Simplex

4007ES and 4007ES Hybrid Fire Alarm Systems Installation Manual

579-1102 Rev H

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1 Cautions, Warnings, and Regulatory Information

READ AND SAVE THESE INSTRUCTIONS Follow the instructions in this installation manual. These instructions must be followed to avoid damage to this product and associated equipment. Product operation and reliability depend upon proper installation.

DO NOT INSTALL ANY SIMPLEX™ PRODUCT THAT APPEARS DAMAGED Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify an authorized Simplex product supplier.

ELECTRICAL HAZARD Disconnect electrical field power when making any internal adjustments or repairs. All repairs should be performed by a representative or an authorized agent of your local Simplex product supplier.

STATIC HAZARD Static electricity can damage components. Handle as follows:

- Ground yourself before opening or installing components.
- Prior to installation, keep components wrapped in anti-static material at all times.

EYE SAFETY HAZARD Under certain fiber optic application conditions, the optical output of this device may exceed eye safety limits. Do not use magnification (such as a microscope or other focusing equipment) when viewing the output of this device.

SULFURIC ACID WARNING Battery contains sulfuric acid, which can cause severe burns to the skin and eyes and can destroy fabric. Replace any leaking or damaged battery while wearing appropriate protective gear. If you come in contact with sulfuric acid, immediately flush skin or eyes with water for 15 minutes and seek immediate medical attention.

FCC RULES AND REGULATIONS – PART 15 This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

SYSTEM REACCPTANCE TEST AFTER SOFTWARE CHANGES To ensure proper system operation, this product must be tested in accordance with NFPA-72, after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

2 Overview

The 4007ES fire alarm control panel provides audible and visible indication of alarms, troubles, and supervisory conditions. The 4007ES panels supports addressable notification and initiating devices and the 4007ES Hybrid panels supports non-addressable notification devices and addressable initiating devices*. The panel can be configured by using a panel programmer.

*From this point on, the 4007ES and the 4007ES hybrid is referred to as 4007ES, unless stated otherwise.

4007ES operator instructions are described in the ***4007ES Operator's Manual 579-1165***.

4007ES programming instructions are described in the ***4007ES Programmer's manual 579-1167***.

2.1 4007ES product list

Table 1: Product list

Part number	Base panels
4007-9101	4007ES Hybrid, red
4007-9201	4007ES, red
4007-9102	4007ES Hybrid, platinum
4007-9202	4007ES, platinum

Table 2: Product List and manual

Part number	Optional modules: field installed	Manual
4007-9801	Zone/Relay Module	579-1103
4007-9802	25V Regulator Module	579-812
4007-9803	IDNet+ Loop Expansion Module	579-1106
4007-9804	Dual Class A Module	579-1029
4007-9805	LED Module	579-1105
4007-9806	DACT Module	579-954
4007-9807	City Circuit with Disconnect Module	579-955
4007-9808	City Circuit without Disconnect Module	579-955
4007-9809	Relay Module	579-955
4007-9810	4120 NIC	579-956
4007-9812	Dual RS-232 Module	579-910
4007-9813	Wired Media Card	579-956
4007-9814	Fiber-Optic Media Card	579-956
4190-6106	TrueInsight Remote Service Gateway and Programming	579-953

2.2 Glossary

Table 3: Glossary

Term	Definition
Aux	Abbreviation for Auxiliary; typically used to describe Auxiliary Power.
EOL	End-of-Line, typically in reference to and end-of-line resistor or EOL resistor.
FACP	Fire Alarm Control Panel.
Hybrid	In this document, "Hybrid" the 4007ES Hybrid models that provide both addressable and conventional initiation with conventional non addressable Notification Appliance Circuits.
IDC	Initiating Device Circuit.
IDNet	Addressable SLC for up to 250 addressable devices.
IDNet+	IDNet which is electrically isolated from internal panel electronics.
IDNAC	Individual Device Notification Appliance Circuit (Addressable).
NAC	Notification Appliance Circuit, formerly called signal circuit.
NIC	Network Interface Card for the 4120 network.
Regulated 24 DC	Notification appliance operation that meets the minimum listing requirements; inrush currents typically require power supply and NAC rating.
RS-232 module	The Dual RS-232 interface module provides a serial communication interface to an AC or DC printer, a PC Annunciator, or a third party computer.
RUI	Remote Unit Interface; SLC for communications with remote annunciators.
Simple NAC	A Reverse Polarity Supervised Notification Appliance Circuit that is capable of on steady or coded operation. Sync or SmartSync operation is not supported.
SLC	Signaling Line Circuit
SmartSync	A reverse polarity monitored NAC capable of synchronizing and controlling both horns and strobes on the same circuit using a proprietary signaling protocol. Used as the protocol for TrueAlert Non-Addressable Devices.

User interface The user interface is a 4.3 in. (109mm) diagonal color LCD with a built-in resistive touch panel and 12 indicating LEDs. The color LCD provides system status and access to perform system functions and to change the system configuration.

Figure 1: 4007ES panel inside view on page 5 shows an inside view of the 4007ES panel with the optional LED module (4007-9805) installed.

Fig 1: 4007ES panel inside view

3 Installation

Introduction

This chapter describes how to install the 4007ES panel. It can be semi-flush or surface mount.

3.1 Mounting the 4007ES panels

- Due to the danger of metal fragments falling into electronics when drilling the holes for the conduits, remove the electronics in the system:
  - To remove the electronics, unscrew the ten screws. Remove the power supply and store it in a safe, clean, and dry location until the panel installation is completed, see Figure 2: Screws location on page 6.
  - If installing a 4007ES hybrid panel, also remove the Zone/Relay card (three screws).
- Use a suitable punch where a conduit entrance is required. The knockouts are not provided. Locate and create on-site as required during installation.

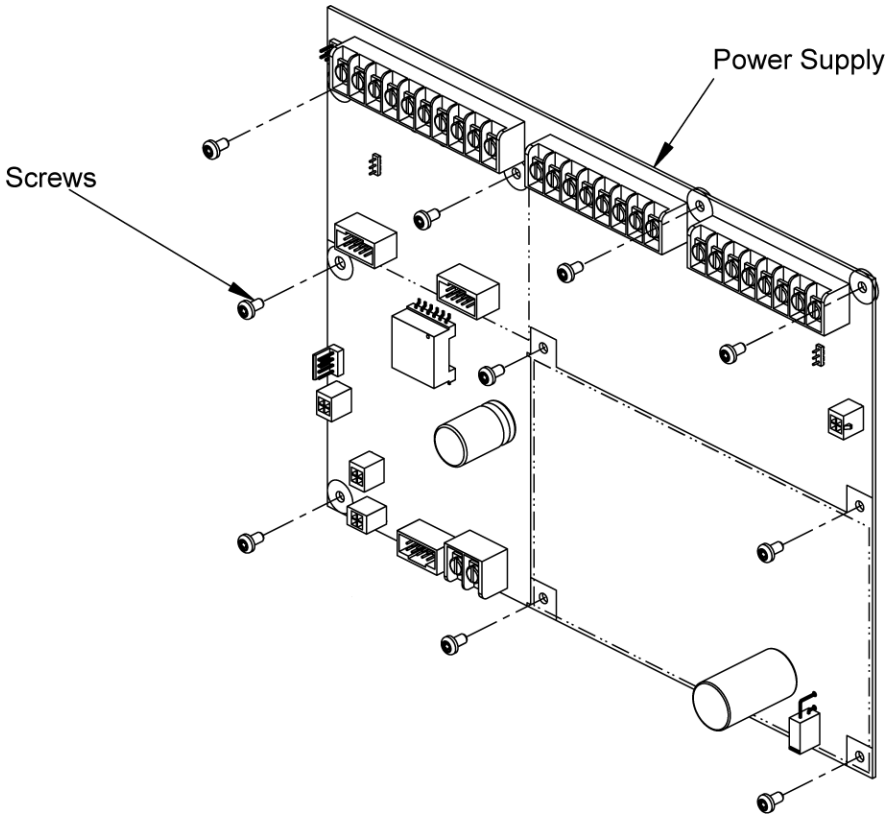

Fig 2: Screws location

- For surface or semi-flush mounting to a wooden wall structure, the panel must be attached with four 1 1/2 in. (38 mm) long lag bolts and four 1/2 in. (13 mm) diameter washers, supplied by others.
- For surface mounting, secure the box to the wall using the tear-drop mounting holes on the back surface. For semi-flush mounting, secure the box along the sides to the wall studs. Note that the front surface of the back box must protrude at least 1-1/2 in. (38mm) from the wall surface for semi-flush installation. A trim kit is supplied for semi-flush mounting, see the Trim kit application on page 7 section for more information.
- To install the panel, see Figure 3: Back Box Installation dimensions and Semi-Flush Mounting (Right) on page 7 for the dimensions and use the holes in the back box to secure it to the wall.

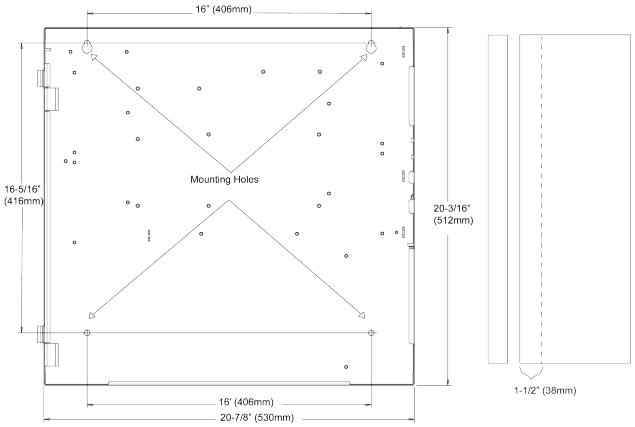

Fig 3: Back Box Installation dimensions and Semi-Flush Mounting (Right)

3.2 Trim Kit

3.2.1 Trim kit application

Trim kits are used to cosmetically cover wall openings when boxes are mounted semi-flush into the wall. The kit includes:

- Two top trim bands (shorter).
- Two side trim bands (longer).
- Four corner pieces.

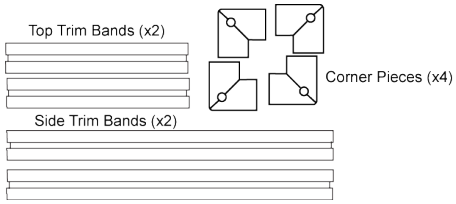

Fig 4: Semi-flush trim kit

After mounting the box semi-flush to the wall, attach the trim per the following procedure:

1. The strips need to be cut before being attached. Carefully cut them to length using a hacksaw or sharp utility knife. Cut the strips approximately 1in. (25 mm) shorter than the box dimension. The box is 20-7/8 in. (530 mm) wide and 20-3/16 in. (512 mm) high.
2. Attach the strips one at the time. Peel off the adhesive tape release and center the strip on the box placing the edge of the strip against the box surface, then press solidly to assure adhesion.
3. Each corner piece overlaps the trim strip slightly less than 3/4 in. (19 mm). Align the corner pieces tight to the box corner and attach with a drywall or similar screw, suitable for the wall material. The screws are not supplied.

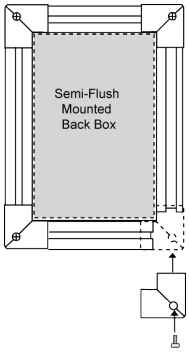

Fig 5: Applying the trim

3.3 Wiring

Wiring guidelines

Follow these guidelines when connecting power-limited (PL) systems. For more information about these guidelines, contact your authorized Simplex product supplier.

- Non-power limited (NPL) field wiring (AC power, batteries, City connection, DACT) must be installed and routed in the shaded areas shown in Figure 6: Field wiring guidelines (NAC power supply shown as reference) on page 8
- You must maintain a minimum of 0.25 in. (6.35 mm) space between NPL and PL field wiring.
- The AC harness is pre-wired and tied to back of the box.

