Fire Alarm Network Reference

Network Overview with
Applications Reference

Features

Network communications among system fire alarm control panels provides:

- Support for Network Emergency voice broadcasts and Centralized Command Center operations
- Multiple Network Loops for campus and other high panel quantity applications
- Network-wide initiation of alarm silence, acknowledge, and reset; and investigation of status and details of system points and point lists
- Distributed system operation to ensure excellent survivability; during a communications fault condition, Network nodes remaining connected will regroup and continue communicating
- Flexible Network Annunciator options such as TrueSite™ Workstations, Network Display Units (NDU) and NDUs with VCC (Voice Command Center)
- Use of InfoAlarm® Command Center equipped nodes to provide increased network information display capability
- Network level command and control provides manual point control for on/off or disable/enable, as well as gathering specific point detail

Network nodes include the following Simplex® products:

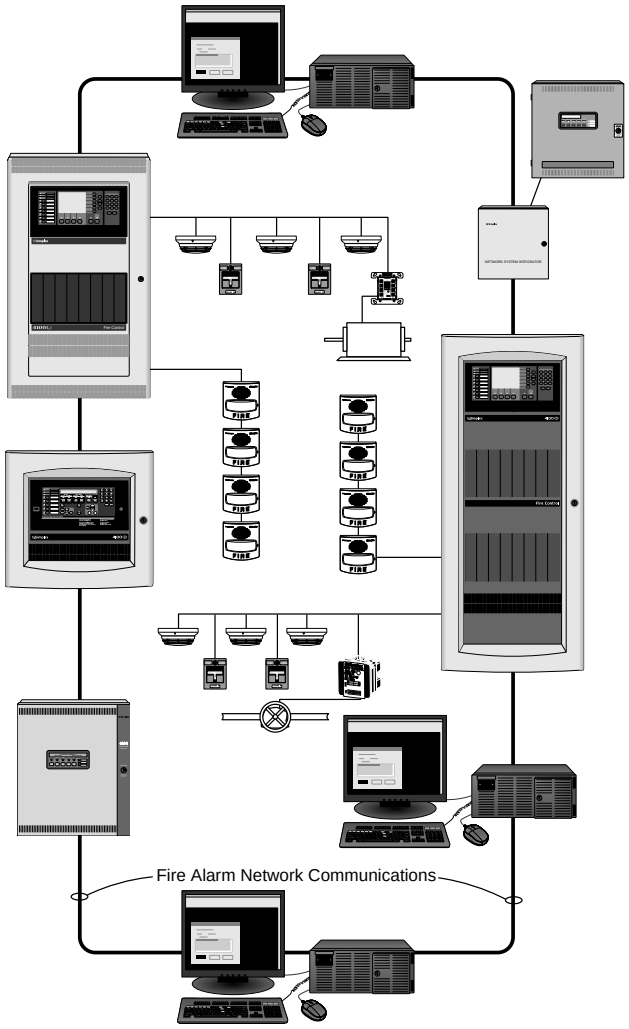
- 4100ES, 4100U, 4010ES and 4010 Series Fire Alarm Control Panels
- 4100ES and 4100U Network Display Units (NDU)
- 4190 Series TrueSite Workstations (TSW)
- 4190 Series Network System Integrators
- Legacy 4120 Series equipment; 4190 Series IMS and GCC systems; 4020, 4002 Series systems and retrofitted 4100/4100+ and 2120 systems

Flexible Network options for Class B (Style 4) or Class X (Style 7) communications:

- Wired communications using a single wire pair between nodes
- Available fiber communications providing increased noise immunity and longer distances
- Network communication fiber modules are available for multi-mode fiber connections
- Multiple communication Network fiber modules are available for either multi-mode or single mode fiber and can carry other communications such as Network audio
- TCP/IP communications using local area network (LAN) connection

Network diagnostics include:

- Attendance and polling error logging
- LED status indications on interface board
- Synchronized time and date allowing precise data logging



Simplex Fire Alarm Network Example

Introduction

Simplex Fire Alarm Networks communicate information among distributed Simplex fire alarm control panels. Systems may be composed of similar capability panels sharing information, or specific nodes may be added to perform dedicated network functions. Illustrations on the following pages provide a summary of a variety of fire alarm Network applications.

