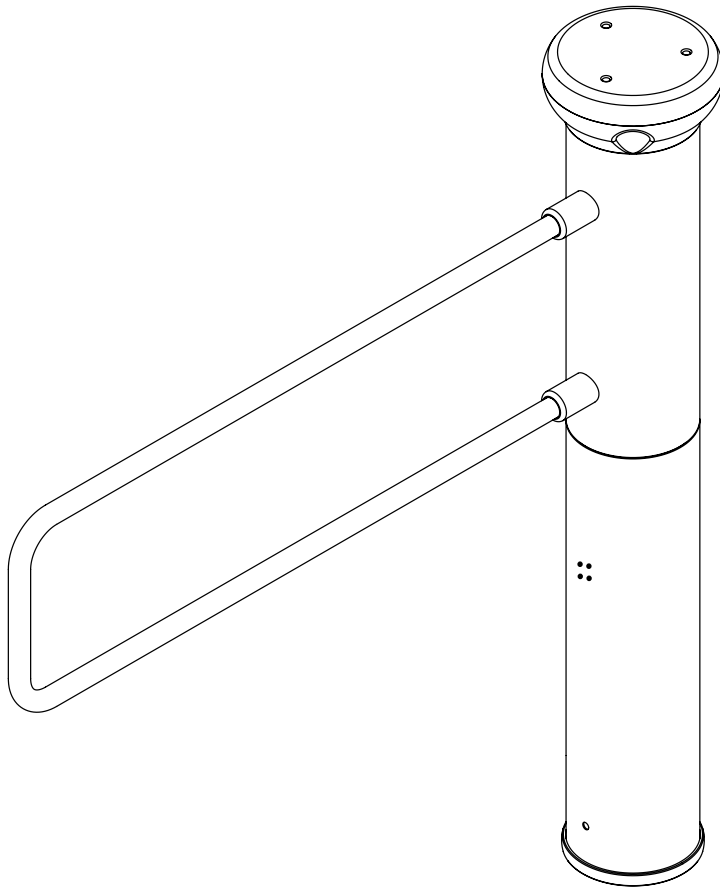


SW500/SW500T
Motorized Pedestrian Gate



Installation and Operation Instructions

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Safety Precautions

WARNING

The SW500 may present a risk to persons and property if it is not installed, tested or operated correctly. It is essential that you read this manual in its entirety, know how this product operates, and follow the layout, installation, operating and testing requirements and recommendations.

- For indoor use only.
- Follow the installation instructions. If you have questions, contact Alvarado before proceeding.
- Follow all other instructions in this manual, including but not limited to the *Application Considerations and Recommendations* on pg.11.
- Use only skilled individuals to install and service the gate.
- The gate is not a toy. DO NOT allow children to congregate or play on or around the gate.
- Do not allow anyone to hang anything on the gate arms.
- Do not cover the motion or presence sensor detection openings.
- Perform the Daily Safety Check procedure described in this manual on a daily basis.
- Take the gate out of service if it has been damaged, is not operating correctly, or fails to pass the Daily Safety Check. Have the unit repaired by a skilled service person before placing back in service.
- Contact Alvarado Technical Support BEFORE changing gate operation settings.
- Follow the maintenance requirements contained in this document.
- DO NOT use non-Alvarado parts to repair a damaged gate.
- Turn power off at the breaker before servicing the gate.

Safety Icons

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

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.



Introduction

Purpose of this Manual

The purpose of this manual is to familiarize you with your motorized pedestrian gate and to provide layout, installation, operating and testing instructions and recommendations. It is essential that you read this entire manual. As the owner or caretaker of this product, it is your responsibility to (1) understand how the gate operates; (2) install and operate the gate consistent with the instructions in this manual; (3) test the gate daily, following the Daily Safety Check procedure described in this manual; and (4) follow the maintenance procedures described in this manual.

Intended Users

This manual is intended for use by system integrators, facility operators, and owners or site managers responsible for installation and operation of the product.

User Responsibilities

As owner or caretaker of the equipment, it is essential that you test and maintain your SW500 and ensure safe product use.

Refer to the *Maintenance* section of this manual for Daily Safety Check instructions and periodic product maintenance requirements.

SW500 Overview

The SW500 is a motorized pedestrian gate that provides single direction entry or exit passage control. The product comes in two versions: the SW500 which is a single gate, and the SW500T which is a tandem gate set.

The gate is pre-configured with factory-set settings which are suitable for most applications. An included Alvarado utility (SwingGate Utility) allows field personnel to adjust selected settings using a laptop computer.

As patrons or carts approach the gate(s) to enter the facility, a forward-facing sensor in the Motion Detection & Presence Sensor Housing detects the movement, signaling the gate to open. Once activated, the gate starts a factory default opening and dwell time cycle. The gate arm will move from the closed, or "home position", to full open allowing passage. The gate will remain in the open position to allow pedestrian(s) to pass before closing. If the motion detection sensor detects another pedestrian or object while open or during the closing cycle, the gate will remain open (or reopen) for another activation cycle.

A presence detection sensor is located in the rear of the Motion Detection & Presence Sensor Housing. This sensor detects the presence of persons and objects in the gate opening path. If a person is detected prior to the gate starting an opening sequence, the gate will not open until the person moves from the detection area. Similarly, once open, if a person or object is detected in the gate closing path prior to the gate starting a closing sequence, the gate will not close until the detection area is clear.

It is important to understand that both the motion detection and presence detection sensors detect presence. For example, if you move into the detection area then stand perfectly still, the gate will open initially when you move into the area, then will stay open until you leave the passage area.

On the presence detection side, a perfectly still person or inanimate object will trigger a constant alarm until the area is clear. For this reason, it is very important that objects (merchandise, shopping carts, boxes, etc.) not be placed in the gate opening path. It is equally important that nothing (merchandise or anything that may attract the attention of patrons or cause them to loiter) be placed around the presence detection area.



SW500 Overview (Cont.)

In sum, you want pedestrians to move through the motion and presence detection areas without loitering. You do not want to place anything around the gates that will attract their attention causing pedestrians to loiter on either the motion detection or presence detection side.

A summary of other SW500 functionality is presented below.

Barrier Breakaway

The SW500 provides limited resistance against a user pushing or pulling the gate open. When the barrier is manually pushed or pulled open, an internal alarm sounds. After approximately two seconds, the gate resets and resumes normal operation. The resistance can be increased through software settings but the SW500 is not a positive locking gate. The barrier can be manually moved relatively easily, even at higher settings.

When the gate is pushed or pulled open, in addition to the local alarm, the gate provides a dry contact output. This output can be used for such things as turning on a surveillance camera, turning on a light visible to store personnel or turning on an external alarm at an attendant desk.

Barrier Impact

Should the barrier encounter an obstruction while opening or closing, the gate will stop moving. After a defined period, and the removal of the obstruction, the gate resets and resumes normal operation.

Fire Alarm / Emergency Override

Activation to open the gate in conjunction with a fire alarm / emergency override signal is achieved by supplying a sustained dry contact signal to the appropriate input on the terminal block (TB1). When the input signal is received, the gate opens in the exit direction and remains open until the input signal is removed. When the input signal is removed, the gate resumes normal operation.

The SW500 default configuration for fire alarm / emergency override input signals is normally open. The gate can also be configured to interface with normally closed input signals.

Power Failure

When power is removed from the unit, the SW500 barrier will remain in its current position and can be moved manually. When pushed or pulled to the open position, the barrier remains open. When power is restored, the gate resumes normal operation.

Barrier Hold Open

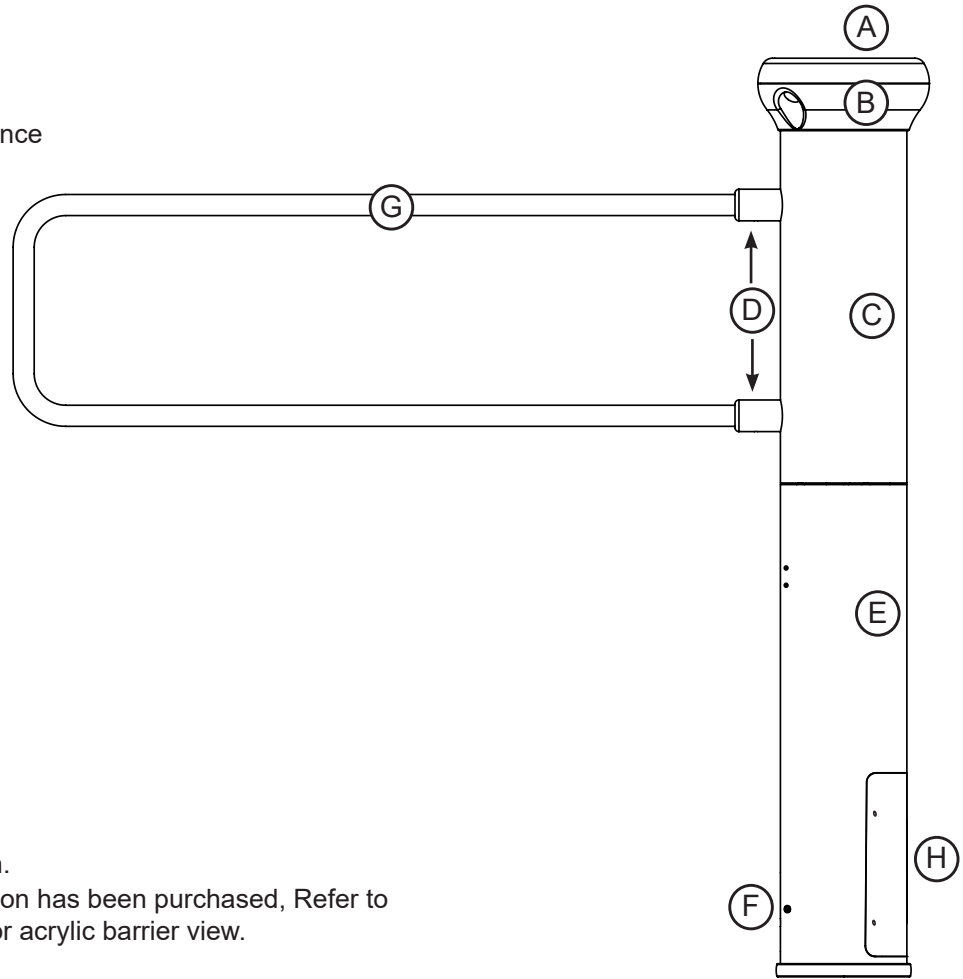
The barrier can be held open indefinitely by supplying a sustained dry contact to the appropriate input on the terminal block (TB1). The gate remains open until the contact is removed. Typically, a toggle switch – often located at an attendant desk - is wired into the appropriate input location. The Barrier Held Open feature is typically used to facilitate the movement of equipment or deliveries through the gate area.



External Components

Figure 1 SW500 - Exterior View

- (A) Lid
- (B) Motion Detection & Presence Sensor Housing
- (C) Upper Column
- (D) Barrier Clamps
- (E) Lower Column
- (F) Power Button
- (G) Barrier
- (H) Access Panel



NOTE

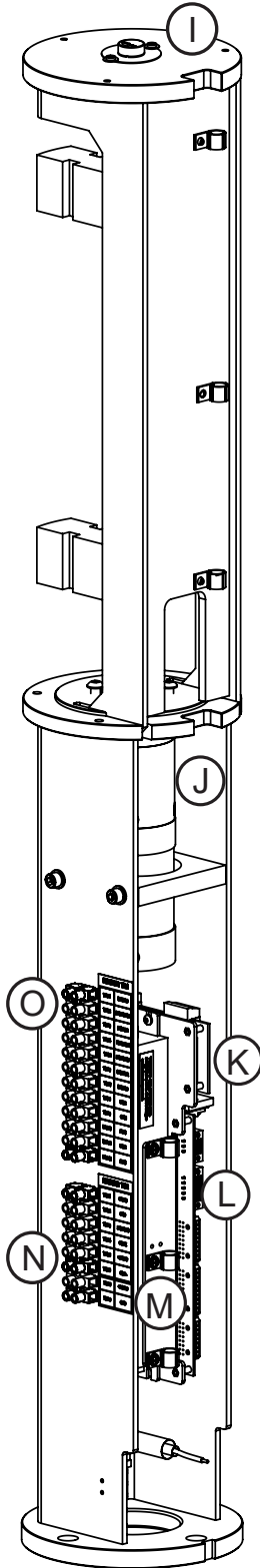
- Metal barrier bar shown.
- If the acrylic barrier option has been purchased, Refer to Appendix B on Pg.44 for acrylic barrier view.



Internal Components

Figure 2 SW500 - Interior View

SW500 Tower Assembly



- I Digital Position Encoder
- J Motor
- K Power Rectifier Board
- L I/O - Motor Control Board
- M Power Supply
- N Communication Terminal Block (TB2)
- O Configuration Terminal Block (TB1)

NOTE

- If the Remote Power Supply option has been purchased, refer to Appendix C on Pg.46 for Remote Power Supply installation instructions.



Internal Components (cont.)

- I Digital Position Encoder**
The digital position encoder continually monitors the position of the barrier and works in conjunction with the motor and I/O - Motor Control Board to control barrier movement.
- J Motor**
The 24VDC brushless motor / planetary gearbox assembly moves the barrier.
- K Power Rectifier Board**
This board receives 24VDC from the power supply and steps it down to 5VDC and 12VDC for additional low voltage requirements.
- L I/O - Motor Control Board**
This board serves as the interface point for gate I/O signals and serves as the controller for motor operation and barrier movement.
- M Power Supply**
The power supply converts primary power to 24VDC low-voltage power for motor operation. The power supply is installed outside of the gate if the Remote Power Supply option is purchased. Refer to Appendix C on Pg.46 for Remote Power Supply installation instructions.
- N Communication Terminal Block (TB2)**
This terminal block is used to supply power to the sensors. When wired as a tandem gate, the Secondary gate uses this block to connect the power and communication crossover cables.
- O Configuration Terminal Block (TB1)**
This terminal block contains all available inputs and outputs.

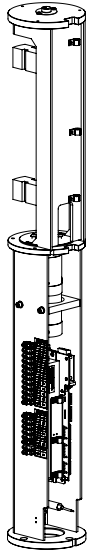


Installation Tools

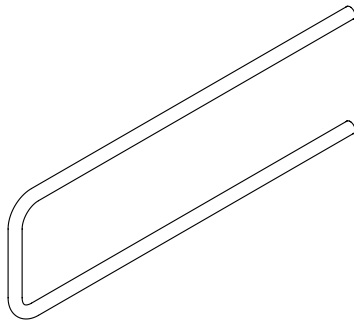
- Hammer Drill
- 5/8" Concrete Drill Bit
- Pencil
- Shop Vac
- Rubber Mallet
- Torque Wrench (ft-lbs. & in-lbs.)
- 9/16" Socket
- Straight Edge Level
- Phillips Head Screwdriver
- Flathead Screwdriver
- Clear RTV Silicone
- Hex Keys: 1/4", 1/8", 3/32", 5/64"
- Fish Tape

Parts List

This tower is shipped partially assembled. Only the barrier needs to be installed once the tower is anchored in the desired location. Make sure that no parts are missing or damaged before beginning installation. If parts are missing and/or damaged, please contact Alvarado Technical Support at (909) 591-8431.



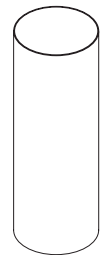
Tower Assembly
(Qty 1)



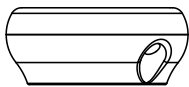
Barrier
(Qty 1)



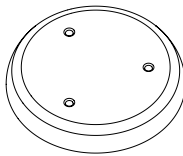
Lower Column
(Qty 1)



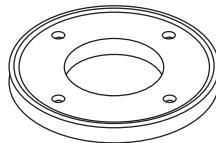
Upper Column
(Qty 1)



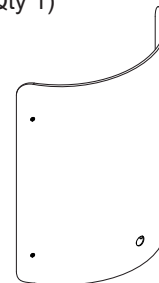
Motion Detection &
Presence Sensor
Housing
(Qty 1)



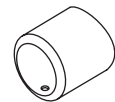
Lid
(Qty 1)



Base Plate
(Qty 1)



Access Panel
(Qty 1)



Barrier Clamp
(Qty 2)

Also Included:

- (4) Concrete Anchor Package (Qty 1)
- Barrier Clamp Mounting Screws (Qty 4)
- Barrier Clamp Set Screws (Qty 4)
- Sensor Housing Mounting Screws (Qty 3)
- Lid Screws (Qty 3)
- Plastic Caps (Qty 2)
- Access Panel Screws (Qty 4)
- Threadlocker tube - Blue (Qty 1)
- SW500 SwingGateUtility USB (Qty 1)

NOTE

- **Tandem installations have quantities doubled.**
- **Refer to Appendix A on Pg.37 for information and instructions specific to SW500T tandem gate installations.**
- **Refer to Appendix B on Pg.44 for acrylic barrier installation instructions.**



Application Considerations and Recommendations

The approximate factory-set motion and presence sensing areas are shown in the diagrams on the following page. While the Motion Detection Area dimensions can be altered, the factory-set detection pattern is the optimum detection pattern for the majority of installation applications.

Use the detection pattern dimensions shown on pg.12 to determine the installation location for your gate(s). Key considerations for gate placement are outlined below. We strongly suggest that you provide us drawings of your proposed installation location well in advance of installation, so we can provide suggestions, identify potential hazards and provide operational alternatives.