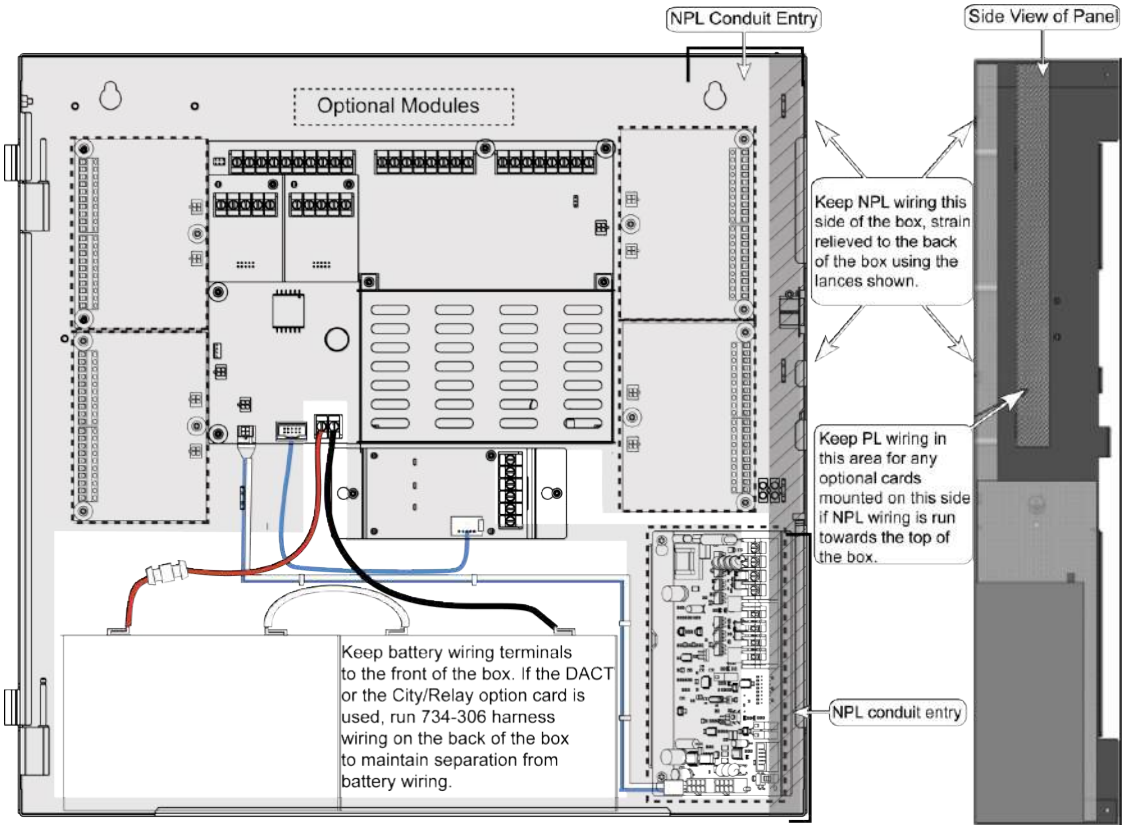

Fig 6: Field wiring guidelines (NAC power supply shown as reference)

- The conductors must test free of all grounds.
- A system ground must be provided for earth detection and lightning protection devices. This connection must comply with approved earth detection per NFPA780.
- Splicing is permitted. All spliced connections must either be soldered (resin-core solder), crimped in metal sleeves, or encapsulated with an epoxy resin. When soldering or crimped metal sleeves are used, the junction must be insulated with a high-grade electrical tape that is as sound as the original insulating jacket. Shield continuity must be maintained throughout.
- Excess slack should be kept to a minimum inside the back box enclosure. The wiring should be neatly dressed and bundled together using wire ties.
- All wiring must use copper conductors only, unless noted otherwise.
- For IDNet, shielded wire is not recommended. If shielded wires are present, cut and tape off the shield at each end in the panel to prevent it coming into contact with other components. The metallic continuity of the shield must be maintained and insulated throughout the entire length of the cable.
- If shielded wire is used, the metallic continuity of the shield must be maintained throughout the entire cable length, and the entire length of the cable must have a resistance greater than 1 megohm to earth ground. Underground wiring must be free of all water.

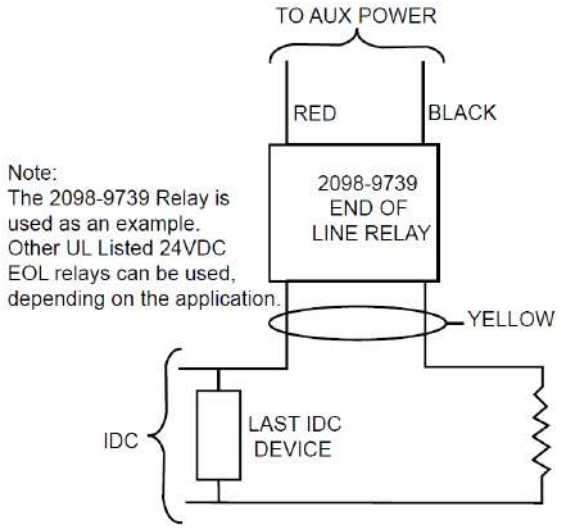

Fig 7: EOL relay diagram

- In areas of high lightning activity, or in areas that have large power surges, use the 2081- 9027 or the 2081-9044 Transient Suppressor on monitor points.
- Wires must not be run through elevator shafts.
- Only system wiring can be run together in the same conduit. When powering remote units using relay contacts, power for these circuits must be provided by a PL power supply listed for fire-protective signaling use. An end-of-line (EOL) relay must be used to supervise the auxiliary power circuit.
- Connect the output of the EOL relay to cause a trouble. Wire in series with the EOL resistor on an available initiating device circuit (IDC) or individual addressable module (IAM).

3.3.1 Safety ground/ ferrite bead

Correct operation and protection against transient energy in accordance with UL 864 and ULC-S527 require the connection of safety ground wire to cabinet chassis. Connect the safety ground before wiring any other circuits to the panel. Ferrite beads must be attached to the incoming AC power line as shown in Figure 8: Safety ground and ferrite bead on page 9. Wrap the line leg **twice** through a ferrite bead, and the neutral leg of the power line **twice** through the other ferrite bead.

Fig 8: Safety ground and ferrite bead

NOTE: The ferrite bead should be installed as close as possible to where power enters the panel.

3.3.2 AC supply wiring

Adhere to the following guidelines when wiring AC Power. See Safety ground/ ferrite bead on page 9 for information about attaching the ferrite bead to the AC power wires.

- The AC power must be wired from a dedicated circuit breaker or fuse, rated no more than 20 A, in accordance with NFPA-72, NEC, and local codes.
- Before handling the AC feed, verify that it is not live using a voltmeter. Make sure the circuit is de-energized and tagged to prevent injury.
- The AC supply wiring must be 14 AWG minimum to 12 AWG maximum.
- Connect a 12 AWG copper ground wire from safety ground in the electrical distribution panel to the panel safety ground stud.
- Input voltage:
  - 120 VAC, 50/60 Hz.
  - 240 VAC, 50/60 Hz.

  No configuration settings required to select.

3.3.3 Battery guidelines

A fused harness is required to connect the backup batteries. Use harness 734-304 for a NAC power supply, and harness 734-303 for an IDNAC power supply. The harness is shipped with the panel. The mating spade lug on the battery should be 0.250 in. X 0.032 in. (6.35 mm X 0.81 mm). If another size is needed, you need to replace the battery terminal connectors on the supplied battery harness.

- The 4007ES battery charger supports up to 33 Ah batteries (maximum) within UL864 and ULCS527 guidelines.
  - 18 Ah batteries can fit inside the box.
  - 25 Ah and 33 Ah batteries use 2081-9282(red 25 Ah or 33 Ah) or 4009-9801 (beige 25 Ah).
- To minimize the power losses due to wiring from the external battery box to the 4007ES, use at least a 12 AWG wire. Mount the battery box within 20 feet (609.6 cm) of the panel in accordance with the mounting instruction label in the box. All interconnecting wiring must be enclosed in conduit.
- Seismic battery brackets can be used internally in the 4007ES box (the 2081-9401: 12.7 Ah bracket, and the 2081-9402: 18 Ah bracket). For more information on how to install the seismic brackets, see the *Battery Bracket installation instructions* (579-944).

3.4 Power

Final installation To finalize the installation:

1. Reinstall the power supply and the electronics.
2. To install the batteries:
   a. Place the first battery on the left side of the panel to avoid interference with the DACT, if installed.
      NOTE: The battery terminals should face the front of the box.
   b. Insert the second battery and make sure it is snugly positioned beside the first battery.
   c. Wire the batteries in series such that you have 24 V. Use the white wire provided to bridge the batteries together, see Figure 9: Power supply on page 10.
      IMPORTANT: Verify all field wiring before applying any power to the panel.

Power up the system:

1. Connect the negative lead to the battery.
2. Apply AC.
3. Connect the positive to the battery.

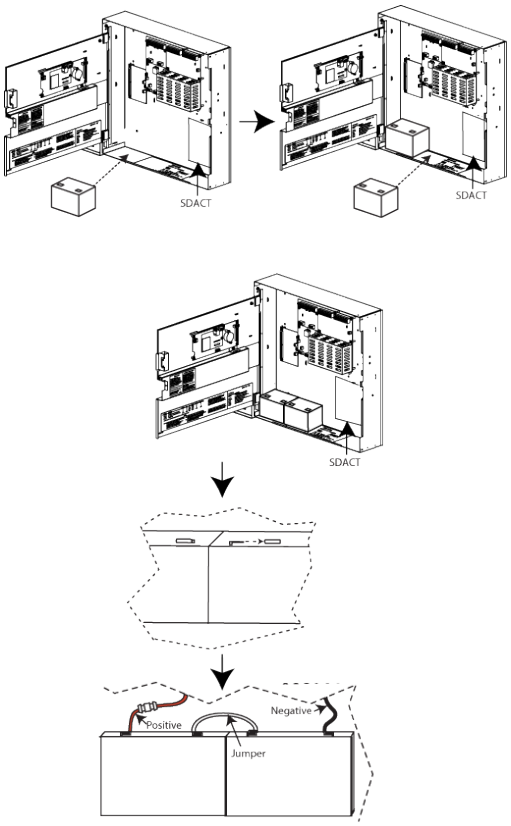

Fig 9: Power supply

4 NAC power supply

A conventional reverse polarity NAC power supply is used in a 4007ES hybrid panel. It provides 6A and can support the following:

- Non-addressable notification devices.
- Addressable initiating devices.

See Figure 10: NAC power supply on page 11 and Table on page 11 for the main components of the NAC power supply.

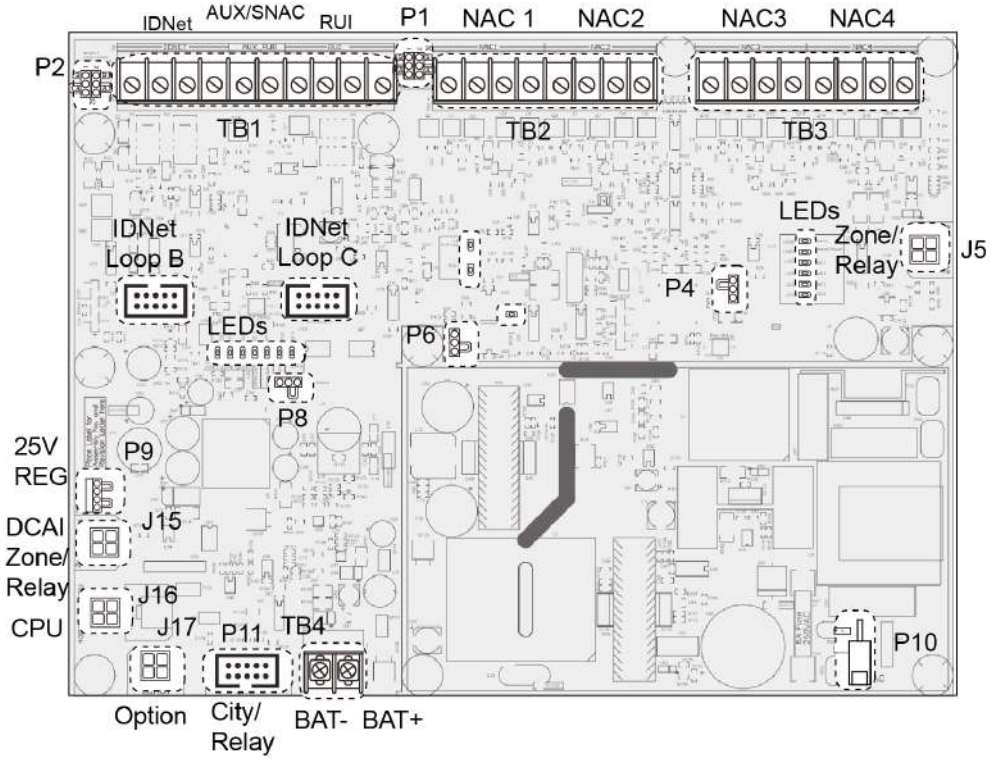

Fig 10: NAC power supply

Table 4: Main components information

P1	RUI Class A/B jumpers	**P2**	IDNet Class A/B jumper
TB4	Battery connection	**TB2**	NAC 1 and NAC 2
P10	AC Power Connection	**TB3**	NAC 3 and NAC 4
J5 and J15	Zone / Relay	**J7**	IDNet Loop B
J16	CPU Connection	**J8**	IDNet Loop C
J17	Option Connection	**P4**	NAC Power Supply Card On-line
P11	City/Relay Connection	**P6**	Battery Depleted Jumper
TB1	IDNet Loop 1, Aux Power, RUI Connection	**P8**	1-2 (default) / IDNet card on line
		P9	25V Regulator Jumpers 1-2, 3-4 default. Power is fed to the zone/ relay card. No jumpers. Using 4007-9802, 25V Regulator Module.

