



## Wireless Door Alarm System Installation and Operation Manual



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**SECURITY, ACCESS : CONTROL**

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Thank you for purchasing the Wireless Door Alarm System. While every effort has been made to ensure the accuracy of the information in this document, PTI Security Systems assumes no liability for any inaccuracies contained herein. We reserve the right to change the information contained herein without notice.

NOTICE: To comply with FCC and or Industry Canada rules (IC), adjustment or modifications of this receiver and/or transmitter are prohibited, except for changing the code setting or replacing the battery. THERE ARE NO OTHER USER SERVICEABLE PARTS.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received including interference that may cause undesired operations.

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## INTRODUCTION

Most conventional door alarm systems have a door switch that is hardwired to the alarm system, which requires a large number of wires run throughout the facility. The wireless door alarm system can be used instead when running wires to every door is impossible or impractical.

The wireless door alarm system consists of a battery-powered transmitter installed at each door, and a wireless multiplexer and wireless receiver connected to the controller. On a typical installation, transmitters have a range of around 400 feet. This range will vary based on actual conditions. On a large site, wireless repeaters can be installed to boost the signal from the transmitters and increase the signal range.

## SYSTEM REQUIREMENTS

The wireless multiplexer and receiver will work properly only when installed and interfaced to the access control system. These items require a properly installed and configured system. The firmware revision on the controller must be 4.10 or newer for proper operation of all features.

The wireless multiplexer requires 12 VDC power at 250 mA. Power is supplied by the power supply for the controller. Make sure the power supply is capable of handling the necessary load when the multiplexer is added.

The recommended connection to the wireless multiplexer from the controller is through 18 AWG, 4-conductor shielded wire. This wire must be run from the nearest device to the multiplexer.

**Warning: The User should follow all installation, operation, and maintenance instructions.** The User is strongly advised to conduct product and systems tests at least once each week. Changes in environmental conditions, electric or electronic disruptions and tampering may cause the product to not perform as expected.

**Warning: PTI Security Systems warrants its Product to the User.** The User is responsible for exercising all due prudence and taking necessary precautions for the safety and protection of lives and property wherever PTI Security Systems products are installed. PTI Security Systems does not authorize the use of its products in applications affecting life safety.

**Notice:** The wireless door alarm system uses 900Mhz technology. Other devices at the site such as cordless telephones or alarm components may cause interference that will disrupt the operation of the system or may be interfered with by the system. PTI Security Systems assumes no liability for any problems caused by interference. It is the sole responsibility of the user to identify and correct such problems.

# INSTALLING WIRELESS DOOR ALARM TRANSMITTERS

The wireless door alarm transmitter was designed for either swing type or roll up doors. It can be mounted vertically or horizontally to accommodate different door and header types. The door transmitter assembly consists of the transmitter box, a mounting plate, the door magnet, and the assembly hardware. Figure 1 shows the door transmitter components. The mounting plate simplifies installation and maintenance of the door transmitters. Additionally, if a transmitter needs to be removed for any reason, the mounting plate ensures that it is reattached in the correct position.

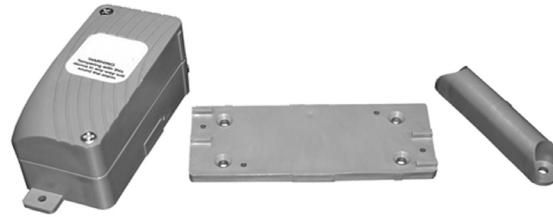


Figure 1: Wireless Door Alarm Transmitter

## Required Tools & Equipment

Before beginning the installation, gather the following required tools and equipment. Most of these tools are available from PTI Security Systems.

- PL Premium Construction Adhesive
- Caulking Applicator Gun (standard tube size)
- Drill with Bits
- Concrete Drill Bits (depending on building construction)
- Screw drivers (battery-powered recommended)

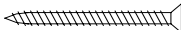



①	#6X1-1/2" FH Sheet metal screw.		(For transmitter lid)
②	6-32X3/8" PH Thread cutting screw.		(For fastening transmitter to mounting plate)
③A	#8 Plastic screw anchor - use 0.250" drill for pilot hole.		(For concrete mounting)
③B	#8X1-1/2" FH Sheet metal screw - use 0.116" (#32) drill for pilot hole.		(For sheet metal mounting)

Figure 2: Mounting Hardware Kit

- Transmitter Mounting Hardware Kit (See Figure 2)
- Pop Rivet Tool (See Figure 3)
- Pop Rivets for Magnet Mounting (See Figure 3)
- Transmitter Test Box

The rivet tool has a special extension on the nose piece that allows it to align properly with the magnet mounting holes.

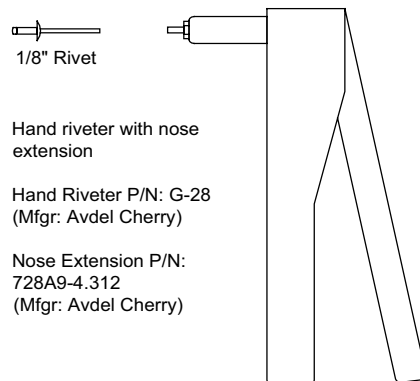


Figure 3: Rivet Tool

## **Selecting the Mounting Location**

How and where the door transmitters are mounted is critical to the reliable operation of the alarm system. The mounting location must be close enough to the door to ensure the proper operation of the magnetic contacts and yet not be vulnerable to damage from travel of the door or furniture or objects passing through the door. The location must also be free of obstructions to the radio signal from the transmitters. The optimal location depends on the type of door.

## **Mounting Door Transmitters**

After gathering the proper tools and equipment and selecting the mounting location, determine which mounting procedure to use based on the type of door on which the transmitter is to be installed.

On roll up doors, the transmitter is installed on the overhead door jamb. There are two ways that the transmitter can be installed on the jamb.

On swing doors, installation procedure is based on whether the door is a metal swing or slide door or a hollow core door. See the instructions that follow for detailed transmitter mounting instructions.

**NOTE:** To ensure a smooth installation, we recommend that the transmitters be registered with the wireless multiplexer before affixing the transmitters to the mounting plates. If the system was shipped complete by PTI Security Systems, the transmitters may have already been registered to the multiplexer at the factory. If so, they will have a number on the transmitter housing that is the channel number assigned in the multiplexer.

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## Roll Up Doors

For roll up doors, the transmitter should be mounted in a location that is high enough off the ground to reduce the possibility of physical damage and is close enough to the door for the magnet to work. PTI Security Systems recommends that the transmitter be mounted on the facing of the door frame on the side of the door opposite the hasp. Some doors are equipped with a foot plate at the bottom of the door that will have to roll past the transmitter as the door opens. This plate must clear the transmitter. If the door is equipped with a foot plate on each side, the transmitter may have to be mounted on the header of the door. Be careful when selecting a location because on many roll up doors, over time, the door moves away from the track and the door frame at the top of the door. This can create too large a gap for the magnet. Once the door is latched, there must not be excessive movement in the door due to wind or other vibration that will cause an alarm to be generated.

The position of the magnet will determine where the transmitter must be mounted. The magnet must be mounted in the trough of the door corrugation so that it will roll up into the door without putting stress on the door mechanism or the magnet. The magnet must also be in a location that will provide the minimum gap from the magnet to the transmitter box. The transmitter box should be as close to the magnet as possible. **IN NO CASE SHOULD THE MAGNET BE MORE THAN ½" FROM THE TRANSMITTER BOX AT THE TIME OF INSTALLATION.** Use the alignment marks on the transmitter box to position the box and magnet. Keep in mind that roll up doors are subject to movement from wind or other causes. Wear on the track and flexure from opening and closing the doors repeatedly may also add to the door movement. Therefore, the gap between the magnet and the transmitter must be carefully set at the time of installation.

See pages 4 and 5 for detailed roll up door installation instructions.

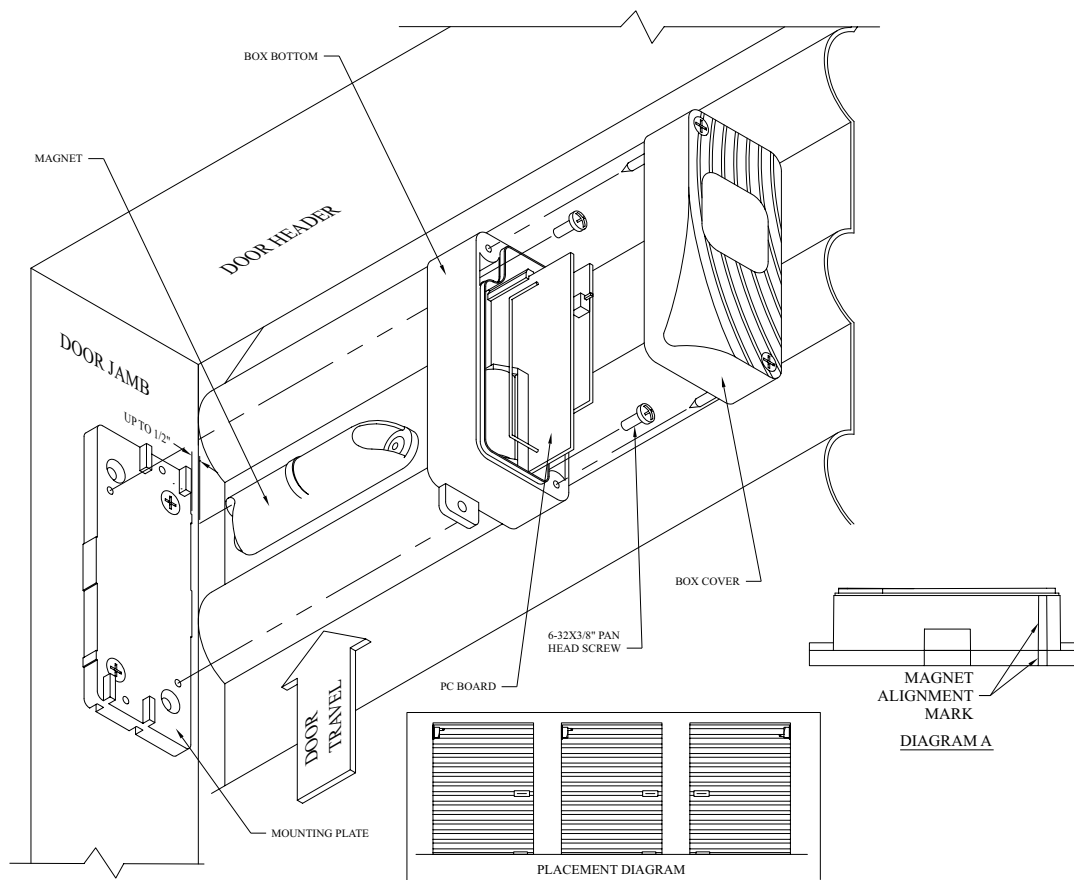
**IMPORTANT:** On all doors, the magnet must be mounted before mounting any other transmitter components. Read through the entire sections on positioning and mounting the magnet, transmitter, and mounting plate before permanently attaching any parts. Note specifically the section on the mounting plate and its ability to act as a spacer.

