

POWERPATH PS-24-8MC POWER BOOSTER POWER SUPPLY

Installation Instructions



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Thank you for using our products.

Use this product according to this instruction manual.

Please keep this instruction manual for future reference.

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NOTE: All **CAUTIONS** and **WARNINGS** are identified by the symbol . All **WARNINGS** are printed in bold capital letters.

 **WARNING:** READ THIS INSTRUCTION MANUAL CAREFULLY. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS, AND WARNINGS COULD RESULT IN IMPROPER APPLICATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

1.0 INTRODUCTION AND SPECIFICATIONS:

1.1 INTRODUCTION

The PS-24-8MC **POWERPATH** is an 8 Amp, 24VDC, filtered and regulated, supervised remote power supply/charger used for supervision and expanded power driving capability for Fire Alarm Notification Appliance Circuits. The PS-24-8MC may be connected to any 12V or 24V (FWR or DC) Fire Alarm Control Panel (FACP) by using a Notification Appliance Circuit (NAC) or a "Dry Contact". Primary applications include NAC expansion (supports ADA requirements) and auxiliary power to support system accessories. This unit provides filtered and regulated 24VDC, 8 Amp up to four (4) Class "B", two (2) Class "A", or two (2) Class "B" and one (1) Class "A" Notification Appliance Circuits. With the optional plug-in PS-4CA module 101648 the unit supports (4) Class "A" Notification Appliance Circuits. Additionally, an auxiliary power output of 3.5 Amps (disconnected upon AC power loss or an alarm condition) or 200 mAmps (constant) is provided, which can be manually reset. The PS-24-8MC also contains a battery charger capable of charging up to 20 Amp/Hour (AH) of battery backup. Batteries larger than 12 AH will not fit inside cabinet, use of an external battery cabinet is necessary.

Two FACP NAC circuits or two "Dry" contact initiating circuits can be connected to the **POWERPATH** inputs. These inputs can then be directed to control supervision and power delivery to any combination of the four (4) outputs.

Each output is rated at 3.0 Amps (Class "B") or (Class "A") and can be programmed to generate a steady or Code 3 Temporal Horn sound and a strobe output under alarm condition. Total load for the PS-24-8MC NAC circuits shall not exceed 8.0 Amps.

The PS-24-8MC under non-alarmed condition provides independent loop supervision for Class "A" and Class "B" FACP NAC circuits. In the event of a loop trouble, the FACP will be notified via the **POWERPATH** steered input (IN1 or IN2). In addition there are two sets of trouble reporting terminals, one used for AC power loss reporting and the other for all troubles. The AC power loss reporting, on the common trouble terminals, can be delayed for either 30 seconds or 170 minutes. The AC power loss terminals will always report the trouble, 30 seconds after loss of AC power.

Wheelock horns/strobes, strobes and horns with synchronizing capability can be utilized with the PS-24-8MC. Audibles can be silenced with only two wires. Additionally, the **POWERPATH** can provide a temporal coded signal for appliances that can utilize it.

1.2 SPECIFICATIONS

Approvals:

- UL Listed 864 Standard for Control Units for Fire Protective Signaling Systems
- Pending: FM
- Pending: MEA approved – NYC Dept. of Buildings
- Pending: California State Fire Marshall (CSFM) approved
- Pending: Fire Protection Bureau (FPB) Chicago
- NFPA 72 compliant

Inputs:

- 120VAC, 50/60Hz, 5.0 Amps Operating Power in Alarm
- 24VDC Battery Backup Connection
- Two (2), 12V or 24V NAC Initiating Circuits (8-33V at 7mA) FWR or DC
- Two (2) “Dry” Contact initiating Circuits
- Accepts two (2) Class “A” or two (2) Class “B” circuit inputs
- Built in battery charger for sealed lead acid or gel type batteries up to a 20 AH.
Batteries larger than 12 AH will not fit inside cabinet, use of an external battery cabinet is necessary.

Outputs:

- NAC outputs are 24VDC, 3.0 Amps each, power limited
- 8 Amps total alarm current for the unit
- Capable of four (4), Class “B” circuits
- Capable of two (2) Class “A” circuits
- Capable of four (4) Class “A” circuits (with optional PS-4CA module)
- Capable of one (1) Class “A” circuit and two (2) Class “B” circuits
- Temporal (Code 3) or constant voltage output generation
- Built-in Wheelock synchronization mode that can be fed to any or all of the output circuits
- Input and output can be synchronized with “IN>OUT SYNC” mode (SM, DSM or 2nd PS-24-8MC is required)
- Audible silence capability
- Filtered and electronically regulated output
- 3.5 Amp auxiliary power limited output with reset capability. (Removed upon AC loss or alarm. Automatic reset 30 seconds after AC power returns or the alarm condition is over) or 200 mAmps auxiliary power limited output which remains on during AC loss or an alarm condition.

Supervision:

- Compatible with 12V or 24V (FWR or DC) FACP
- Signaling appliance loops are supervised and steered to either IN1 or IN2
- 2.2K Ohm, 1 Watt (Wheelock Model #MPEOL) End of Line Resistor (EOLR) for supervision of all outputs
- AC loss trouble reported over a separate set of contacts (delay of either 30 seconds)
- All troubles are reported over the common trouble contacts (AC loss can have a delay of 30 seconds or 170 minutes)
- Automatic switchover to standby battery when AC fails
- Thermal and short circuit protection with auto reset
- Input and output status LED indicators
- AC fail supervision
- Battery presence and low battery supervision
- Ground Fault Detection (60K ohms)

1.3 TERMINOLOGY

CLASS “A” = STYLE Z

CLASS “B” = STYLE Y

FACP = Fire Alarm Control Panel

EOLR = End of Line Resistor

NAC = Notification Appliance Circuit

AH = Ampere/Hour

SM = Wheelock Sync Module with single output.

DSM = Wheelock Dual Sync Module with two outputs.

C = Common

NC = Normally Closed

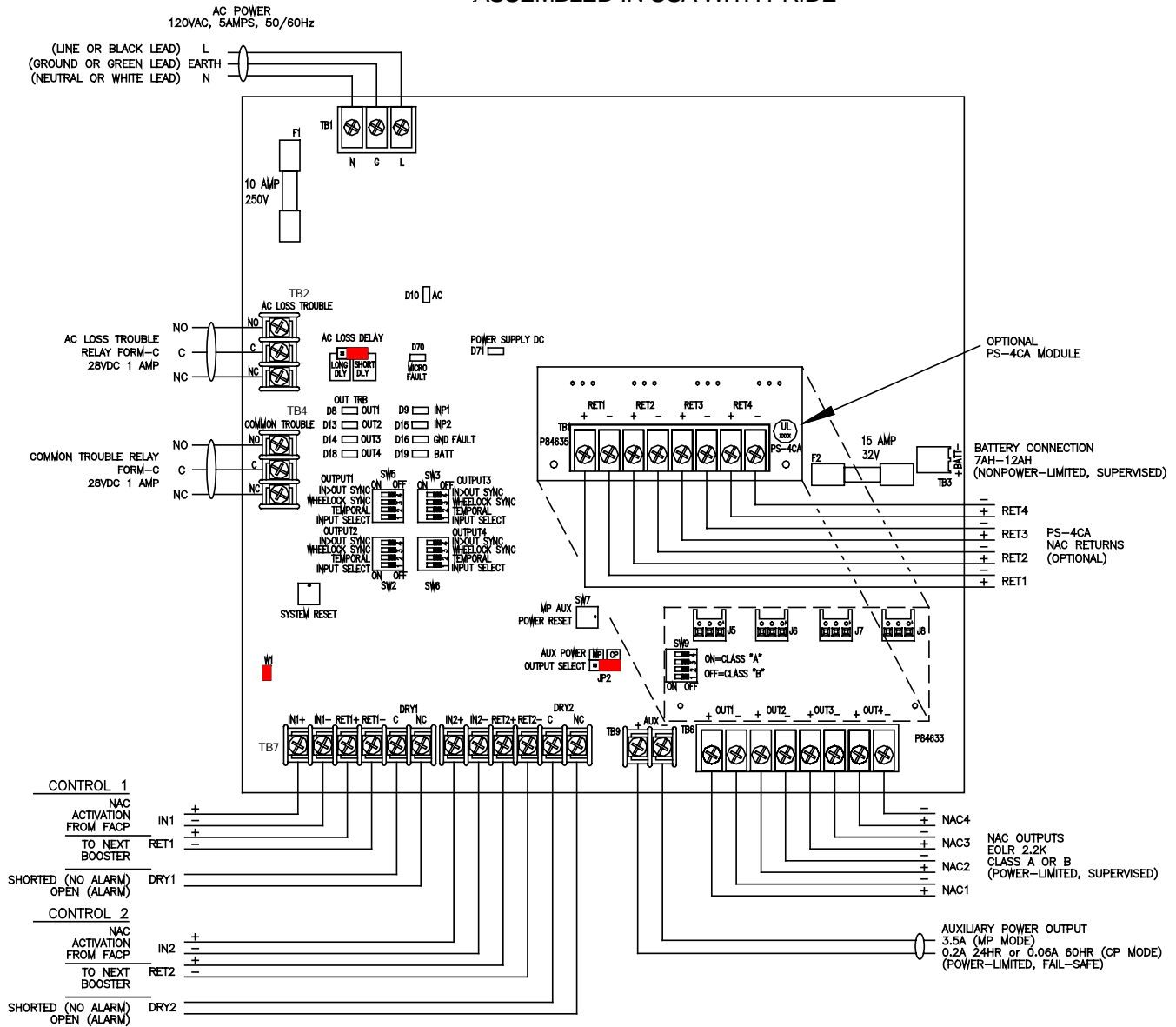
NO = Normally Open

1.4 TERMINAL IDENTIFICATION

Table 1: Terminal Identification

Terminal Block Identification Numbers (Figure 1)	Terminal Identification	Function/Description
TB1-1,3	N,G,L	AC power input terminals 120VAC, 50-60Hz.
TB5-1, 2	+ BAT -	24VDC Battery connection.
TB7-1, 2	IN1+,IN1-	These terminals connect to the input voltage source (i.e. 12VDC or 24VDC FACP). The FACP will supply a voltage from 8-33V (FWR or DC) at 7mA. During the alarm condition these inputs will cause the designated outputs to drive the notification appliances (designated outputs are set by output DIP switch banks). During Stand-by the PS-24-8MC can report troubles from the designated loop by opening the FACP's initiation loop. During an alarm condition the PS-24-8MC closes the loop to ensure that the alarm condition will be passed through to the next device on the loop.
TB7-3, 4	RET1+, RET1-	EOLR is connected on these terminals corresponding to IN1+ and IN1-, or the loop may be continued to other power supplies or appliances before terminating.
TB8-1, 2	IN2+, IN2-	Same as IN1+, IN1- for corresponding terminals.
TB8-5, 4	RET2+, RET2-	Same as RET1+, RET1- for corresponding terminals.
TB7-5, 6	C "DRY1" NC	Dry contacts are used to actuate the designated outputs. Contacts are <u>normally closed</u> and actuate the power supply on contact <u>Open</u> . Designated outputs correspond to IN1+,IN1-. NOTE: Wiring must remain in the same room in conduit. NOTE: FACP NAC circuit cannot energize the power supply by these contacts. NOTE: When these terminals are not in use, a jumper must be connected across them.
TB8-5, 6	C "DRY2" NC	Operates the same as IN2+,IN2- for corresponding terminals. When these terminals are not in use, a jumper must be connected across them. NOTE: Wiring must remain in the same room in conduit.
TB6-1, 2 TB6-3, 4 TB6-5, 6 TB6-7, 8	+OUT1- +OUT2- +OUT3- +OUT4-	Indicating appliances are connected to these outputs (See Examples in Operation Section). Each output can supply a maximum load of 3.0 Amps Class "B" or Class "A" and can be individually programmed for Normal Mode, Temporal Mode, IN>OUT SYNC Mode, or WHEELOCK SYNC Mode. The outputs can be configured as four Class "B" circuits, two Class "A" circuits, or two Class "B" and one Class "A" circuits. With the optional PS-4CA module 101648 the unit can provide four Class "A" circuits. Outputs are controlled by a designated input (INPUT 1 or 2) as selected by the DIP switch for that output. NOTE: When the panel has been set to synchronization mode, IN1 is used for strobe activation and IN2 is used for audible silence. Individual output control is disabled.
TB4-1-3	"NO" "C" "NC" (COMMON TROUBLE OUTPUT)	Typically used to trigger remote alerts or other reporting appliances. Form C contacts rated 28VDC at 1 Amp. Resistive
TB2-1-3	"NO" "C" "NC" (AC LOSS TROUBLE OUTPUT)	Used for local reporting of AC power loss to trigger remote alerts or other reporting appliances. Form C contacts rated 28VDC at 1 Amp. Resistive
TB9-1, 2	+ AUX -	AUX output is rated 20.1 to 28VDC, special applications. (See Appendix A for suitable devices). In MP mode: AUX output is capable of 3.5Amps, and can be reset by a momentary switch on the board. The 3.5 Amps of power is disconnected when AC power is lost or the unit is in alarm. The 3.5 Amps of power is reconnected 30 seconds after AC power returns or the alarm condition is over. In CP mode: The AUX output is capable of 200mAmps with 12AH battery or 70mAmps with 7AH battery. In CP mode, power is available during AC power loss (batteries connected) and during an alarm condition.

