Network System Interface
High-Speed NOTI•FIRE•NET™
Instruction Manual

Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/ 32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Units with a touchscreen display should be cleaned with a dry, clean, lint free/microfiber cloth. If additional cleaning is required, apply a small amount of Isopropyl alcohol to the cloth and wipe clean. Do not use detergents, solvents, or water for cleaning. Do not spray liquid directly onto the display.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

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FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radio-electriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

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Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

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Send email messages to:

FireSystems.TechPubs@honeywell.com

Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

Table of Contents

Section 1: Using This Manual

This manual provides a system design overview for High-Speed Noti•Fire•Net. It describes compatible fire alarm devices that can be linked to the network; network requirements and limitations; and configuration details, including those for NFPA Class B and Class X. High-Speed Noti•Fire•Net works with products that have been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 10h Edition.

⚠️ **CAUTION: SAME VERSION SOFTWARE**
ALL EQUIPMENT ON THE NETWORK MUST BE RUNNING THE SAME VERSION OF THE NETWORK SOFTWARE.

1.1 UL 864 9th and 10th Edition

- Per the UL Continuing Certification Program, UL 864 9th edition fire alarm control equipment will retain certification after the rollout of UL 10th edition (12/2/2018).
- Installations of UL 864 10th Edition certified equipment are permitted to use UL864 9th Edition certified equipment when approved by the local Authority Having Jurisdiction (AHJ).

For product compliance, refer to the UL/ULC listing cards located on the UL online certification directory.
http://iq.ulprospector.com

The following products have not received UL 864 9th or 10th Edition certification and may only be used in retrofit applications. Operation of the High-Speed NOTI•FIRE•NET™ with products not tested for UL 864 9th or 10th Editions have not been evaluated and may not comply with NFPA 72 and/or the latest edition of UL 864. These applications will require the approval of the local Authority Having Jurisdiction (AHJ).

- NFS-3030
- NFS-640
- NCA

1.2 Related Documentation

This table lists equipment that connects directly to High-Speed Noti•Fire•Net. For information about connecting non-network devices to these network nodes, refer to the installation manual(s) for your system. To obtain a complete understanding of specific features within the network, or to become familiar with the network functions in general, make use of the documentation listed in Table 1.1.

For information on…	Refer to…	Part No.
Panels and Intelligent Annunciators	DVC and DAA Series	52411
	NCA-2 Network Control Annunciator	52482
	NCD Network Control Display	LS10210-051NF-E
	ONYXWorks® Workstation	52342
	NFS2-3030 Fire Alarm Control Panel	52544, 52545, 52546
	NFS2-640 Fire Alarm Control Panel	52741, 52742, 52743
	NFS-320 Fire Alarm Control Panel	52745, 52746, 52747
	NFS-3030 Fire Alarm Control Panel	51330, 51344, 51345
	NFS-640 Fire Alarm Control Panel	51332, 51333, 51334
	NCA Network Control Annunciator	51482
Network Interface Equipment	High-Speed Network Communications Module	54014
	BACNet Gateway-3	53372
	ONYXWorks NFN GW-3 Embedded	53369
	ONYXWorks NFN GW-3 PC	53370
	NWS-3 Noti•Fire•Net Web Server-3	53371
Off-line Programming Utility	Veri•Fire Tools help file	Veri•Fire-TCD

Table 1.1 Network Related Documentation

Section 2: Network Nodes & Features

2.1 Network Description

2.1.1 Overview

High-Speed Noti•Fire•Net is a series of modules and products which allow a group of Fire Alarm Control Panels (FACPs) and other control equipment to connect. Equipment that connects to High-Speed Noti•Fire•Net and communicates with other equipment using the network may be referred to as a network node. The minimum hardware requirement for High-Speed Noti•Fire•Net is two nodes connected via wire or fiber-optic cable. High-Speed Noti•Fire•Net supports up to 200 nodes. Each network node requires a unique node address; the node communicates with other nodes via a network interface board. This section provides network-level requirements for these devices; refer to the specific manuals for details on requirements for individual components such as FACPs. See "Network Node Features" in Section 2.2 for a discussion of network nodes and "Network Interface Boards" in Section 2.3 for a discussion of interface boards.

The network supports communications over twisted-pair wire and fiber-optic media, through a proprietary communications protocol. Both wire and fiber may exist in the same network when routed through HS-NCM-WMF (wire to multi-mode fiber network communications module), or HS-NCM-WSF (wire to single-mode fiber network communications module).

When properly configured, High-Speed Noti•Fire•Net is suitable for use as a Protected Premises Fire Alarm System as defined in the National Fire Protection Association (NFPA) 72 documentation.

