Network Engines Catalog Page

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Introduction

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

- 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 supervisory controllers 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.

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.

Figure 1: Network Engines

The network engines are identified by three types:

Small-capacity engines

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

Large-capacity engine

- Network Automation Engine: NAE55

Software-only engine

- Network Automation Engine: NAE85

NAEs provide network supervisor capabilities, IP network connectivity, and third-party 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.

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

Application Documentation

Refer to the *Network Engines Product Bulletin (LIT-12012138)* for important product application information.

Features and benefits

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, and other third-party protocols.

Building management security with the NAE-S

The NAE-S uses embedded encryption technology with a built-in firewall. The NAE-S functions as a secure network engine that reports to an ADS/ADX Site Director. The NAE-S is Common Criteria Certified and meets the Federal Information Processing Standard (FIPS)-140-2, Level 2.

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, and 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

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

Network Control Engines

The following features and benefits are specific to NCEs:

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.

Repair information

If the network engine fails to operate within its specifications, replace the unit. For a replacement engine, contact the nearest Johnson Controls® representative.

Ordering information - NCE25 and NAEx5 models

Contact the nearest Johnson Controls representative to order a network engine. The following tables list the product code numbers and accessories for all available network engines based on model. If you receive an NAE55 engine from the factory that is imaged with Release 10.0, you can field-upgrade the engine to Release 10.1 if the upgrade is supported. To order repair parts, add -702 or -703 in place of the last number (for example, MS-NAE3525-702, MS-NAE4521-702, and MS-NAE5521-703).

Table 1: NCE25 ordering information (Releases 9.0 or 9.0.7)

Product Code Number	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 (Europe only)	9.0.7	Base features with no physical field controller trunk connection.
MS-NCE2506-0 (Europe only)	9.0.7	Base features with no physical field controller trunk connection. Includes integral display screen.
MS-NCE2510-0	9.0.7	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	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	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 third-party trunk depends on the protocol. For the MS/TP bus, up to 32 devices are supported.
MS-NCE2566-0	9.0.7	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 third-party trunk depends on the protocol. For the MS/TP bus, up to 32 devices are supported. Includes integral display screen.

Table 2: NAE35 ordering information (Release 9.0 or 9.0.7)

Product Code Number	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	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	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.

Table 3: NAE45 ordering information (Release 9.0 or 9.0.7)

Product Code Number	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	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.

Table 4: NAE5510-2U ordering information (Release 8.1 only)

Product Code Number	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-NAE5510-2U	8.1	Supports two N2 Bus or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); supports a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk. ⓘ **Note:** This model is UL 864 **10th Edition** UUKL/ORD-C100-13 UUKLC Standard for Smoke Control Equipment for Release 8.1 only. Refer to the *Metasys® System UL 864 10th Edition UUKL/ORD-C100-13 UUKLC Smoke Control System Technical Bulletin (LIT-12012487)* for detailed specifications, requirements, and procedures for installing and operating UUKL 864 Listed *Metasys* system devices. For example, in order to be UL/cUL compliant, this model must be pre-installed and pre-wired in a standard or custom panel built at the Johnson Controls Reynosa factory.

Table 5: NAE55-3 ordering information (Release 8.1 or 10.1)

Product Code Number	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	10.1	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-NAE5510-3U[1]	8.1	Supports two N2 Bus or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk). ⓘ **Note:** This model is UL 864 **10th Edition** UUKL/ORD-C100-13 UUKLC Standard for Smoke Control Equipment for Release 8.1 only. Refer to the *Metasys® System UL 864 10th Edition UUKL/ORD-C100-13 UUKLC Smoke Control System Technical Bulletin (LIT-12012487)* for detailed specifications, requirements, and procedures for installing and operating UUKL 864 Listed *Metasys* system devices. For example, in order to be UL/cUL compliant, this model must be pre-installed and pre-wired in a standard or custom panel built at the Johnson Controls Reynosa factory.

Table 5: NAE55-3 ordering information (Release 8.1 or 10.1)

Product Code Number	Release	Description
MS-NAE5511-3	10.0	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	10.1	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	10.1	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.