ASSEMBLED IN USA WITH PRIDE



FCC COMPLIANCE: THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:
1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE; AND 2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE
RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRABLE OPERATION.

PAT. PEND. PAT. RE38183, 5608375, 5751210, 5982275 FGN PAT. 185360, 2282717

Figure 1: Terminal Locations

1.5 LED STATUS

Table 2 lists status of the LED indicators. The ALARM condition occurs when the input causes the output circuits to energize. The TROUBLE LED's for OUT1, OUT2, OUT3, OUT4 and, GND FAULT latch ON when the trouble occurs. They are turned OFF when an alarm condition occurs or the PS-24-8MC system reset switch (SW5) is pressed. The GND FAULT, BATT and, MICRO FAULT LED's turn ON when the trouble occurs. The trouble relays (AC loss and Common trouble) follow the trouble condition and are non-latching.

NOTE: An alarm condition overrides a trouble condition.

Table 2: LED Status Description			
LED	OFF	ON	ON
OUT1	STANDBY	-----	TROUBLE
OUT2	STANDBY	-----	TROUBLE
OUT3	STANDBY	-----	TROUBLE
OUT4	STANDBY	-----	TROUBLE
INP1	STANDBY	ALARM	TROUBLE*
INP2	STANDBY	ALARM	TROUBLE*
GND FAULT	-----	TROUBLE	-----
AC	No AC	AC Present	-----
BATT	-----	TROUBLE	-----
MICRO FAULT	-----	TROUBLE	-----
POWER SUPPLY DC	TROUBLE	DC PRESENT	-----

- **NOTE:** If INP1 or INP2 LED and OUT1-OUT4 TROUBLE LED are on, TROUBLE exists currently.

1.6 BATTERY MAINTENANCE

Replace batteries every four (4) years or as needed if battery will no longer accept full charge, two 12V batteries are required. Battery capacity must be in accordance with the proper battery calculation for the application using BATTERY CALCULATION SHEET provided on page 27.

NOTE: Battery compartment measures 4.50" High 12.50" Wide 5.00" Deep.

2.0 INSTALLATION INSTRUCTIONS:

NOTE: The PS-24-8MC **POWERPATH** shall be installed in accordance with the National Fire Protection Association (NFPA), National Electrical Code (NEC) and all applicable state and local regulations.

2.1 UNPACKING

The **POWERPATH** was carefully checked before leaving the factory. Inspect shipping container and unit carefully for indications of improper handling. If damage is detected, make an immediate claim to the carrier.

Remove the **POWERPATH** from the shipping container and check that the door lock keys, door lock, and battery connection wires are inside. Make sure the printed circuit board is securely mounted to the rear of the enclosure.

2.2 MOUNTING

⚠ WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

⚠ CAUTION: This product is not intended for use in hazardous locations as defined by the National Electrical Code (NEC) and by the National Fire Protection Association (NFPA).

The **POWERPATH** unit is to be mounted in an indoor, dry location using the mounting dimensions in Figure 2.

Mount the panel in a location that does not exceed a temperature range of 0° C to 49° C (32° F to 120° F) and a humidity equal to 10% to 93% at 30° C (86° F) non-condensing.

When mounting on interior walls, use proper screw anchors in plaster. When mounting to concrete, especially when moisture is expected, first attach a piece of ¾ inch plywood to the concrete surface. Attach the **POWERPATH** to the plywood.

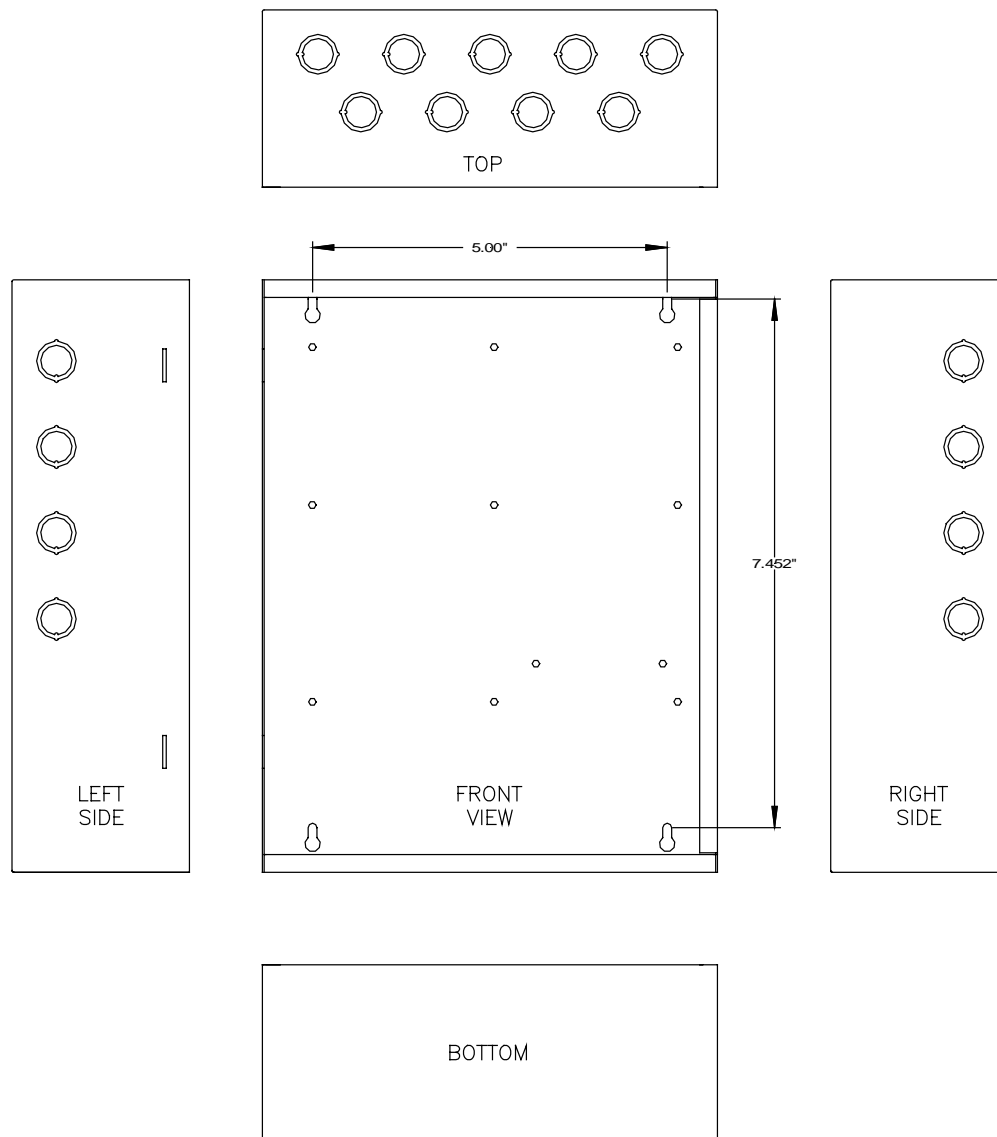


Figure 2: Mounting Dimensions

DIMENSIONS (H x W x D) - 16.70" x 12.83" x 5.00"

NOTE: All dimensions shown are in inches



CAUTION: Use care when punching out knock-outs to avoid damage to internal components.

2.3 WIRING

⚠ WARNING: MAKE SURE THAT THE TOTAL RMS CURRENT REQUIRED BY ALL APPLIANCES THAT ARE CONNECTED TO THE PS-24-8MC's NOTIFICATION APPLIANCE CIRCUITS DOES NOT EXCEED THE PS-24-8MC's RATED CAPACITY (8 AMPS MAXIMUM) OR THE CURRENT RATINGS OF ANY INDIVIDUAL NOTIFICATION APPLIANCE CIRCUIT (3 AMPS MAXIMUM). OVERLOADING THE PS-24-8MC COULD RESULT IN LOSS OF POWER AND FAILURE TO ALERT OCCUPANTS DURING AN EMERGENCY, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

Review the Operation Section (3.0) in order to select the proper hook-up and use of the **POWERPATH**. Set switches and wire the **POWERPATH** as follows: Terminal and switch locations are shown in Figure 1.

- A. Set output DIP Switch(s) to follow corresponding input (IN1, IN2) and desired output mode. See Table 3 DIP Switch Selection and DIP Switch Settings Section (3.2).
- B. Set DIP Switch SW7 position 1 & 2 to select Class "A" or Class "B" operation (Off for Class "B", On for Class "A").

Note: When the PS-24-8MC is used with the optional PS-4CA module, the main board Class switches must be set to Class "B".

- C. Select the mode of operation for the Auxiliary output (JP2) to either managed power (MP) or constant power (CP). In the MP mode of operation the Auxiliary output is disconnected upon AC loss or an alarm condition. The power is reconnected 30 seconds after AC power returns or the alarm condition is over. The power is not disconnected when in the CP mode of operation.
- D. Select the delay, before AC loss trouble will be reported to the common trouble terminals (JP1) to either SHORT DLY or LONG DLY. LONG DLY is 170 minutes and SHORT DLY is 30 seconds.
- E. If using the optional PS-4CA module install it now.
- F. Dress the battery wires down to the back of the enclosure, observing ¼" separation of power limited wire V.S. non-power limited wiring. See Figure 3.
- G. Connect notification appliances to desired outputs OUT1 – OUT4 See Operation Section (3.0).
 - The **POWERPATH** has in-out wiring terminals that accept two #18 to #12 American Wire Gauge (AWG) wires at each screw terminal. Strip leads 3/8 inches and connect to screw terminals. Maximum line impedance is 39 ohms or 3.4 volt drop, whichever is more.
 - Separate all in-out wire runs on supervised circuits to insure integrity of circuit supervision. The polarity shown in the wiring diagrams and on the circuit boards is for operation of the appliances. The polarity is reversed by the FACP during supervision.
 - Total load for the PS-24-8MC NAC circuits shall not exceed 8.0 Amps.
 - Total load of any NAC output circuit shall not exceed 3.0 Amps.
 - In Class "B" mode of operation terminate unused outputs with a 2.2K Ohm EOLR.
 - In Class "A" mode of operation connect unused outputs to there respective returns.
 - When using the optional PS-4CA module connect unused outputs to there respective returns.
- H. Connect the NAC circuit(s) from the FACP to the desired input(s), IN1 and IN2. Connect EOLR to RET1 and RET2. The value is determined by FACP manufacture.
- I. Connect desired auxiliary equipment to the auxiliary output terminals +AUX-.
- J. Connect AC loss trouble relay as desired.
- K. Connect the common trouble relay as desired.
- L. Connect AC source. The AC source shall be connected to a dedicated, non-switch power source. The AC must first be wired into the buildings main electrical power. The conduit entry can be either from the top or left hand side using the knock-outs. See Figure 3. Connect Earth Ground First.
- M. Connect backup batteries. Observe correct polarity, use two of the same connected in series. Use either a 7AH or a 12AH battery depending on circuit loading, BATTERY CALCULATION SHEET is provided on Sheet 27.
- N. Install battery cover between both battery wires and Power Limited Wiring. See Figure 3.
- O. Press Auxiliary Power Reset, SW6 to ensure that Auxiliary Power is present.
- P. Close door and lock.

