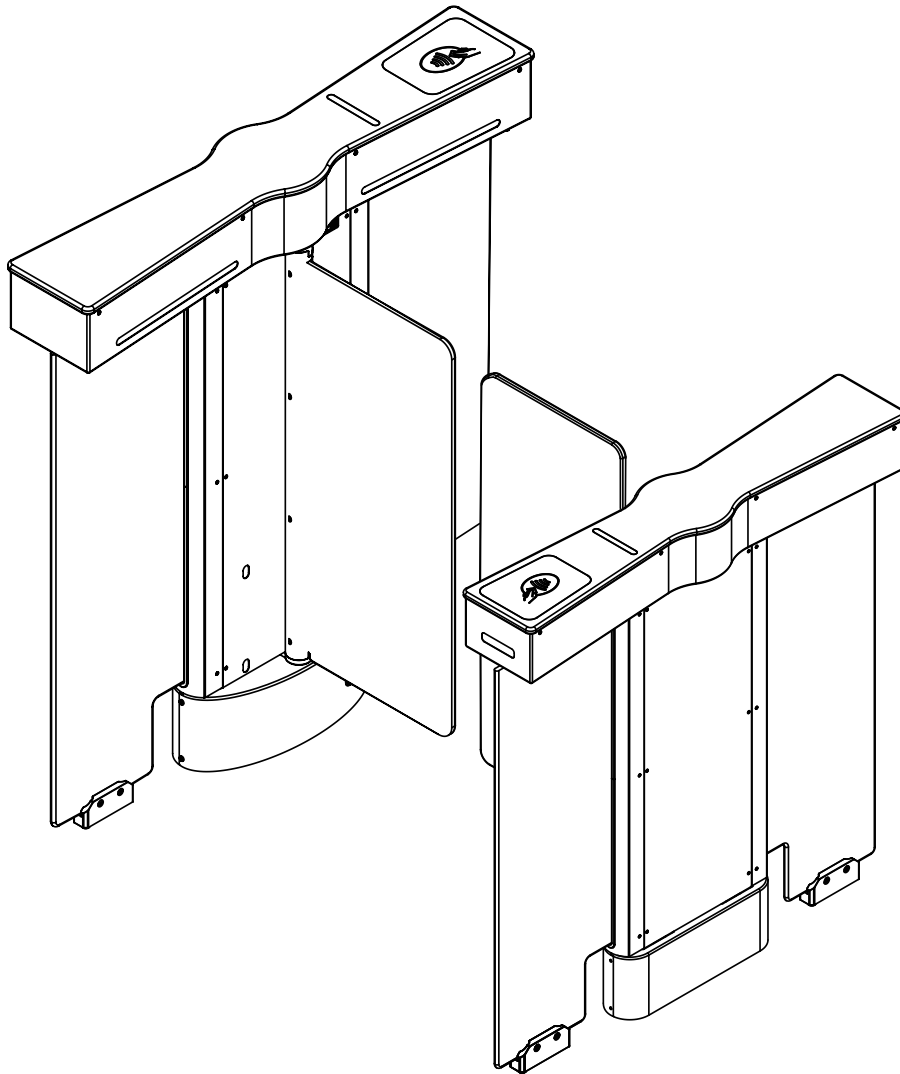


**Supervisor 4500  
(SU4500)  
Optical Turnstile with Bi-Directional Motorized Barriers**



**Installation Instructions**

---

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12660 Colony Street, Chino, CA 91710  
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## Safety Precautions



### WARNING

The Supervisor 4500 may present a risk to persons and property if it is not installed and/or operated correctly. This manual must be read in its entirety and all safety and operations information must be followed. Note the following precautions:

- For indoor use only.
  - Use only skilled individuals to install and service the turnstile.
  - DO NOT operate the turnstile if it has been damaged in any manner. If damaged, have the unit repaired or adjusted by a skilled service person before use.
  - DO NOT modify or alter the turnstile.
  - Have skilled individuals maintain the turnstile according to a proper maintenance schedule.
  - In access control applications, train all personnel that will be using the turnstile in the proper method of operation. In addition, properly train new users as they are added to the system.
  - DO NOT use non-Alvarado parts to repair a damaged turnstile.
  - Closely follow the handling instructions for moving or lifting the turnstile during installation.
  - Power off the turnstile before connecting or disconnecting any communication or power wiring to the turnstile.
- 
- Pour utilisation à l'intérieur seulement.
  - Utilisez uniquement des personnes qualifiées pour installer et entretenir le tourniquet.
  - NE PAS faire fonctionner le tourniquet s'il a été endommagé de quelque façon. S'il est endommagé, faire réparer ou ajuster l'unité avant l'utilisation par un(e) préposé(e) à l'entretien qualifié(e).
  - NE PAS modifier ou altérer le tourniquet.
  - Le tourniquet doit être maintenu selon un calendrier d'entretien adéquat par des personnes qualifiées.
  - Dans les applications de contrôle d'accès, former tout le personnel qui utilisera le tourniquet selon la bonne méthode de fonctionnement. De plus, bien former les nouveaux utilisateurs à leur intégration au système.
  - NE PAS utiliser des pièces ne provenant pas du Alvarado pour réparer un tourniquet endommagé.
  - Suivez strictement les instructions de manutention pour déplacer ou soulever le tourniquet lors de l'installation
  - Éteignez le tourniquet avant de brancher ou de débrancher le câblage de communication ou le câblage d'électricité.
- 
- This turnstile can be used by children aged **12** years and above, and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, if they have been given supervision or instruction concerning use of the turnstile in a safe way and understand the hazards involved. Children shall not play with or around the turnstile.
  - The turnstile shall be disconnected from its power source during service and when replacing parts. The turnstile shall be disconnected from its power source before connecting or disconnecting any communication or other activation/feedback control wires. If it is not possible that the technician can check from any point to which he has access that the main power is removed, a disconnection with a locking system in the isolated position shall be provided.

## Safety Icons

The following symbols are used throughout the manual to highlight important information and potential risks when installing, servicing or using the turnstiles covered in this manual.



### WARNING

This symbol is used in this manual to warn installers and operators of potential harm. Please read these instructions very carefully.



### CAUTION

This symbol is used in this manual to designate potential conditions that may pose a risk to pedestrians, personnel, property and equipment. Please read these instructions very carefully.

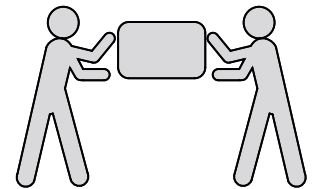


### NOTE

This symbol is used in this manual to designate useful information for the installer and operator. Please read these instructions.



For questions, please contact Alvarado at (909) 591-8431, Monday – Friday 7:00am to 4:00pm PST. Please read this manual completely before installing or operating the purchased product.



A minimum of two people is required to complete the installation of this product.



## Installation Tools

- Tape Measure
- Chalk Line
- Pencil
- Hammer Drill
- 5/8" Concrete Drill Bit
- Shop Vac
- Hammer
- 9/16" Wrench
- Torque Wrench (ft-lbs.)
- Torque Wrench (in-lbs)
- 9/16" Socket
- 5/32" Hex Key
- #2 Phillips Head Screwdriver
- Precision Flat Head Screwdriver
- Clear RTV Silicone
- Level

## Uncrating



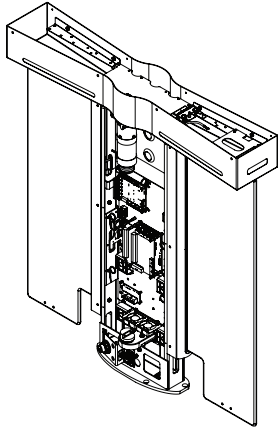
The SU4500 has been packed for shipping to prevent damage to the unit. Two or more installers are required to unload the SU4500 at the installation site. Once the turnstile cabinets have been placed in the installation location, carefully remove the protective packing material from the sides of the cabinets.



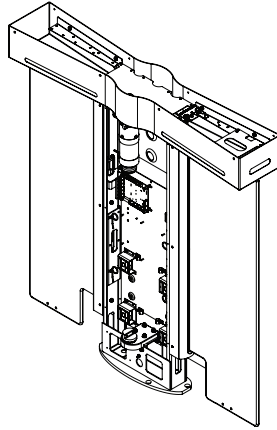
## Parts List

This product is shipped with all installation hardware and components. If installing a single lane, refer to the Single Lane Parts List below. For additional lanes, refer to the Center Cabinet Parts List. Make sure that none of these parts are missing and/or damaged before beginning installation. If parts are missing and/or damaged, please contact Alvarado.

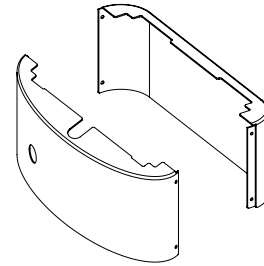
### Single Lane Parts List



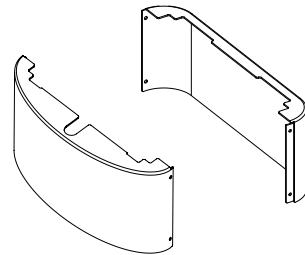
Main Cabinet  
(Qty 1)



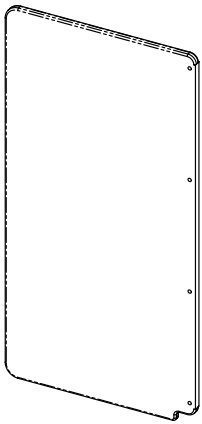
Secondary Cabinet  
(Qty 1)



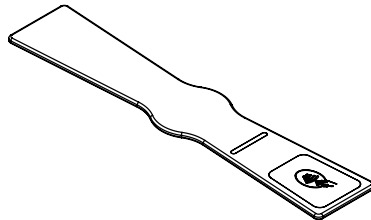
Main Cabinet Base Covers  
(Qty 1)



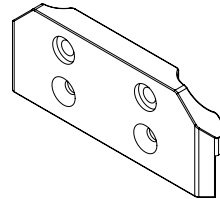
Secondary Cabinet Base Covers  
(Qty 1)



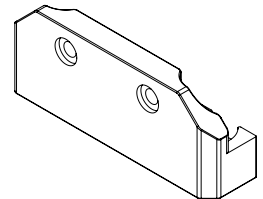
Barriers  
(Qty 2)



Cabinet Lids  
(Qty 2)



Front Anchor Block  
(Qty 4)



Rear Anchor Block  
(Qty 4)

#### Hardware:

- Barrier Clamp Bars (Qty 2)
- Barrier Clamp Bar Screws (Qty 8)
- Lid Screws (Qty 16)
- Binding Posts (Qty 8)
- Anchor Block Hex Screws (Qty 8)
- Base Cover Screws (Qty 8)
- Remote Power Supply with Enclosure
- Spade Connectors (Qty 12)

#### Concrete Anchor Package:

- 3/8" x 2" Concrete Anchors (Qty 14)
- 3/8" x 2 1/2" Hex Head Cap Screws (Qty 14)
- 3/8" Flat Washers (Qty 14)

#### Cabling:

- 8' Crossover Cable (Qty 1)

#### Software:

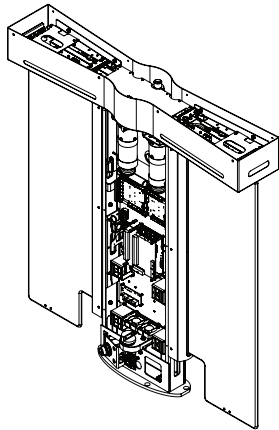
- File Management USB (Qty 1)



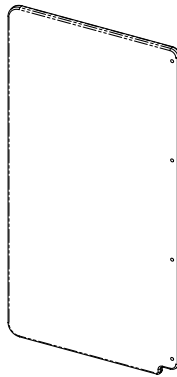
### Parts List (cont.)

Center Cabinets are used to create additional lanes for multi-lane configurations. Each additional lane includes the parts below.

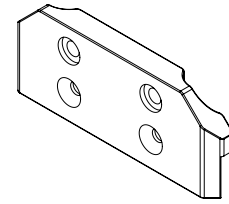
#### Center Cabinet Parts List (Per Center Cabinet)



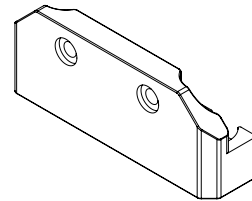
Center Cabinet  
(Qty 1)



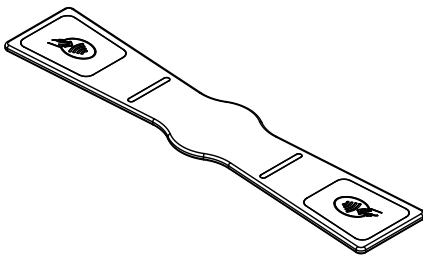
Barriers  
(Qty 2)



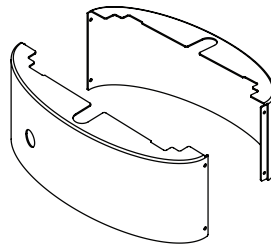
Front Anchor Block  
(Qty 2)



Rear Anchor Block  
(Qty 2)



Center Cabinet Lid  
(Qty 1)



Center Cabinet  
Base Covers  
(Qty 1)

#### Hardware:

- Removable Barrier Clamps (Qty 2)
- Barrier Clamp Mounting Screws (Qty 8)
- Lid Screws (Qty 8)
- Binding Posts (Qty 4)
- Base Cover Screws (Qty 4)

#### Concrete Anchor Package:

- 3/8" x 2" Concrete Anchors (Qty 7)
- 3/8" x 2 1/2" Hex Head Cap Screw (Qty 7)
- 3/8" Flat Washers (Qty 7)

#### Cabling:

- 8' Crossover Cable (Qty 1)



## Introduction

This manual covers the physical installation process for SU4500 Optical Turnstile. A separate *SU4500 User Guide* provides operating instructions and additional information such as configuring turnstiles for bi-directional passage applications and monitoring outputs. It is highly recommended that both this manual and the *SU4500 User Guide* be read in their entirety prior to beginning installation.

## SU4500 Cabinets

There are three types of SU4500 cabinets used to create passage lanes: a Main cabinet, a Secondary cabinet, and a center (expansion) cabinet. A single passage lane consists of a Main cabinet and a Secondary cabinet [Figure 1A]. The center cabinet is used to create additional passage lanes with the addition of a single cabinet [Figure 1B].

Each cabinet has an unsecured and secured side. Alvarado follows what we call the “right-hand rule.” User status lights and card readers are always installed on the right-hand side as you enter the turnstile.

### Main Cabinet

The center portion of the Main cabinet contains the main turnstile controller, I/O control board, motor and motor control board, power supply, safety sensor receivers, one moving barrier, and a power switch located at the base on the secured side.

The top channel of the Main cabinet contains the operational sensor receivers, a Free Pass sensor, a drive system, and a user status display that communicates lane status to the user. A card reader is normally installed during installation underneath the lid below the user status display.

### Secondary Cabinet

The center portion of the Secondary cabinet contains a motor and motor control board, safety sensor transmitters, and one moving barrier.

The top channel of the Secondary cabinet contains the operational sensor transmitters, a drive system, and a user status display that communicates lane status to the user. A card reader is normally installed during installation underneath the lid below the user status display.

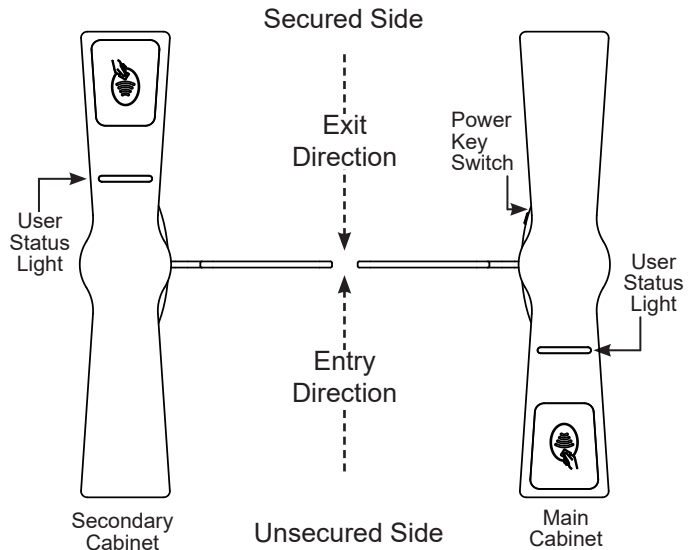
### Center Cabinet (Multi-Lane Configuration)

Center cabinets contain both Main and Secondary components. Center cabinets are extension cabinets used in multi-lane applications. An unlimited number of center cabinets can be added.

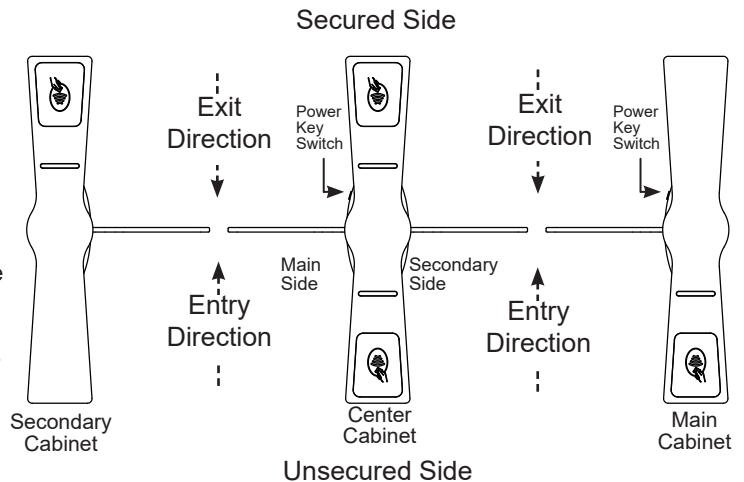
The center portion of the center cabinet contains the main turnstile controller, I/O control board, two motors and two motor control boards, power supply, safety sensors for both the Main and Secondary side of the center cabinet, two moving barriers, and a power switch located at the base on the secured side of the Main side.

The top channel of the center cabinet contains Main and Secondary side operational sensors, a Free Pass sensor, two drive systems, and two user status displays that communicate lane status to the user. Two card readers are normally installed during installation underneath the lid below the user status display on both sides of the center cabinet top channel.

