

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.



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.

Introduction

The 4009 IDNAC Repeater is a TrueAlertES Addressable device that extends the maximum wiring distance supported by the IDNAC Signaling Line Circuit (SLC).

The IDNAC Repeater is compatible with Fire Alarm Control Panels (FACPs) that use the Extended Power Supply (EPS and EPS+).

The following lists IDNAC Repeater models:

- 4009-9601 120 V/240 V Platinum UL/ULC
- 4009-9602 120 V/240 V Red UL/ULC
- 4009-9601 BA 120 V/240 V Platinum UL/ULC assembled in USA.
- 4009-9602 BA 120 V/240 V Red UL/ULC assembled in USA

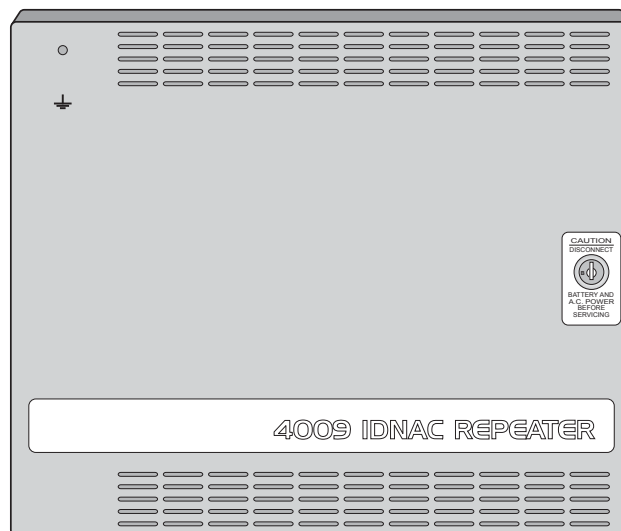


Fig 1: 4009 IDNAC Repeater



Card layout and Specifications

Card layout

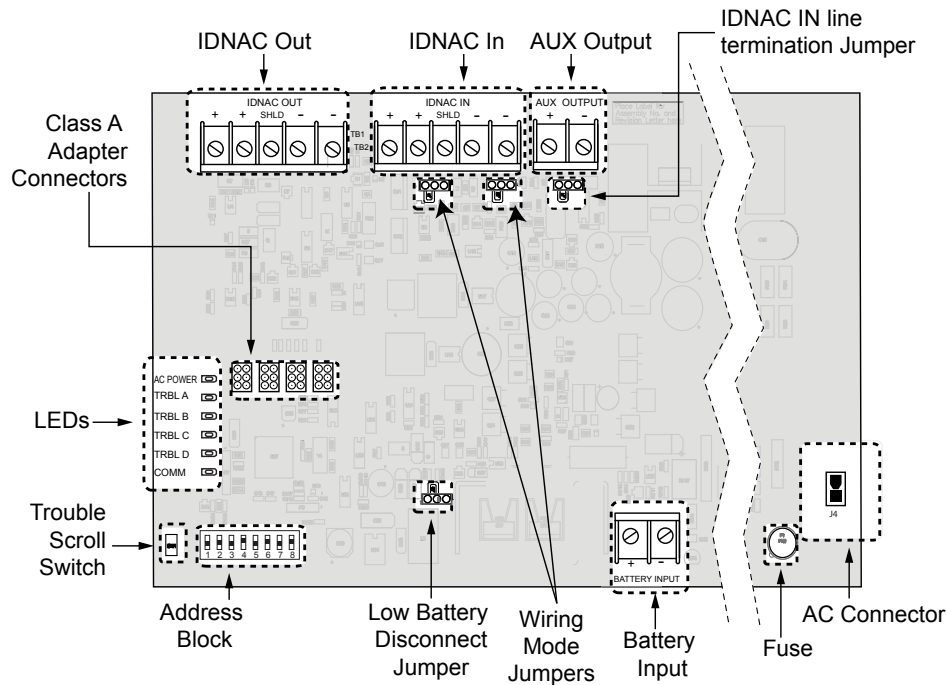


Fig 2: Card Layout

Card specifications

Table 1: Card specifications

Operating conditions	32°F - 120°F (0°C-49°C) Up to 93% relative humidity at 90°F (32°C), non-condensing	
Electrical specifications	AC Input specifications	120 V, 50/60 HZ, 2.5 A 240 V, 50 HZ, 1.25 A
	DC Input specifications (battery standby)	Standby: 70 mA plus 0.8 mA for an IDNAC device plus Aux Output current Alarm: 96 mA plus 1.37XSLC Load Current plus 1.37 X Aux Output Current. (4.5A maximum with 3A IDNAC SLC load and 200mA Aux Output load)
	IDNAC Input specification	1 address, 4 unit loads
	IDNAC Output specification	Voltage: 29 V special application Power: 3 A max.
	Aux Output specification	Voltage: 29V DC Nominal with AC present or when powered from batteries with system in Alarm or 24 V DC nominal when powered from batteries with system in Standby mode. Special Application. Aux Loads include 4603-9101 Annunciator, 4100-96xx series Annunciators, and 4090 series of IDNet ZAMs and IAMs Power: 0.2 A max. @ 29 V
Earth fault	Earth fault detection is 10 k minimum to any circuit	
Internal battery charger	Charges up to 25 Ah sealed lead-acid batteries connected to the power supply	
	High Voltage Internal battery charger Output: 27.6 V	
	Output Current Limit: 1.3 A	

Mounting

The 4009 IDNAC Repeater card arrives pre-installed in a stand-alone cabinet. The cabinet measures W 16.5 inches x H 13.75 inches x D 4.5 inches. It is available in red, and platinum.

Preparing the cabinet

To prepare the Repeater cabinet for mounting, do the following:

1. Carefully remove the Repeater cabinet and contents from the shipping box and lay the cabinet on a flat and solid surface.
2. Prepare the cabinet in order to be able to safely pierce the conduit/service entrances required.
 - a. Disconnect the AC harness.
 - b. Use a screw driver to loosen the 4 screws retaining the Repeater assembly.
 - c. Set the Repeater assembly aside in a safe dry place.
3. Pierce the required conduit and service entrances. It is recommended that the conduit entrance for the AC power be placed at the bottom right side of the cabinet.
4. Return the Repeater assembly to the cabinet and tighten the hardware.
5. Reconnect the AC harness.

