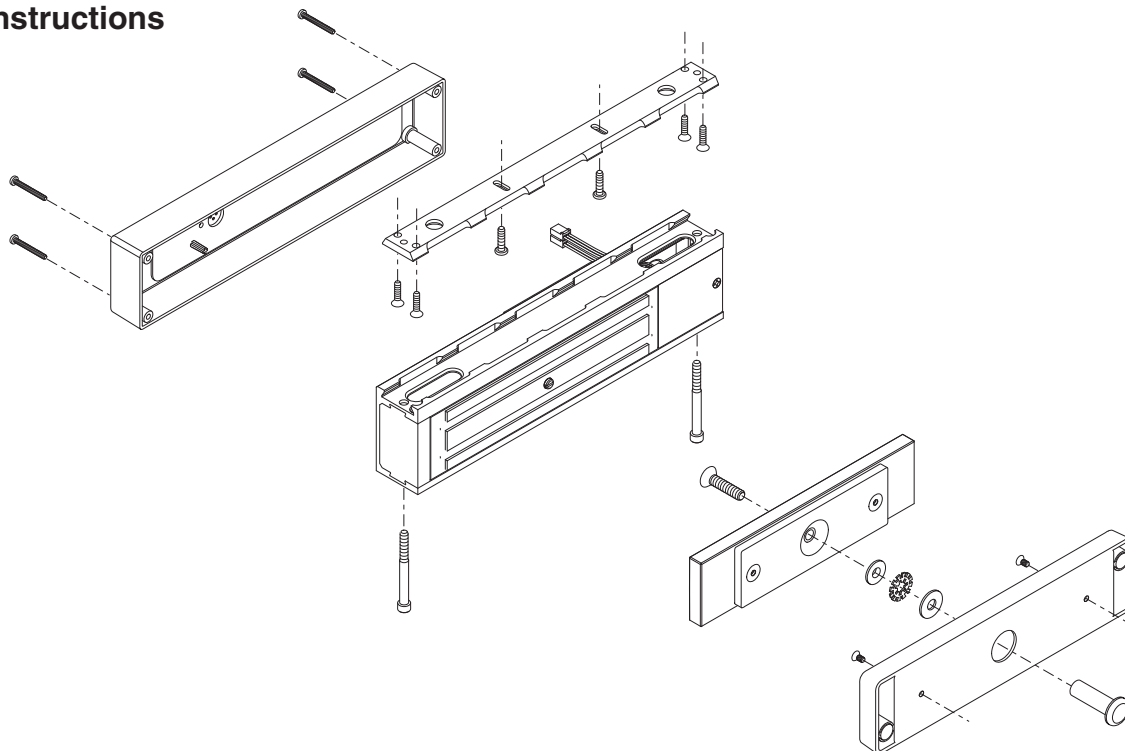


M490DE Electromagnetic Locks



Installation Instructions



FEATURES

Delayed Egress

Unlocking is delayed 15 seconds while an alarm sounds.

Automatic Voltage Selection

Magnet immediately detects 12VDC or 24VDC when power is connected.

Fire Unlock

Input from fire system that will unlock the magnet immediately.

Auxiliary Inputs

Allows use of an auxiliary switch such as an exit device or push button.

Alarm Output

Activates external alarm, when in alarm state.

*Magnetic Bond Sensor (MBS)

Detects proper bond between magnet and armature. It can be monitored remotely and locally with an LED.

*Door Position Switch (DPS)

Indicates whether door is open or closed. This feature is used in conjunction with the MBS.

*Relock Time Delay

Relock time can be changed. Range is 1 - 30 seconds.

*Door Prop Timer

Allows adjustment of the amount of time a door can be propped open before alarm sounds. Range is 0 - 150 seconds.

*Indicators

LED Status and Audible Alarm

**Plus Version Only*

MODELS

M490DE (Single Lock Basic)

Delayed Egress, Automatic Voltage Selection

M490DEP (Single Lock Plus)

Basic features + Magnetic Bond Sensor (MBS), Door Position Switch (DPS), Relock Time Delay, Door Prop Timer, and Indicators

M490DE-2 (Double Lock Basic)

Double lock with same features as the Basic single lock

M490DEP-2 (Double Lock Plus)

Double lock with same features as the Plus single lock

Notes:

- BOCA is a Plus only lock option.
- If BOCA option model is provided, see page 12 for operational description.

UL Requirements:

- Units shall not impair operation of panic hardware mounted on door.
- Units shall not impair intended operation of an emergency exit.
- Not to be used without UL approved latching hardware.
- Units/Models are intended to be connected to UL Listed Equipment, not intended for Burglar or Fire Alarm Initiating or Indicating Devices.
- Ambient Conditions - "For Indoor Use Only".
- Wiring methods shall be in accordance with the National Electrical Code, ANSI/NFPA 70.

This device complies with part 15 of FCC rules.

Operation is subject to following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including any interference that may cause undesired operation. Changes or modifications not expressly approved by party responsible for compliance could void user's authority to operate equipment.

ELECTRICAL SPECIFICATIONS

Model	Input Current @ 12VDC Input	Input Current @ 24VDC Input	Holding Force Per Door Leaf	Size
M490DE or M490DEP	.75ADC	.45ADC	1500 lbs.	3" High x 12 1/2" Wide
M490DE-2 or M490DEP-2	1.25ADC	.76ADC	1500 lbs.	3" High x 25 1/16" Wide

WIRE GAUGE AND LENGTH SPECIFICATIONS

Wire Gauge	SINGLE LOCK		DOUBLE LOCK	
	12VDC Maximum Wire Length	24VDC Maximum Wire Length	12VDC Maximum Wire Length	24VDC Maximum Wire Length
14	1000 feet	4000 feet	500 feet	2000 feet
18	400 feet	1600 feet	200 feet	800 feet
22	150 feet	600 feet	75 feet	300 feet

NOTE: Minimum wire gauge 22AWG.

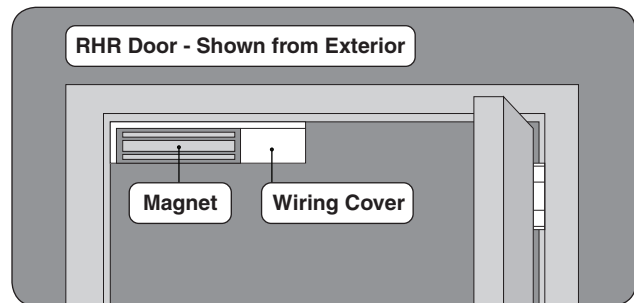
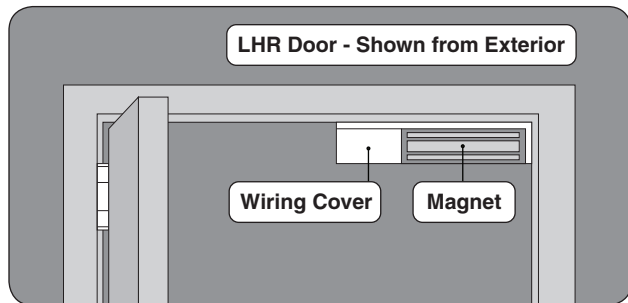
LOCK INSTALLATION

