R ZERO - Counter Sensor Manual

11 July 2023

PURPOSE //

Information on how to use R ZERO'sCounter 2 Sensor

DEFINITIONS //

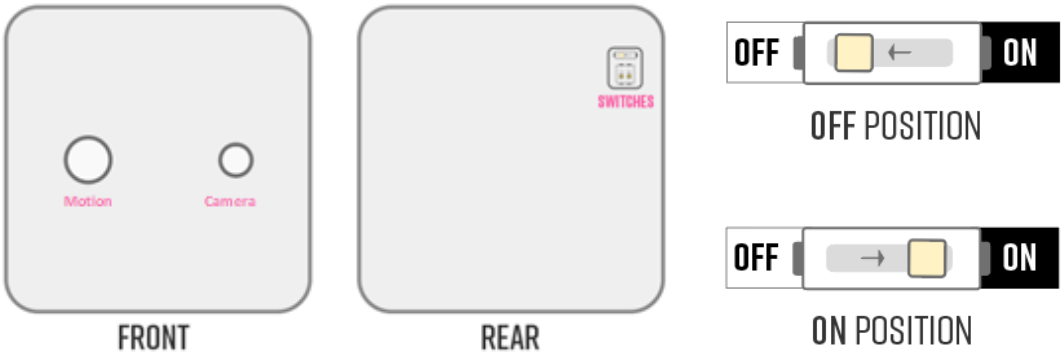
Counter 2 Sensor (a.k.a. "WorkSpace Counter 2")

R ZERO "WorkSpace Counters 2" are battery powered people counters that use a visible camera and AI for counting humans. Counters are ceiling mounted and may be used in a variety of applications wherein multiple occupants may be present. Counters may also be wired in positioned at thresholds for in/out counting.

- Counters are "overhead sensors" that require being attached to the ceiling.
- Counters include a specific mechanical attachment that mounts to the sensor location ceiling type.
- Counters have an on/off switch but all sensors ship to installers with batteries installed and turned on.
- Counters have a Label with an ID.

DEVICE SETTINGS & CONFIGURATION //

R ZERO Counters have several configurations that turn the device on/off, as well as control the data that they transmit. Otherwise, they simply carry out the instructions provided by the firmware. Above:



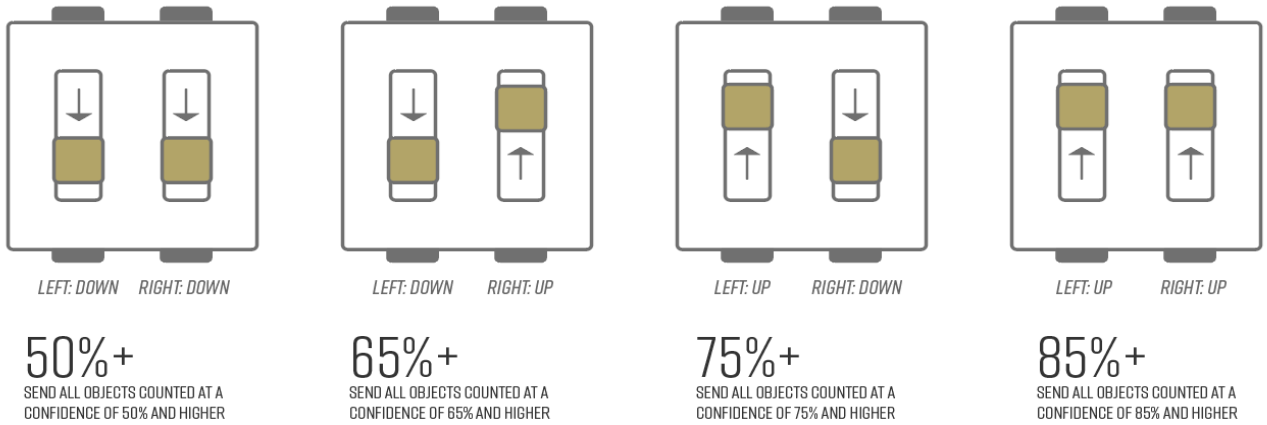
Left: Front/Rear diagram of Counter components and switches.

