



by Honeywell

High-Speed Network Communications Module

Product Installation Document

12 Clintonville Road
Northford, CT 06472-1610 USA
203-484-7161 • FAX 203-484-7118
www.notifier.com

PN 54014:B 11/17/2009 09-359

1 Product Overview

The High-Speed Network Communications Module (HS-NCM) provides a means for connecting specific Notifier fire alarm control products to High-Speed NOTI•FIRE•NET™. There are six types of HS-NCMs available: HS-NCM-W for connecting nodes with twisted-pair wire; HS-NCM-MF and HS-NCM-SF are used for connecting nodes with fiber-optic cable; HS-NCM-WMF and HS-NCM-WSF are used for connecting nodes with fiber-optic cables to nodes with twisted-pair wire; HS-NCM-MFSF for connecting nodes with multi-mode fiber cable to nodes with single-mode fiber cable. The following equipment may be used with the HS-NCM:

UL 9th Edition*

- NFS2-3030
- NFS2-640
- NFS-320
- NCA-2
- DVC-EM
- ONYXWorks

UL 8th Edition**

- NFS-3030
- NFS-640
- NCA

* - Power for the HS-NCM for use with UL 9th Edition panels is provided via the NUP connection on the FACP itself or an external UL/ULC listed power supply.

** - Power for the HS-NCM for use with UL 8th Edition panels must be provided by a 24 VDC UL/ULC listed power supply.

The following revisions[†] of the UL 9th edition panels require a 24 VDC UL/ULC listed power source to power the HS-NCM and can not be powered via the panel's NUP port[‡]:

NFS-320	CPU2-640PCB Revision E or older
NFS2-640	CPU2-640PCB Revision E or older
NFS2-3030	CPU2-3030PCC Revision I or older
DVC-EM	DVC-EMPCB Revision F or older
DVC	DVC-PCA -All Revisions
NCA-2	NCA-2PCC Revision I or older

[†] The revision and assembly name can be found on the fire panel's circuit board.

[‡] NUP Port connections are still required for communication between the HS-NCM and the fire panel.



NOTE: All wiring connections are supervised and power limited.

One HS-NCM can provide network communication for up to two nodes (including fire alarm control panels and network annunciators).

Per UL 864 9th Edition, the HS-NCM uses Active Multiplex Type 3 Communication.

The HS-NCM can also be configured as a high-speed repeater for applications requiring distances beyond the specified limits between two nodes. For configuration and setup information, refer to "HS-NCM Configuration" on page 5. For limitations and network wiring information for the HS-NCM, refer to the *High-Speed Noti•Fire•Net Manual*.

For instructions on the additional capabilities available with the DVC-EM, refer to the *DVC and DAA Series Installation Manual*.

- Input power requirements: 24 VDC, 0.400 A, regulated, power-limited compatible power supply UL/ULC listed for fire protective signalling use.
- Communications circuit requirements: Refer to the High-Speed Noti•Fire•Net Manual for segment length limitations.

Communication Circuit	Voltage and Current Rating/Protocol
TB4 (Ch A - Wire Only)	10 VDC, 25mA
TB5 (Ch B - Wire Only)	10 VDC, 25mA
J6 (NUP)	232 Protocol
J7 (NUP)	232 Protocol
J13 (USBA)	Standard Protocol
J14 (USBB)	Standard Protocol

Table 1 Voltage and Current Ratings for Communication Circuits



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

2 The Network Communications Module for Wire (HS-NCM-W)

- Supports twisted-pair wire medium.
- NFPA Style 4 (Class B) operation or NFPA Style 7 (Class A) operation.
- Transformer coupling provides electrical isolation between nodes.
- Pluggable terminal wiring with strain relief.
- Pluggable service connector (feeds signal directly through) in the event that power must be removed from a node (HS-NBB).
- Data is regenerated at each node.
- Two network ports to allow simultaneous connection of up to two fire alarm control panels and a programming computer.
- Enables software and database upload/download over High-Speed Noti•Fire•Net.

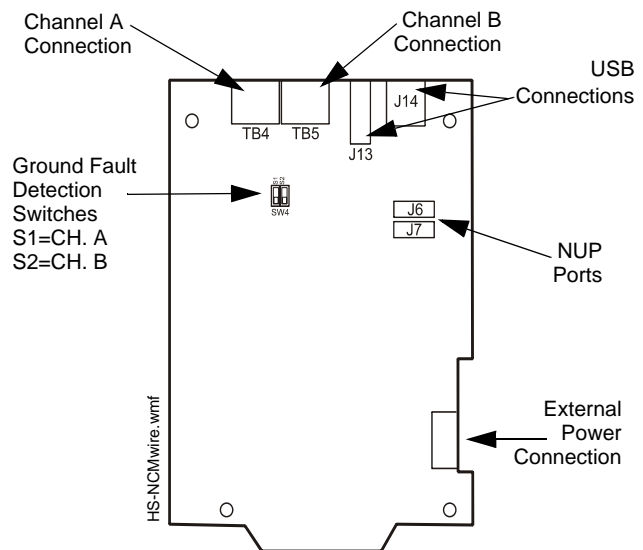


Figure 1 HS-NCM-W

3 The Network Communications Module for Fiber (HS-NCM-MF, HS-NCM-SF,

HS-NCM-MFSF)

- Supports fiber-optic medium.
- NFPA Style 4 (Class B) or Style 7 (Class A) operation.
- Data is immune to all environmental noise.
- Optical isolation prevents ground loops.
- High-Speed Noti•Fire•Net fiber-optic medium.
- Fiber type:
 - 62.5/125 micrometers (multi-mode, 10 dB limit)
 - 50/125 micrometers (multi-mode, 6.5 dB limit)
 - 9/125 micrometers (single-mode, 30 dB limit)
- Wavelength (1): 1310 nanometers.
- Fiber Connectors: LC style.
- Data is regenerated at each node.
- Two network ports to allow simultaneous connection of up to two fire alarm control panels and a programming computer.
- Enables software and database upload/download over High-Speed Noti•Fire•Net.

