supervisory Controller	192 MHz Renesas SH4 7760 RISC processor
Field Controller	20 MHz Renesas H8S2398 processor
Memory	
Supervisory Controller	128 MB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup and 128 MB SDRAM for operations data dynamic memory
Field Controller	1 MB flash memory and 1 MB RAM
Operating System	Microsoft Windows Embedded CE 6.0 (Release 9.0.6) Buildroot 2017.08.2 with Linux kernel 14.4 (Release 9.0.7 or 9.0.8 patch)
Network and Serial Interfaces (Depending on NCE model)	• One Ethernet port; 10/100 Mbps; 8-pin RJ-45 connector • One optically isolated RS-485 SA Bus port; with a pluggable and keyed 4-position terminal block (on all NCE25 models) • One optically isolated RS-485 port; with a pluggable and keyed 4-position terminal block (only on NCE25 models that support an N2 Bus or MS/TP bus trunk) • One LonWorks port; FTT10 78 Kbps; pluggable, keyed 3-position terminal block (only on NCE25 models that support a LonWorks Network trunk). The LonWorks models are supported to run the Metasys Release 9.0.6 software, **but not the Release 9.0.7 or 9.0.8 patch update.** • One RS-232-C serial port with a standard 9-pin sub-D connector that supports standard baud rates • One USB serial port with standard USB connector that supports an optional, user-supplied external modem. Modem functions are available with Release 9.0.6, but **are not** available after the NCE is patched with Release 9.0.7 or 9.0.8.
Analog Input/Analog Output Point Resolution	• Analog Input Points: 16-bit resolution • Analog Output Points: 16-bit resolution and ±200 mV accuracy on 0-10 VDC applications
Input/Output Capabilities	• 10-Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact • 8-Binary Inputs: Defined as Dry Contact Maintained or Pulse/Accumulator Mode • 4-Analog Outputs: Defined as 0–10 VDC or 4–20 mA • 7-Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power) • 4-Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO

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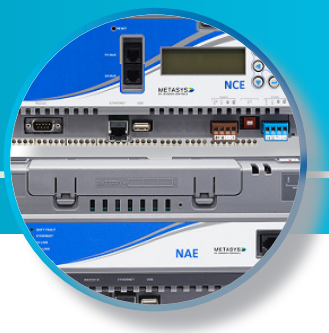

NCE25, NAE35, AND NAE45 METASYS SUPERVISORY NETWORK CONTROLLERS

TECHNICAL SPECIFICATIONS

NCE25

Dimensions (Height x Width x Depth)	155 mm x 270 mm x 64 mm Minimum mounting space required: 250 mm x 370 mm x 110 mm
Housing	
Enclosure material	Plastic housing. ABS and polycarbonate
Protection Class	IP20 (IEC60529)
Mounting	On a flat surface with screws, on three mounting clips, or a single 35 mm DIN rail
Shipping Weight	1.2 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BTL 135-2010 Listed B-BC, Protocol Revision 12

NAE35 AND NAE45

Power Requirement	Dedicated nominal 24 VAC, SELV power supply, at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	25 VA maximum
Ambient Conditions	
Operating	0°C to 50°C; 10% to 90% RH, 30°C maximum dew point
Storage	-40°C to 70°C; 5% to 95% RH, 30°C maximum dew point
Data Protection Battery	Supports data protection on power failure. Rechargeable NiMH battery: 3.6 VDC 500 mAh, with a typical life of 5 to 7 years at 21°C; Product Code Number: MS-BAT1020-0
Processor	192 MHz Renesas SH4 7760 RISC processor
Memory	128 MB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 128 MB SDRAM for operations data dynamic memory
Operating System	Microsoft Windows Embedded CE 6.0 (Release 9.0) Buildroot 2017.08.2 with Linux kernel 14.4 (Release 9.0.7 or 9.0.8 patch)

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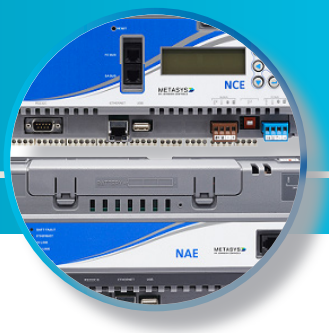

NCE25, NAE35, AND NAE45 METASYS SUPERVISORY NETWORK CONTROLLERS

TECHNICAL SPECIFICATIONS

NAE35 AND NAE45

Network and Serial Interfaces	• One Ethernet port; connects at 10 or 100 Mbps; 8-pin RJ-45 connector • One optically isolated RS-485 port; 9.6k, 19.2k, 38.4k, or 76.8k baud (depending on protocol); with a pluggable and keyed 4-position terminal block (FC Bus available on NAE351x and NAE451x models only) • One LonWorks port; FTT10 78 Kbps; pluggable, keyed 3-position terminal block (LonWorks port available on NAE352x-x and NAE452x models only). The LonWorks models are supported to run the Metasys Release 9.0 software, **but not the Release 9.0.7 or 9.0.8 patch update.** • One RS-232-C serial port with standard 9-pin sub-D connector that supports standard baud rates. • Second serial port, on models without an internal modem, that supports an optional, user-supplied external modem. Modem functions are available with Metasys Release 9.0, but **are not** available after the NAE is patched with Release 9.0.7 or 9.0.8 • One USB serial port with standard USB connector that supports an optional, user-supplied external modem. Modem functions are available with Metasys Release 9.0, but **are not** available after the NAE is patched with Release 9.0.7 or 9.0.8.
Housing	
Enclosure material	Plastic housing material: ABS polycarbonate UL94-5VB
Protection Class	IP20 (IEC 60529)
Mounting	On a flat surface with screws on three mounting clips or a single 35 mm DIN rail
Dimensions (Height x Width x Depth)	131 mm x 270 mm x 62 mm Minimum space for mounting NAE35 and NAE45: 210 mm x 350 mm x 110 mm
Shipping Weight	1.2 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BTL 135-2010 Listed B-BC, Protocol Revision 12

SUPERVISORY
NETWORK CONTROLLERS

METASYS SUPERVISORY
NETWORK CONTROLLERS

NAE55

NETWORK AUTOMATION ENGINE

The NAE55 is a specific series of network engine that performs a key role in the Metasys system architecture. Network engines provide network management and system-wide control and coordination over one or more networks of Metasys equipment controllers, including the following:

- General Purpose Application MS/TP Controllers (CGMs)
- VAV Box Equipment MS/TP Controllers (CVMs)
- Field Equipment Controllers (FECs) and Advanced Application Field Equipment Controllers (FACs)
- Terminal Equipment Controllers (TECs)
- LN (LonWorks® Network) series equipment controllers
- Legacy Metasys controllers, such as Unitary (UNT) controllers, Variable Air Volume Assembly (VMA14xx) controllers, and DX-9100 controllers
- Third-party equipment controllers

Network engines can be networked together for scaling up on large projects, and they can be networked with an Application and Data Server (ADS), an Extended Application and Data Server (ADX), or an Open Application Server (OAS) for additional functionality and site unification.

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

Network engines provide network supervisor capabilities, IP network connectivity, and third-party device integration capabilities. NAE55s at Release 11.0 are FIPS 140-2 Level 1 compliant. The Federal Information Processing Standard (FIPS) 140-2 is a United States government cybersecurity standard that approves cryptographic modules/algorithms used for encryption.

For information about the newest family of network engines that are available at Release 10.1 or later, refer to the SNE/SNC Product Bulletin (LIT-12013296).

For information about other network engine models, refer to the NCE25, NAE35, and NAE45 Catalog Page (LIT-1901147), Secure Network Engine Catalog Page (LIT-1900996), and NAE85 Catalog Page (LIT-1901148).

Lastly, refer to the Metasys for Validated Environments, Extended Architecture Product Bulletin (LIT-12011326) for information about which network engines are approved for use at facilities that require regulatory compliance.

NAE55 METASYS SUPERVISORY NETWORK CONTROLLERS

FEATURES

NETWORK ENGINES

The following features and benefits are applicable to all network engines, with specific features that vary by model and software release.

- **Supervision of controller networks including Johnson Controls and third-party protocol devices -** Connectivity to open network standards is supported for complete flexibility in the selection of field devices. Supported protocols are model and software release dependent. They include BACnet/IP, BACnet MS/TP, LonWorks, N2 Bus, Modbus RTU, Modbus TCP, M-Bus (EN 13757-3) serial and IP, KNX IP, SIMPLEX® Fire, Zettler Fire Panel, Tyco C•CURE, OPC Unified Architecture (UA), and other third-party protocols.
- **Communication using commonly accepted IT standards at the automation and enterprise level -** The Metasys system is installed on your existing IT infrastructure within a building or enterprise and uses standard IT communication services over the company intranet, WAN, public Internet with VPN tunnel, or firewall protection. Network engines also support the ability to optionally authenticate non-local users through a Remote Authentication Dial-in User Services (RADIUS) server and Syslog Destination Delivery Agent (DDA) for network logging of Metasys audits and events.
- **FIPS compliance -** Common to all network engines that run Release 11.0 firmware, the FIPS 140-2 feature provides FIPS compliance to a customer's BAS. The FIPS 140-2 standard is an information technology security approval program for cryptographic modules produced by private sector vendors who seek to have their products certified or validated for use in government departments and regulated industries. For a site to be fully FIPS compliant, you need to upgrade all network engines to Release 11.0, then install and license the FIPS 140-2 feature on the Metasys Server.
- **Secure web-based user interface -** Access system data in the network engines from any supported web browser device connected to the network. All upgraded network engines have self-signed certificates that provide for encrypted communication. Optionally, you can deploy to the network engines trusted certificates that are provided and managed by the customer's IT department or a Certificate Authority (CA).
- **Site Director function -** If you set up one network engine as a Site Director, you can access all site data from that single device. The device that is designated as the Site Director coordinates the display of data from multiple devices for easy navigation through the entire site. This capability is available to all network engine models.
- **Embedded user interface and online system configuration software -** Use the password-protected software to enable, configure, commission, archive data, monitor, command, and perform system diagnosis from any device by using a web browser, without the need for separate workstation software.
- **Linux® operating system -** All network engines run on Linux, which is a robust, widely-accepted, and readily-supported operating system.
- **Background file transfer -** With this new feature, you can transfer firmware upgrades, archive databases, HTTPS security certificates, and security databases from the SCT to the NAE55 while the engine remains operational, minimizing system disruptions. Background file transfer is only available to NAE55s at Release 10.1 or later, and to the new family of SNE and SNC network engines that were introduced at Release 10.1.
  For information about the newest engines, refer to the SNE/SNC Product Bulletin (LIT-12013296).

ORDERING INFORMATION

NAE55-3 ORDERING INFORMATION (RELEASE 8.1 OR 11.0)

CODE	RELEASE	DESCRIPTION
MS-NAE55xx-x (Base Features of Each NAE55)	N/A	NAE55 Network Automation Engines: Requires a 24 VAC power supply. Each model includes two RS-232-C serial ports, two USB serial ports, two RS-485 ports, one Ethernet port, and one MS-BAT1010-0 Data Protection Battery. Supports a BACnet IP network.
MS-NAE5510-3	11.0	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and two N2 or two BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk). Supports up to 100 devices on each N2 or BACnet MS/TP trunk. This model is a BACnet BTL-Listed controller at Protocol Revision 15 (PR15).
MS-NAE5511-3	11.0	Supports two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX) and two N2 or two BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk); includes an internal modem. Supports up to 100 devices on each N2 or BACnet MS/TP trunk. This model is a BACnet BTL-Listed controller at Protocol Revision 15 (PR15). **Note:** Modem functions are no longer available after this engine is updated with Metasys Release 10.0 or later.
MS-NAE5520-3	11.0	Supports a LonWorks trunk, two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX), or two N2 trunks/BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk). Supports up to 255 devices on the LonWorks trunk. Supports up to 100 devices on each N2 or BACnet MS/TP trunk. This model is a BACnet BTL-Listed controller at Protocol Revision 15 (PR15).
MS-NAE5521-3	11.0	Supports a LonWorks trunk, two third-party trunks (Modbus RTU or TCP, M-Bus, or KNX), or two N2 trunks/BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk); includes an internal modem. Supports up to 255 devices on the LonWorks trunk. Supports up to 100 devices on each N2 or BACnet MS/TP trunk. This model is a BACnet BTL-Listed controller at Protocol Revision 15 (PR15). **Note:** Modem functions are no longer available after this engine is updated with Metasys Release 10.0 or later.

ACCESSORIES

NETWORK ENGINES

CODE	DESCRIPTION
MS-BAT1010-0	Replacement data protection battery for NAE55. Rechargeable gel cell battery: 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C
TL-MAP1810-xx	Pocket-sized web server that provides a wireless mobile user interface to Metasys field controllers, thermostats, and smart rooftop units. *Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.* **Note:** The MAP Gateway serves as a replacement for the BTCVT, which is no longer available but continues to be supported.
MS-MULTENGSW-6	DVD with Network Engine software images for all NAEs and NCEs; for upgrading existing, engine-only (no ADS/X) installations.
MS-EXPORT-0	License enabling Metasys Export Utility software for new installation. Software may be obtained by electronic download from the Licensing Portal or by ordering a DVD copy.
MS-COPY-EXPORT	DVD reproduction of Metasys Export Utility product, unlicensed
AS-XFR100-1	Power transformer (Class 2, 24 VAC, 92 VA maximum output), with enclosure
AS-XFR010-1	Power transformer (Class 2, 24 VAC, 92 VA maximum output), no enclosure

ORDERING INFORMATION

ACCESSORIES

MODBUS

CODE	DESCRIPTION
IU-9100-8401	RS232-to-RS485 converter, 230 VAC
IU-9100-8404	RS232-to-RS485 converter, 24 VAC

M-BUS

CODE	DESCRIPTION
SIS-MBUSSCSL-1E	M-Bus level converter for up to 6 unit loads, 24V AC/DC (RS-232 connection)
SIS-MBUSSCLL-0E	M-Bus level converter for up to 100 unit loads, 24V AC/DC (RS-232 connection)
SIS-MBUSNCLL-0E	M-Bus level converter for up to 100 unit loads; 24 VAC/VDC (IP connection)
SIS-MBUSNCLH-0E	M-Bus level converter for up to 100 unit loads; 230 VAC (IP connection)
SIS-MBUSRPLL-0E	M-Bus repeater for up to 100 unit loads, 24V AC/DC
SIS-MBUSRPLH-0E	M-Bus repeater for up to 100 unit loads; 230 VAC
INT-DX-KAB01	Optional connection cable SUB-D to RJ-12 for use with SIS-MBUSSCLL-0E

KNX

CODE	DESCRIPTION
GRRIN01-KNX	KNX router interface to connect KNX line through Ethernet to a network engine
GRIPIN01-S-KNX	Tunneling KNX secure interface module to connect KNX line through Ethernet to the network engine

SUPERVISORY NETWORK CONTROLLERS

NAE55 METASYS SUPERVISORY NETWORK CONTROLLERS

TECHNICAL SPECIFICATIONS

NAE55xx-3

Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply, SELV power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	50 VA maximum
Ambient Conditions	
Operating	0°C to 50°C; 10% to 90% RH, 30°C maximum dew point
Storage	-40°C to 70°C; 5% to 95% RH, 30°C maximum dew point
Data Protection Battery	Supports data protection on power failure. Rechargeable gel cell battery: 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C; P roduct Code Number: MS-BAT1010-0
Clock Battery	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C
Processor	1.46 GHz Intel® Atom® Bay Trail E3815 processor for MS-NAE55xx-3 models
Memory	16 GB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup for MS-NAE55xx-3 models. 2 GB DDR3 SDRAM for operations data dynamic memory for all models
Operating System	
NAE55xx-3	Wind River® Linux LTS 17 (LTS=long-term support) 8 NAE55
Network and Serial Interfaces	• One Ethernet port; 10/100/1,000 Mbps; 8-pin RJ-45 connector • Two optically isolated RS-485 ports; 9.6k, 19.2k, 38.4k, or 76.8k baud; pluggable and keyed 4 position terminal blocks (RS-485 terminal blocks available on NAE55 models only) • Two RS-232-C serial ports, with standard 9-pin sub-D connectors, that support all standard baud rates • Two USB 2.0 serial ports; standard USB connectors support an optional, user-supplied external modem (no longer supported at Release 10.0 or later) • One LonWorks port; FTT10 78 Kbps; pluggable, keyed 3-position terminal block (LonWorks port available on NAE552x-x models only)
Housing	
Enclosure material	Plastic housing with internal metal shield. ABS + polycarbonate;
Protection Class	IP20 (IEC 60529)
Mounting	On a flat surface with screws on four mounting feet or on a dual 35 mm DIN rail
Dimensions (Height x Width x Depth)	226 mm x 332 mm x 96.5 mm including mounting feet Minimum space for mounting: 303 mm x 408 mm x 148 mm
Shipping Weight	2.9 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BTL 135-2016 Listed B-BC/B-BBMD, Protocol Revision 15
FIPS 140-2 Level 1	Compliant with Federal Information Processing Standard (NAE55s at Release 11.0 only)

METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISORY NETWORK CONTROLLERS

METASYS SUPERVISORY NETWORK CONTROLLERS

SNE

SUPERVISORY NETWORK ENGINE

The SNE Series of Network Engines are a new family of Metasys network engines. Network engines are Ethernet-based, supervisory engines that connect BAS networks to IP networks. The SNE network engines succeed the NAE Series of network engines to further the expansion and enhancement of Metasys supervisory control capabilities.

The SNE Series of network engines perform a key role in the Metasys system architecture. They provide network management and system-wide control coordination over one or more networks of equipment controllers, including the following Metasys controllers:

- CGM series general purpose equipment controllers
- CVM series VAV box controllers
- FEC and FAC series field equipment controllers
- VMA series VAV box controllers
- TEC series terminal equipment controllers
- LN series equipment controllers
- Third-party equipment controllers

These devices monitor and control networks of fieldlevel building automation devices, including HVAC equipment, lighting, security, and fire safety equipment. Among a wide host of features, network engines provide building control scheduling, alarm and event management, energy management, data exchange, historical data storage and management, and custom control logic.

Network engines include an embedded user interface called the Site Management Portal (SMP) that provides system navigation and operation using web browser connections. Password protection, permission access control, and IT security best practices secure network engines from unauthorized access. Also, SNEs at Release 11.0 are FIPS 140-2 Level 1 compliant and certified by the National Institute of Standards and Technology (NIST). The Federal Information Processing Standard (FIPS)-140-2 is a United States government cybersecurity standard that approves cryptographic modules/algorithms used for encryption.

In addition to providing general comprehensive equipment monitoring and control, network engines also offer specialized capabilities by series and model to meet a variety of application requirements. These models are available (where x = 0 or 1):

- **SNE2200x-0:** succeeds NAE55 Series of network engines.
- **SNE1100x-0:** succeeds NAE45 Series of network engines.
- **SNE1050x-0:** succeeds NAE35 Series of network engines.

SUPERVISORY NETWORK CONTROLLERS

SNE SERIES NETWORK ENGINE

FEATURES

- **Multiple models available -** Multiple models are available with varying device capacities for integrations that meet the intended application.
- **Linux® operating system -** The SNE runs on Linux, which is a robust, widelyaccepted, and readily-supporting operating system.
- **User interface -** You use the Site Management Portal (SMP) user interface to access system data in the network engines from any supported web browser device connected to the network, including remote users connected by Virtual Private Network (VPN).
- **Encrypted Communications -** All SNE network engines have self-signed certificates that provide for encrypted communication. Optionally, you can deploy trusted certificates from the customer's IT department or from a Certificate Authority (CA).
- **FIPS compliance -** All SNEs that run Release 11.0 firmware include the FIPS 140-2 feature that provides FIPS compliance and is certified by NIST. The FIPS 140-2 standard is an information technology security approval program for cryptographic modules produced by private sector vendors who seek to have their products certified for use in government departments and regulated industries. For a site to be fully FIPS compliant and certified, you need to upgrade all network engines to Release 11.0, then install and license the FIPS 140-2 feature on the Metasys Server. Additionally at Release 11.0, the SNEs are FIPS 140-2 validated.
- **Memory -** The SNE has 2 GB RAM and 16 GB Flash non-volatile memory. This memory provides capacity for further upgrades and a longer operational life.
- **Background file transfer -** You can transfer files such as firmware upgrades, archive databases, and security databases from the SCT to the SNE while the engine remains operational, minimizing system disruptions.
- **Device security -** Device integrity is ensured while the system is rebooting and during normal operation. Embedded technology provides trusted boot operation, firmware protection, secure storage, secure communications, and secure firmware updates complying with strong cyber security practices.
- **Smaller, modularized packaging -** The size of the SNE is much smaller in comparison to the NAE. This smaller size reduces the amount of space you need for mounting, and can potentially reduce the size and cost of control panels.
- **Diagnostic multi-color LEDs -** The use of multi-color LEDs can decrease installation and troubleshooting time.
- **Removable terminal blocks -** The use of removable terminal blocks facilitates ease in installation and servicing.
- **Support for different site directors -** The SNE communicates with a wide variety of Site Directors, which include the Application and Data Server (ADS), Extended Application and Data Server (ADX), Open Application Server (OAS), and Open Data Server (ODS). The ADS-Lite-A (Asia) and ADSLite- E (Europe) site directors are supported for select regions only.
- **Supervision of controller networks including Johnson Controls devices and third-party protocol devices -** Supports connectivity to open network standards for complete flexibility in the selection of field devices. They include BACnet/IP, BACnet MS/TP, N2 Bus, LonWorks, Modbus TCP/IP, Modbus RTU, MBus, KNX, Zettler Fire Panel, Tyco C·CURE, victor, OPC Unified Architecture (UA), and other third-party protocols.
- **No battery -** The SNE uses a supercapacitor, not a battery, to provide temporary power for data backups during shutdown due to AC power loss. This design is more environmentally friendly and saves the eventual cost of replacing the battery. When the supercapacitor is fully charged, the SNE can maintain the real time clock for up to 72 hours during AC power loss.

ORDERING INFORMATION

FEATURES	SNE22000 SNE22001	SNE11000 SNE11001	SNE10500 SNE10501
Succeeds	NAE55 Series	NAE45 Series	NAE35 Series
Communication interfaces	· 1 Ethernet port · 2 RS-485 ports · 2 USB ports [1]	· 1 Ethernet port · 1 RS-485 port · 2 USB ports [1]	
Maximum allowed devices across all integrations. For example, MS/TP +IP. Includes VND integrations and devices brought in through routers.	600	150	60
BACnet/IP maximum trunks	1	1	1
BACnet/IP maximum devices per trunk	200	100	50
BACnet MS/TP maximum trunks	2	1	1
BACnet MS/TP maximum devices per trunk	100	100	50
BACnet MS/TP maximum devices per trunk (with 3rd party)	64	64	32
N2 maximum trunks	2	1	1
Mapped N2 devices per trunk	100	100	50
LonWorks maximum trunks	1	1	1
LonWorks maximum devices	255	127	127
Remote Field Bus maximum trunks	6	3	3
Remote Field Bus maximum Johnson Controls Devices per bus	32	32	32
Remote Field Bus maximum devices per bus (with 3rd party devices)	16	16	16
Maximum objects in device [2]	5000	2500	2500
Supported type of parent server	· ADS · ADX · OAS	· ADS · ADX · ADS-Lite-E · OAS	· ADS · ADX · ADS-Lite-E · OAS
Supported integrations	· BACnet/IP – Simplex® Fire Alarm Control Unit (FACU) – Cree® SmartCast® Lighting Control – Molex® Lighting Control · BACnet MS/TP Field Controller (FC) Bus · N2 Bus Modbus: Modbus TCP/IP on Ethernet and Modbus Remote Terminal Unit on RS-485 · KNX IP · M-Bus · Tyco® C·CURE® 9000 and victor® Video Management · Zettler® Fire Panel · OPC Unified Architecture (UA)		
Operating System	Wind River® Linux LTS 17 (LTS=long-term support)		
Microprocessor	NXP i.MX6 DualLite processor		

...Continued...

ORDERING INFORMATION

FEATURES	SNE22000 SNE22001	SNE11000 SNE11001	SNE10500 SNE10501
Memory	Flash 2GB of DDR3 RAM and 16 GB of eMMC Flash		
User Interface	Site Management Portal (SMP)		

Notes

1 Only the supported USB integration adapters function with the SNE. Other integration adapters that are not supported cannot function with the SNE.

2 Suggested object limit for performance considerations.

ORDERING INFORMATION

CODE	DESCRIPTION
M4-SNExxxxx-xxx (base features of each SNE)	SNE Supervisory Network Engine Series Requires a 24 VAC or 24 VDC power supply. Each model includes one Ethernet port, one RS-485 communications port, two standard USB serial ports, and one micro-USB port (future use). **Supported IP integrations:** BACnet/IP, Modbus TCP/IP, KNX IP, C-Cure/ victor, and OPC UA **Supported field bus integrations:** MS/TP (RS-485) FC Bus, N2 Bus, Modbus RTU, M-Bus, and Zettler
M4-SNE22000-0 (older model) M4-SNE22001-0 (newer model)	Supports two local field bus device integrations with a maximum of 100 devices on each trunk for a maximum of 200 devices per engine if only using the local field buses. The engine supports a total of 600 devices across all integrations. Also includes an RJ-12 connection for the FC Bus. An optional LonWorks adapter can be connected to USB port to add LON communications. Also supports one BACnet/IP device integration.
M4-SNE11000-0 (older model) M4-SNE11001-0 (newer model)	Supports one local field bus device integration with a maximum of 100 devices on the trunk. An optional LonWorks adapter can be connected to USB port to add LON communications. Also supports one BACnet/IP device integration.
M4-SNE10500-0 (older model) M4-SNE10501-0 (newer model)	Supports one local field bus device integration with a maximum of 50 devices on the trunk. An optional LonWorks adapter can be connected to USB port to add LON communications. Also supports one BACnet/IP device integration.

