NFPA 72-2025

Ethernet/IP Communication Requirements

Panel and Communicator Requirements for Fire Alarm and Security Systems

Document Revision History

Rev.	Date	Author	Description of Changes
1.0	01/15/2025	K. Compliance	Initial document creation based on NFPA 72-2025

Purpose

This document summarizes the NFPA 72-2025 National Fire Alarm and Signaling Code requirements for Ethernet and IP-based communication connections on fire alarm panels and communicators. Requirements are categorized by application type: Residential Fire, Residential Security, Commercial Fire, and Commercial Security.

Executive Summary Comparison Table

The following table provides a quick reference comparison of Ethernet/IP communication requirements across application types.

Requirement	Commercial Fire	Residential Fire	Key Section
Single Path Permitted	Yes	Yes	26.6.3.3.1 / 29.10.9.10.3
Supervision Interval (Single)	60 minutes max	Monthly minimum	26.6.3.3.2 / 29.10.9.8
Supervision Interval (Multiple)	6 hours max	N/A	26.6.3.4(1)
Path Failure Annunciation	60 min (single) / 6 hr (multi)	7 days maximum	26.6.3.3.2 / 29.10.9.10.5
Secondary Power	24 hours minimum	24 hours minimum	26.6.3.13 / 29.10.9.10.4
Alarm Transmission Time	90 seconds max	Not specified	26.6.3.8
Cellular as Single Path	Permitted	Permitted	26.6.3 / 29.10.9.10.6
Cybersecurity Required	Yes (11.7)	Yes	11.7 / 29.10.10.4
Equipment Listing	Listed per 10.3	UL 985	10.3 / 29.10.9.10.7

Commercial Fire Alarm Systems

Requirements from Chapter 26 (Supervising Station Alarm Systems) apply to commercial fire alarm systems with off-premises monitoring.

Performance-Based Technologies (IP Communicators)

General Requirements	
Section:	**26.6.3.1**
Requirement:	*Communications methods operating on principles different from specific methods covered by this chapter shall be permitted to be installed if they conform to the performance requirements of this section and to all other applicable requirements of this Code.*
Section:	**26.6.3.2.1**
Requirement:	*Acknowledgments to the protected premises for alarm, supervisory, or trouble signals shall only be initiated by the supervising station.*
Section:	**26.6.3.2.2.1**
Requirement:	*Premises equipment installed to transmit signals shall be listed for the purpose and comply with the applicable requirements of 26.6.3.*
Section: **Requirement:**	**26.6.3.2.2.2** *Premises equipment initiating signal transmission at the control unit shall be listed independently of the communications technology and be part of the fire alarm system.*

Single Communications Pathway Requirements

Single Path Configuration	
Section:	**26.6.3.3.1**
Requirement:	*A single communications pathway shall be permitted unless prohibited by the AHJ or by governing laws, codes, or standards.*
Section: **Requirement:**	**26.6.3.3.2(1)** *The pathway shall be supervised for integrity to ensure end-to-end communications at an interval of not more than 60 minutes.*
Section:	**26.6.3.3.2(2)**
Requirement:	*A failure of the pathway within 60 minutes shall be annunciated in accordance with Section 10.15.*

Multiple Communications Pathway Requirements

Multiple Path Configuration

Section:	**26.6.3.4(1)**
Requirement:	*Each pathway shall be supervised for integrity to ensure end-to-end communications at intervals not exceeding 6 hours.*
Section:	**26.6.3.4(2)**
Requirement:	*Multiple communications pathways shall be arranged so that a single point of failure on one pathway does not cause the failure of any other pathway.*
Section:	**26.6.3.4(3)**
Requirement:	*Failure to complete a signal transmission shall be annunciated in accordance with Section 10.15.*
Section:	**26.6.3.5**
Requirement:	*A single technology shall be permitted to be used to create the multiple communications pathways if the requirements of 26.6.3.4(1) through 26.6.3.4(3) are met.*