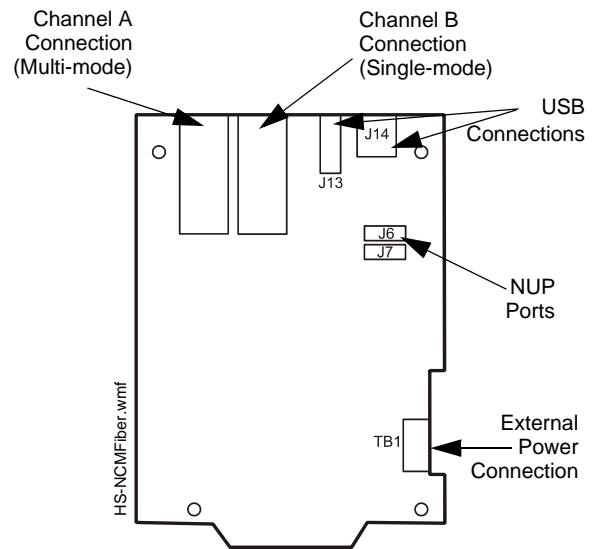


Figure 2 HS-NCM-SF/MF/MFSF



NOTE: When referring to fiber-optic cables, the term “MF” indicates a multi-mode fiber and the term “SF” indicates a single-mode fiber.

4 The Network Communications Module for Wire/Fiber (HS-NCM-WMF, HS-NCM-WSF)

- Supports twisted-pair wire and fiber-optic medium.
- NFPA Style 4 (Class B) or Style 7 (Class A) operation.
- Allows wire and fiber-optic nodes to communicate as one network.
- Fiber type:
 - 62.5/125 micrometers (multi-mode, 10 dB limit)
 - 50/125 micrometers (multi-mode, 6.5 dB limit)
 - 9/125 micrometers (single-mode, 30 dB limit)
- Wavelength (1): 1310 nanometers.
- Fiber Connectors: LC style.
- Wire Connectors: Pluggable terminal wiring with strain relief.
- Data is regenerated at each node.
- Two network ports to allow simultaneous connection of up to two fire alarm control panels and a programming computer.
- Enables software and database upload/download over High-Speed Noti•Fire•Net.
- Port A and Port B assignment for the wire and fiber connections are set through VeriFire Tools. Refer to the *VeriFire™ Tools CD on-line help file*.

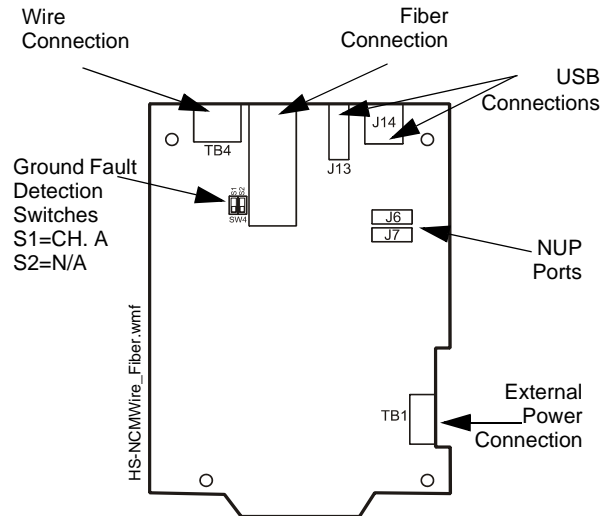


Figure 3 HS-NCM-WSF/WMF



NOTE: When referring to fiber-optic cables, the term "MF" indicates a multi-mode fiber and the term "SF" indicates a single-mode fiber.

5 HS-NCM Configuration

HS-NCM configuration changes are made via the VeriFire Tools Programming Utility, version 5.7 or higher.

VeriFire Tools can be connected to the HS-NCM via two different methods:

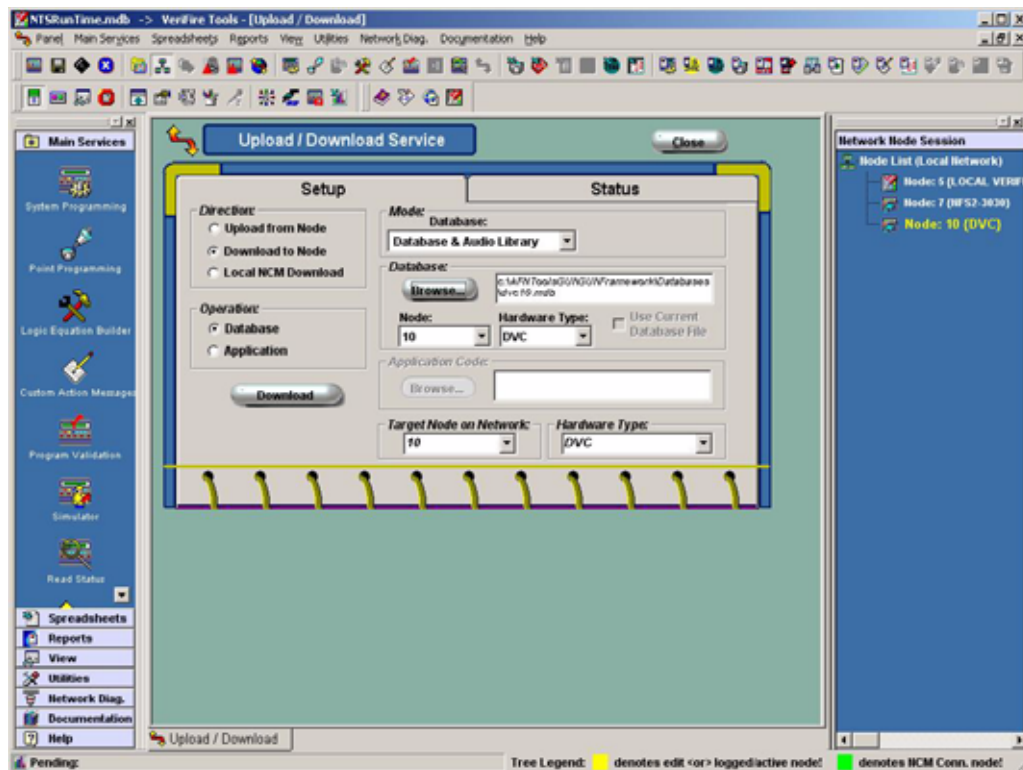
- VeriFire Tools connected to any node on a network using the HS-NCM for network communication.
- HS-NCM directly connected to VeriFire Tools.