Table 3: DIP Switch Selection			
Function	Switch Position	Description	Note
INPUT SELECT	ON	Selected output to be controlled by Input 1 (IN1+, IN1-) (DRY1)	-----
	OFF	Selected output to be controlled by Input 2 (IN2+, IN2-) (DRY2)	-----
TEMPORAL	ON	Generates Code 3 temporal signal on this output.	1
IN>OUT SYNC	ON	Allows a sync signal on the input to be used by the output.	-----
WHEELLOCK SYNC MODE	WHEELLOCK SYNC "ON" IN>OUT SYNC "ON"	Generates Wheelock sync signal for synchronizing Wheelock horns and strobes.	2

NOTE 1: Use only with appliances that can operate using a coded horn appliance. (Example: Wheelock Series CH, and Series MT)

NOTE 2: Use only with Wheelock Series AS/AH, Series NS/NS4/NH, Series RSS and products with SL/SLM strobes.

2.4 TROUBLE RELAY STATUS CONNECTIONS

2.4.1 AC LOSS TROUBLE TERMINALS

The AC LOSS TROUBLE TERMINALS are located on the left side of the PC board and used for transmission of local trouble annunciation. The three terminals are labeled "NO", "C" and "NC". When the PS-24-8MC is operating normally the "NC" "C" terminals are shorted, and the "C" "NO" terminals are open. This set of terminals reports AC LOSS after a 30 second delay. (Immediate/Short Delay Only).

2.4.2 COMMON TROUBLE TERMINALS

The COMMON TROUBLE TERMINALS are located on the left side of the PC Board. The three terminals are labeled "NO", "C" and "NC". When the PS-24-8MC is operating normally the "NC" "C" terminals are shorted, and the "C" "NO" terminals are open. There are five trouble conditions that will cause these terminals to change state.

- Supervision trouble on any output (+OUT1-, +OUT2-, +OUT3-, +OUT4-)
- Battery Fail
- Micro Processor Fault
- GND Fault
- AC Loss

When the trouble is cleared the COMMON TROUBLE TERMINALS return to the operating normally condition.

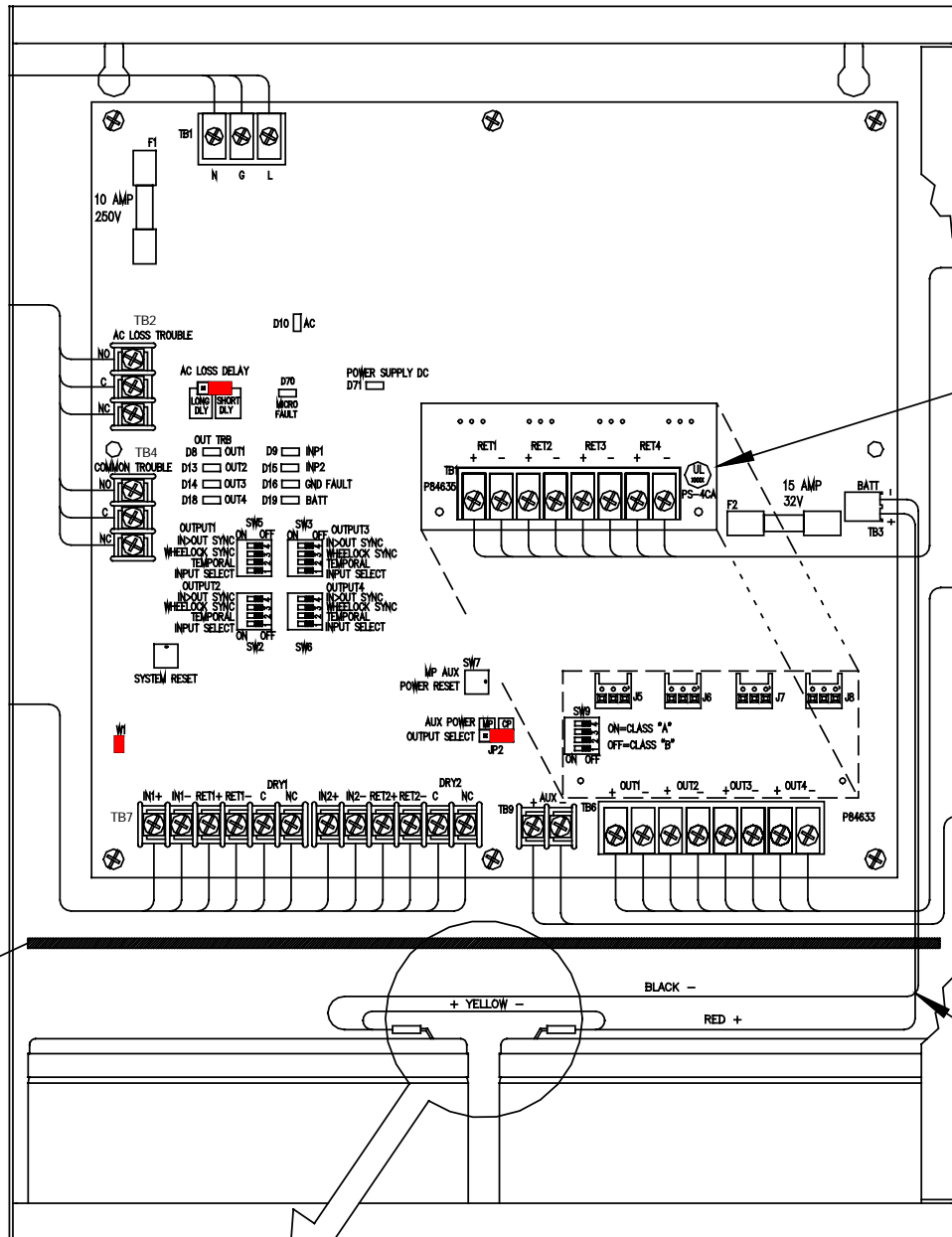
AC LOSS reporting on the COMMON TROUBLE TERMINALS can be selected for 30 seconds (Immediate/Short Delay) or 170 minutes (Long Delay). (170 minutes is used for delay of Off-premise trouble annunciation)

AC POWER
NON-POWER LIMITED
120VAC, 5 AMPS, 50/60Hz

RELAY CONTACTS

INPUT CIRCUITS

BATTERY COVER
RESTS ON
TOP OF
BATTERIES



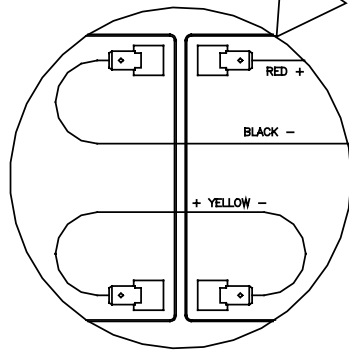
NAC RETURNS
POWER-LIMITED
(OPTIONAL)

OPTIONAL
PS-4CA MODULE

NAC OUTPUTS
POWER-LIMITED

AUX OUTPUT
POWER-LIMITED

BATTERY WIRES
TO BE DRESSED
TO BACK OF
ENCLOSURE
TO ENSURE
POWERLIMITED
V.S. NON POWER
LIMITED 1/4"
SEPARATION.



BATTERY TERMINALS
TOP VIEW

Figure 3: POWERPATH PS-24-8MC

3.0 OPERATION:

3.1 MODES OF OPERATION

The PS-24-8MC **POWERPATH** can provide 24VDC output when initiated by a 8V to 33V (FWR or DC) appliance (IN1 or IN2) or an open contact (DRY1 or DRY2). The output will remain on until the deactivation of the input returns it to standby mode.

The outputs can be configured as four Class "B" circuits, two Class "A" circuits, or two Class "B" and one Class "A" circuits. With the optional plug in PS-4CA module 101648 the unit supports four Class "A" Notification Appliance Circuits.

Each Class "A" circuit or Class "B" circuit is 3.0 Amps. Total load for the PS-24-8MC NAC circuits shall not exceed 8.0 Amps.

There are four output modes which can be used with either Class "A" or Class "B" circuits.

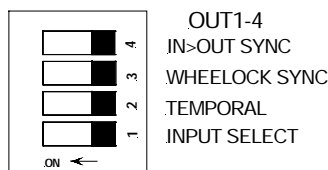
NORMAL MODE	Used for a constant 24VDC output.
TEMPORAL MODE	Provides a temporal output for appliances that can utilize a coded signal. (i.e. single stroke bells and chimes and some horns) (NOTE: Do not use with Wheelock AS, NS, RSS appliances.)
IN>OUT SYNC MODE	Allows ONLY a coded signal or Wheelock synchronization signal input to be utilized by the POWERPATH . This signal may come from a FACP, another PS-24-8MC or a Wheelock Synchronization Module (SM-12/24 or DSM-12/24). Audibles can also be silenced.
WHEELOCK SYNC MODE	Activates the built-in Wheelock Synchronization Mode for use with patented Wheelock synchronized horns and strobes. Audibles can also be silenced.

3.2 DIP SWITCH SETTINGS

The following is the DIP Switch settings for the Outputs.

When switches are changed, press SYS RESET and wait 10 seconds before activating.

Figure 4: Output DIP Switch(s)



MODE	DIP SWITCH SETTING	
NORMAL MODE	INPUT SELECT (1)	"ON" for "IN1" or "DRY1" "OFF" for "IN2" or "DRY2"
	TEMPORAL (2)	"OFF"
	WHEELOCK SYNC (3)	"OFF"
	IN>OUT SYNC (4)	"OFF"
TEMPORAL	INPUT SELECT (1)	"ON" for "IN1" or "DRY1" "OFF" for "IN2" or "DRY2"
	TEMPORAL (2)	"ON"
	WHEELOCK SYNC (3)	"OFF"
	IN>OUT SYNC (4)	"OFF"
IN>OUT SYNC	INPUT SELECT (1)	"ON" for "IN1" or "DRY1" "OFF" for "IN2" or "DRY2"
	TEMPORAL (2)	"OFF"
	WHEELOCK SYNC (3)	"OFF"
	IN>OUT SYNC (4)	"ON"
WHEELOCK SYNC	INPUT SELECT (1)	"ON" for "IN1" or "DRY1" "OFF" for "IN2" or "DRY2"
	TEMPORAL (2)	"OFF"
	WHEELOCK SYNC (3)	"ON"
	IN>OUT SYNC (4)	"ON"