**Fig. 1A** Single Lane Configuration



**Fig. 1B** Multi-Lane Configuration

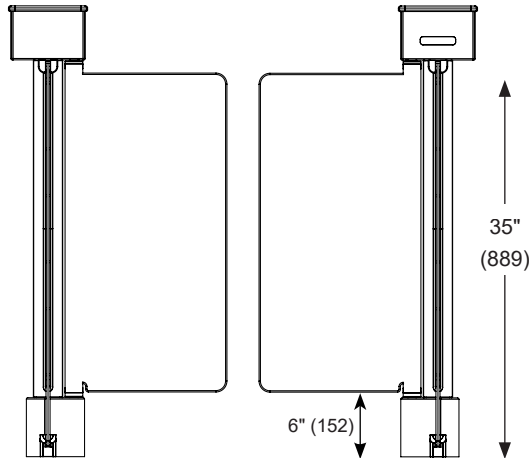




### Barrier Height

SU4500 barriers come in low (35") heights [Figure 2].

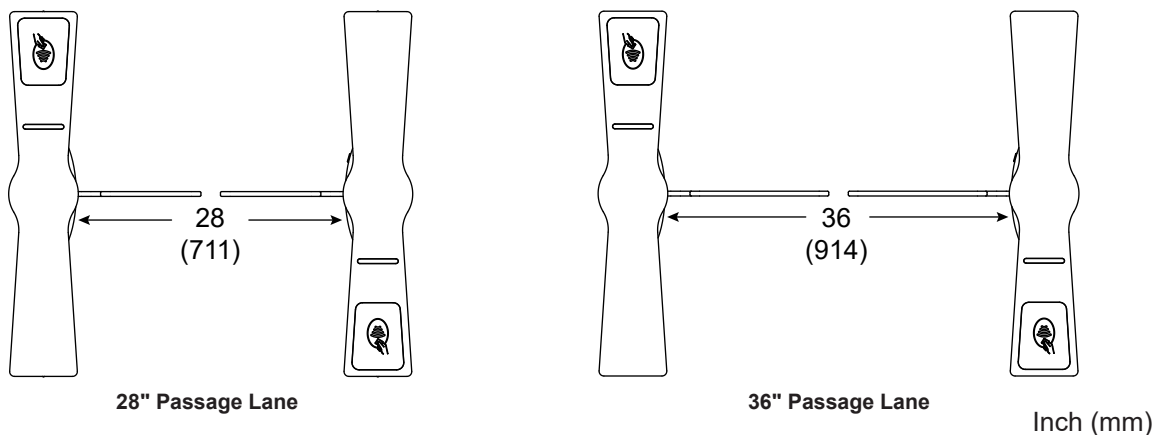
**Fig. 2** Low Height Barrier



### Passage Lane Width

SU4500 barriers come in widths to create 28" or 36" passage lanes [Figure 3].

**Fig. 3** Passage Lane Widths



### Access Control Integration

There are two types of interfaces to allow an access control system to operate with the SU4500:

#### Dry Contact

Single passage activation and the various other inputs and outputs available to / from the SU4500 are accessed through the I/O control board located in the Main cabinet. The required system input is a voltage-free, momentary dry contact. Outputs are also provided in this form. In rare cases, depending on the access control system, it may be desirable to utilize isolation relays to ensure proper system signaling. Additional information on I/O interfacing is provided later in this manual.

#### TCP/IP

For select projects, a TCP/IP interface is available. This interface allows a third party access system to communicate to / from the SU4500 using a defined TCP/IP command structure. There is an additional charge for implementation and use of the TCP/IP interface and implementation requires programming efforts on the part of the access system provider. Instructions pertaining to the TCP/IP interface is outside the scope of this manual.

### Network Communication

SU4500 turnstiles are TCP/IP enabled. Running Ethernet cabling to the SU4500 provides a number of benefits. (1) It allows implementation of Alvarado's TCP/IP control and monitoring software. (2) It allows easy implementation of SU4500 application software updates and enhancements. If the SU4500s are networked, updates can be installed over the network. (3) Alvarado has future plans to further develop the TCP/IP capabilities of the SU4500. The benefits of this future development can only be realized if the turnstiles are networked.





## Before You Begin

Use only skilled technicians for site preparation and installation of the turnstile using Alvarado's instructions.

## Slab Requirements

The following slab requirements must be taken into consideration when selecting the installation location:

- A level solid concrete pad with a minimum thickness of 4" (102mm).
- Use full sweep electrical conduit underneath the floor.
- Three separate conduits for primary source power, external data, and the crossover cable must be used.
- Cabinets must be installed plumb with the floor while level and square to each other.

## Space Requirements

Refer to the footprint and plan drawings [Figure 4a, 4b, 4c] to determine the installation location and conduit requirements for a 28" single lane. **See Appendix C on pg.41 for 36" width dimensions.**

### NOTE

For ease of installation and service, allow 2" of space between cabinets and walls or other surfaces.

Fig. 4a

Plan View

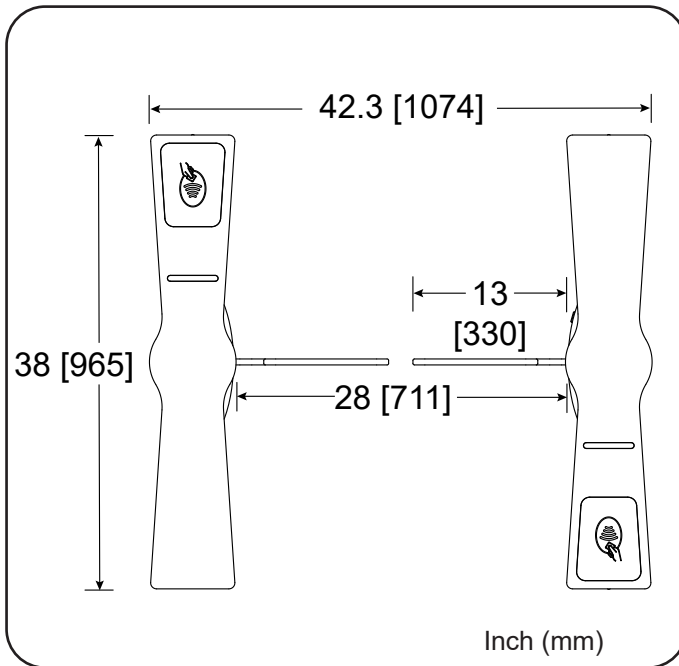
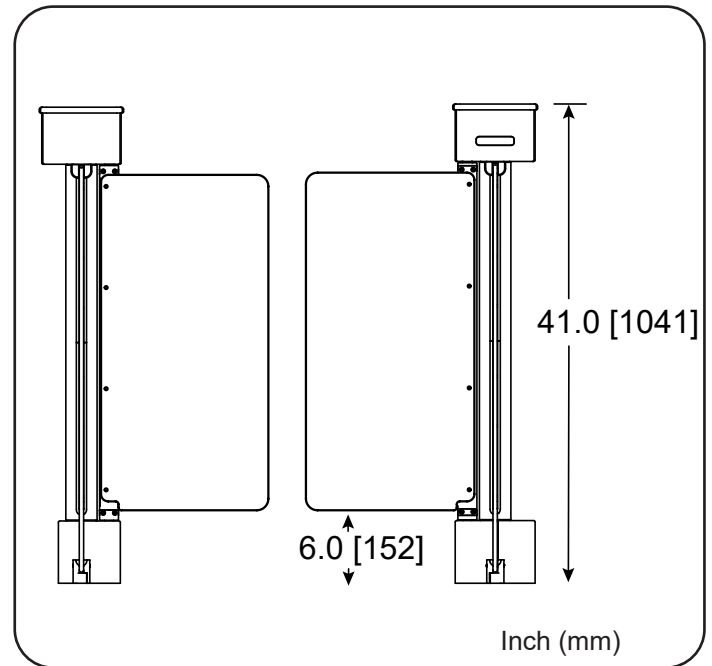


Fig. 4b

Elevation View

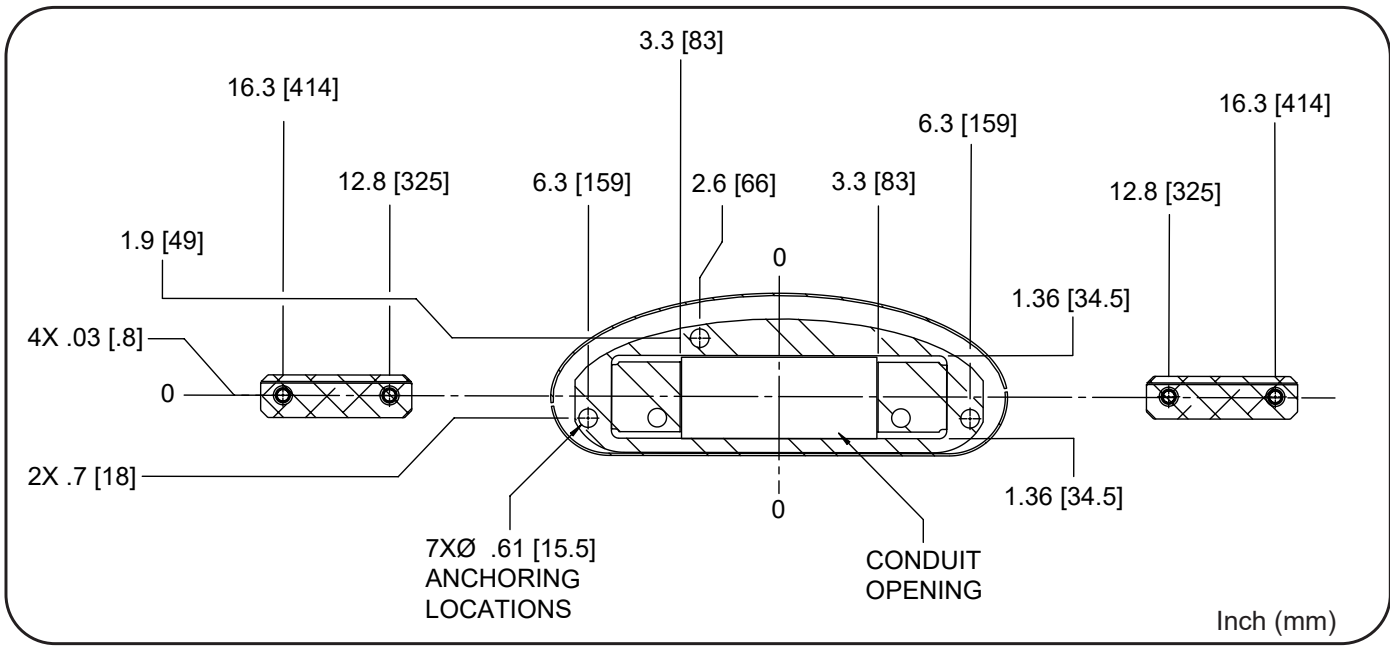




### Space Requirements (Cont.)

Fig. 4c

Footprint Drawing



### Electrical Requirements

This model requires the use of an External DC Power Supply. Refer to Appendix A for instructions of how to wire & mount the external power supply housing.

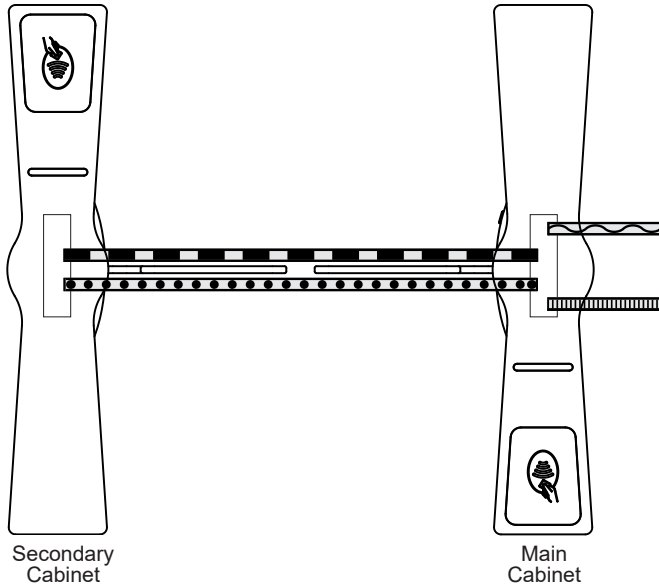
Low-voltage wires must be pulled from the External DC Power Supply install location to each Main and Center cabinets (if any).

<b>Power Supply</b>	110-120 VAC, 60 Hz or 220/240 VAC, 50 Hz
<b>Power Consumption</b>	<b>Peak:</b> 65W <b>Operating:</b> 40W <b>Idle:</b> 20W
<b>Operational Voltage</b>	Primary power is stepped down and rectified for low-voltage: 24 VDC, 12 VDC, and 5 VDC operation
<b>Fuse</b>	2.5A (slo-blo) located in the Main cabinet
<b>Drive Motor</b>	24 VDC (brushless)
<b>Surge Protection</b>	Alvarado suggests the use of surge protection on the high-voltage power line to further protect electronics



## Conduit Requirements

**Fig. 5** SU4500 Conduit Lines



**NOTE**

The opening for the conduit in the center of each cabinet is 6.50" x 2.50" (165mm x 64mm). The three required conduits MUST fit in this area [Figure 5].

Symbology	Description	Conduit Size
	Low-Voltage - 24VDC	1/2"
	Access Control / Ethernet	3/4"
	Access Control	3/4"
	Crossover Cable	1"

**NOTE**

- Seal the floor area around the conduits running up and into the cabinets. This will prevent condensation and debris build-up coming from whatever may be below the floor.
- Refer to Appendix A for instructions to wire the External DC Power Supply.

**NOTE**

For multi-lane conduit requirements, refer to Appendix D.

## Environmental Requirements

- DO NOT** install the product outdoors. This product is intended for indoor use only.
- DO NOT** install the SU4500 where infrared lighting (strobe lights, flash photography, etc.) is in the direct path of the optical sensors. Interference may affect the performance of the turnstile.

The following are suggested operating temperature and humidity ranges for the SU4500:

	Operation	Non-Operation/Storage
Temperature Range	10-32°C / 50-90°F	0-40°C / 32-104°F
Humidity Range (Non-Condensing)	15% - 85% RH	--



Operating the SU4500 outside the listed temperature and humidity ranges may negatively affect turnstile performance, and could potentially cause damage to the turnstile and void the warranty.



## Communication Requirements

### Signal Inputs and Outputs To / From Access Control System

**Inputs** - Signal inputs from outside systems are wired into the SU4500's I/O control board. There are two types of input signals, momentary dry contacts (MDC) and sustained dry contacts (SDC). All input signals must be normally open, voltage-free, dry contacts, with the exception of the fire alarm input, which can be configured (via jumper on the I/O control board) to accept either a normally open or normally closed sustained contact. MDC's must be at least 100ms in duration to register. While the SU4500 can accept signals up to 2 seconds in duration, the suggested MDC input duration is 1 second or less to support rapid throughput in high volume applications.

**Outputs** – Signal outputs are available from the SU4500's I/O control board. Outputs are normally open, voltage-free, momentary dry contacts. The output signal length is 500ms in duration.

**Inability to Provide Specified Inputs** - If the access system cannot provide the specified MDCs, isolation relays should be used. NEVER connect signal lines containing voltage directly to the I/O control board.

### Network Communication

A networked PC with Alvarado's TCP/IP control and monitoring software is required. Adhere to IEEE standards for network cabling requirements.

## Internal Card Reader Installation Requirements

Card readers or other physical access devices may be installed under the top channel lid on either or both right-hand sides of the turnstile. Card readers / physical access devices are not supplied by Alvarado.

**The card reader maximum dimensions:** 2.125" H x 4.5" W x 8" D (54mm x 114mm x 203mm)

## User Training

All personnel that will be involved with operating the SU4500 should be trained in the proper method of operation. Detailed operation instructions are outside the scope of this manual, but can be found in the *SU4500 User Guide* (also included with the product). If further training is desired, contact Alvarado for information regarding on-site training services.

## Pre-Installation Checklist

**It is the installer's responsibility to ensure the following steps are completed before beginning the installation.**

1. All components and hardware to be installed have been unpacked, correctly identified, and moved to the installation location.
2. The turnstile configuration and layout has been confirmed with the site manager.
3. All applicable requirements in the Before You Begin section have been met.



## Pre-Installation Instructions

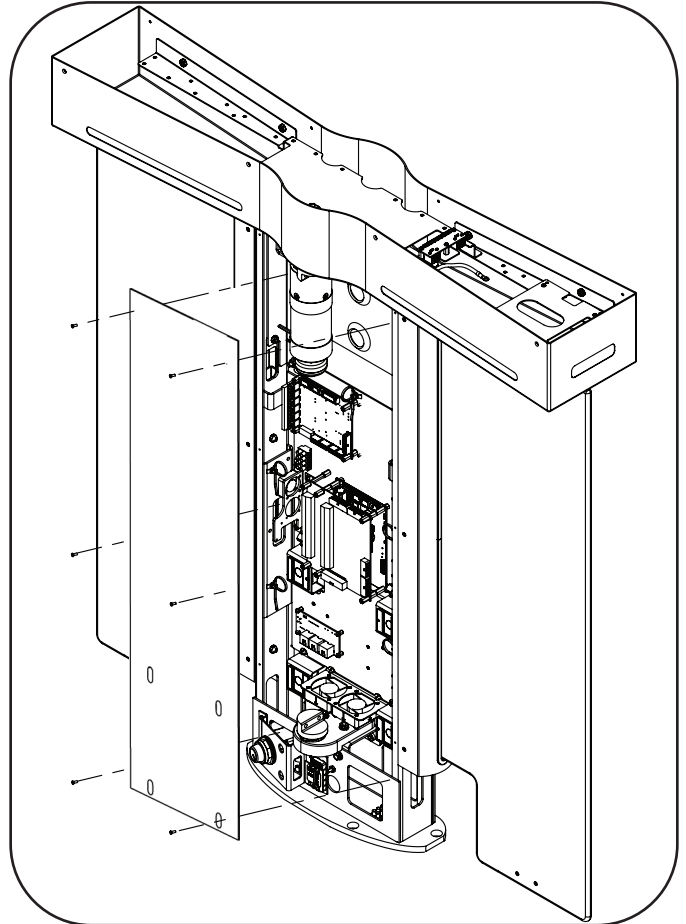
### NOTE

It is assumed that the Pre-Installation Checklist steps are complete.

## Cabinet Panel Removal

1. Using a Phillips screwdriver, remove the six (6) mounting screws that secure the cabinet panel to the Main cabinet [Figure 6]. Do not discard the cabinet panel screws as they will be reused.
2. Once the screws are removed, gently slide the cabinet panel out of position and set the panel off to the side [Figure 6].
3. Repeat steps 1 and 2 to remove the Secondary cabinet panel.

**Fig. 6** Removing Screws



### NOTE

Barrier spindle not shown for ease of view.