ACCESSORIES

CODE NUMBER OR VENDOR MODEL NUMBER	DESCRIPTION
AS-XFR100-1	Power transformer with enclosure, class 2, 24 VAC, 92 VA maximum output.
AS-XFR010-1	Power transformer, no enclosure, class 2, 24 VAC, 92 VA maximum output.
ACC-PWRKIT-1A24	Power Supply, Desktop Kit, 90-264 VAC to 24 VDC, 65 W, includes AC cord with North American Plug.
ACC-PWRKIT-1E24	Power Supply, Desktop Kit, 90-264 VAC to 24 VDC, 65 W, includes AC cord with European Plug.
ACC-USBLON-0 [1]	USB to LonWorks Adapter. Includes DIN Rail mounting bracket. Tested and qualified for use on the SNE.
ACC-USBRS232-0 [1]	USB to RS-232 Adapter. Tested and qualified for use on the SNE.

Note

1 Non-qualified adapters do not function in USB ports of the SNE.

ORDERING INFORMATION

ACCESSORIES

THIRD-PARTY INTEGRATION

CODE	DESCRIPTION
IU-9100-8401	RS232-to-RS485 converter, 230 VAC
IU-9100-8404	RS232-to-RS485 converter, 24 VAC

M-BUS

For the European market, order the SISMBUSxxxx-0E and INT-DX-KAB01 accessories in AOMS from the Johnson Controls Essen Distribution Center.

Note: Order the MR003USB accessory directly from the supplier, made by Relay GmbH.

CODE	DESCRIPTION
SIS-MBUSSCLL-0E	M-Bus level converter for up to 100 unit loads; 24 VAC/VDC (RS-232 connection); requires ACC-USBRS232-0 adapter
SIS-MBUSNCLL-0E	M-Bus level converter for up to 100 unit loads; 24 VAC/VDC (IP connection)
SIS-MBUSNCLH-0E	M-Bus level converter for up to 100 unit loads; 230 VAC (IP connection)
SIS-MBUSRPLL-0E	M-Bus repeater for up to 100 unit loads, 24V AC/DC
SIS-MBUSRPLH-0E	M-Bus repeater for up to 100 unit loads; 230 VAC
INT-DX-KAB01	Optional serial connection cable SUB-D to RJ-12 for use with SIS-MBUSSCLL-0E
MR003USB	Mikro-Master USB–to–M-Bus adapter for up to 10 M-Bus devices **Note:** Order this accessory directly from the supplier, made by Relay GmbH.

KNX

CODE	DESCRIPTION
GRRIN01-KNX	KNX router interface to connect KNX line through Ethernet to a network engine
GRIPIN01-S-KNX	Tunneling KNX secure interface module to connect KNX line through Ethernet to the network engine

TECHNICAL SPECIFICATIONS

SNE2200 NETWORK ENGINE

Power requirement	Dedicated nominal 24 VAC, SELV power supply, at 50/60 Hz (20 VAC minimum to 30 VAC maximum) Alternate: Dedicated nominal 24 VDC, Class II power supply input; ACC-PWRKIT-1E24
Power consumption	38 VA maximum
Operating System	Wind River® Linux LTS 17 (LTS=long-term support)
Processor	NXP i.MX6 DualLite processor, dual core Cortex-A9 processor at 1.0 GHz with 512 KB of L2 cache
Memory	16 GB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 2 GB SDRAM for operations data dynamic memory
Supported integrations	BACnet/IP, BACnet MS/TP, N2 Bus, LonWorks, Modbus, KNX ,M-Bus, Zettler Fire, OPC UA Tyco C•CURE 9000-victor video management, Simplex FACU, Molex Lighting Control, Cree SmartCast Lighting Control
Network and Serial interfaces	One Ethernet port; 1000/100/10 Mbps; 8-pin RJ45 connector Two FC ports (RJ12 6-pin port; connects with 1.5 m RJ12 field bus cable) Two optically isolated RS-485 ports; with a removable 4-pin terminal block Three USB ports (one Micro-B port, and two USB A ports). All support USB 2.0 and Open Host Controller Interface [Open HCI] specification; Micro-USB port currently inactive
Transmission speeds	Ethernet communication: 1000, 100, or 10 Mbps Optically isolated, serial communication (FC Bus): 76,800, 38,400, 19,200, 9600, or 1200 bps (selectable)
Ambient temperature conditions	
Operating	0°C to 50°C
Non-Operating	-40°C to 70°C
Ambient humidity conditions	
Storage	5% to 95% RH, 30°C maximum dew point conditions
Operating	10% to 90% RH, 30°C maximum dew point conditions
Housing	Black Polycarbonate and Acrylonitrile butadiene styrene (ABS) blend IP protection class: IP20 UL flammability rating: UL94-5VB
Mounting	On flat surface with screws on three mounting clips or a single 35 mm DIN rail
Dimensions (Height x Width x Depth)	190 mm x 125 mm x 44.5 mm
Weight	0.387 kg
CE Compliance	Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BTL 135-2016 Listed B-BC/B-RTR/B-BBMD, Protocol Revision 18
FIPS 140-2 Level 1	Compliant and certified with Federal Information Processing Standard; https://csrc.nist.gov/Projects/cryptographic-module-validation-program/ Certificate/3389

SUPERVISORY NETWORK CONTROLLERS

SNE – SERIES NETWORK ENGINE

TECHNICAL SPECIFICATIONS

SNE1100x, SNE1050x, NETWORK ENGINES

Power requirement	Dedicated nominal 24 VAC, SELV power supply, at 50/60 Hz (20 VAC minimum to 30 VAC maximum) Alternate: Dedicated nominal 24 VDC, Class II power supply input; ACC-PWRKIT-1E24
Power consumption	38 VA maximum
Operating System	Wind River® Linux LTS 17 (LTS=long-term support)
Processor	NXP i.MX6 DualLite processor, dual core Cortex-A9 processor at 1.0 GHz with 512 KB of L2 cache
Memory	16 GB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 2 GB SDRAM for operations data dynamic memory
Supported integrations	BACnet/IP, BACnet MS/TP, N2 Bus, LonWorks, Modbus, KNX, M-Bus, Zettler Fire, OPC UA Tyco C•CURE 9000-victor video management, Simplex FACU, Molex Lighting Control, Cree SmartCast Lighting Control
Network and Serial interfaces	One Ethernet port; 1000/100/10 Mbps; 8-pin RJ45 connector One FC port (RJ12 6-pin port; connects with 1.5 m RJ-12 field bus cable) One optically isolated RS-485 port; with a removable 4-pin terminal block Three USB ports (one Micro-B port, and two USB A ports). All support USB 2.0 and Open Host Controller Interface [Open HCI] specification; Micro-USB port currently inactive
Transmission speeds	Ethernet communication: 1000, 100, or 10 Mbps Optically isolated, serial communication (FC Bus): 76,800, 38,400, 19,200, 9600, or 1200 bps (selectable)
Ambient temperature conditions	
Operating	0°C to 50°C
Non-Operating	-40°C to 70°C
Ambient humidity conditions	
Storage	5% to 95% RH, 30°C maximum dew point conditions
Operating	10% to 90% RH, 30°C maximum dew point conditions
Housing	Black Polycarbonate and Acrylonitrile butadiene styrene (ABS) blend
Mounting	On flat surface with screws on three mounting clips or a single 35 mm DIN rail
Dimensions (Height x Width x Depth)	190 mm x 125 mm x 45.5 mm
Weight	0.387 kg
Compliance	Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BTL 135-2016 Listed B-BC/B-RTR/B-BBMD, Protocol Revision 18
FIPS 140-2 Level 1	Compliant and certified with Federal Information Processing Standard; https://csrc.nist.gov/Projects/cryptographic-module-validation-program/ Certificate/3389

METASYS BUILDING MANAGEMENT SYSTEM

SUPERVISORY NETWORK CONTROLLERS

METASYS SUPERVISORY NETWORK CONTROLLERS

SNC

SUPERVISORY NETWORK CONTROL

The Metasys SNC series network control engine is a hybrid offering that provides both supervisory and equipment control in a unified offering.
The SNC series network control engines perform a key role in the Metasys system architecture. When used as a network engine, SNCs connect Building Automation System (BAS) networks to IP networks. They provide network management and system-wide control coordination over one or more networks controllers, including the following devices:

- CGM series general purpose equipment controllers
- CVM series VAV box controllers
- FEC and FAC series field equipment controllers
- VMA series VAV box controllers
- TEC series terminal equipment controllers
- LN series equipment controllers
- Third-party equipment controllers

In addition to providing supervisory control capabilities, the SNC series also feature onboard input and output interfaces (I/O) and programmable logic to provide direct control over HVAC and other building system equipment. The SNC2515x has a total of 40 I/O points - with 25 inputs and 15 outputs. The SNC1612x has a total of 28 I/O points - with 16 inputs and 12 outputs. The first two numbers of the product code represent the number of inputs (SNC2515x) and the next two numbers represent the number of outputs (SNC2515x). *For a full list of controllers and features, refer to "Features".*

The SNC series succeed the NCE series network control engines, providing future-ready Metasys supervisory and equipment control capabilities.

- SNC2515x succeeds the NCE25 series network control engines.
- SNC2515x-04 succeeds the NCE2500 series network control engines.
- SNC1612x-0 succeeds the NCE25 series network control engines.
- SNC1612x-04 succeeds the NCE2500 series network control engines.

Note: The SNC is not an exact drop-in replacement for the NCE.
Refer to SNC Installation Guide (Part No. 24-10143-01892) for more information about how to install an SNC.

SUPERVISORY NETWORK CONTROLLERS

SNC SERIES NETWORK CONTROL

ETHERNET INTEGRATIONS SUPPORTED

- BACnet/IP that includes the following:
  - Johnson Controls and 3rd party BACnet/IP devices
  - Simplex® Fire Alarm Control Unit (FACU)
  - Cree® SmartCast® Lighting Control
  - Molex® Lighting Control
- Tyco® C·CURE® 9000 or victor® Video Management
- Modbus TCP/IP
- KNX IP
- OPC UA

FIELD BUS INTEGRATIONS SUPPORTED

- BACnet MS/TP
- N2 Bus
- LonWorks® with an approved USB adapter
- Modbus Remote Terminal Unit (RTU) with an approved USB adapter
- M-Bus
- Zettler® Fire Panel

Note: For LonWorks, Modbus, and Zettler Fire Panel integrations, use the appropriate USB adapter. Only the qualified USB adapters function in the USB ports. The USB adapter is not required for Modbus. It can be used but is not required.

Note: For M-Bus an approved USB adapter is required if not using an IP connection.

FEATURES

- **Multiple models available -** Multiple models are available with varying device capacities for integrations. Integral control I/O provide flexibility to select the appropriate model for the intended application.
- **Linux® operating system -** Provides a robust, widely-accepted, and readilysupporting operating system.
- **User interface -** You can use the Site Management Portal (SMP) user interface (UI) to access system data in the SNC from any supported web browser device connected to the network, including remote users connected by Virtual Private Network (VPN).
- **Encrypted Communications -** All SNC network engines have self-signed certificates that provide for encrypted communication. Optionally, you can deploy trusted certificates from the customer's IT department or from a Certificate Authority (CA).
- **Onboard Inputs and Outputs -** Provides direct equipment-level control including central plant and large air-handler applications combined with enterprise-level IP network connectivity. The SNC2515x has 25 inputs and 15 outputs, and the SNC1612x has 16 inputs and 12 outputs.
- **Expandable I/O point capacity, NS sensor connectivity, and Variable Frequency Drive (VFD) control on SA Bus -** You can connect multiple Input/Output Control Modules, NS Series Network Sensors, and VFD connections to the SA Bus, which greatly expands control capabilities.
- **Memory -** The memory of the SNC has 2 GB RAM and 16 GB Flash nonvolatile memory. This memory provides capacity for further upgrades and a longer operational life.

SUPERVISORY NETWORK CONTROLLERS

SNC SERIES NETWORK CONTROL

FEATURES

- **Supports background file transfer -** You can transfer files such as firmware upgrades, archive databases, or security transfers from the SCT to the SNC, while the SNC remains operational, minimizing system disruptions.
- **Device security -** Ensures device integrity while the system is rebooting and during normal operation. Embedded technology provides trusted boot operation, firmware protection, secure storage, secure communications, and secure firmware updates complying with strong cyber security practices.
- **Diagnostic multi-color LEDs -** The use of multi-color LEDs can decrease installation and troubleshooting time.
- **Removable terminal blocks -** The use of removable terminal blocks facilitates ease in installation and servicing.
- **Support for different site directors -** The SNC communicates with a wide variety of Site Directors, which include the Application and Data Server (ADS), Extended Application and Data Server (ADX), and Open Application Server (OAS). The ADSLite- A (Asia) and ADS-Lite-E (Europe) site directors are supported for select regions only.
- **Supervision of controller networks including Johnson Controls devices and third-party protocol devices -** Supports connectivity to open network standards for complete flexibility in the selection of field devices. They include BACnet/IP, BACnet MS/TP, N2 Bus, LonWorks, Modbus TCP/IP, Modbus RTU, MBus, KNX, OPC UA, Zettler Fire Panel, Tyco C·CURE, victor, and other third-party protocols.
- **No battery -** The SNC uses a supercapacitor, not a battery, to provide temporary power for data backups during shutdown due to AC power loss. This design is more environmentally friendly and saves the eventual cost of replacing the battery. When the supercapacitor is fully charged, the SNC can maintain the real time clock for up to 72 hours during AC power loss.
- **Certified FIPS 140-2 Level 1 compliance -** FIPS 140-2 is a U.S. government cybersecurity standard used to approve cryptographic modules and algorithms used for encryption. Assures end customers that Metasys uses strong cybersecurity techniques to prevent unauthorized access to systems and data.
- **OPC UA Integration Driver -** OPC Unified Architecture (OPC UA) is a machineto- machine communication protocol popular with industrial automation and process control type devices. This new OPC UA integration driver will enable Metasys to monitor, command, schedule, alarm, trend, interlock, and share data with OPC UA devices, including the new Johnson Controls PLC offering.
- **Updated BACnet Compliance -** Network Engines are enhanced to support BACnet Protocol Revision 18. Assures end customers of compliance to BACnet standard to support interoperability with third-party BACnet devices.
- **Generic SA Bus object -** A more nimble method for supporting the integration of approved BACnet MS/TP edge devices on the SA Bus. Provides system designers with more SA Bus device options to cost-effectively meet controls project requirements
- **SA Bus Provisioning expanded to support XPM and NS8000 SA Bus devices -** SA Bus devices (for example, XPMs and NS8000s) can be updated through the host controller. Saves field technicians time by streamlining upgrade workflows.
- **New SNC models with onboard user interface -** New SNC models feature on onboard, 2.4 in., 320 x 240 resolution display and associated keypad providing local user interface capabilities. Provides end customers with the ability to quickly and clearly monitor equipment status, view alarms, see trends, issue overrides, and change setpoints and parameters.
- **SNC models updated to include a second Ethernet port -** Updated SNC models contain two Ethernet ports that support daisy-chain IP networking topology. Provides system designers with the installation flexibility and reduced installation costs of daisy-chain network topology for IP controller installations.

ORDERING INFORMATION

The SNC2515x supports up to 40 hard-wired onboard I/O points, 25 inputs and 15 outputs. The SNC1612x supports up to 28 hard-wired onboard I/O points, 16 inputs and 12 outputs.

ONBOARD I/O POINTS

SNC	TOTAL I/O	UNIVERSAL INPUTS (UI)	BINARY INPUTS (BI)	CONFIGURABLE OUTPUTS (CO)	ANALOG OUTPUTS (AO)	BINARY OUTPUTS (BO)
SNC2515x	40	14	11	4	4	7
SNC1612x	28	10	6	4	4	4

INPUT AND OUTPUT TERMINALS

TYPE OF POINT	OPTIONS
Universal Inputs	• Voltage Analog inputs (0-10 VDC) • Current Analog inputs (4-20 mA) • Resistive Analog inputs (0-2k Ohm) – RTD: 1k Nickel, 1k Platinum, or A99B SI – NTC: 10k Type L or 2.225k Type 2 • Dry contact Binary inputs
Binary Inputs	• Dry contact maintained • Pulse counter mode (100 Hz)
Configurable Outputs	• Voltage Analog outputs (0-10 VDC) • Binary Outputs (24 VAC Rated Triac)
Analog Outputs	• Voltage Analog outputs (0-10 VDC) • Current Analog outputs (4-20 mA)
Binary Outputs	24 VAC Rated Triac

SNC BASE FEATURES

CODE	DESCRIPTION
M4-SNCxxxxx-xx	SNC Network Control Engine Series Every SNC model includes the following functionality: • Pluggable terminal blocks • Site Management Portal (SMP) UI • Wind River® Linux Operating System • Three mounting clips for direct screw-mounting, or for DIN Rail mounting • Support for BACnet/IP, MS/TP, N2, LonWorks, Modbus RTU, Modbus TCP, M-Bus, KNX, Tyco C•CURE and victor Video Management, Simplex Fire, Molex and CREE Digital Lighting, Zettler Fire integrations, OPC UA servers **Note:** The OPC UA integration is available starting at Release 11.0.

ORDERING INFORMATION

SNC MODEL FEATURES BY PRODUCT CODE NUMBER

Each device counts towards the overall limit of the SNC. For example, you cannot have 50 MS/TP devices and 50 BACnet/IP devices connected to an SNC2515x-0.

FEATURES	SNC25150-0 SNC25151-0 SNC25151-0H	SNC25150-04 SNC25151-04 SNC25151-04H	SNC16120-0 SNC16121-0 SNC16121-0H	SNC16120-04 SNC16121-04 SNC16121-04H
Succeeds	NCE25 Series	NCE2500	NCE25 Series	NCE2500
Onboard inputs and outputs	• 40 total onboard I/O: 14 UI, 11 BI, 4 CO, 4 AO, 7 BO • Supports SA Bus expansion •		• 28 total onboard I/O: 10 UI, 6 BI, 4 CO, 4 AO, 4 BO • Supports SA Bus expansion	
Communication interfaces	• 1 Ethernet port: SNC25150-0, SNC25150-4, SNC16120-0, SNC16120-04 • 2 Ethernet port: SNC25151-0, SNC25151-0H, SNC25151-04, SNC25151-04H, SNC16121-0, SNC16121-0H, SNC16121-04, SNC16121-04H • 1 RS-485 port • 2 USB ports for connecting external integration adapters [1]			
Maximum allowed devices across all integrations. For example, MS/TP +IP. Includes VND integrations and devices brought in through routers.	96	4	60	4
BACnet/IP maximum trunks	1	1	1	1
BACnet/IP maximum devices per trunk	50	4	50	4
BACnet MS/TP maximum trunks	1	1	1	1
BACnet MS/TP maximum devices per trunk	50	4	50	4
BACnet MS/TP maximum devices per trunk (with 3rd party)	50	4	50	4
N2 maximum trunks	1	1	1	1
Mapped N2 devices per trunk	50	4	50	4
LON maximum devices per trunk	64	4	64	4
LON maximum trunks	1	1	1	1
Remote Field Bus maximum trunks [2]	3	0	3	0
Remote Field Bus maximum Johnson Controls Devices per bus	32	0	32	0
Remote Field Bus maximum devices per bus (with 3rd party devices)	16	0	16	0
Maximum objects in device [3]	2500	2500	2500	2500
Supported type of parent server	• ADS • ADX • ADS-Lite-E • OAS • ODS			

...Continued...

ORDERING INFORMATION

SNC MODEL FEATURES BY PRODUCT CODE NUMBER

Each device counts towards the overall limit of the SNC. For example, you cannot have 50 MS/TP devices and 50 BACnet/IP devices connected to an SNC2515x-0.

FEATURES	SNC25150-0 SNC25151-0 SNC25151-0H	SNC25150-04 SNC25151-04 SNC25151-04H	SNC16120-0 SNC16121-0 SNC16121-0H	SNC16120-04 SNC16121-04 SNC16121-04H
Supported integration drivers	• BACnet/IP – Simplex® Fire Alarm Control Unit (FACU) – Cree® SmartCast® Lighting Control – Molex® Lighting Control • BACnet MS/TP • N2 Bus • LonWorks® (requires USB to LON adapter) • Modbus: Modbus TCP/IP on Ethernet and Modbus Remote Terminal Unit on RS-485 • KNX IP • M-Bus • Tyco® C•CURE® 9000 and victor® Video Management • Zettler® Fire Panel • OPC UA			
Operating System	Wind River® Linux LTS 17 (LTS=long-term support)			
Microprocessor	NXP i.MX6 DualLite processor			
Memory	2 GB of DDR3 RAM and 16 GB of eMMC Flash			
User Interface	Site Management Portal (SMP)			

Notes

1 Only the supported USB integration adapters function with the SNC. Other integration adapters that are not supported cannot function with the SNC.

2 The SNC requires Release 11.0 or higher to support the Remote Field Bus integration.

3 Suggested object limit for performance considerations.

ORDERING INFORMATION

ACCESSORIES

CODE	DESCRIPTION
TL-MAP1810-xx	Pocket-sized web server that provides a wireless mobile user interface to Metasys field controllers, thermostats, and smart rooftop units. *Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.* **Note:** The initial release only supports MAP communication with equipment controllers connected to the FC Bus and not with the application within the SNC (which comes at a later release).
AS-XFR100-1	Power transformer with enclosure, class 2, 24 VAC, 92 VA maximum output.
AS-XFR010-1	Power transformer, no enclosure, class 2, 24 VAC, 92 VA maximum output.
ACC-USBLON-0 [1]	USB to LonWorks Adapter. Includes DIN Rail mounting bracket. Tested and qualified for use on the SNC.
ACC-USBRS232-0 [1]	USB to RS-232 Adapter. Tested and qualified for use on the SNC.
ACC-TBKINOUT-0	Input and Output terminal block replacement kit for SNC, CG, CV and XPM products. Kit includes 5 of each 2, 3, and 4 position Input and Output terminal blocks. 30 terminal blocks in total.
ACC-TBKPWFCSA-0	Replacement terminal block kit for power, FC Bus, SA Bus terminal blocks. All blocks are removable and labeled. Kit includes 5 of each terminal block type.
MS-FCP-0	License enabling Metasys Equipment Controller Firmware Package Files required for the Controller Configuration Tool (CCT).
TL-CCT-0	License enabling Metasys CCT software for one user.
TL-SCT-0	System Configuration Tool software for local installations. New project software for sites that do not have a previous version of SCT installed.
TL-SCT-6	System Configuration Tool software for local installations. Upgrade software for previous SCT versions being upgraded to the latest release.

Note

1 Non-qualified adapters do not function in USB ports of the SNC.

M-BUS

Note: For the European market, order the SISMBUSxxxx-0E and INT-DX-KAB01 accessories in AOMS from the Johnson Controls Essen Distribution Center.

Note: Order the MR003USB accessory directly from the supplier, made by Relay GmbH.

CODE	DESCRIPTION
SIS-MBUSSCLL-0E	M-Bus level converter for up to 100 unit loads; 24 VAC/VDC (RS-232 connection); requires ACC-USBRS232-0 adapter
SIS-MBUSNCLL-0E	M-Bus level converter for up to 100 unit loads; 24 VAC/VDC (IP connection)
SIS-MBUSNCLH-0E	M-Bus level converter for up to 100 unit loads; 230 VAC (IP connection)
SIS-MBUSRPLL-0E	M-Bus repeater for up to 100 unit loads, 24V AC/DC
SIS-MBUSRPLH-0E	M-Bus repeater for up to 100 unit loads; 230 VAC
INT-DX-KAB01	Optional serial connection cable SUB-D to RJ-12 for use with SIS-MBUSSCLL-0E
MR003USB	Mikro-Master USB–to–M-Bus adapter for up to 10 M-Bus devices **Note:** Order this accessory directly from the supplier, made by Relay GmbH.

ORDERING INFORMATION

ACCESSORIES

KNX

CODE	DESCRIPTION
GRRIN01-KNX	KNX router interface to connect KNX line through Ethernet to a network engine
GRIPIN01-S-KNX	Tunneling KNX secure interface module to connect KNX line through Ethernet to the network engine

MODBUS TOOL TRAINING COURSE

Modbus Integrations require one or more vendor Modbus definition (VMD) tables for specific third-party equipment. You can purchase tables from your regional System Integration Services (SIS) office, or you can create the tables with the VMD Generator Express (VGE) tool. To obtain a license, attend the training listed in this table.

CODE	DESCRIPTION
PTK-CONT-26	VGE Tool Software Software Training. The VGE tool is required to generate custom Modbus mapping tables.