1 The older MS-NAE5510-2U model may also be available.

Table 6: NAE85 ordering information (Release 10.1 only)

Product Code Number	Release	Description
MS-NXE85SW-0	10.1	License enabling NAE8500 software for new installation; supports a maximum of 10,000 objects. Software may be obtained by electronic download from the Licensing Portal or by ordering a DVD copy.
MS-NXE85SW-6	10.1	License enabling NAE8500 software for upgrading existing installation; supports a maximum of 10,000 objects. Software may be obtained by electronic download from the Licensing Portal or by ordering a DVD copy.
MS-15KUPG-0	10.1	License enabling an additional 15,000 objects on NAE8500 or LCS8500 (resulting in supporting a maximum of 25,000 total objects).
MS-COPY-NXE85SW	10.1	DVD copy of unlicensed NAE8500 software.

Ordering Information - NCE and NAE Accessories

Table 7: Network engines accessories ordering information

Product Code Number	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 (70°F)
MS-BAT1010-0	Replacement data protection battery for NAE55 and NIE55. Rechargeable gel cell battery: 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C (70°F)
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.

Table 7: Network engines accessories ordering information

Product Code Number	Description
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
SC450RM1U (OEM Part No.)	Recommended UPS for NxE85 model: APC Smart-UPS SC 450 VA, 280 W, 120 VAC input/output with NEMA 5-15R output connections

Table 8: Modbus accessories ordering information

Product Code Number	Description
IU-9100-8401 (Europe)	RS232-to-RS485 converter, 230 VAC Order this accessory in AOMS from the Essen Distribution Center.
IU-9100-8404 (Europe) or BM485-CIP (North America)	RS232-to-RS485 converter, 24 VAC For the European market, order this accessory in AOMS from the Essen Distribution Center. For the North American market, order this accessory from duTec (http://www.interfaceconverter.com or 1-800-248-1632), specify vendor #290904

Table 9: M-Bus accessories ordering information

Product Code Number	Description
SIS-MBUSSCSL-0E	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
ⓘ **Note:** Order these accessories in AOMS from the Essen Distribution Center.	

Table 10: KNX accessories ordering information

Product Code Number	Description
SIS-KNXNIXL-0E	KNX IP interface module to connect KNX line through Ethernet to a network engine
SIS-KNXNRXL-0E	KNX IP router to connect KNX line through Ethernet to a network engine, including line or area coupler functionality
ⓘ **Note:** Order this accessory in AOMS from the Essen Distribution Center.	

Technical specifications - NCE25, NAE35, and NAE45 models

Table 11: NCE25 technical specifications

Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply (North America), SELV power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
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).

Table 11: NCE25 technical specifications

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 Operating Conditions	0°C to 50°C (32°F to 122°F), 10% to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Conditions	-40°C to 70°C (-40°F to 158°F), 5% to 95% RH, 30°C (86°F) 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 (70°F); 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) Buildroot 2017.08.2 with Linux kernel 14.4 (Release 9.0.7 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 software, **but not the Release 9.0.7 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 *Metasys* Release 9.0, but **are not** available after the NCE is patched with Release 9.0.7.
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
Dimensions (Height x Width x Depth)	155 mm x 270 mm x 64 mm (6.1 in. x 10.6 in. x 2.5 in.), Minimum mounting space required: 250 mm x 370 mm x 110 mm (9.8 in. x 14.6 in. x 4.3 in.)
Housing	Plastic housing Plastic material: ABS and polycarbonate Protection: 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 (2.7 lb)

Table 11: NCE25 technical specifications

Compliance CE	**United States:** UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class A
	Canada: UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment Industry Canada Compliant, ICES-003
	Europe: CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant
	BACnet International: BTL 135-2010 Listed B-BC, Protocol Revision 12

Table 12: NAE35 and NAE45 technical specifications

Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply (North America), SELV power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	25 VA maximum
Ambient Operating Conditions	0°C to 50°C (32°F to 122°F); 10% to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Conditions	-40°C to 70°C (-40°F to 158°F); 5% to 95% RH, 30°C (86°F) 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 (70°F); 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 patch)
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 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. • 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.
Housing	Plastic housing material: ABS polycarbonate UL94-5VB Protection: 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 (5-3/16 in. x 10-5/8 in. x 2-1/2 in.) Minimum space for mounting NAE35 and NAE45: 210 mm x 350 mm x 110 mm (8-3/16 in. x 13-13/16 in. x 4.-5/16 in.)
Shipping Weight	1.2 kg (2.7 lb)

Table 12: NAE35 and NAE45 technical specifications

Compliance	**United States:** UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class A
	Canada: UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant
CE	**Europe:** CE Mark – 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