1 PREPARE FOR INSTALLATION

1a Determine Proper Magnet Orientation

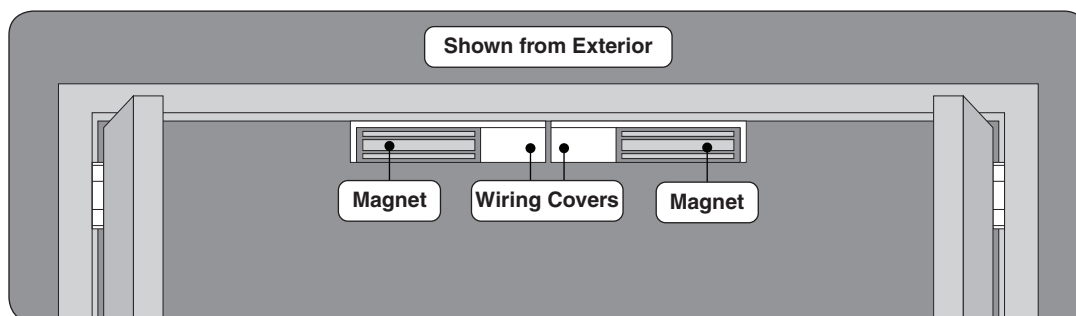
Single Door

Magnet should be placed opposite of door hinges.



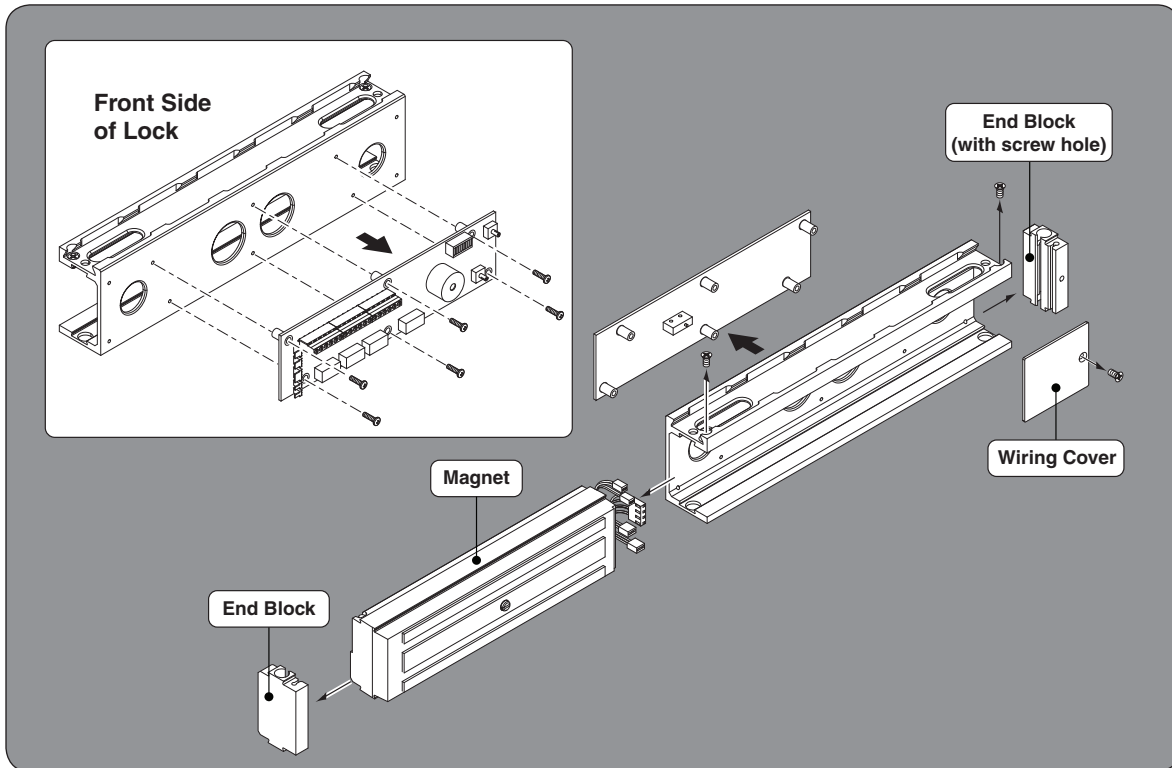
Double Door

Locks should be installed with wiring covers in the middle, so the magnet in one of the locks must be reoriented.

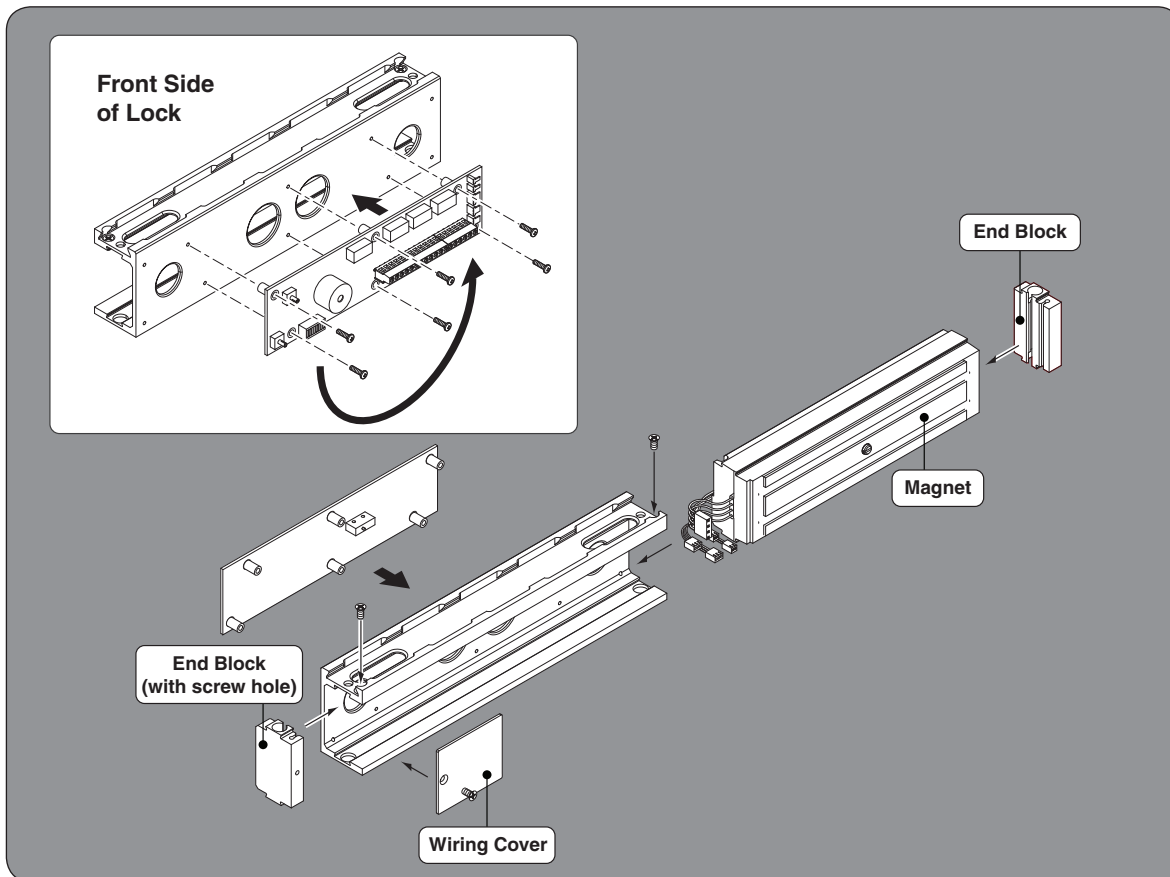


1b**Reorient Magnet and Board (if necessary)**

- Remove screws, wiring cover and end blocks.
- Remove board.