2.1.2 Special Fiber Requirements

Fiber versions of the High-Speed Noti•Fire•Net must use single- or multi-mode fiber. Connections must be made using LC connectors.
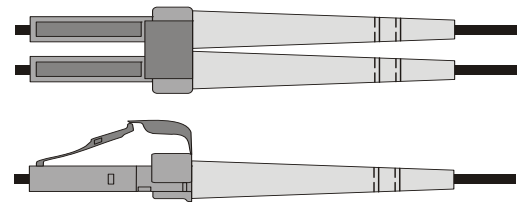

Figure 2.1 LC Connector

2.2 Network Node Features

On each fire alarm control panel, digital audio system or intelligent annunciator, a network interface board *(listed below in italics)* provides the physical connection; see "Network Interface Boards" in Section 2.3.

NOTE: All boards must be running the same version of High-Speed Network Communications Module software.

NOTE: NUP wiring connections to the HS-NCM must be located within 15 feet and encased in conduit.

NOTE: For use with the NFS-640, NFS2-640, NFS-3030, NFS2-3030, NFS-320, NCA, NCA-2, DVC and NCD, the HS-NCM must be connected via the NUP ports!

DVC-EM. *With HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF or HS-NCM-MFSF*

The DVC-EM (DVC) occupies a single node address on the network. The HS-NCM cable plugs into either of the two DVC NUP ports. Cooperative Control-by-Event programming enables the DVC to react to events on other network nodes.

The minimum requirements for a DVC node are a DVC, a High-Speed Network Communications Module and a +24 VDC filtered power source. This power can come from the control panel or from a regulated, power-limited remote power supply that is listed for Fire Protection Signaling use. If local ground fault detection is required, an AMPS-24 power supply must be used.

NCA/NCA-2. *With HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF, or HS-NCM-MFSF*

The NCA and NCA-2 Network Control Annunciators provide a text-based display and control device for the High-Speed Noti•Fire•Net system. The HS-NCM enables the NCA or NCA-2 to display all events from equipment on the High-Speed Noti•Fire•Net system, as well as perform control functions such as Acknowledge, Signal Silence, Drill and System Reset. They can co-exist with other NCAs or NCA-2s or be the sole interface on the network, and can be used to display the network in desirable groups of nodes. The NCA and NCA-2 also support the use of optional devices such as annunciators and printers. The NCA and NCA-2 are capable of interfacing with the NFS2-3030, NFS2-640, NFS-320, DVC-EM, NFS-3030, NFS-640 and High-Speed ONYXWorks.

NCA-2 requires cabinet mounting, a High-Speed Network Communications Module and a +24 VDC filtered power source. This power can come from the control panel or from a regulated, power-limited remote power supply that is listed for Fire Protection Signaling use.

NCD. *With HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF, or HS-NCM-MFSF*

The NCD Network Control display provides a text-based display and control device for the High-Speed Noti•Fire•Net system. The HS-NCM enables the NCD to display all events from equipment on the High-Speed Noti•Fire•Net system, as well as perform control functions such as Acknowledge, Signal Silence, and System Reset. It can be used to display the network in desirable groups of nodes. The NCD is capable of interfacing with the NFS2-3030, NFS2-640, NFS-320, and High-Speed ONYXWorks.

NCD requires cabinet mounting, a High-Speed Network Communications Module and a +24 VDC filtered power source. This power can come from the control panel or from a regulated, power-limited remote power supply that is listed for Fire Protection Signaling use.

High-Speed ONYXWorks Workstation. *With NFN-GW-PC-HNW, NFN-GW-PC-HNMF, NFN-GW-PC-HNSF*

This workstation provides a PC-based graphical interface for monitoring and controlling activity of multiple nodes on a network. It allows the user to program network nodes, display network information, and display the network in desirable groups of nodes. It can perform System Resets, Signal Silence, and Acknowledge on sets of nodes. It also contains a history buffer which can record events and actions which have occurred in the network.

The High-Speed ONYXWorks workstation is a personal computer (UL listed for fire control applications) with interface board installed and with specific software provided. **Do not install third-party software such as office applications or games on this PC.** See your High-Speed ONYXWorks Workstation manual for operating requirements.

NOTE: The ONYXWorks Workstation version number is found on the CD label, and under the ONYXWorks Help menu: About ONYXWorks.

NOTI•FIRE•NET Embedded Gateway *NFN-GW-EM-3 with HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF. or HS-NCM-MFSF*

The NFN-GW-EM-3 is a network server for the High-Speed ONYXWorks system that connects directly to the High-Speed Noti•Fire•Net. The NFN-GW-EM-3 bridged the High-Speed ONYXWorks network with the High-Speed Noti•Fire•Net network, allowing the High-Speed ONYXWorks workstation to perform as the primary facilities workstation. The NFN-GW-EM-3 allows remote users to monitor a High-Speed Noti•Fire•Net network connected to the local workstation.