NOTE: When directly connecting VeriFire Tools to the HS-NCM, if power is not being provided via the NUP connection at the fire panel, external power is needed. Refer to “External Power for HS-NCM Applications” on page 12

Perform the following steps to modify the HS-NCM’s configuration parameters using VeriFire Tools. Refer to the *VeriFire Tools CD on-line help file*.

1. Connect the HS-NCM to the FACP via either NUP port or provide power from an external UL/ULC listed power source.
2. Connect VeriFire Tools to the network or directly connected to the HS-NCM.
3. In VeriFire Tools, access the Upload/Download Screen:



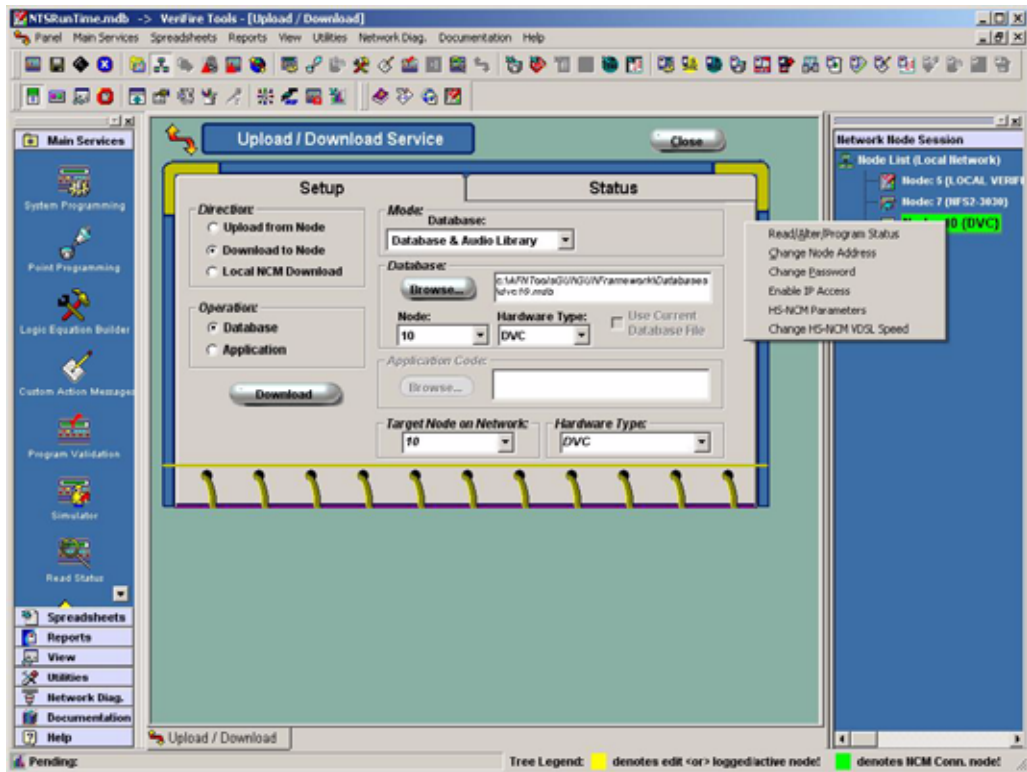
4. In the “Network Node Session” of the Upload/Download screen, find the node connected to the HS-NCM being configured.



NOTE: When the HS-NCM is directly connected to the VeriFire Tools, the node listed in the “Network Node Session” of the VeriFire Tools Upload/Download screen is shown as “Local VeriFire”

