



APD POWER DISTRIBUTION SYSTEMS INSTALLATION INSTRUCTION MANUAL

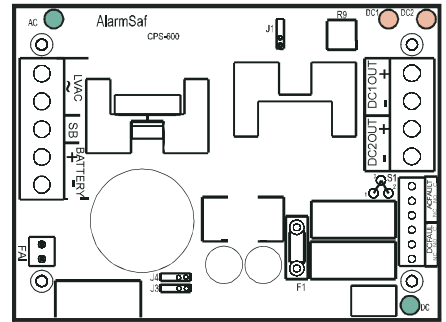
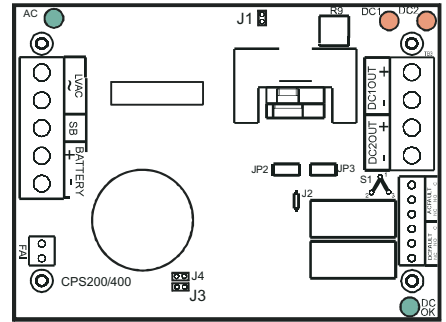
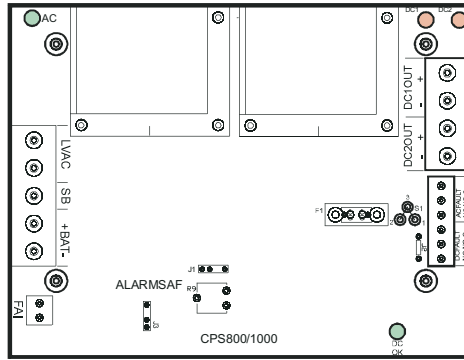
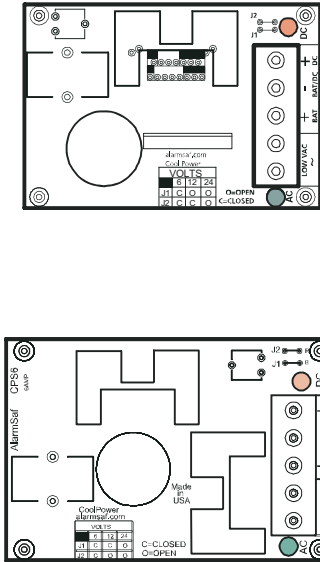
This manual includes the following Installation Instructions:

Pages 2 – 19: 52-209 CPS2-1000 Installation Rev B03-032024

Pages 20 – 43: 52-254 APD8 Installation Rev B02-032024

This manual is for use with the following AlarmSaf products:

ORDER #	MODEL #
02807	CPS 400C-UL/CSA-APD8
02808	CPS 400C-UL/CSA-APD8F
02809	CPS 600C-UL/CSA-APD8
02810	CPS 600C-UL/CSA-APD8F
02811	CPS 800C-UL/CSA-APD8
02812	CPS 800C-UL/CSA-APD8F
02813	CPS 800C-UL/CSA-APD8X
02814	CPS 800C-UL/CSA-APD8FX
02815	CPS 800C-UL/CSA-APD16X
02816	CPS 800C-UL/CSA-APD16FX
02817	CPS 1000C-UL/CSA-APD8
02818	CPS 1000C-UL/CSA-APD8F
02819	CPS 1000C-UL/CSA-APD8X
02820	CPS 1000C-UL/CSA-APD8FX
02821	CPS 1000C-UL/CSA-APD16X
02822	CPS 1000C-UL/CSA-APD16FX
02823	CPS 440DX-UL/CSA-APD16
02824	CPS 440DX-UL/CSA-APD16F
02825	CPS 640DX-UL/CSA-APD16
02826	CPS 640DX-UL/CSA-APD16F



Model CPS2 - CPS1000

Power Supply / Battery Charger

Operating and Installation Instructions

52-209 Rev B.03

I. Warnings and Notices

- **WARNING** - To reduce the risk of fire or electric shock, do not expose this product to rain or moisture
- **WARNING** - This installation and all servicing should be made by qualified service personnel and should conform to all local codes
- **NOTICE** - This equipment shall be installed in a manner which prevents unintentional operation from employees or other personnel working about the premises, by falling objects, by building vibration and by similar causes
- **NOTICE** - This equipment is not intended for use within the patient care areas of a Health Care Facility

Table of Contents

Section	Page
I. Warnings and Notices	2
1 Introduction	4
2 Applicable Standards / Documents	5
3 System Overview	6
3.1 Electrical Ratings and Specifications	6
3.2 Terminal Descriptions and Electrical Ratings	7
3.3 AC Input Connection	8
3.4 Battery Terminals	8
3.5 DC1 Output Terminals	8
3.6 DC2 Output Terminals	9
3.7 FAI Input Terminals	9
3.8 Fault Reporting Terminals	9
3.9 Fusing	9
4 Installation	10
4.1 Mounting	10
4.2 Wiring	11
5 Operating the CPS	12
5.1 Setting the Jumpers	12
5.2 Visual Indicators	13
5.3 Troubleshooting	14
6 Specifications	15
6.1 Electrical Specifications	15
6.2 Temperature Specifications	15
6.3 Mechanical Specifications	15
Appendix A	16
Using the FAI Input and DC2 Output	
Appendix B	17
Using the SB (Special Battery) Terminal	17
Appendix C	18
Using the (Optional) APD8(F)	18

Section 1 Introduction

The CPS line of power supplies provides a field selectable 12VDC or 24VDC at 2.5A to 10A (depending on model) using buck topology switching technology.

Features:

- Field-selectable output voltage of 12V or 24VDC - Specific models also provide a 6V setting
- Units will charge a maximum 7AH to 18AH (depending on model) battery set within 48 hours
- All listed units employ full fault detection with dual Form-C relay outputs
- Non-listed units are optionally available with fault detection also with dual Form-C relay outputs
- Cabinet-level systems are optionally available with one or more APD8 or APD8F distribution boards. See www.alarmsaf.com for details.
- Fault conditions monitored include:
 - Low or missing AC
 - High or low output / battery
 - Reversed Battery
 - Internal Power Supply failure
- Visual indicators include:
 - AC Presence (Green) - Units with Fault Detection only
 - DC OK (Green) - Units with Fault Detection only
 - One or two DC Output Present LEDs (Red)

Section 2

Applicable Standards / Documents

NFPA Standards

NFPA 72 National Fire Alarm Code

NFPA 70 National Electrical Code

NFPA 731 Standard for the Installation of Electronic Premises Security Systems

UL Standards (Applies to model numbers ending in “-UL/CSA” only)

UL 294 Access Control System Units

Canadian Standards (Applies to model numbers ending in “-UL/CSA” only)

CSA C22.2

Other

Applicable Local and State Building Codes

Requirements of the Local Authority Having Jurisdiction (LAHJ)

Product Use

When installed in accordance with all standards listed in Section 2 of this document, the CPS line provides power for use with typical 12 or 24VDC devices as used in the access control or security industries such as, but not limited to, mag locks, door strikes, door holders, card readers, keypads, etc.

Section 3 System Overview

3.1 Electrical Ratings and Specifications

Manufactured By

AlarmSaf
6 Ledgerrock Way, Unit 7
Acton, MA 01720

Tel: 978.658.6717
Tel: 800.987.1050
www.alarmsaf.com

Model Numbers and Electrical Ratings

Model (Note 1)	Order Number	Enclosure	Input Voltage	Max Input Current or Transformer Required.		Max Output Current (Note 4)	Max Battery	Fault/FAI/ DC2/SB? (Note 5)	Listed?
				12V Only	12/24V				
CPS2	00850	None	Note 2	T24V40	T29V120	2.5A	7AH	No	No
CPS20	00857	None	Note 2	T24V40	T29V120	2.5A	7AH	Yes	No
CPS200-UL/CSA	01372	None	28VAC	Note 3	Note 3	2.5A Class 2	7AH	Yes	Note 3
CPS4	00852	None	Note 2	T24V4A	T29V196	4.0A	14AH	No	No
CPS40	00860	None	Note 2	T24V4A	T29V196	4.0A	14AH	Yes	No
CPS400-UL/CSA	01373	None	28VAC	Note 3	Note 3	4.0A Class 2	14AH	Yes	Note 3
CPS6	00854	None	Note 2	T24V4A	T24V5A	6.0A	18AH	No	No
CPS60	00862	None	Note 2	T24V4A	T24V5A	6.0A	18AH	Yes	No
CPS600-UL/CSA	01374	None	28VAC	Note 3	Note 3	6.0A	18AH	Yes	Note 3
CPS80	00864	None	Note 2	28V360	28V360	8.0A	18AH	Yes	No
CPS800-UL/CSA	01375	None	28VAC	Note 3	Note 3	8.0A	18AH	Yes	Note 3
CPS100	00866	None	Note 2	28V360	28V360	10.0A	18AH	Yes	No
CPS1000-UL/CSA	01367	None	28VAC	Note 3	Note 3	10.0A	18AH	Yes	Note 3
CPS2C	00851	8x7x3.5	120VAC	1.00A		2.5A	7AH	No	No
CPS20C	00858	8x7x3.5	120VAC	1.00A		2.5A	7AH	Yes	No
CPS20C-7	00859	12x12x4	120VAC	1.00A		2.5A	7AH	Yes	No
CPS200C-UL/CSA	01365	8x7x3.5	120VAC	1.00A		2.5A Class 2	7AH	Yes	Yes
CPS200C-7-UL/CSA	01364	12x12x4	120VAC	1.00A		2.5A	7AH	Yes	Yes
CPS4C	00853	8x7x3.5	120VAC	1.50A		4.0A	14AH	No	No
CPS4C-14	00856	12x12x4	120VAC	1.50A		4.0A	14AH	No	No
CPS40C	00861	12x12x4	120VAC	1.50A		4.0A	14AH	Yes	No
CPS400C-UL/CSA	01366	12x12x4	120VAC	1.50A		4.0A Class 2	14AH	Yes	Yes
CPS6C	00855	11x15x4	120VAC	2.50A		6.0A	18AH	No	No
CPS60C	00863	11x15x4	120VAC	2.50A		6.0A	18AH	Yes	No
CPS600C-UL/CSA	01368	11x15x4	120VAC	2.50A		6.0A	18AH	Yes	Yes
CPS80C	00865	11x15x4	120VAC	3.00A		8.0A	18AH	Yes	No
CPS800C-UL/CSA	01369	11x15x4	120VAC	3.00A		8.0A	18AH	Yes	Yes
CPS100C	00867	11x15x4	120VAC	3.50A		10.0A	18AH	Yes	No
CPS1000C-UL/CSA	01363	11x15x4	120VAC	3.50A		10.0A	18AH	Yes	Yes
CPS240D-UL/CSA	02901	11x15x4	120VAC	2.00A		2.5A + 4.0A	14AH x 2	Yes	Yes
CPS240DX-UL/CSA	02902	15x18x4	120VAC	2.00A		2.5A + 4.0A	14AH x 2	Yes	Yes
CPS440D-UL/CSA	02903	11x15x4	120VAC	3.00A		4.0A + 4.0A	14AH x 2	Yes	Yes
CPS440DX-UL/CSA	02904	15x18x4	120VAC	3.00A		4.0A + 4.0A	14AH x 2	Yes	Yes
CPS640D-UL/CSA	02905	11x15x4	120VAC	3.50A		6.0A + 4.0A	14AH x 2	Yes	Yes
CPS640DX-UL/CSA	02906	15x18x4	120VAC	3.50A		6.0A + 4.0A	14AH x 2	Yes	Yes

Table 3.1

Note 1 - Some of the above models are available with one or two APD8(F) Advanced Power Distribution modules - www.alarmsaf.com for details

Note 2 - Minimum input AC voltage is 3V above the desired output voltage setting. Maximum transformer voltage is not to exceed 30VAC

Note 3 - This model is a UL recognized component. It is only approved for use as a replacement board using the existing transformer and enclosure

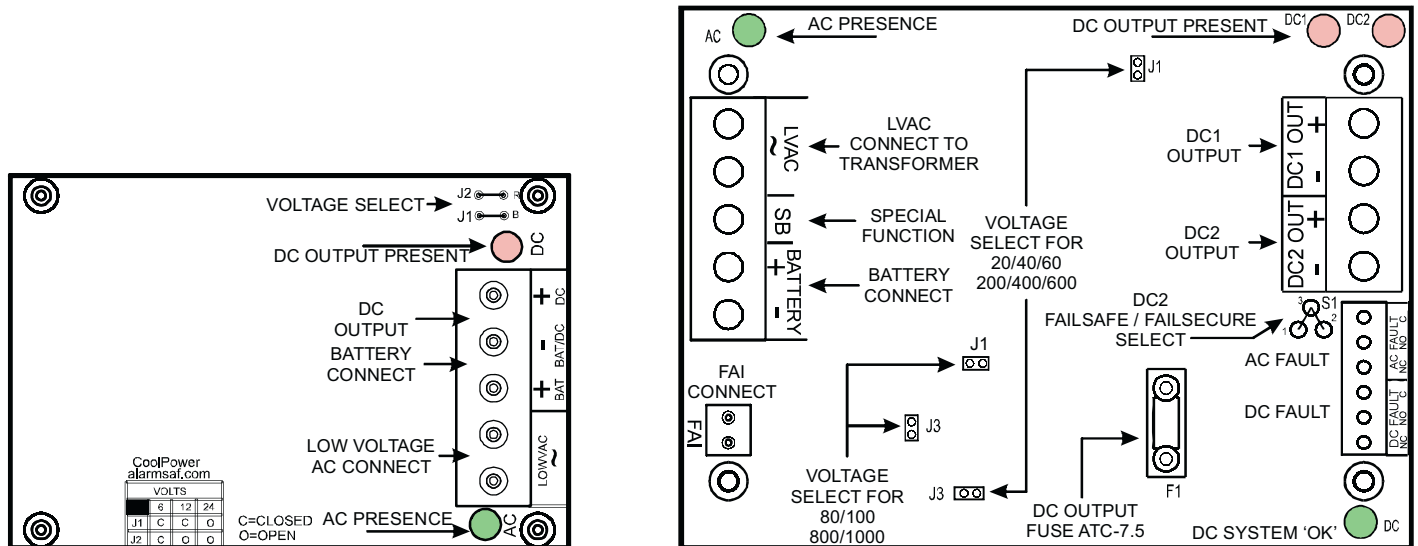
Note 4 - Models which state "Class 2" next to the output current have Class 2 Power Limited DC Outputs

Note 5 - Models marked "Yes" have Fault Outputs, an FAI Input, a DC2 Output, and an SB Terminal. Models marked "No" do not have these features.

