STANLEY Healthcare

BY YOUR SIDE™

EX5210R RUGGED EXCITER

INSTALLATION & CONFIGURATION GUIDE

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Introduction

The EX5210R Rugged Exciter is a component of the STANLEY Healthcare suite of enterprise-level visibility solutions based on standard Wi-Fi wireless communications for location- based applications. The EX5210R Exciter is designed for outdoor mounting, providing robust and sophisticated RFID detection capabilities.

The EX5210R Exciter triggers tags as they pass through a chokepoint or as they approach the Exciter. Tags in turn transmit a message to either the AeroScout Location Receivers or to compatible Access Points within range. The Exciter can activate or deactivate tags, program them, or even instruct the tags to operate in a specific way (for example, to blink). This provides instant acknowledgment that a tagged asset has passed through a gate, doorway, or other specifically defined area. The detection capabilities of the EX5210R Exciter combined with the location features of the AeroScout Location Engine, to make the STANLEY Healthcare suite the most sophisticated enterprise visibility solution, for various applications.

Figure 1: EX5210R Exciter

Exciter Applications and Industry Examples

Theft Prevention

Healthcare organizations or enterprises with expensive and mission-critical equipment can tag valuable assets that are intended to remain within a specified area. The AeroScout System can track the location of such items and trigger an alert when they pass through an exit point or enter a restricted area.

Process Control

Manufacturing companies can track the location of equipment, carriers, and the work-in-process (WIP) inventory during a production cycle. This provides a real-time view of the production line. The type and quantity of products can be tracked through each step in the process.

Automatic Inventory Management

Logistics organizations can update inventory records by automatically determining assets within defined areas, ensuring real-time knowledge of inventory levels without manual checks or barcode scanning.

Real-Time Alerts

Organizations can use the Exciters to trigger automated events and alerts based on the current location of an asset. For example, in a shipping yard, notifications can be sent when vehicles pass through gates and enter or exit a certain dock or bonded area.

Security applications

Exciters can be installed at the entrances of restricted areas to trigger alerts when unauthorized persons attempt to enter or leave.

Exciter Features

RFID Detection of STANLEY Healthcare Tags

The Exciter triggers Tags to transmit as they pass through a defined area, within a range of up to 6.5 meters (21.3 feet)*. This is typically enough to cover door or gate areas. The Exciter also supports a chained configuration, thus enabling an increased RFID detection range for larger areas.

**In an outdoor environment, the Exciter's actual LF coverage range is a maximum of 3meters (9.8feet), even if it is set to the maximum of 6.5m in the Engine.*

**When used indoors, the Exciter's LF coverage range can reach up to 6.5meters.*

Note

The Exciter's effective range may be less than the configured range due to specific site or environmental conditions. The effective range must be taken into consideration when planning and designing the deployment.

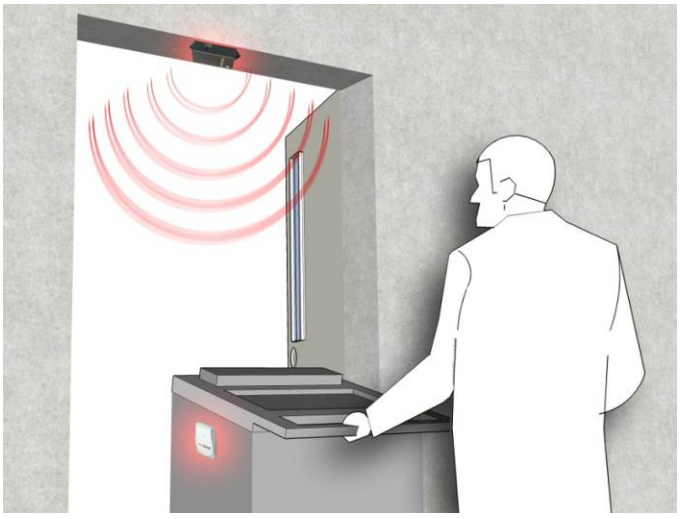


Figure 2: Exciter Positioned at Chokepoint Triggering a Tag

Tag Behavior Modification

Exciters can be programmed to wirelessly activate and deactivate Tags based on pre-configured conditions. Tag battery life can be extended by switching them off when they leave a defined tracking area through a gate or doorway. The Exciter can also be configured to change the Tag transmission rate temporarily or indefinitely to accommodate different usage patterns in different environments.

Message Programming Functions

The Exciter can store messages on the Tag for subsequent transmission. The stored messages can subsequently be triggered by other Exciters, enabling sophisticated process control functions.

The Exciter can trigger a Tag to:

- Transmit up to 15 bytes of data sent to it by the Exciter
- Transmit one of 15 pre-stored (customer-created) messages
- Store up to 15 bytes of data sent to it by the Exciter

Network Connectivity

When connected to the network, the Exciter can be remotely programmed, monitored, and its firmware can be updated via the AeroScout Engine. The Exciter can also work in an offline mode, thus eliminating the need for a physical network connection. In the offline mode, however, remote configuration and monitoring is not available.

Chaining

In an area where the required low frequency (LF) coverage exceeds the capacity of one Exciter, the Exciter can be chained to another Exciter for complete and precise coverage.

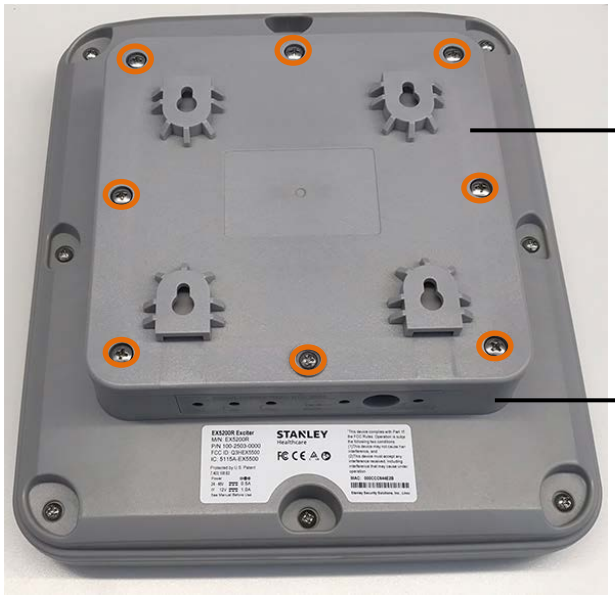
LED Status Indicators

The EX5210R has a single LED that changes color based on the Exciter's status as follows:

- Green (continuous): The Exciter is transmitting and functioning correctly
- Green (Blinking) During Firmware upgrade the Exciter blinks green until the upgrade is complete
- Red (Blinking) During IP reset the Exciter blinks red
- Red (continuous): Error

Exciter Connector Panel

The EX5210R Exciter connection panel is housed in the sealed compartment at the back of the Exciter.



