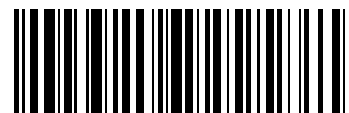


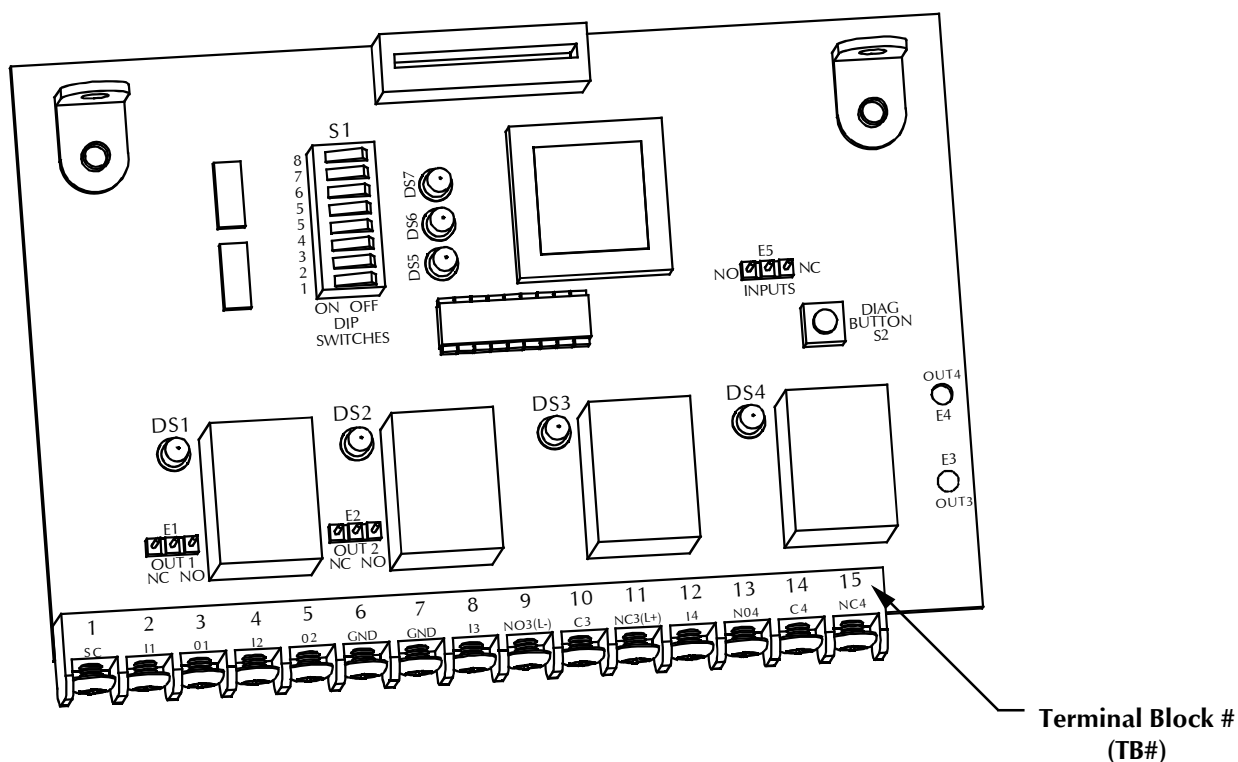
VON DUPRIN

Installation Instructions



941356-00

Option Boards for PS873



These instructions are for the following model numbers:

- 873-4TD:** Four Zone Controller with time delay
- 873-AO:** Auto operator signaling for two zones
- 873-SI:** Security Interlock
- 873-AL:** Alarm and monitor function for two zones
- 873-AC:** Access control for one zone with magnetic lock

See label on bottom of board to identify model number.



DANGER

To avoid risk of electric shock,
remove AC power from PS873
before installing or wiring any
option board.



SPECIFICATIONS:

Power Requirements: Von Duprin PS873 Power Supply.
(Refer to Von Duprin instructions 941352 for information on PS873 and 873-BB.)

INPUTS: **I1 (TB2), I2 (TB4), I3(TB8), I4 (TB12)**
Controlled using Normally Open (NO) or Normally Closed (NC) contacts.
Maximum input current: 50 mA at 24 VDC.

OUTPUTS: **O1 (TB3), O2 (TB5)**
Maximum rating: 24 VDC, 2A or 12 VDC, 4A maximum.
Can be configured as NC or NO using E1 and E2.
Compatible with Von Duprin EL devices.
(See notes 1-3.)

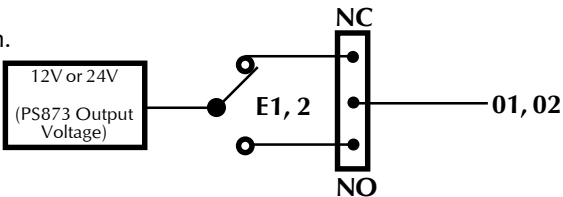


Diagram of Outputs 01 and 02

NO3 (TB9), C3 (TB10), NC3 (TB11) and NO4 (TB13), C4(TB14), (TB15)
Maximum rating: 24 VDC, 2A or 12 VDC, 4A maximum.
Form C contacts available.
Can be configured as dry contacts using E3 and E4.
Compatible with Von Duprin EL devices.
(See notes 1-3.)

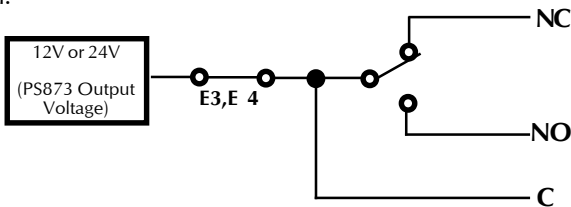


Diagram of Outputs 03 and 04

- Notes:**
1. Sum of all output currents (01-04) & PS873 DC output must not exceed 2A at 24 VDC or 4A at 12 VDC.
 2. During battery backup (873-BB required), output voltage rating is: 10.8 - 12.0 VDC or 22 - 24 VDC.
 3. For UL listed systems, all input and output devices must be UL Listed and compatible with the above ranges.

WIRING GUIDE:

Device	Maximum Wire Run
Von Duprin EL Device	100' of 14 AWG wire, or 200' of 12 AWG wire
Von Duprin 12V Maglock	130' of 18 AWG wire, or 300' of 14 AWG wire
Von Duprin 24V Maglock	500' of 18 AWG wire

DEFINITIONS:

- FAIL SAFE:** Upon ultimate power loss, the locking device will unlock.
- FAIL SECURE:** Upon ultimate power loss, the locking device will remain locked. Install after consulting with local authority having jurisdiction. Listed panic hardware may be required to allow emergency exit from the secured area.
- NO:** Normally open
NC: Normally closed
C: Common

INSTALLATION



DANGER

To avoid risk of shock, disconnect AC power from PS873 before installing or wiring logic boards.



