

# 2050 and 2250 Foundation Series Fire Alarm Control Units Installation Guide





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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 AUTOCALL™ PRODUCT THAT APPEARS DAMAGED** Upon unpacking your Autocall 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 Autocall 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 Autocall product supplier.



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

- Ground yourself before opening or installing components.
- Before 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.

**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 REACCEPTANCE 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.

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## 2 Overview

The A050-9101 and A250-9101 are addressable fire alarm control units (FACUs).

A050-9101 is a small one loop addressable control unit with the capacity of 50 addressable devices or points for each loop. You can wire the loop using Class A or Class B wiring. The control unit supports two Notification Appliance Circuits (NACs). You can wire the NACs using Class A or Class B wiring.

Whereas A250-9101 is a comparatively big one loop addressable control unit with the capacity of 250 addressable devices or points for each loop. You can wire the loop using Class A or Class B wiring. The control unit supports four Notification Appliance Circuits (NACs). You can wire the NACs using Class A or Class B wiring.

Both control units support an internal or external gateway module for communication with the remote station or central station.

Both control units provide audible and visible indications during Fire alarm, Priority-2, supervisory, or trouble conditions. If any of these conditions occur, the system activates the applicable notification appliances, respective LEDs, and the control unit piezo. The indications continue until an operator acknowledges the condition.

**Note:** From this point on, both the A250-9101 control unit and the A250-9101 control unit are referred as 2250, unless stated otherwise. NAC trouble configuration must be avoided for general announcement and must be limited to specific applications like notifying a security person.

### 2.1 Features

- 4 x 40 backlit LCD, LEDs and keypad
- System power supply (6A); 24 V filtered
- One MX loop
  - 50 devices for each loop for the 2050 control unit
  - 250 addressable devices or points for each loop for the 2250 control unit
- 2050: Two Class A or Class B NACs
- 2250: Four Class A or Class B NACs
- Three onboard relay circuits:
  - 1: Default for Trouble
  - 2: Programmable
- Two auxiliary outputs:
  - Aux 1: Non-resettable power
  - Aux 2: Resettable power
- USB service port, is only for panel configuration purpose.
- Connection for interface to optional city card module and gateway module
- RS485 communication for Annunciator support
- Battery-backed, non volatile memory preserves logs, time and date information and disabled points on AC loss.

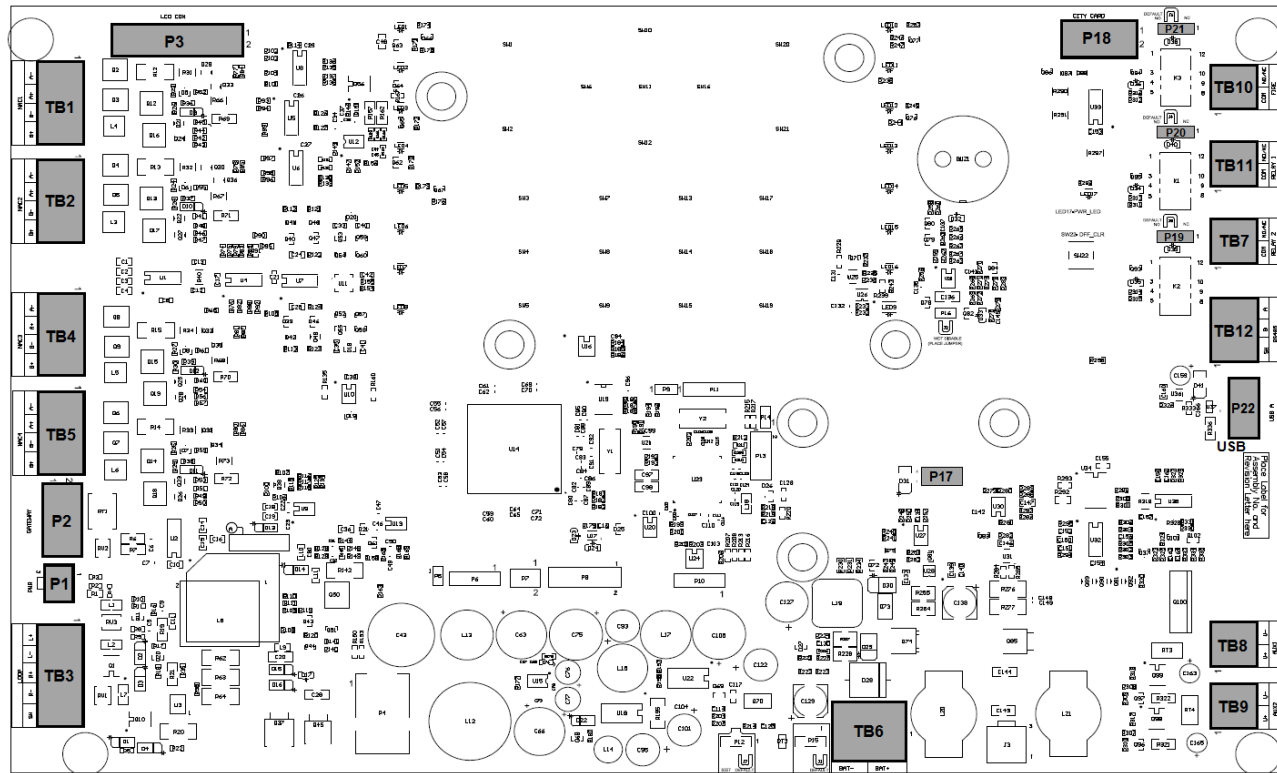


Figure 1: 2250 control unit board

Table 1: Main components information

Identifier	Description	Identifier	Description	Identifier	Description
TB1	NAC1	TB7	Relay-3	P3	LCD display connector
TB2	NAC2	TB8	Aux-1 (Non-resettable power)	P17	RFID connector
TB3	MX Loop	TB9	Aux-2 (Resettable power)	P18	City Card connector
TB4	NAC3 The TB4 is not available in the 2050 control unit board	TB10	Relay-1	P19	Jumper for Relay-3 setting
TB5	NAC4 The TB5 is not available in the 2050 control unit board	TB11	Relay-2	P20	Jumper for Relay-2 setting
TB6	Battery terminal	P1	Gateway module connector	P21	Jumper for Relay-1 setting
		P2	Gateway module power connector	P22	USB port

## 2.2 Power supply specification

A 2250 / 2050 fire alarm panel power supply can source maximum 6A of 24V power including the base draw of main system boards. The current drawn from optional cards, MX devices, AUX powers and NACs must be subtracted from 6A.

**Table 2: 2250 / 2050 system and sub-circuit power limits**

Item	Current
<b>Maximum AC input</b>	2 A at 120 VAC, 50/60Hz
	1 A at 240 VAC, 50/60Hz
<b>Maximum Auxiliary (AUX) supply rating (Both resettable and non-resettable)</b>	1 A at 24 V
<b>Maximum load on MX loop</b>	0.945 A at 40 V
<b>Maximum alarm load for each NAC</b>	3 A at 24 V
<b>Total load supported with NAC and AUX when Loaded together</b>	5 A at 24 V
<b>Maximum rated Battery support</b>	25 Ah at 24 V

### Important:

1. When using more than one NAC supply in Alarm, total current including all NACs and all AUX must not go beyond 5A. Using entire 5 A on NAC and AUX leaves 1A for MX device, base draw and current drawn from optional cards.
2. Do not exceed 6A limit of power supply rating at any running condition.
3. The 2250 / 2050 back box can accommodate up to two 18 Ah batteries. Batteries up to 25 Ah requires external battery cabinet (A009-9801).

### 2.2.1 Battery

#### 2.2.1.1 Battery specification

Use Sealed Lead Acid batteries only.

Maximum battery capacity: 25 Amps Hours.

Maximum charging current: 1.40A.

Standby time- 24hrs

2050 / 2250 Panel can hold maximum two 12 VDC, 18 Ah batteries, of dimension within 184 mm (W) X 86 mm (D) X 168 mm (H) for a single battery.

*Batteries up to 25Ah requires an external battery cabinet: A009-9801.*

#### 2.2.1.2 Battery Replacement Procedure

1. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.
2. This system meets NFPA requirements for operation at 32° to 120° F (0° to 49° C), up to 93% relative humidity at 90° F (32° C). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity.

To replace batteries, ensure you adhere to the following guidelines:

1. Remove the AC power at the breaker from the control unit.
2. Remove insulating cover of the Panel marked with the high voltage warning.
3. Remove red wire from positive terminal from battery.
4. Remove black wire from negative terminal of second battery.
5. Replace with batteries of correct Ah rating.



## 3 Installing the 2250 FACU

This section describes how to install the 2250 FACU. It can be the surface mount only.

### 3.1 Unpacking the 2250 FACU

The control unit packaging contains the following contents:

- A sheet metal cabinet with metal door with an assembled main system board.
- A transparent plastic bag that contains the following:
  - A door lock key
  - A battery harness
  - Operating instruction 579-1439AC

### 3.2 Locating the back box

To locate the back box, complete the following steps:

1. Choose a location that is well-ventilated, clean and dust-free.
2. Locate the back box near a dedicated AC individual branch circuit with an earth ground to maintain a consistent voltage supply.
3. Keep the back box away from sources of heat, including direct sunlight.
4. Keep the back box away from sources of vibration or physical shock.
5. Keep the back box away from sources of Radio Frequency Interference (RFI) such as a radio transceiver base station or hand held unit.
6. Isolate the back box from sources of strong electromagnetic fields, such as air conditioners, large fans, and large electric motors.
7. Mount the back box to the wall so that the top of the enclosure is no more than six feet above the floor. For more information, see [Mounting the back box](#).

### 3.3 Mounting the back box

To mount the back box, complete the following steps:

1. Unlock the control unit's cabinet using the supplied key.
2. Remove the earth cable, then remove the control unit's hinged door and black insulating cover. Keep the control unit's door and insulating cover in a secure location.
3. Place the control unit against the wall and mark the top two keyholes. Keep the control unit in a secure location.
4. Pre drill the marked, top two keyholes.
5. Install the two top fasteners in the wall. Ensure that the screw heads protruding.
6. Place the back box over the top two screws. Ensure that the back box is level and secure.
7. Mark the lower two holes. Remove the back box from the wall and drill the mounting holes.
8. Mount the back box. Install the remaining fasteners and tighten all screws.
9. Complete the entire wiring and terminations as described in [Wiring the 2250 control unit](#).
10. Mount the black insulating cover and the control unit's hinged door back onto the FACU.

