

Features

Provides the 4100ES (or 4100U) Fire Alarm Control Panel with an isolated IDNet communications channel with four fault isolated circuit outputs to optimize performance when retrofitting into existing device wiring:

- Capacity is 246 IDNet external point addresses plus four built-in circuit isolators (250 addresses total)
- IDNet+ communications are isolated from other system reference voltages to reduce common mode noise interaction with adjacent system wiring
- Using existing conventional wiring for addressable communications allows significant material and labor savings when upgrading fire alarm systems
- IDNet communications wiring can be either individual conductors or multi-conductor cable; twisted or shielded wiring is not required (refer to details on pages 2 and 3)
- Operation allows NACs, other IDNet+ channels, and other fire alarm communications signals in the same conduit without interference between signals (refer to details on page 3)

Four fault isolated outputs:

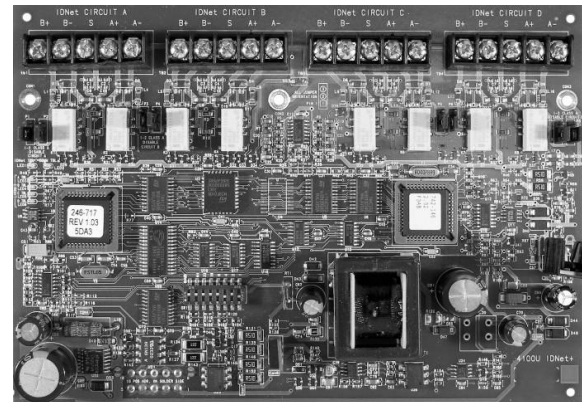
- One IDNet channel is connected through four independently controlled outputs that can be isolated from each other in the event of a short
- Each output is individually on-board selectable for either Class A or Class B operation, intermixed on the same IDNet+ module as desired
- For Class B wiring, multiple connections are available for installation convenience; each output provides two sets of parallel connected output terminals with each terminal sized to allow two wires
- Wiring terminals are rated for up to two 12 AWG wires per terminal
- Standby current requirements are the same as existing 4100ES/4100U IDNet expansion modules
- Outputs are compatible with remote IDNet Isolators and Isolator Bases

UL Listed to Standard 864

Convenient built-in service tools:

- On-board trouble LEDs activate per output
- Ground Fault Detection Diagnostics test each output
- Duplicate Device Detection and Weak Answer Detection Diagnostics assist in locating devices installed incorrectly or in conflict with wiring specifications**
- Device Detect Capability polls all devices, determines device type of each address, and provides Service Port access to the results
- Output troubles with custom labeling are indicated at the control panel per output

** IDNet addressable communications are protected by us Patent No. 4,765,025. IDNet duplicate device detection is protected under us Patent No. 6,034,601.



4100ES IDNet+ Module Detail
(5-9/16" H x 8" W; 144 mm x 204 mm)

Introduction

New Systems Versus Retrofit. When new fire alarm systems are installed, addressable communications wiring can typically be specified exactly as desired with little difficulty. Although typically more expensive than standard branch circuit power wiring, the use of twisted, shielded pair wiring, or other specific wiring types, may be preferred to optimize system performance. However, when an existing non-addressable (conventional) fire alarm system is in need of updating to addressable device operation, the compatibility of the existing wiring with the requirements of the new device communications wiring must be considered.

Compatibility. Digital communications wiring, audio signal wiring, notification appliance circuit (NAC) wiring, or other related power wiring with repetitive switching transients all have the potential to couple portions of their signals into each other if their wiring is in close proximity, such as within the same conduit. Sometimes the result is negligible, but often the result can be intermittent or continuous interference unless twisted, shielded pair (TSP); unshielded, twisted pair (UTP); or shielded wire is used on one, both, or all of the signals involved.

Improving Operation with Existing Wiring. 4100ES IDNet Module 4100-3107 uses on-board circuitry to separate the IDNet communications channel from the source power conductors to provide an isolated IDNet communications channel. An isolated IDNet channel (called IDNet+) significantly improves common mode noise rejection and allows a variety of fire alarm signals to be non-interfering when wired in the same conduit. Additionally, this module provides four fault isolated outputs capable of being selected as Class A or Class B wiring, intermixed on the same module.

* This product has been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7165-0026:251 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Safety Products Westminster.