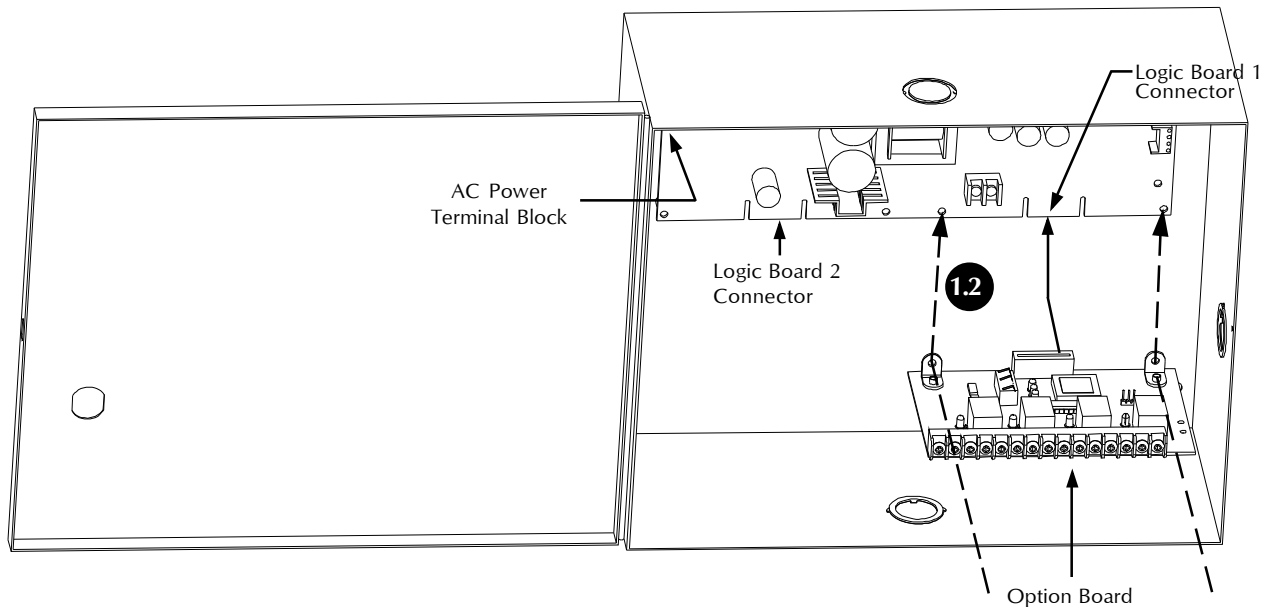
CAUTION

If using 873-BB Battery Backup option, unplug all four wires from battery terminals before installing or wiring Logic Boards.

- 1** If option board was installed on PS873 at the factory, go to Step **2**.

INSTALLING OPTION BOARD:

- 1.1** Disconnect AC Power from PS873 (See Von Duprin Instructions 941352 for more PS873 information). If using 873-BB Battery Backup Option, unplug all four wires from batteries.
- 1.2** Connect option board to the PS873 connector "Logic Board 1." Secure with two #6-32x5/8" screws.



- 1.3** If installing a second option board on the PS873, use PS873 connector "Logic Board 2". Secure with two screws.

- 2** Refer to Table.

TO WIRE MODEL#	GO TO PAGE#
873-4TD	4
873-AO	6
873-SI	8
873-AL	12
873-AC	14

873-4TD

Four Zone Controller with Time Delay - Controls up to four outputs with four inputs.

3 Wiring and Configuring Logic Board

3.1 Set E1, E2, E3, E4, E5 (see diagram below)

3.2 Set Dip Switches

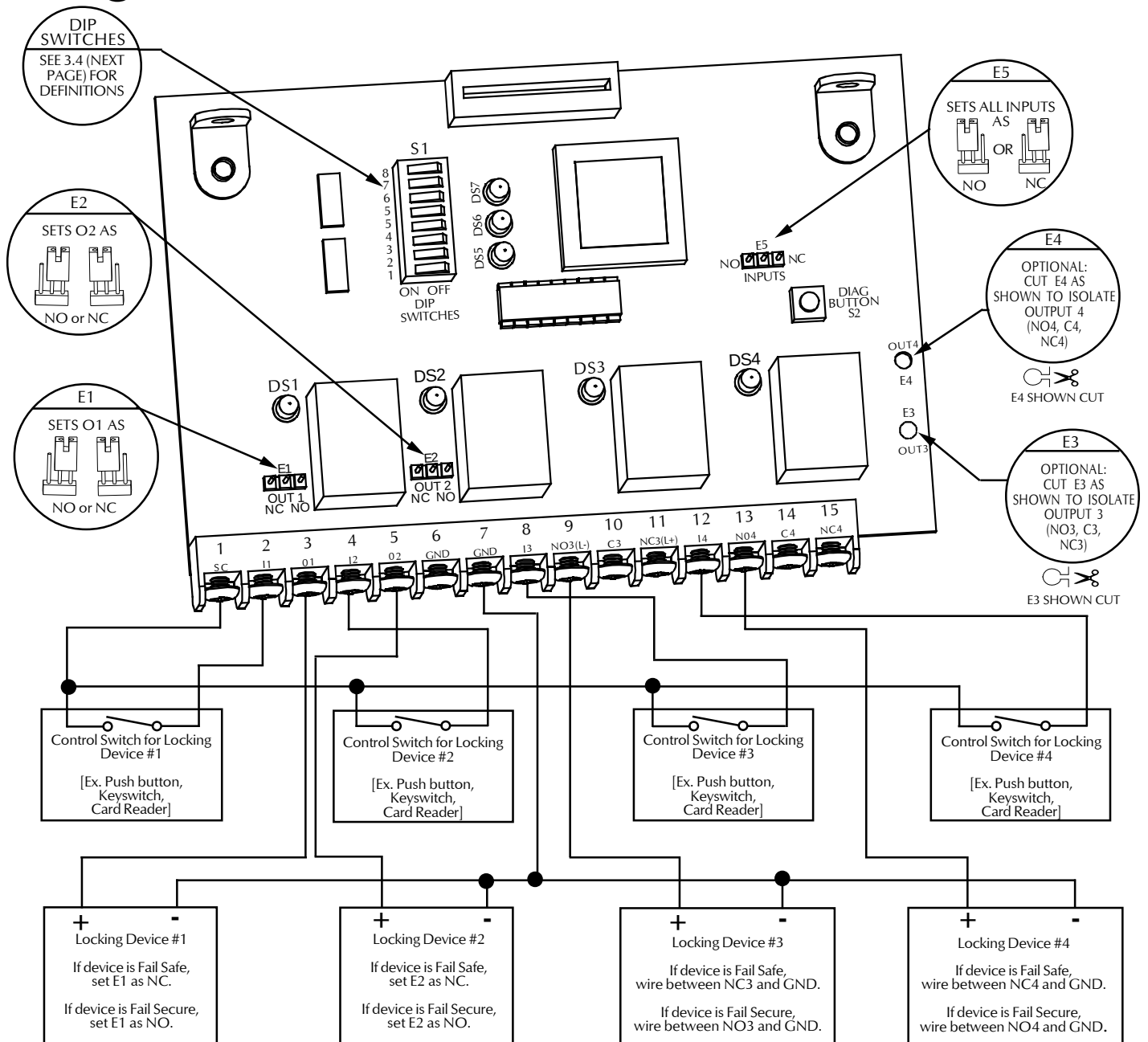
3.3 Wire devices as shown below.

