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AUTHENTICATION			**Installation Instructions**	
PREPARED BY		DATE	**for In-Store Tracking**	
Fred Martensen Rafael Alonso Lore Eargle		08/07/2008	SHEET 1 of 24	NMR# 403-2338-018

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1. Introduction

Nielsen In-Store is a global measurement service designed to help marketing professionals better understand how to reach and influence consumers in retail environments. Nielsen In-Store measures consumer exposure to in-store marketing vehicles, including television, radio, shelf talkers, digital signage, and other point-of-purchase displays.

1.1. Purpose

This document provides installation instructions on installing four modules in the In-Store Tracking system:

- Shelf Transmitter Module and Battery Pack

- Shelf Receiver Module and Battery Pack/COM Module

- Cart Module

- Checkout/Repeater Module

It does not cover installation of the In-Store Unit (ISU).

1.2. Background

The In-Store Tracking system consists of several devices that transmit and receive signals throughout a store and send counting information to a PC known as the In-Store Unit (ISU). Each module that is battery-operated has a built-in alert system which informs the ISU when the battery is approaching the end of its charge.
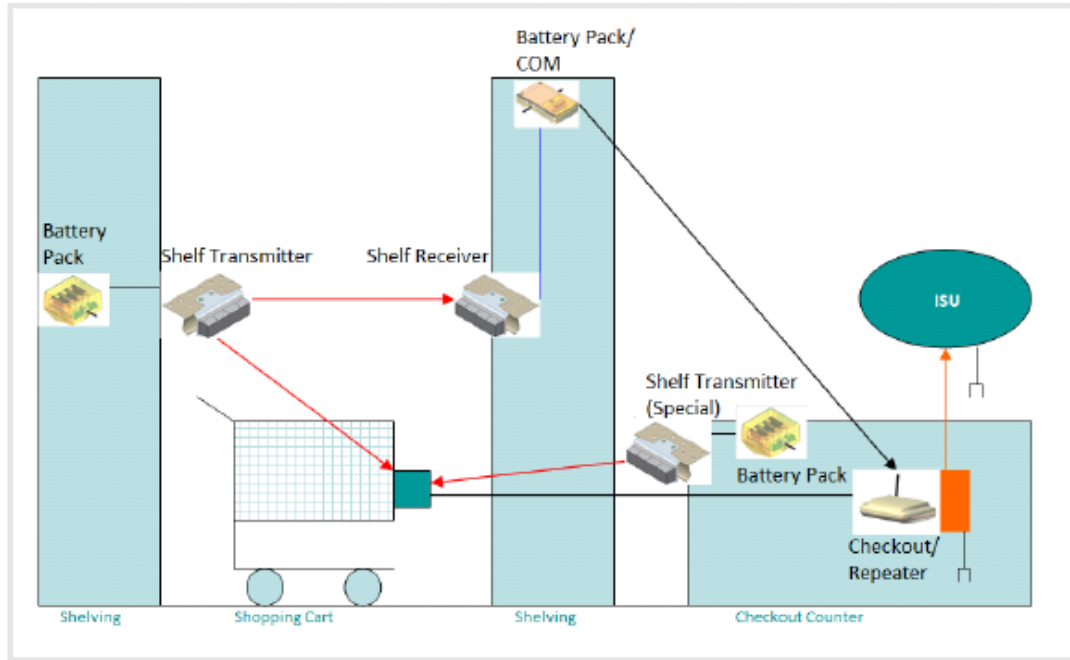
Figure 1. Module Interactions

See the diagram provided with the installation kit for specifics on setting up a specific store.

1.3. Description

In-Store Operations divides a store floor plan is into zones of interest, typically aisles and end caps. They designate the placement of the equipment throughout the store. The marked-up floor plan shows the location for each Shelf Transmitter, as designated by its unique ID, and assigns the transmitters throughout the store to achieve the desired granularity. The carts are fitted with Cart Modules. As a Cart Module passes a Shelf Transmitter, the Cart Module timestamps and captures the unique ID of the Shelf Transmitter.