SUPERVISORY NETWORK CONTROLLERS

SNC SERIES NETWORK CONTROL

TECHNICAL SPECIFICATIONS

SNC25151-0x AND SNC16121-0x (DISPLAY MODELS)

Power requirement	Dedicated nominal 24 VAC, SELV power supply, at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power consumption	33 VA maximum from main power supply **Note:** The VA rating does not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 132 VA (maximum).
Power source	+15 VDC power source terminals provide 100 mA total current; quantity of inputs: five, located in Universal Input terminals; for active (3-wire) input devices
SA Bus power	15 V at 240 mA maximum
Operating System	Wind River® Linux LTS 17 (LTS=long-term support)
Processor	NXP i.MX6DualLite Processor, 1GHz 32-bit dual core Cortex A9 processor
Memory	16 GB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 2 GB SDRAM for operations data dynamic memory
Universal Input (UI) resolution	Input: 24-bit Analog to Digital converter
Analog Output (AO) accuracy	Output: +/- 200 mV accuracy in 0–10 VDC applications
Supported integrations	BACnet/IP, BACnet MS/TP, N2 Bus, LonWorks, Modbus, KNX, M-Bus, Zettler Fire, OPC UA Tyco C•CURE 9000-victor video management, Simplex FACU, Molex Lighting Control, Cree SmartCast Lighting Control
Network and serial interfaces	Two Ethernet ports; 1000/100/10 Mbps; 8-pin RJ45 connector One FC port (RJ12 6-pin port; connects with 1.5 m RJ12 field bus cable) One SA port (RJ12 6-pin port; connects with 1.5 m RJ12 field bus cable) One optically isolated RS-485 port; with a removable 4-pin terminal block One optically isolated SA Bus port; with a removable 4-pin terminal block Two USB A ports. All support USB 2.0 and Open Host Controller Interface [Open HCI] specification.
Transmission speeds	Ethernet communication: 100, or 10 Mbps Optically isolated, serial communication (FC Bus): 76,800, 38,400, 19,200, 9600, or 1200 bps (selectable) Sensor/actuator communication (SA Bus): 38,400 bps
Ambient temperature conditions	
Operating	0°C to 50°C
Non-operating	-40°C to 70°C
Ambient humidity conditions	
Storage	5% to 95% RH, 30°C maximum dew point conditions
Operating	0% to 90% RH, 30°C maximum dew point conditions
Housing	Black Polycarbonate and Acrylonitrile butadiene styrene (ABS) blend
Mounting	On flat surface with screws on three mounting clips or a single 35 mm DIN rail
Dimensions (width x height x depth)	250 mm x 145 mm x 45.5 mm
Weight	0.65 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BTL 135-2016 Listed B-BC/B-RTR/B-BBMD, Protocol Revision 18

METASYS BUILDING MANAGEMENT SYSTEM

PROGRAMMABLE CONTROLLERS

METASYS CONTROLLERS

CV

VAV BOX CONTROLLERS

The CV series equipment controllers are designed for variable air volume (VAV) box applications. These controllers are fully programmable, but also feature a set of preloaded applications allowing these controllers to be made fully operational by selecting the appropriate VAV box application using the MAP.

CV series controllers feature an integral damper actuator, and a digital Differential Pressure Transducer (DPT) sensor. The CVM03050-0P model features an integral potentiometer to sense actual VAV box damper position. These controllers include an integral real-time clock, which enables the controllers to monitor and control schedules, calendars, and trends, and operate for extended periods of time as stand-alone controllers when offline from the Metasys system network. These controllers also connect easily to the wired and wireless network sensors for zone and discharge air temperature sensing.

For product application details, refer to the Metasys CG, CV Equipment Controllers and XPM Expansion Modules Product Bulletin (LIT-12013105).

FEATURES

- **Sleek and modern packaging and styling -** Provides a modern, aesthetically pleasing industrial design.
- **Standard hardware and software platform -** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows. Also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **High memory capacity and fast processing power -** Provides application engineers with the horsepower to meet sophisticated control requirements.
- **Auto-Tuned Control Loops -** Reduce commissioning time, eliminate change-ofseason re-commissioning, and reduce wear and tear on mechanical devices.
- **Patented Proportional Adaptive Control (PAdaptive) and PRAC -** Provides continuous loop tuning.
- **Standard BACnet protocol -** Provides interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.
- **Models to support both BACnet MS/TP and N2, with auto-detection of the communications protocols -** Controller auto-detects the BACnet MS/TP or N2 protocol that is connected to it, which enables the same controller to support multiple communication protocols without the need to purchase a special model per protocol, and without extra manual setup.

FEATURES

- **BACnet Testing Laboratories (BTL) listed and certified as BACnet Advanced Application Controllers (B-AAC) -** Ensures openness and interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.
- **BACnet automatic discovery -** Supports easy controller integration into a Metasys BAS.
- **Wireless ZFR and ZFR Pro support -** Provides a wireless alternative to hard-wired MS/ TP networking, offering application flexibility and mobility with minimal disruption to building occupants, and also simplifies and speeds up replacements.
- **Integral real-time clock -** An integral real-time clock, which enables the controllers to monitor and control schedules, calendars, and trends, and operate for extended periods of time as stand-alone controllers when offline from the Metasys system network.
- **Pluggable screw terminal blocks -** Pluggable input/output wiring terminal blocks that can be removed from the controller provide electrical installers and field technicians the ability to quickly and easily install and service a controller without the need to disconnect and reconnect the input/output wiring.
- **Decimal MS/TP address set with three rotary -** switches Easy-to-use rotary switches set the MS/TP address in decimal format.
- **Universal Inputs and Configurable Outputs -** Allows multiple signal options to provide input/ output flexibility.
- **End-of-Line (EOL) switch in MS/TP equipment controllers -** Enables equipment controllers to be terminating devices on the communications bus.
- **Default application for Input/Output wiring validation -** Enables validation of the input and output terminals' wiring without having to download an application file.
- **Background transfer coupled with enable/ disable logic options in Controller Configuration Tool (CCT) -** Saves field technicians' time, enables productivity and minimizes equipment disruption, since the controllers are operating while file updates take place in the background and the application can be left disabled until the system is ready to run.
- **SA Bus commissioning improvements -** Saves field technicians time when commissioning SA Bus devices by enabling an equipment controller to transfer and apply firmware files to all the SA Bus (IOM, XPM, NS8000) devices connected to it at the same time.
- **An integrated damper actuator and digital Differential Pressure Transducer (DPT) sensor -** Reduces installation time
- **Fast response actuator -** Drives the damper from full open to full closed (90°) in 60 seconds to reduce commissioning time
- **Preloaded, selectable applications -** The CV series VAV box controller is shipped with a factory-installed library of the most popular VAV box control applications. You can make this controller fully operational by using the MAP to select the appropriate VAV box application, thereby, saving field technicians' time by eliminating the provisioning workflow.
- **Optional integrated feedback potentiometer -** Reassures users and field technicians of the VAV box damper's actual position and enables them to easily confirm and troubleshoot VAV controller operations, confirm actuator is at the desired position and track damper position.

ORDERING INFORMATION

		M4-CVM03050-0	M4-CVM03050-0P
Communication Protocols	BACnet MS/TP, N2, or Wireless (using add-on modules)		
Network Engines	All network engine model types *Refer to the Network Engines Product Bulletin (LIT-12012138) for details.*		
Modular Jacks	FC and SA Bus Modular Ports: RJ-12 6-Pin Modular Jacks		
Point Types	**Signals Accepted**		
Universal Input (UI)	15 VDC Power Source (Provides 35mA total current source) Analog Input - Voltage Mode (0–10 VDC) Analog Input - Resistive Mode (0–600k ohm), RTD (1k Nickel [Johnson Controls sensor], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode	3	3
Configurable Output (CO)	Analog Output - Voltage Mode (0–10 VDC) Binary Output 24 VAC Triac Analog Output Signal Common Binary Output Signal Common	2	2
Binary Output (BO)	Binary Output - 24 VAC Triac	3	3
Integrated Actuator	Internal	1	1
Differential Pressure Transducer	Internal	1	1
Integrated Feedback Potentiometer	Internal	No	Yes
SA Bus	Supports up to 10 total wired SA Bus devices, including the XPM and IOM series expansion I/O modules and up to 4 NS series network sensors.	Up to 4 NS Series Network Sensors Up to 9 WRZ sensors when using the ZFR or ZFR Pro Series wireless router configuration and up to 5 WRZ sensors when using the one-to-one WRZ-78xx wireless configuration	

CODES	DESCRIPTION
M4-CVM03050-0	VAV Box Controller with Integrated Actuator and Digital Differential Pressure Transducer (DPT) Sensor. Includes MS/TP (and N2) communication; 8 points (3 UI, 2 CO, and 3 BO); real-time clock; 24 VAC input.
M4-CVM03050-0P	VAV Box Controller with Integrated Actuator, Position Feedback, and DPT Sensor. Includes MS/TP (and N2) communication; 8 points (3 UI, 2 CO, and 3 BO); real-time clock; 24 VAC input.

ACCESSORIES (ORDER SEPARATELY)

CODE	DESCRIPTION
XPM Series Expansion Modules	*Refer to the M4-XPM Expansion Modules Catalog Page (LIT-1901145) for a complete list of available Expansion Modules.*
IOM Series Expansion Modules	*Refer to the Metasys® System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042) for a complete list of available Expansion Modules.*

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ORDERING INFORMATION

ACCESSORIES (ORDER SEPARATELY)

CODE	DESCRIPTION
TL-CCT-0	License enabling Controller Configuration Tool (CCT) software for one user
MS-FCP-0	License enabling Metasys Equipment Controller Firmware Package Files required for CCT
Mobile Access Portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
MS-DIS1710-0	Local Controller Display
NS-ATV7003-0	Handheld VAV Balancing Tool
NS Series Network Sensors	*Refer to the NS Series Network Sensors Product Bulletin (LIT-12011574) for specific sensor model descriptions.*
AS-CBLTSTAT-0	Cable adapter for connection to 8-pin TE-6700 Series sensors
NS-WALLPLATE-0	Network Sensor Wall Plate
WRZ Series Wireless Room Sensors	*Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12000653) for specific sensor model descriptions.*
WRZ-7860-0	*Refer to the WRZ-7860 Receiver for One-to-One Wireless Room Sensing Product Bulletin (LIT-12011640) for a list of available products.*
WRZ-SST-120	*Refer to the WRZ-SST-120 Wireless Sensing System Tool Installation Instructions (LIT-24-10563-55) for usage instructions.*
WRG1830/ZFR183x Pro Series Wireless Field Bus System	*Refer to the WRG1830/FX-ZFR183x Pro Series Wireless Field Bus System Technical Bulletin (LIT-12013553) for a list of available products.*
ZFR-USBHA-0	ZFR USB Dongle provides a wireless connection through CCT to allow wireless commissioning of the wirelessly enabled CGM and CVM controllers. It also allows use of the ZFR Checkout Tool (ZCT) in CCT. **Note:** The ZFR-USBHA-0 replaces the IA OEM DAUBI_2400 ZFR USB dongle. *For additional information about the ZFR-USBHA-0 ZFR dongle, refer to the ZCT Checkout Tool Help LIT-12012292 or the WNC1800_ZFR182x Pro Series Wireless Field Bus System Technical Bulletin (LIT-12012356).*
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 72.2 cm, Primary Leads and 76.2 cm Secondary Leads, Class 2
MS-FIT100-0	The Field Inspection Tool or (FIT) is a portable handheld device with a user interface that is used to test and troubleshoot the BACnet protocol MS/TP RS-485 communications bus that connects supervisory controllers and equipment controllers to field point interfaces. The FIT can be used to check out the wiring of the MS/TP RS-485 bus as well as verify proper communications of supervisory controllers and equipment controllers connected to the bus. The FIT can be used on both the FC Bus and SA Bus.
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router
ACC-TBKPWFCSA-0	Power, FC Bus, and SA Bus terminal block replacement kit for SNC, CG, CV, and XPM products. Kit includes 5 of each terminal block type. 15 terminal blocks in total.
ACC-TBKINOUT-0	Input and Output terminal block replacement kit for SNC, CG, CV and XPM products. Kit includes 5 of each 2, 3, and 4 position Input and Output terminal blocks. 30 terminal blocks in total.

TECHNICAL SPECIFICATION

Codes	
M4-CVM03050-0	VAV Box Controller with Integrated Actuator and Digital Differential Pressure Transducer (DPT) Sensor. Includes MS/TP (and N2) communication; 8 points (3 UI, 2 CO, and 3 BO); real-time clock; 24 VAC input.
M4-CVM03050-0P	VAV Box Controller with Integrated Actuator, Position Feedback, and DPT Sensor. Includes MS/TP (and N2) communication; 8 points (3 UI, 2 CO, and 3 BO); real-time clock; 24 VAC input.
Power requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power consumption	10 VA typical, 14 VA maximum [1] **Note:** The USB feature is not currently supported.
Power source	+15 VDC power source terminals provide 35 mA total current. Quantity 1 located in Universal IN terminals - for active (3-wire) input devices
Ambient conditions	
Operating	0°C to 50°C
Storage	-40°C to 70°C
Network engines	All network engine model types
Communications protocol	BACnet MS/TP; N2. Wireless also supported (at FC Bus and for Sensors) with additional hardware.
Device addressing for BACnet MS/TP	Decimal address set via three rotary switches: valid controller device addresses 4-127
Device addressing for N2	Decimal address set via three rotary switches: valid controller device addresses 1-254
Communications bus [2]	BACnet MS/TP (default), N2 3-wire FC Bus between the supervisory controller and equipment controllers 4-wire SA Bus between equipment controller, network sensors and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from equipment controller) to bus devices
Processor	RX64M 32-bit Renesas microcontroller
Memory	16MB Flash Memory and 8MB SDRAM
Real-time clock backup power supply	Super capacitor maintains power to the onboard real-time clock for a minimum of 72 hours when supply power to the controller is disconnected.
Input and output capabilities	
3 - Universal Inputs	Defined as 0–10 VDC, 0–600k ohms, or Binary Dry Contact
2 - Configurable Outputs	Defined as 0-10 VDC or 24 VAC Triac BO
3 - Binary Outputs	Defined as 24 VAC Triac (external power source only)
Universal Input (UI) Resolution/ Configurable Output (CO) accuracy	
UI Analog Input Mode	15-bit resolution on UIs
CO Analog Output Mode	0–10 VDC ± 200 mV
Air pressure differential sensor	Range: -2 in. to 2 in. H2O
Performance Characteristics	Typical Accuracy at ambient operating conditions: +/- 0.5 % in. H2O Typical accuracy at zero (null) pressure is +/- 0.0006 in. H2O
Actuator rating	4 N·m (35 lb·in) minimum shaft length = 44 mm (if provided)

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TECHNICAL SPECIFICATION

Terminations	
Inputs/Outputs	Pluggable Screw Terminal
FC Bus, SA Bus, and Supply Power	4-Wire and 2-Wire Pluggable Screw Terminal Blocks
FC and SA Bus Modular Ports	RJ-12 6-Pin Modular Jacks
Mounting	Mounts to damper shaft using single set screw and to duct with single mounting screw
Housing	
Enclosure material	ABS and polycarbonate UL94 5VB; Self-extinguishing
Protection Class	IP20 (IEC529)
Dimensions (height x width x depth)	165 mm x 125 mm x 73 mm Center of Output Hub to Center of Captive Spacer: 135 mm
Weight	0.69 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive.
BACnet International	BACnet Testing Laboratories™ (BTL) Protocol Revision 18 Listed and Certified BACnet Advanced Application Controller (B-AAC), based on ANSI/ASHRAE 135-2016

Notes

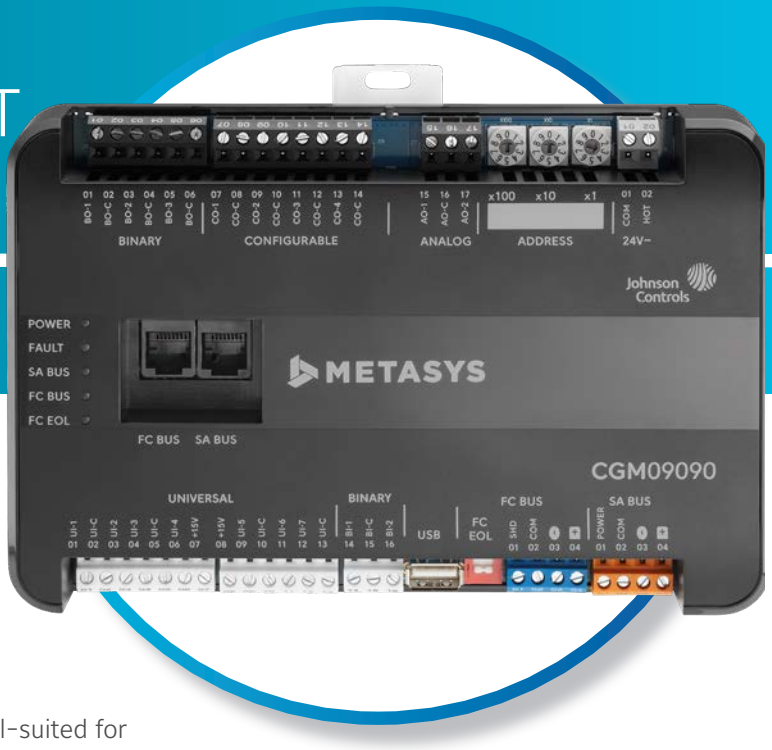
1 The VA rating does not include any power supplied to the peripheral devices connected to Configurable Outputs (COs) or Binary Outputs (BOs), which can consume up to 12 VA for each CO or BO, for a possible total consumption of an additional 60 VA (maximum).

2 *For more information, refer to the MS/TP Communications Bus Technical Bulletin (LIT-12011034).*

METASYS BUILDING MANAGEMENT SYSTEM

PROGRAMMABLE CONTROLLERS

METASYS CONTROLLERS



CG

GENERAL PURPOSE APPLICATION CONTROLLER

The CG series general purpose application controllers are well-suited for controlling a wide variety of facility and HVAC equipment, including fan coils, air handling units, packaged HVAC equipment, and central plant equipment. CG series controllers run pre-engineered and user-programmed applications. There are two models of CG series controllers available with two different sets of onboard input/output interfaces *(Ordering information)*. You can expand their I/O interfaces by connecting XPM or IOM series I/O expansion modules.

CG series equipment controllers include an integral realtime clock, which enables the controllers to monitor and control schedules, calendars, and trends, and operate for extended periods of time as standalone controllers when offline from the Metasys system network.

For product application details, refer to the Metasys CG, CV Equipment Controllers Product Bulletin (LIT-12013105).

FEATURES

- **Sleek and modern packaging and styling -** Provides a modern, aesthetically pleasing industrial design.
- **Standard hardware and software platform -** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows. Also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **High memory capacity and fast processing power -** Provides application engineers with the horsepower to meet sophisticated control requirements.
- **Auto-Tuned Control Loops -** Reduce commissioning time, eliminate change-ofseason re-commissioning, and reduce wear and tear on mechanical devices.
- **Patented Proportional Adaptive Control (PAdaptive) and PRAC -** Provides continuous loop tuning.
- **Standard BACnet protocol -** Provides interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.
- **Models to support both BACnet MS/TP and N2, with auto-detection of the communications protocols -** Controller auto-detects the BACnet MS/TP or N2 protocol that is connected to it, which enables the same controller to support multiple communication protocols without the need to purchase a special model per protocol, and without extra manual setup.
- **BACnet Testing Laboratories (BTL) listed and certified as BACnet Advanced Application Controllers (B-AAC) -** Ensures openness and interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.

PROGRAMMABLE CONTROLLERS

CG METASYS CONTROLLERS

- **BACnet automatic discovery -** Supports easy controller integration into a Metasys BAS.
- **Wireless ZFR and ZFR Pro support -** Provides a wireless alternative to hard-wired MS/ TP networking, offering application flexibility and mobility with minimal disruption to building occupants, and also simplifies and speeds up replacements.
- **Integral real-time clock -** An integral real-time clock, which enables the controllers to monitor and control schedules, calendars, and trends, and operate for extended periods of time as stand-alone controllers when offline from the Metasys system network.
- **Pluggable screw terminal blocks -** Pluggable input/output wiring terminal blocks that can be removed from the controller provide electrical installers and field technicians the ability to quickly and easily install and service a controller without the need to disconnect and reconnect the input/output wiring.
- **Decimal MS/TP address set with three rotary switches -** Easy-to-use rotary switches set the MS/TP address in decimal format.
- **Universal Inputs and Configurable Outputs -** Allows multiple signal options to provide input/ output flexibility.
- **End-of-Line (EOL) switch in MS/TP equipment controllers -** Enables equipment controllers to be terminating devices on the communications bus.
- **Default state for Input/Output wiring validation -** Enables validation of the input and output terminals' wiring without having to download an application file.
- **Background transfer coupled with enable/disable logic options in Controller Configuration Tool (CCT) -** Saves field technicians' time, enables productivity and minimizes equipment disruption, since the controllers are operating while file updates take place in the background and the application can be left disabled until the system is ready to run.
- **SA Bus commissioning improvements -** Saves field technicians time when commissioning SA Bus devices by enabling an equipment controller to transfer and apply firmware files to all the SA Bus (IOM, XPM, NS8000) devices connected to it at the same time.

ORDERING INFORMATION

		M4-CGM09090-0	M4-CGM04060-0
Communication protocol	BACnet MS/TP, N2, or Wireless (using add-on modules)		
Supported Network Engines	All network engine model types *Refer to the Network Engines Product Bulletin (LIT-12012138) for details.*		
Modular Jacks	FC and SA Bus Modular Ports: RJ-12 6-Pin Modular Jacks		
Point Types	**Signals Accepted**		
Universal Input (UI)	15 VDC Power Source (Provide 100mA total current) Analog Input - Voltage Mode (0–10 VDC) Analog Input - Current Mode (4–20 mA) Analog Input - Resistive Mode (0–600k ohm), RTD (1k Nickel [Johnson Controls sensor], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode Universal Input Common	7	3
Binary Input (BI)	Binary Input, Dry Contact Maintained Mode Binary Input - Pulse Counter/Accumulator Mode Binary Input Common	2	1
Binary Output (BO)	Binary Output - 24 VAC Triac (External Power Source) Binary Output Common	3	2
Configurable Output (CO)	Analog Output - Voltage Mode (0–10 VDC) Binary Output 24 VAC Triac Analog Output Signal Common Binary Output Signal Common	4	4
Analog Output (AO)	Analog Output - Voltage Mode (0–10 VDC) Analog Output - Current Mode (4–20 mA) Analog Output Signal Common	2	---
SA Bus	Supports up to 10 total wired SA Bus devices, including the XPM and IOM series expansion I/O modules and up to 4 NS series network sensors.	Up to 4 NS Series Network Sensors Up to 9 WRZ sensors when using the ZFR or ZFR Pro Series wireless router configuration and up to 5 WRZ sensors when using the one-to-one WRZ-78xx wireless configuration	

CODES	DESCRIPTION
M4-CGM09090-0	18-point General Purpose Application MS/TP Controller Includes: MS/TP (and N2) communication; 18 points (7 UI, 2 BI, 4 CO, 2 AO, 3 BO); real-time clock; 24 VAC input
M4-CGM04060-0	10-point General Purpose Application MS/TP Controller Includes: MS/TP (and N2) communication; 10 points (3 UI, 1 BI, 4 CO, 2 BO); real-time clock; 24 VAC input

ORDERING INFORMATION

ACCESSORIES (ORDER SEPARATELY)

CODE	DESCRIPTION
XPM Series Expansion Modules	*Refer to the M4-XPM Expansion Modules Catalog Page (LIT-1901145) for a complete list of available Expansion Modules.*
IOM Series Expansion Modules	*Refer to the Metasys® System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042) for a complete list of available Expansion Modules.*
TL-CCT-0	License enabling Controller Configuration Tool (CCT) software for one user
MS-FCP-0	License enabling Metasys Equipment Controller Firmware Package Files required for CCT
Mobile Access Portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
MS-DIS1710-0	Local Controller Display
NS-ATV7003-0	Handheld VAV Balancing Tool
NS Series Network Sensors	*Refer to the NS Series Network Sensors Product Bulletin (LIT-12011574) for specific sensor model descriptions.*
AS-CBLTSTAT-0	Cable adapter for connection to 8-pin TE-6700 Series sensors
NS-WALLPLATE-0	Network Sensor Wall Plate
WRZ Series Wireless Room Sensors	*Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12000653) for specific sensor model descriptions.*
WRZ-7860-0	*Refer to the WRZ-7860 Receiver for One-to-One Wireless Room Sensing Product Bulletin (LIT-12011640) for a list of available products.*
WRZ-SST-120	*Refer to the WRZ-SST-120 Wireless Sensing System Tool Installation Instructions (LIT-24-10563-55) for usage instructions.*
WRG1830/ZFR183x Pro Series Wireless Field Bus System	*Refer to the WRG1830/FX-ZFR183x Pro Series Wireless Field Bus System Technical Bulletin (LIT-12013553) for a list of available products.*
ZFR-USBHA-0	ZFR USB Dongle provides a wireless connection through CCT to allow wireless commissioning of the wirelessly enabled CGM and CVM controllers. It also allows use of the ZFR Checkout Tool (ZCT) in CCT. **Note:** The ZFR-USBHA-0 replaces the IA OEM DAUBI_2400 ZFR USB dongle. *For additional information about the ZFR-USBHA-0 ZFR dongle, refer to the ZCT Checkout Tool Help LIT-12012292 or the WNC1800_ZFR182x Pro Series Wireless Field Bus System Technical Bulletin (LIT-12012356).*
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 72.2 cm, Primary Leads and 76.2 cm Secondary Leads, Class 2
MS-FIT100-0	The Field Inspection Tool or (FIT) is a portable handheld device with a user interface that is used to test and troubleshoot the BACnet protocol MS/TP RS-485 communications bus that connects supervisory controllers and equipment controllers to field point interfaces. The FIT can be used to check out the wiring of the MS/TP RS-485 bus as well as verify proper communications of supervisory controllers and equipment controllers connected to the bus. The FIT can be used on both the FC Bus and SA Bus.
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router
ACC-TBKPWFCSA-0	Power, FC Bus, and SA Bus terminal block replacement kit for SNC, CG, CV, and XPM products. Kit includes 5 of each terminal block type. 15 terminal blocks in total.
ACC-TBKINOUT-0	Input and Output terminal block replacement kit for SNC, CG, CV and XPM products. Kit includes 5 of each 2, 3, and 4 position Input and Output terminal blocks. 30 terminal blocks in total.