⚠ DANGER

To avoid risk of electric shock, remove AC power from PS873 before wiring 873-4TD.

⚠ CAUTION

If using 873-BB Battery Backup option, unplug all 4 wires from battery terminals before wiring 873-4TD.



Note: Controlling two or more inputs with one switch will automatically sequence the corresponding outputs. Up to eight EL's per PS873 can be sequenced if two 873-4TD's are installed.

3.4 SET DIP SWITCHES

	SWITCH NUMBER	873-4TD DIP SWITCH DEFINITIONS All switches shown in "ON" position in wiring diagram.
Set Time Delay* (0-75 seconds, 5 second increments) 0 Sec: Switches 5-8 "OFF" 75 Sec: Switches 5-8 "ON"	8	Adds 40 seconds to the time delay when "ON"
	7	Adds 20 seconds to the time delay when "ON"
	6	Adds 10 seconds to the time delay when "ON"
	5	Adds 5 seconds to the time delay when "ON"
Enable Time Delay Allows you to choose which outputs will have the above time delay.	4	Turn "ON" to enable time delay for Locking Device 4
	3	Turn "ON" to enable time delay for Locking Device 3
	2	Turn "ON" to enable time delay for Locking Device 2
	1	Turn "ON" to enable time delay for Locking Device 1

* Locking Device output will remain "ON" during time delay.
Time Delay begins when an input is released.

3.5 873-4TD EXAMPLE

YOUR REQUIREMENTS:

- (A) - Normally open control switches I1 - I4
- (B) - Locking Device 1 is fail safe; needs a 35 second time delay
- (C) - Locking Device 2 is fail secure; does not need a time delay
- (D) - Locking Device 3 is fail safe; does not need a time delay
- (E) - Locking Device 4 is fail secure; needs a 35 second time delay

JUMPER	DIP SWITCH	SETTING	PURPOSE, (REQUIREMENT SATISFIED)
E1		NC	Sets control of locking device 1 to Fail Safe, (B)
E2		NO	Sets control of locking device 2 to Fail Secure, (C)
E5		NO	Sets control switches as NO, (A)
	8	OFF	Sets 35 second time delay, (B, E)
	7	ON	
	6	ON	
	5	ON	
	4	ON	Enables device 4 time delay, (E)
	3	OFF	Disables device 3 time delay, (D)
	2	OFF	Disables device 2 time delay, (C)
	1	ON	Enables device 1 time delay, (B)
			Locking device 3 wired to NC3, (D)
			Locking device 4 wired to NO4, (E)

3.6 Go to Page 16!

873-AO

Auto Operator Function - Coordinates the unlocking of one or two zones with the signaling of an auto operator.

3 Wiring and Configuring Logic Board

3.1 Set E1, E2, E3, E4, E5 (see diagram below)

3.2 Set Dip Switches

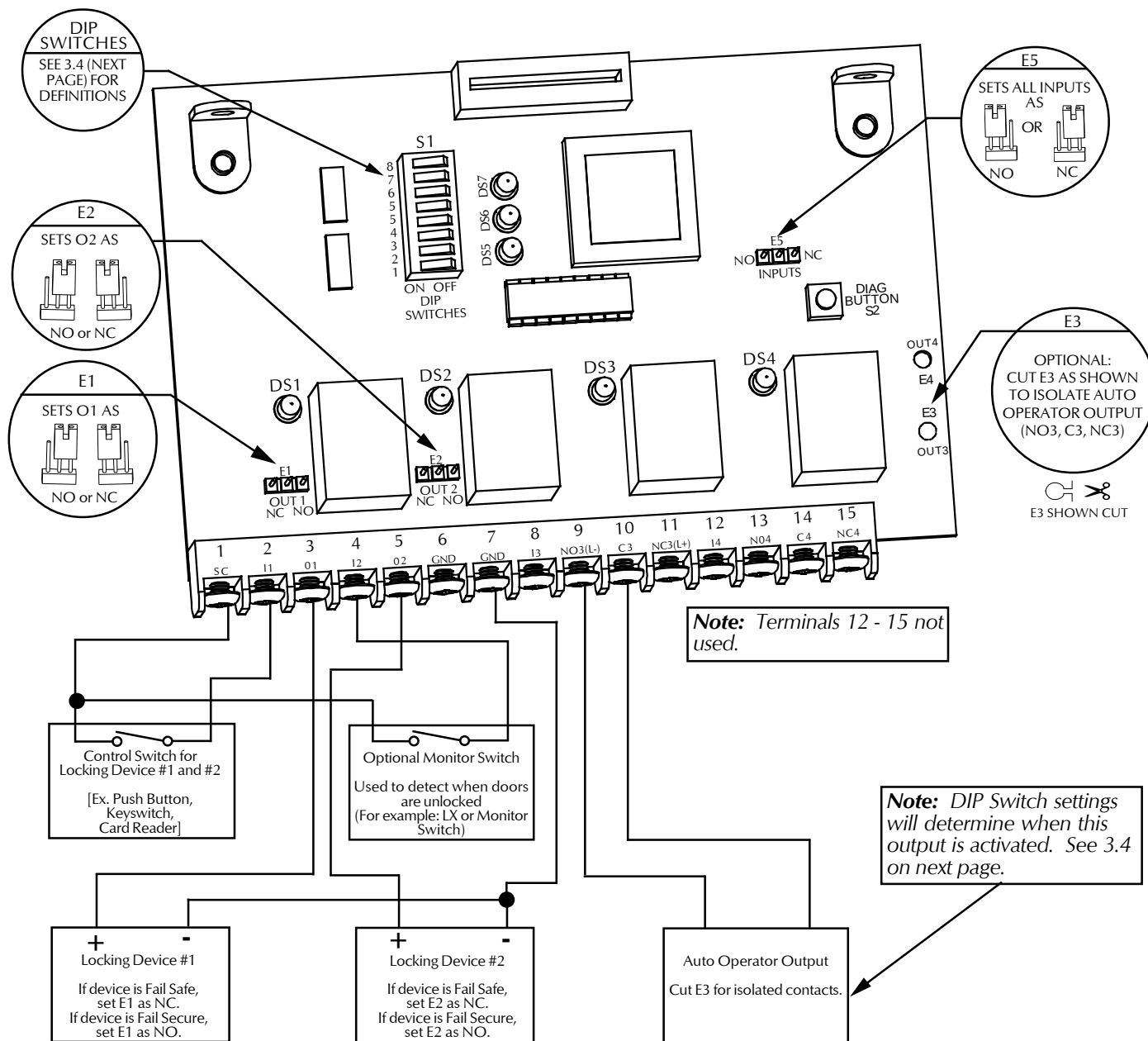
3.3 Wire devices as shown below.

