

NGL FX 2012

Installation Manual

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NGL FX 2012 Installation Manual

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For use with the Checkpoint NGL FX 2012 System both Shielded and Unshielded in-floor models.

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*	Preliminary Release	8/31/2012	Ron Decker, Joseph Galanti

Statements

- The device(s) may only be used for the intended purpose designed by for the manufacturer.
- Unauthorized changes and the use of spare parts and additional devices which have not been sold or recommended by the manufacturer may cause fire, electric shocks or injuries. Such unauthorized measures shall exclude any liability by the manufacturer.
- The liability-prescriptions of the manufacturer in the issue valid at the time of purchase are valid for the device. The manufacturer shall not be held legally responsible for inaccuracies, errors, or omissions in the manual or automatically set parameters for a device or for an incorrect application of a device.
- Repairs may only be executed by the manufacturer.
- Installation, operation, and maintenance procedures should only be carried out by qualified personnel.
- Use of the device and its installation must be in accordance with national legal requirements and local electrical codes.
- When working on devices the valid safety regulations must be observed.
- Before touching the device, the power supply must always be interrupted. Make sure that the device is without voltage by measuring. The fading of an operation control (LED) is not an indicator for an interrupted power supply or the device being out of voltage!
- The installer or licensed electrician must follow all NEC and local codes.
- All wires routed in the floor per article 725 must be Class 2 and be UL Listed. UL Recognized AWM may be employed, provided it is enclosed in Conduit of ENT.
- Inter-pedestal wiring should not be directly installed in wet concrete.

Guide Conventions

Document conventions are described below:

- This is a Warning icon. When it appears, it indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.
- Caution: This is a Caution icon. When it appears, it indicates a potentially hazardous situation which if not avoided, could result in property damage or malfunction of equipment.
- Note: This is a Tip icon. When it appears, the corresponding text indicates a helpful note or tip when using the feature.

For all measurements:

- To meet both CE and FCC requirements, all measurements will be listed in the following format: Metric [Imperial], for example: 46cm [18in] or 0.9m [3ft].
- Where non-S.I. units are applicable, such as 6' x 4' or 3/16", the format is Unit (metric).

Where on-screen computer instructions are given:

Button Name - This describes a button or an on-screen command or drop-down selection.

For example, the <DONE> button is represented in this document as **Done**.

Key Name - This describes a keystroke on a keyboard. For example, **Ctrl** represents the control key.

Important Information to our Users in North America

FCC Regulatory Compliance Statement

Checkpoint Systems, Inc., offers Electronic Article Surveillance (EAS) or Radio Frequency Identification Products that have been FCC certified or verified to 47 CFR Part 15 Subparts B/C. Appropriately, one of the following labels will apply to the approval:

NOTE: This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- OR -

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) including this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation, which may include intermittent decreases in detection and/or intermittent increases in alarm activity.

Industry Canada Regulatory Compliance Statement

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter (IC: 3356B-FX2012) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

Industrie Canada

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio (IC: 3356B-FX2012) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Le fonctionnement de l' appareil est soumis aux deux conditions suivantes:

- (1) Cet appareil ne doit pas perturber les communications radio, et
- (2) cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Pour réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisis de façon que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas celle nécessaire pour une communication réussie.

Equipment Safety Compliance Statement

Checkpoint Systems' EAS or Radio Frequency Identification products have been designed to be safe during normal use and, where applicable, certain components of the system or accessory sub-assemblies have been certified, listed or recognized in accordance with one or more of the following Safety standards: UL 1012, UL 1037, UL 1310, UL 60950-1, CSA C22.2 No. 205, CSA C22.2 No. 220, CSA C22.2 No. 223, CSA C22.2 No. 60950-1. Additional approvals may be pending.

WARNING: Changes or modifications to Checkpoint's EAS or Radio Frequency Identification (RFID) equipment not expressly approved by the party responsible for assuring compliance could void the user's authority to operate the equipment in a safe or otherwise regulatory compliant manner.

Important Information to our Users in Europe

CE Regulatory Compliance Statement

Where applicable, Checkpoint Systems, Inc., offers certain Electronic Article Surveillance (EAS) products that have CE Declarations of Conformity according to R&TTE Directive 99/5/EC, EMC Directive 2004/108/EC, and Low Voltage Directive 2006/95/EC.



System Electromagnetic Compatibility (EMC), has been tested and notified through Spectrum Management Authorities if necessary, using accredited laboratories, whereby, conformity is declared by voluntarily accepted European Telecommunications Standards Institute (ETSI) standards EN 301489-1 and EN 300330-2.

NOTE: Certain Electronic Article Surveillance (EAS) equipment have been tested and found to conform with the CE emission and immunity requirement in Europe. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Under unusual circumstances, interference from external sources may degrade the system performance, which may include intermittent decreases in detection and/or intermittent increases in alarm activity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment experiences frequent interference from external sources or does cause harmful interference to radio communications reception, which can be determined by turning the equipment off and on, please contact a Checkpoint Systems representative for further assistance.

Equipment Safety Compliance Statement

Checkpoint Systems Electronic Article Surveillance products have been designed to be safe during normal use and, where applicable, certain components of the system or accessory sub-assemblies have been declared safe according to the European Low Voltage Directive (LVD) by being certified, listed, or recognized in accordance with one or more of the following European safety standards; EN 60950-1, EN 50364, EN 60742.

WARNING: Changes or modifications to Electronic Article Surveillance equipment not expressly approved by the party responsible for assuring compliance could void the user's authority to operate the equipment in a safe or otherwise regulatory compliant manner additional approvals may be pending.

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CHAPTER

1

INTRODUCTION

Background

For years FX Floor Systems have been installed using Gen One Liberty Electronics (TR4024), but with the development of the Next Gen Liberty or NGL (TR4215) Electronics, it has been found using the new generation of electronics provides better immunity to noise. With this in mind, NGL not only replaces Gen One Liberty Electronics for new installations, the system electronics are intended to replace the components in existing installations where high noise conditions prevail. This manual instructs in the planning, installation and configuration of the FX 2012 Shielded and Unshielded Systems.

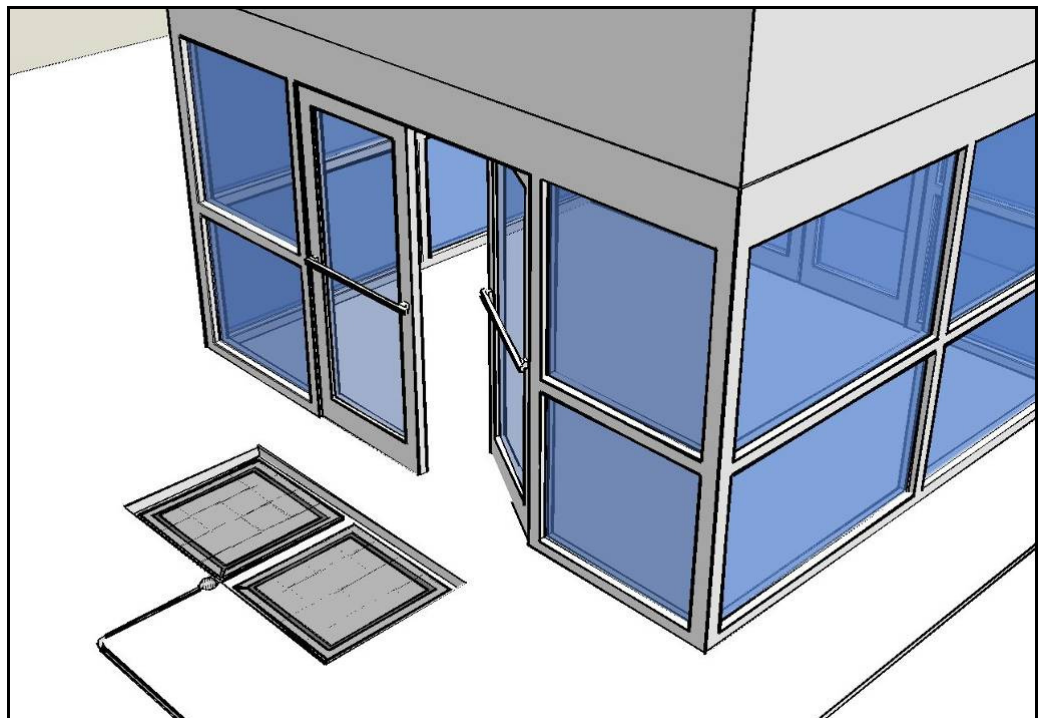


Figure 1-1: NGL Shielded FX System

Chapter Overview

This chapter explains the system hardware and compares the two types of FX systems. This general information is useful for planning and training purposes.

1. Hardware: Lists differences in hardware for the Shielded and Unshielded FX systems.
2. System Diagrams: Shows the basic layout of hardware components for each FX system.

Shielded vs. Unshielded FX System Hardware

Both Shielded and Unshielded FX systems are designed to be installed in the floor and provide an invisible EAS system. The main difference between the shielded and unshielded versions is the in-floor antenna assembly. Shielded FX system uses a metal floor pan and ferrite tiles, which prevent the RF detection field from emitting downward into the floor or into the antenna panel itself.