Technical specifications - NAE55, NAE-S, and NAE85 models

Table 13: NAE5510-2U (Smoke Control) technical specifications

Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply (North America) at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	50 VA maximum
Ambient Operating Conditions	0°C to 50°C (32°F to 122°F); 10% to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Conditions	-40°C to 70°C (-40°F to 158°F); 5% to 95% RH, 30°C (86°F) 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 (70°F); Product Code Number: MS-BAT1010-0
Clock Battery	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C (70°F)
Processor	1.6 GHz Intel Atom® processor
Memory	4 GB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup. 1 GB SDRAM for operations data dynamic memory for all models
Operating System	Johnson Controls OEM Version of Microsoft Windows Standard 2009 (used by *Metasys* system Release 8.1)
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 • Two RS-232-C serial ports, with standard 9-pin sub-D connectors, that support all standard baud rates • Two USB serial ports; standard USB connectors (use is not supported on Smoke Control NAEs)
Housing	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate
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 (8.9 in. x 13.1 in. x 3.8 in.) including mounting feet Minimum space for mounting: 303 mm x 408 mm x 148 mm (12.0 in. x 16.1 in. x 5.8 in.)
Shipping Weight	2.9 kg (6.4 lb)
Compliance CE	**United States**: UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class A UL Listed, File S4977, UL 864 UUKL/UUKLC 10th Edition Listed, Smoke Control Units and Accessories for Fire Alarm Systems Equipment
	Canada: UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment, Industry Canada Compliant, ICES-003 UL Listed, File S4977, UL 864 UUKL/ORD-C100-13 10th Edition Listed, Smoke Control Units and Accessories for Fire Alarm Systems
	Europe: CE Mark - Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant
	BACnet International: BTL 135-2010 Listed B-BC, Protocol Revision 12

Table 14: NAE55xx-3 (Energy Management) and NAE5510-3U (Smoke Control) technical specifications

Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply (North America), SELV power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	50 VA maximum

Table 14: NAE55xx-3 (Energy Management) and NAE5510-3U (Smoke Control) technical specifications

Ambient Operating Conditions	0°C to 50°C (32°F to 122°F); 10% to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Conditions	-40°C to 70°C (-40°F to 158°F); 5% to 95% RH, 30°C (86°F) 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 (70°F); Product Code Number: MS-BAT1010-0
Clock Battery	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C (70°F)
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	Johnson Controls OEM Version of Microsoft Windows Embedded Standard 7 with SP1 (WES7, Release 9.0) Wind River® Linux LTS 17 (LTS=long-term support) at Release 10.1
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 for engines at Release 9.0 or earlier. • One LonWorks port; FTT10 78 Kbps; pluggable, keyed 3-position terminal block (LonWorks port available on NAE552x-x models only)
Housing	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate; Protection: 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 (8.9 in. x 13.1 in. x 3.8 in.) including mounting feet Minimum space for mounting: 303 mm x 408 mm x 148 mm (12.0 in. x 16.1 in. x 5.8 in.)
Shipping Weight	2.9 kg (6.4 lb)
Compliance	**United States**: UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment, FCC Compliant to CFR47, Part 15, Subpart B, Class A UL Listed, File S4977, UL 864 UUKL/UUKLC 10th Edition Listed, Smoke Control Units and Accessories for Fire Alarm Systems Equipment (MS-NAE5510-3U model only with Release 8.1 software)
	Canada: UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment, Industry Canada Compliant, ICES-003 UL Listed, File S4977, UL 864 UUKL/ORD-C100-13 10th Edition Listed, Smoke Control Units and Accessories for Fire Alarm Systems (MS-NAE5510-3U model only with Release 8.1 software)
CE	**Europe**: CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant
	BACnet International: BTL 135-2016 Listed B-BC/B-BBMD, Protocol Revision 15

Table 15: NAE-S technical specifications (North America and Canada only)