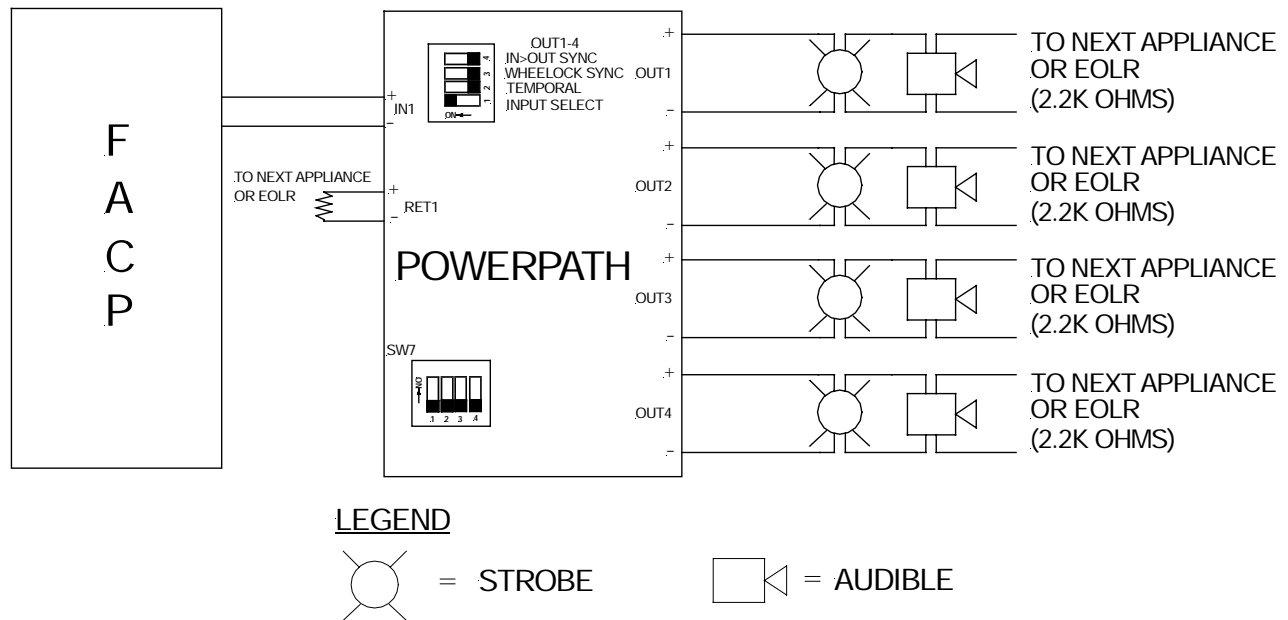
3.3 CLASS “B” OPERATION

Class “B” outputs can be controlled from either IN1 or IN2. Switch SW7 position 1 & 2 on the PC board are in the “OFF” position.

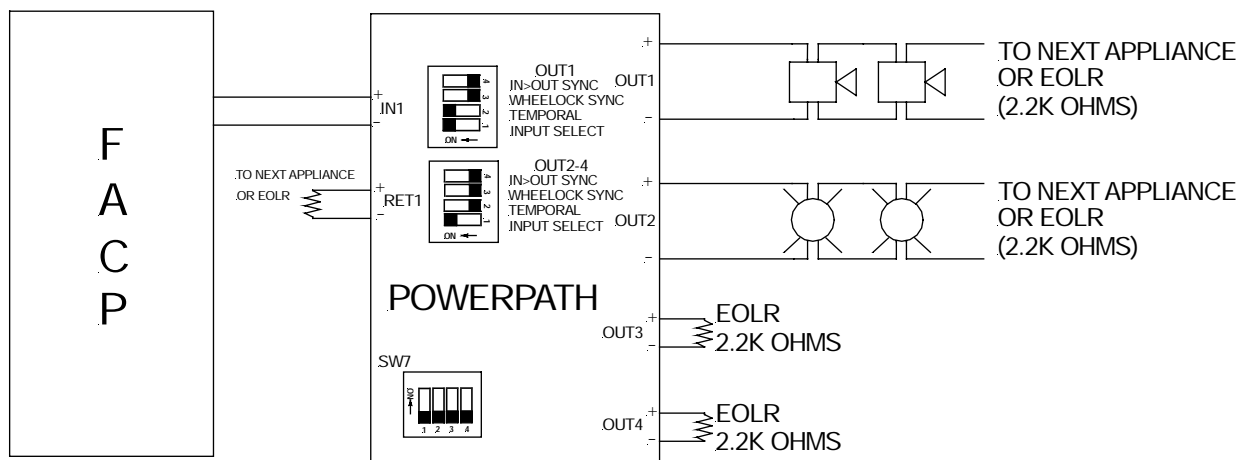
The following are examples of Class “B” connections. A FACP is used as a representative input.

- IN1 and/or IN2 can be used for connection to the FACP. The INPUT SELECT Switch (1) selects which input is to be used to activate the output.
- Board switch SW7 position 1 & 2 control Class “A” or Class “B” configuration. SW7 position 1 controls Outputs 1 and 3. SW7 position 2 controls Outputs 2 and 4.
- The PS-24-8MC requires a 2.2K Ohm End of Line Resistor (EOLR) on each output for proper supervision.

Example 1: NORMAL MODE (CLASS B)



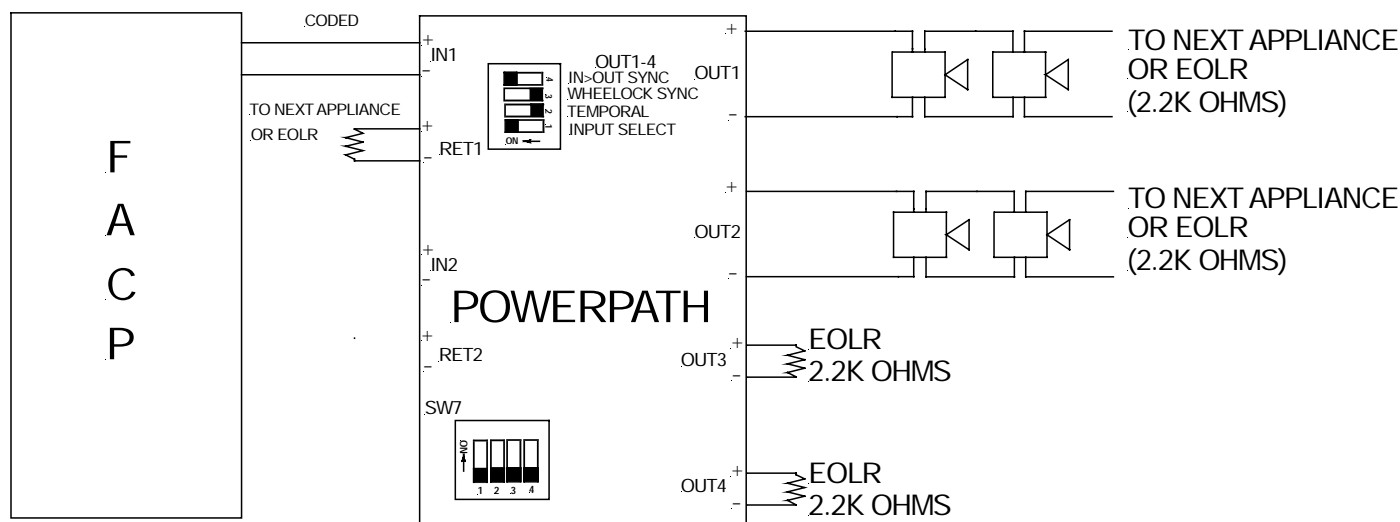
Example 2: TEMPORAL MODE (CLASS B)



⚠ CAUTION: Strobes require constant voltage and will not operate properly in the TEMPORAL MODE. A second output set in the NORMAL MODE will provide the constant voltage.

⚠ CAUTION: Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

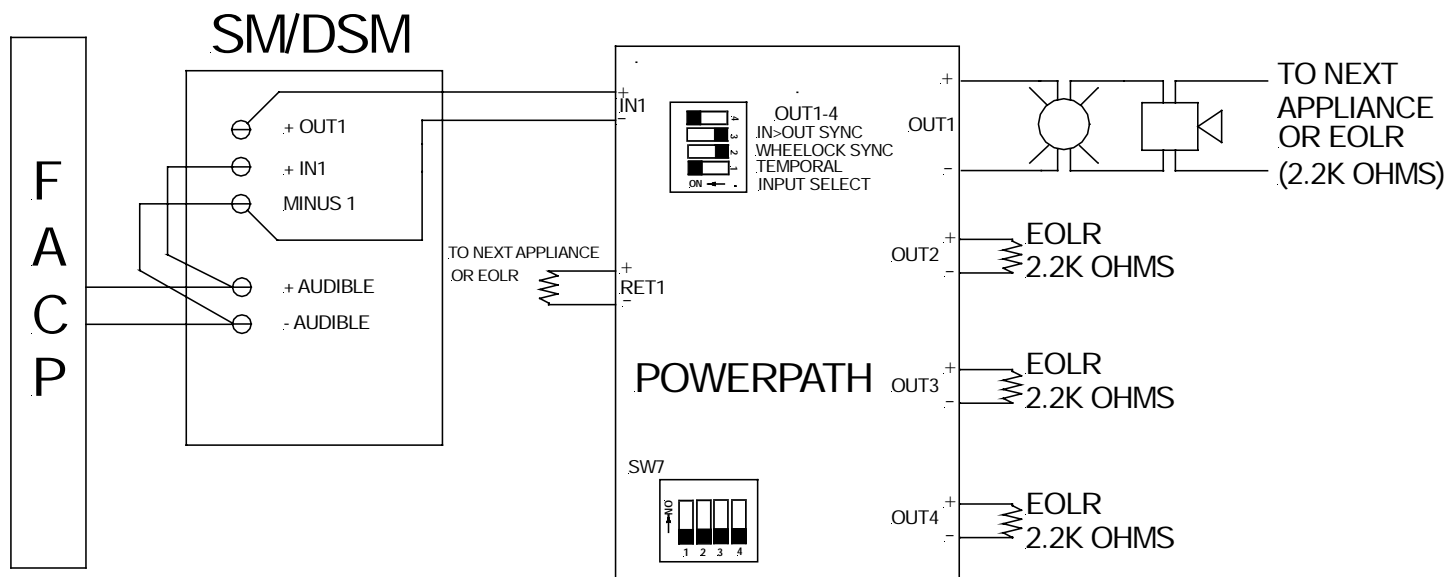
Example 3: IN>OUT SYNC MODE from CODED INPUT SOURCE (CLASS B)



Minimum pulse duration for coded signals must be greater than 0.25 seconds.

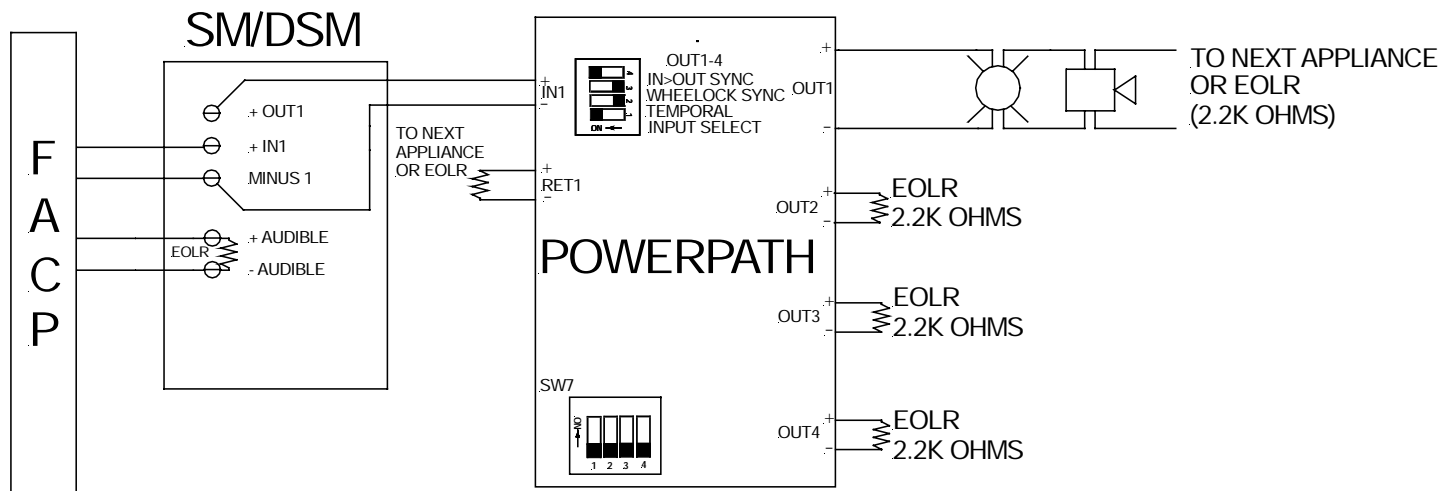
CAUTION: Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