BACnet Gateway. *BACNET-GW-3 with HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF, or HS-NCM-MFSF*

The BACnet Gateway provides an interface between networks that use the BACnet communication protocol and High-Speed Noti•Fire•Net control panels. BACnet clients communicate with the BACnet Gateway using BACnet/IP. High-Speed Noti•Fire•Net communicates with the BACnet Gateway via direct connection for single panel interfaces or via HS-NCM for network interfaces. The BACnet Gateway is compatible with ONYX series panels.

Noti•Fire•Net Web Server. *NWS-3 with HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF or HS-NCM-MFSF*

The NWS-3 is a web-based device that acts as an HTML server. The NWS-3 provides remote access to the High-Speed Noti•Fire•Net network via the internet or intranet allowing the user to view the history, event status, device properties, or other control panel information. The NWS-3 interfaces to the internet/intranet using an IP-based wire ethernet connection.

NFS-3030/NFS2-3030. *With HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF or HS-NCM-MFSF*

The NFS-3030 or NFS2-3030 occupy a single node address on the network. The HS-NCM cable plugs into either of the NFS-3030 or NFS2-3030 NUP ports. The network has the ability to send Acknowledge, Signal Silence, Drill, and System Reset commands to the NFS-3030 or NFS2-3030. Cooperative Control-by-Event programming enables the panel to react to or trigger events on other network nodes.

The minimum requirements for an NFS-3030 or NFS2-3030 node are the central processing unit (CPU-3030D, CPU-3030ND, CPU2-3030D or CPU2-3030ND), AMPS-24/E main power supply, LCM-320, a cabinet, and a High-Speed Network Communications Module.

NOTE: Choose the CPU-3030ND of the NFS-3030's CPU or the CPU2-3030ND version of NFS2-3030's CPU only when the unit is to be entirely controlled by another node on High-Speed Noti•Fire•Net (such as ONYXWorks); programming requires VeriFire™.

NFS-640/NFS2-640. *With HS-NCM-W, HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF or HS-NCM-MFSF*

The NFS-640 or NFS2-640 occupies a single node address on the network. The HS-NCM cable plugs into either of the NFS-640 or NFS2-640 NUP ports. The network has the ability to send Acknowledge, Signal Silence, Drill, and System Reset commands to the NFS-640 or NFS2-640. Cooperative Control-by-Event programming enables the panel to react to or trigger events on other network nodes.

The minimum requirements for an NFS-640 or NFS2-640 node are the CPU board with integral power supply, a cabinet, and a High-Speed Network Communication Module. The NFS-640 and NFS2-640 also require a primary display be installed if it is not to be entirely controlled and programmed by another node on High-Speed Noti•Fire•Net.

NFS-320. *With HS-NCM-W HS-NCM-MF, HS-NCM-SF, HS-NCM-WSF, HS-NCM-WMF or HS-NCM-MFSF*

The NFS-320 occupies a single node address on the network. The HS-NCM cable plugs into either of the two NFS-320 NUP ports. The network has the ability to send Acknowledge, Signal Silence, Drill, and System Reset commands to the NFS-320. Cooperative Control-by-Event programming enables the panel to react to or trigger events on other network nodes.

The minimum requirements for an NFS-320 node are the NFS-320 CPU assembly, which includes an integral power supply and cabinet, and a High-Speed Network Communication Module.

2.3 Network Interface Boards

This section describes the boards that are physically connected together to form the network. "Network Node Features" in Section 2.2 describes the products that are compatible with the High-Speed Noti•Fire•Net.

Network Interface Boards for Fire Alarm Control Panels, Digital Audio Systems, and Intelligent Annunciators

The High-Speed Network Communications Module (HS-NCM) provides a physical communication interface between the NFS2-3030, NFS2-640, NFS-320, NCA-2, NFS-3030, NFS-640, NCA, DVC or NCD and the wire or fiber-optic cable which connects to other nodes on the high-speed network. A single HS-NCM can be used to connect two nodes to the network. The HS-NCM may also be used to pass data transmissions between two differently configured network segments when wire and fiber-optic cable co-exist on the network. Each HS-NCM has two network communication ports, in six possible media combinations:

*   HS-NCM-W: Two twisted-pair wire ports.
*   HS-NCM-MF: Two multi-mode fiber-optic cable ports.
*   HS-NCM-SF: Two single-mode fiber-optic cable ports.
*   HS-NCM-WSF: One twisted-pair wire port, one single-mode fiber-optic cable port.
*   HS-NCM-WMF: One twisted-pair wire port, one multi-mode fiber-optic cable port.
*   HS-NCM-MFSF: One multi-mode fiber optic cable port, one single-mode fiber optic cable port.