Specifications

General System Specifications and Input/Output Specifications

Required System Software Revision	4100ES or 4100U Revision (11.10) or higher	
IDNet Device Compatibility	See reference data sheet S4090-0011 for details	
Input Voltage	24 VDC, system supplied	
Input Current	Module only	Supervisory = 75 mA; Alarm = 115 mA; add IDNet device loading (see below); Maximum Alarm = 361 mA (with 246 remote devices)
	IDNet Devices	Per device; Supervisory = 0.8 mA; Alarm = 1 mA
IDNet+ Output	Voltage	30 VDC nominal, 36 VDC maximum; DC voltage with imposed data
	Current	500 mA maximum
	Devices	Up to 246 remote devices; outputs are assigned addresses 247 to 250

IDNet+ Wiring Specifications

Note: Maximum wiring distance is determined by either reaching the maximum capacitance, the total series wiring resistance, or the stated maximum distance, whichever occurs first.

Capacitance Parameters (for Class A or Class B wiring)

Maximum Individual IDNet+ Channel Wiring Capacitance	The sum of line-to-line capacitance + the capacitance of either line-to-shield (if shield is present) = 0.6 μF maximum; total of all four outputs
Maximum Channel-to-Channel Wiring Capacitance (for multiple IDNet+ SLCs)	Capacitance between any one IDNet+ Channel and other IDNet+ Channels = 1 μF maximum (measured between wires of the same polarity; plus-to-plus; minus-to-minus)

Maximum Channel Wiring Resistance

Class A Wiring Resistance	Up to 125 devices = 50 Ω maximum	Total series wire resistance of all four output loops
	126 to 246 devices = 35 Ω maximum	
Class B Wiring Resistance	Up to 125 devices = 50 Ω maximum	Total series wire resistance of all four outputs, including any "T-taps"
	126 to 246 devices = 35 Ω maximum	

Maximum Wiring Distances (distance may be less due to capacitance and resistance specifications)

Total Channel Maximum Wiring Distance	12,500 ft (3.8 km) ; total for all four outputs, Class A or Class B, including "T-taps" for Class B wiring		
Wiring Distance Limits: Class A wiring ; loop distance limit per output Class B wiring ; maximum distance from the panel to the farthest device on each output	Wire Size*	Up to 125 devices	126 to 246 devices
	18 AWG	4000 ft (1219 m)	2500 ft (762 m)
	16 to 12 AWG	5000 ft (1524 m)	2500 ft (762 m)
	* 18 AWG = 0.82 mm ² ; 16 AWG = 1.31 mm ² ; 14 AWG = 2.08 mm ² ; 12 AWG = 3.31 mm ²		
IDNet+ Wiring Considerations using 2081-9044 Overvoltage Protectors ; UL listed to Standard 1459, <i>Standard for Telephone Equipment</i> (refer to data sheet S2081-0016 for additional details)	Note: Wiring that leaves the building must be shielded (for lightning suppression) and 2081-9044 Overvoltage Protectors must be installed at building exit and entrance locations		
	Capacitance ; each protector adds 0.006 μ F across the connected line		
	Resistance ; each protector adds 3 Ω per line of series resistance; both IDNet lines are protected; 6 Ω per protector will be added to total loop resistance		
	Distance ; maximum distance of a single protected wiring run is 3270 ft (1 km)		

Capacities, Mechanical, and Environmental Specifications

Remote LED Display Capacity	Up to 20 maximum remote device LEDs can be activated simultaneously
Coded Sounder Base Capacity	Up to 43 sounder bases may be coded by IDNet communications when the sounder is powered by 24 VDC (not applicable to NAC powered sounder bases)
Mounting Requirements (see page 4 for additional reference)	5-9/16" x 8" (144 mm x 203 mm) module requires two consecutive horizontal blocks; two maximum are allowed per expansion bay; mounting is left and right
Operating Temperature Range	32° F to 120° F (0° C to 49° C)
Humidity Range	Up to 93% RH, non-condensing @ 94° F (38° C)

Retrofit Equipment Considerations

Existing Equipment. When performing a retrofit installation with the 4100-3107 IDNet+ Module, review the following important considerations.

1. All existing devices, whether conventional or addressable, must be located and removed. **Only IDNet communications compatible devices are allowed on an IDNet channel.** (Refer to data sheet S4090-0011 for the Addressable Device Compatibility list.)
2. Existing devices may be mounted in normally unvisited locations, out of normal view. Look for hidden heat detectors, duct detectors, and other devices that may have minimal maintenance requirements and may be forgotten. Remember, they must be located and removed.