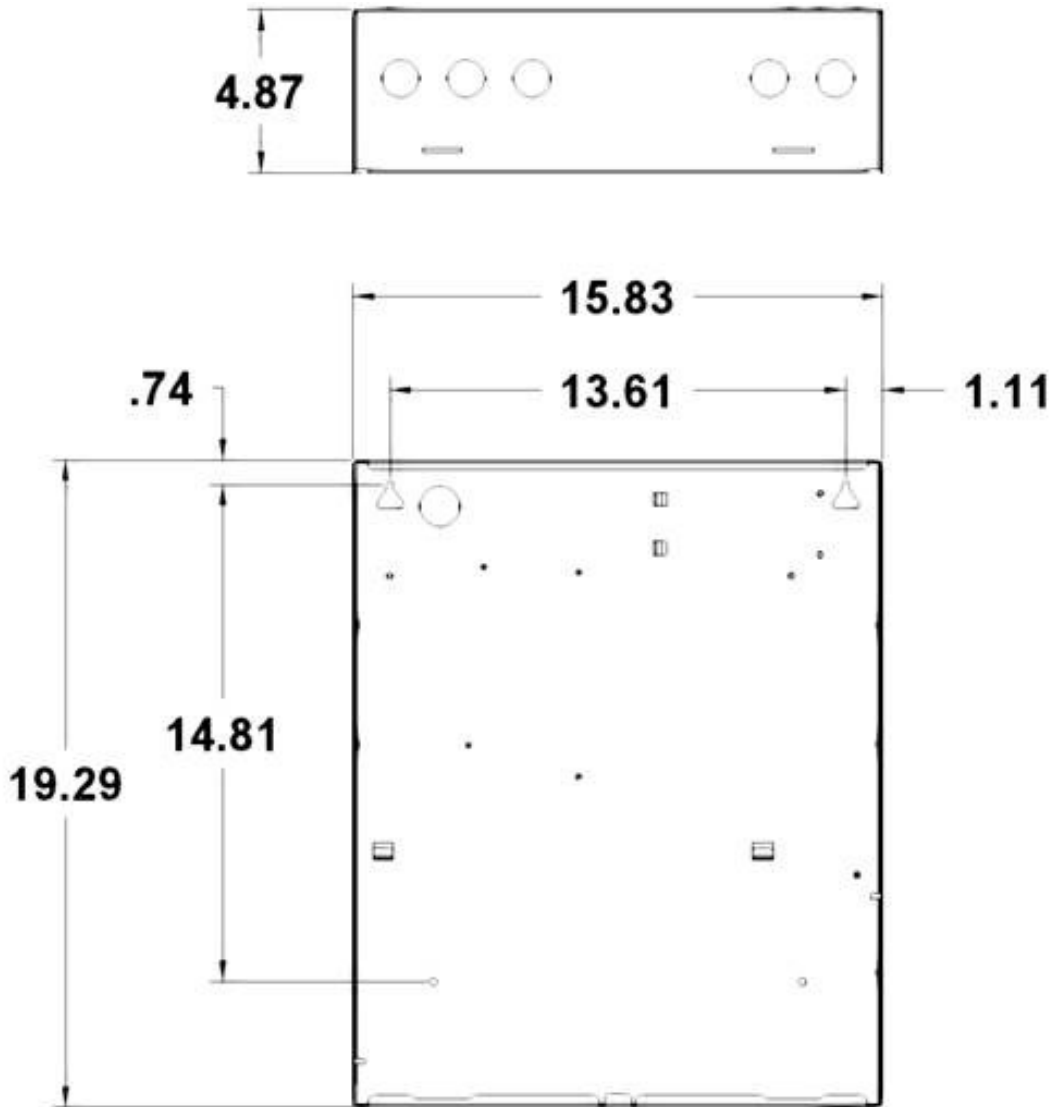


Figure 2: Cabinet details with the dimensions in inches

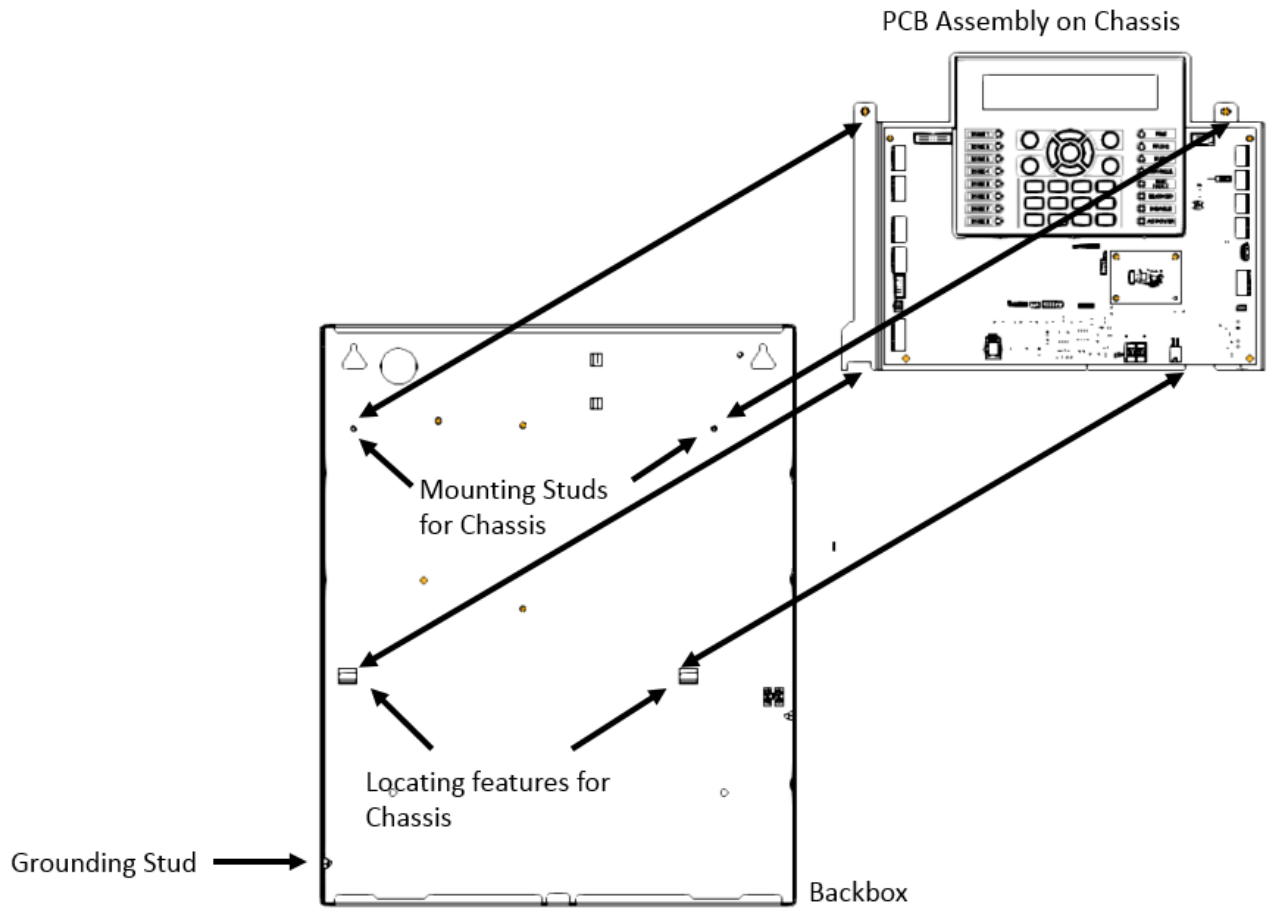


Figure 3: Main system board mounting

### 3.4 Trim kit for semi-flush mounting

This section describes how to apply the trim kit and how to attach the trim.

#### 3.4.1 Trim kit application

Trim kits are used to cosmetically cover wall openings when boxes are mounted semi-flush into the wall. Trim kits include the following contents:

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

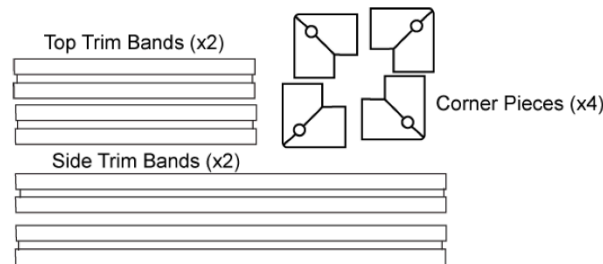


Figure 4: Semi-flush trim kit

#### 3.4.2 Attaching the trim

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 1 in. or 25 mm shorter than the box dimension. The box is 15.83 in. or 402 mm wide and 19.83 in. or 490 mm high.

After mounting the box semi-flush to the wall, attach the trim by completing the following steps:

1. Attach the strips one at a time. Peel off the adhesive tape release and center the strip on the box placing the edge of the strip against the box surface. Press solidly to ensure adhesion.
2. Each corner piece overlaps the trim strip slightly less than 3/4 in. or 19 mm. Align the corner pieces tight to the box corner and attach with a drywall or a similar screw that is suitable for the wall material. The screws are not supplied.

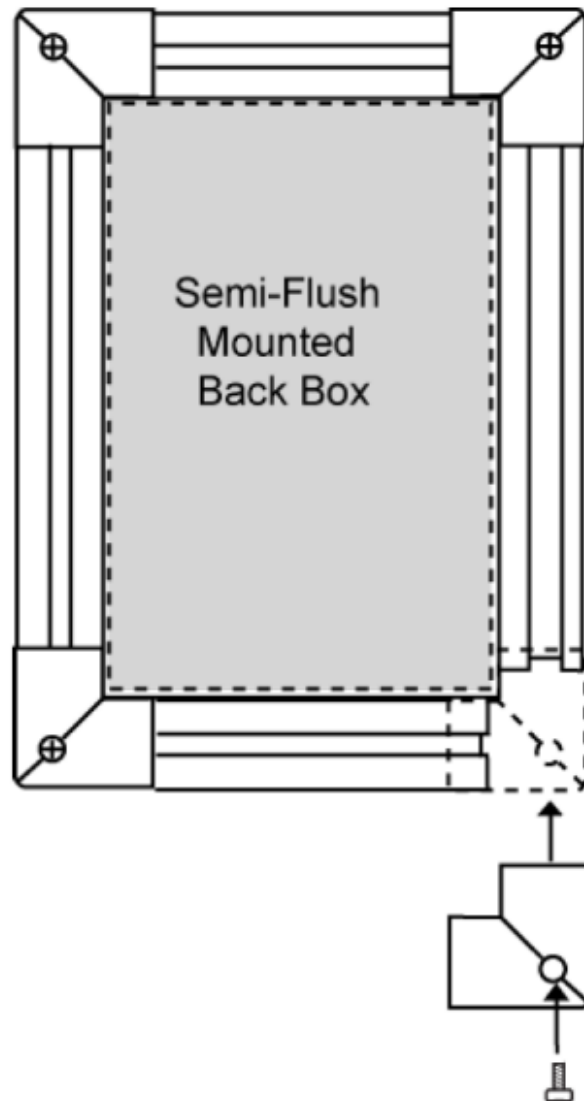
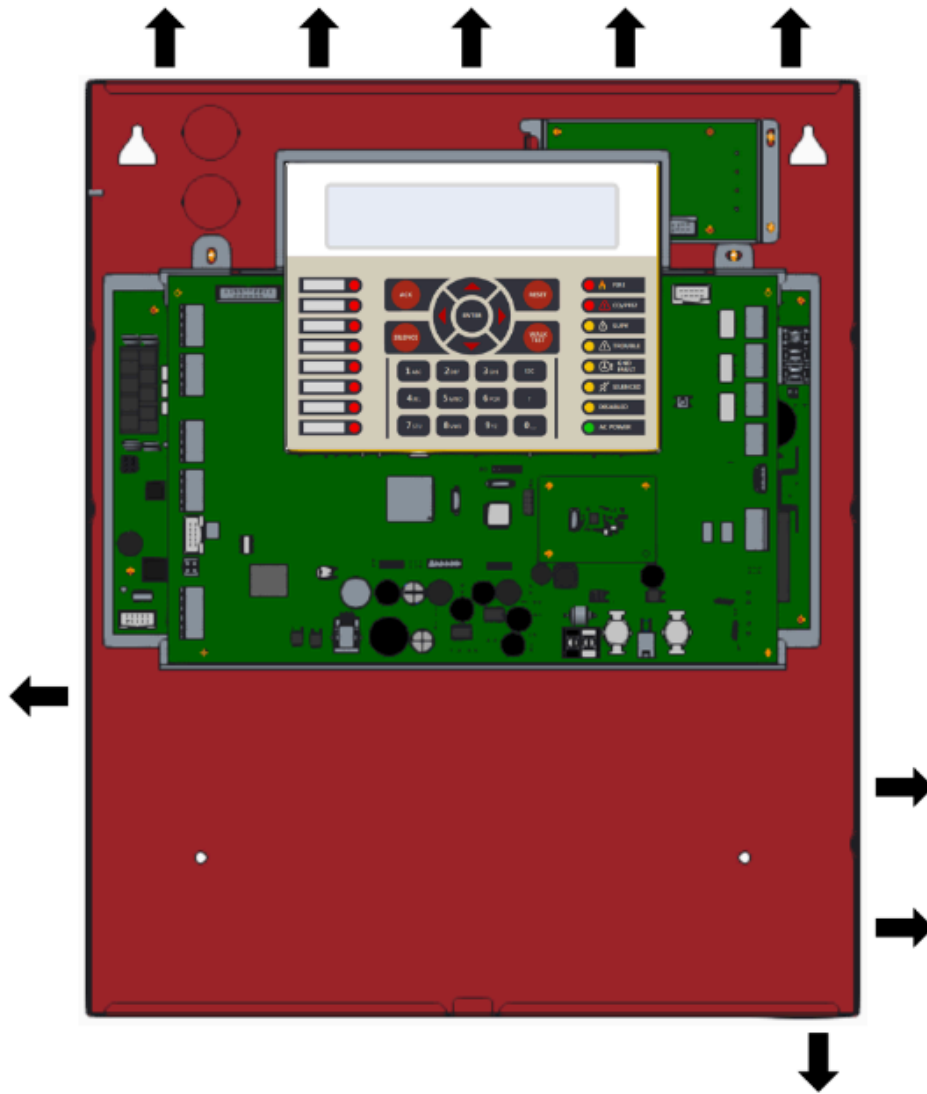


