

**POWERPATH
PS-12/24-8CP
(103047)
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-12/24-8CP **POWERPATH** is an 8 Amp, 12/24VDC, filtered and regulated, supervised remote power supply/charger used for supervision and expanded power driving capability for Fire Alarm Notification Appliance Circuits. The PS-12/24-8CP may be connected to any 12VDC or 24VDC 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 12VDC or 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. Additionally, a continuous auxiliary power output of up to 0.2 Amps for 24 hours and up to 0.06 Amps for 60 hours is provided. The PS-12/24-8CP also contains a battery charger capable of charging either 7 or 12 Amp/Hour (AH) of battery backup.

Two FACP NAC circuits or two "Dry" contact closures 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 3.0 Amps (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-12/24-8CP NAC circuits shall not exceed 8.0 Amps.

The PS-12/24-8CP 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 common trouble output terminals (used to indicate a loop trouble) and common trouble input terminals (used generically by any initiating circuit).

Wheelock horns/strobes, strobes and horns with synchronizing capability can be utilized with the PS-12/24-8CP. 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: Bureau of Fire Protection (BFP) Chicago
- NFPA 72 compliant

Inputs:

- 120VAC, 50/60Hz, 5.0 Amps or 240VAC, 50/60Hz 3.0 Amps Operating Power in Alarm
- 12/24VDC Battery Backup Connection
- Two (2), 12VDC or 24VDC NAC Initiating Circuits (8-33VDC at 5mA)
- Two (2) "Dry" Contact initiating Circuits
- Accepts two Class "A" or two Class "B" circuit inputs
- Built in battery charger for sealed lead acid or gel type batteries

Outputs:

- Switch selectable 12VDC or 24VDC power limited outputs
- 8 Amp in alarm supply current at 12VDC or 24VDC
- Capable of four (4), Class "B" circuits (2.0 Amps each)
- Capable of two (2) Class "A" circuits (3.0 Amps each)
- Capable of one (1) Class "A" circuit (3.0 Amps) and two (2) Class "B" circuits (2.0 Amps each)
- Capable of two (2) Class "B" circuits (3.0 Amps each) and (2) Class "B" circuits (2.0 Amps total)
- 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-12/24-8CP is required)
- Audible silence capability
- Filtered and electronically regulated output
- 0.06 Amp continuous auxiliary power for 60 hours, which is power limited with reset capability.
- 0.2 Amp continuous auxiliary power for 24 hours, which is power limited with reset capability.

Supervision:

- Compatible with 12VDC or 24VDC 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
- Common input and output trouble circuits
- 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 (Form C contact, 1 Amp 28VDC)
- Battery presence and low battery supervision (Form C contact, 1 Amp 28VDC)
- Ground Fault Detection

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

SM = Wheelock Sync Module with single output.

DSM = Wheelock Dual Sync Module with two outputs.

C = Common

NC = Normally Closed

NO = Normally Open

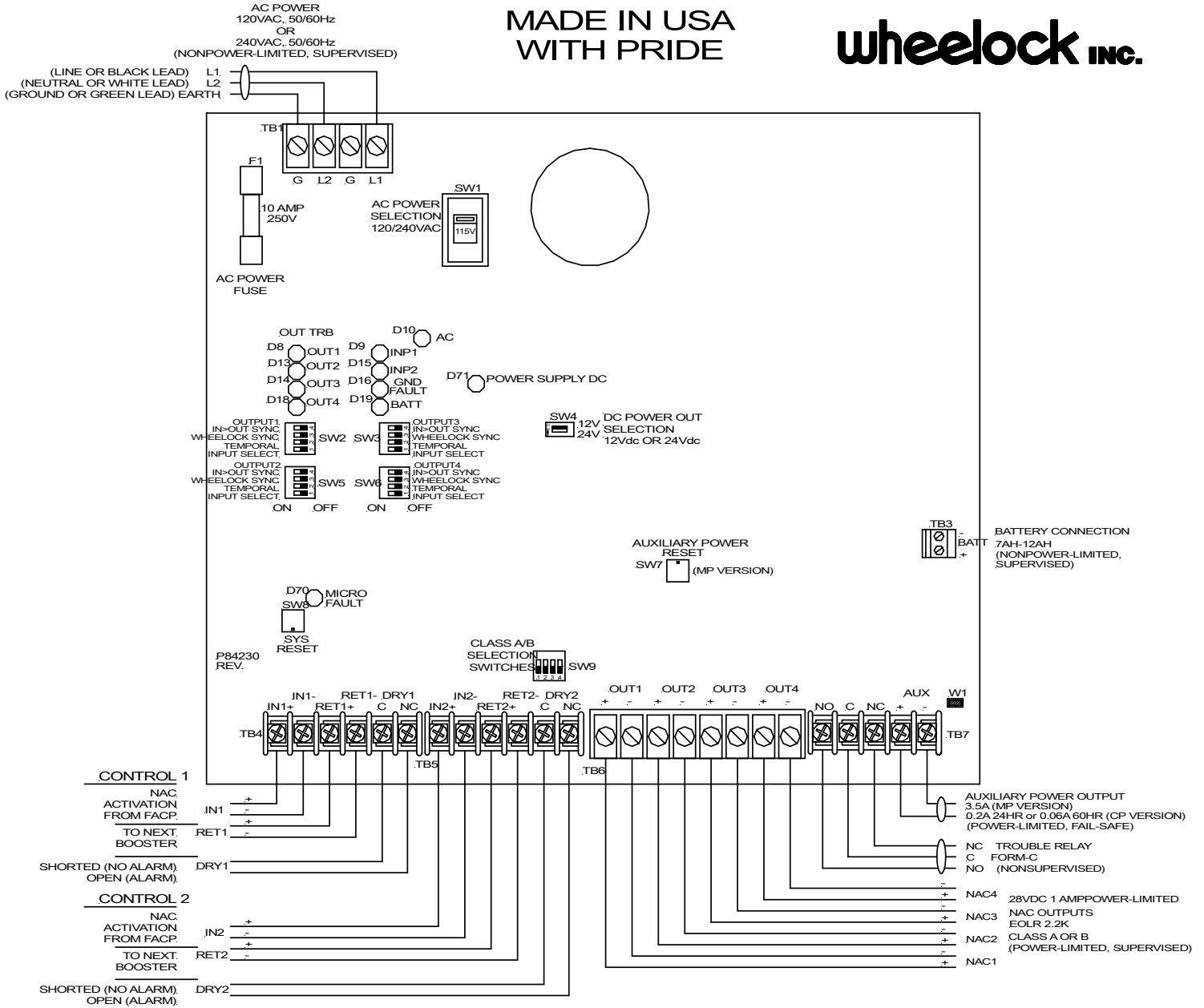
AH = Ampere/Hour

1.4 TERMINAL IDENTIFICATION

Table 1: Terminal Identification		
Terminal Block Identification Numbers (Figure 1)	Terminal Identification	Function/Description
TB4-1, 2	IN1+,IN1-	These terminals connect to the input voltage source (i.e. 12VDC or 24VDC FACP). The FACP will supply a voltage from 8-33VDC at 5mA. 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 on a FACP, a trouble condition on the designated loop will cause these inputs to trip the FACP by opening the FACP loop. Alarm condition always overrides trouble to drive output indicating appliances.
TB4-3, 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.
TB5-1, 2	IN2+, IN2-	Same as IN1+, IN1- for corresponding terminals.
TB5-5, 4	RET2+, RET2-	Same as RET1+, RET1- for corresponding terminals.
TB4-5, 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: 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.
TB5-5, 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.
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 3.0 Amps Class "A" and can be individually programmed for Normal Mode, Temporal Mode, IN>OUT SYNC Mode, or WHEELLOCK 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. 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.
TB7-1-3	"NO" "C" "NC" (COMMON TROUBLE OUTPUT)	Typically used to trigger remote alerts or other reporting appliances. Form C contacts rated 28VDC at 1 Amp.
TB7-4, 5	+ AUX -	This output is capable of 0.06 Amps for 60 hours or 0.2 Amps for 24 hours which can be used on battery backup for desired auxiliary equipment.

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WARNING

TWO DIFFERENT SOURCES OF POWER MAY BE CONNECTED TO THIS UNIT. DISCONNECT BOTH SOURCES OF POWER BEFORE SERVICING. FAILURE TO DISCONNECT BOTH SOURCES OF POWER BEFORE SERVICING COULD RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS

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 UNDESIRED OPERATION.