Acting solely as a bridge, the Checkout/Repeater Module relays the data to a 900 MHz RF modem that links to the In-Store Unit (ISU), a Linux-based PC located in the office of the retail store. The ISU transmits the captured data from the store and sends this data to the Back Office. [Note: In Europe and other locations, the Checkout/Repeater Module transmits at 2.4 GHz.]

Figure 2. Zone Layout 1

2.   Related Documents

- In-Store Tracking Device Diagram
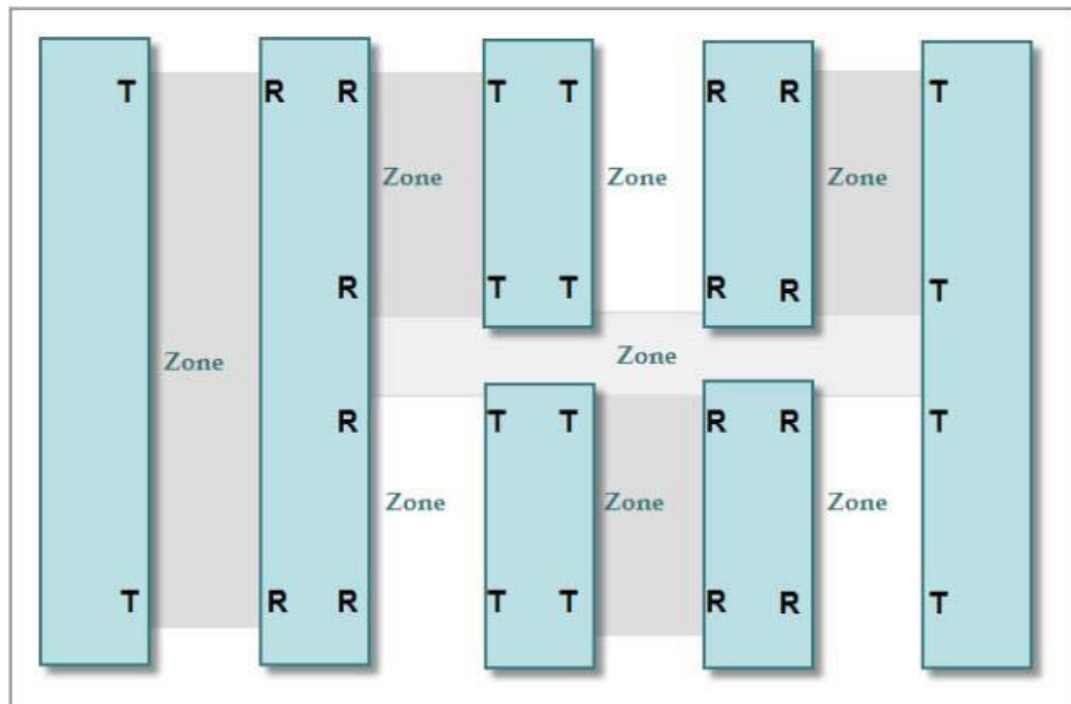- System Diagram

3.   Operational Specifications

3.1.   Shelf Transmitter Module

Shelf Transmitter (Tx) Module—located on shelves throughout a retail store. Each has a separate Battery Unit and transmits two infrared (IR) beams, a tracking and a counting beam.

Figure 3. Shelf Transmitter and its Battery Unit

- The counting beam points across to the Shelf Receiver Module mounted on the self edge on the same aisle opposite the Shelf Transmitter Module.

- The tracking beam has a unique ID that identifies its location within the store. It points downward so that a Cart Module can detect the beam as the cart passes it.

3.2.   Shelf Receiver Module

Shelf Receiver (Rx) Module—located on a store shelf opposite a Shelf Transmitter Module, it looks just like the transmitter except that it has a flat Battery-Pack/COM Module attached to it. The Receiver has two IR sensors that receive transmissions from the Shelf Transmitter across the aisle. The receiver counts traffic and detects the direction of travel. It uses an RF transmitter (802.15.4) to report traffic to the Checkout/Repeater Module. When its sensors are triggered, its MCU receives an interrupt, and it checks the status of its two IR sensors.