Transmission Time and Performance Requirements

Signal Transmission Performance	
Section:	**26.6.3.8**
Requirement:	*The maximum duration between the initiation of an alarm signal at the protected premises, transmission of the signal, and subsequent display and recording of the alarm signal at the supervising station shall not exceed 90 seconds.*
Section:	**26.6.3.9**
Requirement:	*If a transmitter shares a transmission or communications channel with other transmitters, it shall have a unique transmitter identifier.*
Section:	**26.6.3.10**
Requirement:	*Recording and display of alarms at the supervising station shall be at a rate no slower than one complete signal every 10 seconds.*

Secondary Power Requirements

Power Supply for Communications Equipment	
Section:	**26.6.3.13 (referenced)**
Requirement:	*Communication equipment used for transmission of fire alarm signals that receives primary power from the protected premises shall meet the secondary power requirements. Secondary power capacity shall be sufficient to operate the communications equipment for a minimum of 24 hours in normal condition.*

Shared On-Premises Equipment Requirements

Shared Communications Equipment	
Section:	**26.6.3.2.3.1**
Requirement:	*Communications services equipment from communications service providers, including MFVN providers, shall be listed as communications and information technology equipment and comply with applicable requirements of 26.6.3.12 and 26.6.3.13.*
Section:	**A.26.6.3 (Annex)**
Requirement:	*If the transmitter is sharing on-premises communications equipment, the shared equipment must be listed for the purpose (otherwise the transmitter must be installed ahead of the unlisted equipment).*

Communications Pathway Management

Pathway Changes and Documentation	
Section:	**26.6.2.6(1)**
Requirement:	*Any changes to the communications pathway, communications technologies, or communications hardware at the protected premises shall meet: The AHJ shall be notified.*
Section:	**26.6.2.6(2)**
Requirement:	*Reacceptance testing shall be performed in accordance with Chapter 14.*
Section:	**26.6.2.6(3)**
Requirement:	*Documentation shall be provided in accordance with Chapter 7.*
Section:	**26.6.2.6(4)**
Requirement:	*Secondary power shall be verified as complying with 26.6.3.13.*
Section:	**26.6.2.6(5)**
Requirement:	*Communications pathways shall be permanently identified, as approved by the AHJ, at each connection point from the FACU to the service provider communications equipment.*

Class N (Ethernet) Pathway Requirements

Requirements from Chapter 12 for Class N pathways apply to Ethernet-based in-building fire alarm infrastructure.

Class N Pathway Performance	
Section:	**12.3.6(1)**
Requirement:	*When two or more endpoint devices depend on the pathway, it includes a redundant path.*
Section:	**12.3.6(2)**
Requirement:	*When one endpoint device is connected, a single path is permitted.*
Section:	**12.3.6(3)**
Requirement:	*Operational capability of the pathway is verified via end-to-end communication.*
Section:	**12.3.6(4)**
Requirement:	*A loss of communications between endpoints results in the annunciation of a trouble signal.*
Section:	**12.3.6(5)**
Requirement:	*A single open, ground, short, or combination of faults on one pathway does not affect any other pathway.*
Section:	**12.3.6(6)**
Requirement:	*Conditions that affect the operation of the primary pathway(s) and redundant pathway(s) result in the annunciation of a trouble signal when the system's minimal operational requirements cannot be met.*
Section:	**12.3.6(7)**
Requirement:	*Primary and redundant pathways are permitted to share traffic over the same physical segment.*

Residential/Household Fire Alarm Systems

Requirements from Chapter 29 (Single- and Multiple-Station Alarms and Household Signaling Systems) apply to residential fire alarm systems with off-premises monitoring.