Right: Power Switch close-up

Powering On/Off:

Counters have an on/off switch. To power on a Counter, flip the ON/OFF toggle switch to the ON position. To turn off, flip the switch to the OFF position.

Switch Configurations:



The AI-Confidence threshold can be set by configuring the switches in 4 positions. By setting the threshold to a specific setting, the object detections created by the firmware will be limited to the meet the criteria outlined in the diagram above.

FIRMWARE AND FLASHING //

R ZERO Counters ship pre-flashed with the latest firmware. For updates to the firmware, the device must be attached to an installer's computer using a JTAG connector, wherein the firmware revision can be flashed onto the device. Firmware updates are not commonly done on production devices. Over the air update will be possible on the next generation firmware.

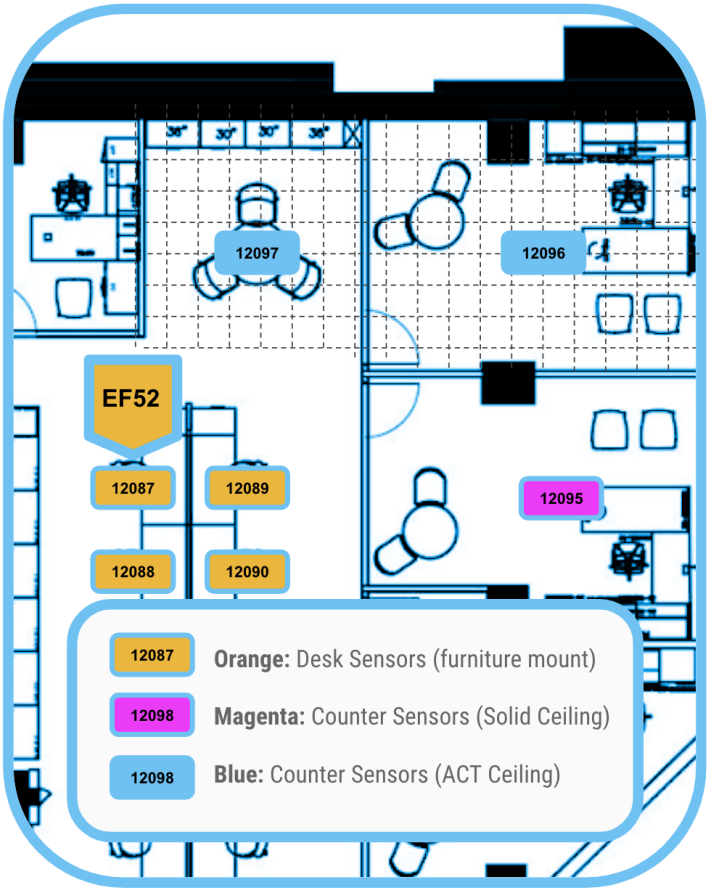
INSTALLATION //

Install Overview

Similar to WorkPoints Sensors, our Counter Sensors have specific locations in which they are to be installed. Each device has an ID that must match the location found on the attached floor plans. Counter Sensors also require a specific position on a ceiling, centered over the work area and spaced a proper distance away from other sensors.

Use the (included) floor plans to locate each sensor. Sensors are typically ordered numerically so the installer should be able to make a continuous path through the floor plan while installing sensors in the order of the devices in the box.

The following steps describe how to install the Counter Sensors based on the ceiling type.



