

POWERPATH

PS-EXP (105534)

NAC EXTENDER POWER ACCESSORY

Installation Instructions

 **COOPER** Notification

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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.

TABLE OF CONTENTS


1.0 - INTRODUCTION AND SPECIFICATIONS	3
1.1 - INTRODUCTION	3
1.2 - SPECIFICATIONS	4
1.3 - TERMINOLOGY	5
2.0 - INSTALLATION INSTRUCTIONS	6
2.1 - UNPACKING	6
2.2 - MOUNTING	6
2.3 - WIRING	8
3.0 - SETTING THE DIP SWITCHES	10
3.1 - CONTROL PC BOARD	10
3.2 - TROUBLE CONDITION PRIORITY IDENTIFICATION	12
4.0 - TROUBLESHOOTING	13
4.1 - TROUBLE MODE	13
4.2 - GROUND FALUT DETECTION MODE	14
5.0 - OPERATION EXAMPLES	15
6.0 - LIST OF COMPATIBLE AUXILIARY DEVICES	23
7.0 - LIST OF COMPATIBLE NAC DEVICES	24
8.0 - WARRANTY STATEMENT	26

LIST OF FIGURES

FIGURE 1: PS-8 Enclosure Layout	5
FIGURE 2: PS-6 Enclosure Layout	6
FIGURE 3: PS-8 Mounting Dimensions	7
FIGURE 4: PS-6 Mounting Dimensions	8
FIGURE 5: PS-EXP PCB Board	9
FIGURE 6: Control PC Board Trouble LED Locations	12
FIGURE 7: NAC Extender Wiring with PS-EXP	14

LIST OF TABLES

TABLE 1: Control PC Board Terminal Identification	9
TABLE 2: PC Board DIP Switch Settings	10
TABLE 3: Control PC Board LED Trouble Indicators	12
TABLE 4: Control PC Board Trouble Priority Identification	12
TABLE 5: Expansion Board Trouble LED's	13

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

 **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 **POWERPATH** PS Expansion Board (PS-EXP) is available as an accessory for the PS-6, PS-8, PS-8-LP, PS-6E, PS-8E and PS-8E-LP products.

The PS-EXP offers additional independently configurable power outputs. Primary applications include NAC expansion (supports ADA requirements) and auxiliary power to support system accessories. This unit provides up to four (4) Class "B", two (2) Class "A", or two (2) Class "B" and one (1) Class "A" Notification Appliance Circuits. The PS-EXP's NAC outputs support the audible silence feature.

Each NAC output is rated at 3.0 Amps (Class "B") or 3.0 Amps (Class "A") and can be programmed to generate a steady, Code 3 Temporal Horn sound, or a strobe output signal. Total load for the PS-8 and PS-8-LP NAC circuits shall not exceed 8.0 Amps. Total load for the PS-6 NAC circuits shall not exceed 6.0 Amps.

The PS-EXP's NAC outputs can also be used as UL-1481 Compliant power supply outputs. When configured this way, the maximum continuous current rating is 3 Amps per power supply output and 4 Amps maximum total current for all continuous duty power supply outputs. When configured this way, the power outputs will shut off during the AC loss trouble condition so they won't deplete the batteries.

The PS-EXP mounts onto a PS-6, PS-8, PS-8-LP, PS-6E, PS-8E or PS-8E-LP's Logic Board. The PS-EXP shares the Logic Board's input signals, including IN1/CC1, IN2/CC2, SBUS IN, and SILENCE IN.

The PS-EXP contains its own separate diagnostic trouble indicators to facilitate the troubleshooting of field wiring. All PS-EXP trouble conditions change the state of the Logic Board's General Trouble Relay and Input Return Relays.

Cooper Notification horn/strobes, strobe and horns with synchronizing capability can be utilized with the PS-EXP.

1.2 SPECIFICATIONS:

Approvals:

- UL Listed 864 Standard for Control Units and Accessories for Fire Alarm Systems.
- UL Listed 1481 Standard for Power Supplies for Fire-Protective Signaling Systems.
- California State Fire Marshal (CSFM)
- FPA 72 compliant
- Environmental: Approved for indoor dry locations.

* Inputs:

- 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.

* **NOTE:** These input connections are shared with the PS-6/8/8-LP or PS-6E/8E/8E-LP Logic Board.

Outputs:

- 24VDC power limited synchronized outputs. Up to 50 NAC devices per output, maximum line impedance 1.46 Ohms per NAC.
- Up to 8 Amps in alarm supply current for the PS-8 or PS-8-LP (Up to 6 Amp in alarm supply current for the PS-6).
- Capable of four (4) Class "B" regulated outputs (Maximum of 3 Amps on an output.)
- Capable of two (2) Class "A" regulated outputs (Maximum of 3 Amps on an output.)
- Capable of one (1) Class "A" regulated outputs and two (2) Class "B" regulated outputs (Maximum of 3 Amps on an output.)
- Temporal (Code 3), strobe synchronization, or constant voltage outputs.
- 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 FOLLOWER" mode.
- Continuous duty NON-RESETTABLE output configuration 4 Amps of maximum continuous duty current. (Maximum of 3 Amps on an output for specific applications.) Continuous power outputs are not battery backed up.
- Audible silence capability.
- Filtered and electronically regulated output.
- The PS-EXP can be synchronized through the SBUS terminals. See Chapter 5.0 beginning with Sheet 15 for Examples.

Supervision:

- Compatible with PS-6/8/8-LP or PS-6E/8E/8E-LP connected to a 12VDC or 24VDC Fire Alarm Control Panel (FACP).
- Signaling appliance loops are supervised and steered to either IN1 or IN2.
- 10K Ohm, 1/2 Watt (Wheelock Model #PSEOL) End of Line Resistor (EOLR) for supervision of all outputs.
- Common input and output trouble circuits.
- Short circuit protection with auto reset.
- Output status LED indicators.
- Any PS-EXP trouble will automatically change the state of the PS-6/8/8-LP or PS-6E/8E/8E-LP General Trouble Relay.
- Ground Fault Detection, with the ability to detect ground faults on individual circuits.
Minimum Impedance = 0 Ohms.

PS-EXP NAC Extender Accessory Current Draw (for battery calculations):

- Current Draw = 0.035 Amps in standby and 0.055 Amps during alarm activation.

Parameter	Description
Operating Temperature	0° C to 49° C (32° F to 120° F)
Storage Temperature	-20° C to 70° C (-4° F to 158° F)
Humidity, Non-condensing	85° C ± 5% at 30° ± 2° C (86° F ± 4° F)

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

Ahrs = Ampere/Hours

ENCLOSURES:

Figures 1 and 3 shows the location of the PC boards and knockouts on the PS-8 panel.

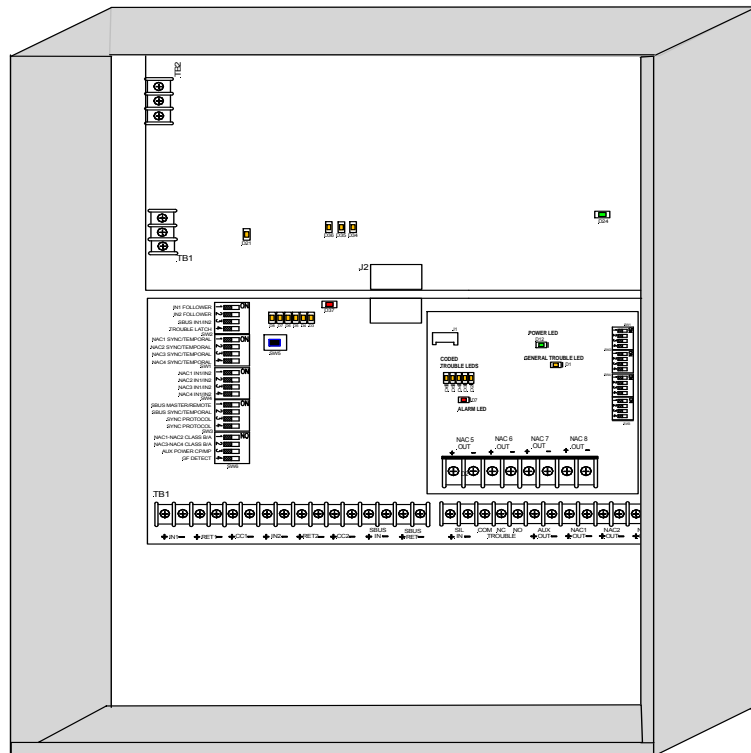


Figure 1: PS-8 Enclosure Layout

Figures 2 and 4 shows the location of the PC boards and knockouts on the PS-6 and PS-8-LP panels.

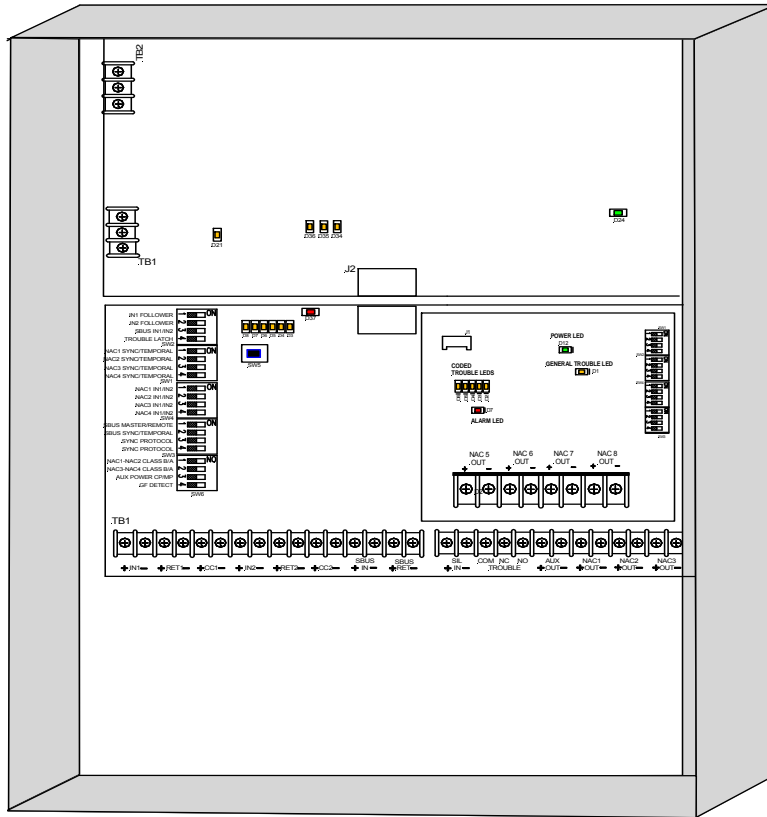


Figure 2: PS-6/PS-8-LP Enclosure Layout

2.0 INSTALLATION INSTRUCTIONS:

NOTE: The PS-EXP NAC Extender Accessory 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 PS-EXP NAC Extender Accessory 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.