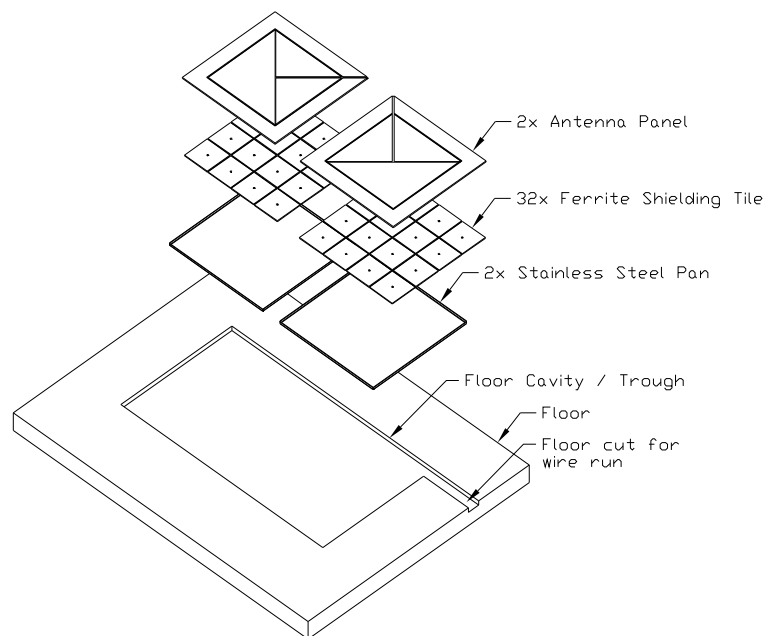


Figure 1-2: Shielded FX Antenna Layer Diagram

Both systems consist of a transceiver-based system using pulse/listen technology, allowing them to work in a single antenna configuration. Some main hardware components are common to each, specifically the electronics enclosure and transmission line. The antenna for the unshielded system is a wire loop ran through Teflon tubing, whereas the antenna for the Shielded FX system is a pre-assembled unit (see Figure 1-2 above).

With both systems, the antenna is wired directly to the Potted Matching Board, another component that is installed in the floor (i.e. buried). The Potted Matching Board provides the link between the antenna wiring and transmission line that connects to the remotely located electronics enclosure.

The electronics enclosure is designed to ensure proper ventilation in a non-condensing 0-40°C environment. The wiring for the FX electronics system is a low-voltage, limited-energy system (operating at 24VDC or less). All wiring must conform to applicable wiring codes.

Shielded FX System Diagrams

FX 2012 Shielded systems use antenna assemblies which are comprised of a Stainless Steel pan, ferrite shielding tiles, and PVC antenna panels. Figures 1.3 and 1.4 below show Shielded FX installations of varying width covering 1.8m and 2.7m door openings [6ft and 9ft, respectively]:

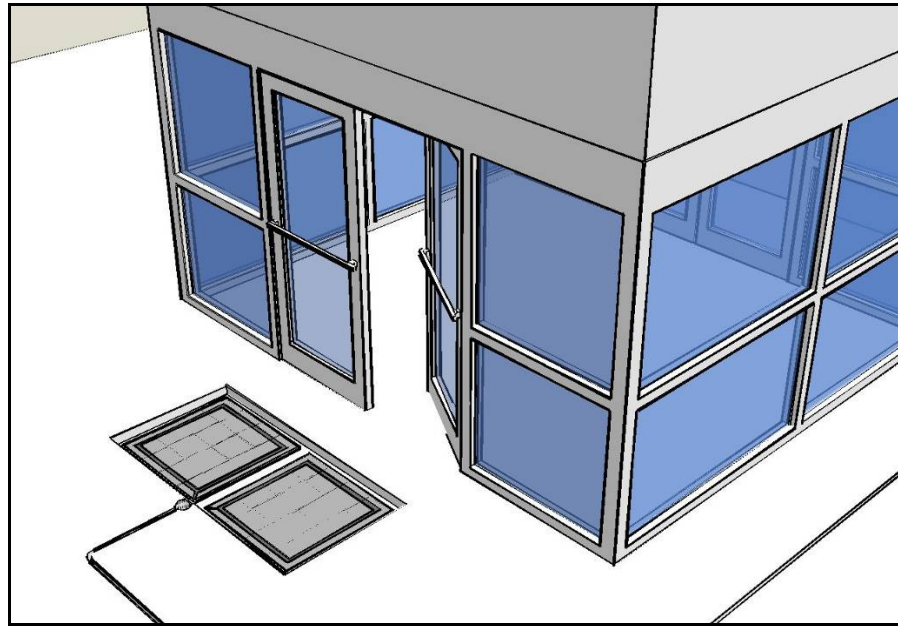


Figure 1.3: Typical Shielded FX 1.8m [6ft] Installation

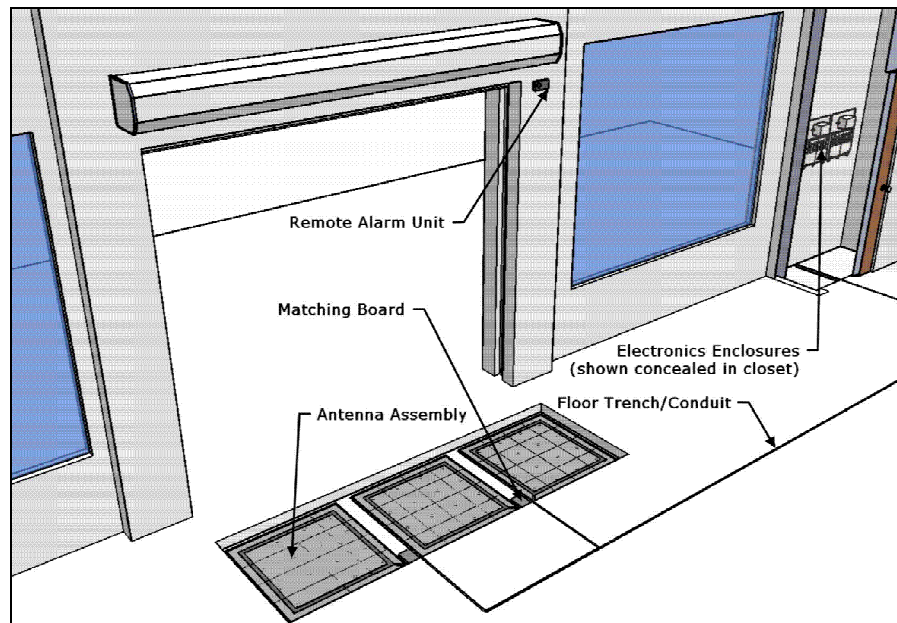


Figure 1.4: Shielded FX 2.7m [9ft] Installation with Component Names

Unshielded FX System Diagrams

Figures 1.5, 1.6, and 1.7 display views of an installation for both 1.2m [4ft] and 3.6m [12ft] door opening. Although not shown, a 1.8m [6ft] installation is also possible (see “Layouts”).