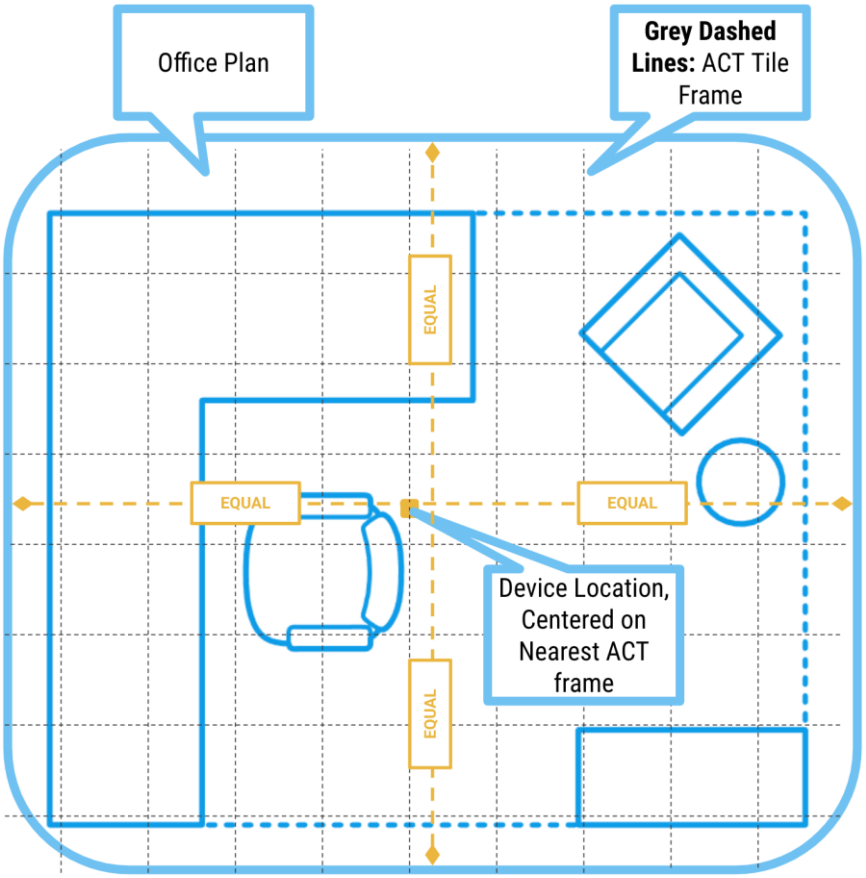
Left: Floor Plan with Sensor IDs
Each Sensor ID will be clearly shown on a specific location of the floor.

Left: Example Key
Icons will be color coded to match the installation type (e.g. desk or ceiling-mount and ceiling-mount type) as indicated on a key.

Ceiling Type 1: Acoustic Ceiling Tile (ACT) Frame

PART ONE

Install the Counter Sensor using the drawings below and checklist below as guidelines for specific placement.