Considerations

Motion Detection Area

- The motion detection sensor will detect straight on, angled, or perpendicular movement (cross-traffic). Any movement detected in the Motion Detection Area will trigger the gate(s) to open.
- You want people to walk into the detection area straight on. We strongly suggest the use of railing along the sides of the Motion Detection Area to facilitate straight on movement and to deter people from walking across the Motion Detection Area.
- Common causes of undesired gate opening are moving devices (such as motorized doors) located in the motion detection area and cross-traffic (patrons and employees walking perpendicular through the Motion Detection Area).

CAUTION

- Do not place objects (signs, merchandise, displays, hand baskets, carts, etc.) in or around the Motion Detection Area. You want pedestrians to move through the Motion Detection and Presence Detection Areas without loitering. You do not want to place anything around the gates that will cause pedestrians to loiter in either the Motion Detection or Presence Detection Areas.

Presence Detection Area

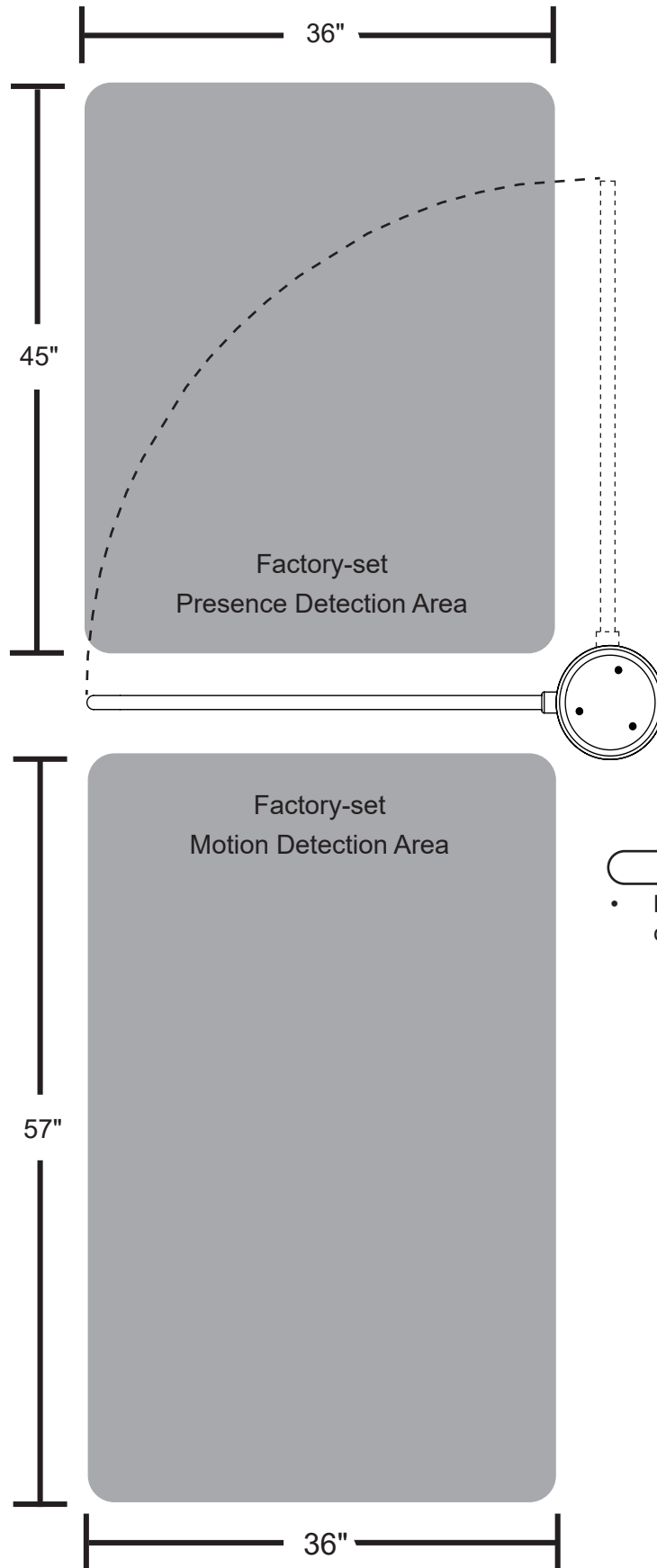
- The presence detection sensor detects the presence of persons and objects in the Presence Detection Area. If a person is detected prior to the gate starting an opening sequence, the gate will not open until the person moves from the detection area. Similarly, once open, if a person or object is detected in the gate closing path prior to the gate starting a closing sequence, the gate will not close until the Presence Detection Area is clear.
- You only want pedestrians or objects in the Presence Detection Area as part of the normal entry process. You do not want to locate the gate in an area where pedestrians already inside the store may walk either straight on or cross-ways into the Presence Detection Area. We strongly suggest the use of railing along the sides of the Presence Detection Area to deter employees or patrons from walking through or loitering in the Presence Detection Area.

CAUTION

- Do not place objects (signs, merchandise, displays, hand baskets, carts, etc.) in or around the Presence Detection Area. You want entering pedestrians to move through at a consistent pace and you do not want to place anything around the gates that will cause pedestrians to loiter in either the Motion Detection or Presence Detection Areas.



Considerations (Cont.)



NOTE

- Barrier shown in closed, "Home", position

*Dimensions are approximate



Requirements

Slab

The following slab requirements must be taken into consideration when determining an installation location:

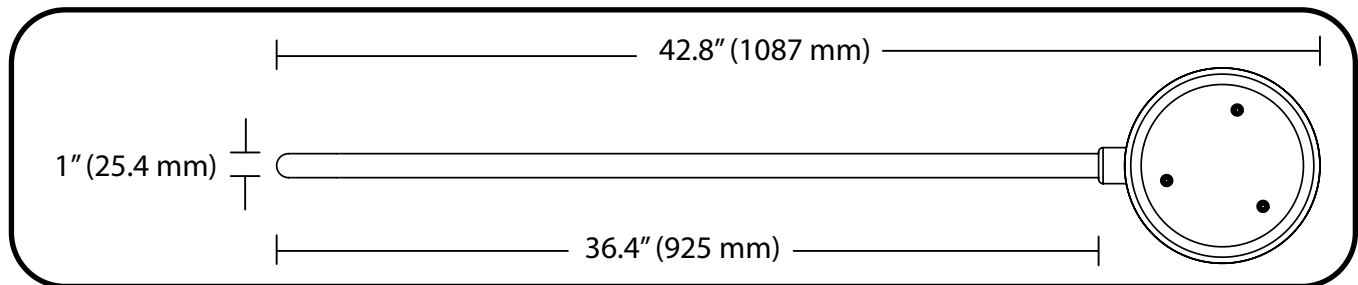
- The gate must be installed on a solid, level concrete pad with a minimum thickness of 4" (102mm).

Space

The following space requirements must be taken into consideration when determining the installation location:

- Allocate 4" (102mm) of space between the back of the tower and adjacent wall or other surface.
- Allow 2" (51mm) of clearance between the end of the barrier and adjacent surface to avoid pinch points.

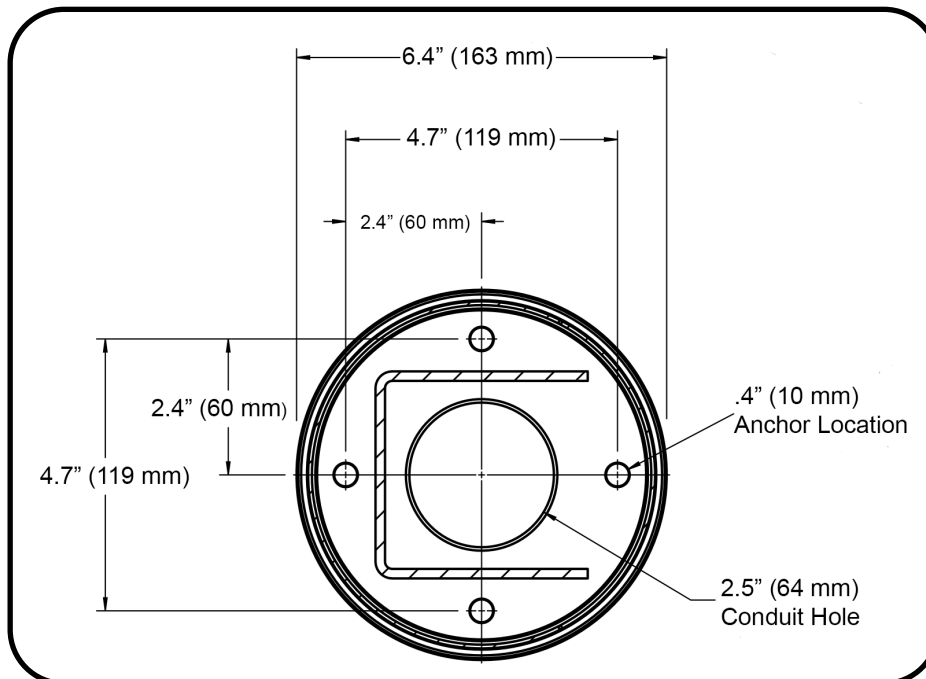
Figure 3 Assembled Gate Dimensions - Metal Barrier Bar



NOTE

Refer to Appendix B on Pg.45 for acrylic barrier dimensions.

Figure 4 Base Plate Dimensions



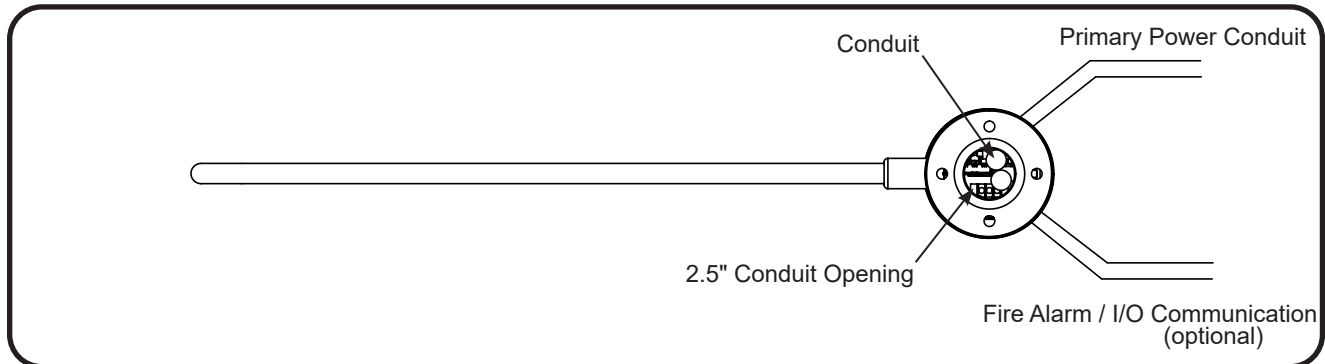


Conduit

- Use full-sweep electrical conduit underneath the floor.
- Use separate conduits for primary power, fire system inputs, and crossover cable (tandem installations only).
- Recommended conduit size is .5" (13mm).
- The total conduit opening must not exceed 2.5" (64mm) in diameter.
- The conduit must not extend above the baseplate or .25" (6mm) above the finished floor.

NOTE

For installations with above ground conduit, refer to Appendix D on pg.49.

Figure 5 Conduit**NOTE**

Seal the floor area with a bead of clear RTV silicone around the conduits running up and into the base plate. This will prevent condensation and debris build-up that may be introduced beneath the floor.

Electrical

Power Supply	100 - 240 VAC. 6.0 A, 50/60 Hz
Power Requirements	Peak power consumption is 228 watts per gate.
Operational Voltage	Primary power is stepped down and rectified for low-voltage 24 VDC, 12 VDC and 5 VDC operation.
Fuse	3A (slo-blo) fuse is installed on each gate.
Surge Protection	Alvarado suggests the use of surge protection on the high-voltage power line to further protect electronics
Drive Motor	24VDC (Brushless)



Environmental

- **DO NOT** install the product outdoors. This product is intended for indoor use only.

The operating temperature and humidity ranges for the SW500:

	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	--

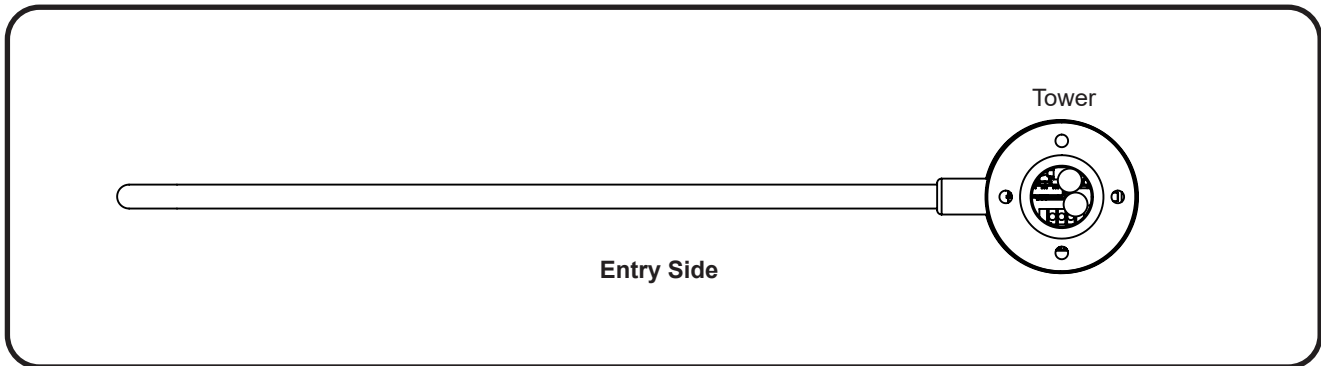


Operating the SW500 outside the suggested temperature and humidity ranges may negatively affect gate performance and could potentially cause damage to gate components.

Orientation

The default orientation for a single gate locates the tower on the right-hand side when viewed from the entry side. [Figure 6]

Figure 6 Correct SW500 Single Gate Orientation



NOTE

Refer to Appendix A on pg.37 for Tandem Gate Orientation.



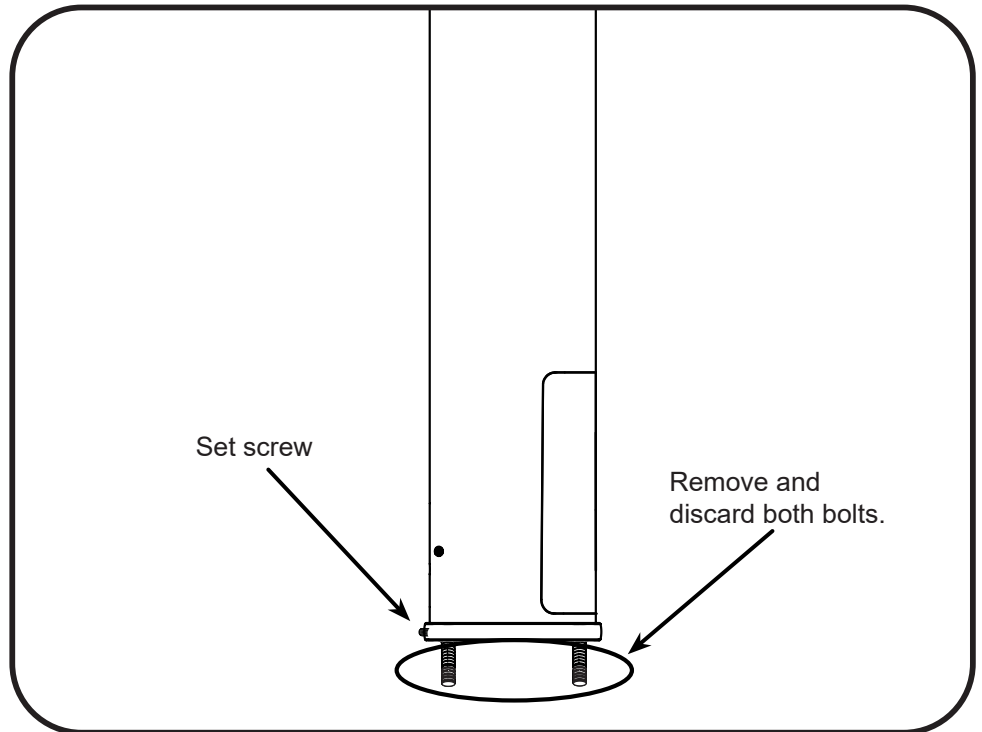
Opening the Boxes

A single SW500 is shipped in two boxes - one each for the tower and arm.

A tandem SW500T is shipped in three boxes - one each for the towers and one for the pair of arms.

1. Using a 3/32" Hex key, loosen the base plate set screw.
2. Unscrew the two nuts securing the base plate to the tower assembly. [Figure 7]
3. Remove the bottom base plate from the bottom of the tower assembly and keep for use in installation.
4. Discard the bolts and nuts securing the base plate to the tower during shipping.

Figure 7 Bolt Removal After Uncrating



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 have been unpacked, correctly identified, and moved to the installation location.
2. The gate configuration and layout has been confirmed with the site manager and reviewed by Alvarado.
3. All requirements (slab, space, application, conduit, and electrical) have been met.