PAT. PEND. PAT. 5400009, 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. TROUBLE condition occurs when the circuit is no longer supervised correctly. 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 PS12/24-8CP system rest (SW8) is pressed. The trouble relay follows any trouble condition and is not latching.

NOTE: An alarm condition overrides a trouble condition.

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

Battery Replacement: Power-Sonic (or equal) 12VDC, replace with new batteries every four (4) years or as needed if battery will no longer accept full charge. Two 12V batteries are required for 24VDC setting. Use either a 7AH battery or a 12AH battery in accordance with the proper battery calculation for the application using BATTERY CALCULATION SHEET provided on Sheet 23.

NOTE: Battery compartment measures 4-1/2" High X 11-1/2" Wide X 4-1/2" Deep.

2.0 INSTALLATION INSTRUCTIONS:

NOTE: The PS-12/24-8CP **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).

Mount the **POWERPATH** in the desired 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 85% 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 3/4 inch plywood to the concrete surface. Attach the **POWERPATH** to the plywood.

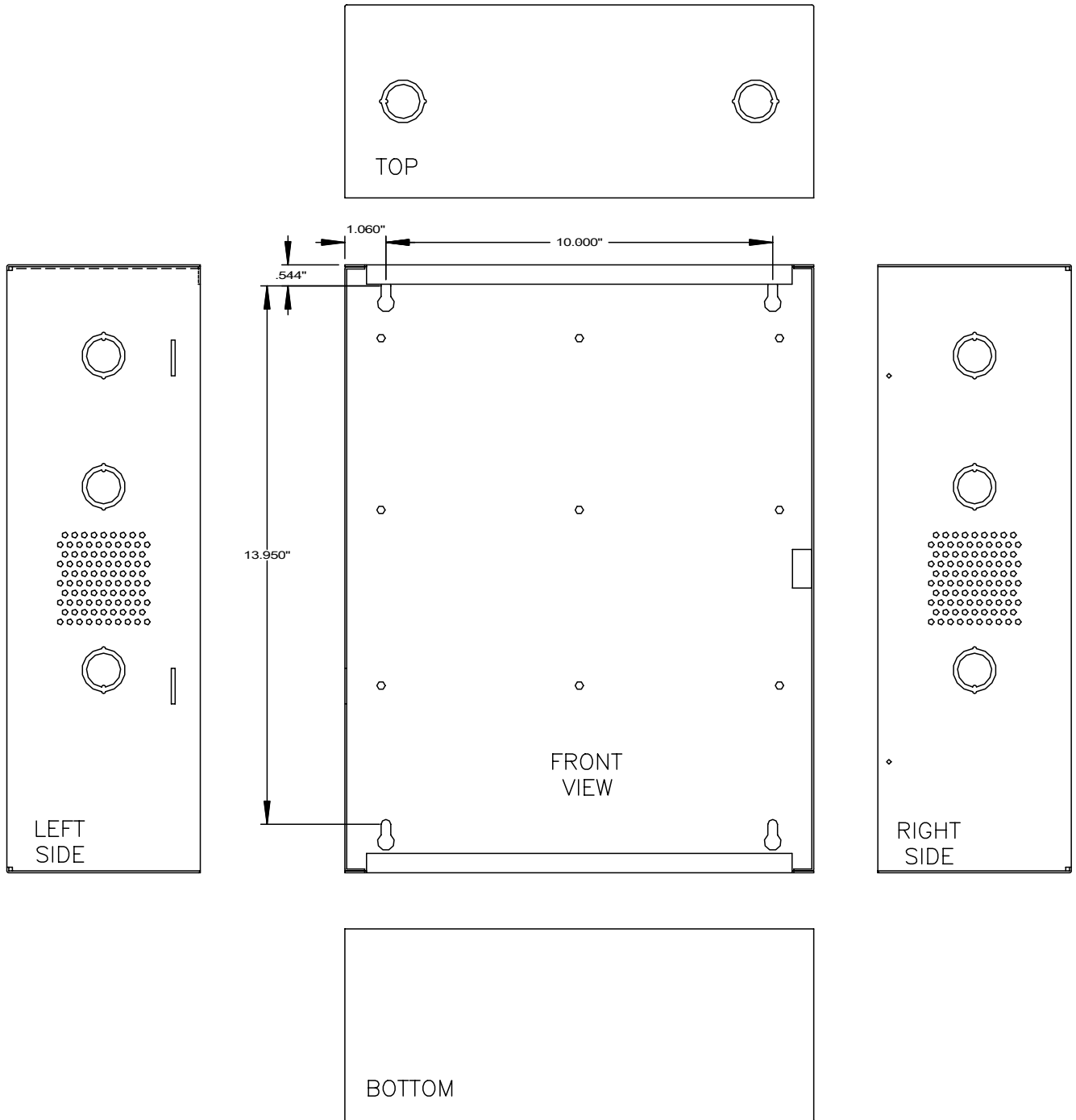


Figure 2:
Mounting Dimensions

DIMENSIONS (H x W x D) - 16" x 12.25" x 5"

NOTE: All dimensions shown are measured in inches.

2.3 WIRING

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 locations are shown in Figure 1.

Set Power Supply switch (SW1) for 120VAC or 240VAC operation. See Figure 1.

- A. Set Power Supply switch (SW4) for desired output voltage (Down for 24VDC, Up for 12VDC). See Figure 1.
- B. 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).
- C. Set DIP Switch SW9 position 1 & 2 to select Class "A" or Class "B" operation (Off for Class "B", On for Class "A"). See Figure 1.
- D. Dress battery wire down to the back of the enclosure, observing ¼" separation of power limited wire V.S. non-power limited wiring. See Figure 3.
- E. 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.
 - 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-12/24-8CP NAC circuits shall not exceed 8.0 Amps.
 - Total load of any Class "B" output circuit shall not exceed 3.0 Amps.
 - Total load of any Class "A" output circuit shall not exceed 3.0 Amps.
 - Terminate unused outputs with a 2.2K Ohm EOLR.
- F. Connect the indicating 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.
- G. Connect desired auxiliary equipment to the auxiliary output terminals +AUX-.
 - Total load of the AUX output shall not exceed 0.06 Amps during 60 hour battery backup. This is UL listed for 5 minute of alarm power. See BATTERY CALCULATION SHEET for further information.
 - Total load of the AUX output shall not exceed 0.2 Amps during 24 hour battery backup.
- H. Connect trouble relays as desired.
- I. Connect backup batteries. Observe correct polarity and voltage. For 12VDC, use a single 12V battery. For 24VDC, 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 22.
- J. Install battery cover between both battery wires and Power Limited Wiring. See Figure 3.
- K. 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.
- L. Press Auxiliary Power Reset, SW7 to ensure that Auxiliary Power is present.
- M. Close door and secure with 2 screws on side.

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 RELAY STATUS CONNECTIONS

COMMON TROUBLE TERMINALS – The common trouble terminals are located on the right bottom side of the PC Board. The three terminals are labeled "NO", "C" and "NC". When the PS-12/24-8CP 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. The relay follows the trouble condition and is not latching.

