STANLEY®
Healthcare

EX5200 EXCITER

DEPLOYMENT GUIDE

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Exciter Applications and Industry Examples

The EX5200 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 EX5200 Exciter extends the suite to provide robust and sophisticated RFID detection capabilities.

The EX5200 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 EX5200 Exciter combine 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: EX5200 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 AeroScout 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

AeroScout Exciters can be installed at the entrances of restricted areas to trigger alerts when unauthorized persons attempt to enter or leave. In hospitals, Exciters can notify staff regarding patient movement, such as a patient leaving the behavioral health department, or an infant being moved out of the NICU.

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.

> **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.
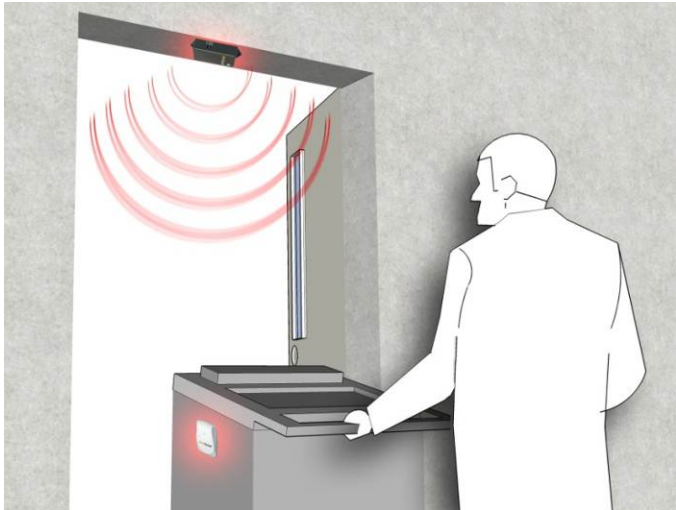
Figure 2: Exciter Positioned at Chokepoint Triggering a Tag

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 EX5200 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

Figure 3: Multi-purpose LED

Exciter Connector Panel

The EX5200 Exciter has four connectors and two switches inside the back panel.

Figure 4: EX5200R 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 adapter 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.

Network and Power Connections

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

Usage Option	Description
Single EX5200– not connected to a network	EX5200 can be used as standalone devices that function 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 EX5200– connected to a network	EX5200 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 Master Exciter controls the slave 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-5200 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 adapter to the Exciter's power jack.

Figure 5: 110/220 VAC to 48 VDC Adapter

Note	The EX5200 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 EX5200 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 slave Exciters in a chain. Slave Exciters receive data from the Master Exciter via the Chain 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 adapter	–	48 VDC	> 0.4 A	> 20 W	Two

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

Chaining EX5200 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 7 shows 5 chained Exciters, their connections and the state of each Exciter termination switch.
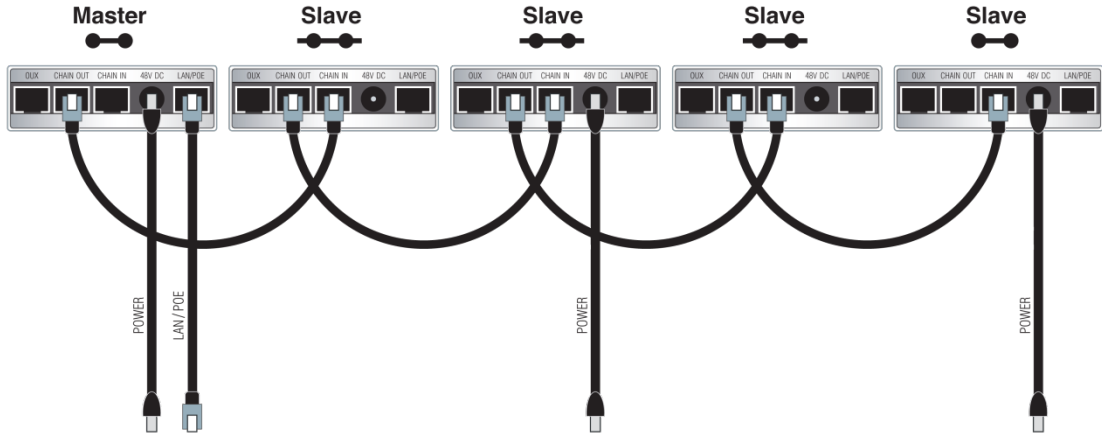

Figure 7: EX5200 Chaining Using a Power Adaptor

EX5200 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 "Master". Other Exciters are designated "Slave".

    EX5200 Exciters can act as either Master or Slave Exciters.