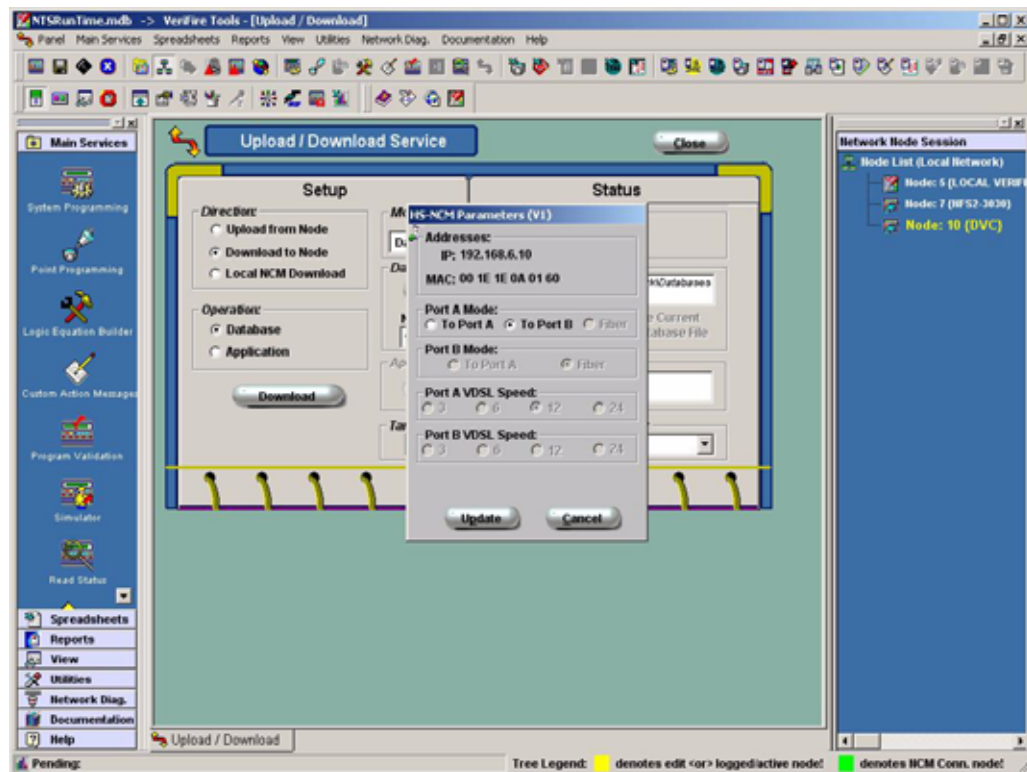
5. Double click the node to log in to the panel.
6. Using the mouse, right click on the node connected to the HS-NCM being configured. A menu of available options is displayed.

7. Select “HS-NCM Parameters”.



HS NCM context menu.jpg

8. The HS-NCM Parameters screen will be displayed listing HS-NCM defaults.



HS NCM UPDL.jpg, HSNCPARMSFORMrpt.jpg

9. Set the HS-NCM parameters as needed and click “Update”

Addresses:

IP - Network address associated with the HS-NCM. Default to all zeros when in repeater mode. Not user-modifiable

MAC - Factory-set identification code for the HS-NCM. Not user-modifiable.

Port A Mode:

To Port A - When configuring the HS-NCM-W, “To Port A” is automatically selected and can not be modified. When configuring a HS-NCM-WMF or HS-NCM-WSF, “To Port A” can be user-selected and will designate the wire connection as “A”.

To Port B - When configuring a HS-NCM-WMF or HS-NCM-WSF, “To Port B” can be user selected and will designate the wire connection as “B”.

Fiber - Indicates that Port A is Fiber - Automatically selected by the HS-NCM-MF and HS-NCM-SF. Not user-modifiable.

Port B Mode:

To Port A - Indicates that Port B is wire - Automatically selected by the HS-NCM-W and can not be modified.

Fiber - Indicates that Port B is Fiber - Automatically selected by the HS-NCM and can not be modified.

Port A VDSL Speed: (Wire Only)

Bandwidth speed for voice transmissions for port A. This applies for wire ports only. Available options are **3 Mb**, **6 Mb**, **12 Mb (default)**, or **24 Mb**. **Not user-modifiable.**

Port B VDSL Speed: (Wire Only)

Bandwidth speed for voice transmissions for port B. This applies for wire ports only. Available options are **3 Mb**, **6 Mb**, **12 Mb (default)**, or **24 Mb**. **Not user-modifiable.**

The screenshot shows a configuration window titled "HS-NCM Parameters (V1)". It contains several sections for configuration:

- Addresses:** IP: 192.168.6.10, MAC: 00 1E 1E 0A 01 60
- Port A Mode:** Radio buttons for "To Port A", "To Port B" (selected), and "Fiber".
- Port B Mode:** Radio buttons for "To Port A" and "Fiber" (selected).
- Port A VDSL Speed:** Radio buttons for "3", "6", "12" (selected), and "24".
- Port B VDSL Speed:** Radio buttons for "3", "6", "12", and "24".

At the bottom of the window are "Update" and "Cancel" buttons.

5.1 HS-NCM Configured as a High-Speed Repeater

The HS-NCM can be configured as a repeater to 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. Once connected to an FACP, the HS-NCM will evaluate the network programming of the fire panel and set its node address accordingly. When power is applied to the HS-NCM without connection via the NUP port to an FACP, the HS-NCM will automatically configure itself as a repeater and its node address will be defaulted to zero. Refer to the *High-Speed Noti•Fire•Net Instruction Manual* for network configurations using the HS-NCM as a repeater.



NOTE: Once configured as a high-speed repeater, network monitoring equipment such as ONYXWorks or the NCA-2 can not monitor any events that occur on the HS-NCM.



NOTE: If the HS-NCM is connected to an external power source and then disconnected from an FACP, it may take up to 30 seconds for the HS-NCM to reconfigure itself as a repeater.

6 Installation

6.1 Mounting Options

The HS-NCM is designed to mount in a variety of CAB-3/CAB-4 compatible chassis, in the NFS-320 enclosure, on a BMP-1 blank plate for dress panel mounting, or behind the DVC-EM in the CA-1 or CA-2 audio chassis. HS-NCM-W can be door-mounted; HS-NCM-MF, HS-NCM-SF, HS-NCM-WMF, HS-NCM-WSF, or HS-NCM-MFSF must be installed in a stationary location. Recommended location is in the top row under the backbox's knockout, so as to avoid over-bending fiber-optic cable. Avoid mounting other option boards in front of HS-NCM so that its LEDs are visible. Attach the HS-NCM using the four screws that ship with it.

Cabinet-mounting HS-NCM-W/HS-NCM-MF/HS-NCM-SF/HS-NCM-WMF/HS-NCM-WSF/HS-NCM-MFSF:

- CHS-4L/4N, CHS2-M3, CHS-M3, the NFS2-640 chassis or NFS-320 enclosure: Mount the HS-NCM in standard option module positions as described in your control panel installation manual. Figure 4 shows CHS-4L as an example.
- CA-1, CA-2: Mount the HS-NCM-W/MF/SF behind a DVC-EM in either the CA-1 or CA-2 audio chassis. Figure 5 illustrates how to install it in a CA-1. Mounting is the same behind a DVC-EM in the lower half-chassis of a CA-2.