Figure 5: Applying the trim

### 3.5 Connecting conduit entrances

Eight knockouts are provided for conduit connection. The location of each knockout is shown in Figure 6.



**Figure 6: Knockout locations**

To connect a conduit, complete the following steps:

1. Select the suitable knockout or knockouts and pull the conductors in the box.
2. Separate the non-power limited (NPL) wiring from the power limited (PL) wiring.
3. Maintain a minimum distance of 0.25 in. or 6.35 mm between non-power limited wiring and power limited wiring.
4. Power all auxiliary relay loads from the AUX power circuit or from a regulated, 24 VDC, power limited power supply that is UL listed for fire protective signaling service.

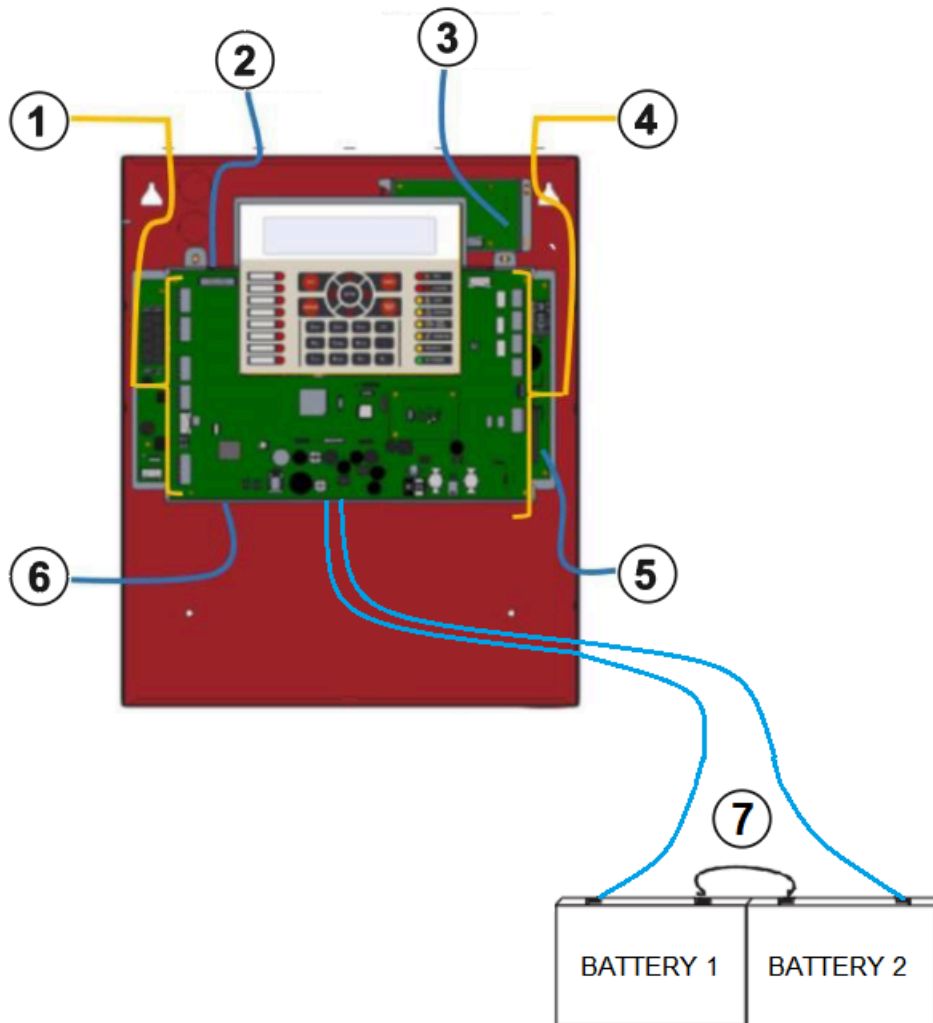


Figure 7: Orange power limited and blue non-power limited wiring

Table provides the description for Figure 7.

Callouts	Description
1	PL conduit entry for loop and NAC circuits
2	NPL conduit entry for PSTN lines from the gateway module 12 to 18 AWG.
3	NPL conduit entry for city circuits
4	PL conduit entry for relays, RS485 and Aux power
5	NPL conduit entry for AC power
6	NPL conduit entry for IP channel from gateway module
7	NPL conduit entry for External battery box

**Note:** Wiring for Internal Battery is NPL and it must be correctly spaced as by the mentioned spacing in section 3.5 with PL wiring while doing connection.

**Caution:** When installing, route field wiring away from sharp projections, corners and internal components.

## 4 Wiring the 2250 FACU

This section describes how to wire the 2250 FACU.

### 4.1 Wiring the 2250 control unit

Follow these guidelines when connecting power-limited (PL) systems:

1. Separate the PL circuit wiring from the NPL circuit wiring in the cabinet.
2. Maintain a minimum distance of 0.25 in. or 6.35 mm between NPL and PL wiring.
3. Check that the conductors test free of all grounds.
4. Provide a system ground for earth detection and lightning protection devices.  
**Note:** Check that this connection complies with approved earth detection for each NFPA780. Earth Detection Threshold: 10 K ohms from either positive or negative terminals.
5. Use copper conductors for all wiring, unless noted otherwise.
6. Keep excess slack to a minimum inside the back box enclosure.
7. Use wire ties to neatly dress and bundle the circuit wiring together.
8. Use unshielded wire. If you are using shield wire, leave the shield unterminated or open.
9. Do not run wires through elevator shafts.

#### 4.1.1 Wiring the AC power supply

To wire the AC power supply, complete the following steps:

1. Before handling the AC feed, use a voltmeter to verify that it is not live.
2. Ensure that the circuit is de-energized and tagged to prevent injury.
3. Wire the AC power from a dedicated circuit breaker or fuse that is rated at a maximum of 20 A in accordance with NFPA 72, NEC, and local codes.
4. Check that the AC supply wiring is between 14 AWG minimum and 12 AWG maximum.
5. Connect a 12 AWG copper ground wire from a safety ground in the electrical distribution unit to the control unit's safety ground stud.
6. The input voltage range for the AC power supply is:
  - 120 VAC, 50 or 60 Hz
  - 240 VAC, 50 or 60 Hz

**Note:** You are not required to select any configuration settings.

#### 4.1.2 Connecting the backup batteries

Use the harness that comes with the control unit to connect the backup batteries to the system board in the same cabinet. For more information, see [Connecting the battery harness](#).

The system requires 24 V battery back up. Use two 12 V batteries that are connected in series.



### 4.1.3 Connecting the battery harness

To connect the main battery harness to the 0.25 in. fast-on battery terminals, complete the following steps:

1. Connect the black wire to the negative battery terminal of Battery 1.
2. Connect the Gray / White wire (jumper) from the positive battery terminal of Battery 1 to the negative battery terminal of Battery 2.
3. Do not connect the red wire at this time.
4. Connect the battery harness to the battery terminal (TB6) on the system board.

**Note:**

- Red wire is connected to positive terminal of battery 2 during powering up.
- Ensure that the battery terminals face the front of the box.

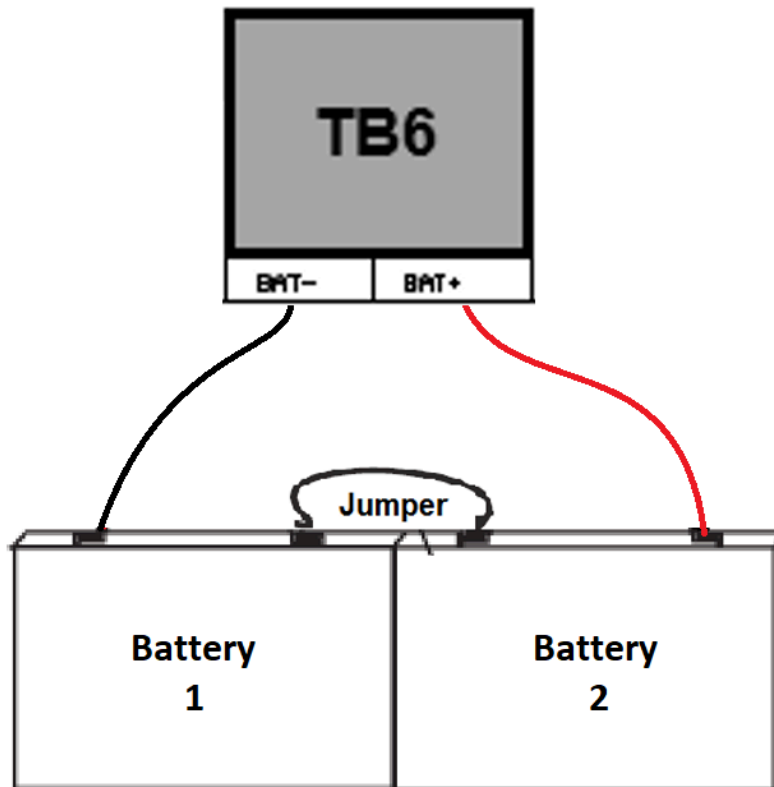


Figure 8: Connecting the battery harness

### 4.1.4 Minimizing power losses

The 2250 control unit's battery charger supports up to maximum of 25 Ah batteries within UL 864 guidelines. 18 Ah batteries can fit inside the cabinet. For batteries greater than 18Ah, an external battery box (A009-9801) is required.