4.1 NAC power supply specifications

The NAC power supply can supply 6 A of 24 V power in addition to the base draw of the CPU/ Power Supply cards. The current draw taken from optional cards, IDNet Devices, Aux Power, and NACs must be subtracted from 6 A.

IMPORTANT: See the *4007-9801 8-Point Zone/Relay Card Installation Instructions 579-1103*, to determine the draw of the pre-installed Zone/Relay card.

Table 5: 4007ES hybrid system current draw

Maximum AC input	2 A at 120 VAC, 50/60Hz 1 A at 240 VAC, 50/60Hz
Standby conditions	Current (battery standby 24 V)
No alarms (NACs normal). No IDNet devices connected.	145 mA
Add to above for each additional IDNet device in standby.	0.8 mA
Total current for fully loaded IDNet channel in standby.	345 mA
Alarm conditions	Current (battery alarm 24 V)
4 NACs ON: TBL Relay Activated: IDNet LED On. No IDNet devices connected.	190 mA
Add to above for each IDNet device in alarm.	1 mA
Add to above for each IDNet LED On (20 maximum IDNet devices LEDs On).	2 mA
Total current for fully loaded IDNet channel in alarm.	480 mA

4.2 NAC section overview

The NAC power supply allows connection to up to four Class A NAC circuits. Notification appliances within the 4007ES system are synchronized including any attached 4009 series NAC extenders. Do not mix Wheelock and Simplex branded devices in the same system, they will not be synchronized. The following TrueAlert non-addressable appliances are Special Application compatible with the NAC power supply:

- 4098-9772 Sensor Base with 520 Hz Sounder
- 4098-9773 CO Sensor Base with 520 Hz Sounder
- 4901-series Horn
- 4903-series A/V
- 4903-series S/V
- 4904-series VO
- 4906-Multicandela series
- 49CMT series Horn
- 49CMTV series A/V
- Wheelock Series: AS, HS, NS, ZNS, RSS, RSSP, STR, ZRS, MT, AMT, MTWP, ET, CH, E50, E60, E70, E80, E90, S8, SA

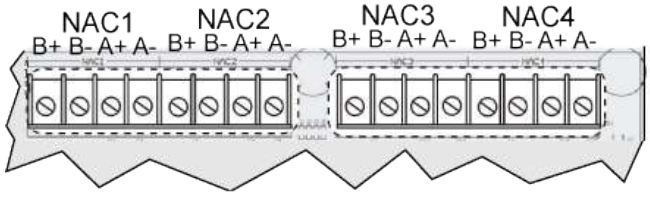

Fig 11: NAC terminal on NAC power supply

4.3 Specifications

Table 6: Specifications

Maximum appliances	70 per circuit.*
* Each 49CMT series appliance counts as 5 regular appliances for the maximum 70 appliances that can be supported per NAC. As the earth fault sensitivity with thirteen MT appliances drops from 10 K to 9.6K ohms, no more than thirteen 49CMT series appliances may be placed on one circuit.	
Electrical specifications:	
Voltage	24 VDC nominal.
Alarm current	The maximum alarm current is 3 A per circuit.
Supervisory current	Refer to Table on page 13.
Special application appliances (TrueAlert Non-Addressable)	6 A total.
NOTE: When NACs are used for Regulated 24DC appliances, maximum current per NAC is reduced to 2 A and total power supply notification current rating is reduced to 3 A. Current used by modules powered from the 4007ES power supply must be deducted from the total current.	

4.3.1 Wiring parameters

The NAC power supply is supervised and power-limited. See Table on page 13 for the NACs' supported EOL resistors and the related supervisory current, and see Table on page 13 for the wiring parameters.

NOTE: If a shielded wire is used, cut it and tape it at both ends.

Table 7: Wiring parameters

Maximum wiring distance	
Maximum cable load	10,000 ft (3,048 m) per channel
Maximum wire length from panel to any device	4,000 ft (762 m)
Maintain the correct polarity on terminal connections. Do not loop wires under terminals.	

Table 8: Supported EOLR and supervisory current

EOLR	Current
3.9 k	5.7 mA
4.7 k	4.8 mA
5.1 k	4.4 mA
5.6 k	4.0 mA
10 k	2.2 mA
15 k	1.4 mA

4.3.2 Wiring distances

Table on page 14 lists the maximum distances from the NAC terminal block to the last appliance in a Class A configuration, depending on wire gauge and current. Use Table on page 14 to calculate the wire distances for your application if you are using Class A wiring. Table on page 14 gives the values for a Class B configuration.

Table 9: Class A wiring distances

Alarm current	Max distance w/ 18 AWG(0.8231 mm^2)	Max distance w/ 16 AWG(1.309 mm^2)	Max distance w/ 14 AWG(2.081 mm^2)	Max distance w/ 12 AWG(3.309 mm^2)	DC resistance
0.25 A	420 ft (128 m)	667 ft (203 m)	1,063 ft (324 m)	1,691 ft (515 m)	6 Ohms
0.50 A	210 ft (64 m)	334 ft (102 m)	532 ft (162 m)	845 ft (258 m)	3 Ohms
0.75 A	140 ft (43 m)	222 ft (68 m)	354 ft (108 m)	564 ft (172 m)	2 Ohms
1.00 A	105 ft (32m)	167 ft (51 m)	266 ft (81 m)	423 ft (129 m)	1.5 Ohms
1.25 A	84 ft (26 m)	133 ft (41 m)	213 ft (65 m)	338 ft (103 m)	1.2 Ohms
1.50 A	70 ft (21 m)	111 ft (34 m)	177 ft (54 m)	282 ft (86 m)	1 Ohm
1.75 A	60 ft (18 m)	95 ft (29 m)	152 ft (46 m)	242 ft (74 m)	0.86 Ohm
2.00 A	53 ft (16 m)	83 ft (25 m)	133 ft (41 m)	211 ft (64 m)	0.75 Ohm
2.25 A	47 ft (14 m)	74 ft (23 m)	118 ft (36 m)	188 ft (57 m)	0.67 Ohm
2.50 A	42 ft (13 m)	67 ft (20 m)	106 ft (32 m)	169 ft (51 m)	0.60 Ohm
2.75 A	38 ft (12 m)	61 ft (19 m)	97 ft (30 m)	154 ft (47 m)	0.55 Ohm
3.00 A	35 ft (11 m)	56 ft (17 m)	89 ft (27 m)	141 ft (43 m)	0.50 Ohm

Table 10: Class B wiring distances

Alarm current	Max distance w/ 18 AWG(0.8231 mm^2)	Max distance w/ 16 AWG(1.309 mm^2)	Max distance w/ 14 AWG(2.081 mm^2)	Max distance w/ 12 AWG(3.309 mm^2)	DC resistance
0.25 A	840 ft (256 m)	1,335 ft (407 m)	2,126 ft (648 m)	3,382 ft (1,031 m)	12 Ohms
0.50 A	420 ft (128 m)	667 ft (203 m)	1,063 ft (324 m)	1,691 ft (515 m)	6 Ohms
0.75 A	280 ft (85 m)	445 ft (136 m)	709 ft (216 m)	1,127 ft (344 m)	4 Ohms
1.00 A	210 ft (64 m)	334 ft (102 m)	532 ft (162 m)	845 ft (258 m)	3 Ohms
1.25 A	168 ft (51 m)	267 ft (81 m)	425 ft (130 m)	676 ft (206 m)	2.4 Ohms
1.50 A	140 ft (43 m)	222 ft (68 m)	354 ft (108 m)	564 ft (172 m)	2 Ohms
1.75 A	120 ft (37 m)	191 ft (58 m)	304 ft (93 m)	483 ft (147 m)	1.71 Ohms
2.00 A	105 ft (32 m)	167 ft (51 m)	266 ft (81 m)	423 ft (129 m)	1.5 Ohms
2.25 A	93 ft (28 m)	148 ft (45 m)	236 ft (72 m)	376 ft (115 m)	1.33 Ohms
2.50 A	84 ft (26 m)	133 ft (41 m)	213 ft (65 m)	338 ft (103 m)	1.2 Ohms
2.75 A	76 ft (23 m)	121 ft (37 m)	193 ft (59 m)	307 ft (94 m)	1.09 Ohms
3.00 A	70 ft (21 m)	111 ft (34 m)	177 ft (54 m)	282 ft (86 m)	1 Ohm

NOTE:

- Max distance = distance from the power supply to last appliance.
- This table is calculated at 49°C (120°F). If you are installing in locations that could be exposed to higher temperatures, refer to NEC Table 8.
- Distances are based on a 3 V drop, and take into account the worst-case panel output voltage.
- If circuit integrity wire is used instead of housing cable in a fire rated enclosure, reduce the wiring distances by 38 ft (12 m) for every 10 ft (3 m) of potential exposure.

4.3.3 Class A wiring

NOTE: The Class A wiring style is set up in the ES Panel Programmer. See the *4007ES Programmer's Manual* (579-1167), for more information.

To connect the power supply to reverse-polarity, non-addressable notification appliances using Class A wiring, complete the following steps:

1. Route wire from the B+ and B- outputs of the power supply to the appropriate inputs on a peripheral notification appliance. Use NAC1, NAC2, NAC3, or Figure 12: Class A NAC wiring on page 15.
2. Route the wire from the first appliance to the next. Repeat this for each appliance.

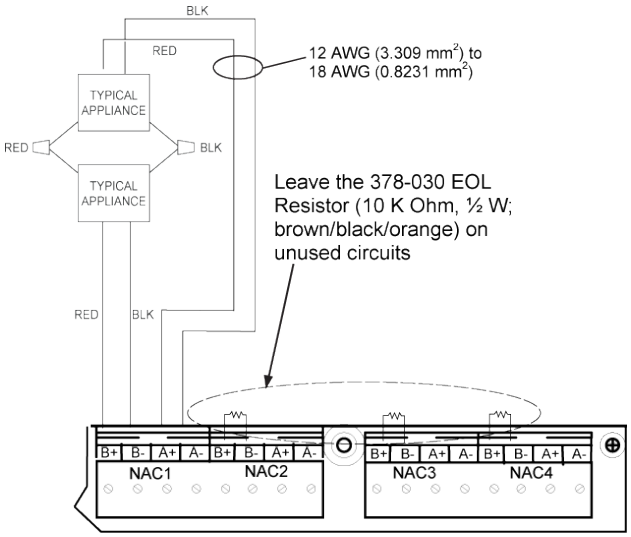

Fig 12: Class A NAC wiring

3. Route the wire from the last appliance to the A+ and A- inputs on the same NAC circuit of the power supply.
4. Repeat steps 1 through 3 for each NAC output you want to use.
5. Leave the 10 KOhms, 1/2 W, brown/black/orange resistor (378-030) on each unused circuit. No external end-of-line resistor is needed for circuits in use.

4.3.4 Class B wiring

NOTE: The Class B wiring style is set up in the ES Panel Programmer. See the *4007ES Programmer's Manual* (579-1167), for more information.