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).

- A. Mount the PS-EXP NAC Extender Accessory to the Logic Board inside the **POWERPATH** PS-6, PS-8, PS-8-LP, PS-6E, PS-8E or PS-8E-LP.
- B. Ensure that the PS-EXP panel is being installed in an indoor and dry area that does not exceed a temperature range of 32° F to 120° F (0° C to 49° C) and humidity equal to 10% to 85% at 86° F (30° C) non-condensing.
- C. Remove desired knockouts and mount conduit and conduit fittings to the enclosure.

NOTE: All dimensions shown are measured in inches.

KNOCKOUTS TYP.
17X 0.882+/-0.023 & 01.117+/-0.23
FLUSH ON OUTSIDE OF ENCLOSURE
ORIENTATION OPTIONAL

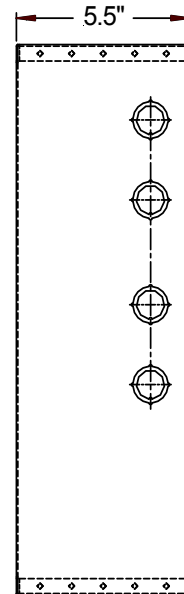
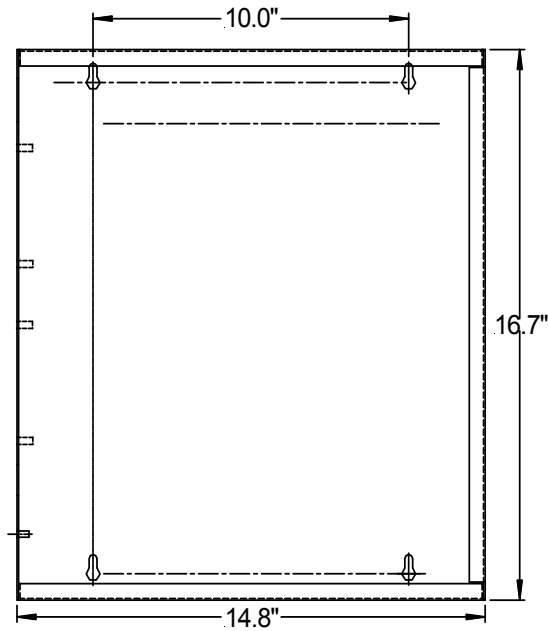
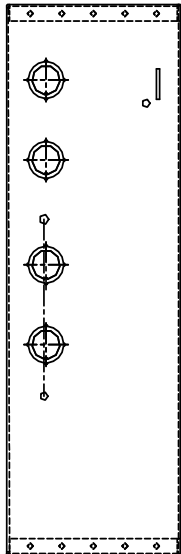
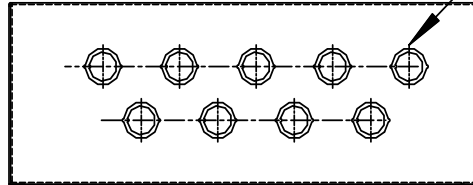
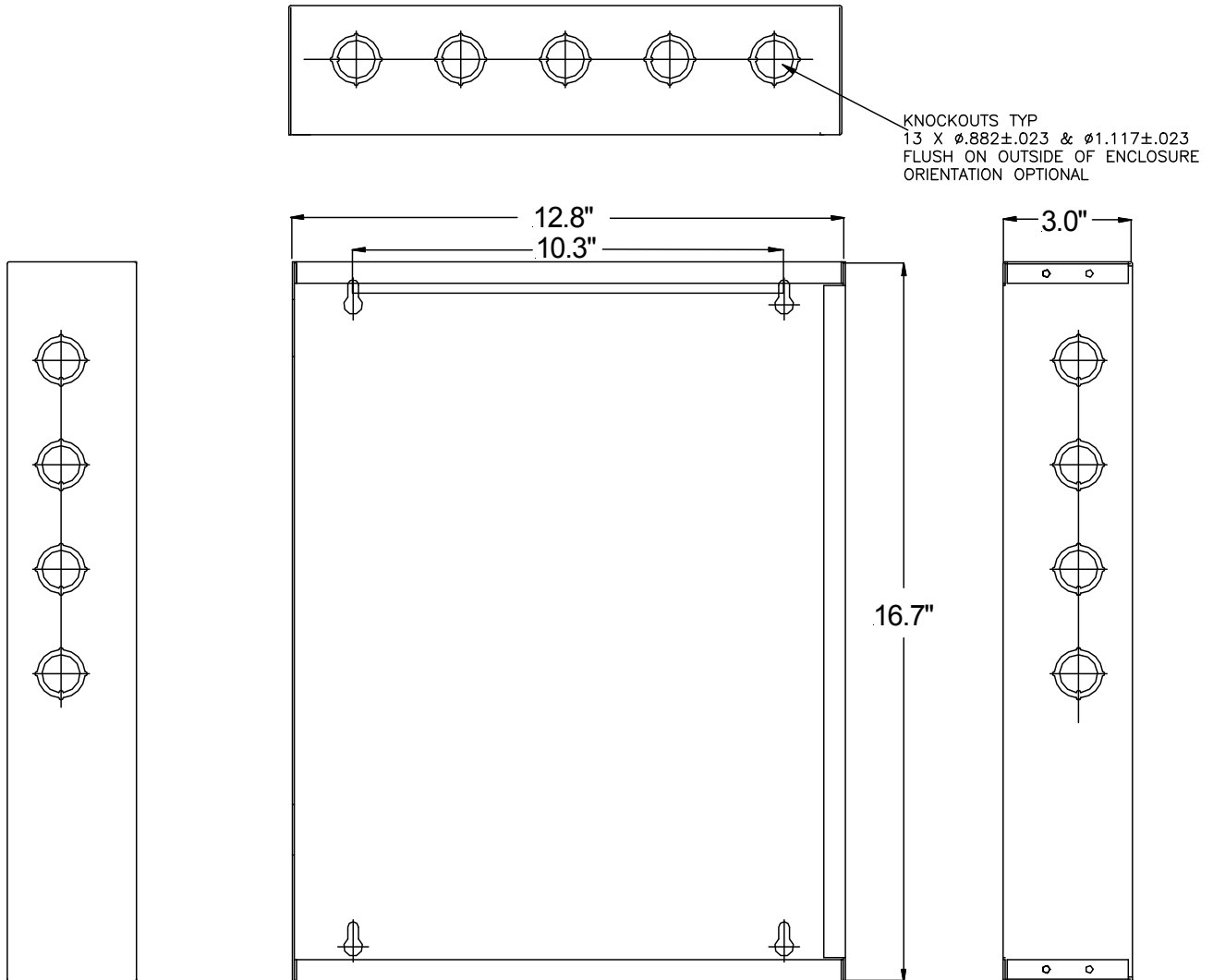


Figure 3: PS-8
Mounting Dimensions
DIMENSIONS (H x W x D) – 16.7" x 14.8" x 5.5"



**Figure 4: PS-6 and PS-8-LP
 Mounting Dimensions
 DIMENSIONS (H x W x D) – 16.7" x 12.8" x 3"**

2.3 WIRING

Review the Operation Section (5.0) in order to select the proper hook-up and use of the PS-EXP NAC Extender Accessory.

NOTE: The maximum current on a Class "A" or "B" output is 3 Amps with the rest of the PS-EXP NAC Extender Accessory output current divided among the remaining circuits.

DO NOT CONNECT WIRING TO THE AC INPUT SOURCE OR TO THE BATTERIES UNTIL ALL WIRING AND ALL SWITCH SETTINGS HAVE BEEN MADE

POWER LIMITED AND NON-POWER LIMITED WIRING SHALL BE SEPARATED AND SHALL NOT BE WITHIN 1/4" OF EACH OTHER. NON POWER LIMITED WIRE SHALL BE SEPARATED FROM PC BOARDS BY 1/4".

PS-EXP PC Board

Refer to Figure 5 for the locations of the terminal described in Table 1.

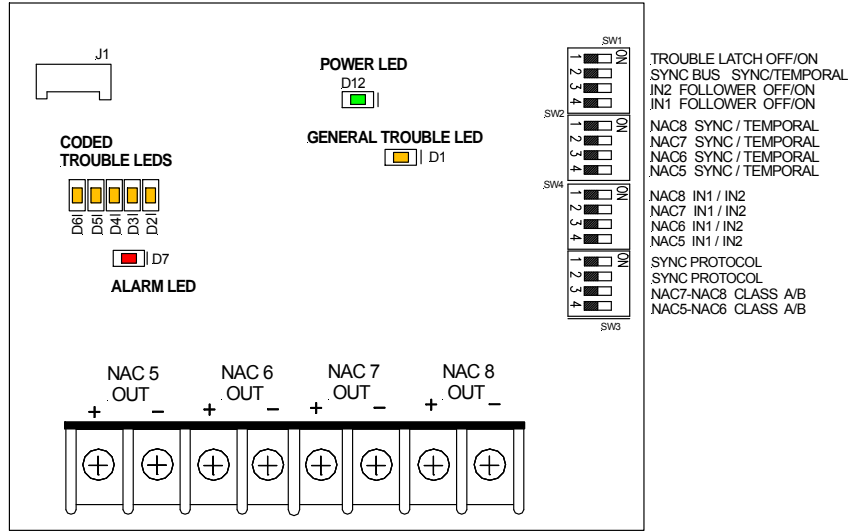


Figure 5: PS-EXP PC Board

Table 1: Control PC Board Terminal Identification		
Terminal Block Identification Numbers	Terminal Identification	Function/Description
TB2-1,2,3	TB2	These terminals are located on the underside of the PS-EXP board. They are used to allow the PS-EXP to get power from and communicate with the POWERPATH logic board.
TB3-1,2,3	TB3	These terminals are located on the underside of the PS-EXP board. They are used to allow the PS-EXP to get power from and communicate with the POWERPATH logic board.
TB1-1,2,3	TB3	These terminals are located on the underside of the PS-EXP board. They are used to allow the PS-EXP to get power from and communicate with the POWERPATH logic board.
TB4-8,9 TB4-10,11 TB4-12,13 TB4-14,15	+NAC OUT5- +NAC OUT6- +NAC OUT7- +NAC OUT8-	NAC appliances are connected to these outputs. 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 Wheelock Strobe Sync Mode, Temporal Mode or Input follower 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 (IN1/CC1 or IN2/CC2) as selected by the DIP switch for that output. These outputs are power limited.

NOTE: The maximum number of NAC appliances is dependent upon the field wire gauge used and the total current draw of the Appliances on the NAC circuit.