2.4 High-Speed Network Communications Modules in Repeater Mode

The HS-NCM can also be configured as a repeater. In this configuration, the HS-NCM can boost data signals between network nodes to extend communication distances or to pass data transmissions between two differently configured network segments when wire and fiber co-exist on a network. For limitations and network wiring information for the HS-NCM in repeater mode, refer to Section 3, "Network Configurations". When using the HS-NCM as a repeater, the node address for the HS-NCM must be set to zero (default). If the HS-NCM is connected to a fire panel via the NUP port, the HS-NCM will evaluate the Network Programming of the fire panel and mimic the assigned node number. Once removed from the fire panel, the HS-NCM will default to node zero. The HS-NCM's parameters can be configured through VeriFire Tools. Refer to the *VeriFire™ Tools CD on-line help file.*

Section 3: Network Configurations

3.1 Point-to-Point Configuration

A point-to-point wiring configuration is defined as a segment with only two nodes/repeaters attached to it. In a point-to-point configuration, two nodes/repeaters are interconnected by a single circuit that is terminated at each port (Refer to Figure 3.1 and Figure 3.3 for wiring configurations).

Characteristic Impedance in a Point-to-Point Configuration

The wire segment of each point-to-point connection is a transmission line. The physical construction of the twisted-pair cable used for a segment determines the characteristic impedance of that segment. To minimize unwanted data reflections, never mix more than one brand name, gauge, or type of wire within a point-to-point segment.

> **NOTE:** For 14 AWG (2.08 mm^2) to 18 AWG (0.82 mm^2) cable, the maximum allowable distance is 3,000 ft. (914.4 m) provided that the maximum line DC Loop Resistance of 39 ohms is not exceeded.

3.2 NFPA Class B Configurations

High-Speed Noti•Fire•Net is capable of communicating using an NFPA Class B SLC (refer to Figure 3.1). Under this class of operation, a single open, wire-to-wire short, wire-to-wire short and open, wire-to-wire short and ground, or open and ground results in fragmentation of the network. A single ground does not affect communication, but is detected. Each fragment of the network re-configures to permit communication among the nodes within the fragment.
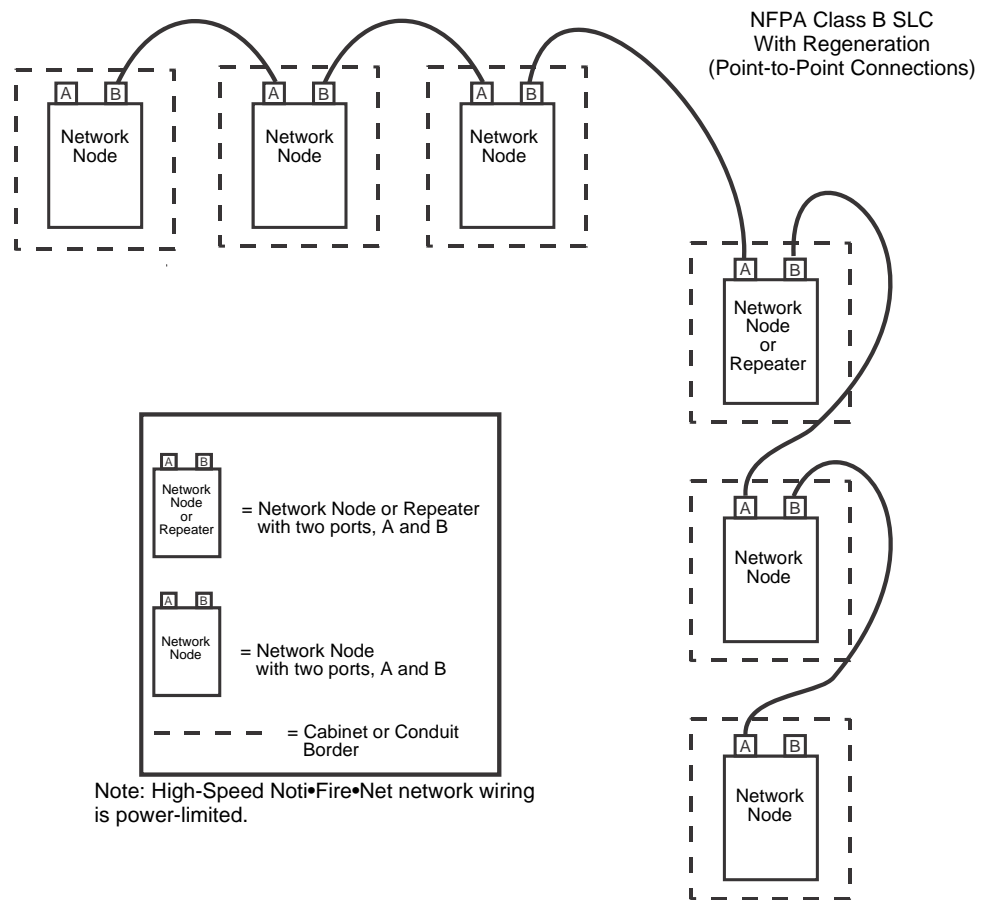