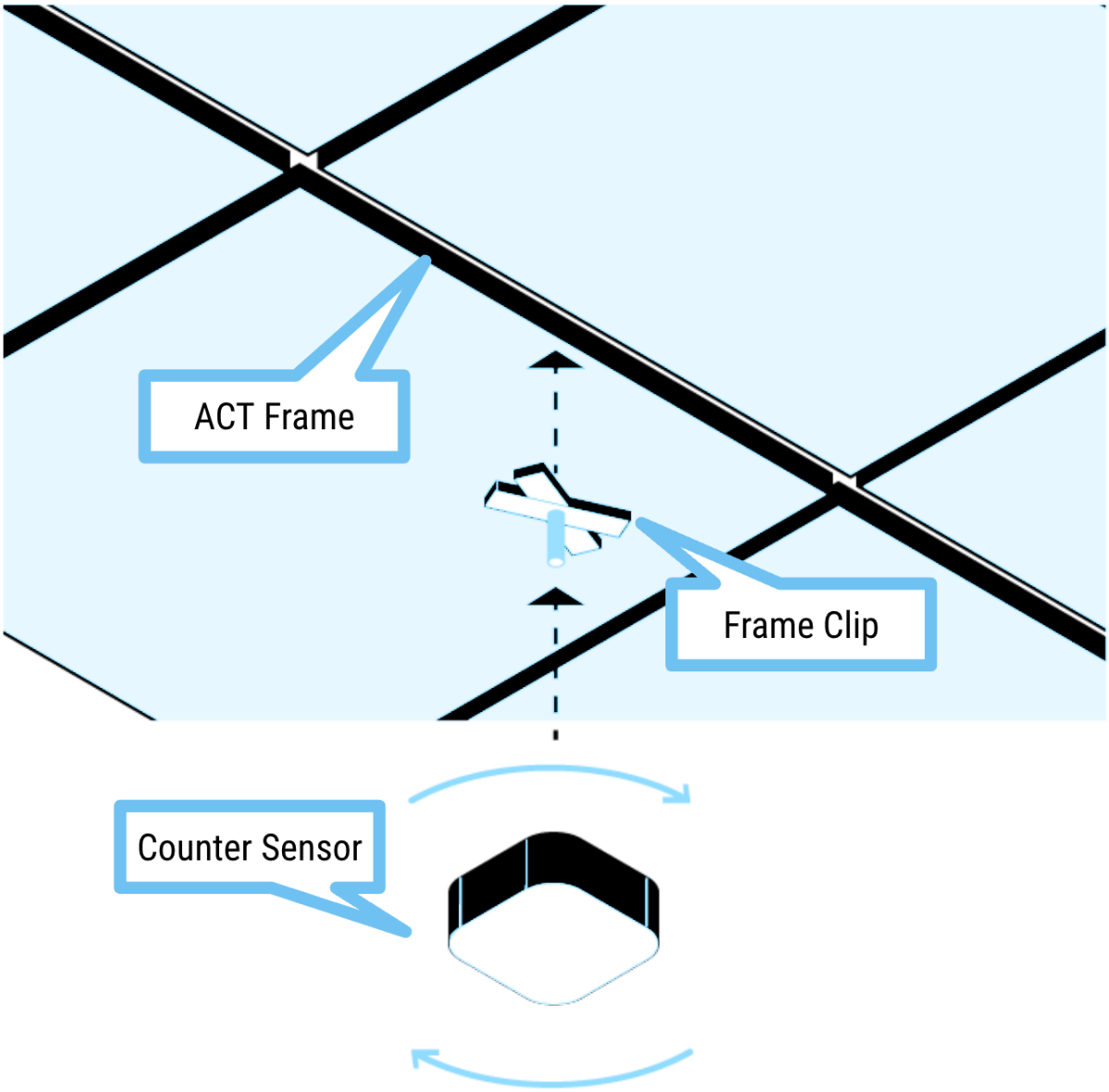
- ❑ Center the sensor on the space. The sensor location on the plan should indicate if the sensor is centered on the room or above a specific area of the room.
- ❑ Locate the Sensor on the nearest ACT Frame. This may be slightly off-center of the room.
- ❑ Use the included Frame clip to attach the Counter to the Frame as shown in the next slide.

PART TWO - OPTION 1 - Using a Clip

Your Sensor should ship with a twist/clamp-on attachment to match your ACT System.

Use the location determined using the guidelines on the previous sheet

- ❑ Attach using Frame Clip (image right):
  - ❑ Squeeze the Clamp onto the T-Bar
  - ❑ Twist the Counter onto the Stem
  - ❑ Orient the Counter with the white lens at the top of the floor plan. Do Not Overtighten