Mounting the repeater

Danger - High Electrocutation Risk. Do not remove the protective casings that are pre-installed on the card. They cover High Voltage zones that present a high electrocutation risk.

To mount the Repeater, complete the following steps:

1. Locate the place the Repeater will be installed. To do this, consult the following guidelines:
 1. - There must be a clear space of at least 1000 mm in front of the Repeater to provide access for maintenance and testing.
 - The top of the cabinet must not be more than 2400 mm above the finished floor level.
 - The Repeater must be located in an area that is compatible with its operation conditions.
2. Using the Repeater as a template, mark the wall through the tear drop knock out at the top of the Repeater cabinet and through the two holes at the base of the cabinet.
3. Pierce the four holes.
4. Insert the appropriate hardware, into the top two holes, leaving a 1/8 inch (3.175 mm) gap between the screw head and the wall.
5. Align the tear drop hole in the back of the Repeater with the protruding screws.
6. Hang the repeater on the protruding screws.
7. Insert the appropriate hardware into the two holes at the base of the Repeater.
8. Install the batteries, see Installing the batteries for instructions.

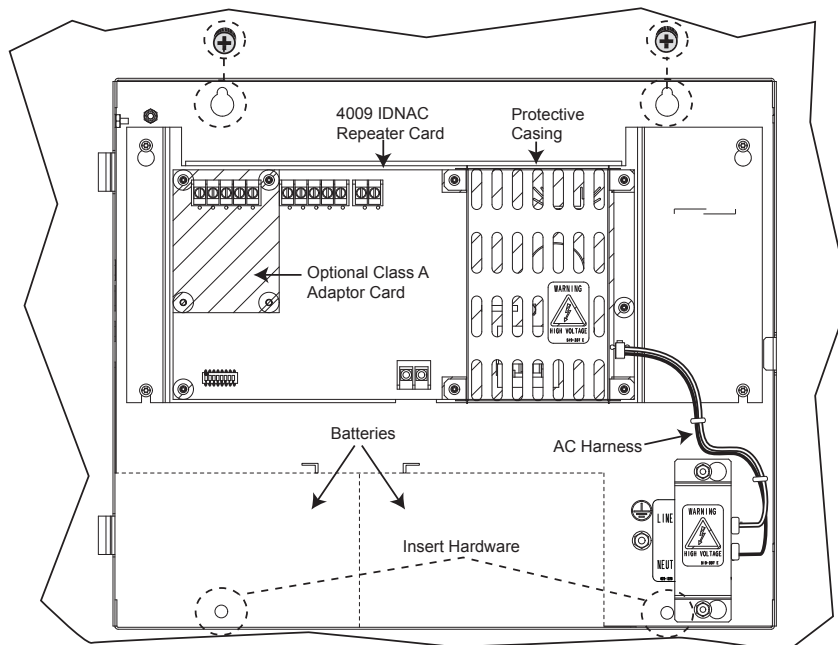


Fig 3: Mounting the 4009 Repeater cabinet

Installing the batteries

The Repeater cabinet is built to accommodate two 12.7 AH batteries.

To safely install the batteries in the Repeater Cabinet using the battery harness, complete the following steps:

1. Place both batteries to the left side on the bottom of the cabinet.
2. Connect the positive terminal of the left battery to the positive battery input on the Repeater using the red cable.
3. Connect the negative terminal of the right battery to the negative battery input on the Repeater using the black cable.
4. Connect the two remaining battery terminals using the white jumper cable, to join the two batteries.

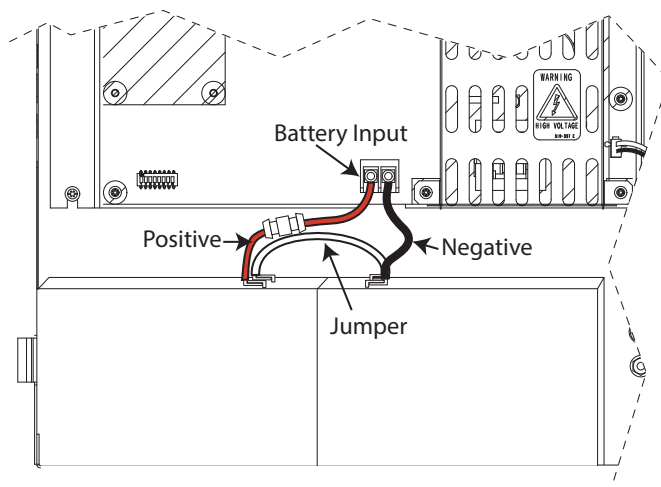


Fig 4: Installing the batteries

Connecting the Repeater to the AC

The Repeater connects to the building AC through the AC terminal block located on the lower right of the Repeater.

IMPORTANT: Ensure that the Power to the circuit is off before proceeding

To connect the repeater to the building AC, complete the following steps:

1. Loosen the screws securing the AC cover.
2. Slide off the cover.
3. Bring the AC wiring in through the conduit entrance on the lower right side of the Repeater cabinet.
4. Connect building AC to the terminal block. The ground wire can be secured under the AC cover screws.
5. Place the AC cover back over the terminal block and tighten the screws.

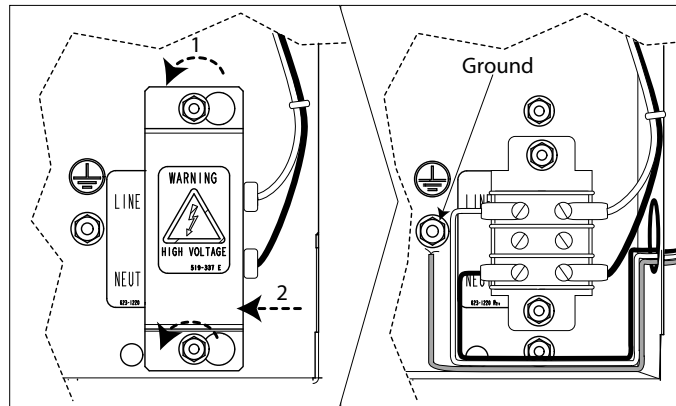


Fig 5: Connecting the Repeater to the AC

NOTE: Wire the Non-Power-Limited wiring only in the shaded areas. This includes AC input and battery connections. All other wiring is Power-Limited. Maintain at least ¼-inch spacing between all Power-Limited and Non-Power-Limited wiring.