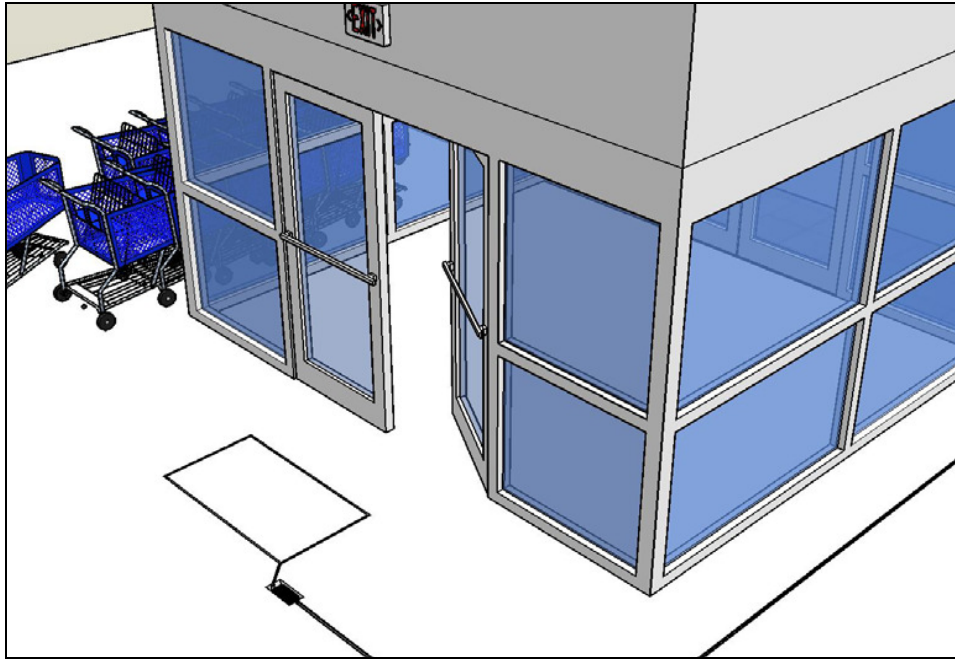


Figure 1.5: Typical Unshielded FX 1.2m [4ft] Installation

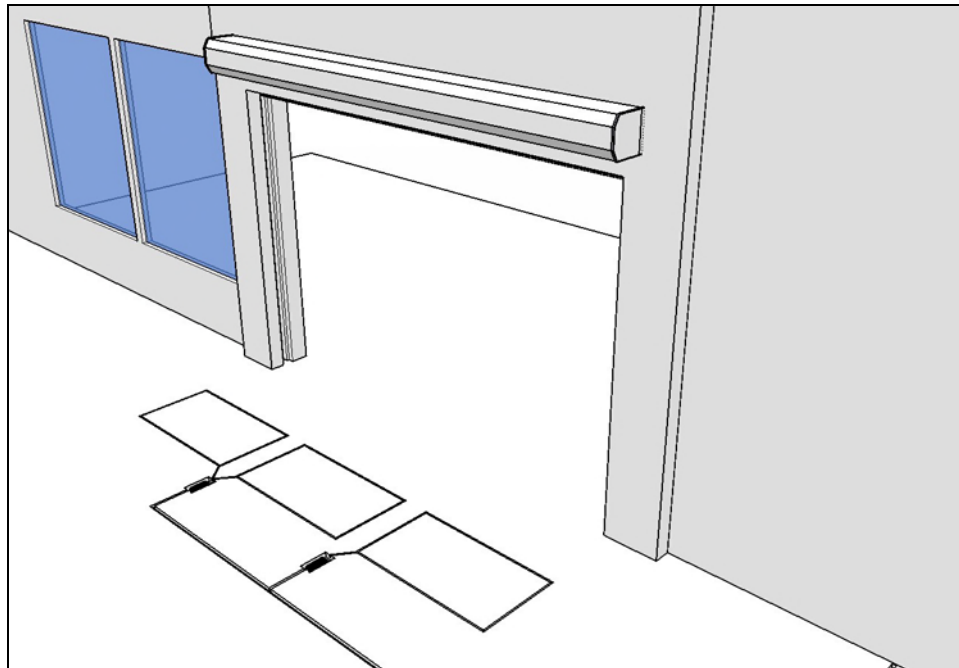


Figure 1.6: Typical Unshielded FX 3.6m [12ft] Installation

Coverage width spans from 0.91m [3ft] to 4.88m [16ft] for both Unshielded and Shielded FX systems. The 3.6m [12ft] door opening shown above is created by combining a 1.2m [4ft] and 2.4m [8ft] system together. Grouping multiple installation kits together is possible, but while wider openings can be covered, it requires approval from Checkpoint's Product Management and confirmation of feasibility during the planning stage (refer to the "Site Survey"*** section below).

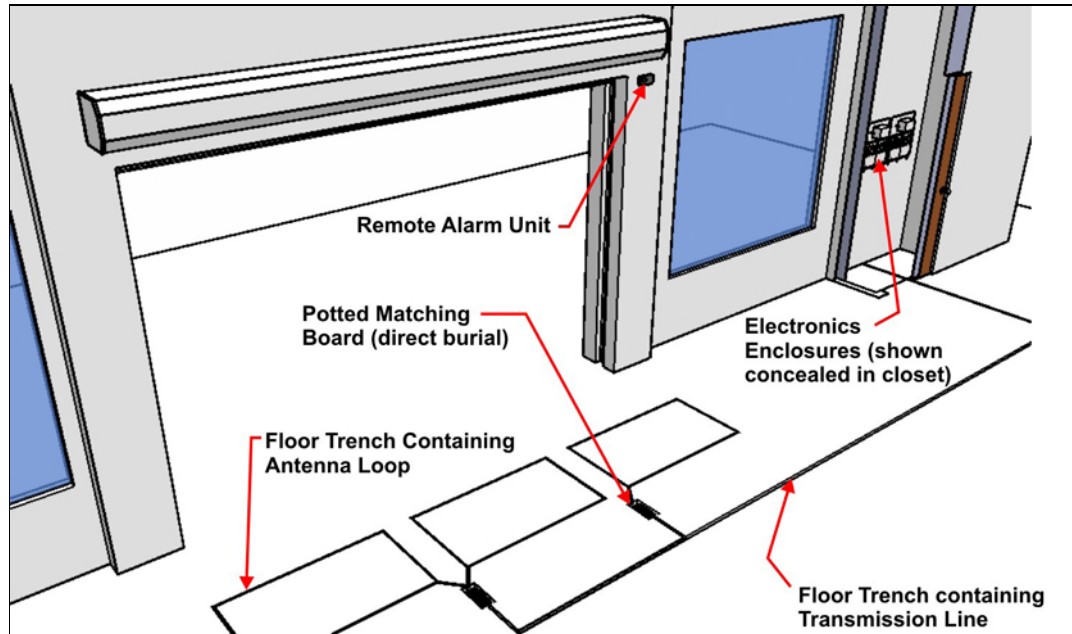


Figure 1.7: Typical Unshielded FX 3.6m [12ft] Installation with Components Names

CHAPTER

2

SITE PLANNING

Overview and Goals

Checkpoint Field Service personnel visit the location to perform a site survey before installation. The initial planning stage is the appropriate time to determine site suitability, where the antenna loops will be located (for maximum EAS protection) and the type of FX system to be installed.

Antenna Distance from Interfering Elements

Carefully execute antenna placement so environmental factors do not degrade system performance. Reducing the chances that nearby elements could cause interfering effects *before installation* is crucial. For repeatability, all measurements are given at baseline (i.e. using a standard tag type).

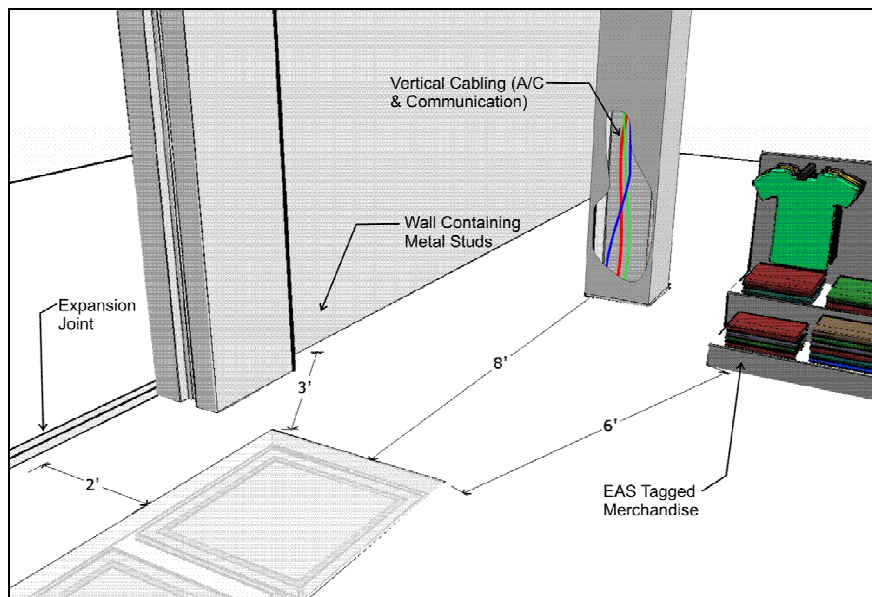


Figure 1.8: Distances from Interfering Elements

Note*: Figure 1.8 above shows a Shielded FX system, yet the common interfering elements and the minimum allowable distance (from antenna to element) is the same for Unshielded FX systems.

Common interfering elements and their minimum distances from an FX antenna are listed below:

- Expansion Joints: The minimum distance from an expansion joint is 0.6 m [2 ft].
- Vertical Cabling: The minimum distance from vertical cabling is 2.4 m [8 ft].
- Metal Wall Studs: The minimum distance from a metal wall stud is 0.9 m [3 ft].
- Inward and Outward Swinging Doors (Metal): The minimum distance from a manual swinging metal door is 0.6 m [2 ft].
Note: The antenna must not be located below door when it is fully opened. Locate the FX system components *beyond* the door – with a minimum clearance gap of 0.3 m [12 in].
- Sliding Doors (Metal): The minimum distance from a metal sliding door is 1.2 m [4 ft]
- Tagged Merchandise: The minimum distance from any tagged merchandise is 1.8 m [6 ft]

Note*: For details about location of other systems, such as CP IX/D11 Deactivators, that may interfere with FX system operation, see appendix section X-Y***.

Determining the Electronics Location

FX antennas connect to the electronics enclosure, an integral device responsible for radio signal control and alarm detection. This enclosure and its power supply are mounted remotely, and environmental constraints must be taken into account. Determine an approximate location of the electronics enclosure during the Site Survey.

Note*: The power supply can be mounted adjacent to the electronics enclosure, but this is not a requirement.

Identify a location that is no further than 12.2m (40 linear-feet) or 15.2m (50 cable-feet) to allow for bends in the conduit run. The electronics enclosure is usually wall-mounted approximately 1.8m [6ft] above the floor to reduce RF-interaction between the electronics enclosure and any wiring in the ceiling or floor. Electronics mounted in the ceiling or rafters can potentially have a high RF-interaction with the surrounding environment, and therefore, may not perform optimally.

Both the electronics enclosure and power supply are plenum-rated and can be installed above a drop ceiling or in HVAC areas. Determined whether or not this is necessary during the site survey, because the hood kit must be ordered separately. If the power supply is going to be located in the plenum, the Power Supply hood kit must be installed by a licensed electrician (CKP P/N 7367100) (GS-599MC-KIT(R)).

***Note: Another option is to install the electronics enclosure in the plenum and locate the power supply outside the plenum (below the drop ceiling).

During the following evaluation you can place the electronics enclosure and power supply on the floor, but strive to locate the electronics near their final locations (to avoid unintended noise later).

Determining the Appropriate System Type

It is the responsibility of Checkpoint Field Service Personnel (and/or Project Management) to identify environmental complications that would prevent *any* EAS system from being installed and operating properly. After arriving at the site, evaluate the surroundings for possible locations of in-ground antennas. Look for environmental factors that may affect the system, such as wiring, lighting, and floor construction. In particular, metal pan flooring (slab on metal deck) will effect RF detection; buildings with metal flooring are unlikely to be suitable for unshielded installations.