Installation Instructions

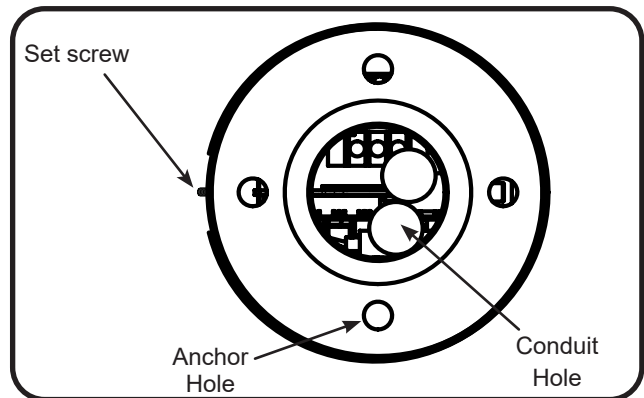
Base Plate Installation

1. Align the base plate over the conduit opening and mark the location of each anchor hole with a pencil. Remove the base plate when finished.

NOTE

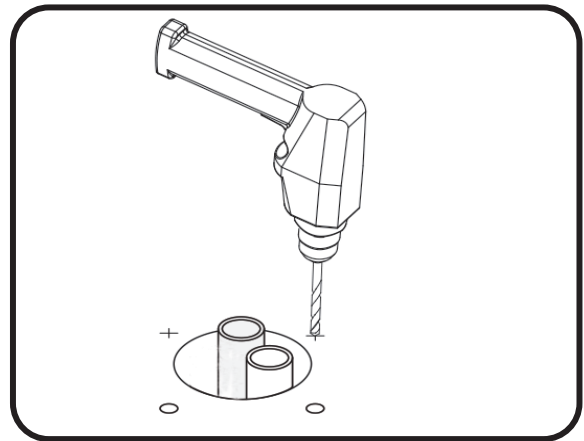
The set screw on the bottom base plate will align with the barrier. [Figure 8]

Figure 8 Base Plate / Barrier Alignment



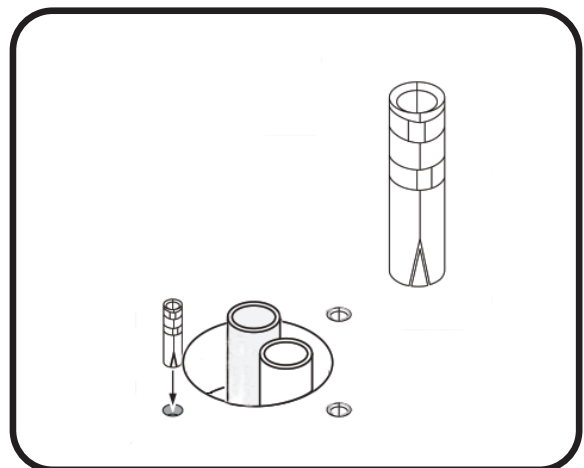
2. Using a hammer drill and 5/8" concrete drill bit, drill four (4) anchor holes to a depth of 2.5" (64mm). [Figure 9]
3. Using a shop vac, vacuum any debris from the anchor holes. Anchors will not tighten properly if debris is present.

Figure 9 Drill Anchor Holes



4. Insert anchors threaded side down. [Figure 10]
5. Ensure each anchor is flush with the surface of the concrete. If necessary, use a rubber mallet to tap the anchors until they are flush.

Figure 10 Insert Anchors





Tower Assembly Installation

NOTE

- If installing an SW500T tandem gate, refer to Appendix A on Pg.37 for instructions on routing DC power and communication to the Secondary gate.

1. Route primary power and I/O communication wiring, if applicable, through the base plate into the tower assembly. [Figure 11]

NOTE

- For installations with above ground conduit, place base plate in the desired location. Refer to Appendix D on pg.49 for conduit instructions.

2. Using a Phillips screwdriver, remove the 4 screws securing the Access Panel. [Figure 12]

Figure 11 Route Conduit through Base Plate

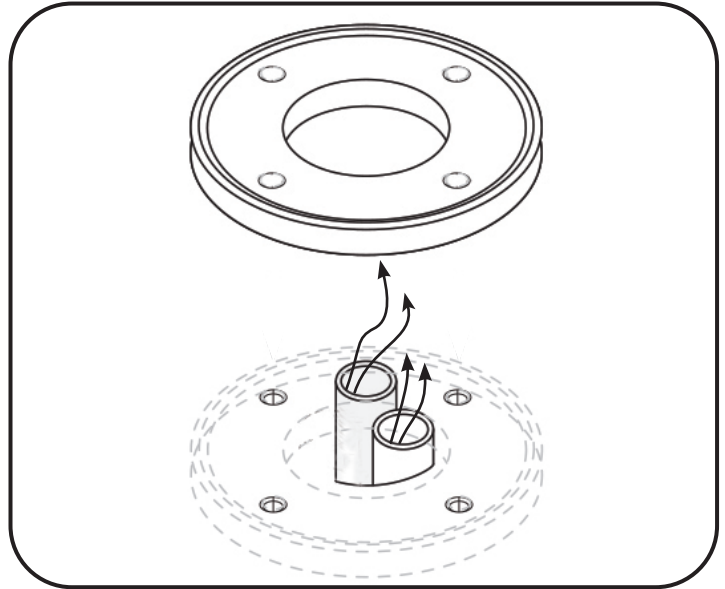
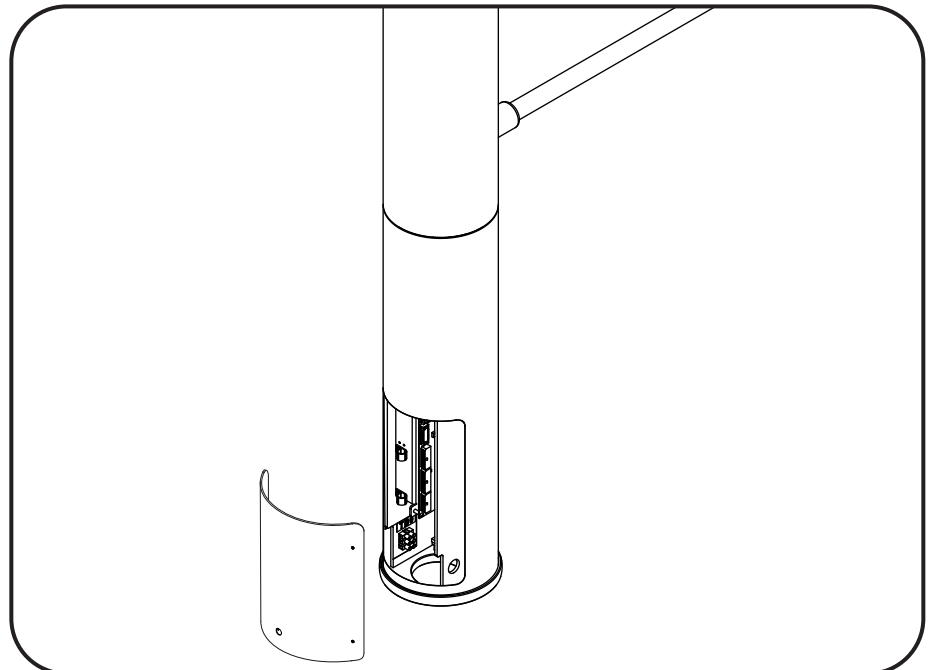


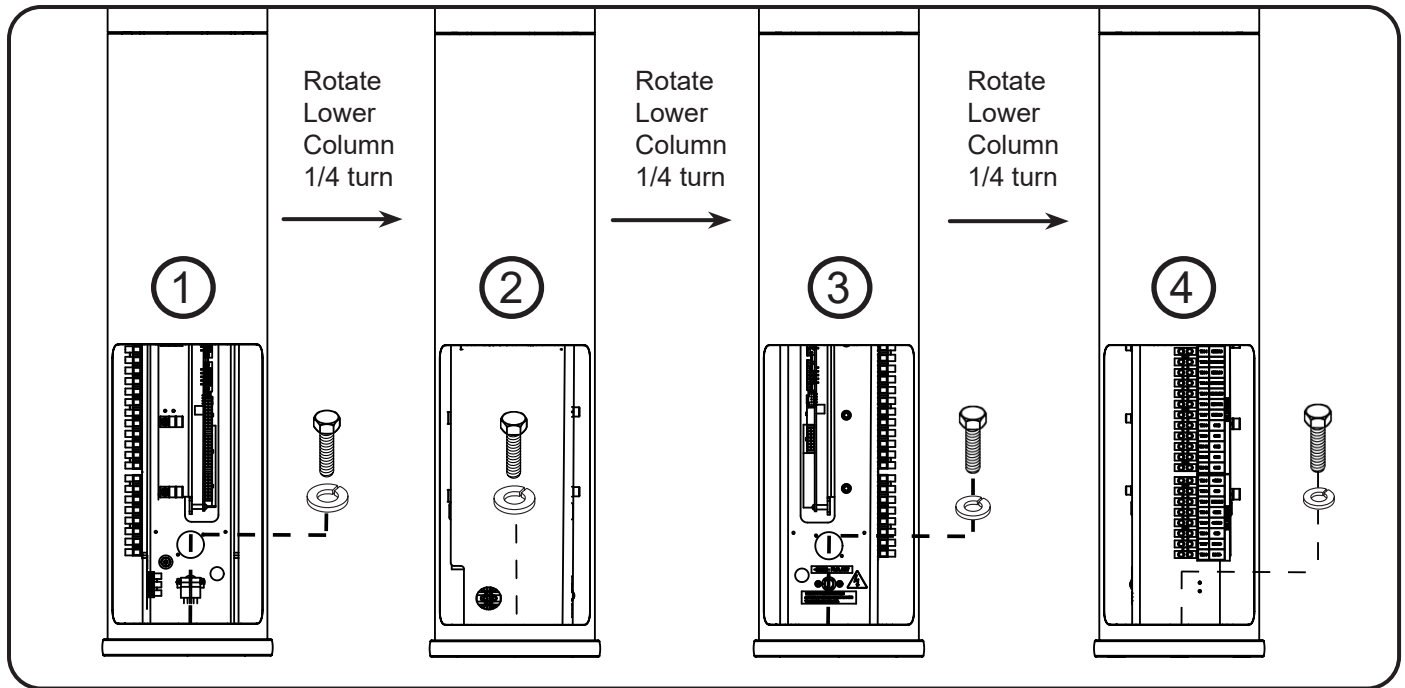
Figure 12 Open Access Panel





Tower Assembly Installation (Cont.)

Figure 13 Anchoring the Tower - Rotate Lower Column 1/4 Turn to Locate Anchor Holes



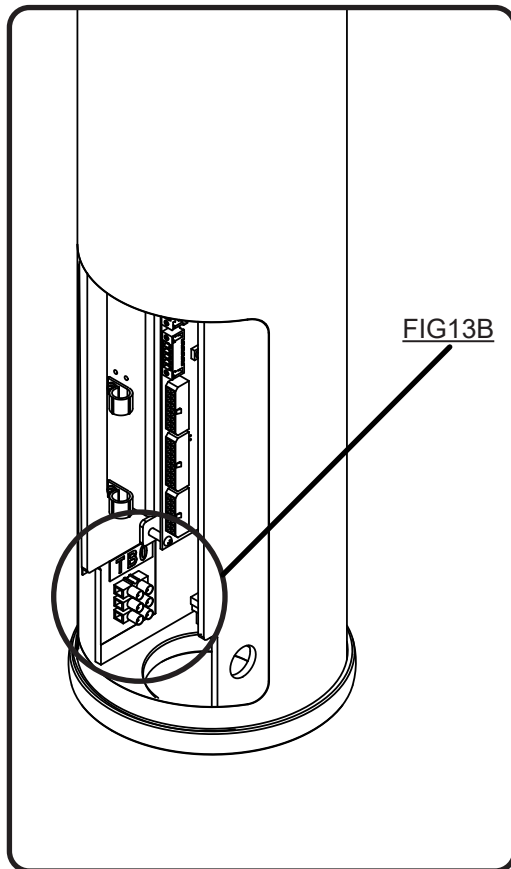
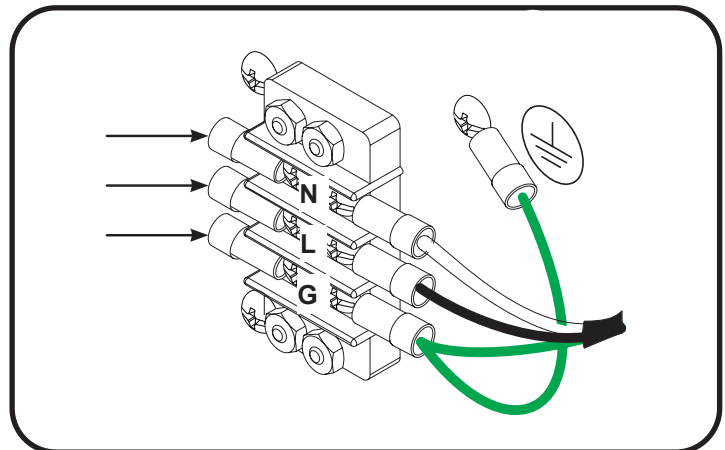
NOTE

With the set screw loosened, the Lower Column can rotate freely.

3. Align the tower assembly and base plate with the anchor holes. Insert four (4) anchor bolts and washers. [Figure 13]
4. Using a wrench and a 9/16" socket, tighten the anchors until snug.
5. Using a straight edge level, verify the tower is plumb and level. If necessary, use shims to level the tower.
6. Using a torque wrench and 9/16" socket, torque the anchor bolts to 20 ft-lbs.
7. Apply a bead of clear RTV silicone around the base plate.
8. Rotate Lower Column to original position by aligning the power button with the power button hole.
9. Use the 7/8" plastic cap to plug the Access Panel hole.



Connecting Primary Power

Figure 14A TB0 Terminal Block Location**Figure 14B** TB0 Terminal Block**Table 1**

Terminal	110V	220V
Neutral (N)	White	Blue
Ground (G)	Green or Green/Yellow	Green/Yellow
Line (L)	Black	Brown

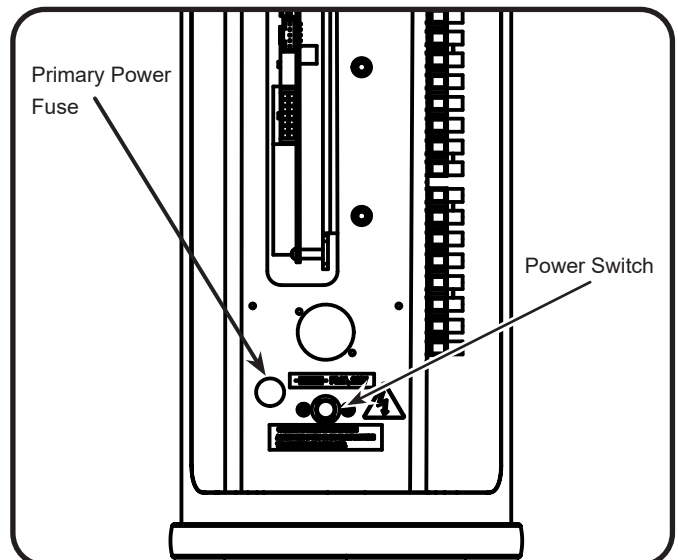
NOTE

- Refer to Appendix A on Pg.37 for instructions on wiring DC power to the SW500T Secondary gate.
- If the external power supply option was purchased, refer to Appendix C on Pg.46 for instruction on wiring the external power supply enclosure.

CAUTION

- It is strongly recommended that a licensed electrician perform the following steps, maintaining adherence to local electrical codes.
- The ground wire must be connected. Serious injury may result if the ground wire is not properly secured.

- Locate the terminal block TB0 at the bottom of the Main tower assembly. [Figure 14A]
- Use Table 1 [Figure 14B] to determine wire designations. Connect the wires to the appropriate terminal.

Figure 15 Primary Power Fuse Location**NOTE**

- Lower Column rotated to show power switch.



Connecting Inputs / Outputs

Terminal blocks for wiring input / output signals to the SW500 are mounted to the frame [Figure 16]. Instructions for wiring I/O communication leads are provided on the following pages.

Figure 16 Terminal Block Locations

TB1 - Configuration Terminal

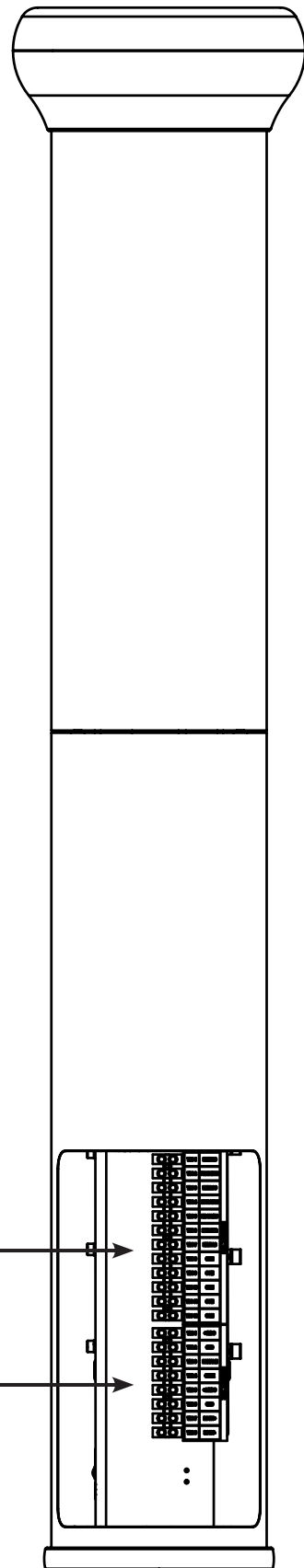
Terminal	Description
1	Entry Pass
2	Presence Sensor
3	Entry Accept
4	Barrier Held Open
5	Emergency Override Select - NO / NC
6	Emergency Override
7	Exit Pass
8-12	COM

TB2 - Communication Terminal

Terminal	Description
1	+5VDC
2	GND
3	BREAKAWAY ALARM
4	GNDX
5	+24VDC
6	GND
7	RS485+
8	RS485-

NOTE

- Refer to Appendix A on Pg.37 for Secondary terminal block configuration layout.
- Lower Column is rotated to view terminal blocks.