- A. Connect notification appliances to desired outputs OUT5 – OUT8. See Examples beginning on sheet 15.
 - The PS-EXP Accessory has in-out wiring terminals that accept one #18 to #12 American Wire Gauge (AWG) wire at each screw terminal. Strip leads 3/8 inch and connect to screw terminals.
 - Separate all in-out wire runs on supervised circuits to ensure 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 PS-EXP during supervision.
 - Total load for the PS-EXP NAC circuits when installed in a PS-8(-LP) or PS-8E(-LP) shall not exceed 8.0 Amps.
 - Total load for the PS-EXP NAC circuits when installed in a PS-6 or PS-6E shall not exceed 6.0 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.
- B. Terminate unused Class "B" outputs and the last appliance on an output with a 10K Ohm EOLR. ***Do not terminate*** Class "A" outputs with an EOLR, use jumper wires. See Class "A" Operation Examples on sheets 19-21.
- C. Connect the indicating circuit(s) from the FACP to the desired input(s), POWERPATH IN1/CC1 and or IN2/CC2. Connect FACP compatible EOLR's to RET1 and RET2.
- D. In order to use the audible silence feature, connect a 24V or NAC output to the POWERPATH SIL input terminal.
- E. Connect system trouble relay terminals as desired.

3.0 SETTING THE DIP SWITCHES

3.1 PS-EXP BOARD

1. Set NAC output DIP Switch(s) on SW1 to follow corresponding input (IN1, IN2).
2. See Figure 5 for DIP switch locations and Table 2 for DIP Switch Selection and DIP Switch Settings.

Table 2: PS-EXP PC Board DIP Switch Settings					
		LOGIC BOARD SET TO MASTER MODE		LOGIC BOARD SET TO REMOTE MODE	
DIP Switch	Function Description	Dip Switch Setting: "LEFT"	Dip Switch Setting: "RIGHT"	Dip Switch Setting: "LEFT"	Dip Switch Setting: "RIGHT"
SW1					
Position 1	TROUBLE LATCH OFF/ON	Any trouble condition will clear automatically as the trouble condition is repaired.	Trouble indicators latch ON until this switch is switched to the disable [LEFT] position or all power is removed from the panel.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 2	SBUS SYNC/TEMPORAL	Set this switch to same setting as the MASTER POWERPATH.	Set this switch to same setting as the MASTER POWERPATH.	Set this switch to same setting as the MASTER POWERPATH.	Set this switch to same setting as the MASTER POWERPATH.
Position 3	IN2 FOLLOWER OFF/ON	NAC Output(s) set to trigger on IN2/CC2 will generate signals according to its SYNC/TEMPORAL switch setting.	NAC Output(s) set to trigger on IN2/CC2 turn on when IN2/CC2 is "Active" and will apply NAC reverse supervision voltage when IN2/CC2 is "Not Active."	If Logic board's SBUS = IN2. NAC Output(s) set to trigger on IN2/CC2 and set for "SYNC" will repeat the SBUS Input only when IN2/CC2 goes active. If Logic board's SBUS = IN1. NAC Output(s) set to trigger on IN2/CC2 and set for "SYNC" will repeat the SBUS Input only when IN2/CC2 goes active.	If Logic board's SBUS = IN2. NAC Output(s) set to trigger on IN2/CC2 and set for "SYNC" will repeat the SBUS Input only when IN2/CC2 goes active. If Logic board's SBUS = IN1. NAC Output(s) set to trigger on IN2/CC2 and set for "SYNC" will repeat the IN2/CC2 Input.
Position 4	IN1 FOLLOWER OFF/ON	NAC Output(s) set to trigger on IN1/CC1 will generate signals according to its SYNC/TEMPORAL switch setting.	NAC Output(s) set to trigger on IN1/CC1 turn on when IN1/CC1 is "Active" and will apply NAC reverse supervision voltage when IN1/CC1 is "Not Active."	If Logic board's SBUS = IN1. NAC Output(s) set to trigger on IN1/CC1 and set for "SYNC" will repeat the SBUS Input only when IN1/CC1 goes active. If Logic board's SBUS = IN2. NAC Output(s) set to trigger on IN1/CC1 and set for "SYNC" will repeat the SBUS Input only when IN1/CC1 goes active.	If Logic board's SBUS = IN1. NAC Output(s) set to trigger on IN1/CC1 and set for "SYNC" will repeat the SBUS Input only when IN1/CC1 goes active. If Logic board's SBUS = IN2. NAC Output(s) set to trigger on IN1/CC1 and set for "SYNC" will repeat the IN1/CC1 Input.
SW2					
Position 1	NAC8 SYNC/TEMPORAL	NAC8 will repeat the SBUS signals when it gets activated.	NAC8 will generate CODE 3 Temporal Pattern. This Temporal Pattern is automatically synchronized with the POWERPATH logic board that the PS-EXP is installed in.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 2	NAC7 SYNC/TEMPORAL	NAC7 will repeat the SBUS signals when it gets activated.	NAC7 will generate CODE 3 Temporal Pattern. This Temporal Pattern is automatically synchronized with the POWERPATH logic board that the PS-EXP is installed in.	Same Functionality as Master Mode.	Same Functionality as Master Mode.

Position 3	NAC6 SYNC/TEMPORAL	NAC6 will repeat the SBUS signals when it gets activated.	NAC6 will generate CODE 3 Temporal Pattern. This Temporal Pattern is automatically synchronized with the POWERPATH logic board that the PS-EXP is installed in.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 4	NAC5 SYNC/TEMPORAL	NAC5 will repeat the SBUS signals when it gets activated.	NAC5 will generate CODE 3 Temporal Pattern. This Temporal Pattern is automatically synchronized with the POWERPATH logic board that the PS-EXP is installed in.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
SW4					
Position 1	NAC8 IN1/IN2	Input 1 (IN1or CC1) triggers NAC8. Any trouble condition on NAC8 will cause an open condition on IN1_RET & IN2_RET.	Input 2 (IN2 or CC2) triggers NAC8. Any trouble condition on NAC8 will cause an open condition on IN1_RET & IN2_RET.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 2	NAC7 IN1/IN2	Input 1 (IN1or CC1) triggers NAC7. Any trouble condition on NAC7 will cause an open condition on IN1_RET & IN2_RET.	Input 2 (IN2 or CC2) triggers NAC7. Any trouble condition on NAC7 will cause an open condition on IN2_RET.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 3	NAC6 IN1/IN2	Input 1 (IN1or CC1) triggers NAC6. Any trouble condition on NAC6 will cause an open condition on IN1_RET.	Input 2 (IN2 or CC2) triggers NAC6. Any trouble condition on NAC6 will cause an open condition on IN1_RET & IN2_RET.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 4	NAC5 IN1/IN2	Input 1 (IN1or CC1) triggers NAC5. Any trouble condition on NAC5 will cause an open condition on IN1_RET & IN2_RET.	Input 2 (IN2 or CC2) triggers NAC5. Any trouble condition on NAC5 will cause an open condition on IN1_RET & IN2_RET.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
SW3					
Position 1	SYNC PROTOCOL	Wheelock Sync Only – Leave in this position.	For Future Use	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 2	SYNC PROTOCOL	Wheelock Sync Only – Leave in this position.	For Future Use	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 3	N7 – N8 A/B	Set NAC 7 & NAC 8 for Class "A".	Set NAC 7 & NAC 8 for Class B.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 4	N5 – N6 A/B	Set NAC 5 & NAC 6 for Class "A".	Set NAC 5 & NAC 6 for Class B.	Same Functionality as Master Mode.	Same Functionality as Master Mode.

EXAMPLE – Basic Settings on the Control PC Board

For a 4 NAC, Class B circuit output controlled by Input 1 (IN1), Wheelock Sync, Auxiliary set the switches as follows:

SW1	Positions	1 - 4	Left
SW2	Positions	1 - 4	Left
SW4	Positions	1 - 4	Left
SW3	Positions	1 - 2	Left
		Positions	3 - 4
			Right

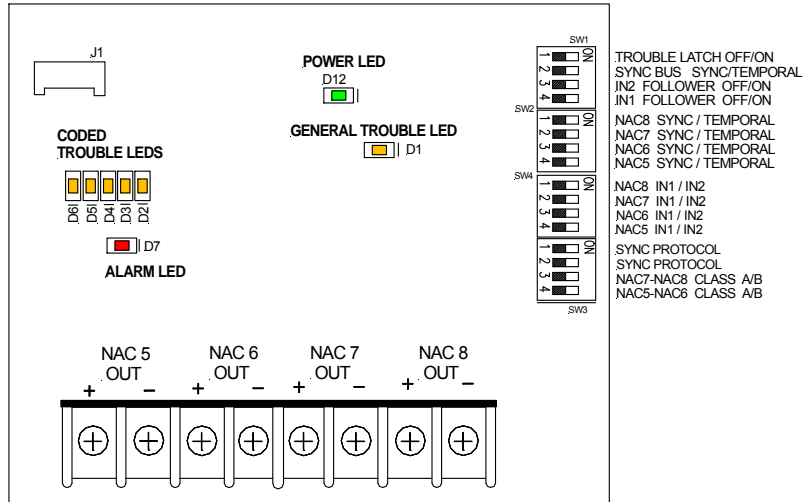


Figure 6: Control PC Board Trouble LED Locations

LED Designator	Identification	LED Color	Description	Action
D12	Power	Green	Indicates when power is applied to the PS-EXP.	No Action Required
D7	Active	Red	Indicates when the PS-EXP is activated and supplying power to the NAC output circuits.	No Action Required
D1	System Trouble	Amber	Indicates that a general trouble condition exists on the PS-EXP.	Check the Coded Trouble LED Indicators and the Ground Fault LED on the POWERPATH Logic Board. Repair any problems indicated. If no indication is observed, replace the PS-EXP Board. See Table 5.
D6, D5, D4, D3, D2	Coded Trouble LED Indicators	Amber	These five LEDs light in a coded pattern indicating the location and type of trouble condition. If multiple troubles are present the LEDs will indicate the highest priority trouble. When repaired the LEDs will indicate the next priority trouble.	See Table 5.

3.2 TROUBLE CONDITION PRIORITY IDENTIFICATION:

When multiple troubles exist the PS-EXP board Coded Trouble LED Indicators indicate the highest priority trouble. Table 4 shows the priority sequence. When the highest priority is repaired, the next highest priority will automatically be displayed. Table 4 lists the coded condition of these 5 LED indicators and the action required.