Example 4: IN>OUT SYNC MODE with External Sync Module without Audible Silence (CLASS B)



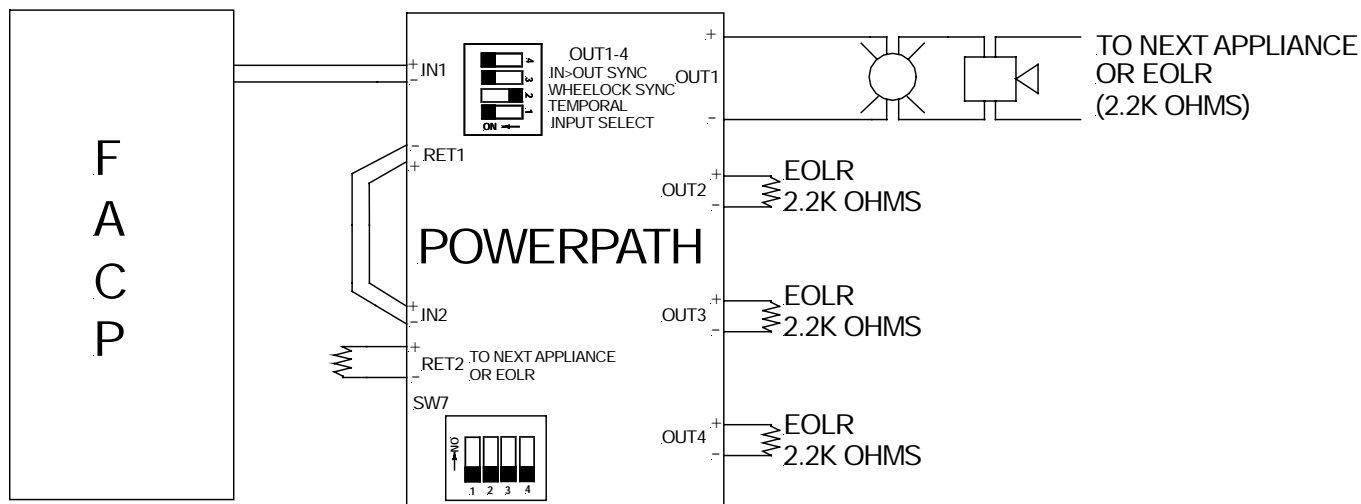
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

Example 5: IN>OUT SYNC MODE with External Sync Module with Audible Silence (CLASS B)



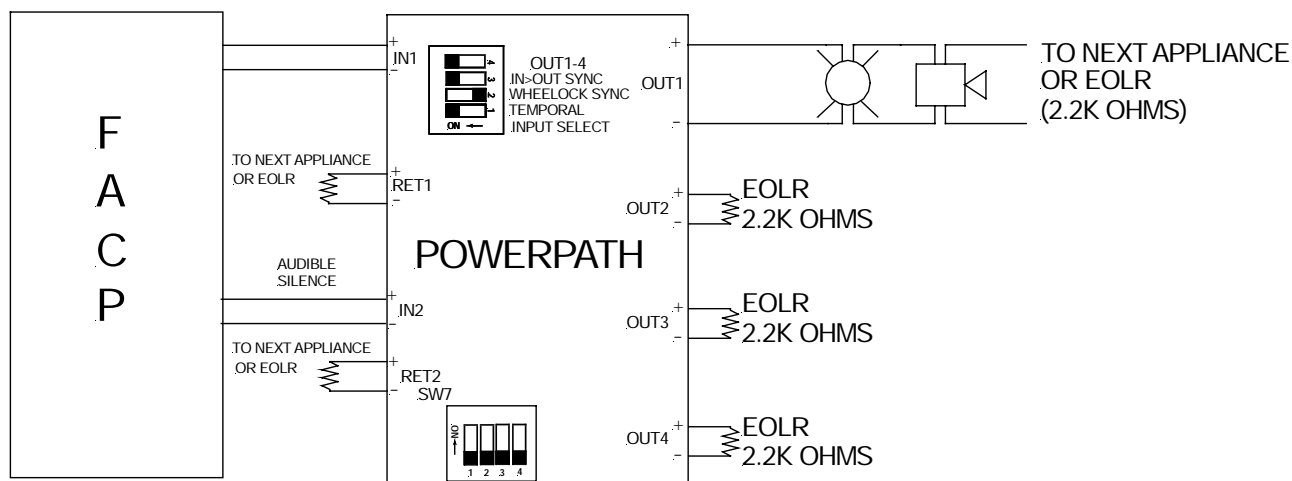
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization **will only occur** with Wheelock sync appliances.

Example 6: WHEELLOCK SYNC MODE without Audible Silence (CLASS B)



- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.
- If only strobes are connected to the **POWERPATH** outputs, the initiating input to IN2 is not required.
- When synchronized horns are used on the two wire output of the **POWERPATH**, IN2 must be connected as shown or the horns will not operate.

Example 7: WHEELOCK SYNC MODE with Audible Silence (CLASS B)



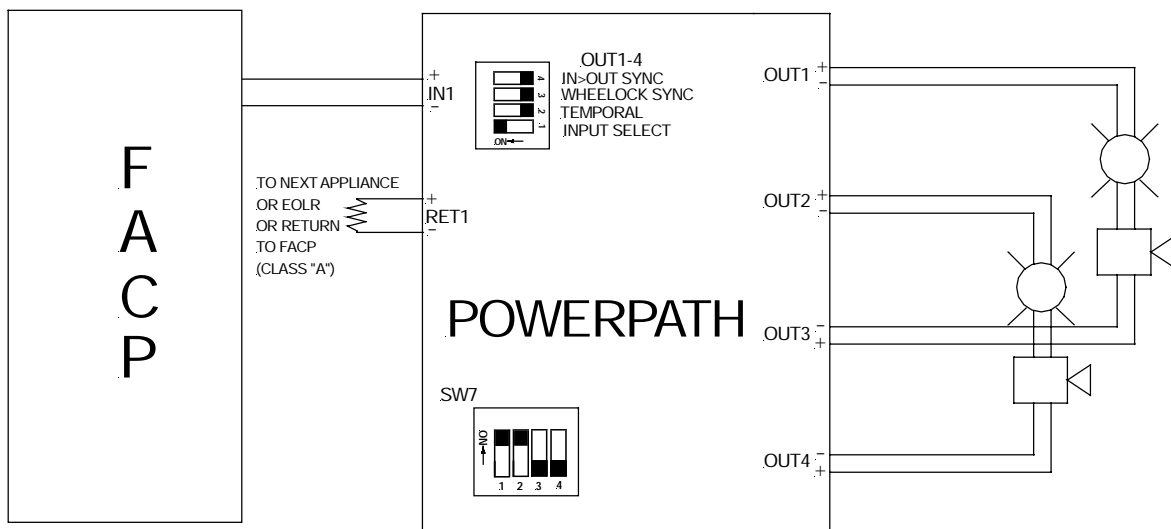
- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.

3.4 CLASS “A” OPERATION WITHOUT OPTIONAL PS-4CA MODULE

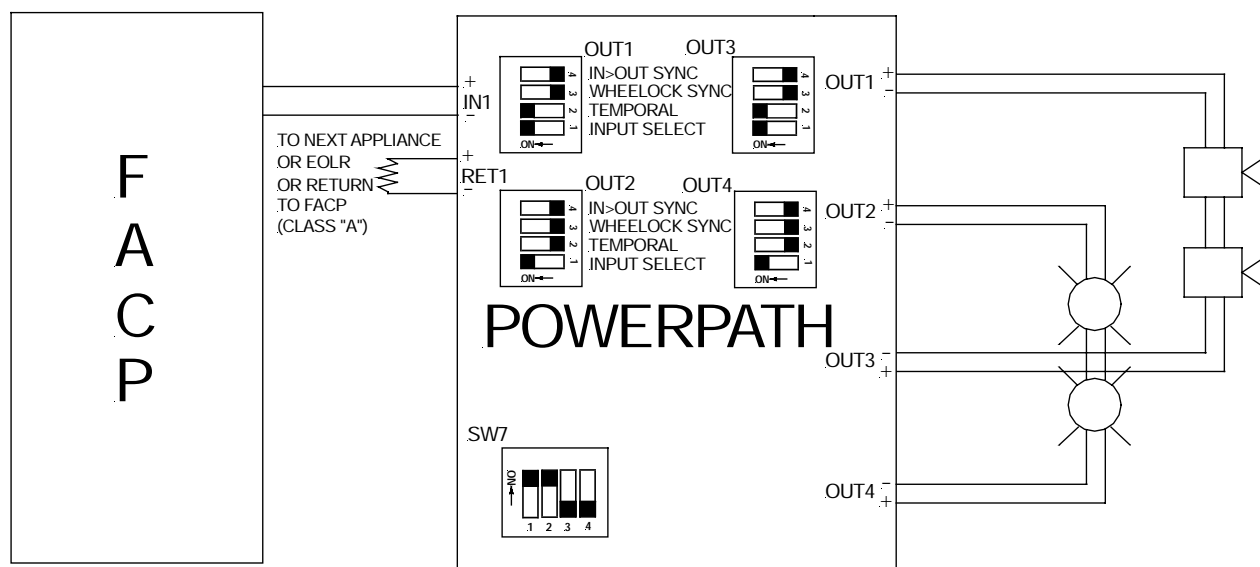
Class “A” circuit 1 uses “OUT1” and “OUT3”. Class “A” circuit 2 uses “OUT2” and “OUT4”. When operating in Class “A” the two circuits must have the same switch settings for the operational mode selected. Switch SW7 position 1 & 2 on the PC board are in the “ON” position.

- IN1 and/or IN2 can be used for connection to the FACP. The INPUT SELECT Switch (1) selects which input is to be used to activate the output.
- Board switch SW7 position 1 & 2 control Class “A” or Class “B” configuration. SW7 position 1 controls Outputs 1 and 3. Switch SW7 position 2 controls Outputs 2 and 4.
- DIP Switch settings for each circuit in the Class “A” output must be set identically.