Unscrew the 8 mounting plate screws and remove the plate.

The Exciter has four connectors and two switches inside the back panel:

Figure 3: EX5210R Connector Wiring

(#1) Ethernet LAN Connection: RJ-45 connector. In a configuration with a physical Ethernet cable connection to the LAN, the network cable is attached here.

Permanent connection to a wired network is not mandatory. However, you must have a wired connection to configure the Exciter. Some monitoring functions are not available if the Exciter is not connected to the network. This connection is also used for Power over Ethernet (PoE, 802.3af).

(#2) Power Jack: Accepts an input voltage of 24-48V DC. This is a standard 5.5 mm jack connector for direct power supply. The power Adaptor is not supplied with the Exciter and can be purchased separately. When PoE is used, this connector becomes redundant.

(#3) Chain IN: RJ-45 connector. This connector is used for receiving data from Chained Exciters. The Chain IN port is also used to set the Exciter IP via the Exciter Manager Application using a special 10-pin RJ45 to DB9 serial cable (AeroScout SKU EXM-1000, or part of the Hardware Management kit).

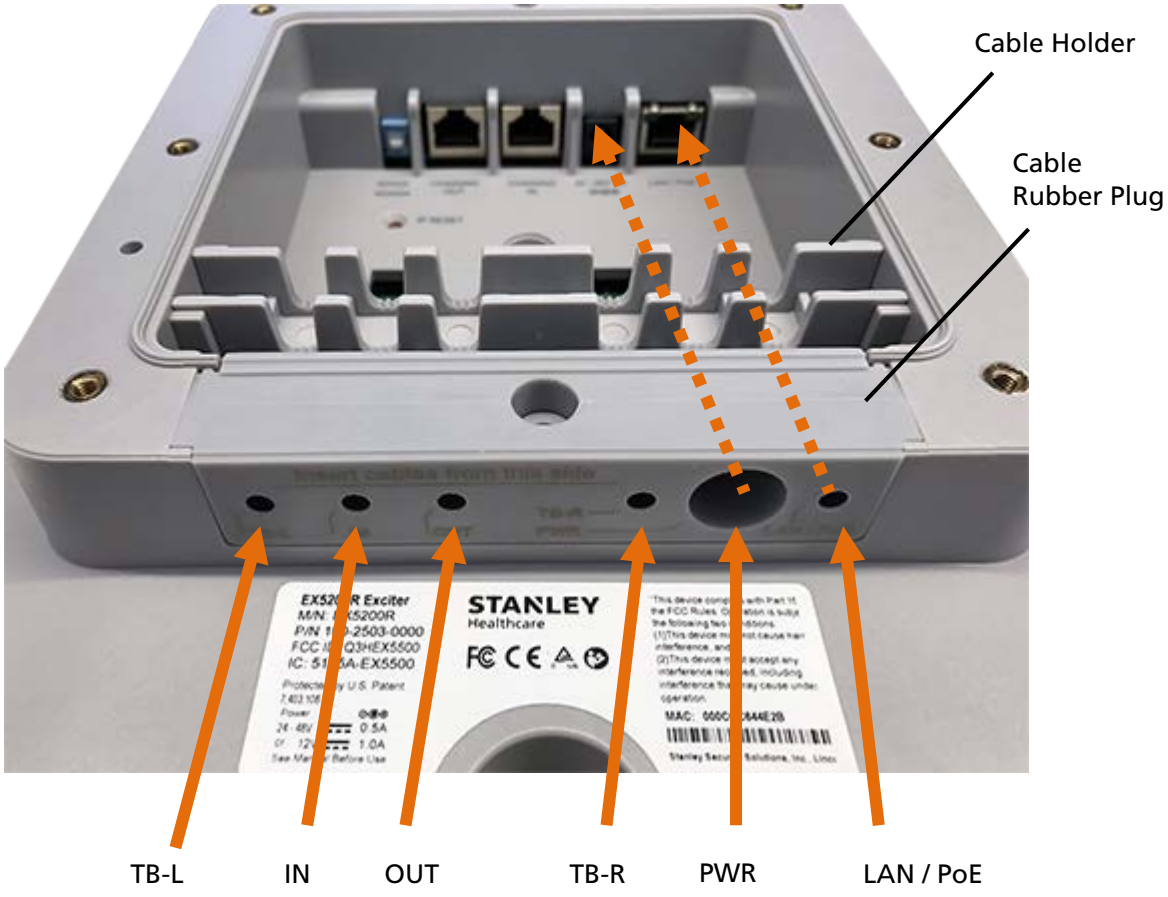
(#4) Chain OUT and Control Connector: RJ-45 connector. This connector is used for distributing power and data to Chained Exciters and to connect the External LF Antenna device. The output voltage is 12 V DC (0.5A maximum).

(#5) Termination Switch: For defining the termination settings in a Chained Exciters installation. The termination of the first and last Exciter in the chain must be set to **On** (**o-o**) and the other Exciters set to **Off**: **(-o-o-)**.

(#6) IP Reset: Restores the Exciter's IP address to the company-set default value. See Resetting the Exciter IP Address for details.

Wiring the Exciter

When wiring the Exciter, all cables must be pushed through the removable cable rubber plug and then connected to the required port. Use the cable holder to keep the cables in-line with the rubber's holes.



Once the cables are connected correctly, place and screw in the mounting panel. Make sure the mounting panel is secured and sealed correctly ***before*** mounting the Exciter.

LF Coverage

The EX5210R has an adjustable coverage range between 0.5m (1.6 ft.) and 6.5m (21.3 ft.) in intervals of 0.5 m (1.6 ft.). LF Coverage varies according to location*

**Indoor LF Coverage is around 6.5 meters (21.3 feet). Outdoor LF Coverage is around 3 meters (9.8 feet).*

The LF coverage pattern set at 4m is displayed in Figure 5.