## Installation Instructions

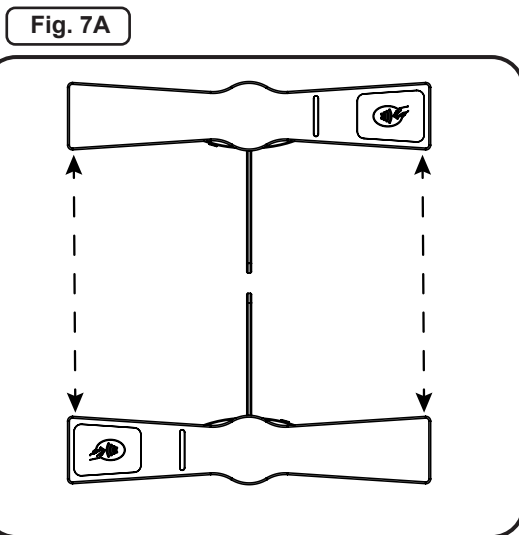
### Anchoring the Turnstile

1. Remove the turnstile cabinets from the wooden skids.
2. Using a Phillips screwdriver, remove the L-bracket attached to the bottom edge of the stationary panels. Discard the bracket.

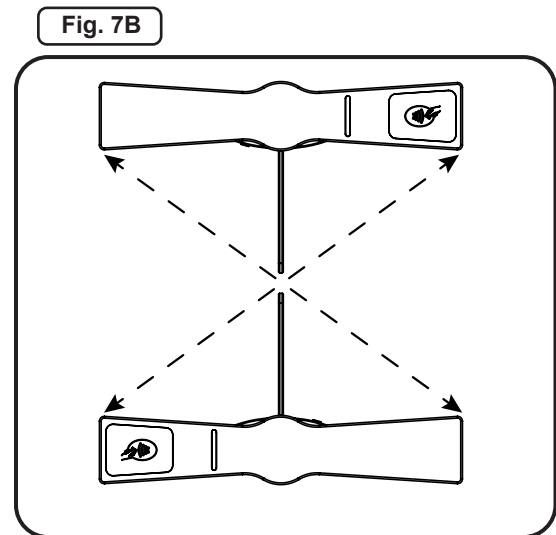
**NOTE** The Lane 1 Main cabinet is always the right-most cabinet in relation to the unsecured side.

3. Place the Main cabinet and the Secondary cabinet in the determined location [see dimensions - Figure 4].
4. All cabinets must be level and square to each other. This will ensure that the optical sensors are aligned, and that the barriers will line up properly when installed. Use the following procedures to level the cabinets, and square each cabinet with respect to the floor and other cabinets:

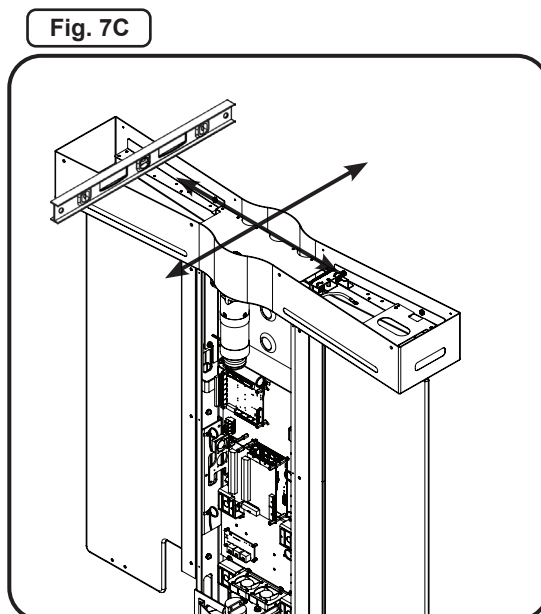
- A. Measure the distance from the inside wall of one cabinet top channel to the inside wall of the other cabinet top channel, on both the entry and exit side of the lane for a consistent measurement [Figure 7A].



- B. Measure the diagonal distance from the end of one cabinet to the end of the opposing cabinet, then measure the opposing diagonal distance [Figure 7B]. If these distances are equal, the cabinets are square.



- C. Using a level, verify each cabinet is level [Figure 7C]. If necessary, shim to bring the cabinets level.





## Anchoring the Turnstile (cont.)

5. Using a pencil, mark each mounting hole location on the center black frame of the turnstile. There will be a total of three (3) mounting holes per frame. [Fig 8]
6. Using the included anchor template, fit the curved portion of the template against the curved portion of the center black frame. Ensure the template is flush with the frame - mark the location of the two (2) anchor holes using a pencil.
7. Flip the anchor template 180 degrees and repeat Step 6 for the remaining two (2) anchor holes.

### NOTE

There are a total of 7 anchor holes per cabinet.

8. Move the cabinets once anchor locations have been marked.
9. Using a 5/8" concrete drill bit, drill the anchor holes 3" in depth at the center of each marked location.

### Caution

If drilling through terrazzo flooring, add the thickness of the terrazzo tile to the hole depth. Use appropriate length anchor bolts.

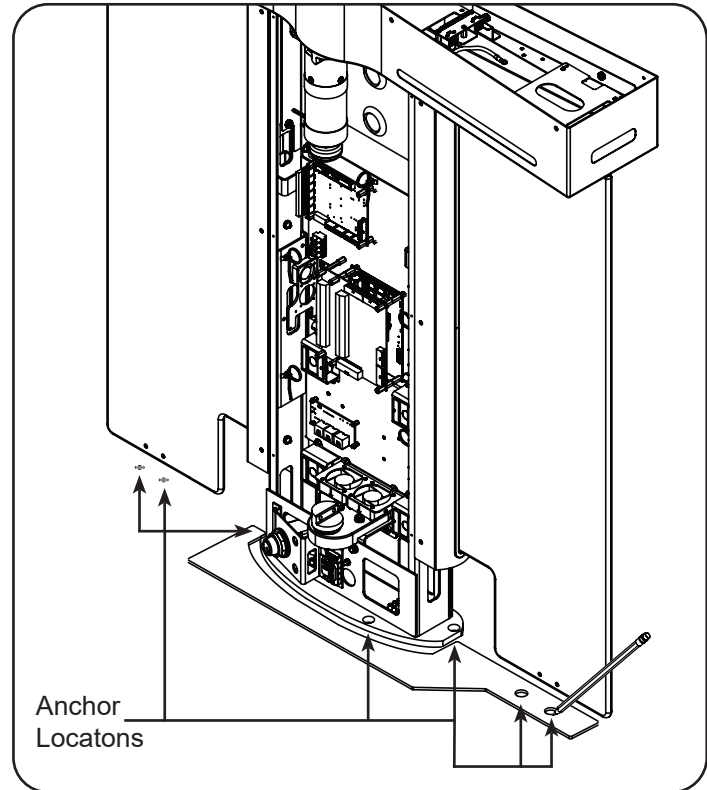
10. Using a Shop Vac, vacuum debris from each drilled anchor hole.

### NOTE

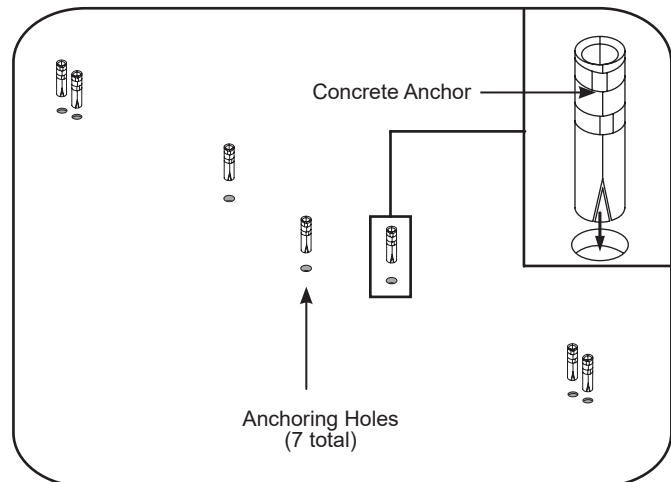
The anchor holes must be clean before installing the anchor bolts. If the holes are not clear of debris, the anchor bolts may not tighten correctly.

11. Insert anchors into each drilled hole [Figure 9]. The threaded end of the anchor must be inserted into the hole first. Use a hammer to tap the anchors into place, if needed. Ensure that the anchors are flush with the concrete floor.

**Fig. 8** Marking Anchor Holes



**Fig. 9** Inserting Anchors



### NOTE

The anchors are not torqued to specification yet, as the turnstile may need shimming during the barrier leveling procedure on Page 25. **Torque anchors to 25 ft-lbs after the barrier leveling procedure on pg.24 is completed.**



## Anchoring the Turnstile (cont.)

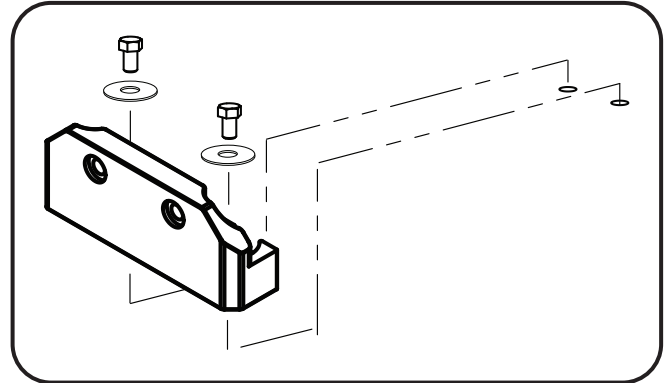
12. Place the two (2) Rear Anchor Blocks onto the floor, aligning the anchor holes. Repeat for Secondary cabinet.
13. Insert two (2) 3/8" x 2-1/2" Hex Head Cap Screws and flat washers into each of the Rear Anchor Blocks. [Fig. 10]
14. Using a torque wrench and a 9/16" socket, torque Rear Anchor Blocks anchors to 25 ft-lbs.
15. Maneuver each cabinet over the anchor locations and align the holes on the lower edge of the stationary panels with the holes in the Rear Anchor Blocks.
16. If not already done, pull all wires (low-voltage power, access control and crossover cable) through the conduit access hole into the center frame of the cabinet.

### NOTE

The last Secondary cabinet to be installed will have a bundle of RJ45 cable that must be routed along with the crossover cable. See Page 19.

17. Using RTV silicone, seal the gaps between the conduit and conduit holes.
18. Insert three (3) 3/8" x 2-1/2" Hex Head Cap Screws and flat washers into the remaining holes in the black frame.
19. Using a torque wrench, provisionally snug the anchor bolts. Do not fully tighten.
20. Using two (2) binding posts, insert the posts into the Rear Anchor Blocks.
21. Press the Front Anchor Block into position and secure in place using two (2) binding screws and two (2) #2 Phillips screwdrivers. The Front Anchor Block should be located *inside* the lane.
22. Using a 5/32" hex key, insert and secure two (2) hex bolts to secure the Rear and Front Anchor Blocks together.
23. Ensure cabinets are square and level to each other. Shim as needed to level cabinets.
24. Using a torque wrench and 9/16 socket, torque remaining anchor bolts to 25 ft-lbs.

**Fig. 10** Securing Rear Anchor Blocks







## Internal Card Reader Installation

Card readers used in conjunction with the sites' access control system are not included with the SU4500.

Most card readers do not require separate power inputs. In the event that your reader requires a separate power input – **do not draw power from the SU4500 power supply.**

Access control boards used in conjunction with the SU4500 are to be installed at locations outside of the SU4500, such as a wiring closet or other location.

1. Locate the card reader mounting bracket [Figure 11].
2. Install the card reader per manufacturer's instructions.

### NOTE

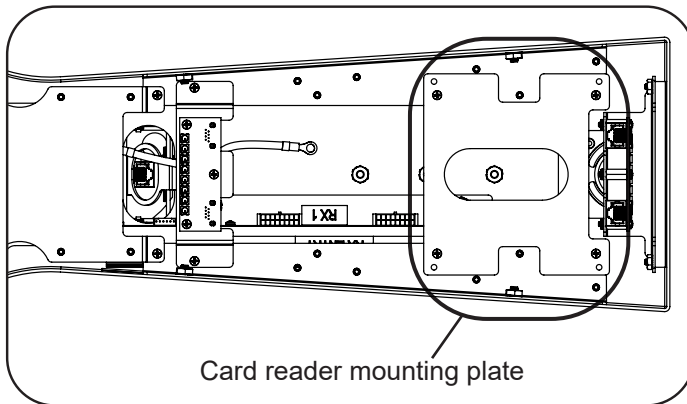
If the distance between the installed card reader and top channel lid exceeds the read range of the card reader, shims may be used to elevate the card reader by a maximum of **3/8" (9.5mm)**.

3. Route the output cable through the turnstile and connect to your access control system. [Figure 11a & 11b].

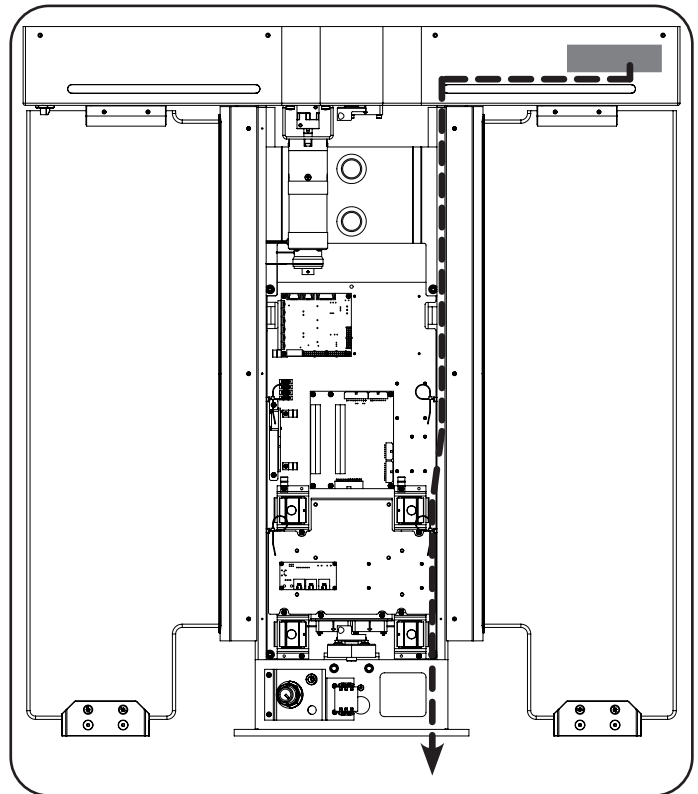
### NOTE

Output cable must be routed down through the access hole.

**Fig. 11a** Routing the Output Cable



**Fig. 11b** Routing the Output Cable



### NOTE

Ensure wires do not obstruct the discrete optic sensors.



## Wiring Instructions

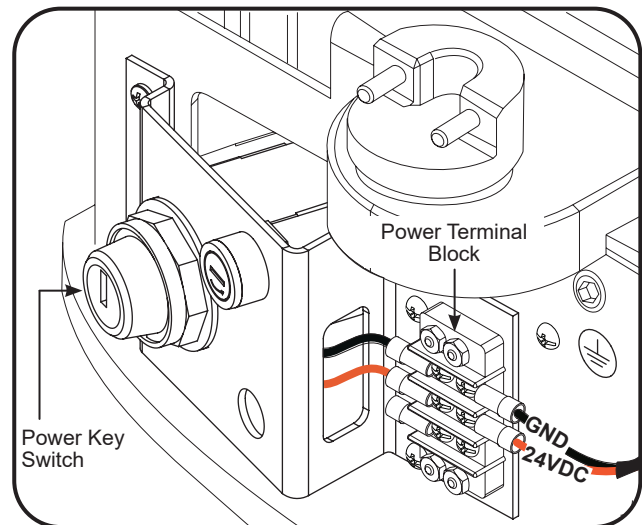
### NOTE

It is assumed the External DC Power Supply has been mounted and wired for Primary Power. Low-Voltage conduit should be run to the turnstiles according to the Conduit Requirements. Refer to Appendix A for instructions

### Low-Voltage - 24VDC Connection

1. Locate the pre-installed Power Terminal Block (located next to the power key switch).
2. Attach each low-voltage wire to the power terminal block with the corresponding color exiting on the other side. [Fig. 12]
3. Using a Phillips head screwdriver, tighten each terminal block connection.
4. Reattach the plastic cover over the Power Terminal Block.

Fig. 12



### Crossover Cable Connection

The included crossover cable carries communication signals and low-voltage 24VDC between the Main and Secondary cabinets. The default length of the crossover cable included with the SU4500 is 8'. Optional crossover cable lengths of 13', 20' and 40' are available; as well crossover cables for conduits smaller than 1.5".

1. Locate the low-voltage terminal block tucked in the bottom of the base in the Main cabinet [Figure 13].
2. Insert the 24VDC positive wire (orange) and the negative wire (black) into the terminal block, matching the colors with the other side and tighten [Figure 13].
3. Connect the data connector from the crossover cable to the data connector in the Main cabinet [Figure 13].

### NOTE

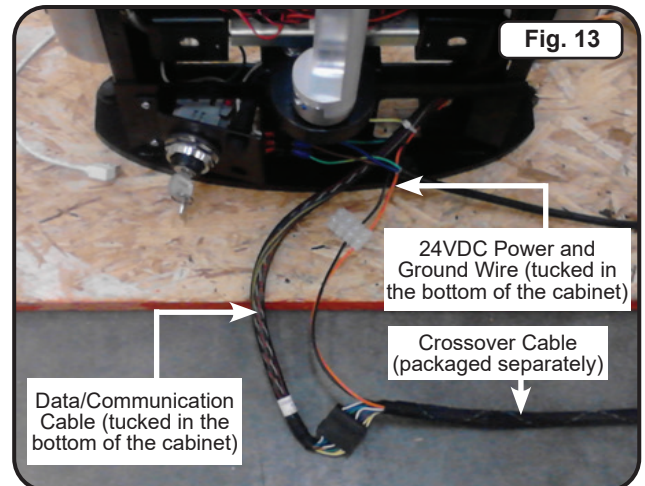
**The crossover cable must connect from Main to Secondary.**

Center cabinets have two crossover cable connectors tucked in the base: one labeled Main and one labeled Secondary.

Refer to Appendix E for crossover cable connection diagrams.