TECHNICAL SPECIFICATIONS

Code	
M4-CGM09090-0	General Purpose Application Controller Includes: MS/TP (and N2) communication; 18 points (7 UI, 2 BI, 4 CO, 2 AO, 3 BO); realtime clock; 24 VAC input
M4-CGM04060-0	General Purpose Application Controller Includes: MS/TP (and N2) communication; 10 points (3 UI, 1 BI, 4 CO, 2 BO); real-time clock; 24 VAC input
Power Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power Consumption	14 VA maximum [1] **Note:** The USB feature is not currently supported.
Power Source	+15 VDC power source terminals provide 100 mA total current.
M4-CGM09090-0	Quantity 2 located in Universal IN terminals for active (3-wire) input devices
M4-CGM04060-0	Quantity 1 located in Universal IN terminals for active (3-wire) input devices
Ambient Conditions	
Operating	0°C to 50°C; 10 to 90% RH noncondensing
Storage	-40°C to 80°C; 5 to 95% RH noncondensing
Supported Network Engines	All network engine model types
Communications Protocol	BACnet MS/TP; N2. Wireless also supported (at FC Bus and for Sensors) with additional hardware.
Device Addressing for BACnet MS/TP	Decimal address set via three rotary switches: valid controller device addresses 4-127
Device Addressing for N2	Decimal address set via three rotary switches: valid controller device addresses 1-254
Communications Bus	BACnet MS/TP (default); N2 3-wire FC Bus between the supervisory controller and equipment controllers 4-wire SA Bus between equipment controller, network sensors and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from equipment controller) to bus devices.
Processor	RX64M Renesas® 32-Bit microcontroller
Memory	16 MB flash memory and 8 MB SDRAM
Real-Time Clock Backup Power Supply	Super capacitor maintains power to the onboard real-time clock for a minimum of 72 hours when supply power to the controller is disconnected.
Input and Output Capabilities	
M4-CGM09090-0	7 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohms, or Binary Dry Contact 2 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 4 - Configurable Outputs: Defined as 0-10 VDC or 24 VAC Triac BO 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA 3 - Binary Outputs: Defined as 24 VAC Triac (external power source only)
M4-CGM04060-0	3 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohms, or Binary Dry Contact 1 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 4 - Configurable Outputs: Defined as 0-10 VDC or 24 VAC Triac BO 2 - Binary Outputs: Defined as 24 VAC Triac (external power source only)

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TECHNICAL SPECIFICATION

Universal Input (UI) Resolution/ Analog Output (AO) Accuracy	
Input	24-bit Analog to Digital converter
Output	+/- 200 mV accuracy in 0–10 VDC applications
Terminations	
Input/Output	Pluggable Screw Terminal Blocks
FC Bus, SA Bus, and Supply Power	4-Wire and 2-Wire Pluggable Screw Terminal Blocks
FC and SA Bus Modular Ports	RJ-12 6-Pin Modular Jacks
Mounting	Horizontal on single 35 mm DIN rail mount (recommended), or screw mount on flat surface with three integral mounting clips on controller
Housing	
Enclosure material	ABS and polycarbonate UL94 5VB; Self-extinguishing
Protection Class	IP20 (IEC529)
Dimensions (Height x Width x Depth)	
M4-CGM09090-0	150 mm x 190 mm x 44.5 mm including terminals and mounting clips.
M4-CGM04060-0	150 mm x 125 mm x 44.5 mm including terminals and mounting clips
	Note: Mounting space requires an additional 50 mm (2 in.) space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	
M4-CGM04060-0	0.29 kg
M4-CGM09090-0	0.5 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive nd RoHS Directive.
BACnet International	BACnet Testing Laboratories™ (BTL) Protocol Revision 18 Listed and Certified BACnet Advanced Application Controller (B-AAC), based on ANSI/ASHRAE 135-2016

Note

1 The VA rating does **not** include any power supplied to the peripheral devices connected to Configurable Outputs (COs) or Binary Outputs (BOs), which can consume up to 12 VA for each CO or BO; for a possible total consumption of an additional 84 VA (maximum).

METASYS BUILDING MANAGEMENT SYSTEM

PROGRAMMABLE CONTROLLERS

METASYS CONTROLLERS

M4-XPM

EXPANSION MODULES

The M4-XPM series input/output (I/O) expansion modules are part of the Metasys system CG, CV Equipment Controller family and can serve in one of two capacities depending on where they are installed in the Metasys system. When installed on the Sensor/Actuator (SA) Bus of a Metasys equipment controller, an XPM expands the input and output interfaces that can be used with that equipment controller. When installed on the Field Controller (FC) Bus of a Metasys network engine, an XPM can be used as I/O point multiplexors to support monitoring and control from a Metasys network engine. The point multiplexor can also be useful for sharing points between other equipment controllers on the FC Bus using peer-to-peer connectivity.

XPMs operate on an RS-485 BACnet MS/TP Bus and are BACnet Testing Laboratory (BTL) listed and certified to the BACnet Smart Actuator (B-SA) profile.

COMPATIBILITY

XPM series expansion modules can be connected to the SA Bus of the following equipment controller device types:

- CG series General Purpose Application Equipment Controllers
- CV series VAV Box Controllers
- FAC series Advanced Application Field Equipment Controllers
- FEC series Field Equipment Controllers
- VMA16, VMA18, and VMA19 series VAV Box Controllers
- SNC series Network Control Engines
- NCE series Network Control Engines

Note: XPM series expansion modules may coexist on the SA Bus with IOM series input/ output expansion modules.

XPM series expansion modules can be connected to the FC bus of the following network engine types:

- SNE series Network Engines
- SNC series Network Control Engines
- NAE35, NIE39, NAE45, NAE49, NAE55, and NAE59 series Network Automation and Integration Engines
- NCE25 and NIE29 series Network Control Engines

Note: XPM series modules may coexist on the FC Bus with IOM series input/output expansion modules.

M4-XPM METASYS CONTROLLERS

FEATURES

- **Sleek and modern packaging and styling -** Provides a modern, aesthetically pleasing industrial design.
- **Standard hardware and software platform -** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows. Also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **Ability to Reside on the FC Bus or SA Bus -** Provides application flexibility.
- **BACnet Testing Laboratories (BTL) listed and certified -** Ensures openness and interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.
- **BACnet automatic discovery -** Supports easy integration into a Metasys BAS.
- **Wireless ZFR and ZFR Pro support -** Provides a wireless alternative to hard-wired MS/TP networking, offering application flexibility and mobility with minimal disruption to building occupants, and also simplifies and speeds up replacements.
- **Pluggable screw terminal blocks -** Pluggable input/output wiring terminal blocks provide electrical installers and field technicians the ability to quickly and easily install and service a device without the need to disconnect and reconnect the input/output wiring.
- **Decimal MS/TP address set with three rotary switches -** Easy-to-use rotary switches set the MS/TP address in decimal format.
- **Universal Inputs and Configurable Outputs -** Allows multiple signal options to provide input/output flexibility.
- **End-of-Line (EOL) switch in MS/TP equipment controllers and expansion modules -** Enables devices to be terminating devices on the communications bus.

ORDERING INFORMATION

		M4-XPM04060	M4-XPM09090	M4-XPM18000
Communication Protocols	BACnet MS/TP			
Network Engines	*For a list of compatible Network Engines, see Compatibility. Refer to the Network Engines Product Bulletin (LIT-12012138) for details.*			
Modular Jacks	SA/FC Bus Port: RJ-12 6-Pin Modular Jack			
Point Types	Signals Accepted	Number of points		
Universal Input (UI)	15 VDC Power Source (Provide 100mA total current) Analog Input - Voltage Mode (0–10 VDC) Analog Input - Current Mode (4–20 mA) Analog Input - Resistive Mode (0–600k ohm), RTD (1k Nickel [Johnson Controls sensor], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode Universal Input Common	3	7	---
Binary Input (BI)	Binary Input, Dry Contact Maintained Mode Binary Input - Pulse Counter/ Accumulator Mode Binary Input Common	1	2	18
Configurable Output (CO)	Analog Output - Voltage Mode (0–10 VDC) Binary Output 24 VAC Triac Analog Output Signal Common Binary Output Signal Common	4	4	---
Analog Output (AO)	Analog Output - Voltage Mode (0–10 VDC) Analog Output - Current Mode (4–20 mA) Analog Output Signal Common	---	2	---
Binary Output (BO)	Binary Output - 24 VAC Triac (External Power Source) Binary Output Common	2	3	---

CODE	DESCRIPTION
M4-XPM04060-0	10-point Input/Output Expansion Module Includes: MS/TP communication; 10 points (3 UI, 1 BI, 4 CO, 2 BO); 24 VAC input
M4-XPM09090-0	18-point Input/Output Expansion Module Includes: MS/TP communication; 18 points (7 UI, 2 BI, 4 CO, 2 AO, 3 BO); 24 VAC input
M4-XPM18000-0	18-point Input Expansion Module Includes: MS/TP communication; 18 points (18 BI); 24 VAC input

ORDERING INFORMATION

ACCESSORIES (ORDER SEPARATELY)

CODE	DESCRIPTION
TL-CCT-0	Metasys Controller Configuration Tool (CCT) software
MS-FCP-0	Metasys Equipment Controller Firmware Package Files required for CCT
Mobile Access Portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
WRZ Series Wireless Room Sensors	*Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12000653) for specific sensor model descriptions.*
WRZ-7860-0	Receiver for One-to-One Wireless Room Sensing Systems - functions with WRZ Series Sensors room sensors. *Refer to the WRZ-7860 Receiver for One-to-One Wireless Room Sensing Product Bulletin (LIT-12011640) for a list of available products.*
WRZ-SST-120	Wireless System Survey Tool. For use with the lower power 10mW WRZ and WRZ-7860 systems. *Refer to the WRZ-SST-120 Wireless Sensing System Tool Installation Instructions (LIT-24-10563-55) for usage instructions.*
ZFR-HPSST-0	Wireless System Survey Tool. For use with the higher power WRG1830/ZFR183x systems.
WRG1830/ZFR183x Pro Wireless Field Bus System	This system is used for installations that support BACnet/IP but can also coexist with the ZFR1800 Series when installed under the same supervisor. *Refer to the WRG1830/ZFR183x Pro Series Wireless Field Bus System Catalog Page (LIT-1901026) for a list of available products.*
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 72.2 cm, Primary Leads and 76.2 cm Secondary Leads, Class 2
ACC-TBKINOUT-0	Input and Output terminal block replacement kit for SNC, CGM, CVM and XPM products. Kit includes 5 of each 2, 3, and 4 position Input and Output terminal blocks. 30 terminal blocks in total.
ACC-TBKPWFCSA-0	Power, FC Bus, and SA Bus terminal block replacement kit for SNC, CGM, CVM, and XPM products. Kit includes 5 of each terminal block type. 15 terminal blocks in total.
MS-FIT100-0	The Field Inspection Tool or (FIT) is a portable handheld device with a user interface that is used to test and troubleshoot the BACnet protocol MS/TP RS-485 communications bus that connects supervisory controllers and equipment controllers to field point interfaces. The FIT can be used to check out the wiring of the MS/TP RS-485 bus as well as verify proper communications of supervisory controllers and equipment controllers connected to the bus. The FIT can be used on both the FC Bus and SA Bus.
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router

TECHNICAL SPECIFICATION

Power Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power Consumption	14 VA maximum **Note:** The VA rating does **not** include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO; for a possible total consumption of an additional 84 VA (maximum).
Power Source	+15 VDC power source terminals provide 100 mA total current. Only present on XPM09090 and XPM04060 models.
M4-XPM09090-0	Quantity 2-located in Universal IN terminals for active (3-wire) input devices
M4-XPM04060-0	Quantity 1-located in Universal Input terminals for active (3-wire) input devices
Ambient Conditions	
Operating	0°C to 50°C (32°F to 122°F); 10% to 90% RH noncondensing
Storage	-40°C to 80°C (-40°F to 176°F); 5% to 95% RH noncondensing
Network Engines	All network engine model types
Communications Protocol	BACnet MS/TP; Wireless also supported (at FC Bus and for Sensors) with additional hardware.
Device Addressing for BACnet MS/TP	Decimal address set via three rotary switches; valid controller device addresses 4-127
Communications Bus	BACnet MS/TP (default); 3-wire FC Bus between the supervisory controller and expansion modules 4-wire SA Bus between equipment controller, network sensors and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from equipment controller) to bus devices.
Processor	RX64M Renesas® 32-Bit microcontroller
Memory	16 MB flash memory and 8 MB SDRAM
Input and Output Capabilities	
Universal Inputs	Defined as 0–10 VDC, 4–20 mA, 0–600k ohms, or Binary Dry Contact
Binary Inputs	Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
Configurable Outputs	Defined as 0-10 VDC or 24 VAC @500mA Triac BO
Analog Outputs	Defined as 0–10 VDC or 4–20 mA
Binary Outputs	Defined as 24 @500mA VAC Triac (external power source only)
Universal Input (UI) Resolution/ Analog Output (AO) Accuracy	
Input	24-bit Analog to Digital converter
Output	+/- 200 mV accuracy in 0–10 VDC applications
Terminations	
Input/Output	Pluggable Screw Terminal Blocks
SA/FC Bus and Supply Power	4-Wire and 2-Wire Pluggable Screw Terminal Blocks
SA/FC Bus Port	RJ-12 6-Pin Modular Jack
Mounting	Horizontal on single 35 mm DIN rail mount (recommended), or screw mount on flat surface with three integral mounting clips on controller

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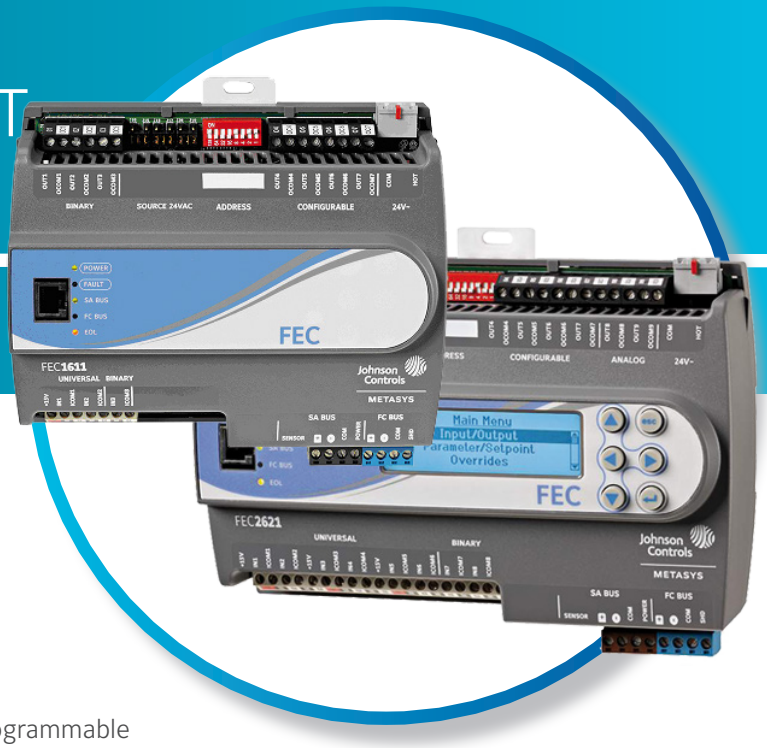
TECHNICAL SPECIFICATION

Housing	
Enclosure material	ABS and polycarbonate UL94 5VB; Self-extinguishing
Protection Class	IP20 (IEC529)
Dimensions (Height x Width x Depth)	
M4-XPM09090-0	150 mm x 190 mm x 44.5 mm including terminals and mounting clips
M4-XPM04060-0, M4-XPM18000-0	150 mm x 125 mm x 44.5 mm including terminals and mounting clips
	Note: Mounting space requires an additional 50 mm (2 in.) space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	
M4-XPM04060-0, XPM18000-0	0.29 kg
M4-XPM09090-0	0.5 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive.
BACnet International	BACnet Testing Laboratories™ (BTL) Protocol Revision 18 Listed and Certified BACnet Smart Actuator (B-SA), based on ANSI/ASHRAE 135-2016

METASYS BUILDING MANAGEMENT SYSTEM

PROGRAMMABLE CONTROLLERS

METASYS CONTROLLERS



FEC

FIELD EQUIPMENT CONTROLLERS

The Field Equipment Controller (FEC) Series products are programmable controllers that can be switched between BACnet® MS/TP and N2 communications protocols. When they are used as BACnet MS/TP devices, they are BACnet Application Specific Controllers (B-ASCs) with integral MS/TP communications. In N2 mode, they can be used to modernize sites with legacy Johnson Controls® controllers.

FECs feature 32-bit microprocessor architecture, patented continuous tuning adaptive control, and peer-to-peer communications, and are available with an optional built-in LCD screen local UI.

A full range of FEC models combined with the Input/Output Module (IOM) models can be applied to a wide variety of building applications ranging from simple fan coil or heat pump control to advanced central plant management. All FEC Series Controllers configured for BACnet support wireless communications using the ZFR System accessories.

FEATURES

- **Switchable Communications Protocols –** Provides flexibility with a choice between BACnet MS/TP and N2 communication
- **Standard BACnet® Protocol –** Provides interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.
- **Standard Hardware and Software Platform –** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows. Also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **ZFR Wireless Field Controller (FC) or Sensor/Actuator (SA) Bus Interface –** Provides a wireless alternative to hard-wired Metasys® system counterparts with either the ZFR1800 Series Wireless Bus or the WNC1800/ZFR182x Pro Series Wireless Field Bus (ZFR Pro), offering application flexibility and mobility with minimal disruption to building occupants.
- **Bluetooth® Wireless Commissioning –** Provides an easy-to-use connection to the configuration and commissioning tool.
- **Auto-Tuned Control Loops –** Reduce commissioning time, eliminate change-of-season re-commissioning, and reduce wear and tear on mechanical devices.
- **Universal Inputs, Configurable Outputs, and Point Expansion Modules –** Allows multiple signal options to provide input/output flexibility.
- **Optional Local User Interface Display –** Allows convenient monitoring and adjusting capabilities at the local device.

PROGRAMMABLE CONTROLLERS

FEC METASYS CONTROLLERS

FEATURES

- **BACnet® Testing Laboratories (BTL) Listed –** Ensures interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.
- **32-bit Microprocessor –** Ensures optimum performance and meets industry specifications.
- **BACnet Automatic Discovery –** Supports easy controller integration into a Metasys BAS.
- **End-of-Line (EOL) Switch in MS/TP Field Controllers –** Enables field controllers to be terminating devices on the communications bus.
- **Pluggable Communications Bus and Supply Power Terminal Blocks –** Expedites installation and troubleshooting.
- **Patented proportional adaptive control (P-Adaptive) and Pattern Recognition Adaptive Control (PRAC) technologies –** Provide continuous loop tuning.
- **Wireless Connectivity through the ZFR1800 Series or the WNC1800/ZFR182x Pro Series Wireless Field Bus Systems in MS/TP Controllers –** Enables wireless mesh connectivity to supervisory controllers, facilitating easy initial location and relocation.
- **Writable Flash Memory –** Allows standard or customized applications to be downloaded from the Controller Configuration Tool (CCT) and enables persistent application data.
- **Large Product Family –** Provides a wide range of point mix to meet application requirements and allows for the addition of one or more Input/Output Module (IOM) and Network Sensors to provide even more I/O capacity.
- **User-Friendly Graphic Theme and Clear Pushbutton Identification –** Facilitate easy navigation of the integral or optional UI/display.

ORDERING INFORMATION

MODEL INFORMATION (INCLUDING POINT TYPE COUNTS)

		FEC16	FEC26
Communication protocol		BACnet MS/TP, N2	
Engines		All Model types. Some NIE models support MS/TP and N2 devices. Refer to the Network Engines Product Bulletin (LIT-12012138) for details.	
Modular jacks		6-pin SA Bus Modular Port supports one communicating sensor. Or you can wire up to four communicating sensors to the SA Bus Terminal Block. They cannot be used at the same time.	
		6-pin FC Bus for tool support	
Point types	Signals accepted		
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC Analog Input, Current Mode, 4–20 mA [1] Analog Input, Resistive Mode, 0–2k ohm, resistance temperature detector (RTD) (1k NI [Johnson Controls], 1k PT, A99B SI), negative temperature coefficient (NTC) (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode	2	6
Binary Input (BI)	Dry Contact Maintained Mode Pulse Counter/Accumulator Mode (High Speed), 100 Hz	1	2
Analog Output (AO)	Analog Output, Voltage Mode, 0–10 VDC Analog Output, Current Mode, 4–20 mA		2
Binary Output (BO)	24 VAC Triac	3	3
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC Binary Output Mode, 24 VAC Triac	4	4

Notes

1 Analog Input, Current Mode is set by hardware for the FEC26, and by software for the FEC16.

ORDERING INFORMATION

CODES	DESCRIPTION
MS-FEC1611-1	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support
MS-FEC1611-1ET	10-Point Field Equipment Controller Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C.
MS-FEC1621-1	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support; Integral Display and 6-Button Navigation Touchpad
MS-FEC2611-0	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support
MS-FEC2611-0ET	FEC2611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C
MS-FEC2621-0	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support; Integral Display and 6-Button Navigation Touchpad

ACCESSORIES

CODES	DESCRIPTION
Mobile Access portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
MS-DIS1710-0	Local Controller Display *Refer to Local Controller Display Product Bulletin (LIT-12011273) for more information.*
WRZ Series Wireless Room Sensors	Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011653) for specific sensor model descriptions.
ZFR1800 Series Wireless Field Bus System	This system is used for installations that only support BACnet MS/TP. Refer to the WNC1800/ ZFR182x Pro Series Wireless Field Bus System Product Bulletin (LIT-12012320) for a list of available products.
NS Series Network Sensors	Refer to the NS Series Network Sensors Product Bulletin (LIT-12011574) for specific sensor model descriptions.
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2
AP-TBK4SA-0	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown (Bulk Pack of 10)
AP-TBK4FC-0	Replacement MS/TP FC Bus Terminal, 4-Position Connector (Bulk Pack of 10)
AP-TBK3PW-0	Replacement Power Terminal, 3-Position Connector, Gray (Bulk Pack of 10)
AS-CBLTSTAT-0	Cable adapter that provides a connection between 8-pin TE-6700 Series sensors and field controllers that do not have a 8-pin sensor connection.
ZFR-USBHA-0	ZFR USB Dongle provides a wireless connection through CCT to allow wireless commissioning of the wirelessly enabled FEC, Advanced Application Field Equipment Controller (FAC), IOM, and VMA16 controllers. Also allows use of the ZFR Checkout Tool (ZCT) in CCT. **Note:** The ZFR-USBHA-0 replaces the IA OEM DAUBI_2400 ZigBee® USB dongle. For additional information on the ZFR-USBHA-0 ZigBee dongle, refer to the ZFR1800 Series Wireless Field Bus System Technical Bulletin (LIT-12011295) or ZFR1800 Series Wireless Field Bus System Quick Reference Guide (LIT-12011630).
TL-BRTRP-0	Portable BACnet IP to MS/TP Router

TECHNICAL SPECIFICATION

Codes	
MS-FEC1611-1	10-Point FEC
MS-FEC1611-1ET	FEC1611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C.
MS-FEC1621-1	10-Point FEC with Integral Display and Pushbutton User Interface
MS-FEC2611-0	17-Point FEC
MS-FEC2611-0ET	FEC2611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C
MS-FEC2621-0	17-Point FEC with Integral Display and Push Button User Interface
Supply voltage	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety, Extra-Low Voltage (SELV)
Power consumption	20 VA maximum
	Note: VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 84 VA (maximum).
Ambient conditions	
Operating	0 to 50°C; 10 to 90% RH noncondensing
Storage	-40 to 80°C; 5 to 95% RH noncondensing
	Note: FEC models with an -xET suffix have an operating temperature range of -40 to 70°C.
Controller addressing	
For BACnet-configured controllers	DIP switch set; valid field controller device addresses 4–127 (device addresses 0–3 and 128–255 are reserved)
For N2-configured controllers	DIP switch set; valid control device addresses 1–255
Communications Bus [1]	RS-485, field selectable between BACnet MS/TP and N2 communications: 3-wire FC Bus between the supervisory controller and field controllers 4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from field controller) to bus devices
Processor	H8SX/166xR Renesas® 32-bit microcontroller
Memory	1 MB Flash Memory and 512 KB RAM
Input and Output capabilities	
MS-FEC16 Models	2 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 1 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power) 4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO
MS-FEC26 Models	6 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power) 4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA

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TECHNICAL SPECIFICATION

Analog Input/Analog Output resolution and accuracy	Analog Input: 16-bit resolution Analog Output: 16-bit resolution and ±200 mV in 0–10 VDC applications
Terminations	Input/Output: Fixed Screw Terminal Blocks FC Bus, SA Bus, and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks FC Bus and SA Bus Port: RJ-12 6-pin Modular Jacks
Mounting	Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
Housing	
Enclosure material	ABS and polycarbonate UL94 5VB; self-extinguishing; Plenum-rated
Protection Class	IP20 (IEC529)
Dimensions (Height x Width x Depth)	
MS-FEC16 Models	150 x 164 x 53 mm including terminals and mounting clips
MS-FEC26 Models	150 x 190 x 53 mm including terminals and mounting clips
	Note: Mounting space for all field controllers requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	
MS-FEC16 Models	0.4 kg
MS-FEC26 Models	0.5 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BACnet Testing Laboratories (BTL) Protocol Revision 4 Listed BACnet Application Specific Controller (B-ASC)

Note

1 *For more information, refer to the MS/TP Communications Bus Technical Bulletin (LIT-12011034).*

FAC

FIELD ADVANCED CONTROLLERS

The Advanced Application Field Equipment Controller (FAC) Series Controllers are programmable controllers that can communicate using BACnet/IP, MS/TP, or N2 communications protocols, depending on the model. The FAC4911 is a BACnet Advanced Application Controller (B-AAC) that communicates using BACnet/ IP communications protocol. All other FAC Series controllers can be switched between MS/TP and N2 communication protocols. FAC controllers used as MS/TP devices are B-AACs with integral RS-485 MS/TP communications.