Figure 4. Shelf Receiver and its Battery/COM Unit

- If both sensors are triggered, no one is crossing.

- If one sensor is on and the other is off, one trip is captured. It records the direction and timestamp stored in the buffer.

- When its buffer is full or after a preset interval, whichever occurs first, the Shelf Receiver and Battery Pack/COM Module sends the received data to the ISU.

3.3.   Cart Module

The Cart Module is mounted on shopping carts. This module receives and stores the IR IDs transmitted from the Shelf Transmitter Modules. It uses an RF transmitter (802.15.4) to report traffic to the Checkout/Repeater Module. When its buffer is full or at a preset interval, it sends the data to the ISU through the Checkout/Repeater Module. The Cart Module consists of the following:

- IR receiver

- Micro controller

- Radio frequency transmitter
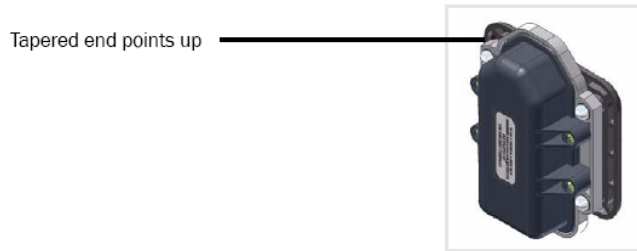
Figure 5. Cart Module

3.4.   Checkout/Repeater Module

The Checkout/Repeater Module is located throughout the store. It is wall-powered. It uses RF (802.15.4) to receive data from the Shelf Receiver and Cart Modules. Using an attached (off-the-shelf) 900 MHz RF transmitter module, it forwards data to the ISU. [In Europe and other locations, it transmits at 2.4 GHz.] The Checkout/Repeater simply receives data from either the Shelf Receiver Module or the Cart Module via RF (802.15.4) and forwards the data to the ISU via the 900 Mhz (or 2.4 GHz) RF transmitter module.

Figure 6. Checkout/Repeater Module

4.   Required Parts and Tools

Table 1. Parts Required for Installation

Item	Part #
Alcohol wipes	006-1251-000
Cart Module	501-2227-000
Fastener, 3M™ Dual Lock™ reclosable	269-0083-000
Module, Checkout/Repeater	501-1508-000
Module, Shelf Receiver (Rx) with Battery Pack/Communications (COM) Unit	501-1509-000
Module, Shelf Transmitter (Tx)	501-1510-000
Nut, hex with cap	272-0031-000
Screws, #8 =32x1/2"	062-0310-000
Screws, #8-32x3/4"	062-0317-000
Screw, #8x1"	062-0316-000
Tape, double-stick	269-0072-000
Tie wrap, 4", thick	267-0017-001
Tie wrap, 4", thin	267-0001-001
Tie wrap anchor, 1" pressure-sensitive adhesive	267-0015-000

Tools Required for Installation

- Ladder, 6-foot
- Ladder, 12-foot
- Pliers
- Scissors
- Screwdriver, #1 Phillips
- Screwdriver, #2 Phillips
- Utility cart
- Wire cutters

