

FireNET

FN-4127-IO 16 Channel Input/Output Board Installation and Operation Manual



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Section 1 – Introduction

The FN-4127-IO is a 16 channel input/output board that provides expansion capability to the FireNET system. The FN-4127-IO is listed as compatible for use with the FireNET and FireNET Plus analog fire alarm control panels.

1.1 Limitations of Fire Alarm Systems

Follow Recommended Installation Guidelines: To achieve early fire detection, fire detection sensors should be installed in all rooms and areas of a house, apartment, or building in accordance with the recommendations of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, state and local codes, and the recommendations contained in Guide for the Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. Generally, the standards and recommendations include the following (but installers should refer to the specific guidelines above before installing):

- Sleeping Rooms: Smoke detectors should be installed in every sleeping room.
- Hallways: More than one smoke detector should be installed in a hallway if it is more than 30 feet long.
- At least Two Smoke Detectors: There should never be less than two smoke detectors per apartment or residence.
- Smoke Detectors in Alarm, Electrical, or Phone Locations: Smoke detectors should be located in any room where an alarm control is located or an alarm control connects to an electrical source or phone line. If detectors are not so located, a fire within the room could prevent the alarm control from reporting a fire.
- Notification Systems: All fire alarm systems require notification devices, including sirens, bells, horns, and/or strobes. In residential applications, each automatic alarm initiating device when activated should cause the operation of alarm notification device that should be clearly audible in all bedrooms over ambient or background noise levels (at least 15dB above noise) with all intervening doors closed.
- Alarm in Every Bedroom and Level of Residence: A smoke detector with an integral sounder (smoke alarm) should be located in every bedroom and an additional notification device should be located on each level of a residence.
- Maintenance: A maintenance agreement should be arranged through the local manufacturer's representative and maintenance should be performed annually by authorized personnel only. To keep a fire alarm 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 Chapter 7 of NFPA 72 (1999) shall be followed.
- Test Weekly: The alarm system should be tested weekly to make sure all sensors and transmitters are working properly. The most common cause of an alarm system not functioning when a fire occurs is inadequate maintenance.

Alarms Cannot Guarantee Warning or Protection: Fire alarm system cannot guarantee warning or protection against fire in every potential situation. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off or give early warning in as many as 35% of all fires.

Limitation on Fire Alarm Effectiveness: A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons. For example:

- No Detection: Particles of combustion or smoke from a developing fire may not reach the sensing chambers of smoke detectors because:
 1. **Barriers** (such as closed or partially closed doors, walls, or chimneys) may inhibit particle or smoke flow.
 2. Smoke particles may become **cold, stratify, or not reach** the ceiling or upper walls where detectors are located.
 3. Smoke particles may be **blown away** from detectors by air outlets.
 4. Smoke particles may be **drawn into air returns** before reaching the detector.
- No Multi-Floor Detection: In general, smoke detectors on one level of a structure cannot be expected to sense fires developing on another level.
- Insufficient Smoke: 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 the detector, the detector will not go into alarm.
- Smoldering vs. Flaming Fires: Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectric 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.
- False Alarms and Pre-Fire Disconnection: Smoke detectors are subject to false alarms and nuisance alarms and may have been disconnected by users. For example, a smoke detector located in or near a kitchen may go into nuisance alarm during normal operation of kitchen appliances. In addition, dusty or steamy environments may cause a smoke detector to falsely alarm. If the location of a smoke detector causes an abundance of false alarms or nuisance alarms do not disconnect the smoke detector, call a professional to analyze the situation and recommend a solution.
- Fast Fires and Explosions: Smoke detectors cannot be expected to provide adequate warning of fires caused by arson and children playing with matches (especially within bedrooms), smoking in bed, violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).
- Heat Detectors: Heat detectors do not sense particles of combustion and are designed to alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Heat detectors are designed to protect property, not life.