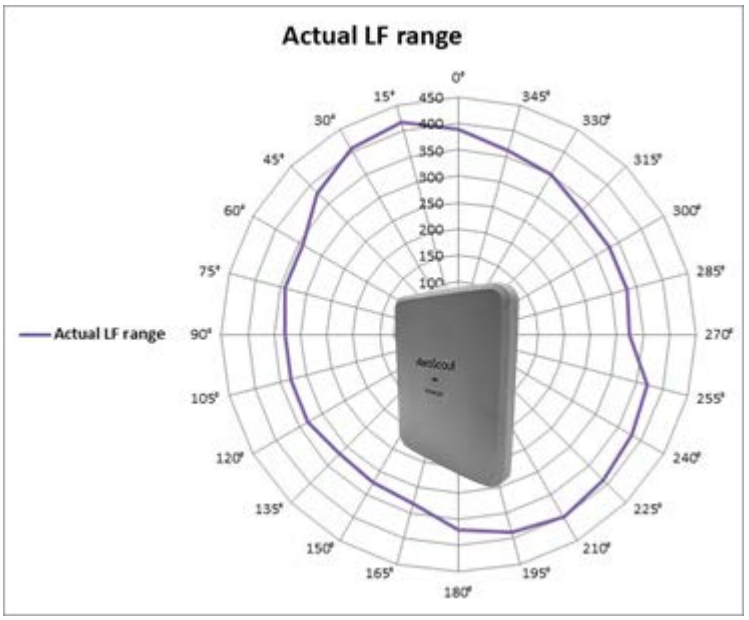


Figure 4: EX5210R LF range and coverage pattern set at 4m

Network and Power Connections

The following is a brief summary of available powering and networking options:

Usage Option	Description
Single EX5210R– not connected to a network	EX5210R can be used as standalone device that functions independently without any network connection. In this case, you only need to connect the Exciter to the power supply. Using the AeroScout Engine Manager (AEM), set the device as “not connected to the network."
Single EX5210R– connected to a network	EX5210R can be remotely controlled (for configuration and monitoring purposes) via the local area network. In this case, you need to connect it to both a power source and the network. The power can be provided either via the LAN/ PoE connector, or via the dedicated power supply connection, using 24-48VDC.
Chained Exciter	In case of a Chained Exciter, the Primary Exciter controls the Chained Exciter over RS485 communication. An external power supply can be used to power up to two Exciters. In case external power is used, every second Exciter needs to be powered (#1 in the chain, #3, #5, #7). In case PoE is used (either via a PoE switch or PoE injector), two EX-5210R can be powered from one PoE port.

Direct Power Supply

To connect to the power supply, connect a 110/220 VAC to 48 VDC power Adaptor to the Exciter's power jack.

Figure 5: 110/220 VAC to 48 VDC Adaptor

Note

The EX5210R requires approximately 6W of power. When connecting an Exciter to a direct power source, verify that the power level is sufficient.

When using a direct power source for chaining, you can only power up to two Exciters sequentially, even if the power source is sufficient for more.

Exciters must only be powered by a limited (marked LPS or NEC class 2) power supply.

PoE Switch

If your network has a Power-over-Ethernet infrastructure, you can connect a CAT-5/6 Ethernet cable from the PoE switch to the Exciter's LAN connector. This supplies both the power and the network connection.

Note

PoE standard 802.3af class 0 allows power for a single EX5210R Exciter.

When using PoE with the other Chained Exciters, a PoE connection must be made to every second Exciter in the chain. In addition, the LAN connectivity that the PoE supplies is not used for Chained Exciters in a chain. Chained Exciters receive data from the Primary Exciter via the Chaining IN connection.

110/220 VAC to 48 VDC PoE Single-Port Injector

The PoE Single Port Injector converts 110/220 VAC to 48 VDC. In addition, it can receive a network connection and you can run a single cable to the Exciter's LAN connector, thus supplying both power and network connectivity.

When using this injector, the Exciter power jack is not used.

Figure 6: 110/220 VAC to 48VDC PoE Single-Port Injector

The injector's IN connector is connected to the network. The injector's OUT connector is connected to the Exciter's LAN connector.

The injector can be used for both networked and non-networked Exciters. In the case of a non-networked Exciters, the IN connector on the injector is not used.

Power Connection Summary

The following table summarizes the power connection options:

Power Supply	Input	Output	Maximum Current	Available Power	Maximum # of Exciters with One Source
PoE single port injector	100-240 VAC, 50-60 Hz	48 VDC	0.32 A(1)	15.4 W	Two
Standard PoE 802.3af switch port(2)	–	48 VDC	0.32 A(1)	15.4 W	Two
External power Adaptor	–	48 VDC	> 0.4 A	> 20 W	Two

Note

To prevent power loss, PoE cables must not exceed 100m (330’) in length.

Chaining EX5210R Exciters

In an area where the required LF coverage exceeds the capacity of one Exciter, you can extend the coverage by chaining several Exciters. For example, a large entrance with two sets of double doors too wide for a single Exciter might require two Exciters chained together.

The system treats Chained Exciters as a single device with a single ID. Transmissions do not interfere with one another.

Each Exciter must be positioned to allow transmission range overlap between neighboring Exciters. This ensures full coverage of the area.

Figure 8 shows 5 Chained Exciters, their connections and the state of each Exciter termination switch.

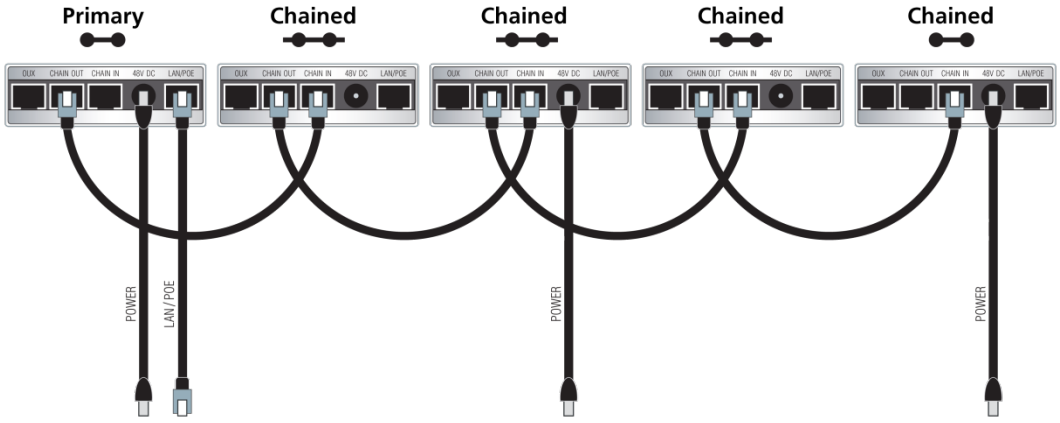


Figure 7: EX5210R Chaining Using a Power Adaptor

EX5210R Chain Connection

Up to 8 Exciters can be connected in a chain, as follows:

1. The first Exciter in the chain, directly connected to the LAN, is designated the “Primary”. Other Exciters are designated “Chained”.

   EX5210R Exciters can act as either Primary or Chained Exciters.

2. The Primary Exciter is connected to the first Chained Exciter as follows: Primary *Chaining OUT* to Chained *Chaining IN*.

3. Chained Exciters are then connected as follows: Chaining OUT to Chaining IN.

4. The Termination Switch of the Primary Exciter and the last Chained Exciter in the chain must be set to On (o-o).

   On the other Chained Exciters, it must be set to Off (-o o-).