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

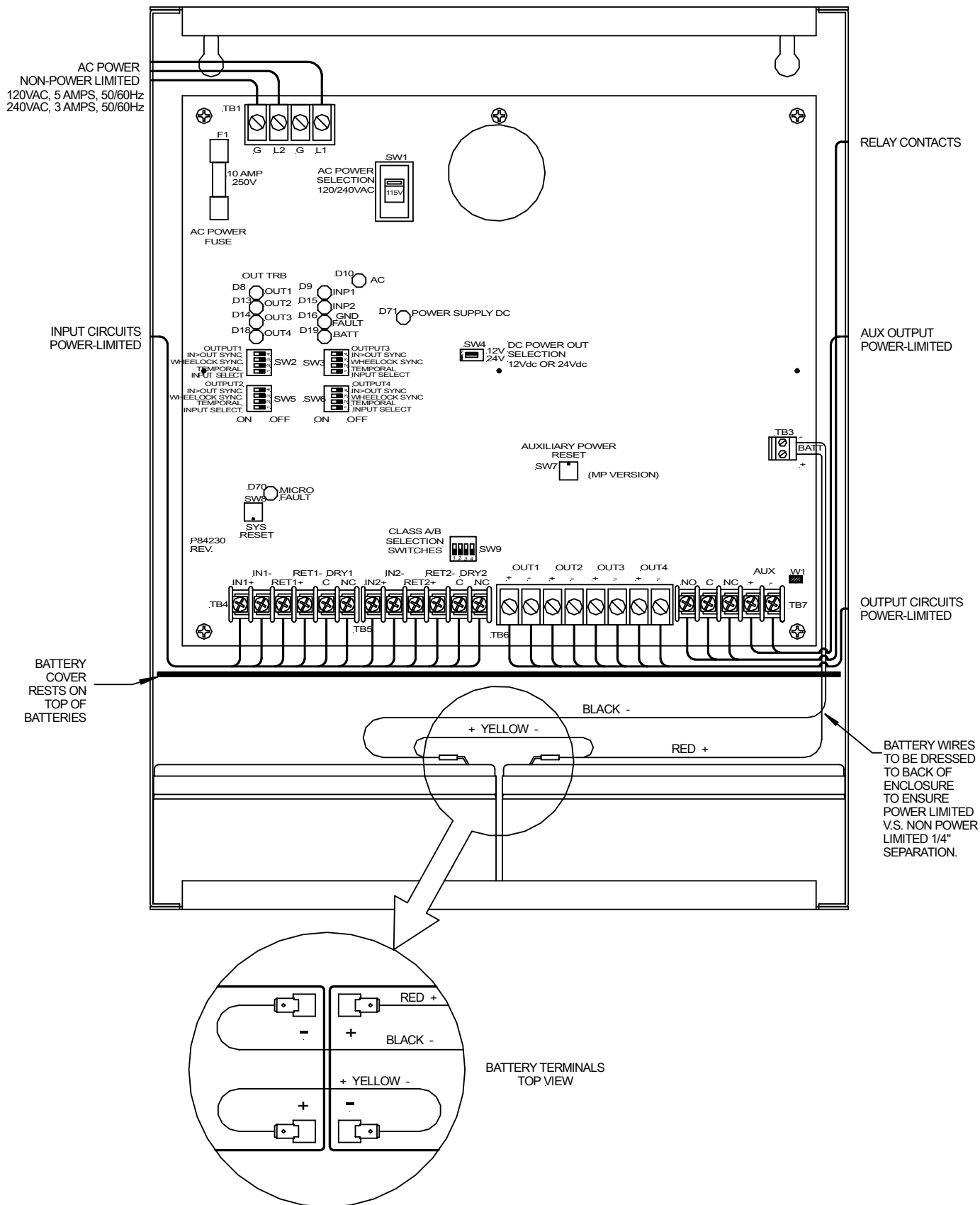


Figure 3:
POWERPATH PS-12/24-8CP

3.0 OPERATION:

3.1 MODES OF OPERATION

The PS-12/24-8CP **POWERPATH** can provide a 12VDC or 24VDC output when initiated by a 8VDC to 33VDC 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.

Each Class "A" circuit is 3.0 Amps and each Class "B" circuit is 3.0 Amps. Total load for the PS-12/24-8CP NAC circuits shall not exceed 8.0 Amps.

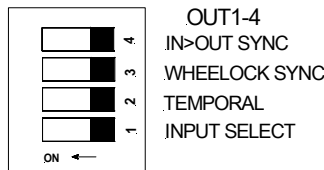
There are four output modes which can be used with either Class "A" or Class "B" circuits.

NORMAL MODE	Used for a constant 12VDC or 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 a coded signal or synchronization signal input to be utilized by the POWERPATH . This signal may come from a FACP, another PS-12/24-8CP or a Wheelock Synchronization Module (SM-12/24 or DSM-12/24). Audibles can also be silenced.
WHEELLOCK SYNC MODE	Activates the built-in Wheelock Synchronization Mode for use with patented synchronized horns and strobes. Audibles can also be silenced.

3.2 DIP SWITCH SETTINGS

The following is the DIP Switch settings for Output 1. Each of the remaining outputs is controlled similarly. When switches are changed, press SYS RESET and wait 30 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"
	WHEELLOCK 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"
	WHEELLOCK 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"
	WHEELLOCK SYNC (3)	"OFF"
	IN>OUT SYNC (4)	"ON"
WHEELLOCK SYNC	INPUT SELECT (1)	"ON" for "IN1" or "DRY1" "OFF" for "IN2" or "DRY2"
	TEMPORAL (2)	"OFF"
	WHEELLOCK SYNC (3)	"ON"
	IN>OUT SYNC (4)	"ON"

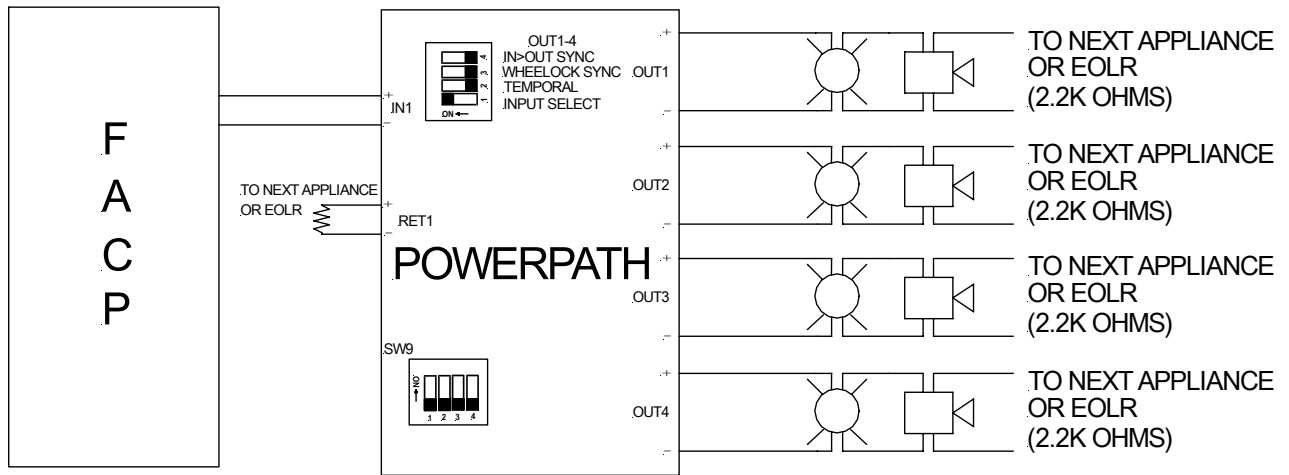
3.3 CLASS “B” OPERATION

Class “B” outputs can be controlled from either IN1 or IN2. Switch SW9 position 1 & 2 on the 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 SW9 position 1 & 2 control Class “A” or Class “B” configuration. SW9 position 1 controls Outputs 1 and 3. SW9 position 2 controls Outputs 2 and 4.
- The PS-12/24-8MP requires a 2.2K Ohm End of Line Resistor (EOLR) on each output for proper supervision.

Example 1: NORMAL MODE (CLASS B)