Retrofit Equipment Considerations (Cont'd.)

3. The site must be surveyed for all new fire alarm system device requirements. Existing device locations must be reviewed with respect to relocation and whether still required.
4. Existing device functions to be retained, and new device requirements, must be satisfied with the proper application of new IDNet addressable devices, located in compliance with the latest applicable building codes.
5. For audio systems, if applicable, consider using 70.7 VRMS audio NACs. The higher voltage/lower current reduces cross-coupling.
6. Detailed installation considerations are located in Installation Instructions 579-786.

Wiring Compatibility with IDNet+ Signals, Sequence of Evaluation

1. **IMPORTANT:** Install IDNet+ channel wiring in accordance with the previously stated electrical specifications and any applicable local codes. Where appropriate, wiring should also be NFPA 70 (National Electrical Code[®]) Article 760 compliant or equivalent.
2. Evaluate compatibility of the non-IDNet+ fire alarm signals that will be in the same conduit with IDNet+ signals and determine the required wiring types. **NOTE: Wiring that runs external to the building is required to be twisted, shielded pair.**
3. The following table describes the wiring types required of the non-IDNet+ signals when the IDNet+ signals are run on **unshielded and untwisted wire** in the same conduit. **NOTE: Contact your Simplex product supplier for other wiring combinations.**
4. "Minimum wiring allowed" means interaction with other circuits **MUST** be considered and restrictions on wiring distance or loading may apply. "Recommended wiring" means compatibility with other circuits in the same conduit will be optimized. Contact your Simplex product supplier for details.

FOR RETROFIT INSTALLATIONS Minimum wiring allowed when IDNet+ wiring is unshielded and untwisted	Signal Wiring Type with IDNet+ Wiring in Same Conduit (IDNet+ Wiring is assumed to be on unshielded and untwisted wires)	FOR NEW INSTALLATIONS Recommended wiring when IDNet+ wiring is unshielded and untwisted
Unshielded and Untwisted Wire or Cable	IDC Wiring	Unshielded and Untwisted Wire or Cable
	DC NAC Wiring	
	AC or DC Power Wiring (for system devices)	
	(Another) IDNet+ Channel	
Unshielded and Untwisted Wire or Cable (restrictions apply)	TrueAlert [®] Addressable Communications	Unshielded, Twisted Pair (UTP)
Unshielded, Twisted Pair (UTP)	4100ES/4100U Digital Riser	
Unshielded and Untwisted Wire or Cable (restrictions apply)	MAPNET II [®] Isolated*	Twisted, Shielded Pair (TSP)
	RUI/RAI/RSI	
Unshielded, Twisted Pair (UTP) Wire or Cable (restrictions apply)	4100ES/4100U Audio NAC	
	RS-232	
	IDNet Channel (one maximum, up to 2500 ft)	
	MAPNET II [®] Unisolated*	
	Network Communications	
	Non-4100ES/4100U Audio NAC	
Twisted, Shielded Pair (TSP)	(1) IDNet Channel > 2500 ft long	
	(2) or more IDNet or MAPNET II Channels > 1000 ft	
	(3) or more IDNet or MAPNET II Channels	
	4100ES/4100U Analog Riser	
	Firefighters Telephones	
	Remote Microphone	
	24 Point I/O	
Must be in separate conduit	Graphic RCU/SCU I/O	Must be in separate conduit

* 4100ES/4100U MAPNET II communications can be selected as either isolated or unisolated; refer to Installation Instructions 579-222 for details.

Class A Output Operation

Standard Class A Operation. When wired and configured for Class A output (selectable on a per circuit basis), IDNet communications from the “B” output terminals are wired in/out at each device and are brought back to the panel where they are monitored at the “A” terminals. If there is an open circuit in the wiring, the Class A, IDNet+ Module will then drive both ends of the wiring loop which is typical of most Class A circuit operation.