5. The Primary/Chaining configuration is set via AeroScout Engine Manager.

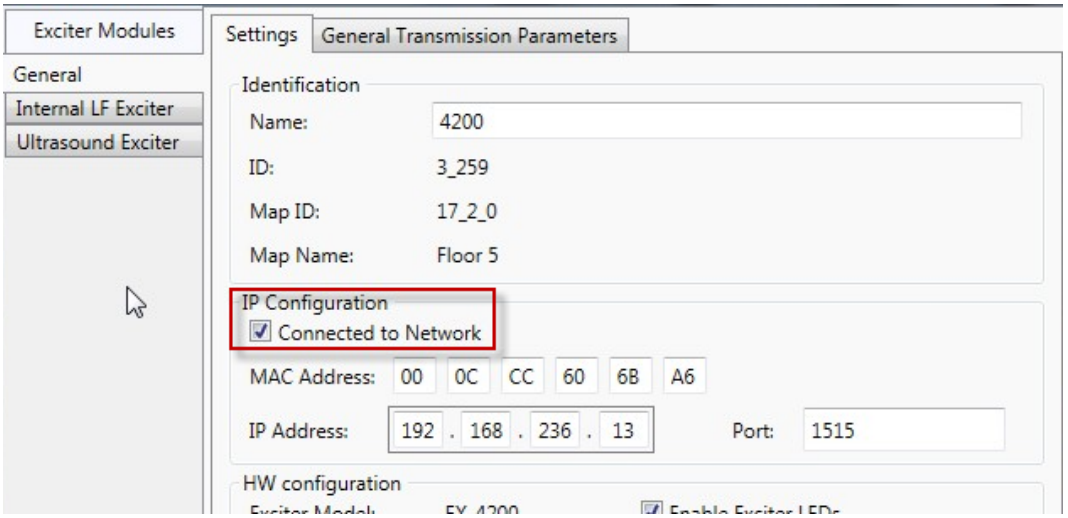
   Chained Exciters inherit the Primary Exciter ID and LF configuration. **Transmission range is configurable.** See Configuring Chained Exciters.

Configuring Chained Exciters

Each Chained Exciter must be set as 'Slave Exciter' and the transmission range configured, in the AeroScout Engine Manager, before being connected to the Primary. *The EX5210R appears as an **EX5210** in the Engine Manager*.

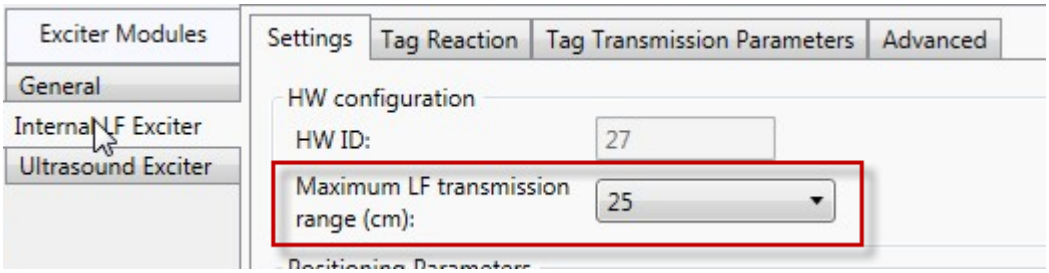
Configurations for Engine 5.2 and below

1. Connect the Chained Exciter directly to the network via the LAN port.
2. Under **IP Configuration**, check **Connected to network**.