Power Requirements	**NAE551S-2 Engine:** Dedicated nominal 24 VAC, Class 2 power supply (North America), at 50/60 Hz (20 VAC minimum to 30 VAC maximum) **Internal Module with Embedded Encryption Technology:** Input: Dedicated nominal 100–240 VAC, Class 1 power supply (North America), at 50/60 Hz (85 VAC minimum to 264 VAC maximum) Output: 24 VDC (22 VDC minimum to 26 VDC maximum)
Power Consumption	50 VA maximum
Power Specifications for Encryption Board	Dedicated nominal 24 VDC, input voltage range 85–264 VAC (120–375 VDC), output current 2.0A
Ambient Operating Conditions	0°C to 50°C (32°F to 122°F); 10% to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Conditions	-40°C to 70°C (-40°F to 158°F); 5% to 95% RH, 30°C (86°F) 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 70°F (21°C); Product Code Number: MS-BAT1010-0
Clock Battery	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C (70°F)
Processor	1.6 GHz Intel Atom® processor
Memory	4 GB flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 1 GB SDRAM for operations data dynamic memory for all models
Network and Serial Interfaces	• One Ethernet port; 10/100/1000 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)
Housing	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate; Protection: IP20 (IEC 60529)
Mounting	Must be mounted in a locked, secure panel using four mounting feet or dual 35 mm DIN rails.
Dimensions (Height x Width x Depth)	226 mm x 332 mm x 96.5 mm (8.9 in. x 13.1 in. x 3.8 in.) including mounting feet Minimum space for mounting: 303 mm x 408 mm x 148 mm (12.0 in. x 16.1 in. x 5.8 in.)
Shipping Weight	3.88 kg (10.4 lb)
Shipping Restriction	The Bureau of Industry and Security of the U.S. Department of Commerce has regulated this shipment under 740.17(b)(2) of the EAR and restricted the shipment of this product to the following countries: Cuba, Iran, North Korea, Sudan, and Syria.
Compliance	**United States**: UL 508A and CCN NITW Industrial Control Panel Listed, FCC Compliant to CFR47, Part 15, Subpart B, Class A
	Canada: cUL CSA-C22.2 No. 14, CCN NITW7, Industrial Control Equipment; IC Compliant to ICES-003 Class A
	BACnet International: BTL 135-2012 Listed B-BC, Protocol Revision 12

Table 16: NAE85 software system recommendations for installation or upgrade

Recommended Computer Platform	IntelXeon E5506, 2.13 GHz, 4 MB Cache 2 x 160 GB 7.2K SATA, 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller)
Recommended Memory	8 GB RAM minimum
Hard Disk	160 GB minimum

Table 16: NAE85 software system recommendations for installation or upgrade

Supported Operating Systems and Software	• Windows® Server® 2016 with Update (KB4489890) (64-bit) • Windows® Server® 2012 R2 with Update (KB2919355) (64-bit) • Windows® Server® 2012 with Update (KB3172614) (64-bit) ⓘ **Note:** The NAE85 software requires two Windows components: Microsoft .NET Framework Version 3.5 SP1 and Microsoft .NET Framework Version 4.6.1.
Supported Operating Systems for *Metasys* Client Computers	• Windows® 10 Pro and Windows 10 Enterprise Editions (version 1809 or later) (64-bit) • Windows® 8.1 Pro and Windows 8.1 Enterprise Editions with Update (KB2919355) (64-bit) • Windows® 7 Professional, Enterprise, and Ultimate Editions with SP1 (64-bit) • Windows® 7 Professional, Enterprise, and Ultimate Editions with SP1 (32-bit) • Apple® OS X® 10.14 Mojave • Apple® OS X® 10.13 High Sierra • Apple® OS X® 10.12 Sierra • Apple® OS X® 10.11 El Capitan **Notes:** • Apple® operating systems are supported for *Metasys* client computers only. • In Apple® OS X®, you cannot view Graphics+ graphics in the SMP UI.
Internal Optical Drive	DVD ROM, SATA
Recommended Antivirus Software	Symantec Endpoint Protection version 12
Supported Web Browser Software for *Metasys* Client Computers	• Windows® Internet Explorer® 11.0.9600.18816 Update version 11.0.47 or later • Google® Chrome™ version 72.0.3626.121 or later • Apple® Safari® 11 or later **Notes:** • 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. • Other browsers, such as Mozilla® Firefox®, may also be used but are not fully supported. • Use a web browser to download the Launcher application. After you install Launcher, use Launcher, not the web browser, to log on the *Metasys* SMP UI.
Supported Virtual Environments	Microsoft Hyper-V™, VMware®
Network Communication	Network Interface: 1 Gbps Ethernet network interface card connects at 10 Mbps, 100 Mbps, or 1 Gbps (100 Mbps or better recommended)
Recommended Data Protection	UPS for NxE85 model: APC Smart-UPS SC 450VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U

North American emissions compliance

United States

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

Canada

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

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

Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIJANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

For more contact information, refer to www.johnsoncontrols.com/locations.

Software terms

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

Product warranty

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

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