Example 8: NORMAL MODE (CLASS A)

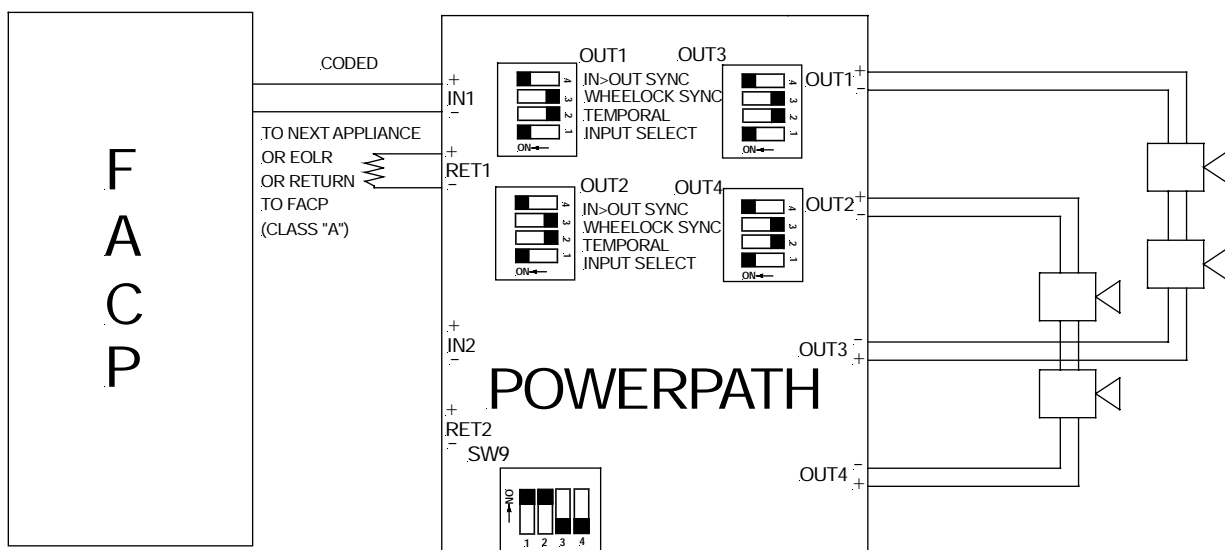


Example 9: TEMPORAL MODE (CLASS A)



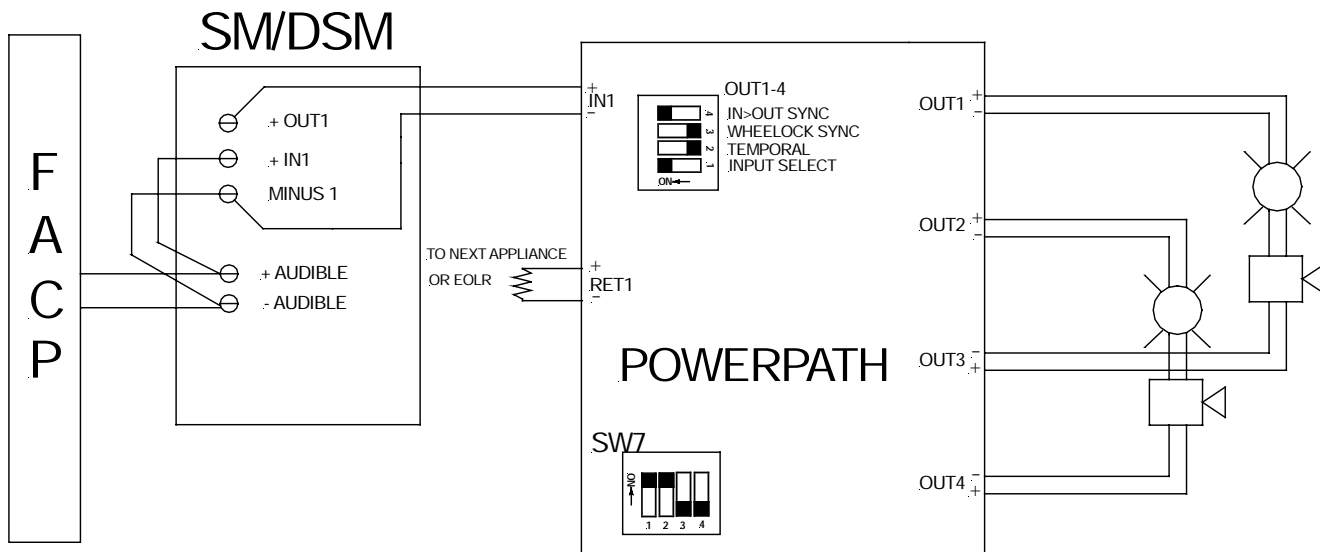
⚠ CAUTION: Strobes require constant voltage and will not operate properly in the TEMPORAL MODE. A second Class “A” output set in the NORMAL MODE will provide the constant voltage for the strobe circuit. Only use sounding appliances that can use a coded signal. Do not use Wheelock AS/AH or NS/NS4/NH appliances with TEMPORAL MODE.

Example 10: IN>OUT SYNC MODE from CODED INPUT SOURCE (CLASS A)



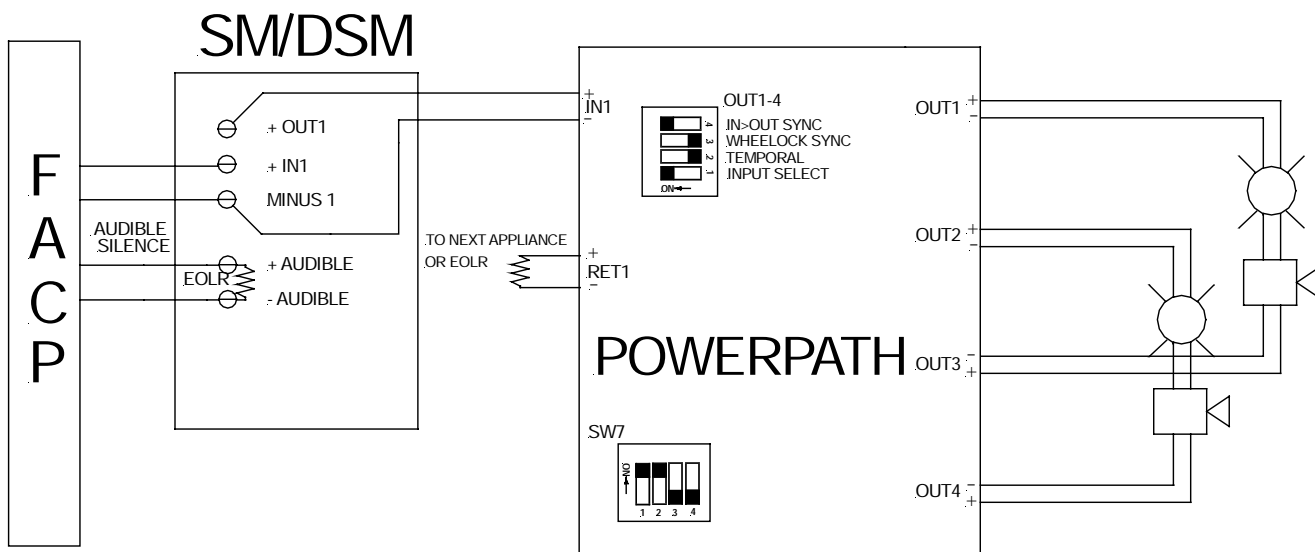
Minimum pulse duration for coded signals must be greater than 0.25 seconds.

Example 11: IN>OUT SYNC MODE with External Sync Module without Audible Silence (CLASS A)



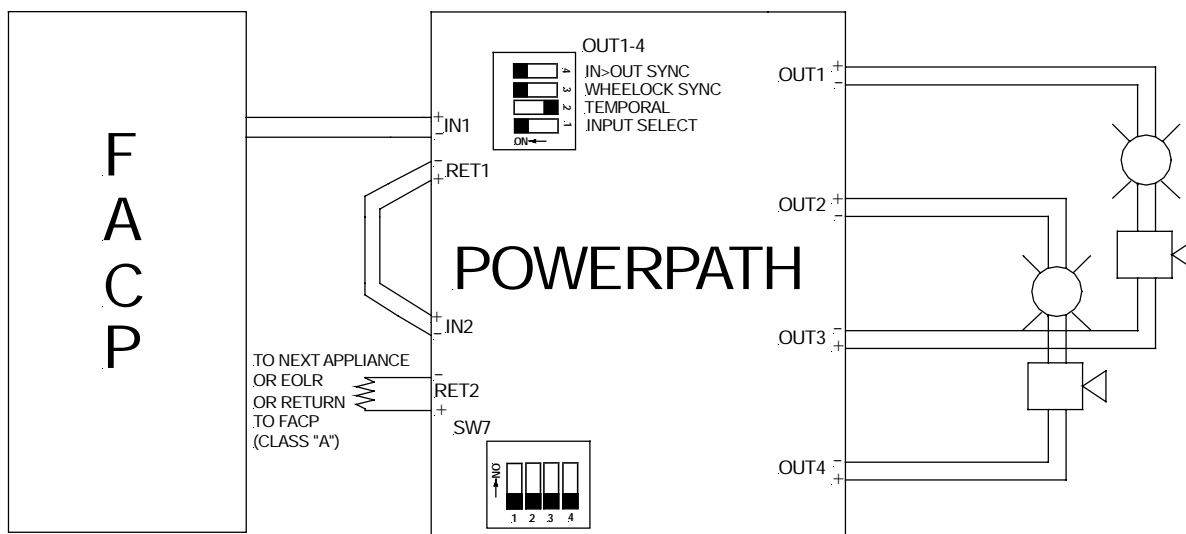
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

Example 12: IN>OUT SYNC MODE with External Sync Module with Audible Silence (CLASS A)



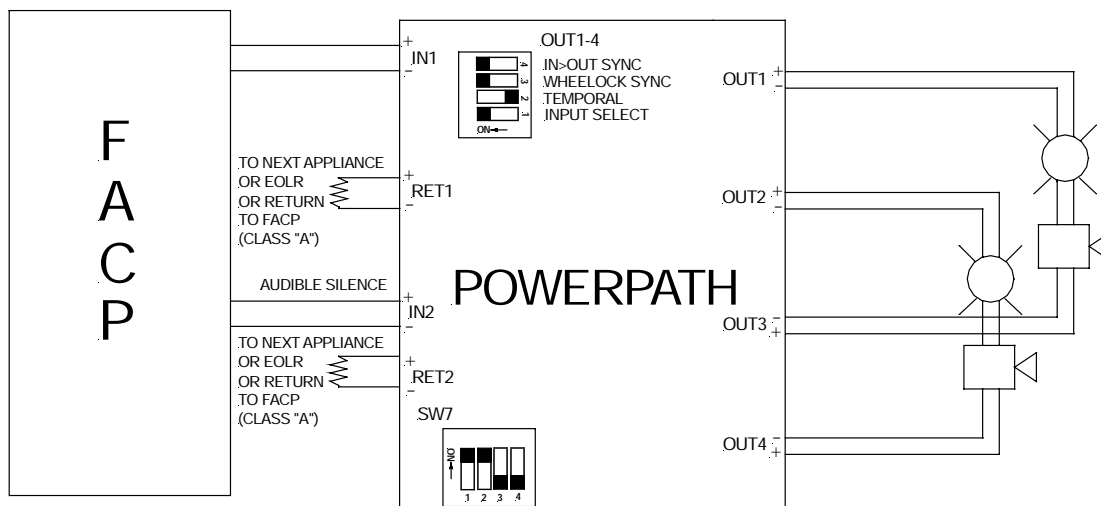
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

Example 13: WHEELLOCK SYNC MODE without Audible Silence (CLASS A)



- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.
- If only strobes are connected to the **POWERPATH** outputs, the initiating input to IN2 is not required.
- When synchronized horns are used on the two wire output of the **POWERPATH**, IN2 must be connected as shown or the horns will not operate.

Example 14: WHEELLOCK SYNC MODE with Audible Silence (CLASS A)



- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.

COMBINATION CLASS "A" AND CLASS "B" HOOKUP

The PS-24-8MC **POWERPATH** can be configured to have one Class "A" (3.0 Amps) and two Class "B" (3.0 Amps each circuit) outputs at the same time, with a maximum 8 Amps total for the unit. This is done by Switch SW7 position 1 & 2. **NOTE:** When SW7 position 1 is ON, OUTPUTS 1 and 3 are the Class "A" circuit. When SW7 position 2 is ON, OUTPUTS 2 and 4 are the Class "A" circuit.

COMBINATION OF MODES

- In Class "B" configuration, each output can be set to an independent mode as desired.
- In Class "B", IN1 or IN2 can be selected to activate any of the outputs desired.
- In Class "A", OUTPUT DIP Switches must be set identically for each Class "A" output.

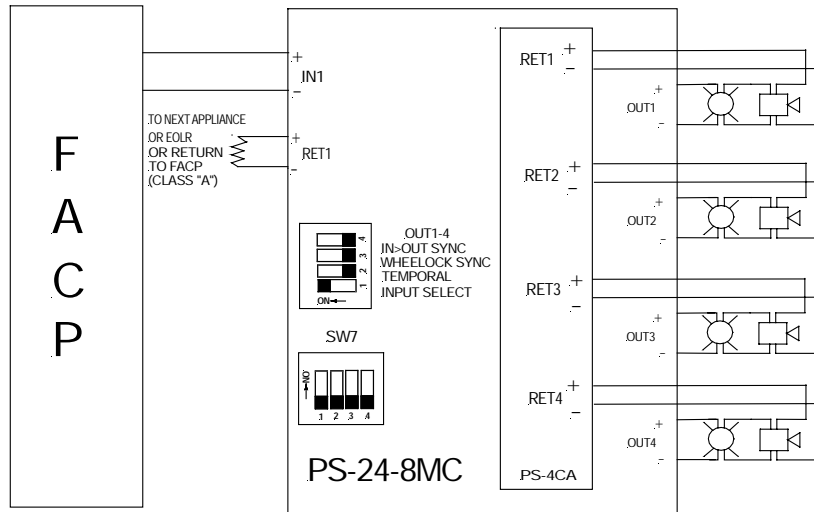
3.5 CLASS “A” OPERATION WITH OPTIONAL PS-4CA MODULE

When using the PS-4CA Class “A” module switch SW7 position 1 & 2 on the board are in the “OFF” position.