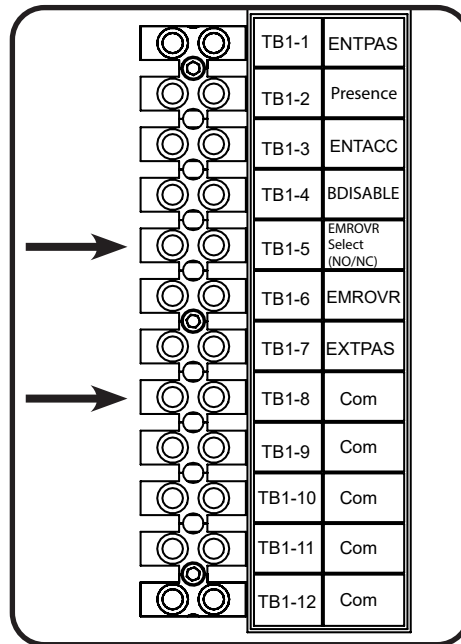
**Fire Alarm / Emergency Override State Select**

This terminal is used to configure the Emergency Override State terminal (TB1-6) as either normally open (N.O) or normally closed (N.C).

The default configuration is normally open (no wire jumper installed).

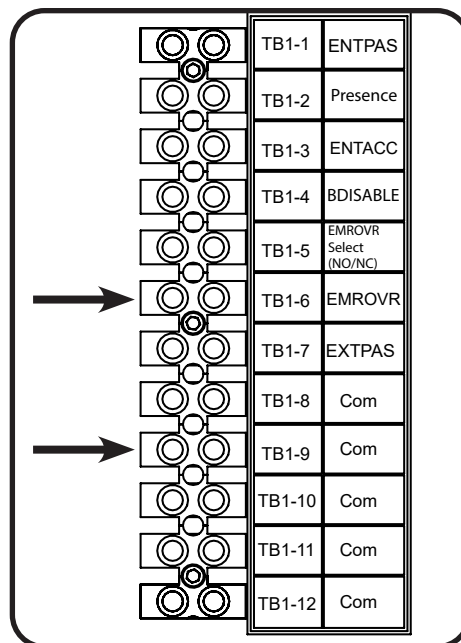
To configure as normally closed (N.C):

1. Locate the TB1 terminal block on the Main. [Figure 16]
2. Using a wire jumper, jump TB1-5 and any common (TB1-8 through TB1-12). [Figure 17]

Figure 17 Emergency Override State Select Terminals**Fire Alarm / Emergency Override**

Opens the barrier towards the exit direction and remains inactive until the SDC (sustained dry contact) is: removed if configured as N.O. or reestablished if configured as N.C.

1. Locate the TB1 terminal block on the Main. [Figure 16]
2. Connect wires to TB1-6 and any common (TB1-8 through TB1-12). [Figure 18]

Figure 18 Emergency Override Terminals



Barrier Hold Open

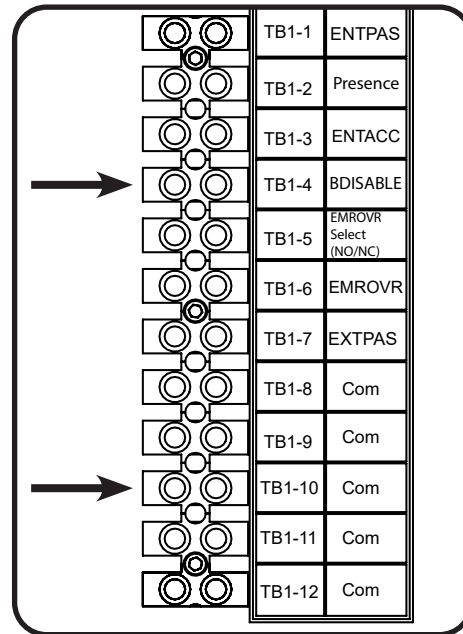
A sustained dry contact (SDC) to this terminal keeps the gate open for as long as the contact signal is provided. Typically, these signals are provided by an integrated toggle button used to keep the gate open for an indefinite period of time.

1. Locate the TB1 terminal block [Figure 16].
2. Connect wires to TB1-4 and common (TB1-8 through TB1-12). [Figure 19]

NOTE

Input signal must be a voltage-free, normally open, sustained dry contact..

Figure 19 Barrier Hold Open Terminals

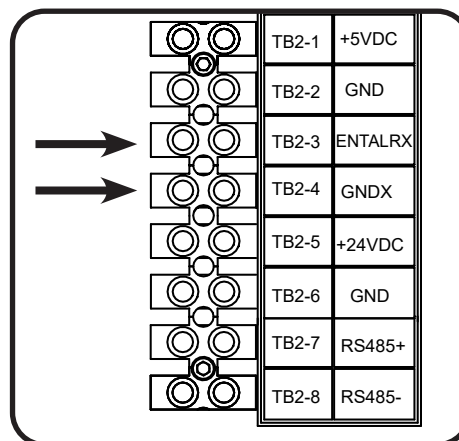


Breakaway Alarm Output

This terminal is used to generate an output signal when the barrier is forced open (breakaway alarm). The output signal is a voltage-free, normally open, momentary dry contact.

1. Locate the TB2 terminal block on the Main [Figure 16].
2. Connect wires to TB2-3 and TB2-4. [Figure 20]

Figure 20 Breakaway Terminal





Barrier Installation

1. Locate arm mounting hardware taped to the end of the arms. [Figure 21]
2. Slide the barrier into the clamps. [Figure 22]
3. Apply a small dab of blue thread locker on the bottom threads of each of the 4 set screws.
4. Using a Torque Wrench and a 1/8" Hex key, insert and torque each set screw to 75 in-lbs.

NOTE

The set screw closest to the tower does not sit flush with the barrier clamp.

This completes the physical assembly of the SW500
Continue for instructions on how to: apply power, set barrier
closed position, and test the gate.

Figure 21 Arm Attachment Hardware Location

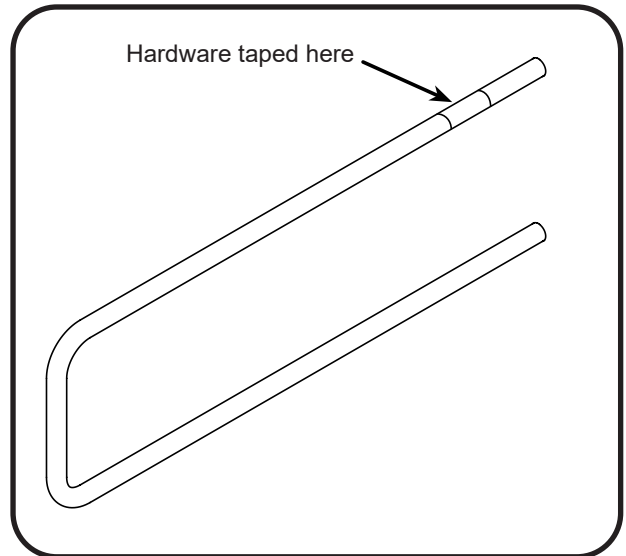
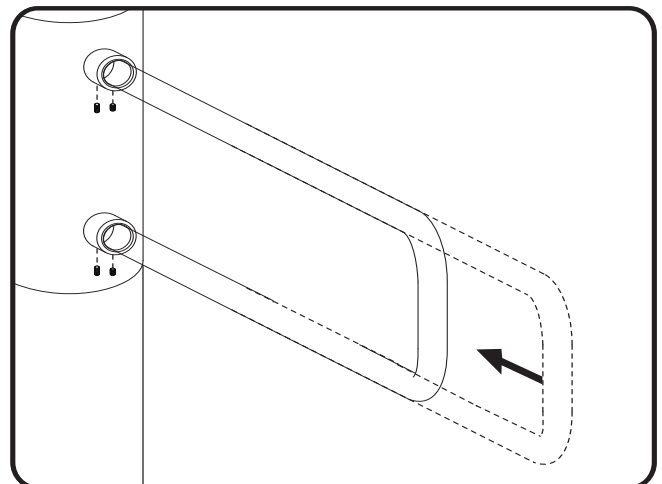


Figure 22 Barrier Installation

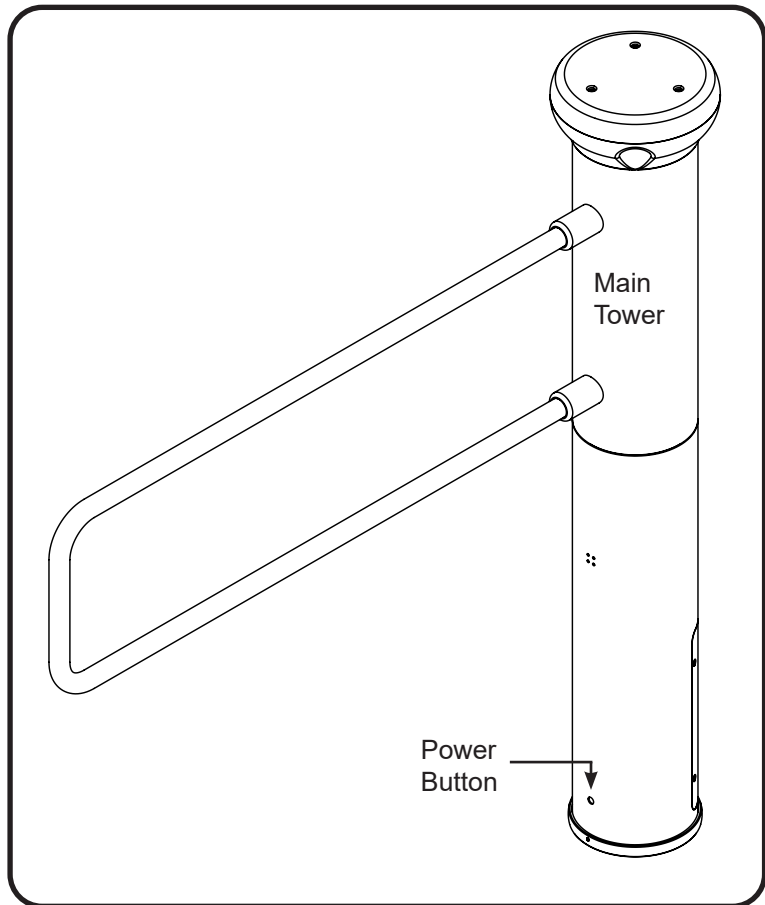




Powering On

1. The power button is aligned with the barrier and recessed into the lower column on the Main tower.
[Figure 23]
2. Using a slim object such as the eraser-end of a pencil, press the power button.
3. The gate will swing to the closed "Home" position when ready to use.

Figure 23 Power Button Location

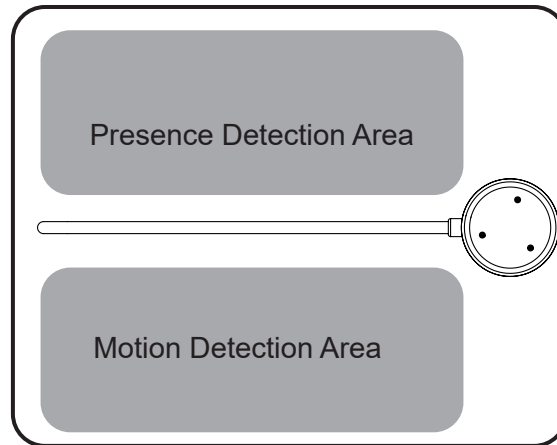




Setting Home Position Manually

Prior to testing, it is necessary to set the "home" position of the barrier when in the closed position. There are two ways to set the home position: manually, as shown in the instructions below; or through the use of the included SwingGate Utility -- see pg.30.

Figure 24 Barrier shown in "Home" position



NOTE

Motion and Presence Detection Areas not shown to scale.

1. Locate the I/O - Motor Control Board. [Figure 25]
2. Slide three fingers into the space in front of the control board near the two green terminals. You will feel 3 buttons.
3. Press and hold the the top button, "Test Mode", for two seconds to enter Test Mode. The D2 Green LED will change from *flashing* to *solid* signifying the board is in Test Mode. [Figure 25]
4. Swing the barrier through its entire range of motion and then place it in the "Home" position. [Figure 24]
5. Press the lowest button, "Home Position", once. [Figure 26]
6. Press and hold the "Test Mode" button for two seconds to exit Test Mode. The D2 Green LED will change from *solid* to *flashing* signifying the board has exited Test Mode.
7. Using a Phillips screwdriver, reattach the four (4) screws to secure the Access Panel.

NOTE

For tandem installations, repeat for Secondary tower.

Once barrier Home Position is set, proceed to Function Validation to verify gate operation.

Figure 25 Press and Hold Test Mode for 2 sec

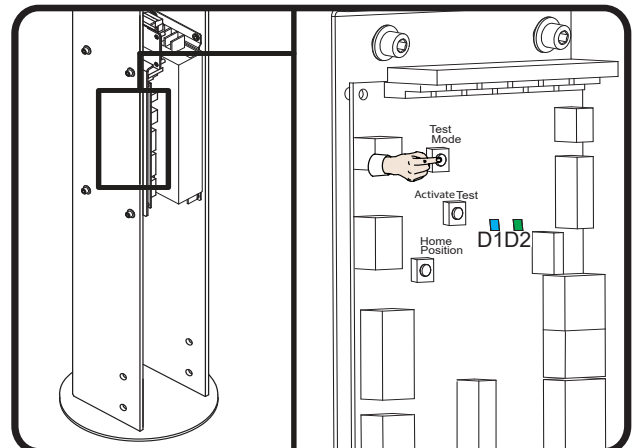
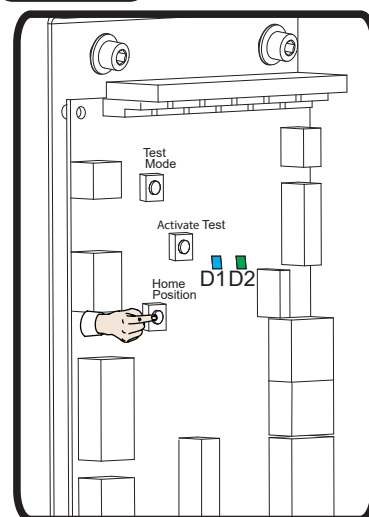


Figure 26 Press Home Position once





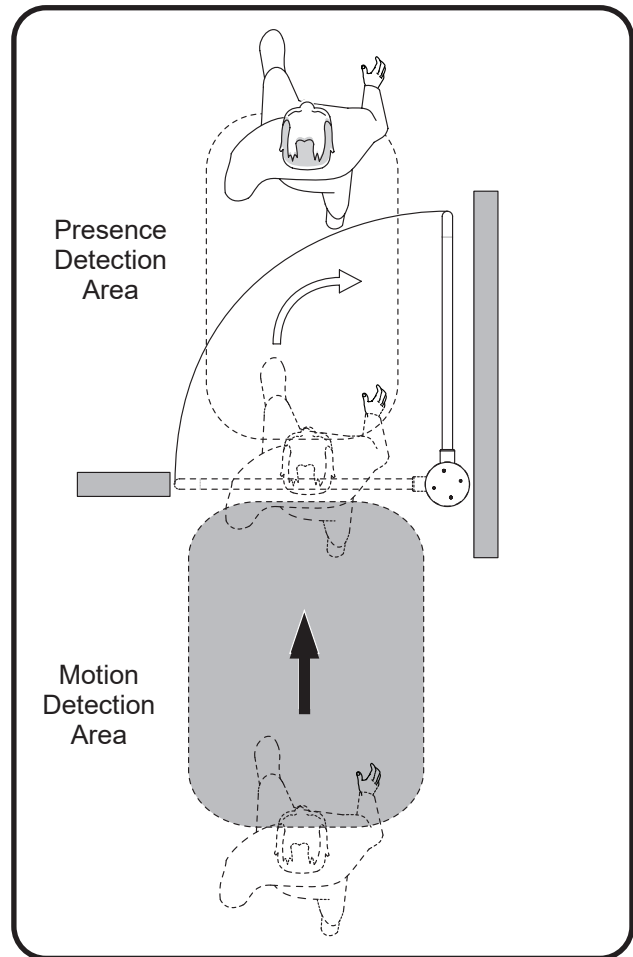
Function Validation

Perform the following gate functionality tests to validate basic gate operation. Tests are provided for Open Entry, Barrier Breakaway, Unsafe to Open, Unsafe to Close, and Fire / Emergency Override.

Open Entry

1. Approach the Motion Detection Area of the gate at a moderate speed.
2. Once the patron has entered the Motion Detection Area, the barrier should activate and come to a complete stop in the open position.
3. Move through the barrier opening and exit the gate.
4. After the dwell time has elapsed, the barrier should close.