Wiring the control unit from the external battery box can cause power losses. To minimize power losses, complete the following steps:

1. Use a 12 AWG wire.
2. Mount the battery box less than 20 feet or 609.6 cm of the control unit.
3. Enclose all interconnecting wiring in conduit.
4. The battery circuit is supervised, but not power-limited.

## 5 Powering the system

To power the system, complete the following steps:

1. Check that the AC power is wired to the control unit.
2. Check that the breaker controlling the circuit is off.
3. Connect the negative lead, the black wire, of the battery harness to the battery.  
**CAUTION:** Do not connect the positive lead, the red wire, of the battery harness to the battery at this point.
4. Verify the system wiring with a volt-ohm meter (VOM) as described in [Wiring the 2250 control unit](#).
5. Apply AC power.
6. Connect the positive lead to the battery.

## 6 Product description

The following section contains the product description of the 2250 control unit and a list of compatible devices.

### 6.1 MX addressable devices

The 2250 is compatible with the following different types of addressable devices:

1. Photoelectronic smoke sensor
2. Heat detector
3. Combination of photo and heat sensor
4. Triple (Combination of photo, heat and CO)
5. Isolator module

Refer to *579-1462AC MX compatibility chart document for more details.*

#### 6.1.1 MX loop specifications

- The 2050 control unit can support up to 50 devices and addressable points for each loop and the 2250 control unit can support up to 250 devices and addressable points for each loop.
- You can wire the loop using Class A or Class B wiring.
- MX circuit load: 945 mA maximum.
- All wiring must be 18 AWG min. to 12 AWG max.
- Maximum loop length: 2 km (6561 ft.), with 18 AWG wire.
- Conductors must test free of all grounds and stray voltages before connection to appliances and control unit.
- All wiring is supervised and power-limited.
- 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  $\mu$ F.
- Resistance to compatible devices. (Include the A2081-9044 Overvoltage Protector resistance when applicable) = 50 ohms maximum.
- Earth detection threshold: 10 K ohms from either positive or negative terminals.

**Note:**

1. Installer must not use a double loop or redundant conductors or circuits to avoid electrical supervision does not meet the intent of these requirements.

### 6.1.1.1 Class A wiring

To wire the loop using Class A wiring, complete the following steps:

1. Select Class A wiring style from the PC tool.
2. Route the wire from the loop circuit primary terminals **B+ B-** on the **TB3** of the MX loop to the corresponding inputs of the first device.
3. Route the wiring from the first device to the next as in or out, repeat this step for each device. See Figure 9.
4. Route the wire from the last appliance to the **A+ A-** terminals of the control unit's system board.
5. Do not **T-Tap** the wiring.

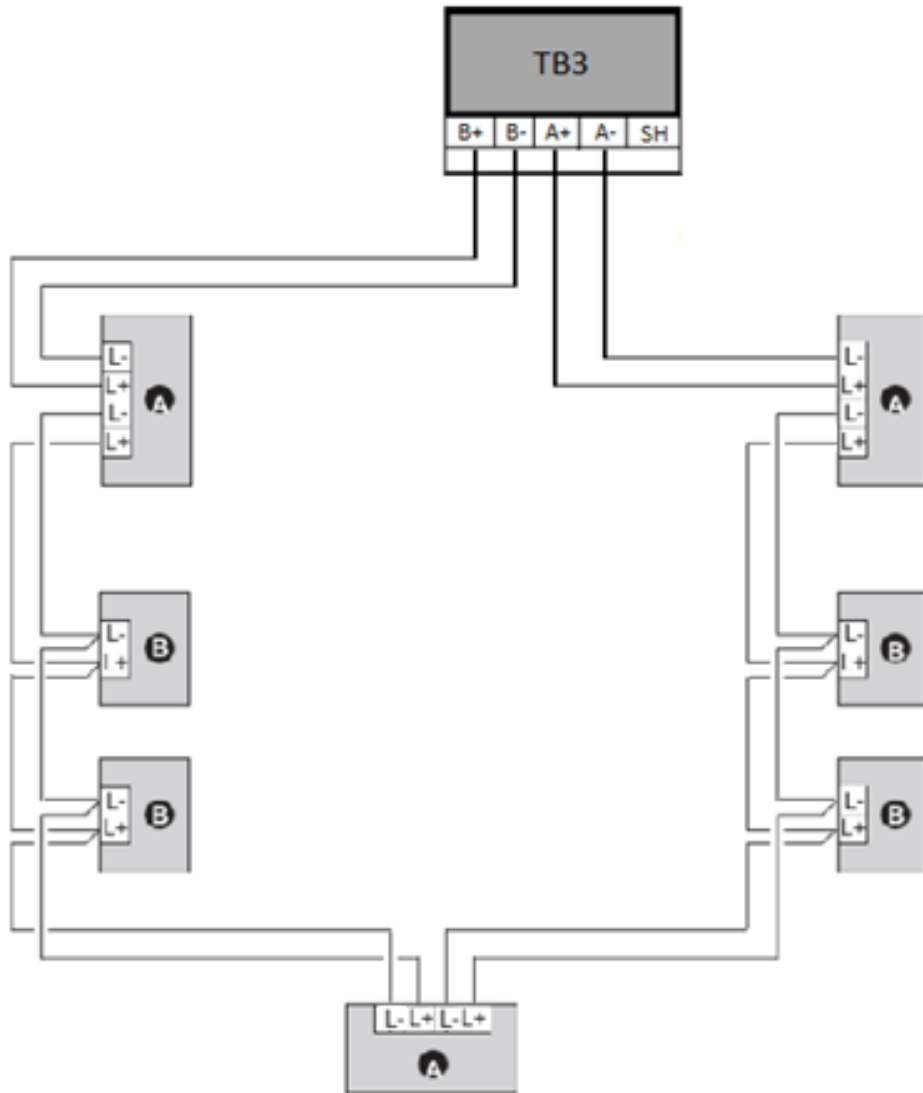


Figure 9: Class A wiring

Callout	Description
A	Isolators
B	Compatible addressable devices (Detector, Input modules, Output modules)

### 6.1.1.2 Class B wiring

To wire the loop using Class B wiring, complete the following steps:

1. Select Class B wiring style from the PC tool.
2. Route the wire from the loop circuit primary terminals **B+ B-** on the **TB3** of the MX loop to the corresponding inputs of the first device.
3. Route the wiring from the first device to the next as in and out, repeat this step for each device. See Figure 10.
4. Terminate the wire at the last device. A return loop to the control unit or end-of-line resistor (EOLR) is not required.

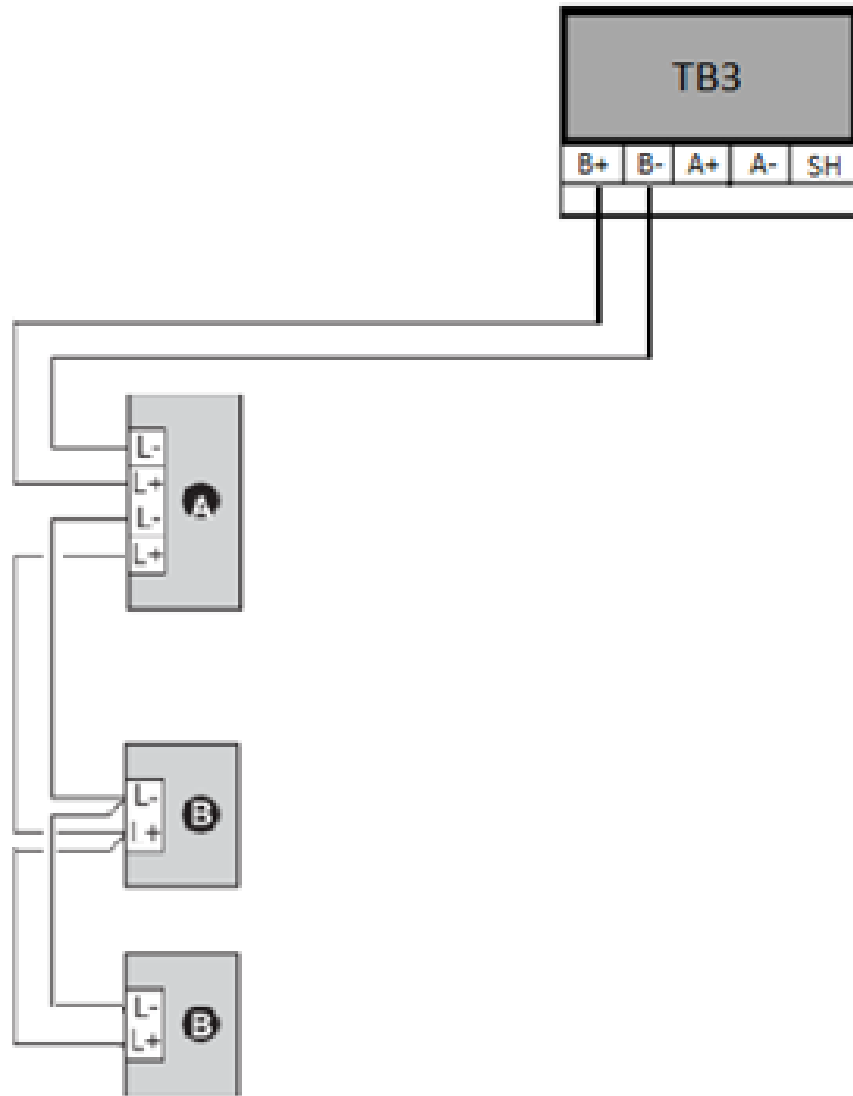


Figure 10: Class B wiring

Callout	Description
A	Isolators
B	Compatible addressable devices (Detector, Input modules, Output modules)

## 6.2 Notification Appliances Circuits (NACs)

A 2050 panel has two and 2250 panel has four conventional reverse polarity NAC circuits. It provides total 5A (including panel board consumption, NACs and Aux circuits) and can support non-addressable notification devices.

2050 panel allows connection to up to two Class A or Class B NAC circuits.

2250 panel allows connection to up to four Class A or Class B NAC circuits.

The following TrueAlert non-addressable are special application compatible NAC devices:

- A4906 multi-candela series
- A4901 series horn
- A49CMT series horn
- A49CMTV series AV
- A4902 series Non-Addressable Chime
- A4905-9835 Temporal code 4 Sync module

Refer Annexure A for list of devices and maximum quantity of devices supported

### 6.2.1 Wiring NACs

- Check that all wiring is between 18 AWG minimum and 12 AWG maximum.
- Check that conductors test free of all grounds and stray voltages before connecting to appliances and the control unit.
- All wiring is supervised and power-limited. All NAC circuits are regulated.
- Leave the supplied 10K, 1/2 W resistor across all unused NAC terminals.
- Terminate Class B circuits with listed 10K, 1/2 W end-of-line resistor harness, part number 0733-894AC.