Location Priority	Location Displayed Priority
1. NAC 5	1. CURRENT LIMIT
2. NAC 6	2. SHORT
3. NAC 7	3. OPEN
4. NAC 8	4. GROUND FAULT

4.0 TROUBLESHOOTING:

⚠ WARNING: WHEN INSTALLED INSIDE A POWERPATH, THE PS-EXP NAC EXTENDER ACCESSORY CONTAINS VOLTAGES THAT CAN CAUSE DEATH OR SERIOUS INJURY. ALWAYS OBSERVE PROPER ELECTRICAL SAFETY PRECAUTIONS AND WARNINGS.

4.1 TROUBLE MODE:

- Trouble mode occurs when any trouble condition is detected.
- When a trouble occurs, the coded trouble LED indicators are lit specifically identifying which trouble has occurred.
- For any trouble condition, the general trouble LED indicator will light.
- If intermittent troubles occur, use the trouble latch (SW1 Position1) to find the trouble.

The LED troubles are coded as the following:

Table 5: Expansion Board Trouble LED's									
Coded Trouble LED's "□" = OFF, "■" = ON					Trouble Locator	Trouble Condition	Action		
D6	D5	D4	D3	D2					
□	□	□	□	□	No Fault	No Fault	No Action Required.		
□	□	□	□	■	NAC Output 5	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired (+) to (-) or (-) to (+) a short trouble will be indicated.)		
□	□	□	■	□	NAC Output 5	Open	Check NAC 5 terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.		
□	□	□	■	■	NAC Output 5	Current Limit	Reduce the number of NAC Appliances on NAC Output 5.		
□	□	■	□	□	NAC Output 6	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired (+) to (-) or (-) to (+) a short trouble will be indicated.)		
□	□	■	□	■	NAC Output 6	Open	Check NAC 6 terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.		
□	□	■	■	□	NAC Output 6	Current Limit	Reduce the number of NAC Appliances on NAC Output 6.		
□	□	■	■	■	NAC Output 7	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired (+) to (-) or (-) to (+) a short trouble will be indicated.)		
□	■	□	□	□	NAC Output 7	Open	Check NAC 7 terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.		
□	■	□	□	■	NAC Output 7	Current Limit	Reduce the number of NAC Appliances on NAC Output 7.		
□	■	□	■	□	NAC Output 8	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired (+) to (-) or (-) to (+) a short trouble will be indicated.)		
□	■	□	■	■	NAC Output 8	Open	Check NAC 8 terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.		
□	■	■	□	□	NAC Output 8	Current Limit	Reduce the number of NAC Appliances on NAC Output 8.		
■	□	□	■	■	NAC Output 5+	Ground Fault (Note 1)	Check for circuit wire contact with enclosure or conduit.		
■	□	■	□	□	NAC Output 5-	Ground Fault (Note 1)	Same as above		
■	□	■	□	■	NAC Output 6+	Ground Fault (Note 1)	Same as above		
■	□	■	■	□	NAC Output 6-	Ground Fault (Note 1)	Same as above		
■	□	■	■	■	NAC Output 7+	Ground Fault (Note 1)	Same as above		
■	■	□	□	□	NAC Output 7-	Ground Fault (Note 1)	Same as above		
■	■	□	■	□	NAC Output 8+	Ground Fault (Note 1)	Same as above		
■	■	□	□	■	NAC Output 8-	Ground Fault (Note 1)	Same as above		

NOTE: When LED indicator D3 is lighted on the Logic Circuit Board, it indicates a general ground fault condition. Momentarily depress switch SW5 (Ground Fault Detect Enable Pushbutton, which is located on the POWERPATH Logic PCB.) The Coded Trouble LED's will indicate the circuit location of the ground fault.

4.2 GROUND FAULT DETECTION MODE:

- This special diagnostic mode only occurs when a ground fault condition is detected and the end user presses the ground fault locator switch (momentary switch) located on the Control PC Board.
- While in this mode, each input and output gets tested to determine which input(s) and or output(s) have a ground fault trouble condition.
- The coded trouble LEDs will display the specific input or output with the ground fault trouble condition.
- NAC Output 5, NAC Output 6, NAC Output 7, NAC Output 8 ground faults can all be individually detected and reported on the coded Trouble LEDs (See Table 3).

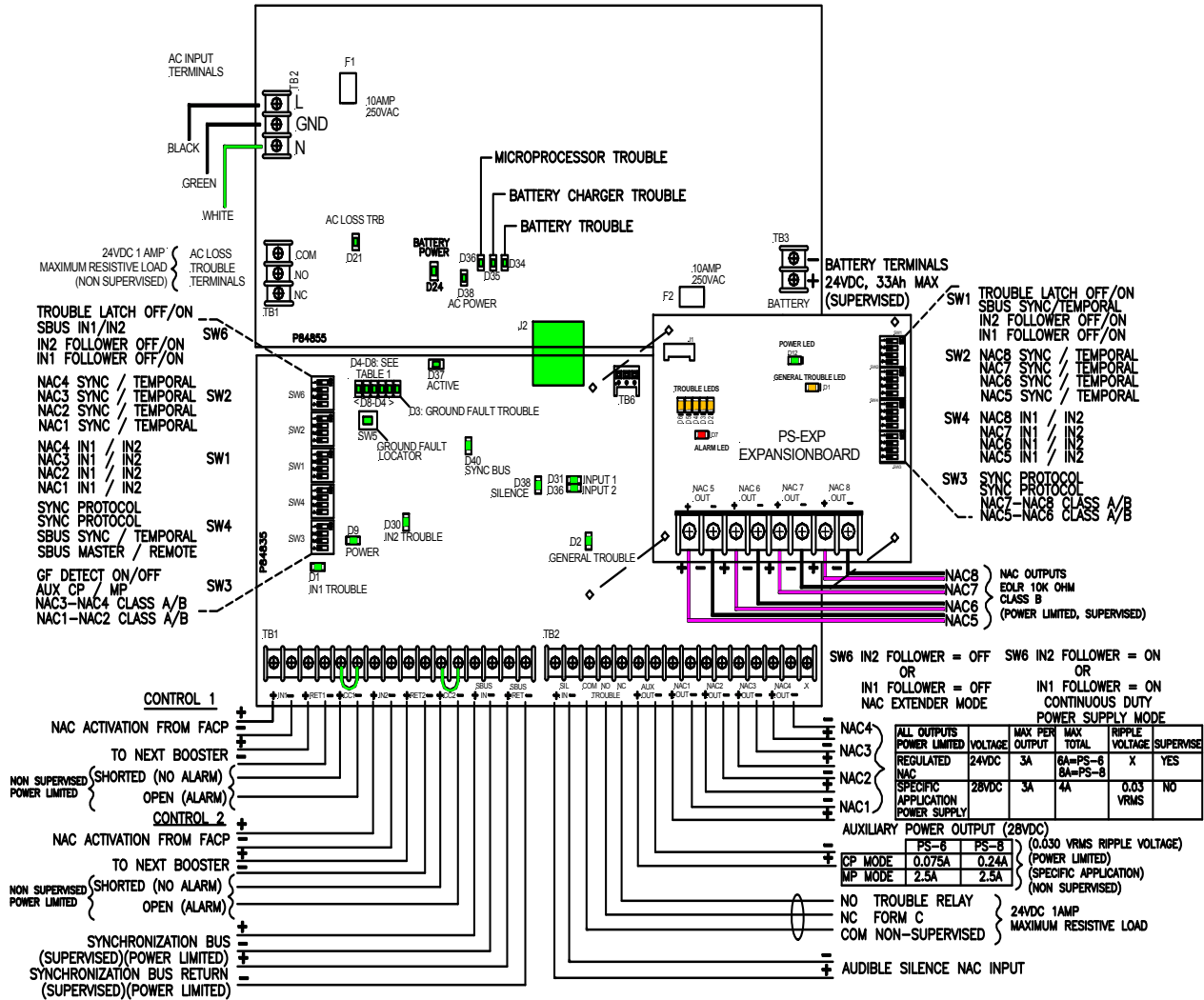


Figure 7: NAC Extender Wiring with PS-EXP Class "B"

5.0 OPERATION EXAMPLES:

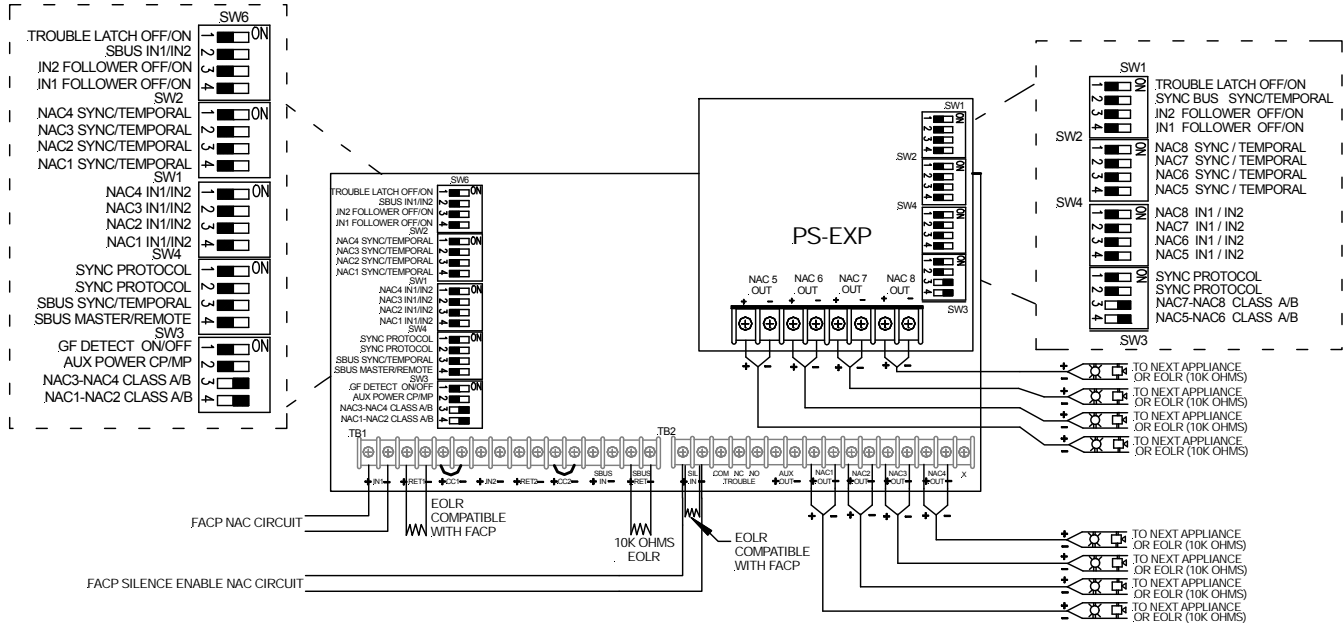
CLASS "B" OPERATION:

Class "B" outputs can be controlled from either IN1 or IN2 on the NAC Extender Power Supply Control PC Board.