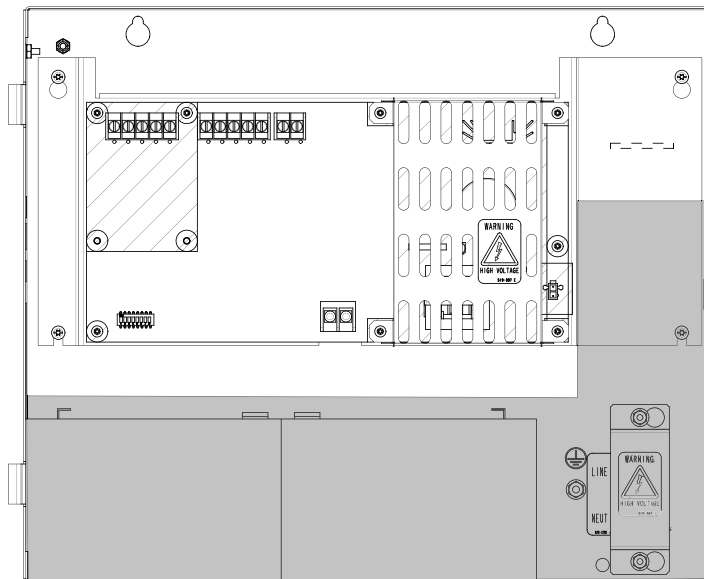


Fig 6: Non-Power-Limited Zone

Configurations

Setting the address

The Repeater has a unique address that is set with an eight-position DIP switch (SW2). Set the dip switch according to the address assigned in the panel ES Programmer job. See [Adding the Repeater to the ES Programmer](#) on page 17 for more information.

To set the dip switches, complete the following steps:

1. Retrieve the assigned address in the ES Programmer.
2. Use a non marking tool to set the switches to the address.
3. Record the set address.

NOTE: DIP switch position 8 is not used and must be set to **OFF**.

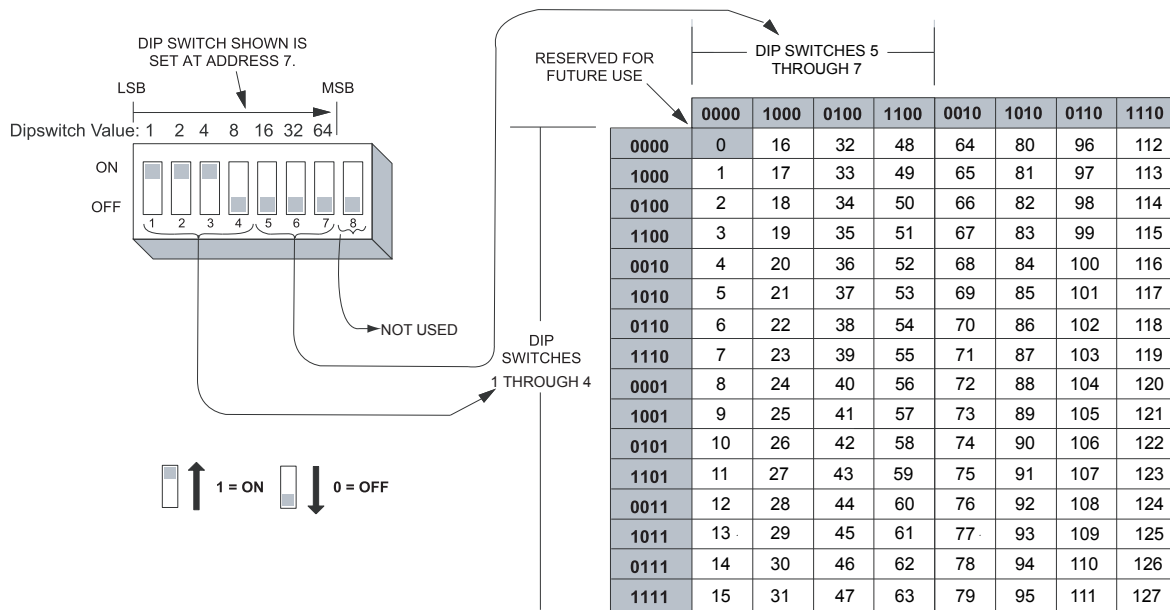


Fig 7: Card addresses

Battery Disconnect Jumper

Use Jumper J3 to select Low Battery operation. The Jumper operates as follows:

- Jumper in the right position (pins 2-3) causes panel shutdown when the batteries are depleted.
- Jumper in the left position (pins 1-2) enables the panel to continue operating.

For S527 compliance, the Jumper must be installed to the right position of J3.

NOTE: When the Jumper is set to pins 2-3, the Repeater will not power-up from the battery.

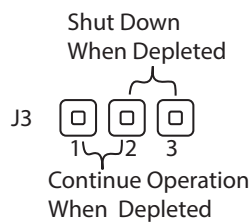


Fig 8: Battery Disconnect Jumper positions

Wiring Jumpers

Use Jumpers J1 and J2 to configure the wiring. Set the jumper according to the wiring configuration. Consult the following information when setting the Jumper:

For local Class B wiring:

Set the Jumper to the Local setting, jumper position 1-2.

For a local Class A* loop:

To create a Class A local loop off of the repeater set the jumper to the Local setting, Jumper position 1-2.

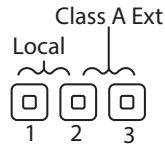


Fig 9: Wiring Jumpers

For an extended Class A* loop:

To make the Repeater part of a Class A loop extending from a DCAI ** set the Jumper to the Class A Ext setting, jumper position 2-3.

* The Class A Adapter card must be installed on the repeater in order to use Class A wiring. The wiring jumper setting on the Class A Adapter card must be identical to the jumper setting on the repeater. Consult the Class A Adapter manual 579-1080 for more information.

**Consult the DCAI manual 579-1029 for more information.

IDNAC IN, Built-in Line Termination Jumper, P10 Connector

This jumper is located on the main PCB at header P10. It is factory configured for OFF across P10 pins 1 and 2. It must remain in that position for standard operation.

