

MS-NAE35xx-x, MS-NAE45xx-x, MS-NAE55xx-x, NAE8500-0

Network Automation Engine

Description

Network Automation Engines (NAEs) enable Internet Protocol (IP) connectivity and Web-based access to Metasys® Building Management Systems (BMSs).

NAEs leverage standard building management communication technologies, including BACnet® protocol, LONWORKS® network, and N2 Bus protocol to monitor and supervise a wide variety of Heating, Ventilating, and Air Conditioning (HVAC); lighting; security; fire; and access control equipment.

NAEs provide comprehensive equipment monitoring and control, scheduling, alarm and event management, energy management, data exchange, data trending, and data storage.

NAEs feature an embedded Site Management Portal user interface, support multiple concurrent Web browser sessions with password and permission access control, and provide the protection of industry standard Information Technology (IT) security.

NAE55 models support a comprehensive set of supervisory features and functions for large facilities and technically advanced buildings and complexes.

The NAE35/NAE45 models enable cost-effective NAE connectivity and control in smaller facilities, and can extend NAE supervisory functions in larger facilities.

The NAE85 is a high-capacity NAE that allows integration of large BACnet IP systems and can take the place of multiple NAEs.

Refer to the *Network Automation Engine Product Bulletin (LIT-1201160)* for important product application information.

Features

- communication using commonly accepted IT standards at the automation and enterprise level
- Web-based user interface
- Site Director function
- support for Web services at the automation network level
- user interface and online system configuration software embedded in NAE
- supervision of field controller networks including N2 Bus, LONWORKS network, BACnet Master-Slave/Token-Passing (MS/TP), and BACnet IP devices
- multiple connection options for data access

Repair Information

If the NAE fails to operate within its specifications, refer to the *Network Automation Engine (NAE) Product Bulletin (LIT-1201160)* for a list of repair parts available.



NAE35/NAE45



NAE55



NAE85

Selection Charts

NAE35

Product Code Number ¹	Description
MS-NAE35xx-x (Base Features of Each NAE35)	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.
MS-NAE3510-2	Supports one N2 or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports up to 50 devices on the N2 or BACnet MS/TP trunk.
MS-NAE3510-2U	Supports one N2 or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports up to 50 devices on the N2 or BACnet MS/TP trunk. Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-NAE3511-2	Supports one N2 or BACnet MS/TP (RS-485) trunk; includes an internal modem; supports up to 50 devices on the N2 or BACnet MS/TP trunk.
MS-NAE3514-2	Supports one N2 or BACnet MS/TP (RS-485) trunk; features Basic Access support; includes an additional RS-232-C serial port for optional external modem; supports up to 50 devices on the N2 or BACnet MS/TP trunk.
MS-NAE3515-2	Supports one N2 or BACnet MS/TP (RS-485) trunk; features Basic Access support; includes an internal modem; supports up to 50 devices on the N2 or BACnet MS/TP trunk.
MS-NAE3520-2	Supports one LONWORKS trunk, includes an additional RS-232-C serial port for optional external modem. Supports up to 64 devices on the LONWORKS port.
MS-NAE3520-2U	Supports one LONWORKS trunk, includes an additional RS-232-C serial port for optional external modem. Supports up to 64 devices on the LONWORKS port. Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-NAE3521-2	Supports one LONWORKS trunk, includes an internal modem. Supports up to 64 devices on the LONWORKS port.
MS-NAE3524-2	Supports one LONWORKS trunk, features Basic Access support, and includes an additional RS-232-C serial port for optional external modem. Supports up to 64 devices on the LONWORKS trunks.
MS-NAE3525-2	Supports one LONWORKS trunk, features Basic Access support, and includes an internal modem. Supports up to 64 devices on the LONWORKS trunks.

1. Some models are also available in a Buy American version (add a G after the code number). For repair parts, add -702 after the code number.

Network Automation Engine (Continued)

NAE45

Product Code Number ¹	Description
MS-NAE45xx-x (Base features of each NAE45)	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.
MS-NAE4510-2	Supports one N2 or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports up to 100 devices on the N2 or BACnet MS/TP trunk.
MS-NAE4510-2U	Supports one N2 or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports up to 100 devices on the N2 or BACnet MS/TP trunk. Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-NAE4511-2	Supports one N2 or BACnet MS/TP (RS-485) trunk; includes an internal modem; supports up to 100 devices on the N2 or BACnet MS/TP trunk.
MS-NAE4520-2	Supports one LONWORKS trunk, includes an additional RS-232-C serial port for optional external modem; supports up to 127 devices on the LONWORKS port.
MS-NAE4520-2U	Supports one LONWORKS trunk, includes an additional RS-232-C serial port for optional external modem; supports up to 127 devices on the LONWORKS port. Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-NAE4521-2	Supports one LONWORKS trunk, includes an internal modem; supports up to 127 devices on the LONWORKS port.