3.2 CPS Board Terminal Descriptions and Electrical Ratings

Terminal / Connector	Description	Rating
<i>TB1 - Low Voltage AC Input and Battery Output</i>		
LVAC	Low voltage AC input	28.2VAC - See Table 3.1 for Ratings
LVAC		
SB	Special Battery Terminal	See Appendix B for details on the SB terminal
BAT +	Positive Battery Connection	12VDC or 24VDC at 7AH - 18AH maximum - See Table 3.1 for Ratings
BAT -	Negative Battery Connection	
<i>TB2 - Fire Alarm Input - Units with FAI Input ONLY</i>		
FAI	Fire Alarm Input	Dry Contact Input - See Appendix A
FAI		
<i>TB3 - DC Output (DC2 Present on Units with FAI Input ONLY)</i>		
DC1 OUT +	DC1 Positive Output	12VDC or 24VDC at full output current of supply - See Table 3.1 for ratings.
DC1 OUT -	DC1 Common Output	
DC2 OUT +	DC2 Positive Output - FAI Controlled	12VDC or 24VDC at full output current of supply - FAI Controlled - See Table 3.1 and Appendix A.
DC2 OUT -	DC2 Common Output - FAI Controlled	
<i>TB4 - Fault Outputs - Units with Fault Outputs ONLY</i>		
DC FAULT NC	DC Fault Relay Normally Closed	1 Amp at 24VDC (Resistive) - Contacts are labeled in the non-powered (Fault) condition
DC FAULT NO	DC Fault Relay Normally Open	
DC FAULT C	DC Fault Relay Common	
AC FAULT NC	AC Fault Relay Normally Closed	1 Amp at 24VDC (Resistive) - Contacts are labeled in the non-powered (Fault) condition
AC FAULT NO	AC Fault Relay Normally Open	
AC FAULT C	AC Fault Relay Common	

Figure 3.2



Note: Wire should be sized appropriately for voltage drop and current carrying capability. All terminals are labeled for polarity where appropriate.

3.3 AC Input Connection

3.3.1 Board-Level Supplies

Board-level units are connected to an appropriate low-voltage AC supply voltage of a sufficient VA rating (See Table 3.1). The connection is made on TB1 at the terminals labeled “LVAC.” The phase of this connection is not important.

3.3.2 Cabinet-Level Supplies

Cabinet-level supplies are supplied with a hardwired transformer of the correct voltage. The connections should be made as follows:

- Black Hot
- White Neutral
- Green Earth Ground

Note - *The Green or Green/Yellow earth ground wire should always be connected first or disconnected last for safety.*

Note - *All wiring should be installed in accordance with (NEC760) NFPA70, NFPA72, and all local code requirements. Power limited wiring requires that power limited and non-power limited wiring remain physically separated. All power limited circuits must remain at least one quarter inch (¼”) away from any non-power limited circuit wiring. All power limited circuit wiring must enter and exit the cabinet through different knockouts than non-power limited wiring.*

3.4 Battery Terminals

The CPS has one set of battery terminals labeled BAT +/- which will charge a sealed lead acid / gel cell battery set for backup of the output voltage. The battery terminals are fuse protected.

Caution - Observe the polarity of the battery terminals with respect to the battery set or damage to the load, power supply, or battery set may occur.

Note - Series-connected batteries should always be of the same ampour capacity, age, and state-of-charge to prevent battery / system damage.

Note - It is the responsibility of the installer to determine the minimum battery requirement for the particular application in which the supply is being used. Backup batteries should be serviced at regular intervals as determined by local and/or national codes.

3.5 DC1 Output Terminals

The DC1 output terminals provide a constant output of either 12VDC or 24VDC. See Section 5.1 for additional information on output voltage selection on board-level units.

Caution - Observe the polarity of the output terminals with respect to the load or damage to the load may occur.

3.6 DC2 Output Terminals

The DC2 output terminals provide a controlled output of either 12VDC or 24VDC. Control is provided through the FAI input. The operation of the DC2 output is set by jumper S1. See Appendix A for more information on using the FAI Input and DC2 output.

Note - Not all models of CPS have a DC2 output.

Caution - Observe the polarity of the output terminals with respect to the load or damage to the load may occur.

3.7 FAI Input Terminals

The FAI input accepts either a normally open or normally closed set of dry contacts to provide control to the DC2 output. The operation of the FAI input is set by jumper J1. See Appendix A for more information on using the FAI Input and DC2 output.

Note - Not all models of CPS have an FAI input - See Table 3.1 for details.

3.8 Fault Reporting Terminals

Some models of CPS have two integral sets of Form-C fault relay outputs. See Table 3.1 to determine whether the Fault Outputs are present for a particular model number. Fault conditions indicated include:

- Low or missing AC
- High Battery Voltage
- High Output Voltage
- Blown Fuse (AC or Battery)
- Low Battery Voltage
- Low Output Voltage

NOTE - The CPS line of power supplies does NOT detect battery presence. If battery presence detection is required, AlarmSaf also manufactures supplies with integral battery presence detection.

The integral relay outputs provide fail-safe, Form-C relay outputs rated at 1A at 24VDC. Terminals are labeled in the unpowered (fault) state.

3.9 Fusing

Some models of CPS contain one replaceable fuse - the Battery Fuse. When replacing this fuse, only the equivalent type and rating are to be used. Battery Fuses are blade-type automotive fuses (ATC).

Section 4 Installation

4.1 Mounting

The CPS line is available in either board-level or cabinet level versions.

4.1.1 Mounting a Cabinet-Level Supply

If the CPS is provided in a wall mount enclosure, use #8 hardware minimum in four locations. Use an appropriate fastening system for the mounting surface.

Cabinet Mounting:

1. Mark and predrill two holes for the top keyhole mounting screws
2. Install two fasteners in the mounting wall leaving screwheads protruding approximately $\frac{1}{4}$ inch
3. Using the two upper keyholes, mount the cabinet over the two screws
4. Mark the two lower holes, remove the cabinet and drill the lower mounting holes
5. Mount the cabinet, install the remaining fasteners, and tighten all fasteners

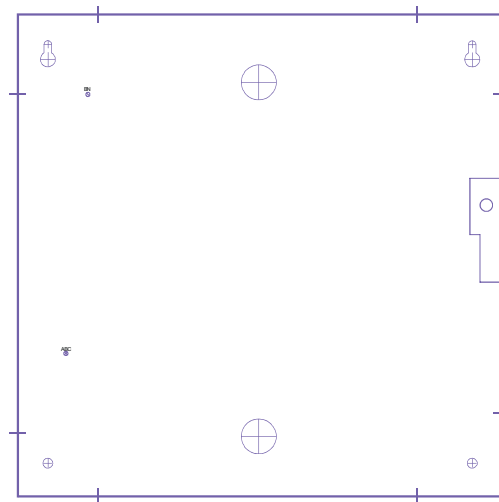


Figure 4.1.1

4.1.2 Mounting a Board-Level Supply

Board-level, supplies can be mounted either with the provided double-sided tape or by using nylon standoffs and hardware (not included). Replacement boards for a listed supply must reuse the existing hardware to maintain the listing.

4.2 Wiring

4.2.1 Wire Routing

All wiring must be installed in accordance with NFPA70, NFPA72, and all local code requirements.

Power Limited wiring requires that power limited and non-power limited wiring remain physically separated. Any power limited circuit entering the enclosure must remain at least one quarter inch (¼") away from any non-power limited circuit wiring. Any power limited circuit wiring must enter and exit the enclosure through different knockouts than non-power limited circuit wiring. Wiring within the enclosure should be routed around the perimeter of the cabinet. It should not be routed across the circuit boards.

4.2.2 AC Input

4.2.2.1 Cabinet Level Supplies

Connection should be made via an approved method. AC mains wiring should be no smaller than 14 AWG. See Section 3.3 for details.

4.2.2.2 Board-Level Supplies

Locate the LVAC Input terminals. These terminals are non-removable and accept wire sizes between #12 and #22 AWG. Phasing of the LVAC input is not important on the CPS. See Section 3.1 for Transformer requirements.

4.2.3 Output Wiring (DC1 / DC2)

Locate the output terminals. These terminals are non-removable and accept wire sizes between #12 and #22 AWG. Polarity is marked on the PCB, and on the supporting documentation.

4.2.4 Battery Wiring

Locate the battery terminals. These terminals are non-removable and accept wire sizes between #12 and #22 AWG. Polarity is marked on the PCB. If the CPS is set for 12VDC, connect a single 12V battery to the terminals. If the CPS is set for 24VDC, connect two 12V batteries in series to the terminals.

CAUTION - A lead-acid battery has the capability of producing extremely high current. Personal or property damage can occur if the batteries are shorted or improperly connected.

4.2.5 Fault Output Wiring

Locate the Fault Output relay terminals. These terminals are non-removable and accept wire sizes between #14 and #22 AWG. The relay terminals are marked in the non-powered (fault) state (In a normal (non-fault) condition, there is a connection between C and NO).

Section 5 Operating the CPS

5.1 Setting the Jumpers

Before powering a system containing a CPS, the jumpers should be set for proper operation. Be sure to reference the proper section of the manual (5.1.1 or 5.1.2) for the model of CPS you are using.

5.1.1 Units WITH Fault Relay Output

Jumper	Description	Settings	Default
J1 & J3	Output voltage Setting	Both ON - 12V Both OFF - 24V	Both ON
J2	DC2 Battery Backup	Intact - Backup Enabled Cut - Backup Disabled	Intact
J4	Not Used	Leave Jumper Off	Off
S1	DC2 Operation	See Section 5.1.1.3	Fail-Safe

WARNING - BOTH voltage setting jumpers must be set for proper operation of the CPS. Failure to set both jumpers will result in damage to the CPS board.

5.1.1.1 Output Voltage Setting (J1 & J3)

J1 and J3 control the output voltage setting of the CPS. With both jumpers ON, the output voltage will be 12VDC nominal. With both jumpers OFF, the output voltage will be 24VDC. ***BOTH jumpers must be set, or damage to the CPS will occur.***

5.1.1.2 DC2 Battery Backup (J2)

J2 is a wire jumper that controls whether or not the DC2 output is backed up by the standby battery set. This is useful for installations that require maglocks to open upon AC power loss. Cutting this jumper removes the battery backup from the DC2 output. This jumper does not affect the DC1 output.

5.1.1.3 DC2 Operation (S1)

On units with Fault Relay Output, the DC2 output is the FAI controlled output of the power supply. The S1 jumper determines the operation of the DC2 output when there is an FAI (Fire Alarm Interface) input. The default setting on all units is **FAIL-SAFE**. Jumper positions are:

JUMPER S1 - DC2 OUTPUT SETTINGS				
DESCRIPTION		S1 POSITION		
		CPS20/40 & CPS200/400	CPS60 & CPS600	CPS80/100 & CPS800/1000
FAIL-SAFE (DEFAULT)	Power to the DC2 output is removed when an FAI input is received. Power to the DC2 output returns when the FAI input is removed	1 - 3	3 - 2	3 - 2
FAIL-SECURE	There is no power to the DC2 output until an FAI input is received. DC2 remains powered during the FAI event. Power is removed from DC2 when the FAI input is removed.	1 - 2	3 - 1	3 - 1

5.1.2 Units WITHOUT Fault Relay Output

Jumper	6V Output	12V Output*	24V Output
J1	N/A	Closed	Open
J2	N/A	Open	Open

*Factory default

5.1.2.1 Output Voltage Setting (J1 & J2)

J1 and J2 control the output voltage setting of the CPS. CPS models without Fault Relays may be set for 12VDC, or 24VDC output. Set the jumpers as shown in the table for the desired output voltage.

5.2 Visual Indicators

The CPS contains one or four visual status indicators, depending on model. Models with fault outputs have four visual indicators, while models without fault outputs only have one visual indicator.

5.2.1 AC (Green) - Units with Fault Outputs ONLY

This LED lights when Low Voltage AC is present.

CAUTION - Always check for AC presence with an AC volt meter before servicing

5.2.2 DC OK (Green) - Units with Fault Outputs ONLY

This LED lights when there is no trouble condition detected by the CPS. The LED extinguishes under one of the fault conditions listed in Section 3.8.