NOTE: When mounting wire or fiber versions of the HS-NCM using the CHS-RL-MP chassis, refer to the *CHS-RL-MP Product Installation Document*.

Door-mounting HS-NCM-W:

- Door-mount on the ADP-4B Dress Panel on a single-space blank plate (BMP-1) for mounting in a CAB-4 series backbox, as described in Figure 6.

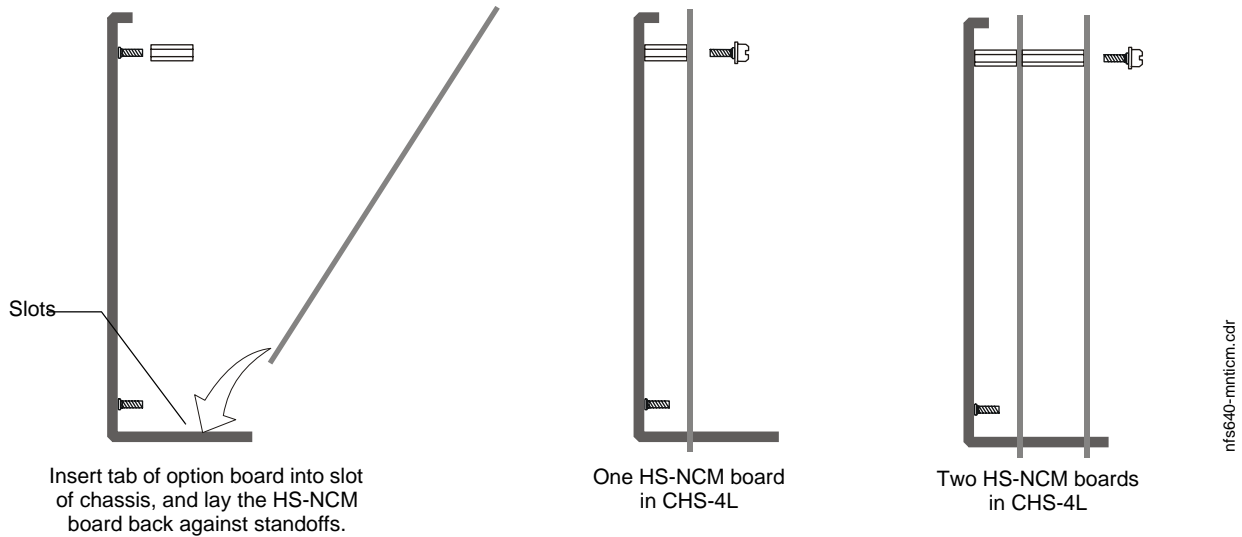


Figure 4 Mounting HS-NCM in a Chassis (CHS-4L Shown)

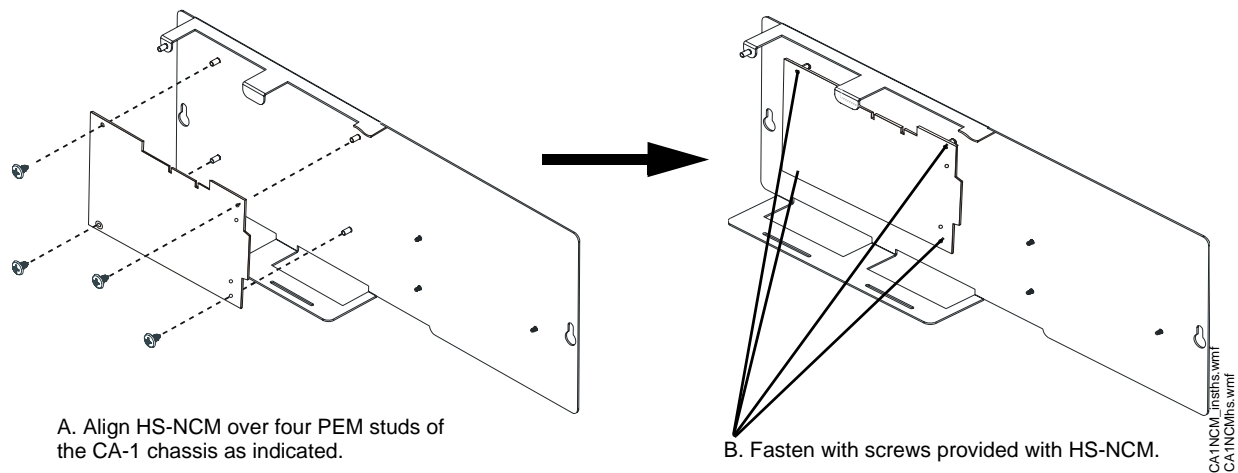
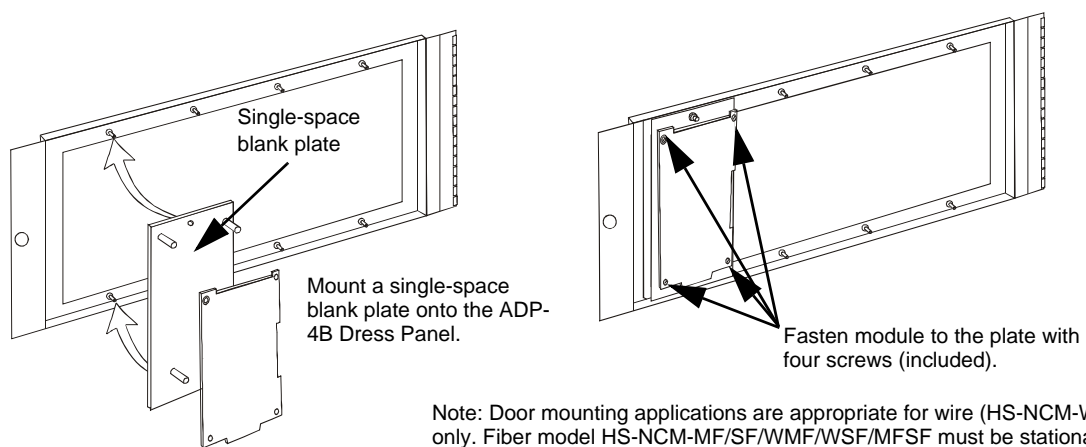