## Door Jamb Mounting Instructions

**Note:** If placement of the wireless box on the jamb will interfere with the travel path of the toe plate and/or the door handle, use the Door Header Mounting Instructions instead.

1. Apply PL Premium construction adhesive to the back of the mounting plate and use two wall anchors and two #8 x 1" flat head screws to fasten the mounting plate.
2. Apply PL Premium construction adhesive to the back of the magnet. Align the center of the magnet with the narrow mark on the side of the mounting plate facing the door and rivet the magnet to the door no more than  $\frac{3}{4}$  inch away from the mounting plate.
3. Position the box bottom with the magnet alignment mark facing toward the door and fasten the wireless box bottom to the mounting plate using two 6-32 x  $\frac{3}{8}$ " pan head screws.
4. Place the PC board in the box bottom and hold in place until the box cover is in place.
5. Fasten the box cover to the box bottom using two #6 x 1- $\frac{1}{2}$ " flat head screws.

**Application Note:** Always use PL Premium on both the magnet and the mounting plate. The box assembly should be mounted as high as possible on the jamb to prevent damage.



**Figure 4: Overhead Door Jamb Mounting**



### Door Header Mounting Instructions

(Use only if jamb mount not possible)

1. Apply PL Premium construction adhesive to the back of the mounting plate and use two wall anchors and two #8 x 1" flat head screws to fasten mounting plate.
2. Apply PL Premium construction adhesive to the back of the magnet. Align the center band of the magnet with the wide alignment mark on the side of the mounting plate facing the door and fasten to the door no more than  $\frac{3}{4}$  inch from mounting plate with two screws (type of screw used to be determined by door type).
3. Position the box bottom with the magnet alignment mark facing toward the door and fasten the wireless box bottom to the mounting plate using two 6-32 x  $\frac{3}{8}$ " pan head screws.

4. Place the PC board in the box bottom and hold in place until the box cover is in place.
5. Fasten the box cover to the box bottom using two #6 x 1- $\frac{1}{2}$ " flat head screws.

**Application Note:** Always use PL Premium on both the magnet and the mounting plate. The box assembly should be mounted as high as possible on the jamb to prevent damage.

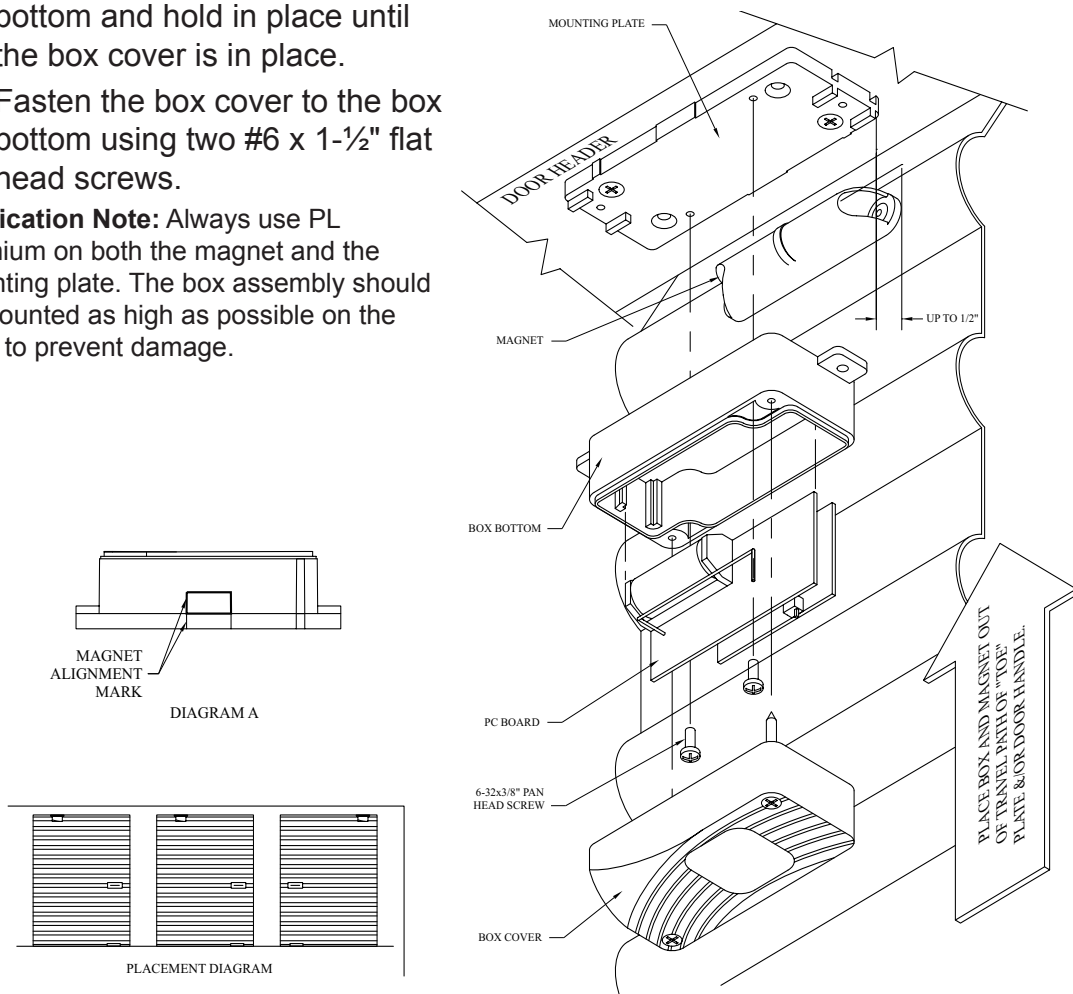


Figure 5: Door Header Mounting

### **Swing Doors**

On swing doors, the transmitter should be mounted in a location that is high on the door and out of the way of the door swing. It must not be in a location that is subject to being damaged by items being moved through the door. The transmitter should also be installed on the hasp side of the door on the jamb or the header. See pages 7 and 8 for detailed swing door mounting instructions.

The magnet and transmitter must be in a location that will provide the minimum gap from the magnet to the transmitter box. The transmitter box should be as close to the magnet as possible. **IN NO CASE SHOULD THE MAGNET BE MORE THAN ½" FROM THE TRANSMITTER BOX AT THE TIME OF INSTALLATION.** Use the alignment marks on the transmitter box to position the box and magnet. Keep in mind that swing doors are subject to movement from wind or other causes. If there is too much movement at the latch side of the door, the transmitter and magnet can be moved closer to the middle of the door to reduce the possibility of false alarms.

In some cases, there may not be enough room on the door jamb or header for the transmitter box. In these situations, the transmitter can be mounted on the door with the magnet mounted on the jamb or header. However, this is not recommended because of the increased risk of damage to the transmitter from the movement of the door.

### Metal Swing/Slide Door Header Mounting Instructions

1. Apply PL Premium construction adhesive to the back of the mounting plate and use two wall anchors (if necessary) and two #8 x 1" flat head screws to fasten mounting plate.
2. Apply PL Premium construction adhesive to the back of the magnet. Align the center band of the magnet with the wide alignment mark on the side of the mounting plate facing the door and fasten to the door no more than  $\frac{3}{4}$  inch away from mounting plate with two screws (type of screw used to be determined by door type).
3. Position the box bottom with the alignment marks facing toward the door and fasten the wireless box bottom to the mounting plate using two 6-32 x  $\frac{3}{8}$ " pan head screws.
4. Place the PC board in the box bottom and hold in place until the box cover is in place (See diagram for cover positioning).
5. Fasten the box cover to the box bottom using two #6 x 1- $\frac{1}{2}$ " flat head screws.

**APPLICATION NOTE:** Always use PL Premium on both magnet and mounting plate. Box assembly should be mounted in place on header to prevent damage.

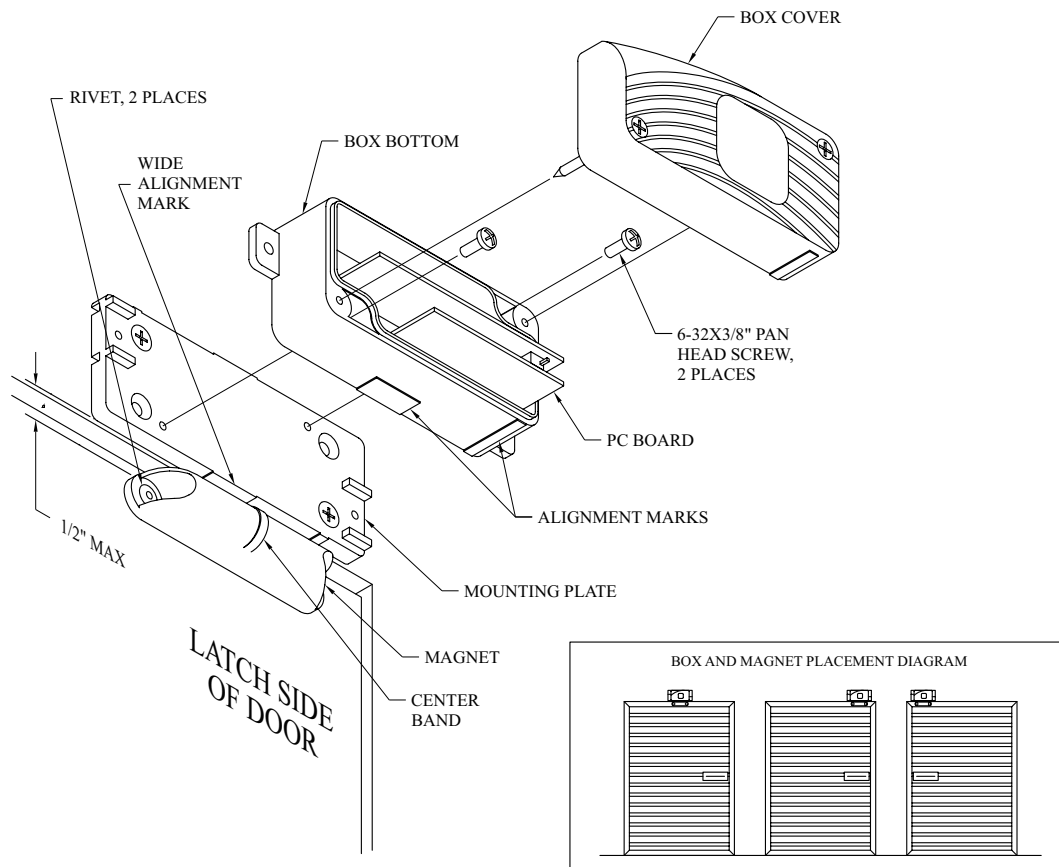


Figure 6: Metal Swing/Slide Door Header Mounting

### Hollow Core Swing Door Header Mounting Instructions

1. Apply PL Premium construction adhesive to the back of the mounting plate and use two wall anchors (if necessary) and two #8 x 1/2" flat head screws to fasten mounting plate.
2. Apply PL Premium construction adhesive to the back of the magnet. Align the center band of the magnet with the wide alignment mark on the side of the mounting plate facing the door and fasten to the door no more than 3/4 inch away from mounting plate with two screws (type of screw used to be determined by door type).
3. Position the box bottom with the alignment marks facing toward the door and fasten the wireless box bottom to the mounting plate using two 6-32 x 3/8" pan head screws.
4. Place the PC board in the box bottom and hold in place until the box cover is in place (See diagram for cover positioning).
5. Fasten the box cover to the box bottom using two #6 x 1-1/2" flat head screws.