The procedure known as a “dry run” helps you determine if the less-costly Unshielded FX system, which is more susceptible to noise, is the appropriate FX system type. Unshielded systems are installed in situations where coupling to metallic objects in the floor is not an issue.

***FX Performance

Environmental Considerations ***

FX systems are not approved for operation in a wet environment, so this procedure is meant for dry installations only. The ideal location of the antenna(s) is where the water table does not interfere (i.e. water drains away from in-floor assembly and does not pool above).

Note***: It is recommended that if the slab is on grade that the concrete be poured above a vapor barrier to prevent moisture from rising, thus keeping the slab dry.

The store's architect will recommend the maximum permissible loading in the floor area where FX-Shielded antenna panels are installed. The architect must consider such factors as anticipated traffic over the floor and the material characteristics of the flooring (if covered above concrete). The weight of the floor should not rest on the antenna(s).

The guidelines included in this guide assume installation into concrete (typical), but the antennas may be placed above concrete if finished flooring, such as hardwood, laminate, tile or stone, will conceal. With all installations, the concrete and other materials above the antenna(s) cannot be metallic. For example, wire mesh cannot be used for reinforcement above the concrete. Tile grout and the mortar used to fill the antenna trenches MUST BE non-metallic and non-magnetic grout.

As for the electronics, typical indoor environmental considerations must be met:

Operating temperature is 0°C to +40°C [32° to 104°F]. Permissible humidity range is 10 to 75%.

The UV Exposure requirement is the electronics enclosure must be located where it is not exposed to direct sunlight. However, locating the enclosure where it will be exposed to sunlight through glass is acceptable.

Perform a Dry Run

A “dry-run” can determine where potential problems might occur. The following procedure simulates an FX antenna in place to ensure proper final configuration of the complete system:

1. **Build the Floor Loop Jig.** The device consists of a piece of cardboard that is 0.9m x 1.5m [3ft x 5ft].
 - a. Cut out a rectangular piece of cardboard measuring 0.9m x 1.5m [3ft x 5ft].
 - b. Cut at least 14m [13.33ft] of 18 AWG Stranded wire, then form a rectangular loop that measures 61cm x 112cm (24” x 44”). Approximately 0.3m [1ft] of excess wire on both sides of the loop remains \.
 - c. Duct tape the loop to surface of the cardboard, centering it appropriately.
 - d. Allow extra wire to extend from the jig in the middle of one of the 61cm [24in] ends of the rectangle or the corner. Twist together the two ends until it forms a braid. Do not create more than 2 turns per 2.5 cm [2 turns per in].
2. Plug the loop terminals into X device. ***specifics to the connection or electronics control settings? Then power on the system. Test possible in-floor locations...

Content to work with***

Test by moving the Floor Loop Jig from opening to opening; shift from Side to side while monitoring noise, see Chapter 6: Tuning*** until a suitable location is found.

Typical performance --- measurements , different detection heights...

Based on the outcome of the dry run test (i.e. the level of noise when simulating an unshielded system), the decision is made to test with a Shielded FX system or continue with the installation (if results indicate it will perform optimally in the environment). To simulate Shielded FX system operation, the entire antenna assembly (floor panel) is placed on the floor. Testing occurs as before.

Site Survey Conclusion

Overall, the site survey is an opportunity to gather details and share information required for the proper installation workflow. Before leaving the test site, the location of the remote electronics, conduit cuts and their layout (plans with exact dimensions), floor cuts or pre-installation space requirements (see diagrams found in the “Physical Installation” sections), power outlet locations (or hardwire into electrical). Coordinating with contractors facilitates easier installation.

Note*: It is strongly suggested for any new construction that the transmission line be ran through conduit. Communicate with the contractor (or store personnel) before concrete has been poured. Ensure wire run does not exceed the maximum distance to the electronics’ planned location. This crucial action will allow the transmission line cable to be easily routed through the conduit.

CHAPTER

3

PHYSICAL INSTALLATION

Chapter Outline

This chapter offers diagrams and lists steps for physical installation of the major system hardware:

1. **Requirements:** Lists tool and part requirements for a typical installation.
2. **Installation Outline:** Lists all of the basic installation steps as a sequence.
3. **Cut Diagrams:** How to plan/make cuts for proper installation of the antenna assembly, potted matching board, and install/route the wiring of the transmission line cable.
4. **Mounting the Electronics Enclosure:** Lists the basic steps for installing the enclosure.

Requirements

Tools

The following tools are required for FX system installations:

- Arrow T-25 Staple Gun
- Diagonal wire cutter
- Hammer drill with 3/16" and 1/2" bits
- Extension cord
- Tape Measure
- Hammer
- Marker, Black Felt
- Ratchet driver with 9/16" socket
- Screwdrivers: mini, regular and #2 Phillips
- Hacksaw
- Utility knife
- Wire Snake
- Wire Strippers
- Wrench, combination end 9/16"
- TR4215 FX 2012 Installation Manual (This manual)
- TR4215 Tuning Procedure (This manual)
- Checkpoint Systems Field Service Diagnostic Management Software (DMS version 1.8.31 or later version) installed on a laptop with the appropriate cables. DMS is an application developed to install and configure TR4215 boards via serial connections. DMS provides for firmware updates without replacement of microchips.

Parts

Quantity will vary according to site.

- 18 AWG 2-conductor (STP)
- CAT5e cable
- 22 AWG 4-conductor (STP) (5594)
- 1/2" Anchor Bolts
- *DekDuct (wire chase)
- *Wiremold (1500 or 2600 series)
- *Wiremold anchor bolts Note:

Note***: Wire routing methods will vary by installation.

Note***: Complete parts lists with OEM Part Numbers are included in the Appendix*** section Part lists.

Installation Outline

Follow this sequence to successfully install the components and validate system operation:

1. Determine optimal antenna placement:
 - a. Perform a site survey now or
 - b. Use the results of a previous survey.
2. Determine power supply requirements and the ideal location for system electronics.
3. Physically install the antenna(s).
4. Connect the antenna wiring.
5. Install the peripherals.
6. Configure the system using DMS.

FX Antenna Installation

Antenna installation and tuning is performed by trained Checkpoint personnel. You have already determined the number and size of the panels or ground loops, or you recently received this key information from a prior survey. If you are unsure of any specifics, contact Checkpoint Project Management. Install the antenna(s) in the proper location(s) discovered during the site survey.

During Construction

In the event of a new construction, please convey the following information to the site contractors (construction team foreman) or manager responsible for pouring the concrete:

- Location where antenna pan(s) will be placed (define a reference point).
- The exact dimensions of the pan(s); provide them with the "Floor Cut" diagrams below.
- The bury depth and length of the conduit (PVC), installed ahead of time, to route the transmission cable.

After Construction

Convey the following instructions to the contractor for any existing sites (i.e. where cuts are made). Refer to the diagrams from the appropriate "Floor Cut" sections corresponding to the required FX system type and antenna configuration(s).

Shielded FX Antenna Floor Cuts

Installing the FX antenna panels in an existing store requires a trough to be cut in the floor. If the site is under construction, it is easier to mold the system into the floor (explained above). These floor cut diagrams include the details on the size of the trough cuts required for each configuration.

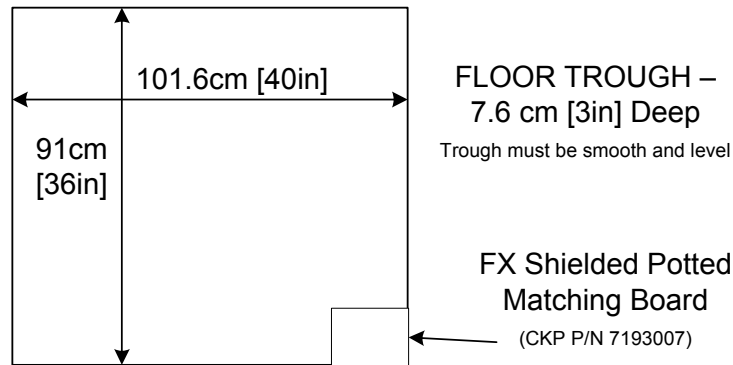


Figure 5X***: FX Shielded w/Potted Matching Board for 0.9m [3ft] Opening

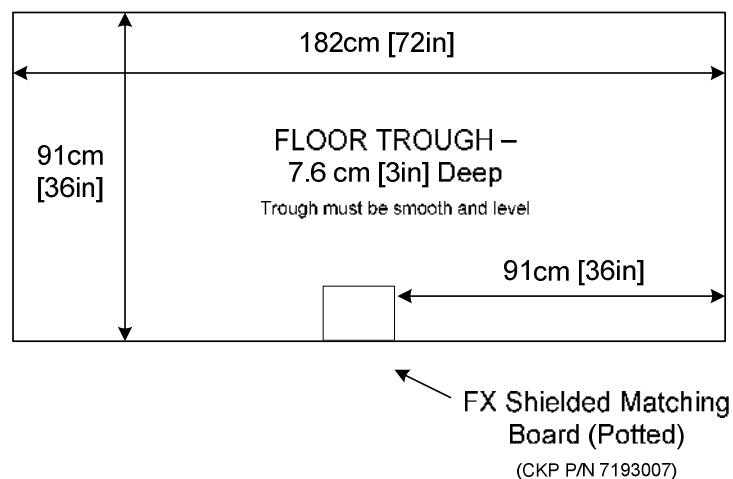


Figure 6X***: FX Shielded w/Potted Matching Board for 1.8m [6'] Opening

It is possible to create a wider system by combining either of the smaller two floor kits (Figures 3-1 and 3.2). For example, to cover a 2.7m [9'] mall opening, a 0.9m [3'] kit and a 1.8m [6'] kit would be ordered. Figure 3-3 (on the following page) shows the required floor cuts when a single antenna and double antenna are combined. Following that, two double antennas are installed side by side.