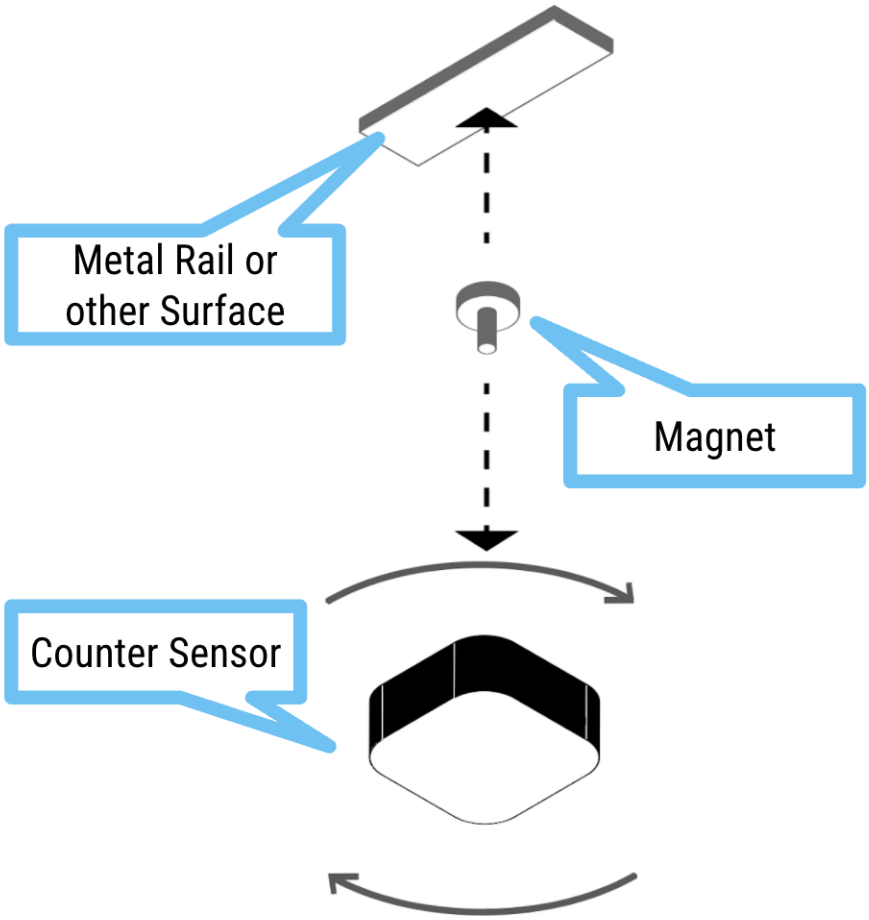
PART TWO - OPTION 2 - Using a Magnet

If your Sensor shipped with a magnet attachment. This can be used to attach to any surface with strong magnetic properties. Note: Magnets will not attach to aluminum frames.

Use the location determined using the guidelines on the previous sheet

Attach using Magnets:

Locate the position on the metal ACT frame or other metal surface that orients the Sensor with the white lens to the top of the floor plan



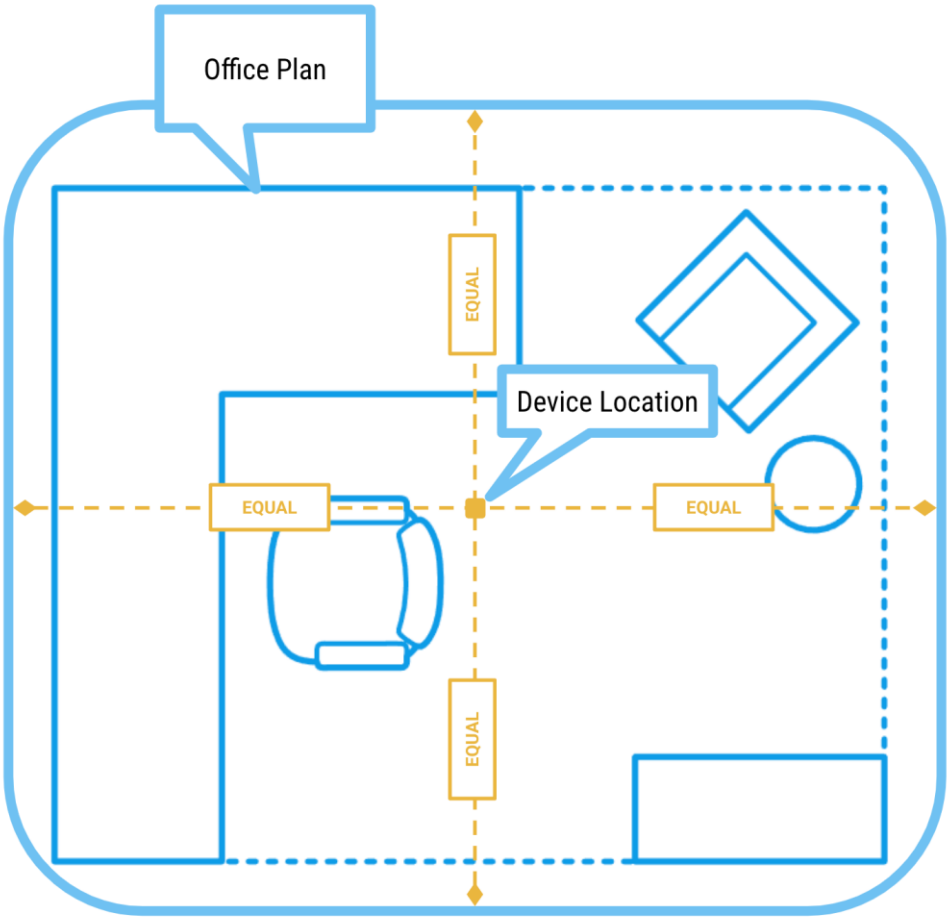
Ceiling Type 2: Solid gypsum, metal, wood, etc.