LEGEND

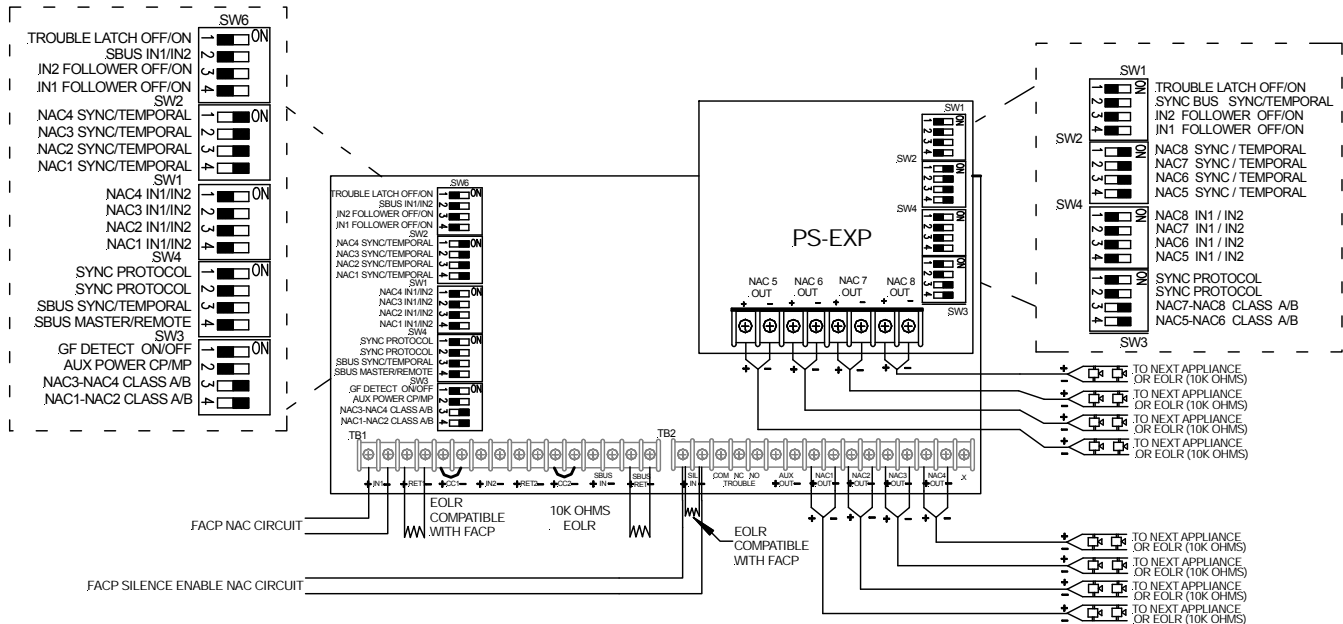


EXAMPLE 1: WHEELLOCK SYNC MODE (CLASS B) FOR ALL NAC CIRCUITS.



- This mode will only synchronize Wheellock horns, horn strobes, and strobes with the synchronization capability.
- When audible silence functionality is not used, the "SIL IN" silence terminals can be left unconnected.

EXAMPLE 2: TEMPORAL MODE (CLASS B) FOR ALL NAC CIRCUITS.

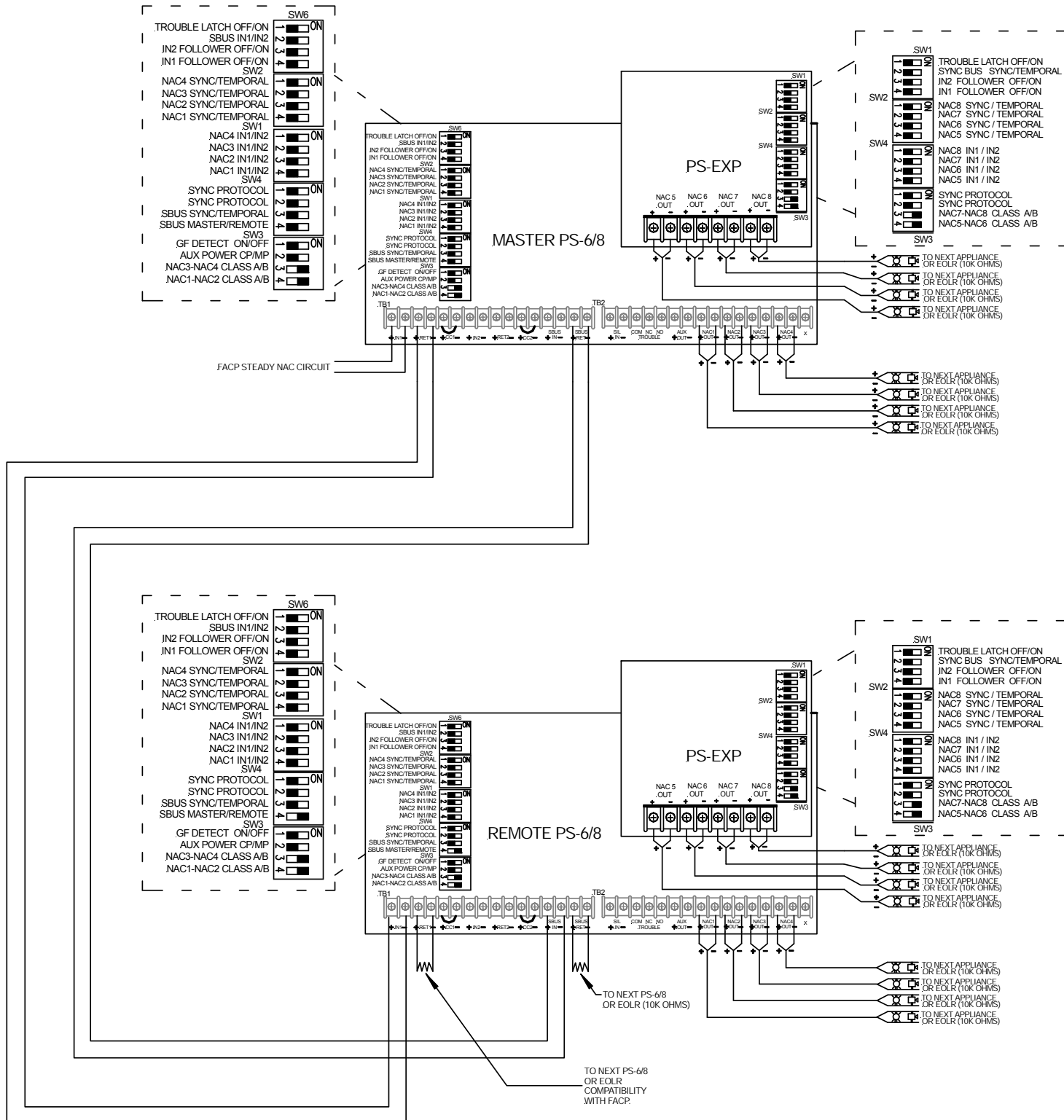


- When audible silence functionality is not used, the "SIL IN" silence terminals can be left unconnected.

⚠ 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.

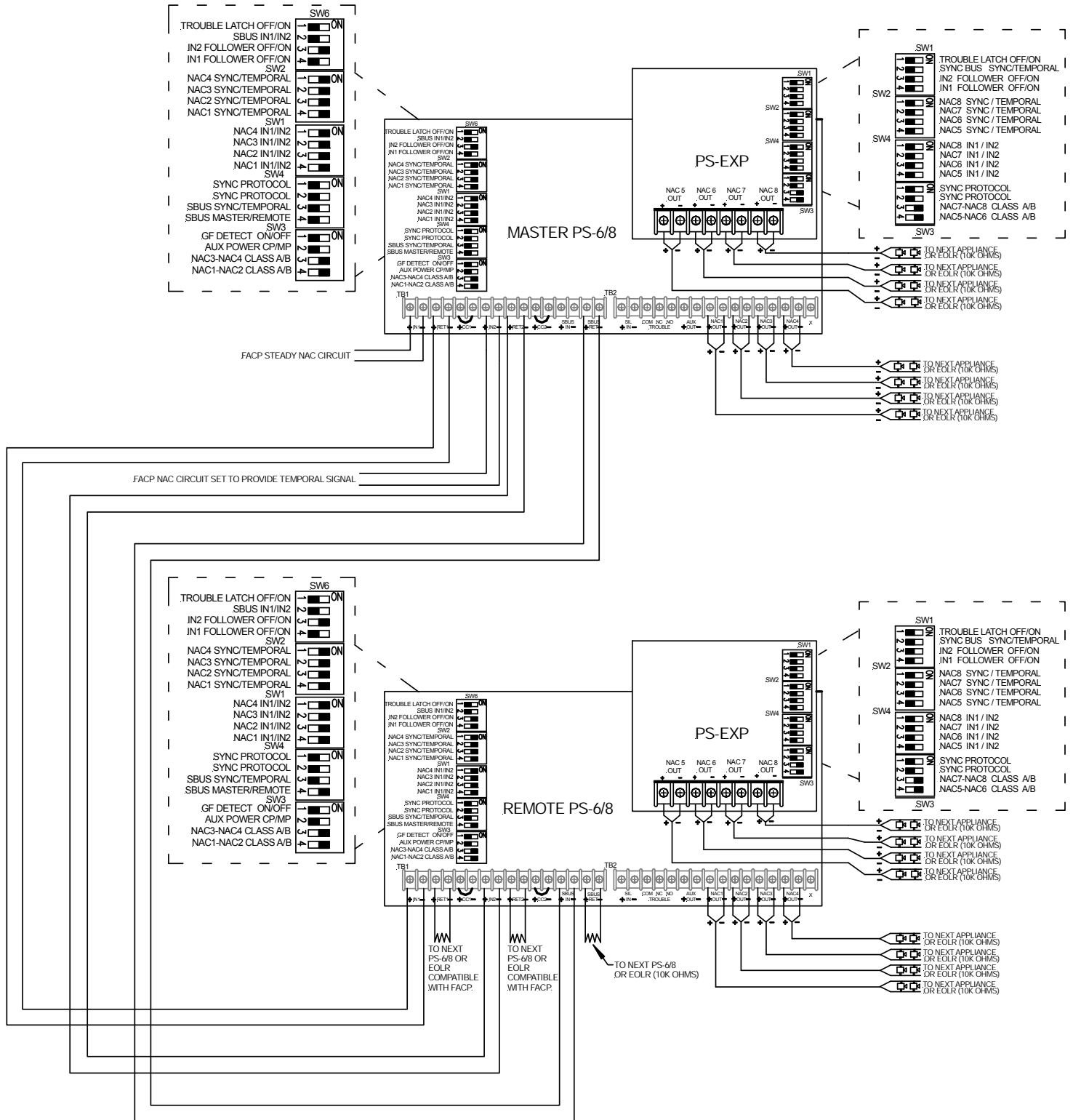
⚠ CAUTION: Only use audible appliances that can use a coded signal. Do not use with Wheellock Series AS/AH, NS/NH or HS4/HS appliances.

