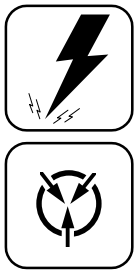
Cautions and Warnings

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 Simplex.



ELECTRICAL HAZARD - Disconnect electrical power when making any internal adjustments or repairs. Servicing should be performed by qualified Simplex Representatives.

STATIC HAZARD - Static electricity can damage components. Therefore, handle as follows:

1. Ground yourself before opening or installing components.
2. Keep component wrapped in anti-static material at all times.

Introduction

The Simplex 4009 NAC Power Extender (Figure 1) provides additional DC signaling capacity to a Fire Alarm Control Panel (FACP) with a reverse polarity Notification Appliance Circuit (NAC). The 4009 is UL-listed, electrically-supervised, and protected against brown-out conditions and loss of primary AC power.

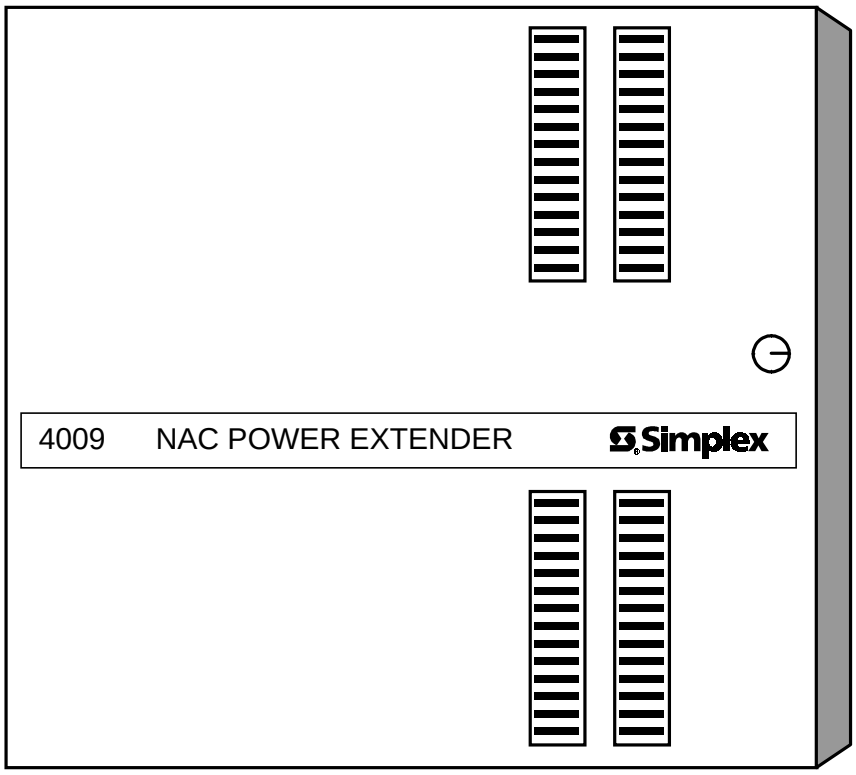


Figure 1. Simplex 4009 NAC Power Extender

Continued on next page

Introduction, *Continued*

The 4009 connects as an end-of-line device to a compatible, dedicated notification appliance circuit from the host panel (e.g., Simplex 4001 or 4002). It provides eight amperes of DC signaling power to either four or eight supervised reverse-polarity NACs, style Y or style Z. Alarms from the host panel signal the four (or eight) 4009 NACs to extend the alarm.

The 4009 can also minimize transmission line losses associated with sending large currents long distances within buildings. In a fire alarm system with the 4009, power supply and batteries for notification appliances are located near the actual signaling devices, saving system power and battery capacity while minimizing line losses. The 4009 monitors each output NAC if a trouble occurs. EARTH fault detection is maintained by the host FACP. Simplex currently provides for earth detection at the 4009 via an earth detect module. The signal cards are set for isolated mode and the 4009 now provides EARTH fault capability.

Hardware Components

Features of the 4009 include:

- Style Y or Z (Class A or B) NACs
- Four or eight NACs, controlled in groups of four
- Eight amperes of DC Signaling Power
- EARTH fault capability of host FACP retained
- Earth fault capability at 4009 if desired
- Two-wire operation from host FACP
- 4001-Size back box.
- 18 Ah battery charger (Provides charging for 10 Ah batteries internally and 18 Ah batteries externally [4009-9801 battery cabinet required])

Modules available with the 4009 NAC Power Extender include:

- 565-367 or 565-488 Power Supply
- 565-386 or 565-569 Style Y (Class B) Signal Card
- 565-388 or 565-545 Style Z (Class A) Signal Card
- 565-558 Earth Detect Card

565-367 or 565-488 POWER SUPPLY

If the 4009 is used with a 4001 system, adequate power from the host FACP may not be available for the NACs and system use. The power supply used in the 4009 is a linear supply with brownout and battery charger features. Power supply capacity is adequate for battery charging. Battery charging is limited to 18 Ah, (10 Ah internally/ 18 Ah externally with 4009-9801 battery cabinet) so provisions are made to allow connection of external battery power. The charger is disabled when external batteries are used.