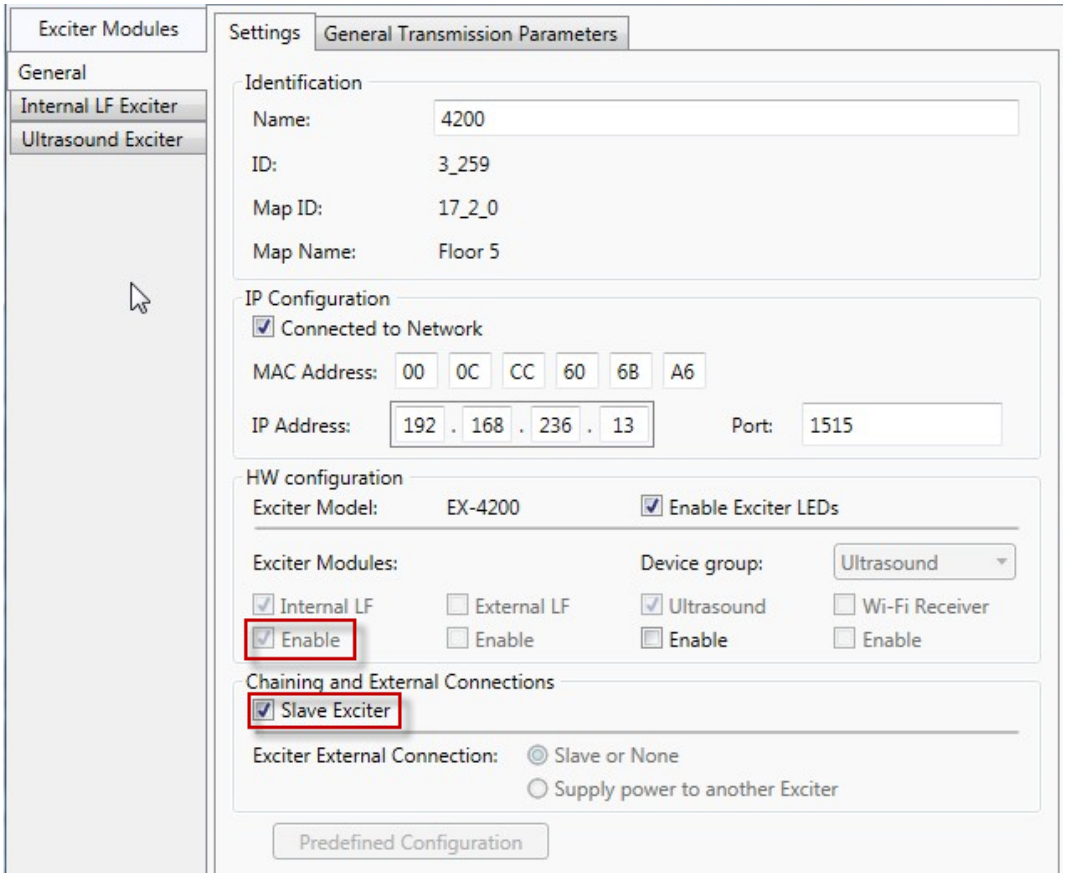


3. Configure the following parameters:

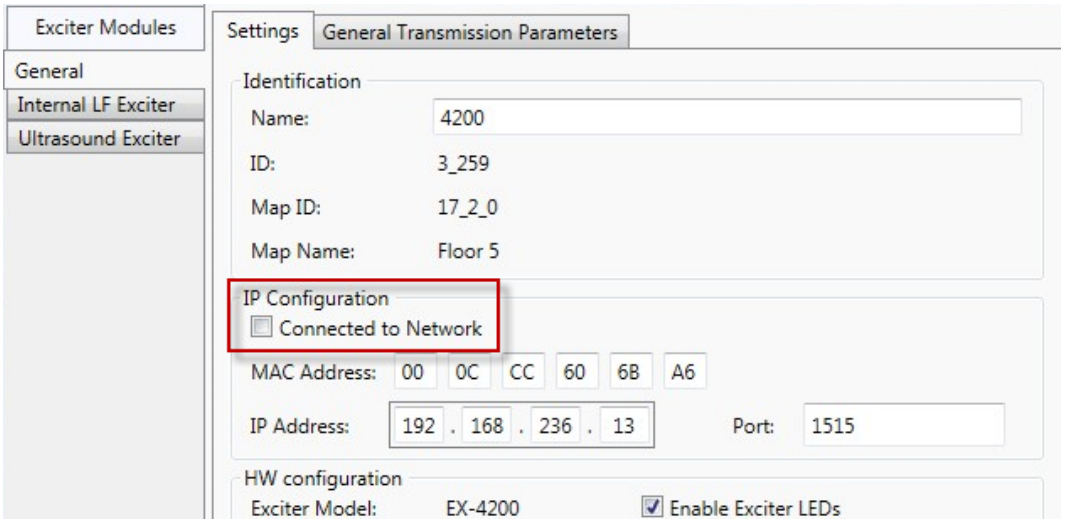
   - **Transmission Range** (Internal LF Exciter > Settings tab): Select the desired **transmission range** of the Chained Exciter so that the LF coverage is sufficient and some overlap exists between the chained Exciters.



- Under Exciter Modules (General > Settings tab), make sure **Enable** is checked.
- Under Chaining and External Connections (General > Settings tab), check **Slave Exciter**.



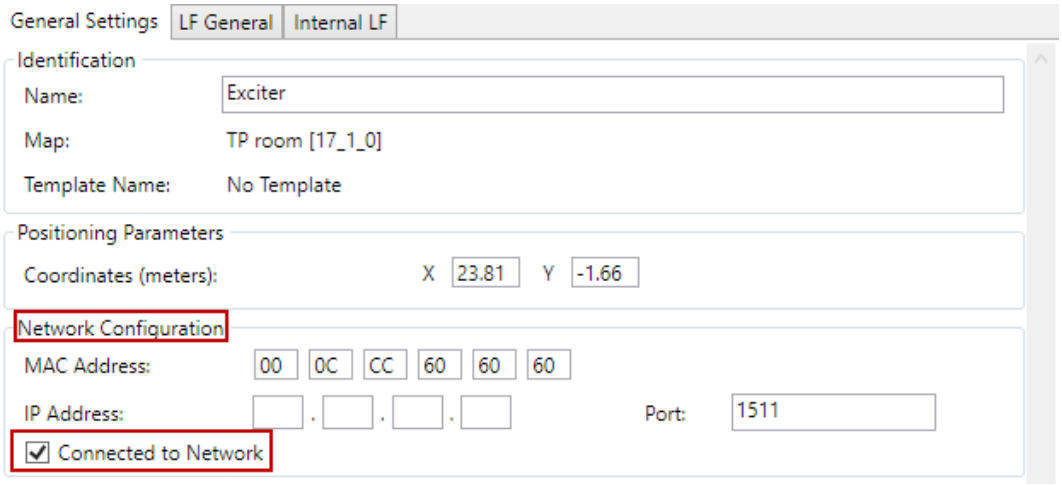
4. Under **IP Configuration**, uncheck **Connected to Network**.



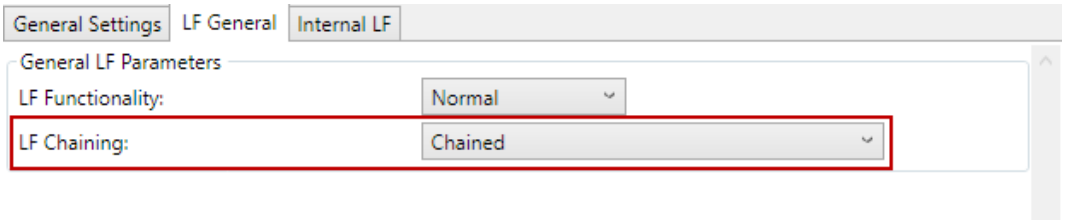
5. Click **OK**.
6. Connect the Chained Exciter to the Primary Exciter.

Configurations for Engine 5.3 and above

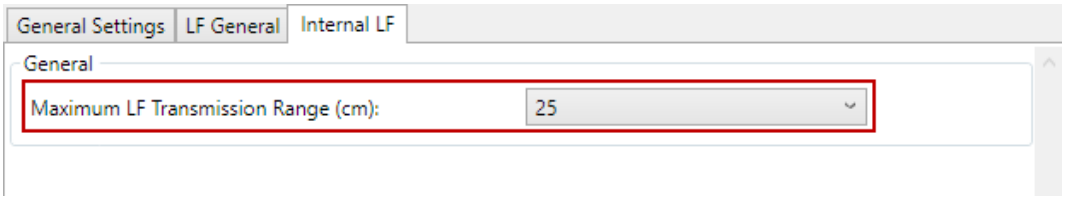
1. Connect the Chained Exciter directly to the network via the LAN port.
2. In the **General Settings** tab, under **Network Configuration**, make sure **Connected to Network** is checked.