4. Repeat Steps 1 – 3 for the Secondary cabinet.

Fig. 13



### CAUTION

**DO NOT MODIFY CROSSOVER CABLE.**

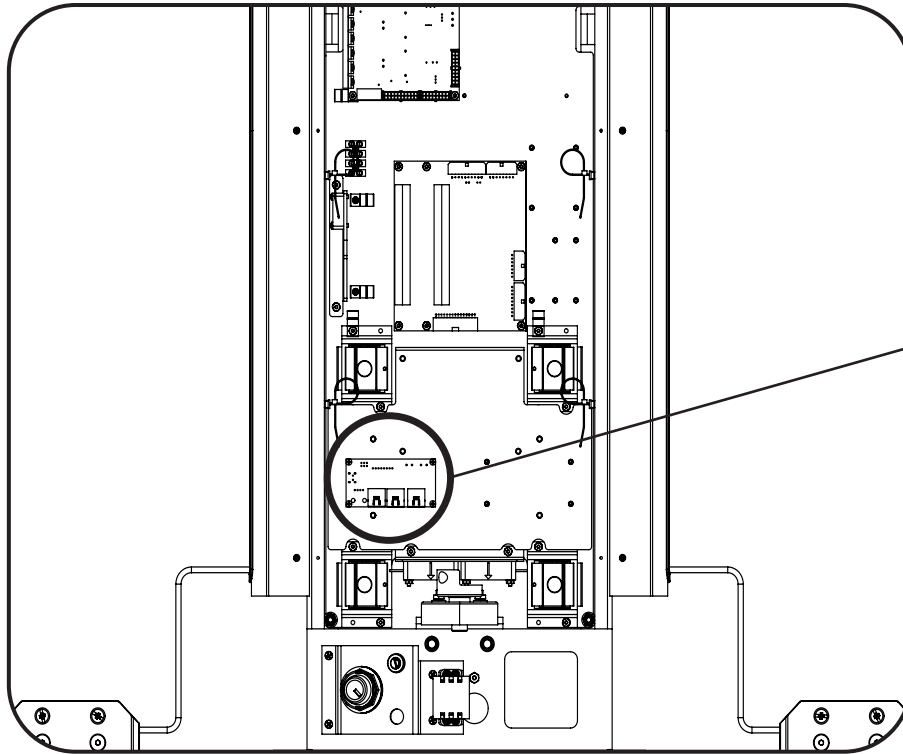
Modifying the crossover cable will void the product warranty.



## LED Light Connection from Secondary Cabinet

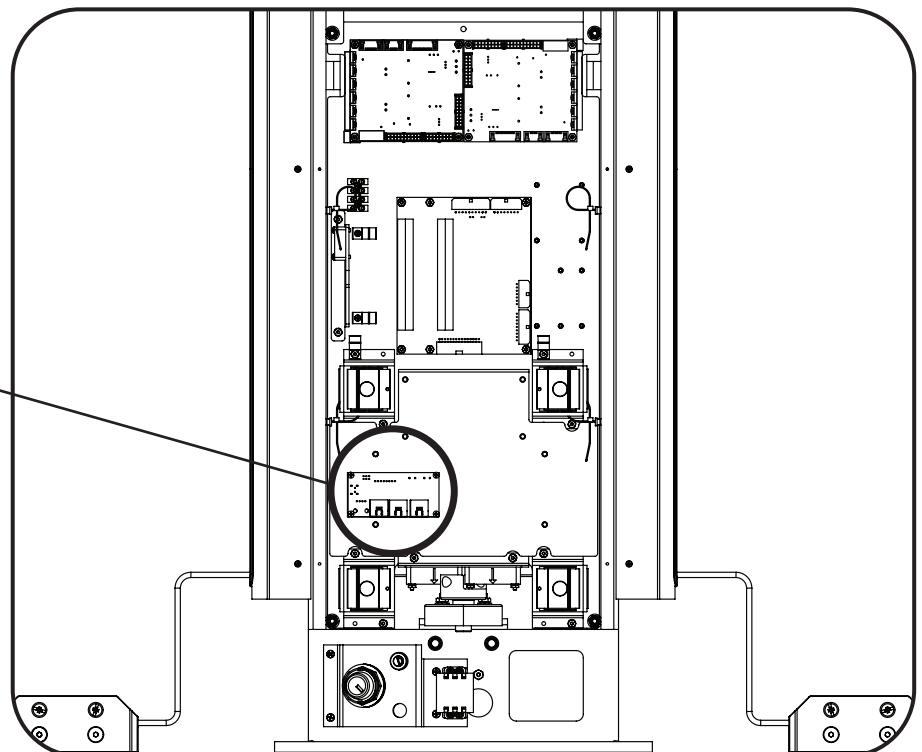
The Secondary cabinet will contain a bundle of RJ45 cable located at the bottom of the black frame of the cabinet. This cable must be pulled along with the crossover cable and connect to the Main cabinet, if a single lane; or the last Center cabinet, if a multi-lane set. [Figure 14 A&B]

**Fig. 14A** Single Lane LED Connection Location



**Single Lane:**  
Connect Secondary RJ45 to Secondary on power board located in Main cabinet.

**Fig. 14B** Multi-Lane Set LED Connection Location



**Multi-Lane:**  
Connect Secondary RJ45 to Secondary on power board located in last Center cabinet.



# I/O Control Board

## Signal Inputs and Outputs To / From Access Control System

### Inputs

Signal inputs from outside systems are wired into the SU4500's I/O control board. There are two types of input signals, momentary dry contacts (MDC) and sustained dry contacts (SDC). All input signals must be normally open (N.O.), voltage-free, dry contacts, with the exception of the fire alarm input, which can be configured (via jumper on the I/O control board) to accept either a normally open or normally closed (N.C.) sustained contact. MDC's must be at least 100ms in duration to register. While the SU4500 can accept signals up to 2 seconds in duration, the suggested MDC input duration is 1 second or less to support rapid throughput in high volume applications.

### Outputs

Signal outputs are available from the SU4500's I/O control board. Outputs are normally open, voltage-free, momentary dry contacts. The output signal length is 500ms in duration.

### Inability to Provide Specified Inputs

If the access system cannot provide the specified MDCs, isolation relays should be used. NEVER connect signal lines containing voltage directly to the I/O control board.

Fig. 15 Main Cabinet

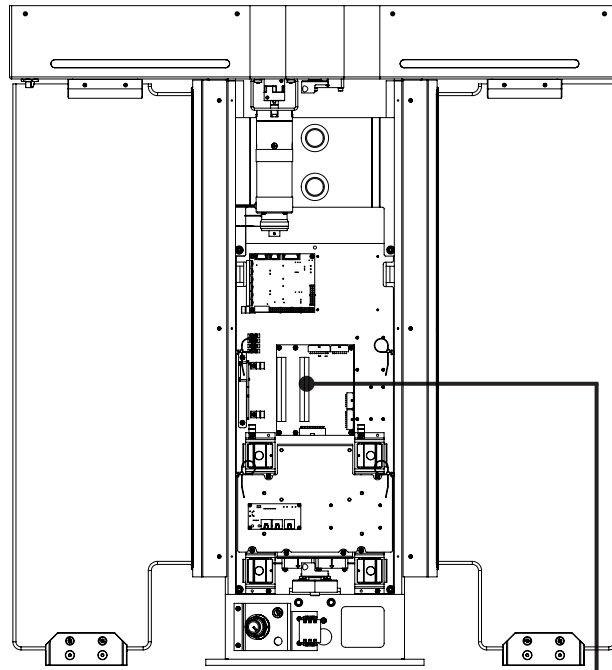
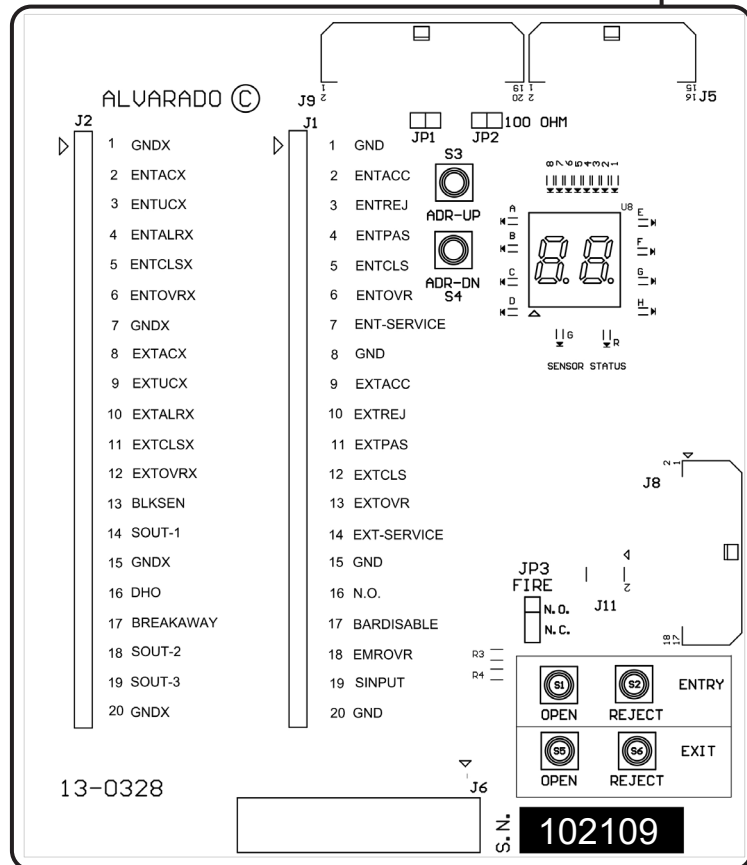


Fig. 15A I/O Control Board



LEGEND	
ITEM	NAME
J1	Input Terminals
J2	Output Terminals
JP1	RS485 Termination Resistor
JP2	RS485 Termination Resistor
JP3	Fire Alarm System Jumper (N.O. - N.C.)
S1	Entry Side Open Test Button
S2	Entry Side Reject Test Button
S3	Previous Sensor Group
S4	Next Sensor Group
S5	Exit Side Open Test Button
S6	Exit Side Reject Test Button



## I/O Control Board Terminal Descriptions

J2 Output Contacts					J1 Input Contacts				
Pin #	Pin Name	Function Description	Contact Type	Function & Behavior Description	Pin #	Pin Name	Function Description	Contact Type	Function & Behavior Description
1	GNDX	Ground	N/A	Common output signal ground.	1	GND	Ground	N/A	Common input signal ground.
2	ENTACX	Authorized Passage Entry	MDC	An output occurs when an authorized entry passage is completed.	2	ENTACC	Good Card Entry	MDC	Opens the turnstile for one authorized passage until passage occurs or timeout.
3	ENTUCX	Unauthorized Passage Entry	MDC	An output occurs when an unauthorized entry passage is completed.	3	ENTREJ	Bad Card Entry	MDC	Illuminates the entry side RED User Status Icon for 2 seconds.
4	ENTALRX	Unauthorized Presence Entry	MDC	An output occurs when there is entry into the lane area from the entry direction without authorization.	4	ENTPAS	Free Passage Entry	SDC	Sets the turnstile to Free Passage mode in the entry direction.
5	ENTCLSX	Tailgate Passage Entry	MDC	An output occurs when there is a tailgate passage in the entry direction.	5	ENTCLS	Close Direction Entry	SDC	Sets the turnstile to No Passage mode in the entry direction.
6	EXTACX	N/A	N/A	Reserved	6	ENTOVR	Single Override Entry	MDC	Opens the turnstile for one authorized passage in the entry direction independent of the access control system. (Typically used for button at security desk.)
7	GNDX	Ground	N/A	Common output signal ground.	7	ENTSERVICE	Visitor Mode	SDC	Places the turnstile in Free Passage/Barrier Disabled Mode in both the entry and exit directions.  ** Used with Power Buffer option to open barriers on power loss.
8	EXTACX	Authorized Passage Exit	MDC	An output occurs when an authorized exit passage is completed.	8	GND	Ground	N/A	Common input ground signal.
9	EXTUCX	Unauthorized Passage Exit	MDC	An output occurs when an unauthorized exit passage is completed.	9	EXTACC	Good Card Exit	MDC	Opens the turnstile for one authorized passage until passage occurs or timeout.
10	EXTALRX	Unauthorized Presence Exit	MDC	An output occurs when there is entry into the lane area from the exit direction without authorization.	10	EXTREJ	Bad Card Exit	MDC	Illuminates the exit direction RED User Status Icon for 2 seconds.
11	EXTCLSX	Tailgate Passage Exit	MDC	An output occurs when there is a tailgate passage in the exit direction.	11	EXTPAS	Free Passage Exit	SDC	Sets the turnstile to Free Passage mode in the exit direction.
12	EXTOVRX	N/A	N/A	Reserved	12	EXTCLS	Close Direction Exit	SDC	Sets the turnstile to No Passage mode in the exit direction.
13	BLKSEN	Blocked Sensor	MDC	An output occurs when a sensor is blocked for a defined length of time (default 15 seconds).	13	EXTOVR	Free Passage Sensor Accept	MDC	Accepts activation signals from the Free Pass sensor.
14	SOUT-1	Free Passage Exit	MDC	An output occurs when there is a activation in the exit direction.	14	EXTSERVICE	Lid Alarm Input	N/A	Used in conjunction with the Lid Alarm option.
15	GNDX	N/A	N/A	Common output signal ground.	15	GND	Ground	N/A	Common input ground signal.
16	DHO	Door Held Open	MDC	An output occurs when the barriers remain open after the allotted time to close after passage (default 12 seconds).	16	N/O	Normally Open Mode	N/A	Not available on the SU4500.
17	BREAKAWAY	Barrier Broken Away	MDC	An output occurs when the barrier holding force has been exceeded and the barriers give way.	17	BARDISABLE	Barrier Disable Mode	SDC	Sets the turnstile to Barrier Disabled mode for barrierless optical turnstile operation.
18	SOUT-2	Lid Alarm	MDC	An output occurs when the lid load sensors detect sufficient weight on the lid to prevent climbing over the cabinets.	18	EMROVR	Emergency Override	SDC (N.O. or N.C.)	Opens the barriers toward the unsecured side; barriers remain open and turnstile is inactive until SDC is removed, or contact is reestablished if N.C. jumper is enabled. (Typically used for fire alarm or life safety systems.)
19	SOUT-3	N/A	N/A	Reserved	19	SINPUT	N/A	N/A	Reserved
20	GNDX	Ground	N/A	Common output signal ground.	20	GND	Ground	N/A	Common output signal ground.



## Configuring Passage Modes

The SU4500 provides bi-directional access control in conjunction with a facility access control system. For bi-directional applications, the entry and exit directions can be individually configured to different passage modes to suit facility requirements. For example, a turnstile can be configured for Controlled Passage mode in the entry direction, and No Passage mode in the exit direction. SU4500 passage modes are described on Page 26. Further information on the smart use of passage modes can be found in the *SU4500 User Guide*.

Turnstile passage modes can be configured in one of two ways:

### I/O Control Board

Passage modes are set via wiring to the I/O control board inputs. This method is ideal for facilities that do not require changing passage mode configurations throughout the day. This is the most common method used by our customers. Instructions for wiring to the I/O control board are provided below.

### GateKeeper

GateKeeper is an optional web-based software application. GateKeeper, along with other functionality, allows the passage modes for both the entry and exit side of the turnstiles to be changed. Instructions on configuring passage modes using GateKeeper is outside the scope of this manual.

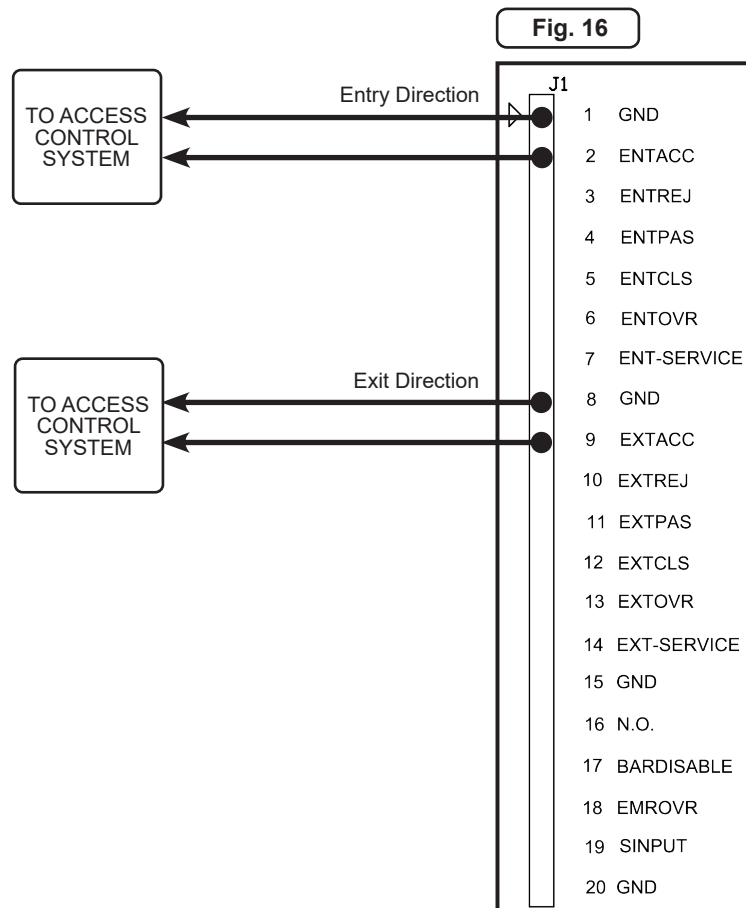
## Setting Controlled Passage Mode (I/O Control Board)

### Entry Direction

1. Locate the access control system leads used to indicate an authorized passage in the **entry** direction is allowed.
2. Connect leads to the ENTACC and GND terminals on the I/O control boards input terminal strip (J1) [Figure 16].

### Exit Direction

1. Locate the access control system leads used to indicate an authorized passage in the **exit** direction is allowed.
2. Connect leads to the EXTACC and GND terminals on the I/O control boards input terminal strip (J1) [Figure 16].