Continued on next page

Hardware Components, *Continued*

565-386 or 565-569 STYLE Y (CLASS B) SIGNAL CARD

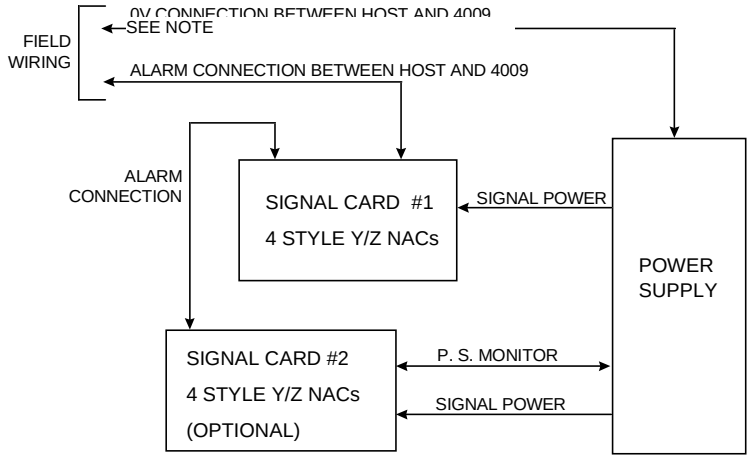
This module allows supervision of four Style Y (Class B) circuits with one signal circuit from a 4001, 4002, 4020, or 4100/4100+ (or any reverse polarity signal circuit operating at 24 VDC). It also accepts a +24V auxiliary alarm input, and can be supervised by the host FACP. All four signal circuit alarm relays energize with an alarm from the host signal circuit. A short or open circuit trouble on any of the four circuits results in an open condition at the host signal circuit, causing the required trouble indication at the host FACP.

565-388 or 565-545 STYLE Z (CLASS A) SIGNAL CARD

This 565-388 is functionally identical to the 565-386 Signal Card and the 565-545 is functionally identical to the 565-569 Signal Card, except that these Signal Cards provide for Style Z (Class A) wiring of outgoing circuits.

System Configuration

A functional block diagram depicting the interconnections between modules is shown in Figure 2. Alarm signal and 0V connections provide alarm and trouble operation. The host FACP can detect EARTH faults on any NAC wiring from the signal card.



Note: 4009 installed local to host panel:

- Connect to NAC (+) and Panel 0V when earth detect module is not used.
- Connect to NAC (+) and NAC (-) when earth detect module is used.

4009 installed remote to host panel:

- Use earth detect module and connect to NAC (+) and NAC (-).

Figure 2. 4009 Functional Block Diagram

Power to the second Signal Card is harnessed in the field, the card is installed as an after-market option. The 733-805 wiring harness is provided in the after-market kit, and is connected from P2 of the second signal card to TB1 of the 565-367 or 565-488 Power Supply.

Note: Make certain that the second Signal Card has its P3 jumper set to position 1-2.

Alarm Input Requirements

When using 565-386 or 565-388 signal cards the alarm input from the host NAC must be 20 to 32 volts DC, with a maximum ripple voltage of 2 volts peak-to-peak.

When using 565-545 or 565-569 signal cards the alarm input from the host NAC must be 18 to 32 volts DC, unfiltered power supplies can be used.

Alarm current for all signal card configurations is a maximum of 2 A at 24 VDC per circuit, and is power-limited. Minimum alarm current per Signal Card (total of four circuits) must be 0.9 VDC. (See the 841-925 Field Wiring Diagram.)

System Installation

General Information

Important: Notify the appropriate personnel (building occupants, fire department, monitoring facility, etc.) of the installation.

The following paragraphs contain material which is applicable to all 4009 NAC Power Extender systems. Be sure that you are thoroughly familiar with this material before installing your 4009.

To help you with installation of this and other Simplex equipment, the following publication is available for general reference: **How to Wire a Building for a Fire Alarm System**.

Tools and Equipment Required

The following tools and equipment are required to install the 4009:

- 1/4-inch flat-tip screwdriver, 8-inches long
- 1/8-inch flat-tip screwdriver, 4-inches long
- Volt-Ohmmeter
- Diagonal cutting pliers
- Wire strippers
- End-of-line resistors (supplied by Simplex)
- Field Wiring Diagram 841-925.