PART ONE

The drawing below indicates the typical installation into a solid material ceiling. Depending on your specific ceiling type, there may be slight differences. Please ask if you have any questions prior to drilling or damaging any materials.

- ❑ Locate the mounting position using the drawings and ceiling type

- ❏ Drill a ½" hole in the surface
- ❏ Insert the SnapToggle or other Threaded Anchor product included with your shipment
- ❏ Tighten the Threaded Anchor into place
- ❏ Gently Twist the Counter into the Anchor
- ❏ Orient the Sensor to position the white lens closest to the top of the floor plan and parallel to the space's walls. Do not over tighten.

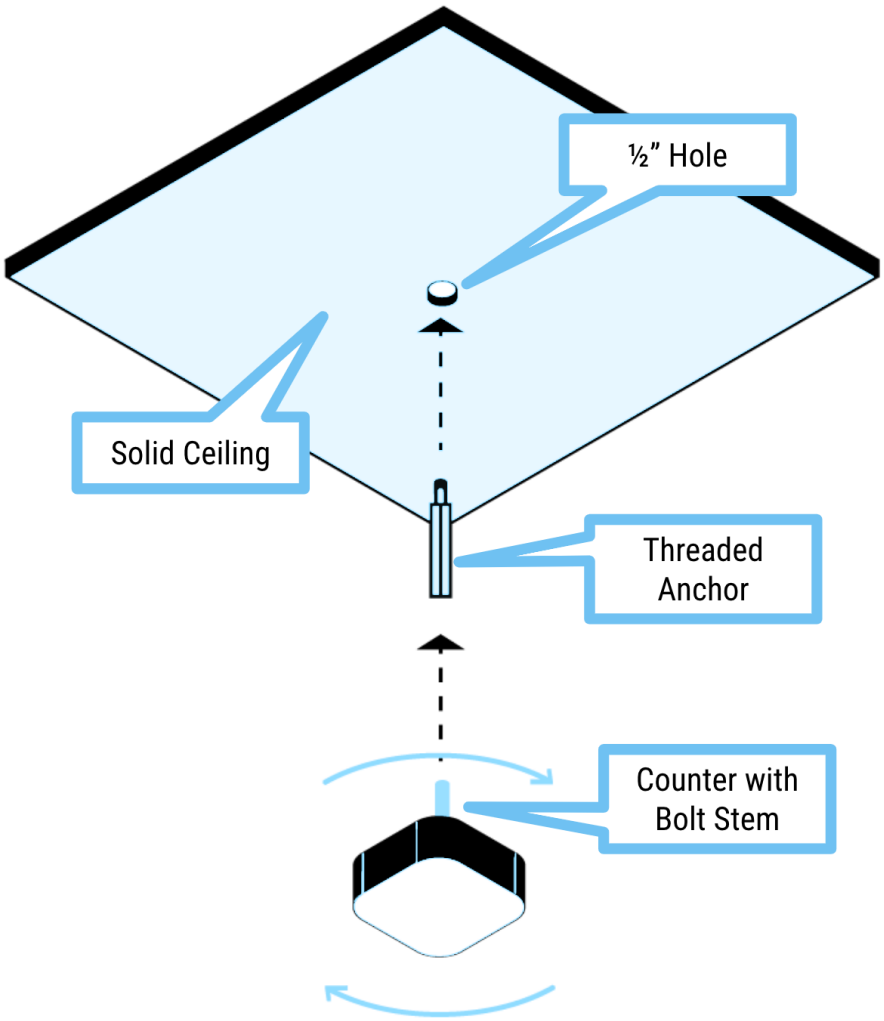


Ceiling Type 2: Solid gypsum, metal, wood, etc.