**APPLICATION NOTE:** Always use PL Premium on both magnet and mounting plate. Box assembly should be mounted in place on header to prevent damage.

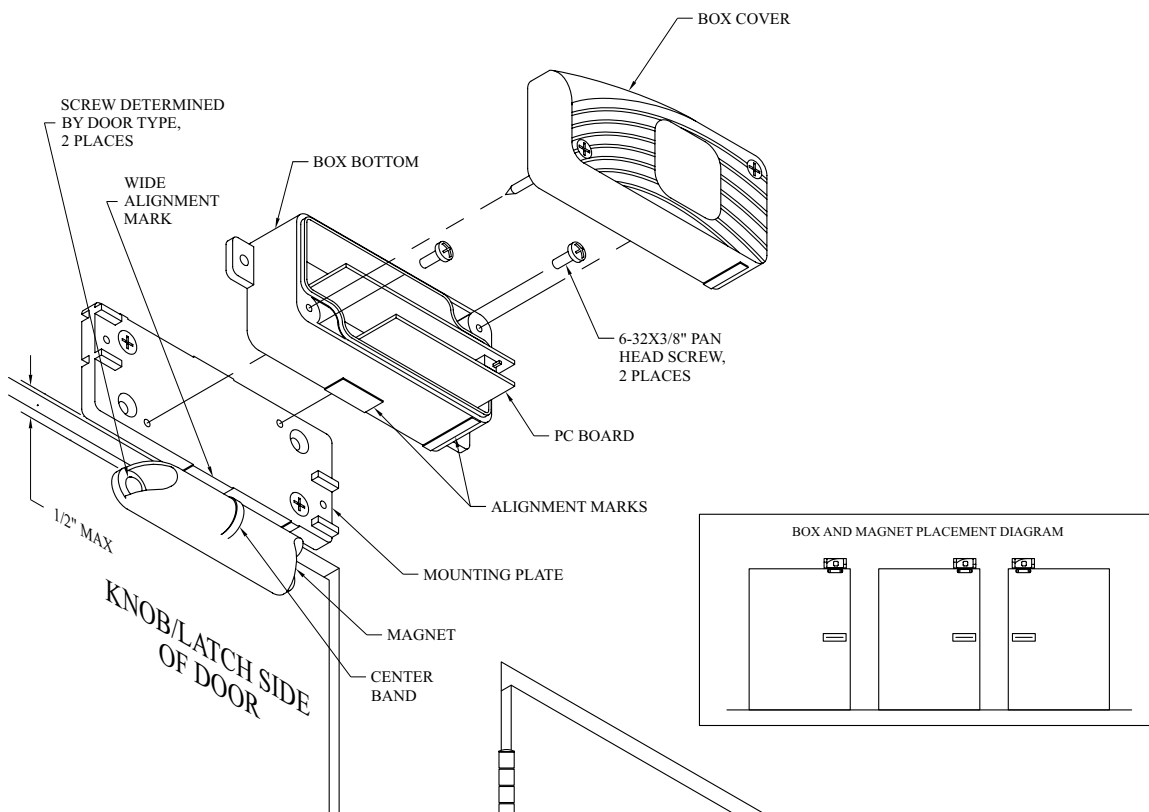


Figure 7: Hollow Core Swing Door Header Mounting

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## Mounting the Door Magnet

After the transmitter has been installed, mount the magnet to the door. The magnet must be attached to the door using both PL Premium adhesive and rivets or screws. On thin metal doors (such as roll up types), attach the magnet with the rivets provided by PTI Security Systems using a rivet tool. The simplest method of application is to attach the magnet to the door with the PL Premium adhesive and then, before the adhesive sets, drill the holes and install the rivets. On some doors it may not be feasible to use rivets to attach the magnets. In these cases, the magnets can be attached with screws provided by the installer.

**NOTE:** DO NOT allow the PL Premium adhesive to bleed over the mounting hole as it could potentially cause damage to the drill bit when drilling the hole.

When installing the transmitter on the door jamb on a roll up or similar type door, the center of the magnet should align roughly with the center of the alignment mark on the transmitter box lid. Because the magnet may need to be moved away from the jamb for installation, the transmitter mounting plates have been designed to be stacked. This will allow the installer to compensate for the increased distance. Additional mounting plates are available.

## Testing the Transmitter Location

As an installation aide, PTI Security Systems can provide to dealers and installers a testing transmitter box equipped with an LED that indicates when the door is reporting closed. This tool will help the installer determine when the magnet and transmitter mounting plate are in the proper alignment. This box is a test unit only and not a transmitter. Use this box to test the alignment of the transmitter box and the magnet. When the door is closed and the transmitter is properly positioned, the LED on the test box will be ON.

If the LED is not on when the door is closed, the magnet and transmitter are not properly positioned. The magnet may be too far from the transmitter box or out of alignment. Adjust the position of the transmitter until the proper location is determined. Once the location has been determined, latch the door and then push, pull, tug, and otherwise move the door to make sure that the door movements will not trigger a false alarm.

## Securing the Transmitter Mounting Plate

While some installations may not require mounting plates, we recommend that mounting plates be used whenever possible. Once the position of the transmitter box has been determined, install the mounting plate in that location. A hardware kit is provided for attaching the mounting plate to different surfaces. When the mounting plate is attached to concrete, use the concrete anchors. When attaching to metal surfaces, use the sheet metal screws.

The mounting plate must be attached using both PL Premium adhesive and at least two mounting screws installed in opposite corners of the plate. This provides maximum strength and resistance to flexure. PL Premium adhesive must be applied to the area of the mounting plate that contacts the mounting surface. In some cases (usually roll up doors) the construction of the door frame may require that the mounting plate extend beyond or hangs over the mounting surface. If this setup is required, two mounting holes on one side of the plate can be used. Use the drawing in Figure 8 as a guide for affixing the mounting plate.

### Attaching the Transmitter to the Mounting Plate

Each transmitter box is equipped with mounting tabs that protrude from each end of the box. These tabs are to be used only when the transmitter is mounted in a secure area such as inside a locked door (we do not recommend locating transmitters inside locked units that are not accessible for regular maintenance.) The boxes also have mounting holes that are accessible only by removing the lid of the box. These are the recommended mounting holes. Whenever the lid is removed from the box, the transmitter sends a tamper alarm. When the transmitter is attached using the internal mounting holes, the box cannot be removed from the base without sounding the tamper alarm.

After removing the cover on the transmitter box, position the transmitter on the mounting plate and attach it to the mounting plate using the screws provided in the mounting hardware kit. **DO NOT USE ADHESIVE TO ATTACH THE TRANSMITTER TO THE MOUNTING PLATE.** Before installing the cover, check the battery on the transmitter board to make certain it is seated in the battery holder. Reinstall the cover on the transmitter box, making sure the small antenna wire is not caught in the lid.

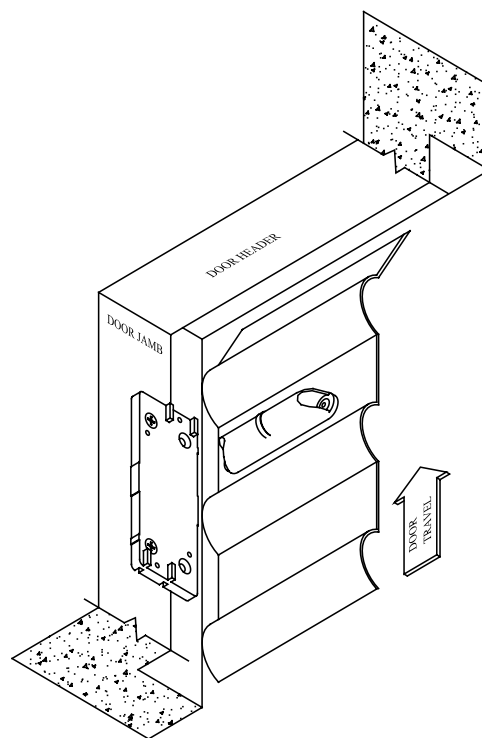
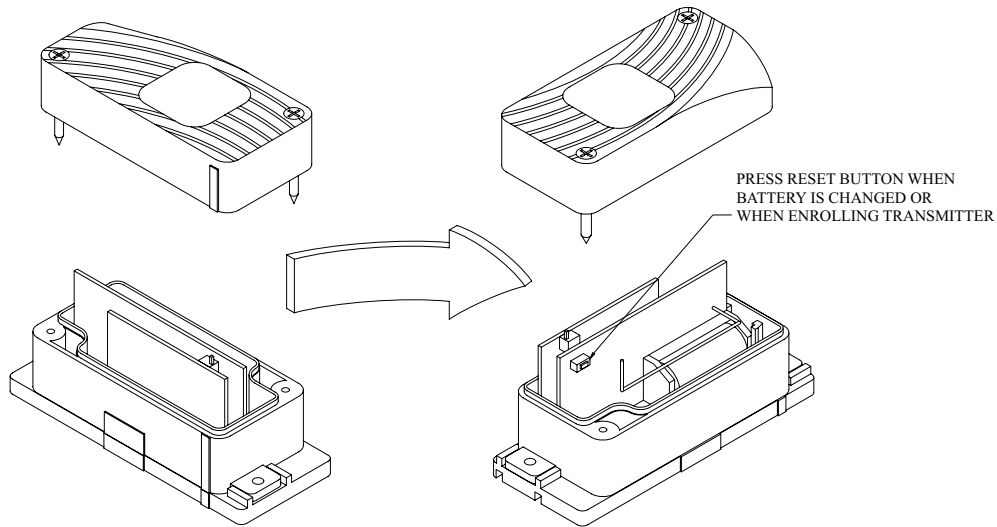


Figure 8: Mounting Plate Positioning

## Resetting the Transmitter

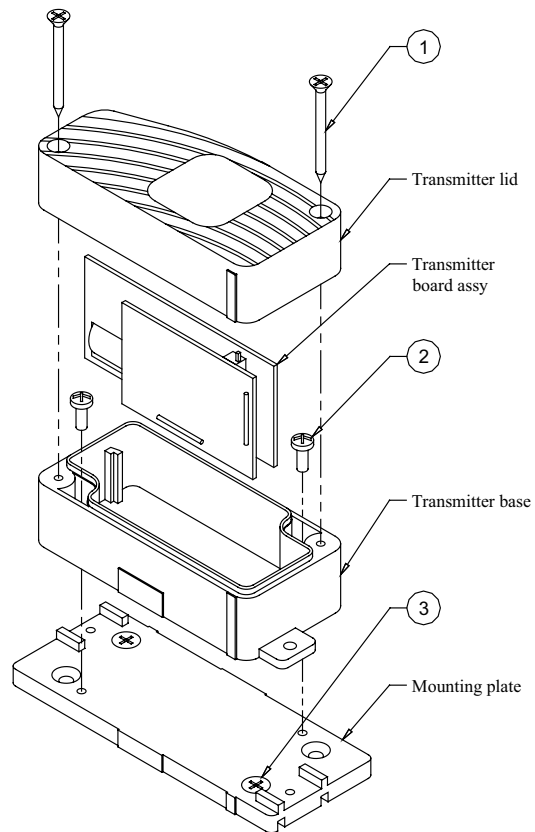
Each transmitter is equipped with a reset switch that must be pressed after changing the battery or when registering the transmitter with the multiplexer. See Figure 9. If the battery is removed from, or loose in, the holder, press the reset switch after reseating the battery.