For non-Simplex panels, a Network System Integrator can be used to connect equipment to the Network using optically isolated inputs and relay contact outputs.

– NOTE: Refer to individual product data sheets for specific product listing details, see reference data sheet list on page 7.

Basic Network Operation

Nodes. Each panel with direct communications into the Network is defined as a node. Each node can be a large or small fire alarm control panel, TrueSite Workstation, or Network System Integrator.

Communications Process. Network information is sequentially transmitted from one node to another. At each node, the network message is captured and either retransmitted as received, or modified before retransmission to provide the network with a status update. The ability of the message to circulate through the network will define the network status and allow the nodes to respond accordingly.

Survivability. If a node goes "off-line" or if the connection between nodes either shorts, opens, or has any other form of communication problem, the nodes will isolate that section of wiring. Nodes that cannot retransmit onto the next node of the network will transmit back to the previous node to maintain communications and to notify the network of the node status. In the event of multiple wiring problems, the remaining nodes will effectively "regroup" and establish new, smaller "sub-networks" that will maintain communications among the active nodes.

Communications Options. Figure 1 below shows a multiple node network interconnected with a variety of communications means for reference.

- *Wired* communications are compatible with a variety of new and retrofit wiring
- *Standard* fiber optic communications are for multi-mode fiber and are dedicated to Network communications; dual fiber communications are standard; single fiber can be used with bi-directional couplers
- *Multiple-Communication* modems use a single fiber (available for single mode or multi-mode fiber) and can carry multiple communications signals such as Network communications and Network Audio broadcasts
- *TCP/IP* Physical Bridge modem communications are also available, refer to page 7 for more information