Figure 5 Installing an HS-NCM-W/MF/SF/MFSF onto the CA-1 or CA-2 Audio Chassis Assembly



NOTE: The module cannot be mounted in the ADP-4B Dress Panel when a front slot of the CHS-4 or CHS-4N is occupied, or when either of the two front right positions of the CHS2-M2 is occupied. Always be certain there is enough clearance to close the cabinet door when this installation is used.

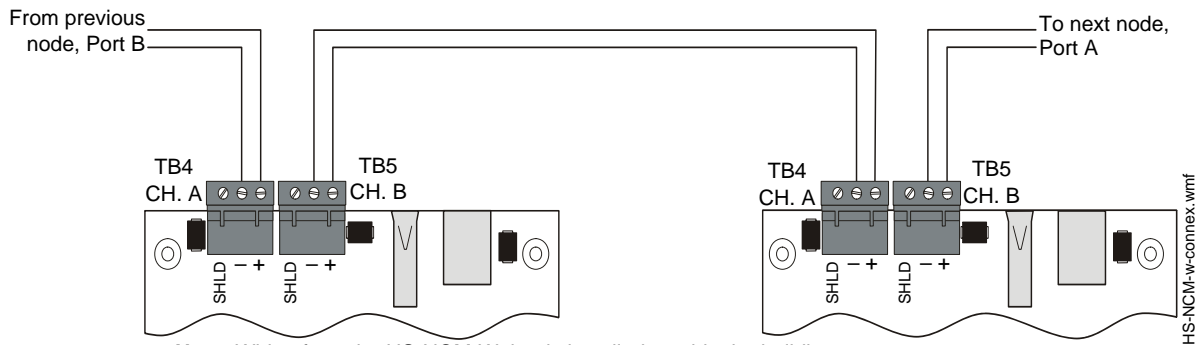
Figure 6 Door-Mounting the HS-NCM-W

6.2 Interconnecting the HS-NCM-W

When wiring consecutive HS-NCM-W boards, note that wiring may enter or exit at Port A or Port B as shown in Figure 7. HS-NCM-W port-to-port wiring is polarity sensitive. Port A must be connected to Port B of the next HS-NCM-W. A HS-NCM-W may be connected to any of the following devices:

- HS-NCM-W (in another panel)
- HS-NCM-WSF/HS-NCM-WMF (in another panel)
- ONYXWORKS-HNW

For information regarding these devices, refer to the documentation listed in Table 6 “Supplemental Documentation”.



Note: Wiring from the HS-NCM-W that is installed outside the building:

- Cannot exceed 1000m (3280 ft.).
- Must be in conduit and is to be buried in a trench separate from any power lines.
- Cannot cross any power lines.

Figure 7 The HS-NCM-W

TB4-1	CH-A (+)	Channel-A Driver/Receiver
TB4-2	CH-A (-)	Channel-A Driver/Receiver
TB5-1	CH-B (+)	Channel-B Driver/Receiver
TB5-2	CH-B (-)	Channel-B Driver/Receiver

Table 2 NOTI•FIRE•NET™ Connections: HS-NCM-W

■ **Switch Functions: Ground Fault Detection.**

For UL 864 applications, enable ground fault detection by setting EF switches “on”:
SW4.1 for Channel A, and SW4.2 for Channel B.

Correct configuration depends on your network design; for an explanation of design concepts, refer to the *High-Speed Noti•Fire•Net™ Manual*.

Ground faults are detected when the resistive value reaches 0 ohms.

Ground Fault monitoring is performed by the FACP associated with the HS-NCM.

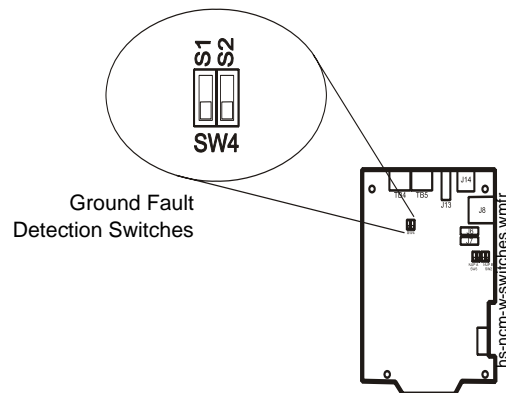


Figure 8 HS-NCM-W Switches



NOTE: Ground fault detection **must** be enabled for UL 864 applications and for ULC applications.

6.3 Interconnecting the HS-NCM-MF/SF/WMF/WSF/MFSF

An HS-NCM-MF/SF/MFSF may be connected to any of the following devices:

- HS-NCM-MF/SF/WMF/WSF/MFSF (in another panel)
- ONYXWORKS-HNMF/SF

For information regarding these devices, refer to the documentation listed in Table 6 “Supplemental Documentation”.