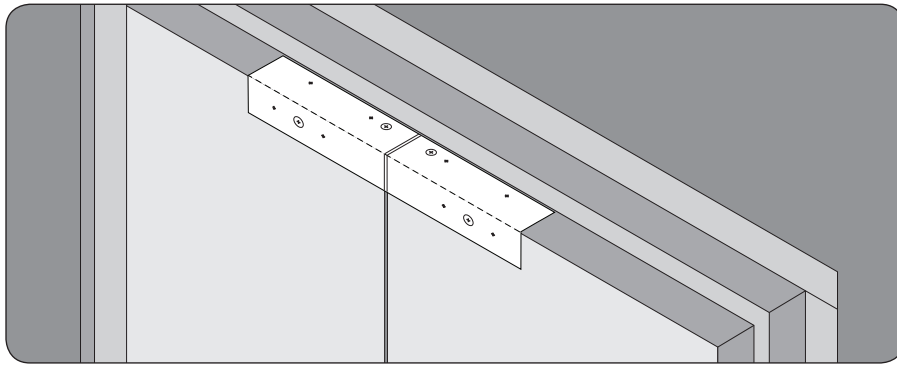
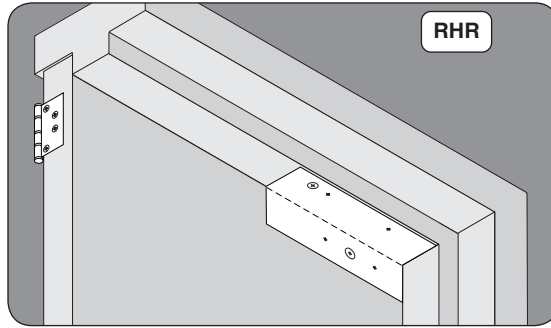
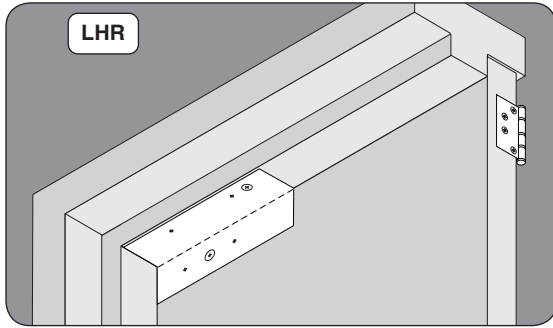
- Rotate magnet, end blocks and wiring cover as shown, then reassemble.
- Rotate board 180°, then reassemble.



1c

Place Template and Mark Holes

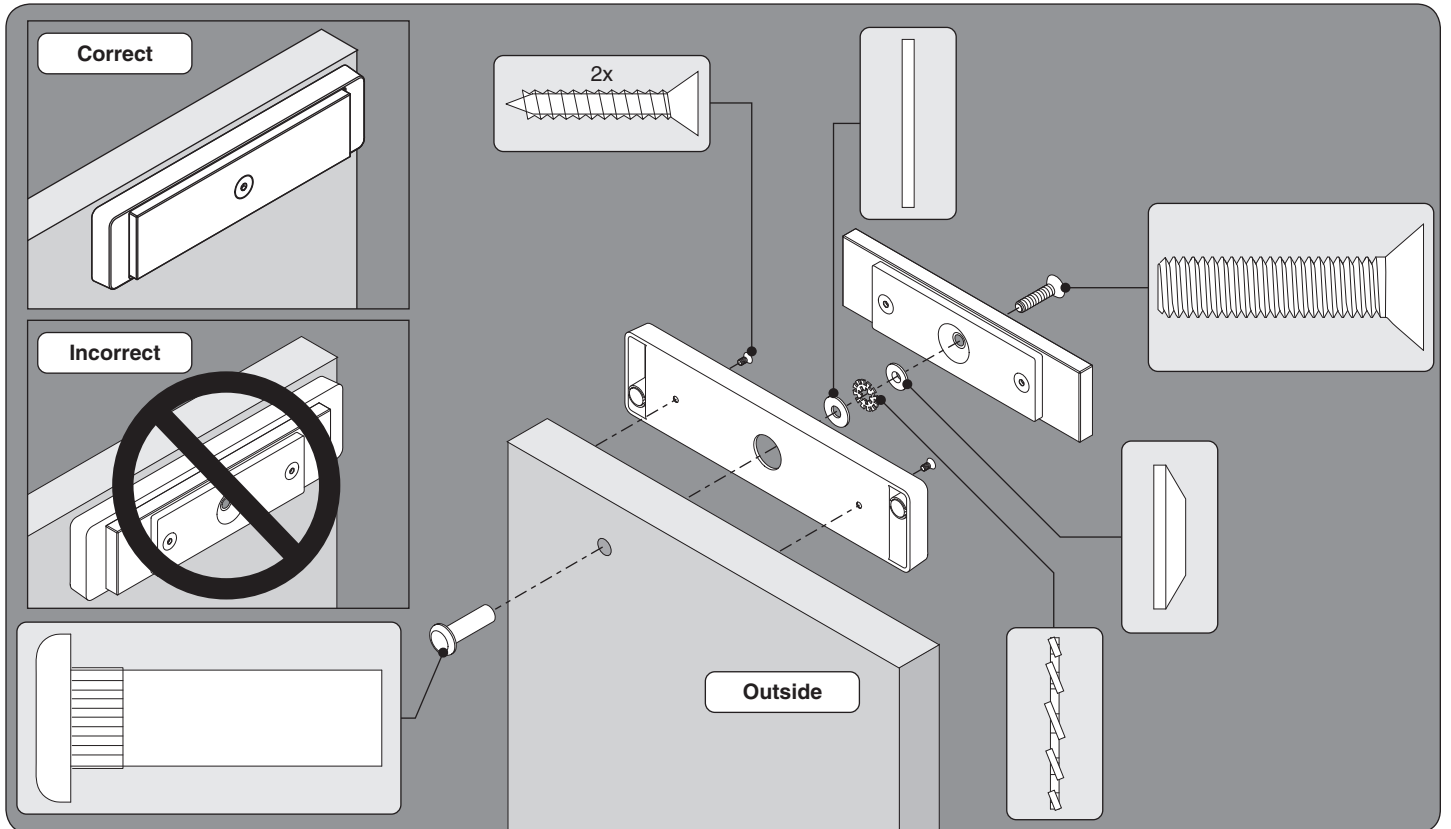
- Place template on top corner, opposite of hinges.
- Mark holes and prepare them per template.