Figure 3.1 Class B Configurations

In an NFPA Class B fiber-optic system, a single break will result in loss of communication between network nodes. In Figure 3.2, the fragment to the left of the break cannot receive information from the fragment to the right of the break. The fragment to the right of the break cannot receive information from the fragment to the left of the break.
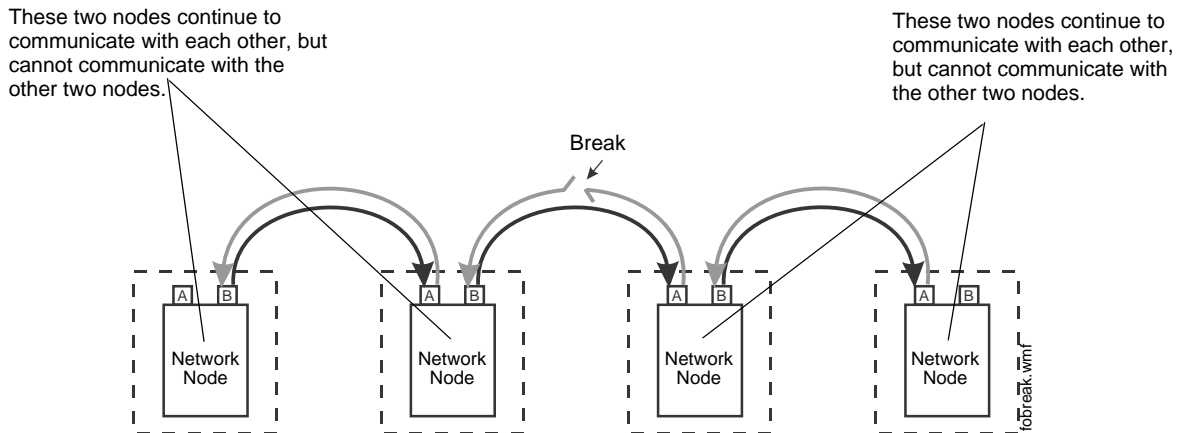
These two nodes continue to communicate with each other, but cannot communicate with the other two nodes.

These two nodes continue to communicate with each other, but cannot communicate with the other two nodes.