Figure 27 Open Entry

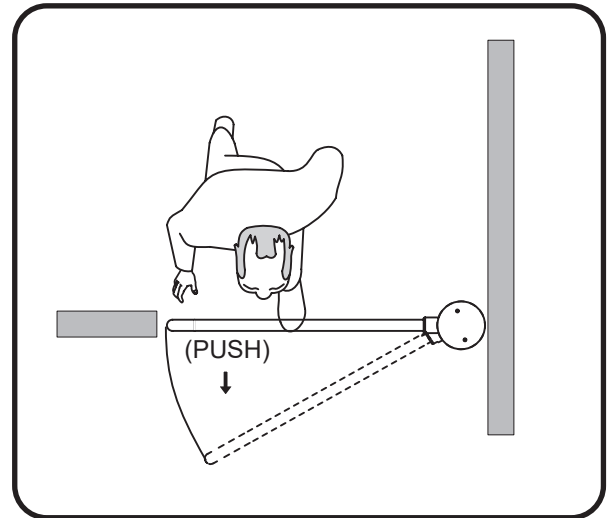




Barrier Breakaway

1. Approach the gate from the Presence Detection Area.
2. Using your hands, push or pull the barrier open.
3. An alarm should sound.
4. After 2 seconds, the barrier should return to the home position.

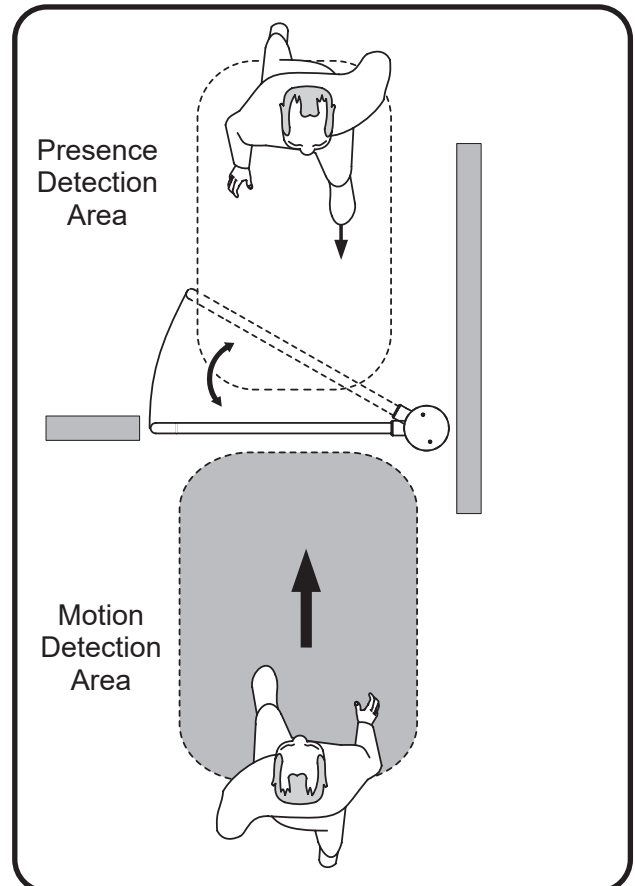
Figure 28 Barrier Breakaway



Unsafe to Open

1. Have someone move into the Presence Detection Area.
2. Enter the Motion Detection Area of the gate at a moderate speed.
3. The barrier will not open until the Presence Detection Area is clear.
4. Once the Presence Detection Area is clear, the barrier will open.
5. After the dwell time has elapsed, the barrier will close.

Figure 29 Unsafe to Open

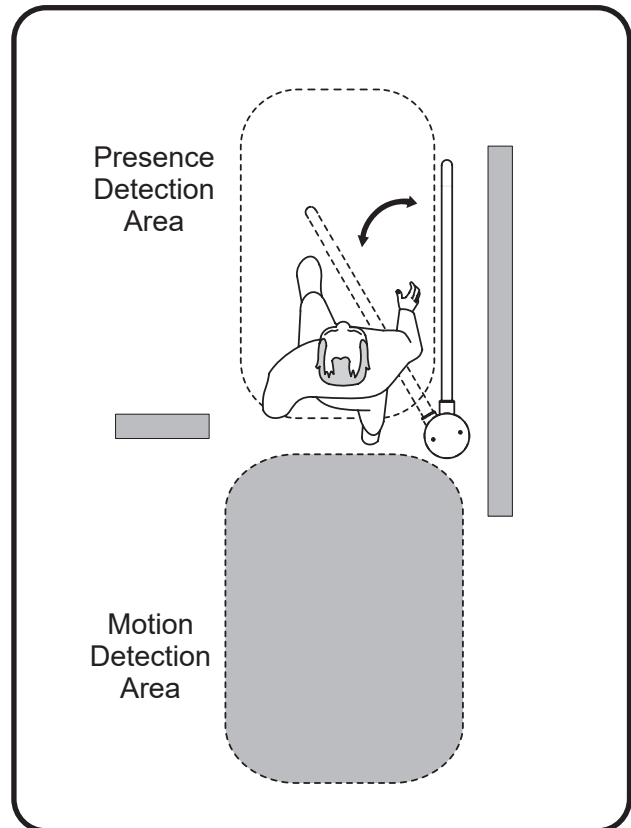




Unsafe to Close

1. Enter the Motion Detection Area and pass through the gate.
2. With the barrier fully open, stop and stand in the Presence Detection Area.
3. The barrier should not close.
4. After leaving the Presence Detection Area and the dwell time elapses, the barrier should close.

Figure 30 Unsafe to Close



Fire / Emergency Override

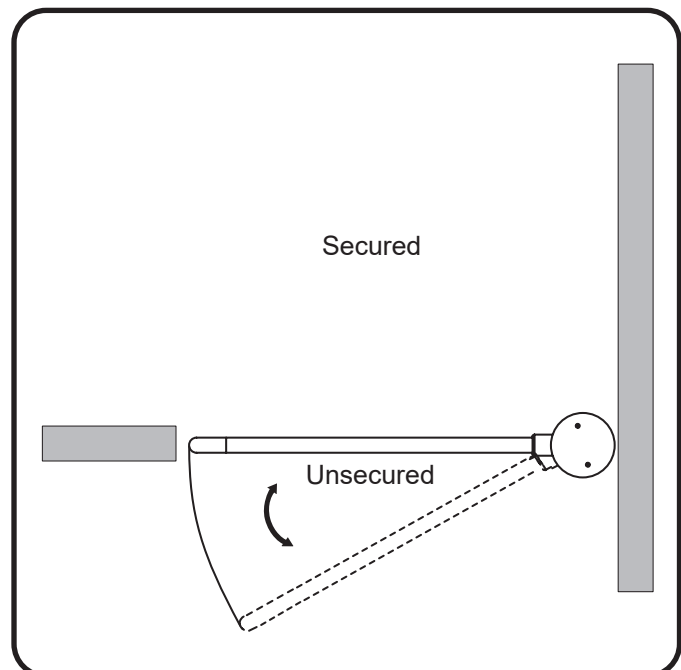
For Normally Open configurations:

1. On the Main I/O - Motor Control Board, jump TB1-6 and GND to provide a sustained dry contact (SDC)
2. The gate should open towards the exit direction and the motion and presence detection sensors should become inactive until the SDC is removed.
3. Upon removal of the SDC, the gate resumes normal operation.

For Normally Closed configurations:

1. On the Main I/O - Motor Control Board, remove wire landing on TB1-6 to remove the sustained dry contact (SDC)
2. The gate should open towards the exit direction and the motion and presence detection sensors should become inactive until the SDC is reapplied.
3. Upon reapplication of the SDC, the gate should resume normal operation.

Figure 31 Fire / Emergency Override





Swing Gate Utility

The SwingGate Utility can be used to configure gate settings. This utility is located on the software USB drive that was included with the SW500. No installation is required. Simply copy **SwingGateUtility.exe** over to the laptop and double-click to run.

Minimum computer requirements:

- 1 GHz Processor
- 512 MB RAM
- 2 GB Hard Drive
- Windows XP / Vista / 7 / 8 / 10
- .NET v4.0.3019 or later
- Serial Port (or Serial to USB adapter)

NOTE

The SwingGate Camera Utility is a separate utility that is used to configure the Motion Detection Area distance and sensitivity. The default settings are applicable to most installations. If required, this utility is can be obtained by contacting Alvarado.

Setting the Gate Closed Position (Home Position) Using the Utility

The gate closed position is called the Home Position. The final installation steps require setting the Home Position. Refer to Figure 24 on pg.26 for an illustration of the barrier Home Position.

1. Using a Phillips screwdriver, remove the 4 screws securing the Access Panel.
2. Using a 3/32" Hex key, loosen base plate set screw.
3. Rotate Lower Column to align the Access Panel with the power button. The RS232 Programming cable will be visible.
4. Connect your laptop using the RS232 programming cable.

NOTE

If you do not have a serial port on your laptop, use a serial-to-USB adapter.

5. Doubleclick SwingGateUtility.exe icon to launch the utility. This will bring up the SwingGate Utility main screen.
6. Select the **COM port** from the drop-down menu and click **Open**. This will populate the boxes with current values.
7. Confirm Home Position value is set to "**2000**".

NOTE

Do not change this value. Value MUST read 2000.

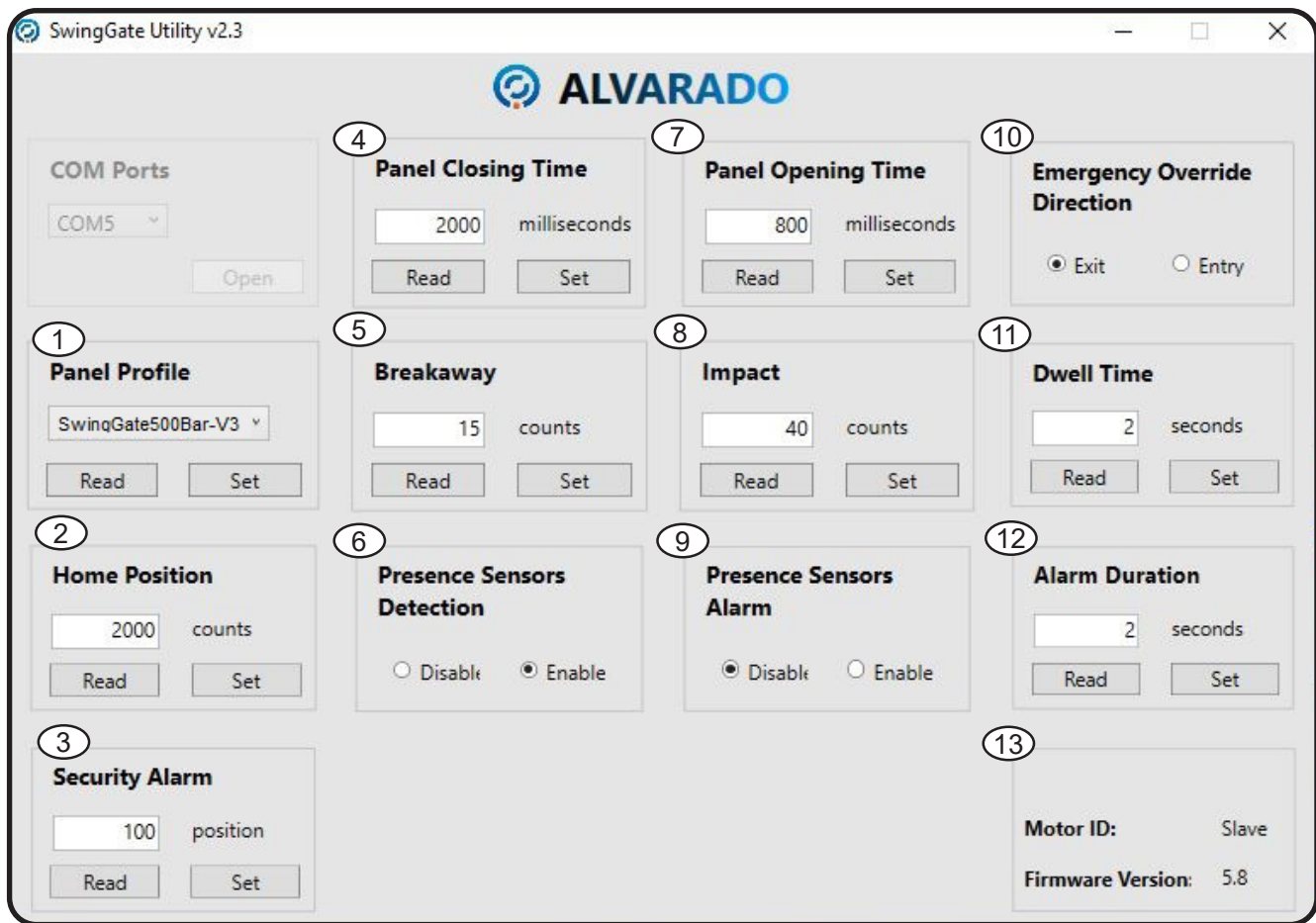
8. Manually move the barrier to the closed (Home) position.
9. Once barrier is in the correct position, click on the SET button underneath the Home Position value.
10. Disconnect the RS232 Programming cable.
11. Rotate Lower Column to original position, aligning the power button with the power button hole.
12. Using a 3/32" Hex key, tighten the base plate set screw.
13. Using a Phillips screwdriver, insert and tighten four (4) screws to secure the Access Panel to the tower.



Using SwingGate Utility to Configure Settings

- To check the current value of a gate parameter, click **Read**.
- To customize a gate parameter, enter a value in the text box and click **Set**.
- For SW500T tandem units, settings must be configured on each tower assembly.
- Contact Alvarado **before** changing settings.
- If a value is changed, perform test activations to confirm setting has changed.

Figure 32 SwingGate Utility Main Screen Parameters



Parameter descriptions on next page.



ITEM	SETTING	DESCRIPTION
1	Panel Profile	<p>Selects the panel profile:</p> <ul style="list-style-type: none"> • Metal Barrier Bar - SwingGate500Bar-V.3 • Acrylic Panel - SW1000 Low Panel - V.2 <p>The panel profile setting is factory-set and only needs to be changed if the I/O - Motor Control Board has been replaced.</p>
2	Home Position	<p>Sets the barrier closed (Home) position.</p> <ul style="list-style-type: none"> • Refer to pg.26 for steps to set the closed (Home) position manually. • Refer to pg.30 for steps to set the closed (Home) position with the SwingGate Utility. <p>The home position value must always be 2000. DO NOT change this value.</p>
3	Security Alarm	<p>Defines how far the barrier can be pushed / pulled from the home position before an alarm sounds and an output is generated.</p> <p>The default setting: 100</p>
4	Barrier Closing Time	<p>Sets the length of time (in milliseconds) the barrier takes to move from the open position to the closed position (home).</p> <p>The default setting for the Metal Barrier Bar: 2000 ms. The default setting for the Acrylic Barrier Panel: 2500 ms.</p> <p>Contact Alvarado Technical Support BEFORE changing this setting.</p>
5	Breakaway	<p>Sets the maximum force the motor uses to keep the barrier closed during an attempt to force the barrier open. When the force applied to the barrier exceeds this setting, the barrier gives way and an alarm sounds and an output is generated. The default setting: 15.</p> <p>Do NOT set Breakaway to more than 100.</p>
6	Presence Sensors Detection	This is always enabled. Do not change.
7	Barrier Opening Time	<p>Sets the length of time (in milliseconds) the barrier takes to move from the closed position (Home) to the open position.</p> <p>The default setting for the Metal Barrier Bar: 800 ms. The default setting for the Acrylic Barrier Panel: 1800 ms.</p> <p>Contact Alvarado Technical Support BEFORE changing this setting.</p>
8	Impact	<p>Sets the force threshold used to close the barrier upon impact with an object. When the force required to close the barrier exceeds this setting, the barrier gives way and an alarm sounds. The default setting: 40.</p> <p>Contact Alvarado Technical Support BEFORE changing this setting.</p>
9	Presence Sensors Alarm	This is disabled.
10	Emergency Override Direction	<p>Sets the direction the barrier opens in emergency override mode.</p> <p>The default setting: Exit.</p>
11	Dwell Time	<p>Sets the duration (in seconds) the barrier remains in the open position after the patron has cleared the motion detection area before closing.</p> <p>The default setting: 2 seconds.</p>
12	Alarm Duration	<p>Sets the duration (in seconds) the alarm sounds after the gate has been violated.</p> <p>The default setting: 2 seconds.</p>
13	Gate Information	<p>Motor ID: Identifies the gate motor ID as either Main or Secondary. Only SW500T tandem gates will have a Secondary motor ID.</p> <p>Firmware Version: Displays installed firmware version.</p>



Maintenance

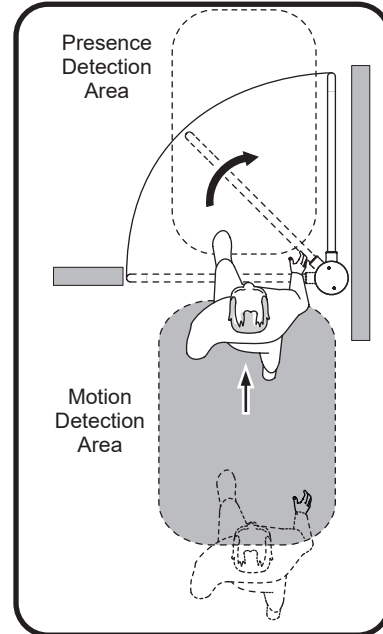
Daily Functions Safety Check

The following safety checks should be performed on a daily basis. These checks should be done while traffic is restricted in all detection and sensing zones.

Motion Sensing Activation [Figure 33]

- Check 1. Check the motion detection by walking through the Motion Detection Area and passing completely through the Presence Detection Area. The barrier should start opening as you enter the Motion Detection Area; it should open smoothly and stop without impact. After the set dwell time has expired, the barrier should close.