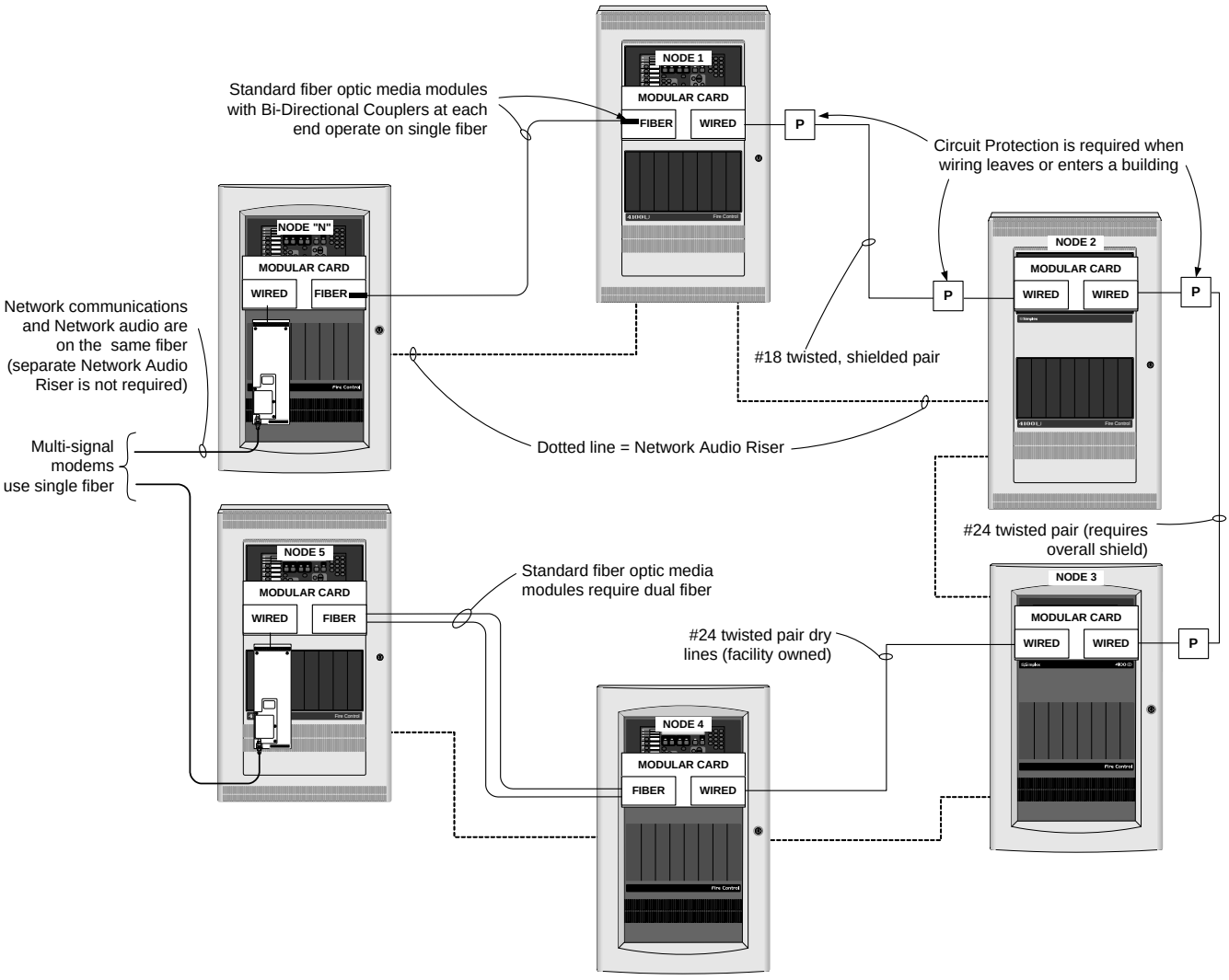


Figure 1. Network Communications Options Reference

Multiple Building Network Example

Multiple Building/Campus Network. Figure 2 below represents a multiple building/campus Network with duplicate InfoAlarm Command Center Network Display Unit (NDU) locations. The East security office might normally be the Master Command Center in the event of an emergency while the West security office can take control if needed.