#### 6.2.1.1 Selecting an end-of-line resistor

The NAC Class B circuit supports 3.9K, 4.7K, 5.1K, 5.6K and 15K values for end-of-line (EOL) resistors to accommodate retrofit applications.

Use the **UI** option or PC tool to select an EOL value. For more information on the supported EOL resistors and the related supervisory current, see Table 3.

**Table 3: Supported EOLR and supervisory current**

EOLR value	Current
3.9K	5.7 mA
4.7K	4.8 mA
5.1K	4.4 mA
5.6K	4.0 mA
10K (Default)	2.2 mA
15K	1.4 mA

### 6.2.1.2 Wiring the Class A notification appliance circuits

To wire Class A NACs, complete the following steps:

1. Route the wire from the **B+ B-** terminals of the system board to the appropriate inputs on a peripheral notification appliance. See Figure 11.
2. Route the wire from the first appliance to the next. Repeat this step for each appliance.
3. Route the wire from the last appliance to the **A+ A-** terminals on the same NAC circuit of the system board.
4. Do not **T-Tap** the wiring.

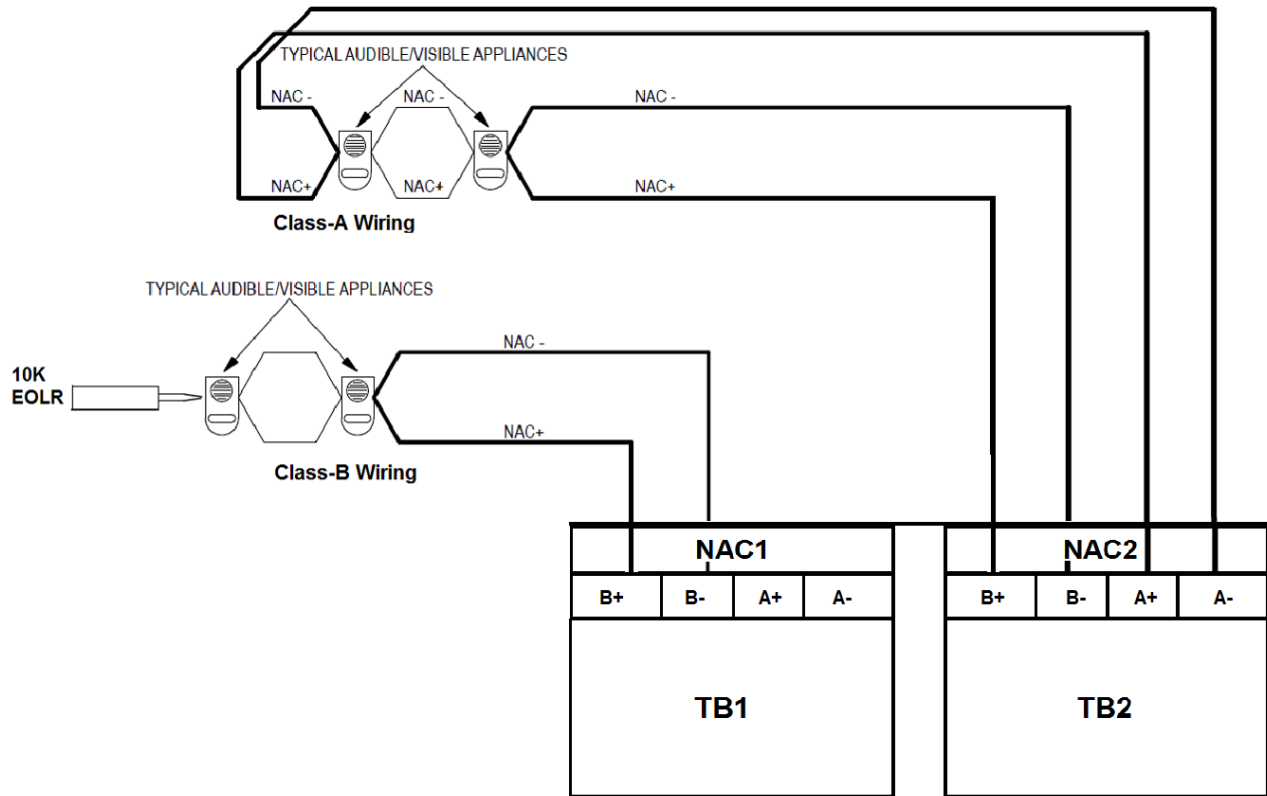


Figure 11: NAC wiring

### 6.2.1.3 Wiring the Class B notification appliance circuits

To wire the Class B NACs, complete the following steps:

1. Route the wire from the **B+ B-** terminals of the system board to the appropriate inputs on a peripheral notification appliance. See Figure 11.
2. Route the wire from the first appliance to the next. Repeat this step for each appliance.
3. Route the wire from the last appliance to the 10K, 1/2 W end-of-line resistor harness 0733-894AC.
4. Do not **T-Tap** the wiring.

### 6.2.1.4 NAC wiring distance

This section describes the wiring distances for the Class A and Class B NACs. The wiring distances for the Class A and Class B NACs are calculated at 49°C or 120°F. If you are installing in locations that are exposed to higher temperatures, refer to NEC. The wiring distance is based on a 3 V drop and takes into account the control unit's worst case output voltage.

**Table 4: NAC Class A wiring distances**

Alarm Current	Max distance w/ 18 AWG (0.8231 mm <sup>2</sup> )	Max distance w/ 16 AWG (1.309 mm <sup>2</sup> )	Max distance w/ 14 AWG (2.081 mm <sup>2</sup> )	Max distance w/ 12 AWG (3.309 mm <sup>2</sup> )	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 5: NAC Class B wiring distances**

Alarm Current	Max distance w/ 18 AWG (0.8231 mm <sup>2</sup> )	Max distance w/ 16 AWG (1.309 mm <sup>2</sup> )	Max distance w/ 14 AWG (2.081 mm <sup>2</sup> )	Max distance w/ 12 AWG (3.309 mm <sup>2</sup> )	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
2.50A	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

### 6.2.1.5 NAC wiring specifications

- The maximum ripple is 1/2 V peak-to-peak.
- The current rating for each NAC circuit is 3A maximum. Total load (All NAC's, Aux, MX loop etc...) for panel PSU must not exceed 6A.
- The maximum wiring capacitance when using two-wire audible or visible appliances is 0.22 µF.
- See Table 4 and Table 5 for the wiring distances for 0.25 A to 3 A loads.
- For all other UL listed notification appliances, the rating for each NAC is 24 VDC regulated at a maximum of 3 A.
- The total 5 A capacity can be shared between auxiliary loads or all NAC circuits, considering maximum 3A load to each NAC circuit.
- The synchronization of strobes across all NACs in a system that is UL listed for Autocall models is listed in section [Notification Appliances Circuits \(NACs\)](#).



### 6.3 Auxiliary relays

The control unit has three onboard relays. The contact rating for auxiliary relays is 24 VDC at 2 A. You can select each relay for normally closed or normally open operation. For the relay settings, see Table 6.

- Relay 1 is the common trouble relay and is normally energized. Relay 1 is non programmable.
- When the control unit is completely powered off, the default setting of the trouble relay is **Off Normal**.

Relays 2 and 3 are programmable. The default operation for relays 2 and 3 are as follows:

- Relay 2 is the common alarm and the default setting for Relay 2 is **On Until Rest**.
- The default setting for relay 3 is common supervisory.

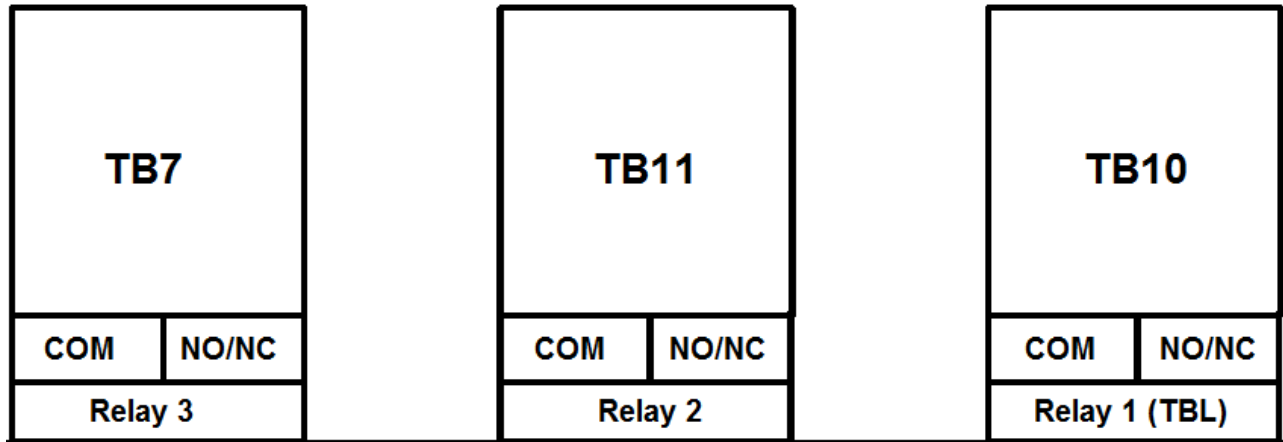






Figure 12: AUX relays

Table 6: Relay settings

Ref designator	Functions	Settings	Jumper position
P21	Relay 1 contact setting	Normally open	1-2 (Left) 
		Normally closed (Default)	2-3 (Right) 
P20 and P19	Relays 2 and 3 contact setting	Normally open (Default)	1-2 (Left) 
		Normally closed	2-3 (Right) 

#### 6.3.1 Wiring auxiliary relays

To wire an auxiliary relay, check that the following requirements are met:

- All wiring is between 18 AWG minimum and 12 AWG maximum.
- Check that the conductors test free of all grounds and stray voltages before you connect the auxiliary relay to the control unit.
- All wiring is unsupervised.

**Note:** All auxiliary relay loads must be powered from the AUX power circuit or from a regulated, 24 VDC, power limited power supply that is UL-listed for fire protective signaling service.

## 6.4 The RS485 interface

Use the RS485 interface to connect annunciators.

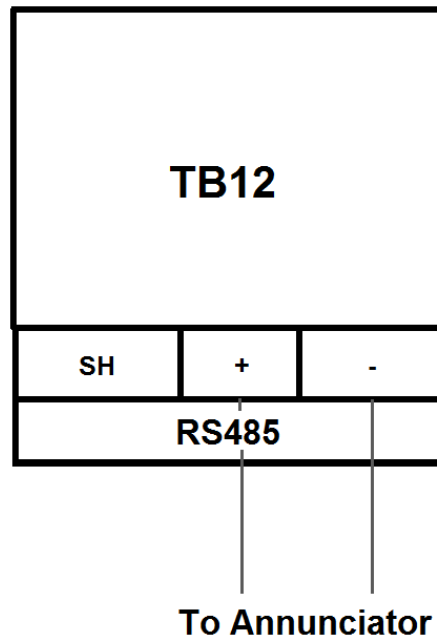


Figure 13: RS485

### 6.4.1 Wiring annunciators

To wire an annunciator, complete the following steps:

- All wiring is between 18 AWG minimum and 12 AWG maximum.
- All wiring is supervised and power limited.
- Check that all conductors must test free of all grounds and stray voltages before you connect the annunciator to the unit.
- For bus style wiring, the maximum wiring limit is 4,000 feet. For bus style wiring, see Figure 14.
- For T-Tap style wiring, the maximum distance to the furthest device is 2,500 feet. For T-Tap style wiring see Figure 15.
- The maximum wiring capacitance is 0.58  $\mu$ F.
- Attach 0733-974AC (100 ohm, 1/2 W) resistor **A** as shown in Figure 14 and Figure 15 for the line matching.
- Refer to the remote annunciator's instructions for more details.
- Annunciator wiring of RS485 needs to be in class B only.
- Annunciator model compatible with A250-9101 and A050-9101 model is A606-9101.