Supervising Station Communication Requirements

General Household Monitoring Requirements	
Section:	**29.10.9.1**
Requirement:	*Household alarm systems shall be permitted to be supervised by a supervising station or by a public emergency alarm reporting system.*
Section:	**29.10.9.1.2**
Requirement:	*Where off-premises supervision is provided, the system shall transmit at least a general alarm signal.*
Section:	**29.10.9.2**
Requirement:	*Supervising station systems and services shall meet the requirements of Chapter 26 for the type of system and type of service selected, except as modified by 29.10.9.5 through 29.10.9.10.*
Section:	**29.10.9.8**
Requirement:	*Household fire alarm systems shall be programmed by the manufacturer to generate at least a monthly test of the communication or transmission means.*

IP/Ethernet Communication Requirements (Non-DACT)

Single Path IP/Cellular Communication	
Section:	**29.10.9.10.3**
Requirement:	*Where a communication or transmission means other than DACT is used, only a single communication technology and path shall be required to serve the protected premises.*
Section:	**29.10.9.10.4(1)**
Requirement:	*Where a communication or transmission means other than DACT is used, all equipment necessary to transmit an alarm signal shall: Be provided with a minimum of 24 hours of secondary power capacity.*
Section:	**29.10.9.10.4(2)**
Requirement:	*Transmit a specific trouble signal upon loss of primary power.*
Section:	**29.10.9.10.5**
Requirement:	*Failure of the communication path referenced in 29.10.9.10.3 shall be annunciated at the supervising station and at the protected premises within not more than 7 days of the failure.*
Section:	**29.10.9.10.6**

Requirement:	*A dedicated cellular telephone connection shall be permitted to be used as a single means to transmit alarms to a constantly attended remote monitoring location.*

Equipment Listing Requirements

Listed Equipment	
Section:	**29.10.9.10.7**
Requirement:	*Transmission devices connected to the supervising station shall be in compliance with applicable standards such as UL 985, Household Fire Warning System Units.*
Section:	**29.10.9.10.8**
Requirement:	*Transmission devices connected to the supervising station sharing on-premises equipment shall be listed as communications or information technology equipment.*

Cybersecurity Requirements

IP/Cellular Cybersecurity	
Section:	**29.10.10.1**
Requirement:	*All control units shall be designed for cybersecurity as determined by the manufacturer.*
Section:	**29.10.10.2**
Requirement:	*All devices that are connected wirelessly to a control unit and rely on the control unit for occupant notification activation shall not diminish the cybersecurity of the control unit.*
Section:	**29.10.10.3**
Requirement:	*All system or software updates required or initiated by the manufacturer shall not diminish the cybersecurity of the control unit.*
Section:	**29.10.10.4**
Requirement:	*All alarms that use IP or cellular communication shall be designed for cybersecurity as determined by the manufacturer.*

Secondary Power Requirements

Household System Power	
Section:	**29.9.3.1(1)**
Requirement:	*Household fire and carbon monoxide alarm systems shall have two independent power sources consisting of a primary source that uses commercial light and power and a secondary source that uses a rechargeable battery.*
Section:	**29.9.3.1(2)**
Requirement:	*The secondary source shall be capable of operating the household alarm system for at least 24 hours in the normal condition, followed by 4 minutes of fire alarm or 12 hours of carbon monoxide alarm.*
Section:	**29.9.3.1(3)**
Requirement:	*The secondary power source shall be supervised so that a distinctive audible and visible trouble signal results upon removal or disconnection of a battery or a low-battery condition.*

Security System Applications

NFPA 72 does not explicitly differentiate security from fire alarm communication requirements. When security signals share the same monitoring infrastructure as fire alarm systems, they typically follow the same transmission requirements. The following notes apply:

Security System Considerations	
Section:	**General Note**
Requirement:	*Security-only systems may be subject to different standards (UL 681, UL 827) and local AHJ requirements. When combined fire/security systems are installed, NFPA 72 requirements for fire alarm communication take precedence.*
Section:	**10.3 (Equipment Listing)**
Requirement:	*Equipment constructed and installed in conformity with this Code shall be listed for the purpose for which it is used.*
Section:	**26.3.2 (Central Station Service)**
Requirement:	*Central station service shall include the monitoring for alarm, supervisory, and trouble signals; retransmission; and record keeping and reporting.*

Note: This document provides a summary of key requirements. Always refer to the complete NFPA 72-2025 code for full compliance details and consult with the Authority Having Jurisdiction (AHJ) for local interpretations.