2 ATTACH ARMATURE TO DOOR

2a

Install as Shown

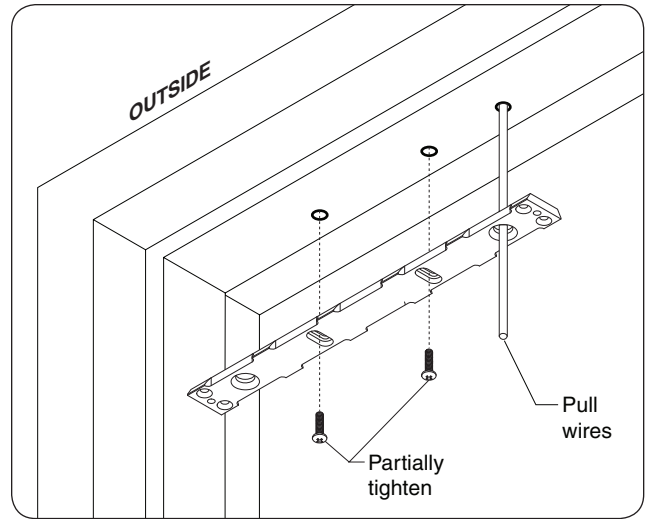
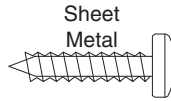
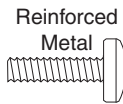


3 INSTALL MOUNTING BRACKET INTO FRAME

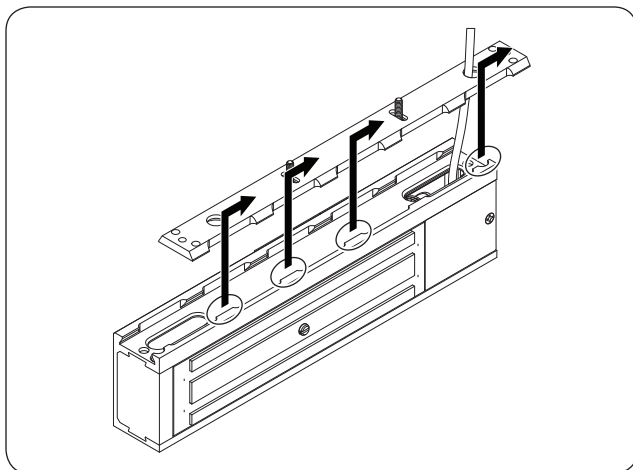
3a Attach Mounting Bracket Temporarily

- Install two middle screws into slots and partially tighten.

Actual Size

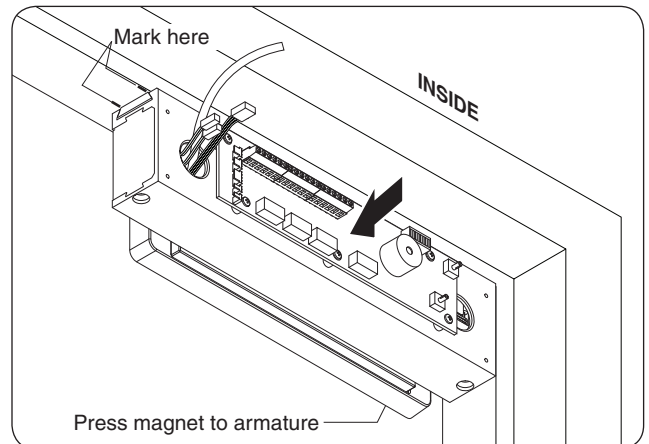


3b Slide Magnet onto Bracket

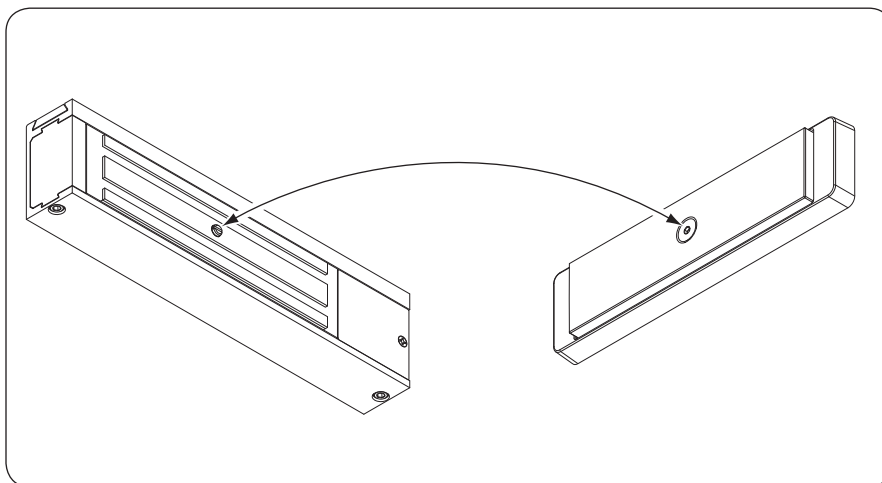


3c Align Magnet to Armature

- Close door.
- Press magnet to fully engage with armature.
- Mark bracket location.



3d Verify that DE plunger aligns with screw head on armature

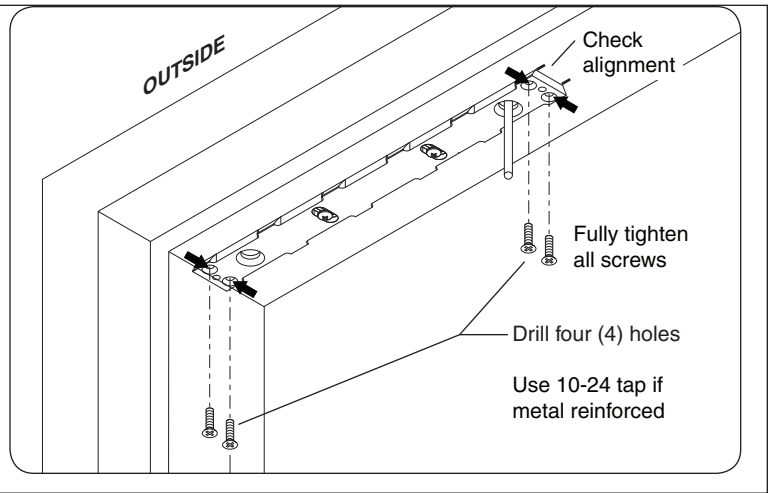
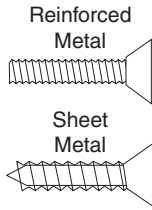


3e

Fully Attach Bracket

- Remove magnet from bracket.
- Check bracket alignment with marks.
- Fully tighten two screws in slotted holes.
- Drill four (4) remaining holes.
- Fully tighten all screws.