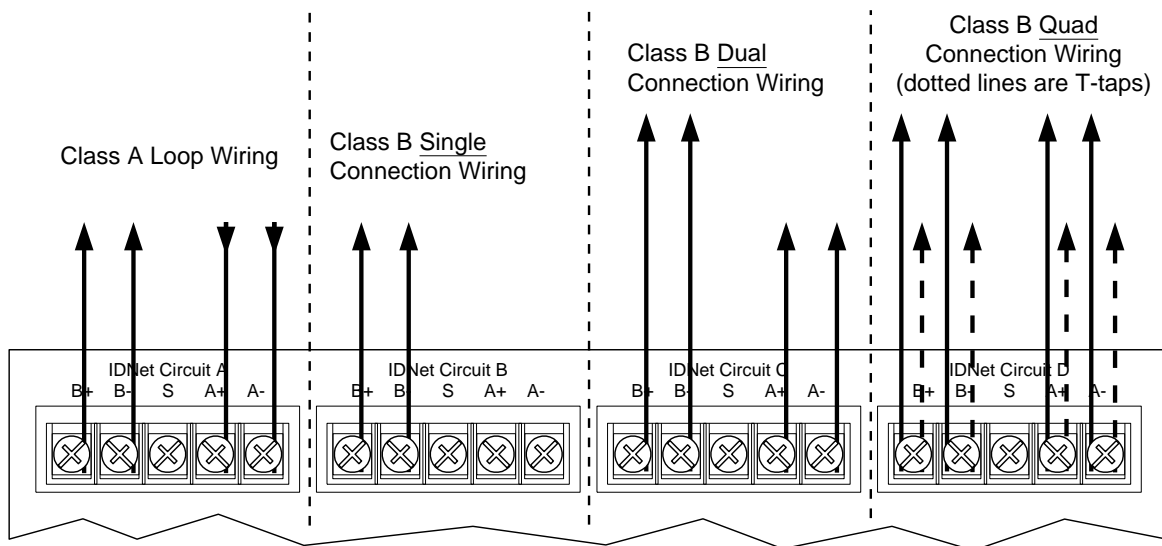
Additional Isolation. In addition to typical Class A operation, the IDNet+ Module provides “A” and “B” terminal outputs that are fault isolated from each other. With this additional isolation, fewer remote isolator

devices are required to properly separate the loop from short circuits; a concern of particular importance during initial system startup, even for retrofit.

IDNet+ Output Wiring Options

Each output can be individually selected for either Class A or Class B wiring. Each wiring terminal can accept one or two wires, up to 12 AWG. This allows wiring options as indicated in the diagram below. For Class B wiring, where T-tapping is acceptable, the availability of multiple terminals (as shown in the diagram) provides convenient terminations for the multiple zone wiring that may exist when retrofitting.

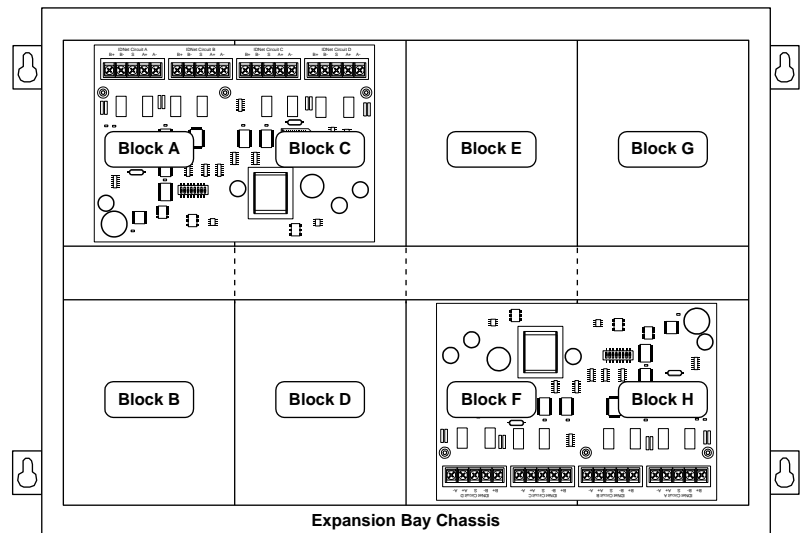
IDNet+ Output Wiring Options Reference Drawing



Module Loading Reference

Module Mounting Rules

1. IDNet+ Module 4100-3107 requires two consecutive horizontal block locations.
2. A maximum of two IDNet+ Modules may be connected to one card-power source.
3. The module makes a symmetrical connection to the PDI and it can be mounted upside down if that location is more convenient with respect to the other modules in the bay.
4. Refer to the diagram for additional reference.



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