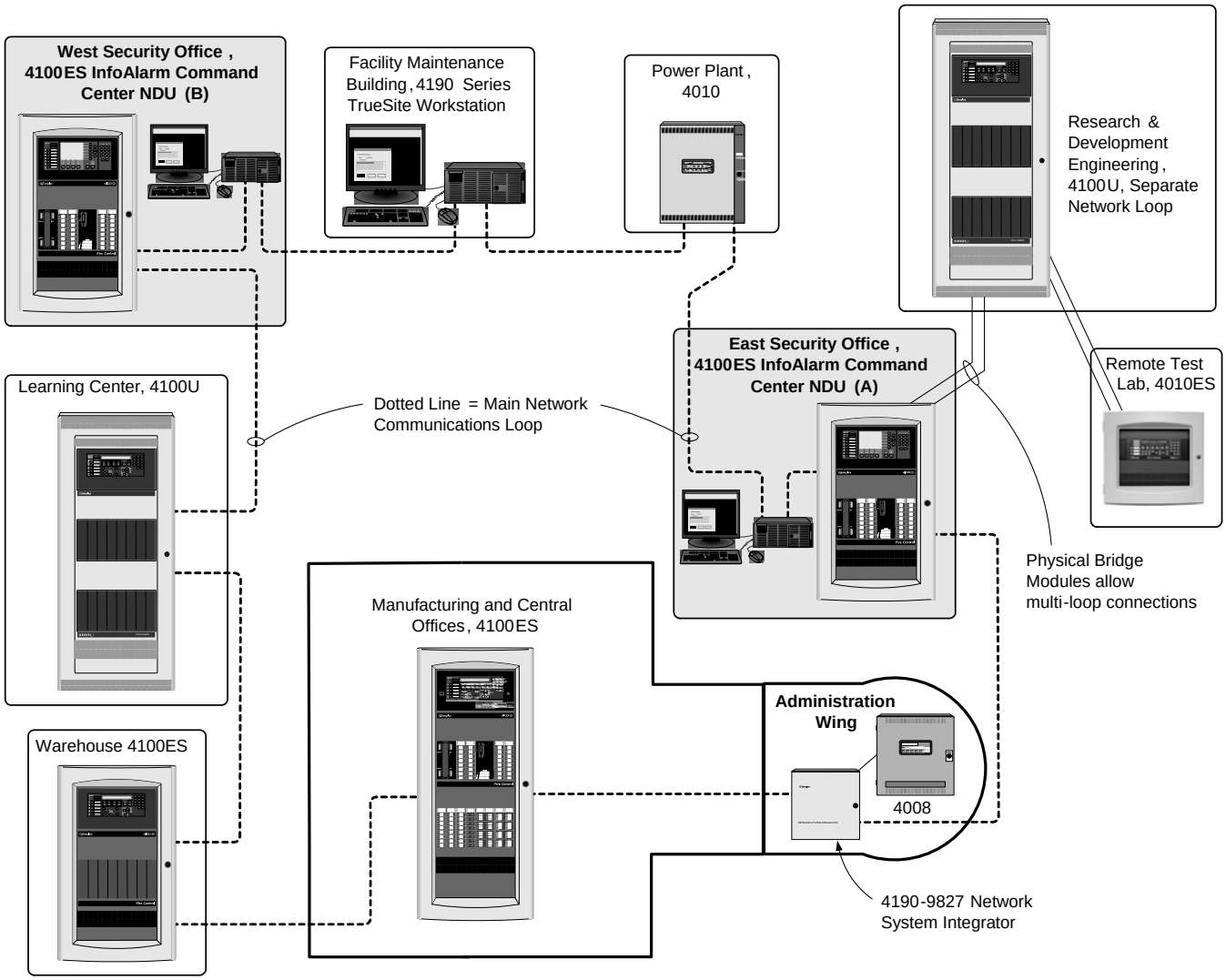
Hub Node Function using Physical Bridge Modules. The East Security Office NDU also performs as a basic hub node, supporting a Star topology via Physical Bridge modules, and allowing the two panel Network of the Research & Development loop to connect to the main Network loop. Physical Bridge modules allow a variety of other Network connections (refer to data sheet S4100-0057 for additional information).

Network Oversight. System activity recording occurs at both of the NDU locations with each capable of manually investigating and operating the same network public points. Access to the operation is passcode controlled such that only authorized operators have access to override the automatic operation.

Support for "In Control" Command Centers. "In Control" Network operation allows a prioritization to establish which Command Center is in control.

"In Control" functions include:

- Annunciation of which Command Center is "In Control"
- Establishing whether Command Centers have equal access to Control or are prioritized
- Allowing a "Request Control" command to be accepted where a specific Command Center takes control over other equal priority Command Centers – typically due to location of the incident of concern



Network Connections using Multiple Communication Fiber Optic Modems

Network Interconnection Flexibility. Multiple communication signal fiber optic modems provide the ability to communicate Network information and Network audio information over a single fiber. Additionally, they also can provide a variety of interconnection capabilities functioning as a hub node to tie into Star topology wiring and to interconnect Network loops.

As shown below, a Network can consist of both Class B (Style 4) and Class X (Style 7) communications wiring depending on system requirements.