5.2.3 DC (Red) - Models without Fault Outputs ONLY

This LED lights when output voltage is present at the DC Output terminals

5.2.4 DC1 / DC2 - Models with Fault Outputs ONLY

These LEDs light when output voltage is present on the DC1 and DC2 outputs respectively. The DC2 LED may switch on or off depending on the state of the FAI input and jumper S1

5.3 Troubleshooting

Condition	Possible Cause	Solution
The output voltage of the CPS is incorrect or missing	Incorrect jumper settings	Verify proper jumper settings
	Excessive loading on output	Verify that output current is less than rated current
	AC trouble	Verify presence of AC voltage
	Bad / Incorrect Battery Set	Verify that a good battery set of the proper voltage is connected to the CPS
	Internal problem with CPS	Contact AlarmSaf
The DC OK LED is extinguished, indicating a fault condition	Blown battery fuse	Verify fuse is intact - Check wiring integrity before replacing fuse
	Excessive loading on output	Verify that output current is less than the rated current
	Damaged, Incorrect, or Missing Battery Set	Verify that a good battery set of the proper voltage is connected to the CPS
	Low or Missing AC	Verify the presence of at least 102VAC on the primary of the Transformer
	Internal problem with CPS	Contact AlarmSaf

Section 6 Specifications

6.1 Electrical Specifications

6.1.1 Input Voltage	See Section 3.1
6.1.2 Input Power	See Section 3.1
6.1.3 Output Voltage	12 or 24VDC Nominal - See Section 5.1
6.1.4 Output Current	See Section 3.1
6.1.5 Maximum Battery Charger Capacity	See Section 3.1

6.2 Temperature Specifications

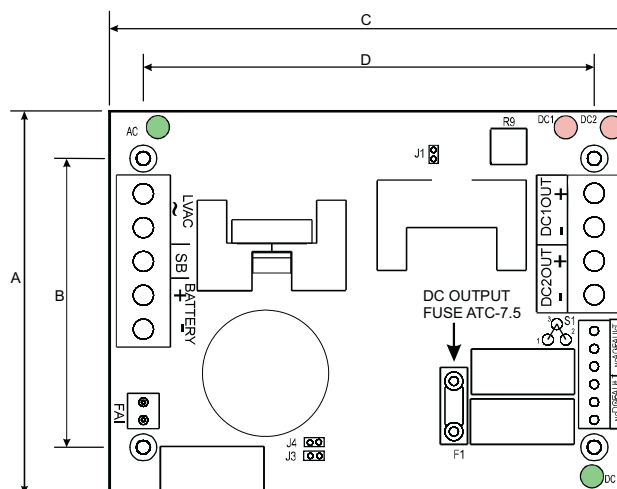
6.2.1 Ambient Temperature Range: 0°C to 49°C (32°F to 120°F)
6.2.2 Ambient Humidity: 85% at 30 °C (86°F) Maximum

6.3 Mechanical Specifications

All dimensions in inches; all weights in pounds. Reference drawing below table for more details.

Model	Width (A)	Length (C)	Height	Mounting Width (B)	Mounting Length (D)	Approximate Board Weight
CPS2	2.75	4.00	1.125	2.45	3.60	0.60 LBS
CPS4	2.75	4.00	1.50	2.45	3.60	0.60 LBS
CPS20 / 200	4.25	5.75	1.50	3.20	5.00	1.25 LBS
CPS40 / 400	4.25	5.75	2.25	3.20	5.00	1.25 LBS
CPS6	3.00	4.50	2.125	2.70	4.00	1.25 LBS
CPS60 / 600	4.25	5.75	2.25	3.20	5.00	1.5 LBS
CPS80 / 800	4.75	6.25	2.25	3.20	5.00	1.5 LBS
CPS100 / 1000	4.75	6.25	2.25	3.20	5.00	2.20 LBS

NOTE: ALL DIMENSIONS IN INCHES AND ARE APPROXIMATE

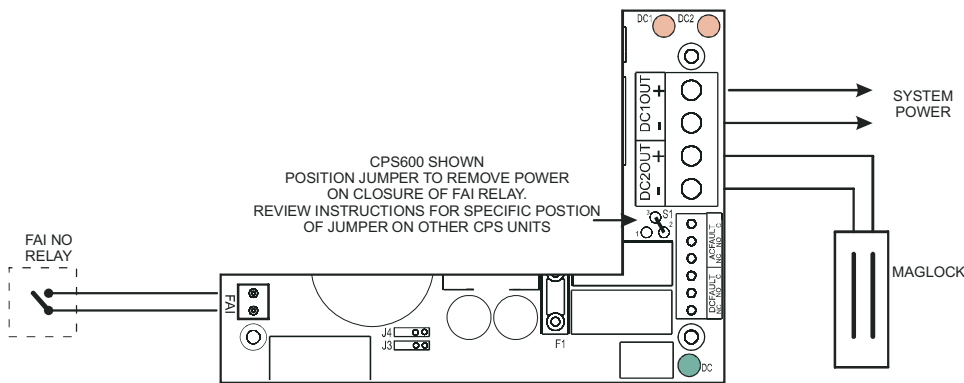


UL 294 Performance Levels:
Line Security: I
Endurance: I
Attack: I
Standby: IV

Appendix A Using the FAI Input and DC2 Output

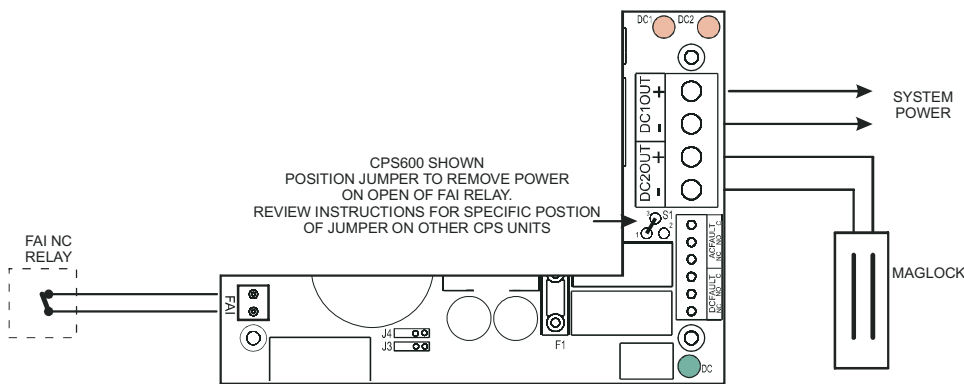
Some models of CPS have an FAI input and a DC2 output, which is controlled by the FAI input. The FAI input may be activated by either a Normally Open or a Normally Closed contact, and the DC2 output can operate either as Fail-Safe or Fail-Secure by setting the S1 jumper appropriately (See Section 5.1).

The diagrams below show the common methods of using and wiring the FAI input and DC2 output.



This diagram shows a system which removes power from the DC2 output when the NO contact on the FAI terminals closes. Power returns when the contact is opened.

If the NO contact was replaced with an NC contact, the DC2 output would normally be unpowered and the output would power up when the NC contact opens.

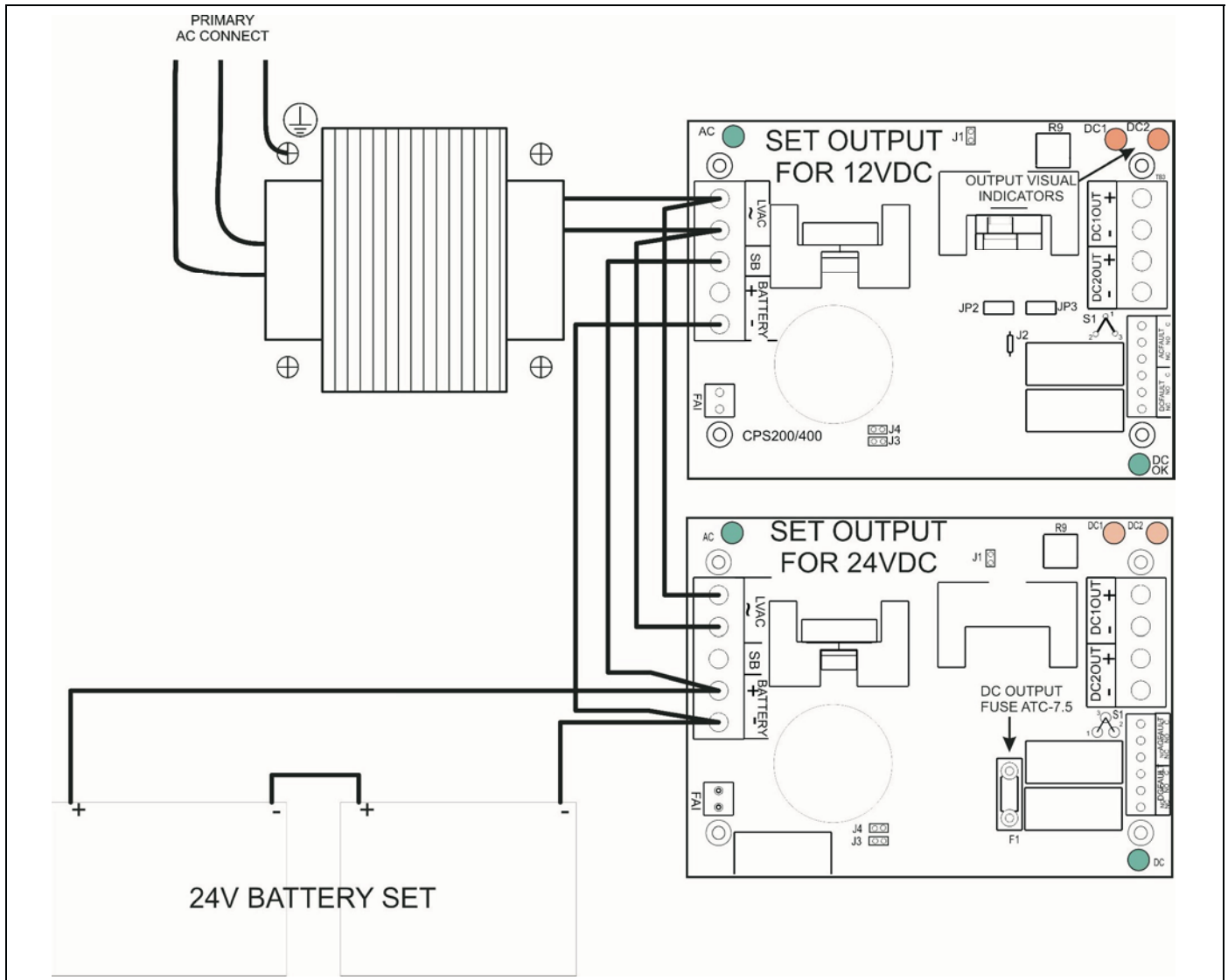


This diagram shows a system which removes power from the DC2 output when the NC contact on the FAI terminals opens. Power returns when the contact is opened.

If the NC contact was replaced with an NO contact, the DC2 output would normally be unpowered and the output would power up when the NO contact closes.

Appendix B Using the SB (Special Battery) Terminal

The SB Terminal allows the use of a single battery set in dual voltage systems utilizing multiple power supplies. A 24V battery set is connected to the 24V power supply as normal, then also connected to the 12V supply using the BAT- terminal and the SB terminal. Upon loss of AC power, the 12V supply will then draw power from the 24V battery set and regulate it down to 12VDC. See the diagram below for an example of wiring to the SB terminal.



Appendix C Using the (Optional) APD8(F)

Some models of CPS are available with one or two APD8(F) Advanced Power Distribution modules. This Appendix provides a quick reference for jumper and switch settings for the APD8(F) and assumes a basic knowledge of the APD8(F) - for full APD8(F) instructions, refer to document number 52-254, available from www.alarmsaf.com.

Input Configuration (S1-S8)

Each input has one set of DIP switches, labeled S1 through S8. On each switch block, only the top six switches are used - the bottom two are not used.

Note - Due to inconsistencies by the manufacturers of DIP switches in the labeling of switch numbers and ON and OFF positions, AlarmSaf indicates switch settings visually and descriptively.