To connect the power supply to appliances using Class B wiring, complete the following steps:

1. Route the wire from the B+, B- outputs on TB2 and TB3 of the power supply to the appropriate inputs on a peripheral notification appliance. Use NAC1, NAC2, NAC3, or NAC4.

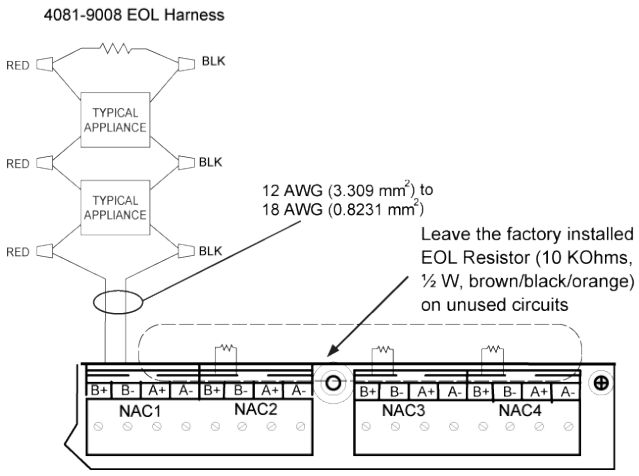

Fig 13: Class B NAC wiring

2. Route the wire from the first appliance to the next. T-tapping is not permitted. Repeat this for each appliance.
3. Route the wire from the last appliance to the EOLR harness (10KOhms, 1/2 W: P/N 733- 894).
4. Repeat steps 1 through 3 for each NAC output you want to use.
5. Leave the factory installed EOL resistor (10 KOhms*, 1/2 W; brown/black/orange) on each unused circuit. The circuit must connect B+ to B- terminals.
6. Document the EOL value in the panel for each circuit.

*If using a 4007ES hybrid panel, keep the original value and set the ES Panel Programmer accordingly.

4.4 Troubleshooting

Figure 14: LEDs on the 4007ES hybrid power supply on page 16 and Table on page 16 show the LED definition for the NAC power.

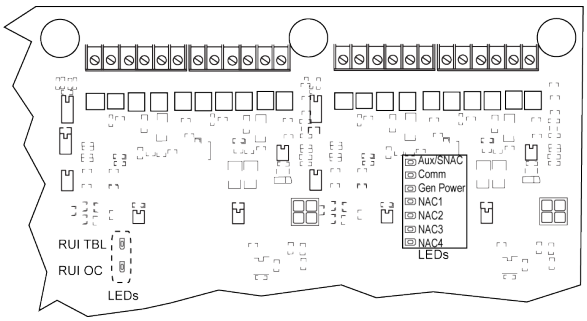

Fig 14: LEDs on the 4007ES hybrid power supply

Table 11: LEDs on the 4007ES hybrid power supply

LED10	AC	Green. Off on AC failure.
LED2	RUI Trouble	Yellow. On for Class A RUI trouble.
LED6	RUI OC	Yellow. Indicates a short (overcurrent).
LED3	Comm	Yellow. Indicates that the communication between the NAC power supply and the CPU is lost.
LED 4	Gen Power	Steady On, yellow. Indicates AC power loss, earth fault, overcurrent and battery trouble.
LED5, 7, 8, and 9	NAC 1, 2, 3, 4	Steady On, yellow. Used to signal overcurrent, short, and open circuit.
LED1	Aux/SNAC	Steady On, yellow. Use to signal overcurrent, short, and open circuit.

5 IDNAC power supply

An IDNAC power supply is used in the 4007ES panel, the non-hybrid panel. It provides 4 A and can support the following:

- Addressable notification devices.
- Addressable initiating devices.

See Figure 15: IDNAC power supply on page 17 and Table on page 17 for the main components of the IDNAC power supply.

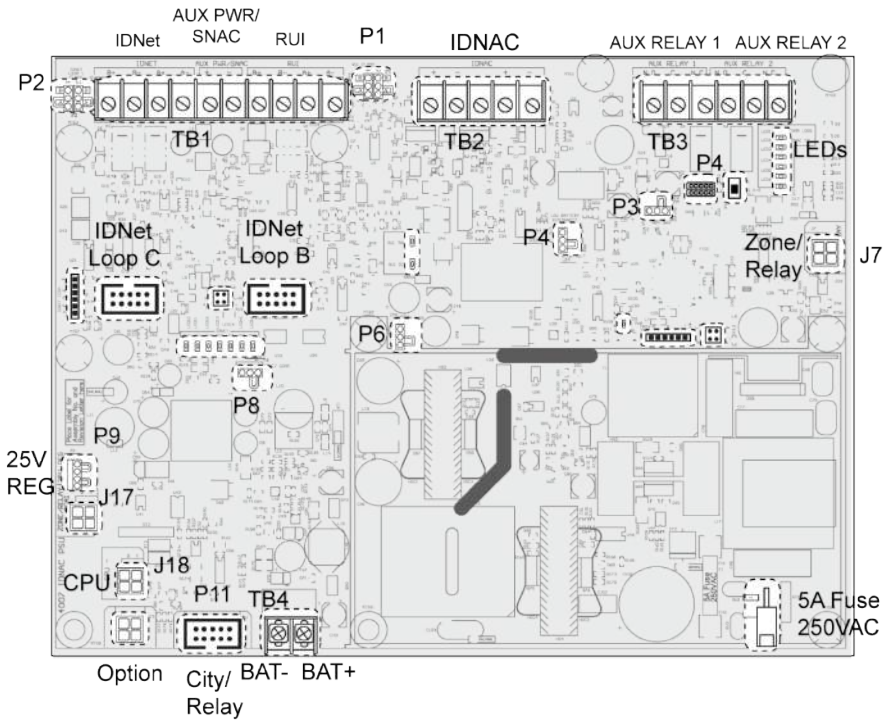

Fig 15: IDNAC power supply

Table 12: Main components information

P1	RUI Class A/B jumpers	**P2**	IDNet Class A/B jumper
TB4	Battery connection	**TB2**	IDNAC
P10	AC Power Connection	**TB3**	Aux Relay 1 and 2
J15	DCAI Zone/Relay Connection	**J10**	IDNet Loop 2
J7	Zone/Relay	**J11**	IDNet Loop 3
J16	CPU Connection	**P5**	Battery Depleted Jumper
J17	Option Connection	**P8**	1-2 (default) / IDNet card on line
P11	City Circuit Connection	**P9**	25V Regulator Jumpers 1-2, 3-4 default. Power is fed to the zone/relay card. No jumpers. Using 4007-9802, 25V Regulator Module
TB1	IDNet Loop 1, Aux Power, RUI Connection		

5.1 Power supply specifications

The IDNAC Power Supply can supply 4A of 24V power in addition to the base draw of the CPU/power supply cards. The current draw taken from optional cards, IDNet Devices, Aux Power, and NACs must be subtracted from 4A.

Table 13: 4007ES system current draw

Maximum AC input	2 A at 120 VAC, 50/60 Hz 1 A at 240 VAC, 50/60 Hz
Standby conditions (see Note 1)	Current (see Note 1) (Battery Standby 24 V)
No alarms (NACs normal). No IDNet devices connected	180 mA
Add to above for each additional IDNet or IDNAC device in standby	0.8 mA
Total current for fully loaded IDNet or IDNAC channel in standby	431 mA
Alarm conditions (see Note 1)	Current (see Note 1) (Battery Alarm 24 V)
IDNAC ON: No IDNet LED On. No IDNet devices connected	185 mA
Add to above for each IDNet device in alarm (see note 2)	1 mA
Add to above for each IDNet LED On (20 maximum IDNet devices LEDs On)	2 mA
Total current for fully loaded IDNet channel in alarm (20 LEDs On) (see note 2)	475 mA

NOTE:

1. Add an additional 9 mA per active auxiliary relay (Alarm or Standby).
2. The IDNAC Alarm current depends on the IDNAC device used. See the relevant device manual for more information on currents.

5.2 IDNAC section overview

The IDNAC power supply has a single SLC for connecting addressable IDNAC devices. The power supply is compatible with TrueAlertES and TrueAlert Addressable product lines, both multi and fixed candela. The IDNAC output is Class B only. Class A operation requires use of the optional module 4007-9804, IDNAC dual Class A isolator.

The output is duplicated on the terminal block to facilitate T-tapping on the circuit at the panel. EOL resistors are not required.

All wiring is supervised and power-limited.

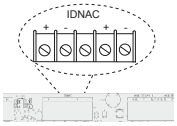

Fig 16: IDNAC terminal

5.3 Specifications

Table 14: IDNAC specifications

Supports	• Up to 12 4905-9929 remote TrueAlert Addressable Isolators per IDNAC Circuit. • Up to 30 devices connected directly to any isolator terminal pair*. • Up to six isolators between any appliance and the IDNAC SLC terminals. All wiring is 20 AWG to 12 AWG. *For more information on the isolator, refer to the ***4905 Isolator+ Installation Instruction***s, 574-769.
Electrical specifications:	
Channel voltage	29.5 VDC nominal.
Circuit requirements	The maximum alarm current is 3 A per circuits.
Isolator	
Isolator (DCAI)	To wire an IDNAC as a Class A circuit, the DCAI modules (4007-9804) is required (2 Class A circuits with fault isolation). For more information about Dual Class A isolators and on how to calculate Class B wiring with isolation, see the ***DCAI Installation Instruction***s (579-1029).

5.4 Wiring parameters

Table on page 19 identifies the wiring parameters for the IDNAC.

Table 15: IDNAC Wiring parameters

IDNAC wiring limits	
Channel loading	127 devices (IDNAC devices or other compatible devices). See Compatible devices and appliances on page 22 for more information.
Max. wiring distance	
Max. cable load	10,000 ft (3,048m) per channel.
Max. wire length from panel to any device	4,000ft (762m).

NOTE: If a shielded wire is used, cut it and tape it. The required wiring is unshielded twisted pair (UTP). This wiring must have a capacitive rating of less than 60pF/ft and a minimum of 3 twists (turns) per foot.

5.5 IDNAC Class B wiring tables

Use the following tables to calculate the wiring distance to farthest appliance. The maximum wiring distance is the shorter of the distance limits as calculated by alarm current voltage drop or by reaching the communications distance limit.

Wiring Limit Based on Alarm Current

Alarm Current	Distance to the Last Appliance				
	20 AWG	18 AWG	16 AWG	14 AWG	12 AWG
0.050	4000 ft	4000 ft	4000 ft	4000 ft	4000 ft
0.100	2644 ft	4000 ft	4000 ft	4000 ft	4000 ft
0.150	1763 ft	2802 ft	4000 ft	4000 ft	4000 ft
0.200	1322 ft	2102 ft	3342	4000 ft	4000 ft
0.250	1058 ft	1681 ft	2674 ft	4000 ft	4000 ft
0.300	881 ft	1401 ft	2228 ft	3542 ft	4000 ft
0.350	755 ft	1201 ft	1910 ft	3036 ft	4000 ft
0.400	661 ft	1051 ft	1671 ft	2657 ft	4000 ft
0.450	588 ft	934 ft	1485 ft	2362 ft	3756
0.500	529 ft	841 ft	1337 ft	2125 ft	3380
0.750	353 ft	560 ft	891 ft	1417 ft	2254 ft
1.000	264 ft	420 ft	668 ft	1063 ft	1690 ft
1.250	212 ft	336 ft	535 ft	850 ft	1352 ft
1.500	176 ft	280 ft	446 ft	708 ft	1127 ft
1.750	151 ft	240 ft	382 ft	607 ft	966 ft
2.000	132 ft	210 ft	334 ft	531 ft	845 ft
2.250	118 ft	187 ft	297 ft	472 ft	751 ft
2.500	106 ft	168 ft	267 ft	425 ft	676 ft
2.750	96 ft	153 ft	243 ft	386 ft	615 ft
3.000	88 ft	140 ft	223 ft	354 ft	563 ft
Wiring distance must not exceed 4000 ft					

Ohms per 1000 ft

Gage	Ohms/1000 ft
20 AWG	11.347
18 AWG	7.137
16 AWG	4.488
14 AWG	2.8230
12 AWG	1.7750