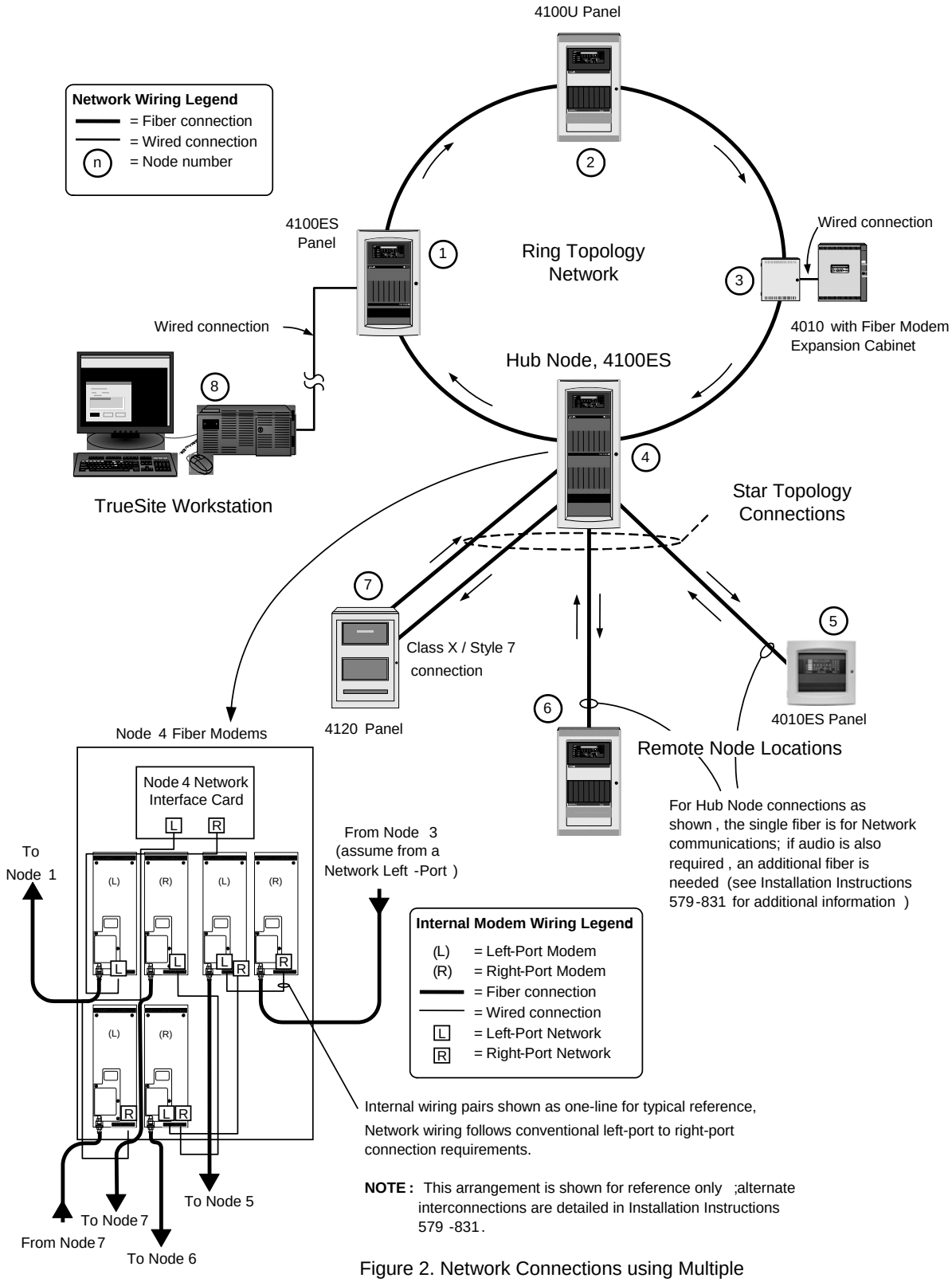