General Notes

1. All wiring must be done in accordance with local codes.
2. A minimum of 6 inches of free conductor is required is each electrical box to facilitate termination's.
3. A 12-inch service loop of cable is required for all continuous pulls through an electrical box.
4. All system wiring subject to physical damage must be mechanically protected based on the environment to which the cable is subjected.
5. A neatly wired system helps assure an accurate inspection of all connections and simplify troubleshooting.

Continued on next page

Installation Checklist

The installation checklist (shown in Table 1) provides a systematic method for installing the 4009. When you finish a procedural step, place a check mark in the appropriate box in the left column.

Table 1. Installation Checklist

☑	PROCEDURE
☐	1. Mount 4009 back box.
☐	2. Install system wiring as required and check for absence of voltage, opens, and shorts.
☐	3. Install peripheral devices and connect end-of-line resistors across terminals of the last device in the circuit.
☐	4. Connect ground wire from electrical distribution panel to the 4009 green grounding screw.
☐	5. When 565-558 Earth Detect Module is not used, and on non-isolated systems, connect separate wire from system 0V of the host FACP to 0V on the 565-367 Power Supply.
☐	6. Connect external NACs to TB1-1 (SIG +) and TB1-2 (SIG -) on the 4009 Signal Card.
☐	7. Install jumper in position 1-2 of P3 on the 4009 Signal Card if connected to a 4003, or install jumper in position 2-3 of P3 if connected to another panel..
☐	8. Install and connect additional Signal Card by installing jumper into position 1-2 of P3 on the second Signal Card.
☐	9. Install battery charger options as required. • For external batteries and charger, install jumper position 1-2 on P4 of 565-367 or 565-488 Power Supply. • When external battery charger is used, splicing into existing 733-807 harness is required. Refer to Field Wiring Diagram 841-925. • To use 4009 Battery Charger, install jumper position 2-3 on P4 of 565-367 or 565-488 Power Supply.
☐	10. Install battery switch over option as required. • For automatic switch to battery upon power failure, install jumper to position 2-3 of 565-367 or 565-488 Power Supply.
☐	11. Connect AC power leads to TB3 on the 565-367 Power Supply or to transformer flying leads of 565-488 Power Supply.
☐	12. Apply system power.
☐	13. If using internal batteries, connect as indicated.
☐	14. If using external batteries from FACP, connect as indicated.
☐	15. Test the system.

Continued on next page

Mounting the 4009

Note: The following pages provide a detailed description of the installation. If you experience problems that cannot be resolved, call your local Simplex Branch Office.

Use the following procedure when mounting a 4009.

1. Carefully open the shipping container.
2. Remove the 4009 from the shipping container and lay the unit on a flat surface.
3. Unlock and open the panel door.
4. Remove the knockout plugs on the back box for wire entry.
5. At the 4009 mounting location, install the 4009 back box as shown in Figure 3.
   a. Position the back box on two wall-mounted screws capable of supporting the panel with batteries using the special keyholes at the top of the box.
   b. Tighten screws until snug.
   c. Insert a mounting screw in each of the two mounting holes at the bottom of the box and tighten these screws until snug.

Note: For semi-flush mounting, the back box must be extended 1 1/2 inches from the finished wall.

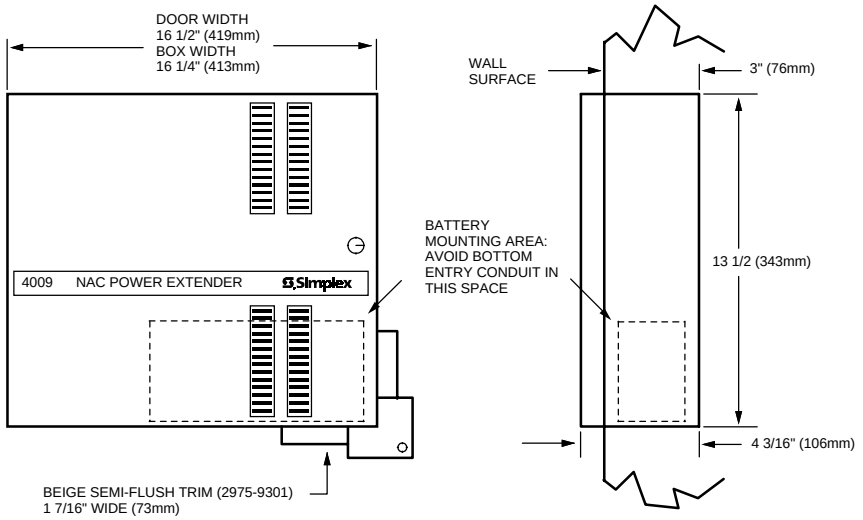


Figure 3. Installing the 4009 Back Box

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System Installation, *Continued*

Wiring the 4009

When wiring the 4009, refer to the 841-925 Field Wiring Diagram, the Wiring Information mounted on the inside of the 4009 panel door, the 4009 NAC Power Extender Connection Diagram (Figure 4), and the following system wiring requirements.