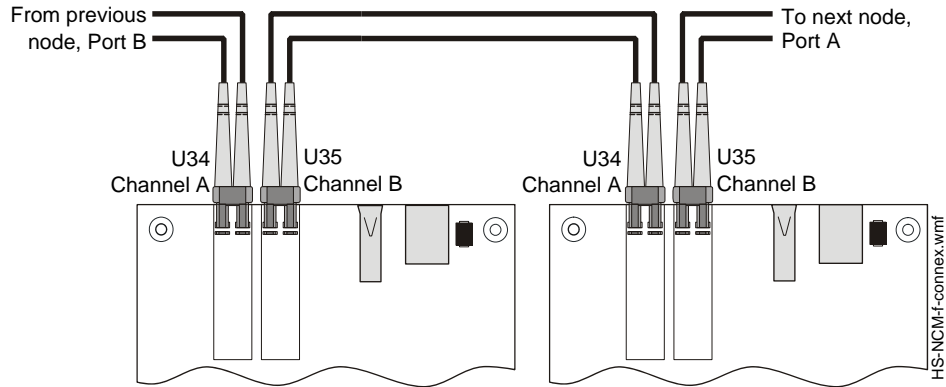


Figure 9 HS-NCM-MF/SF/MFSF Connection

U34	CH A	Transmit
U34	CH A	Receive
U35	CH B	Transmit
U35	CH B	Receive

Table 3 NOTI•FIRE•NET™ Connections: HS-NCM-MF/SF/MFSF

6.4 Mixing Wire & Fiber on One Network

In some networks, it may be necessary to mix twisted-pair wire and fiber-optic cable—use a HS-NCM-WMF or HS-NCM-WSF as an interface between wire and fiber.

Fiber ports are not polarity sensitive. However, port-to-port wiring for the HS-NCM wire connections are polarity sensitive. When converting from a wire to fiber network, it may be necessary to change the port designation for the wire connection on the HS-NCM-WMF/WSF. To change the wire port designation, the HS-NCM parameters must be changed via VeriFire Tools. For instructions on how to change the HS-NCM parameters, refer to “HS-NCM Configuration” on page 5.

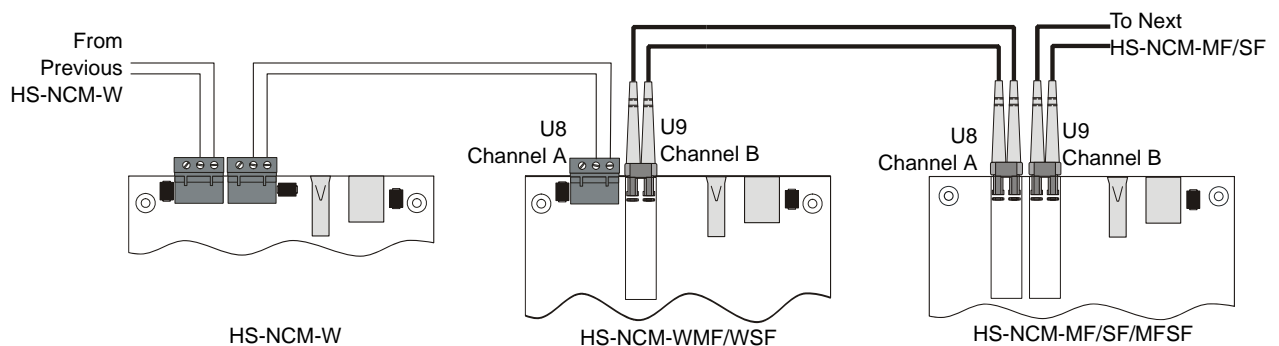


Figure 10 Wire-to-Fiber Connections

See Section 3, “The Network Communications Module for Fiber (HS-NCM-MF, HS-NCM-SF, HS-NCM-MFSF)” for requirements and restrictions on the use of fiber-optic cable. See the High-Speed Noti•Fire•Net™ Manual for a discussion of all compatible configurations.

6.5 Approved Cables and Distances for HS-NCM Applications

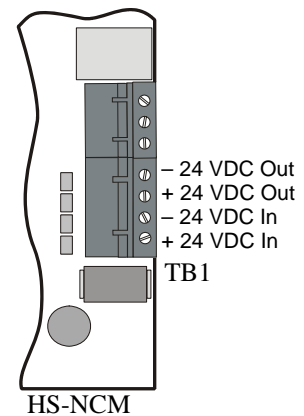
The following table shows approved wiring cables that can be used with the HS-NCM and the maximum total distance allowed for each.

Wire Type / Gauge	Maximum Distance:
Aerospace 7131KK / 16 AWG	2,000 ft. (609.6 m.)
Belden 5320UJ / 18 AWG	3,000 ft. (914.4 m)
Belden 5320UM / 18 AWG	3,000 ft. (914.4 m)
Belden 5220UM / 16 AWG	1,000 ft. (304.8 m)
Genesis 4050 / 18 AWG	3,000 ft. (914.4 m)
Genesis 4631 / 18 AWG	3,000 ft. (914.4 m)
Genesis 4433 / 14 AWG	3,000 ft. (914.4 m)
Genesis 4633 / 14 AWG	3,000 ft. (914.4 m)
Genesis 4431 / 18 AWG	2,000 ft. (609.6 m)
Genesis 5502 / 16 AWG	1,000 ft. (304.8 m)

Table 4 Maximum Distance for Approved Cables.

6.6 External Power for HS-NCM Applications

When using the HS-NCM with UL 8th edition panels, UL 9th edition panels where power can not be applied via the NUP port or when configured as a repeater, a 24 VDC external power source is required. Where applicable, the external 24 VDC external power source must share the same ground reference as the NUP port.



7 Diagnostic Indicators

The HS-NCM has LEDs that serve as diagnostic indicators to help in troubleshooting and system connection. Refer to Table 5 for a list of diagnostic indicators and their descriptions. Refer to Figure 11 for diagnostic indicator locations.