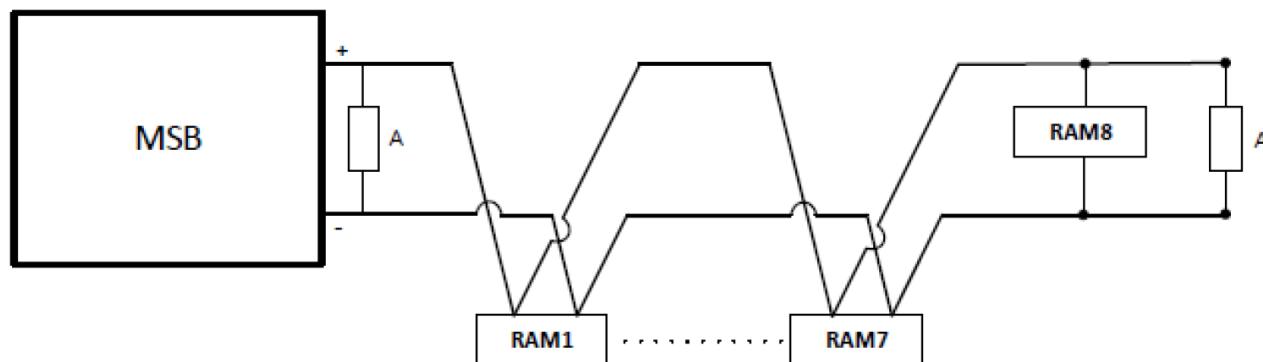


Figure 14: Bus style wiring

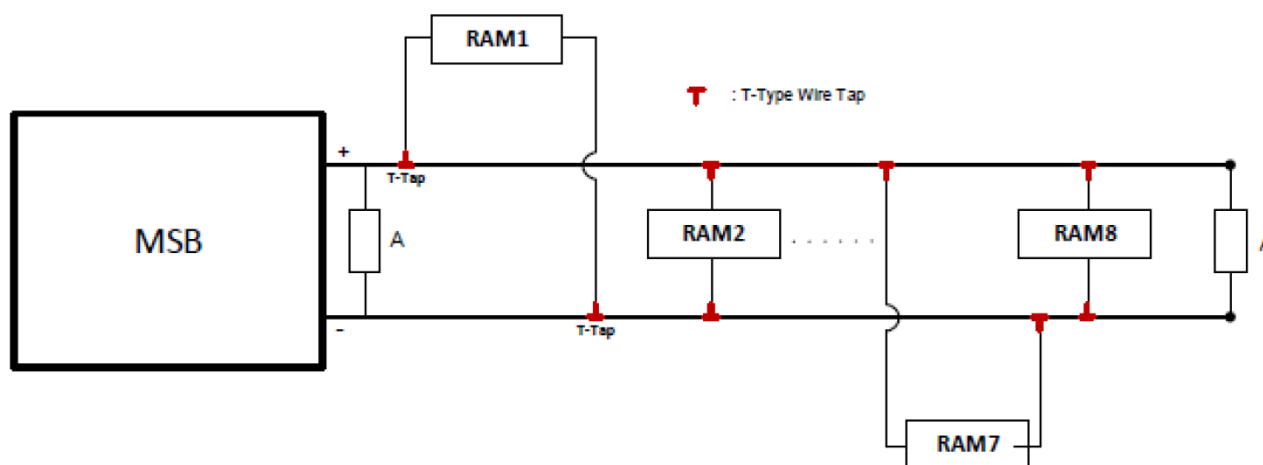


Figure 15: T-Tap style wiring

Callout	Description
RAM	Remote annunciator module
MSB	Main system board
A	100 ohm, 1/2 W line matching resistor

Table 7: Maximum distance supported for respective AWG for annunciator quantity

Maximum Annunciator QTY	Maximum Distance (Ft) w/ 22AWG	Maximum Distance (Ft) w/ 20AWG	Maximum Distance (Ft) w/ 18AWG	Maximum Distance (Ft) w/ 16AWG	Maximum Distance (Ft) w/ 14AWG
8	310	493	783	1244	1980
7	354	563	895	1421	2263
6	413	657	1044	1658	2640
5	496	788	1253	1990	3168
4	620	985	1566	2488	3960
3	826	1314	2088	3317	4000
2	1239	1970	3132	4000	4000
1	2478	3941	4000	4000	4000

## 6.5 Auxiliary power

The control unit has two onboard auxiliary power circuits :

- Aux 1: Non-resettable power (Default setting)
- Aux 2: Resettable power (Default setting)

**Note:** User can change resettable/ non-resettable setting for both Aux circuits.

24 V, 1 A maximum is available at each auxiliary circuit.

Connect only auxiliary power to the remote annunciator.

### 6.5.1 Wiring auxiliary power

To wire an auxiliary power circuit, complete the following steps:

- Wiring is between 18 AWG minimum and 12 AWG maximum.
- Special Application, Supervised for Ground and shorts. Need to use any Fire Alarm listed Supervising relay to monitor Single Open. Check that the conductors test free of all grounds and stray voltages before you connect the auxiliary power circuit to the control unit.
- Compatible devices must operate from a range of 19.5 VDC to 28 VDC or greater, and have a total current draw of 1 A or less.
- AUX power wiring needs to be in class B only.

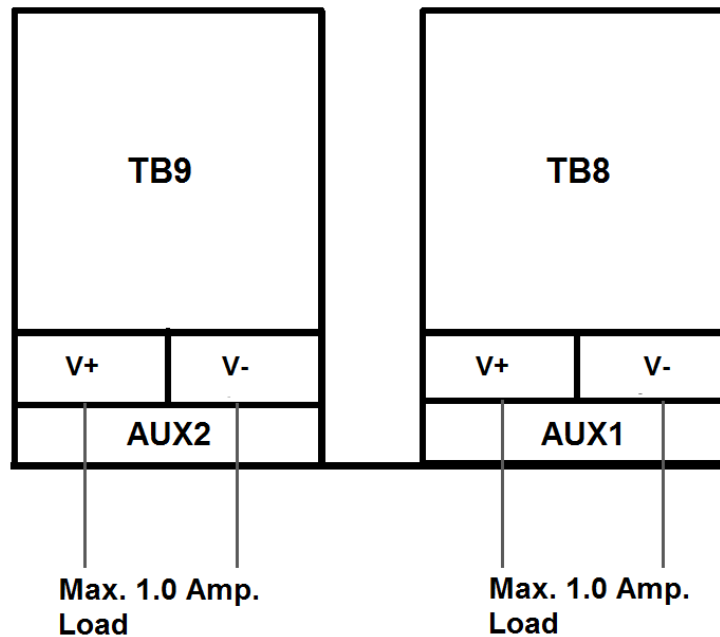


Figure 16: Aux power wiring

## 6.6 The USB interface

Use the USB interface to connect the PC for programming and upgrading the firmware of the control unit.

## 6.7 Optional modules

The following section lists all of the optional modules for the 2250. Refer to the installation instructions of each module for more information on specific modules. Refer to the label inside the door of the 2250 control unit for the placement of the optional modules.

### 6.7.1 City circuit cards A050-9909

Use the city circuit card to annunciate alarms and other urgent indications to remote facilities. The card has two circuits that are configurable for alarm, trouble or supervisory reporting. For example, if you configure a city card for a trouble output, in the event of a CPU failure the city card sends a trouble to the city circuit. The city card also provides hardware disconnect switches for each circuit.

**Note:** Only one city circuit card for each system.

For City Circuit card install instruction, refer to 579-1420AC.

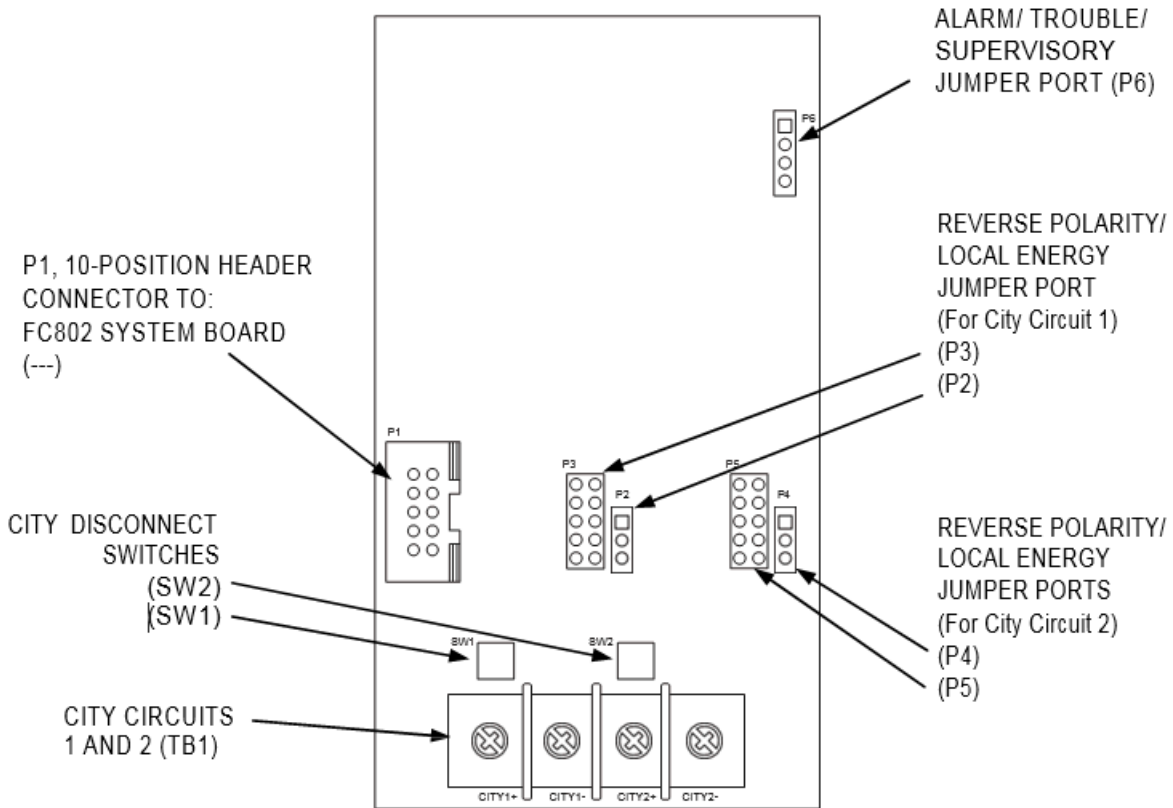


Figure 17: City circuit card

Table 8: Jumper configuration

City circuit	Jumper position	
	Reverse polarity	Local energy
City circuit 1	P3: 1-2, 3-4, 5-6 P2: 2-3	P3: 7-8, 9-10 P2: 1-2
City circuit 2	P5: 1-2, 3-4, 5-6 P4: 2-3	P5: 7-8, 9-10 P4: 1-2

### 6.7.1.1 Mounting the city circuit card

To mount the city circuit card, complete the following steps:

1. Remove the AC power at the breaker from the control unit.
2. Open the cabinet and disconnect the battery.
3. Locate the city module in the enclosure using the locating features provided.
4. Using the two supplied #6 Torx screws, mount the card on the top right corner of the cabinet as shown in Figure 18.
5. Add the modules to the system configuration. For more information on adding the modules to the system configuration refer to the *2250 Operation Guide*.
6. Connect one end of the power and communication harness to the connector labeled **P1** on the city card as shown in Figure 19.
7. Connect the other end of the power and communication harness to the connector labeled **P18** on the system board as shown in Figure 19.
8. After completing steps six and seven, apply battery power and then apply AC power at the breaker.