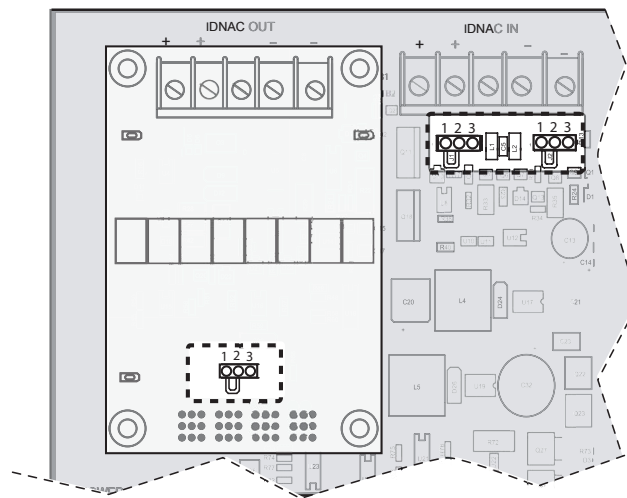


Fig 10: Wiring Jumper location, shown with a Class A adapter

Wiring overview

The Repeater doubles the EPS SLC maximum wiring distance. Wire the Repeater in either a Class A or Class B wiring configuration.

Repeater specific wiring guidelines

- A Repeater cannot be wired directly into another repeater.
- Only one Repeater can be wired as part of a Class A Loop.
- In a Class B wiring configuration using T-Tap connectors, an SLC can support up to five wiring branches that each include a Repeater.

NOTE: The Repeater does not increase the maximum number of devices supported on the IDNAC channel. The total number of devices on a channel includes all devices present before and after the repeaters.

General wiring guidelines

- Ensure conductors test free of all grounds.
- All wiring must be done using copper conductors only, unless noted otherwise.
- The required wiring is unshielded Twisted Pair. This wiring must have a capacitive rating of less than 60pf/ft and minimum three twists (turns) per foot.
- If shielded wire is used, the following conditions apply:
 - Ensure metallic continuity of the shield is maintained throughout the entire cable length.
 - Ensure the entire length of the cable has a resistance greater than 1 megohm to earthground.
- In areas of high lightning activity, or in areas that have large power surges, use the 2081-9027 Transient Suppressor on monitor points.
- Do not run wires through elevator shafts.
- When splicing is used, ensure all spliced connections are either soldered with resin-core solder, crimped in metal sleeves, or encapsulated with an epoxy resin. When soldering, or crimped metal sleeves are used, insulate the junction with a high-grade electrical tape that is as sound as the original insulating jacket. If shielded wiring is used, maintain shield continuity throughout.
- Provide a system ground for earth detection and lightning protection devices. This connection must comply with approved earth detection per NFPA780.

- Only system wiring can be run together in the same conduit.
- Ensure underground wiring is free of all water.

Device wiring guidelines

Consult the following guidelines for devices before you begin the field wiring:

- Only IDNAC devices and other compatible devices are permitted on the SLCs. Consult [Compatible devices](#) on page 18 for a list of compatible devices.
- A maximum of six isolators between any appliance and SLC terminals is permitted. A maximum of 12 isolators for each SLC is permitted.
- A maximum of 30 devices connected directly to any isolator terminal pair is permitted.
- All wiring must be 20 AWG to 12 AWG.
- All wiring must be supervised and power-limited.
- A maximum alarm current of 3 A is permitted.

NOTE: In a Class A extension wiring configuration, the maximum loop current is limited to 3 A. In this configuration, the repeater extends the wiring distance but does not increase the current available for the devices.

- The maximum cable load is 10,000 feet (3,048 m) per channel. The maximum wire length from the Repeater to any device is 4,000 feet (1219 m).
- The nominal voltage rating is 29 VDC.
- Follow the IDNAC Speaker Wiring Application Guidelines in document 579-1015: *EPS Installation Instructions* for TrueAlert ES Speaker and S/V appliances.

Installing ferrite beads

A ferrite bead must be installed on all wiring. To install the ferrite bead, do the following:

1. Loop the wire once through the ferrite bead close to the Repeater field wiring terminals for lowest radiated emissions before the wires leave the box. Do not loop the ground wire on the AC wiring or the shield wire on shielded cables through the ferrite bead.
2. Secure the ferrite bead with the provided cable ties.

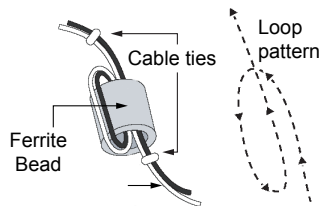


Fig 11: Ferrite Bead Installation

Wiring length tables

Use the following tables to calculate the maximum wiring length starting from the Repeater.

NOTE: Use Table on page 9 in place of Table on page 9 for TrueAlertES Speakers and Speaker/Visible appliances.

The maximum wiring length is the shorter of the distance limits calculated by alarm current voltage drop, or by reaching the communications distance limit.

Table 2: UTP wiring limit based on alarm current

Alarm current	Local and extended loop Class A wiring: Total loop length from the Repeater				
	Local Class B wiring: 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

Table 2: UTP wiring limit based on alarm current

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

Table 3: UTP wiring limit based on communication

Line Impedance (Ohms)	Devices	Local and extended loop Class A wiring: Total loop length from the Repeater				
		Local Class B wiring:				
		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

Table 4: 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

NOTE: Although the required wire for IDNAC circuits is twisted pair (controlled impedance) wiring, in some applications it may be advantageous to use existing wiring that is not twisted pair. This is only permitted 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 any wiring that is not twisted pair.