Note - All switch settings shown below are indicated with the board positioned so that the edge of the board with two 8-pin terminal strips is at the top, as shown in the diagram below

	Negative Trip	Positive Trip	12V External Trip
Top Switch	Right (On / Closed)	Left (Off / Open)	Left (Off / Open)
Second Switch	Right (On / Closed)	Left (Off / Open)	Right (On / Closed)
Third Switch	Right (On / Closed)	Left (Off / Open)	Left (Off / Open)
Fourth Switch	Left (Off / Open)	Right (On / Closed)	Left (Off / Open)
Fifth Switch	Left (Off / Open)	Right (On / Closed)	Right (On / Closed)
Sixth Switch	Left (Off / Open)	Right (On / Closed)	Left (Off / Open)

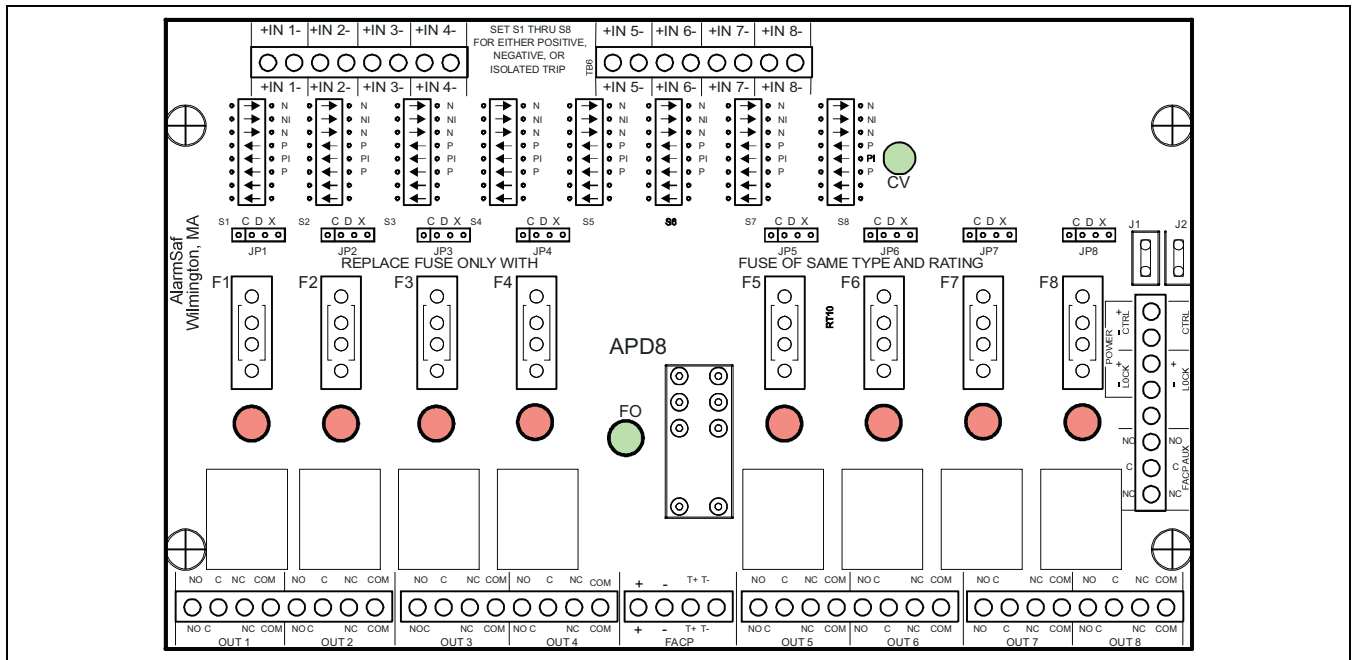
Output Configuration (JP1-JP8)

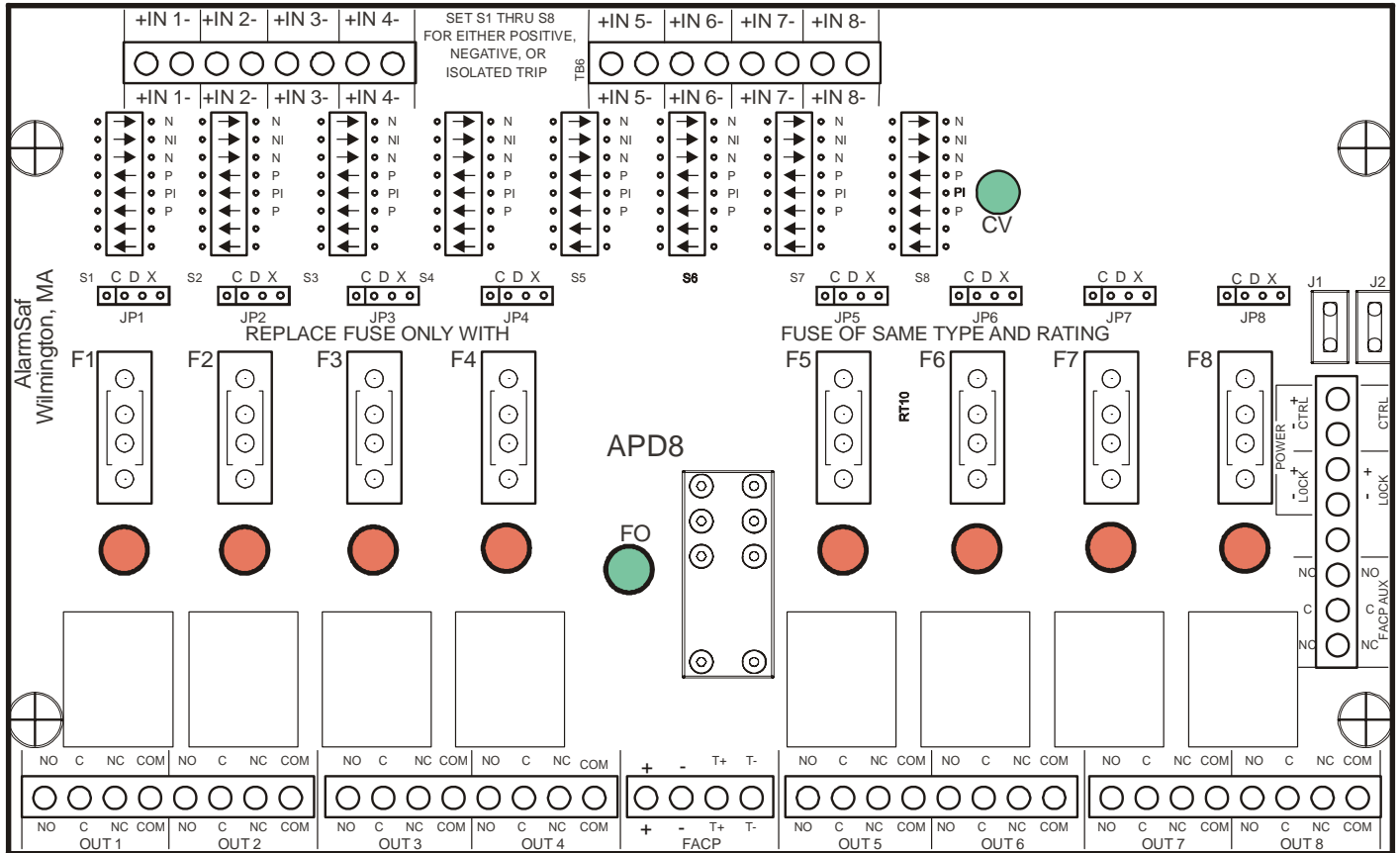
Each output has one jumper which may be set to one of three positions - C, D, or X. These three positions correspond to Constant Output, Disable Output on FAI, or Dry Contact output (X), respectively.

Power Source Setup (J1 and J2)

These jumpers select whether the APD8(F) uses one source for control power and output power or separate sources.

- With both jumpers IN, the APD8(F) uses the same source of power for both output power and internal relay & control power. Input power can be wired to either the "Lock Power" input or the "CTRL Power" input. This is the normal setting.
- With both jumpers OUT, the APD8(F) requires separate control and output power. This setting is not normally required.





Model APD8(F)

Eight-Zone Advanced Power Distribution

Operating and Installation Instructions

52-254 Rev B02

I. Warnings and Notices

- WARNING - To reduce the risk of fire or electric shock, do not expose this product to rain or moisture
- WARNING - This installation and all servicing should be made by qualified service personnel and should conform to all local codes
- NOTICE - This equipment shall be installed in a manner which prevents unintentional operation from employees or other personnel working about the premises, by falling objects, by building vibration and by similar causes
- NOTICE - This equipment is not intended for use within the patient care areas of a Health Care Facility

Symbol Definitions



WARNING - Read the instruction manual to avoid personal injury or property damage



WARNING - Risk of electric shock. Service to be performed by a qualified service person

Table of Contents

Section	Page
I. Warnings and Notices	2
1 Introduction	4
2 Applicable Standards / Documents	5
3 System Overview	6
3.1 Electrical Ratings and Specifications	6
3.2 Connector Descriptions and Electrical Ratings	7
3.3 Control Power and Lock Power Input Connections	8
3.4 Zone Inputs	9
3.5 Zone Outputs	9
3.6 FACP Input	10
3.7 FACP AUX Output	10
3.8 Fusing	11
4 Installation	12
4.1 Mounting	12
4.2 Wiring	13
5 Operating the APD8(F)	14
5.1 Power Separation Jumper Settings	14
5.2 Zone Input Configuration Switch Settings	14
5.3 Output Configuration Jumper Settings	15
5.4 Visual Indicators	15
5.5 Troubleshooting	16
6 Specifications	17
6.1 Electrical Specifications	17
6.2 Temperature Specifications	17
6.3 Mechanical Specifications	17
Appendix A	
Configuring the Zone Inputs For Any Application	18
Appendix B	
Using The Zone Outputs	20
Appendix C	
Using the FACP Input and FACP AUX Output Terminals	21
Appendix D	
Sample Applications	22

Section 1

Introduction

The APD8(F) is an access control power distribution system providing eight relay controlled, individually protected outputs. The ADP8 provides Class-2 power limited outputs via PTC protection, while the APD8F uses fuse protected outputs. Either system can be operated from 12V or 24V AC or DC and features independently programmable outputs, a variety of input option modes, Fire Alarm Interface and visual status indication.

Systems Integrator applications include mag lock and door strike control, reader power, request to exit device power, and system power. The diversity, flexibility and level of system isolation provided by the APD8(F) make this unit a universal toolbox for access control applications.

- Eight outputs - each individually programmable for fail-safe, fail-secure, form-C dry contact, continuous output voltage, and FAI controlled
- Eight inputs - each individually programmable for negative trip, positive trip, open collector / dry contact trip, or isolated trip
- Fire Alarm Interface - latching or non-latching
- Available with Class-2 Power Limited outputs
- Output voltage can be isolated from control voltage
- Visual status indication
 - Input Activation (Red)
 - Control Voltage Present (Green)
 - FAI Status (Red)
- Removable field wiring terminal strips

Section 2

Applicable Standards / Documents

NFPA Standards

NFPA 72 National Fire Alarm Code

NFPA 70 National Electrical Code

NFPA 731 Standard for the Installation of Electronic Premises Security Systems

US Standards

UL 294 Access Control System Units

Canadian Standards

CAN/CSA-C22.2 No. 107.1-01 General Use Power Supplies

Other

Applicable Local and State Building Codes

Requirements of the Local Authority Having Jurisdiction (LAHJ)

UL 294 Performance Levels:

Line Security: I

Destructive Attack: N/A

Endurance: N/A

Standby Power: N/A

Section 3

System Overview

3.1 Electrical Ratings and Specifications

Manufactured By

AlarmSaf
6 Ledgerrock Way, Unit 7
Acton, MA 01720

Tel: 978.658.6717
Tel: 800.987.1050
www.alarmsaf.com

Model Numbers (Board-Level)

APD8, APD8F

Electrical Ratings

Input Voltage	10 - 30V AC or DC
Input Power	0.4A@12VDC/0.2A@24VDC maximum control current + 8A maximum output current
Total Output Current	8A maximum output current or rating of power source - whichever is less
	APD8 - 1.6A maximum ; APD8F - 3.0A maximum
Zone Output Voltage	Dependant on input voltage
Input Trip Current	0.03A per input
FAI Trip Current	0.01A @ 24VDC

Product Use

When installed in accordance with all standards listed in Section 2 of this document, the APD8(F) provides power distribution for use with typical 12 or 24VDC devices used in the access control or security industries such as, but not limited to, mag locks, door strikes, door holders, card readers, keypads, etc.

3.2 APD8(F) Connector Descriptions and Electrical Ratings

Terminal / Connector	Description	Rating
<i>TB7 - Power Inputs and FACP AUX Output</i>		
CTRL+	Control Power Positive Input	10V-30V AC or DC - 0.4A at 12VDC, 0.2A at 24VDC Maximum
CTRL-	Control Power Common Input	
LOCK+	Lock Power Positive Input	10V-30V AC or DC - 8A Maximum - depending on output current and voltage rating of power source
LOCK-	Lock Power Common Input	
FACP AUX NO	FACP Relay Output - Normally Open	1A @ 24VDC Maximum
FACP AUX C	FACP Relay Output - Common	
FACP AUX NC	FACP Relay Output - Normally Closed	
<i>TB8 - FACP Input</i>		
FACP +	FAI Voltage Input Positive	9VDC-30VDC - 0.01A @ 24VDC
FACP -	FAI Voltage Input Common	
FACP T+	FAI Dry Contact Input Positive	0.01A @ 12VDC Nominal
FACP T-	FAI Dry Contact Input Common	
<i>TB5 & TB6 - Zone Inputs</i>		
IN x +	Zone x Positive Input	12VDC Nominal @ 0.03A
IN x -	Zone x Common Input	
<i>TB1, TB2, TB3, & TB4 - Zone Outputs</i>		
OUT x NO	Zone x Output Normally Open	Output voltage determined by Lock Input Voltage APD8 - 1.6A per zone maximum APD8F - 3.0A per zone maximum
OUT x C	Zone x Output Relay Common	
OUT x NC	Zone x Output Normally Closed	
OUT x COM	Zone x Output Power Common	

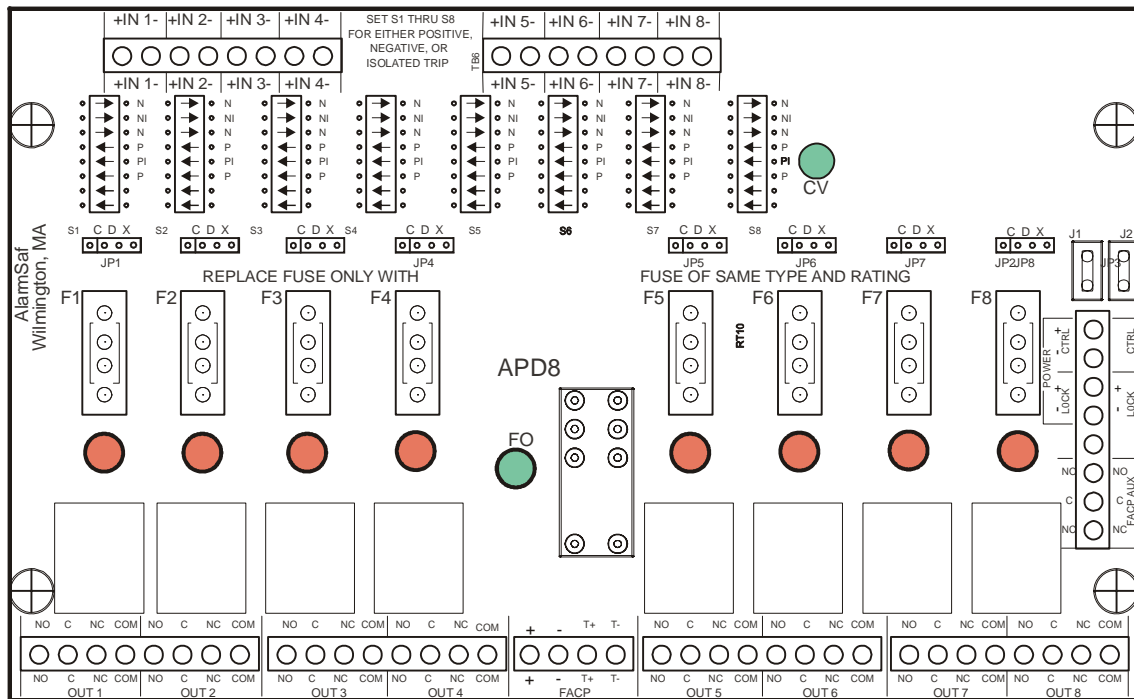


Figure 3.2.1

Note - Wire should be sized appropriately for voltage drop and current carrying capability. All terminals are labelled for polarity where appropriate.