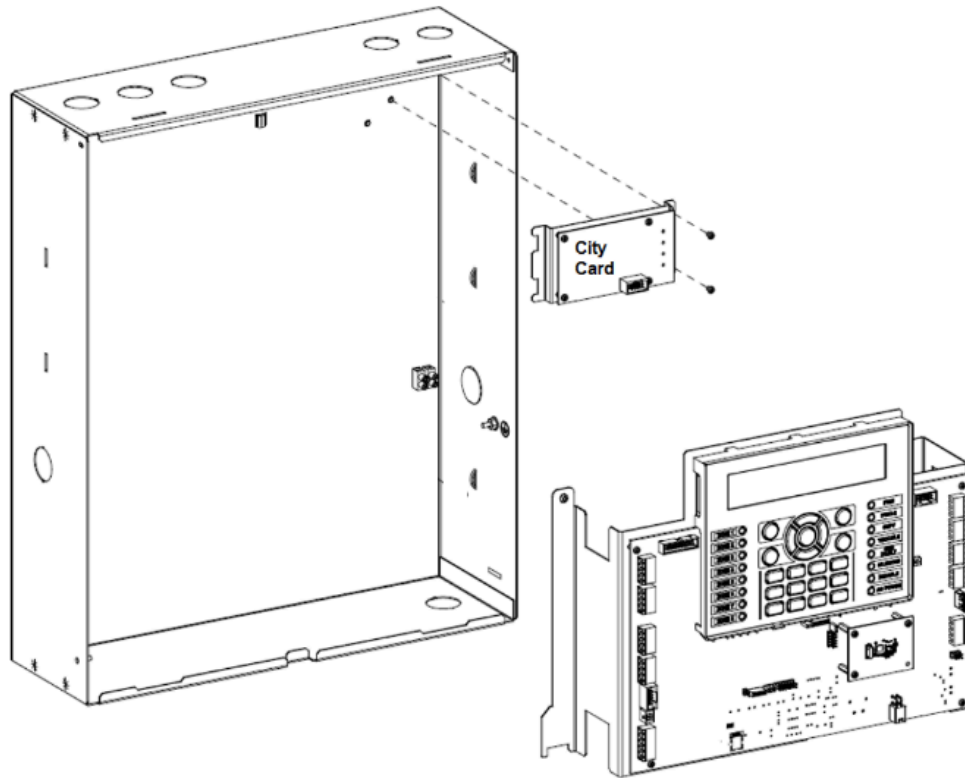


Figure 18: City card mounting

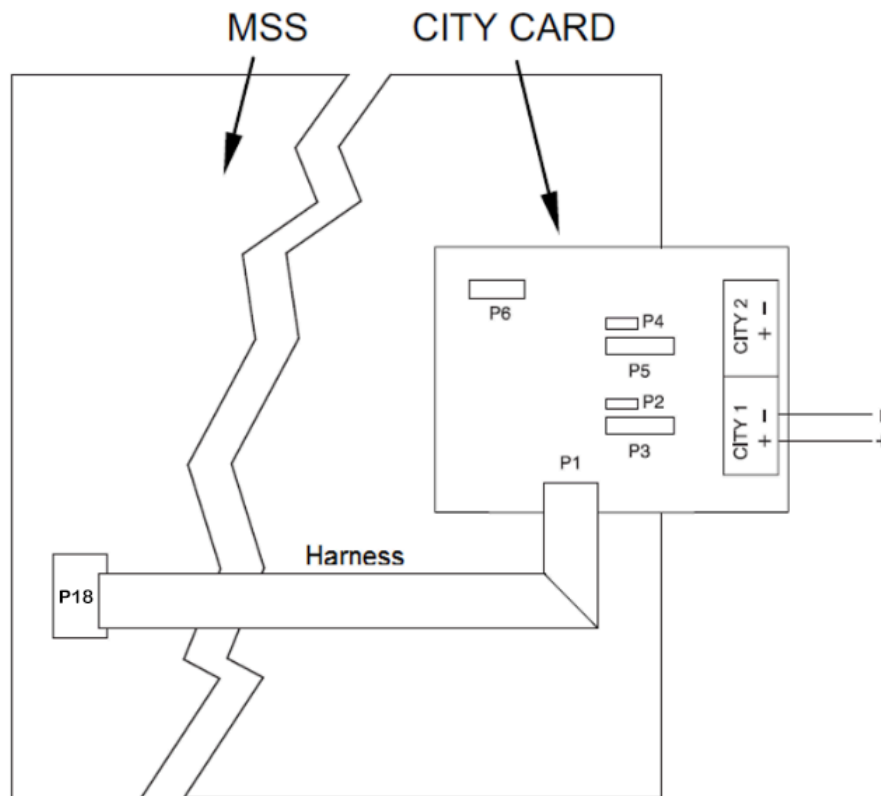


Figure 19: City card connection with system board

### 6.7.1.2 Field wiring

For successful wiring, complete the following steps:

1. Terminate all wiring at **TB1** on the city card.
2. All wiring are supervised for open and GND only. Wiring is not power limited.
3. Check that the conductors test free of all grounds before you connect the city card to the system.
4. The wiring for reverse polarity is between 20 AWG minimum and 12 AWG maximum.
5. The wiring for local energy is between 18 AWG minimum and 12 AWG maximum.
6. Leave the 2.2K, 1/2 W resistor on an unused terminal.

**Note:**

1. Statement for reverse polarity/ remote station compatibility.
2. Statement for reverse polarity/ remote station compatibility.

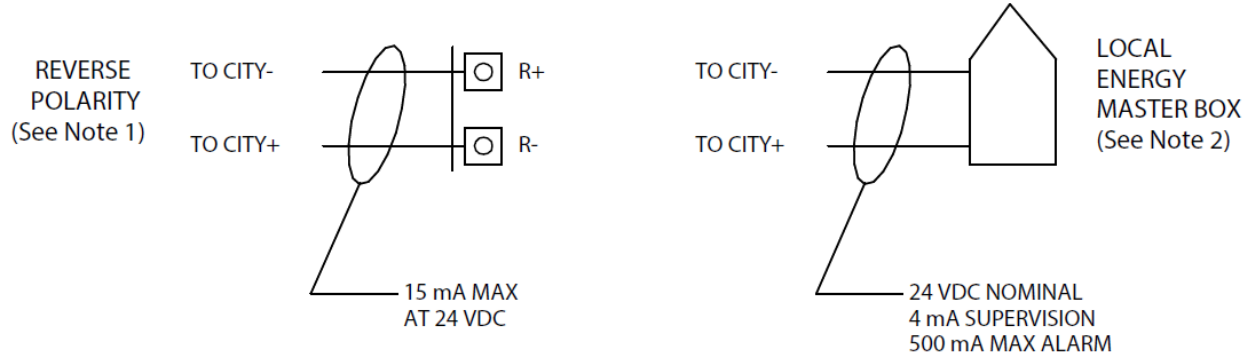


Figure 20: City card wiring

### 6.7.2 IP Communicator / Connected Services Gateway Module (A250-9800)

Use the gateway module to communicate with the remote or central station.

The IPC/CSG provides permanent connected services, central station reporting, or both for FACUs. You can mount the IPC/CSG internally in the FACU or close-nippled. The IPC/CSG connects using telephone lines, LAN Ethernet, or with a cellular connection.

Refer to the following documentations:

2050 / 2250 Panels IP Communicator / Connected Services Gateway Module Installation Guide 579-1463AC.

IP Gateway GSM Cellular Module Installation Guide 579-1248AC.

IP Gateway External Box Installation Guide 579-1249AC.

### 6.7.3 NFC

NFC can only be used to load configuration into a panel or reading configuration from a panel. NFC is not activated by default and only works in **SERVICE MODE**. Service personnel needs to unlock the panel, then login at access level 3 to enable or disable NFC. Open the NFC mobile application and bring the phone near the NFC sticker on the safety insulation cover inside the panel enclosure.



### 6.7.3.1 Loading configuration using NFC

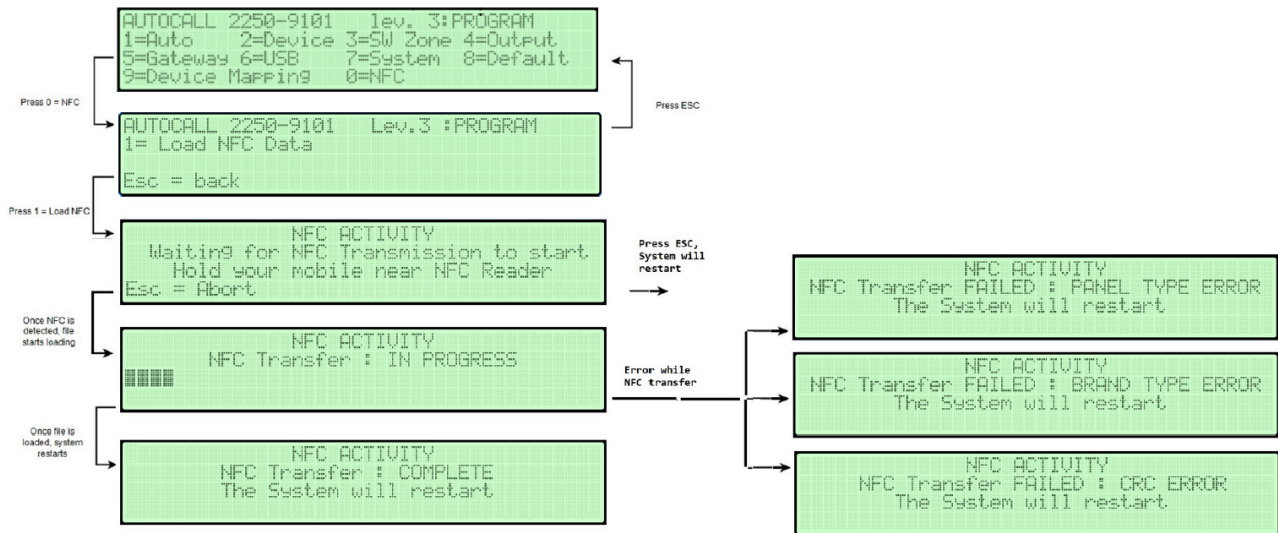


Figure 21: Load NFC data

## **7 Periodic Testing and Maintenance**

The minimum requirements for periodic testing of the fire alarm system are outlined in chapter 14 of NFPA-72.