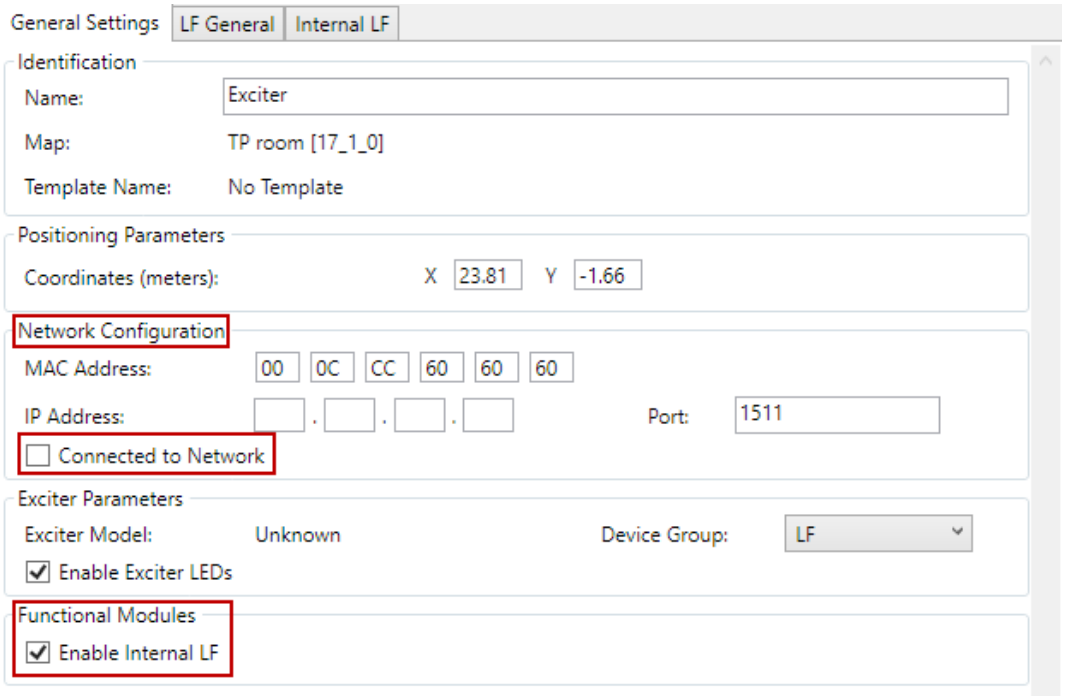
3. Select the **LF General** tab and configure the following parameters:
   - Under **General LF Parameters** select **LF Chaining** as **Chained**.



4. Select the **Internal LF** tab and configure the following:
   - Select the desired **Transmission Range** of the Chained Exciter so that the LF coverage is sufficient and some overlap exists between the chained Exciters.



5. Select the **General Settings** tab again and perform the following:
   - Under **Functional Modules** make sure that **Enable Internal LF** is checked.
   - Under **Network Configuration** uncheck **Connected to Network**.



6. Click **OK**.
7. Connect the Chained Exciter to the Primary Exciter.

DHCP

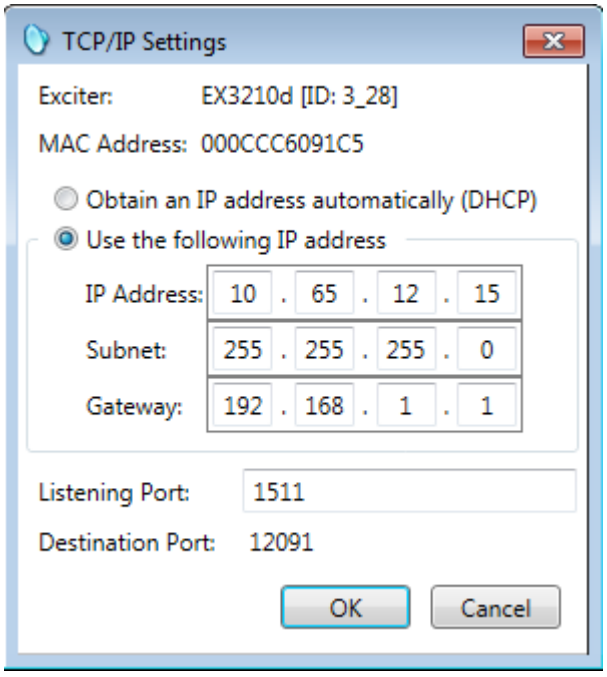
Exciters with firmware version 314.54 and above support Dynamic IP (DHCP) and Static IP configurations.

Static: The IP address and connection settings are specified manually.

Dynamic (DHCP): The DHCP server automatically assigns an available IP every time the device connects to the network.

Exciters with firmware version 314.54 and above will be set to DHCP by default. The Exciter's IP can be changed via the Location Engine; (Select **Configuration, Exciters, IP Settings** or right-click an Exciter and select **IP Settings**. This command allows you to change the network addressing details of the exciter).

For more information, see the DHCP section in the any Location Engine Deployment Guide from version 5.1 and above.



Resetting the Exciter IP Address

You can reset the Exciter's IP address to the factory default value. The default IP address is 192.168.1.178.

To do so, press the **IP Reset button** with a ballpoint pen for 5 seconds.

After a successful IP reset, a flashing red LED indication appears for three seconds.

Figure 8: IP Reset Button

Mounting the Exciter

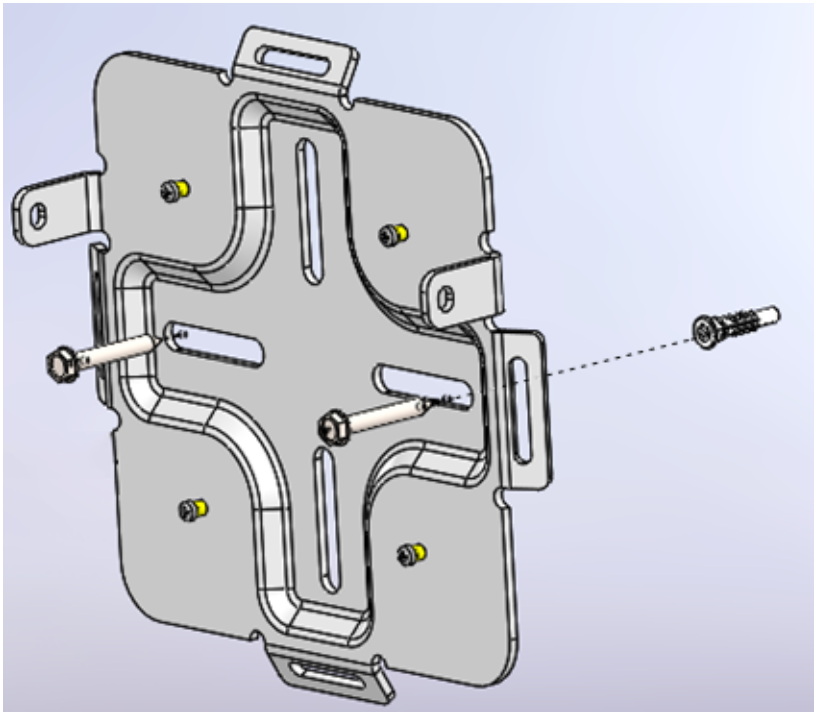
Position and mount each EX5210R Exciter in the site according to the site survey recommendations.