3.3 Control Power and Lock Power Input Connections

The APD8(F) has two separate power inputs - a control power input, and a lock power input. Using two separate power inputs allows total separation of lock and control power sources. Typically, this is not required, and jumpers J1 and J2 should remain in. See Section 5.1 for more information on configuring the APD8(F) for using separate power inputs.

Note - If J1 and J2 are out, BOTH power inputs must be wired to a power source. If J1 and J2 are in place, either the control input or the power input may be used.

Note - If J1 and/or J2 are missing, the control power and lock power inputs can be connected together with wire jumpers if isolated power sources are not required.

3.3.1 Control Power Input

If J1 and J2 are removed, this input provides power to the internal relays and related circuitry of the APD8(F). The Control Power common is tied to the zone input common connections (unless the zone input is set as an insulated input). If J1 and J2 are removed, the Control Power input or Zone Inputs have NO connection to the Lock Power input or the Zone Outputs.

3.3.2 Lock Power Input

If J1 and J2 are removed, this input provides power to the zone outputs of the APD8(F). The Lock Power common is tied to the zone output common connections. If J1 and J2 are removed, the Lock Power input or Zone Outputs have NO connection to the Control Power input or Zone Inputs.

Note - All wiring should be installed in accordance with (NEC760) NFPA70, NFPA72, and all local code requirements. Power limited wiring requires that power limited and non-power limited wiring remain physically separated. All power limited circuits must remain at least one quarter inch (1/4") away from any non-power limited circuit wiring. All power limited circuit wiring must enter and exit the cabinet through different knockouts than non-power limited wiring.

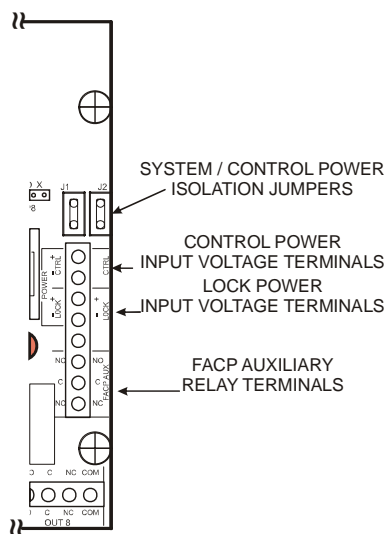


Fig. 3.3.1

3.4 Zone Inputs

Each Zone Output has a corresponding Zone Input. Each Zone Input provides on/off control for its associated output. Inputs are programmable for a variety of input types, including:

- Normally Open Dry Contact - Positive Switching
- Normally Open Dry Contact - Negative Switching
- Non-Isolated Negative Trip
- Isolated Voltage Trip
- Normally Closed Dry Contact - Positive Switching
- Normally Closed Dry Contact - Negative Switching
- Non-Isolated Positive Trip
- Open Collector Input

See Appendix A for specific information and example wiring diagrams for connecting the Zone Inputs.

3.5 Zone Outputs

Each Zone Output of the APD8(F) can be used as a dry contact output, or as either a fail-safe or fail-secure voltage output. Jumpers JP1 through JP8 select the type of output for each zone (see Section 5.1 for jumper information). See Appendix B for more information on the Zone Outputs.

3.5.1 If the Zone Output is configured as a dry contact output, the following connections apply:

- NO Normally Open relay contact
- C Relay Common
- NC Normally Closed relay contact

3.5.2 If the Zone Output is configured as a voltage output, the following connections apply:

- NO Outputs voltage when the zone relay is active
- C Always outputs voltage, regardless of relay condition
- NC Outputs voltage when the zone relay is inactive
- COM This terminal is the DC common associated with the output

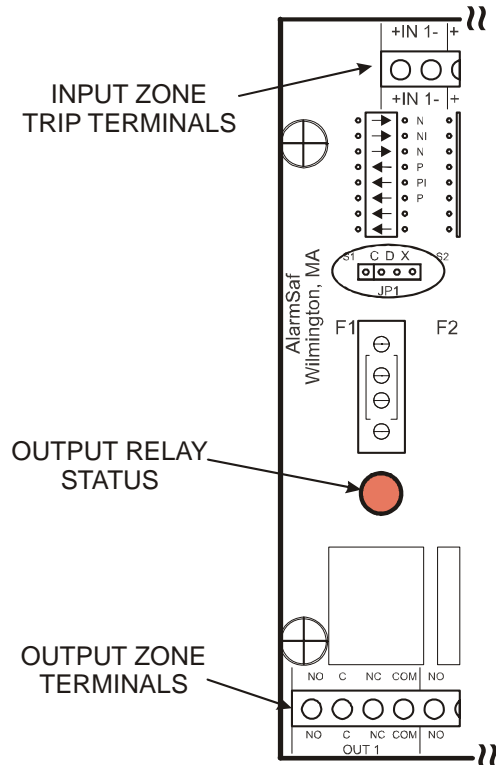


Fig. 3.4

3.6 FACP Input

The APD8(F) has two FAI inputs, one which accepts a voltage input, and one that accepts a dry contact input. Consult the appropriate section below for Terminal Connections for the type of connection being used. See Appendix C for more information and specific wiring diagrams for the FACP Input.

3.6.1 Voltage FACP Input

- FACP + FACP Input Positive
- FACP - FACP Input Common

3.6.2 Dry Contact FACP Input

- FACP T+ One leg of the FACP Dry Contact Input (This terminal is positive with respect to DC Common)
- FACP T- The other leg of the FACP Dry Contact Input

NOTE - If the APD8(F) is being used with a power supply which has its own FAI Input, the supply's FAI input may be used to control the APD8(F) board. See Appendix D for more information.

3.7 FACP AUX Output

The FACP AUX output is a relay output which follows the FACP Input state. Typically, this output is used to activate the FACP Input on additional APD8(F) boards. See Appendix C and Appendix D for wiring details.

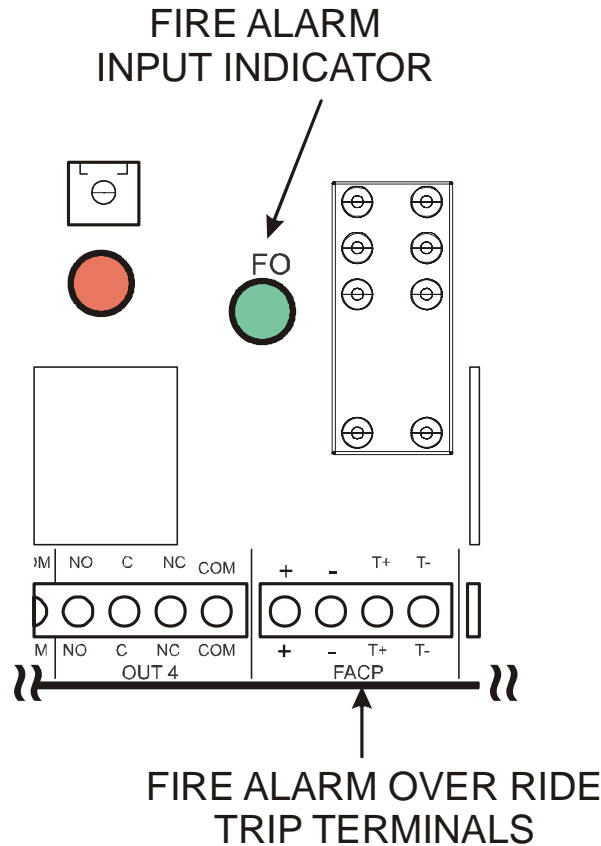


Fig. 3.6

3.8 Fusing

The APD8F contains eight replacable fuses - one for each output zone. When replacing these fuses, only the equivalent type and rating are to be used. The APD8F utilizes commonly available automotive blade-type fuses (Type ATC). All fuses are rated at 3A (ATC-3).

Only the APD8F contains fuses. The APD8 uses output PTCs.

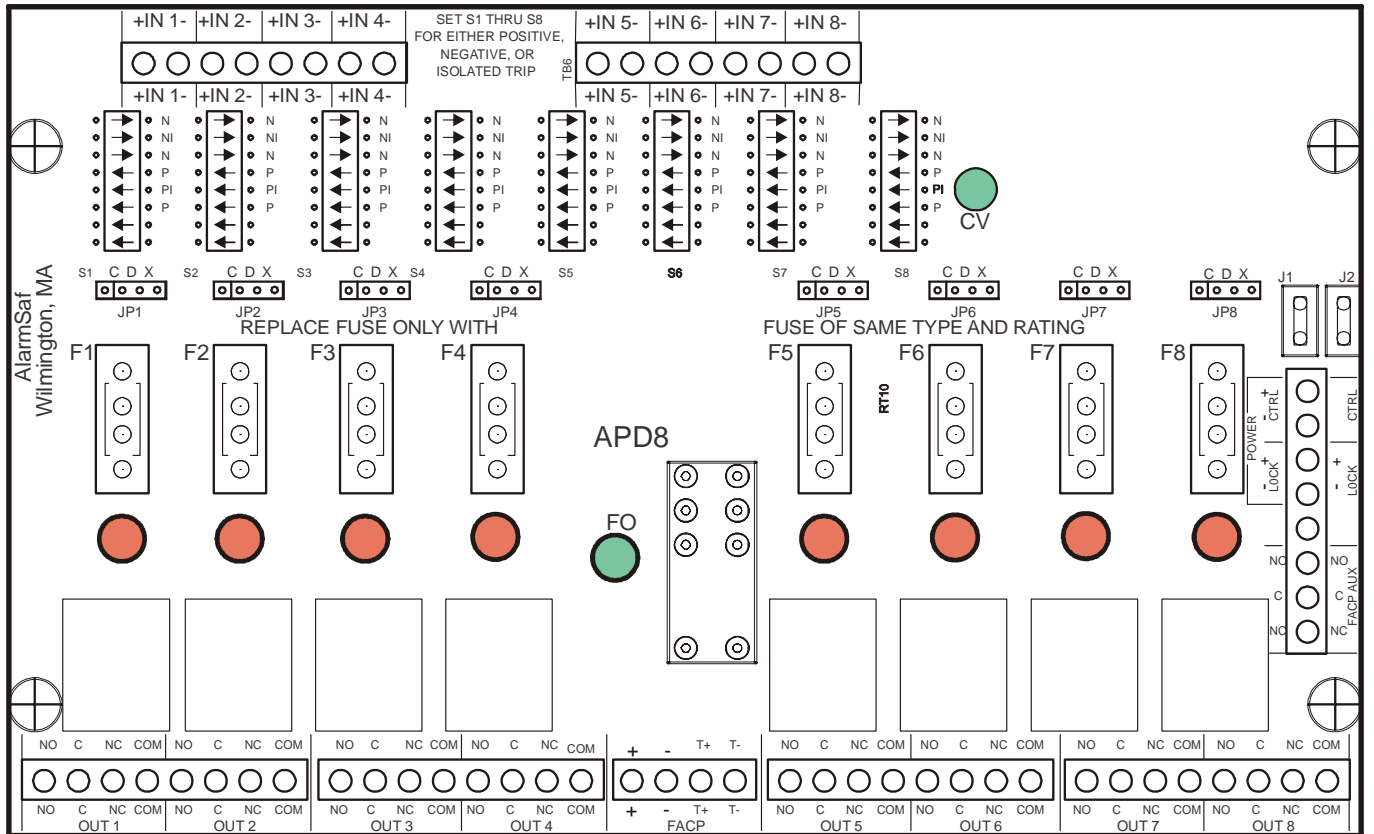


Fig. 3.8

Section 4 Installation

4.1 Mounting

The APD8(F) line is available in either board-level or cabinet level versions.