Figure 33 Motion Sensing Activation



Presence Sensor [Figure 34]

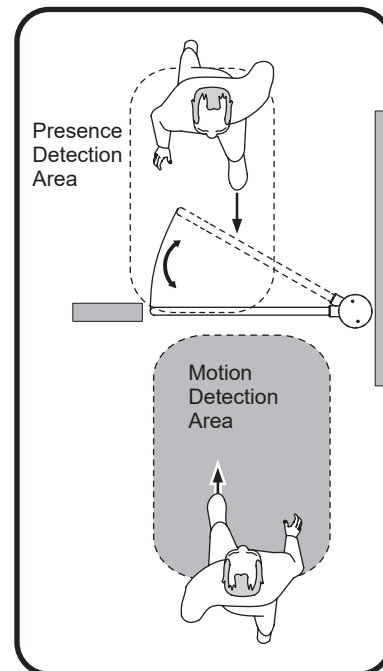
- Check 2. Move into the Presence Detection Area. Have another person approach the Motion Detection Area; the barrier will remain closed as long as you are in the Presence Detection Area.

NOTE

If you do not have a second person, one person can test the presence detection functionality.

1. Stand near the tower outside the Motion Detection and Presence Detection Areas.
2. Place one hand in front of the presence detection sensor.
3. Then place the other hand in front of the motion detection sensor.
4. The barrier should remain closed.
5. Remove your hand away from the presence detection sensor.
6. After a brief delay, the gate should open.

Figure 34 Checking the Presence Sensor



If the gate does not pass the Daily Functions Check:

1. Power cycle the gate and retest operation.
2. Take the gate(s) out of service and contact Alvarado Technical Support for troubleshooting assistance.



Maintenance (Cont.)

Preventative maintenance should be performed periodically after installation to ensure the product maintains its visual exterior appeal and optimal performance. To maintain the SW500, follow the instructions below as needed. Due to the various types of exterior finishes available, different types of care must be taken to keep the unit clean and undamaged.

Exterior Finish

The best way to maintain the SW500's exterior finish and prevent corrosion is to clean it regularly.

1. Stainless Steel Finishes - The goal of a cleaning program should be to clean the surface, keeping the stainless steel's protective chromium oxide layer intact. The frequency of cleaning will depend on the environment.

Cleaning can be accomplished by wiping the stainless steel with a damp cloth to remove accumulated chemicals, materials and particulates. Wipe dry with a clean cloth. Clean immediately after contact with chlorides (chlorine powder, salt melt, seawater, etc.) .

For embedded deposits, a neutral detergent, such as a car shampoo, clean warm water and a soft brush can be used. Wipe the surface with a damp cloth after cleaning. *Never use steel wool*. MAAS makes an excellent stainless steel cleaner spray, MAAS Stainless Steel & Chrome Cleaner, that is available from the MAAS website (www.maasinc.com).

For stubborn stains, heavy spotting and rust, our #1 recommendation is MAAS Metal Polish (liquid form). Follow the manufacturer's directions but in brief: (1) wipe down excess dirt from the surface; (2) apply polish to the metal; (3) polish in the direction of the grain with a super fine (0000) or fine (000) synthetic steel wool (depending on the level of tarnish), (4) wipe clean, (5) repeat steps 2 - 4 until clean. MAAS Metal Polish (liquid) is also available from the MAAS website (www.maasinc.com). Synthetic steel wool can generally be found at home improvement centers or online. Again, *never use steel wool*.

2. Bright Chrome Finish - A good dish detergent and a soft rag (chrome scratches easily) may be used to remove light dirt and grime. Wipe clean when complete. Use vinegar diluted with water if a stronger cleaner is needed. As vinegar is slightly acidic, it works well for taking tarnish and gunk off chrome. Remember to use different parts of the rag as you wipe, so that a clean section of the rag is always being used.
3. Powder Coat Finishes - Use a neutral detergent, such as a car shampoo, and clean with a damp cloth. In the event that the powder coat finish is chipped, and bare metal is showing, seal the area as soon as possible. If the area is not sealed, the underlying metal will rust, which could eat away the powder coat and cause flaking. Touch up paint is available from Alvarado.
4. Acrylic (Optional) - Use cleaning products that are specifically recommended for use on acrylic surfaces. We recommend two products: Brillianize, Novus #1. The two recommended products will clean the material and repel dust / resist fingerprints. DO NOT use scouring compounds or chemical cleaners like Windex that contain ammonia or alcohol. Using a soft cloth, clean the acrylic surfaces according to the instructions provided with the recommended cleaning product. *Do not scrub the acrylic!*

Dust Removal

Dust removal should be performed every year.

1. Using canned air suitable for electronics, blow out the dust on the I/O - Motor Control Board and other internal electronics.
2. Use this opportunity to check wiring for loose connections and crimps.



Maintenance (Cont.)

Recommended Weekly Inspections

- Check that the gate is secure (no wobbling). Tighten anchors securing the tower as needed.
- Ensure fasteners holding the Motion Detection and Presence Sensor Housing are secure. Tighten approximately $\frac{1}{4}$ turn past snug.
- Ensure gate barrier set screws are tight and gate arm is secure. Torque as needed.
- Ensure Access Panel is secure. Tighten fasteners as needed
- Check for any signs of damage. If there are signs of damage, take the gate out of service and contact Alvarado Technical Support for instructions.

**Troubleshooting**

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

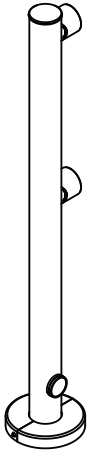
Symptom	Possible Cause	Solution
On boot up, the barrier opens and does not close.	Motion and Presence Detection Areas were not clear during the entire sensor background calibration process.	Power the gate off. Wait 5 seconds and power gate back on while keeping Motion and Presence Detection Areas clear during the sensor background calibration process (approximately 12 seconds).
	Gate is in Emergency Override mode.	Ensure Emergency Override State Select is set according to the facility requirements (Normally Open / Normally Closed).
	Barrier Held Open contact is closed.	Check to see if Barrier Held Open contact is closed. Remove SDC if present.
The barrier does not open.	No power	Verify power to the gate indicated by a green LED on the I/O - Motor Control Board.
	Blown main fuse	Check fuse; refer to Connecting Primary Power on Pg.20 for fuse location. If necessary, replace with 5mm x 20mm 3A Slo-Blo fuse.
	User has not stepped into the motion detection area	Step closer to the gate to enter the activation area.
	There is an object in the presence detection area	Remove the object.
The barrier does not close after opening.	Presence detection sensor relay is locked up.	Clear the Motion and Presence Detection Areas of any persons or objects for 15 seconds.
		Power cycle the gate to see if the relay resumes normal operation. If normal operation is not restored, contact Alvarado Technical Support for assistance.
The Secondary barrier does not activate in conjunction with the Main (SW500T ONLY).	No power from Main tower	Ensure DC-Crossover wires are connected from the Main power supply to the Secondary power terminal block as shown on Pg.40.
	No communication with Main tower	Check that communication crossover wires are connected to the Main TB2 Communication block to the Secondary TB2 Communication block on Pg.41.
	Blown I/O - Motor Control Board fuse	Check the 12VDC and 24VDC fuses on the Secondary I/O - Motor Control Board. If necessary, replace with same type and rating fuse.
The barrier does not center properly.	The barrier was forced open, causing the barrier position to change.	Set the barrier closed (Home) position using the instructions found on Pg.30.



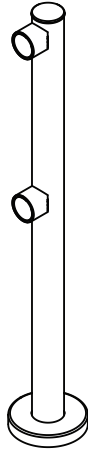
Appendix A - SW500T Installation

Parts List

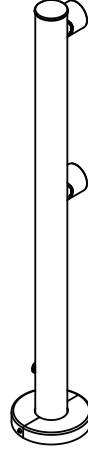
The SW500 Tandem installation includes the components shown below as well as the parts listed on pg.10. Make sure that no parts are missing or damaged before beginning installation. If parts are missing or damaged, please contact Alvarado Technical Support at (909) 591-8431.



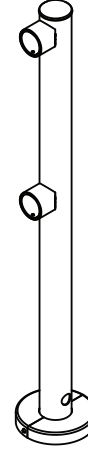
Reflector Post
QTY1



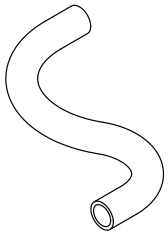
Post
QTY1



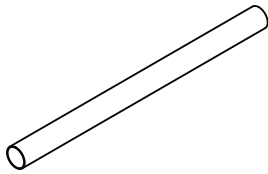
Sensor Post
QTY1



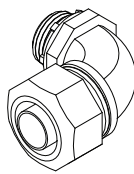
Conduit Post
QTY1



Flex Conduit
QTY1



Rail
QTY4



Conduit
Bend
QTY2



Tandem Gate Orientation

Figure A1 Correct SW500T Tandem Gate Orientation & Dimensions

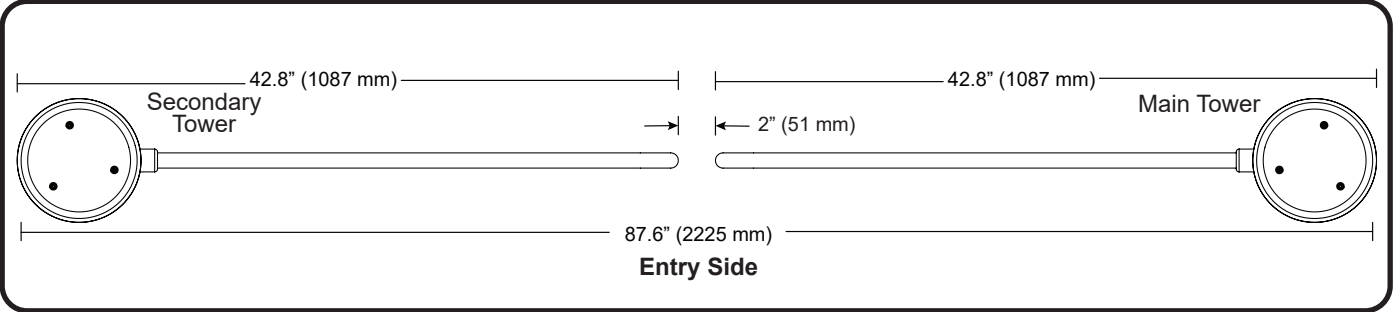
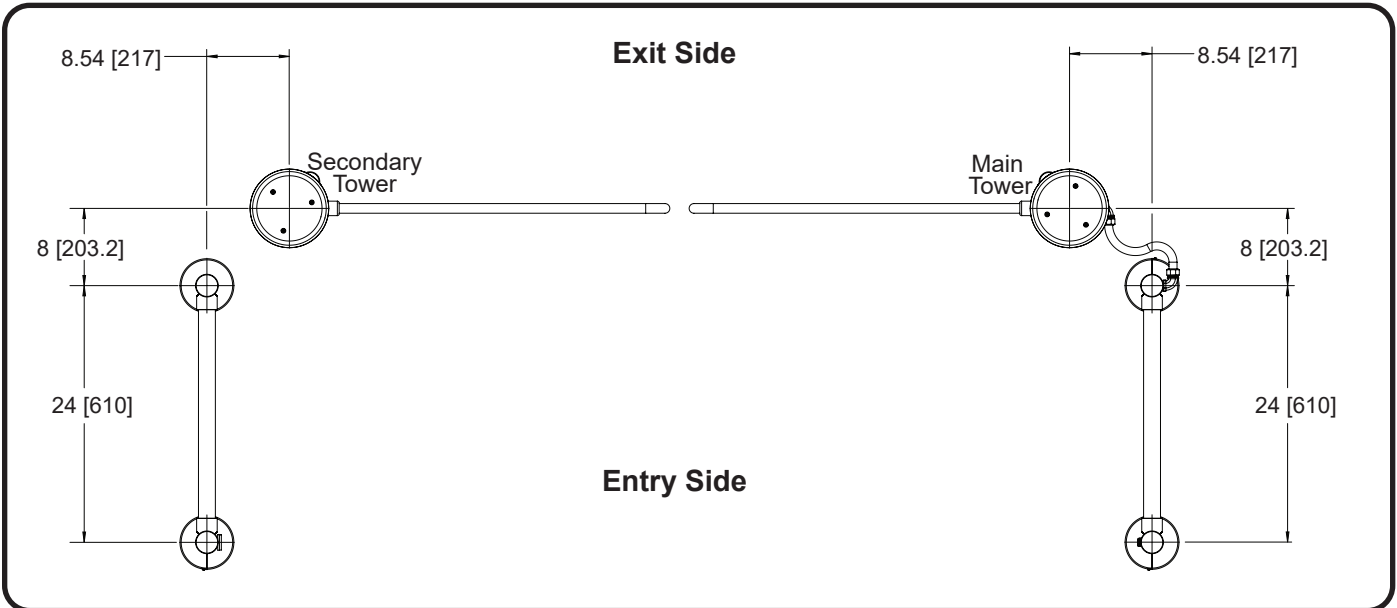


Figure A2 Tandem Corral Dimensions





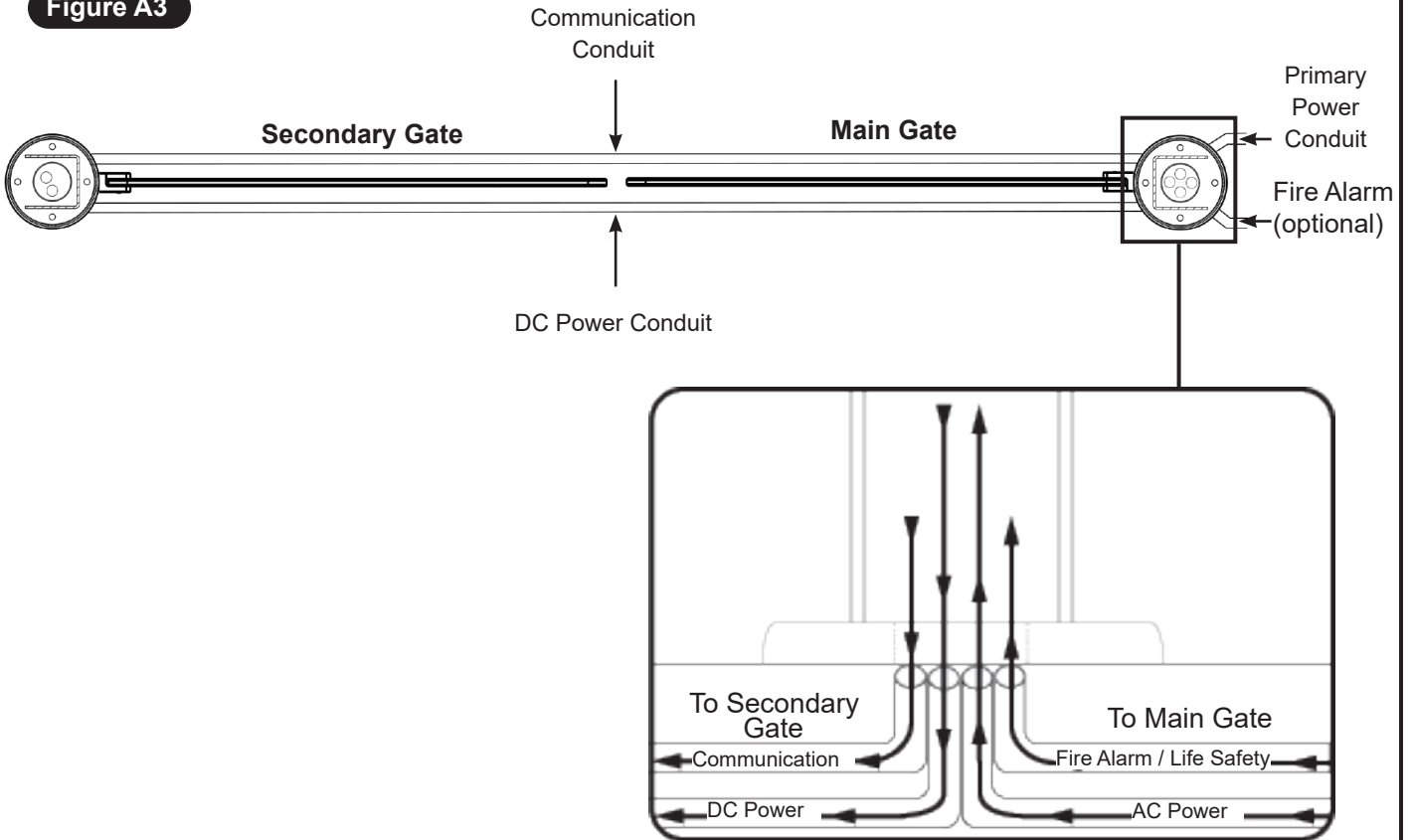
Conduit Requirements

- Conduit opening is 2.5" (64mm). Recommended conduit size is .5" (13mm).
- Run primary power and Fire Alarm, if used, conduit to the Main gate.
- Run DC power and communication conduit from the Main gate to the Secondary gate.

NOTE

- DC Power and Communication can use the same conduit
- If using above ground conduit, refer to Appendix D on pg.49.