Break

Figure 3.2 Fiber-Optic Class B System Break

3.3 NFPA Class X Configurations

High-Speed Noti•Fire•Net is capable of communicating using an NFPA Class X SLC (refer to Figure 3.3). Under this style of operation, a single open, wire-to-wire short, wire-to-wire short and open, wire-to-wire short and ground, or open and ground will not result in fragmentation of the network. Communication will continue throughout any of the aforementioned circumstances, while the system displays a trouble condition. A single ground does not affect communication, but is detected. Class X operation may also be achieved using fiber-optic cable or mixed media (wire and fiber).
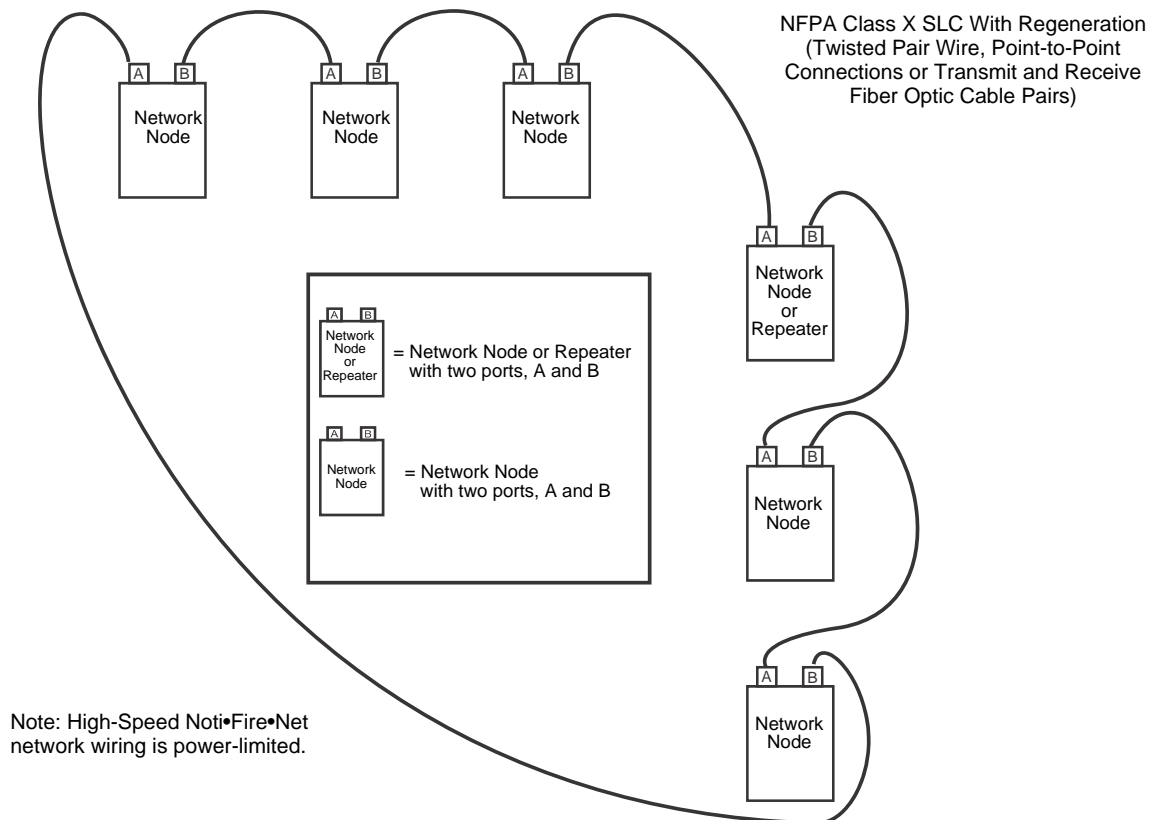
NFPA Class X SLC With Regeneration
(Twisted Pair Wire, Point-to-Point
Connections or Transmit and Receive
Fiber Optic Cable Pairs)

Network Node or Repeater with two ports, A and B

= Network Node or Repeater with two ports, A and B

= Network Node with two ports, A and B

Note: High-Speed Noti•Fire•Net network wiring is power-limited.

Figure 3.3 Class X Configurations

3.4 Network Wiring for Ground Fault Detection

Because the twisted-pair communication link between adjacent nodes is isolated from other nodes through the HS-NCM (transformer coupling), a single ground fault on one of the wires will have no effect on circuit operation.

Network ground fault detection from a node power supply may be enabled or disabled with switches on the HS-NCM-W and ONYX-Works-HNW. Refer to each product's related documentation for switch designation and ground fault detection setup.

> **NOTE:** If both ground fault switches are set to the "OFF" position, ground fault detection for the HS-NCM is completely disabled. Completely disabling ground fault detection is not recommended and is not in compliance with UL 864 Standards.

Ground fault detection may be provided by the following:

- NFS-3030 or NFS2-3030 node (powered by AMPS-24/E)
- NFS2-640, NFS-640, or NFS-320 node (own power supply)
- NCA or NCA-2 node powered by Main Power Supply (AMPS-24/E)
- DVC-EM node powered by Main Power Supply (AMPS-24/E)
- NCD node powered by Main System Power Supply or Auxiliary Power Supply

> **NOTE:** ONYXWorks-HN does not detect ground fault, but ONYXWORKS-HNW can pass the signal between network nodes on either side of ONYXWorks. Disabling ground fault detection will prevent signal feed-through.

Point-to-Point Configuration

In a point-to-point configuration, enable ground fault detection on only one side of each point-to-point connection. In Figure 3.4, the left node provides the ground fault detection, and thus must be one of the ground fault detection nodes. SW4 on the HS-NCM is set to the ON position to enable ground fault detection on the left HS-NCM Port B. The corresponding Port A switch of the right HS-NCM is set to the OFF position, disabling ground fault detection for the node on the right. When a ground fault occurs on any HS-NCM connected to the network, the ground fault will be detected by the power supply of the HS-NCM with ground fault enabled.
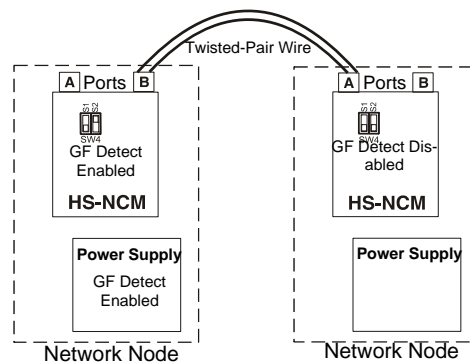

Figure 3.4 Point-to-Point Ground Fault Detection

If an HS-NCM configured as a repeater is employed, two ground fault detection schemes are possible within a point-to-point configuration. One or both nodes (refer to Figure 3.5 and Figure 3.6) may provide ground fault detection, depending on the number of repeaters and the setting of the repeater ground fault detect switch (SW4) at each repeater (refer to EXAMPLES 1 and 2).