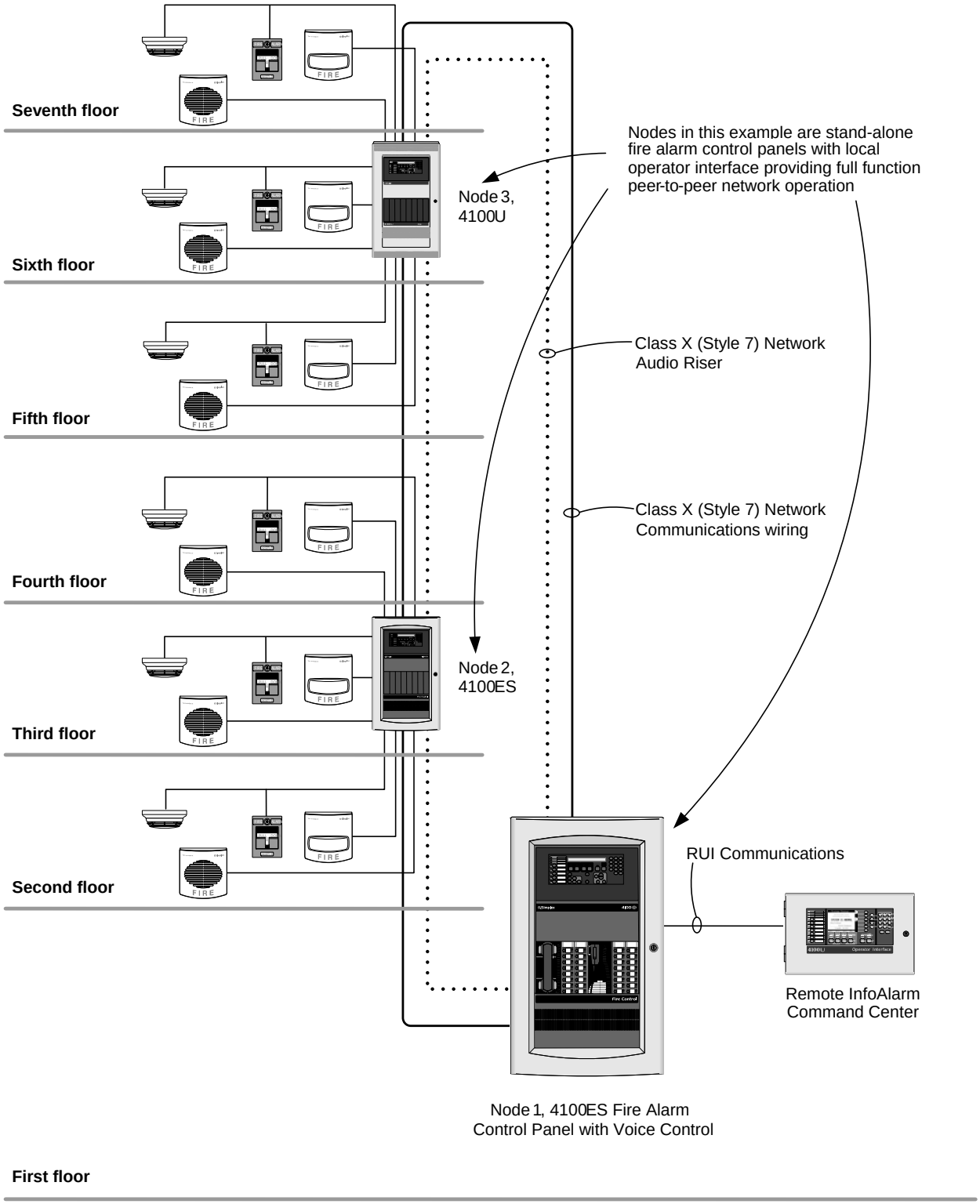