- Unheeded Warning: Warning devices (including horns, sirens, and bells) may not alert people or wake up sleepers who are located on the other side of closed or partially open doors. A warning device that activates on a different floor or level of a dwelling or structure is less likely to awaken or alert people. Even persons who are aware may not notice the warning if the alarm is muffled by noise from a stereo, radio, air conditioner or other appliance, or by passing traffic. Audible warning devices may not alert the hearing impaired (strobes or other devices should be provided to warn these people). Any warning device may fail to alert people with a disability, deep sleepers, people who have recently used alcohol or drugs, or people on medication or sleeping pills.
 - Strobes: Strobes can under certain circumstances, cause seizures in people with conditions such as epilepsy.
 - Drills: Studies have shown that certain people, even when they hear a fire alarm signal, do not respond or comprehend the meaning of the signal. 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 on the proper reaction to alarm signals.
 - Hearing Loss: In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.
- Telephone Transmissions Problems: Telephone lines needed to transmit alarm signals from a premises to a central station may be out of service or temporarily out of service. For added protection against telephone line failure, backup radio transmission systems are recommended.
- System Failure With Age or Lack of Maintenance: System components, though designed to last many years, can fail at any time. As a precautionary measure, it is recommended that smoke detectors be checked, maintained, and replaced per manufacturer's recommendations.
- Electrical Power Problems: System components will not work without electrical power. If system batteries are not serviced or replaced regularly, they may not provide battery backup when AC power fails.
- High Air Velocity or Dusty or Dirty Environments: Environments with high air velocity or that are dusty or dirty require more frequent maintenance.

Importance of Maintenance: In general, fire alarm systems and devices will not work without power and will not function properly unless they are maintained and tested regularly.

Alarm is Not Substitute for Insurance: While installing a fire alarm system may make the owner eligible for a lower insurance rate, an alarm system is not a substitute for insurance. Property owners should continue to act prudently in protecting the premises and the people in their premises and should properly insure life and property and buy sufficient amounts of liability insurance to meet their needs.

Section 2 – General Wiring Specifications

Care should be taken when wiring the system to avoid situations that would contribute to inducing electrical noise from one wire to another. Induced noise can interfere with telephone communications or cause erratic system operation. Follow these general guidelines to plan your system wiring prior to installation.

- Route high and low voltage wiring separately. Maintain a minimum 2” separation between high and low voltage wiring throughout the building.
- Route control panel wiring around the perimeter of the control panel enclosure. A minimum .25” separation is required between high and low voltage wiring.
- Identify which group each wire or cable is associated with from the list below. Isolate each group’s wiring as much as possible. Avoid running a single multi-conductor cable for multiple groups of conductors.
 - AC Power - Main Power Supply
 - Notification Appliances
 - SLC Circuits
 - Relay Outputs
 - Voltage Outputs
 - Remote Control and Auxiliary Inputs
 - Network Wiring (Shielded wire required)
 - RS485 Bus Wiring (Shielded wire required)
- Keep wiring from different groups separated as much as possible. If you must share the same conduit with different conductor groups consider using shielded cable.
- If shielded cable is used terminate the shield to the earth ground terminal block in the main control panel and leave open at field side of cable. Do not ground at both ends of cable.

Section 3 – Installing the FN-4127-IO 16 Channel I/O Board

3.1 Overview of the FN-4127-IO

The FN-4127-IO 16 channel Input/Output board provides input and output expansion capability for the FireNET system. Each channel can be individually configured as either an input or an output. Up to 32 FN-4127-IO boards can be connected to the FireNET system via the RS485 bus, giving the system an additional 512 inputs/outputs.

Each FN-4127-IO board is available to the entire network which allows for network-wide input/output mapping. Typical uses for the I/O module include graphical LED map displays/annunciators, tabular LED zone display/annunciators, and input/output logic to and from the fire system for secondary use such as access control, burglary, CCTV, intercom, voice or other 3rd party systems.

3.2 Environmental Specifications

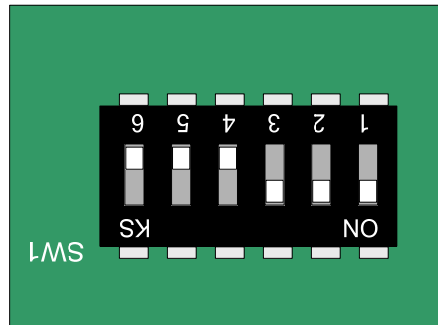
The FN-4127-IO board should be installed in locations where it will NOT be exposed to temperatures outside the range of 32° F – 120°F or humidity outside the range of 10%-85% non-condensing.