- **EXAMPLE 1:** In this example, the node on the left provides the ground fault detection, and thus must be one of the ground fault detection nodes defined on page 12. S2 (Port B) of the HS-NCM on the left is set to the ON position to enable ground fault detection on Port B. The repeater ground fault detection switch (SW4) is ON, allowing the left node to provide ground fault detection for the two point-to-point wire connections on the left and right of the repeater. The Port A switch on the right HS-NCM is set to the OFF position, disabling ground fault detection from the node on the right. The node on the right can be any network node.
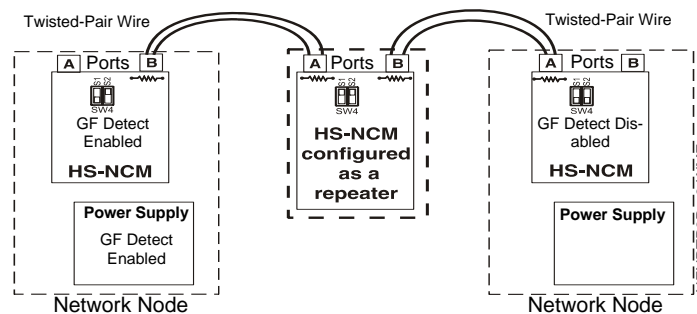

Figure 3.5 Point-to-Point (EXAMPLE 1)

- **EXAMPLE 2:** By setting the ground fault detect switch (SW4) on the repeater to the OFF position, both nodes may provide their own ground fault detection (refer to Figure 3.6). The left node provides ground fault detection up to the repeater, and thus must be one of the ground fault detection nodes defined on page 12. S2 (Port B) is set to the ON position to enable ground fault detection on the left HS-NCM.

  The Port A switch on the right HS-NCM is also set to the ON position, providing ground fault detection up to the repeater. This node must also be one of the ground fault detection nodes defined on page 12.
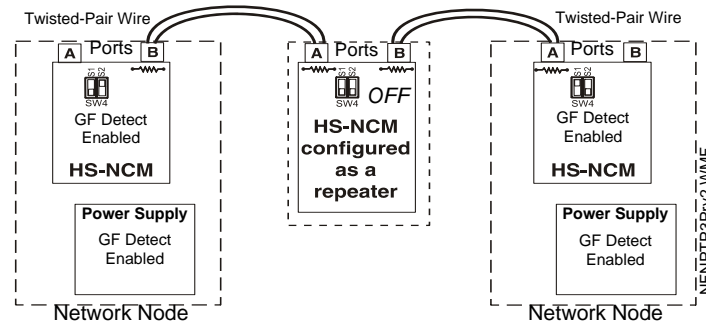

Figure 3.6 Point-to-Point (EXAMPLE 2)

- **EXAMPLE 3:** Ground fault detection is effective for a maximum of two serially connected (point-to-point) repeaters. Therefore, a maximum of five HS-NCMs configured as repeaters can be connected in series when ground fault detection is required. Figure 3.7 shows how the ground fault detection switches must be arranged in order to achieve this maximum configuration.
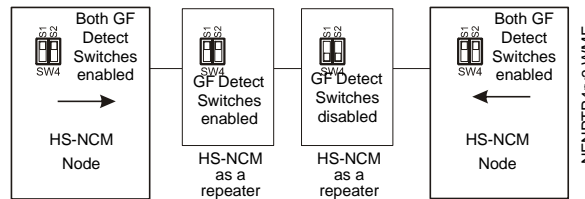

**Figure 3.7 Maximum Point-to-Point Series Repeater
Ground Fault Pass-Through Configuration (EXAMPLE 3)**

- **EXAMPLE 4:** The HS-NCM can be shared between two network nodes. In this example, the HS-NCM is shared between two nodes with separate power supplies. Ground Fault detection should only be enabled for one of the power supplies.
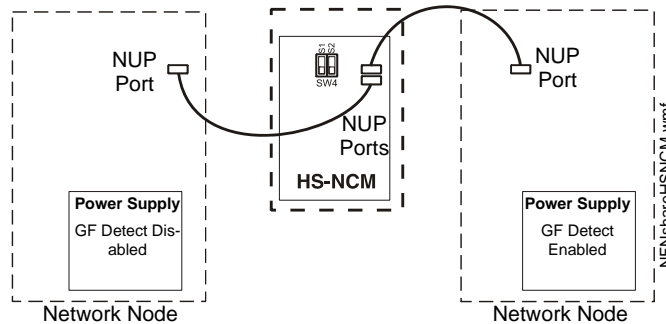