! DANGER

To avoid risk of electric shock, remove AC power from PS873 before wiring 873-AO.

! CAUTION

If using 873-BB Battery Backup option, unplug all 4 wires from battery terminals before wiring 873-AO.



Note: Locking devices #1 and #2 are automatically sequenced 0.5 seconds apart.

3.4 Set DIP Switches

	Switch Number	873-AO Dip Switch Definitions All switches shown in "ON" position in wiring diagram
Set Time Delay* (0-30 seconds, 2 second increments) 0 Sec: 5-8 "off" 30 Sec: 5-8 "on"	8	Adds 16 seconds to the time delay when "ON"
	7	Adds 8 seconds to the time delay when "ON"
	6	Adds 4 seconds to the time delay when "ON"
	5	Adds 2 seconds to the time delay when "ON"
Not Used	4 3	
Set Auto Operator Signaling Option Determines when the Auto Operator signal (03) will be active	2 Off 1 Off	Operator is signaled when monitor switch becomes active. Monitor Switch Required.
	2 Off 1 On	Operator is signaled 0.5 seconds after control switch becomes active. No Monitor Switch used.
	2 On 1 Off	Operator is signaled 1.0 seconds after control switch becomes active. No Monitor Switch used.
	2 On 1 On	Operator is signaled 1.5 seconds after control switch becomes active. No Monitor Switch used.

* Locking devices are unlocked and Auto Operator output is active during time delay. Time delay begins when the input is released.

3.5 873-AO EXAMPLE

YOUR REQUIREMENTS:

- (A) - Normally Open Input
- (B) - Two fail safe outputs
- (C) - Isolated contacts required to signal operator
- (D) - No lock sensing used, so operator will be signaled one second after a valid input
- (E) - Doors must stay open for 10 seconds

JUMPER	DIP SWITCH	SETTING	PURPOSE, (REQUIREMENT SATISFIED)
E1		NC	Sets control of Locking Device 1 as Fail Safe, (B)
E2		NC	Sets control of Locking Device 2 as Fail Safe, (B)
E3		CUT	Cut for isolated contacts for operator, (C)
E5		NO	
	8	OFF	Sets 10 Second Time Delay, (E)
	7	ON	
	6	OFF	
	5	ON	
	2	ON	Sets 1 second time delay between receiving an input and signaling the auto operator, (D)
	1	OFF	

3.6 Go to Page page 16!

873-SI

Security Interlock Function - Controls multi-door interlocks. (Two, three or four-door systems possible.)

3 Wiring and Configuring Logic Board

⚠ DANGER

To avoid risk of electric shock, remove AC power from PS873 before wiring 873-SI.

⚠ CAUTION

If using 873-BB Battery Backup option, unplug all 4 wires from battery terminals before wiring 873-SI.

STOP

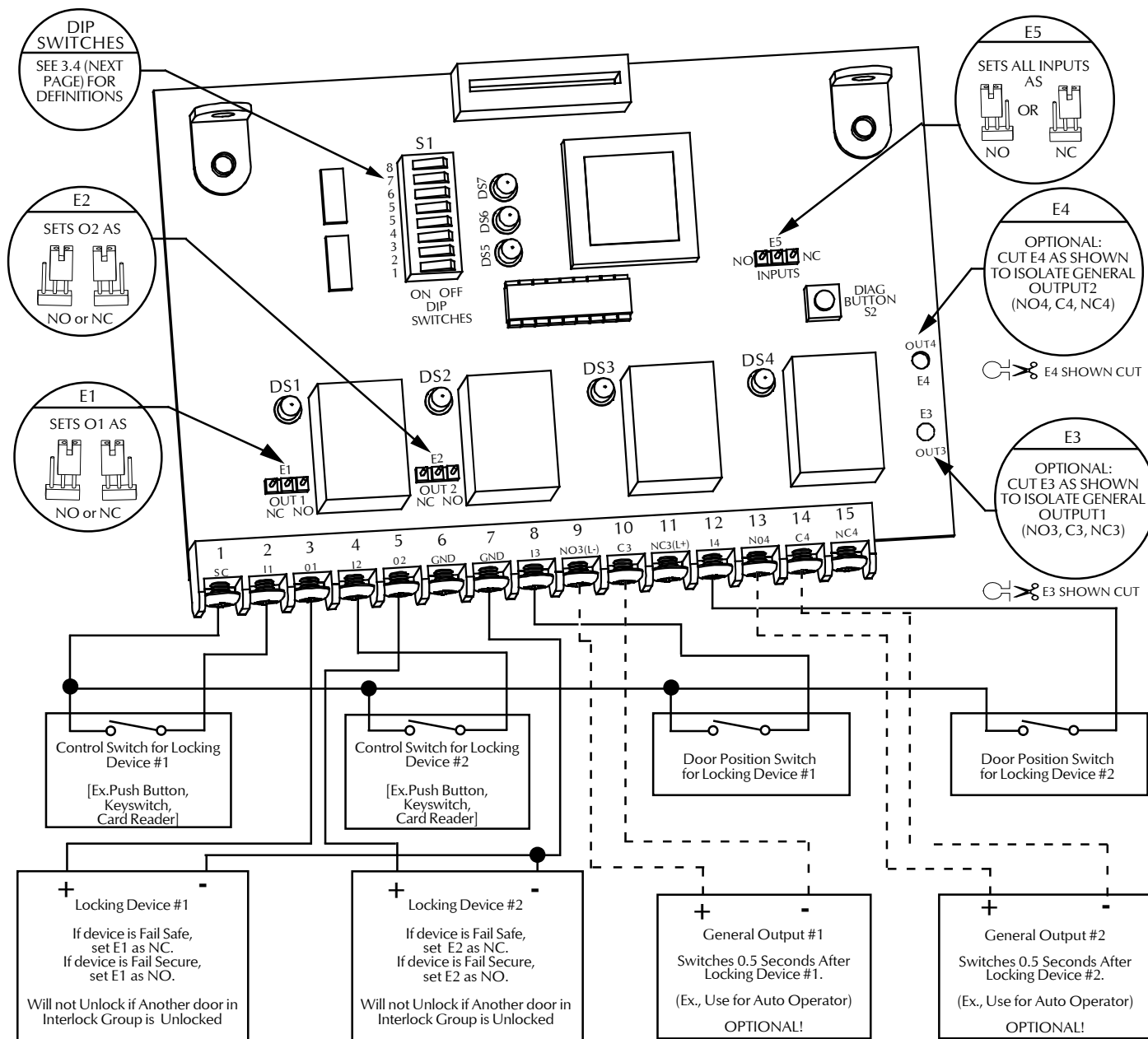
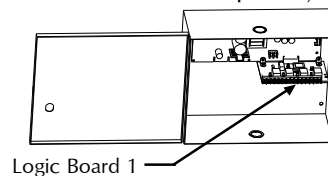
For 2 door interlocks, do steps 3.1 through 3.5.