The FN-4127-IO Input/Output board is intended for installation in indoor environments in a dry location.

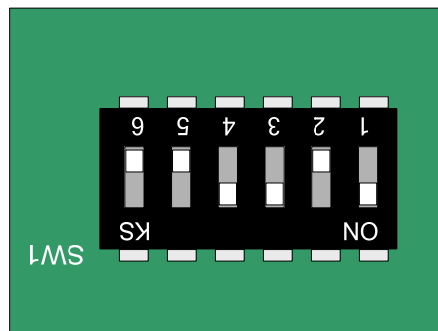
3.3 Addressing

Up to 32 FN-4127-IO boards may be connected to a control panel. Each I/O board must be set to a unique address before it is installed. The address for each I/O board is set using a 6-position DIP switch in binary fashion. Switches 1- 5 represent the values 1, 2, 4, 8, and 16 respectively; switch 6 is not used. To set the address, move only the switches whose values when added equal the address value you wish to set to the “ON” position. For example, moving switches 1 and 3 (whose values are 1 and 4 respectively) to the “ON” position sets the address of 5 into the annunciator. See the other examples below:

Switch Number	Value
1	1
2	2
3	4
4	8
5	16
6	not used



Address 7. Switches 1, 2 and 3 are in the ON position ($1 + 2 + 4 = 7$)



Address 13. Switches 1, 3 and 4 are in the ON position ($1+4+8=13$)

Note that addresses must be set with no power applied to the board.

For address 32 all switches must be OFF.

3.4 Installation of the FN-4127-IO Input/Output Board

The I/O board can be mounted either in the main control panel on the standoffs provided or in an accessory cabinet (FN-ACC). When mounting remotely in an accessory cabinet the distance from the panel to the I/O board must not exceed 4000 feet. A suitable communications cable for RS485 applications must be used for all RS485 bus devices.

All wiring terminals on the FN-4127-IO board can accept wire gauges from 22AWG to 14AWG.

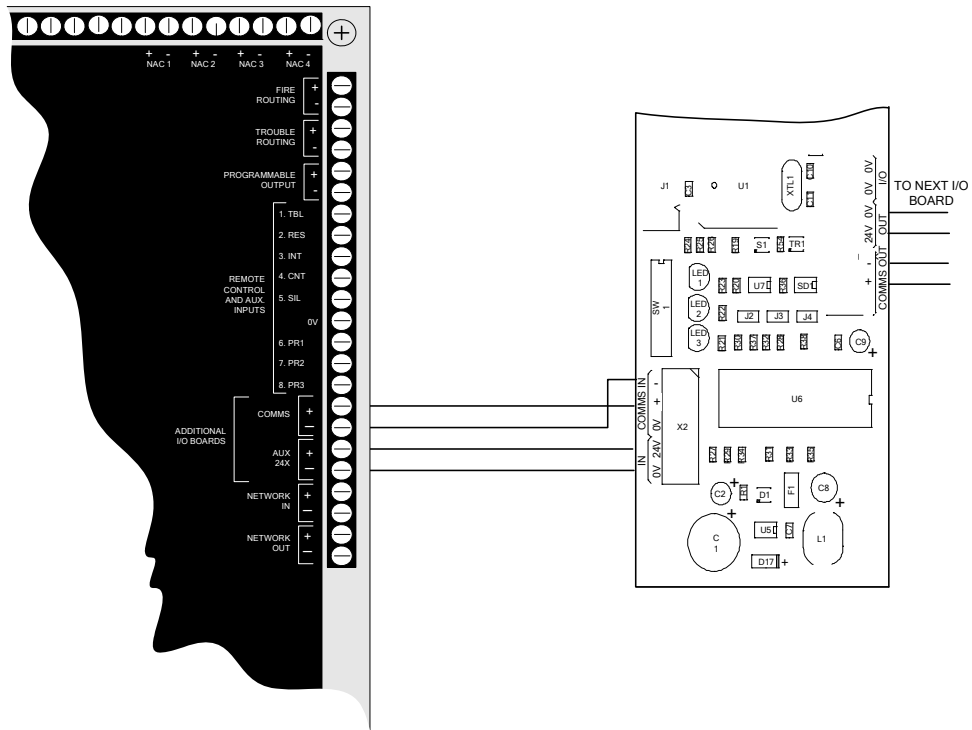
3.4.1 Power Connections

The I/O board requires 24 VDC power to operate. The AUX 24V terminals of the FireNET panel can supply this voltage (500 milliamps maximum). You may also use an external power supply that provides 24 VDC output.