EXAMPLE 3: MASTER & REMOTE NACS (CLASS B) ALL SET FOR WHEELLOCK SYNC.



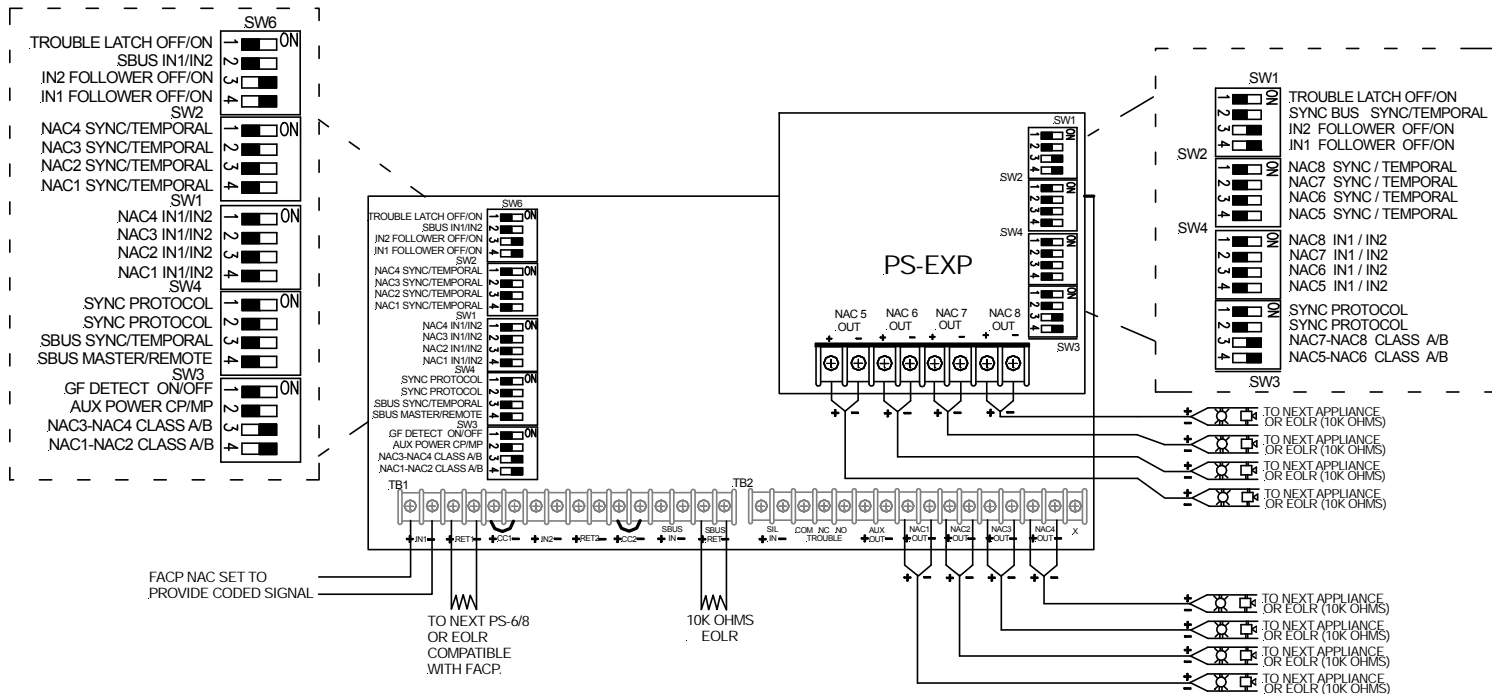
- This mode will only synchronize Wheellock horns, horn strobes, and strobes with the synchronization capability.

EXAMPLE 4: MASTER & REMOTE (CLASS B) WITH 4 NACS SET FOR WHEELLOCK SYNC ON EACH PS-EXP AND 4 NACS SET FOR TEMPORAL ON EACH PS-6/8-LP LOGIC BOARD.



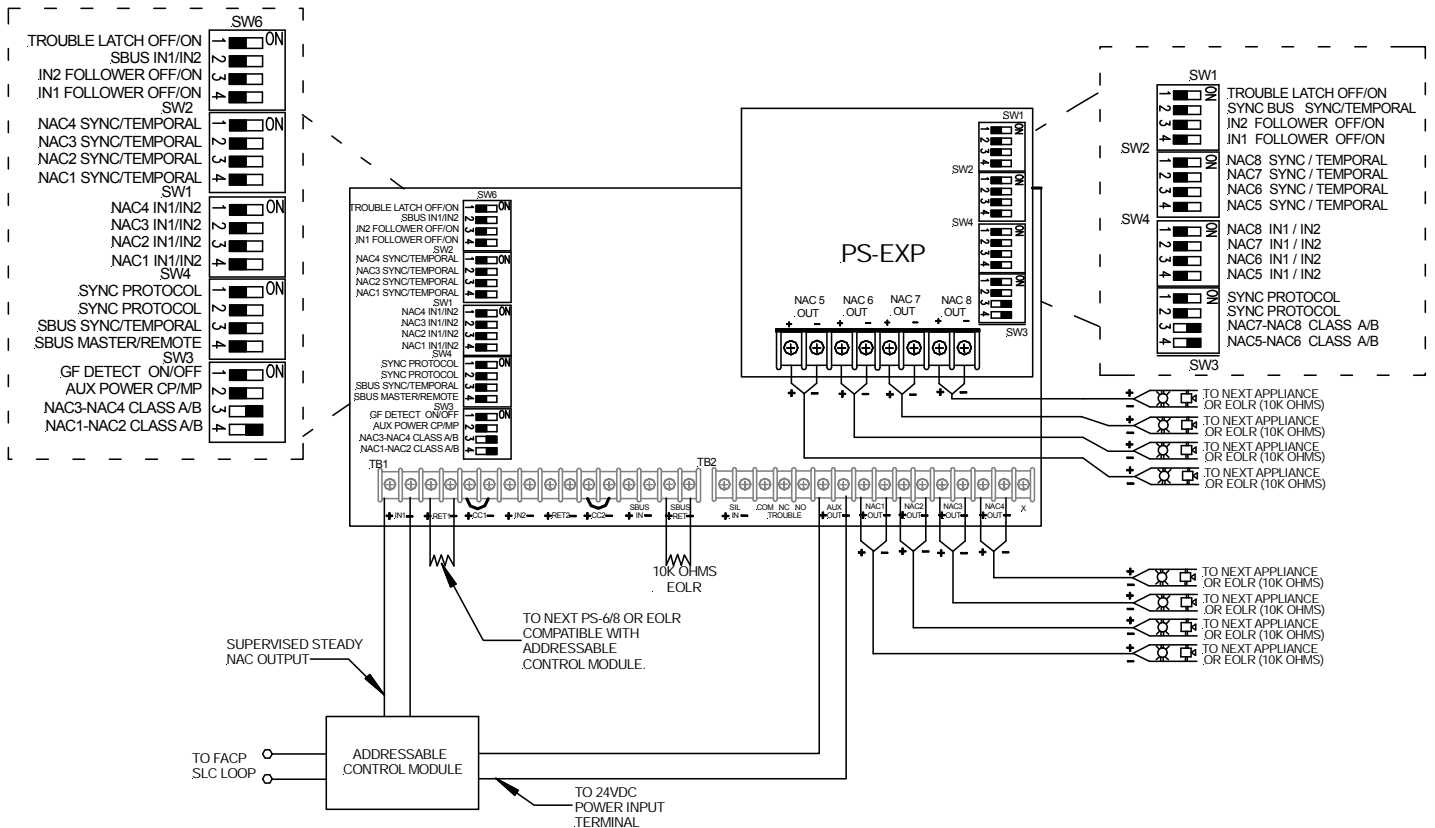
- In this setup, all NAC Outputs set for WHEELLOCK SYNC are synchronized together and all NAC Outputs set for TEMPORAL are synchronized together.

EXAMPLE 5: INPUT > OUTPUT FOLLOWER MODE (CLASS B)



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

EXAMPLE 6: ADDRESSABLE CONTROL MODULE ACTIVATING/SUPERVISING PS-8(LP) + PS-EXP



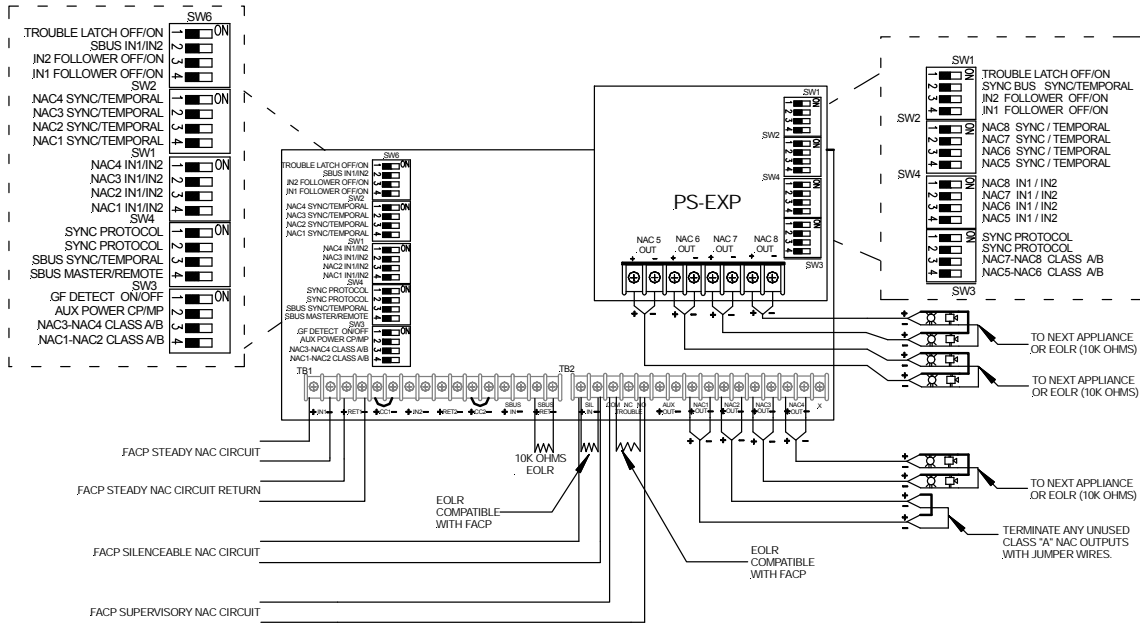
CLASS “A” OPERATION:

Class “A” outputs can be controlled from either IN1 or IN2 on the NAC Extender Power Supply Control PC Board.