The following are examples of Class “A” connections with the PS-4CA module. A FACP is used as a representative input.

- IN1 and/or IN2 can be used for connection to the FACP. The INPUT SELECT Switch (1) selects which input is to be used to activate the output.

Example 15: NORMAL MODE (CLASS A using the PS-4CA module)



LEGEND

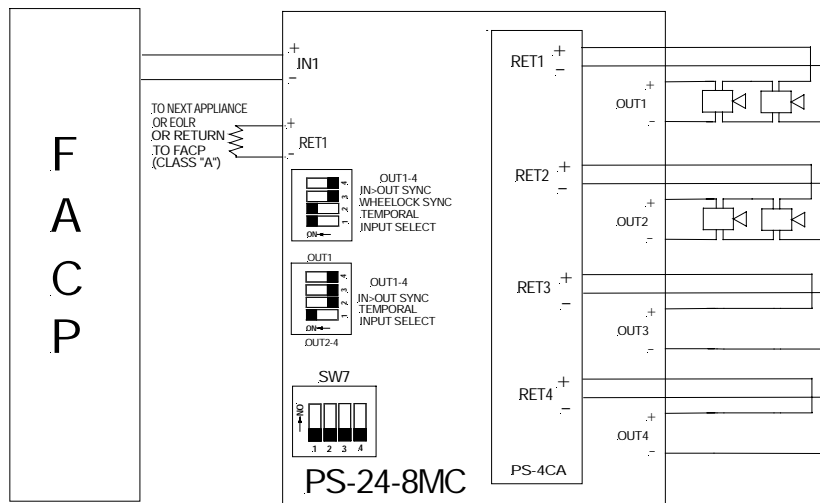


= STROBE



= AUDIBLE

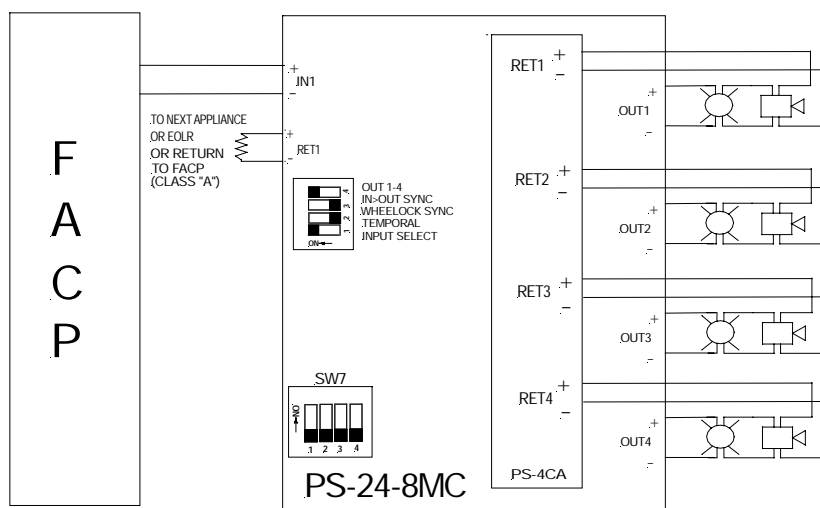
Example 16: TEMPORAL MODE (CLASS A using the PS-4CA module)



⚠ CAUTION: Strobes require constant voltage and will not operate properly in the TEMPORAL MODE. A second output set in the NORMAL MODE will provide the constant voltage.

⚠ CAUTION: Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

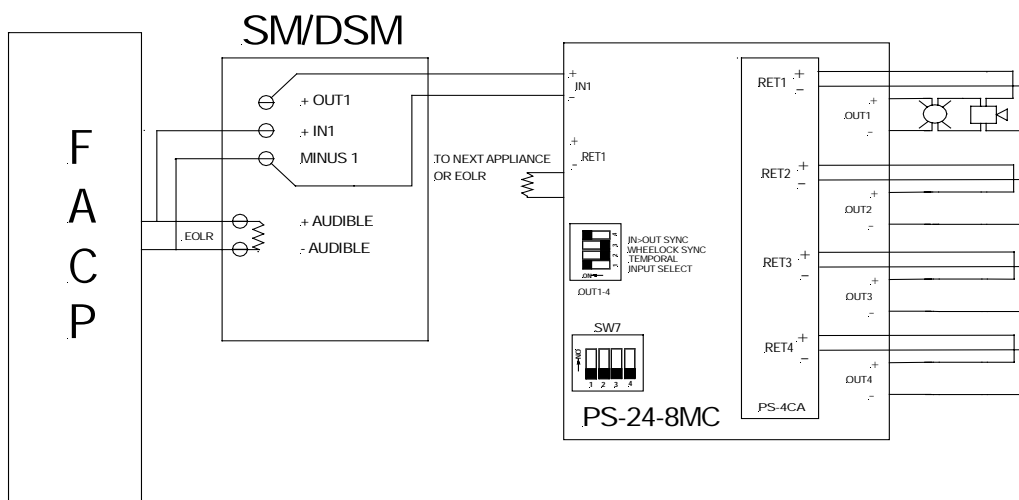
**Example 17: IN>OUT SYNC MODE from CODED INPUT SOURCE
(CLASS A using the PS-4CA module)**



Minimum pulse duration for coded signals must be greater than 0.25 seconds.

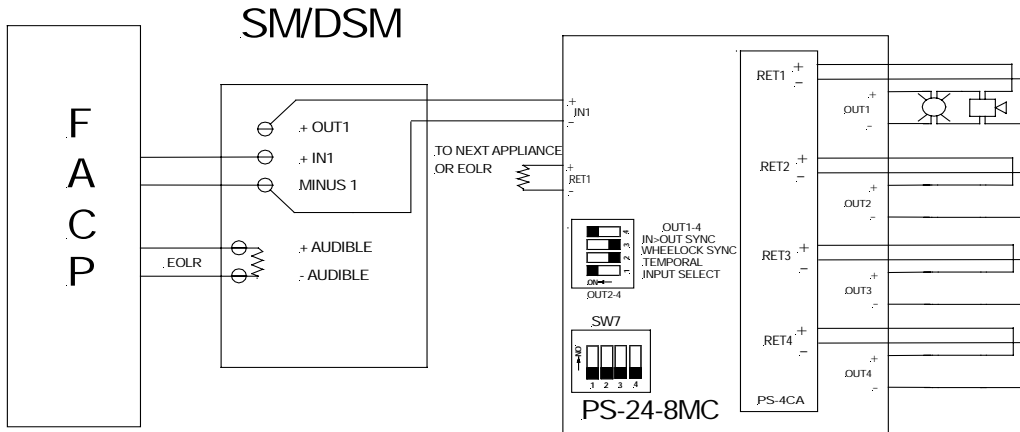
CAUTION: Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

**Example 18: IN>OUT SYNC MODE with External Sync Module without Audible Silence
(CLASS A using the PS-4CA module)**



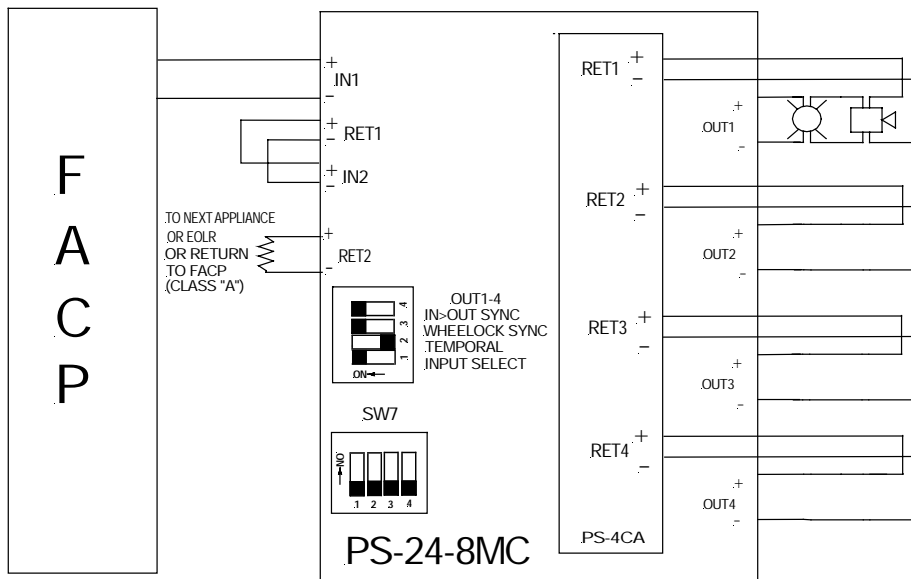
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

**Example 19: IN>OUT SYNC MODE with External Sync Module with Audible Silence
(CLASS A using the PS-4CA module)**



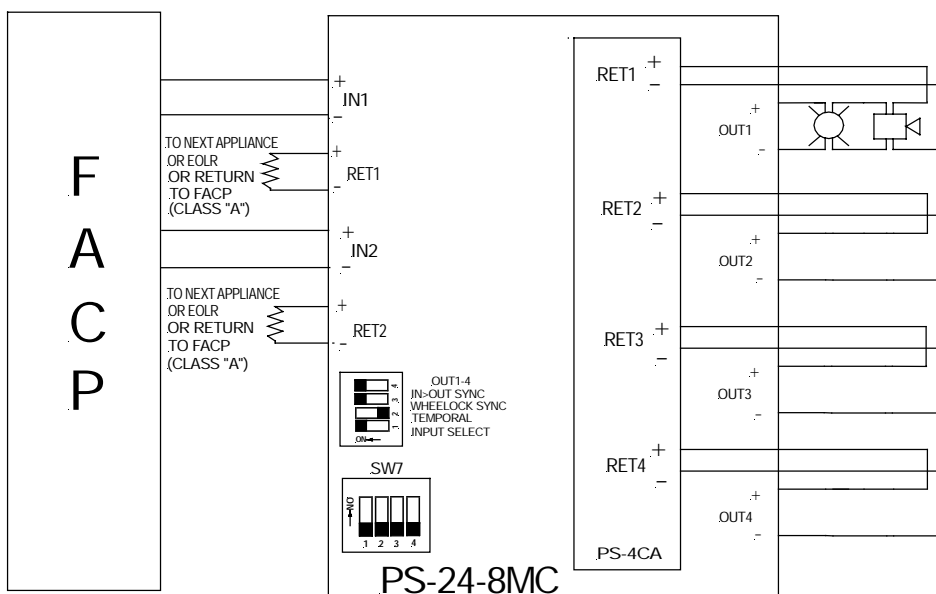
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization **will only occur** with Wheelock sync appliances.

**Example 20: WHEELLOCK SYNC MODE without Audible Silence
(CLASS A using the PS-4CA module)**



- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.
- If only strobes are connected to the **POWERPATH** outputs, the initiating input to IN2 is not required.
- When synchronized horns are used on the two wire output of the **POWERPATH**, IN2 must be connected as shown or the horns will not operate.