Wiring Limit Based on Communication

Line Impedance (Ohms)	Devices	Distance to the Last Appliance				
		20 AWG	18 AWG	16 AWG	14 AWG	12 AWG
14.54	1	1252 ft	2038 ft	3241 ft	4000 ft	4000 ft
12.96	5	1142 ft	1815 ft	2887 ft	4000 ft	4000 ft
11.38	10	1003 ft	1595 ft	2536 ft	4000 ft	4000 ft
10.14	15	893 ft	1420 ft	2258 ft	3590 ft	4000 ft
9.12	20	804 ft	1278 ft	2033 ft	3231ft	4000 ft
8.28	25	730 ft	1160 ft	1845 ft	2934 ft	4000 ft
7.58	30	668 ft	1061 ft	1688 ft	2683 ft	4000 ft
6.97	35	614 ft	977 ft	1553 ft	2469 ft	3928 ft
6.45	40	568 ft	904 ft	1437 ft	2285 ft	3634 ft
6.00	45	528 ft	840 ft	1336 ft	2124 ft	3378 ft
5.60	50	493 ft	784 ft	1247 ft	1982 ft	3152 ft
5.24	55	462 ft	734 ft	1168 ft	1856 ft	2952 ft
4.92	60	434 ft	690 ft	1097 ft	1744 ft	2774 ft
4.75	63	419 ft	665 ft	1058 ft	1682 ft	2675 ft
4.64	65	409 ft	650 ft	1034 ft	1643 ft	2613 ft
4.38	70	386 ft	614 ft	976 ft	1552 ft	2468 ft
4.15	75	366 ft	581 ft	924 ft	1469 ft	2337 ft
3.94	80	347 ft	551 ft	877 ft	1394 ft	2217 ft
3.74	85	330 ft	524 ft	833 ft	1325 ft	2107 ft
3.56	90	314 ft	499 ft	794 ft	1262 ft	2006 ft
3.40	95	299 ft	476 ft	757 ft	1203 ft	1913 ft
3.24	100	286 ft	454 ft	723 ft	1149 ft	1827 ft
3.10	105	273 ft	435 ft	691 ft	1099 ft	1748 ft
2.97	110	262 ft	416 ft	662 ft	1052 ft	1673 ft
2.85	115	251 ft	399 ft	634 ft	1009 ft	1604 ft
2.73	120	241 ft	383 ft	609 ft	968 ft	1539 ft
2.58	127	228 ft	362 ft	576 ft	915 ft	1456 ft
Wiring distance must not exceed 4000 ft						

Fig 17: Class B wiring tables

NOTE: Although the required wiring for IDNAC circuits is twisted pair (controlled impedance) wiring, some applications will wish to take advantage of existing wiring that is not twisted pair. This is only allowed if both conductors of the IDNAC circuit reside in the same metal conduit, and only under certain conditions. Check with your local sales office before using wiring that is not twisted pair.

5.6 IDNAC Class B wiring

To connect the power supply to appliances using Class B wiring:

1. Route the wire from the + and the - outputs on the IDNAC terminal block (TB2) to the appropriate inputs on a peripheral notification appliance.
2. Route the wire from the first appliance to the next. T- tapping is permitted. Repeat this for each appliance.
3. Repeat steps 1 and 2 for each IDNAC output you want to use.

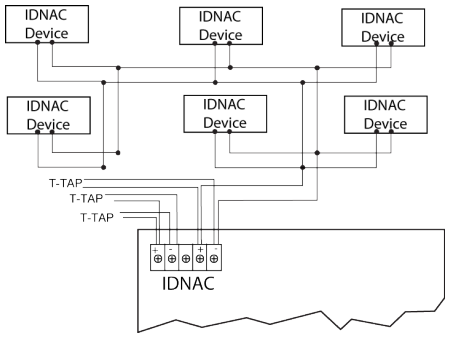

Fig 18: Class B wiring

NOTE:

1. Notification appliances are rated using an individual nameplate label. Maintain the correct polarity on terminal connections.
2. Each IDNAC + and - terminal is rated for 2 identical wires. This allows up to 4 Class B T-TAP circuits directly from each IDNAC terminal block, see IDNAC Class B wiring on page 21.

5.7 Compatible devices and appliances

The devices and appliances listed in Table on page 22 are compatible with the IDNAC power supply. Notification devices are synchronized within the 4007ES system, including any attached 4009 series NAC extenders.

Table 16: Compatible devices and appliances

Addressable device description	Model numbers
4009 IDNAC Repeater	4009-9601 (platinum) 4009-9602 (red)
Dual Class A Isolator (DCAI)	4007-9804
TrueAlert Addressable Isolator+ module	4905-9929

Table 17: Compatible devices and appliances

Addressable device appliance description	TrueAlert ES appliance model numbers		TrueAlert appliance model numbers
Audible only (AO) horn notification appliances	49AO-WRF 49AO-WRF-BA 49AO-WRS-BA 49AO-WRS 49AO-WRQ 49AO-WWF 49AO-WWF-BA 49AO-WWS-BA 49AO-APPLC 49AO-APPLC-BA 49AO-APPLW	49AO-APPLW-BA 49MT-WRF[1] 49MT-WRF-BA[1] 49MT-WRS-BA[1] 49MT-WWS-BA[1] 49MT-WWF-BA[1] 49MT-APPLW[1] 49MT-APPLW-BA[1]	4901-9850 4901-9853
Audible/visible (A/V) notification appliances	49AV-WRF 49AV-WWF 49AV-WRF-BA 49AV-WRQ-BA 49AV-WRS-BA 49AV-APPLC 49AV-APPLC-BA 49AVH-APPLC 49AVH-APPLC-BA 49AVH-APPLCA 49AVH-APPLCA-BA 49AVH-APPLCB 49AVH-APPLCB-BA 49AV-WWF-BA 49AV-WWS-BA	49AV-WRS 49AV-APPLW-BA 49AV-APPLW 49AV-WRQ 49MTV-WWS-BA[2] 49MTV-WRF[2] 49MTV-WRF-BA[2] 49MTV-WRS-BA[2] 49MTV-WWF[2] 49MTV-WWF-BA[2] 49MTV-APPLW[2] 49MTV-APPLW-BA[2]	4906-9227 4906-9229 4906-9228 4906-9230

Table 17: Compatible devices and appliances

Addressable device appliance description	TrueAlert ES appliance model numbers		TrueAlert appliance model numbers
Visible only (VO) notification appliances	49VO-WRF 49VO-WWF 49VO-WRA-A 49VO-WRA-A-BA 49VO-WWA-A 49VO-WRA-BA 49VO-WRF-BA 49VO-WRQ-BA 49VO-APPLC 49VO-APPLC-BA 49VOH-APPLC 49VOH-APPLC-BA 49VOH-APPLCA 49VOH-APPLCA-BA 49VOH-APPLCB 49VOH-APPLCB-BA 49VO-WRS-BA	49VO-WWS-BA 49VO-WWF-BA 49VO-WWA-BA 49VO-WWA-A-BA 49VO-WWS-A-BA 49VO-WRS 49VO-WWS 49VO-WWA 49VO-WWQ 49VO-WRA 49VO-WRQ 49VO-APPLW 49VO-APPLW-BA 49VO-APPLWE 49VO-APPLWE-BA	4906-9201 4906-9203 4906-9202 4906-9204
Speaker/visible (S/V) notification appliances (visible/strobe)			4906-9251 4906-9253 4906-9254
Audible/visible (A/V) weatherproof notification appliances	49AV-WRFO 49AV-WRFO-BA 49AV-WWFO-BA 49AV-APPLW-CO	49AV-WRQO-C 49AV-WRFO-C 49AV-APPLW-O 49AV-APPLW-O-BA	N/A
Visible only (VO) weatherproof notification appliances	49VO-WRFO 49VO-WRFO-BA 49VO-WRSO-BA 49VO-WWFO-BA 49VO-APPLW-CO	49VO-WRFO-C 49VO-WRQO-C 49VO-WRSO 49VO-APPLW-O 49VO-APPLW-O-BA	N/A
TrueAlert adapter	N/A		4905-9816
LED visible only (VO) wall mount	59VO-WRF 59VO-WRF-BA 59VO-WWF 59VO-WWF-BA 59VO-WRFAB	59VO-WRFAB-BA 59VO-WWFAB 59VO-WWFAB-BA 59VO-APPLWR 59VO-APPLWW	
LED visible only (VO) high candela wall mount	59VO-WRFH-BA 59VO-WWFH-BA 59VO-WRFABH-BA	59VO-WWFABH-BA 59VO-APPLWRH 59VO-APPLWWH	
LED visible only (VO) wall mount weatherproof	59VO-WRFO 59VO-WRFO-BA 59VO-WWFO-BA 59VO-WRFABO	59VO-WRFABO-BA 59VO-WWWFABO-BA 59VO-APPLWR-O 59VO-APPLWW-O	
LED visible only (VO) high candela wall mount weatherproof	59VO-APPLWRH-O 59VO-APPLWWH-O		

Table 17: Compatible devices and appliances

Addressable device appliance description	TrueAlert ES appliance model numbers		TrueAlert appliance model numbers
LED audible/visible (A/V) wall mount	59AV-WRF 59AV-WRF-BA 59AV-WWF 59AV-WWF-BA 59AV-WRFAB 59AV-WRFAB-BA	59AV-WWFAB 59AV-WWFAB-BA 59AV-APPLWR 59AV-APPLWW	
LED audible/visible (A/V) wall mount high candela	59AV-WRFH 59AV-WRFH-BA 59AV-WWFH-BA 59AV-WRFABH	59AV-WRFABH-BA 59AV-WWFABH-BA 59AV-APPLWRH 59AV-APPLWWH	
LED audible/visible (A/V) wall mount weatherproof	59AV-WRFO 59AV-WRFO-BA 59AV-WWFO-BA 59AV-WRFABO	59AV-WRFABO-BA 59AV-WWFABO-BA 59AV-APPLWR-O 59AV-APPLWW-O	
59AV-APPLWR-O 59AV-APPLWW-O	59AV-APPLWRH-O 59AV-APPLWWH-O		
Audible only (AO) wall mount	59AO-WRS 59AO-WRS-BA 59AO-WWS	59AO-WWS-BA 59AO-APPLWR 59AO-APPLWW	
Audible only (AO) wall mount weatherproof	59AO-WRSO 59AO-WRSO-BA 59AO-WWSO-BA	59AO-APPLWR-O 59AO-APPLWW-O	
Plate	59AP-EUROBB		

Notes:

1. Maximum thirty-two (32) 49MT appliances per circuit.
2. Maximum twenty-one (21) 49MTV appliances per circuit.

5.8 Auxiliary relays section overview

Table 18: Electrical specifications for Auxiliary relays

Electrical specifications:	
Relay circuit rated to switch:	2 A at 30 VAC or 30 VDC, resistive load.
Contacts**:**	Relay contacts are Form C dry contacts. Transorbs provide suppression to earth. Do not switch voltages greater than rating, or damage may result.

Table 19: Power specifications for auxiliary relays

Power
When power through auxiliary contacts is provided by the power supply, the wiring is power-limited.
When power through auxiliary contacts is not provided by the power supply, use in-line fuse holder 208-165 with 208-183, 1A fuse with attached cap (supplied separately). If the power source is not power-limited to the requirements of UL864, wiring is to be segregated to the non-power-limited spaces of the cabinet.
Note: The Aux relay terminals on the IDNAC power supply are controlled by two on-board programmable relays. The relay circuits are not supervised.

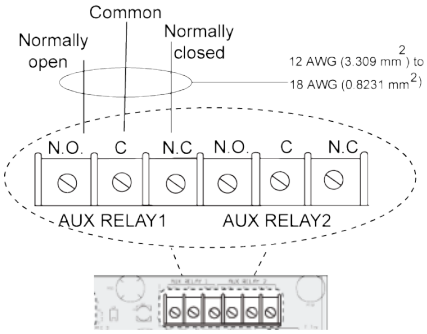

Fig 19: Aux relay terminals

5.9 Troubleshooting

The code produced by the illuminated yellow indicator LEDs corresponds to a trouble that is either occurring on the system, or on the SLC channels. See Table on page 26 for the 4007ES LED definitions, and see Figure 21: SLC channel trouble LED codes on page 27 for the 4007ES LEDs and their codes.