2. The Master Exciter is connected to the first Slave Exciter as follows: Master Chain OUT to Slave Chain IN.

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

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

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

5. The Master/Slave configuration is set via System Manager.

   Slave Exciters inherit the Master Exciter ID and LF configuration, as well as from the transmission range.

6. Each slave must be connected directly to the network and the following parameters configured before being connected to the MASTER:

   - Transmission Range

     Exciter is Slave

   - Exciter is disconnected from network

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.
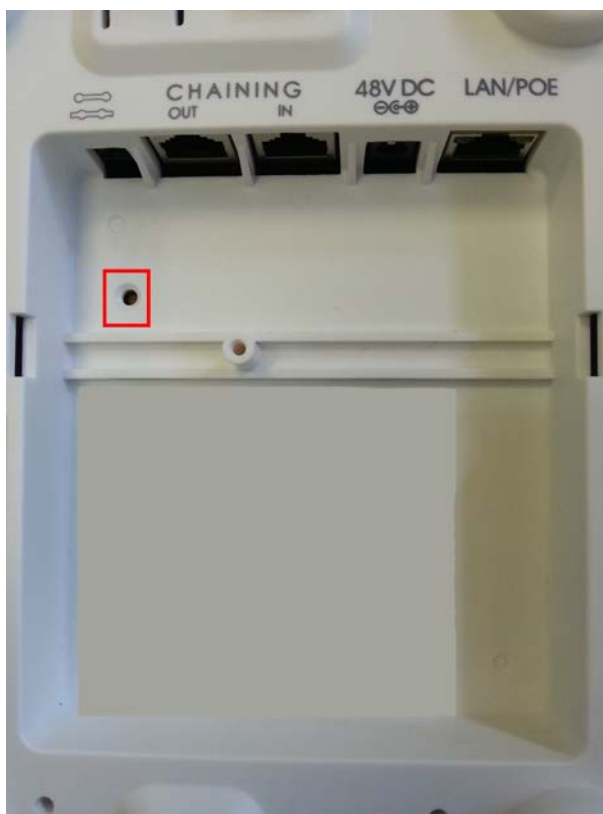

Figure 8: IP Reset Button

Connecting an External LF Antenna

The External LF Antenna device is designed to extend the Exciter's LF coverage. The two devices communicate via a standard CAT5 cable connection.

Connect the Exciter's Chaining OUT connector to the external LF device's IN connector. **For configuration instructions, refer to the AeroScout Engine Manager.**

The External LF Antenna's LED blinks while the Exciter transmits.

Figure 9: External LF Device

Mounting the Exciter

Position and mount each EX5500 Controller in the site according to the site survey recommendations.

Fixing the Controller to a Floating Ceiling:

Attach the device to the false ceiling using the ceiling mounts located on the bottom casing of the device.

Figure 10: Controller mounted on a Floating Ceilings

Mounting the Controller on a Wall

The EX5500 Controller is shipped with a mounting template which can be used to measure the holes for mounting the Controller on a wall. See Figure 11. The mounting plate supplied with the Controller is not required for this type of mounting.
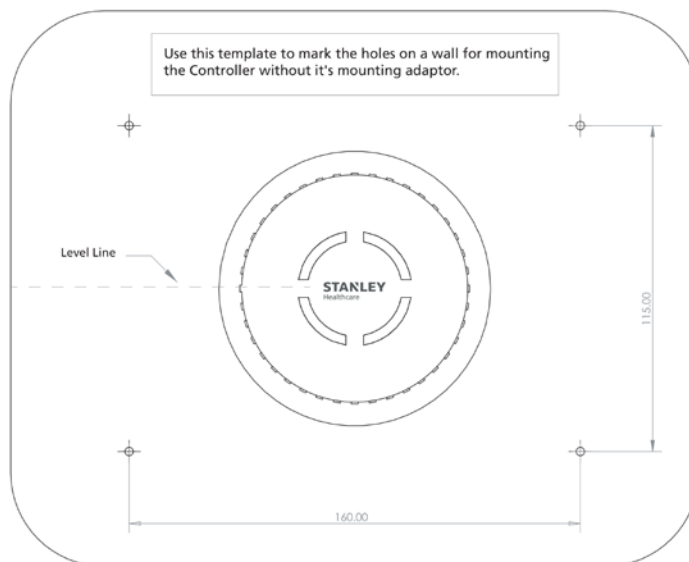
Figure 11: EX5500 mounting template (supplied with the Controller)

1. Hold the template on the wall in the location you wish to mount the Controller. Make sure the template is level.

2. Mark the four holes for the screws through the template.

3. Remove the template.

4. Drill the holes for the screws.

5. Anchor the screws into the wall, leaving 10mm of each of the screws exposed. Use appropriate screws and or anchoring plugs.