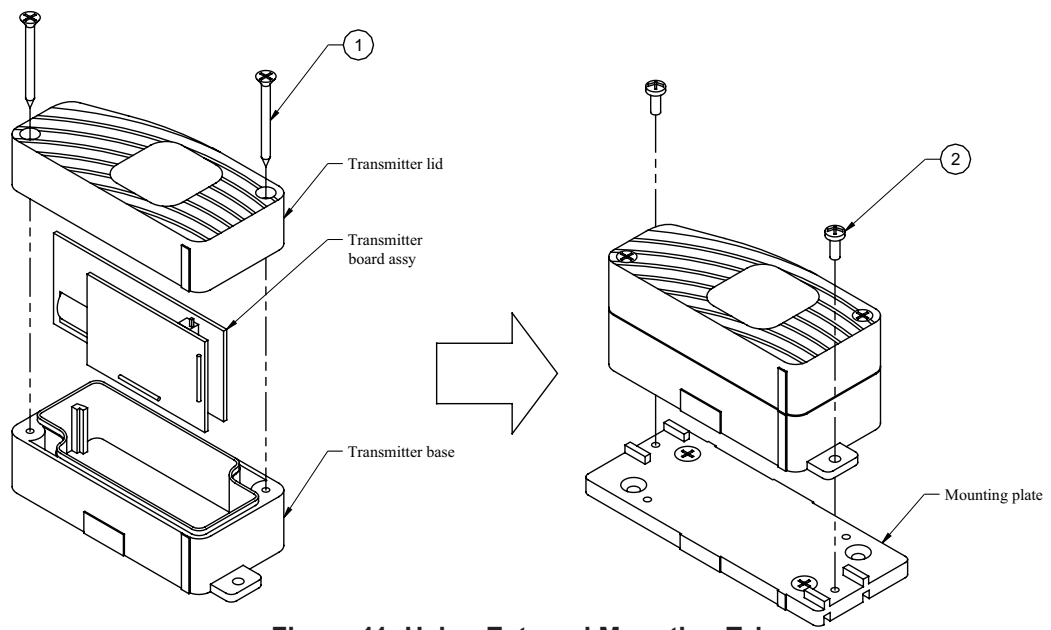
**Figure 9: Reset Switch Location**

Figure 10 shows the mounting of the transmitter using the internal mounting holes. The reference numbers shown in the drawing refer to the components in the mounting hardware kit.

Figure 11 shows the mounting of the transmitter using the external mounting tabs. The reference numbers shown in the drawing refer to the components in the mounting hardware kit.



**Figure 10: Using Internal Mounting Holes**



**Figure 11: Using External Mounting Tabs**



## INSTALLING THE WIRELESS MULTIPLEXER

The wireless multiplexer is used to interface wireless transmitters to the access control system. Connected to the wireless multiplexer is the wireless receiver. This receiver picks up signals from the transmitters and relays them to the multiplexer. The multiplexer then interprets the signals and determines the state of each transmitter.

Each transmitter on the site must be registered to a channel number in the wireless multiplexer. If a transmitter is not registered, it will be ignored by the system. Once a transmitter has been registered to a channel, it will report to the system as that channel.

The access control system uses a multiplexer number and channel number for each unit to monitor the door alarms. The multiplexer number will be the address of the multiplexer that monitors the specific door. The channel number for the doors will be assigned in the wireless multiplexer. One wireless multiplexer will monitor all of the door alarm transmitters for the entire site.

### Locating the Wireless Multiplexer

The wireless multiplexer must be installed in a secure indoor location that is accessible for system programming and maintenance. Do not install it where users can access it. The multiplexer should be installed in the office where access to it is easily controlled and within 100 feet of the wireless receiver.

### Locating the Receiver

The wireless receiver must be installed in a secure indoor location. It should be located as high as possible in the building. If possible, keep it away from large metal objects. Do NOT install the receiver on a metal surface as installation on metal surfaces will impair the performance of the receiver.

The ideal location for the receiver is near the middle of the site. However, if this is not possible, the receiver should be installed in an office on the wall closest to the center of the site. Make sure the location is free from large metal objects that can interfere with the signals from the transmitters.

### Connecting the Wireless Multiplexer

Following are instructions on installing a wireless door alarm multiplexer in connection with an access control system. Power for the receiver is supplied by the multiplexer through the three-conductor cable. See Figure 12.

1. Mount the multiplexer in the desired location using the four holes. 18 AWG, 4-conductor shielded wire in conduit can be run into the housing through one of three conduit knockouts in the back of the box. These are double knockouts which allow room for installation of  $\frac{3}{4}$  inch or 1 inch conduit with compression fittings. If a larger size conduit is needed, the installer will have to drill the correct size hole in the housing in the bottom or lower back of the housing. The receiver also is mounted using the mounting holes located in it.

2. Once the conduit locations are determined, place the multiplexer against the wall and mark the wall through the four mounting holes on the rear of the housing using a pencil. Use a torpedo level to verify that the housing will be mounted level, then mount the box to the wall using the proper anchors.
3. Pull the necessary wires through the conduit into the housing. The wireless mux should have the following wires:
  - One 18 AWG, 4-conductor, shielded cable coming in from the controller or from the previous AI device in line.
  - One 18 AWG, 4-conductor, shielded cable going out to the next AI device in line (if there is another AI device in line).
  - One earth ground wire
  - One wire running to the receiver mounted nearby.
4. Strip back the outer insulation and shield foil from both of the 18 AWG, 4-conductor, shielded cables (coming from the controller or previous AI device in line and going out to the next AI device in line), being careful not to cut the bare shield wire. Strip  $\frac{1}{4}$  inch of insulation off the end of each of the individual colored conductor wires.
5. Remove the terminal block (P1) from the multiplexer board by sliding it up and off. The terminal block may be somewhat difficult to remove as a tight electrical connection is necessary. If it is tight, rock it slightly back and forth while lifting away from the board.
6. Insert both red wires into terminal slot 1 on the terminal block (P1). Ensure that they are both seated all the way inside the slot. Use a flathead precision screwdriver to tighten down the terminal screw to firmly hold the wires in place. Verify that the terminal slot has tightened down on the copper wire and not on the rubber insulation. There should be no copper wire showing outside of the terminal slot. Gently tug the wires to verify that they are tightly held inside the terminal slot.

Repeat this process with each of the remaining wire connections. Connect the earth ground to a true earth ground in the building: either a grounded water pipe or a copper rod in the ground as per code.
7. The receiver connects to the multiplexer using the connector in the upper right-hand corner of the board (connector P8).

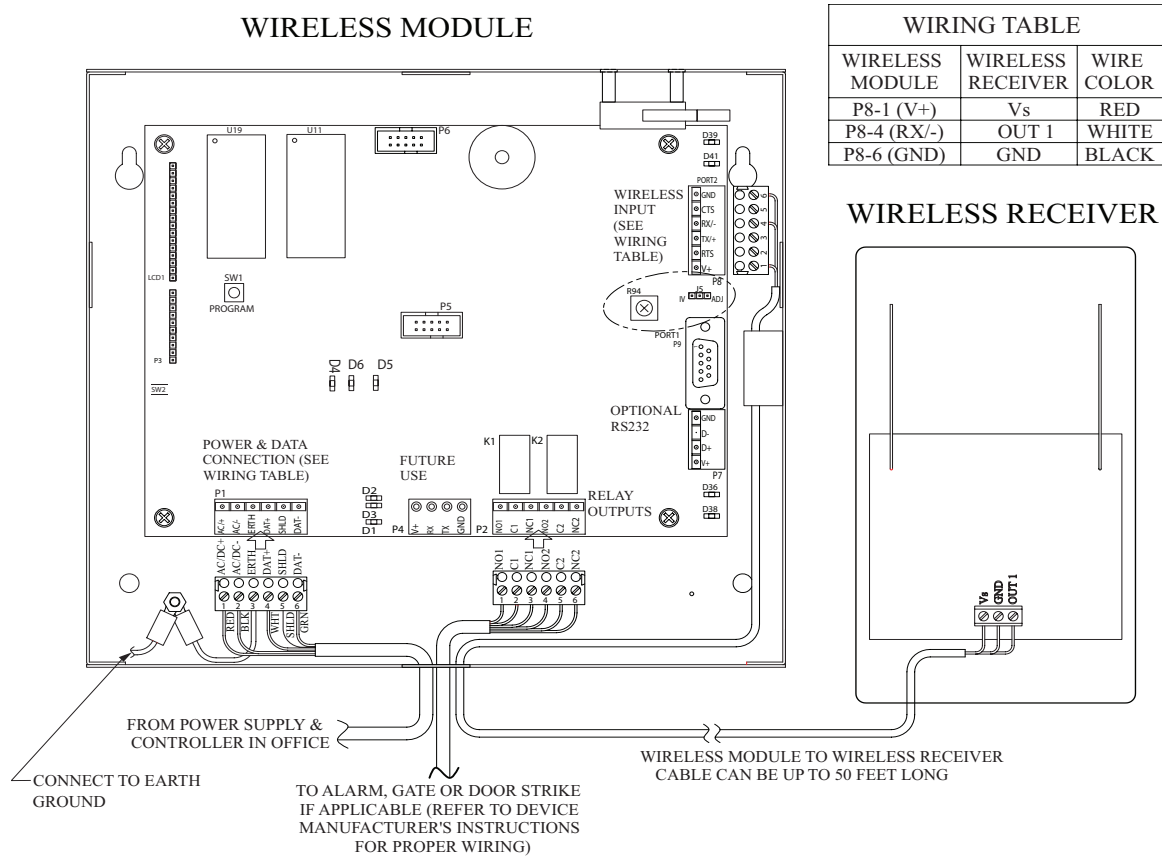


Figure 12: Wireless Multiplexer Wiring

### Operating the Wireless Multiplexer

The wireless multiplexer is designed to operate as a single interface point to up to 700 wireless door alarm transmitters on a site. In addition to monitoring the door alarms, the wireless multiplexer is equipped with two relays that can be used for other functions. An additional wireless mux can be added to the system if the site has more than 700 doors.

When operating properly, the wireless multiplexer display changes approximately every four seconds between showing the time and date and the last four events. The date and time on the display are set automatically from the controller once it is communicating.

TUESDAY 08/08/09  
02:35:26 pm  
Press \* to begin

Door Close 0001  
Door Open 0001  
RECEIVER ON 0000  
NO ACTIVITY 0000

Pressing the \* key will toggle through the various menu options available. These options are shown in the order they appear on the screen:

REGISTER A SINGLE DOOR TRANSMITTER? Press * to Change PRESS # WHEN DONE	ENTER SETUP MODE?  Press * to Change PRESS # WHEN DONE
REGISTER A RANGE OF DOOR TRANSMITTERS? Press * to Change PRESS # WHEN DONE	DISPLAY UNIT ID?  Press * to Change PRESS # WHEN DONE
CLEAR A SINGLE DOOR REGISTRATION? Press * to Change PRESS # WHEN DONE	CANCEL  Press * to Change PRESS # WHEN DONE

Select the desired option by pressing the # key when it is shown on the display. If CANCEL is selected or no key is pressed in a short period of time, the display will resume normal operation.