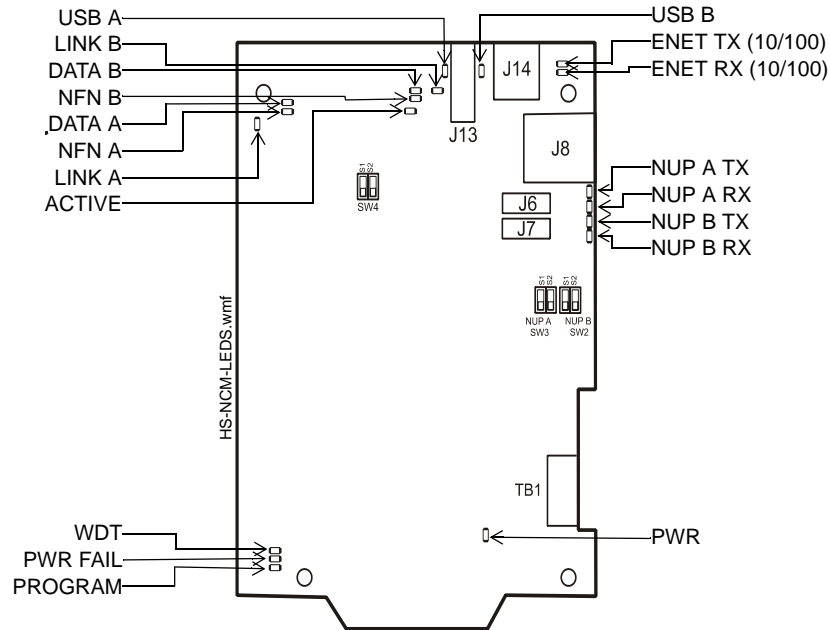


Figure 11 Diagnostic Indicator Locations

LED Indicator	LED Description	LED Color	LED State
PWR	Local +3.3V Power	Green	On steady when power is applied. If off, check the power wiring or the NUP connection.
PWR FAIL	Power Supply Tolerance	Yellow	Off. On steady when power supply is out of tolerance.
WDT	Watchdog Status	Yellow	Steady On during Watchdog failure. Contact Technical Support for resolution.
DATA A	Channel A Network Activity	Green	Blinks On when data is received.
DATA B	Channel B Network Activity	Green	Blinks On when data is received.
LINK A	Channel A Link	Green	Off. On steady when link is established. If off when link is established, check NFN wire and/or fiber connections.
LINK B	Channel B Link	Green	Off. On steady when link is established. If off when link is established, check NFN wire and/or fiber connections.
NUPA TX	NUPA Transmit	Green	Off. Blinks On when data is transmitted. If not periodically blinking, check the NUP cable for connection and integrity.
NUPA RX	NUPA Receive	Green	Off. Blinks On when data is received. If not periodically blinking, check the NUP cable for connection and integrity.
NUPB TX	NUPB Transmit	Green	Off. Blinks On when data is transmitted. If not periodically blinking, check the NUP cable for connection and integrity.
NUPB RX	NUPB Receive	Green	Off. Blinks On when data is received. If not periodically blinking, check the NUP cable for connection and integrity.
USBA	USBA Data Link	Green	Off. On steady when USB data link is established. If communication can not be established, check the USB wire for connection and integrity.
USBB	USBB Data Link	Green	Off. On steady when USB data link is established. If communication can not be established, check the USB wire for connection and integrity.
10/100	Ethernet frames receive	Green	Steady, Blinks when data is received.
10/100	Ethernet frames transmit	Green	Steady. Blinks when data is transmitted.
NFN A	Network test LED	Yellow	(Wire Only) Off, Blinks On when out of sync. If out of sync, check NFN wiring integrity.
NFN B	Network test LED	Yellow	(Wire Only) Off, Blinks On when out of sync. If out of sync, check NFN wiring integrity.
ACTIVE	Program Status	Green	Off. Blinks On when a program is running.
PROGRAM	Flash Programming	Yellow	Off. Blinks On during Flash programming. DO NOT REMOVE POWER WHEN FLASH PROGRAMMING!

Table 5 Diagnostic Indicator Functions and Colors

8 Supplemental Documentation

The table below provides a list of document sources (manuals) containing additional information regarding the HS-NCM-W/MF/SF and the High-Speed Noti•Fire•Net products that it can connect to.

For information on...	Refer to...	Part No.
Fire Alarm Control Panels (FACPs) and Networking	High-Speed Noti•Fire•Net Manual	54013
	ONYXWorks Workstation	52342
	NCA-2 Network Control Annunciator	52482
	NWS-3 Noti•Fire•Net Web-Server-3	53371
	ONYXWorks NFN Gateway-3 (Embedded)	53369
	ONYXWorks NFN GW PC	53370
	ONYXWorks Web Server	53030
	BACNet Gateway-3	53372
	NFS2-640 Installation	52741
	Operations	52743
Programming	52742	
NFS-320	Installation	52745
	Operations	52747
	Programming	52746
NFS2-3030	Installation	52544
	Operations	52545
	Programming	52546
NFS-640	Installation	51332
	Operations	51334
	Programming	51333
NFS-3030	Installation	51330
	Operations	51344
	Programming	51345
	NCA	51482
	DVC and DAA Series Installation, Programming and Operations Manual	52411
Off-line Programming Utility	VeriFire™ Tools CD on-line help file	VeriFire-TCD
Compatible Devices	Device Compatibility Document	15378
Cabinets & Chassis	CAB-3/CAB-4 Series Installation Document	15330
	CA-1 CA-1 Audio Chassis Product Installation Document	52455
	CA-2 Audio Chassis Installation Document	52474
	BMP-1 Product Installation Document	51119
	CHS-RL-MP Product Installation Document	53215
	Also see your panel's Installation Manual	

Table 6 Supplemental Documentation



NOTE: For module mounting instructions, refer to the documentation for your control panel.