Connections are provided on the I/O board for both incoming and outgoing power.

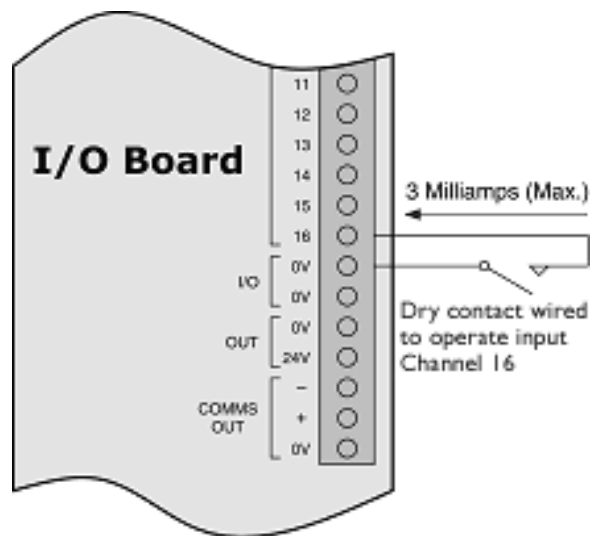
3.4.2 COMMS Connection

In addition to power, each I/O board requires a pair of conductors for data communication. This wiring is connected to the COMMS + and - terminals on the FireNET control panel. The communication wiring may also be connected to the COMMS OUT + and - terminals of another RS485 bus device.



3.4.3 Configuring Inputs

Inputs to the FN-4127-IO are optically isolated and connected to the board by installing a normally open contact with a resistance no greater than 500 ohms to any input and a terminal marked 0V. The current switched by the contact will be a maximum of 3 milliamps.



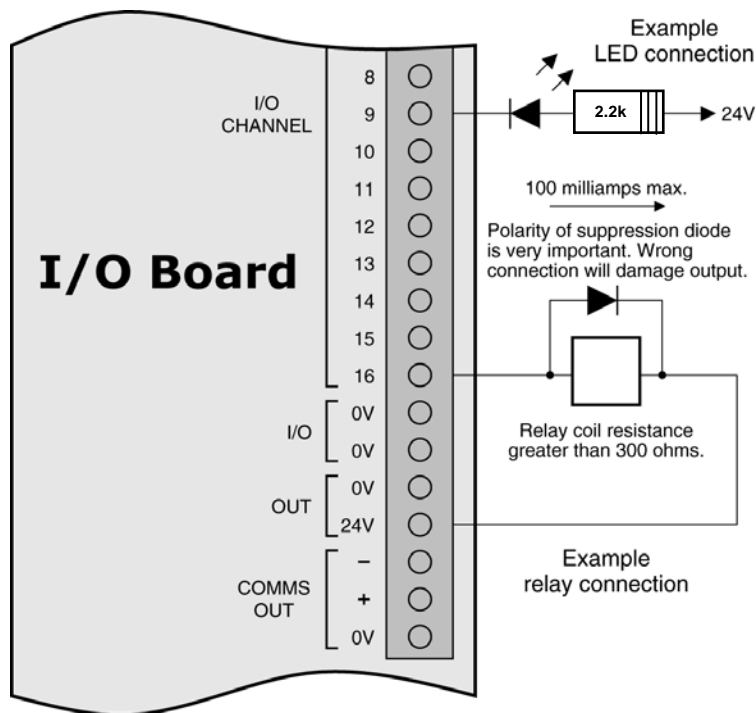
NOTE: Inputs on the I/O board are not supervised. These inputs are not for primary initiating or detection of fire or life safety conditions. These inputs are programmable for secondary use only, and not used for signaling Fire, Supervisory, or Trouble conditions. All primary initiating or detection inputs must be connected to applicable SLC devices listed for fire.