The EX5210R Rugged Exciter is designed for outdoor mounting using a specifically designed mounting plate. Mounting options include:

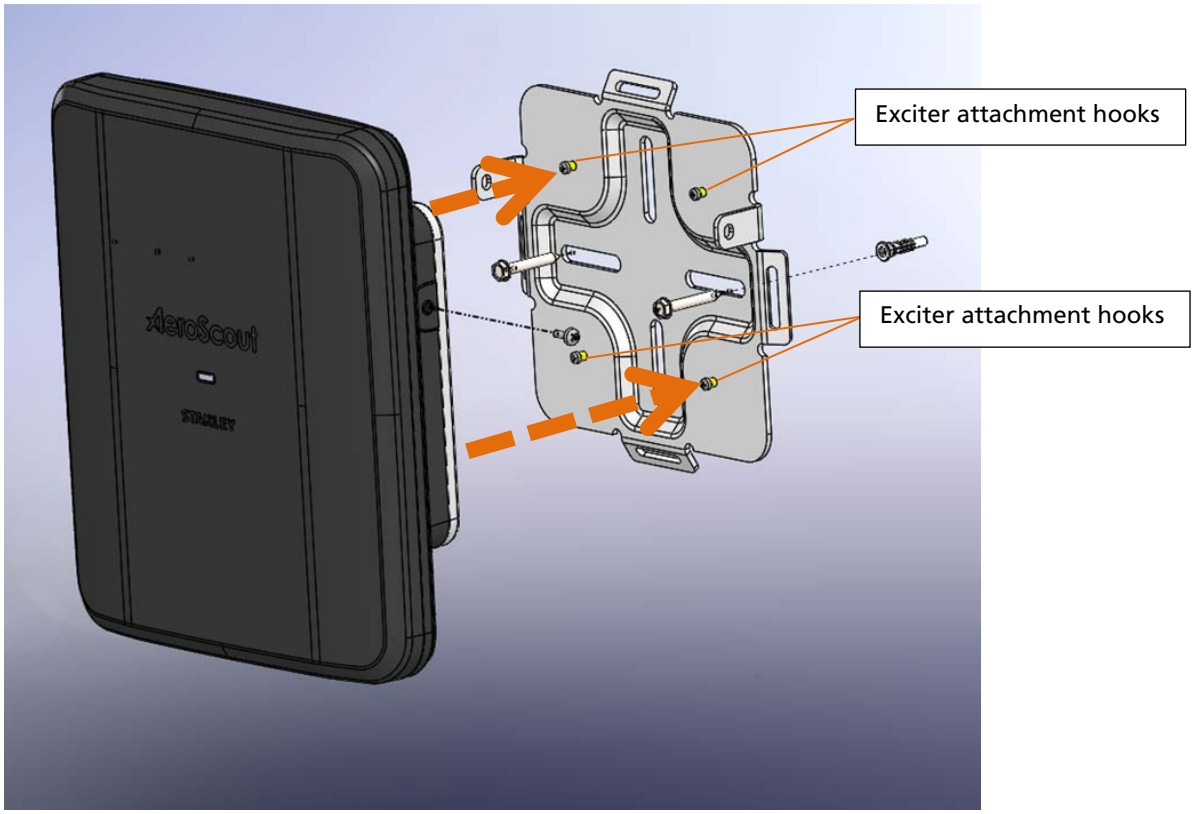
- Walls
- Ceilings
- Polls

Fixing the Exciter to a Wall/Ceiling

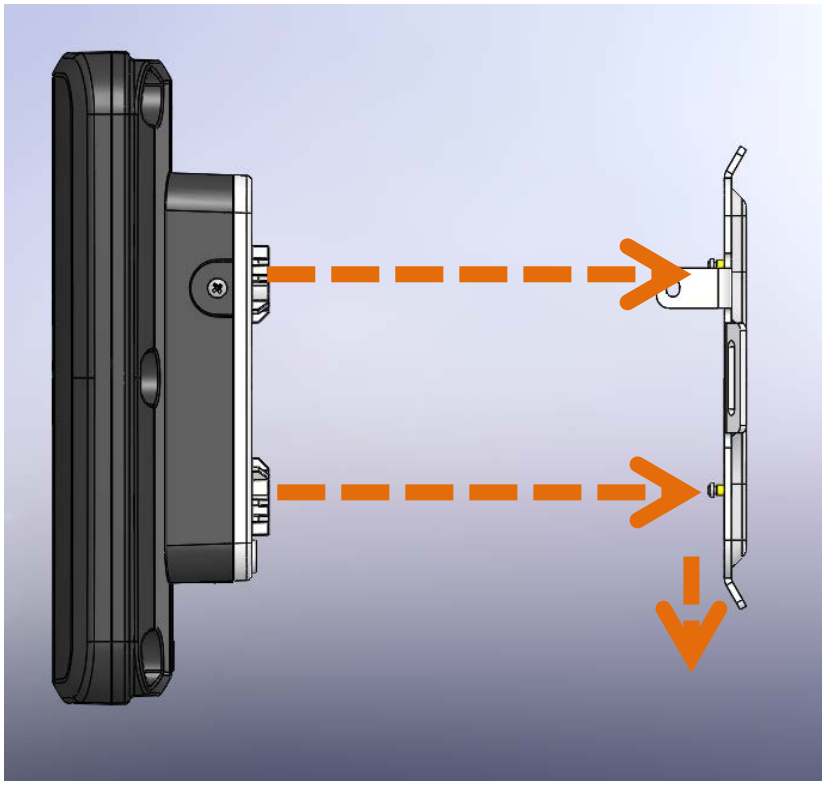
1. Using the mounting plate as a template, place and hold the mounting plate to a wall or ceiling surface.
2. Mark the screw holes that will be used for mounting.
3. Drill the holes for the screws.
4. Mount the Exciter mounting plate using the correct screws and anchors required for the mounting surface.