5.   FCC

FCC0003729381WHR001

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

Modular Approval: The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation and transmitter operating conditions for satisfying RF exposure compliance.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
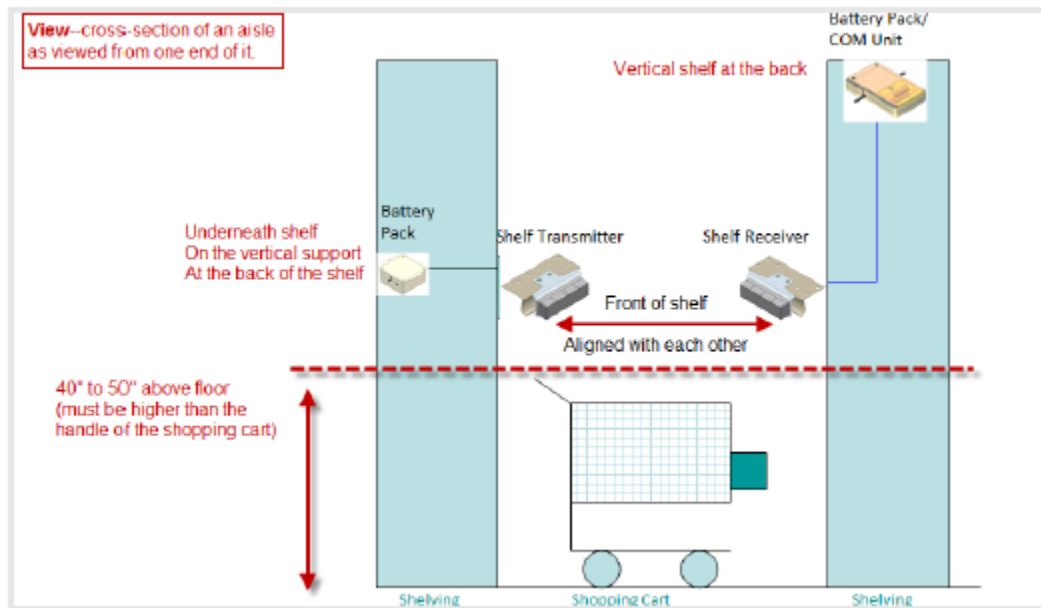
6. Installation Procedures

Figure 7. Positions as Viewed from the End

6.1. Installing the Shelf Transmitter Module:

1. The module arrives with the power off. To turn the unit on, while looking at the unit from the top, slide the switch toward the cable.

2. Do the following:

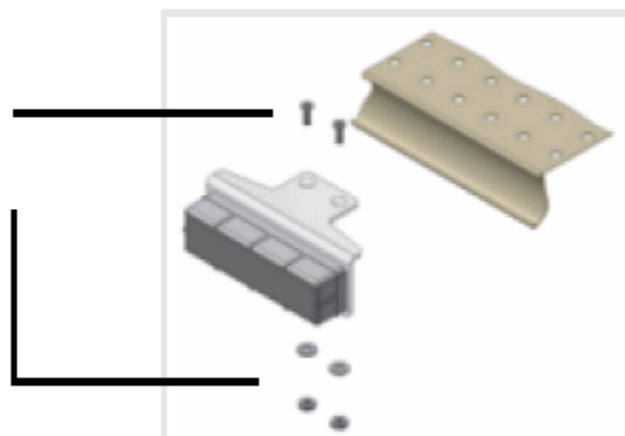Remove the two screws, washers, and nuts from the Shelf Transmitter bracket.

**Figure 8. Shelf Transmitter with Screws Removed**

3. Using the screws, washers, and nuts, attach the unit to a shelf in a position with these characteristics:

    o   With the black, plastic housing facing toward the aisle.

    o   40" to 50" above the floor, which should be barely higher (and never lower) than the handle of a store shopping cart.

    o   For shelving with an endcap—a minimum of 12 inches from the shelf end.

