

Network Automation Engine Catalog Page

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

Code No. LIT-1900195

Software Release 6.0

Issued January 30, 2013

Supersedes December 21, 2011

Refer to the [QuickLIT website](#) for the most up-to-date version of this document.

NAEs provide comprehensive equipment monitoring and control, via key features such as scheduling, alarm and event management, energy management, data exchange, data trending, and data storage that are key tools in reducing operation and energy costs for any type of building.

This line of NAEs feature and leverage IP connectivity and Web-based access to Metasys® Building Management Systems (BMSs), including BACnet® protocol, LONWORKS® network, and N2 Bus protocol, to monitor and supervise a wide variety of HVAC, lighting, security, and fire safety equipment.

With the embedded Site Management Portal user interface, NAEs can support multiple concurrent Web browser sessions with password and permission access control. To further enhance IT compatibility, NAEs employ standard IT security best practices.

Specific features of NAE models include:

- NAE55 models support a comprehensive set of supervisory features and functions for large and technically advanced buildings and controllers.
- NAE35/NAE45 models enable cost-effective NAE connectivity and control in smaller facilities and can increase distribution of control in larger facilities.
- The NAE85 is a high-capacity NAE that is designed to provide supervisory level control of Metasys networks that include a large number of BACnet IP devices.

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

Features

- Communication Using Commonly Accepted IT Standards, Including Web Services, at the Automation and Enterprise Level
- Web-Based User Interface

Ordering Information

Contact the nearest Johnson Controls representative to order an NAE. Specify the desired product code from [Table 1](#) for the NAE35, [Table 2](#) for the NAE45, [Table 3](#) for the NAE55, [Table 4](#) for the NAE85, and [Table 5](#) for accessories.

Table 1: NAE35 Ordering Information

| 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 Bus or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 50 devices on the N2 Bus or BACnet MS/TP trunk. |
| MS-NAE3510-2U | Supports one BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 50 devices on the 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 Bus or BACnet MS/TP (RS-485) trunk; includes an internal modem; supports a maximum of 50 devices on the N2 Bus or BACnet MS/TP trunk. |
| MS-NAE3514-2 | Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; limited to Basic Access support; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 50 devices on the N2 Bus or BACnet MS/TP trunk. |
| MS-NAE3515-2 | Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; limited to Basic Access support; includes an internal modem; supports a maximum of 50 devices on the N2 Bus 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 a maximum of 64 devices on the LONWORKS port. |
| MS-NAE3521-2 | Supports one LONWORKS trunk; includes an internal modem. Supports a maximum of 64 devices on the LONWORKS port. |

- Site Director Function
- User Interface and Online System Configuration Software Embedded in NAE
- Supervision of Field Controller Networks Including BACnet MS/TP, N2 Bus LONWORKS Network, and BACnet IP Devices
- Multiple Connection Options for Data Access

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

Figure 1: NAE55 Network Automation Engine



Table 1: NAE35 Ordering Information

| Product Code Number ¹ | Description |
|----------------------------------|---|
| MS-NAE3524-2 | 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. |
| MS-NAE3525-2 | Supports one LonWORKS trunk; limited to Basic Access support; and includes an internal modem. Supports a maximum of 64 devices on the LonWORKS trunks. |

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

Table 2: NAE45 Ordering Information

| 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 Bus or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 100 devices on the N2 Bus or BACnet MS/TP trunk. |
| MS-NAE4510-2U | Supports one BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 100 devices on the 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 Bus or BACnet MS/TP (RS-485) trunk; includes an internal modem; supports a maximum of 100 devices on the N2 Bus 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 a maximum of 127 devices on the LonWORKS port. |
| MS-NAE4521-2 | Supports one LonWORKS trunk, includes an internal modem; supports a maximum of 127 devices on the LonWORKS port. |

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

Table 3: NAE55 Ordering Information

| 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. |
| MS-NAE5510-2 | 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. |
| MS-NAE5511-2 | 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; includes an internal modem. |
| MS-NAE5520-2 | Supports a LonWORKS trunk, and two N2 Bus trunks or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk). Supports a maximum of 255 devices on the LonWORKS trunk and a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk. |
| MS-NAE5521-2 | Supports a LonWORKS trunk, and two N2 Bus trunks or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); includes an internal modem. Supports a maximum of 255 devices on the LonWORKS trunk and a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk. |

1 Some models are also available in Buy American version (add G after the code number). For the European versions of the NAE55, add an E after the code number. For repair parts, add -702 after the code number.