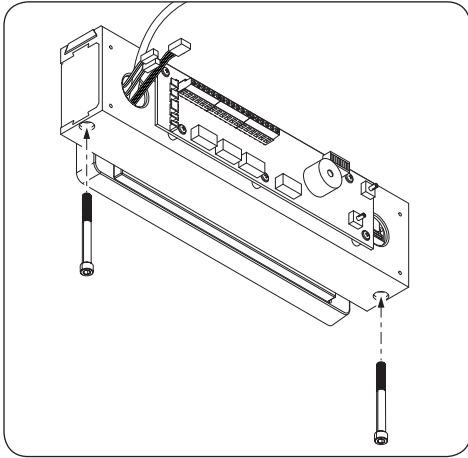
Actual Size



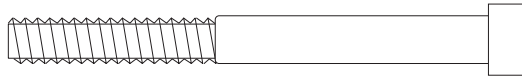
4 INSTALL LOCK

4a

Install Magnet and Secure with Screws



Actual Size



5 CONNECT WIRING TO BOARD (BASIC MODEL)

5a

Connect Plug and Wires to Board

Power Input
12/24V DC
UL 294 Listed, power limited, Class 2, power supply must be used

Fire Alarm Input
Apply a normally closed dry contact or a jumper if not connected to fire alarm.

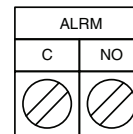
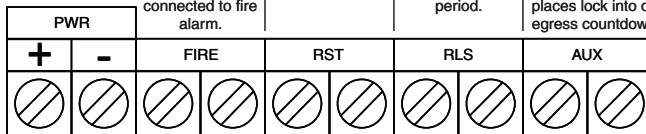
Reset Input
Dry contact closure resets lock in alarm condition.

Release Input
Dry contact closure will release lock for the time delay period.

Auxiliary Input
Apply a normally closed dry contact or a jumper if not using. Opening dry contact places lock into delayed egress countdown.

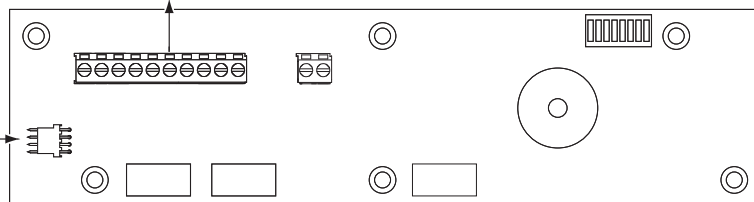
Alarm Output (Optional)
Contacts change state during an alarm condition.

30V @ 1A resistive



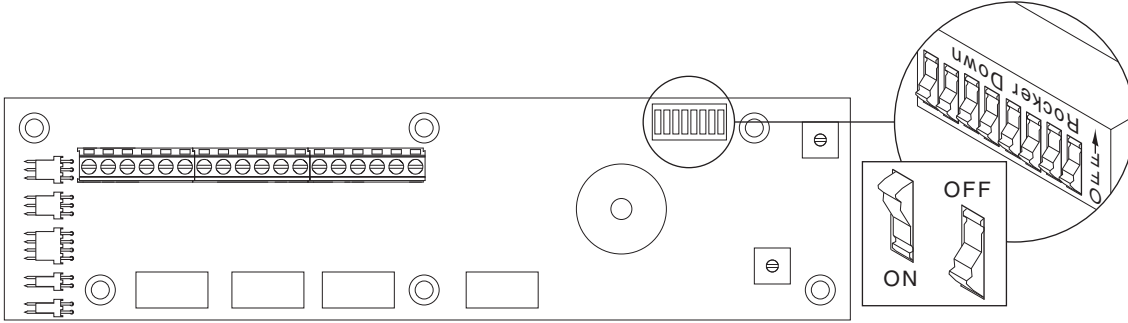
For wire gauge and length specifications, see page 2.

COILS



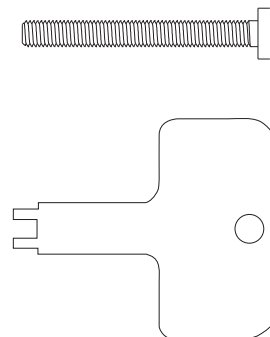
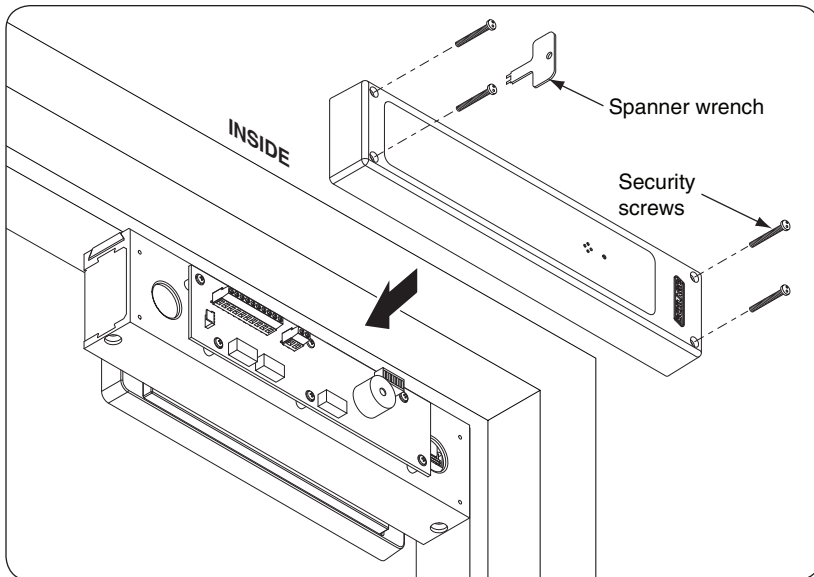
5b Set SW2 Dip Switches

→ **NOTE:** Dip switch panel may be upside-down, depending on installation. Look for the “OFF” label and compare to the images below for correct dip switch positions.



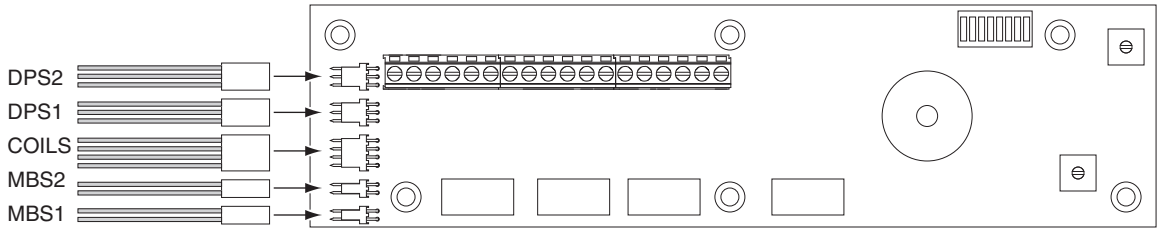
Nuisance Delay					
	0 seconds	1 second	2 seconds	3 seconds	Nuisance delay is the amount of time the door must be pushed or aux input must be pressed before triggering the Delayed Egress Cycle. Programmable to 0-3 seconds.
1	Off	On	Off	On	
2	Off	Off	On	On	
Nuisance Alert					
3	Off=Disabled		On=Enabled		Causes horn to sound during nuisance delay
Auto Relock					
4	Off=Disabled		On=Enabled		When enabled, lock will energize upon regaining power or after a fire alarm condition clears.
Anti-Tailgate (Available on Plus Model Only)					
5	Off=Disabled		On=Enabled		Door will relock as soon as it closes – even if the relock time delay has not ended.
Door Propped/Forced (Available on Plus Model Only)					
6	Off=Disabled		On=Enabled		Enables door propped and door forced alarms
Unlock Alert					
7	Off=Disabled		On=Enabled		Horn sounds whenever door is unlocked and power is still applied to the door
DEL Enabled					
8	Off=Disabled		On=Enabled		Enables or disables the DEL plunger switch. Aux Input will always function even if DEL plunger switch is disabled.