LEGEND

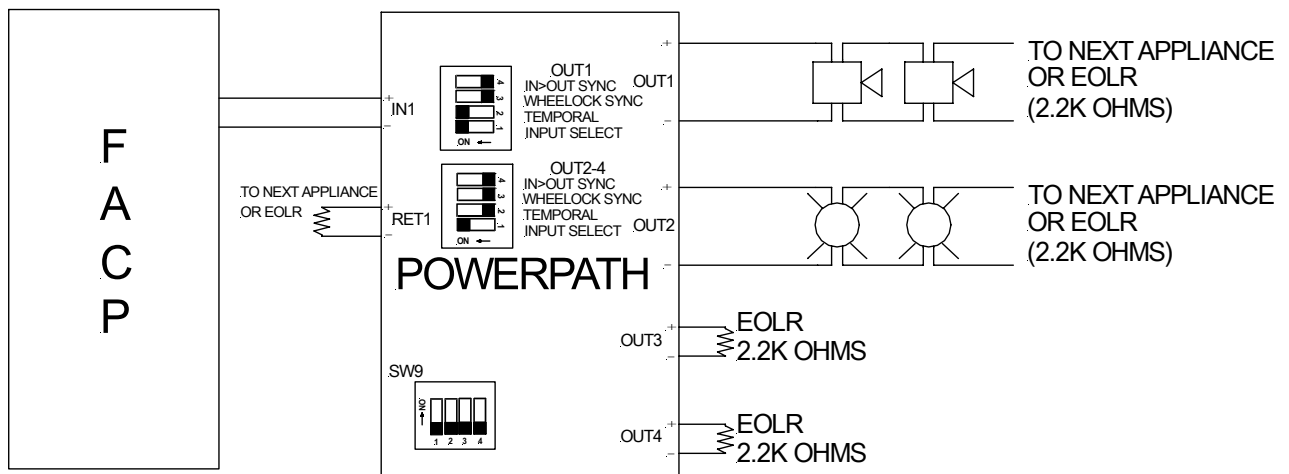


= STROBE



= AUDIBLE

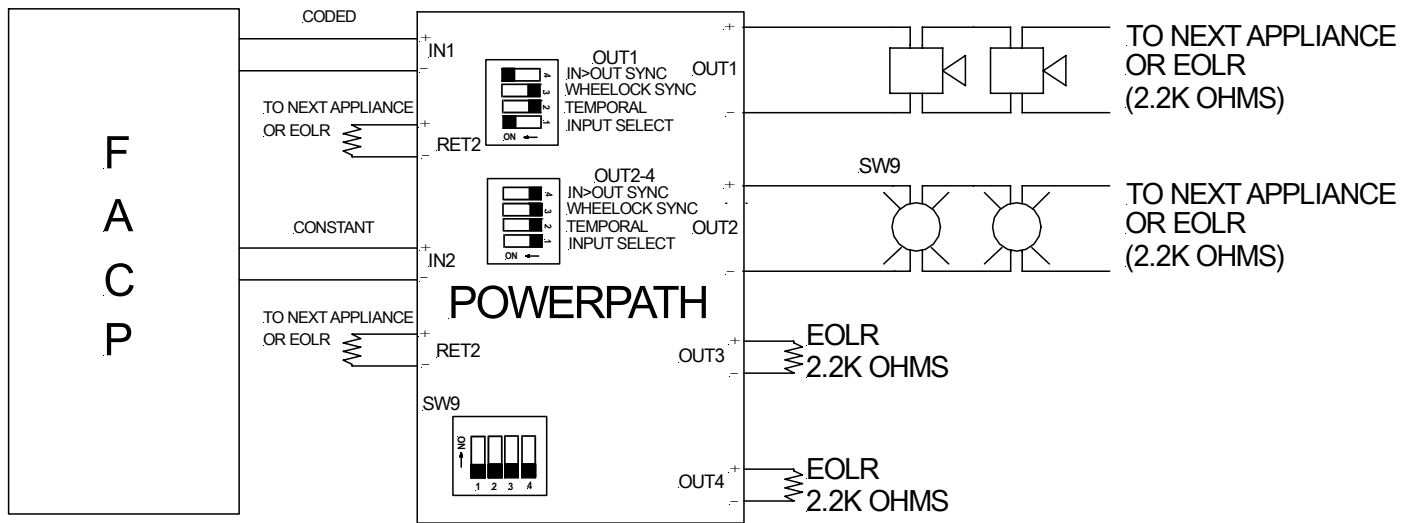
Example 2: TEMPORAL MODE (CLASS B)



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)

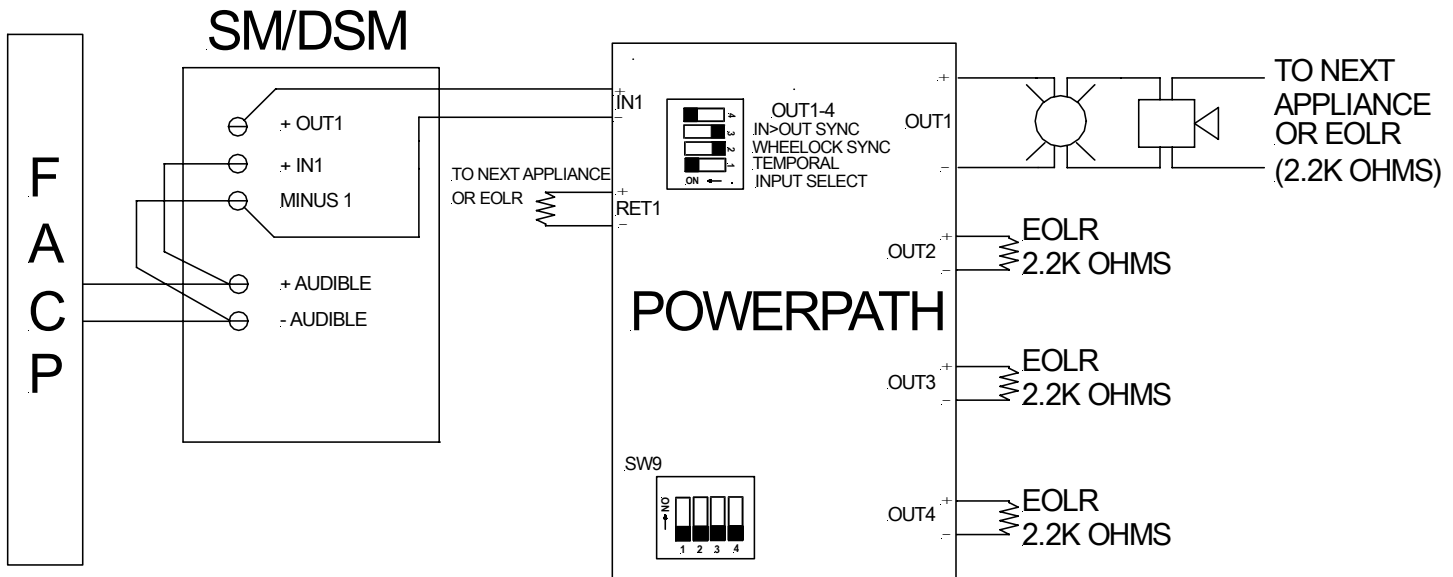


Minimum pulse duration for coded signals must be greater than 0.4 seconds.

CAUTION: Strobes require constant voltage and will not operate properly in the IN>OUT SYNC MODE with a coded input source. A second constant input with a second output set in the NORMAL MODE will provide the constant voltage.

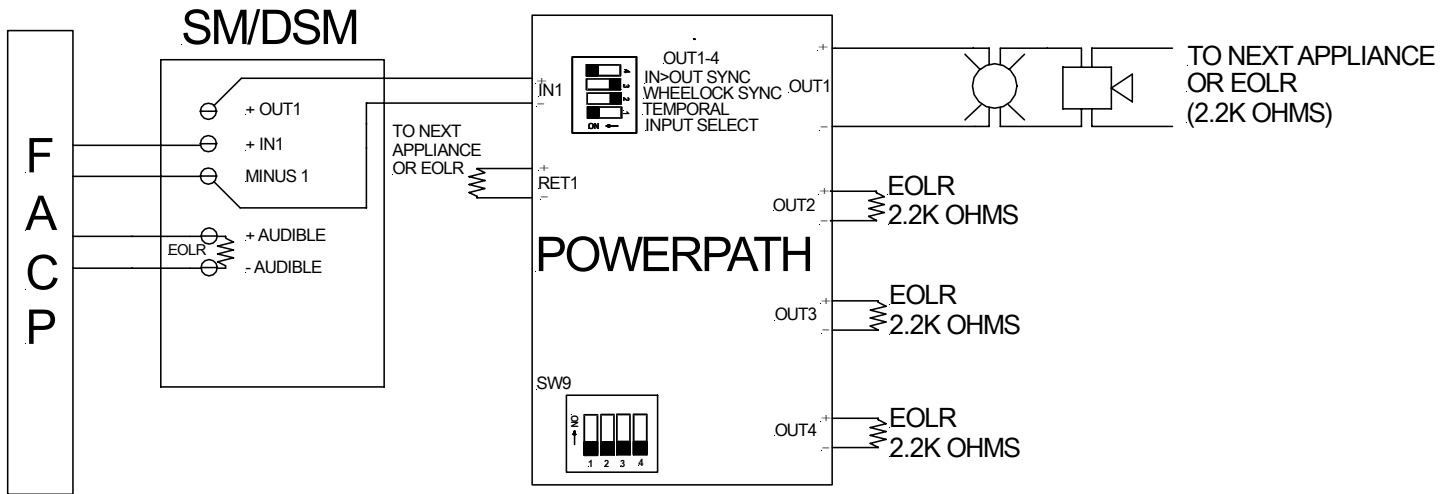
CAUTION: Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