## Setting No Passage Mode (I/O Control Board)

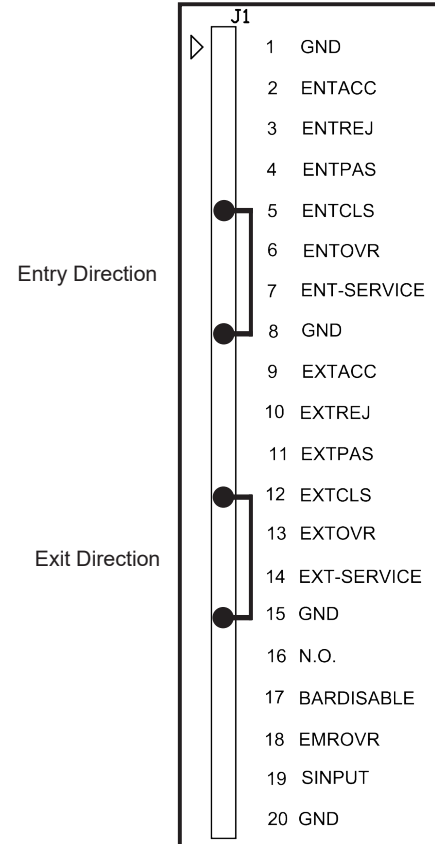
### Entry Direction

1. Locate the ENTCLS and GND terminals.
2. Use a wire jumper to connect the ENTCLS and GND terminals [Figure 17].

### Exit Direction

1. Locate the EXTCLS and GND terminals.
2. Using a wire jumper, connect the EXTCLS and GND terminals [Figure 17].

Fig. 17



## Setting Free Passage Mode (I/O Control Board)

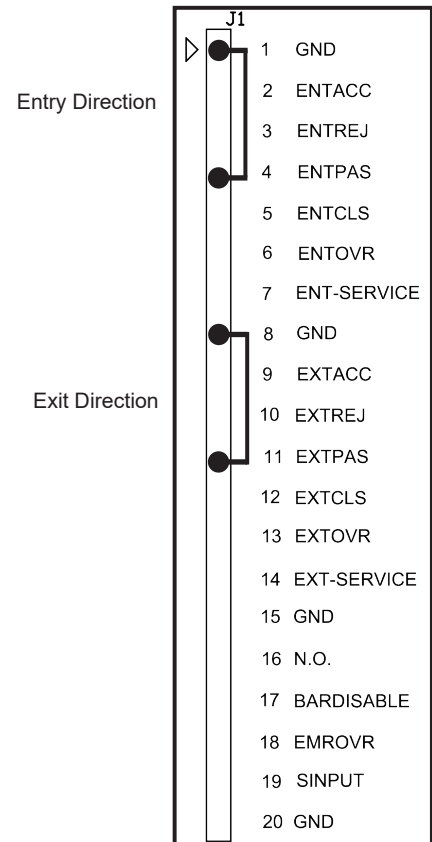
### Entry Direction

1. Locate the ENTPAS and GND terminals.
2. Using a wire jumper, connect the ENTPAS and GND terminals [Figure 18].

### Exit Direction

1. Locate the EXTPAS and GND terminals.
2. Use a wire jumper to connect the EXTPAS and GND terminals [Figure 18].

Fig. 18





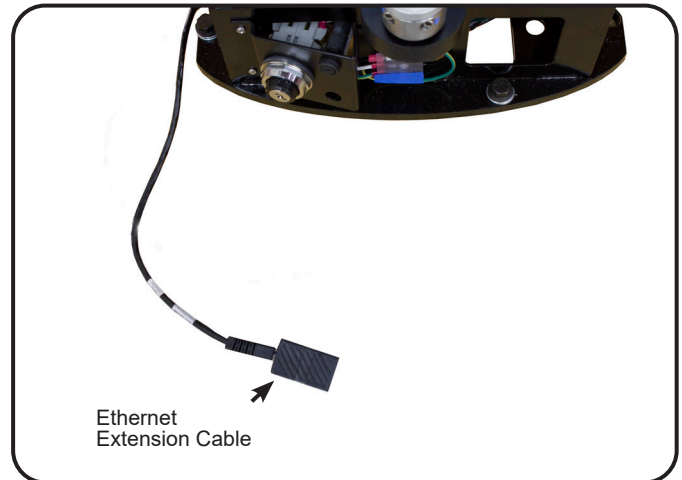
## Ethernet Communication (Optional)

### NOTE

It is assumed that Ethernet cabling has been run to the turnstile via conduit and pulled through the conduit opening in Step 17 of the Anchoring the Turnstile section.

1. Locate the Ethernet extension cable tucked in the base of the Main/center cabinet [Figure 19].
2. Connect the Ethernet cable to the Ethernet extension cable.
3. Tuck the Ethernet extension cable back into the base of the cabinet.

Fig. 19 Ethernet Cable Location



## Barrier Installation

### NOTE

The barriers are shipped unattached to the turnstile. The clamp bars and hardware are packaged in the box labeled "HARDWARE ENCLOSED."



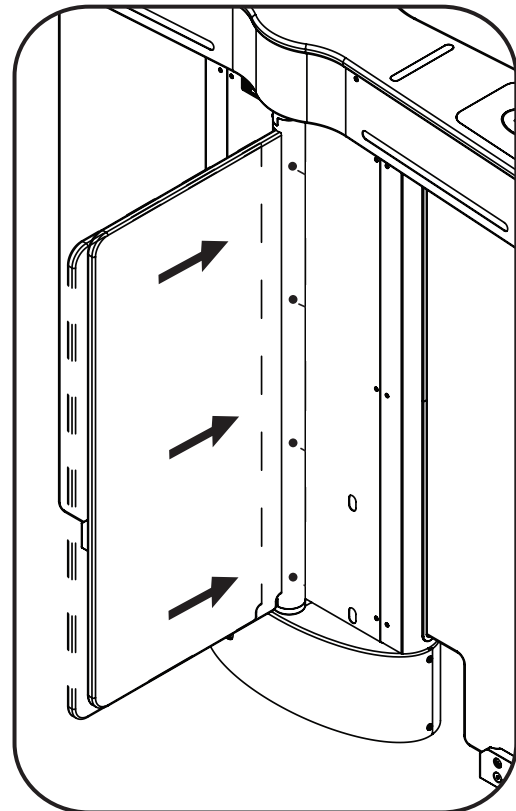
This installation requires two people: One person will need to hold the barrier while the other person inserts and tightens the mounting screws.

1. Insert the barrier edge into the mounting groove on the spindle, aligning the barrier and spindle mounting holes [Figure 20].

### NOTE

- Exercise care not to scratch the barriers during handling. Do not lay or lean the barriers on an abrasive surface. If the barriers are going to be cleaned, use only a soft cloth and a cleaner suitable for acrylic surfaces.
- If barriers are etched, ensure barriers are installed in the correct orientation.

Fig. 20 Inserting Barrier Edge



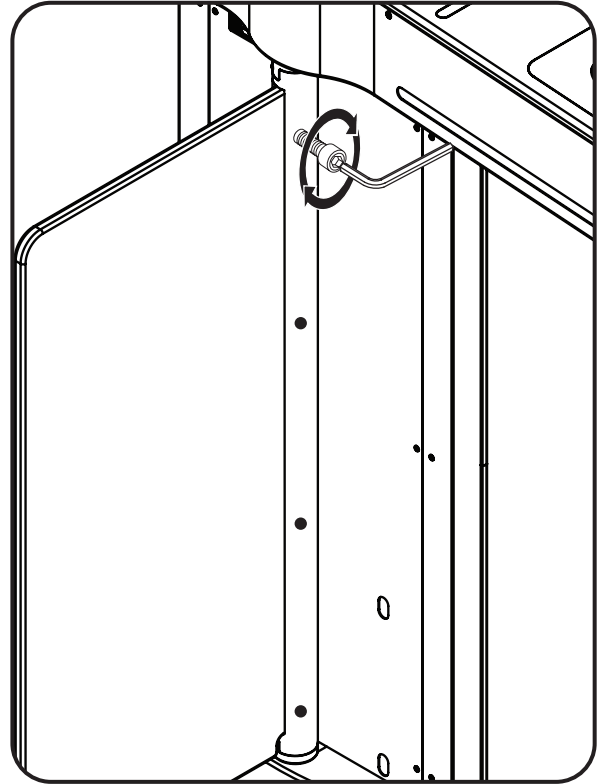




## Barrier Installation (cont.)

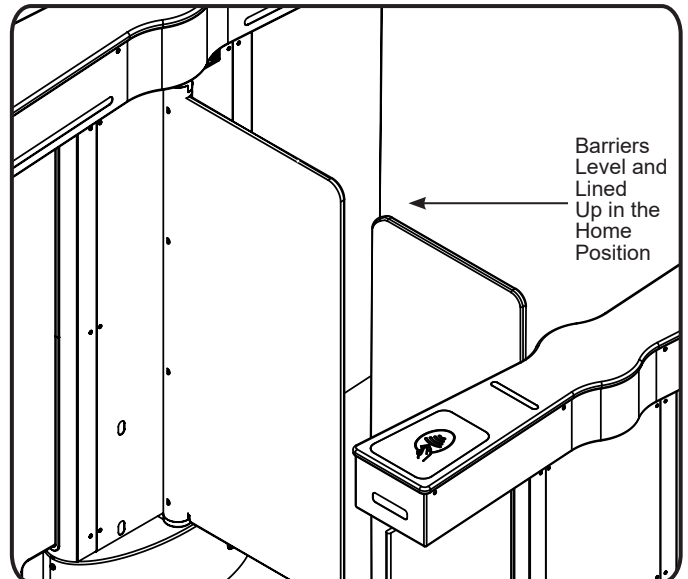
- Position the clamp bar on the barrier. Insert and tighten the mounting screws and clamp bar to 44 in-lbs. Test to make sure the barrier does not wiggle [Figure 21].

**Fig. 21** Tightening Mounting Screws



- Once the barriers have been installed, manually move the barriers and check that they are level and lined up properly in the Home position. If the barriers do not line up in the Home position, the cabinets may not be level. Refer to Page 14 for instructions on leveling and squaring the cabinets. [Fig. 22]

**Fig. 22** Checking that Barriers are Level



### NOTE

The barriers below are shown in the Home Position.









## Post-Installation Functions Check

Alvarado turnstiles are thoroughly inspected and tested for proper performance prior to being shipped. Perform the following function checks to verify the turnstiles have been installed properly and are fully operational. If any problems are encountered during the functions check, refer to the Troubleshooting section on pg.33.

## Passage Modes

Before beginning the Post-Installation Functions Check, please read the following brief descriptions of the three SU4500 passage modes. More information on SU4500 passage modes can be found in the *SU4500 User Guide*.

Passage Mode	Description	User Status Light	Open / Closed Light
<b>Controlled Passage</b>	The barriers are closed, securing the turnstile. Upon receipt of an authorization signal from an access control system the barriers move away from the user to the open position, allowing a single passage in the authorized direction. The barriers will close after the user has passed through the turnstile or the time delay reset (6 second default) has expired.  <b>This is the default passage mode SU4500s are set to before leaving the factory.</b>	 Amber	 Green
<b>Free Passage</b>	An access control authorization signal is not required for a user to pass through the turnstile. Barriers are closed until a user enters the turnstile at which time the barriers automatically open in the direction of travel. The barriers will close after the user has passed through the turnstile or the time delay reset (6 second default) has expired.	 Green	 Green
<b>No Passage</b>	No passage is allowed. The barriers are closed and remain closed. Valid electronic credentials are ignored and passage is not allowed. The barriers will still open in the exit direction if a fire alarm or life safety input is received.	 Red	 Red

## Powering On

### NOTE

The keys to power the turnstile ON/OFF are packaged in the hardware box that was shipped with the turnstile.

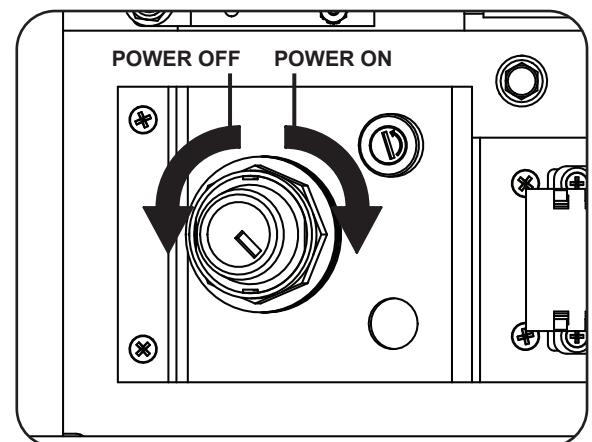
There is a power key switch on the inside of the base cover of all Main and center cabinets.

1. Turn power on using the power key switch [Figure 23]. The power-up cycle will take less than one minute to complete.
2. After the power-up sequence has completed, the SU4500 barriers will move to the Home position and the SU4500 will enter into Controlled Passage mode, for both the entry and exit directions.

### NOTE

Barriers are pre-aligned at the factory. However, they may need slight adjustment after installation. Refer to Appendix B on pg.40 for instructions on setting the barrier Home position.

**Fig. 23** Power Key Switch





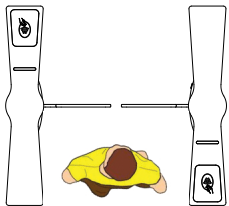
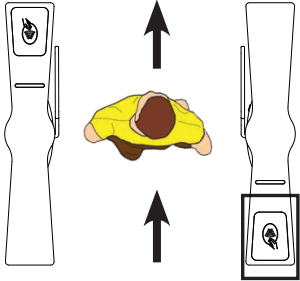
## Testing Turnstile Functionality

Perform the following turnstile functionality tests to validate basic turnstile operation. Tests are provided for Controlled Passage, No Passage, and Free Passage modes.

The following is assumed (Controlled Passage mode tests only):

- The access control system is operational and all access control wiring to the turnstile is connected.
- Valid access cards are on hand for activating the turnstile.

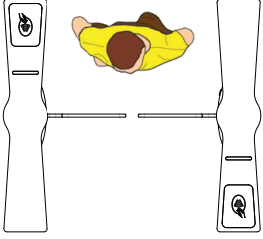
### CONTROLLED PASSAGE MODE

TEST	PROCEDURE	TURNSTILE RESPONSE
<p style="text-align: center;"><b>Unauthorized Entry / Exit</b></p> <p style="text-align: center;">Secured Side</p>  <p style="text-align: center;">Unsecured Side</p> <p style="text-align: center;">(Unauthorized Entry shown)</p>	<p>Enter the turnstile without authorization.</p>	<ul style="list-style-type: none"> <li>• Unauthorized Entry / Exit alarm sounds.</li> <li>• User Status Light flashes red in the direction of the violation.</li> <li>• Open / Closed Status Light turns red in the direction of the violation.</li> <li>• Barriers remain closed.</li> </ul>
<p style="text-align: center;"><b>Authorized Entry / Exit</b></p> <p style="text-align: center;">Secured Side</p>  <p style="text-align: center;">Unsecured Side</p> <p style="text-align: center;">(Authorized Entry shown)</p>	<p>Using a valid card, activate the turnstile. Walk through the turnstile. Verify the barriers close upon passage completion.</p>	<ul style="list-style-type: none"> <li>• Authorized Entry chime sounds.</li> <li>• User Status Light turns green in the direction of passage.</li> <li>• Barriers move to the open position, and close upon passage completion or the timeout period is reached.</li> </ul>

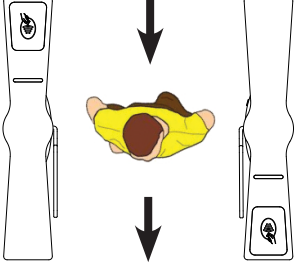


## Testing Turnstile Functionality (cont.)

### NO PASSAGE MODE

<p><b>No Passage Entry / Exit</b></p> <p>Secured Side</p>  <p>Unsecured Side</p> <p>(No Passage Exit shown)</p>	<p>Enter the turnstile.</p>	<ul style="list-style-type: none"><li>• Open / Closed Status Light is red.</li><li>• No alarms sound when standing in the turnstile.</li><li>• Barriers remain closed.</li></ul>
--	-----------------------------	--

### FREE PASSAGE MODE

<p><b>Free Passage Entry / Exit</b></p> <p>Secured Side</p>  <p>Unsecured Side</p> <p>(Free Passage Exit shown)</p>	<p>Enter the turnstile from the side equipped with the free pass sensor and complete a passage.</p>	<ul style="list-style-type: none"><li>• Barriers open away from the user entering the turnstile.</li><li>• Barriers close after passage completion.</li></ul>
--	---	---



## Testing Ethernet Communication (Optional)

### NOTE

The following procedure is applicable to non-networked (standalone) turnstiles. For instructions on testing Ethernet communication over a facility network, please refer to the *SU4500 User Guide*.

### Required Items:

- CAT5/6 Ethernet Cable
- Laptop Computer Running Windows 7 or Windows 8

1. Locate the Ethernet Adapter extension tucked in the base of the Main/center cabinet [Figure 24].
2. Connect the Ethernet cable to the Ethernet adapter extension.
3. Connect the other end of the Ethernet cable to the laptop computer.
4. Launch **Command Prompt** on the computer by typing **CMD** in the 'Search programs and files' field.
5. Enter the following command: **ping XXX.XXX.XXX.XXX**, where XXX.XXX.XXX.XXX is the IP address of the turnstile [Figure 24].

### NOTE

192.168.0.100 is the default IP address configured by Alvarado. If the turnstile has been assigned a different network IP address, ping that IP address instead. Contact your system administrator for network information.