Figure A3



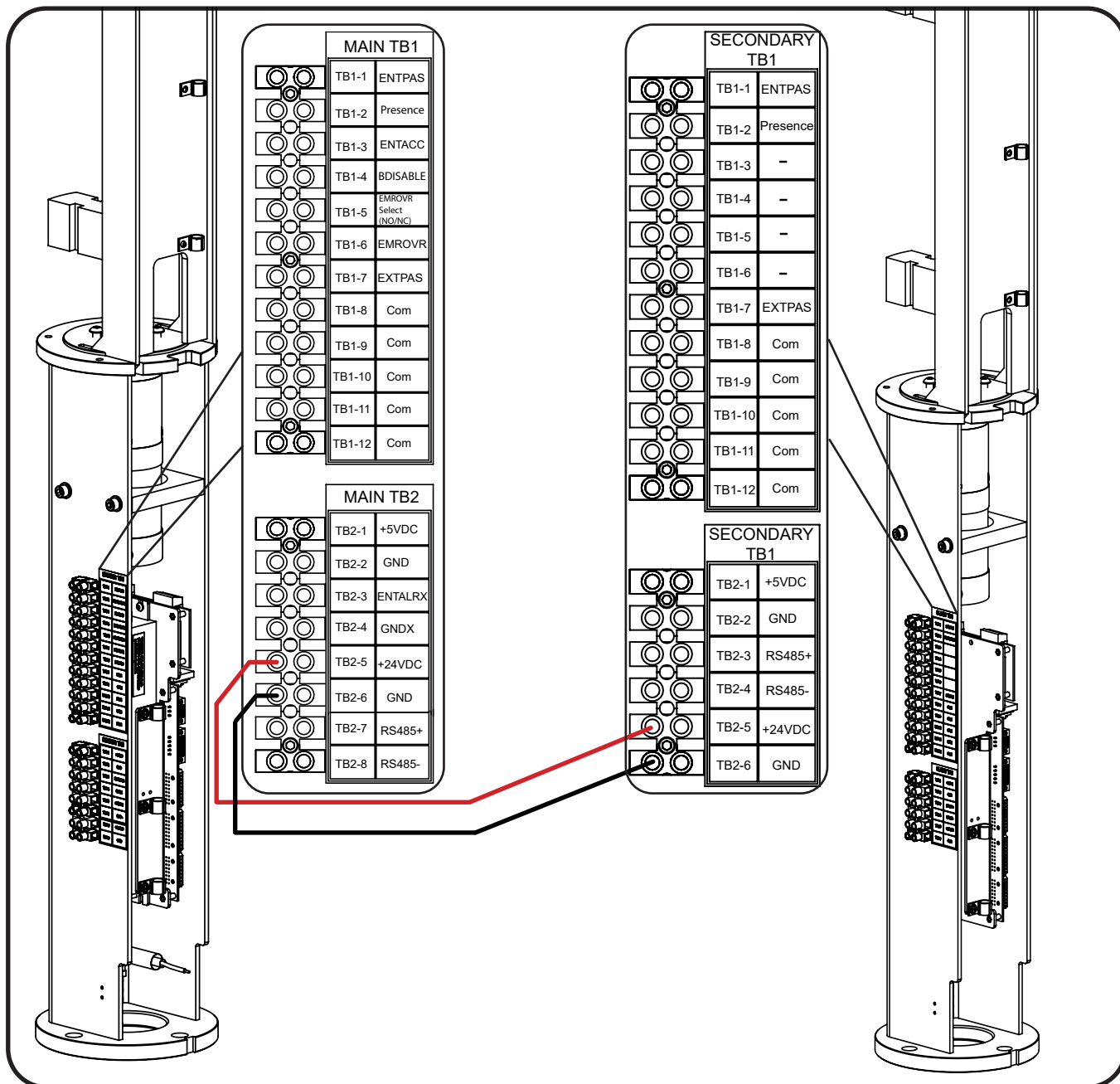


Crossover Cable - DC

DC power is run from the Main gate to the Secondary gate using the DC-Crossover cable (**Alvarado PN# 10-1353**). Follow the instructions below to connect DC power to the Secondary gate.

1. Locate the DC-Crossover cable shipped with the Secondary gate.
2. On the Main tower assembly, connect the crossover cable wires to TB2-5 (red) and TB2-6 (black). [Figure A4]
3. On the Secondary tower assembly, connect the crossover cable wires to TB2-5 (red) and TB2-6 (black). [Figure A4]

Figure A4 DC-Crossover Connection



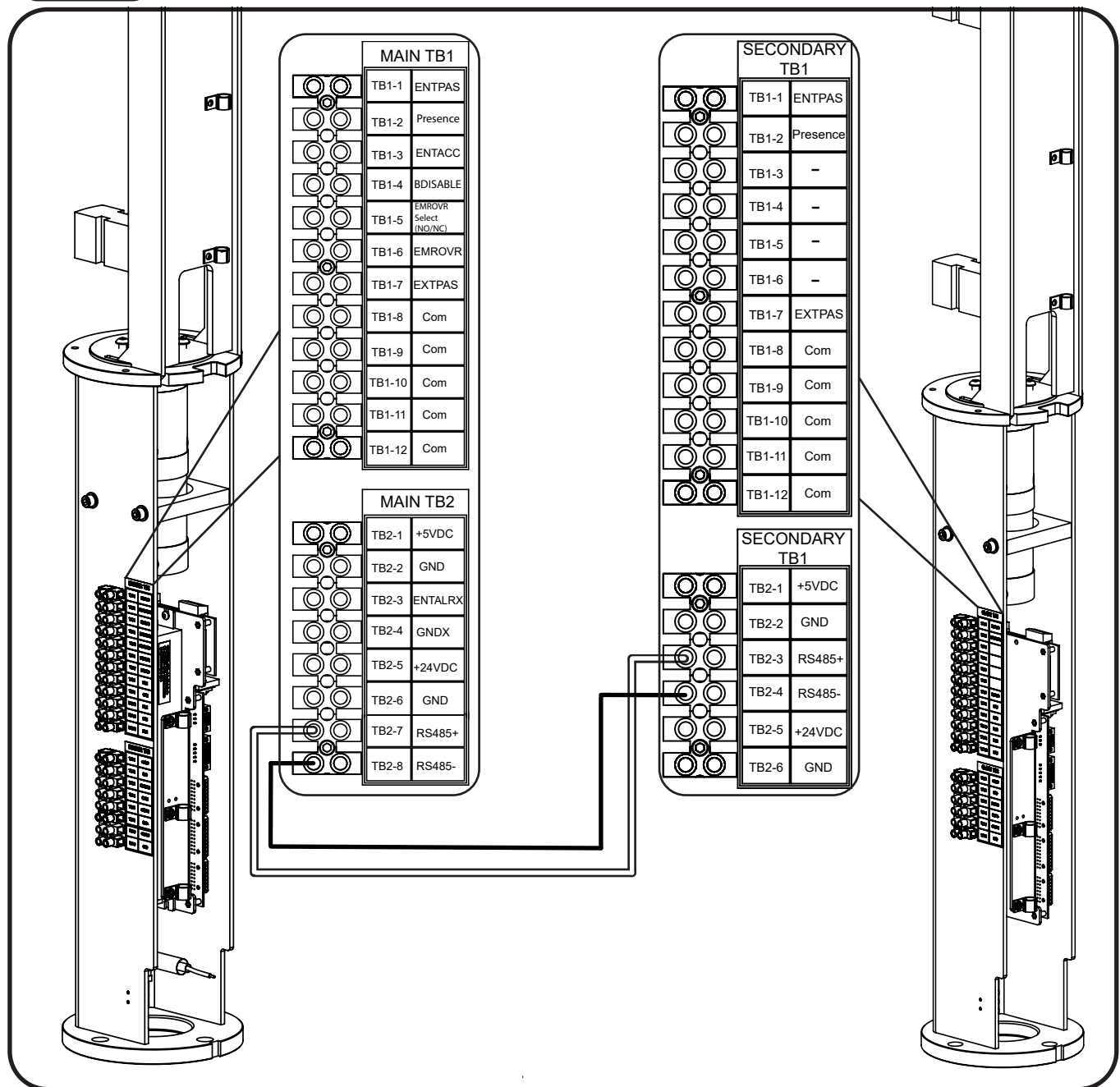


Crossover Cable - Communication

Communication is run from the Main gate to the Secondary gate using the communication crossover cable (Alvarado PN# 10-1306). Follow the instructions below to connect communication to the Secondary gate.

1. Locate the communication crossover cable shipped with the Secondary gate.
2. On the Main gate, connect the bare wires to TB2-7 (white) and TB2-8 (black). [Figure A5]
3. On the Secondary gate, connect the bare wires to TB2-3 (white) and TB2-4 (black). [Figure A5]

Figure A5 Communication Crossover Connection





Corral Construction

1. Confirm the location of the corral posts according to Figure A2. Ensure the correct posts are in the necessary location.
2. Press fit the lower railing between the Sensor & Conduit Posts while pulling the sensor cable harness through. Ensure sensor cable harness has approx. 2ft of slack hanging from the Conduit Post.
3. Press fit the rest of the rails to their corresponding posts.
4. Place the post & rails into position according to Figs. A2 & A6 and mark the anchor hole locations.

NOTE

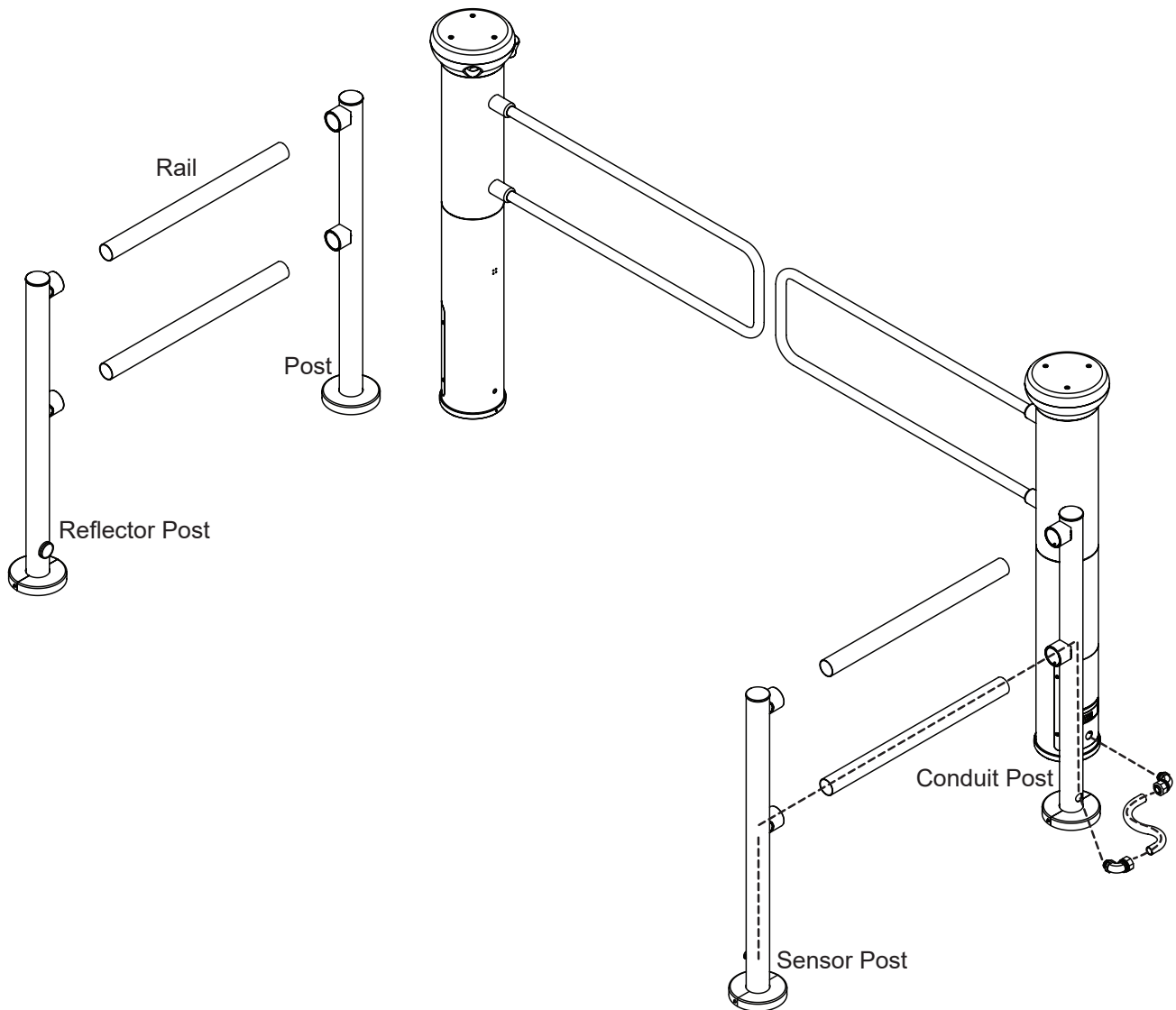
Each post uses QTY4 anchors.

5. Remove the posts & drill each anchor hole to a depth of 3 inches.
6. Vacuum material the from holes & insert an anchor into each hole. Ensure holes are free of debris before inserting anchors.
7. Place the posts back over the anchor holes and insert a washer & bolt into each hole. Using a torque wrench and a 9/16" socket, torque anchor bolts to 20 ft-lbs.
8. Secure each anchor cover to the base of each post.
9. Using a 1/8" hex wrench, tighten the set screws on the underside of the rail sockets.
10. Route the sensor cable harness through the 90 degree conduit bend, through the flex conduit, and then through last 90 degree bend.
11. Secure the 90 degree conduit bends to their respective post.
12. Remove the Main gates' access panel. Route the sensor harness through the hole in the access panel.
13. Rotate the bottom cover 90 degrees CLOCKWISE to expose the terminal block.
14. Connect the sensor harness to TB1-1 and an available GND.
15. Secure the flex conduit to the conduit bends to ensure a complete seal on both ends.



Corral Construction (Cont.)

Figure A6 Corral Post Arrangement



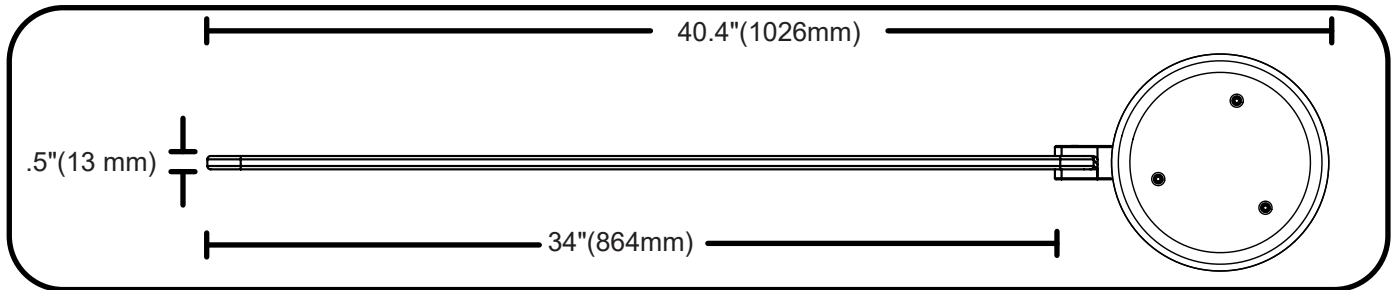
NOTE Ensure sensor aligns with the reflector.



Appendix B - Acrylic Barrier Installation (Optional)

The SW500 is available with an acrylic barrier panel. The panel is available in a 39" height, measured from the floor to the top of the panel.

Figure B1 Assembled Gate Dimensions - Acrylic Barrier Panel



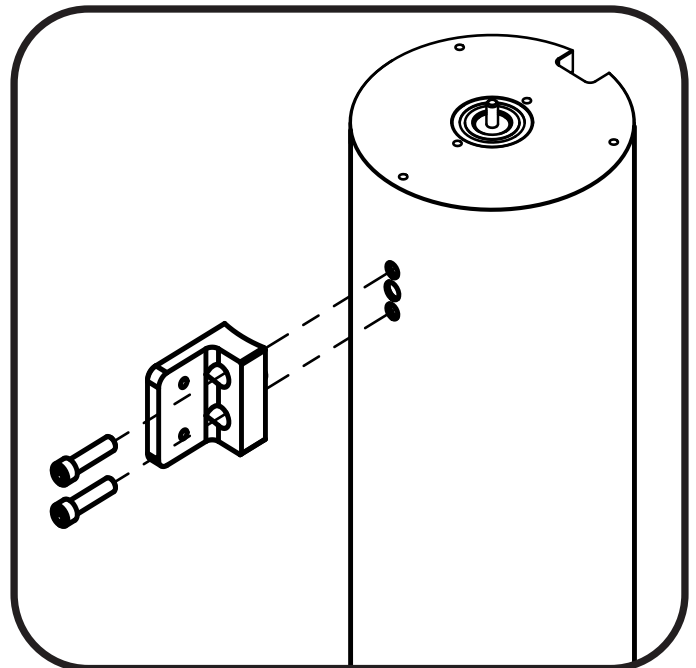
Acrylic barrier panel installation hardware includes:

- Panel Clamps (Qty 2)
- Clamp Plates (Qty 2)
- Clamp Mounting Screws (Qty 4)
- Plate Screws (Qty 4)

Below are instructions how to install the acrylic barrier to the gate.