Local codes may require additional testing and maintenance. All system components must be tested in accordance with governing codes.

Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance.

## 8 Battery calculations

Each component of the panel has a specified alarm and standby current rating. To calculate the current draw for the system, add the specified standby current for each module and device to obtain an alarm and a standby current rating for your system.

**Note:** Auxiliary power from the system's AUX 24 V taps must also be included in the calculation unless that power is switched off during battery standby. Notification Appliance load must be included in the alarm current total.

**Table 9: Current for each module**

Device / Module	Standby Current (mA)	Alarm Current (mA)
Photo / Heat Sensor with DIP SW	0.35	4
Photo Sensor with DIP SW	0.35	4
Heat Sensor with DIP SW	0.35	4
Triple Sensor with DIP SW	0.35	4
Mx Triple Sensor with Isolator and Address Switch	0.35	4
Mx Phot/Heat Sensor with Address Switch	0.35	4
Mx Photo Sensor with Address Switch	0.35	4
Mx Heat Sensor with Address Switch	0.35	4
Sounder Base 85db 10FT	0.01	24
Line Isolator Module	0.08	-
LCD Annunciator (w/ LCD ON)	65	72
2050 Main System Board draw	175	215
2250 Main System Board draw	185	225
Internal Gateway	125	125
External Gateway (Assembly with Cell modem)	145	145
City Circuit	30	60

**Note:** Device quantity selected at any point should ensure total current on MX LOOP is less than 945 mA.

Total standby current A (Note a) = \_\_\_\_

Total alarm current B (Note b) = \_\_\_\_

1. Identify **Standby Time** (C), in hours. C = \_\_\_\_ (Typically 4, 12, 24 hr).
2. From previous calculations, locate total **Standby Current** (A) and total **Alarm Current** (B) in amperes. A = \_\_\_\_ B = \_\_\_\_.
3. Identify **Alarm Time** (D) in minutes. D = \_\_\_\_ (Max 5 min).
4. Using the values in steps 1-3, perform an **Initial Battery** calculation as follows:  $(A \times C) + (0.0167 \times B \times D)$ , **Initial Battery** = \_\_\_\_ Ah (Ah = ampere hours).
5. As per UL864 derating factor for battery to be chosen as Df = 20% or 0.2
6. Find the **Derated Battery** capacity using value in 4 and the derating factor:  $[\text{Initial Battery} / (1 - 0.2)]$ , **Derated Battery** capacity = \_\_\_\_ Ah
7. Select a battery size **LARGER** than the number from the **Derated Battery** calculation from the allowable battery sizes. Maximum battery size that can be connected to the addressable panel is 25Ah.

**Note:**

- Consider all connected peripherals active during standby (any other Aux 24V load including).
- The maximum alarm current cannot exceed 6A (including NAC alarm current)

## 9 Fuse replacement procedure

To replace the fuse, follow these steps:

1. Remove the AC power to the control unit.
2. Open the panel door and remove the insulating cover of the FACU. The insulating cover has a high voltage warning on the front.
3. The fuse is installed on the power supply board that is mounted inside the chassis in front. Remove the chassis with the control unit board and power supply assembly. See [Mounting the back box](#) for assembly connections to the chassis.
4. Remove the J3 connector on the control unit board and remove first the control unit board from chassis.
5. Remove the SMPS board from the chassis and identify fuse F1 on this board.
6. Remove the fuse from the fuse holder and verify if the fuse is ruptured.

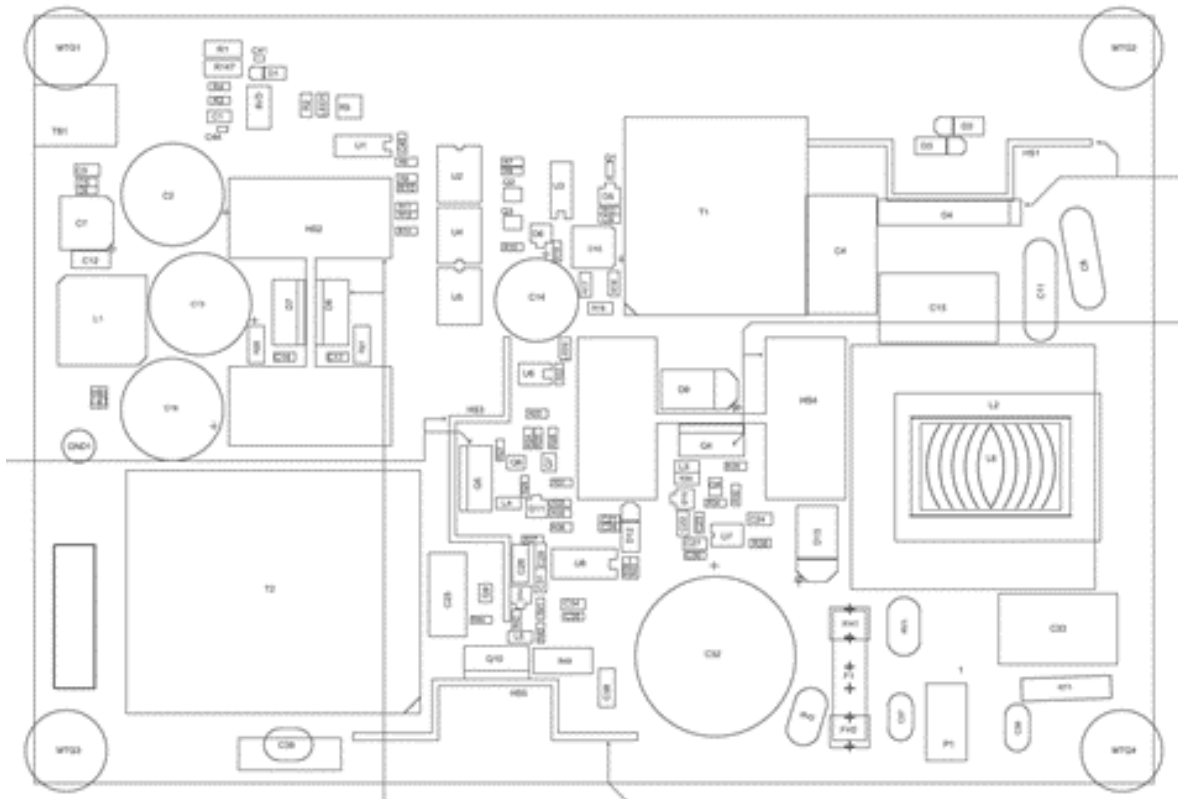


Figure 22: PCB component silkscreen

7. If the fuse is faulty, replace it with an intact fuse that has the following ratings:
  - Voltage: 250VAC
  - Current: 5 A
  - Size: 5mm x 20mm
  - Glass tube
8. Reconnect the power supply and the control unit board to the chassis.
9. Mount the chassis assembly back into the panel enclosure as in [Mounting the back box](#).
10. Reattach the insulating cover and connect to mains power.

**Note:** Only a qualified service technician can replace the fuse with specified rating 250 VAC, 5 A.

## 10 Annexure A

**Table 10: Addressable panel notification appliances**

Devices	Minimum candela cd	Minimum current mA	Max device quantity	Description
A4901-9820	-	23	130	TrueAlert Non-Addressable Horn Free-Run/SmartSync
A4901-9858	-	19	157	Non-Addressable Mini-Horn SmartSYNC Red Blank
A4901-9859	-	19	157	Non-Addressable Mini-Horn SmartSYNC White Blank
A4902-9210	-	15	200	Non-Addressable Chime SmartSYNC Red FIRE
A4906-9101	15	60	50	TrueAlert Multi-Candela Strobe Wall-Mount
A4906-9103	15	60	50	TrueAlert Multi-Candela Strobe Wall-Mount
A4906-9107	15	60	50	TrueAlert Multi-Candela Strobe Wall-Mount
A4906-9108	15	60	50	TrueAlert Multi-Candela Strobe Wall-Mount
A4906-9109	135	209	14	TrueAlert Multi-Candela Strobe Wall-Mount High-
A4906-9111	135	209	14	TrueAlert Multi-Candela Strobe Wall-Mount High-
A4906-9102	15	75	40	TrueAlert Multi-Candela Strobe Ceiling-Mount
A4906-9104	15	75	40	TrueAlert Multi-Candela Strobe Ceiling-Mount
A4906-9110	135	237	12	TrueAlert Multi-Candela Strobe Ceiling-Mount High-
A4906-9112	135	237	12	TrueAlert Multi-Candela Strobe Ceiling-Mount High-
A4906-9114	15	75	40	TrueAlert Multi-Candela Strobe Ceiling-Mount
A4906-9115	15	75	40	TrueAlert Multi-Candela Strobe Ceiling-Mount
A4906-9116	15	75	40	TrueAlert Multi-Candela Strobe Ceiling-Mount
A4906-9117	15	75	40	TrueAlert Multi-Candela Strobe Ceiling-Mount
A4906-9128	15	86	34	TrueAlert Multi-Candela Horn/Strobe Ceiling-Mount
A4906-9130	15	86	34	TrueAlert Multi-Candela Horn/Strobe Ceiling-Mount
A4906-9140	135	237	12	TrueAlert Multi-Candela Horn/Strobe Ceiling-Mount
A4906-9142	135	237	12	TrueAlert Multi-Candela Horn/Strobe Ceiling-Mount
A4906-9127	15	75	40	TrueAlert Multi-Candela Horn/Strobe Wall-Mount
A4906-9129	15	75	40	TrueAlert Multi-Candela Horn/Strobe Wall-Mount
A4906-9139	135	209	14	TrueAlert Multi-Candela Horn/Strobe Wall-Mount High-
A4906-9141	135	209	14	TrueAlert Multi-Candela Horn/Strobe Wall-Mount High-
A4906-9131	15	91	32	TrueAlert Multi-Candela Horn/Strobe Wall-Mount
A4906-9132	15	91	32	TrueAlert Multi-Candela Horn/Strobe Wall-Mount
A4906-9143	5	125	24	TrueAlert Multi-Candela Horn/Strobe Wall-Mount
A4906-9105	15	77	38	TrueAlert Multi-Candela Strobe Wall-Mount
A4906-9106	15	77	38	TrueAlert Multi-Candela Strobe Wall-Mount
A4906-9113	5	115	26	TrueAlert Multi-Candela Strobe Wall-Mount
A4906-9136	15	85	35	Non-Addressable Chime/Strobe
A4906-9133	15	70	42	Non-Addressable Chime/Strobe
A49CMT-APPLW	-	62	48	TrueAlert Non-Addressable MultiTone Horn Appliance
A49CMTV-APPLW	15	145	20	TrueAlert Non-Addressable MultiTone Horn/Strobe
A4905-9835	-	15	200	Temporal Code 4 Module for CO Gas Alarm

**Note:** All listed NAC devices have the same protocol, so they can be used together for synchronization.



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