### **Displaying the Multiplexer Address and ID**

To display the multiplexer address and ID, press the \* key on the multiplexer until the display shows "DISPLAY UNIT ID?". Then press the # key. The display will then show the part number of the multiplexer, the address it is set for, and the serial number of the device. The display will be similar to:

AXWM400AAO 1.10
UNIT ADDRESS: 05
UNIT SERIAL NUMBER
AXWM10001001 020109

The first line shows the part number of the multiplexer and the firmware revision. The second line shows the address of the multiplexer on the RS485 communication line. This address is used by the controller to communicate with the multiplexer. It must be unique and not shared by any other device attached to the system. The last line shows the serial number of the multiplexer and the manufacturing date code. This is the easiest way of checking the address of the device. This display will also show for a few seconds when the multiplexer is first connected to power.

## Setting the Operating Parameters

The operating parameters of the multiplexer determine how the display will appear and how the unit will function. The setup mode allows the operating parameters to be changed or customized. To enter the setup mode, press the \* key until the display shows:

ENTER SETUP MODE?  
  
Press \* to Change,  
PRESS # WHEN DONE

Once this display is shown, press the # key to enter setup. Once in setup, the multiplexer will ask for the setup password. This password is the numeric code that has been set to restrict access to changing the operating parameters. The factory default password is 8898. If an invalid password is entered, the multiplexer will resume normal operation

When the correct setup password is entered, the multiplexer display will change to prompt for the unit address. The following sections describe each of the setup parameters in the order in which they appear.

### **Unit Address**

The Unit Address is the address of the multiplexer on the RS485 communications line. This parameter must be set for the multiplexer to operate without errors. Ensure that no devices on the network have the same address. The valid address range is from 1 to 31. Do not use address 22 as it is reserved by the controller. If an improper address is entered, the display will show an invalid address message and repeat the prompt for the address. The factory default for the address is 1.

Current Address: 005  
Enter New Address:  
  
PRESS # WHEN DONE

### **Communications Rate**

The Communications Rate is the baud rate used by the controller to communicate to the multiplexer. Press the \* key to step through the available options.

Communications Rate:  
9600 baud  
Press \* to Change,  
PRESS # WHEN DONE

**NOTE:** The controller can only communicate to remote devices at 1200 and 9600 baud. The other available options are for future use. The factory default setting is 9600 baud.

### ***Change Setup Password***

Change Setup Password allows the factory default setup password to be changed. When the # key is pressed while this is showing, the multiplexer will prompt for the new password. After the new password is entered, it will prompt for the password to be entered a second time. If the password matches, the new password will be set and the display will continue to the next parameter. If the passwords do not match, the display will show a warning that the passwords do not match and then revert back to this screen.

Change the Setup  
Password?  
Press \* to Change,  
PRESS # WHEN DONE

### ***Tamper Sensor Enable/Disable***

The Tamper Sensor parameter determines the function of the tamper switch. When enabled, the multiplexer will send a tamper alarm to the controller if the door to the multiplexer is opened. If disabled, the tamper sensor is ignored. This affects only the tamper sensor on the multiplexer case. It does not enable or disable tamper alarms from the wireless transmitters. The factory default is enabled.

Tamper Sensor is:  
ENABLED  
Press \* to Change,  
PRESS # WHEN DONE

### ***Beep with Key Press***

Beep with Key Press controls the operation of the buzzer on the system. When set to Yes, the multiplexer will produce a very short beep when a key is pressed. This makes the operation of the device simpler. The factory default is Yes.

Beep with Key Press?  
YES  
Press \* to Change,  
PRESS # WHEN DONE

### ***Date Format***

The Date Format parameter controls the format of the date shown on the display. It does not affect the date or time from the controller. The options are US format and European format. The factory default is US.

Date Format:  
US  
Press \* to Change,  
PRESS # WHEN DONE

### **Time Format**

The Time Format parameter controls the format of the time shown on the display. It does not affect the date or time from the controller. The options are 12 Hour and 24 Hour. The factory default is 12 Hour.

Time Format:  
12 Hour  
Press \* to Change,  
PRESS # WHEN DONE

### **Relay 2 Function**

Relay 1 on the multiplexer is always set to function like the relay on any keypad or access control device. It can also function as a relay board relay if desired. The Relay 2 Function parameter controls the operation of Relay 2 on the multiplexer. The available options are Alarm Output, Hold Open by Time, Slave to Relay 1, Different Hold Time, and Aux. Output.

Relay #2 Function:  
ALARM OUTPUT  
Press \* to Change,  
PRESS # WHEN DONE

**Alarm Output.** Sets Relay 2 to activate when the controller sends an alarm. In this mode, it can be used to trigger an external siren or strobe light. The time the relay will be active for is controlled by the controller.

**Hold Open by Time.** Allows Relay 2 to activate at a certain time of day and deactivate at a different time. Each day of the week can have different activate and deactivate times. For purposes of clarification, the activate time is referred to as the OPEN time and the deactivate time is referred to as the CLOSE time. This terminology is based upon using the relay to Open or Close a secondary gate.

When this option is selected, the multiplexer will prompt for the open and close times for each day of the week Monday through Sunday. It will also ask for the Holiday open and close times, and the next holiday date. The multiplexer will automatically track the date and time and control the relay accordingly.

**Slave to Relay 1.** Causes Relay 2 to activate when Relay 1 activates and release when Relay 1 deactivates. It is intended for use when the relays are controlling a gate or other device that requires two isolated relays.

**Different Hold Time.** Causes Relay 2 to activate when Relay 1 activates but deactivate at a different time. When selected, the multiplexer will prompt for the Relay 2 hold time. The time Relay 1 will be active for is always controlled from the controller. This option is designed to be used with devices that require different hold times. It can also be used to activate a door holder.

**Aux. Output.** Causes Relay 2 to act as a second relay on the multiplexer. When this option is selected, the relay will function just like a relay on any relay board.

### **Restoring Factory Settings**

The wireless multiplexer has been programmed with the ability to restore the factory defaults. To restore the default settings, hold the program switch while connecting power to the multiplexer. The display will then ask if you want to restore the factory defaults. Selecting Yes will restore the parameters to the factory defaults. Remember to set the address and baud rate after restoring the parameters.

### **Registering Transmitters**

Every transmitter has a unique identification number programmed from the factory. The wireless multiplexer uses this identification number to determine which transmitter is sending data. The identification number does not match the channel number and each transmitter must be registered to a channel within the wireless multiplexer before it will function. After the transmitter is registered, the multiplexer can look up the channel number to which the transmitter is assigned when it receives data from the transmitter. This helps prevent unwanted or unknown signals from interfering with the operation of the system.

Transmitters can be registered one at a time or in a group. Registering a single transmitter can be used to replace an existing transmitter that was damaged or to add a single transmitter to the site. Registering a group or range of transmitters is used to add a number of transmitters to a site.

#### ***Register a Single Door Transmitter***

The process for registering a single door transmitter is shown in Figure 13. The displayed messages are shown to the right of the prompts. To begin the process of registering a single channel, press the \* key on the multiplexer until the REGISTER A SINGLE DOOR TRANSMITTER option is shown, then press the # key. This will start the process shown in Figure 13. When a reset of a transmitter has been recognized, the multiplexer will beep to give an audible signal that the transmitter has been registered. When the multiplexer is waiting for a reset on a transmitter, the timeout is disabled. You must manually complete the operation using the keypad.

#### ***Register a Range of Door Transmitters***

This function allows you to register a group of transmitters to a range of channels. The channels will be sequential beginning with the starting channel entered. The process for registering a range of transmitters is shown in Figure 14. The displayed messages are shown to the right of the prompts. To begin the process of registering a range of transmitters, press the \* key on the multiplexer until the REGISTER A RANGE OF DOOR TRANSMITTERS option is shown, then press the # key. This will start the process shown in Figure 14. The multiplexer will prompt for the first channel number to use and will automatically increment to the next channel when a transmitter has been reset.

The multiplexer will not allow a transmitter that has already been assigned to another channel to be registered as part of a group. Use the Register A Single Door Transmitter function to reassign transmitters that have already been registered.



When a reset of a transmitter has been recognized, the multiplexer will beep to give an audible signal that the transmitter has been registered and the channel number will automatically increment. The multiplexer is equipped with a timer that will revert back to the idle state if no key is pressed for a certain amount of time. While waiting for a transmitter reset, the timer is disabled. You must manually complete the process using the keypad.

**NOTE:** While registering channels, activity from all other transmitters is ignored. Therefore you should only register new channels during periods of low activity at the site.