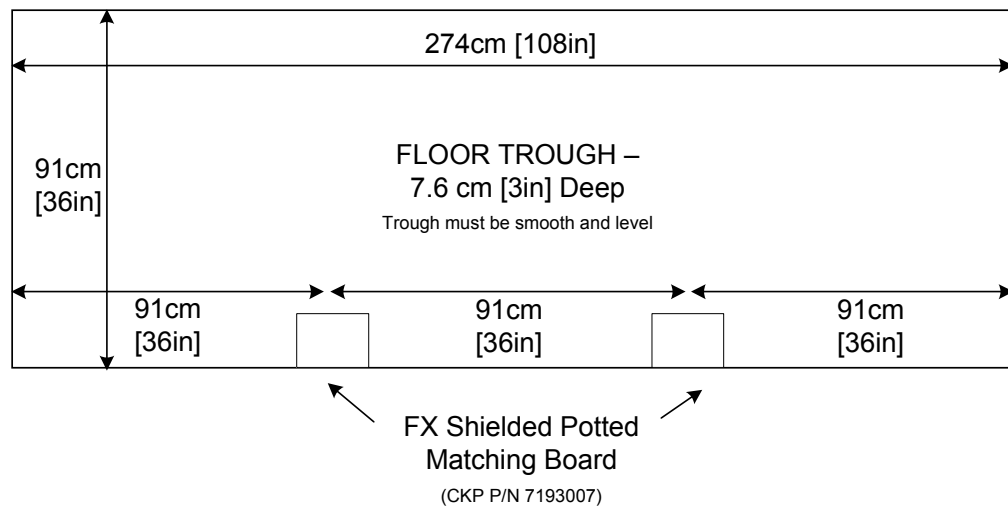


Figure 7X***: FX Shielded w/Potted Matching Board for 2.7m [9'] Opening

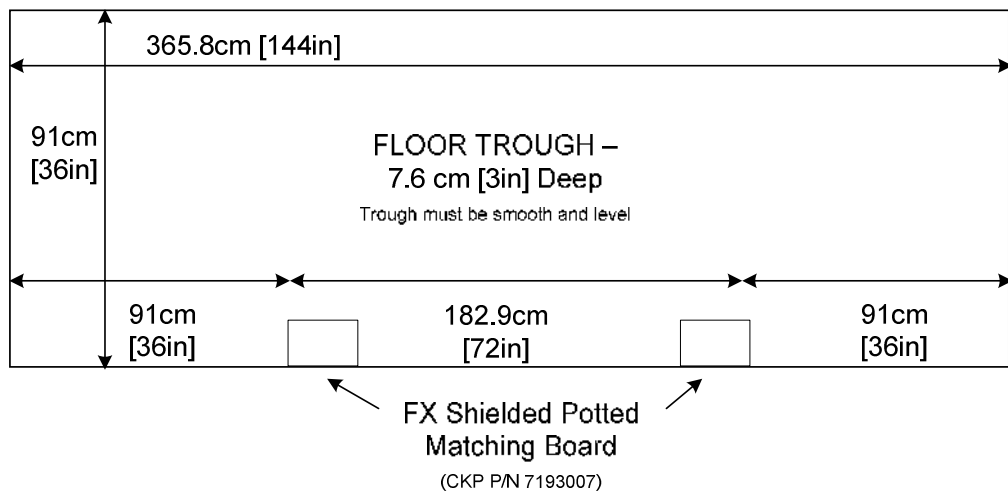
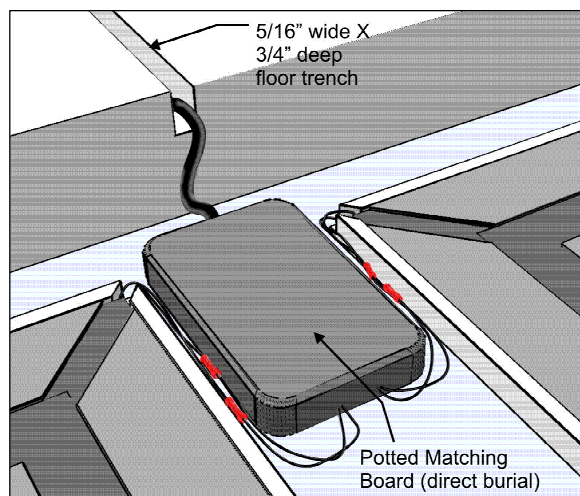


Figure 8X***: FX Shielded w/Potted Matching Board for 3.7m [12'] Opening

Figure 9: Shielded FX Matching Board Placement

Note: The Potted Matching Board for the multi-panel FX system must be positioned between panels and not outside (a different placement compared to Unshielded systems).



Unshielded FX Antenna Floor Cuts

There are three (3) NGL Unshielded FX kits available:

- Two Antenna
- Single Antenna
- Four Antenna

Determine the version to be installed and then work with the contractor. Use the appropriate diagram to plan the floor cuts. Antenna floor cuts will measure approx. 5/16" wide and 3/4" deep (0.79cm and 1.9cm, respectively) for the Unshielded FX system.

Note: The range for the antenna length dimension goes from 91.4cm [36in] minimum to 113.7cm [44in] maximum.

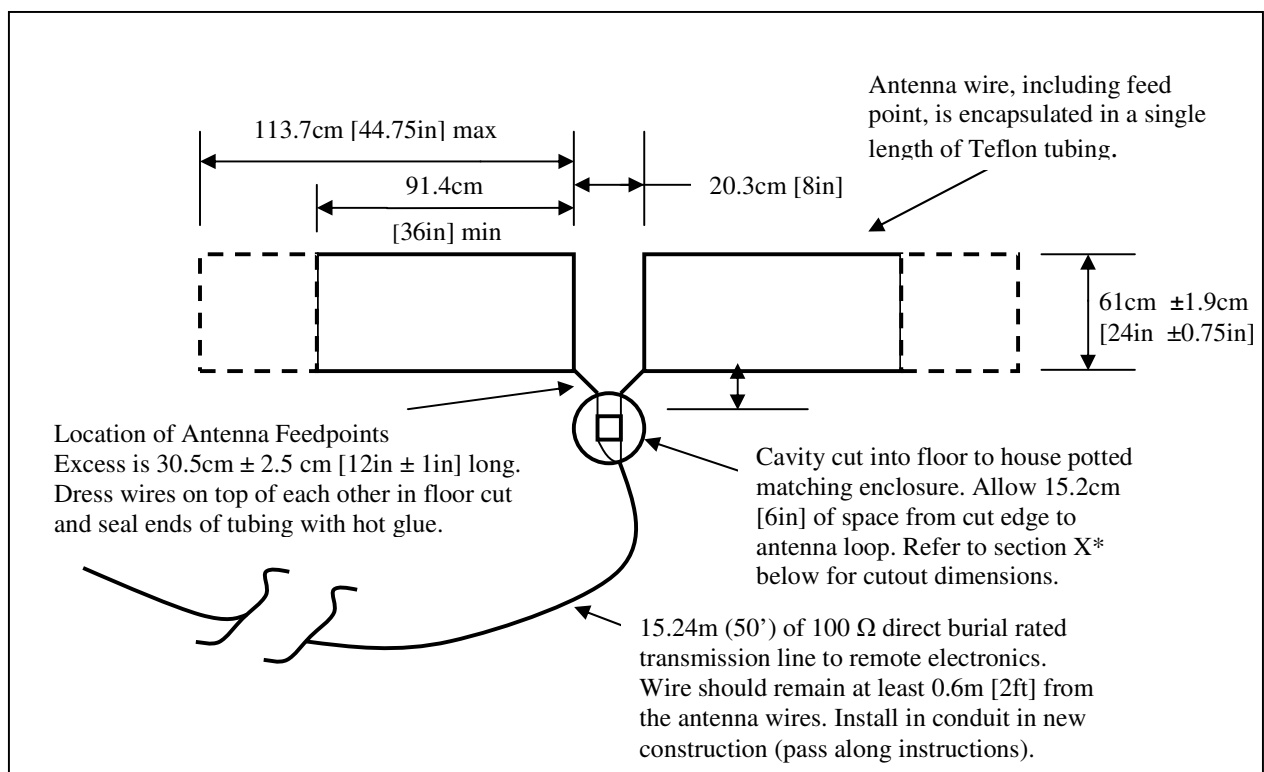


Figure 23X*: Two-Antenna Installation**

Note: The floor trench specifications for two-antenna Unshielded FX systems are above.