5c Install Cover Using Spanner Wrench and Security Screws



6 CONNECT WIRING TO BOARD (PLUS MODEL)

6a Connect Plugs to Board



6b Connect Wires to Board

Power Input
12/24V DC

UL 294 Listed, power limited, Class 2, power supply must be used

Fire Alarm Input
Apply a normally closed dry contact or a jumper if not connected to fire alarm.

Reset Input
Dry contact closure resets lock in alarm condition.

Release Input
Dry contact closure will release lock for the time delay period.

Auxiliary Input
Apply a normally closed dry contact or a jumper if not using. Opening dry contact places lock into delayed egress countdown.

DPS Output (Optional)
Contacts change state when door is closed.

12V@200mA
24V@100mA
resistive

Alarm Output (Optional)
Contacts change state during an alarm condition.

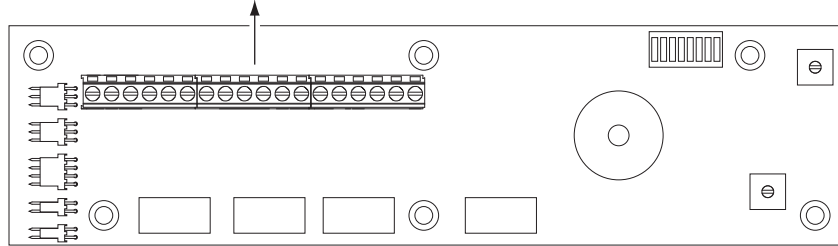
30V@1A
resistive

MBS Output (Optional)
Contacts change state when magnet is properly bonded to its armature. Poor bond can be caused by low voltage, misalignment, or damaged mating surfaces.

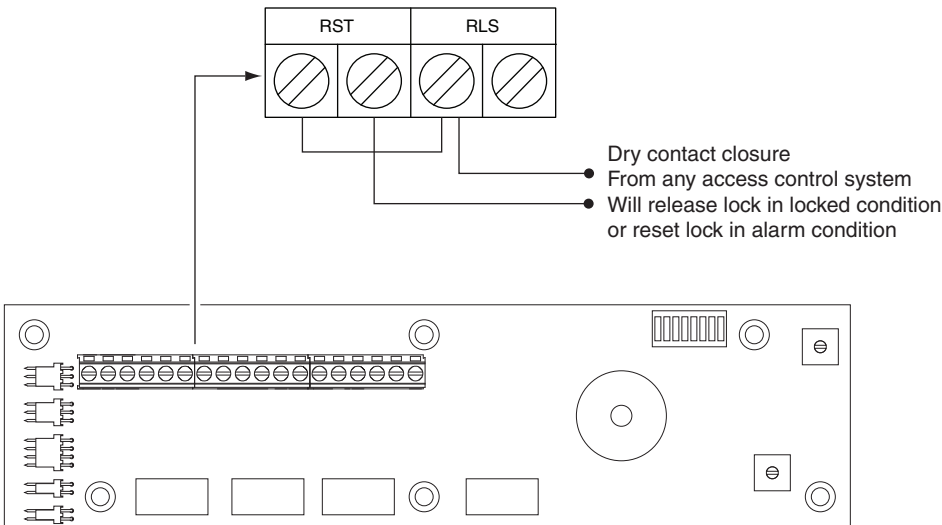
30V@1A
resistive

PWR		FIRE		RST		RLS		AUX		DPS			ALRM		MBS		
+	-									NO	C	NC	C	NO	NO	C	NC
⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘

For wire gauge and length specifications, see page 2.

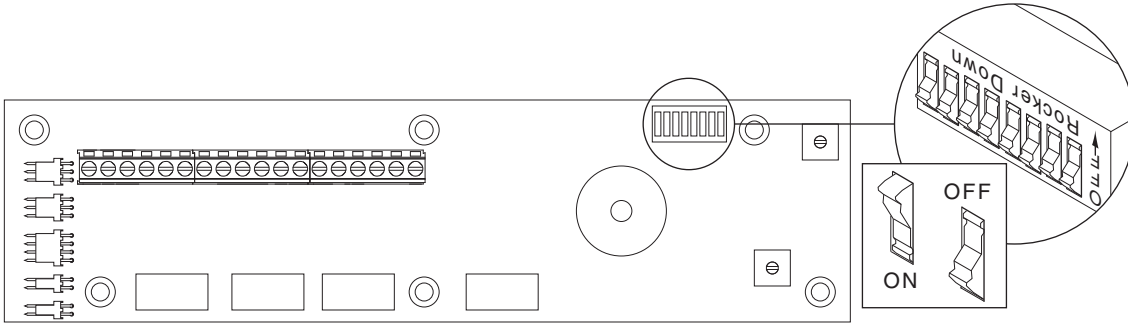


6c (Optional) To use one access control for both Reset and Release, wire as shown.



6d Set SW2 Dip Switches

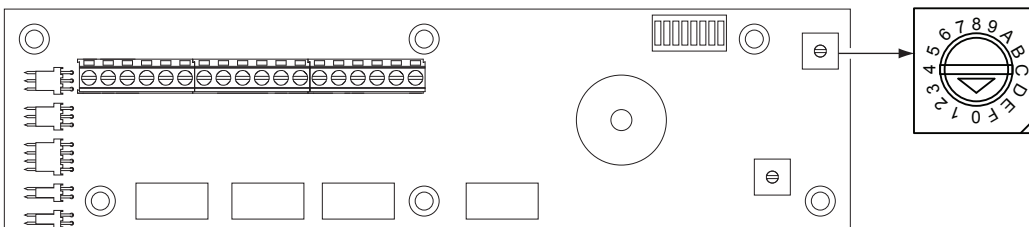
→ **NOTE:** Dip switch panel may be upside-down, depending on installation. Look for the “OFF” label and compare to the images below for correct dip switch positions.



Nuisance Delay					
	0 seconds	1 second	2 seconds	3 seconds	Nuisance delay is the amount of time the door must be pushed or aux input must be pressed before triggering the Delayed Egress Cycle. Programmable to 0-3 seconds.
1	Off	On	Off	On	
2	Off	Off	On	On	
Nuisance Alert					
3	Off=Disabled		On=Enabled		Causes horn to sound during nuisance delay
Auto Relock					
4	Off=Disabled		On=Enabled		When enabled, lock will energize upon regaining power or after a fire alarm condition clears.
Anti-Tailgate					
5	Off=Disabled		On=Enabled		Door will relock as soon as it closes – even if the relock time delay has not ended.
Door Propped/Forced					
6	Off=Disabled		On=Enabled		Enables door propped and door forced alarms
Unlock Alert					
7	Off=Disabled		On=Enabled		Horn sounds whenever door is unlocked and power is still applied to the door
DEL Enabled					
8	Off=Disabled		On=Enabled		Enables or disables the DEL plunger switch. Aux Input will always function even if DEL plunger switch is disabled.