    o   For shelving with no endcap—a minimum of 24 inches from the shelf end.
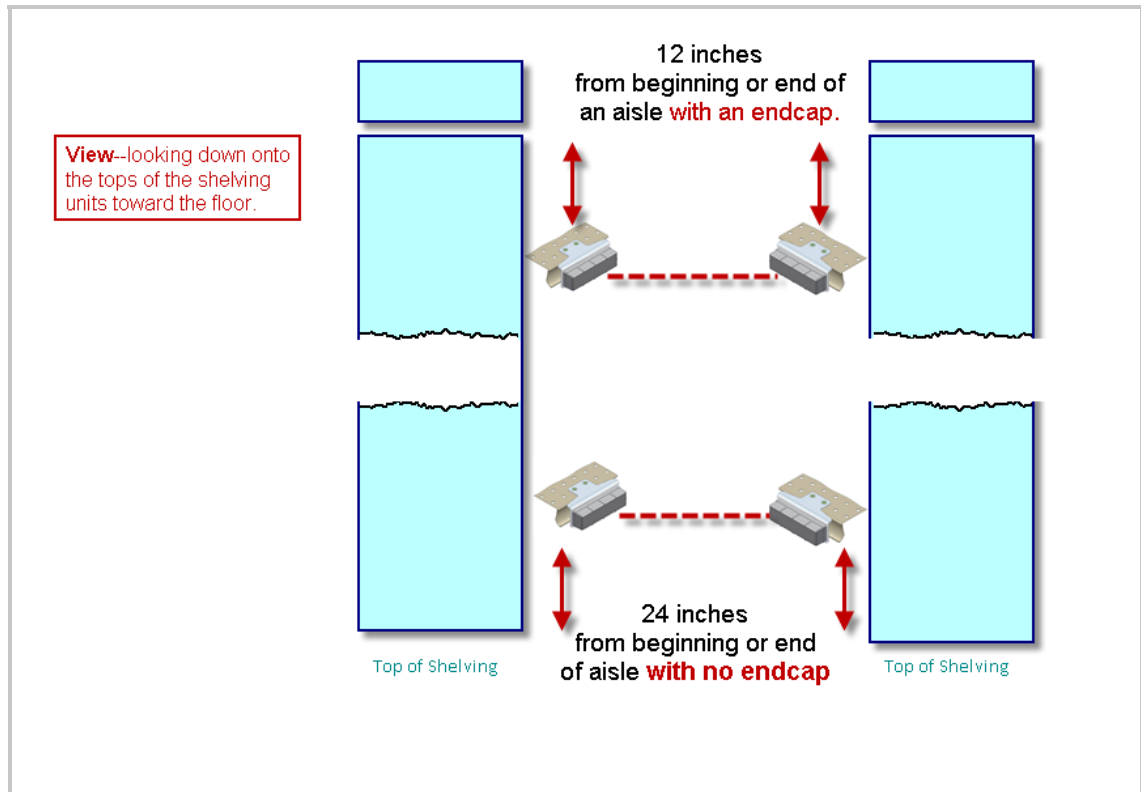
Figure 9. Positions as Viewed from Above

    o   Away from any shelf space that would be used for store products and yet with a clear line of sight to the position where you will place the receiver.

    o   If either the Transmitter or the Receiver has to be placed higher, select the Transmitter as the higher one.

    o   If the assigned location does not let you properly align the two modules because of shelf design or product layout, adjust the horizontal placement of the Transmitter and Receiver as necessary within the aisle.
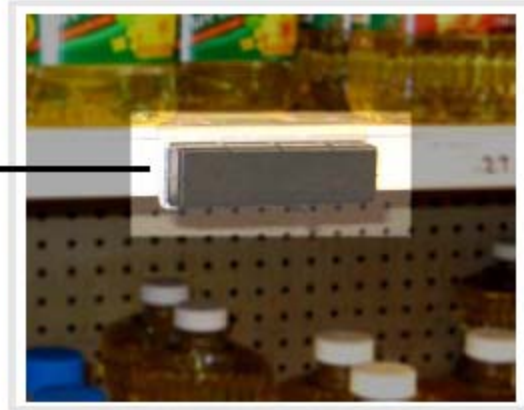
Figure 10. Installed Shelf Transmitter

4. Route the cord between the transmitter and the battery pack unit so that it is hidden beneath the shelves and behind the supports.

5. Plug into header P1.

6. Using alcohol wipes, clean the areas where you will place the tie wrap anchors and reclosable fasteners.

7. So the cord cannot easily be disturbed or removed, attach it to the shelving with pressure-sensitive adhesive tie wrap anchors.

8. Attach the battery unit to the shelving with reclosable fasteners in the following way:

   o   On the upright for the shelf.

   o   Away from store products.