FAC Series Controllers feature an integral real-time clock. FACs support time-based tasks and maintain timebased control, which enables these field controllers to monitor and control schedules, calendars, alarms, and trends. FACs can continue time-based control and monitoring when offline for extended periods of time from a Metasys system network.

FAC Series Controllers can also operate as standalone controllers in applications that do not require a networked supervisory device or for network applications where it is preferred to have the scheduling, alarming, and/or trending performed locally in the field controllers.

The FAC4911 controllers operate on BACnet/IP networks and integrate into Johnson Controls® and third-party systems.

The FAC3613 model include a fast persistence feature that allows data values to be held at a configurable value, up to once per second. Persistence refers to how often samples of data are stored locally. In the event of a problem, such as a loss of power, data can be retrieved up to the rate that the data is persisted, minimizing the potential loss of data. When power is restored, previously persisted data, up to the rate of persistence, remains available and accessible. For example, if persistence is configured for once per second, you only risk losing one second of data. Persisting data may be essential for situations that require greater data accuracy, including certain methods of utility data collection and billing.

The FAC2612 controller features line-voltage relay outputs, which makes this controller well-suited for use in terminal units. The FAC2612-2 model uses a line-voltage power supply, which eliminates the need for a 24 VAC transformer in line-voltage applications.

The FAC2611, FAC2612, and FAC3613 controllers using the MS/TP protocol support wireless communications using the ZFR or ZFR Pro Series accessories and the WRZ-7860 One-to-One Receiver.

PROGRAMMABLE CONTROLLERS

FAC METASYS CONTROLLERS

FEATURES

- **Switchable Communications Protocols -** Provides flexibility with a choice between BACnet MS/TP and N2 communication.
- **Standard BACnet Protocol -** Provides interoperability with other Building Automatcion System (BAS) products that use the widely accepted BACnet standard.
- **Standard Hardware and Software Platform -** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows; also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **ZFR Wireless FC or SA Bus Interface -** Provide a wireless alternative to hard-wired Metasys system counterparts, offering application flexibility and mobility with minimal disruption to building occupants.
- **Auto-Tuned Control Loops -** Reduce commissioning time, eliminate change-ofseason re-commissioning, and reduce wear and tear on mechanical devices.
- **Universal Inputs and Configurable Outputs -** Allows multiple signal options to provide input/ output flexibility.
- **BACnet Testing Laboratories (BTL) Listed and Certified -** Ensures interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industrystandard protocol.
- **BACnet Automatic Discovery -** Supports easy controller integration into a Metasys BAS.
- **End-of-Line (EOL) Switch in MS/TP Field Controllers -** Enables field controllers to be terminating devices on the communications bus.
- **Pluggable Communications Bus and Supply Power Terminal Blocks -** Expedites installation and troubleshooting.
- **Writable Flash Memory -** Allows standard or customized applications to be downloaded from the CCT and enables persistent application data.
- **DIS17 Remote Display and the MAP Gateway Support -** Enable monitoring and commanding of I/O and configuration parameters

ORDERING INFORMATION

MODEL INFORMATION (INCLUDING POINT TYPE COUNTS)

		FAC2513	FAC2611	FAC2612	FAC3613	FAC4911
Communication protocol		BACnet MS/TP	BACnet MS/TP, N2			BACnet/IP
Engines supported		All Model types. Some NIE models support MS/TP and N2 devices. *Refer to the Network Engines Product Bulletin (LIT-12012138) for details.*				SNC, SNE, OAS, NAE, and ODS at Release 9 or later.
Modular jacks		6-pin SA Bus Modular Port supports one communicating sensor. **Or** you can wire up to four communicating sensors to the SA Bus Terminal Block. They cannot be used at the same time.				
			6-pin FC Bus for tool support			
Point types	Signals accepted					
Universal Input (UI)	Analog Input, Voltage mode, 0–10 VDC Analog Input, Current Mode, 4–20 mA Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A99B SI), NTC (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode	4 Current mode not supported	6	5	8	10
Binary Input (BI)	Dry contact maintained mode Pulse counter/accumulator mode (high speed), 100 Hz	6	2	4	6	6
Analog Output (AO)	Analog Output, Voltage mode, 0–10 VDC Analog current mode, 4–20 mA	2 Current mode not supported	2	---	6	4
Binary Output (BO)	24 VAC triac	2 External Power only	3	---	6	4
Configurable Output (CO)	Analog Output, Voltage mode, 0–10 VDC Binary Output mode, 24 VAC Triac	2	4	4	---	4
Relay Output (RO)	RO: Single-Pole, Double-Throw (SPDT) RO: Single-Pole, Single-Throw (SPST)	---	---	2 - SPDT and 3 - SPST line-voltage relays, 1/4 hp 120 VAC, 1/2 hp 240 VAC	---	---

ORDERING INFORMATION

CODES	DESCRIPTION
MS-FAC2513-0	16-Point Advanced Application Field Equipment Controller with 4 UI, 6 BI, 2 CO, 2 BO, and 2 AO; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock **Note:** This model is only available in certain regions. Contact your local Johnson Controls representative for more information.
MS-FAC2611-0	17-Point Advanced Application Field Equipment Controller with 6 UI, 2 BI, 4 CO, 3 BO, and 2 AO; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock
MS-FAC2612-1	18-Point Advanced Application Field Equipment Controller with 5 UI, 4 BI, 4 CO, 2 SPDT and 3 SPST Line-Voltage ROs 1/4 hp 120 VAC, 1/2 hp 240 VAC; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock;
MS-FAC2612-2	18-Point Advanced Application Field Equipment Controller with 5 UI, 4 BI, 4 CO, 2 SPDT and 3 SPST Line-Voltage ROs, 1/4 hp 120 VAC, 1/2 hp 240 VAC; 100–240 VAC; SA Bus; FC Bus; Integral Real-time Clock
MS-FAC3613-0	26-Point Advanced Application Field Equipment Controller with 8 UI, 6 BI, 6 BO, and 6 AO; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock; Fast Persistence
MS-FAC4911-0	28-Point Advanced Application Field Equipment Controller with 10 UI, 6 BI, 4 BO, 4 AO, and 4 CO; 24 VAC; SA Sensor Port; Integral Real-time Clock; 2 Ethernet Ports for BACnet/IP Communications

ACCESSORIES

CODES	DESCRIPTION
IOM Series Expansion Modules	*Refer to the* Metasys® *System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042) for a complete list of available IOM Series Controllers.*
TL-CCT-0	Metasys Controller Configuration Tool (CCT) software
MS-FCP-0	Metasys Field Controller Firmware Package Files for CCT
Mobile Access Portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
NS Series Network Sensors	*Refer to the NS Series Network Sensors Product Bulletin (LIT-12011574) for specific sensor model descriptions.*
WRZ Series Wireless Room Sensors	*Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011653) for specific sensor model descriptions.*
MS-DIS1710-0	Local Controller Display: Refer to Local Controller Display Product Bulletin (LIT-12011273) for more information.
WRZ-7860-0	Receiver for One-to-One Wireless Room Sensing Systems - functions with WRZ Series Sensors room sensors
WRZ-SST-120	Wireless System Survey Tool (for use with the lower power 10mW WRZ and WRZ-7860 systems)
ZFR-HPSST-0	Wireless System Survey Tool (for use with the higher power WRG1830/ZFR183x systems)
WRG1830/ZFR183x Pro Wireless Field Bus System	This system is used for installations that support BACnet/IP but can also coexist with the ZFR1800 Series when installed under the same supervisor such as a network engine. *Refer to the WRG1830/ZFR183x Pro Series Wireless Field Bus System Catalog Page (LIT-1901026) for a list of available products.*
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2

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ORDERING INFORMATION

ACCESSORIES

CODES	DESCRIPTION
AP-TBK4SA-0	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown (Bulk Pack of 10)
AP-TBK4FC-0	Replacement MS/TP FC Bus Terminal, 4-Position Connector (Bulk Pack of 10)
AP-TBK3PW-0	Replacement Power Terminal, 3-Position Connector, Gray (Bulk Pack of 10)
AS-CBLTSTAT-0	Cable adapter for connection to 8-pin TE-6700 Series sensors
MS-TBKLV03-0	Terminal Block Kit - FAC Line Voltage AC Power - 3 Pieces
MS-TBKRO02-0	Terminal Block Kit - FAC 2-Position Relay Output - 9 Pieces
MS-TBKRO03-0	Terminal Block Kit - FAC 3-Position Relay Output - 6 Pieces
MS-TBKCO04-0	Terminal Block Kit - FAC 4-Position Configurable Output - 6 Pieces
MS-TBKUI04-0	Terminal Block Kit - FAC 4-Position Universal Input - 3 Pieces
MS-TBKUI05-0	Terminal Block Kit - FAC 5-Position Universal Input - 3 Pieces
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router

TECHNICAL SPECIFICATION

Codes	
MS-FAC2513-0	16-Point FAC with Integral Real-Time Clock and 24 VAC Supply Power
MS-FAC2611-0	17-Point FAC with Integral Real-Time Clock and 24 VAC Supply Power
MS-FAC2612-1	18-Point FAC with Integral Real-Time Clock and 24 VAC Supply Power
MS-FAC2612-2	18-Point FAC with Integral Real-Time Clock and 100–240 VAC Supply Power
MS-FAC3613-0	26-Point FAC with Integral Real-Time Clock and 24 VAC Supply Power with Fast Persistence
MS-FAC4911-0	28-Point FAC with Integral Real-Time Clock and 24 VAC Supply Power; Communicates over BACnet/IP network
Communications protocol	
MS-FAC2513-0, MS-FAC2611-0, MS-FAC2612-1, MS-FAC2612-2, MS-FAC3613-0	BACnet MS/TP, N2
MS-FAC4911-0	BACnet/IP
Engines supported	
MS-FAC2513-0, MS-FAC2611-0, MS-FAC2612-1, MS-FAC2612-2, MS-MS-FAC3613-0	All Model types. Some NIE models support MS/TP and N2 devices. *Refer to the Network Engines Product Bulletin (LIT-12012138) for details.*
MS-FAC4911-0	All Model types; however, certain restrictions apply. *Refer to the footnotes in the Network Engine Hardware Limitations table of the Metasys System Configuration Guide (LIT-12011832) for details.*
Power requirement	
MS-FAC2513-0, MS-FAC2611-0, MS-FAC2612-1, MS-FAC3611-0, MS-FAC4911-0	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60Hz, SELV
MS-FAC2612-2	100–240 VAC 50/60 Hz
Power consumption	
MS-FAC2513-0, MS-FAC2611-0, MS-FAC3613-0, MS-FAC4911-0	14 VA maximum
MS-FAC2612-1	30 VA maximum
MS-FAC2612-2	40 VA maximum
	Note: VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 84 VA (maximum).
Ambient conditions	
Operating	0 to 50°C, 10 to 90% RH noncondensing; Pollution Degree 2
Storage	-40 to 80°C, 5 to 95% RH noncondensing
Addressing	
For BACnet MS/TP-configured controllers	DIP switch set; valid field controller device addresses 4–127 (device addresses 0–3 and 128–255 are reserved and not valid controller addresses.)
For BACnet/IP controllers	3 rotary switches to assign unique number for each controller on the subnet to identify it in the Controller Tool for uploading, downloading, and commissioning
For N2-configured controllers	DIP switch set; valid controller device addresses 1–254

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TECHNICAL SPECIFICATION

Communications bus *RS-485, field selectable between BACnet MS/TP and N2 communications on certain models*	• 3-wire FC Bus between the supervisory controller and field controllers • 4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from field controller) to bus devices.
MS-FAC4911-0	• BACnet/IP over Ethernet cable • 4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from field controller) to bus devices.
Processor *MS-FAC2611-0, MS-FAC2612-1, MS-FAC2612-2*	H8SX/166xR Renesas® microcontroller
MS-FAC2513-0, MS-FAC3613-0	RX631 32-Bit Renesas microcontroller
MS-FAC4911-0	RX63N 32-Bit Renesas microcontroller
Memory *MS-FAC2611-0, MS-FAC2612-1, MS-FAC2612-2*	4 MB Flash Memory and 1 MB RAM
MS-FAC2513-0, MS-FAC3613-0	16 MB Flash Memory and 8 MB SDRAM
MS-FAC4911-0	16 MB Flash Memory and 8 MB RAM
Real-Time Clock Backup Power Supply	Super capacitor maintains power to the onboard real-time clock for a minimum of 72 hours when supply power to the controller is disconnected.
Input and Output capabilities *MS-FAC2513-0*	4 - Universal Inputs: Defined as 0–10 VDC, 0–600k ohm, or Binary Dry Contact 6 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 2 - Analog Outputs: Defined as 0–10 VDC 2 - Binary Outputs: Defined as 24 VAC Triac (external power source only) 2 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO
MS-FAC2611-0	6 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA 3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power) 4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO
MS-FAC2612-1, MS-FAC2612-2	5 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 4 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO 2 - Relay Outputs (Single-Pole, Double-Throw): UL 916: 1/4 hp 120 VAC, 1/2 hp 240 VAC; 360 VA Pilot Duty at 120/240 VAC (B300); 3 A Non-inductive 24–240 VAC; EN 60730: 6 (4) A N.O. or N.C. only 3 - Relay Outputs (Single-Pole, Single-Throw): UL 916:1/4 hp 120 VAC, 1/2 hp 240 VAC; 360 VA Pilot Duty at 120/240 VAC (B300); 3 A Non-inductive 24–240 VAC; EN 60730: 6 (4) A N.O. or N.C. only
MS-FAC3613-0	8 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohms, or Binary Dry Contact 6 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 6 - Binary Outputs: Defined as 24 VAC Triac (external power source only) 6 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA
MS-FAC4911-0	10 - Universal Inputs: Defined as 0–10 VDC, 0–600k ohms, or Binary Dry Contact 6 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 4 - Binary Outputs: Defined as 24 VAC Triac (external power source only) 4 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA 4 - Configurable Outputs: Defined as AO mode , 0–10 VDC or BO mode, 24 VAC Triac

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TECHNICAL SPECIFICATION

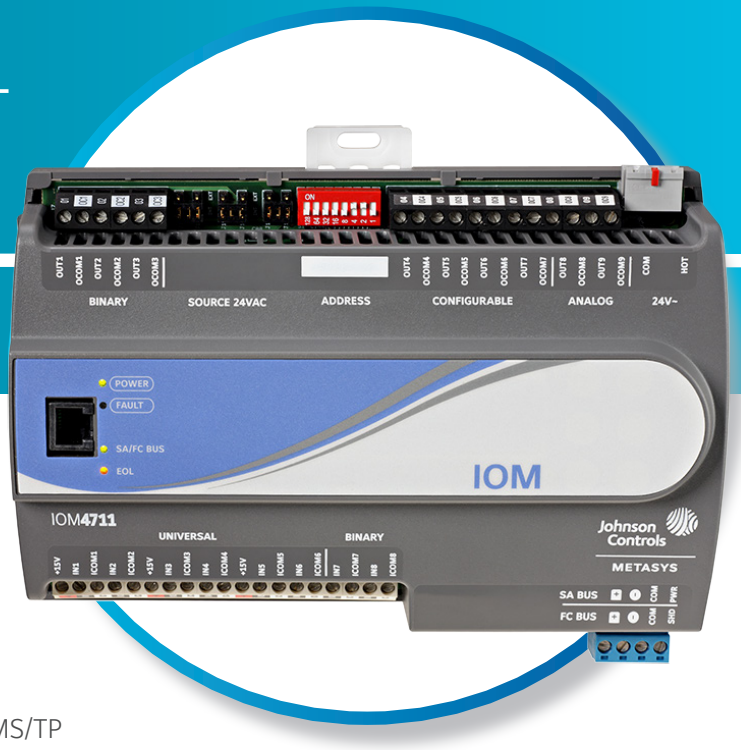
Analog Input (AI)/Analog Output (AO) resolution and accuracy	
Analog Input	15-bit resolution
Analog Output	15-bit resolution, ±200 mV accuracy in 0–10 VDC applications
Terminations	
MS-FAC2513-0	Input/Output: Fixed Screw Terminal Blocks FC Bus, SA Bus and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks SA Bus Port: RJ-12 6-pin Modular Jacks
MS-FAC2611-0, MS-FAC3613-0	Input/Output: Fixed Screw Terminal Blocks FC Bus, SA Bus and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks FC Bus and SA Bus Port: RJ-12 6-pin Modular Jacks
MS-FAC2612-1, MS-FAC2612-2	Input/Output: Pluggable Screw Terminal Blocks FC Bus, SA Bus and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks FC Bus and SA Bus Port: RJ-12 6-pin Modular Jacks
MS-FAC4911-0	Input/Output: Fixed Screw Terminal Blocks SA Bus and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks SA Bus Port: RJ-12 6-pin Modular Jacks
Mounting	Horizontal on single 35 mm DIN rain mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
Housing	
Enclosure material	ABS and polycarbonate UL94 5VB, self-extinguishing
Plenum rated Protection Class	IP20 (IEC529) (except the FAC2612 controller)
Dimensions (Height x Width x Depth)	
MS-FAC2513-0	150 x 164 x 48 mm including terminals and mounting clips
MS-FAC2611-0	150 x 190 x 53 mm including terminals and mounting clips
MS-FAC2612-x	150 x 164 x 53 mm including terminals and mounting clips
MS-FAC3613-0, MS-FAC4911-0	150 x 220 x 57.5 mm including terminals and mounting clips
	Note: Mounting space for FAC models requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	0.5 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive. Johnson Controls, declares that the FAC2612-2 models are also in compliance with the essential requirements and other relevant provisions of the Low Voltage Directive. Declared as Independently Mounted, Intended for Panel Mounting, Operating Control Type 1.B, 4kV rated impulse voltage, 100°C ball pressure test.
BACnet International	**MS-FAC261x-x:** BACnet® Testing Laboratories (BTL) Protocol Revision 7 Listed BACnet Advanced Application Controller (B-AAC) **MS-FAC2513-0, MS-FAC3613-0, MS-FAC4911-0:** BACnet® Testing Laboratories (BTL) Protocol Revision 15 Listed and Certified BACnet Advanced Application Controller (B-AAC)

Note

The MS-FAC2513-0 model is only available in certain regions. Contact your local Johnson Controls representative for more information.

PROGRAMMABLE CONTROLLERS

METASYS CONTROLLERS



IOM

INPUT/OUTPUT MODULES

The IOM Series expansion I/O modules have integral RS-485 MS/TP communications and integrate into the web-based Metasys system.
IOMs can serve in one of two capacities, depending on where they are installed in the Metasys system. When installed on the Sensor/Actuator (SA) Bus of an Advanced Application Field Equipment Controller (FAC), Field Equipment Controller (FEC), or VAV Modular Assembly (VMA) controller, the IOM expands the point count of these controllers. When installed on the Field Controller (FC) Bus, IOMs can be used as I/O point multiplexors to support monitoring and control from a Network Automation Engine (SNE) or Network Control Engine (SNC). The point multiplexor can also be useful for sharing points between other field controllers on the FC Bus using peer-to-peer connectivity.

Note: At Controller Configuration Tool (CCT) Release 10.1 and later, FACs, FECs, and VMAs can communicate by using either the BACnet or the N2 field bus networking protocol. The operation of the IOM Input/Output Module is not affected by the selection of the BACnet or the N2 protocol in the host controller.

All IOM expansion modules are BACnet Testing Laboratory (BTL) listed and certified. *Refer to "Technical Specifications" for details.*

Important: You cannot purchase a similar thirdparty device and install it in a UL/ULC Listed smoke control system. Doing so voids the UL/ULC Smoke Control Listing. Third-party devices must be provided and labeled by the factory as described in the UL/ULC Smoke Control Listing.

Important: Only those Johnson Controls products identified for use in smoke control applications have been tested and listed by UL for use in a Metasys System UL 864 10th Edition UUKL/ORD-C100-13 UUKLC Smoke Control System. Installation of a product that is not UL/ULC Listed and labeled for this application prevents the entire system from being UL/ULC Listed for smoke control.

FEATURES

- **Ability to reside on the FC Bus or SA Bus –** Provides application flexibility.
- **Standard BACnet Protocol –** Provides interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.
- **BACnet Testing Laboratories (BTL) listed and certified –** Ensures interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.
- **Standard hardware and software platform –** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows; also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **Universal Inputs and configurable Outputs –** Allows multiple signal options to provide input/output flexibility.
- **32-bit Microprocessor –** Ensures optimum performance and meets industry specifications.

IOM METASYS CONTROLLERS

FEATURES

- **BACnet automatic discovery –** Supports easy controller integration into a Metasys BAS.
- **Pluggable Communications Bus and supply power terminal blocks –** Expedites installation and troubleshooting.
- **Wireless ZFR and ZFR Pro Series Wireless Field Bus systems in MS/TP Controllers –** Enables wireless mesh connectivity to supervisory controllers, facilitating easy initial location and relocation.
- **End-of-Line (EOL) Switch in MS/TP Field Controllers –** Enables field controllers to be terminating devices on the communications bus.

ORDERING INFORMATION

IOM SERIES MODEL (INCLUDING POINT TYPE COUNTS)

The IOM2723, IOM3723, and IOM3733 models are only available in certain regions. Contact your local Johnson Controls representative for more information.

	IOM 1711	IOM 2711	IOM 2721	IOM 3711	IOM 3721	IOM 3731	IOM 4711	IOM 2723	IOM 3723	IOM 3733
Communication protocol	BACnet MS/TP									
Engines supported	All Model types									
Modular jacks	6-pin SA Bus Modular Port supports one communicating sensor. **Or** you can wire up to four communicating sensors to the SA Bus Terminal Block. They cannot be used at the same time.									
	6-pin FC Bus for tool support							---	---	---
Point types	Signals accepted									
Universal Input (UI)										
Analog Input, voltage mode, 0–10 VDC *Analog Input, current mode, 4–20 mA* *Analog Input, resistive mode, 0–2 kOhm, RTD (1k NI [Johnson Controls], 1k PT, A99B SI), NTC (10k Type L, 2.252k Type 2)* *Binary Input, dry contact maintained mode*	---	2	8	4	---	---	6	8	---	---
Binary Input (BI)										
Dry contact maintained mode *Pulse counter/accumulator mode (high speed), 100 Hz*	4	---	---	---	16	8	2	---	16	8
Analog Output (AO)										
Analog Output, voltage mode, 0–10 VDC *Analog Output, current mode, 4–20 mA*	---	---	2	---	---	---	2	2	---	---
Binary Output (BO) [1]										
24 VAC triac	---	---	---	---	---	8	3	---	---	8

...Continued...

ORDERING INFORMATION

IOM SERIES MODEL (INCLUDING POINT TYPE COUNTS)

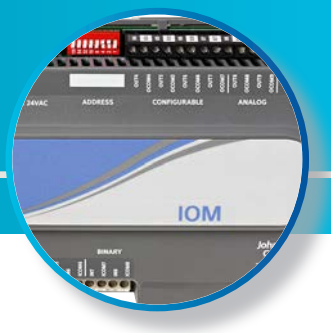
The IOM2723, IOM3723, and IOM3733 models are only available in certain regions. Contact your local Johnson Controls representative for more information.

	IOM 1711	IOM 2711	IOM 2721	IOM 3711	IOM 3721	IOM 3731	IOM 4711	IOM 2723	IOM 3723	IOM 3733
Universal Output (UO)										
Analog Output, voltage mode, 0–10 VDC *Binary Output mode, 24 VAC/DC Field-Effect Transistor (FET)* *Analog Output, current mode, 4–20 mA*	---	2	---	4	---	---	---	---	---	---
Configurable Output (CO)										
Analog Output, Voltage mode, 0–10 VDC *Binary Output mode, 24 VAC Triac*	---	---	---	---	---	---	4	---	---	---
Relay Output (RO) (-0 models only)										
120/240 VAC	---	2	---	4	---	---	---	---	---	---
Relay Output (RO) (-2 models only)										
240 VAC	---	2	---	4	---	---	---	---	---	---

Note

1 The IOM2723, IOM3723, and IOM3733 models are only available in certain regions. Contact your local Johnson Controls representative for more information.

CODE	DESCRIPTION	CE MARKED
MS-IOM1711-0	4-Point IOM with 4 BI, FC Bus and SA Bus Support	■
MS-IOM2711-0	6-Point IOM with 2 UI, 2 UO, 2 BO, FC Bus, and SA Bus Support. Relays are rated for 120/240 VAC.	---
MS-IOM2711-2	6-Point IOM with 2 UI, 2 UO, 2 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC.	■
MS-IOM2721-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support	■
MS-IOM2723-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support **Note:** This model is only available in certain regions. Contact your local Johnson Controls representative for more information.	■
MS-IOM3711-0	12-Point IOM with 4 UI, 4 UO, 4 BO, FC Bus, and SA Bus Support. Relays are rated for 120/240 VAC.	---
MS-IOM3711-2	12-Point IOM with 4 UI, 4 UO, 4 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC.	■
MS-IOM3721-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support	■
MS-IOM3723-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support **Note:** This model is only available in certain regions. Contact your local Johnson Controls representative for more information.	■
MS-IOM3731-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support	■
MS-IOM3733-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support Binary Outputs (BOs) on MS-IOM3733 controllers do not supply power for the outputs; the BOs require external low-voltage (<30 VAC) power sources. **Note:** This model is only available in certain regions. Contact your local Johnson Controls representative for more information.	■
MS-IOM4711-0	17-Point IOM with 6 UI, 2 BI, 3 BO, 2 AO, 4 CO, FC and SA Bus Support	■



ORDERING INFORMATION

ACCESSORIES

CODE	DESCRIPTION
TL-CCT-0	Controller Configuration Tool (CCT) software
MS-FCP-0	Field Controller Firmware Package Files for CCT
Mobile Access Portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
WRG1830/ZFR183x Pro Series Wireless Field Bus System	*Refer to the WRG1830/ZFR183x Pro Series Wireless Field Bus System Technical Bulletin (LIT-12013553) for further details.*
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2
AP-TBK4SA-0	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown (Bulk Pack of 10)
AP-TBK4FC-0	Replacement MS/TP FC Bus Terminal, 4-Position Connector (Bulk Pack of 10)
AP-TBK3PW-0	Replacement Power Terminal, 3-Position Connector, Gray (Bulk Pack of 10)
AS-CBLTSTAT-0	Cable adapter for connection to 8-pin TE-6700 Series sensors
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router

TECHNICAL SPECIFICATION

The MS-IOM2723-0, MS-IOM3723-0, and MS-IOM3733-0 models are only available in certain regions. Contact your local Johnson Controls representative for more information.