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



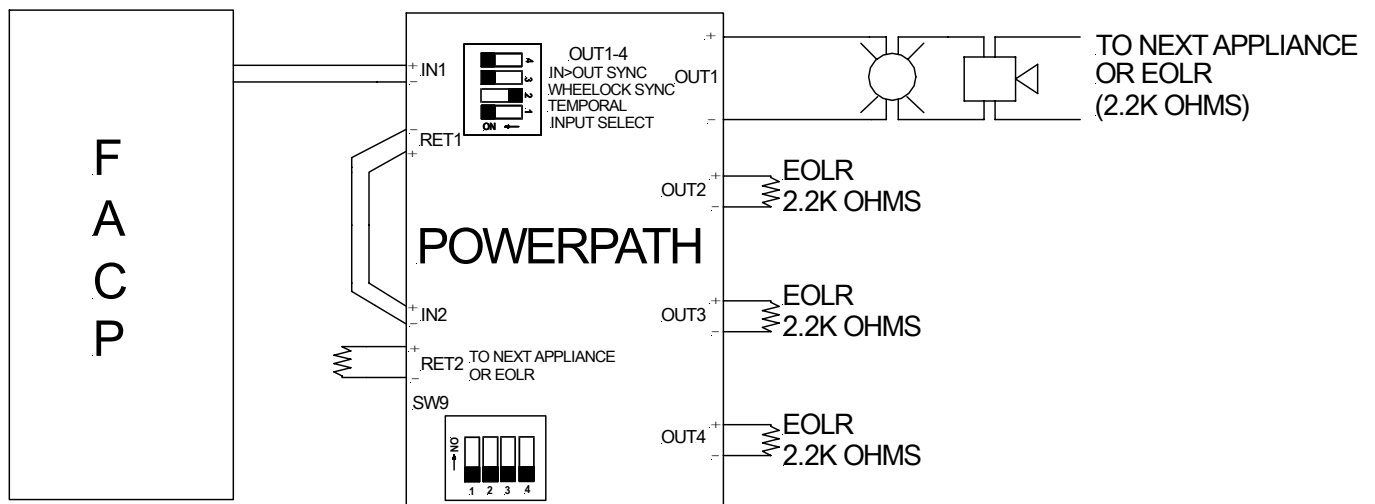
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

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



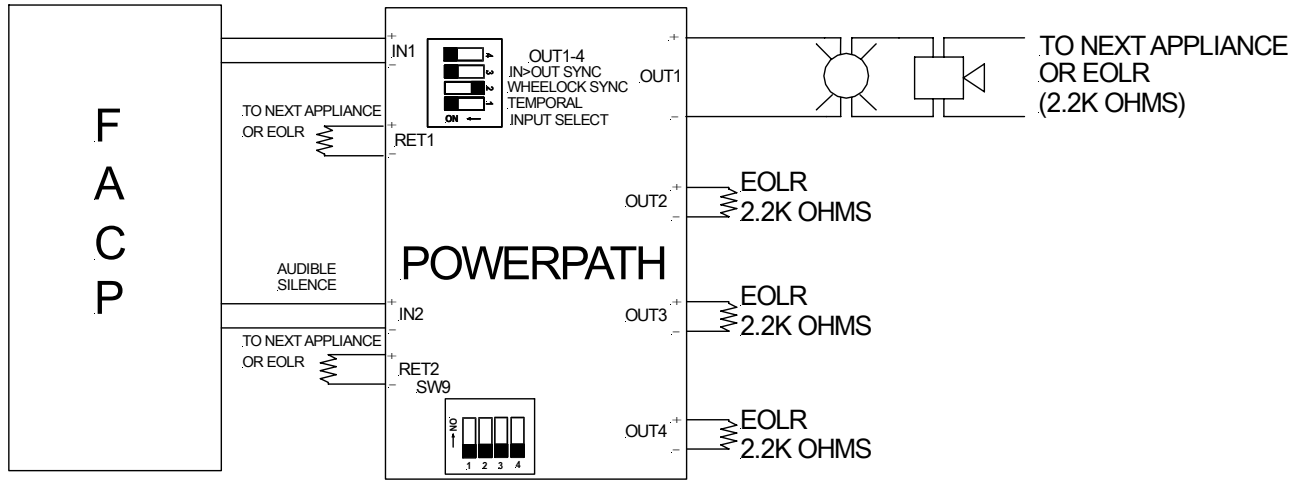
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

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)



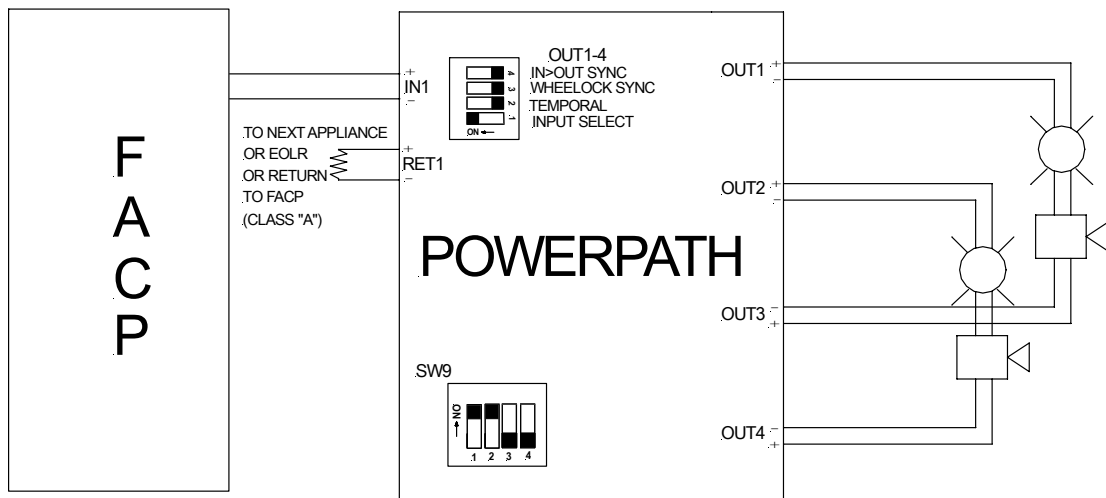
- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.

3.4 CLASS “A” OPERATION

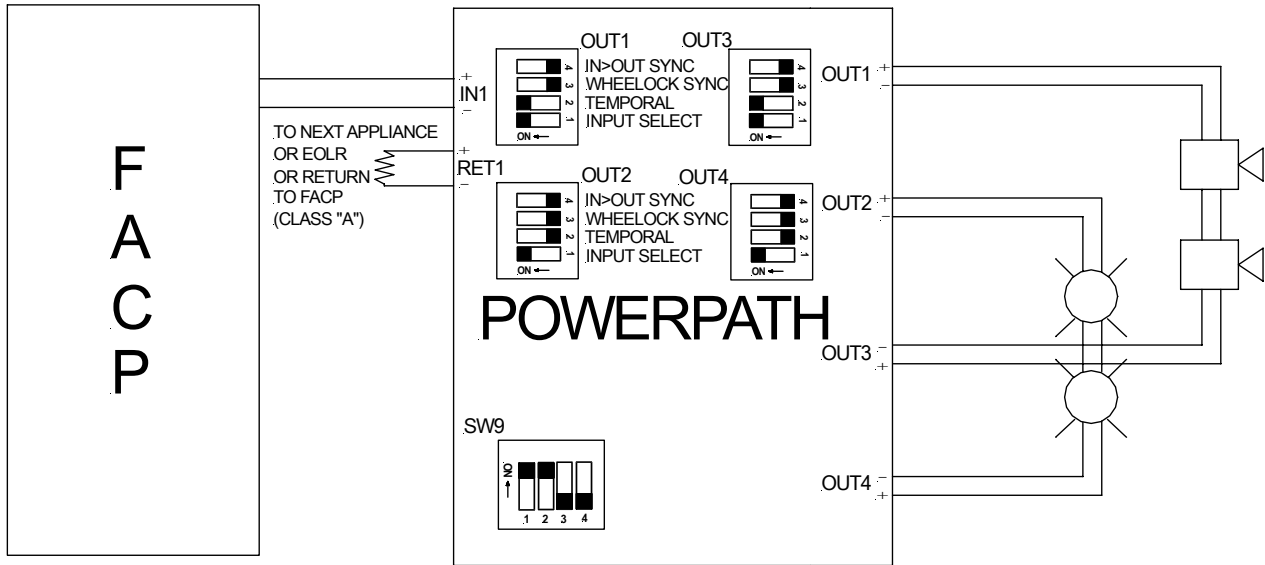
Class “A” circuit 1 uses “OUT1” and “OUT3”. Class “A” circuit 2 uses “OUT2” and “OUT4”. When operating in Class “A” the two circuits must have the same switch settings for the operational mode selected. Switch SW9 position 1 & 2 on the PC board are in the “ON” position.