For 3 or 4 door interlocks, do steps 3.1 through 3.11. (Two 873-SI boards required.)

3.1 Identify 873-SI board plugged into PS873 connector "Logic Board 1".

3.2 Set DIP Switches, and set E1, E2 and E5 as shown below.

3.3 Wire devices as shown below.



3.4 873-SI DIP SWITCH DEFINITIONS

	Switch Number	873-SI DIP Switch Definitions All switches shown in "ON" position in wiring diagram
Set Time Delay* (0-30 seconds, two second increments) 0 Sec: 5-8 "off" 30 Sec: 5-8 "on"	8	Adds 16 seconds to the time delay when "ON"
	7	Adds 8 seconds to the time delay when "ON"
	6	Adds 4 seconds to the time delay when "ON"
	5	Adds 2 seconds to the time delay when "ON"
Must be set to "OFF"	4	Set to "OFF"
	3	Set to "OFF"
Enable Time Delay	2	Turn "ON" to enable time delay for Locking Device #2
Allows you to choose which outputs will have the above time delay	1	Turn "ON" to enable time delay for Locking Device #1

* Locking Device output will remain "ON" during time delay.
Time delay begins when an input is released.



For two-door interlocks, see example below.

For three and four-door interlocks, continue at 3.6

873-SI EXAMPLE FOR TWO-DOOR INTERLOCK

YOUR REQUIREMENTS:

- (A) - Normally Open control inputs
- (B) - Two Fail Safe devices need to be interlocked
- (C) - Locking device 1 needs a 20 second time delay
- (D) - Locking device 2 has no time delay

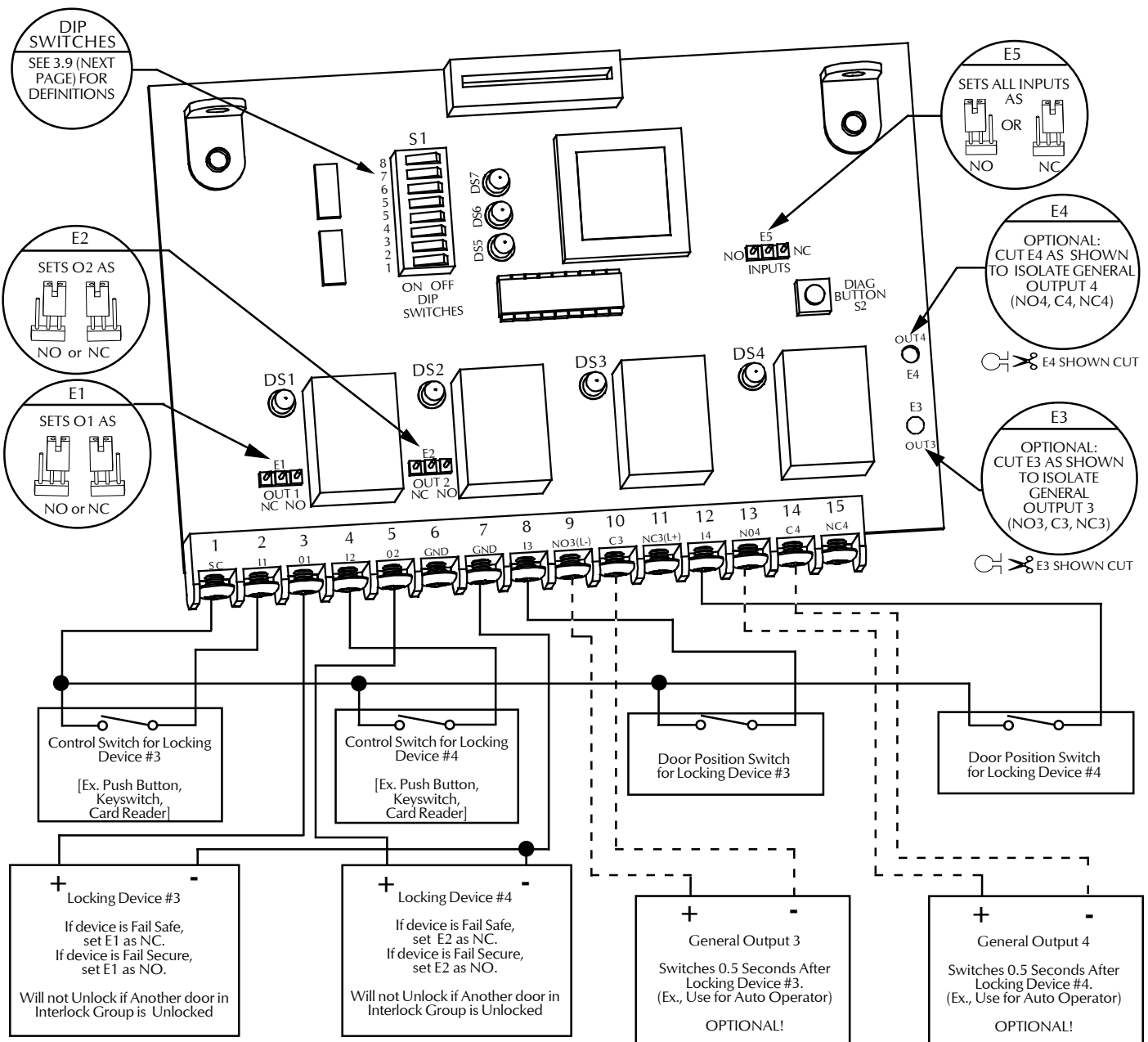
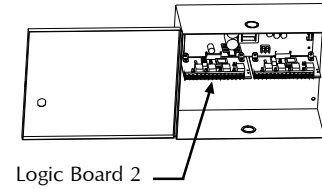
THEN SET:

JUMPER	DIP SWITCH	SETTING	PURPOSE, (REQUIREMENT SATISFIED)
E1		NC	Sets Locking Device 1 as Fail Safe, (B)
E2		NC	Sets Locking Device 2 as Fail Safe, (B)
E5		NO	Sets Control Switches for NO, (A)
	8	ON	Sets 20 second time delay, (C)
	7	OFF	
	6	ON	
	5	OFF	
	4	OFF	
	3	OFF	
	2	OFF	Disables time delay for device 2, (D)
	1	ON	Enables 20 second time delay for device 1, (C)

3.5 Two-door wiring is complete, go to page 16!

873-SI THREE AND FOUR-DOOR INTERLOCKS

- 3.6 You can now add up to two more doors to the interlock group. First, identify the second 873-SI board, which is plugged into PS873 connector "Logic Board 2".
- 3.7 On Logic Board 2, Set E1, E2 and E5 and set DIP Switches as shown below.
- 3.8 Wire devices as shown below.