- All wiring, except incoming power and ground connecting wires, must be free from grounds or shorts and have a resistance of one megohm, or higher, to EARTH.
- All wires are to be copper conductors only.
- All wiring must be terminated with UL listed devices (e.g., wire nuts, pressure connectors). Wiring terminated with only electrical tape is not permitted. All splicing (free ends of conductors) must be covered with an insulation equivalent to that of the conductors.
- When running wires to the 4009, identify the wires appropriately: Input power, dedicated NAC wiring, external battery connection (if required), and the four NAC circuits (an additional four NAC circuits are available as a field-installed option).

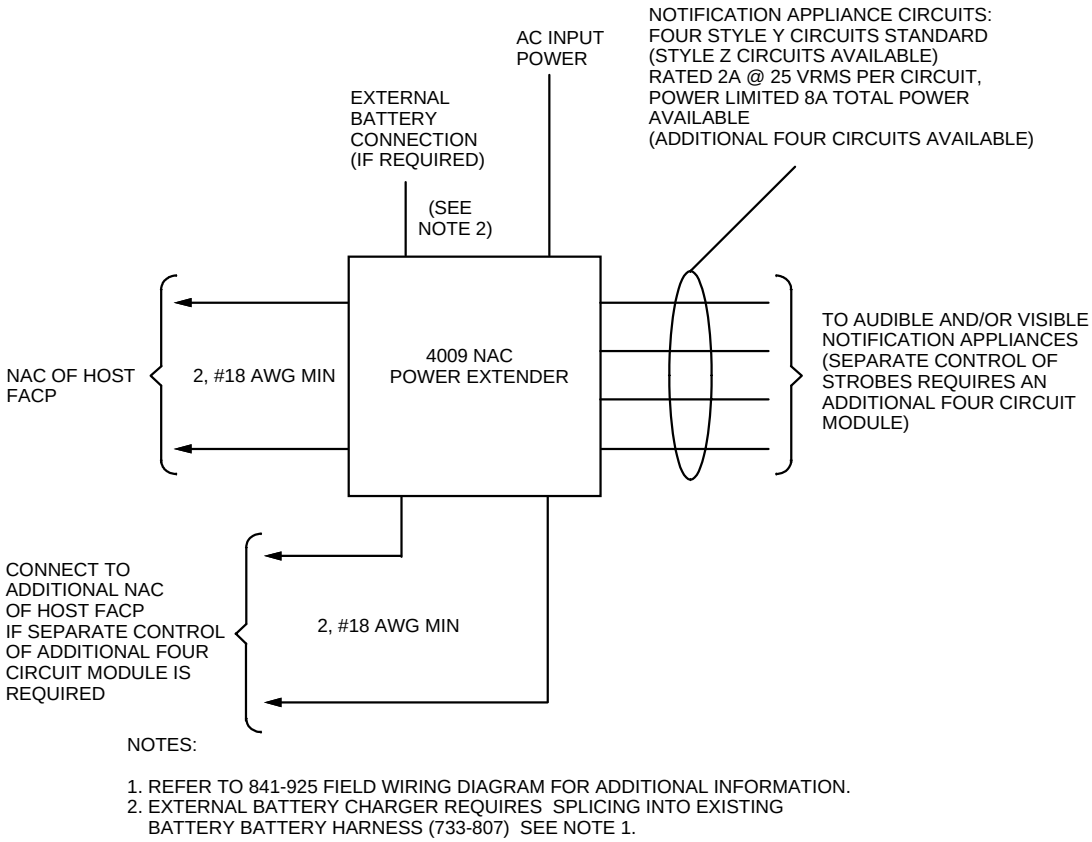

Figure 4. 4009 NAC Power Extender Connection Diagram

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System Installation, *Continued*

Mounting and Wiring Peripheral Devices

Note: Use the resistor color code shown in Figure 5 to identify the End-of-Line Resistors used in the installation.

Refer to the 841-925 Field Wiring Diagram and the procedure listed below when installing the 4009 peripheral devices.