- 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 SW9 position 1 & 2 control Class “A” or Class “B” configuration. SW9 position 1 controls Outputs 1 and 3. Switch SW9 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)

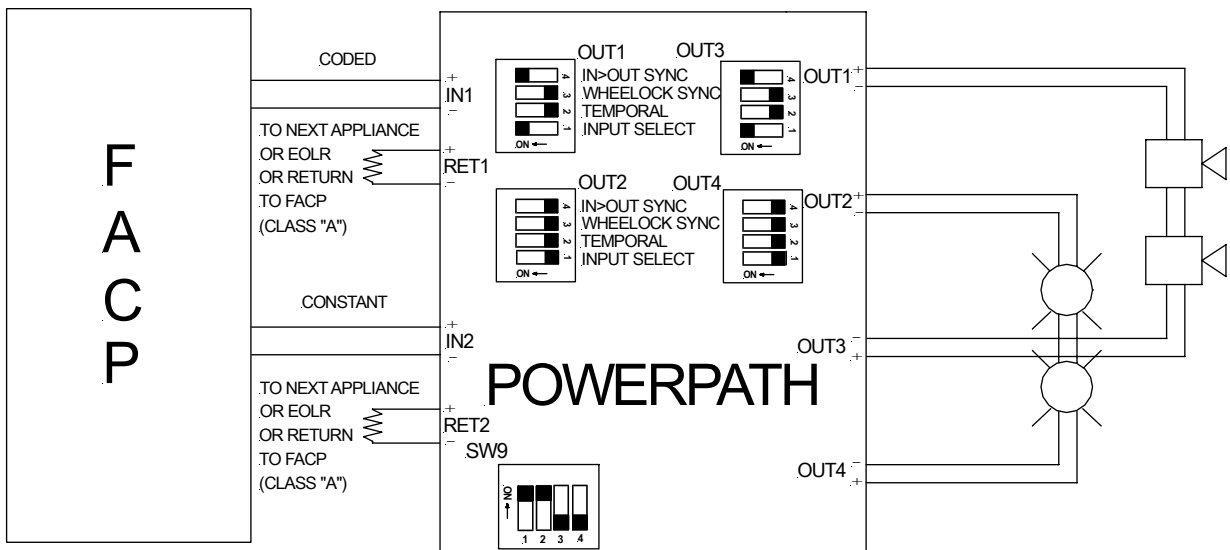


Example 9: TEMPORAL MODE (CLASS A)



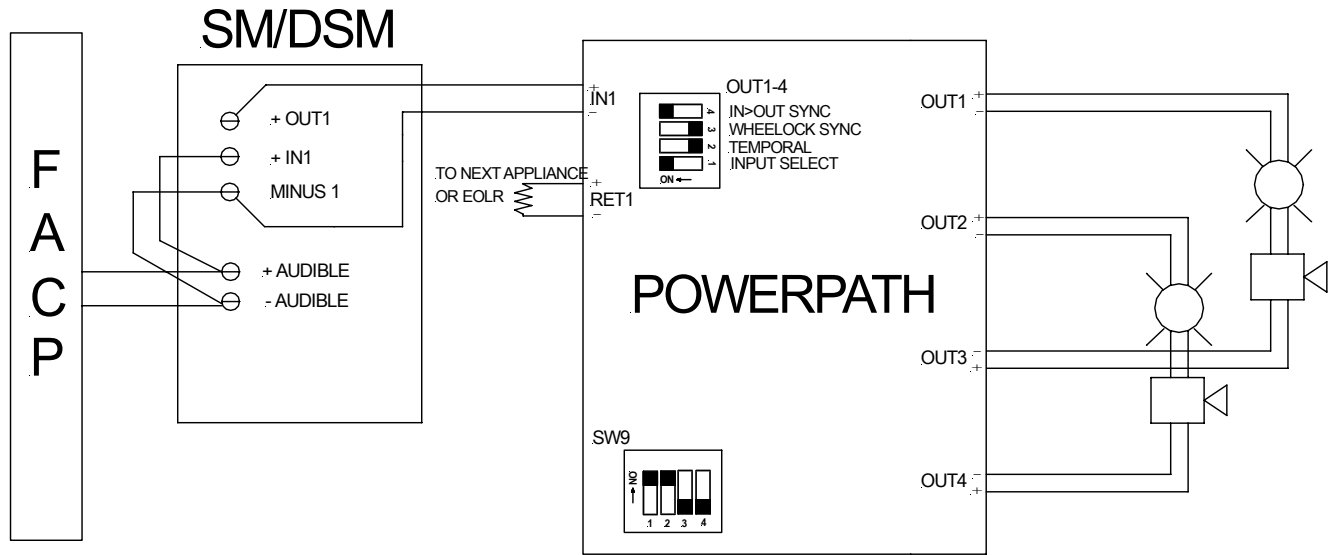
CAUTION: Strobes require constant voltage and will not operate properly in the TEMPORAL MODE. A second Class “A” output set in the NORMAL MODE will provide the constant voltage for the strobe circuit. Only use sounding appliances that can use a coded signal. Do not use Wheelock AS/AH or NS/NS4/NH appliances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

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



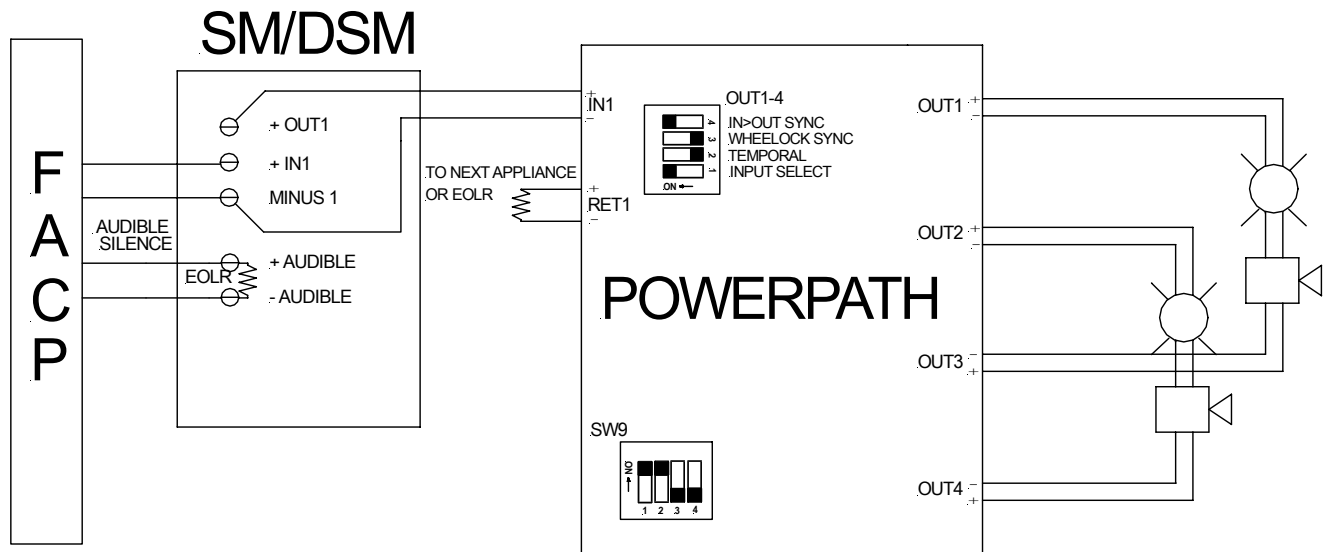
CAUTION: Strobes require constant voltage and will not operate properly in the IN>OUT SYNC MODE with a coded input. A second Class “A” output set in the NORMAL MODE will provide the constant voltage for the strobe circuit. Only use audible appliances that can use a coded signal. Do not use Wheelock AS/AH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