IDNAC channel troubles are indicated by yellow LEDs labeled IDNAC TBL and letters A to D. When the IDNAC TBL LED illuminates, the IDNAC channel is experiencing a trouble. Refer to Figure 22: System trouble LED codes on page 28 or the trouble codes for LEDs A to D. The **LED SCROLL** pushbutton can be used to scroll through multiple trouble indicators.

Table 20: 4007ES indicator LEDs

LED: A, B, C, D	Signal various trouble conditions on the 4007ES and its SLC. Refer to Figure 21: SLC channel trouble LED codes on page 27 and Figure 22: System trouble LED codes on page 28 for troubles details.
IDNAC TBL	When On steady, refer to Figure 21: SLC channel trouble LED codes on page 27 for detailed troubles indicated by LEDs A-D.
LED COMM Loss	Indicates that the communication between the IDNAC power supply and the CPU is lost.
Scroll Push Button (SW1)	Used to scroll through multiple troubles, since only one trouble can be displayed at a time.

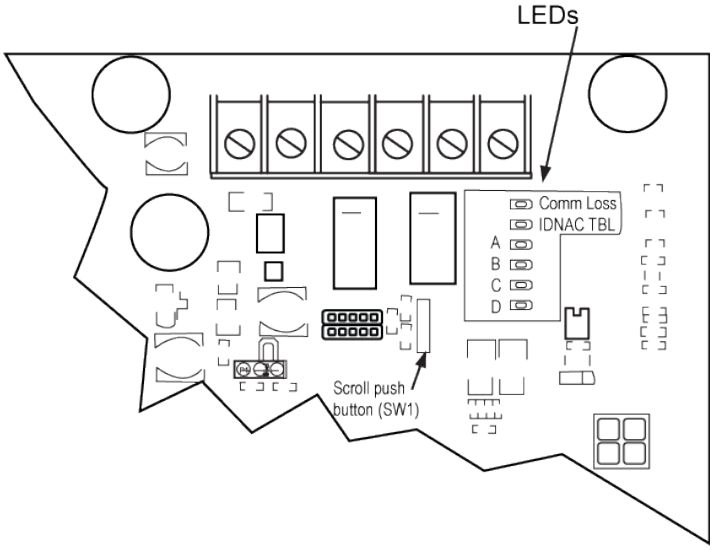

Fig 20: LEDs on the 4007ES power supply

5.9.1 SLC channel trouble LED codes

SLC channel troubles are indicated by LEDs A to D, as well as IDNAC. See Figure 21: SLC channel trouble LED codes on page 27 for the description of the LEDs.

IDNAC	A	B	C	D	Description:
■	■	□	□	□	IDNAC Channel Fail: The channel is not responding.
■	□	■	□	□	IDNAC Short Circuit: There is a short circuit on the channel.
■	■	■	□	□	IDNAC Duplicate Device: There are 2 devices on the channel that have the same address.
■	□	□	■	□	IDNAC Missing device: There is a device programmed on the channel that it cannot detect.
■	■	□	■	□	IDNAC Extra Device: The channel is detecting the address of a device that has not been programmed.
■	□	■	■	□	IDNAC Wrong Device: The channel is detecting a device that had been programed as the wrong “type”.
■	■	■	■	□	IDNAC Controller Fail: The channel can no longer detect the controller.
■	□	□	□	■	IDNAC Address Out of Range: There is a device with an unsupported address on the channel.
■	■	□	□	■	IDNAC Isolator Trouble: An isolator on the channel is open.
■	□	■	□	■	IDNAC Overcurrent: A device on the Channel is drawing too much current.
■	■	■	□	■	IDNAC Earth Trouble: There is a positive or a negative earth fault on the channel.

Fig 21: SLC channel trouble LED codes

5.9.2 System trouble LED codes

System troubles are indicated by LEDs A to D.

A	B	C	D	Description:
▭	▭	▭	▭	No Trouble : There are no troubles detected on the system.
✹	▭	▭	▭	AC Fail: The AC power is disconnected but the battery is working.
▭	✹	▭	▭	Low Battery: The battery voltage is under 22.8 V.
✹	✹	▭	▭	Battery Cutout : The Battery voltage is below 19.4 V. At this point, if jumper P16 is set to "battery disconnect when depleted", the system shuts down.
▭	▭	✹	▭	Depleted/Missing Battery: If jumper P16 is not set to "battery disconnect when depleted", this trouble appears when the battery voltage is below 19.4 V. This code will also appear if t he system cannot detect the battery.
✹	▭	✹	▭	Charger Trouble : There is a trouble with the battery charger.
▭	✹	✹	▭	Card Overcurrent : The module is drawing too much current.
✹	✹	✹	▭	Negative Earth: The circuit is shorted to ground on the negative wire.
▭	▭	▭	✹	Positive Earth: The circuit is shorted to ground on the positive wire.
✹	▭	▭	✹	Negative Earth on RUI: The RUI circuit is shorted to ground on the negative wire.
▭	✹	▭	✹	Positive Earth on RUI: The RUI circuit is shorted to ground on the positive wire.
✹	✹	▭	✹	City Circuit 1 Trouble: The trouble configured on the City Card's circuit one has been triggered.
▭	▭	✹	✹	City Circuit 2 Trouble: The trouble configured on the City Card's circuit two has been triggered.
✹	▭	✹	✹	AuxNAC Open: Depending on the chosen configuration, either the Aux circuit or the NAC circuit is open.
▭	✹	✹	✹	AuxNAC Short: Depending on the chosen configuration, either the Aux circuit or the NAC circuit is ex periencing a short circuit.
✹	✹	✹	✹	AuxNAC Overcurrent: Depending on the chosen configuration, either the Aux circuit or the NAC circuit is drawing too much current.

Fig 22: System trouble LED codes

6 4007ES power supplies

This chapter describes the common sections of both the 4007ES Hybrid NAC power supply and the 4007ES IDNAC power supply.

6.1 Power supplies specifications

Table 21: Operating conditions

Operating conditions:	
Operating temperature range	32 °F - 120 °F (0 °C - 49 °C).
Operating humidity range	Up to 93% relative humidity at 90 °F (32 °C), non-condensing.

6.2 Wiring guidelines

Class A: Using Class A wiring allows devices to communicate with the FACP even in the event of a single open circuit somewhere on the loop. Class A wiring requires that two wires are routed from the power supply to each device, and then back to the power supply.

Class B: T-tapping is permitted on Class B wiring. Class B wiring therefore requires less cable distance per installation than Class A.

Auxiliary power only: Supervision must be provided if the auxiliary power circuit is to be wired as a power-limited circuit. In order to connect a circuit using PL wiring, the devices being powered must all be addressable, or a UL Listed EOL relay must be used to supervise the circuit.

6.3 IDNet Section overview

The power supply provides an isolated IDNet channel. This section is compatible with IDNet communicating initiating devices and enables the system CPU to communicate with up to 250 peripheral devices, such as smoke detectors and pull stations.

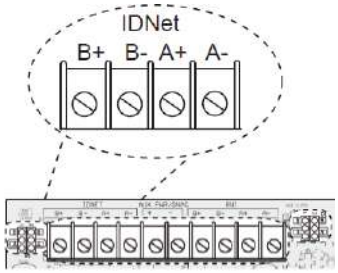

Fig 23: IDNET on the power supply

Specifications

Table 22: IDNet specifications

Supports:	Up to 250 addressable IDNet devices and up to 43 coded piezo sounders may be coded by the IDNet channel. Base panel supports 100 points, with 75 additional points per additional IDNet+ Loop Expansion Module (refer to manual 579-1106).
Electrical specifications:	
Channel voltage to remote devices	30 VDC (normal); 35 VDC Alarm. Data rate is 3333 bps. Output circuits are supervised and power-limited.
Earth detection threshold:	10k ohms minimum from either positive or negative terminals.
Circuit requirements:	Refer to Table on page 12 for the IDNet current on a NAC power supply. Refer to Table on page 18 for the IDNet current on a IDNAC power supply.
LEDS:	
For detailed information on LEDs troubleshooting, refer to Figure 21: SLC channel trouble LED codes on page 27Figure 22: System trouble LED codes on page 28 in the Troubleshooting section.	

6.4 Device addressing, Class A and Class B

The IDNet section can be wired as a Class A circuit or a Class B circuit.

Class A wiring: Class A wiring provides an alternate communication path that maintains communication to all devices when a single open circuit fault occurs. Class A wiring requires two wires to be routed from the IDNet Primary Terminals (B+, B-) to each device, and then back to the IDNet Secondary Terminals (A+, A-). Wiring is in/out, and T-tapping is not permitted.

Class B wiring: T-tapping is permitted on Class B wiring. IDNet wiring is inherently supervised due to individual device level communications. EOL resistors are not required.

- If there are no remote isolators or isolator bases on the loops, device addressing can be assigned without concern for sequence.
- **If there are remote isolators or isolator bases on the loops**, the required addressing approach is to start from the B side and assign each successive isolator a higher address than the isolator it precedes.
- **For Class B wiring only**, the A output and B output on a loop are connected in parallel using a jumper.

6.5 Wiring parameters

Table on page 31 identifies the IDNet wiring parameters that you must consider when installing this card. For additional wiring information, see *Simplex Addressable Fire Alarm Panels Field Wiring Specifications (900-408)*.

Table 23: IDNet wiring parameters

IDNet wiring capacitance parameters		
Parameter	**Value**	
Maximum supported channel capacitance	The sum of line-to-line capacitance, plus the capacitance of either line-to-shield (if shield is present) = 0.6 µF	
IDNet wiring Class A and Class B limits		
Channel loading	Up to 125 devices	126 to 250 devices
Max. resistance to compatible devices. (Include the 2081-9044 Overvoltage Protector resistance when applicable)	50 ohms maximum	35 ohms maximum
Maximum wiring distance*: (18 AWG, 16 AWG, 14 AWG, 12 AWG)	4000 ft (1219 m)	2500 ft (762 m)
NOTE: • The maximum wiring distance is the maximum distance from both the IDNet control terminals (primary and return) to the farthest device on the circuit. See Figure 24: Maximum wiring distance on page 31. • The maximum wiring distance is determined by either reaching the maximum resistance, the maximum capacitance, or the stated maximum distance, whichever occurs first. • The total circuit cable load (amount of cable used) must not exceed 12,500ft (3,8km). • Twisted wiring is recommended for improved noise immunity.		

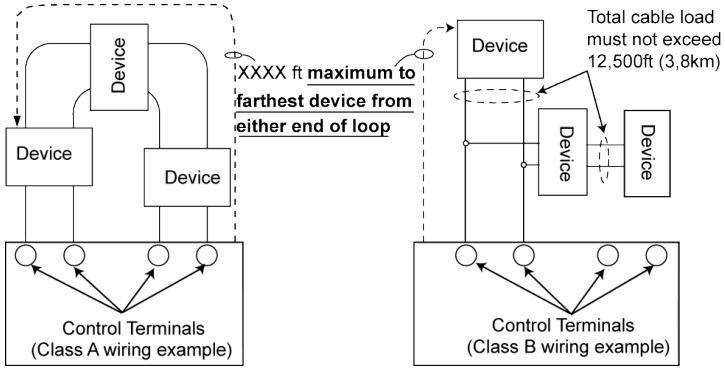

Fig 24: Maximum wiring distance

Table 24: IDNet wiring considerations

IDNet wiring considerations using 2081-9044 Overvoltage Protectors (2081-9044 is UL listed to Standard 1459, *Standard for Telephone Equipment)*	External wiring must be shielded (for lightning suppression) and 2081-9044 Overvoltage Protectors must be installed at building exit and entrance locations. For more information, refer to the *Model 2081-9044 Overvoltage Protector Installation Instructions* (S4906-0016).
	Capacitance; each protector adds 0.006 µF across the connected line.
	Resistance; each protector adds 3 ohms per line of series resistance; both IDNet wires are protected; 6 ohms per protector will be added to the total loop resistance.
	The maximum distance of a single protected wiring run is 3270 ft (1 km).
	See the *2081-9044 Overvoltage Protector Installation Instructions* (574-832), for additional information.