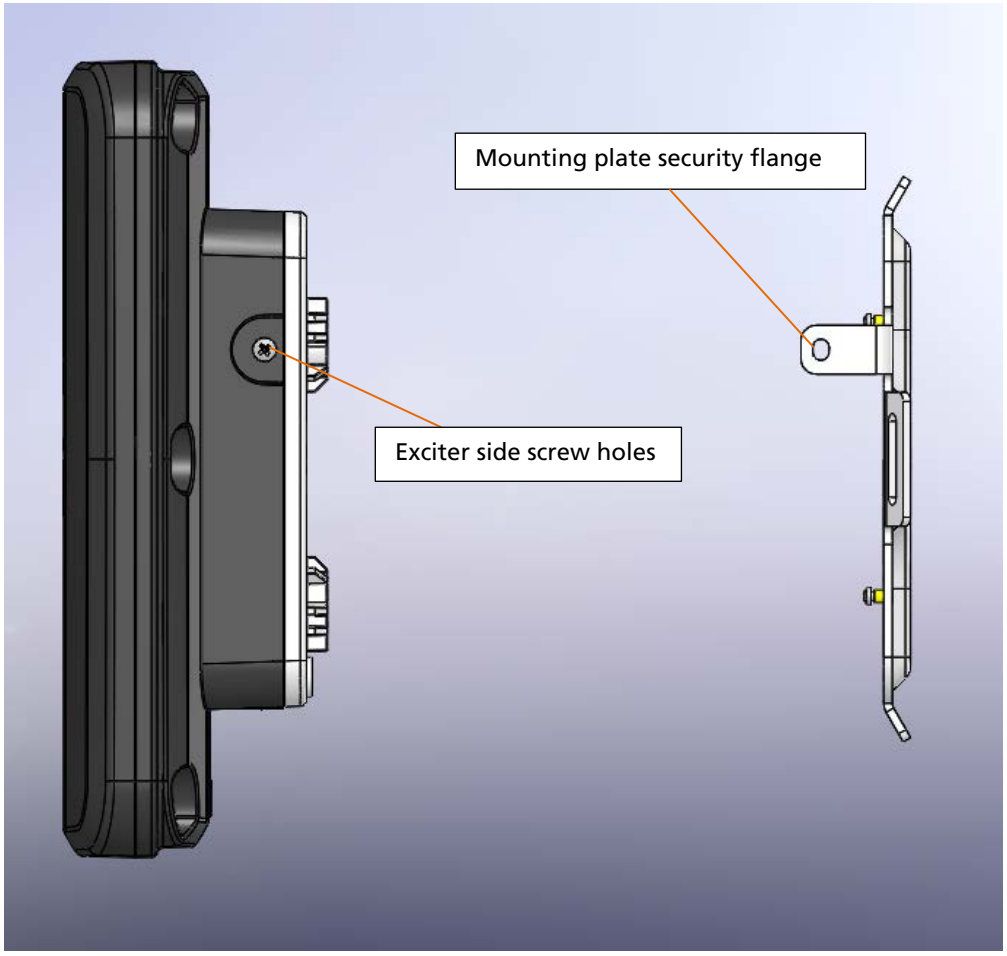
5. Align the Exciter with the attachment hooks on the mounting plate.



6. Place the Exciter into the mounting plate and press the Exciter down until it locks into place.



7. When the Exciter is correctly locked into place, the mounting plate's security flange will align with the Exciter's side screw holes.



8. Screw in the Exciter to the mounting plate's security flanges.

Mounting the Exciter to a Poll

The mounting plate can be mounted to a poll using a U-Bolt mounting kit. Once the mounting plate is mounted, attach the Exciter and screw it into the mounting plate's security flanges.

Appendix A: Exciter and Accessories

Product	SKU	Description
EX5210R Exciter	EX-5210R M/N: EX-5200R	EX5210R Exciter includes 48 VDC input, Ethernet and PoE interface. Wall mounting plate included. Power supply not included.
Exciter Power Supply	APD-047-U (US) APD-047-E (Europe) APD-047-UK (UK) APD-047-J (Japan)	AC/DC Adaptor 45W 48 V/1.0A 90-264VAC for EX2000B, EX4210, EX5000, EX5200 and EX5210R Exciters.
PoE Injector	ADP-030-U (US) ADP-030-E(Europe) ADP-030-UK (UK) ADP-030-J (Japan)	PoE Power Injector for use with EX2000B, EX3210, EX4210, EX5000, EX5200 and EX5210R Exciters. 110/220VAC-48VDC.
Exciter Detector Tool	EXD-1000	Tool for visualizing the effective LF Exciter transmission field. Analyzes the Exciter coverage during deployment. Includes a PC application and detector hardware that can be connected via USB to a PC.
U-Bolt mounting kit	TBD	Used for pole mounting

Appendix B: Exciter Specifications

Product Model

- SKU: EX-5210R
- M/N: EX-5200R

Physical and Mechanical

- Dimensions: 232mm X 262mm X 102mm (9.1in x 10.3in x 4in)
- Weight: 1.8 kg (4lbs)
- Housing: Reinforced Polycarbonate with 10%GF (Lexan 503R from Sabic)

Coverage

- Adjustable coverage range between 0.5m (1.6 ft.) and 6.5m (21.3 ft.) by intervals of 0.5 m (1.6 ft.).

  Note the following:

  - *In an outdoor environment, the Exciter's actual LF coverage range is a maximum of 3meters (9.8feet), even if it is set to the maximum of 6.5m in the Engine.*
  - *When used indoors, the Exciter's LF coverage range can reach up to 6.5meters.*

LF Channel

- 125 KHz
- Field intensity limits: 66dBuV/m @ 10m (ETSI)
- Propagation limits: 25.7dBuV/m@ 300m (FCC)
- Modulation: ASK

Network Interface

- Ethernet (RJ-45)

Power

- Input voltage: 24-48 VDC
- PoE (802.3af) 48 VDC
- Maximum power consumption: 6W
- Maximum power consumption of External LF Antenna: 5W

Environmental

- Operating temperature: -20°C to 50°C (-4°F to 122°F)
- Humidity: 0 to 95%, non-condensing
- Ingress Protection Rating: IP-65

Certifications

- **Radio**:

  FCC Part 15, sub-part C class B, sub-part B EN 300-330, EN 301-489

  RSS 210 (Canada), EMC IEC60601-1-2 (Europe)

- **Safety**:

  CE, cTUVus (EN60950)

FCC Compliance Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause such interference, which can be verified by turning the device off and on, the user is encouraged to eliminate the interference by one or more of the following measures:

- Re-orient or re-locate the receiving antenna.
- Increase the distance between the device and the receiver.
- Connect the device to an outlet on a circuit different from the one that supplies power to the receiver.
- Consult the dealer or an experienced radio/TV technician.

WARNING! Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with FCC Rules Part 15 and with Industry Canada licence-exempt RSS standard(s). Operation is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may be received or that may cause undesired operation.

Le present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes :(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

About STANLEY Healthcare

STANLEY Healthcare provides over 5,000 acute care hospitals and 12,000 long-term care organizations with enterprise solutions that create a safe, secure and efficient healthcare experience across life's stages. The STANLEY Healthcare solution set enables customers to achieve organizational excellence and superior care in critical areas: Patient/Resident Safety, Security & Protection, Environmental Monitoring, Clinical Operations & Workflow and Supply Chain & Asset Management. These solutions are complemented by STANLEY Healthcare's By Your Side™ Lifetime Customer Care commitment to ensure that every customer achieves success and realizes the full value of their investment, through consulting, training, implementation and integration services. STANLEY Healthcare is proud to be part of Stanley Black & Decker, Inc. For more information, visit **stanleyhealthcare.com**. Follow STANLEY Healthcare on **Facebook**, **Twitter**, **LinkedIn** and **YouTube**.

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