Codes	
MS-IOM1711-0	4-Point IOM with 4 BI, FC Bus and SA Bus Support
MS-IOM2711-0	6-Point IOM with 2 UI, 2 UO, 2 BO, FC Bus, and SA Bus Support. Relays are rated for 120/240 VAC
MS-IOM2711-2	6-Point IOM with 2 UI, 2 UO, 2 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC.
MS-IOM2721-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support
MS-IOM2723-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support
MS-IOM3711-0	12-Point IOM with 4 UI, 4 UO, 4 BO, FC Bus, and SA Bus Support. Relays are rated for 120/240 VAC
MS-IOM3711-2	12-Point IOM with 4 UI, 4 UO, 4 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC
MS-IOM3721-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support
MS-IOM3723-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support
MS-IOM3731-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support
MS-IOM3733-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support
MS-IOM4711-0	17-Point IOM with 6 UI, 2 BI, 3 BO, 2 AO, 4 CO, FC and SA Bus Support
Power Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power Consumption	14 VA maximum **Note:** VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 84 VA (maximum), depending on the IOM model.
Ambient Conditions	
Operating	0 to 50°C; 10 to 90% RH noncondensing
Storage	-40 to 80°C; 5 to 95% RH noncondensing
Addressing	DIP switch set; valid field controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid IOM addresses).
Communications Bus	BACnet MS/TP, RS-485 3-wire FC Bus between the supervisory controller and expansion modules (for MS/TP bus communications at 38,400 baud) 4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices. Includes a lead source 15 VDC supply power (from controller or expansion module) to bus devices(for MS/TP bus communications at 38,400 baud). **Note:** *For more information, refer to the MS/TP Communications Bus Technical Bulletin (LIT-12011034).*
Processor	
MS-IOM1711-0, MS-IOM2711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-0, MS-IOM3711-2, MSIOM3721-0, MS-IOM3731-0, MS-IOM4711-0	H8SX/166xR Renesas® 32-bit microcontroller
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	RX631 Renesas 32-bit microcontroller

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TECHNICAL SPECIFICATION

Memory	
MS-IOM1711-0, MS-IOM2711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-0, MS-IOM3711-2, MSIOM3731-0, MS-IOM4711-0	512 KB Flash Memory and 128 KB RAM
MS-IOM3721-0	640 KB Flash Memory and 128 KB RAM
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	4 MB External Serial Flash Memory and 768 KB internal flash and 128 KB internal RAM
Input and Output Capabilities	
MS-IOM1711-0	4 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/ Accumulator Mode
MS-IOM2711-x	2 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Universal Outputs: Analog Output: Voltage Mode, 0-10 VDC; Binary Output Mode: 24 VAC/DC FET; Analog Output: Current Mode, 4-20 mA 2 - Relay Outputs: (Single-Pole, Double-Throw) **UL 916** (-0 model only): 1/4 hp 120 VAC, 1/2 hp 240 VAC; 360 VA Pilot Duty at 120/240 VAC (B300); 3 A Noninductive 24-240 VAC **EN 60730** (-2 model only): 6 (4) A N.O. or N.C. only, 240 VAC
MS-IOM2721-0, MS-IOM2723-0	8 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA
Input and Output Capabilities (Cont.)	
MS-IOM3711-x	4 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 4 - Universal Outputs: Analog Output: Voltage Mode, 0-10 VDC; Binary Output Mode: 24 VAC/DC FET; Analog Output: Current Mode, 4-20 mA 4 - Relay Outputs: (Single-Pole, Double-Throw) **UL 916** (-0 model only): 1/4 hp 120 VAC, 1/2 hp 240 VAC; 360 VA Pilot Duty at 120/240 VAC (B300); 3 A Noninductive 24-240 VAC **EN 60730** (-2 model only): 6 (4) A N.O. or N.C. only, 240 VAC
MS-IOM3731-0, MS-IOM3733-0	8 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 8 - Binary Outputs: Defined as 24 VAC Triac (Require external low-voltage power source) **Note:** Binary Outputs (BOs) on MS-IOM3733-0 models do not supply power for the outputs; the BOs require external low-voltage (< 30 VAC) power sources.
MS-IOM4711-0	6 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Binary Inputs: Defined as Dry Contact Maintained or Pulse/Counter Accumulator Mode 3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power) 4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA
Analog Input/Analog Output Resolution and Accuracy	
MS-IOM1711-0, MS-IOM2711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-0, MS-IOM3711-2, MSIOM3731-0, MS-IOM4711-0	**Analog Input:** 16-bit resolution **Analog Output:** 16-bit resolution and ±200 mV in 0–10 VDC applications
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	**Analog Input:** 15-bit resolution **Analog Output:** ±200 mV in 0–10 VDC applications

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TECHNICAL SPECIFICATION

Terminations	
MS-IOM1711-0, MS-IOM2711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-0, MS-IOM3711-2, MSIOM3731-0, MS-IOM4711-0	Input/Output: Fixed Screw Terminal Blocks SA/FC Bus and Supply Power: 4-wire and 3-wire Pluggable Screw Terminal Blocks SA/FC Bus Port: RJ-12 6-Pin Modular Jacks
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	Input/Output: Fixed Screw Terminal Blocks **Note:** There are no labels on I/O terminal blocks. The labels are above/below the terminal blocks on theIOM packaging. SA/FC Bus and Supply Power: 4-wire and 3-wire Pluggable Screw Terminal Blocks
Mounting	Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
Housing	
Enclosure material	ABS and polycarbonate UL94 5VB; self-extinguishing, Plenum-rated
Protection Class	IP20 (IEC529)
Dimensions (Height x Width x Depth)	
MS-IOM1711, MS-IOM2711	150 x 120 x 53 mm including terminals and mounting clips
MS-IOM2721-0, MS-IOM2723-0, MS-IOM3721-0, MS-IOM3723-0, MS-IOM3731-0, MS-IOM3733-0	150 x 164 x 53 mm including terminals and mounting clips
MS-IOM3711-0, MS-IOM4711-0	150 x 190 x 53 mm including terminals and mounting clips
	Note: Mounting space for all field controllers requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	0.5 kg maximum
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive. Declared as Independently Mounted, Intended for Panel Mounting, Operating Control Type 1.B, 4kV rated impulse voltage, 100.7°C ball pressure test. **Note:** Except MS-IOM2711-0 and MS-IOM3711-0
BACnet International	**MS-IOM1711-0, MS-IOM2711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-0, MS-IOM3711-2, MSIOM3731- 0, and MS-IOM4711-0:** BACnet Testing Laboratories (BTL) Protocol Revision 4 Listed BACnet Application Specific Controller (B-ASC) **MS-IOM2723-0, MS-IOM3723-0, and MS-IOM3733-0:** BACnet Testing Laboratories (BTL) Protocol Revision 18 listed and certified BACnet Smart Actuator (B-SA)

METASYS BUILDING MANAGEMENT SYSTEM

PROGRAMMABLE CONTROLLERS

METASYS CONTROLLERS

RM

INPUT/OUTPUT MODULES

The Romutec Input/Output Modules are point expansion modules compatible with the Johnson Controls family of Field Controllers and Network Controllers and integrate seamlessly into the Metasys system. They are designed to provide additional inputs and outputs for all compatible controllers that are programmed with the controller configuration tool (CCT). A full range of Field and Network controllers and Romutec IO Modules allow various combinations, which will meet the requirements from simple to advanced building applications.

Romutec Input/Output modules can be used when manual overrides are required or when control panel space is limited and a small footprint is needed.

Six models of IO modules are offered with different combinations of BI's, BO's, AI's and AO's. In addition to the standard models optional manual override modules are available. Manual override modules come in two versions, one which can be used inside a control cabinet (DIN rail mounting) and the other for fixing on the cabinet door (front panel mounting).
The manual override modules are connected with a USB type cable directly to their corresponding host IO Module.
They are preconfigured so setting up requires nothing more than selecting the appropriate DIP switch settings.

Six additional models are also available to meet the requirement for DIN rail mounted IO modules with integral overrides and point status LED's.

Some models include a connector that can be used to lock the operation of manual overrides, i.e. if a signal is applied, the positions of the switches have no influence, and the outputs will behave as if all switches are in the "Automatic" position.

FEATURES

- Small footprint, compared with the Metasys® Input/Output module (IOM) series.
- Manual overrides available as an option. Integral manual overrides for AO and BO on selected models.
- Models available for indicating the status of binary inputs with LED's.
- Models available with input to remotely lock the operation of manual overrides.
- Easy engineering as supported by CCT (Controller Configuration Tool).
- Quick engineering for manual overrides as all modules are preconfigured.
- Connected to the SA Bus of the compatible controller.
- Equipped with fault and status LED's for troubleshooting.
- Pluggable terminals with spring clamp for quick and simple wire termination without special tools.
- NEW – All models have a refreshed design to compliment the new generation of Metasys controllers.

ORDERING INFORMATION

POINT TYPES, FUNCTIONS AND RATINGS

POINT TYPES	FUNCTION	SIGNAL/RATING
Analog IN	Analog Input, Voltage mode	Accepts a 0-10VDC input signal, internal 75kΩ pull-down
	Analog Input, Current mode	Accepts a 0-20 mA input signal, internal 100Ω load impedance
	Analog Input, Resistive mode	Accepts a 0-600 kΩ input signal, internal 12V, 15kΩ pull-up RTD:1k Nickel [L & G], 1k Nickel [DIN], 1k Platinum, A99B Silicon Temperature sensor
Binary IN	Binary Input, Dry contact maintained mode	0.01s minimum pulse width (50Hz at 50% duty cycle) Internal 35V, 2.7kΩ pull-up
Analog OUT	Analog Output, Voltage mode, sources 0-10 VDC output voltage	External 1kΩ minimum load required 10 VDC maximum output voltage, 10 mA maximum output current
Binary OUT	Binary Output, up to 250VAC Relay contact Connects NO to common when activated	Characteristics (Resistive Load): Initial contact resistance 100mΩ (at 1A / 24VDC) Rated load 5A at 250VAC, 5A at 30VDC, 10A at 125VAC Max. switching voltage 277VAC, 30VDC Max. switching capacity 1250VA (AC), 150W (DC) Endurance $1x10^5$ ops (Rated Load), $1x10^7$ ops (no Load)
	Binary Output, up to 250VAC Relay contact Disconnects NC from Common when activated	Characteristics (Resistive Load): Initial contact resistance 100mΩ (at 1A / 24 VDC) Rated load 3A at 250VAC, 5A at 30VDC, 10A at 125VAC Max. switching voltage 277VAC, 30VDC Max. switching capacity 1250VA (AC), 150W (DC) Endurance $1x10^5$ ops (Rated Load), $1x10^7$ ops (no Load)
Lock man Op.	Remote lock of manual overrides	Binary Input, Dry Contact Maintained Mode 0.01 s minimum pulse width (50 Hz at 50% duty cycle) Internal 35 V, 2.7kΩ pull-up

ORDERING INFORMATION

INPUT/OUTPUT MODULE WITH OPTIONAL CONTROL PANELS

ITEM	BI	BO	AI	AO	CONTROL PANEL
JDB1610	16	---	---	---	JBD1620 (for status LED)
JDB6410	6	4	---	---	JDB6420 or JDB6440 (for outputs manual override)
JDB8010	8	---	---	---	JDB8020 or JDB8040 (for status LED)
JDB8410	8	4	---	---	JDB8420 or JDB8440 (for outputs manual override)
JAB0410	---	---	---	4	JAB0420 or JAB0440 (for manual override)
JAB6610	2	2	4	4	No control panel available

INPUT/OUTPUT MPODULES WITH INTEGRATED CONTROL PANELS

ITEM	BI	BO	AI	AO	CONTROL PANEL
JDB1651	16	---	---	---	Integral status LED
JDB8051	8	---	---	---	Integral status LED
JDB8451	8	4	---	---	Integral BO manual override and BI status LED
JDB6451	6	4	---	---	Integral BO manual override and BO status LED
JAB0451	---	---	---	4	Integral manual override and status LED
JAB6651	2	2	4	4	No control panel available

CODES	DESCRIPTION
JAB0410	4-point Romutec IOM with 4 AO, SA Bus support and Override lock.
JAB0420	Optional manual overrides for JAB0410, front panel mounting
JAB0430	Bundle of JAB0410 (Base module), JAB0420 (Override module, panel) and 3.0 m USB-cable
JAB0440	Optional manual overrides for JAB0410, DIN Rail mounting
JAB0450	Bundle of JAB0410 (Base module), JAB0440 (Override module, DIN rail) and 0.1 m USB-cable
JAB0451	4-point Romutec IOM with 4 AO and SA Bus support with integral overrides and status LED's, DIN rail mounting
JAB6610	12-point Romutec IOM with 2 BI, 2 BO, 4 AI, 4 AO and SA Bus support (Points only, no overrides or input status LED's).
JAB6651	12-point Romutec IOM with 2 BI, 2 BO, 4 AI, 4 AO and SA Bus Support (Points only, no overrides or input status LED's), same style as integral models
JDB1610	16 Binary input point Romutec IOM
JDB1620	Optional point status LED module for JDB1610, front panel mounting
JDB1630	Bundle of JDB1610 (Base module), JDB1620 (Status LED module, panel) and 3.0 m USB-cable
JDB1651	16-point Romutec IOM with 16 BI and SA Bus Support with integral point status LED's, DIN rail mounting
JDB6410	10-point Romutec IOM with 6 BI, 4 BO, SA Bus support and Override lock.
JDB6420	Optional manual overrides for JDB6410, DIN Rail mounting
JDB6430	Bundle of JDB6410 (Base module), JDB6420 (Override module, panel) and 0.1 m USB-cable
JDB6440	Optional manual overrides for JDB6410, DIN Rail mounting. Not currently available as single item, purchase JDB6450.

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ORDERING INFORMATION

CODES	DESCRIPTION
JDB6450	Bundle of JDB6410 (Base module), JDB6440 (Override module, DIN rail) and 0.1 m USB-cable
JDB6451	10-point Romutec IOM with 6 BI, 4 BO (two 2-state drives) and SA Bus support with integral overrides and status
JDB8010	8-point Romutec IOM with 8 BI and SA Bus support
JDB8020	Optional LED's for indicating the BI status of JDB8010, front panel mounting
JDB8030	Bundle of JDB8010 (Base module), JDB8020 (LED module, panel) and 3.0 m USB-cable
JDB8040	Optional LED module for indicating the BI status of JDB8010, DIN Rail mounting
JDB8050	Bundle of JDB8010 (Base module), JDB8040 (LED module, DIN rail) and 0.1 m USB-cable
JDB8051	8-point Romutec IOM with 8 BI and SA Bus Support with integral status LED's, DIN rail mounting
JDB8410	12-point Romutec IOM with 8 BI, 4 BO, SA Bus support (four 1-state drives) and Override lock.
JDB8420	Optional manual override module for JDB8410, front panel mounting
JDB8430	Bundle of JDB8410 (Base module), JDB8420 (Override module, panel) and 3.0 m USB-cable
JDB8440	Optional manual overrides for JDB8410, DIN Rail mounting
JDB8450	Bundle of JDB8410 (Base module), JDB8440 (Override module, DIN rail) and 0.1 m USB-cable
JDB8451	12-point Romutec IOM with 8 BI, 4 BO (four 1-state drives) and SA Bus Support with Integral overrides and status

ACCESSORIES

CODES	DESCRIPTION
USB-A-B-0.1	USB-cable A-B type, 0.1 m
USB-A-B-3.0	USB-cable A-B type, 3.0 m
USB-A-B-5.0	USB-cable A-B type, 5.0 m
JD-RTR4084	19"-rack 4HE/84TE, plastic (GRP), for mounting of 10 front panels
JD-RTR4084S	Same as JD-RTR4084, but with transparent lockable cover and IP54 protection class
JD-RTR7050	19"-rack 7HE/50TE, plastic (GRP), for mounting of 12 front panels
JD-RTR7050S	Same as JD-RTR7050, but with transparent lockable cover and IP54 protection class
JDL8000	Cover 3HE/8TE , colour blue, for unused slots
JD-JUMPER	Three-pole jumper, needed for coding the colour of a LED to orange

TECHNICAL SPECIFICATIONS

Codes	**JAB0410** **JDB1610** **JDB6410** **JAB6610** **JDB8010** **JDB8410**	**JAB0420** **JDB1620** **JDB6420** **JDB8020** **JDB8420**	**JAB0440** **JDB6440** **JDB8040** **JDB8440**	**JAB0451** **JDB1651** **JDB6451** **JAB6651** **JDB8051** **JDB8451**
Supply voltage	24 VAC ±10% at 50 or 60 Hz	5 VDC ±5%, provided by the I/O-Module via USB		24 VAC ±10% at 50 or 60 Hz
Power consumption	12 VA maximum incl. Front panel Load	1 VA maximum, provided by I/O-Module		12 VA maximum
Ambient conditions				
Operating	0 to 50°C; 10 to 90% RH non-condensing			
Storage	0 to 70°C; 10 to 90% RH non-condensing			
Terminations	Spring-type terminals for I/O's, power supply and MS/TP Bus	USB type B for the connection to the I/O Module		Spring-type terminals for I/O's, power supply and MS/TP Bus
Device addressing	DIP switch set (128-254). Addresses 0-127, 255 are reserved	Not Required		DIP switch set (128-254). Addresses 0-127, 255 are reserved
Communications bus	BACnet® MS/TP; 4-wire SA Bus (3 wires used)	USB connection to host module		BACnet® MS/TP; 4-wire SA Bus (3 wires used)
Mounting	35 mm DIN rail	Panel front 19" Rack	35 mm DIN rail	
Dimensions (Height x Width x Depth)	116 x 32 x 166 mm	129 x 40.5 x 43 mm	116 x 32 x 166 mm	92 x 72 x 70 mm
Housing				
Plastic material	PA6.6 25%GF	ABS + Polycarbonate UL94 5VB	PA6.6 25%GF	PC-GF10
Protection Class	IP20 (IEC529)			
Weight	**JAB0410:** 0.180 kg **JDB1610:** 0.180 kg **JDB6410:** 0.232 kg **JAB6610:** 0.222 kg **JDB8010:** 0.180 kg **JDB8410:** 0.240 kg	**JAB0420:** 0.102 kg **JDB1620:** 0.075 kg **JDB6420:** 0.089 kg **JDB8020:** 0.075 kg **JDB8420:** 0.105 kg	**JAB0440:** 0.143 kg **JDB6440:** 0.133 kg **JDB8040:** 0.132 kg **JDB8440:** 0.135 kg	**JAB0451:** 0.240 kg **JDB1651:** 0.160 kg **JDB6451:** 0.200 kg **JAB6651:** 0.190 kg **JDB8051:** 0.150 kg **JDB8451:** 0.210 kg
CE Compliance	Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.			

VMA16 (32-BIT), VMA18, AND VMA1930

VAV MODULAR ASSEMBLY CONTROLLER SERIES

VMA16s (32-bit) and VMA18s are programmable digital controllers tailored for VAV applications that can be switched between MS/TP and N2 communications protocols. When they are used as MS/TP devices, they communicate through the BACnet® MS/TP protocol. In N2 mode, they can be used as replacements for legacy Johnson Controls® controllers.

Note: When a VMA1400 Series controller is replaced on an existing N2 network, the VMA18 Series controller is the preferred device because certain existing sensor models can be reused. VMA18 controllers are intended for use as functional replacements for the VMA1410, VMA1415, VMA1420, and VMA1440 controllers only. VMA18 controllers support field-selectable BACnet MS/TP or N2 protocols. VMA18 controllers support the N2 Open Communications protocol at a maximum rate of 9600 baud.

The VMA1930 programmable controller uses BACnet/ IP networking for higher speed communication with the Controller Configuration Tool (CCT) and improved bandwidth. This gives you more flexibility in choosing controllers for your site's specific needs.

The VMA1615, VMA1630, VMA1832, and VMA1930 (32-bit) controllers feature an integral digital differential pressure transducer (DPT), an integral damper actuator, and a 32-bit microprocessor. The controllers' small package size facilitates quick field installation and efficient use of space, while not compromising high-tech control performance. These controllers easily adapt NS Series Network Sensors for zone and discharge air temperature sensing.

The VMA1626 controller is shipped with an actuator but without a differential pressure transducer (DPT), making it well suited for commercial zoning applications or for pressure-dependent VAV box applications where no DPT is required.

The VMA1656 controller is shipped without a differential pressure transducer but with an integrated actuator and ball valve linkage. These controllers are for use on the Johnson Controls VG-1000 1/2 - 1 inch valves and needs to be used primarily as a replacement for the VMA assembly of the VG-1000 Series Smart Valve product. The smart valve product line is ideal for chilled beam applications.

The VMA1628 includes a DPT but does not have an actuator. Without an actuator, this controller is well suited for controlling large VAV boxes that require more than 4 N·m of torque.

These features make the VMA16 (32-bit) controllers the product of choice for VAV systems. The wide variety of network sensor models provides options for measuring and displaying zone temperature, occupancy detection, duct temperature, zone humidity and dewpoint determination, carbon dioxide (CO2) level, setpoint adjustments, VAV box fan speed control, and discharge air temperatures.

The VMA18 models are designed to be functional replacements for the VMA14xx Series Variable Air Volume Modular Assembly controllers. They contain a sensor actuator bus port and accessories well suited for replacing VMA14xx controllers.

FEATURES

- **Standard BACnet Protocol –** Provides interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.
- **Standard hardware and software platform –** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows; also uses a common software design to

support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.

- **Switchable communications protocols from BACnet MS/TP to N2 protocols or N2 to BACnet MS/TP protocols**
- **ZFR Wireless FC or SA Bus Interface –** Both the ZFR and ZFR Pro Series provide a wireless alternative to hard-wired Metasys system counterparts, offering application flexibility and mobility with minimal disruption to building occupants.
- **Auto-Tuned Control Loops –** Reduce commissioning time, eliminate change-of-season re-commissioning, and reduce wear and tear on mechanical devices.
- **Universal Inputs and configurable Outputs –** Allows multiple signal options to provide input/ output flexibility.
- **Optional Local User Interface Display –** Allows convenient monitoring and adjusting capabilities at the local device.
- **BACnet Testing Laboratories (BTL) listed and certified –** Ensures interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.
- **32-bit Microprocessor –** Ensures optimum performance and meets industry specifications.
- **BACnet automatic discovery –** Supports easy controller integration into a Metasys BAS.
- **End-of-Line (EOL) switch in MS/TP Field Controllers –** Enables field controllers to be terminating devices on the communications bus.
- **Pluggable Communications Bus and supply power terminal blocks –** Expedites installation and troubleshooting.
- **Writable Flash Memory –** Allows standard or customized applications to be downloaded from the CCT and enables persistent application data.

THE FOLLOWING FEATURES ARE SPECIFIC TO PARTICULAR MODELS

- Models that include a DPT feature a state-of-the- art digital non-flow DPT to provide 14-bit resolution with bidirectional flow operation that supports automatic correction for polarity on high- and low-pressure DP tube connections; this pressure sensor eliminates high- and lowpressure connection mistakes.
- A phone jack-style connector on the FC Bus and SA Bus of the VMA16 supports quick connection to the Mobile Access Portal (MAP) Gateway, ZFR or ZFR Pro Series Wireless Field Bus System wireless routers, and network sensors.
- Models that include an actuator feature a fast response actuator that drives the damper from full open to full closed (90°) in 60 seconds to reduce commissioning time.