6e Set Relock Time - SW4

- Relock time is the amount of time the lock is de-energized after a valid release. If auto relock is enabled, it also controls the amount of time the lock is unlocked before it automatically relocks after a power-on or fire alarm reset. Programmable 0-30 seconds in 2 second increments.



Setting	Delay Time (Seconds)
0	0
1	2
2	4
3	6

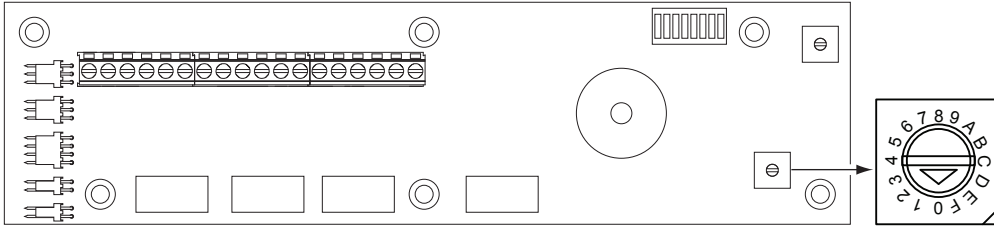
Setting	Delay Time (Seconds)
4	8
5	10
6	12
7	14

Setting	Delay Time (Seconds)
8	16
9	18
A	20
B	22

Setting	Delay Time (Seconds)
C	24
D	26
E	28
F	30

6f Set Door Prop Time - SW3

- The amount of time the door must be propped open (after normal release time delay has ended) before triggering the alarm. The alarm will clear as soon as the door closes again. Programmable 0-150 seconds in 10 second increments.



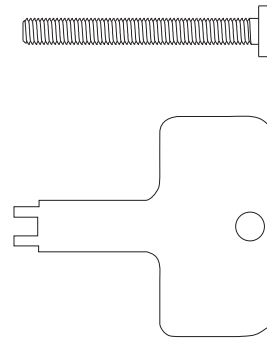
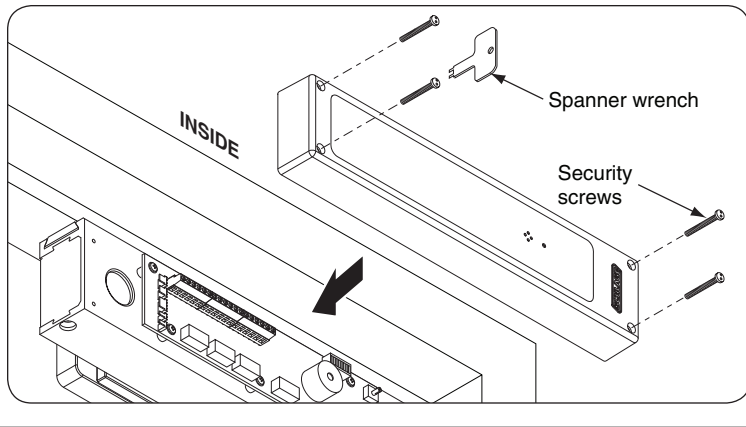
Setting	Delay Time (Seconds)
0	0
1	10
2	20
3	30