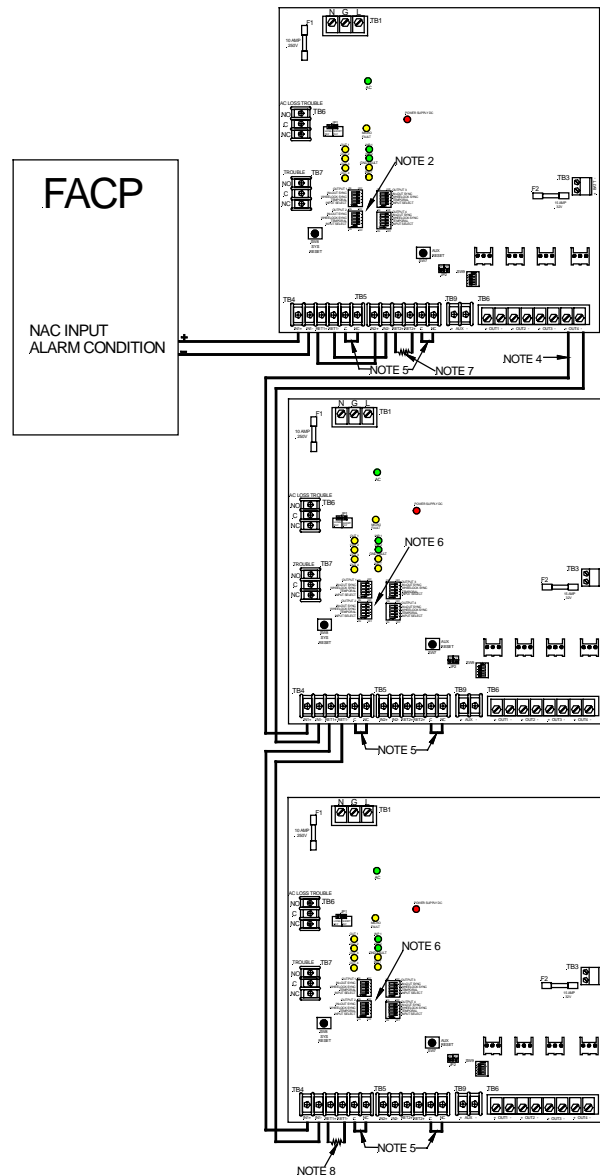
**Example 21: WHEELLOCK SYNC MODE with Audible Silence
(CLASS A using the PS-4CA module)**



- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.

3.6 MASTER REMOTE OPERATION

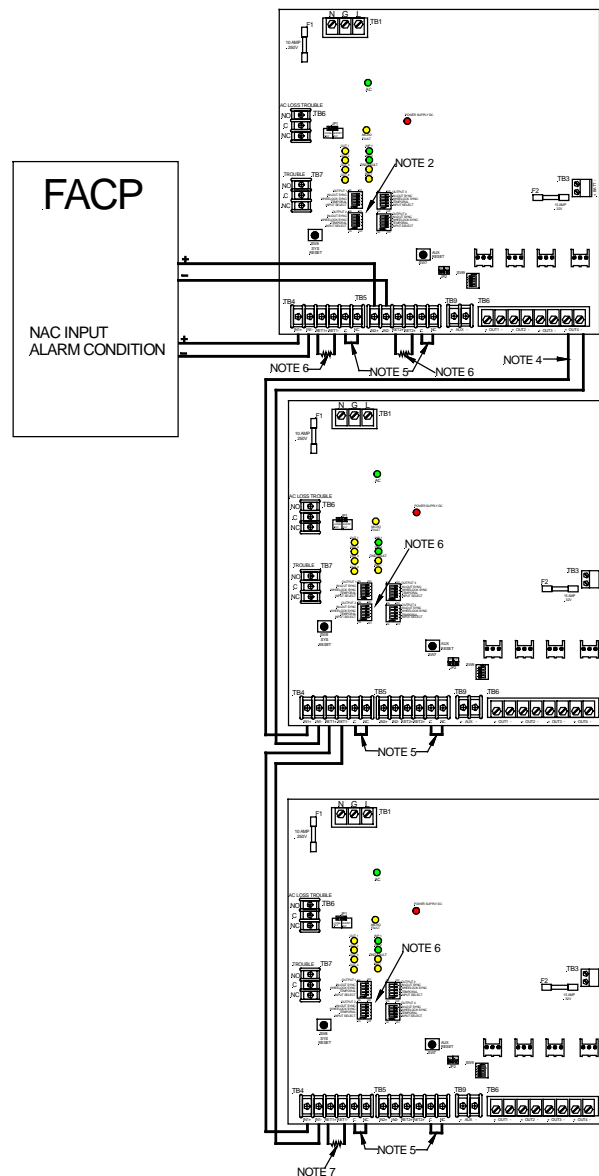
Example 22: Synchronized Multiple PS-24-8MC Using a Master PS-24-8MC (in the WHEELLOCK SYNC MODE) Without Audible Silence, and Using Input #1.



See Figure 1 on Sheet 6 for larger view of PC Board.

- NOTE 1:** NAC Input Voltage 8.0V to 33.0V (FWR or DC) Constant.
- NOTE 2: OBSERVE DIP SWITCH SETTINGS (MASTER)**
Input Selection DIP Switches (Position 1) on OUT1 to OUT4 are to be set in the "ON" position allowing Input #1 to activate Outputs 1-4, (Positions 2-4) are set for "WHEELLOCK SYNC MODE"
- NOTE 3:** Jumper "RET 1-" to "IN 2-" and "RET 1+" to "IN 2+" only on the Master PS-24-8MC.
- NOTE 4:** Diagram shown with an output circuit (OUT4) on Master **POWERPATH** used to synchronized the Remote **POWERPATHs**.
- NOTE 5:** Jumpers must be placed across "DRY 1" and "DRY 2" terminals when operating Power Supply using "IN 1" or "IN 2".
- NOTE 6: OBSERVE DIP SWITCH SETTINGS (REMOTE)**
Input Selection DIP Switches (Position 1) on OUT 1 to OUT 4 are to be set in the "ON" position allowing Input #1 to activate Outputs 1-4, (Positions 2-4) are set for "IN>OUT SYNC MODE".
- NOTE 7:** The value of this EOLR is determined by the FACP requirements.
- NOTE 8:** The value of this EOLR is UL Listed 2.2K Ohm

Example 23: Synchronized Multiple PS-24-8MC Using a Master PS-24-8MC (in the WHEELLOCK SYNC MODE) With Audible Silence, and Using Input #1



See Figure 1 on Sheet 6 for larger view of PC Board.

- NOTE 1:** NAC Input Voltage 8.0V to 33.0V (FWR or DC) Constant.
- NOTE 2: OBSERVE DIP SWITCH SETTINGS (MASTER)**
Input Selection DIP Switches (Position 1) on OUT1 to OUT4 are to be set in the "ON" Position allowing Input #1 to activate Outputs 1-4, (Positions 2-4) are set for "WHEELLOCK SYNC MODE"
- NOTE 3:** Diagram shown with an output circuit (OUT4) on Master **POWERPATH** used to synchronize the remote **POWERPATHs**.
- NOTE 4: OBSERVE DIP SWITCH SETTINGS (REMOTE)**
Input Selection DIP Switches (Position 1) on OUT 1 to OUT 4 are to be set in the "ON" Position allowing Input #1 to activate Outputs 1-4, (Positions 2-4) are set for "IN>OUT SYNC MODE".
- NOTE 5:** Jumpers must be placed across "DRY1" and "DRY2" terminals when operating Power Supply using "IN1" or "IN2".
- NOTE 6:** The value of the EOLR is determined by the FACP requirements.
- NOTE 7:** The value of the EOLR is UL Listed 2.2K Ohms.

4.0 TROUBLESHOOTING:

 **WARNING: THE PS-24-8MC POWERPATH CONTAINS VOLTAGES THAT CAN CAUSE DEATH OR SERIOUS INJURY. ALWAYS OBSERVE PROPER ELECTRICAL SAFETY PRECAUTIONS AND WARNINGS.**

Always follow good troubleshooting procedures:

- AUX power is available after a 20 second delay on power up and when coming out of alarm.
- When trouble occurs, observe all visual indications and note them.
- If the problem is obvious or it can be located on the Troubleshooting Table, note it.
- Press SYS RESET (SW5) and wait 10 seconds check for a trouble indication.
- Always de-energize the **POWERPATH** completely (Remove both AC and DC power) repairs.
- While the **POWERPATH** is de-energized, perform a visual and hands on check of all terminals and wires to ensure proper termination.

Table 4: Troubleshooting		
Trouble	Cause	Action
INP1, INP2 LED's do not light in ALARM.	No input signal on terminals IN1+IN1-, IN2+IN2-.	Check input and input wiring.
GND FAULT LED ON	GND FAULT	Check output circuits.
DC LED OFF	No DC output.	Check wiring to AC power source.
AC LED OFF	No AC power.	Check AC power source.
No audible output in WHEELLOCK SYNC MODE.	No input to IN2+,IN2-.	See Example 13 and 14 for proper input connections.
Horn, horn strobes, or strobes do not synchronize.	Improper MODE selection Improper appliances.	Check MODE selection. Check appliances to ensure proper type for synchronization. For IN>OUT MODE check input appliance (DSM, SM or PS-24-8MC).
CLASS "A" circuit is not functioning properly. (WITH OUT OPTIONAL PS-4CA MODULE)	Improper MODE selection or SW7 settings.	Check to be certain MODE selection is identical for each Class "A" output circuit. Class "A" OUT1 uses outputs 1 and 3. Class "A" OUT2 uses outputs 2 and 4. Check SW7 POS 1 and POS 2 on board for "ON" position.
CLASS "B" circuit is not functioning properly.	Improper MODE selection or SW7 settings.	Check SW7 POS 1 and POS 2 on board for "OFF" position.
OUT1, OUT2, OUT3, OUT4 LED's on during standby.	Trouble on output.	Check output supervision voltage. Check output EOLR.
CLASS "A" circuit is not functioning properly. (WITH OPTIONAL PS-4CA MODULE)	Improper MODE selection or SW7 settings.	Check to be certain MODE selection is identical for each Class "A" output circuit. Check SW7 POS 1 and POS 2 on the main board is set to the "OFF" position.

5.0 BATTERY CALCULATION SHEET:

PS-24-8MC BATTERY CALCULATION SHEET

STANDBY BATTERY CALCULATION

- | | | |
|--|--|--|
| 1. The Standby Current for the PS-24-8MC is 0.080 Amps. | Amps | |
| 2. If in the CP mode of operation enter the AUX current draw
(0.060 Amps, 60 hour operation maximum)
(0.200 Amps, 24 hour operation maximum) | Amps | |
| 3. Add Steps 1 and 2 together | Amps | |
| 4. The number of hours in standby. | | |
| | 24 Hours Standby = 24
60 Hours Standby = 60 | |
| | Hours | |
| 5. Multiply the answer from Step 3 with Step 4 | AH | |
| 6. If the LONG DELAY is selected for AC Trouble reporting enter 0.29 AH
otherwise enter 0.00 AH . | AH | |
| 7. Add Step 5 and 6 together for the Total Standby Battery Requirement in Amp Hours. | AH | |

ALARM BATTERY CALCULATION

1. List notification appliance requirements.

	CURRENT
ALARM CURRENT FOR THE PS-24-8MC	0.240
NOTIFICATION APPLIANCE	

- | | | |
|---|---|--|
| 2. Calculate total notification appliance current plus alarm current for PS-24-8MC. | Amps | |
| 3. Multiply Step 2 by alarm time required for the Alarm Battery Requirement. | AH | |
| | 15 Min : Multiply by 0.25
5 Min : Multiply by 0.0833 | |

TOTAL BACKUP BATTERY REQUIREMENTS

- | | | |
|---|-----------|--|
| 1. Enter Standby Battery Requirement from "STANDBY BATTERY CALCULATION" Step 5. | AH | |
| 2. Enter Alarm Battery Requirement from "ALARM BATTERY CALCULATION" Step 3. | AH | |
| 3. Add Steps 1 and 2 together. | AH | |
| Multiply Step 3 by 1.1 for minimum Backup Battery Requirements. | AH | |

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