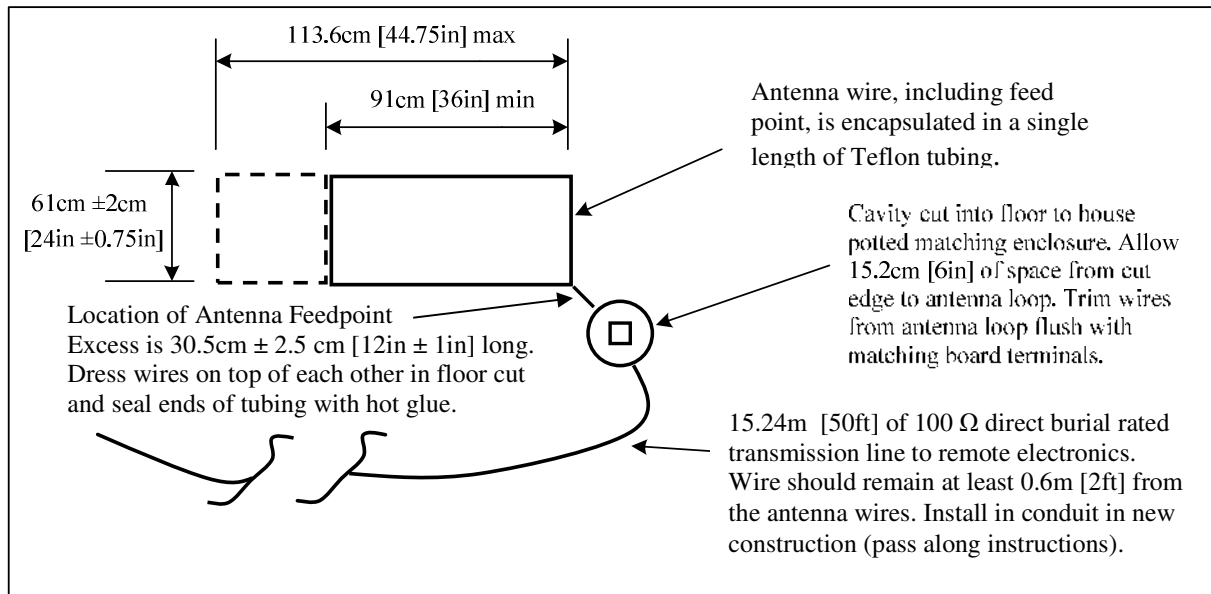


Figure 24X*: Single-Antenna Installation**

Note: The floor trench specifications for a single-antenna Unshielded FX system are shown above.

Note: Details on how the components are installed are written (on the specific parts) shown above. Please see notes on transmission line cable routing and conduit as note (complete instructions on wiring are found in “Wiring”).

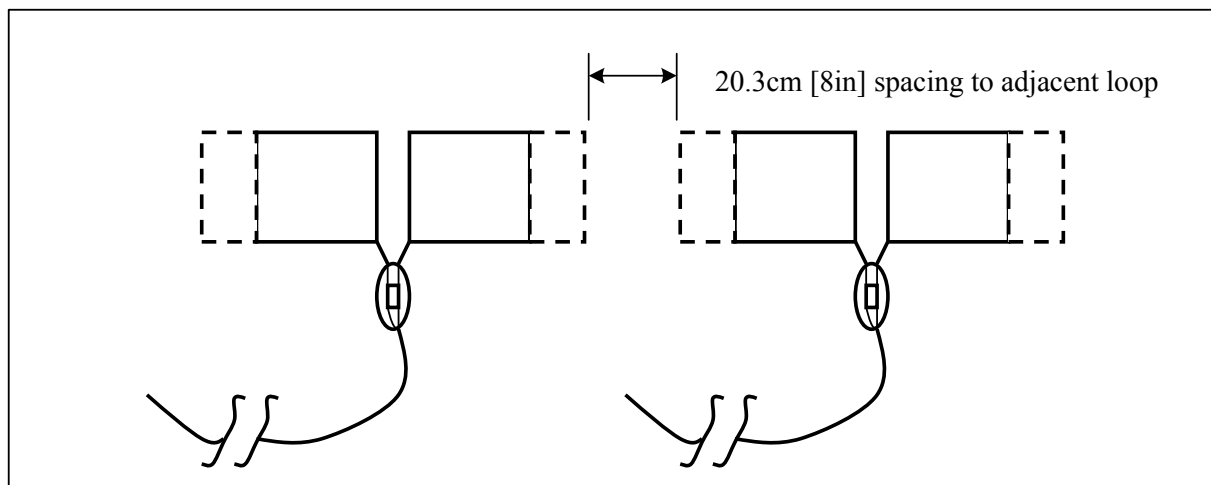
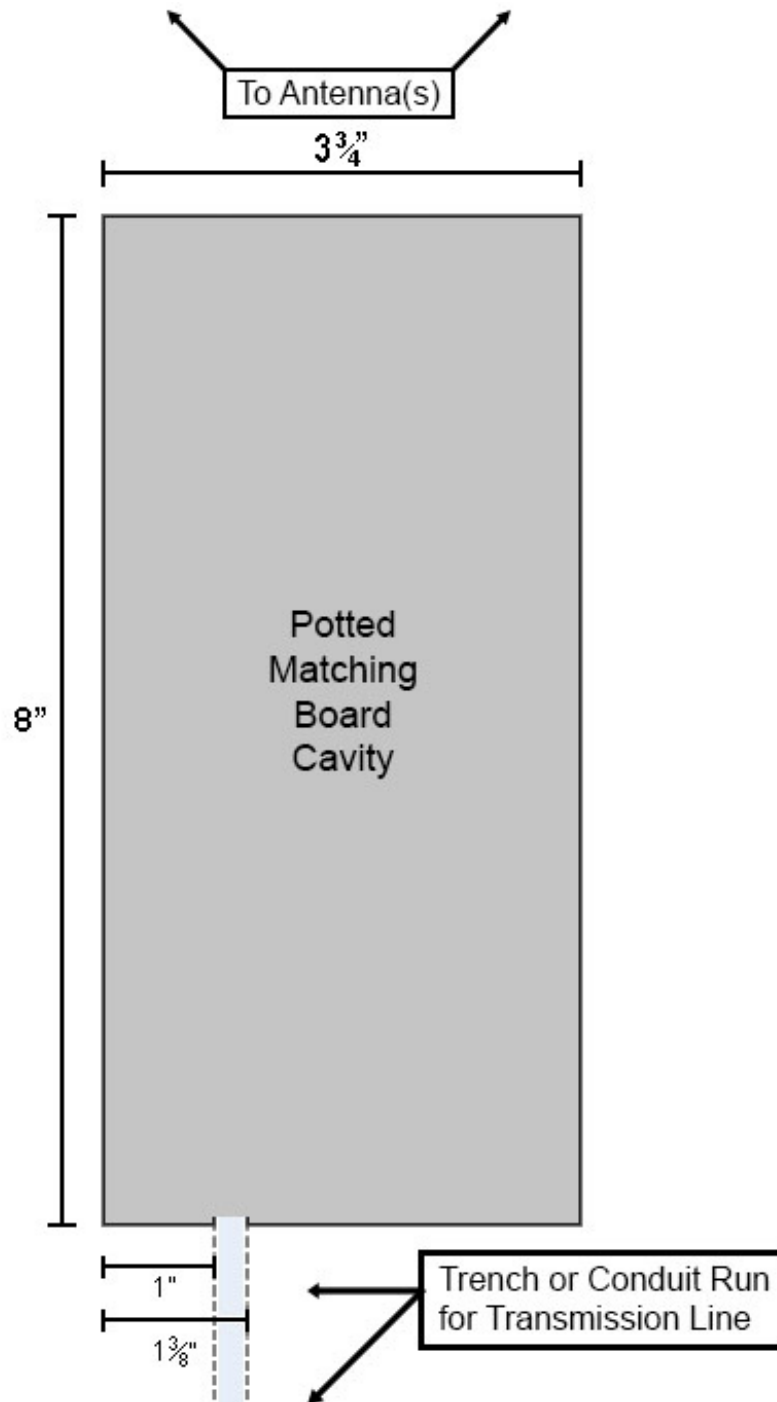


Figure 25X*: Four-Antenna Installation**

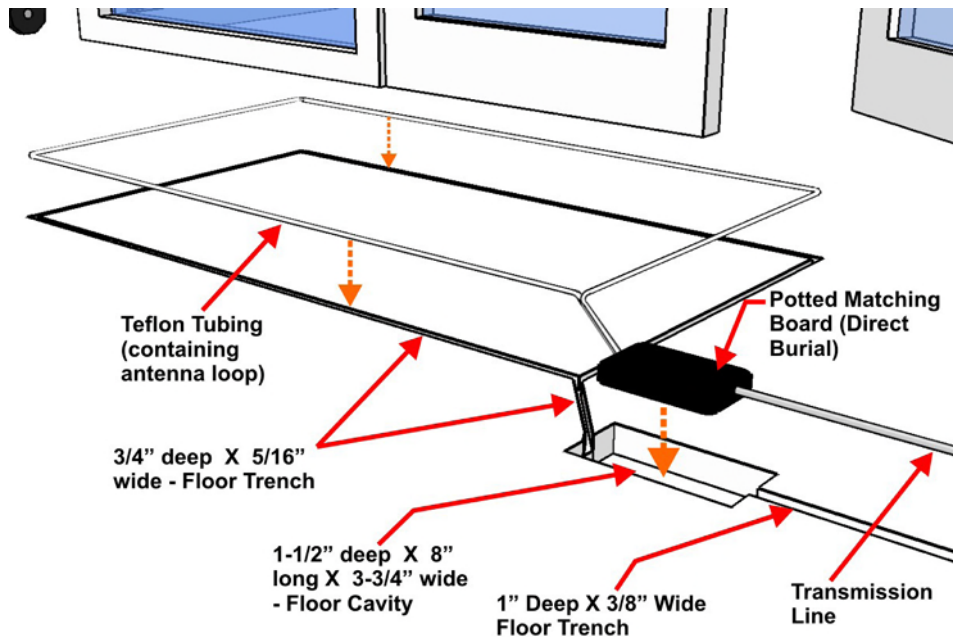
NOTE*: These kits can be combined to create larger systems. For example, to cover a 12 ft opening, a 4 ft kit and an 8 ft kit would be ordered.