   o   With the switch accessible.
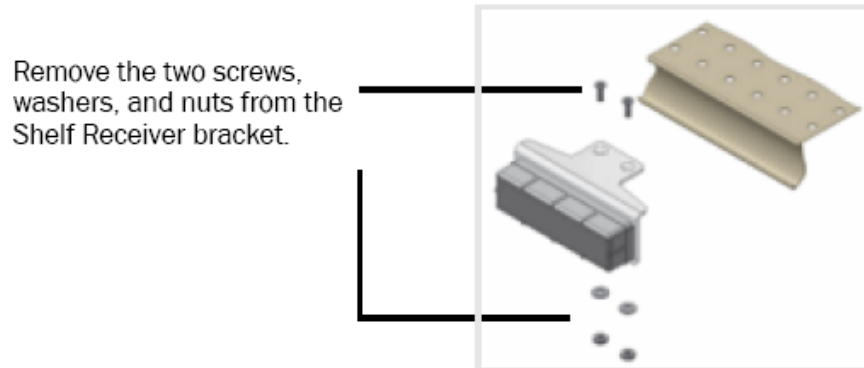

Figure 11. Installed Shelf Transmitter and Battery Unit

6.2. Installing the Shelf Receiver Module with Battery/Communications Pack

1. The module arrives with the power off. To turn the unit on, while looking at the unit from the top, slide the switch toward the cable.

2. Do the following:

Remove the two screws, washers, and nuts from the Shelf Receiver bracket.

Figure 12. Installed Shelf Receiver

3. Using the screws, washers, and nuts, attach the receiver unit so the black plastic housing is in line with the transmitter unit across the aisle.

Shelf Receiver

Figure 13. Installed Shelf Receiver

   o With the black, plastic housing facing toward the aisle.

   o 40" to 50" above the floor, which should be barely higher (and never lower) than the handle of a store shopping cart.

   o Away from any shelf space that would be used for store products and yet with a clear line of sight to the position where you placed the Transmitter.

   o If either the Transmitter or the Receiver has to be higher than the other, select the Transmitter as the higher one.

4. Using alcohol wipes, clean the areas where you will place the tie wrap anchors and reclosable fasteners.

5. Attach the cord to the shelving with pressure-sensitive adhesive tie wrap anchors so it cannot easily be disturbed or removed.

6. Route the cord between the receiver and the Battery Pack/COM Module so that it is hidden beneath the shelves and behind the supports.

7. Plug the cable into P1.

8. Place the Battery Pack/COM Module as follows:

    o On the upright above the top shelf.

    o Away from store products.

    o With the antenna pointing up and away from the shelving.


Figure 14. Installed Battery Pack/COM Unit

9. Attach the Battery Pack/COM Module to the upright with reclosable fasteners.

6.3.   Installing the Cart Module

1. Position the back plate so it and the cart module meet the following criteria:

    *   Back plate—inside the front panel of the cart.

    *   Cart module—outside the front panel of the cart.

    *   Both—

        o   In the lowest section of the front panel and low enough that the module is protected from coming into contact with another cart when the cart is stacked or pushed into a corral

        o   Not near any of the corners on the front of the cart.

        o   In an area wide enough for the holes in the back plate to be unobstructed.
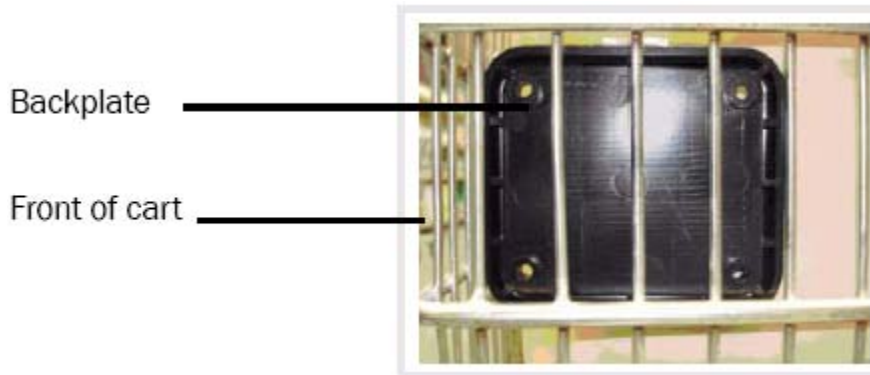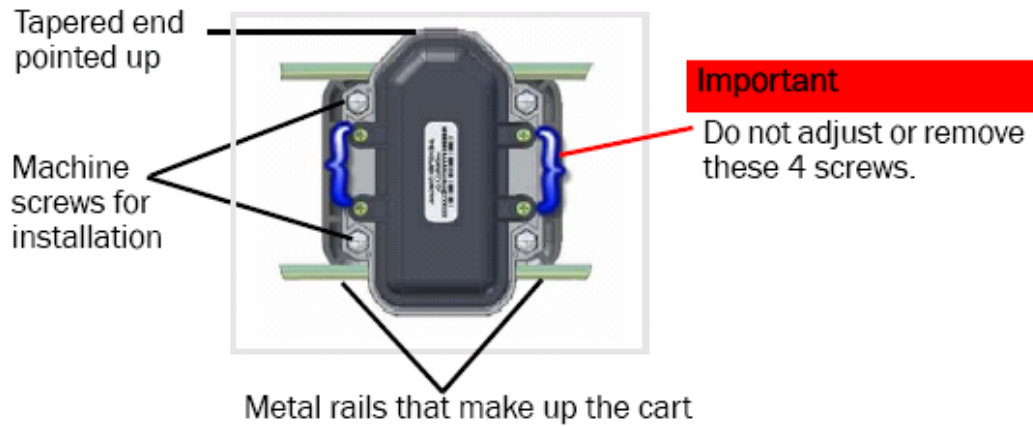