1. Determine the mounting locations of the peripheral devices and install system wires from the mounting location of each peripheral device to the 565-386 or 565-569 Style Y (Class B) Signal Card or the 565-388 or 565-545 Style Z (Class A) Signal Card.
2. Install all peripheral devices and connect them to appropriate wires. (Refer to the installation instructions packed with the devices.)
3. For Style Y (Class B) devices, connect a 10K, 1/2 W End-of-Line Resistor (EOLR) across the terminals of the last device in the circuit and mark the device accordingly.

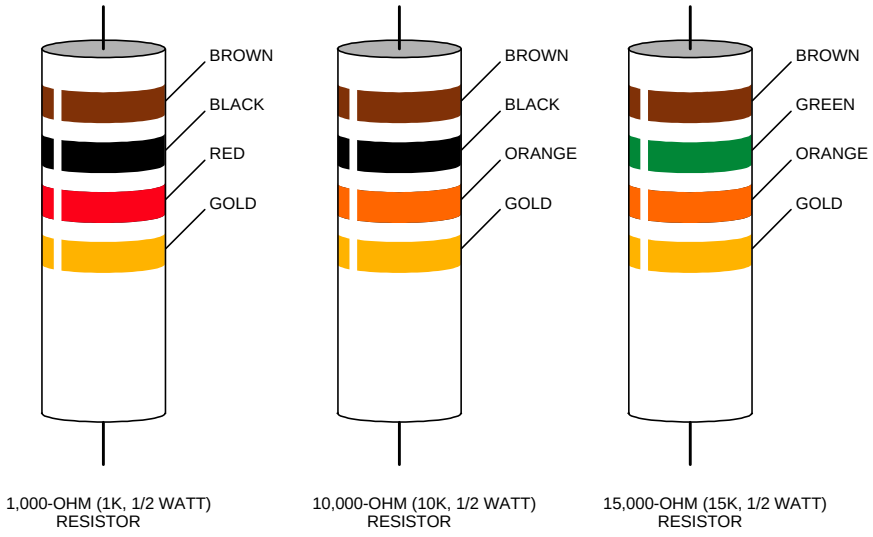

Figure 5. End-of-Line Resistor (EOLR) Color Code

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System Wiring Configurations

The 4009 has the following system wiring configurations:

- Style Y (Class B)
- Style Z (Class A)
- Interconnection to Host Panel, Single Signal Card
- Interconnection to Host Panel, Two Signal Cards
- Interconnections as a Single Reverse Polarity Device (single or two signal card(s), isolated or non-isolated configuration

Notes:

1. The 4009 terminal blocks are labeled with a "TB number", and each terminal on the terminal block has a number. (For example, Terminal No. 1 on Terminal Block No. 1 is labeled TB1-1.)
2. Each terminal on the terminal block is also identified with an abbreviation of the circuit wire that is connected to it. (For example, TB2-1 on the 565-386 Signal Card is labeled "SIG3+".)

Jumper Placements and Terminal Connections

Refer to the 841-925 Field Wiring Diagram and the procedure listed below when installing the 4009 NAC Power Extender.

1. Connect a 12 AWG copper ground wire from safety ground in the electrical distribution panel to the 4009 green grounding screw.
2. Connect external NACs to TB1-1 (SIG +) and TB1-2 (SIG -) on the first Signal Card.
3. Install jumper in position 2-3 of P3 on the first 4009 Signal Card, install jumper in position 1-2 of P3 if used with 4003 (Assemblies 565-360, 565-386, 565-388, 565-545, 565-569).
4. Install and connect additional 4009 Signal Card as required.
5. Install jumper in position 1-2 of P3 on the second Signal Card (if installed).
6. Install battery charger options as required.

   - For external batteries and charger, install jumper to position 1-2 on P4 of 565-367 or 565-488 Power Supply.
   - When external battery charger is used, splicing into existing 733-807 harness is required. Refer to Field Wiring Diagram 841-925.
   - To charge 18 Ah or 10 Ah lead-acid batteries, install jumper to position 2-3 on P4 of 565-367 or 565-488 Power Supply.
7. Install battery switch over option as required.
   - For automatic switch to battery upon power failure, install jumper to position 2-3 on P3 of 565-367 or 565-488 Power Supply.

System Installation, *Continued*

Continued on next page

Jumper Placements and Terminal Connections (continued)

8. When 565-558 Earth Detect Module is not used, and on non-isolated systems, install an 12 AWG copper wire from TB2-3 on the 565-367 and 565-488 power supply to 0V on the battery block of the host FACP.
9. Apply system power.
10. If using internal batteries, connect as indicated.
11. If using external batteries from FACP, connect as indicated.
12. Test the system.