LEGEND

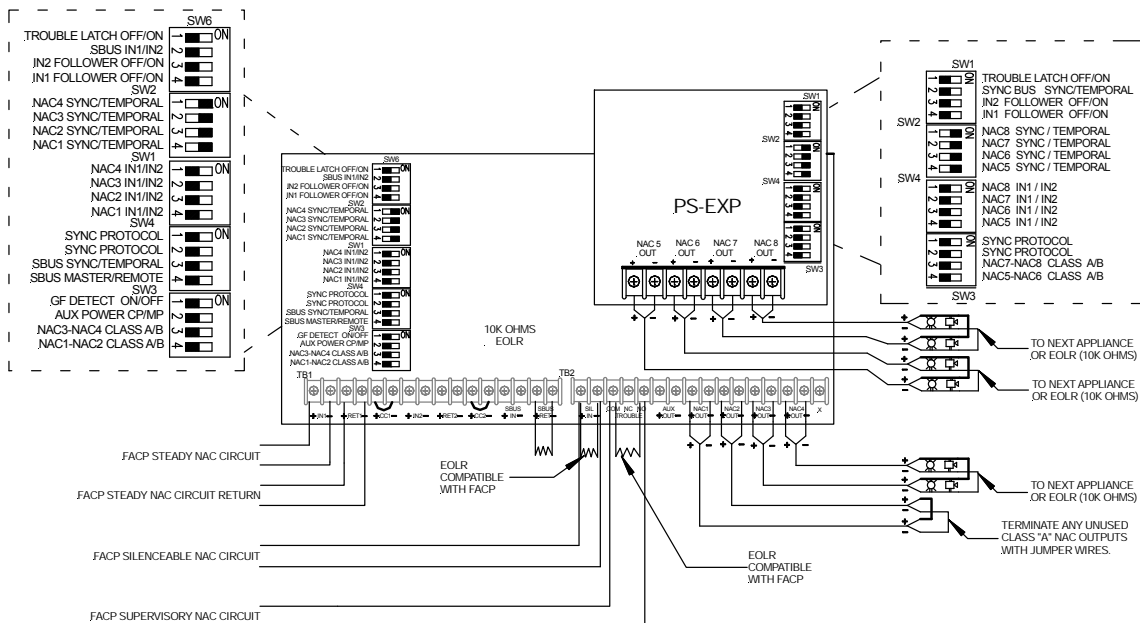


EXAMPLE 7: WHELOCK SYNC MODE (CLASS “A”) FOR ALL NAC OUTPUTS



- When audible silence functionality is not used, the “SIL IN” silence terminals can be left unconnected.

EXAMPLE 8: TEMPORAL MODE (CLASS “A”) FOR ALL NAC OUTPUTS

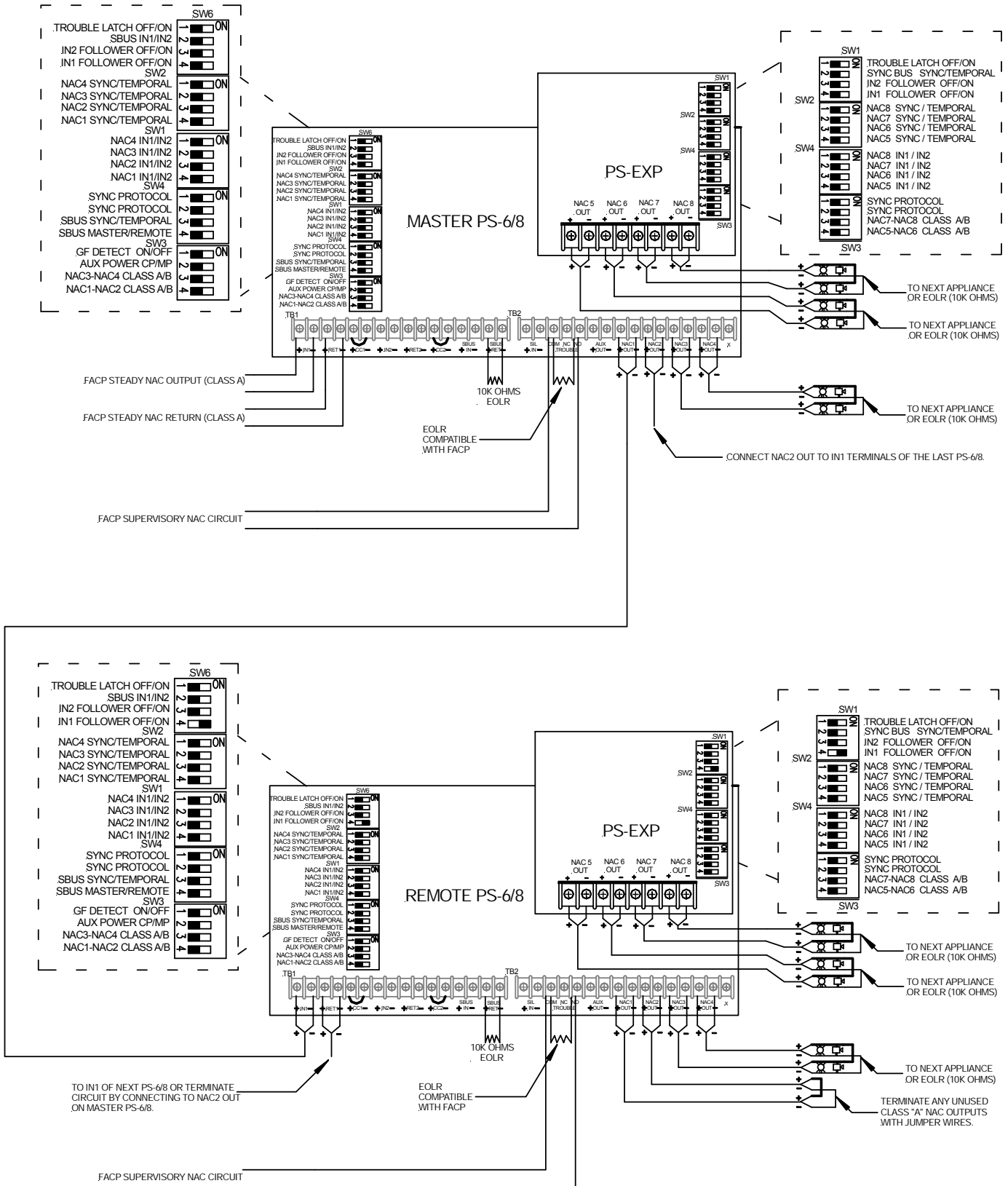


- When audible silence functionality is not used, the “SIL IN” silence terminals can be left unconnected.
- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.

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.

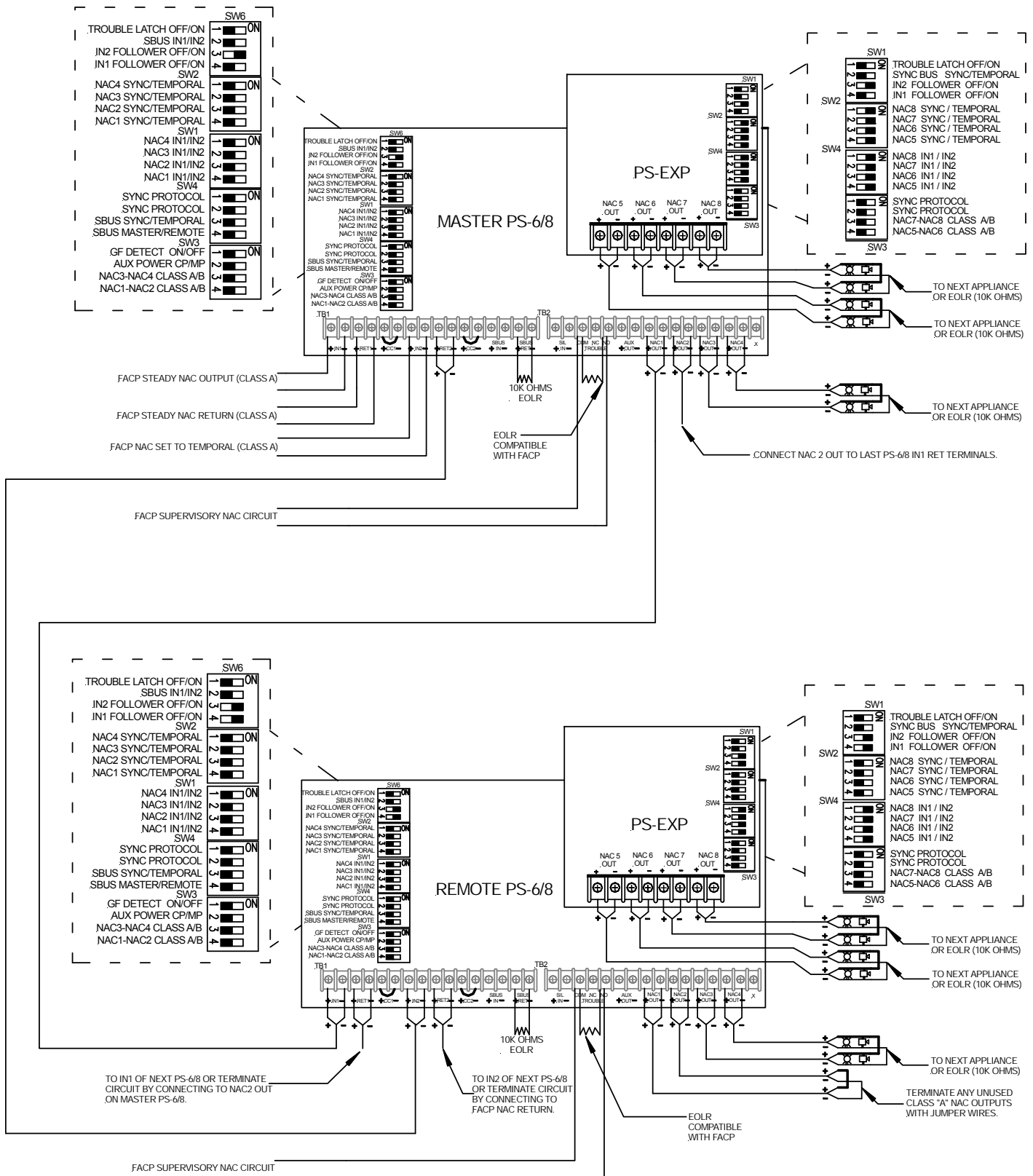
CAUTION: Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

EXAMPLE 9: MASTER & REMOTE (CLASS "A") WITH ALL NACS SET FOR WHEELLOCK SYNC.