Potted Matching Board Cuts – Unshielded FX Only

The cavity for the potted matching PCB is to be placed 15.2cm [6in] from the antenna loops, centered between them. Plan the cuts for this cavity using the specifications below:



*Figure X***: Potted Matching Board Cavity*



*Figure X***27: Unshielded Floor Trench Specifications*

Mounting the Electronics Enclosure

Instructions for locating the Electronics Enclosure are included below.

It is important that the electronics enclosure be located no further than 12.2 linear-meters [40 linear-feet] from the antenna panels to allow for bends in the 15.2 cable meters [50 cable feet] run. The enclosure, which weighs 5.17kg [11.4lbs], has keyhole slots at its edges to facilitate mounting to the wall surface. The mounting hardware can support the weight of the unit. Do not mount the electronics enclosure beneath potential water sources (e.g. a sprinkler or pipe).

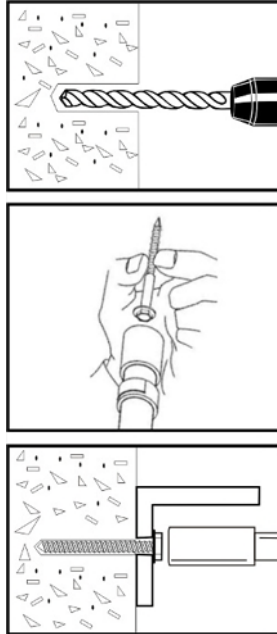
The enclosure must have 2.5cm [1 in] clearance on all sides. It is suggested to locate the enclosure directly over (or nearest to) the conduit's end wire as possible, ensuring the cable length is kept to a minimum. Limiting exposed cable prevents interference (but do not cut, see "Transmission Line," and "Wrapped Cable" section). Use schedule 40 PVC conduit (contractor supplied) or wire run, such as Checkpoint approved Dek Duct, to route the cable.

Installation procedures are listed for each type of material on which the enclosure can be installed:

- **Wood Surface,**
- **Drywall,** and
- **Concrete.**

Wood Surface Installation

For mounting to wood, use a #7 x 1/2" (0.38cm x 1.3cm) hex head screw (CKP P/N 7939172).



Using the proper diameter bit, drill a hole into the base material to a depth of at least 0.6cm [1/4"] deeper than the embedment required. Blow the hole clean of dust and other material.

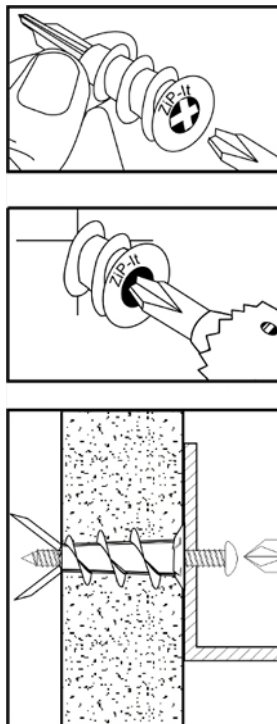
Select the installation tool and drive socket to be used. Insert the head of the screw into the hex head socket driver.

Place the point of the screw through the fixture into the pre-drilled hole and drive the anchor in one steady continuous motion until it is fully seated at the proper embedment.

Figure X*: Wood Surface Installation**

Drywall Surface Installation

For mounting to drywall, use a #8 x 1" (0.42cm x 2.5cm) panhead screw (CKP P/N 7308823), which is a Power Fastener Zip-it (P/N 02348).



Insert either # 2 or # 3 Phillips driver bit into the recess of the ZiP-It anchor head. Use a manual screwdriver or a low-rpm battery-powered electric screw gun.

Push the ZiP-It anchor into the surface of the wallboard until the two cutting blades penetrate the surface. Using gentle forward pressure, rotate the ZiP-It until the collar sets flush to the surface of the wall.

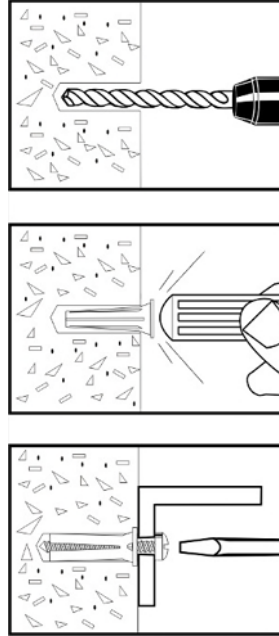
Put the fixture in place, insert screw and tighten until it feels secure. As the screw is threaded into the nylon versions, the point will expand resulting in increased load capacity in thicker wallboard.

Note: When using an electric screw gun for application, set clutch and use slow speed (do not exceed approximately 300-400 RPM).

Figure X*: Drywall Installation**

Concrete Surface Installation

For mounting to concrete, use a 5/16" lead anchor and a #12 x 1 1/2" panhead screw (CKP P/N 366291). Lead anchor (0.79cm) is a Power Fastener (P/N 09439). Screw is 0.55cm x 3.8cm.



Drill a hole into the base material to the depth required. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15.

Blow the hole clean of dust and other material. Insert the anchor into the hole until the flange is seated flush with the surface of the base material.

Position the fixture. Insert the screw tip through the fixture into the anchor and tighten.

*Figure X***: Concrete Installation*

Mounting the Power Supply

The power supply can be mounted near the electronics enclosure or, by space requirements, in another remote location. If the power supply is installed above a drop ceiling or in the plenum (HVAC ventilation), the Above Ceiling Conversion Kit must be ordered in advance.

For the unit's weight and dimensions, refer to the Appendix "Power Supplies" section.

GS-599ES(R) Installation

Hold the unit in place and mark the screw hole locations. Secure the power supply in its intended location using the same instructions found above (refer to "Mounting the Electronics Enclosure").

GS-599MC-KIT(R) Installation

Refer to Appendix 1 for the complete hood kit instructions.

CHAPTER

4

WIRING

Overview

This chapter instructs on the wiring of the entire floor system, beginning with the FX antenna and potted matching board* wiring, then moving to the transmission line and its proper connection to the electronics enclosure. Figures show the proper wiring of the A1111 Interface Board and DC Power Supply. Lastly, the system-specific (sync, IPC and alarm group) wiring schemes are shown.

WARNING*: *This system uses TR4215[†] electronics with firmware version 4.00 or higher. It is critical to note that ONLY TR4215 electronics can be used in conjunction with this system.*

It is also critical that DMS version 1.8.31 or later be used to configure the system.

The outline below is a sequence of the FX system wiring procedures.

1. Antenna Wiring
 - a. Wiring the Shielded FX Panel to the Potted Matching Board
 - b. Wiring the Unshielded FX antenna to the Potted Matching Board
2. Electronics Chassis
 - a. Transmission Line Wiring to the A1111 board
 - b. DC Power Supply wiring
 - c. Sync and Alarm Group ***waiting for info
 - d. Lights and Sounder
 - e. Inter-pedestal communication

Antenna Wiring

Recall the Potted Matching Board installation and wiring differs between Shielded and Unshielded FX systems. Instead of locating it in a separate cavity, the Shielded FX matching board is placed in the top center between the assemblies (or directly beside it, for a single loop). After successful hardware installation, the next step is wiring the antenna(s) to the matching board.

Shielded FX Antenna

Figure X below shows the proper wiring of the Shielded FX system.

***Graphic of Shielded system wired to PMB.

*Figure X***28: Shielded FX system Antenna Panel*

Note: If this is a single loop configuration, use the right pair of short and long antenna wires for the loop (right wires are with potting material facing up and wires exiting the potted matching assembly towards you). Trim the unused antenna wires at the potted matching board assembly.

Wiring the Potted Matching Board

Perform the following to wire the Potted Matching Board (CKP P/N 7193007) to the Shielded FX antenna system:

1. Connect the antenna wire to the 0.3m [1ft] wire adjacent to it (wire on the right side of the potted matching board with the potting side up) in the potted matching assembly using one of the provided wire nuts.
2. Strip the wire leads about 1.2cm (½"). Next, without pre-twisting the leads, align the wire conductors and then twist a wire nut onto each connector until hand tight.
3. Apply excess sealant in and around conductors. This forms a tight connection that will not fail once buried in the concrete. Refer to the "FX Antenna Floor Cuts" section for details on the placement of the potted matching board.

The external and internal wiring before potting of the matching board (P/N 7193007) is displayed in Figure X***. Item 3 is the 15m [50ft] cable coming from the interface board. Item 4 displays the connections from J8 and J2 which are connected to the FX antenna. The fly wires from these ports are 0.3m [1ft] in length.



Unshielded FX Antenna

The component list and wiring instructions for connecting the Unshielded FX system antenna loop to the potted matching board are below. Figure X***29 details the unshielded potted matching board's electrical connections before potting is done.