6. A successful ping will result in the message shown in [Figure 25]:

Fig. 24 Ethernet Adapter

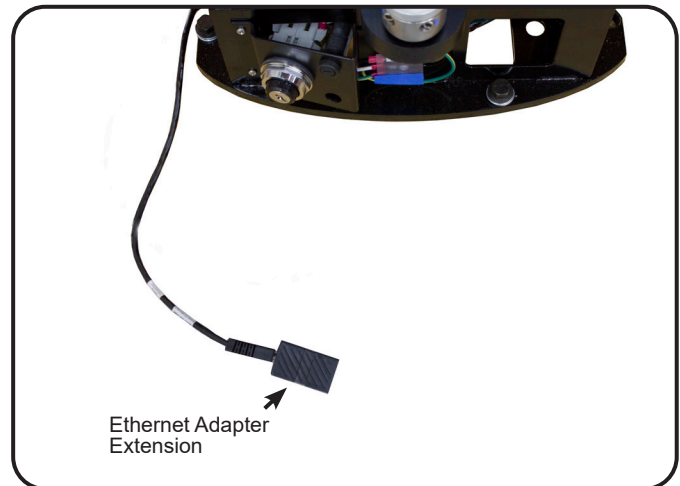


Fig. 25 Ping Results

```

C:\> Administrator: C:\Windows\system32\cmd.exe
C:\> ping 192.168.0.100
Pinging 192.168.0.100 with 32 bytes of data:
Reply from 192.168.0.100: bytes=32 time<1ms TTL=128
Reply from 192.168.0.100: bytes=32 time<1ms TTL=128
Reply from 192.168.0.100: bytes=32 time<1ms TTL=128
Reply from 192.168.0.100: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
  
```



## Finish the Installation

### Cabinet Lid Installation

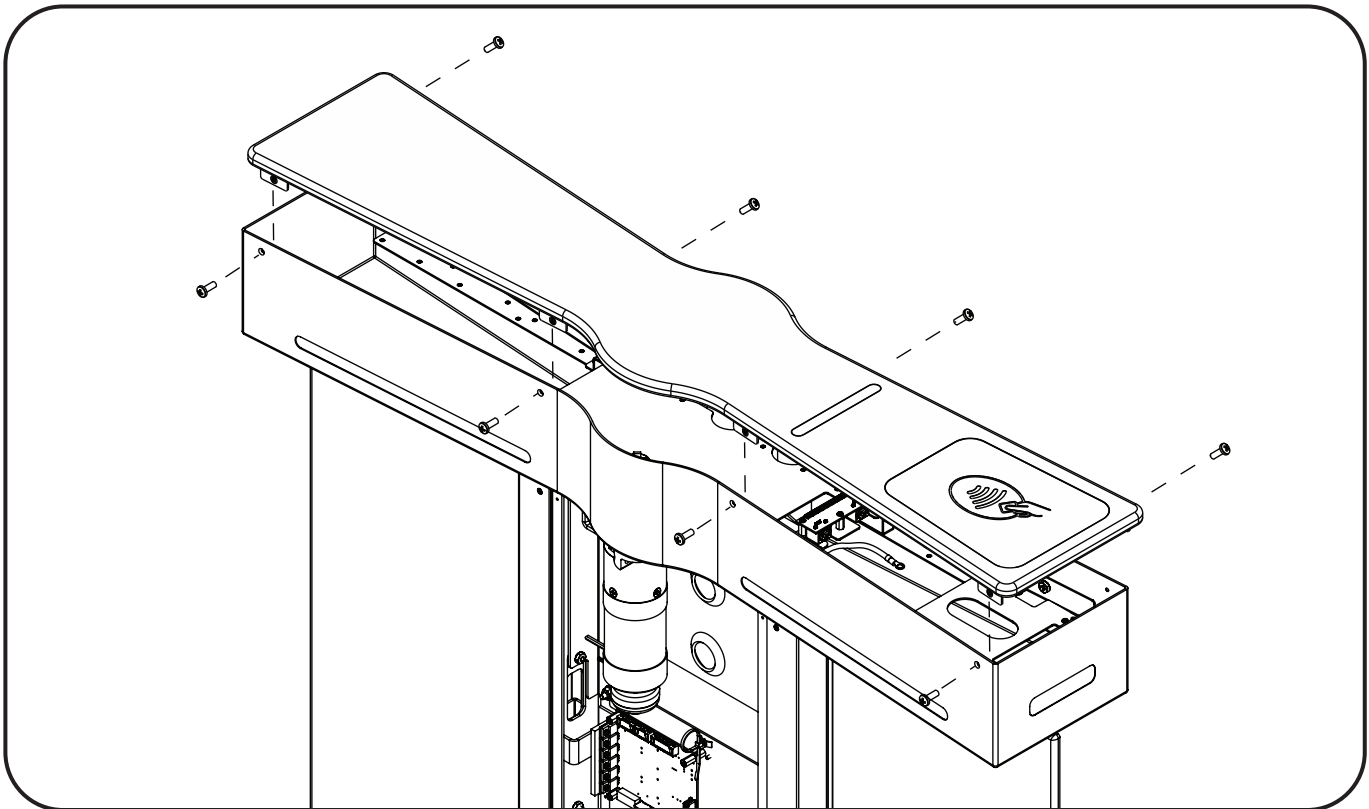
1. Lower the lid onto the cabinet housing [Figure 26].

**WARNING**

Do not force the lid into place. Doing so may damage the lid.

2. Secure lid in place using a Phillips screwdriver and eight (8) lid screws [Figure 26].
3. Repeat steps 1 and 2 to install the remaining cabinet lid(s).

**Fig. 26** Cabinet Lid Installation

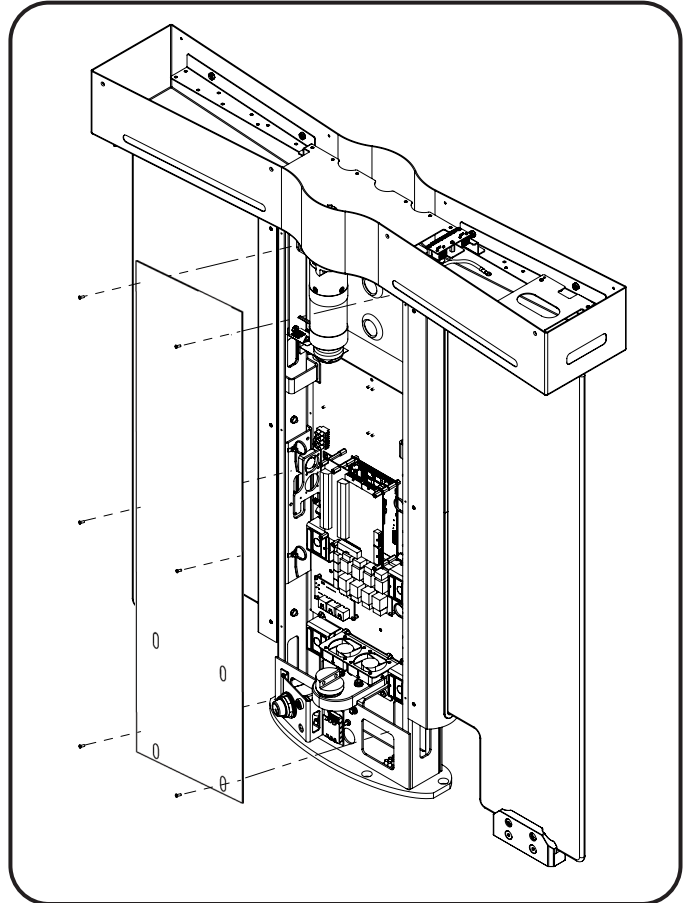




## Cabinet Panel Installation

1. Orient the cabinet panel so the sensor windows are at the bottom and gently slide the cabinet panel into position.
2. Using a Phillips screwdriver, insert and tighten the six (6) mounting screws that secure the cabinet panel to the cabinet [Figure 27].

**Fig. 27** Cabinet Panel Installation



**NOTE**

Barrier spindle not shown for ease of view.

## Base Cover Installation

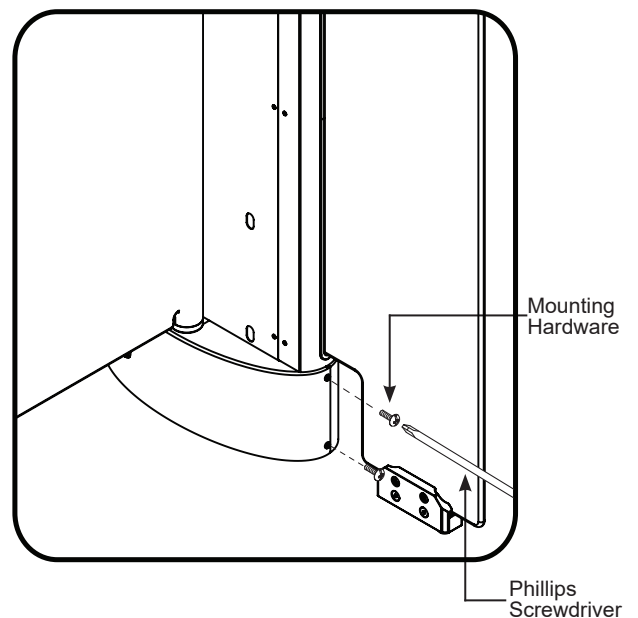
1. Place the base covers in position. The opening for the power key switch must be facing towards the interior of the lane.

**NOTE**

Main and center cabinet base covers can be identified by the power key switch hole.

2. Align the four (4) mounting holes (two (2) are located on each side of the base cover) [Figure 28].
3. Using a Phillips screwdriver, insert and tighten the mounting hardware [Figure 28].
4. Repeat Steps 1 - 3 to install the remaining base covers.

**Fig. 28** Base Cover Installation





## Post-Installation Checklist

1. Power On
  - SU4500 boots up successfully as indicated by two audible chimes.
2. Lane Functionality
  - User status displays and open / closed status lights are functioning properly.
  - Auditory alarms are playing back correctly.
  - Barriers move smoothly between the open and closed positions.
3. Access Control Integration
  - Installed card readers are successfully reading credentials.
  - Valid credentials are activating the turnstile.
4. Barrier Alignment
  - Barriers are properly aligned in both the open and closed positions.
  - Barriers aligned in the Home position.
5. Attachment
  - Barriers, cabinet lids, and base covers are securely fastened to the turnstile.
6. Wipe Down Turnstile
  - Acrylic - Wipe down acrylic barriers using a soft cloth and cleaner suitable for acrylic surfaces. We recommend Brillianize and Novus #1 acrylic cleaners.
  - Stainless Steel – Wipe down stainless steel with a damp cloth or use Alvarado's recommended commercial products (see *SU4500 User Guide*).
  - Powder Coated - Wipe down powder coated surfaces with a damp cloth.
7. Manuals Handoff
  - Provide both these *SU4500 Installation Instructions* and the *SU4500 User Guide* to the project or site manager.



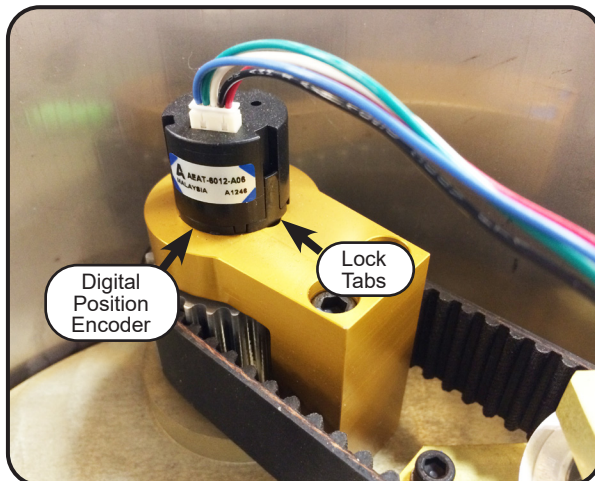


## Troubleshooting

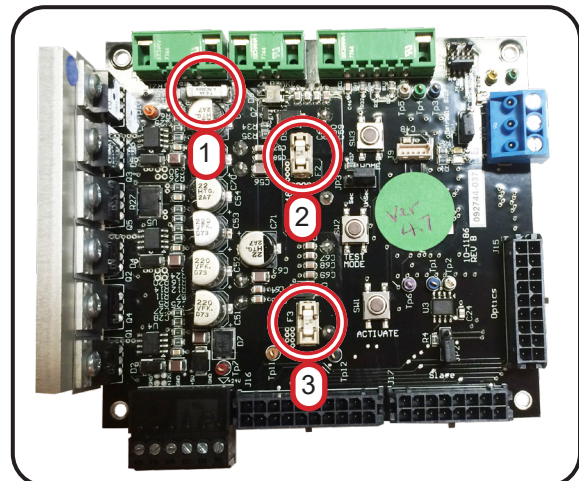
This basic troubleshooting section is provided to aid installers with the most commonly encountered installation problems. If you require further troubleshooting assistance, contact Alvarado Technical Support.

Symptom	Possible Cause	Solution
Unit will not turn on	No power	Make sure that there is power to the turnstile power terminal block. Check if LEDs are lit on the I/O control board and the seven-segment display is showing a number.
	Blown fuse	Check primary power fuse in the external power supply enclosure. If necessary replace with a 2.5A (slo-blo) fuse.
Constant auditory alarming	Communication/low-voltage cable	Check the I/O control board to see if the red STATUS LED is lit or flickering. If it is, the most likely problem is a loose or improper communication connection. Power turnstile off and disconnect the black 16-pin connectors from the I/O control board and motor control boards, apply contact cleaner / lubricant to connector pins and reseal. Retry operation.  If condition persists, perform the same process on the 16-pin connectors going into and out of the light boards and sensor boards. Retry operation. Alvarado Technical Support has a process document and can provide additional instructions.
Barriers operate erratically	Digital position encoder is not in place	Verify the digital position encoder is secured to the pulley shaft with all the locks tabs in place. [Figure 28]. <b>NOTE: After re-seating the digital position encoder, the barrier Home position must be reset PRIOR to power cycling the turnstile.</b>
Barriers do not move.	Blown 24VDC fuse on the motor controller board.	Locate the motor controller board fuses [Figure 30]. Using a multimeter, check the 24VDC 6.3A fuse for continuity. If the fuse is blown, contact Alvarado for replacement instructions.
Blocked Sensor auditory alarms sounds after 15 seconds (default).	Wire or cable blocking sensors	Check for stray wires or cables in front of the transmitter and receiver operational sensors (horizontal arrays). Tuck any stray wire or cable out of sensor viewing area. If this does not resolve the problem, contact Alvarado technical support for instructions on using the ADR-UP and ADR-DN buttons on the I/O control board to perform diagnostics on sensors.
Barriers either stay open or start to close then open back up	Safety sensor blocked	Check for stray wires or cables in front of the individual transmitter and receiver safety sensors. Tuck any stray wire or cable out of sensor viewing area. If this does not resolve the problem, contact Alvarado technical support for instructions on using the ADR-UP and ADR-DN buttons on the I/O control board to perform diagnostics on sensors.
Barriers do not align in closed position	Home position needs to be reset	Follow the Setting the Home Position instructions in Appendix B on Page 40.
System does not boot.	Motor controller board fuse is blown.	Locate the motor controller board fuses [Figure 30]. Using a multimeter, check the 5VDC 3A and 12VDC 2A fuses for continuity. If a fuse is blown, contact Alvarado for a replacement.  <b>NOTES: If a user status display or open / closed status light is out, this may indicate the 5VDC 3A fuse is blown. If the motor controller board LEDs are out, this indicates the 12VDC 2A fuse is blown.</b>

**Fig. 29** Digital Position Encoder



**Fig. 30** Motor Controller Board Fuses



**FUSES**

- 1) 24VDC 6.3A
- 2) 12VDC 2A
- 3) 5VDC 3A



## Appendix A - External DC Power Supply Installation

### Before You Begin

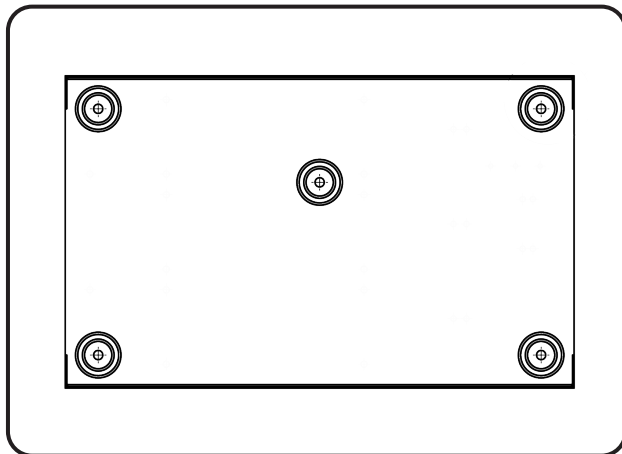
- One power supply is required per lane. Each power supply enclosure can house up to three power supplies. The power supplies are pre-installed at Alvarado prior to shipping. Make sure to locate all required components, and verify the correct number of power supplies are present prior to beginning installation.
- It is assumed that conduit has been run to the Main/center cabinet for each lane for low-voltage 24VDC power wiring. Refer to Conduit Requirements section on Page 11 for more information.
- Due to the various mounting methods and surfaces available for mounting the enclosure, mounting hardware and detailed mounting instructions are not provided.
- Wire gauge recommendations for 30, 50, and 100 ft. runs are provided on Page 36. If your installation requires runs beyond 100 ft, ensure wire gauge is appropriate and in compliance with local electrical codes.
- The location of the power supply enclosure must adhere to the Environmental Requirements section found on pg.9. Controlled environments such as an electronics closet are ideal.
- See pg.39 for power supply enclosure dimensions.
- It is strongly recommended that a licensed electrician perform this procedure in accordance with applicable local electrical codes.
- Throughout this document, the power supply enclosure is shown with three power supplies installed. The instructions are the same for single and dual power supply installations.

### Locate and Mount the Enclosure(s)

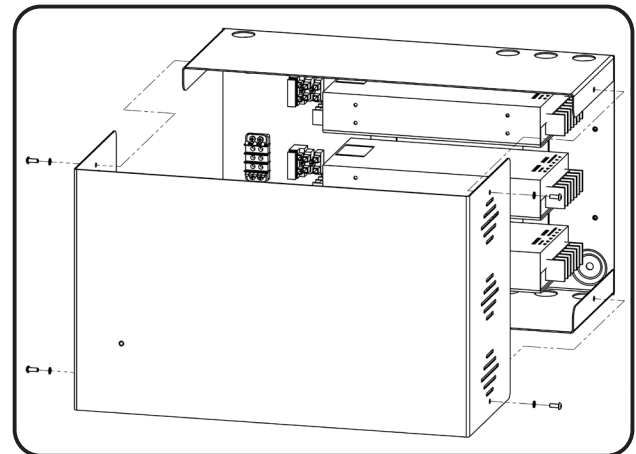
**WARNING** ENSURE PRIMARY POWER IS SHUT OFF AT THE BREAKER.

1. Determine the installation location for the power supply enclosure(s). If mounting the enclosures to a wall or other surface, use the five (5) provided mounting holes and appropriate hardware [Figure A1].
2. Using a 5/64" Allen wrench, remove the four (4) cover screws and remove the cover [Figure A2].

**Fig. A1** Mounting Holes (Side View)



**Fig. A2** Removing Cover Screws





## Connect Primary Power to Enclosure(s)

**NOTE**

Primary power wiring and connectors are not supplied by Alvarado.

The primary wiring lines for 110VAC and 220VAC consist of the following:

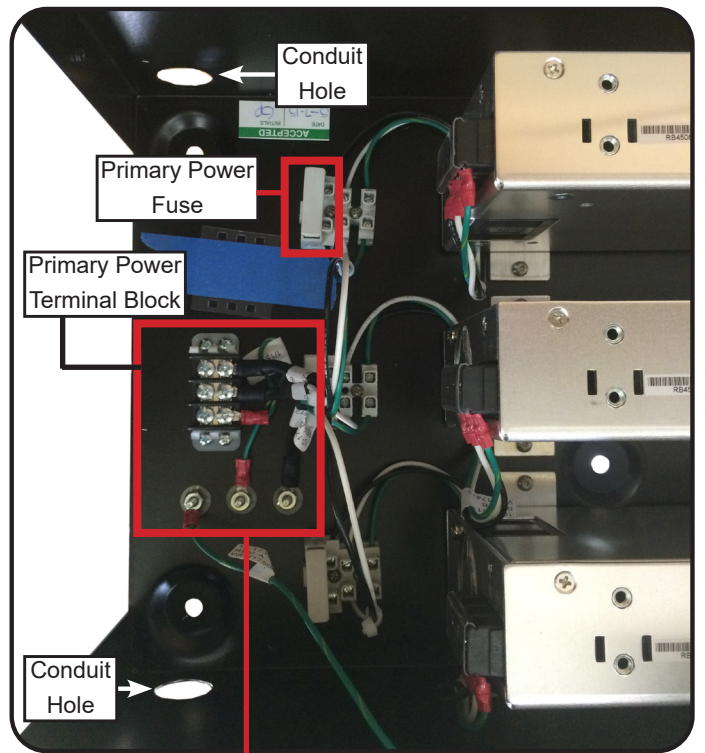
Terminal	110V	220V
<b>L</b> ine	Black	Brown
<b>N</b> eutral	White	Blue
<b>G</b> round	Green	Green/Yellow

- Route primary power conduit to one of the supplied conduit holes on the enclosure [Figure A3].
- Locate the pre-installed primary power terminal block [Figure A3]. There is one primary power terminal block per enclosure.
- Attach each primary power wire to the primary power terminal block according to the table above [Figure A3a].
- Using a Phillips-head screwdriver, tighten each terminal block connection.
- Attach the supplied protective cover on the terminal block.
- Repeat Steps 3 for 7 for additional power supply enclosures.