NOTE - For UL compliance, if the APD8(F) is mounted in an unprotected area, a Tamper Switch must be used.

4.1.1 Mounting a Cabinet-Level Version

If the APD8(F) is provided in a wall mount enclosure, use #8 hardware minimum in four locations. Use an appropriate fastening system for the mounting surface.

Cabinet Mounting:

1. Mark and predrill two holes for the top keyhole mounting screws
2. Install two fasteners in the mounting wall leaving screwheads protruding approximately ¼ inch
3. Using the two upper keyholes, mount the cabinet over the two screws
4. Mark the two lower holes, remove the cabinet and drill the lower mounting holes
5. Mount the cabinet, install the remaining fasteners, and tighten all fasteners

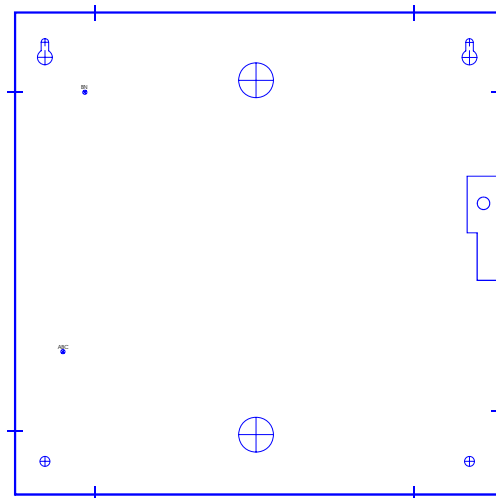


Figure 4.1.1

4.1.2 Mounting a Board-Level Version

Board-level units can be mounted either with the provided double-sided tape or by using nylon standoffs and hardware (not included). Replacement boards for a listed unit must reuse the existing hardware to maintain the listing.

4.2 Wiring

4.2.1 Wire Routing

All wiring must be installed in accordance with NFPA70, NFPA72, and all local code requirements.

Power Limited wiring requires that power limited and non-power limited wiring remain physically separated. Any power limited circuit entering the enclosure must remain at least one quarter inch (¼") away from any non-power limited circuit wiring. Any power limited circuit wiring must enter and exit the enclosure through different knockouts than non-power limited circuit wiring. Wiring within the enclosure should be routed around the perimeter of the cabinet. It should not be routed across the circuit boards.

4.2.2 Control and Lock Power Inputs

Locate the power input terminal block (TB7) and remove the terminal block from the header. Connect one or both power inputs as appropriate for the settings of J1 and J2 (See Sections 3.3 and 5.1). Power input wiring should be sized appropriately for the total current draw from the outputs of the APD8(F). See Section 3.3 for details. Replace the terminal block on the header.

4.2.3 Zone Input Wiring

Locate the terminal block for the zone input to be wired and remove the terminal block from the header. Connect the input in the manner appropriate for the type of input signal being applied. See section 3.4 and Appendix A for more information. Replace the terminal block on the header.

4.2.4 Zone Output Wiring

Locate the terminal block for the zone output to be wired and remove the terminal block from the header. Connect the output in the manner appropriate for the application. See section 3.5 and Appendix B for more information. Zone Output wiring should be sized appropriately for the total current draw from the output. Replace the terminal block on the header.

4.2.5 FACP Input

Locate the FACP Input terminal block (TB8) and remove the terminal block from the header. Connect the proper input in the manner appropriate for the type of input signal being applied. See Section 3.6 and Appendix C for more information. Replace the terminal block on the header.

4.2.6 FACP AUX Output

Locate the FACP AUX Output terminal block (TB7) and remove the terminal block from the header. Connect the FACP AUX Output as needed. See Section 3.7, Appendix C, and Appendix D for more information. Replace the terminal block on the header.

Section 5

Operating the APD8(F)

5.1 Power Separation Jumper Settings

The APD8(F) gives the installer the ability to electrically isolate the Control power from the Zone Output power. This can be helpful in installations where noise-sensitive devices would be affected by lock noise.

To isolate the LOCK power input from the CTRL power input, jumpers J1 and J2 must BOTH be removed.

Note - If J1 and J2 are out, BOTH power inputs must be wired to a power source. If J1 and J2 are in place, either the control input or the power input may be used.

Note - If J1 and/or J2 are missing, the control power and lock power inputs can be connected together with wire jumpers if power isolation is not required.

5.2 Zone Input Configuration Switch Settings

Each zone of the APD8(F) has a set of DIP switches associated with its input. These switches configure the input for use with a variety of signal types, however three basic configurations will cover a majority of applications. See Appendix A for information on configuring additional input types.

Note - Only switches 1 through 6 are used for each input - switches 7 & 8 are unused.

Note - The factory configuration of these switches (Negative Trip Mode) should work for most applications.

5.2.1 Negative Trip Mode

Negative Trip Mode will cover applications including Dry Contact (NO or NC) and Open Collector (including Casi-Rusco). To set the APD8(F) for Negative Trip Mode, Switches 1, 2, and 3 should be ON (Closed), and all other switches should be OFF (Open).

5.2.2 Positive Trip Mode

Positive Trip Mode covers applications where a positive voltage is applied to the input for activation. To set the APD8(F) for Positive Trip Mode, Switches 4, 5, and 6 should be ON (Closed), and all other switches should be OFF (Open).

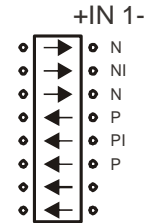
5.2.3 External 12VDC Trip (Isolated)

External Trip Mode covers applications with a completely isolated 12V source as an activation source. The source may or may not be common-grounded with the rest of the system. To set the APD8(F) for External Trip Mode, Switches 2 and 5 should be ON (Closed), and all other switches should be OFF (Open).

Switch #	Neg. Trip	Pos. Trip	Ext. Trip
1 (N)	ON (Closed)	OFF (Open)	OFF (Open)
2 (NI)	ON (Closed)	OFF (Open)	ON (Closed)
3 (N)	ON (Closed)	OFF (Open)	OFF (Open)
4 (P)	OFF (Open)	ON (Closed)	OFF (Open)
5 (PI)	OFF (Open)	ON (Closed)	ON (Closed)
6 (P)	OFF (Open)	ON (Closed)	OFF (Open)

Table 5.2

INPUT ZONE CONFIGURATION SWITCH



5.3 Output Configuration Jumper Settings

Each Zone Output has a configuration jumper which must be set for one of three modes for proper operation.

- 'C' Position - The output is 'C'onstant, regardless of the FACP input. Only the Zone Input can change the state of the output.
- 'D' Position - The output will 'D'rop power when a valid FACP input is received, regardless of the state of the Zone Input.
- 'X' Position - The output is set as a dry contact output.

OUTPUT ZONE CONFIGURATION

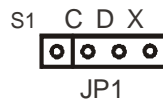


Figure 5.3

5.4 Visual Indicators

The APD8(F) contains ten visual status indicators as described below.

LED	Description	Color	Conditions
CV (D33)	Control Voltage	Green	Lights when the internal power source is present
FO (D1)	Fire Override	Green	Lights when there is no FACP input present
(D10-D17)	Zone Relay	Red	Each LED lights when its associated Zone Output relay is powered.

5.4.1 CV (D33)

This LED lights when the APD8(F)'s internal power source is operating properly.

5.3.2 FO (D1)

This LED illuminates there is not a valid FACP signal being received. This LED extinguishes when an FACP signal is received and output power is dropped to zones set for 'D'.

5.3.3 Zone Output Relay LEDs (D10-D17)

Each Zone Output relay has an associated LED which lights when the relay is activated.

5.5 Troubleshooting

Condition	Possible Cause	Solution
No power on output(s)	J1 and J2 set incorrectly	See Section 5.1
	No power input	Verify power is present on the power input terminals. If J1 and J2 are removed, BOTH power inputs must be powered.
	Zone Input in the wrong state	Verify the input is configured properly
	Zone Output wired incorrectly	Verify the output is configured properly
	Output Configuration Jumper set incorrectly	See Section 5.3
	Blown Fuse / Tripped PTC	Verify output integrity and replace fuse, or remove output load to reset PTC.
	FACP Input active	Verify that the FACP input is not activated.
	Other Problem	Contact AlarmSaf
Output not dropping power on a FACP input	Output Configuration Jumper set incorrectly	See Section 5.3
	FACP Input wired incorrectly	Verify the FACP Input configuration
	Zone Output wired incorrectly	Verify the Zone Output wiring

Section 6 Specifications

6.1 Electrical Specifications

6.1.1 Input Voltage	10-30V AC or DC
6.1.2 Input Power	0.4A@12VDC / 0.2A@24VDC maximum control current + 8A maximum output current
6.1.3 Output Voltage	Dependent on Input Voltage
6.1.4 Total Output Current	8A Maximum
6.1.5 Zone Output Current	APD8 - 1.6A Maximum APD8F - 3.0A Maximum
6.1.6 Input Trip Current	0.03A per input
6.1.7 FAI Trip Current	0.01A at 24VDC

6.2 Temperature Specifications

6.2.1 Ambient Temperature Range	0°C to 49°C (32°F to 120°F)
6.2.2 Ambient Humidity	85% at 30°C (86°F) Maximum

6.3 Mechanical Specifications

6.3.1 Weight (PCB Only)	0.70lbs.
6.3.2 Size (PCB Only)	7.75" L x 4.75" W x 1.25" H Max.
6.3.3 CAD Drawing	

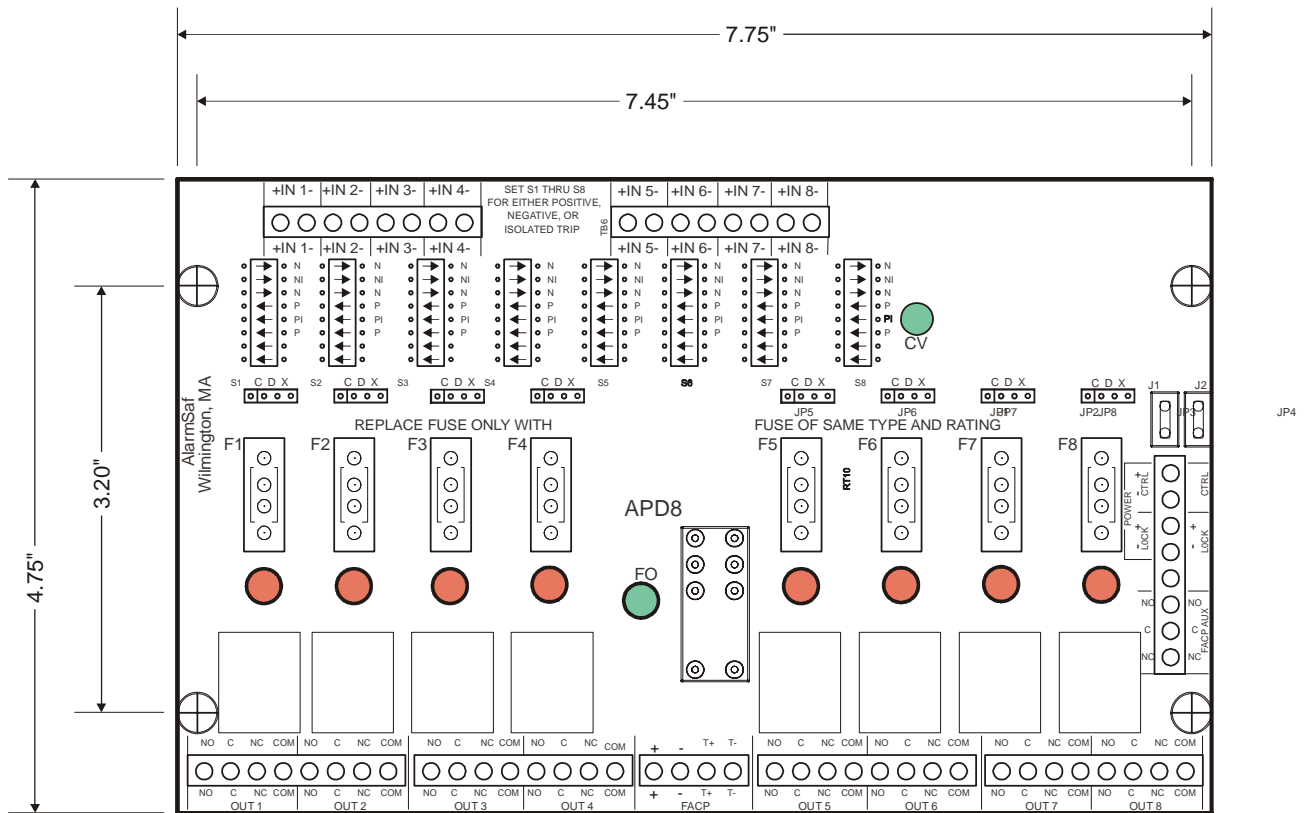


Figure 6.3.1

Appendix A

Configuring The Zone Inputs For Any Application

Each zone of the APD8(F) has a set of DIP switches associated with its input. These switches configure the input for use with a variety of signal types, including:

- Normally Open Dry Contact - Positive Switching
- Normally Open Dry Contact - Negative Switching
- Non-Isolated Negative Trip
- Isolated Voltage Trip
- Normally Closed Dry Contact - Positive Switching
- Normally Closed Dry Contact - Negative Switching
- Non-Isolated Positive Trip
- Open Collector Input

Note - Only switches one through 6 are used for each input - switches 7 & 8 are unused.