PART TWO

Install the Counter Sensor using the drawings below and checklist below as guidelines for specific placement.

- ❑ Center the sensor on the space. The sensor location on the plan should indicate if the sensor is centered on the room or above a specific area of the room.
- ❑ Locate the Sensor on the nearest ACT Frame. This may be slightly off-center of the room.
- ❑ Use the included Frame clip to attach the Counter to the Frame as shown in the next slide.



FREQUENTLY ASKED QUESTIONS //

A Counter Sensor is showing offline on our FloorPlan, what can I do?

- If it's a single Counter Sensor amongst multiple other online Counter Sensors, it's likely the battery. Remove the Counter Batteries and replace. Please note these takes 3.6V LI AA batteries, not conventional AA. If swapping the battery does not resolve the issue, please contact R ZERO and we'll send you a replacement.
- If multiple Counter Sensors are offline:
    - The sensors may be out of range of the nearest Hub, try moving a Hub closer to test the connection. Sometimes a sensor's signal may be blocked depending on its installed location. Please reach out to R ZERO via chat or email if you think an extra Hub is needed.
    - The nearest Hub may be offline. Check the nearest Hub on the FloorPlan to ensure it is online.

Will Counter Sensors detect workers walking through a space?
Yes, if installed overhead, the area of detection will be triggered by any humans entering the space.

Are Counter Sensors dangerous to human health?

- Counter Sensors use Bluetooth Low Energy (BLE) to communicate. The output power of R ZERO Bluetooth Low Energy devices is so low, the FCC does not require them to be tested for Specific Absorption Rate (SAR), a measure of the rate at which energy is absorbed by the human body when exposed to RF radiation, including microwave radiation. Cellphones and laptops, on the other hand, must pass strict SAR testing requirements, since they operate at higher power levels.

How do I know if Counter Sensors are collecting data?

- Counter Sensors are always reporting data if they are turned on. As long as the batteries are charged or it is powered via USB, the device will broadcast

data. It may appear that a Counter Sensor is offline, however, if the connection to R ZERO's cloud (your Hub) has been disconnected or powered off.

FCC Statement

This equipment 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 a residential installation. 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 communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modi?cations to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

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.

RF Exposure Information

The device has been evaluated to meet general RF exposure requirement.

The device can be used in 0mm exposure condition, compliance with exposure requirements.

Only in the stated conditions, the device is shown to fully comply with the FCC RF Exposure requirements of KDB 447498.

ISED Statement

English:This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada ’ s licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).

French: Cet appareil contient des émetteurs/récepteurs exempts de licence qui sont conformes aux RSS exemptés de licence d'Innovation, Sciences et Développement économique Canada.

L'exploitation est soumise aux deux conditions suivantes :

(1) Cet appareil ne doit pas provoquer d'interférences.

(2) Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.

l'appareil numérique du ciem conforme canadien CAN ICES-3 (B)/NMB-3(B).

This device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS 102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

cet appareil est conforme à l'exemption des limites d'évaluation courante dans la section 2.5 du cnr - 102 et conformité avec rss 102 de l'exposition aux rf, les utilisateurs peuvent obtenir des données canadiennes sur l'exposition aux champs rf et la conformité.

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme aux limites d'exposition aux rayonnements du Canada établies pour un environnement non contrôlé.

The device has been evaluated to meet general RF exposure requirement. This equipment should be installed and operated with minimum distance 0mm between the radiator & your body.

L'appareil a été évalué pour répondre aux exigences générales d'exposition aux RF. Cet équipement doit être installé et utilisé avec une distance minimale de 0 mm entre le radiateur et votre corps.