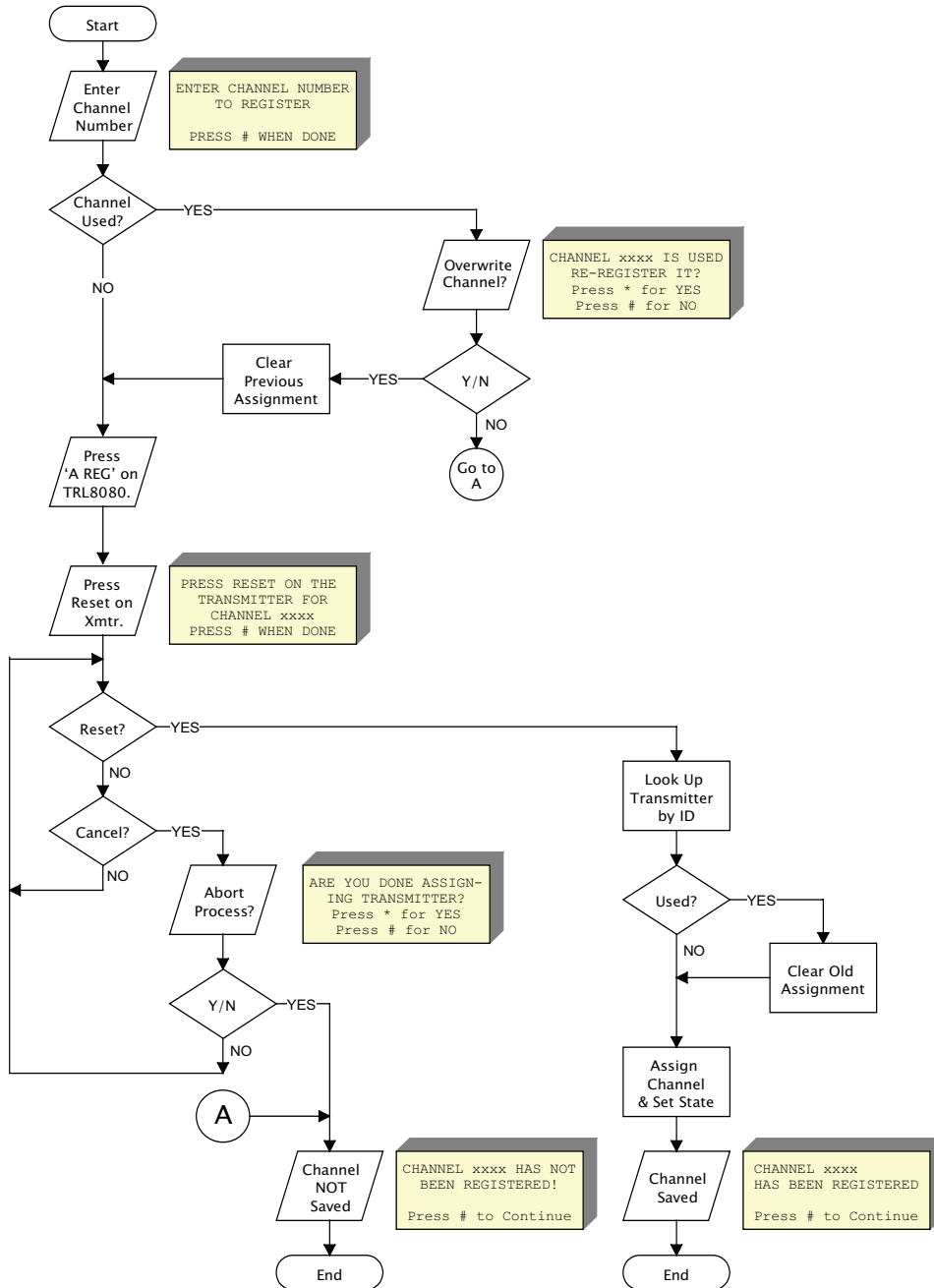


Figure 13: Register a Single Door Transmitter

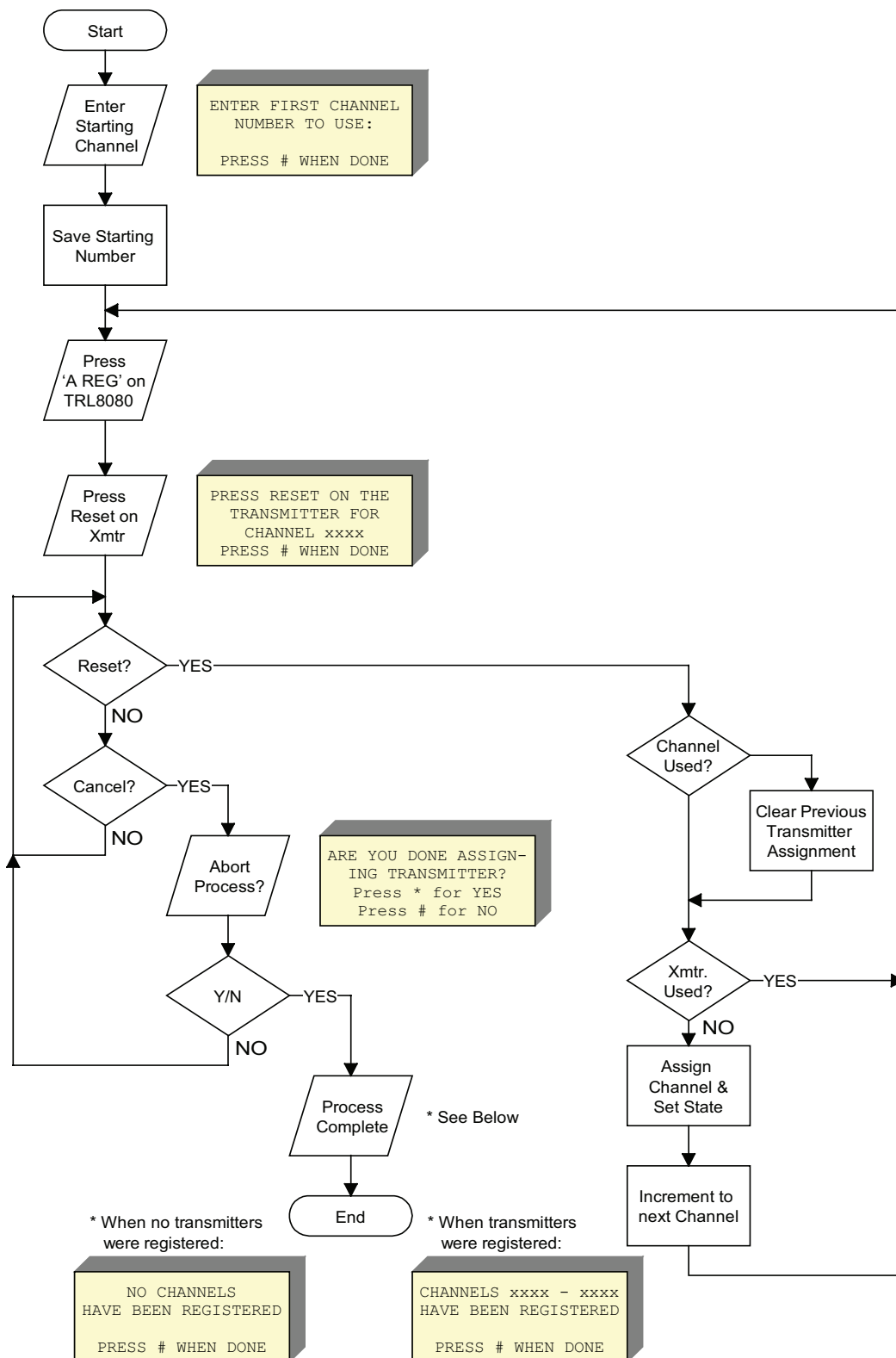


Figure 14: Register a Range of Transmitters

## Clearing Transmitter Registrations

Clearing Transmitter Registrations is used to remove the channel assignments from the multiplexer. Use this function when removing or replacing transmitters.

### *Clear a Single Channel Registration*

This function will clear the registration of a single transmitter. Use this option when removing or replacing a transmitter. To use the option, press the \* key on the multiplexer until the CLEAR A SINGLE DOOR REGISTRATION message is displayed, then press the # key. The multiplexer will prompt you to enter the channel number to be removed. If a registered channel number is entered, the multiplexer will ask if you are sure you want to remove the channel. If Yes is selected, the channel registration will be cleared.

### *Clear All Channel Registrations*

This function clears all transmitter registrations from the multiplexer. It is intended for use only when the site is being reconfigured.

**NOTE:** After using this option, all transmitters on the site will have to be registered again. Be careful not to use this option unless you are planning on resetting every transmitter on the site.

To use this option, press the \* key on the multiplexer until the CLEAR ALL DOOR REGISTRATIONS message is displayed, then press the # key. The system will ask if you are sure you want to remove all registrations. Once Yes is selected, the process will start. While clearing all registrations, the display on the multiplexer will show the following message:

\* PLEASE WAIT \*

Clearing Channel  
Registrations

This process takes several minutes to complete. During this process, the controller will report that the multiplexer has lost communication. It will restore once the process is complete.

## **Setting Up the Controller**

To ensure that the multiplexer operates properly, it must be set up in the access control system as a multiplexer. Make sure the controller firmware version is at least 4.10. Once the firmware version is verified, use the Setup Remotes function to configure the remote. The controller refers to the remote devices only by the address on the RS485 line. For the wireless multiplexer, configure the remote in the controller to be a multiplexer.

The most important step in the installation process is constructing the door table for the system. The controller knows which door is reporting activity by the multiplexer and channel number assigned to it. The installer must write down the unit number on which each door transmitter is installed. A sample format is:

<b>Door or Unit Number</b>	<b>Multiplexer Number</b>	<b>Channel</b>
A0001	3	0001
A0002	3	0002

The Multiplexer Number is the address of the wireless multiplexer. The channel number is the channel to which the transmitter is assigned. A worksheet is included on page 40 to track this information.

## **Reported Events**

The multiplexer has several different events that it reports for each transmitter. The following list of events is listed as they appear on the display of the multiplexer. Each event is followed by a description of the event and how it reports from the controller.

Door Open 0001	Reports the opening of a door. The numbers following the message indicate the channel number to which the transmitter is registered. The controller will look up the channel number in the door table. If the channel is not assigned, the event will report as Unknown Door Open referenced to the multiplexer and channel numbers. If the channel is assigned, the event will report as Door Open or Door Alarm depending on whether the tenant referenced to the unit number is on site. The actual reporting of the event depends on the configuration of the controller.
Door Close 0001	Reports the closing of a door. The numbers following the message indicate the channel number to which the transmitter is registered. The controller will look up the channel number in the door table. If the channel is not assigned, the event will report as an Unknown Door Close referenced to the multiplexer and channel numbers. If the channel is assigned, the event will report as Door Close referenced to the unit number. The actual reporting of this event depends on the configuration of the controller.

<p>Tamper Alarm 0001</p>	<p>Reports that a transmitter has been tampered with. The numbers following the message indicate the channel number to which the transmitter is registered. The controller will look up the channel number in the door table. If the channel is not assigned, it will report the event as an Unknown Tamper Alarm referenced to the multiplexer and channel numbers. If the channel is assigned, it will report the event as a Unit Tamper Alarm referenced to the unit number. If the option is enabled, the event will sound the alarm siren for the site. The actual reporting depends on the configuration of the controller.</p>
<p>Tamper Secure 0001</p>	<p>Reports that a transmitter has been secured from the tampered state. The numbers following the message indicate the channel number to which the transmitter is registered. The controller will look up the channel number in the door table. If the channel is not assigned, it will report the event as an Unknown Tamper Secure referenced to the multiplexer and channel numbers. If the channel is assigned, it will report the event as a Unit Tamper Secure referenced to the unit number. The actual reporting depends on the configuration of the controller.</p>
<p>Unit Comm. Off 0001</p>	<p>Indicates that a transmitter has not reported in the required time. Each transmitter is scheduled to report to the multiplexer within a fixed amount of time. If a transmitter fails to report, the multiplexer will record this event and send it to the controller. The numbers following the message indicate the channel number to which the transmitter is registered. The controller will look up the channel number in the door table. If the channel is not assigned, it will report the event as an Unknown Check in Fail referenced to the multiplexer and channel numbers. If the channel is assigned, the controller will report the event as a Unit Check in Fail referenced to the unit. Depending on the settings in the controller, this event can also sound the alarm siren. <i>To ensure that this event is not ignored, the wireless multiplexer will send this notification to the controller every four hours until the problem is corrected.</i></p>
<p>Unit Comm. On 0001</p>	<p>Indicates that a transmitter has reported to the multiplexer after it had been off. The numbers following the message indicate the channel number to which the transmitter is registered. The controller will look up the channel number in the door table. If the channel is not assigned, the controller will report the event as an Unknown Check in Restore. If the channel is assigned, the event will report as a Unit Check in Restore. The actual reporting of this event depends on the settings in the controller.</p>