	NO Dry Contact Positive	NO Dry Contact Negative	NC Dry Contact Positive	NC Dry Contact Negative	Non Isolated Negative Trip	Non Isolated Positive Trip	Isolated Voltage Trip	Open Collector Input
Switch 1	Off (Open)	On (Closed)	Off (Open)	On (Closed)	On (Closed)	Off (Open)	Off (Open)	On (Closed)
Switch 2	Off (Open)	On (Closed)	Off (Open)	On (Closed)	On (Closed)	Off (Open)	On (Closed)	On (Closed)
Switch 3	Off (Open)	On (Closed)	Off (Open)	On (Closed)	On (Closed)	Off (Open)	Off (Open)	On (Closed)
Switch 4	On (Closed)	Off (Open)	On (Closed)	Off (Open)	Off (Open)	On (Closed)	Off (Open)	Off (Open)
Switch 5	On (Closed)	Off (Open)	On (Closed)	Off (Open)	Off (Open)	On (Closed)	On (Closed)	Off (Open)
Switch 6	On (Closed)	Off (Open)	On (Closed)	Off (Open)	Off (Open)	On (Closed)	Off (Open)	Off (Open)

- **NO Dry Contact Positive** - This configuration will activate the zone's output relay when the normally open contact connected to the input closes. The NO contact is in series with the positive leg of the internal zone output relay coil.
- **NO Dry Contact Negative** - This configuration operates the same as the NO Dry Contact Positive configuration, except that the NO contact is in series with the ground side of the internal zone output relay coil. This is the most common configuration.
- **NC Dry Contact Positive** - This configuration holds the zone output relay active. The zone output relay deactivates when the NC contact opens. The NC contact is in series with the positive leg of the internal zone output relay coil.
- **NC Dry Contact Negative** - This configuration operates the same as the NC Dry Contact Positive configuration, except that the NC contact is in series with the ground side of the internal zone output relay coil.
- **Non-Isolated Negative Trip** - The positive source for the zone output relay coil is provided internally. A DC common connected to the input's '-' terminal will activate the zone output relay. No connection is required to the input's '+' terminal. The DC common used to activate the zone must be common grounded with the control power input's DC common.
- **Non-Isolated Positive Trip** - The DC common for the zone output relay coil is provided internally. A positive 12VDC voltage connected to the input's '+' terminal will activate the zone output relay. No connection is required to the input's '-' terminal. The positive voltage used to activate the zone must be common grounded with the control power input's DC common. Do not use a 24V source to activate the input or damage to the zone output relay will occur.
- **Isolated Voltage Trip** - Connection of a 12VDC source across the input's '+' and '-' terminals will activate the zone output relay. When used in this mode, the zone input is completely isolated from the control power input and the lock power input. Do not use a 24V source to activate the input or damage to the zone output relay will occur.
- **Open Collector Input** - This configuration is identical to the "NO Dry Contact Negative configuration, except that the dry contact is replaced with the open collector output.

<p style="text-align: center;">NO Contact</p> <p style="text-align: center;">+IN 1- +IN 1-</p> <p style="text-align: center;">N NI N P PI P</p>	<p style="text-align: center;">NC Contact</p> <p style="text-align: center;">+IN 1- +IN 1-</p> <p style="text-align: center;">N NI N P PI P</p>	<p style="text-align: center;">Open Collector</p> <p style="text-align: center;">+IN 1- +IN 1-</p> <p style="text-align: center;">N NI N P PI P</p> <p>The trip source MUST be common grounded to the APD8(F)'s control power source.</p>
<p style="text-align: center;">Positive Trip</p> <p style="text-align: center;">EXTERNAL 12VDC</p> <p style="text-align: center;">+IN 1- +IN 1-</p> <p style="text-align: center;">N NI N P PI P</p> <p>The trip source MUST be common grounded to the APD8(F)'s control power source.</p>	<p style="text-align: center;">Negative Trip</p> <p style="text-align: center;">+IN 1- +IN 1-</p> <p style="text-align: center;">N NI N P PI P</p> <p>The trip source MUST be common grounded to the APD8(F)'s control power source.</p>	<p style="text-align: center;">Isolated Voltage Trip</p> <p style="text-align: center;">+ EXTERNAL - 12VDC</p> <p style="text-align: center;">+IN 1- +IN 1-</p> <p style="text-align: center;">N NI N P PI P</p> <p>The power source does <i>not</i> need to be common grounded to the APD8(F)'s control power source.</p>

Appendix B

Using The Zone Outputs

The APD8(F)'s outputs can be used in a variety of configurations, allowing flexibility and compatibility with virtually any application. Each output can individually be set up for disconnect on FAI, no action on FAI, or Dry Contact Output (no action on FAI) by setting the Zone Output Configuration jumpers for each zone (See Section 5.3). In addition to the jumper settings, each output may be wired in a variety of configurations to suit the required application.

- **Dry Contact Output - 'X'** - When the zone output configuration jumper is set in the 'X' position, the zone output is disconnected from all voltage sources and acts as a dry contact output. The C, NC, and NO terminals act as a normal relay which is controlled by the zone's input terminals. The terminal labelled 'COM' is connected internally to the DC common of the Lock Power Input. When used as a dry contact output, the rating of the output is 3A.

Note - When configured as a dry contact output, the zone output protection (fuse / PTC) is not in the output circuit.

Note - The FACP input has no effect on a dry contact output.

- **Voltage Output - Constant - 'C'** - When the zone output configuration jumper is set in the 'C' position, the zone output will supply the voltage applied to the Lock Power Input. Internally, the Lock Input voltage is connected to the zone output relay's C terminal. Depending on the state of the zone output relay, the voltage is output via the NC or NO terminal as follows:
 - NO - Voltage is output on this terminal when the zone output relay is activated
 - C - Voltage is always present on this terminal, regardless of the state of the zone output relay
 - NC - Voltage is output on this terminal when the zone output relay is NOT active
 - COM - This terminal is the DC common ('-') for the zone output. It is connected internally to the Lock Input '-' terminal.

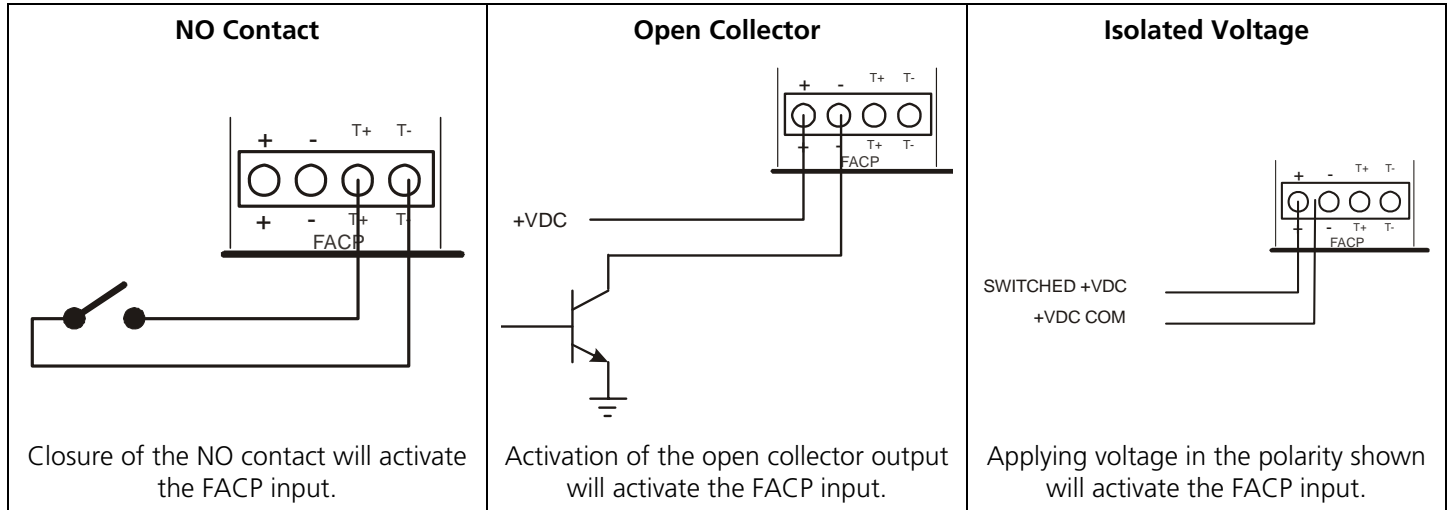
Note - The FACP input has no effect on an output whose zone output configuration jumper is set for 'C'.

- **Voltage Output - Disconnect - 'D'** - When the zone output configuration jumper is set in the 'D' position, the zone output will function exactly the same as when it is set for 'C', with the exception that power will be removed from the NO, C, and NC terminals when a valid input is received at the FACP input.

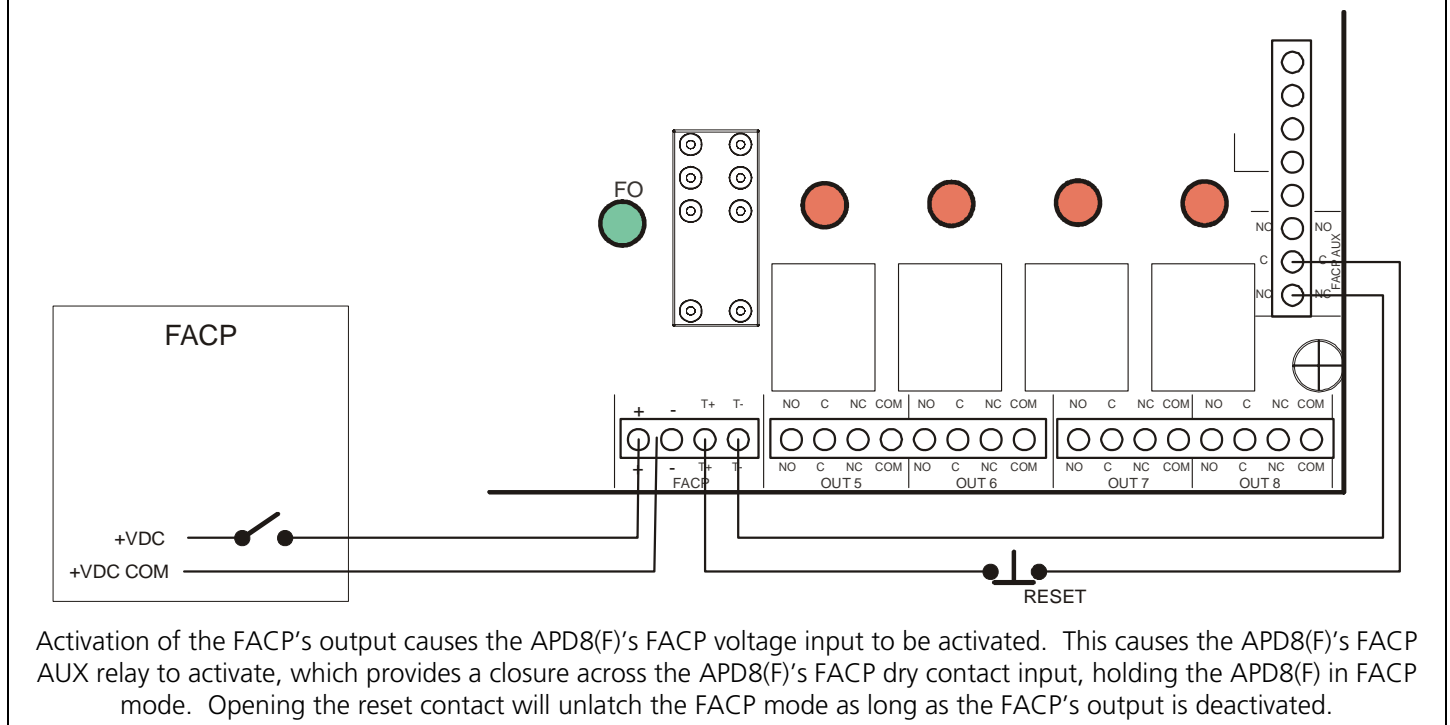
Appendix C Using The FACP Input and FACP AUX Output Terminals

The APD8(F) has two FACP inputs which can be used to drop power to selected outputs when activated. One of the FACP inputs is for connection to a voltage source trip, while the other is for connection to a NO contact trip or open collector trip. See Section 3.6 for more information. The FACP voltage input incorporates an on-board blocking diode for connection to a polarity-reversing source.

The FACP AUX relay output follows the FACP input and can be used to activate additional APD8(F) FACP inputs, to latch the FACP input on, or for other functions. See Section 3.7 and Appendix D for more information.