3.9 SET DIP SWITCHES FOR LOGIC BOARD 2

	Switch Number	873-SI DIP Switch Definitions All switches shown in "ON" position in wiring diagram.
Set Time Delay* (0-30 seconds, 2 second increments) 0 Sec: 5-8 "off" 30 Sec: 5-8 "on"	8	Adds 16 seconds to the time delay when on
	7	Adds 8 seconds to the time delay when on
	6	Adds 4 seconds to the time delay when on
	5	Adds 2 seconds to the time delay when on
Select Interlock Group	4	Turn "OFF" to add Device 4 to the Logic Board 1 interlock group Turn "ON" to add Device 4 to the Logic Board 2 Interlock group.
	3	Turn "OFF" to add Device 3 to the Logic Board 1 interlock group. Turn "ON" to add Device 3 to the Logic Board 2 interlock group.
Enable Time Delay Allows you to choose which outputs will have the above time delay.	2	Turn "ON" to enable time delay for Locking Device 4
	1	Turn "ON" to enable time delay for Locking Device 3

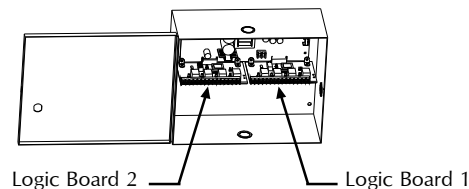
* Locking Device output will remain "ON" during time delay.
Time delay begins when an input is released.

873-SI EXAMPLE FOR THREE-DOOR INTERLOCK

3.10

YOUR REQUIREMENTS:

- (A) - Four Fail Safe devices
- (B) - All inputs are NO
- (C) - Devices 1, 2 and 3 are interlocked together
- (D) - Device 4 operates independently
- (E) - Devices 1, 2 and 3 have 10 second time delay
- (F) - Device 4 has no time delay



Logic Board 2

Jumper	DIP Switch #	Setting	Purpose (Requirement Satisfied)
E1		NC	Sets Device 3 as Fail Safe (A)
E2		NC	Sets Device 4 as Fail Safe (A)
E5		NO	Sets Control Switches for Devices 3 & 4 as NO (B)
	8	OFF	Sets 10 second time delay (E)
	7	ON	
	6	OFF	
	5	ON	
	4	ON	Keeps Device 4 independent (D)
	3	OFF	Add Device 3 to the Logic Board 1 interlock group (C)
	2	OFF	Disables Device 4 time delay (F)
	1	On	Enables Device 3 time delay (E)

Logic Board 1

Jumper	DIP Switch #	Setting	Purpose (Requirement Satisfied)
E1		NC	Sets Device 1 as Fail Safe (A)
E2		NC	Sets Device 2 as Fail Safe (A)
E5		NO	Sets Control Switches for Devices 1 & 2 as NO (B)
	8	OFF	Sets 10 second time delay (E)
	7	ON	
	6	OFF	
	5	ON	
	4	OFF	Interlock Devices 1 and 2 (C)
	3	OFF	
	2	ON	Enables Device 2 time delay (E)
	1	ON	Enables Device 1 time delay (E)

873-SI EXAMPLE FOR FOUR-DOOR INTERLOCK

3.11

To add Device 4 to the three-door interlock group in the above example, simply turn "OFF" DIP Switch 4 of Logic Board 2.

3.12

Go to page 16!

873-AL

Alarm Function - Controls one or two outputs with one or two inputs. A signaling output (momentary or latched) is activated if door is forced open, or held open longer than optional time delay.

3 Wiring and Configuring Logic Board

3.1 Set E1, E2, E3, E4 and E5.

3.2 Set DIP Switches.

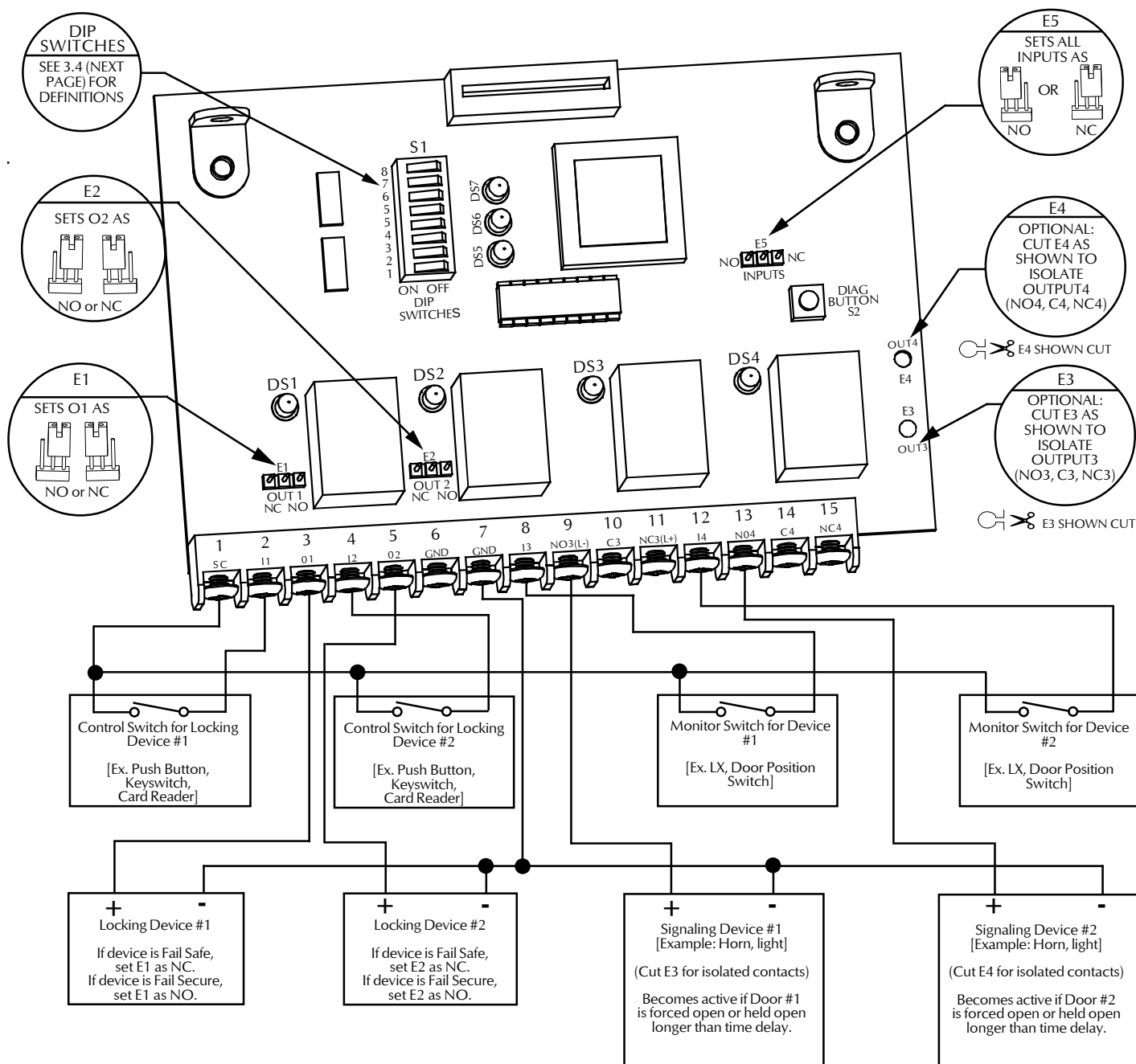
3.3 Wire devices as shown below.