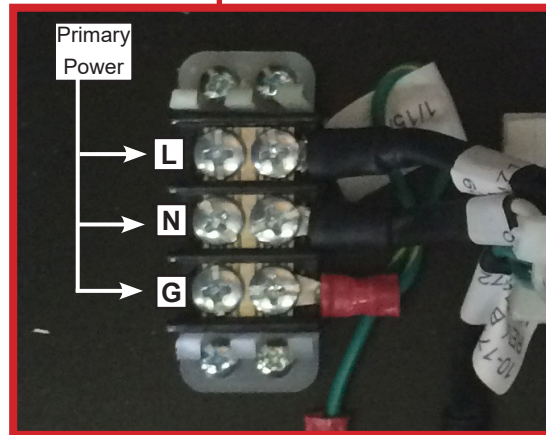
**NOTE**

Each power supply is protected by its own primary power fuse that is located in a white holder mounted directly in front of it.

**Fig. A3** Primary Power Terminal Block



**Fig. A3a**



**Connect Low-Voltage 24VDC from Enclosure to Turnstile(s)****NOTE**

Twelve (12) spade connectors are supplied by Alvarado for connecting low-voltage 24VDC power to the turnstiles. If you do not require all twelve connectors, only use what is needed.

Due to the differences of each installation scenario, 24VDC wire is not supplied by Alvarado. See the recommendations below for selecting the best wire for your installation.

DISTANCE	GAUGE
30 ft (9.14m)	16 AWG
50 ft (15.24m)	14 AWG
100 ft (30.48m)	12 AWG

- Route 24VDC power conduit(s) to supplied conduit holes on the enclosure. See [Figure A6] on pg.37 for location of 24VDC conduit holes.

**TIP**

If connecting to multiple turnstiles, it is recommended to label each power supply i.e. Lane 1, Lane 2, Lane 3, etc.

- For each power supply to be connected, locate the output terminal block [Figure A4]. Each terminal block has three (3) 24VDC (+V) and three (3) ground (-V) terminals. You will only require one (+V) and one (-V) per lane.

**NOTE**

The 24VDC (+V) and GND (-V) terminals are common.

- Using the supplied spade connectors, connect the 24VDC (+V) and ground (-V) wires to the output terminal block [Figure A4].
- Pull low-voltage wire to the turnstile(s) according to the Conduit Requirements located on Page 11.

**Fig. A4 Power Supply Output Terminal Block**

**Return to Wiring Instructions section located on Page 18 to continue the installation.**

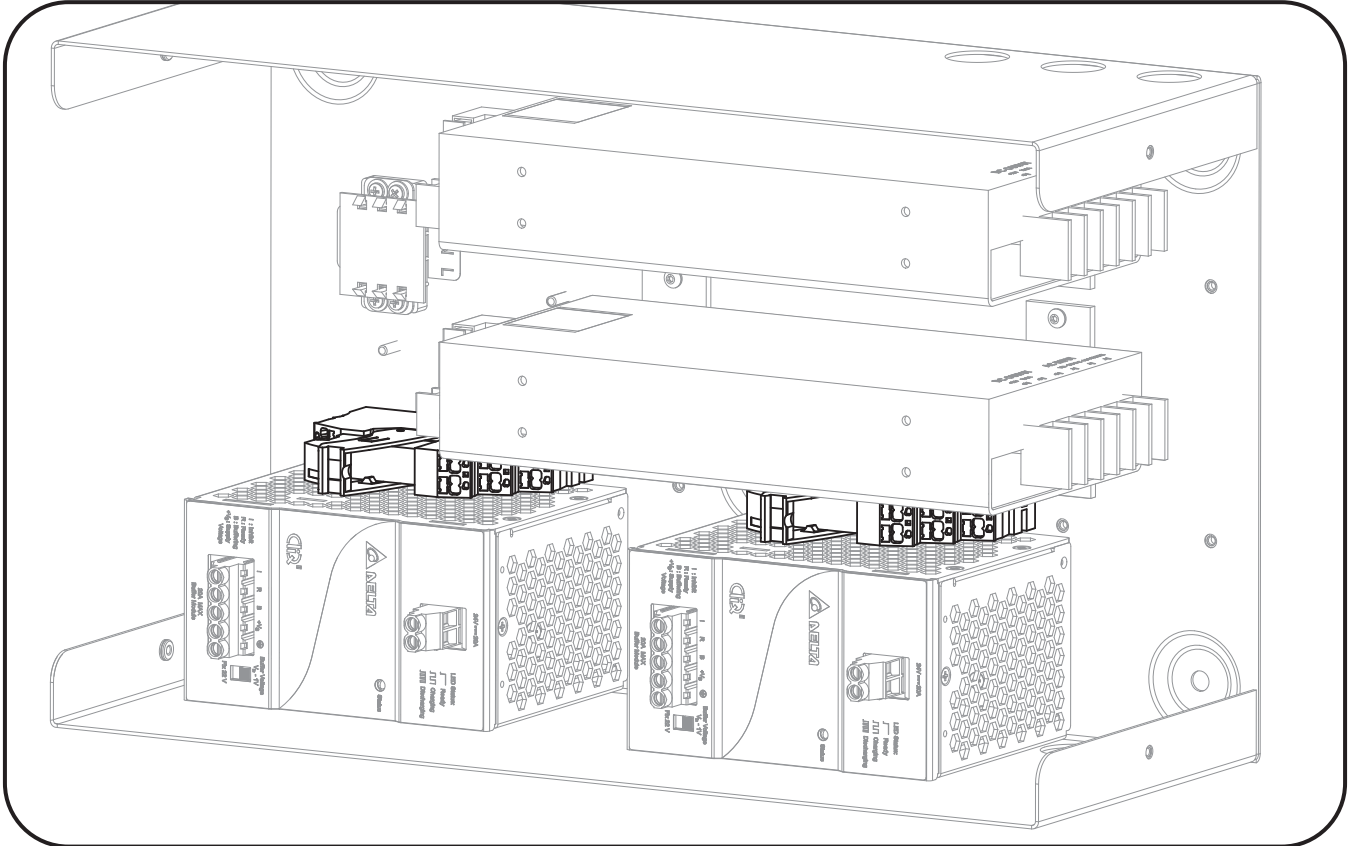


## Option: Power Buffer - Connect from Enclosure to Turnstile

The Remote Power Supply option can also include a Power Buffer, which ensures the barriers open towards the exit direction upon power loss.

The Power Buffer for the Remote Power Supply requires one additional connection to be made from the enclosure relay(s) to each respective turnstile I/O Board; wire not supplied. The Power Buffer option limits the total number of power supplies in each enclosure to two (2).

**Fig. A5** Power Buffer Relay Location



To wire the Power Buffer relays to the IO Boards:

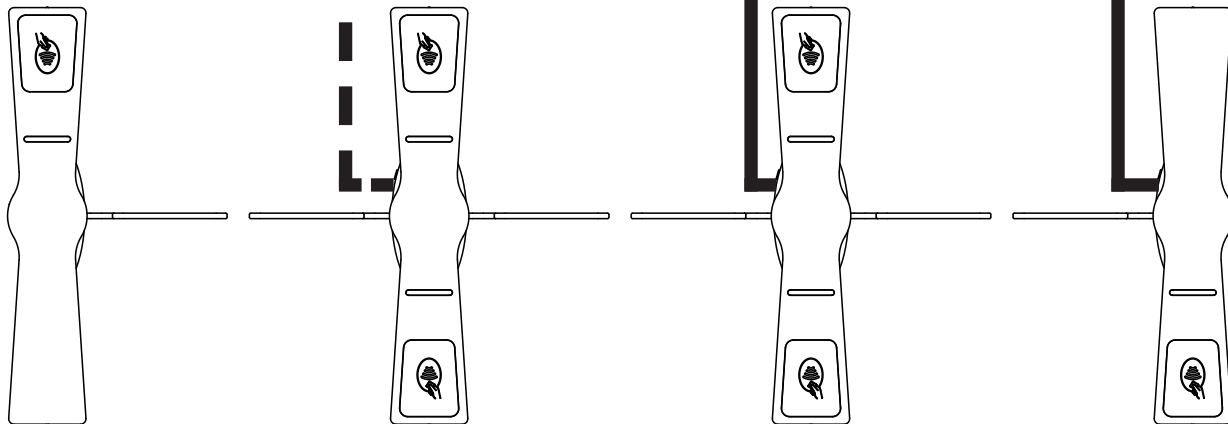
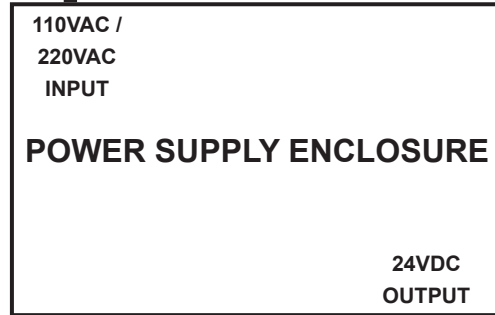
1. Connect wire from the output terminals 11 & 12 from each relay.
2. Pull wire from the enclosure relays to the Main & Center cabinets of each lane.
3. Terminate the wires onto Pins 7 & 8 (ENT-Service & GND) on the J1 Block of each I/O Board.



# External DC Power Supply Connection Diagram

Fig. A6 Connection Diagram

TO CIRCUIT  
BREAKER



**NOTE**

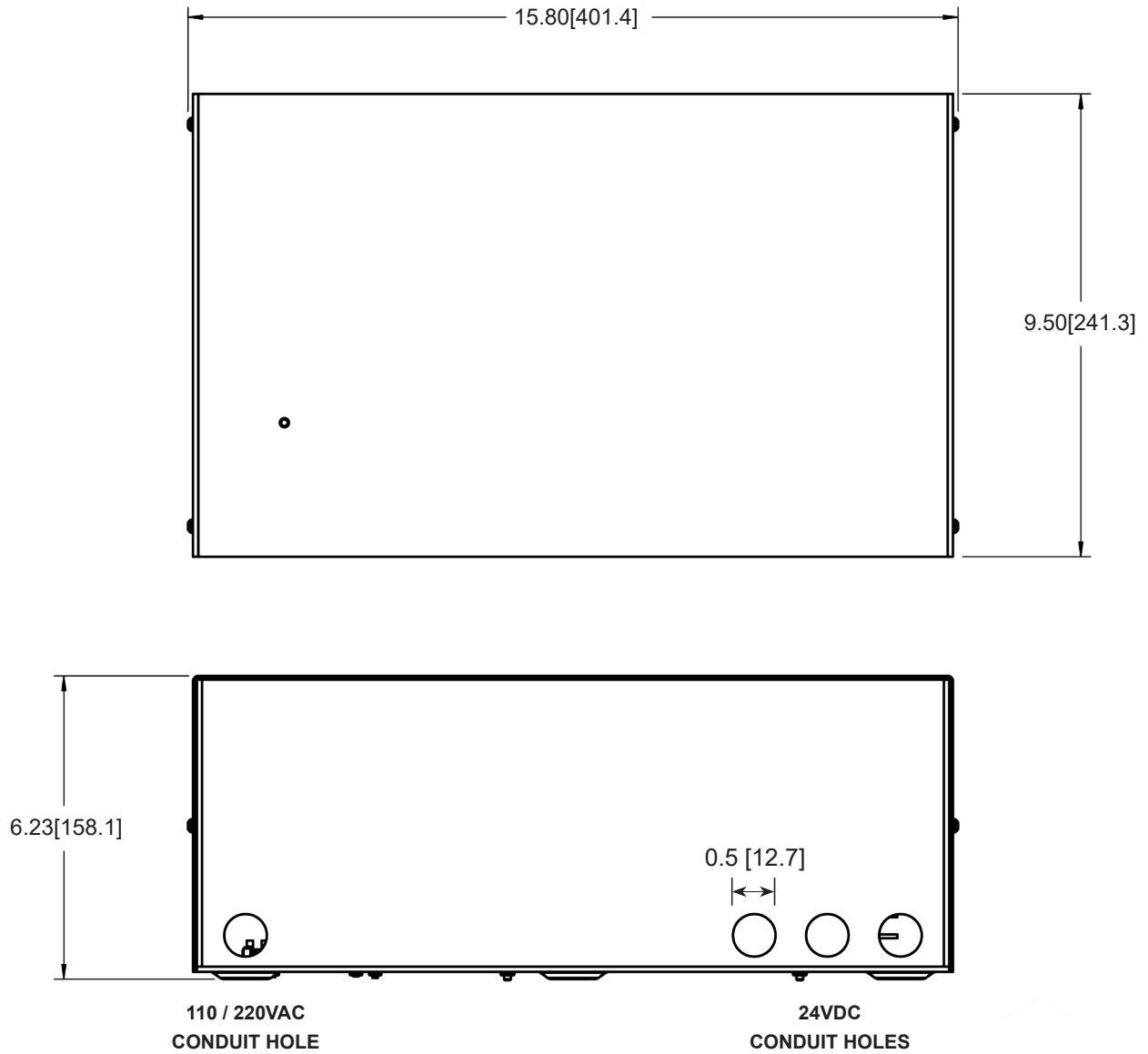
If the power buffer option is not included, up to 3 lanes are supported per each remote enclosure.

If power buffer option is included, only 2 lanes are supported per remote enclosure.



# Power Supply Enclosure Dimensions

**Fig. A7** Dimensions





## Appendix B - Setting the Home Position

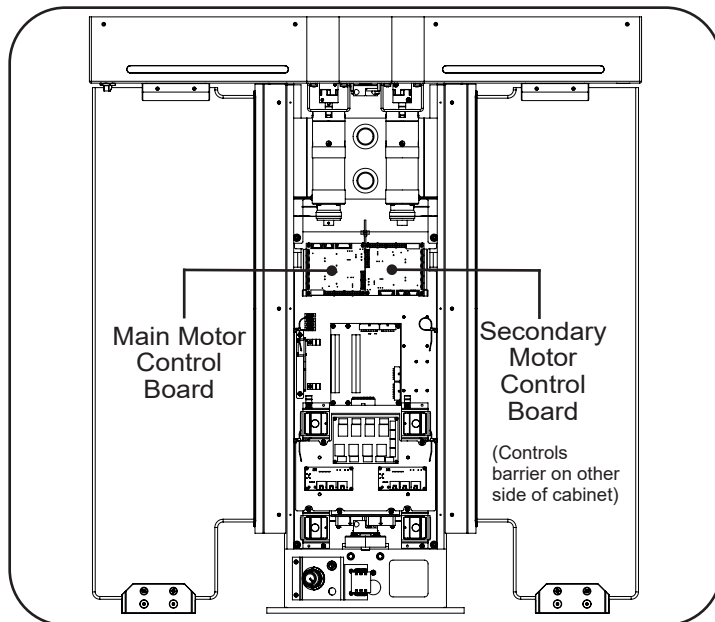
1. Locate the motor controller board in the Main or center cabinet [Figure B1 or B2] respectively. The (D2) LED will be blinking indicating normal operation mode.
2. Press the 'Test Mode' button for two seconds. The (D2) LED will be lit solid. You are now in test mode [Figure B1].
3. Move the barrier through its full range of motion in both directions and then place it in the home position [Figure B3].
4. Press the 'Home' button to set.
5. Press the 'Test Mode' button for two seconds to exit test mode. The (D2) LED will return to blinking status indicating normal operation mode.
6. Locate the Secondary motor controller board in the Secondary or center cabinet.

### NOTE

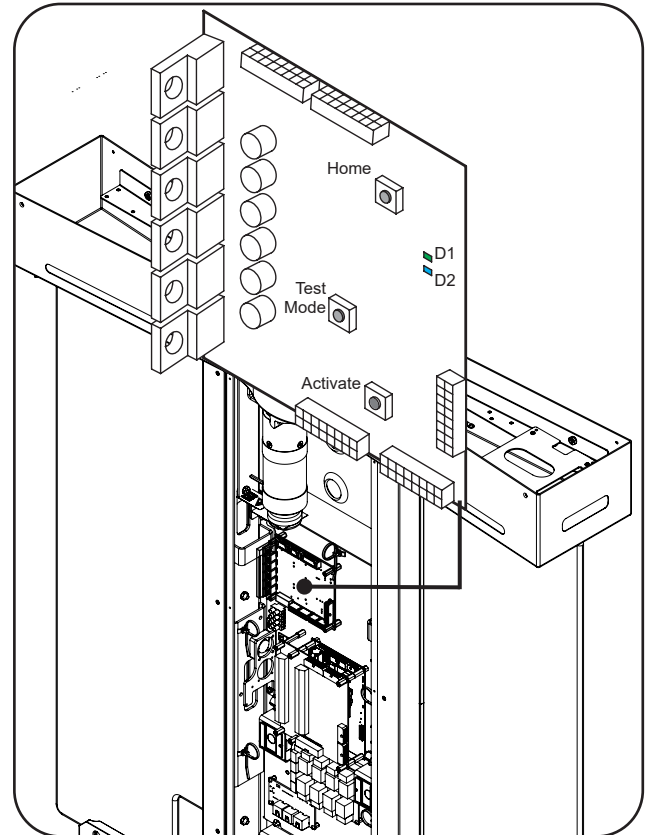
On center cabinets, the Secondary motor controller board controls the Secondary barrier on the other side of the cabinet (the adjacent lane).

