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NAE55 Catalog Page

2021-07-28 LIT-1900195 Release 11.0



Introduction

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.

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.

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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)*.

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.

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Ordering information

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. For ordering information about the secure NAE55 (NAE-S), refer to the *Secure Network Engine Catalog Page (LIT-1900996)*. If you receive an NAE55 engine from the factory that is imaged with Release 10.0, you can field-upgrade the engine to Release 11.0 if the upgrade is supported. To order repair parts, add -702 or -703 in place of the last number (for example, MS-NAE5521-703).

ⓘ **Note:** The discontinuation and end-of-support of the Secure NAE Engine (NAE-S) is effective from July 2021.

Table 1: 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.

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Table 2: NAE55-3 ordering information (Release 8.1 or 11.0)

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	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-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.

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Table 2: NAE55-3 ordering information (Release 8.1 or 11.0)

Product Code Number	Release	Description
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.

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

Ordering Information - Accessories

Table 3: Network engines accessories ordering information

Product Code Number	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 (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.

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Table 3: Network engines accessories ordering information

Product Code Number	Description
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

Table 4: 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 5: M-Bus accessories ordering information

Product Code Number	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
ⓘ **Note:** Order these accessories in AOMS from the Essen Distribution Center.	

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Table 6: 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

Table 7: NAE5510-2U (UL 864, 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)

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Table 7: NAE5510-2U (UL 864, Smoke Control) technical specifications

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	**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
CE	**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 8: NAE55xx-3 (UL 916, Energy Management) and NAE5510-3U (UL 864, 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
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

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Table 8: NAE55xx-3 (UL 916, Energy Management) and NAE5510-3U (UL 864, Smoke Control) technical specifications

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	**NAE5510-3U (UL 864)**: Johnson Controls OEM Version of Microsoft® Windows® Embedded Standard 7 with SP1 (WES7) **NAE55xx-3: (UL 916)**: Wind River® Linux LTS 17 (LTS=long-term support)
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	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)

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Table 8: NAE55xx-3 (UL 916, Energy Management) and NAE5510-3U (UL 864, Smoke Control) technical specifications

	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
	FIPS 140-2 Level 1: Compliant with Federal Information Processing Standard (NAE55s at Release 11.0 only)

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.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

Industry Canada Statement(s)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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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Software terms

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

Patents

Patents: https://jcipat.com

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