! DANGER

To avoid risk of electric shock, remove AC power from PS873 before wiring 873-AL.

! CAUTION

If using 873-BB Battery Backup option, unplug all 4 wires from battery terminals before wiring 873-AL.



3.4 SET DIP SWITCHES

	Switch Number	873-AL DIP Switch Definitions All switches shown in "ON" position in wiring diagram.
Set Time Delay* (0-75 seconds, 5 second increments) 0 Sec: 5-8 "off" 75 Sec: 5-8 "on"	8	Adds 40 seconds to the time delay when "ON"
	7	Adds 20 seconds to the time delay when "ON"
	6	Adds 10 seconds to the time delay when "ON"
	5	Adds 5 seconds to the time delay when "ON"
Set method for clearing the signaling device output	4 OFF 3 OFF	Clear Signaling Output by closing the door
	4 ON 3 ON	Clear Signaling Output by activating the controlling input of the device in alarm
	4 ON 3 OFF	Clear by activating the controlling input of the device in alarm or alarm will reset after 2 minutes automatically
Enable Time Delay Allows you to choose which outputs will have the above time delay.	2	Turn "ON" to enable time delay for Locking Device 2
	1	Turn "ON" to enable time delay for Locking Device 1

* Locking Device output will remain "ON" during time delay.
Time delay will begin when an input releases.

3.5 873-AL EXAMPLE

YOUR REQUIREMENTS:

- (A) - Normally Open Control Switches
- (B) - Device 1 is fail safe; needs a 25 second time delay
- (C) - Device 2 is fail secure; does not need a time delay
- (D) - Clear alarm by activating control switch of device in alarm

THEN SET:

JUMPER	DIP SWITCH	SETTING	PURPOSE, (REQUIREMENT SATISFIED)
E1		NC	Sets control of Locking Device 1 as Fail Safe, (B)
E2		NO	Sets control of Locking Device 2 as Fail Secure, (C)
E5		NO	Sets Input Switches as NO, (A)
	8	OFF	Sets 25 second time delay, (B)
	7	ON	
	6	OFF	
	5	ON	
	4	ON	Sets Alarm Clear option, (D)
	3	ON	
	2	OFF	Disables Device 2 time delay, (C)
	1	ON	Enables Device 1 time delay, (B)

3.6 Go to Page 16!

873-AC

Access Control Function: Provides one zone access control for electrical devices that do not have mechanical override (such as magnetic locks).

873-FA (Fire Alarm Input) option must be installed on PS873 power supply and wired to NC fire alarm contacts.

NC Relay Contacts are required from the following: Access Control device, Motion Detector, Override button contacts.

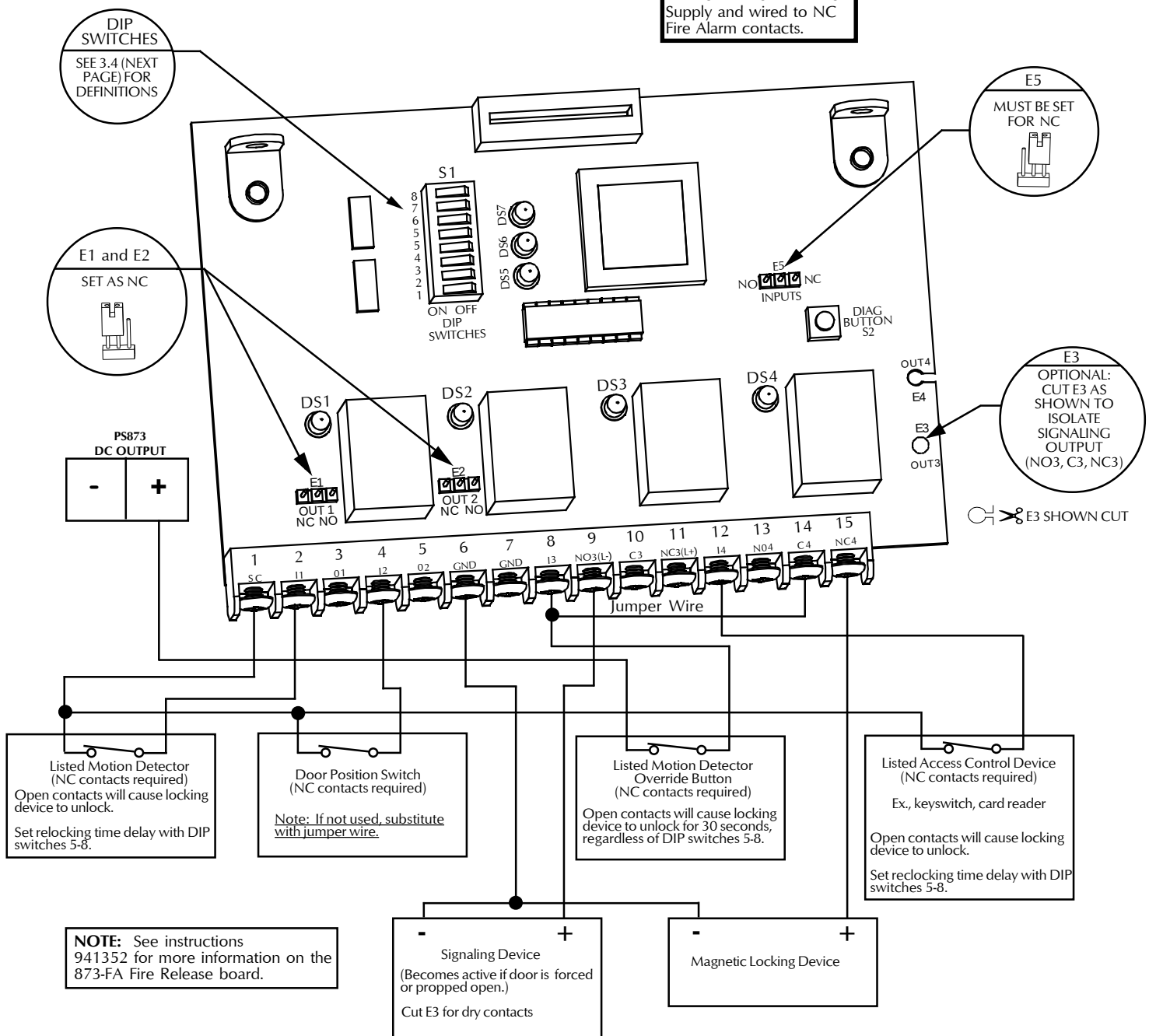
Wiring and Configuring Logic Board

- 3.1** Set E1, E2, E3, E4, E5 (see diagram below)
- 3.2** Set Dip Switches (see Dip Switch table on page four).
- 3.3** Wire devices as shown below.