Table 5: UTP wiring limit for speaker and S/V devices based on communication

Devices	Distance to the last appliance				
	20 AWG	18 AWG	16 AWG	14 AWG	12 AWG
1	1218 ft	1936 ft	3079 ft	4000 ft	4000 ft
5	1028 ft	1634 ft	2599 ft	4000 ft	4000 ft
10	853 ft	1356 ft	2156ft	3428 ft	4000 ft
15	715 ft	1137 ft	1807 ft	2873 ft	4000 ft
20	603 ft	959 ft	1525 ft	2424 ft	3855 ft
25	548 ft	871 ft	1385 ft	2201 ft	3500 ft
30	501 ft	797 ft	1266 ft	2013 ft	3201 ft
35	461 ft	733 ft	1165 ft	1853 ft	2946 ft
40	427 ft	678 ft	1078 ft	1714 ft	2726 ft
45	397 ft	631 ft	1002 ft	1593 ft	2534 ft
50	370 ft	588 ft	935 ft	1487 ft	2365 ft
55	347 ft	551 ft	876 ft	1393 ft	2215 ft
60	326 ft	518 ft	823 ft	1308 ft	2081 ft
63	314 ft	500 ft	794 ft	1262 ft	2007 ft
65	307 ft	488 ft	776 ft	1233 ft	1960 ft
70	290 ft	461 ft	733 ft	1165 ft	1852 ft
75	275 ft	436 ft	694 ft	1103 ft	1753 ft
80	261 ft	414 ft	658 ft	1046 ft	1663 ft
85	248 ft	394 ft	626 ft	994 ft	1581 ft
90	236 ft	375 ft	596 ft	947 ft	1505 ft
95	225 ft	357 ft	568 ft	903 ft	1436 ft
100	215 ft	341 ft	543 ft	862 ft	1371 ft
105	206 ft	326 ft	519 ft	825 ft	1311 ft
110	197 ft	313 ft	497 ft	790 ft	1256 ft
115	189 ft	300 ft	476 ft	757 ft	1204 ft
120	181 ft	288 ft	457 ft	726 ft	1155 ft
127	171 ft	272 ft	432 ft	687 ft	1092 ft

Wiring distances must not exceed 4000 feet (1219.2 meters)

Connecting Local Class B wired appliances

To connect the Repeater to the EPS or to an appliance using local Class B wiring, complete the following steps:

1. Route the wire from the + and the - outputs to the Repeater IDNAC IN terminal block.
2. Route the wire from the + and the - outputs on the Repeater IDNAC OUT terminal blocks to the corresponding inputs on a peripheral notification appliance.
3. Route wire from the first appliance to the next one. T tapping is allowed. Repeat this for each appliance.

NOTE:

1. Notification appliances are rated for each individual name plate label. Maintain correct polarity on terminal connections. Do not loop wires under terminals.
2. Each IDNAC+ and - terminal is rated for two identical wires, enabling up to four Class B T-Tap circuits to be placed directly on each IDNAC terminal block. See figure below.

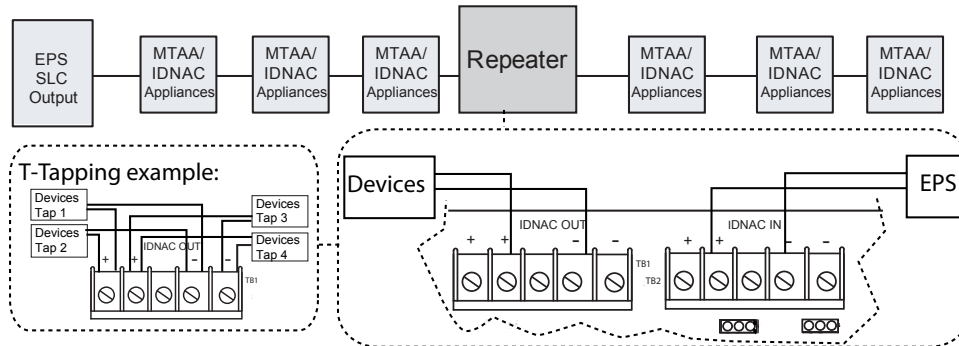


Fig 12: Local Class B wiring diagram

Local Class A Loop wiring

To create a local Class A* loop that stems from the Repeater, complete the following steps:

NOTE: For all Class A wiring, the repeater must be fitted with a Class A Adapter. Consult document 579-1080 for more information.

1. Route the wire from the **B+** and the **B-** outputs on the Class A Adapter terminal block to the appropriate inputs on a peripheral notification appliance.
2. Route the wire from the first device to the next one. Repeat this for each appliance.
3. When all the appliances have been added to the local Class A loop, close the loop by routing the wire to the **A+** and the **A-** outputs on the Class A Adapter terminal block.

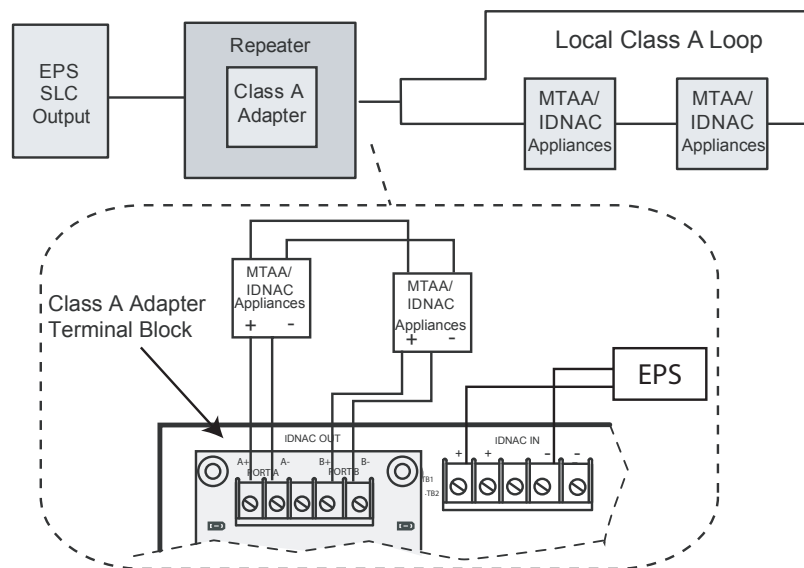


Fig 13: Local Class A Loop wiring

Testing and Troubleshooting

Extended Class A Loop wiring

One Repeater can be wired as part of an extended Class A Loop* Mode Configuration.

NOTE: To achieve this, a 4100-6103 Dual Class A Isolator (DCAI) must be part of the EPS configuration, see document 579-1029 for more information. The repeater must be fitted with a Class A Adapter, see document 579-1080 for more information. The 4905-9929 TrueAlert Isolator + Module is not supported in extended Class A Mode.