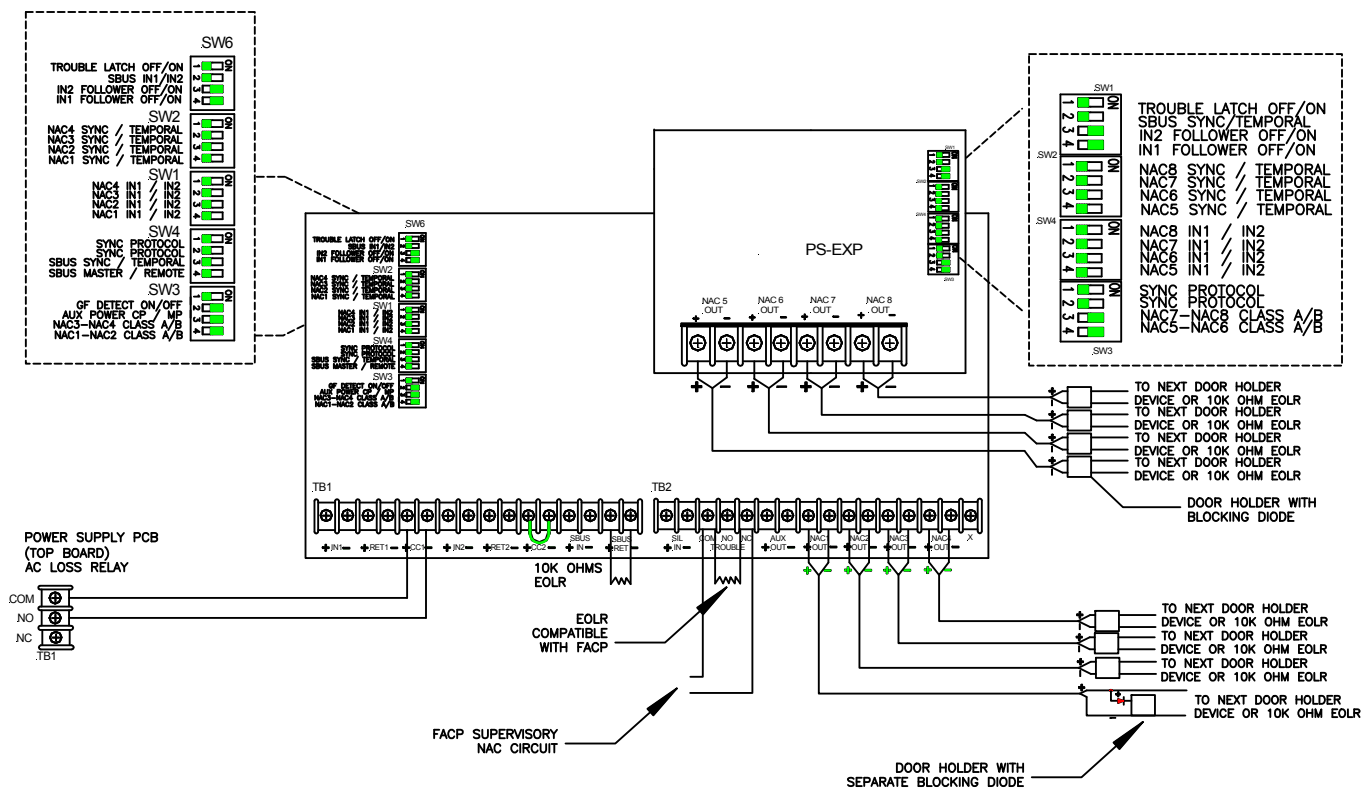
- In this setup, all NAC Outputs set for WHEELLOCK SYNC are synchronized together.

EXAMPLE 10: MASTER & REMOTE (CLASS "A") WITH ALL 4 NACS SET FOR WHEELOCK SYNC ON EACH PS-EXP AND 4 NACS SET FOR TEMPORAL ON EACH PS-6/8-LP LOGIC BOARD.



- In this setup, all the CLASS "A" NAC outputs on the PS-6/8/8-LP Logic boards are synchronized to WHEELLOCK SYNC, and all of the CLASS "A" NAC outputs on the PS-EXP boards are synchronized to the FACP TEMPORAL signal.

EXAMPLE 11: NON-RESETTABLE CONTINUOUS DUTY POWER MODE.



- If door holder does not include an integrated blocking diode, one must be added to each door holder as shown in Example 11.
- Ensure that JP1 is installed on the Power Supply PCB (The upper pc board.)
- The maximum current rating for a NAC Output set for Continuous Power Mode is 3.0 Amps.
- The maximum current rating for all NAC Outputs set for Continuous Power Mode must not exceed 4.0 Amps.
- For a list of compatible auxiliary devices see Chapter 6.0 on Sheet 23.

NOTE: Continuous duty power supply outputs ARE NOT battery backed up. These outputs will TURN OFF if AC Mains power is lost. These outputs will AUTOMATICALLY TURN ON when AC Mains power is restored.

⚠ WARNING: OUTPUTS CONFIGURED AS “CONTINUOUS DUTY POWER SUPPLY OUTPUTS” WILL NOT SYNCHRONIZE STROBES.

COMBINATION CLASS “A” AND CLASS “B” HOOKUP:

The PS-EXP 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 6 for the PS-6 or 8 Amps for the PS-8(-LP) NAC extender Power Supplies.

COMBINATION OF MODES:

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

6.0 LIST OF COMPATIBLE AUXILIARY DEVICES

LIST OF COMPATIBLE AUXILIARY DEVICES	
<i>For use with AUX CP MODE ONLY</i>	
Manufacturer	Model
GE/EST	SD-4WJ/ESD-4WJ
BOSCH	D285DH
	D282A/D283A
FIRELITE	MMF-300
	CMF-300
	CRF-300
SPACE AGE	SL-2000
	SM-501
GENTEX	8000/8003
SYSTEM SENSOR	4WTAB
	4WTARB
	4WITARB
	4WTRB
	4WTB
	DH100ACDCLP
	R-10T Multi Voltage Relay
	R-20T Multi Voltage Relay
<i>For use with AUX MP MODE or CONTINUOUS POWER</i>	
Manufacturer	Model
LCN	SEM1960
	SEM78020/7820
GE/EST	DHFM12412
	DHFM22412
	DHFM11224
	DHFM21224
	DHF24120C
	DHS24120C
	DHR24120C
	1501-AQN5
	1502-AQN5
	1504-AQN5
	1505-AQN5
	1508-AQN5
1509-AQN5	
BOSCH	D370
	D371

7.0 LIST OF COMPATIBLE NAC DEVICES:

The following is a list of appliances produced by Cooper Wheelock that are compatible with the Wheelock power supplies.

SYNCHRONIZING HORNS	
AH-12	AH-24
AH-12WP	AH-24WP
HS-24	MIZ-24S
NH-12/24	HN/HN-C
ZNH	LLFHN
	LHN/LHN-C
SYNCHRONIZING HORN STROBES	
AS-121575W	AS-241575W
AS-24MCW	AS-24MCC
AS-24MCWH	AS-24MCCH
AS-2415C	AS-2430C
AS-2475C	AS-24100C
ASWP-2475W	-----
NS4-121575W	NS-121575W
HS4-241575W	NS-2-41575W
HS4-24MCW	NS-24MCW
HS4-24MCWH	HS4-24150C
HS/HS-C	HS4-24185W
ZNS-MCW	LHS/LHS-C
ZNS-MCWH	LLFHS
SYNCHRONIZING STROBES	
RSS-121575W	RSSP-121575W
RSS-241575W	RSSP-241575W
RSS-24MCW	RSSP-24MCW
RSS-24MCC	-----
RSS-2415C	-----
RSS-2430C	-----
RSS-2475C	-----
RSS-24100C	-----
RSS-2415CR	-----
RSS-2430CR	-----
RSS-2475CR	-----
RSS-24100CR	-----
RSS-24150C	-----
RSS-24177C	-----
RSS-24150W	RSSP-24150W
RSS-24177W	RSSP-24177W
RSS-24185W	RSSP-24185W
RSS-24150CR	-----
RSS-24177CR	-----
RSSWP-2475W	-----
ZRS-MCW	-----
ZRS-MCWH	ST/ST-C
BELLS	
MB-G6-24	MB-G10-24

FOR ANY OTHER USE, INCLUDING DESCRIPTION OF THE PRODUCT'S APPLICATION, OPERATION, INSTALLATION AND TESTING IS USED AT THE SOLE RISK OF THE USER, AND COOPER NOTIFICATION WILL NOT HAVE ANY LIABILITY FOR SUCH USE.

8.0 WARRANTY STATEMENT:

LIMITED WARRANTY

Cooper Wheelock, Inc. dba Cooper Notification and Cooper Notification, Inc. (each, a "Seller") products must be used within their published specifications and must be PROPERLY specified, applied, installed, operated, maintained and operationally tested in accordance with these instructions at the time of installation and at least twice a year or more often and in accordance with local, state and federal codes, regulations and laws. Specification, application, installation, operation, maintenance and testing must be performed by qualified personnel for proper operation in accordance with all of the latest National Fire Protection Association (NFPA), Underwriter's Laboratories (UL), National Electrical Code (NEC), Occupational Safety and Health Administration (OSHA), local, state, county, province, district, federal and other applicable building and fire standards, guidelines, regulations laws and codes including, but not limited to, all appendices and amendments and the requirements of the local authority having jurisdiction (AHJ). Seller products when properly specified, applied, installed, operated, maintained and operationally tested as provided above are warranted against mechanical and electrical defects for a period of (a) three (3) years from date of manufacture with respect to MEDC and Seller Industrial Signals and Seller Fire and Security Notification Appliances and Devices, or (b) one (1) year from date of manufacture with respect to Waves and SafePath Voice Evacuation and Mass Notification Systems (date of manufacture is determined by date code.) Correction of defects by repair or replacement shall be at Seller's sole discretion and shall constitute fulfillment of all obligations under this warranty. THE FOREGOING LIMITED WARRANTY SHALL IMMEDIATELY TERMINATE IN THE EVENT ANY PART NOT FURNISHED BY SELLER IS INSTALLED IN THE PRODUCT. THE FOREGOING LIMITED WARRANTY SPECIFICALLY EXCLUDES ANY SOFTWARE REQUIRED FOR THE OPERATION OF OR INCLUDED IN A PRODUCT. SELLER MAKES NO REPRESENTATION OR WARRANTY OF ANY OTHER KIND, EXPRESS, IMPLIED OR STATUTORY WHETHER AS TO MECHANABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER MATTER.

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07/15