⚠ DANGER
To avoid risk of electric shock, remove AC power from PS873 before wiring 873-AC.

⚠ CAUTION
If using 873-BB Battery Backup option, unplug all 4 wires from battery terminals before wiring 873-AC.

⚠ DANGER
873-FA option must be installed on PS873 Power Supply and wired to NC Fire Alarm contacts.



3.4 Set DIP Switches.

Set Time Delay* (0-75 seconds, 5 second increments) 0 Sec: 5-8 "OFF" 75 Sec: 5-8 "ON"	Switch Number	873-AC DIP Switch Definitions All switches shown in "ON" position in wiring diagram.
	8	Adds 40 seconds to the time delay when "ON"
	7	Adds 20 seconds to the time delay when "ON"
	6	Adds 10 seconds to the time delay when "ON"
	5	Adds 5 seconds to the time delay when "ON"
Set method for clearing Signaling Output	4 ON	Clear Alarm with valid Access Control Input
	4 OFF	Clear Signaling by closing the door
End Rearm**	3	Turn "ON" to enable End Rearm option.
Not Used	2	
	1	

* Magnetic Lock remains unlocked during time delay.
Time delays begins when an input is released.

** END REARM MODE: (Door Position Switch required). If door open and closes during time delay, then door will automatically relock in 2.5 seconds after the door closes.

3.5 873-AC EXAMPLE

YOUR REQUIREMENTS:

- (A) - Magnetic lock on an egress door with card reader control
- (B) - 25 second time delay when motion detector or card reader activated
- (C) - No End Rearm option
- (D) - Must provide valid card reader input to clear an alarm

THEN SET:

Jumper	DIP Switch	Setting	Purpose (Requirement Satisfied)
E5		NC	Sets Input Switches as NC.
	8	OFF	Sets 25 second time delay, (B)
	7	ON	
	6	OFF	
	5	ON	
	4	ON	Sets Alarm Clear option, (D)
	3	ON	Disable End Rearm option, (C)

3.6 Go to page 16!

4 Test Installation.

Note: For steps 4.1 and 4.2, refer to Von Duprin PS873 instructions #941352 for additional information on the PS873 Power Supply and 873-BB Battery Backup option.

- 4.1 Apply AC voltage to PS873 terminal block labeled "AC".
- 4.2 If using 873-BB Battery Backup option, reconnect the four wires to the battery terminals. (One wire pair per battery; red wire to (+) and black wire to (-).
- 4.3 Test ALL devices associated with the system for proper operation.

Your test should verify that:

- **All outputs (locking devices, signaling devices, etc.) respond appropriately to all inputs (card readers, pushbuttons, monitoring switches, etc.)**
- **Active fire alarm contacts immediately unlock all devices.**
- **All time delays are correct.**
- **Signaling outputs (ex. horns) can be cleared correctly (873-AL and 873-AC functions only)**
- **End Rearm feature works correctly (873-AC function only)**

5 LED Definitions and Troubleshooting

5.1 Option Board LED Descriptions

LED Descriptions		
DS1	Red	"ON" when output 1 is closed (powered)
DS2	Red	"ON" when output 2 is closed (powered)
DS3	Red	"ON" when output 3 is closed (powered)
DS4	Red	"ON" when output 4 is closed (powered)
DS5	Green	"ON" when one or more inputs are active
DS6	Red	Flashes during time delay countdown. On solid during active fire alarm condition.
DS7	Yellow	One flash per second indicates proper operation. Three flashes per second indicate factory mode. Turn AC power off, then on, to clear factory mode.



DANGER

To avoid risk of shock, remove AC power (and disconnect 873-BB if applicable) while correcting wiring problems.



DANGER

If Troubleshooting is unsuccessful, remove AC power from PS873 (and disconnect 873-BB if applicable), then consult factory.

5.2 Troubleshooting

SYMPTOM	PROBLEM	SOLUTION
DS7 (Yellow LED) not flashing	Option board does not have power.	Apply AC voltage to PS873. Green LED on PS873 should be illuminated.
* Outputs not responding to inputs * DS5 (Green LED) does not illuminate when an input is active * DS6 (Red LED) is "OFF"	Incorrect input switch wiring	Each input switch must be wired between Signal Common (TB1) and an input terminal (TB2, 4, 8 or 12). Refer to wiring diagram and check input switch wiring.
	Incorrect E5 setting	Jumper E5 must be set as NO or NC to match type of input switch. <u>ALL</u> input switches on the same logic board must be of the same type (either NO or NC).
* Outputs not responding to inputs * DS5 (Green LED) illuminates when an input becomes active, and * DS6 (Red LED) is "OFF"	Incorrect output wiring	All outputs should be wired between an output terminal (O1, O2, NO3, NC3, NO4, NC4) and GND (Exception: If O3 or O4 configured for dry contacts, then wire contacts in series with external device). Refer to correct wiring diagram and check wiring.
	Incorrect E1 or E2 jumper setting	Jumpers E1 and E2 configure outputs O1 and O2, respectively, as NO or NC. Verify E1 and E2 are set correctly. Note: LED's DS1-DS4 illuminate when outputs O1-O4, respectively, are active. If an LED indicates that the proper output is active, then there may be a problem with the device.
* Outputs not responding to inputs * DS5 (Green LED) is "ON"	DS5 "ON" means one of the inputs is already active	Determine which input is active, correct the input so that it is inactive, then go to Step 4 to re-test the system.
* Outputs not responding to inputs * DS6 (Red LED) flashing.	A time delay is active.	Wait for time delay to expire, then retest the application.
* Outputs not responding properly to inputs * Problems not covered above	Other wiring problem	Refer to wiring diagram and carefully check all wiring. See "Wiring Guide" on page 2.
	Incorrect jumper setting	Refer to correct wiring diagram and verify E1, E2, E3, E4 and E5 are set properly. (Note: not all jumpers are used for every logic board function).
Incorrect time delays	Incorrect DIP Switch setting	Refer to correct wiring diagram and verify DIP Switches have been set correctly for all options and time delays.
Incorrect logic board functionality		
*Outputs not responding to inputs *DS6 (Red LED) on solid	873-FA board is in active fire alarm mode	Clear fire alarm condition
DS7 (Yellow) flashing approximately 3 times per second.	Logic board in factory mode	Turn AC power off, then on.