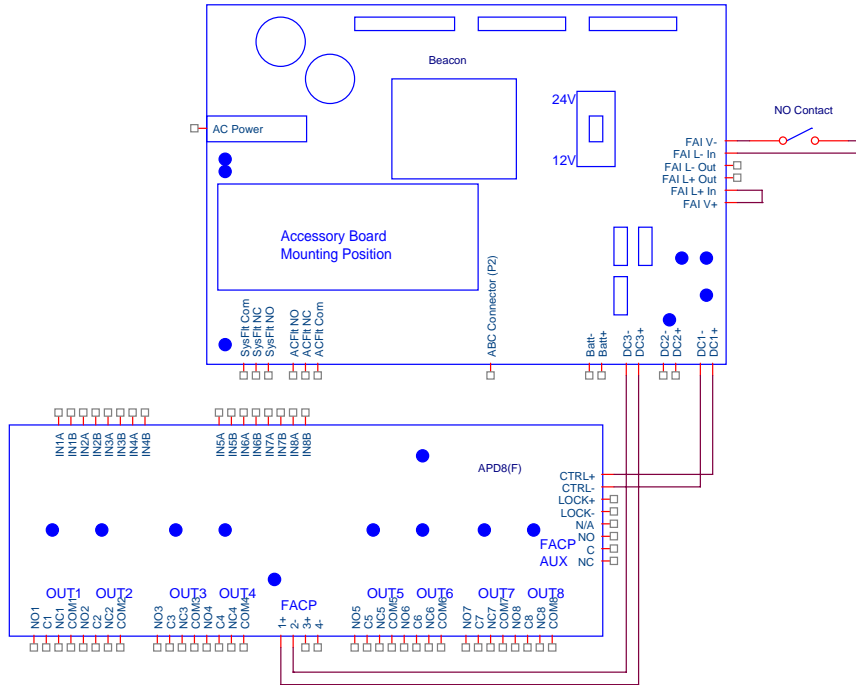


Latching the FACP for Canadian Applications



Appendix D Sample Applications

Using a Beacon Power Supply's FAI Input to activate the APD8(F)'s FACP Input



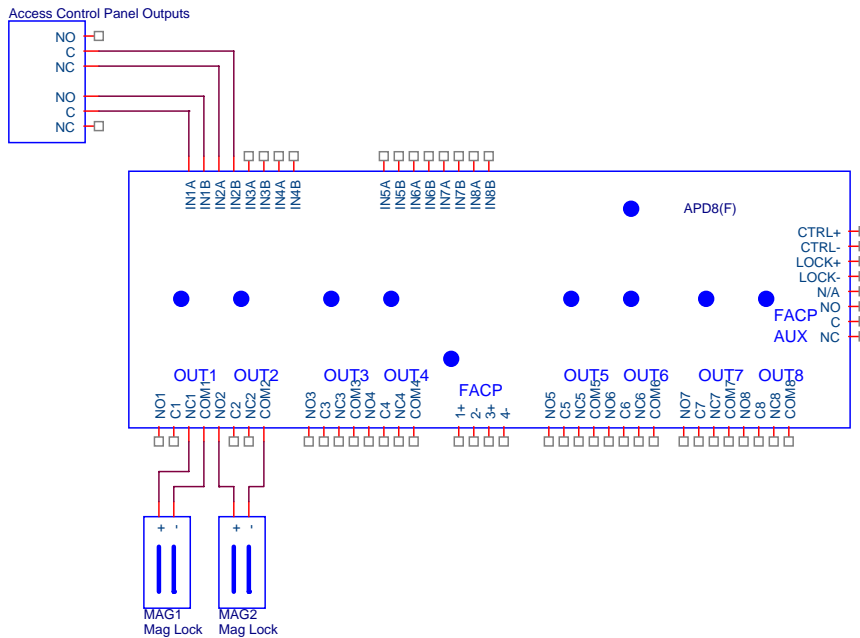
To provide greater flexibility of options for FAI trip options, the APD8(F) can be slaved to a Beacon Power Supply's FAI action.

Any acceptable method of FAI connection can be used on the Beacon power supply. Consult the Beacon Power Supply's installation manual for acceptable connection methods.

Activating the FAI terminals of the Beacon power supply causes the Beacon's DC3 output to activate, which in turn activates the APD8(F)'s FACP voltage input.

The APD8(F)'s FACP AUX terminals may be used to daisychain to the next APD8(F), if used.

Using a NO or NC contact to control a Maglock

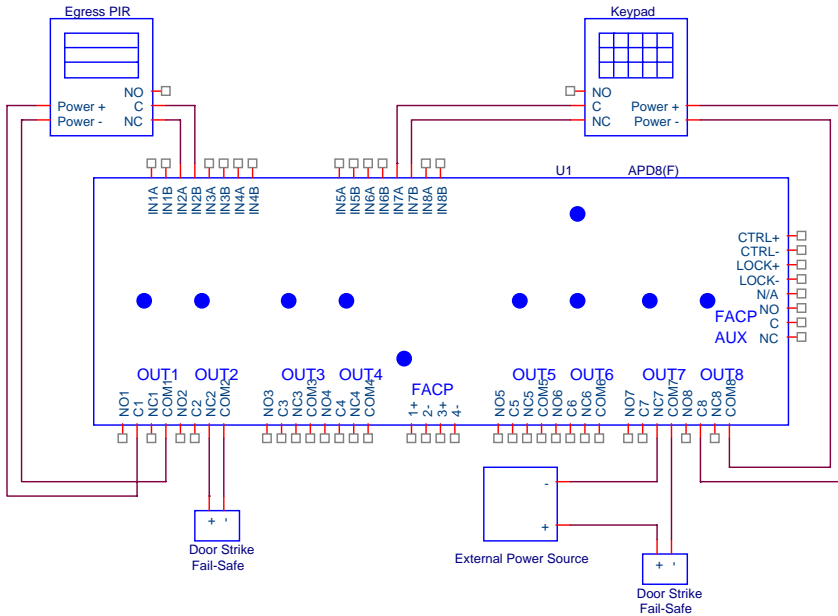


Zone 1 is configured to maintain power to a maglock. Release is by *closure* of the access control panel's NO relay contact, activating the Zone Output relay.

Zone 2 is also configured to maintain power to a maglock. Release is by the *opening* of the access control panel's NC relay contact, deactivating the Zone Output relay.

Setting the Zone Output Configuration jumper to the 'D' position will also allow the FACP input to release the outputs when used for egress.

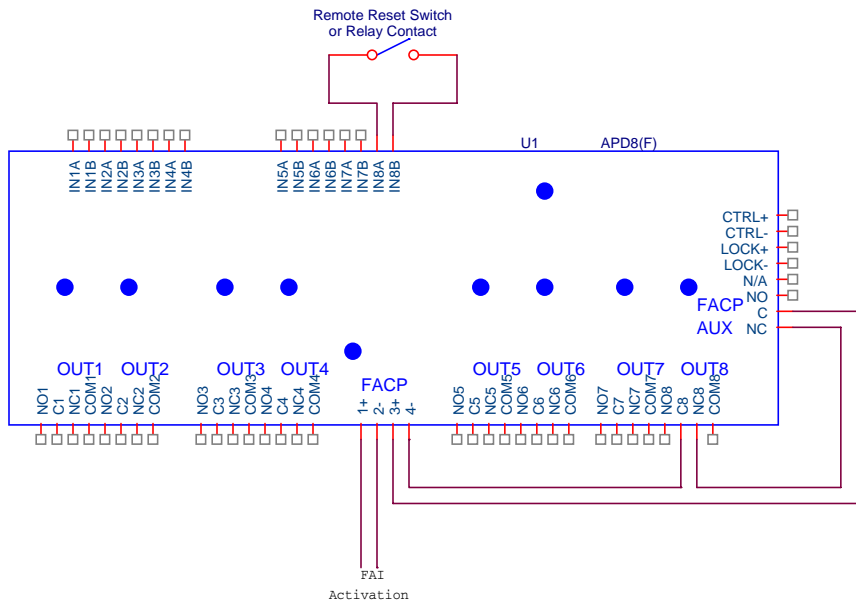
Using an output as a constant power source



Zone 2 is connected to release a doorstrike when an egress PIR sees a valid target. Zone 1 provides constant power to the egress PIR through the 'C' terminal. The Zone Input is set for NC Dry Contact Negative (See Appendix A) and the Zone Output Configuration jumper is set for 'C', since fire override is not required for a failsafe doorstrike.

Output 7 is used to control a doorstrike powered from an external power source on command by the keypad connected to Zone Input 7 and powered by Zone Output 8. The Zone Output Configuration jumper is set for 'X', for a dry contact output.

Latching FAI Input with Remote / Flexible Reset

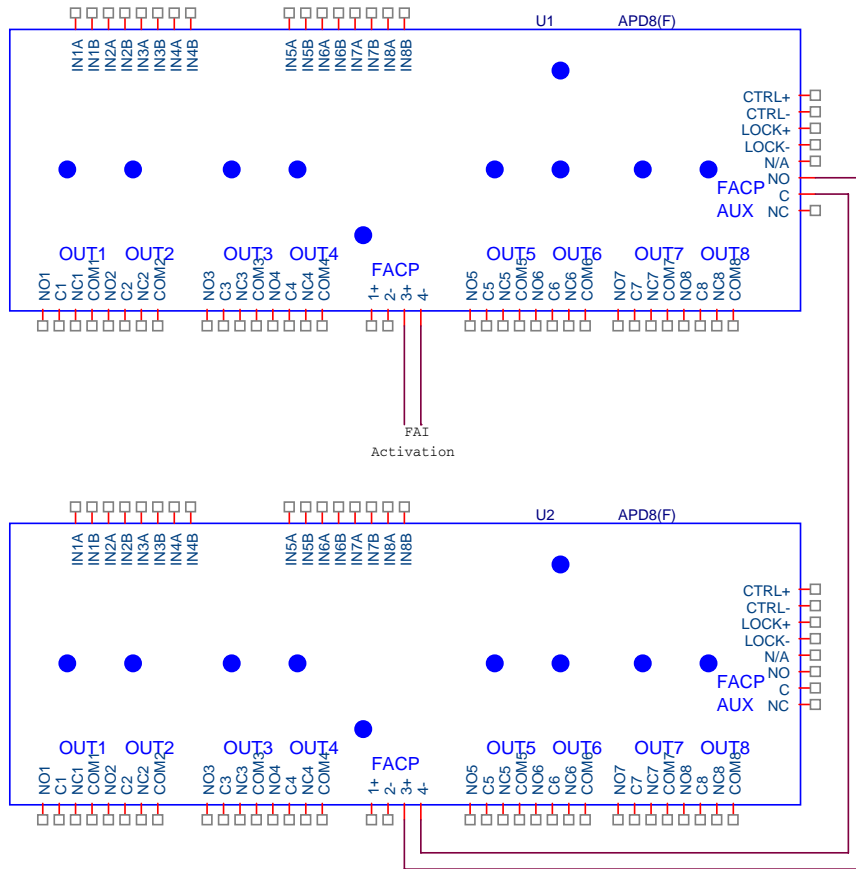


In this application, FAI latch release is provided via Zone Input 8. Configuring the Fire Override in this manner is preferred in installations where the reset switch is located far away from the APD8(F) board.

This configuration also allows any type of input source to reset the FAI latch, including, NC contact, NO contact, open collector, and voltage source.

The zone input should be configured along with the zone output for the type of input being used (See Appendix A).

“Daisy-Chaining” FACP Inputs Between Multiple APD8(F) boards

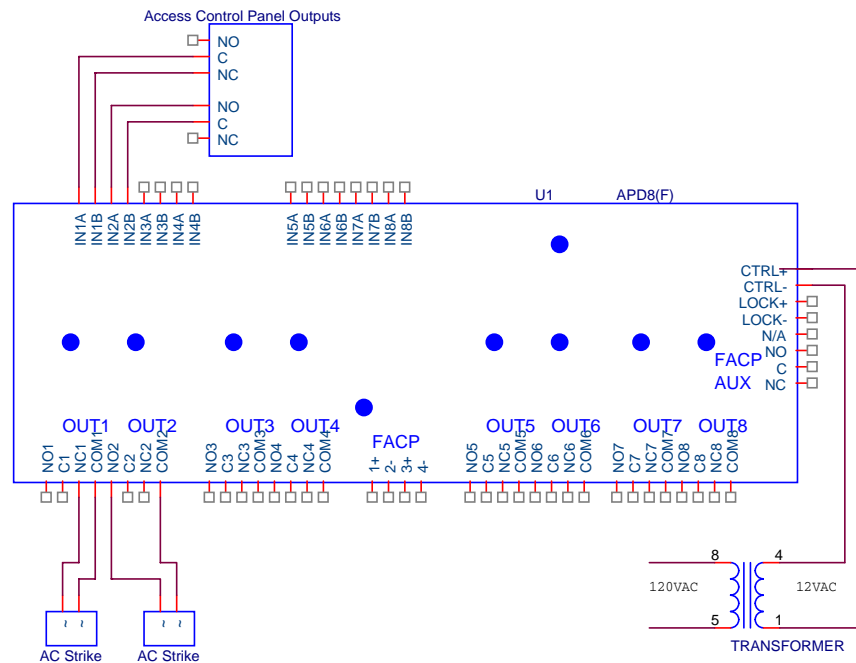


Activating the FACP input of the top APD8(F) transfers its FACP AUX output. These contacts then activate the FACP dry contact input of the bottom APD8(F).

Any valid FACP Input activation method can be used on the top APD8(F). See Appendix C for more information.

If there are more than two APD8(F) boards which need to activate on FAI, the FACP AUX output of the second APD8(F) board would be connected to the next APD8(F)'s FACP dry contact input. This can be repeated for as many APD8(F) boards as necessary.

Powering and Controlling AC Devices



A little known application for the APD8(F) is for powering and controlling AC devices. This application shows an APD8(F) controlling two AC strikes in an apartment complex. Zone 1's input is configured to accept a NC contact, while Zone 2's input is configured for a NO contact. Note the different output wiring for each application.

If the strikes are not failsafe, the FACP input may be used with a zone output configuration jumper setting of 'D'.

Also note that the APD8(F) has an internal rectifier and regulator for its own relay power, eliminating the need for a separate DC power source for powering the APD8(F).