1. Some models are also available in a Buy American version (add a G after the code number). For repair parts, add -702 after the code number.

NAE55

Product Code Number ¹	Description
MS-NAE55xx-x (Base features of each NAE55)	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 up to 100 devices on each N2 or BACnet MS/TP trunk.
MS-NAE5510-1	Supports two N2 or two BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk).
MS-NAE5510-1U	Supports two N2 or two BACnet MS/TP trunks (or one N2 trunk and one BACnet MS/TP trunk). Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-NAE5511-1	Supports two N2 or two BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk); includes an internal modem.
MS-NAE5512-1	Supports two N2 or two BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk). Note: MS-NAE5512-1 models support N2 tunneling on N2 trunks (only).
MS-NAE5513-1	Supports two N2 or two BACnet MS/TP (RS-485) trunks (or one N2 trunk and one BACnet MS/TP trunk); includes an internal modem. Note: MS-NAE5513-1 models support N2 tunneling on N2 trunks (only).
MS-NAE5520-1	Supports a LONWORKS trunk, and two N2 trunks or two 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.
MS-NAE5520-1U	Supports a LONWORKS trunk, and two N2 trunks or two 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. Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-NAE5521-1	Supports a LONWORKS trunk, and two N2 trunks 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 255 devices on the LONWORKS trunk.

1. Some models are also available in a Buy American version (add a G after the code number). For the European version, add an E after the code number. For repair parts, add -701 after the code number.

NAE85

Product Code Number	Description
MS-NIE8500-0¹	NxE85 model with 1U chassis for mounting in a server rack Note: The NAE85 models ship as MS-NIE8500-0 models. Use the ChangeModel utility in the NxE85 Metasys software to change an NIE85 to an NAE85.
MS-NxE85SW-0	NxE85 software for 10,000 objects (new projects only software)

1. Standard NxE85 models supports 10,000 objects; an upgrade is available to support an additional 15,000 objects.

Accessories

Product Code Number	Description
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)
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 10 years at 21°C (70°F)
MS-15KUPG-0	15,000 object upgrade for NxE85
MS-MULTENGSW-6	Contains ToggleTunnel utility for converting an NAE55/NIE55 to an NAE55 model with the N2 Tunneling features enabled. Not for use with MS-NAE5510-OU or MS-NIE5510-OU.

Network Automation Engine (Continued)

Product Code Number	Description
MS-RAP-0	Ready Access Portal Server provides a user interface that is a natural, complementary extension of the Metasys Site Management Portal user interface. Note: This option is not necessary for sites that have an ADS/ADX that is the Site Director because Ready Access Portal Server is provided with the ADS/ADX solution.
MS-EXPORT-0	Export Utility extracts historical trend, alarm, and audit data from the system and presents the historical data in a variety of formats. Note: This option is not necessary for sites that have an ADS/ADX that is the Site Director because Export Utility is provided with the ADS/ADX solution.
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 Uninterruptable Power Supply (UPS) for NxE85 Models: American Power Conversion (APC®) Smart-UPS SC 450VA, 280 W 120 VAC input/output with NEMA 5-15R output connections

Technical Specifications

NAE35 and NAE45	
Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply (North America), Safety Extra- Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	25 VA maximum
Ambient Operating Conditions	0 to 50°C (32 to 122°F); 10 to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Conditions	-40 to 70°C (-40 to 158°F); 5 to 95% RH, 30°C (86°F) maximum dew point
Data Protection	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 Synchronous Dynamic Random Access Memory (DRAM) for operations data dynamic memory
Operating System	Microsoft® Windows® CE embedded
Network and Serial Interfaces	One Ethernet port; 10/100 Mbps; 8-pin RJ-45 connector One optically isolated RS-485 port; 9600, 19.2k, 38.4k, or 76.8k baud (depending on protocol); with a pluggable and keyed 4-position terminal block (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) One RS-232-C serial port with standard 9-pin sub-D connector that supports standard baud rates. A second serial port, on models without an internal modem, that supports an optional, user-supplied external modem. One USB serial port with standard USB connector that supports an optional, user-supplied external modem. Option: One telephone port for internal modem; up to 56 Kbps; 6-pin RJ-11 connector (NAE models with an optional internal modem have one RS-232-C serial port only.)
Housing	Plastic housing material: ABS + polycarbonate UL94-5VB Protection: IP20 (IEC 60529)
Mounting	On flat surface with screws on three mounting clips or a single 35 mm DIN rail
Dimensions (Height x Width x Depth)	131 x 270 x 62 mm (5.2 x 10.6 x 2.5 in.) Minimum space for mounting NAE35 and NAE45: 210 x 350 x 110 mm (8.3 x 13.8 x 4.3 in.)
Shipping Weight	1.2 kg (2.7 lb)
Compliance	United States: UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment (MS-NAE35x0-2U and MS-NAE45x0-2U models only); 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, EMC Directive 2004/108/EC, in accordance with EN 61000-6-3 Generic Emission Standard for Residential and Light Industry and EN 61000-6-2 Generic Immunity Standard for Heavy Industrial Environment Australia and New Zealand: C-Tick Mark, Australia/NZ Emissions Compliant BACnet International: BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC)