Table 4: NAE85 Ordering Information

| Product Code Number | Description |
|---------------------------|--|
| MS-NIE8500-0 | Rack-mount server preloaded with supported operating system, NxE85 software, and other Metasys system software components; supports up to 10,000 objects. Note: The NAE85 models ship as MS-NIE8500-0 models. Use the Change Model utility in the NxE85 Metasys software to change an NIE85 to an NAE85. |
| MS-NxE85SW-0 ¹ | New NxE85 software only; for new installations/projects |
| MS-NxE85SW-6 ¹ | Upgrade NxE85 software; for existing NxE85 engines |

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

Table 5: NAE Accessories Ordering Information

| 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 5 to 7 years at 21°C (70°F) |
| MS-15KUPG-0 | 15,000 object expansion upgrade for NxE85 (only one expansion per NxE85) |

Table 5: NAE Accessories Ordering Information

| Product Code Number | Description |
|--------------------------|---|
| 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-NAE5510-1U. |
| 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 UPS for NxE85 model: American Power Conversion (APC®) Smart-UPS SC 450 VA, 280 W, 120 VAC input/output with NEMA 5-15R output connections |

Technical Specifications

Table 6: 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 | 0–50°C (32–122°F); 10–90% RH, 30°C (86°F) maximum dew point |
| Ambient Storage Conditions | -40–70°C (-40–158°F); 5–95% 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 Synchronous Dynamic Random Access Memory (SDRAM) for operations data dynamic memory |
| Operating System | Microsoft® Windows® Embedded CE 6.0 |
| 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) 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 modular 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 (5-3/16 x 10-5/8 x 2-1/2 in.) Minimum space for mounting NAE35 and NAE45: 210 x 350 x 110 mm (8-3/16 x 13-13/16 x 4.-5/16 in.) |
| Shipping Weight | 1.2 kg (2.7 lb) (8-3/16 x 13-13/16 x 4.-5/16 in.) |
| 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 Australia and New Zealand: C-Tick Mark, Australia/NZ Emissions Compliant 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 2004/108/EC. BACnet International: BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC) |



Table 7: NAE55xx-2

| | |
|--|---|
| 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 | 0–50°C (32–122°F); 10–90% RH, 30°C (86°F) maximum dew point |
| Ambient Storage Conditions | -40–70°C (-40–158°F); 5–95% 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 (2 GB partitioned) 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 | Microsoft Windows Embedded Standard 2009 |
| Network and Serial Interfaces | One Ethernet port; connects at 10 Mbps, 100 Mbps, or 1 Gbps; 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 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 modular connector 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 UL94-5VB Protection: IP20 (IEC 60529) |
| Mounting | On flat surface with screws on four mounting feet or on dual 35 mm DIN rail |
| Dimensions (Height x Width x Depth) | 226 x 332 x 96.5 mm (8-7/8 x 13-1/8 x 3-13/16 in.) including mounting feet Minimum space for mounting: 303 x 408 x 148 mm (12 x 16-1/8 x 5-13/16 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 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, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. Australia and New Zealand: C-Tick Mark, Australia/NZ Emissions Compliant BACnet International: BTL 135-2004 Listed B-BC |



Table 8: NAE85 Turnkey

| | |
|-------------------------------------|--|
| Computer Type | Dell® PowerEdge® R410 or latest equivalent |
| Power Requirement | 120–240 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 = 29°C) |
| Ambient Storage Conditions | -40 to 65°C (-40 to 149°F); 5 to 95% RH (noncondensing twmax = 38°C) |
| 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 |
| Processor | Intel® Xeon® E5506, 2+ GHz, 4 MB Cache2 or comparable (subject to availability) |
| Memory | 2 GB or more, 1066 MHz or higher, 2 x 1 GB, single ranked UDIMMs for 1 processor |
| Hard Disk | 2 total (providing ample storage space, size subject to availability) 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) or higher |
| Internal Optical Drive | DVD ROM, SATA |
| Operating System | Windows Server® 2008 R2 OS (64-bit) |
| Antivirus Software | Symantec® Endpoint Protection, Small Business Edition (latest version) |

Table 8: NAE85 Turnkey

| | |
|--|--|
| 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 front, 2 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 (Record Holder: http://www.dell.com/regulatory_compliance) |

Table 9: NAE85 Software System Requirements for Installation/Upgrade

| | |
|---|--|
| Product Code | MS-NxE85SW-0: NxE85 software for 10,000 objects (new projects only software) |
| Recommended Computer Platform | Intel Xeon®E5506, 2.13 GHz, 4 MB Cache 2 x 160 GB 7.2K 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 |
| Supported Operating Systems and Software | Windows Server® 2008 R2 OS (64-bit) with SP1 IIS Version 7.5, Microsoft .NET Framework Version 3.5.1 and 4.0 Windows Server 2008 OS (32-bit) with SP2 IIS Version 7.0, Microsoft .NET Framework Version 3.5.1 and 4.0 Windows Web Server 2008 OS (32-bit) with SP2 IIS Version 7.0, Microsoft .NET Framework Version 3.5.1 and 4.0 |
| Network Communication | Network Interface: Single 1 Gbps Ethernet network interface card connects at 10 Mbps, 100 Mbps or 1 Gbps; (100 Mbps or better recommended) |
| Data Protection | Recommended UPS for NxE85 model: APC Smart-UPS SC 450VA, 280 W, 120 VAC input/output, National Electrical Manufacturers' Association (NEMA) 5-15R output connections, OEM Part No. SC450RM1U |

**Building Efficiency**

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