6.6 Class A Wiring

To wire an IDNet section as a Class A circuit:

1. Make sure the jumpers on P2 are set to positions 3-5 and 4-6.
2. Route the wiring from the IDNet circuit primary terminals (B+, B-) on TB1 of the IDNet to the corresponding inputs on the first device.
3. Route the wiring from the first device to the next as in/out. See Figure 25: IDNet Class A wiring on page 32. Repeat this for each device.
4. Route the wiring from the last device to the terminals A+, A- to the panel, maintaining polarity.
5. Shielded wire is not recommended. If shielded wires are present, cut and tape off the shield at each end in the panel to prevent it from coming into contact with other components. The metallic continuity of the shield must be maintained and insulated throughout the entire length of the cable.

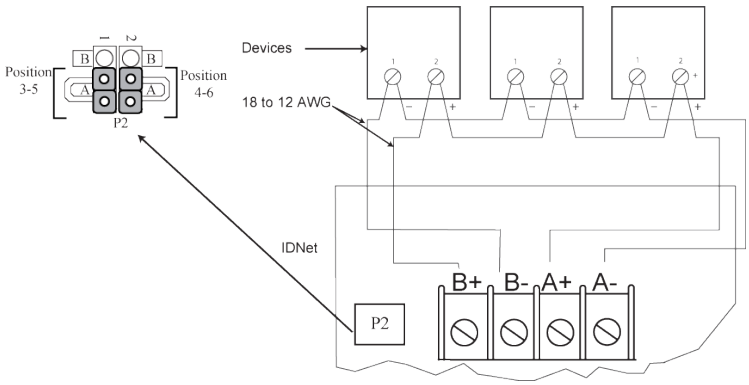

Fig 25: IDNet Class A wiring

6.7 Class B Wiring

When wiring the circuit as Class B, both the B+, B- and A+, A- terminals are available for parallel connections. Within the IDNet circuitry, A+ is connected to B+, and A- is connected to B- so circuits can stem from either one. Additionally, two wires can be connected to each screw terminal.

To wire an IDNet as a Class B circuit, complete the following steps:

1. Set the jumpers on P2 to positions 1-3 and 2-4.
2. Route the wiring from the IDNet circuit primary terminals (B+, B-) to the corresponding inputs on the first device. It is possible to add up to 4 circuits on the terminal block when using Class B wiring. See Figure 26: IDNet Class B wiring on page 32 for the diagram.
3. Route the wiring from the first device to the next as in/out, see Figure 26: IDNet Class B wiring on page 32. Repeat this for each device.
4. Shielded wire is not recommended. If shielded wires are present, cut and tape off the shield at each end (in the panel and at the last device in each run) in the panel to prevent it coming into contact with other components. The metallic continuity of the shield must be maintained and insulated throughout the entire length of the cable.

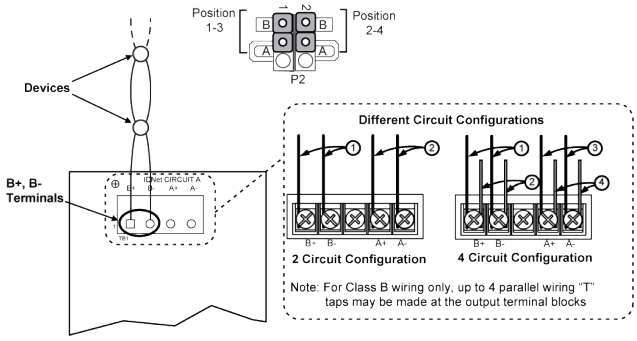

Fig 26: IDNet Class B wiring

6.8 Auxiliary power selection

AUX PWR/SNAC overview

The AUX PWR/SNAC terminal block is located on the top left corner of the power supply. Using the ES Panel Programmer, this point can be configured as either a 24V Auxiliary (AUX) power or as a simple reverse polarity Notification Appliance Circuit (NAC). This circuit does not support TrueAlert addressable devices nor non-addressable SmartSync appliances.

The AUX PWR/SNAC is rated 2 A maximum. The current used is deducted from the total available power supply current.

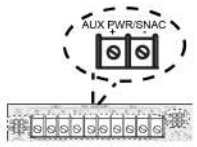

Fig 27: AUX/SNAC terminal

Output rating:	29.5 V maximum
Current Rating:	2 A, maximum.
Earth Detection Threshold	10K ohms minimum from either positive or negative terminals.
Wiring Gauge:	18 AWG (min.) to 12 AWG (max.).

Wiring Notes:

1. All wiring from the AUX/SNAC is power limited.
2. The conductors must test free of all grounds and stray voltages before connection to appliances and panel.
3. Terminate Class B NACs, as shown, using a 733- 894 EOL. For Canadian applications, mount end-of-line resistor to a Simplex-US Model 431537 EOL plate in accordance with ULC-S527.
4. If the wiring is routed outside the building, use of a listed secondary protector is required. Use Simplex2081-9028 (rated 5 A) or 2081-9044 (rated 0.2 A). A protector must be installed at each building exit or entrance. Each 2081-9028 adds 0.2 ohms wiring resistance. 2081-9044 adds 6 ohms wiring resistance, and greatly reduces the wiring distance.

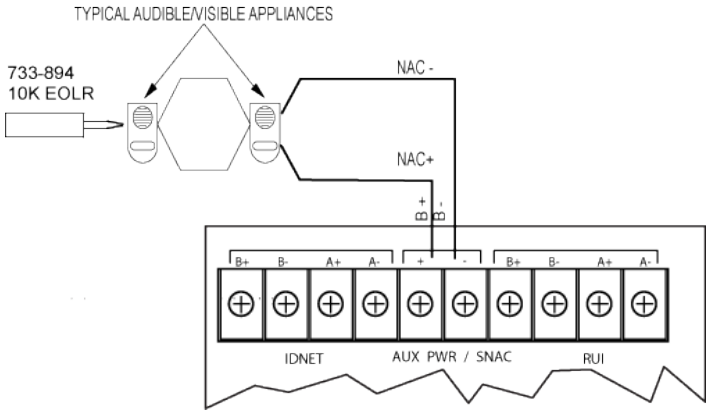

Fig 28: Simple NAC wiring

Table 25: Simple NAC wiring limits

Alarm current	20 AWG	18 AWG	16AWG	14 AWG	12 AWG	Line resistance (Ohms)
0.25	617 ft	981 ft	1560 ft	2480 ft	3944 ft	14.00
0.50	308 ft	490 ft	780 ft	1240 ft	1972 ft	7.00
0.75	206 ft	327 ft	520 ft	827 ft	1315 ft	4.67
1.00	154 ft	245 ft	390 ft	620 ft	986 ft	3.50
1.25	123 ft	196 ft	312 ft	496 ft	789 ft	2.80
1.50	103 ft	163 ft	260 ft	413 ft	657 ft	2.33
1.75	88 ft	140 ft	223 ft	354 ft	563 ft	2.00

Table 25: Simple NAC wiring limits

Alarm current	20 AWG	18 AWG	16AWG	14 AWG	12 AWG	Line resistance (Ohms)
2.00	77 ft	123 ft	195 ft	310 ft	493 ft	1.75
Note: This chart indicates the maximum distance for 1/4 -2A loads. The wiring distance is from the panel terminals to the last appliance. Use of a 2081-9044 protector reduces wiring distance.						

Output of AUX or NAC is 24 V nominal. The minimum voltage is 19.5 at minimum battery; the maximum is 29.5 V. Aux Loads include the compatible 4007ES annunciators series, 4090 series of IDNet ZAMs and IAMs, and any listed device operating within the output limits of the AUX. Calculate the wiring loss for the actual devices used. Compatible appliances include 4904 series of free-run strobes, 4901 series non-SmartSync horns, 4098 series TrueAlarm Sounder Base and 4009 NAC extenders, used in reverse-polarity activation mode.

Table 26: Compatible devices with 24V Aux.power

2088-series relays	2098-series four-wire smoke detectors
4098-series four-wire smoke detectors	4190-9050/9051 4-20mA ZAMs
4090-series IDNet ZAMs	4100-7401, -7402 Graphic Annunciator Modules
4602-6001, 4602-7001, 4602-7101, and 4602-9150 RCU/SCU Modules	

6.9 RUI section

RUI overview

The 4007ES RUI channel supports the following devices:

- 4100-7401, 7402 Graphic Modules.
- 4602-6001, 7001, 7101, 9150 RCU/SCU Modules.

Wire from the power supply's RUI channel on terminal block TB1 to each RUI device. The wiring can be Class A or Class B.

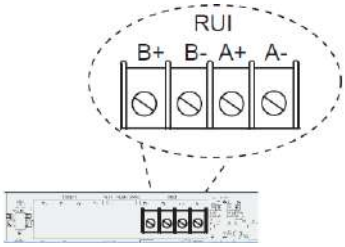

Fig 29: Location of the RUI terminal block

Table 27: RUI specifications

Supports:	Up to 10 RUI devices.
Electrical specifications:	
Channel voltage	29.5 V nominal.
Earth detection threshold	10K ohms minimum from either positive or negative terminals.
Capacitance	The maximum allowed line-to-line capacitance ("+" to "-" terminals) is 0.58uF. For applications with shielded wire, be sure that the total capacitance from line-to-line plus the shield to either line is not more than 0.58uF.
Wiring	
Maximum wiring distance: (18 AWG, 16 AWG, 14 AWG, 12 AWG)	2,500 feet (762 m) to device from PSU card.
Maximum T- tapping length	10,000 feet (3,048 m).
Notes: Maintain the correct polarity on terminal connections. Do not loop wires under terminals. If Class A is not used, configure jumpers P1 accordingly. Shielded wire is not required. Twisted wire is recommended for improved noise immunity.	

Figure 30: RUI wiring to the host panel on page 35 depicts Class A and Class B wiring.

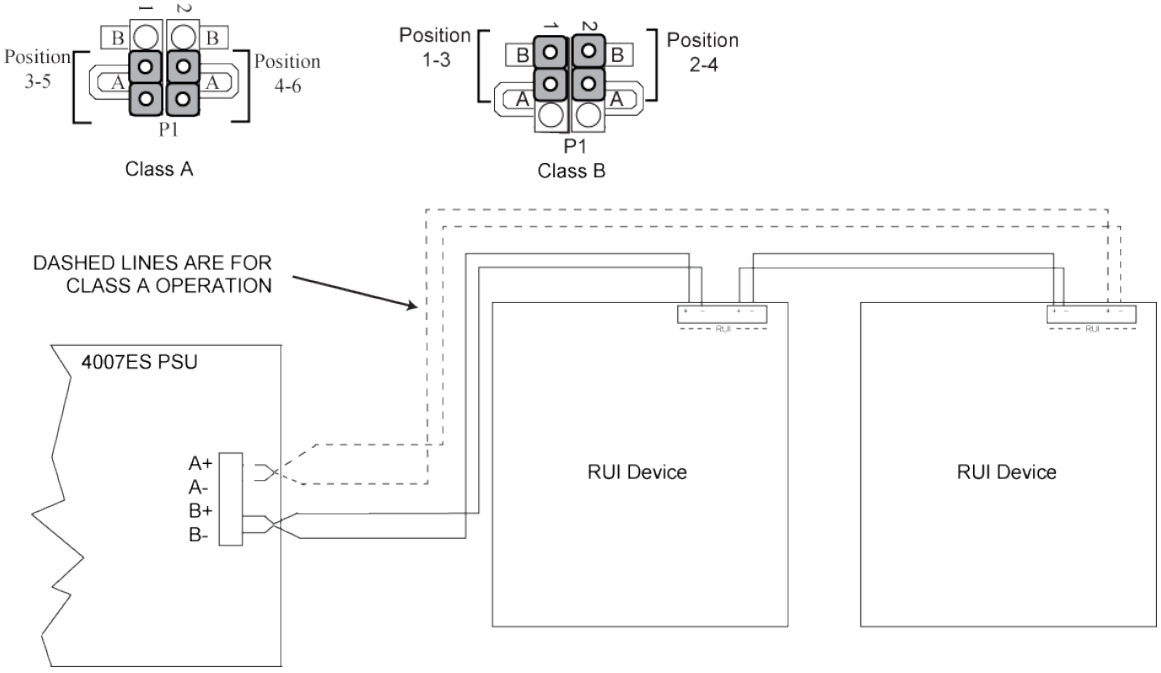

Fig 30: RUI wiring to the host panel

6.10Troubleshooting

The code produced by the illuminated indicator LEDs corresponds to a trouble occurring on the system. See Table on page 36 for the IDNet LED definitions, and see Table on page 36 for the 4007ES trouble messages.