VMA16 (32-BIT), VMA18, AND VMA1930 METASYS CONTROLLERS

ORDERING INFORMATION

VMA16 (32-BIT) SERIES AND VMA1930 (INCLUDING POINT TYPE COUNTS PER MODEL)

		VMA 1615	VMA 1626	VMA 1628	VMA 1630	VMA 1656	VMA 1930
Communication protocol		BACnet MS/TP, N2					BACnet/IP
Engines supported		All Model types					SNE, SNC, OAS. NAEs and ODS at R9.0 or greater.
Modular jacks		6-pin SA Bus Modular Port supports one communicating sensor. **Or** you can wire up to four communicating sensors to the SA Bus Terminal Block. They cannot be used at the same time.					
		6-pin FC Bus for tool support					
Point types	Signals accepted						
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode	3	3	3	3	3	3
Binary Output (BO)	24 VAC Triac	2	3	3	3	3	3
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC Binary Output Mode, 24 VAC Triac	---	2	2	2	2	2
Integrated Actuator	Internal	1	1	---	1	1 with ball valve linkage	1
Differential Pressure Transducer	Internal	1	---	1	1	---	1
SA Bus	Supports up to 10 total wired SA Bus devices, including the XPM and IOM series expansion I/O modules and up to 4 NS series network sensors.	Up to 4 NS Series Network Zone Sensors					
		Up to 9 WRZ sensors when using the ZFR or ZFR Pro Series wireless router configuration and up to 5 WRZ sensors when using the one-to-one WRZ-78xx wireless configuration					

VMA16 (32-BIT), VMA18, AND VMA1930 METASYS CONTROLLERS

ORDERING INFORMATION

VMA18 SERIES (INCLUDING POINT TYPE COUNTS PER MODEL)

		VMA1826	VMA1832
Communication protocol		BACnet MS/TP, N2	
Engines supported		All model types	
Modular jacks		8-pin SA Bus supports analog noncommunicating sensor	
Point types	Signals accepted		
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode	3	3
Binary Output (BO)	24 VAC Triac	3	3
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC Binary Output Mode, 24 VAC Triac	2	2
Integrated Actuator	Internal	1	1
Differential Pressure Transducer	Internal	---	1
SA Bus	Supports up to 10 total wired SA Bus devices, including the XPM and IOM series expansion I/O modules and up to 4 NS series network sensors.	Up to 4 NS Series Network Zone Sensors Up to 9 WRZ sensors when using the ZFR or ZFR Pro Series wireless router configurations and up to 5 WRZ sensors when using the one-toone WRZ-78xx wireless configuration	

VMA16 (32-BIT), VMA18, AND VMA1930 METASYS CONTROLLERS

ORDERING INFORMATION

CODE	DESCRIPTION
MS-VMA1615-1	32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI and 2 BO; 24 VAC; FC Bus, and SA Bus
MS-VMA1626-1	32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus; (No DPT)
MS-VMA1628-1	32-bit, Integrated VAV Controller and DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus (No Actuator)
MS-VMA1630-1	32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus
MS-VMA1656-1	32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus, Integrated Ball Valve Linkage
MS-VMA1826-1	32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus; Includes cable adapters for use when replacing VMA14xx Series controllers. Recommended replacement for VMA1440 controller (No DPT)
MS-VMA1832-1	32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI and 2 BO; 24 VAC; FC Bus, and SA Bus, includes cable adapters for use when replacing VMA14xx Series controllers. Recommended replacement for VMA1410, VMA1415, or VMA1420 controller.
MS-VMA1930-0	32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; and SA Sensor Port; Integral Real-time Clock; 2 Ethernet Ports for BACnet/IP Communications

ACCESSORIES

VMA16 (32-BIT)

CODES	DESCRIPTION
IOM Series	*Refer to the* Metasys® *System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042) for a complete list of available IOM Series Modules.*
TL-CCT-0	Metasys Controller Configuration Tool (CCT) software
MS-FCP-0	Field Controller Firmware Package Files for CCT
Mobile Access Portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
NS Series Network Sensors	*Refer to the NS Series Network Sensors Product Bulletin (LIT-12011574) for specific sensor model descriptions.*
MS-DIS1710-0	Local Controller Display *Refer to Local Controller Display Product Bulletin (LIT-12011273) for more information.*
NS-ATV7003-0	Handheld VAV Balancing Tool
WRZ Series Wireless Room Sensors	*Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011653) for specific sensor model descriptions.*
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2
AP-TBK1002-0	2-Position Screw Terminal that Plugs onto VMA Output Point Spade Lug
AP-TBK1003-0	3-Position Screw Terminal that Plugs onto VMA Output Point Spade Lugs
AP-TBK4SA-0	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown (Bulk Pack of 10)
AP-TBK4FC-0	Replacement MS/TP FC Bus Terminal, 4-Position Connector (Bulk Pack of 10)

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ORDERING INFORMATION

ACCESSORIES

VMA16 (32-BIT)

CODES	DESCRIPTION
AP-TBK3PW-0	Replacement Power Terminal, 3-Position Connector, Gray (Bulk Pack of 10)
AP-TBK2PW-0	Replacement Power Terminal, 2-Position Connector, Gray (Bulk Pack of 10)
AS-CBLTSTAT-0	Cable adapter for connection to 8-pin TE-6700 Series sensors
AS-CBLVMA-1	Cable Adapter, 8-Pin Female Socket to 6-Pin Male Jack (Bulk Pack of 10)
MS-TBKLV03-0	Terminal Block Kit - FAC Line Voltage AC Power - 3 Pieces
MS-TBKRO02-0	Terminal Block Kit - FAC 2-Position Relay Output - 9 Pieces
MS-TBKRO03-0	Terminal Block Kit - FAC 3-Position Relay Output - 6 Pieces
MS-TBKCO04-0	Terminal Block Kit - FAC 4-Position Configurable Output - 6 Pieces
MS-TBKUI04-0	Terminal Block Kit - FAC 4-Position Universal Input - 3 Pieces
MS-TBKUI05-0	Terminal Block Kit - FAC 4-Position Universal Input - 3 Pieces
NS-WALLPLATE-0	Network Sensor Wall Plate
F-1000-325	Replacement Barbed Fitting for use on VMA1615, VMA1630, and VMA1832 for Connecting Tubing (Bulk Pack of 10)
F-1000-326	Flexible Tubing Extension with Barbed Fitting for VMA1615, VMA1630, and VMA1832, 14 in. Length (Bulk Pack of 20). Use to extend tubing that connects between the DPT connectors and the DPT sensors, including when replacing a VMA1400 series controller with a VMA16xx or VMA18xx controller.
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router
WRZ-7860-0	Receiver for One-to-One Wireless Room Sensing Systems - functions with WRZ Series Sensors room sensors

VMA16 (32-BIT), VMA18, AND VMA1930 METASYS CONTROLLERS

TECHNICAL SPECIFICATION

Codes	
MS-VMA1615-1	32-bit, Integrated VAV Controller/Actuator/Pressure Sensor, 3 UI and 2 BO; 24 VAC; FC and SA Bus
MS-VMA1626-1	32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus (No DPT)
MS-VMA1628-1	32-bit, Integrated VAV Controller and DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus (No Actuator)
MS-VMA1630-1	32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, 2 CO; 24 VAC; FC and SA Bus
MS-VMA1656-1	32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus, Integrated Ball Valve Linkage (No DPT)
MS-VMA1826-1	32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus, with 8-9in TSTAT Port, Recommended for use as a replacement for VMA1440 (No DPT)
MS-VMA1832-1	32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, 2 CO; 24 VAC; FC and SA Bus, with 8-pin TSTAT Port. Recommended for use as a replacement for VMA1410, VMA1415, or VMA1420
MS-VMA1930-0	32-bit, Integrated VAV Controller/Actuator/Pressure Sensor - DPT, 3 UI and 3 BO, 2 CO, 24 VAC, and SA Bus, Includes 6-pin Sensor Port for use with TE-7xx Series Non-Communicating Sensors and two Ethernet Ports for BACnet/IP Communications
Communications Protocol	
MS-VMA16xx-x, MS-VMA18xx-x	BACnet MS/TP, N2
MS-VMA1930-0	BACnet/IP
Engines Supported	
MS-VMA16xx-x, MS-VMA18xx-x	All Models
MS-VMA1930-0	SNC, SNE, NAE55, NAE85, ODS, OAS (MS-VMA1930-0 supports R9.0 or later versions of these engines)
Power Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power Consumption	10 VA typical, 14 VA maximum **Note:** VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 60 VA (maximum).
Ambient Conditions	
Operating	0°C to 50°C
Storage	-40°C to 70°C
Terminations	
MS-VMA1615-x, MS-VMA1626-x, MS-VMA1628-x, MS-VMA1630-x, MSVMA1656-x	Inputs/Outputs: 6.3 mm Spade Lugs FC Bus, SA Bus, and Supply Power: 4-Wire and 2-Wire Pluggable Screw Terminal Blocks FC Bus and SA Bus Port: RJ-12 6-Pin Modular Jacks
MS-VMA1826-x, MS-VMA1832-x	Inputs/Outputs, SA Bus, and Supply Power: 6.3 mm Spade Lugs N2/FC Bus: Pluggable Screw Terminal Block TSTAT Modular Port: RJ-45 8-Pin Modular Jack
MS-VMA1930-0	Inputs/Outputs: 6.3 mm (1/4 in.) Spade Lugs SA Bus and Supply Power: 4-Wire and 2-Wire Pluggable Screw Terminal Blocks SA Bus Modular Ports: RJ-12 6-Pin Modular Jacks

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PROGRAMMABLE CONTROLLERS

VMA16 (32-BIT), VMA18, AND VMA1930 METASYS CONTROLLERS

TECHNICAL SPECIFICATION

Controller Addressing	
For BACnet-configured controllers	DIP switch set: valid field controller device addresses 4–127 (device addresses 0–3 and 128–255 are reserved)
For BACnet/IP controllers	3 rotary switches to assign a unique number for each controller on the subnet to identify it in the CCT controller configuration tool for uploading, downloading, and commissioning
For N2-configured controllers	DIP switch set; valid control device addresses 1–254
Communications Bus	
MS-VMA16xx, MS-VMA18xx models	RS-485, field selectable between BACnet MS/TP and N2 communications: **N2/FC Bus:** 1.5 mm (18 AWG) standard 3-wire, twisted, shielded cable recommended between the supervisory controller and field controllers **BACnet MS/TP:** 0.6 mm (22 AWG) stranded, 4-wire (2-twisted pairs) shielded cable recommended from the VMA controller for network sensors and other sensor/ actuator devices; includes a terminal to source 15 VDC supply power from VMA to SA Bus devices **Note:** *For more information, refer to the MS/TP Communications Bus Technical Bulletin (LIT-12011034)*
MS-VMA1930-0	**BACnet/IP:** Two Ethernet ports; 10/100 Mbps; 8-pin RJ-45 connector
Processor	
MS-VMA16 (32-bit), MS-VMA18	RX630 32-bit Renesas® microcontroller
MS-VMA1930-0	RX63N 32-bit Renesas microcontroller
Memory	
MS-VMA16 (32-bit), MS-VMA18	1 MB Flash Memory and 512 KB RAM
MS-VMA1930-0	16 MB serial flash memory and 8 MB of SDRAM
Input and Output Capabilities	
MS-VMA1615-x, MS-VMA1617-x	3 - Universal Input: Defined as 0–10 VDC, 0–600k ohm, or Binary Dry Contact 2 - Binary Outputs: Defined as 24 VAC Triac (internal power source)
MS-VMA1626-x, MS-VMA1628-x, MS-VMA1630-x, MS-VMA1632-x, MS-VMA1656-x, MS-VMA1826-x, MS-VMA1832-x, MS-VMA1930-0	3 - Universal Input: Defined as 0–10 VDC, 0–600k ohm, or Binary Dry Contact 3 - Binary Outputs: Defined as 24 VAC Triac (internal power source) 2 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO
Analog Input/Analog Output Accuracy	
Analog Input	15-bit resolution on UIs
Analog Output	0–10 VDC ±200 mV
Differential Pressure Transducer	Range: -1.5 in. to 1.5 in. W.C. **Performance Characteristics:** Accuracy ±1.3% Full Span Maximum (± .039 in. w.c.) **Note:** Combined error due to offset, non-linearity, and temperature variation. Typical accuracy at zero (null) pressure is +/-0.2% fullscale **Note:** Includes error due to non-linearity.
Mounting	Mounts to damper shaft using single set screw and to duct with single mounting screw.
Actuator Rating	4 N•m (35 lb•in.) minimum shaft length = 44 mm (1-3/4 in.)
Dimensions Height x Width x Depth	165 mm x 125 mm x 73 mm Center of Output Hub to Center of Captive Spacer: 135 mm
Weight	0.65 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive.
BACnet International	**MS-VMA16xx and MS-VMA18xx models:** BACnet Testing Laboratories (BTL) Protocol Revision 7 Listed BACnet Application Specific Controller (B-ASC) **MS-VMA1930-0:** BACnet Testing Laboratories (BTL) Protocol Revision 18 Listed and Certified BACnet Advanced Application Controller (B-AAC)

METASYS BUILDING MANAGEMENT SYSTEM

CONFIGURABLE FIELD CONTROLLERS

TERMINAL UNIT CONTROLLERS

ATC

ADVANCED TERMINAL UNIT CONTROLLER

The Advanced Terminal unit Controller (ATC) from Johnson Controls® is a series of configurable controllers specifically designed for terminal unit equipment.

The ATC is available in two line voltage powered hardware models, and controls 2-pipe and 4-pipe equipment. The controller meets the most demanding comfort and efficiency requirements, due to its energy optimization and on demand ventilation controls.

The ATC features a long list of Johnson Controls patents, best practices. An extensive library of factory-programmed, fully documented and proven applications are available to lower engineering and commissioning costs, granting superior reliability and efficiency.

The on-board power sources for the ancillary field devices reduce the number of required components, such as transformers and wires, therefore cutting installation costs.

The cable strain relief and optional safety cover reduce installation costs, this enables, where regulation allows, the ATC to be installed without an additional cabinet.

The controller's field-selectable communications protocols, including BACnet®, Modbus® and N2, make the ATC suitable for both new and retrofit installations because they provide a cost effective upgrade and modernization path for customers who are using existing N2 controllers.

The ATC fully supports the SMART Equipment™ technology, making it plug and play on the *Verasys*® smart control systems.

FEATURES

- **Applications Library -** Lower engineering and commissioning costs providing a full set of advanced features as the patented automatic PID tuning, network sensors plug and play, indoor air quality control, energy performance indication, fault detection diagnostics and automatic commissioning mode
- **Line power supply with on-board power for field devices -** Reduce the number of components required which lowers total installation costs
- **Cable strain relief and optional safety covers -** Enable installation without the need for an electrical box which lowers installation costs where applicable
- **Specialized models for Simpler and Complex Applications -** Lower product cost
- **Fully featured SMART Equipment technology -** Verasys SMART Control System enabled
- **Real-time switchable communications protocols -** Suitable for new and retrofit installation, providing higher flexibility, thus protecting investments
- **Standard BACnet protocol -** BACnet Testing Laboratories (BTL) Listing Rev 12 provides interoperability with other Building Automation Systems (BAS) products that use the widely accepted BACnet standard

ORDERING INFORMATION

CODES	DESCRIPTION
LC-ATC1100-0	11-points Advanced Terminal unit Controller with 2 UI, 2 BI, 2 BO, 2 CO, 3 RO, FC and SA Bus, 240 VAC
LC-ATC1500-0	15-points Advanced Terminal unit Controller with 4 UI, 2 BI, 2 BO, 3 CO, 4 RO, FC and SA Bus, 240 VAC

ACCESSORIES

CODES	DESCRIPTION
LC-IP20	Advanced Terminal unit Controller IP20 Safety Terminal Cover Kit
TL-MAP1810-0PE	Portable MAP Gateway – includes MAP Gateway, RJ-12 cable, protective shell, and lanyard

TECHNICAL SPECIFICATIONS

Codes	
LC-ATC1100-0	11-points Advanced Terminal unit Controller with 2 UI, 2 BI, 2 BO, 2 CO, 3 RO, FC and SA Bus, 240 VAC
LC-ATC1500-0	15-points Advanced Terminal unit Controller with 4 UI, 2 BI, 2 BO, 3 CO, 4 RO, FC and SA Bus, 240 VAC
Supply voltage	240 VAC, 50/60 Hz
Power consumption	20 VA max
Ambient conditions	
Operating	0 to 40°C; 10 to 95% RH noncondensing
Storage	-40 to 85°C; 5 to 95% RH noncondensing
Addressing	
BACnet MS/TP	Valid field controller device addresses 4–127 (Device addresses 0 to 3, 117, and 128 to 255 are reserved and not valid field controller addresses)
N2 Slave	Valid field controller device addresses 1 to 255
Communication bus	
BACnet MS/TP, Modbus® and N2 through RS-485	FC Bus between the supervisory controller and field controller SA Bus between controller, network sensors and other sensor/actuator devices, includes a 15 VDC, 210 mA power supply for bus devices
Processor	Renesas® RX631 32-bit microcontroller, 2 MB Flash, 128 kB RAM
External memory	16 MB Flash and 8 MB RAM

Input and Output capabilities

Binary Input (BI):
- Dry Contact Maintained
- Pulse Counter/Accumulator Mode (30 Hz)

Universal Input (UI):

User-Configurable, 3 available modes:
- Voltage Input: 0 to 10 VDC
- Resistive (0-10 kOhm)
- Dry-contact maintained binary

Configurable Output (CO):
- User-Configurable, 2 available modes:
- Voltage Output: 0 to 10 VDC, 10 mA
- Triac Output: 24 VAC, 500 mA (Externally sourced)

24 VAC out for actuator power:

24 VAC at 500 mA

5A Relay Output (5A RO):
- Single-Pole, Single-Throw, Normally Open
- 240 VAC, 5 A Resistive, 50K cycles
- 240 VAC, 0.66 FLA / 4 LRA, 50K cycles
- Shared common terminal between all 5 A RO's

Binary Output Triac (BO):
- 24 VAC or 240 VAC, 500 mA
- Externally powered
- Shared common terminal between all BO Triacs

10 A Relay Output (10A RO):
- Single-Pole, Single-Throw, Normally Open
- 240 VAC, 10 A Resistive, 100K cycles

Input and Output count

	BI	UI	CO	5 A RO	BO	10 A RO
LC-ATC1100-0	2	2	2	3	2	0
LC-ATC1500-0	2	4	3	3	2	1

Analog Input / Output resolution	
Analog Input	12-bit resolution, ±1% in the 0-10 kOhm range, ±50 mV in the 0-10 VDC range
Analog Output	15-bit, ±200 mV in the 0-10 VDC range

...Continued...

TECHNICAL SPECIFICATIONS

Terminations *Input/Output*	Screw terminals
FC Bus	4-wire pluggable Screw Terminal Block
SA Bus	4-wire pluggable Screw Terminal Block and RJ-12, 6-pin modular jack
Mounting	Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller. Mount the controller on a wall or DIN rail inside an enclosure
Dimensions (Height x Width x Depth)	165 x 130 x 63 mm 165 x 165 x 63 mm including terminals and mounting clips (with IP20 cover)
Weight	0.6 kg
CE Compliance	Johnson Controls declares that this product is also in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive (IEC/EN60730-1). Declared as an Electronic Independantly-Mounted Control for mounting in or on a panel
BACnet International	BACnet Testing Laboratories (BTL) Protocol Revision 12 Listed BACnet Application Specific Controller (B-ASC)

METASYS BUILDING MANAGEMENT SYSTEM

CONFIGURABLE FIELD CONTROLLERS

TERMINAL UNIT CONTROLLERS

ATC1510

ADVANCED TERMINAL UNIT CONTROLLER - PROGRAMMABLE

The Johnson Controls® Advanced Terminal Unit Controller (ATC) 1510 is a programmable controller specifically designed for terminal unit equipment.

The ATC is tailored to meet the most demanding requirements in terms of comfort and energy efficiency. The controller features a long list of Johnson Controls patents and best practices that help you achieve lower engineering and commissioning costs, and grant superior reliability and efficiency.

When you use the on-board power sources for the ancillary field devices, you can reduce installation costs, because you need fewer components, such as transformers and wires. In addition, you can utilize the cable strain relief and optional safety cover to install the ATC without an additional cabinet, where regulation allows, which also cuts installation costs.

The controller's field-selectable communications protocols, BACnet® and N2, make the ATC suitable for both new and retrofit installations because they provide a cost effective upgrade and modernization path for customers who are using existing N2 controllers.

FEATURES

- **Standard hardware and software platform -** Uses a hardware and software design that is common throughout the family line of Metasys field controllers. Installation and commissioning is quicker and cheaper because of the support for standardized wiring practices and installation workflows. Minimal technical training is sufficient because there is a single tool for control applications, commissioning, and troubleshooting.
- **Universal Inputs and Configurable Outputs -** Multiple signal options provide input/output flexibility.
- **Line power supply with on-board power for field devices -** Reduces the number of components required, which lowers total installation costs.
- **Cable strain relief and optional safety covers -** Enables installation without the need for an electrical box, which lowers installation costs, where regulation allows.
- **Switchable communication protocols -** With the Controller Configuration Tool (CCT), you can configure ATCs to communicate using either the BACnet MS/TP or the N2 field bus networking protocol. This makes ATCs suitable for new and retrofit installation, providing higher flexibility, thus protecting investments.
- **Standard BACnet protocol -** BACnet Testing Laboratories (BTL) listed and certified, which ensures interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.
- **End-of-Line (EOL) switch -** Enables equipment controllers to be terminating devices on the communications bus.
- **Default state for input/output wiring validation -** You can validate the wiring of the input and output terminals prior to the download of an application file.

CONFIGURABLE FIELD CONTROLLERS

ATC1510 TERMINAL UNIT CONTROLLERS

FEATURES

- **Background transfer coupled with enable/disable logic options in CCT -** Saves time for the field technicians, enables productivity, and minimizes equipment disruption, because the controllers operate while file updates take place in the background. You can leave the application disabled until the system is ready to run.
- **Optional local user interface display -** Allows convenient monitoring and adjusting capabilities at the local device.

ORDERING INFORMATION

CODE	DESCRIPTION
LC-ATC1510-0	Advanced Terminal Controller, 15 point

ACCESSORIES

CODES	DESCRIPTION
LC-IP20	Advanced Terminal unit Controller IP20 Safety Terminal Cover Kit
TL-MAP1810-0PE	Portable MAP Gateway - includes MAP Gateway, RJ-12 cable, protective shell, and lanyard
MS-FCP-0	Metasys Field Controller Firmware Package Files for CCT

TECHNICAL SPECIFICATIONS

Code	
LC-ATC1510-0	Advanced Terminal Controller, 15 point
Supply voltage	240 VAC, 50/60 Hz (L1, L2)
Power consumption	20 VA Max
Ambient conditions	
Operating	0°C to 40°C; 10% to 95% RH noncondensing
Storage	-40°C to 85°C; 5% to 95% RH noncondensing
Addressing	
BACnet® MS/TP	Valid field controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses.)
N2	Valid field controller device addresses 1 to 254 (Device address 255 is reserved for the broadcast address and not a valid field controller address.)
Communications bus (FC, SA)	BACnet MS/TP and N2 through RS-485: FC Bus between the supervisory controller and field controller SA Bus between controller, network sensors and other sensor/actuator devices, includes a 15 VDC, 210 mA power supply for bus devices Same circuit as modules logic circuitry +15 VDC, 200 mA SELV, Limited Power (<15 Watts), Class 2
Processor	Renesas® RX631 32-bit microcontroller, 2 MB Flash, 128 KB RAM

...Continued...

TECHNICAL SPECIFICATIONS

External memory	16 MB flash memory and 8 MB RAM
Input and Output capabilities	
Binary Input (BI)	Dry Contact Maintained Pulse Counter/Accumulator Mode (30 Hz) Dry Contacts; SELV, Limited Power (<15 Watts), Class 2
Universal Input (UI)	User-Configurable, 3 available modes: Voltage Input: 0 VDC to 10 VDC, Resistive (0k ohm to 600k ohm), qualified sensors: 0-2k ohm potentiometer, RTD (1k Ni, 1k Pt, A99B Si), NTC (10k Type L, 2.252k Type 2) Dry-contact maintained binary Same circuit as modules logic circuitry +15 VDC, 100 mA SELV, Limited Power (<15 Watts), Class 2 OR 0 V to 10 V or 0 kΩ to 10 kΩ or Dry Contact closure; SELV, Limited Power (<15 Watts), Class 2
Configurable Output (CO)	User-Configurable, 2 available modes: Voltage Output: 0 VDC to 10 VDC, 10 mA; Same circuit as modules logic circuitry (0 V to 10 V or 4 mA to 20 mA); SELV, Limited Power (<15 Watts), Class 2 Triac Output: 24 VAC, 500 mA (Externally sourced); Isolated circuits; SELV, 24 VAC, 0.5 A resistive; Not-limited power (>15 Watts) Class 2
24 VAC out for actuator power (VAC_P)	24 VAC @ 500mA Same circuit as modules logic circuitry 24 VAC, SELV; Not-limited power (>15 Watts) Class 2, 0.5 A
5 A Relay Output (5A RO) (K1, K2, K3)	Single-Pole, Single-Throw, Normally Open 240 VAC, 5 A Resistive, 50k cycles 240 VAC, 0.66FLA/4LRA, 50k cycles Shared common terminal between all 5A ROs
Binary Output Triac (BO)	24 VAC or 240 VAC, 500 mA Resistive Externally powered Shared common terminal between all BO Triacs
10 A Relay Output (10A RO) (K8)	Single-Pole, Single-Throw, Normally Open 240 VAC, 10 A Resistive, 100k cycles For the line-voltage-capable outputs, ensure that they are wired correctly before applying power.
Input and Output count	2 BI, 4 UI, 3 CO, 3 RO (5 A), 2 BO, 1 RO (10 A)
Analog Input/Output resolution	
Analog Input	12-bit resolution
Analog Output	15-bit resolution
Terminations	Input/Output Screw terminals FC Bus: 4-wire pluggable Screw Terminal Block SA Bus: 4-wire pluggable Screw Terminal Block and RJ-12, 6-pin modular jack

...Continued...

TECHNICAL SPECIFICATIONS

Mounting	Mount the controller using a 35 mm DIN rail, or three screws and the integral mounting clips on the controller. Ensure that the controller is mounted so that the side with the outputs/powerinput is "up". If IP20 covers are not in use, or if local regulations do not allow surface mounting, the controller must be mounted in or on a panel. The IP20 covers and cable strain reliefs have been designed to permit surface mounting in certain countries.
Dimensions (Height x Width x Depth)	165 x 130 x 63 mm including terminals and mounting clips 165 x 165 x 63 mm (With IP20 Cover)
Weight	0.6 kg
CE Compliance	Johnson Controls declares that this product is also in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive (IEC/EN60730-1). Declared as an Electronic Independently-Mounted Control for mounting in or on a panel
BACnet International	BACnet Testing Laboratories (BTL) Protocol Revision 15 Listed BACnet Application Specific Controller (B-ASC)

ADDITIONAL PRODUCT DECLARATIONS

Purpose of control	Operating Control
Construction of control and whether the control is electronic	All Models: Electronic Independently Mounted Control - Intended to be mounted in a remote panel
No. of cycles	*See: Input and Output Capabilities*
Type 1 or Type 2 action	TYPE 1.C (Micro-interruption) for relays
External pollution situation	All Models: Pollution Degree 2
Rated impulse voltage	4000 V
Ball pressure temperature	90°C
Binary - relay (Outputs)	Reference all relay commons to the same pole of the supply circuit
Binary - triacs (Outputs)	Reference all triac commons to the same pole of the supply circuit

METASYS BUILDING MANAGEMENT SYSTEM

CONFIGURABLE FIELD CONTROLLERS

TERMINAL UNIT CONTROLLERS

TUC03

TERMINAL UNIT CONTROLLER

The TUC03 configurable Terminal Unit Controller is designed specifically to provide direct digital control of terminal unit applications with heating and/or cooling coils, an electric heater and a three-speed or variable speed fan.