1. Place panel clamp over the mounting holes and align.
2. Using a torque wrench and a 1/4" hex key, insert two (2) socket head screws and torque to 120 in-lbs. Repeat for second clamp.
[Figure B2]

Figure B2 Installing Barrier Clamps

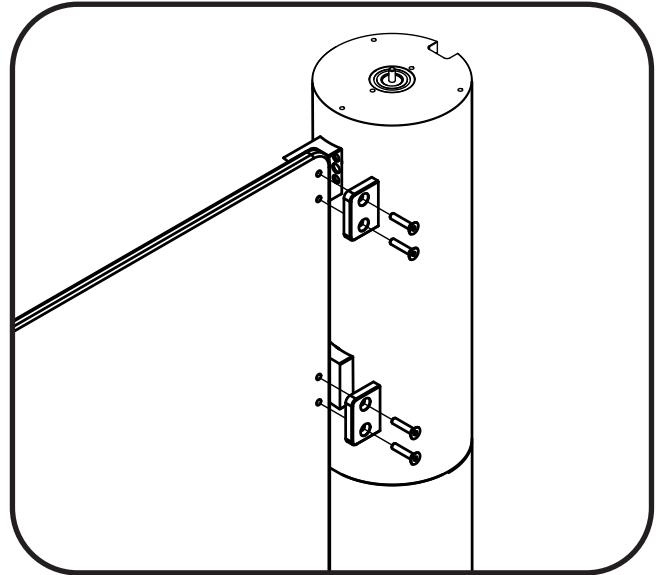




Appendix B - Acrylic Barrier Installation (Optional)

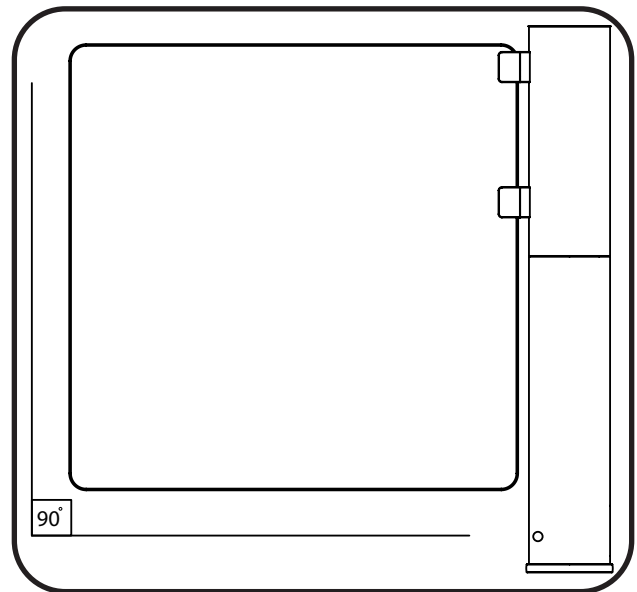
3. Align acrylic barrier panel with panel clamps; it is recommended to have a second person hold the acrylic barrier panel in place. Mount the acrylic barrier panel to the panel clamps using the plates and screws. Using a 5/32" hex key, insert two (2) screws and tighten. [Figure B3]
4. Using a level, verify the acrylic panel is plumb and level to the ground. [Figure B4]
5. Repeat Steps 1-4 for Tandem installations.

Figure B3 Installing Barrier Plates



This completes the acrylic barrier installation. Refer to *Powering On* on Pg.25 to continue the installation.

Figure B4 Plumb and Level





Appendix C - External DC Power Supply Installation (Optional)

THESE INSTRUCTIONS ARE APPLICABLE FOR EXTERNAL DC POWER SUPPLY INSTALLATIONS ONLY.

Before You Begin

- One power supply is required for a single tower or tandem gate installation.
- It is assumed that conduit has been run to the Main / Secondary gates for each set for low-voltage 24VDC power and communication wiring. Refer to Appendix A - SW500T Installation on Pg.37 for more information.
- Wire gauge recommendations for 30, 70, and 100 ft. runs are provided (see Page 48). If your installation requires runs beyond 100ft., contact Alvarado Technical Support.
- The location of the power supply must adhere to the Environmental Requirements section. Controlled environments such as an electronics closet are ideal.
- It is strongly recommended that a licensed electrician perform this procedure in accordance with applicable local electrical codes.

Mounting the Enclosures

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 C1]
2. Using a 5/64" hex key, remove the four cover screws and remove the cover. [Figure C2]

Figure C1 Mounting Holes (Side View)

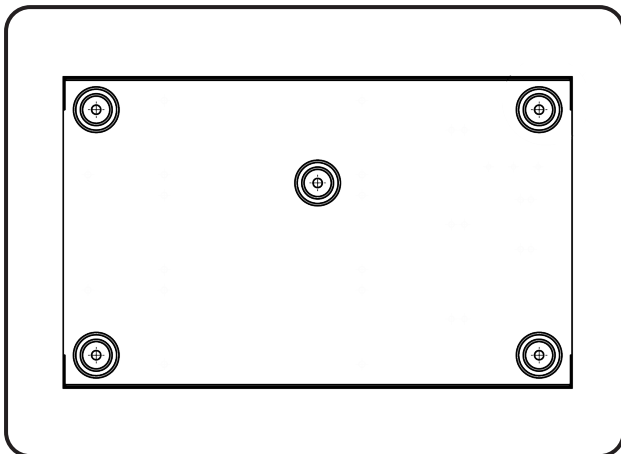
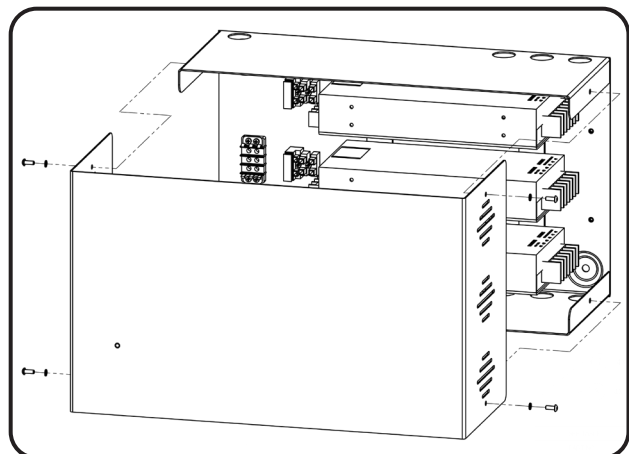


Figure C2 Removing Cover Screws





Wiring Primary Power to Enclosures

NOTE

Primary power wiring and connectors are not supplied by Alvarado.

3. Route primary power conduit to one of the supplied conduit holes on the enclosure.
4. Locate the pre-installed primary power terminal block. There is one primary power terminal block per enclosure. [Figure C3A]
5. Attach each primary power wire to the primary power terminal block according to the table below. [Figure C3B]

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

6. Using a Phillips screwdriver, tighten each terminal block connection.
7. Attach the supplied protective cover to the terminal block.
8. Repeat Steps 3-7 for additional power supply enclosures.

Figure C3A Primary Power Terminal Block

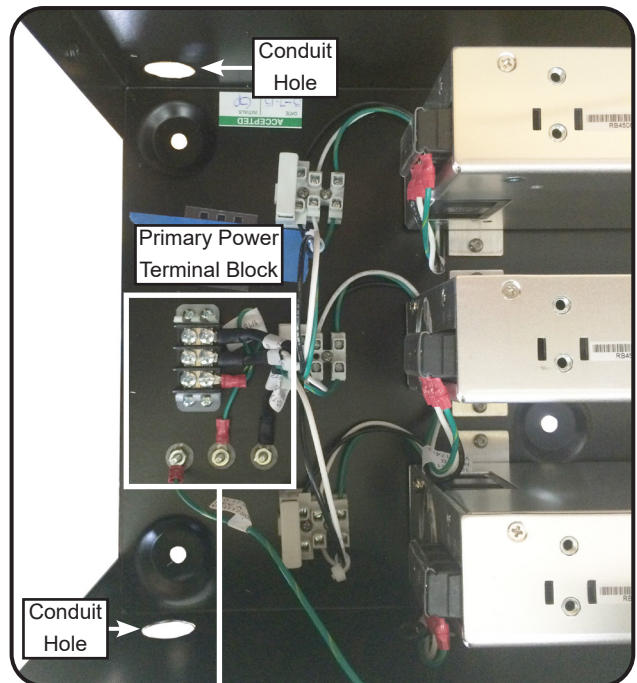
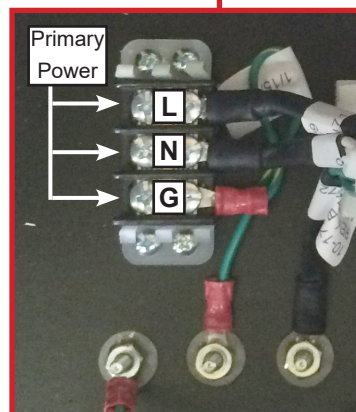


Figure C3B



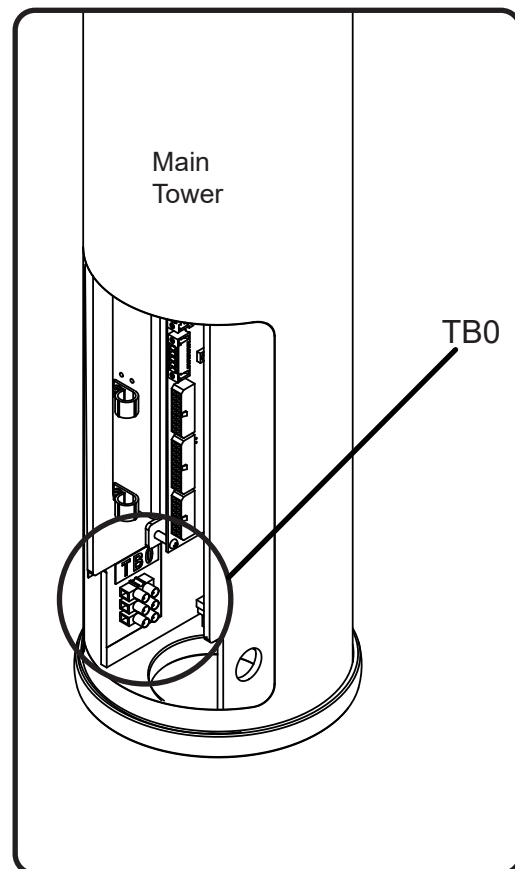
**Connect Low-Voltage 24VDC from Enclosure to Gate(s)****NOTE**

- Due to the differences of each installation scenario, low-voltage wire is not supplied by Alvarado. See the recommendations below for selecting the best wire for your installation.
- Twelve (12) spade connectors are supplied by Alvarado for connecting low-voltage 24VDC power to the gates. Use as required.

DISTANCE	GAUGE
30 ft (9.14m)	16 AWG
70 ft (21.34m)	14 AWG
100 ft (30.48m)	12 AWG

- Route 24VDC power conduit(s) through supplied conduit holes on the enclosure. [Figure C3A]
- For each power supply to be connected, locate the output terminal block. Each terminal block has one 24VDC (+V) and one ground (-V) terminals. You will require one (+V) and one (-V) per tandem installation.
- Using the supplied spade connectors, connect the 24VDC (+V) and ground (-V) wires to the output terminal block.
- At the gate, using the supplied connectors, connect the 24VDC and the GND wires to TB0 according to Table 2. [Figure C4]
- Repeat Steps 9-12 for additional power supplies and gates.

Return to *Connecting Inputs / Outputs* located on Pg.21 to continue the installation.

Figure C4 Low-Voltage to TB0 Terminal Block**Table 2**

TB0	Wire Color	DC Input
TB0-1	Orange	+24V
TB0-2	Black	GND
TB0-3	--	--



Appendix D - SW500T Above Ground Conduit Installation (Optional)

Follow these instructions to install the SW500T using above ground conduit. This installation process is used with the Appendix A on pg.37 & Appendix C on pg.46. DC Power from the Remote Power Supply, Fire Alarm, I/O Communication, DC-Crossover, and Communication crossover cables will route through the hole in the Access Panel on the Main tower and DC, and communication crossover cables will route through the hole in the Access Panel on the Secondary tower.

Running Above Ground Conduit

1. Refer to Appendix A for correct Tandem orientation.
2. Anchor Main and Secondary towers in the correct Tandem gate orientation according to *Installation Instructions* on pg.17.
3. Route the following cables from the Remote Power Supply location into the Main tower conduit:
 - DC power from the Remote Power Supply
 - Fire Alarm & I/O Communication, if necessary
 - Crossover cables: DC & Communication
4. Route the conduit down to the Main tower Access Panel. [Figure D1]
5. With the Access Panel removed, feed the wires through the hole in the Access Panel.
6. Secure the conduit in place with a locknut on the inside of the Access Panel.
7. Rotate the Lower Column 1/4 turn counter-clockwise to expose the terminal blocks. [Figure D2]
8. Gently pull the wires to the terminal blocks and connect them to the following:
 - Fire Alarm & I/O Communication wires according to the chart in *Connecting Inputs/Outputs* on pg.21.
 - DC-Crossover & Communication Crossover cables according to the Main connection in Appendix A on pg.37.
9. Rotate the Lower Column 1/4 clockwise to return it to its original position by aligning the power button with the power button hole.
10. Connect the DC Power wires from the Remote Power supply according to Appendix C on pg.46.
11. Using a Phillips screwdriver, secure the Access Panel with 4 screws.

Figure D1 Route Conduit to Main Access Panel

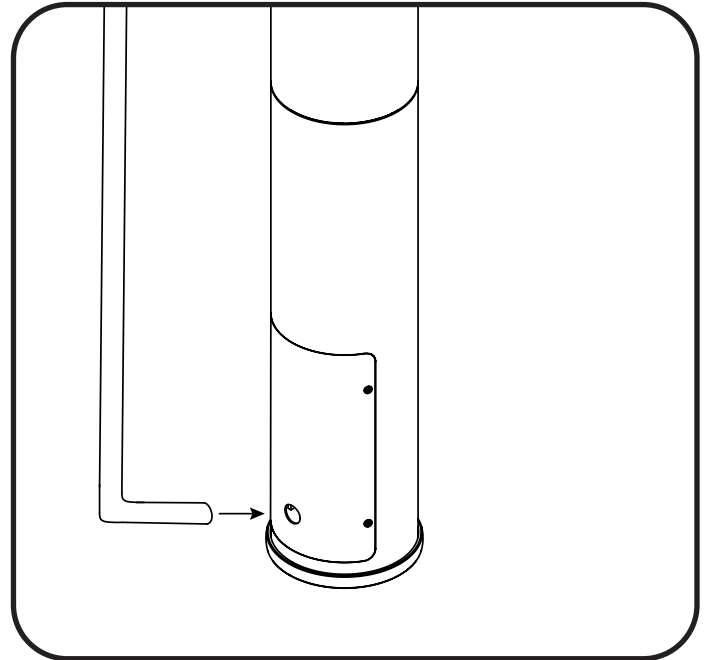
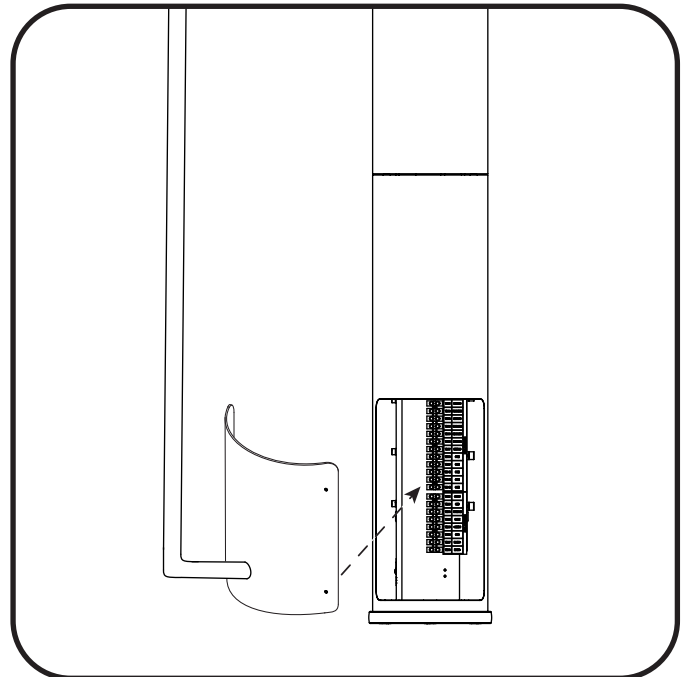


Figure D2 Secure Conduit to Access Panel





Appendix D - Above Ground Conduit Installation (Cont.)

12. Pull the other ends of the DC-Crossover & Communication crossover cables over to the Secondary tower conduit.
13. Route the DC-Crossover & Communication crossover cables through the Secondary tower conduit.
14. Route the conduit down to the Secondary tower Access Panel.
15. With the Access Panel removed, feed the crossover cables through the hole in the Access Panel.
16. Secure the conduit in place using a locknut on the inside of the Access Panel.
17. Rotate the Lower Column 1/4 turn counter-clockwise to expose the terminal blocks.
18. Gently pull the wires to the terminal blocks and connect them to the following:
 - DC-Crossover & Communication Crossover cables according to the Secondary connection in Appendix A on pg.37.
19. Rotate the Lower Column 1/4 clockwise to return it to its original position by aligning the power button with the power button hole.
20. Using a Phillips screwdriver, secure the Access Panel with 4 screws.

Return to *Barrier Installation* located on Pg.24 to continue the installation.



Revision History

Revision	Date	Author	Description
1-0	10/20/17	C. Maynez	Original Document
1-1	1/5/18	C. Maynez	Updated Overview & Application Considerations
1-2	2/28/18	C. Maynez	Updated Access Panel & included DHO wiring
1-3	6/27/18	C. Maynez	Updated page layout and format. Added Above Ground Conduit Appendix D.
1-4	6/26/20	C. Maynez	Terminology update.
1-5	7/15/21	C. Maynez	Updated Appendix A - Tandem Installation