Figure 2. Network Connections using Multiple Communication Signal Fiber Modems

Network High Rise Audio Example

Fire Alarm Network principles apply equally to high rise applications. For the example shown below in Figure 4, a wired Network communications link is paired with a wired audio riser.



Multiple-Loop Operation using a TrueSite Workstation

When extensive network expansion or interconnection of existing, separate networks is required, up to four network loops may be interfaced using the TrueSite Workstation.

Each network loop is connected to its own network interface module allowing the workstation to appear as a node in each individual loop. With the workstation as a network loop interface, information from one loop can be passed along to another loop.

With a multi-loop network connection, the TrueSite Workstation is a node member of each network loop with up to 98 additional nodes per loop. This allows up to 392 total nodes and the workstation (393 total) to be interconnected.

Multi-Loop Operation Features

Improved survivability:

- Individual network loops operate independently
- In the event of loss of one or more loops, remaining loops continue to operate

Loop independence:

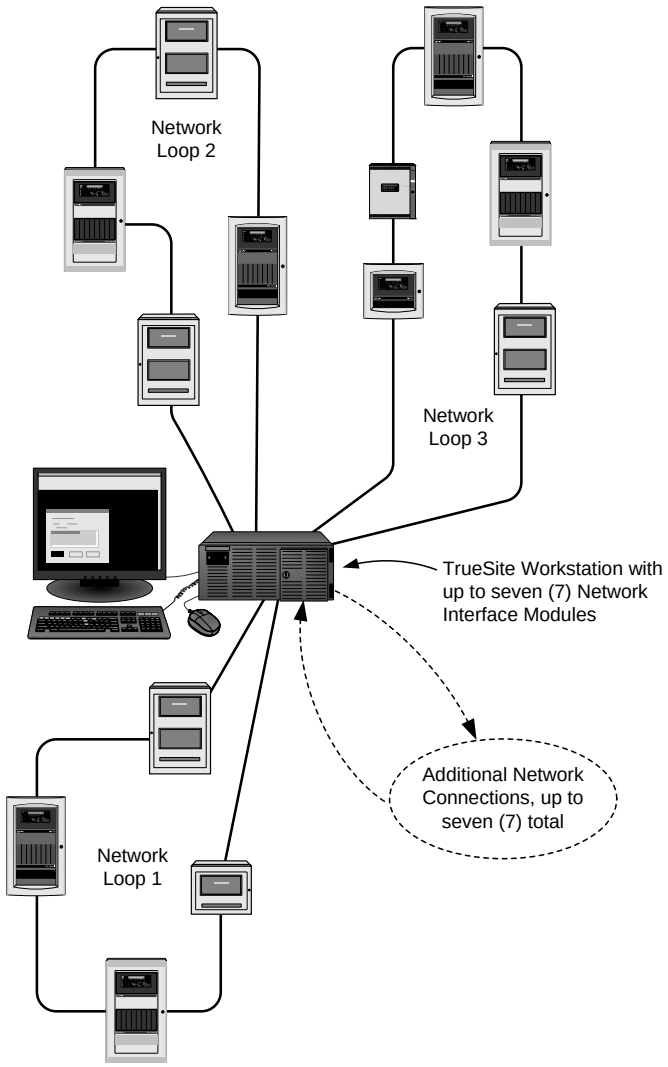
- New loops can be added without impacting existing loops

Assists with phased-in system expansion:

- Each loop can be installed as a stand-alone network allowing local node programming to evolve as required
- When construction or renovation reaches completion, loops can be combined for coordinated facility protection

TrueSite Workstation hardware requirements:

- Each loop requires a dedicated Network Interface Card with two media modules
- A maximum of four Network Interface Cards are allowed per workstation



Typical Interface of Multiple Network Loops Using a TrueSite Workstation

Multiple Network Loop Connections using TCP/IP Physical Bridge Modules

For additional Network connection flexibility, TCP/IP Physical Bridge Modules are available. (Transmission Control Protocol (TCP) using Internet Protocol (IP) formatting.) Bridging between Network loops or to a Star configuration using these modules allows the connection to be via a local area network (LAN) connection.

Refer to data sheet S4100-0029 for additional TCP/IP Physical Bridge module details.