These applications include close control units, fan coil units, unit ventilators and chilling or heating ceiling beam installations.

The device can be configured by the installer, without the need of a PC and software tool, using a set of on-board dip-switches.

The controller is designed for field installation in a panel or enclosure or for mounting by original equipment manufacturers (OEMs) on DIN-rail or directly on a surface.

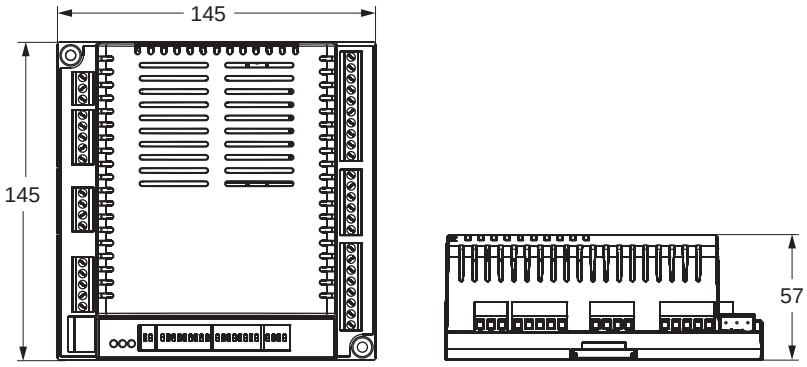
The space comfort set point, occupancy mode and fan speed may be adjusted from a wide range of room sensor modules with options for a digital display.

Communication options are available to enable the controller to be integrated into an N2 Open or BACnet® network of a building automation system. The BACnet interface of the controller complies with the ANSI/ASHRAE Standard 135-2004 for sharing data other devices on the network.

FEATURES

- Field Selectable application type, communication protocol and room module, via dip-switches on controller
- 230 VAC power supply
- 5 VDC / 15 VDC / 24 VAC power supply for field devices, directly provided by the controller
- Modular range of room sensor modules
- Network communications options - N2 Open and BACnet MS/TP
- BACnet MS/TP with peer to peer communication
- Configurable using standard tools

DIMENSIONS *(in mm)*



ORDERING INFORMATION

CODES	DESCRIPTION
TUC0301-2	230 VAC N2 / BACnet Terminal Unit Controller, no cover
TUC0311-2	230 VAC N2 / BACnet Terminal Unit Controller

ROOM SENSOR MODULES

CODES	DESCRIPTION
	With LCD display and Integrated IR Receiver
LP-RSM003-000C	Room Sensor Module, wall mount
LP-RSM003-001C	Room Sensor Module, horizontal flush mount
LP-RSM003-003C	IR receiver w/ integrated temperature sensor
LP-RSM003-004C	IR hand held remote control unit
	Without display - 80 mm x 80 mm
TM-2140-0000	Room sensor module, temperature sensor only
TM-2150-0000	Room sensor module, occupancy button and LED
TM-2160-0000	Room sensor module, 12-28 °C setpoint dial, occupancy button and LED
TM-2160-0002	Room sensor module, 12-28 °C setpoint dial, occupancy button and LED, fan speed override
TM-2160-0005	Room sensor module, ±setpoint dial, occupancy button and LED
TM-2160-0007	Room sensor module, ±setpoint dial, occupancy button and LED, fan speed override
TM-2190-0000	Room sensor module, 12-28 °C setpoint dial
TM-2190-0005	Room sensor module, ±setpoint dial
	With backlit LCD display - 80 mm x 80 mm
RS-1180-0000	Room Sensor module, 12-28°C setpoint dial
RS-1180-0005	Room Sensor module, ±setpoint dial
RS-1180-0002	Room Sensor module, 12-28 °C setpoint dial, fan speed override
RS-1180-0007	Room Sensor module, ±setpoint dial, fan speed override

ORDERING INFORMATION

ACCESSORIES

CODES	DESCRIPTION
LP-KIT003-010C	Remote temperature sensor, NTC 50k Ω, bulb, 80 cm leads
LP-KIT003-011C	Remote temperature sensor, NTC 50k Ω, wall mount, decorative box
LP-KIT003-012C	Remote temperature sensor, NTC 50k Ω, duct mount
LP-KIT003-013C	Remote temperature sensor, NTC 50k Ω, wall mount, decorative box
HX-9100-8001	Condensation (dew point) sensor
TS-6340K-F00	Remote temperature sensor, NTC 10k Ω, bulb, 200 cm leads
TS-6340C-E10	Remote temperature sensor, NTC 10k Ω, ceiling

LP-RSM003-000C

RS Series

LP-RSM003-003C
and LP-RSM003-004C

LP-RSM003-001C

TM Series

METASYS BUILDING MANAGEMENT SYSTEM

CONFIGURABLE FIELD CONTROLLERS

TERMINAL UNIT CONTROLLER

TUC03 PLUS

TERMINAL UNIT CONTROLLER PLUS

The TUC03 Plus configurable Terminal Unit Controller is specifically designed to provide an improved BACnet® integration compared to the standard TUC03 model.

It allows the direct digital control of terminal unit applications with heating and/or cooling coils, an electric heater and a three-speed or variable speed fan.

These applications include close control units, fan coil units, unit ventilators and chilling or heating ceiling beam installations.

The device can be configured by the installer, without the need of a PC and software tool, using a set of on-board dip-switches.

The controller is designed for field installation in a panel or enclosure or for mounting by original equipment manufacturers (OEMs) on DIN-rail or directly on a surface.

The space comfort set point, occupancy mode and fan speed may be adjusted from a wide range of room sensor modules with options for a digital display.

The MS/TP field bus is available to enable the controller to be integrated into a BACnet network of a building automation system.

By focusing on supporting the BACnet protocol only, the TUC03 Plus provides a much better BACnet integration compared to its standard version. The N2 protocol will continue to be available on the standard TUC03 model.

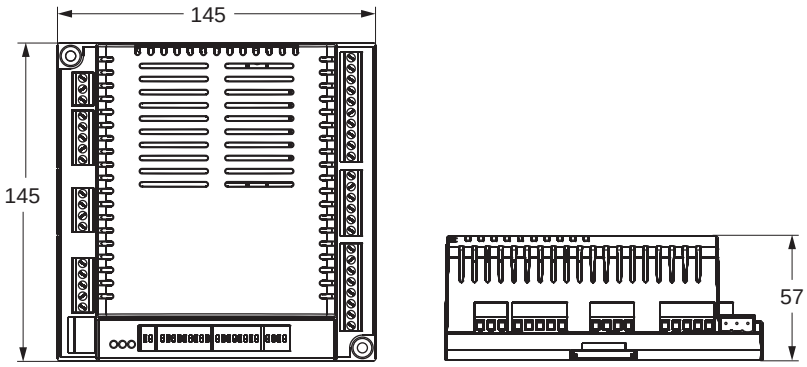
FEATURES

- **Improved Performances –** TUC03 Plus BACnet Change-of-Value and Segmentation features improve the overall system communication performances allowing to reduce the number of components required to manage the whole network and therefore saving on the total installed costs.
- **Enhanced User Experience –** TUC03 Plus BACnet State Text features enable a quicker, simpler but enhanced user experience lowering engineers effort during integrations then reducing the engineering costs.
- **Dedicated Room Module –** TUC03 Plus features a new and unique room module with touch screen interface on both white and black colors widening the offering of room user interfaces.

CONFIGURABLE FIELD CONTROLLERS

TUC03 PLUS TERMINAL UNIT CONTROLLER

DIMENSIONS *(in mm)*



ORDERING INFORMATION

CODES	DESCRIPTION
TUC0312-2	230 VAC BACnet TUC Plus

ACCESSORIES

CODES	DESCRIPTION
TRM0312-0W	Touch Room Module for TUC03 Plus - White
TRM0312-0B	Touch Room Module for TUC03 Plus - Black

Touch Room Modules

NETWORK DISPLAYS, WEBSERVER AND GATEWAYS

MAP GATEWAYS

MAP

MOBILE ACCESS PORTAL GATEWAY

The Mobile Access Portal (MAP) Gateway is a pocket-sized web server that provides a wireless mobile user interface to Smart Equipment Rooftop Units (RTUs). The mobile user interface can be displayed in the browser of a phone, tablet, or computer.

The MAP Gateway ships from the factory with a base set of features that allow users to access, view, edit, and override key information from all devices connected on a common BACnet Token Passing (TP) field bus. The wireless connection on the MAP Gateway allows users to be up to 31m (100 ft line of sight) away indoors and up to 91 m (300 ft line of sight) away outdoors. The MAP Gateway can also be permanently mounted, powered with an optional separate power supply and connected to an Ethernet access point for use as remote connection to a TP field bus of devices.

MAP Gateways ship from the factory with version 5.0x firmware, MAP Gateway units already in the field with version 3.0x firmware or later can be upgraded to Release 5.0 to provide a complete set of Commissioning and Wiring Validation functions targeted for use by electricians, commissioning contractors, and technicians.

The Release 5.0 upgrade can be acquired from Johnson Controls internal portal pages or Offering's Catalog on HVAC Navigator. These updates are complemented by a set of targeted videos that are available using the following link *https://jcpublic.kzoplatform.com/containers/957891534378768109*.

The YK MAP Gateway **cannot** be used on anything other than Smart Equipment Rooftops. You must have the latest version of MAP to view latest features in Smart Equipment. The MAP Gateway user interface is accessed either over Wi-Fi or an existing Ethernet network on site.

FEATURES

- **Simple Brower-Based User Interface -** The MAP Gateway has a consistent, intuitive, menudriven set of browser based views that allow you to quickly navigate between the connected devices and drill down into the point and feature data supported by each device type.
- **Secure Wi-Fi Connectivity to Multiple Platforms -** The MAP Gateway communicates securely using WiFi to smart phones, tablets or personal computers. The browser-based user interfaces automatically conforms to the size constraints of the connected platform
- **Carry with You or Leave on Site -** The MAP Gateway can be used as a basic, portable commissioning tool to view, adjust, or override the key points on Smart Equipment Rooftops that are standalone, or connected on an MS/TP network.
- **Access to Schedules, Alarms and Trends -** The MAP Gateway allows you to view alarms, events, and trends, and modify the rooftop unit schedules.
- **Permanent Audit Log -** Allows you to export and view a log file to review all user logins, transactions, and to log any events generated from the connected controllers.

ORDERING INFORMATION

CODE	DESCRIPTION
TL-MAP1810-0PE	Portable MAP Gateway – includes MAP Gateway, RJ-12 cable, protective shell and lanyard

ACCESSORIES

CODES	DESCRIPTION
TL-PWRKIT-0D	Universal AC Power Supply Adapter – Used for connecting to Ethernet
MP-STAKIT-0	Stationary Mounting Cradle only – includes mounting bracket
MP-STAFBA-0	Field Bus Adapter – RJ-12 to 4-position Terminal Block Adapter. Used for connecting directly to MS/TP Field Bus

Portable MAP Gateway

Stationary Mounting Cradle

TECHNICAL SPECIFICATIONS

Code	
TL-MAP1810-0PE	Portable MAP Gateway – includes MAP Gateway, RJ-12 cable, bumper guard, and lanyard
Supply voltage	From SA/FC bus: 15 VDC at 2.7 VA maximum
Ambient conditions	
Operating	0 to 50°C; 5 to 95% RH, 30°C maximum dew point conditions
Operating survival	-30 to 60°C
Storage	-40 to 70°C; 5 to 95% RH 30°C maximum dew point conditions
Transmission power (Typical)	
Wireless local area Network (WLAN) transmission power	+14.5 dBm, 54 Mbps +12.5 dBm, 65 Mbps
WLAN Receiver Sensitivity (Typical)	-76 dBm, 10% packet error rate (PER), 54 Mbps -73 dBm, 10% PER, 65 Mbps
Transmission speeds	
Wireless communication	2.4 GHz ISM bands, 802.11 b/g/n, 11/22/54 Mbps
Serial communication (SA/FC Bus)	9600, 19.2k, 38.4k, or 115.2k bps **Note:** If you connect a MAP at 4.0 or earlier to an FC bus, select an MSTP baudrate of 38.4k bps.
Ethernet communication	10 Mbps, 100 Mbps
Wi-Fi Transmission Range (Typical)	
Wi-Fi Wireless communication	30 m line-of-sight indoors; however, a typical indoor range in an area with obstacles is 15 m 91 m line-of-sight outdoors
WLAN range performance	0 – 15 ft = Excellent 15 – 30 ft = Good 30 – 90 ft = Weakest, approaching out of range
Wi-Fi Wireless security	WPA2-PSK TKIP (Wi-Fi Protected Access Pre-Shared Key mode Temporal Key Integrity Protocol) WPA2-EAP-PEAP WPA2-EAP-TLS
Network and serial interfaces	One SA/FC port (6-pin port; connects with ZFR1820/1823. Can be extended to 30 m (100') if necessary) One USB port (Micro-B port; 2.0; supports Open Host Controller Interface [Open HCI] specification)
Dimensions (Height x Width x Depth)	
Unit alone	120 x 70 x 24.5 mm (when used vertically)
Unit in shell	128 x 75 x 29.5 mm (when used vertically)
Housing	White Acrylonitrile butadiene styrene (ABS) bracket Black silicone shell
Weight	
MAP Gateway alone	0.10 kg

...Continued...

TECHNICAL SPECIFICATIONS

MAP Gateway in shell	0.15 kg
	Note: Weights do not include any peripheral components such as cables, lanyard, or an external power supply.
Web browser requirements for computers and handheld devices	
Computer	Google®Chrome™ 54 and above is the preferred browser for MAP. Windows Internet Explorer® 11, and Apple®Safari® 8 and above are also supported.
Handheld device	The handheld device must be running iOS version 8.0 or later on an Apple® iPhone® or iPod touch®; Android™ versions 5.1 or later; or using the browser Google Chrome 54 or above. **Note:** Other web browsers may display the UI, but the functionality is not guaranteed.
CE Compliance	Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.

FAD

FIELD ADVANCED DISPLAY

The Field Advanced Display (FAD) is a user friendly operator interface featuring BACnet® communication and a colorful, graphic display with touch-screen interface.

The solution is specifically designed to enable user interaction with a BACnet MS/TP-based Building Automation Control System through a convenient, comprehensive and intuitive user interface.
The FAD is delivered with a factory programmed application for ease of use and to reduce and simplify its set-up.

Its flexible, attractive and intuitive graphical interface allows any user type to navigate the Building Automation Control System to view useful information such as temperatures, adjust parameters as set-points, program schedules and calendars and monitor dynamic information such as alarms and events. The access authority to information is managed though a series of optional user passwords.

The FAD offers various options to configure. It can be configured directly without the need of a PC or software tool, using its own user interface or it can be conveniently prepared off-line using a PC.
The device configuration can be easily archived, exported or imported with a widely supported file format (CSV) through the embedded USB port.

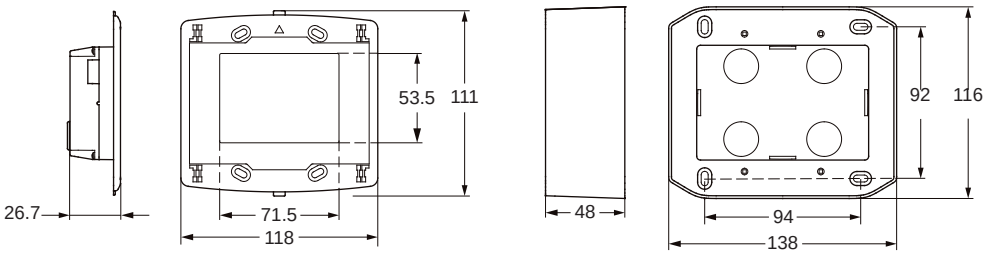
Its compact dimensions, IP protection ratings and multiple mounting options, together with its modern and discrete design, allow the FAD to properly adapt its style to any type of room and user's preference.

FEATURES

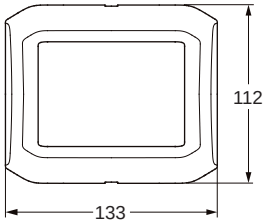
- Factory Programmed Application
- BACnet® MS/TP Communication
- Portable configurations and easily upgradeable
- Compact and neutral design

FAD FIELD ADVANCED DISPLAY

DIMENSIONS *(in mm)*



Wall mount box (WMB0351-0)



Plastic frame (WPF0351-0 and BPF0351-0)

ORDERING INFORMATION

CODES	DESCRIPTION
FAD0351-0	3.5" Field Advanced Display
WMB0351-0	Wall mounting box
FMB0351-0	Flush mounting box
IPG0351-0	IP65 gasket
WPF0351-0	White plastic frame
BPF0351-0	Black plastic frame
USB0351-0	USB cable, 0.5 m
USB0351-1	USB cable, 2 m

CONTROLLERS WITH DISPLAY PACKAGED SOLUTIONS

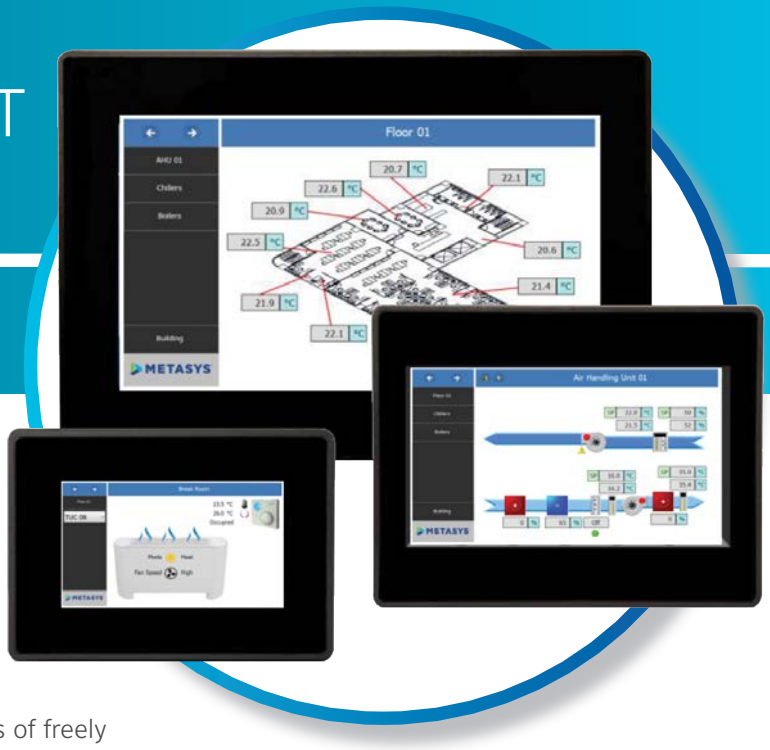
A series of bundle packages are available to facilitate and optimize ordering and logistics operations.
These bundles are including the selected field controller and a Field Advanced Display to offer a convenient solution.

CODES	DESCRIPTION
FED2611-0	Field Equipment controller, 24 VAC, 17-points with FAD display
FCD2612-1	Field Advanced controller, 24 VAC, 18-points with FAD display
FCD2612-2	Field Advanced controller, 230 VAC, 18-points with FAD display
FCD2611-0	Field Advanced controller, 24 VAC, 17-points with FAD display

METASYS BUILDING MANAGEMENT SYSTEM

NETWORK DISPLAYS, WEBSERVER AND GATEWAYS

TOUCH ADVANCED DISPLAY



TAD

TOUCH ADVANCED DISPLAY

The Touch Advanced Display (TAD) is a comprehensive series of freely programmable operator interfaces featuring MQTT, OPC UA and both IP and MSTP BACnet® communication and colorful, graphic displays with touch-screen interface.

TAD Displays feature bright TFT widescreen (16:9) displays of different sizes 4.3", 7" and 10" with a fully dimmable LED backlight and resistive touch interface. The integrated HTML 5.0 web server grants remote access whenever the units are connected to an accessible IP network.

TAD series offers an unprecedented price / performance ratio to meet challenging applications requirements from offices to control rooms. They combines state-of-the-art features and top performance with an outstanding design.

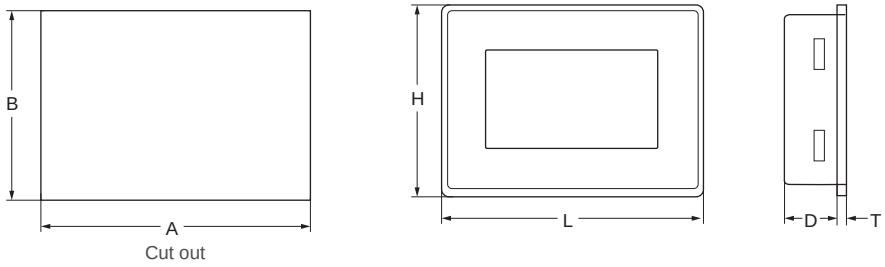
TAD Series is the ideal choice for User Interface applications enabling an intuitive and easy interaction with the building automation controls and equipment.

FEATURES

- **Standard BACnet Interfaces (IP / MSTP)** - The TAD Series fulfill the standard BACnet Operator Display (B-OD) profile enriching its minimum requirements with Alarms, Time Schedules and Calendars support, enabling users to take full advantage of the features included in the connected devices.
  T3 studio 4.0 introduces BACnet points (AV, BV, MV) and notification in the protocol section. They can be visible from a BACnet client.
- **Freely Programmable -** The Touch-Screen Tailoring Tool (T^3) suite allows customizing the TAD user experience tailoring it to the effective User requirements. Thanks to the extensive library of symbols and widgets, building data and operations are presented in a consistent way across different applications.
- **Web-Browser Widget -** Embedded web browser devices are becoming a common demand in the marketplace. TAD features a web-browser widget that can be included in the User Interface project empowering the end user to connect to simple web pages and interact with remote systems.
- **Embedded Web-Server -** The web server capabilities natively included in TAD devices allow users to remotely connect and interact with the device thought standard internet browsers. The web pages user interface will reflect the same UX of the local application therefore maintaining a consistent look across different interfaces.
- **Simple and Elegant but Robust Design -** Its simplicity of design does not preclude the immediate impression of beauty and the IP66 protection rate for the front of the unit.

TAD TOUCH ADVANCED DISPLAY

DIMENSIONS *(in mm)*



CODES	A	B	D	H	L	T
TAD0471	136	96	29	107	147	5
TAD0701	176	136	29	147	187	5
TAD1001	271	186	29	197	282	6

ORDERING INFORMATION

CODES	DESCRIPTION
TAD0471-0	4.3" Touchscreen Advanced Display
TAD0701-0	7.0" Touchscreen Advanced Display
TAD1001-0	10.0" Touchscreen Advanced Display

ACCESSORIES (TO BE ORDERED SEPARATELY)

CODES	DESCRIPTION
BOX04-01	Wall mount box for TAD04
BOX07-01	Wall mount box for TAD07
BOX10-01	Wall mount box for TAD10
DEMO-STAND07	Demonstration Stand for TAD07

PROGRAMMING TOOL LICENSE

CODES	DESCRIPTION
TTT0103	Touchscreen Tailoring Tool, single license Key for 3 installations
TTT0110	Touchscreen Tailoring Tool, single license Key for 10 installations
TTT0130	Touchscreen Tailoring Tool, single license Key for 30 installations

TAD TOUCH ADVANCED DISPLAY

TECHNICAL SPECIFICATION

Codes	
TAD0471-0	4.3" Freely programmable Touchscreen Advanced Display
TAD0701-0	7.0" Freely programmable Touchscreen Advanced Display
TAD1001-0	10.0" Freely programmable Touchscreen Advanced Display
Display	
TAD0471	4.3" Widescreen TFT 64k Colors, 480 x 272 and LED backlight
TAD0701	7.0" Widescreen TFT 64k Colors, 800 x 480 and LED backlight
TAD1001	10.1" Widescreen TFT 64k Colors, 1024 x 600 and LED backlight
Brightness	200 cd/m^2 max
Touch-Screen	Resistive
Supply voltage	18 - 32 VDC
Real-time clock	Yes
Ethernet Port	1 – Port 0 10/100
Serial Port	1 – RS-232 / RS-422 / RS-485 Software Configurable
USB Port	1 – Host v. 2.0, max. 500 mA
Power consumption	
TAD0471	250 mA max at 24 VDC
TAD0701	300 mA max at 24 VDC
TAD1001	380 mA max at 24 VDC
Ambient conditions	
Operating	0 to 50°C, 5 to 85% RH Noncondensing
Storage	-20 to 70°C, 5 to 85% RH Noncondensing
Dimensions (Height x Width x Depth)	
TAD0471	107 x 147 x 29 mm
TAD0701	147 x 187 x 29 mm
TAD1001	197 x 282 x 29 mm
Weight	
TAD0471	0.4 Kg
TAD0701	0.6 Kg
TAD1001	1.0 Kg
Memory	
TAD0471	256 MB RAM, 2 GB Flash
TAD0701	256 MB RAM, 2 GB Flash
TAD1001	512 MB RAM, 4 GB Flash
Protection Class	IP66 Front*, IP20 Back *IP66 rating is achieved respecting the instructions provided.
CE Compliance	Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive. Emission EN 61000-6-4, Immunity EN 61000-6-2 for installation in industrial environments Emission EN 61000-6-3, Immunity EN 61000-6-1 for installation in residential environments