To wire the Repeater as part of an extended Class A loop using the Class A Adaptor, complete the following steps:

1. Route the wire coming from the DCAI to the **A+** and the **A-** inputs (default) on the Class A Adapter terminal block that is attached to the Repeater.
2. Route the wire from the **B+** and the **B-** outputs (default) on the Class A Adapter terminal block to the appropriate inputs on a peripheral notification appliance.
3. Route the wire from the first appliance to the next one. Repeat this for each device.
4. When all the devices have been added, route the wire back to the DCAI.

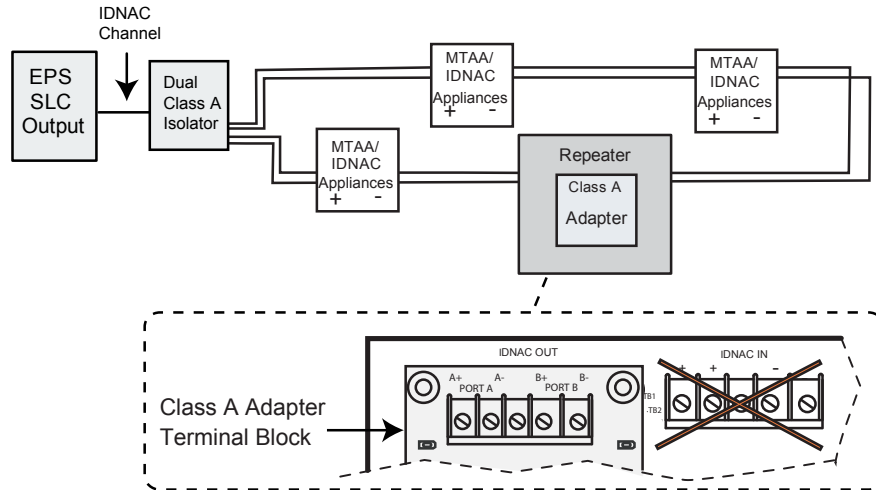


Fig 14: Extended Class A Loop wiring

Testing circuit supervision

Use the following procedures to confirm that the IDNAC and Aux Power output are supervising for opens, shorts, and grounds. The right column in this table shows the LEDs that illuminate when an open, short, or ground occurs on a specific circuit.

Table 6: Testing circuit supervision

Condition	Wiring configuration	Action	Corresponding LEDs
Open	Class B circuit	Disconnect the IDNAC circuit wiring from the repeater IDNAC OUT terminal block.	Missing devices reported at the panel. No indications on the Repeater trouble LEDs.
	Local or Extended Class A Loop circuit	Disconnect the wiring from the Class A Adapter Port A terminal block.	Class A trouble displayed on the Repeater trouble LEDs (LED C and D lit).
	Aux power output	No supervision for opens.	No supervision for opens.
Short	Class B circuit	Apply a zero ohm jumper across the IDNAC circuit at the repeater output.	IDNAC Out trouble displayed on the repeater trouble LEDs (LED A, B and D lit).
	Local or Extended Class A Loop circuit	Apply a zero ohm jumper across the IDNAC circuit at the Class A Adapter board Port B terminal block.	Class A trouble displayed on the Repeater trouble LEDs (LED C and D lit).
	Aux power output	Apply a zero ohm jumper across the Aux output terminal block.	Aux Trouble displayed on the repeater trouble LEDs (LED A and D lit).
Earth Ground	All wiring configurations	Place a 10K or smaller value resistor from supervised wiring to Earth ground.	Negative or Positive Earth trouble displayed on the repeater trouble LEDs. Negative: LED A, B, C lit - Positive: LED D lit.

Periodic battery testing

Consult the following requirements for battery testing:

- Test the batteries annually by discharging them with a suitable tester and verifying that the battery voltage is at least 21 V when fully discharged.
- Replace the batteries sooner than 4 years from the date of installation.
- Install batteries within six months of the date of their manufacture.

Additional battery information is as follows:

- The 4009 Repeater battery charger is temperature compensated according to battery manufacturer recommendations. There is no charger voltage adjustment.
- The battery voltage fluctuates with temperature variations. At normal room temperature the battery voltage should be 27-27.6 V when the battery set is fully charged. At higher temperatures, the voltage is lower. At lower temperatures, the voltage is higher.
- Table on page 13 shows the proper range of battery voltage across the specified operating range of the equipment.

Table 7: Voltage and temperature*

Temp (F)	Temp (C)	V/cell (min)	V/cell (max)	Min. Battery Voltage	Max. Battery Voltage
32	0	2.294	2.367	27.53	28.40
41	5	2.284	2.352	27.41	28.22
50	10	2.274	2.337	27.29	28.04
59	15	2.264	2.322	27.17	27.86
72	22.2	2.250	2.300	27.00	27.60
77	25	2.244	2.292	26.93	27.50
86	30	2.234	2.277	26.81	27.32
95	35	2.224	2.262	26.69	27.14
104	40	2.214	2.247	26.57	26.96
113	45	2.204	2.232	26.45	26.78
120.2	49	2.196	2.220	26.36	26.64

* For 12-Cell battery sets with 24 V minimal rating

Replaceable Devices

Consult the table below for a list of replaceable devices.

Table 8: Replaceable devices

Part	Replacement part number	Replacement notes
Battery Fuse*	208-099	The battery fuse is a fast acting, 8 A, 32 V fuse and is located in the positive lead of the battery harness.
AC Input Fuse* (F1)	208-195	The AC Input Fuse is in the line side of the AC input and is a time-delay, 4 A, 250 VAC fuse. It is located in the fuse holder FH1 under the High Voltage Cover. Shut down AC power and remove the high voltage cover to replace the fuse.
CAUTION: For continued protection against risk of fire, only replace with the same type and rating of fuse.		

LED Trouble indicator overview

The IDNAC Repeater is equipped with six indicator LEDs. There are four LED trouble indicators, one AC Power LED and one COMM LED.

The code produced by the LEDs corresponds to a trouble that is occurring on the FACP system. See Figure 16: System Trouble LED Codes on page 16 for the Trouble LED codes.