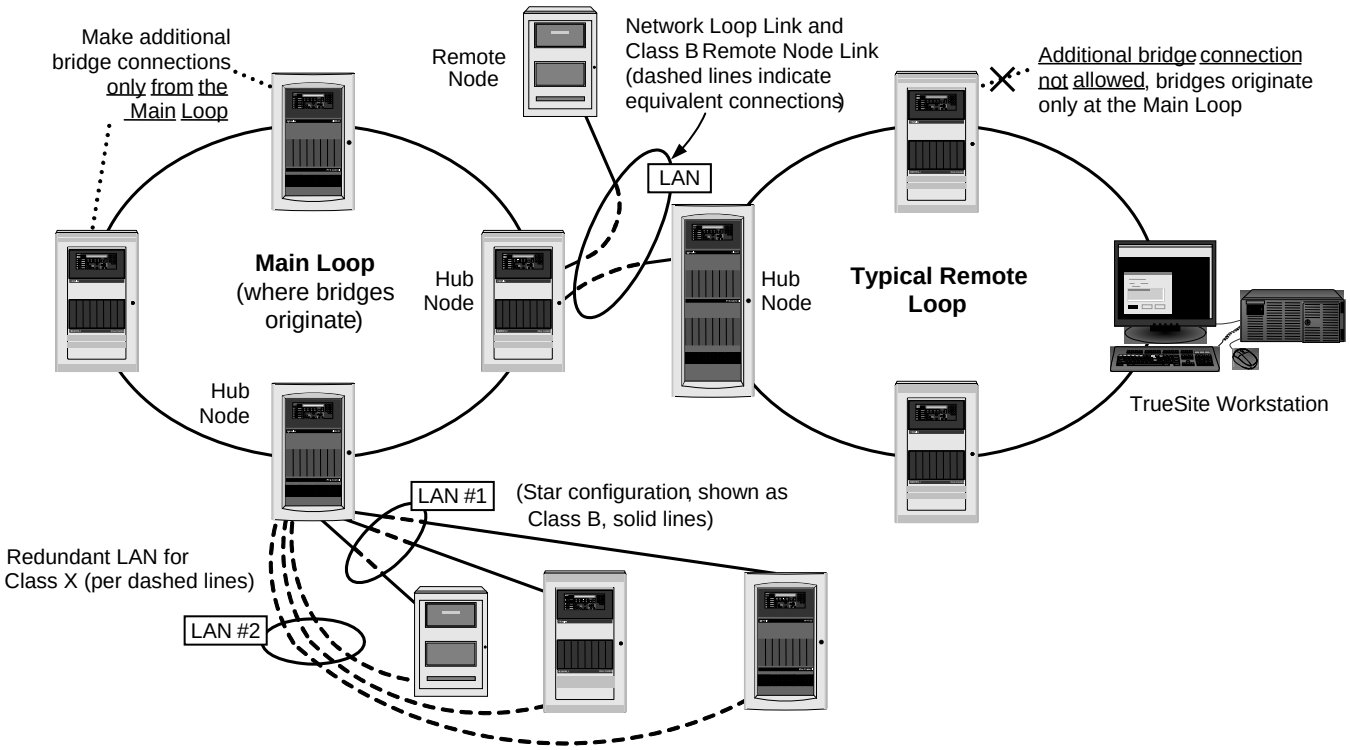


Figure 3. Multiple Loop Network with TCP/IP Modems

Additional Network Reference

Subject	Data Sheet
Basic 4100ES Reference	S4100-0031
Network Communications, Options and Specifications	S4100-0056
4100ES Network Display Unit (NDU)	S4100-0036
InfoAlarm Command Center	S4100-0045
TrueSite Workstations	S4190-0016
4010ES Fire Alarm Control Panel	S4010-0004
4010ES Fire Alarm Control Panel (International)	S4010-0006
4010 Fire Alarm Control Panel	S4010-0001
Network Systems Integrator	S4190-0017
Multiple Signal Fiber Optic Modems and Accessories	S4100-0049
PC Annunciators	S4190-0013
TCP/IP Physical Bridge Modules	S4100-0029
Physical Bridge Modules	S4100-0057

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