Figure 3.8 HS-NCM Shared Between Two Network Nodes with Separate Power Supplies (EXAMPLE 4)

- **EXAMPLE 5:** Example 4 above shows the HS-NCM shared by two network nodes. If the network wiring is being monitored by an adjacent node (refer to Figure 3.9), the Ground Fault switch (SW4) on the shared HS-NCM should be set to OFF. The power supply Ground Fault detection for each is dependent on the requirements of their respective network nodes.
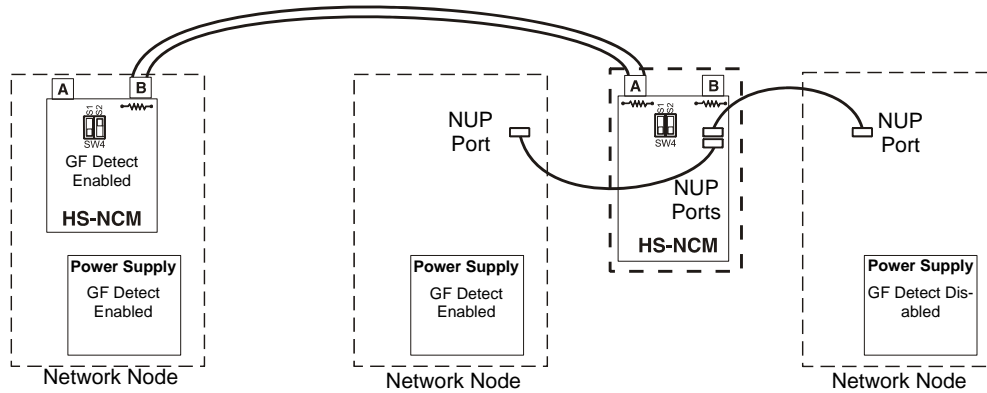

Figure 3.9 Shared HS-NCM Network Connection (EXAMPLE 5)

Appendix A: Compatibility with Other Systems

The High-Speed Noti•Fire•Net is compatible with Honeywell, Johnson Controls and Tyco/Unimode Systems UL 864 9th Edition products as described below:

NOTE: Each product can only be networked with products of the same brand. Do not mix multiple brands on the same network.

A.1 Honeywell Fire Systems

The following Honeywell products will function as nodes on the High-Speed XLS-NET:

- XLS3000*
- XLS140-2*
- XLS140
- XLS120*
- XLS-NCA2*
- XLS-NCA
- XLS-DVC-EM*
- EBI

These products are compatible with the High-Speed NCM as described in this manual.

*UL 864 9th Edition Products

A.2 Johnson Controls Fire Systems

The following Johnson Controls products will function as nodes on the High-Speed Noti•Fire•Net:

- IFC2-3030
- IFC2-640
- IFC-320
- IFC-3030
- IFC-640
- JNCA-2
- JNCA
- JDVC-EM
- IFI Workstation

These products are compatible with the High-Speed NCM as described in this manual.

A.3 Tyco/Unimode Fire Systems

The following Tyco/Unimode products will function as nodes on the High-Speed Unimode Network:

- Unimode 640-2
- Unimode 640
- ADT-NCA-2
- ADT-NCA
- ADT-DVC-EM

These products are compatible with the High-Speed NCM as described in this manual.

Notes

Manufacturer Warranties and Limitation of Liability

Manufacturer Warranties. Subject to the limitations set forth herein, Manufacturer warrants that the Products manufactured by it in its Northford, Connecticut facility and sold by it to its authorized Distributors shall be free, under normal use and service, from defects in material and workmanship for a period of thirty six months (36) months from the date of manufacture (effective Jan. 1, 2009). The Products manufactured and sold by Manufacturer are date stamped at the time of production. Manufacturer does not warrant Products that are not manufactured by it in its Northford, Connecticut facility but assigns to its Distributor, to the extent possible, any warranty offered by the manufacturer of such product. This warranty shall be void if a Product is altered, serviced or repaired by anyone other than Manufacturer or its authorized Distributors. This warranty shall also be void if there is a failure to maintain the Products and the systems in which they operate in proper working conditions.

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Warranty Claims. Manufacturer shall replace or repair, at Manufacturer's discretion, each part returned by its authorized Distributor and acknowledged by Manufacturer to be defective, provided that such part shall have been returned to Manufacturer with all charges prepaid and the authorized Distributor has completed Manufacturer's Return Material Authorization form.   The replacement part shall come from Manufacturer's stock and may be new or refurbished. THE FOREGOING IS DISTRIBUTOR'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A WARRANTY CLAIM.

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