<p>Low Battery 0001</p>	<p>The multiplexer monitors each transmitter for battery condition. The transmitters will report a low battery condition to the multiplexer at least one week before the battery will fail. The numbers after the message indicate the channel number to which the transmitter is registered. The controller will look up the channel number in the door table. If the channel is not assigned the event will report as an Unknown Low Battery referenced to the multiplexer and channel numbers. If the channel is assigned the event will report as a Unit Low Battery referenced to the unit. <i>To ensure that this event is not ignored, the multiplexer will send this notification to the controller approximately every six hours until the battery is replaced.</i> See Maintenance for recommendations on battery replacement.</p>
<p>Receiver On 0001</p>	<p>Indicates that the multiplexer is in contact with the receiver. This event will always show a channel number of 1 and will report every time the multiplexer is powered on or when the receiver is connected after being off. It reports to the controller as Data Comm. On – Controller 1 referenced to the multiplexer number.</p>
<p>Receiver Off 0001</p>	<p>Indicates that the multiplexer has lost the connection to the receiver. It will always show a channel number of 1 and will report to the controller as Data Comm. Off – Controller 1 referenced to the multiplexer number. Depending on the settings in the controller, this event can sound the alarm siren.</p>
<p>No Activity 0000</p>	<p>This message does not report to the controller. It will only show after the multiplexer is powered up.</p>
<p>Multiplexer Tamper Alarm</p>	<p>This event does not show on the display of the multiplexer. It reports to the controller as a Tamper Alarm referenced to the multiplexer number. It indicates that the door to the multiplexer has been opened. Reporting of this event can be disabled in the multiplexer setup. Depending on the settings in the controller, it can also sound the alarm siren.</p>
<p>Multiplexer Tamper Secure</p>	<p>This event does not show on the display of the multiplexer. It reports to the controller as a Tamper Secure referenced to the multiplexer number. It indicates that the door to the multiplexer has been closed. Reporting of this event can be disabled in the multiplexer setup. The actual reporting of this event depends on the settings in the controller.</p>

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## WIRELESS REPEATERS

Wireless repeaters are available to boost the signal from the transmitters when they are too far from the receiver, located in high noise areas, or installed where objects interfere with the signal. The actual number of repeaters needed will vary from site to site depending on several factors. Repeaters must be installed near a standard 120 V outlet. Each repeater is supplied with a low voltage power pack and a rechargeable battery. The battery provides backup power for the repeater in the event of a power failure.

### Determining the Number of Repeaters Needed

In ideal conditions the receiver can pick up signals from transmitters up to 1500 feet away. However, for most installations, at least one repeater should be installed for transmitters located more than 400 feet from the receiver, particularly on sites with metal construction. The actual number of repeaters needed may be more.

Repeaters transmit at a much higher power than door transmitters, which allows the repeaters to be spaced much further apart than transmitters. The location of the repeaters is therefore determined by the placement of the transmitters.

There are two methods for determining the number of repeaters needed for a site: site survey and post-installation test. Each method varies in complexity and equipment required.

#### Site Survey

The most accurate way to determine the location for the repeaters is through a site survey. PTI Security Systems has a site survey kit available for trained installers. The survey kit allows the installer to determine the signal strength at the receiver for every transmitter on the site. Repeaters are then located where the signal strength readings indicate the need. This method allows for optimum placement of the repeaters. The one drawback to this method is that the installer must be specifically trained in the operation of the survey kit.

#### Post Installation Test

Though less accurate than the site survey, this method still provides for efficient placement of the repeaters. After the site is completely installed, the installer tests every door transmitter on the site over a period of 1 to 2 days, looking for transmitters that fail to check in or do not report door activity. This indicates a weak signal to the receiver. Repeaters are then located near the transmitters that exhibit these symptoms. The power of the repeaters creates overlap in the signals that creates a very stable signal.

## Repeater Location requirements

Repeaters must be placed as high as practical in a location that is somewhat sheltered and not subject to physical damage. Each repeater must be installed near a 120 VAC outlet or have wiring run from the nearest outlet to the repeater.

## Installing the Repeaters

The installation of the repeaters is very simple. Once the repeater location is determined and the weatherproof housing has been mounted, connect the internal battery and the external power supply. The repeater is shipped with a low voltage wall transformer. This transformer must be plugged into an unswitched 120 VAC outlet. It should be secured to the outlet using the tab on the transformer to prevent it from being accidentally unplugged. The transformer must be connected to the repeater using 20 AWG or larger wire. The length of the wire from the transformer to the repeater should not exceed 325 feet. See Figure 15.

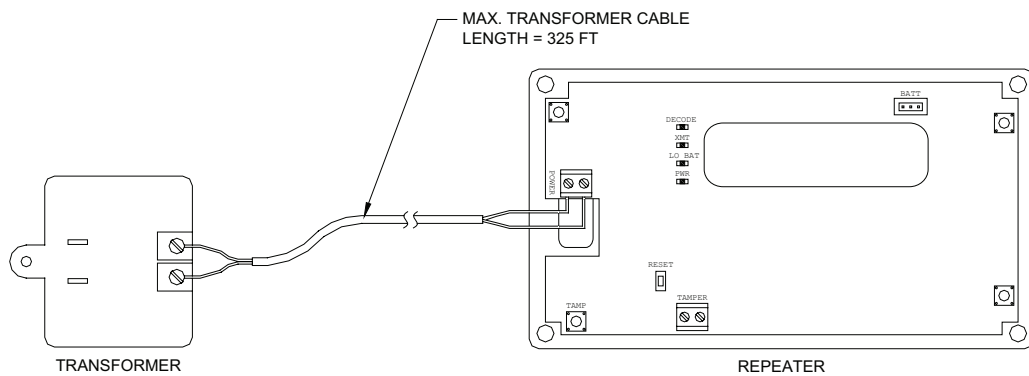


Figure 15: Repeater Wiring



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## TESTING THE INSTALLATION

No installation is complete until the product has been demonstrated to be working properly. Testing the wireless door alarm system can usually be completed in a few hours for most installations. Testing consists of four basic steps:

1. Test the link to the controller

Make sure the wireless multiplexer is communicating with the controller. When properly connected, the controller will report a Data Comm. On event referenced to the multiplexer address. Another way to check the communication is to look at the light emitting diodes (LEDs) on the wireless multiplexer board (See Figure 12). Just below the center of the board there are six LEDs that indicate the status of communications. These LEDs can be quickly identified by looking for the reference designators D1 through D6 on the board. During normal operation, all of the lights should be blinking. When the multiplexer is not communicating, D3 and D6 will be constantly ON. If the wireless multiplexer is not communicating, check the wiring and the settings in the controller.

2. Test the wireless receiver

Make sure the wireless multiplexer is communicating with the wireless receiver. The wireless multiplexer has two light emitting diodes in the upper right-hand corner of the board that indicate the communication status with the wireless receiver. These diodes can be identified by looking for the reference designators D39 and D41 on the board (refer to Figure 12). When the wireless multiplexer is communicating with the wireless receiver, these diodes will blink at least once every minute. Door activity causes these diodes to blink. If one of the diodes is ON all the time or they do not blink at all, check the wiring and the connections between the wireless multiplexer and the wireless receiver.

3. Test the repeaters

Verify that the wireless repeaters are working by looking at the lights on the front of the repeater. To do this, remove the cover on the weatherproof enclosure. There are five lights on the front of the repeater (refer to Figure 15). The light at the top is labeled AC and should be lit all the time. If the power goes out, the second light labeled BATTERY will come on. When the repeater is working, the next two lights labeled DECODE and TRANSMIT should blink at irregular intervals. This indicates the repeater is receiving signals from the transmitters and relaying them to the receiver. The bottom light labeled NOT ACTIVE should not be ON for more than a few seconds after powering up the system. If the AC light is not on, check the connection to the power transformer. If the NOT ACTIVE light is on, try resetting power to the wireless multiplexer.

4. Test the door transmitters

Test all of the door transmitters. This can be accomplished by using a thin piece of ferrous metal slipped between the magnet and the transmitter housing. An electrical junction box cover works very well. Make sure that the metal used is not copper, brass, or aluminum. A magnet must stick to the metal for it to work.

To test the doors, slip the metal plate between the magnet and the transmitter housing. Hold it in position for two to three seconds, then remove it. If the door transmitter is working properly, the controller will show a Door Open or Door Alarm event followed by a Door Close event referenced to the unit number. If the controller does not show any activity, check the transmitter installation carefully. If the controller shows an Unknown Door Open and an Unknown Door Close, the door table has not been correctly entered or it has not been downloaded to the controller. If the door table has been entered correctly, the unit number will be correct. If not, the door table will need to be corrected or the system will not operate properly.

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# SYSTEM MAINTENANCE & TROUBLESHOOTING

## System Maintenance

The wireless door alarm system requires a minimum of maintenance. When the recommended maintenance is performed as specified, the system will provide the best possible security for your site.

### Periodic Visual Inspection

Because the door transmitters are to be mounted on the outside of doors, a periodic visual inspection is very easy. We recommend that all door transmitters be inspected monthly. Look for visible signs of damage or wear. Also, check the doors to make sure the magnets are still in alignment and there is not excessive movement in the door.

### Monitor the Door Activity Reports

The site manager should periodically go over the site activity reports to look for abnormalities. For example, if a report shows an entry and an exit for a tenant but does not show any door activity for the tenant's unit, then the door transmitter may not be functioning properly. Inspect and test any door transmitters that may not be working properly.

These reports will also show a low battery or a unit that has not checked in and should be checked for any low battery or check in fail events. If these events occur, check the door transmitter involved. The Reports can be found in the access control software.

### Battery Replacement

The life of the batteries in the door transmitters depends on several factors, including the amount of activity. A Low Battery condition will begin to report approximately one week before the battery will be completely drained. This report will repeat to the wireless mux display and access control software every six hours until the battery is changed. Under normal conditions, the battery should last for between two and five years.

Replacement of batteries should be a scheduled maintenance item for the site. Once the transmitters begin reporting low battery, all batteries should be replaced at once to reduce maintenance costs.

## **Troubleshooting**

To begin the troubleshooting process, start with the simple question. Is this a new installation that is not yet working or is this an existing installation that has been working in the past? Refer to the appropriate section below.

### **New Installation**

For a new installation, the typical problems encountered are related to the installation or configuration process. Start at Step 1 in the Troubleshooting Steps section and proceed until the problem is found and resolved.

### **Existing (Previously Working) Installation**

This is the starting point for systems that have already been installed and have been working. The first step of this process is to determine if anything has been changed at the site. Has there been any new construction? This includes any changes to the site, adding units, reconfiguring units, changing or adding video surveillance components, changing any electrical wiring, roofing changes, painting, etc. No matter how small the change, it is possible that wiring was disturbed or disconnected or something was added that interferes with the proper operation of equipment at the site. If there has been new construction, start at Step 1 in the Troubleshooting Steps section and proceed until the problem is found and resolved.

If the wireless multiplexer is not working, start at Step 1 and proceed until the problem is found and corrected.

If the multiplexer is working but no door activity is being reported, start at Step 7 and proceed until the problem is found and corrected.

If some doors are reporting activity but others are not, start at Step 11 and proceed until the problem is found and corrected.

If a group of transmitters has stopped working, start at Step 16 and proceed until the problem is found and corrected.

Refer to the Testing the Installation section for more information on isolating problems. Make sure the problems are not related to routine maintenance including battery replacement.

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## Troubleshooting Steps

**Step 1:** Does the wireless multiplexer have power?

Yes – Proceed to Step 2

No – Check power supply and wiring and retest

This can be tested quickly by checking the display of the multiplexer. If the display is on or if any of the LEDs on the board are on, the board has power. If there is no indication of power from the display or LEDs, use a voltmeter to check for the presence of voltage on connector P1 pins 1 and 2.