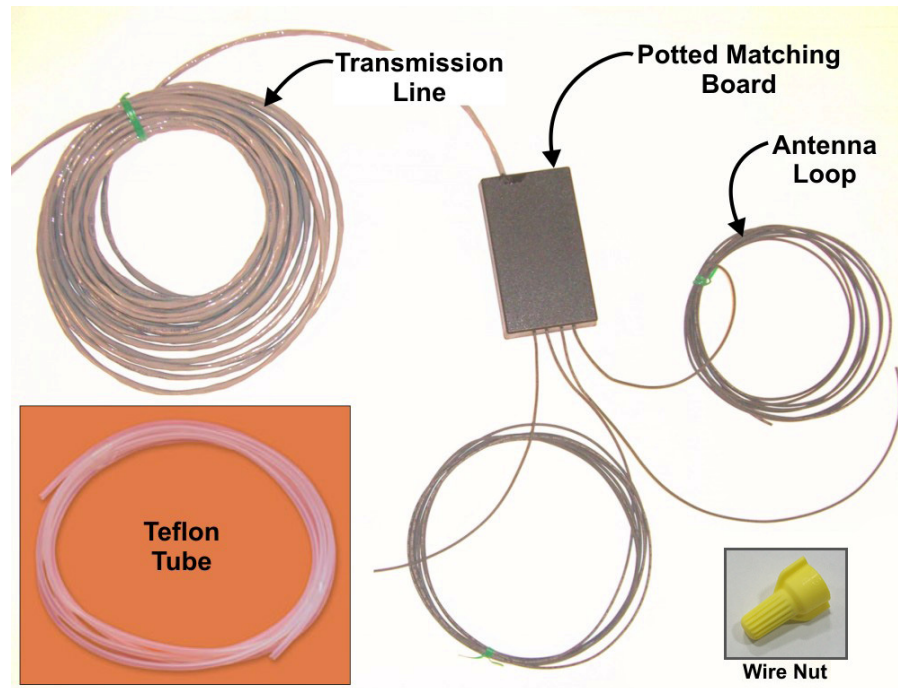


Figure X***: Potted Matching board and Unshielded FX Antenna Loop Components

Wiring the Potted Matching Board

Please note the placement of the potted matching board 15.24cm [6in] in front of the antenna instead of in between the antenna. The matching board for the Unshielded FX system has a different part number (CKP P/N 7113880), but has the same physical dimensions.

1. Determine the length of wire to be cut for antenna loop configuration(s). Cut long if unsure.
2. Insert the cross linked polyethylene-jacketed wire through the Teflon tubing. Allow the excess wire to stick out at either end of the tubing.
3. Starting about 3.8cm [1.5in] from the potted matching assembly, place the tubing in the cut trough.
4. Install the wire in the trench, feeding it around until the loop is complete. The antenna feed point will be 30.5cm +/- 2.5cm [12in +/- 1in] when trimmed. No extra wire is allowed because it may affect tuning.
Note*: The Teflon tubing should be one continuous piece beginning at the assembly, through the cut for the pigtail, through the antenna loop cut, and back through the pigtail cut. One tube is positioned above the other at the pigtail location.
Note*: Keep exposed wire (not in Teflon tubing) to a minimum leaving just enough to allow the wire nuts to be installed. The exposed wire should measure approximately 3.81 cm [1.5in].
5. Next, seal the ends of the Teflon tubing completely with hot glue to prevent the infiltration of concrete or moisture.

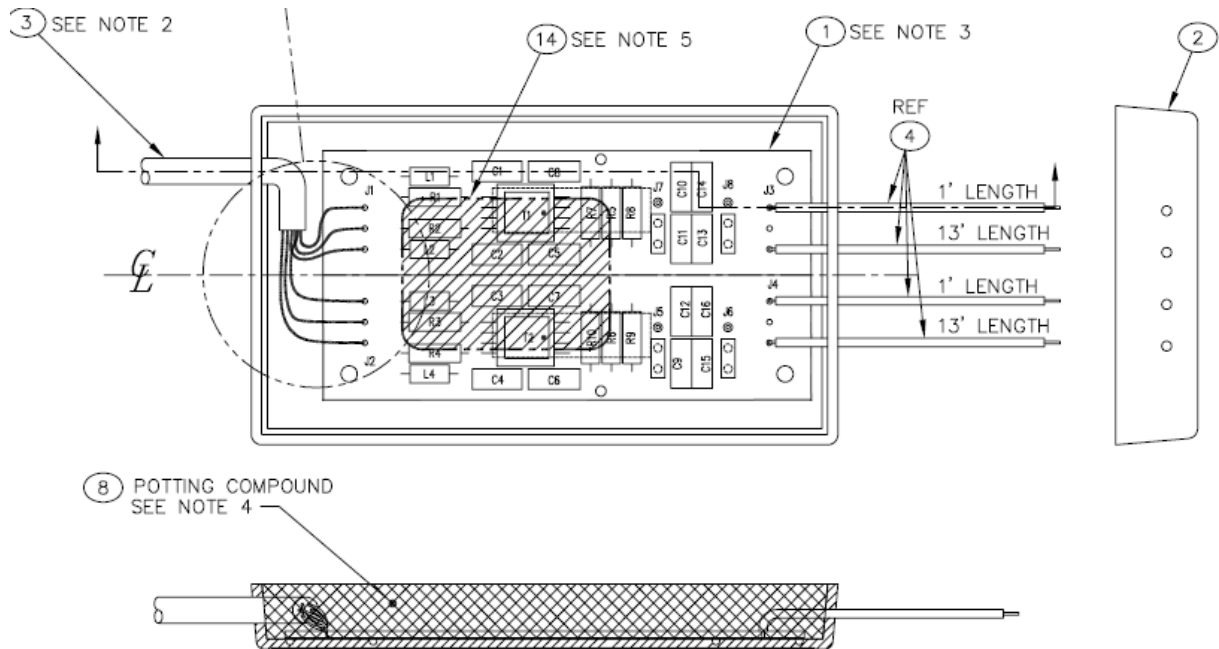


Figure X*29: Unshielded Potted Matching Board Wiring**

Note: If this is a single loop configuration, the pair of short and long antenna wires on the right (see FigureX***) are wired to the antenna loop. As shown in the graphic, the potting material side faces up and the wires exit the assembly (towards you). The unused antenna wires are trimmed (see step 4 below).

TR4215 Components and Enclosure

Overview

Connections to the Electronics Enclosure / reader assembly are listed below. This section describes how to prepare and wire all cables and wires involved in the antenna installation. TR4215 board with all interfaces labeled. A ferrite clip (CKP P/N 7284760) (Fair Rite P/N 044380640) is installed on all TR4024 I/O cables shown below.

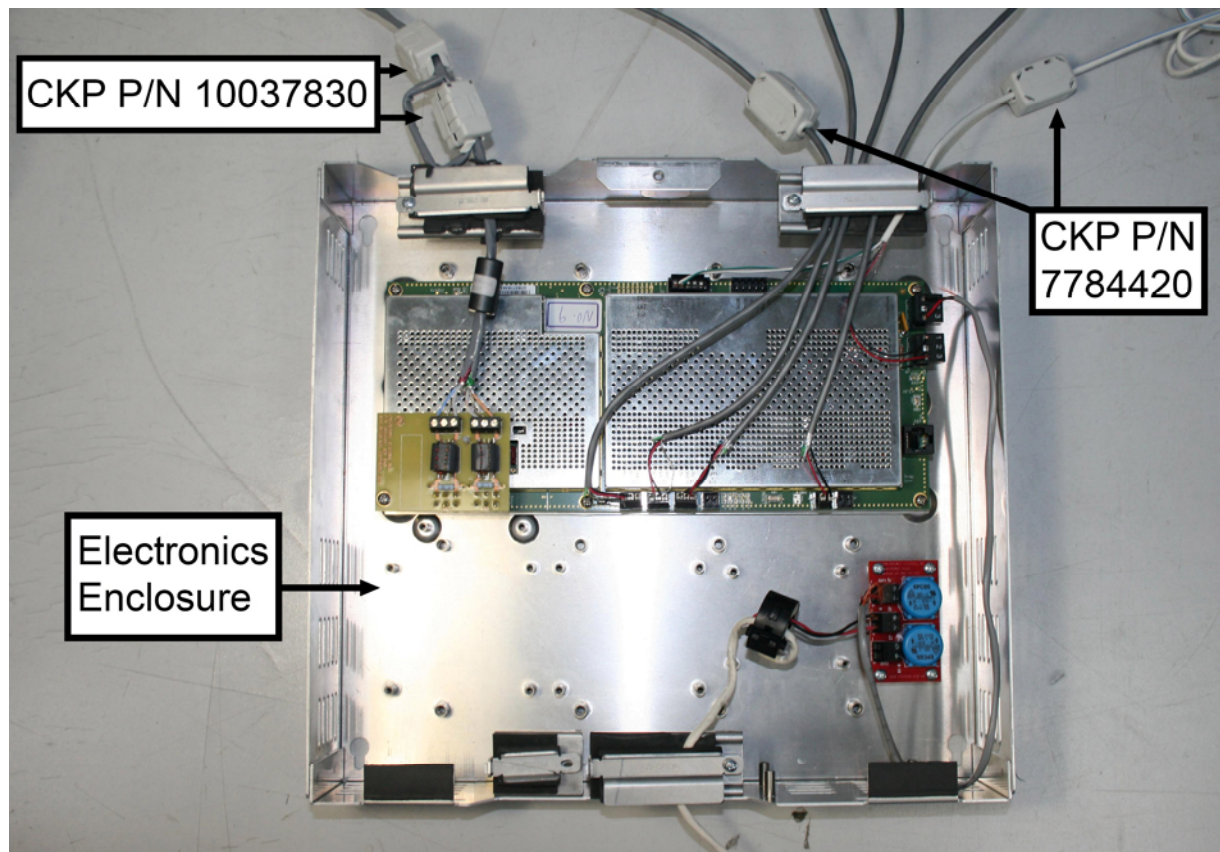


Figure 11: Electronics Enclosure panel

Connector type: Riacon, 4 terminal

Cable type: 22 AWG, 4-conductor with drain wire