7. Repeat Steps 1 through 5 for the Secondary barrier.

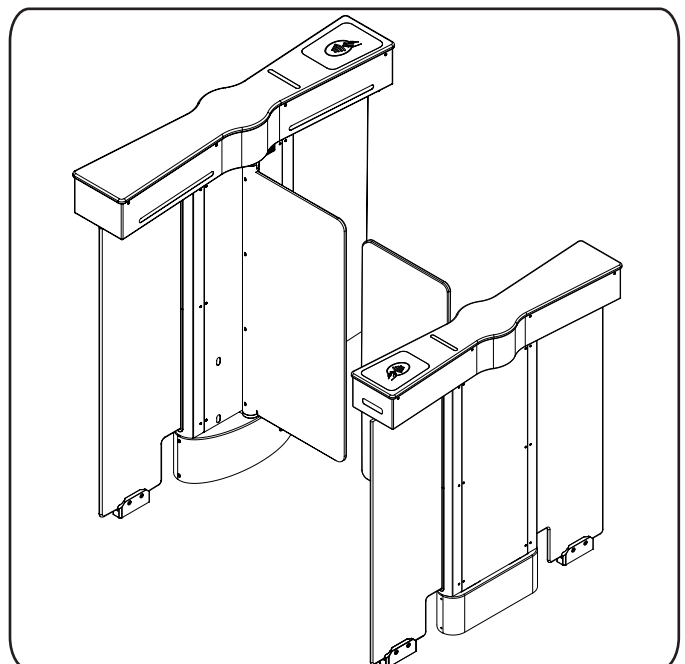
**Fig. B2** Center Cabinet - Motor Controller Boards



**Fig. B1** Main Cabinet - Motor Controller Board



**Fig. B3** Barrier Home Position

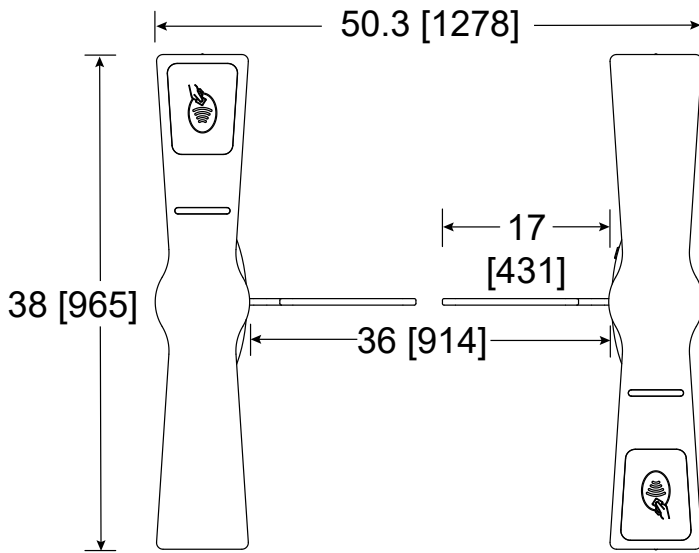




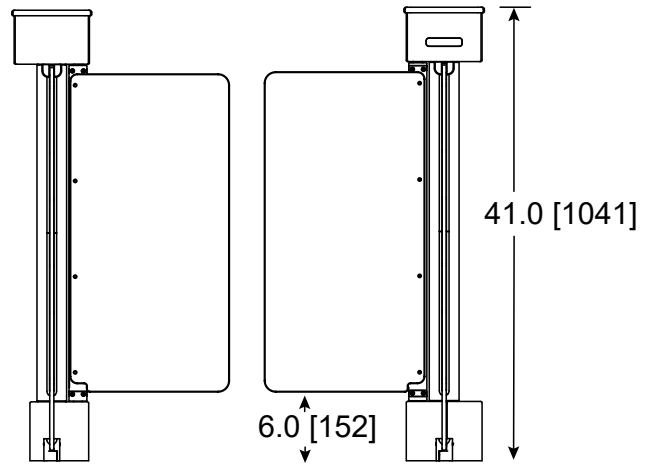


**Appendix C - 36" Single Lane - Plan, Elevation, & Footprint Drawing**

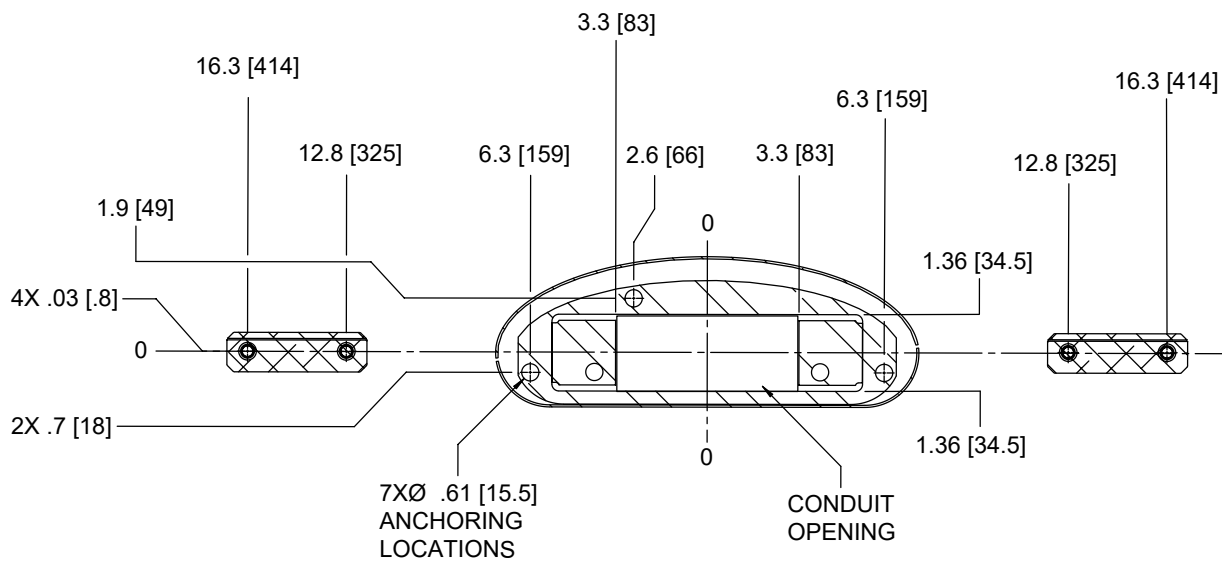
**Plan View**



**Elevation View**



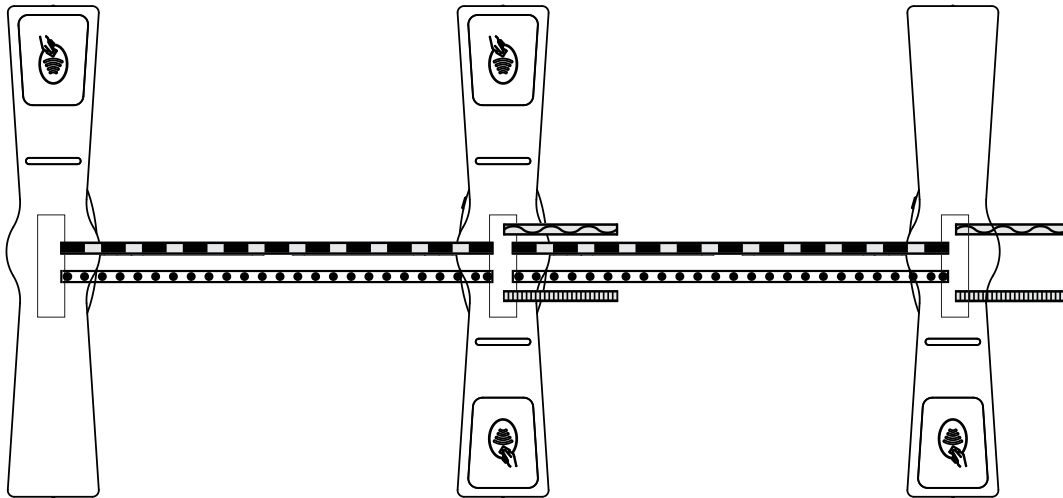
**Footprint**



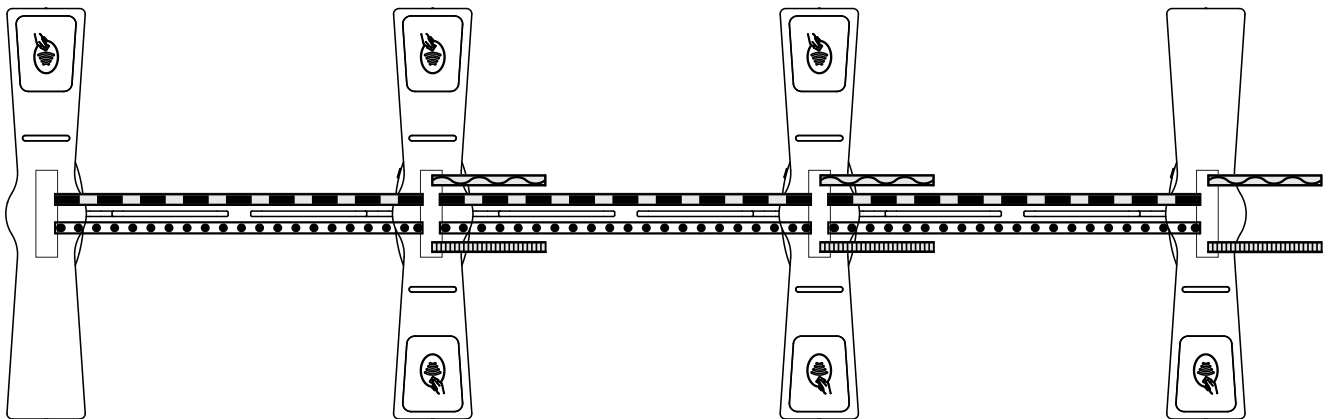


## Appendix D - Multi-Lane Conduit Requirements

### Two - Lane Configuration



### Three - Lane Configuration



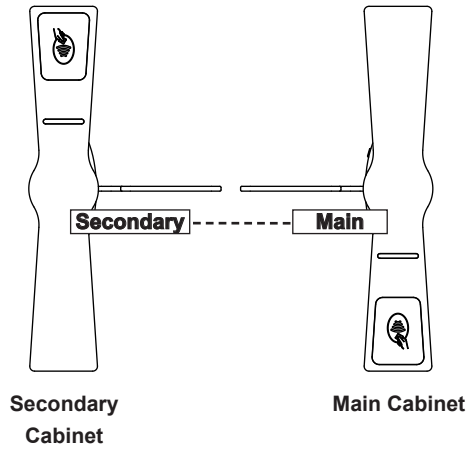
Symbology	Description	Conduit Size
	Low-Voltage - 24VDC	1/2"
	Access Control / Ethernet	3/4"
	Access Control	3/4"
	Crossover Cable	1"

The opening for the conduit in the center of each cabinet is 6.50" x 2.50" (165mm x 64mm). The three required conduits MUST fit in this area.

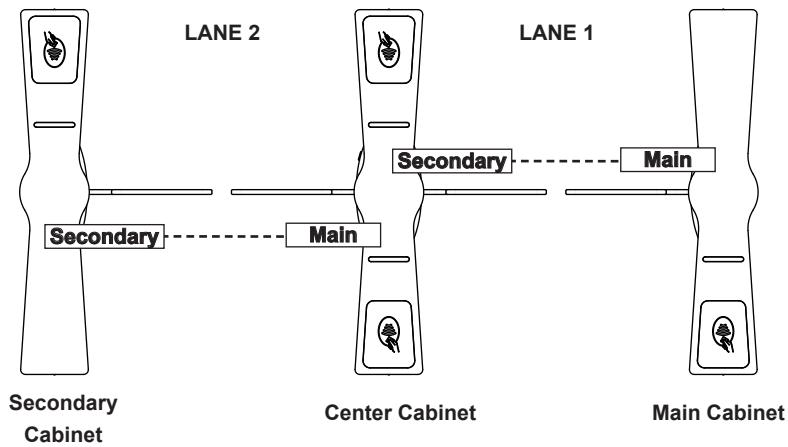


## Appendix E - Crossover Cable Connection Diagrams

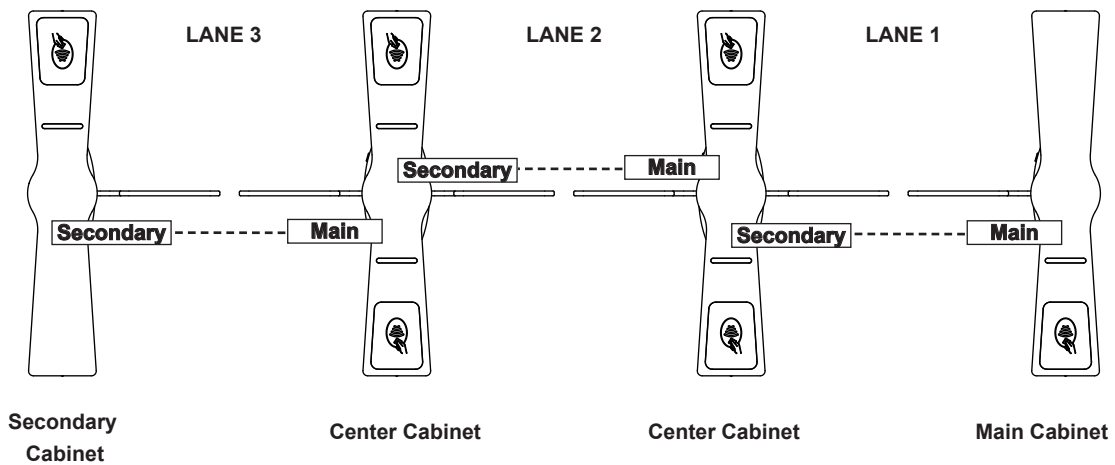
### One-Lane Configuration



### Two-Lane Configuration



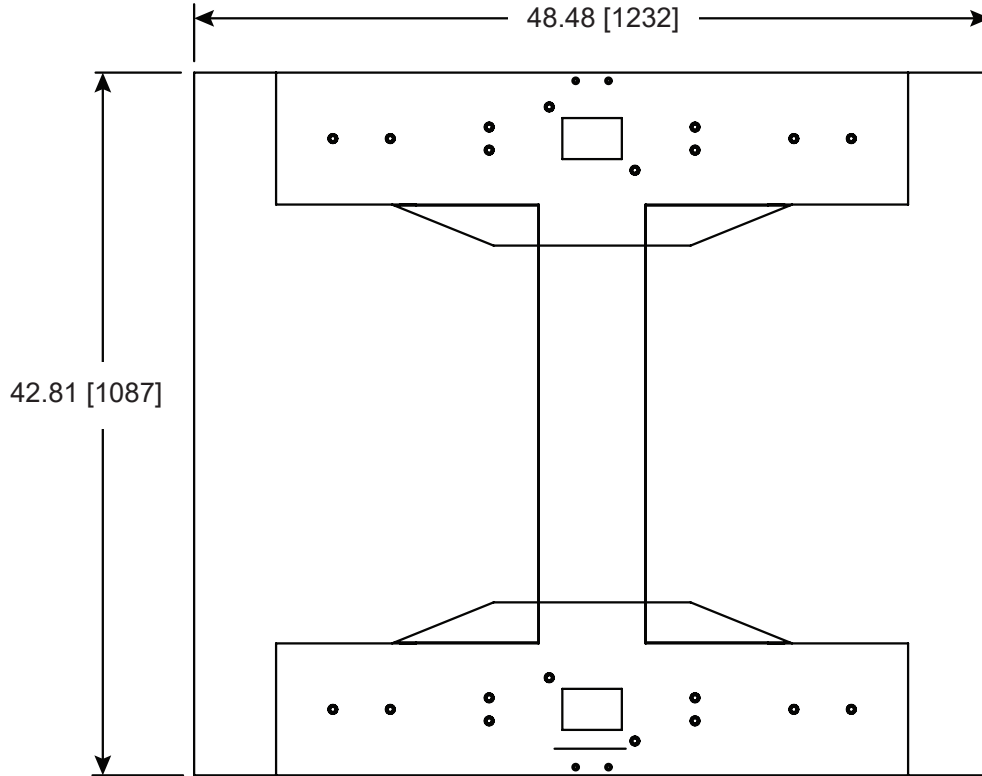
### Three-Lane Configuration



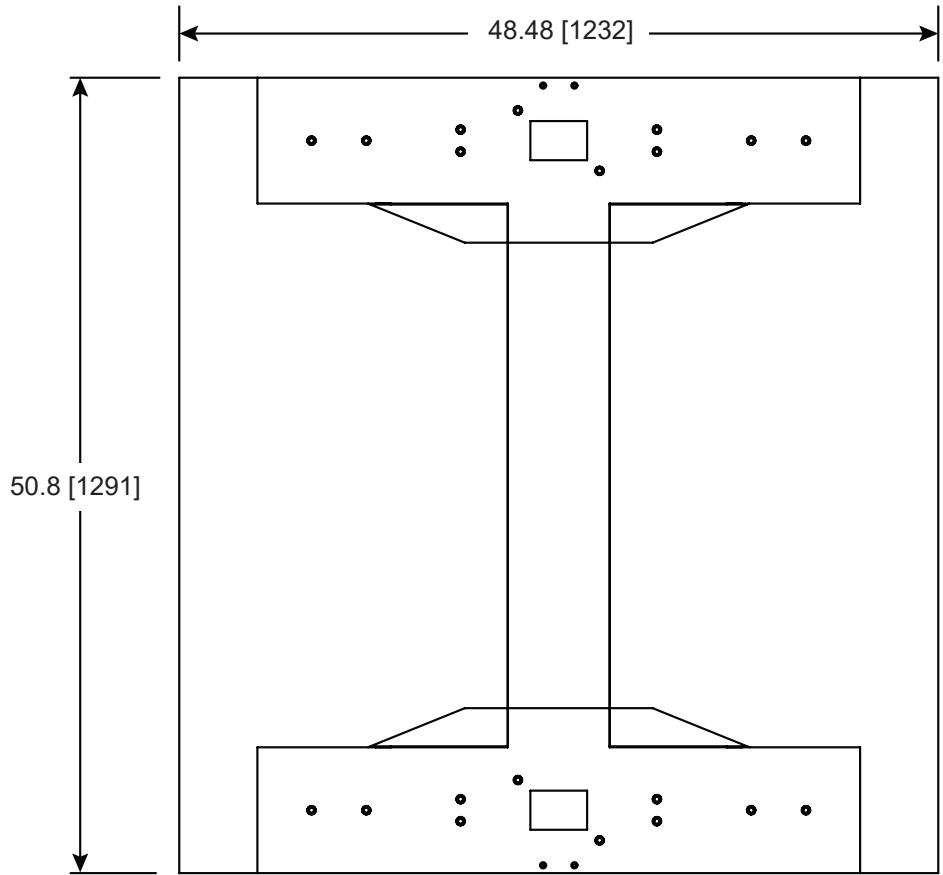


### Appendix F - Single Lane Platform Dimensions - 28" & 36" Passages

**Fig. F1** 28" Baseplate Dimensions



**Fig. F2** 36" Baseplate Dimensions





## Revision History

Revision	Date	Author	Description
1-0	6/7/2019	C. Maynez	Initial document creation.
1-1	6/30/2020	C. Maynez	Updated: Installation instructions, conduit size callout, corrected page callouts, Terminology. Added: Appendix A, & Appendix F.
1-2	7/2/2021	C. Maynez	Updated Crossover conduit size.
2-0	4/17/2023	C. Maynez	Rebranded to corporate standards.
2-1	10/20/2023	C. Maynez	Updated baseplate images.



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