Setting	Delay Time (Seconds)
4	40
5	50
6	60
7	70

Setting	Delay Time (Seconds)
8	80
9	90
A	100
B	110

Setting	Delay Time (Seconds)
C	120
D	130
E	140
F	150

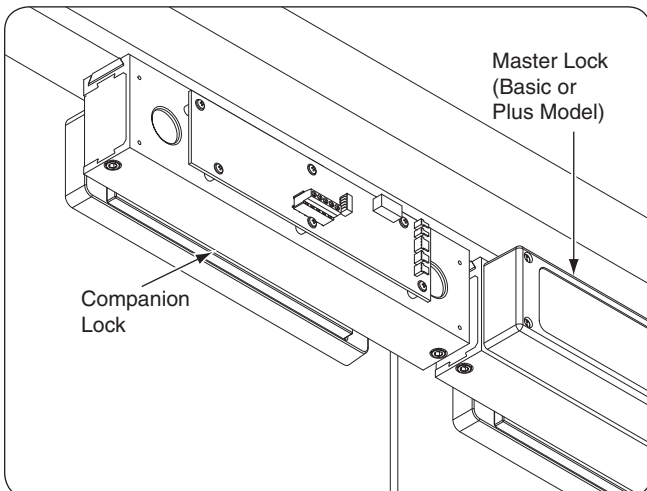
6g Install Cover



7 IF DOUBLE DOOR, INSTALL SECOND LOCK (M490DE-2 OR M490DEP-2)

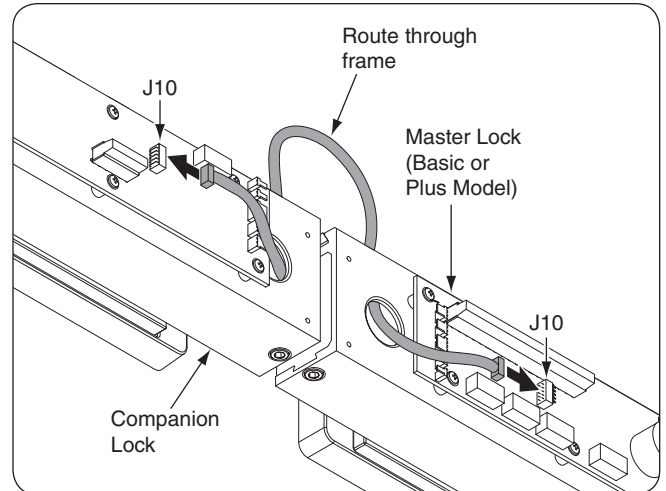
7a Install Second Lock

- Reorient as needed per step 1b.
- Install lock per steps 2-4

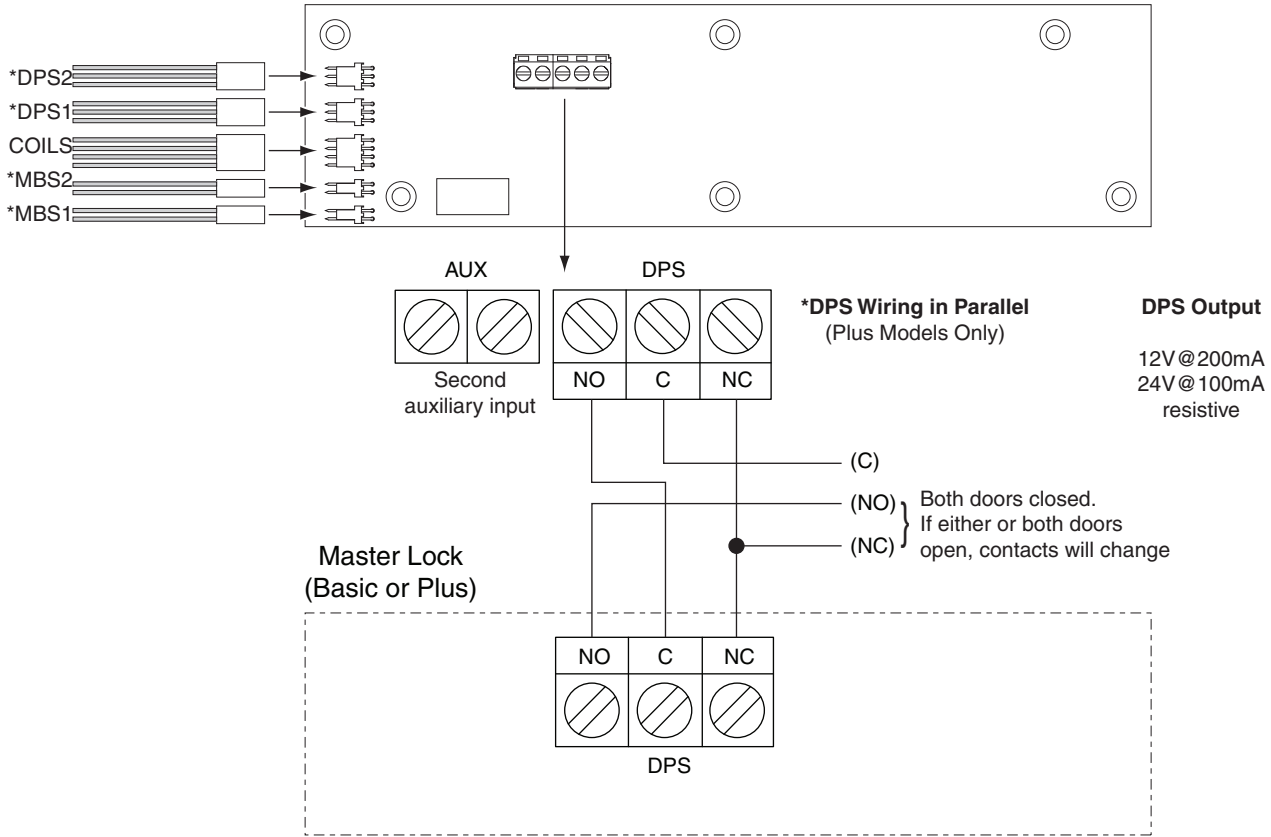


7b Install Communication Cable

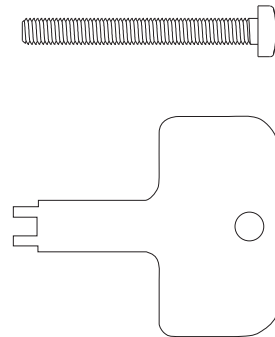
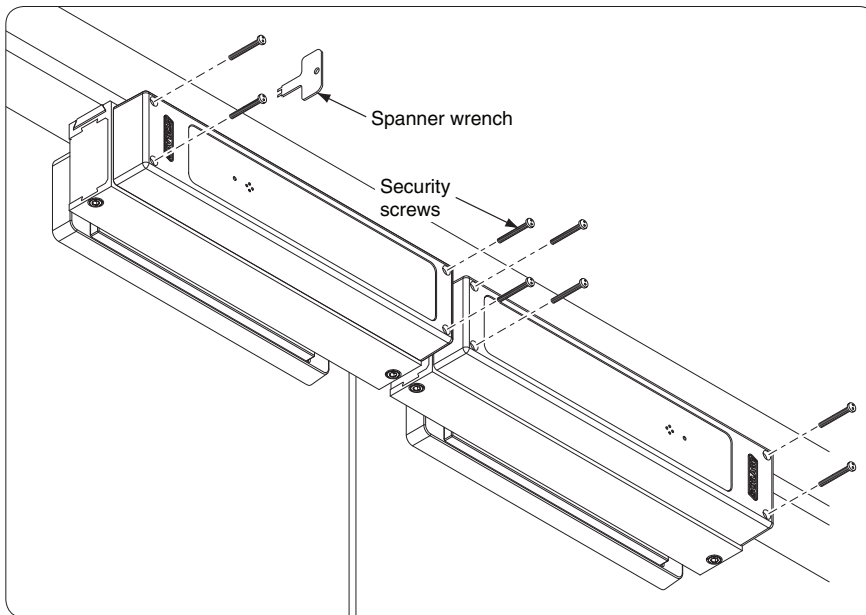
- Route cable (supplied) through frame
- Connect cable to each lock



7c Connect wiring to second lock



7d Install Covers



INDICATOR TABLE

Condition	LED Indicator	Audible	Alarm Relay State
Standard Features			
Lock Secure	Off	Off	Open
Authorized Release Input	Steady Green	Off	Open
During Nuisance Delay	Steady Red	Off (Default) Set by SW2-3	Open
During Fire Alarm	Steady Green	Off	Closed
During Delayed Egress	Flashing Red	Beeping	Closed
After Delayed Egress	Steady Green	Steady Tone	Closed
Switch Selectable Features			
SW2-7 "ON" = Unlock Alert whenever lock is unlocked	Steady Green	Steady Tone	Open
SW2-3 "ON" = Horn will sound during nuisance alert	Steady Red	Steady Tone	Open
Optional Switch Selectable Features Plus Model Required			
Door Propped Open Alarm	Flashing Green	Beeping	Closed
Door Forced Open Alarm	Flashing Red	Steady Tone	Closed
Door Forced Open Alarm followed by Delayed Egress Input	Steady Green + Flashing Red	Steady Tone	Closed

TROUBLESHOOTING

Condition	LED Indicator
Lock has power but won't lock. LED (on lock) is Green.	Fire alarm not connected or open connection. SW4-7 not ON (set switch, remove and re-apply power).
Won't go into delayed egress.	Check dipswitch settings
	Armature washers not installed properly
	Magnet not properly aligned with armature.
Goes into delayed egress upon powerup.	Armature washers not installed properly
	Improper gap between magnet and armature
Lock can be pushed open with minimal resistance.	Magnet/Armature/washers not installed properly
Lock "hums" or vibrates noisily when energized.	Magnet/Armature/washers not installed properly
LED(s) flash once quickly.	Relock delay set to 0 sec.
	Keypad not initialized
MBS doesn't change state when locked.	Low voltage. Mechanical misalignment. Debris between lock and armature. Armature/magnet not installed properly
DPS option not working properly.	Armature holder not aligned with DPS switch.
	Switch not plugged into correct jack

BOCA Option is Applicable in United States Jurisdictions Only BOCA Operational Description

1. Lock the door and start the release process by pushing on the actuating bar (or door if no actuating bar provided) for at least 1 second. The door will release within 15 seconds.
2. The door will not relock until the door has been opened, and returned to the closed position for not less than 30 seconds. Any reopening of the door during this time will restart the 30 second relocking cycle.
3. A 30 second release time delay may be provided with code official approval.