3.4.4 Configuring Outputs

When configured as outputs, the I/O board channels supply a negative voltage (with respect to the I/O board 24V power supply) via a transistor.

Because transistor elements can be damaged by excessive current drain, great care should be taken when connecting to outputs. Particular care should be taken to ensure that suppression diodes on relay coils are correctly polarized. Wrongly connected diodes will damage the outputs. Diodes should be connected with the band to the positive 24V.

Individual channels can supply current up to 100 milliamps but this must be limited to 500 milliamps for each bank of eight (500 milliamps for 1-8 and 500 milliamps for 9-16). The power supply to the I/O board should also be considered to ensure that its rating is not exceeded if multiple channels are switched on. Overall current draw for the I/O board is 1010mA max.



NOTE: Outputs on the I/O board are not supervised. These outputs are not for primary notification of fire conditions (i.e. not for use as NAC circuits). These outputs are for secondary use only. All primary notification output devices must be connected to applicable NAC circuits on the FireNET panel.

When powering the I/O board from the FireNET Aux 24VDC power (limited to 500ma), the following maximum wiring distances apply at the gauges noted:

<u>Wire</u>	<u>Distance</u>
18AWG	875ft
16AWG	1400ft
14AWG	2300ft
12AWG	3700ft

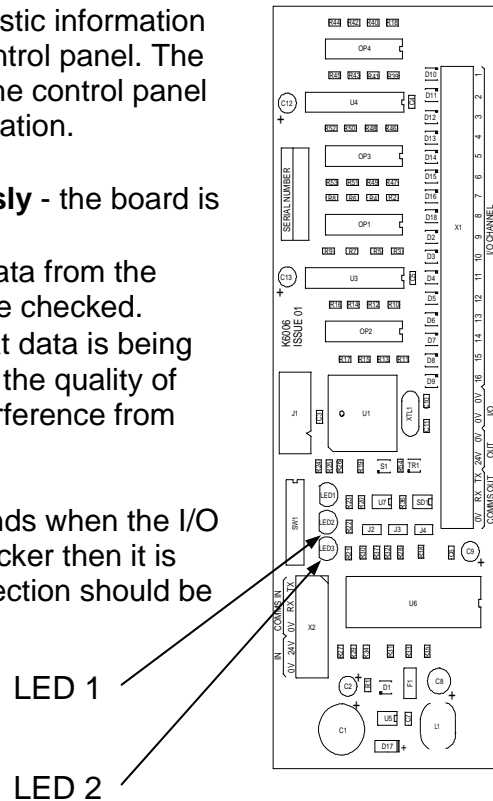
When powering the I/O board from a separate Aux 24VDC UL Fire listed supply the maximum voltage drop cannot exceed 4VDC.

3.4.5 LED Indicators

LED indicators on the I/O board give some simple diagnostic information and show that the boards are communicating with the control panel. The red LED (LED1) is on during receipt of a message from the control panel and will turn off if the I/O board detects normal communication.

- **If the LED is flickering more or less continuously** - the board is operating normally.
- **If this LED is not lit** - the board is not receiving data from the control panel and the comms connection should be checked.
- **If this LED is permanently lit** - then it is likely that data is being received but that it is being corrupted. In this case the quality of the comms connection should be checked for interference from AC power or other noise generating sources.

The yellow LED (LED2) will flicker briefly every few seconds when the I/O board responds to the main panel. If this LED does not flicker then it is not responding to the control panel and the comms connection should be checked.



WARRANTY

Hochiki America Corporation manufactured equipment is guaranteed to be free from defects in materials and workmanship for a period of one (1) year from date of original shipment. HOCHIKI will repair or replace, at its option, any equipment which it determines to contain defective material or workmanship. Said equipment must be shipped to HOCHIKI prepaid. Return equipment will be prepaid by HOCHIKI. We shall not be responsible to repair or replace equipment which has been repaired by others, abused, improperly installed, altered or otherwise misused or damaged or exposed to conditions outside the products specifications in any way. Unless previously contracted by HOCHIKI, HOCHIKI will assume no responsibility for determining the defective or operative status at the point of installation, and will accept no liability beyond the repair or replacement of the product at our factory service department. Please contact HOCHIKI's Sales department for proper procedure for claims and return of merchandise.

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End of Manual

March 2009