6. Mount the Controller with the STANLEY Healthcare logo facing up, onto the 4 screws. The Controller's back panel has 4 mounting brackets for this purpose.

Mounting the Controller using the Exciter Mounting Clip

To mount the Controller in the center of a ceiling tile using the Exciter Mounting Clip, Figure 12, you must order an EX5500 Mounting Clip Kit, sold separately (SKU: EXAC-141). The Kit can be used to mount the Controller in deployments where mounting on the ceiling grid is not possible.

Figure 12: Mounting Clip for EX5500 (SKU: EXAC-141)

1. Position the Mounting Clip on a standard 60cm (24") grid false ceiling.

2. Snap the Mounting Clip onto the topside of the T-Grid using the 'snaps' on the ends of the clip.

Figure 13: Mounting Clip positioned on a grid of a false cieling

3. Attached the two screws and spacers that are supplied with the EX5500 Mounting Clip Kit to the center slot of the mounting clip and position them at both ends of the slot.

Figure 14: Mountng Clip with Screws and Spacers

4. Measure and mark the required positions of the mounting screws on the ceiling tile.

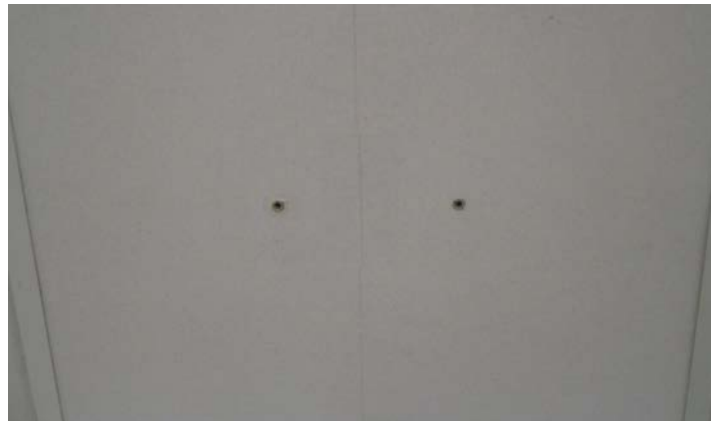5. Drill holes in the ceiling tile at the marked positions and refit the ceiling tile.

Figure 15: Ceiling Tile with Holes for Attaching the Mounting Adapter

6. Screw the Controller's Mounting Adapter to the spacers of the Mounting Clip using the two screws supplied with the kit.

Figure 16: Screwing the Mounting Adapter to the Spacers of the Mounting Clip

7. Attach the Controller to the Mounting Adapter by aligning the clips on the back of the Controller casing with the four brackets on the adapter.

8. Slide the Controller to the right and clip into place.

Figure 17: Attaching the Controller to the Mounting Adapter

9. To detach the Controller from the Mounting Adapter, press the release button on the left side of the adapter and slide the Controller to the left.

Figure 18: Releasing the Controller from the Mounting Adapter

Appendix A: Exciter and Accessories

Product	SKU	Description
EX5200 Exciter	EX-5200	EX5200 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, EX4200, EX5000, EX5200 and EX5500 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, EX4200, EX5000 and EX5200 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.
Exciter Mounting Clip	EXAC-141	Heavy-duty Mounting Clip for EX5200/EX5500 Controllers. Snaps easily onto the topside of the T-Grid of a false ceiling with a standard 24" span grid. Includes mounting kit for attaching the Clip to the Controller's mounting adaptor (supplied with the Controller).
External LF Antenna	ANT-4200	External LF Antenna Device, powered directly from the Exciter. It includes a mounting plate and a ceiling mount.

Appendix B: Exciter Specifications

Physical and Mechanical

- Dimensions: 245mm X 200mm X 60mm (9.6in x 7.9in x 2.4in)

- Weight: 865g (31oz)

- Housing: Polycarbonate and ABS

Coverage

- Adjustable coverage range between 1.5m (4.9 ft.) and 6.5m (21.3 ft.) by intervals of 0.5 m (1.6 ft.)

LF Channel

- 125 KHz

- Field intensity limits: 37.3 dBµA/m at 10 m (ETSI)

- Propagation limits: 21.8 dBµV/m at 300 m (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: 0 to 50 °C (32°F to 122°F)

- Humidity: 0 to 95%, non-condensing

Certifications

- EMC Certifications

- US standard: FCC part 15 sub part B

- European standard: ETSI 300.328, 300.330, ETSI 301.489

- Safety Certifications

- US – cTUVus: UL 60950-1; -22

- Europe – CE mark: EN 60950-1; -22

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.

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