Figure 15. Back plate mounted on shopping cart

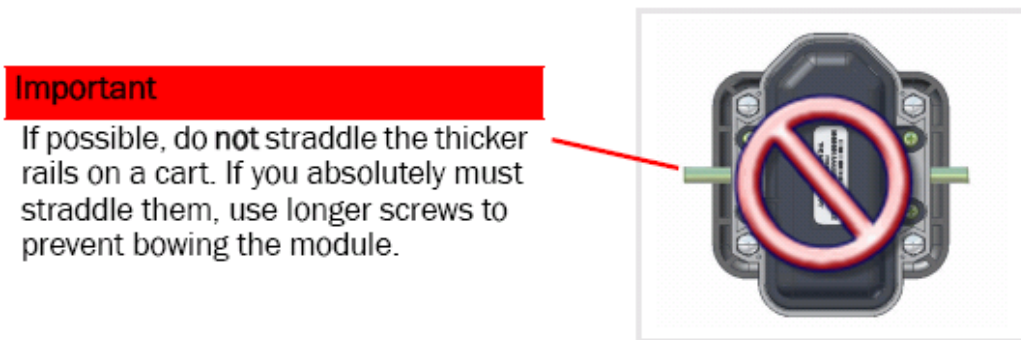2. Insert the appropriate (long enough) machine screw through the back-plate and through the corresponding hole in the module and into the hex nut cap. The cap should fit into the hole in the module enclosure.

3. Secure the machine screw to the hex nut cap.

Important
Position the cart module so the tapered end points up and, if possible, so it is between the thicker rails on the shopping cart.

Tapered end pointed up

Machine screws for installation

Important
Do not adjust or remove these 4 screws.

Metal rails that make up the cart

Figure 16. Correct placement of Cart Module between thick cart rails

Important
If possible, do **not** straddle the thicker rails on a cart. If you absolutely must straddle them, use longer screws to prevent bowing the module.

Figure 17. Wrong placement of Cart Module straddling thick cart rails

4. Repeat until the 4 machine screws are secure. If a machine screw is not long enough, try one that is ¼" to 1" longer.

5. Once all machine screws are in place, fully tighten the screws, but do not over-tighten.

6.4. Installing the Checkout/Repeater Module

1. Determine a location that does the following:

   - Fulfills the assignment on the schematic.

   - Provides electrical power to the Checkout/Repeater Module.

2. Using alcohol wipes, clean the areas where you will place the reclosable fasteners.

3. Attach the module with reclosable fasteners.

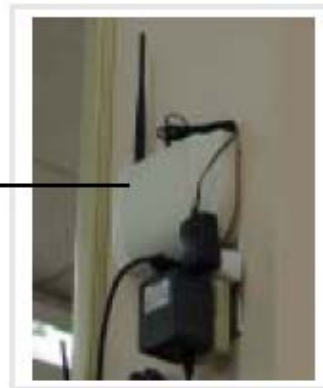4. Ensure the antenna is pointing up.