**Step 2:** *Is the voltage at the wireless multiplexer, connector P1 pins 1 and 2 greater than 10.5 Volts? (Use a voltmeter to measure the voltage).*

Yes – Proceed to Step 3

No – Check power supply and wiring and retest

**Step 3:** *Is the display on the wireless multiplexer blank?*

Yes – Replace the wireless multiplexer and retest

No – Proceed to Step 4

**Step 4:** *Is the wireless multiplexer communicating with the controller?*

Yes – Proceed to Step 7

No – Check wiring and proceed to Step 5

This can be determined by checking the LEDs on the wireless multiplexer board or running the system setup report on the controller. When the wireless multiplexer is communicating with the controller, LEDs D1 – D6 will be blinking. If only D1 and D4 are blinking, proceed to Step 6.

**Step 5:** *Are any other devices set to the same address as the wireless multiplexer?*

Yes – Change one of the devices and retest

No – Proceed to the Step 6

This can be determined by checking the addresses on all of the devices or by disconnecting the wireless multiplexer and running the system setup report on the controller. If the system setup report shows the remote number (address) assigned to the wireless multiplexer as being ON LINE with the multiplexer disconnected, then another device is sharing the same address.

**Step 6:** *Is the Maximum Remotes in the controller set to a number greater than the address of the wireless multiplexer?*

Yes – Proceed to Step 7

No – Change the maximum number of remotes and retest

This can be determined by running the system setup report from the controller. If the value is lower than the address of the wireless multiplexer, the controller will not try to communicate with it.

**Step 7:** *Is the wireless receiver connected to the wireless multiplexer?*

*Yes – Proceed to the Step 8*

*No – Connect the wireless receiver and retest*

The wireless receiver is connected to the wireless multiplexer at connector P8 located in the upper right-hand corner of the wireless multiplexer board.

**Step 8:** *Is the wireless receiver communicating with the wireless multiplexer?*

*Yes – Proceed to Step 9*

*No – Check the connection and wiring, reset the wireless multiplexer and retest.*

This is determined by checking the LEDs in the upper right-hand corner of the wireless multiplexer board. When the wireless receiver is connected and working properly, LEDs D39 and D41 will blink whenever there is door activity at the site. There will be some sort of activity at least every two minutes. Also, when the wireless multiplexer is first powered up, if the wireless receiver is connected, the display on the wireless multiplexer will show RECEIVER ON 0001 on the display.

**Step 9:** *Does the display on the wireless multiplexer show any activity besides receiver On?*

*Yes – Skip to Step 11*

*No – Proceed to Step 10*

**Step 10:** *Have any transmitters been registered to the wireless multiplexer?*

*Yes – Proceed to Step 11*

*No – Register the transmitters and retest*

**Step 11:** *Has the transmitter in question been registered to the wireless multiplexer?*

*Yes – Proceed to Step 12*

*No – Register the transmitter and retest*

**Step 12:** *Has the transmitter in question reported Low Battery in the past?*

*Yes – Replace the battery and retest*

*No – Proceed to Step 13*

This can be determined by checking the site activity log from the controller print out or the access control software. Make sure that the battery is installed correctly. An incorrectly installed or reversed battery will prevent a transmitter from working and may damage the transmitter.

**Step 13:** *Does the battery in the transmitter read more than 2.6 VDC when tested with a meter?*

*Yes – Proceed to the Step 14*

*No – Replace the battery and retest*

**Step 14:** *Does the transmitter in question report any activity at all (Tamper, Door Open, etc)?*

*Yes – Check the magnet alignment and retest*

*No – Proceed to Step 15*

Remove the cover of the transmitter box to test the tamper alarm.

**Step 15:** *Does a different transmitter work when put in the same location?*

*Yes – Replace the transmitter and send it to PTI Security Systems for testing*

*No – Proceed to Step 16*

**Step 16:** *Are the wireless repeaters on the site working?*

*Yes – Proceed to Step 17*

*No – Fix the repeaters and retest*

To determine if the repeaters are working, remove the cover of the repeater box and check the LED indicators on the front of the repeater. There are five lights on the front of the repeater (refer to Figure 14). The light at the top is labeled AC and should be lit all the time. If the power goes out, the second light labeled BATTERY will come on. When the repeater is working, the next two lights labeled DECODE and TRANSMIT should blink at irregular intervals. This indicates the repeater is receiving signals from the transmitters and relaying them to the receiver. The bottom light labeled NOT ACTIVE should not be ON for more than a few seconds after powering up the system. If the AC light is not on, check the connection to the power transformer. If the NOT ACTIVE light is on, try resetting power to the wireless multiplexer.

**Step 17:** *Has any additional construction been done at the site or nearby?*

*Yes – Retest the site for repeater locations*

*No – Contact Technical Support for further assistance*

This includes any changes to the site, adding units, reconfiguring units, changing or adding video surveillance components, changing any electrical wiring, roofing changes, painting, etc. No matter how small the change, it is possible that wiring was disturbed or disconnected or something was added that interferes with the proper operation of equipment at the site.

### Troubleshooting Door Alarms

The following steps can be used for troubleshooting door alarms. Remember to keep a good set of notes as you troubleshoot. These notes can help for comparison to find problems, prevent confusion, and help speed things up if site service by a technician or telephone technical support are required. Many door alarm issues will need to be checked by a trained service technician.

Ask the following questions: “Is the problem with a single door (or alarm input) or is it with a bank of doors?” and “Are the units rented or not?” If the unit or units are rented, it may be necessary to gain access to the doors from the tenants for troubleshooting.

Check the doors in question. Are they loose, possibly moving due to wind or vibration from traffic?

Check the wireless multiplexer. The circuit board, case, and wiring should be checked for obvious damage (i.e., vandalism, burn marks from power surge/lightning, corrosion on the circuit board, water marks, insects, construction debris).

If the problem is occurring in unused channels:

1. Connect a length of 24 AWG wire from pin # 5 of the power and data terminal block to one of the four screws that mount the circuit board to the metal case. The metal case of the multiplexer must also be mounted directly to a grounded metal building or tied to a ground rod or grounded metal structural element of the building such as a metal water pipe or ground rod in accordance with local code.

Verify that all wire used during installation of the system is correct to PTI Security Systems specifications. 18 AWG shielded wire should be used for power and communications. Verify that there are no breaks in the shield, skinned or bare wire, shorts or breaks in the wire, or splices in the wiring (other than those required for the door alarm switches).

In some cases, radio frequency interference (RFI) may also be a problem. All electronic equipment is susceptible to RFI. PTI Security Systems equipment has protection built into it to keep it safe from most RF interference; however, extreme levels of RF interference can cause communications problems. Radio antennas, military bases, airports, radar, power plants, certain types of lighting, and communications equipment, are all examples RF generators that can cause interference problems.



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Humidity, temperature, and cloud cover, as well as broadcasting strength and proximity to the RF source can all make the problem worse. Generally, extreme levels of RF will cause the system data communications to go on and off (data comm on/data comm off) or cause the system to report scattered false door activity during the times when the RF levels are highest. In these extreme cases, braided shielded telephone wire and/or RF filters on the door alarm wires may be required in addition to the recommended fixes above. Both of these products are available through PTI Security Systems and can be installed by a certified installer.

If necessary, a full site reset can be performed if there are multiple problems or ongoing issues. Generally, ongoing problems are a sign of problems in the wiring, either from bad splices, pinched or nicked wires, radio frequency interference, water in conduit, or incorrect wire type. To reset the entire site:

1. At every multiplexer and AI device with door alarm inputs, open the housings and unplug the power and data terminal blocks.
2. Once every device on the site is unplugged, add one device back in to the system at a time.
3. Allow that device to function for an hour and then add in the next device in line.
4. Eventually, a device will be added that causes the problem to manifest. Switch this device with one that has been previously added to verify if the problem exists in the location or in the device.

## **WARRANTY & DISCLAIMER**

PTI Security Systems warrants its products and equipment to conform to its own specifications and to be free from defects in materials and workmanship, under normal use and service, for a period of one year from the date of shipment. Within the warranty period, PTI Security Systems will repair or replace, at its option, all or any part of the warranted product which fails due to materials and/or workmanship. PTI Security Systems will not be responsible for the dismantling and/or re-installation charges. To utilize this warranty, the customer must be given a Return Materials Authorization (RMA) number by PTI Security Systems. The customer must pay all shipping costs for returning the product.

This warranty does not apply in cases of improper installation, misuse, failure to follow the installation and operating instructions, alteration, abuse, accident, tampering, natural events (lightning, flooding, storms, etc.), and repair by anyone other than PTI Security Systems. This warranty does not warrant the replacement of batteries that are used to power our products.

This warranty is exclusive and in lieu of all other warranties, expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. PTI Security Systems will not be liable to anyone for any consequential or incidental damages for breach of this warranty or any other warranties.

This warranty will not be modified or varied. PTI Security Systems does not authorize any person to act on its behalf to modify or vary this warranty. This warranty applies to PTI Security Systems products only. All other products, accessories, or attachments used in conjunction with our equipment, including batteries, will be covered solely by their own warranty, if any. PTI Security Systems will not be liable for any direct, incidental, or consequential damage or loss whatsoever, caused by the malfunction of product due to products, accessories, or attachments of other manufacturers, including batteries, used in conjunction with our products.

The customer recognizes that a properly installed and maintained security system may only reduce the risk of events such as burglary, robbery, personal injury, and fire. It does not insure or guarantee that there will be no death, personal damage, and/or damage to property as a result. PTI Security Systems does not claim that the Product may not be compromised and/or circumvented, or that the Product will prevent any death, personal and/or bodily injury and/or damage to property resulting from burglary, robbery, fire, or otherwise, or that the Product will in all cases provide adequate warning or protection.

PTI Security Systems products should only be installed by qualified installers. The customer is responsible for verifying the qualifications of the selected installer.

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PTI Security Systems shall have no liability for any death, injury, or damage, however incurred, based on a claim that PTI Security Systems Products failed to function. However, if PTI Security Systems is held liable, directly or indirectly, for any loss or damage arising under this limited warranty or otherwise, PTI Security Systems's maximum liability will not in any case exceed the purchase price of the Product, which will be fixed as liquidated damages and not as a penalty, and will be the complete and exclusive remedy against PTI Security Systems

**Warning: The User should follow all installation, operation, and maintenance instructions.** The User is strongly advised to conduct Product and systems test at least once each week. Changes in environmental conditions, electric or electronic disruptions, and tampering may cause the Product to not perform as expected.

**Warning: PTI Security Systems warrants its Product to the User.** The User is responsible for exercising all due prudence and taking necessary precautions for the safety and protection of lives and property wherever PTI Security Systems Products are installed. PTI Security Systems does not authorize the use of its Products in applications affecting life safety.

**Notice.** Some PTI Security Systems products use 900Mhz wireless technology. Other devices at the site such as cordless telephones or alarm components may cause interference that will disrupt the operation of the system or may be interfered with by the system. PTI Security Systems assumes no liability for any problems caused by interference. It is the sole responsibility of the user to identify and correct such problems.





**For Technical Support, Please Visit:  
support.ptisecurity.com**

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