Table 28: LEDs on the 4007ES power supplies

Comm trouble	Normally off. Turns on steady if the IDNet is not communicating with the FACP CPU.
IDNet trouble	Normally off. Illuminates to indicate a problem with the IDNet channel: • Channel failure. • Line short. • Class A failure or an open line.
Earth fault+	Illuminates to indicate a positive earth fault.
Earth fault -	Illuminates to indicate a negative earth fault.
IDNet LEDs: A, B, and C	Steady ON: Indicates an open or short condition on indicated loop.

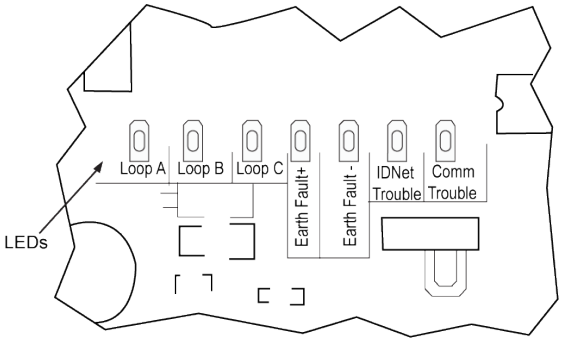

Fig 31: LEDs on the 4007ES power supplies

Table 29: 4007ES system trouble messages

Message	Definition
AC Fail	AC power is not present or is too low for proper system operation.
Low Battery	The battery voltage is below the 22.8 V nominal level by 10% or more.
Depleted/Missing Battery	The battery is either below 19.4 V or completely undetected.
Card Overcurrent	The module is drawing more current than it should. Check for faults on the circuit.
Charger trouble	The battery charger is either defective or being heavily loaded by batteries. Read charger current at front panel, if charger current is approximately 1.4 A, batteries are likely loading the charger. Remove battery connection and measure the output. If the output is 27.6 (or close, temperature dependent), there is a possibility of depleted batteries or a bad set of batteries. Allow batteries to charge or replace them if they do not take a charge. If the current is ~1.4 A with batteries and charger voltage below 20 V, remove the batteries and recheck the charger voltage. If the voltage is around ~27.3 V, then the batteries are heavily depleted.
Extra Device	Appears if one or more extra devices (i.e., devices that have not been configured for the IDNAC or IDNet channel) are on the system. Only one message appears, regardless of the number of extra devices found.
Earth Fault Search	Comes up during the Earth Fault Search diagnostic function. Once the search is initiated, the front panel display indicates how far along the search process has progressed (10%, 25%...75%), and then shows the results of the search. The result either identifies the offending circuit or indicates that the earth fault could not be found. During the search of circuits (IDNet, NAC, IDNAC, and aux power), system alarm and trouble processing is suspended.
Positive Earth	Appears when a positive earth fault is detected.
Negative Earth	Appears when a negative earth fault is detected.
Short Circuit	Appears when a short is detected on the IDNAC/NAC channel. This status clears automatically when the short circuit is removed.
Channel Fail	Appears when each device on the IDNet channel has been configured, and when none of the devices are communicating on the channel. This message does not appear if there are no configured devices on the IDNAC channel.

7 Optional modules and cards

The 4007ES can be ordered with a variety of optional cards and modules, depending on the system requirements.

8 Point Zone/ Relay Card

The 8-point Zone/relay Card (4007-9801) mounts in the 4007ES panel. Up to four cards can be added. Each card monitors up to eight Class B or four Class A zones, or eight relay contacts. For more information about the 8-point zone/relay card, see the 4***007-9801 8-Point Zone/Relay Card installation instructions*** (579-1103).

25V Regulator Module

The 25V Regulator Module (4007-9802) regulates the panel power supply output received from the NAC power supply (4007ES) or the IDNAC power supply (4007ES hybrid) to a 25VDC level. The 25VDC regulated output is isolated from the panel and complies with power-limited requirements. For more information about the 25V regulator module, see the ***25 V Regulator Module installation instructions*** (579-812).

IDNet+ Loop Expansion Card

The IDNet+ loop expansion card (4007-9803) mounts directly on the IDNAC/NAC power supply. Up to two cards can be added. Each card adds a single Class A/Class B IDNet+ loop and increases the device capacity by 75 points. For more information about the IDNet+ loop expansion card, see the *4007-9803 IDNet+ Loop Expansion Card installation instructions* (579-1106).

LED module

The operator uses the LED module (4007-9805) to view the simultaneous signaling of alarm and trouble conditions on up to 24 zones. All the LEDs have configurable colors, red or yellow, except the LEDs in the last column, which are configurable as red or green.

For more information about the LED module, see the ***4007-9805 LED Module installation instructions*** (579-1105).

The SDACT card

The SDACT card (4007-9806) can be mounted in the 4007ES panel. It is used to notify a central station when an event occurs, to report changes to a specific point, and to connect a transmitter to a central station. For more information, see the ***4010 ES and 4007ES Serial Digital Alarm Communications Transmitters installation instructions*** (579-954).

City Circuit

The city circuit card with disconnect switches (4007-8907), and without disconnect switches (4007-9808), are used to annunciate alarms and other urgent indications to remote facilities. Each city circuit module has two configurable circuits (alarm, trouble, or supervisory reporting) and supports Reverse Polarity and Local Energy Master Box Applications. Only one city card can be installed on a system. It is not available when an alarm relay is used.

For more information about city circuits cards, see the ***City and Relay Cards installation instructions*** (579-955).

Alarm Relay Card

The Alarm relay card (4007-9809) is used to provide common unsupervised control functions or indications for devices. Each relay module has three circuits (alarm, trouble, and supervisory signals). It is not available when a city circuit card is used. For more information about alarm relay card, see the *City and Relay Cards installation instructions* (579-955).

TrueInsight Service Gateway

The remote service gateway (4190-6104) sends data to a remote service monitoring facility to detail troubles in the panel. When the data reaches the monitoring facility, a qualified technician is notified by e-mail, and can then begin the diagnostic process remotely. For more information about the remote service gateway, see the ***TrueInsight Remote Service gateway installation instructions*** (579-953).

Dual Class A Isolator

The Dual Class A Isolator (DCAI) (4007-9804) card converts the Class B output of the IDNAC SLC into two isolated Class A outputs. For more information about the DCAI, see the ***4100- 6103, 4007-9804 DCAI Cards installation instructions*** (579-1029).

NIC

The panel connects to a 4120 network using a NIC slave card. This enables communication between each panel by fiber, modem, or twisted shielded pair wire in a Style 4 or Style 7 wiring configuration.

Two types of cards can be used with the NIC:

- The Fiber-Optic Media card can be used for noisy electrical environments, or for connecting externally to other buildings.
- The Wired Media Card is used for all other applications.

The 4007ES NIC is part of the 4007-9810 kit which also includes the mounting bracket used to mount the card inside the 4007ES panel. See the *4010ES and 4007ES Network Interface and Media Cards Installation Instructions* (579-956***)*** for more information about installing the NIC.

Dual RS-232 Module

The Dual RS-232 interface module provides a serial communication interface to an AC or DC printer, a PC Annunciator, or a third party computer. Power to both ports can be either isolated or non-isolated. The isolated power is intended for AC printers or PC Annunciators. Ground faults can result if isolated power is not used for AC devices and third party computers. DC printers use the non-isolated power.

The 4007-9812 Dual RS-232 Interface Module is pre-installed on a bracket and it must be mounted in the top left corner (Block E) of the 4007ES box. To complete the module installation, complete the following steps:

NOTE: The Dual RS-232 Interface Module cannot be installed if a module such as a 25 V Regulator, DCAI or a Zone Relay Card is already mounted in Block E inside the panel.

1. Connect one end of the provided harness (734-308) to connector P7 on the back of the RS-232 card.

2. Use the provided hardware to secure the RS-232 bracket to the 4007ES box.
3. Connect the free end of harness 734-308 to connector J17 (Zone/Relay) on the IDNAC PSU.

See the *Dual RS-232 Interface Module installation instructions* (579-910) for more information about installing the module.

7.1 Example of combinations

Figure 32: Example 1 on page 38 , Figure 33: Example 2 on page 38, and Figure 34: Example 3 on page 38 are examples of some of the combinations that can be made in a 4007ES using the available optional cards and modules.

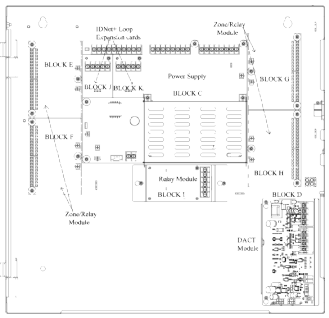

Fig 32: Example 1

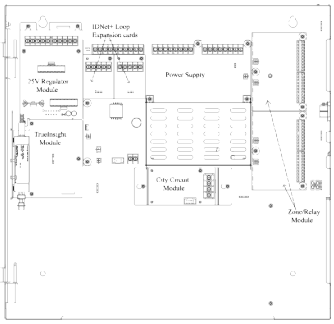

Fig 33: Example 2

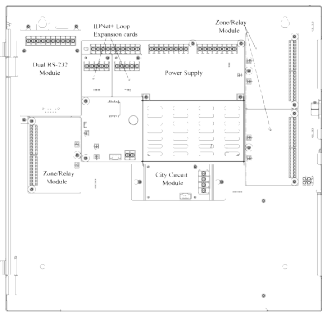

Fig 34: Example 3

8 Appendix A ULC programming requirements

8.1 Common earth fault ground and common trouble indicator

This application monitors a system pseudo that counts the number of ground faults or troubles that occur on the system. Each time this counter increments, such as when a ground fault or trouble occurs, a yellow LED on the operator interface panel illuminates.

Step 1. Add a Custom Control equation to monitor all ground faults:

1. Click the **Custom Control** tab.
2. Add a new equation.
3. Paste the following equation:

```
[INPUTS]
 STATUS ON
A112 | ANALOG | COUNTER | GROUND TROUBLE COUNTER
OR STATUS ON
2-0-8 | CARDSTAT | CSP | IDNET+ EARTH TROUBLE
[END INPUTS]
[OUTPUTS]
TRACK ON PRI=9,9
P535 | DIGITAL | UTILITY |
[END OUTPUTS]
```

NOTE: P535 is shown as an example; use any digital point.

Step 2. Open Color User Interface Card Properties Dialog

1. Click the **Hardware** tab and expand the **Unit 0**, **Box 1**, **Bay 1** icons to display the **Color User Interface Card**. Click the + signs to the left of the Unit 0, Box 1, and Bay 1 icons to expand them.

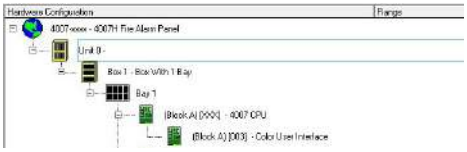

Fig 35: Selecting the Color User Interface Card

2. Right-click the **Color User Interface** card icon and select **Properties**.
3. Click the **Point Editing** tab, see Figure 36: The Display tab:Display Checkboxes on page 39.

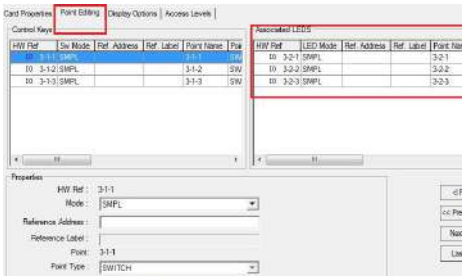

Fig 36: The Display tab:Display Checkboxes

Step 3. Program the LED

1. Select one of the multicolor LEDs (**3-2-1**, **3-2-2**, or **3-2-3**) to program.
2. Click the **Point Type** drop down list and select **LEDYELLOW**.
3. Click the **Mode** drop down list and select **ON**.
4. Enter P535, or your chosen digital point number from the equation, in the **Reference Address** field to program the LED for ground faults.
   OR
5. Enter A2 (no spaces) in the **Reference Address** field to program the LED to illuminate whenever a general system trouble is present.