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



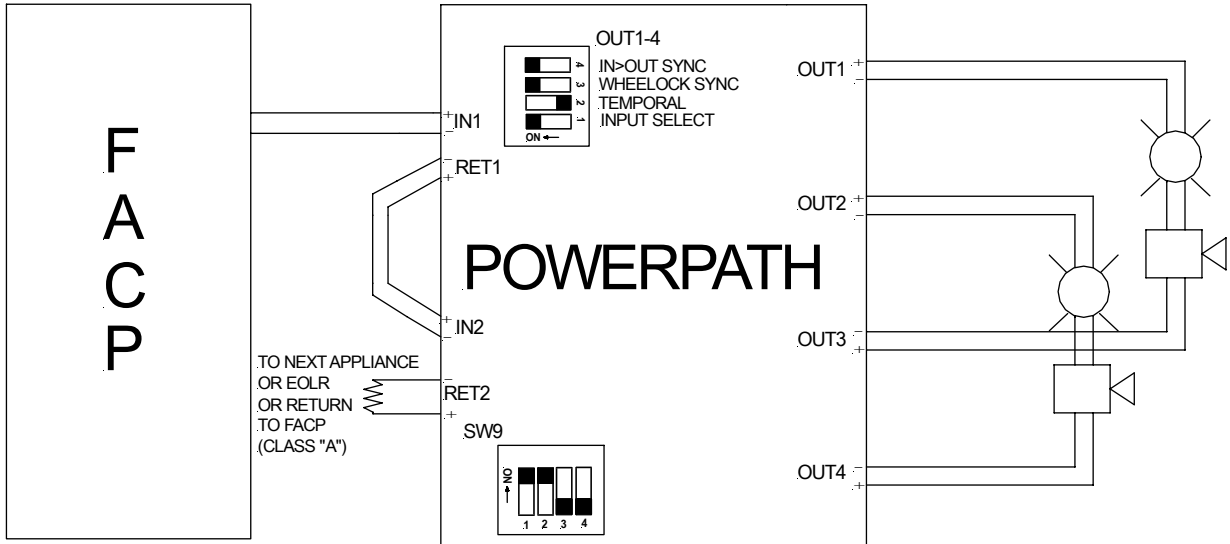
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

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



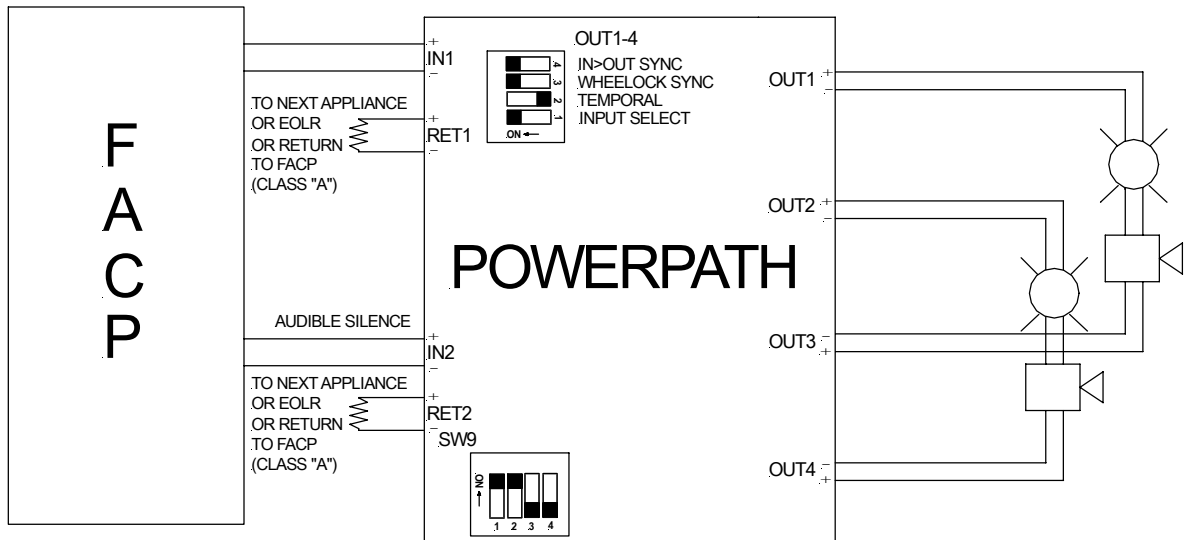
NOTE: When using the Wheelock external Sync Module (SM or DSM), synchronization will only occur with Wheelock sync appliances.

Example 13: WHEELOCK 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: WHEELOCK 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

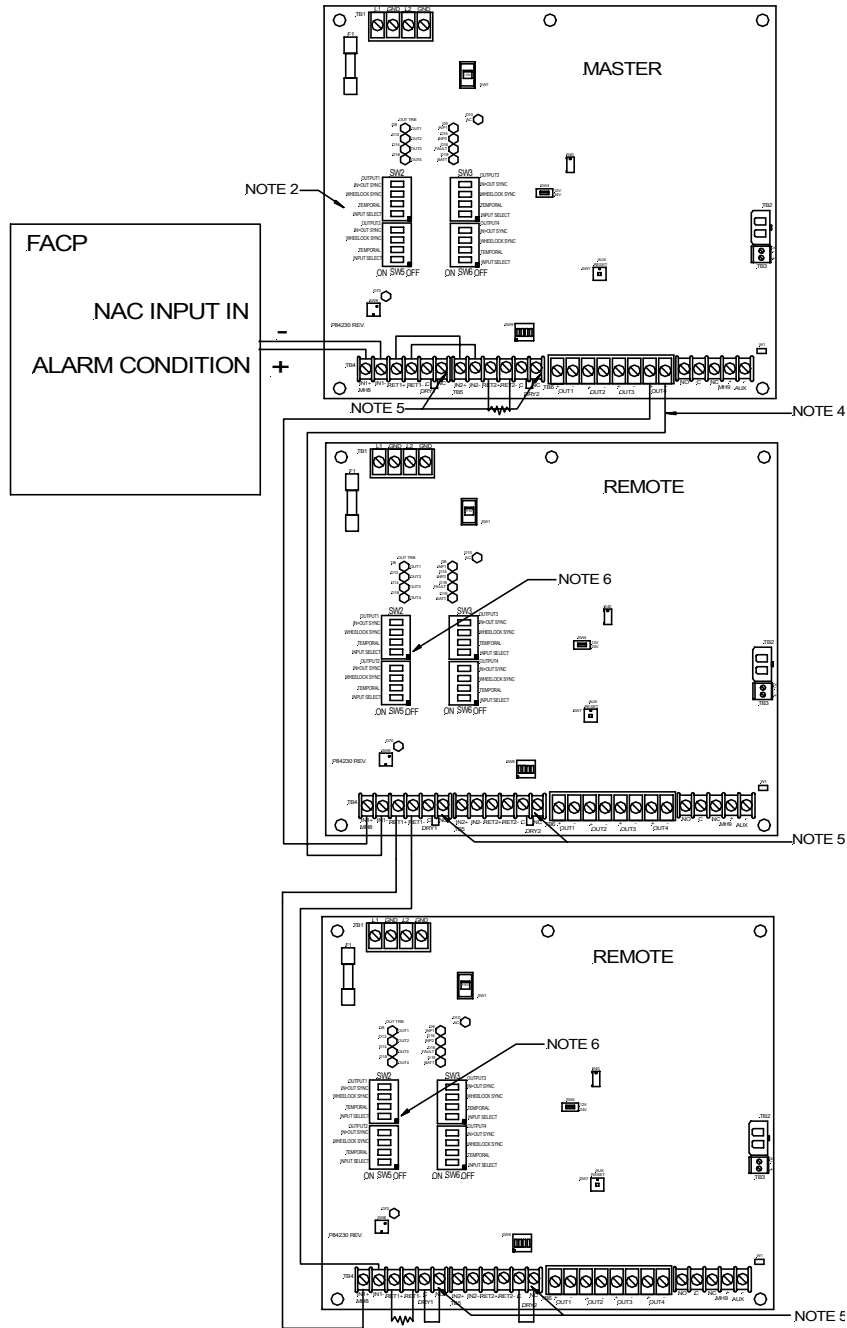
The PS-12/24-8CP **POWERPATH** can be configured to have one Class “A” (3.0 Amps) and two Class “B” (2.0 Amps each circuit) Outputs at the same time. This is done by Switch SW9 position 1 & 2. **NOTE:** When SW9 position 1 is on, OUTPUTS 1 and 3 are the Class “A” circuit. When SW9 position 2 is on, OUTPUTS 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 MASTER REMOTE OPERATION:

Example 15: Synchronized Multiple PS-12/24-8MP or PS12/24-8CP Using a Master PS-12/24-8MP or PS12/24-8CP (in the WHEELLOCK SYNC MODE) Without Audible Silence, and Using Input #1.