> If the best location is the brackets for a drop ceiling, attach the module with zip ties.

Checkout/Repeater Module installed in drop-ceiling braces.
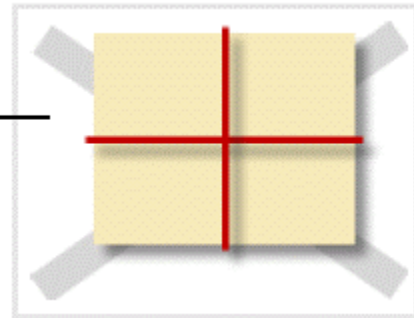
Figure 18. Checkout/Repeater Module Attached with Zip Ties

Checkout/Repeater Module installed on a wall

Figure 19. Checkout/Repeater Module--Wall Mount

7.   Verification Test

7.1.   Required Parts

The parts needed to verify the installation are:

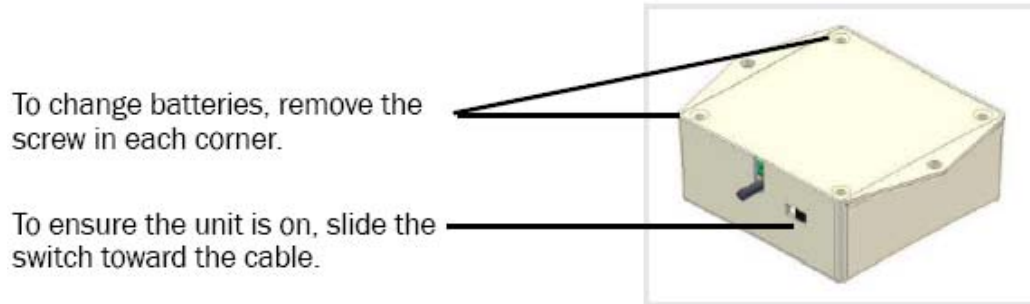| Item |
|------|
| Camera (digital or cell phone) |

7.2.   Test Procedure

To verify the installation:

1. Aim the lens at the transmitter as though you are taking a photo.

2. Look through the view finder for a flashing LED.

3. To see the other LED, hold the camera so the lens is at a 45° angle to the transmitter.

4. Look through the view finder for a flashing LED.

8.   Troubleshooting

Each device has a unique serial number, part number, and device ID programmed in flash at the factory. The Checkout/Repeater Module has an additional IRID programmed.

When new devices are needed, verify with Back Office that the ID is not in use at the given installation site.

To change batteries, remove the screw in each corner.

To ensure the unit is on, slide the switch toward the cable.

Figure 20. Battery Unit for Shelf Transmitter

If…	Do this:

The LED on the Transmitter Module does not flash in a camera view finder	▪ Check that the switch is set to on.
	  a. To turn the unit on, while looking at the unit from the top, slide the switch toward the cable.
	  b. If you decide that the unit was on and is now off, wait 30 seconds before moving the switch again.
	▪ Check that the cord is firmly attached at both ends.
	▪ Check that the cable is not damaged.
	▪ Ensure the batteries are firmly seated.
	▪ Ensure all batteries are installed.

Any of the other equipment is not working	Contact the Operations team.

Glossary

C

Cart Module

Tracking device located on a shopping cart.

**Checkout/
Repeater Module**

Located at or near the checkout counter, it forwards data from either the Shelf Receiver or the Cart Modules. In the United States, it contains (off-the-shelf) 900MHz radio frequency transceiver. In Europe, it contains a 2.4 GHz transceiver.

I

Installation Module

Infrared ID Receiver (for device installation assistance).

IR

Infrared.

ISU

In-Store Unit - In-Store Personal Computer.

R

RF

Radio Frequency.

S

Shelf Receiver Module

Counting device located on the shelf opposite the Shelf Transmitter Module. It includes a Battery/Communications Unit.

Shelf Transmitter Module

Dual-purposed module used as a transmitter device for counting/tracking and, in a special configuration, to signify the end of a shopping trip.

U

uC

Micro controller.

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