NAE55 (Part 1 of 2)	
Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply (North America), Safety Extra-Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	50 VA maximum
Ambient Operating Conditions	0 to 50°C (32 to 122°F); 10 to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Conditions	-40 to 70°C (-40 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	400 MHz Pentium® class Geode® GX533 processor for MS-NAE55xx-1 models

Network Automation Engine (Continued)

NAE55 (Part 2 of 2)	
Memory	512 MB Flash nonvolatile memory for operating system, configuration data, and operations data storage and backup for MS-NAE55xx-1 models. 256 MB Synchronous Dynamic Random Access Memory (DRAM) for operations data dynamic memory for all models
Operating System	Microsoft Windows XP® embedded
Network and Serial Interfaces	One Ethernet port; 10/100 Mb; 8-pin RJ-45 connector Two optically isolated RS-485 ports; 9600, 19.2K, or 38.4K baud; pluggable and keyed 4 position terminal blocks (RS-485 ports 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 serial ports, standard USB connectors support an optional, user-supplied external modem Options: One telephone port for internal modem; up to 56 Kbps; 6-pin RJ-11 connector One LONWORKS port; FTT10 78 Kbps; pluggable, keyed 3-position terminal block (LONWORKS port available on NAE552x-xxx models only)
Housing	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate UL94-5VB Protection: IP20 (IEC 60529)
Mounting	On flat surface with screws on four mounting feet or on dual DIN rail
Dimensions (Height x Width x Depth)	226 x 332 x 96.5 mm (8.9 x 13.1 x 3.8 in.) including mounting feet Minimum space for mounting: 303 x 408 x 148 mm (12.0 x 16.1 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 UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment (MS-NAE55x0-1U models only) 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, EMC Directive 2004/108/EC, in accordance with EN 61000-6-3 Generic Emission Standard for Residential and Light Industry and EN 61000-6-2 Generic Immunity Standard for Heavy Industrial Environment Australia and New Zealand: C-Tick Mark, Australia/NZ Emissions Compliant BACnet International: BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC)
NAE85	
Computer Type	Dell® PowerEdge® R410
Power Requirement	100–240 VAC 50/60 Hz
Power Supply	480 W
Ambient Operating Conditions	10 to 35°C (50 to 95°F); 20 to 80% RH, noncondensing (twmax=29C)
Ambient Storage Conditions	-40 to 65°C (-40 to 149°F); 5 to 95% RH, noncondensing (twmax=38C)
Data Protection	Recommended Uninterruptable Power Supply (UPS): American Power Conversion (APC®) Smart-UPS SC 450 VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U
Processor	Intel® Xeon® L5520, 2.26 GHz, 8 MB Cache, 5.86 GT/s QPI, Turbo, HT
Memory	2 GB DDR2, 1066 MHz, 2x1 GB, Single Ranked UDIMMs for 1 Processor
Hard Disk	2x500 GB 7.2K RPM Serial Advanced Technology Attachment (SATA), 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller)
Internal Optical Drive	DVD ROM, SATA
Operating System	Microsoft Windows Web Server 2008 OS with SP2, 32-bit x86 version
Network and Serial Interfaces	2 RJ45 1 Gbps Ethernet Ports, Port 2 is disabled. 2 video ports; 1 front, 1 back 1 9-pin Serial port 4 USB ports (2 on front, 2 on back)
Dimensions (Height x Width x Depth)	4.3 x 43.4 x 62.7 cm (1.7 x 17.1 x 24.7 in.)
Mounting	Mount in an EIA-310D compatible server cabinet
Shipping Weight	15.9 kg (35 lb)
Compliance	Europe: CE Mark NAE only: BACnet International BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC)

Network Automation Engine (Continued)

Minimum Computer Requirements for Nx85 Software		
Product Code	MS-Nx85SW-0	Nx85 software for 10,000 objects (new projects only software)
Recommended Computer Platform	Intel® Xeon® L5520, 2.26 GHz, 8 MB Cache, 5.86 GT/s QPI, Turbo, HT 2x500 GB 7.2K RPM Serial Advanced Technology Attachment (SATA), 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller) DVD ROM, SATA	
Memory	1 GB RAM minimum	
Hard Disk	160 GB minimum	
Operating System	Microsoft® Windows® 2003 OS ¹ with SP2 Web Edition Microsoft Windows Web Server 2008 OS ² with SP2	
Communication	Network Interface Single 1 Gbps Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)	
Data Protection	Recommended Uninterruptible Power Supply (UPS): American Power Conversion (APC®) Smart-UPS SC 450VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U	

1. We support the 32-bit x86 version. We do not support the x64 version
2. We support the 32-bit x86 version without Hyper-V. We do not support the x64 version.