See Figure 1 on Sheet 5 for larger view of PC Board.

NOTE 1: NAC Input Voltage 8.0VDC to 33.0VDC Constant.

NOTE 2: OBSERVE DIP SWITCH SETTINGS

Input Selection Switch (Position 1) on OUT1 to OUT4 DIP Switches are shown 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-12/24-8CP.

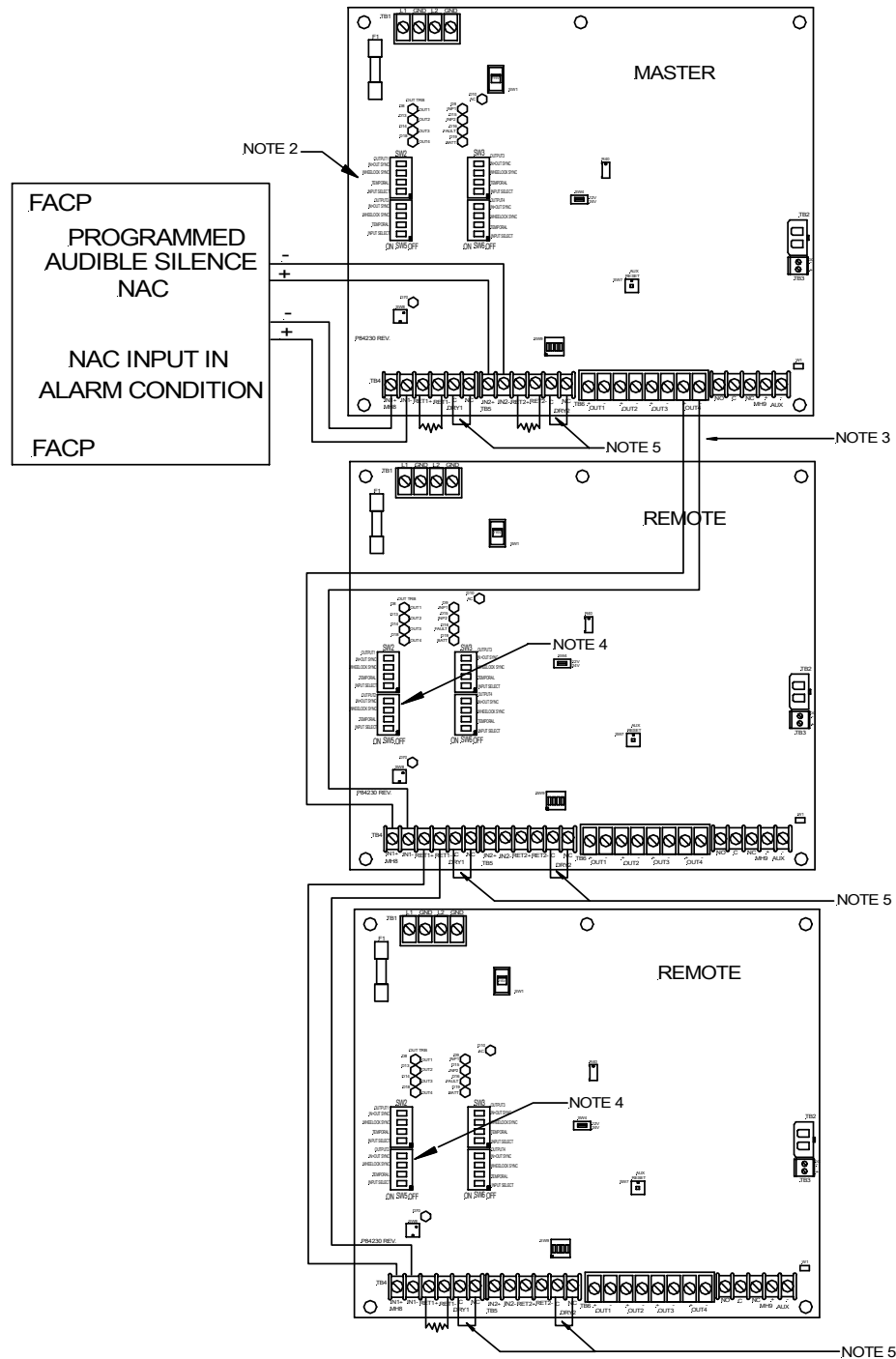
NOTE 4: Diagram shown with an output circuit (OUT4) on Master **POWERPATH** used to synchronized the Remote **POWERPATHS**.

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

Input Selection Switch (Position 1) on OUT 1 to OUT 4 DIP Switches are shown in the "ON" Position allowing Input #1 to activate Outputs 1-4. Positions 2-4 are set for "IN>OUT SYNC MODE".

Example 16: Synchronized Multiple PS-12/24-8MP or PS-12/24-8CP Using a Master PS-12/24-8MP or PS12/24-8CP (in the WHEELLOCK SYNC MODE) With Audible Silence, and Using Input #1



See Figure 1 on Sheet 5 for larger view of PC Board.

NOTE 1: NAC Input Voltage 8.0 to 33.0VDC Constant.

NOTE 2: OBSERVE DIP SWITCH SETTINGS

Input Selection Switch (Position 1) on OUT1 to OUT4 DIP Switches are shown 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

Input Selection Switch (Position 1) on OUT 1 to OUT 4 DIP Switches are shown 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".

4.0 TROUBLESHOOTING:

⚠ WARNING: THE PS-12/24-8CP POWERPATH CONTAINS VOLTAGES THAT CAN CAUSE DEATH OR SERIOUS INJURY. ALWAYS OBSERVE PROPER ELECTRICAL SAFETY PRECAUTIONS AND WARNINGS.

Always follow good troubleshooting procedures:

- 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 (SW8) and wait 30 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.

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-12/24-8MP or PS-12/24-8CP).
CLASS "A" circuit is not functioning properly.	Improper MODE selection or SW9 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 SW9 POS 1 and POS 2 on board for "ON" position.
CLASS "B" circuit is not functioning properly.	Improper MODE selection or SW9 settings.	Check SW9 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.

5.0 BATTERY CALCULATION SHEET:

PS-12/24-8CP BATTERY CALCULATION SHEET

STANDBY CURRENT CALCULATIONS

1. The Standby Current for the PS-12/24-8CP is .060 Amps. _____ **Amps**
2. Enter the AUX current draw (0.06 Amps, 60 hour operation maximum)**
 (0.20 Amps, 24 hour operation maximum) _____ **Amps**
3. Add Steps 1 and 2 together _____ **Amps**
4. Multiply Step 3 by the number of hours required.
- 24 Hours - Multiply by 24
 60 Hours - Multiply by 60**

TOTAL STANDBY CURRENT IN Amp HOURS. _____ **AH**

ALARM CURRENT CALCULATIONS

1. List notification appliance requirements.

	CURRENT
ALARM CURRENT FOR THE PS-12/24-8CP	0.100
NOTIFICATION APPLIANCE	

2. Calculate total notification appliance current plus alarm current for PS-12/24-8CP. _____ **Amps**
3. Multiply Step 2 by alarm time required. _____ **AH**
- 15 Min – Multiply by 0.25**
 5 Min – Multiply by 0.0833

**Note: 15 Minute alarm is not UL listed for 60 hour battery backup when AUX power is used.

BACKUP BATTERY REQUIREMENTS

1. Enter Standby Current. _____ **AH**
2. Enter Alarm Current from Step 3 above. _____ **AH**
3. Add Steps 1 and 2 together. _____ **AH**
4. Multiply step 3 by 1.2 for minimum Backup Battery Requirements _____ **AH**

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11/04