Use the **Trouble Scroll** button, see Figure 15: LED and trouble scroll location on page 15, to scroll through multiple troubles. Only one trouble is displayed at a time.

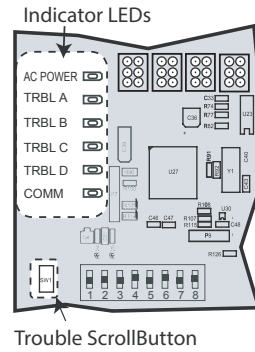


Fig 15: LED and trouble scroll location

COMM LED behavior

Blinking: The COMM LED blinks when communicating with the EPS module.

Off: An off COMM LED indicates a power failure.

AC power LED behavior

On: The AC Power LED is on when the power is on.

Off: An off AC Power LED indicates a power failure.

System Trouble LED codes

System troubles are indicated by LEDs A to D.

A	B	C	D	Description:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Trouble: There are no troubles detected on the system.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AC Fail: The AC power is disconnected but the battery is working.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low Battery: The battery charge is under X V.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Battery Cutout: The Battery charge is below X V. At this point if Jumper J3 is set to battery disconnect when depleted the system shuts down.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Depleted/Missing Battery: If Jumper J3 is not set to battery disconnect when depleted, this trouble appears when the battery charge is below X V. This code also appears if the system cannot detect the battery.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Charger Trouble: There is a trouble with the battery charger.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Card Overcurrent: The IDNAC Out is drawing too much current.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Negative Earth: The IDNAC Out or AUX output is shorted to ground on the negative wire.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Positive Earth: The IDNAC Out or AUX output is shorted to ground on the positive wire.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Aux Trouble: The AUX output is shorted or in overcurrent.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Power Trouble (8V, 13V, 24V): One or more of the supplies are not present.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	IDNAC Out Trouble: IDNAC Out is shorted or forced in shut down during initialization.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Class A Trouble: A short or open has been detected on IDNAC and the Return port/Port Swap is active.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Operation Mode Mismatch: Configuration received from the panel does not match the repeater configuration, Local Class B, Local Class A or Extended Class A loop mismatch.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Class A Port A Trouble: An open, when the port is set as an input, or a short is present on the Class A Adapter Port A.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Class A Port B Trouble: An open, when the port is set as an input, or a short is present on the Class A Adapter Port B.

Fig 16: System Trouble LED Codes

Programming

Trouble messages on the 4100ES

The table below explains the Repeater trouble messages that appear on the FACP display.

Table 9: Repeater 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 24 V nominal level by 10% or more.
Depleted/Missing Battery	The battery is either below 20 V or completely undetected.
Card Overcurrent	The EPS is drawing more current than it should. Check for faults on the circuit.
Charger	The battery charger is either defective or being heavily loaded by batteries. Read the charger current at the front panel. If the charger current is approximately 2 A, the batteries are likely loading the charger. Remove the battery connection and measure the output of the EPS. If the output is 27.6 (or close, temperature dependent), there is a possibility the batteries are depleted, or are a bad set of batteries. Charge the batteries or replace them if they do not take a charge.
Earth Fault Search	This is displayed during the Earth Fault Search diagnostic function. When the search is initiated, the front panel display indicates how far along the search process has progressed for example, 10%, 25%...75%. It then shows the results of the search. The result either identifies the offending circuit or indicates that the earth fault could not be found. EPS circuits such as, IDNet, IDNAC, and aux power are searched. System alarm and trouble processing is suspended during the search.
Short Circuit	This is displayed when a short is detected on the IDNAC channel. This status clears automatically when the short circuit is removed.

Compatible devices

Software requirements

In order to properly program the Repeater the computer must use ES Panel FACP System Firmware version 1.04 or later. Consult the *ES Panel Programmer's Manual (574-849)* for more information.

Adding the Repeater to the ES Programmer

The Repeater is programmed through the **EPS Point Editing** tab. To program the Repeater, complete the following steps:

1. Open or create a job in the ES Programmer.
2. Click the **Hardware** tab.
3. Double-click the EPS module connected to the Repeater to open the **Properties** window.
4. Click the **Point Editing** tab.
5. From the **Select Device** list, select **REPEATER**

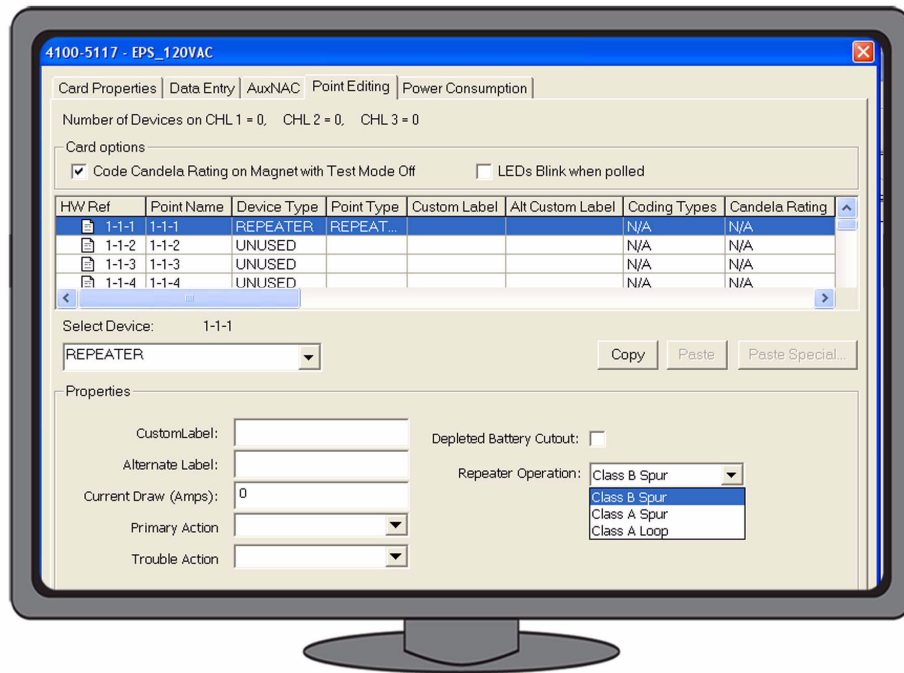


Fig 17: the Repeater

Setting the card properties

The **Card Properties** tab has the following input options:

- **Custom Label:** Enter a label that describes the card function, location, or other information.
- **Alternate Label:** Enter an alternative description of the card.
- **Current Draw (Amps):** This option specifies the current drawn by the device. The current draw is based on the device PID. To open the **Power** table and select the device, press the F11 key. When the correct device is selected, and the quantity entered the correct power rating for this device is displayed.
- **Primary Action:** Assign a Primary state Action Message to use for the NAC circuit. Select the action message from the list of default and user defined messages.
- **Trouble Action:** Assign a Trouble state Action Message to use for the NAC.
- **Depleted Battery Cutout:** If this check box is selected the Repeater shuts off after detecting a depleted battery condition when no AC power is present. This option is clear by default.
- **Repeater Options:** Select the option from the list that corresponds to the Repeater wiring style.
 - **Class B Spur** for Local Class B wiring
 - **Class A Spur** for Local Class A Loop wiring
 - **Class A Loop** for Extended Class A Loop wiring

Compatible devices

The following appliances are compatible with the 4009 IDNAC Repeater:

Table 10: Compatible addressable appliances

Addressable appliance description	TrueAlert ES appliances Model numbers			TrueAlert appliances Model numbers
Audible Only Horn notification appliances	49AO-WRF 49AO-WRF-BA 49AO-WRS-BA 49AO-WWF 49AO-WWF-BA	49AO-WWS-BA 49AO-APPLC-BA 49AO-APPLC 49MT-WRF ¹ 49MT-WRF-BA ¹	49MT-WRS-BA ¹ 49MT-WWS-BA ¹ 49MT-WWF-BA ¹ 49MT-APPLW ¹	4901-9850 4901-9853
Audible/Visible notification appliances	49AV-WRF 49AV-WWF 49AV-WRF-BA 49AV-WRQ-BA 49AV-WRS-BA 49AV-WWF-BA 49AV-WWS-BA 49AV-APPLC	49AV-APPLC-BA 49AVH-APPLCB-BA 49AVH-APPLCB 49AVH-APPLCA-BA 49AVH-APPLCA 49AVH-APPLC-BA 49AVH-APPLC	49MTV-WRF ² 49MTV-WRF-BA ² 49MTV-WRS-BA ² 49MTV-WWF ² 49MTV-WWF-BA ² 49MTV-WWS-BA ² 49MTV-APPLW ²	4906-9227 4906-9228 4906-9229 4906-9230
Visible Only notification appliances	49VO-WRF 49VO-WWF 49VO-WRA-A 49VO-WWA-A 49VO-WRA-BA 49VO-WRF-BA 49VO-WRQ-BA 49VO-APPLC	49VOH-APPLCB-BA 49VOH-APPLCB 49VOH-APPLCA-BA 49VOH-APPLCA 49VOH-APPLC-BA 49VOH-APPLC 49VO-APPLC-BA	49VO-WRS-BA 49VO-WWA-BA 49VO-WWF-BA 49VO-WWS-BA 49VO-WRA-A-BA 49VO-WWA-A-BA 49VO-WWS-A-BA	4906-9201 4906-9202 4906-9203 4906-9204
Speaker/Visible notification	-			4906-9251 4906-9253 4906-9254
Audible/Visible Weatherproof notification appliances	49AV-WRFO 49AV-WRFO-BA 49AV-WWFO-BA 49AV-APPLW-CO			-
Visible Only Weatherproof notification appliances	49VO-WRFO 49VO-WRFO-BA 49VO-WRSO-BA 49VO-WWFO-BA 49VO-APPLW-CO			-
TrueAlert Adapter				4905-9816
LED Visible-Only 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 High-Candela Wall- Mount	59VO-WRFH-BA 59VO-WWFH-BA	59VO-WRFABH-BA 59VO-WWFABH-BA	59VO-APPLWWH 59VO-APPLWRH	
LED Visible-Only Wall-Mount Weatherproof	59VO-WRFO 59VO-WRFO-BA 59VO-WWFO-BA	59VO-WRFABO 59VO-WWFABO-BA 59VO-WRFABO-BA	59VO-APPLWR-O 59VO-APPLWW-O	
LED Visible-Only High-Candela Wall- Mount Weatherproof	59VO-APPLWRH-O 59VO-APPLWWH-O			

Table 10: Compatible addressable appliances

Addressable appliance description	TrueAlert ES appliances Model numbers		TrueAlert appliances Model numbers	
LED Audible/Visible 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 Wall-Mount High- Candela	59AV-WRFH 59AV-WRFH-BA 59AV-WWFH-BA	59AV-WRFABH-BA 59AV-WRFABH 59AV-WWFABH-BA	59AV-APPLWRH 59AV-APPLWWH	
LED Audible/Visible 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	
LED Audible/Visible Wall-Mount High Candela Weatherproof	59AV-APPLWRH-O 59AV-APPLWWH-O			
Audible-Only Wall-Mount	59AO-WRS 59AO-WRS-BA	59AO-WWS 59AO-WWS-BA	59AO-APPLWR 59AO-APPLWW	
Audible-Only Wall-Mount Weatherproof	59AO-WRSO 59AO-WRSO-BA 59AO-WWSO-BA	59AO-APPLWR-O 59AO-APPLWW-O		
Wall-Mount Speaker and Speaker/ Visible and backplate	49SV-APPLW -BA 49HFV-APPLW -BA 49MP-SVWR	49HF-APPLW-BA 49SO-APPLW-BA 49MP-SVWW	49MP-SOWW 49MP-SOWR	
Ceiling-Mount Speaker and Speaker/Visible	49SO-APPLC-BA 49HF-APPLC-BA 49SV-APPLC-BA	49HFVH-APPLC-BA 49SVH-APPLC -BA 49HFV-APPLC-BA	49HFVH-APLCB-BA 49HFVH-APLCA-BA	
Plate	59AP-EUROBB			
¹ A maximum of thirty-two 49MT appliances for each circuit. ² A maximum of twenty-one 49MTV appliances for each circuit.				

Table 11: Compatible devices

Addressable device description	Model numbers
Dual Class A Isolator (DCAI)	4100-6103
TrueAlert Addressable Isolator+ Module	4905-9929

