Installation Guide

FLIR BRICKSTREAM®

3D Gen 2

Release 6.2 – June 2021

FLIR® | The World's Sixth Sense®

FCC Compliance / Conformité FCC

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 undesirable operation.

Cet appareil respecte l'article 15 des règlements du de la Federal Communications Commission (FCC). Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas provoquer d'interférences nuisibles, et (2) cet appareil doit accepter toutes les interférences reçues, y compris les interférences pouvant en gêner le fonctionnement.

Korean EMC Certification / Certification CEM coréenne

The KCC symbol indicates that this product complies with Korea's Electrical Communication Basic Law regarding EMC testing for electromagnetic interference (EMI) and susceptibility (EMS).

Le symbole KCC indique que ce produit est conforme à la loi-cadre coréenne sur les communications électriques en ce qui concerne les essais de compatibilité électromagnétique (CEM) relatifs à la perturbation (EMI) et à la susceptibilité (EMS) électromagnétiques.

Hardware Warranty / Garantie du matériel

The warranty for the Brickstream sensor is 1 year. For detailed information on how to repair or replace your camera, please see the terms and conditions on our website.

La garantie du capteur Brickstream est d'une durée d'un (1) an. Pour connaître la procédure détaillée de réparation ou de remplacement de votre caméra, veuillez consulter les conditions sur notre site Web.

WEEE

The symbol indicates that this product may not be treated as household waste. Please ensure this product is properly disposed as inappropriate waste handling of this product may cause potential hazards to the environment and human health. For more detailed information about recycling of this product, please contact FLIR.

Ce symbole indique que ce produit ne peut être traité comme un déchet ménager. Veuillez vous assurer que ce produit est éliminé de façon adéquate, puisqu'une manipulation inappropriée de celui-ci peut poser un danger pour l'environnement et la santé. Pour en savoir plus sur le recyclage de ce produit, veuillez communiquer avec FLIR.

Caution / Avertissement

This symbol indicates a hot surface. Do not touch. Allow device to cool before handling.

Ce symbole indique la présence d'une surface chaude. Ne pas toucher. Laisser l'appareil refroidir avant de le manipuler.

Use only the recommended PoE injectors (FLIR part numbers ACC-POE20U-560, ACC-POE29U-1AT, or ACC-POE29U-1AF). Using any other power adapter or injector may cause damage to the device and may cause fire or injury.

N'utiliser que les injecteurs PoE recommandé (Numéros de pièce FLIR ACC-POE20U-560, ACC-POE29U-1AT, ou ACC-POE29U-1AF). L'utilisation de tout autre adaptateur ou injecteur risque d'endommager l'appareil et de causer un incendie ou des blessures.

Trademarks

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Licensing

To view the licenses of open source packages used in this product please see KB11065 What open source packages do people counting products use?

Contents

Introduction

Welcome to the Brickstream 3D Gen 2 sensor. The sensor represents the next generation of video analytics. Brickstream 3D Gen 2 captures and analyzes traffic metrics in a single sensor for retail outlets, malls, transportation hubs, and smart buildings.

The sensor technical documentation suite includes:

- *Brickstream 3D Gen 2 Installation Guide* (this document)
- *Brickstream 3D Gen 2 Counting Configuration Guide*
- *Brickstream 3D Gen 2 Advanced Configuration Guide*
- *Brickstream Programmer's Guide* for developers

The FLIR Brickstream support website contains links to firmware and documentation as well as technical notes.

Contact your FLIR Brickstream representative for more information.

About this Document

This Installation Guide details installation instructions for installers, implementation engineers, as well as support teams and training coordinators.

What is Covered

This document is divided into the following sections to help you navigate the sensor:

Section	Provides
Introduction	An overview of the sensor technology and an outline of the supporting documentation that can be found in this guide.
Planning the Solution Design	Steps to follow when planning a solution for a site, including selection of lenses, performing a site survey, and creating a solution design.
Setting up the Sensor	Instructions on how to use the PoE system; setup IP address client network connection; and create basic configuration settings.
Installing the 3D Gen 2 Sensor On-Site	Instructions on how to mount and provide power to the sensor as well as how to verify its operation using calibration.
3D Gen 2 Sensor Specifications	Specifications of the sensor including: network requirements, technical specifications, components, and part numbers.
Troubleshooting	Troubleshooting and corrective actions.

About the Brickstream 3D Gen 2 Sensor

The sensor captures behavior and tracks physical movements that provide a basis for analytical algorithms, enabling it to generate traffic metrics, queue metrics, and service metrics in a single sensor for retail outlets, malls, transportation hubs, and smart buildings.

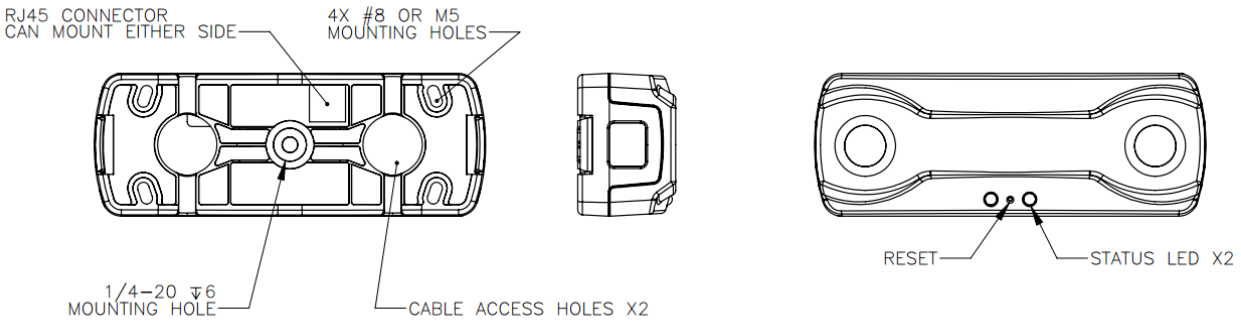
The sensor:

- Has two camera lenses
- Uses CMOS (complementary metal-oxide semiconductor) image sensors for Wide VGA, High Dynamic Range (HDR) images
- Uses LINUX operating system (OS)
- Provides on-board processing and data storage
- Adjusts automatically to environmental changes (i.e., lighting and temperature)
- Is IP addressable for remote management and support, including firmware upgrades
- Uses proven advanced stereo vision and patented path tracking technology to:
  - Collect and store metrics at one minute granularity
  - Can distinguish between adults, children, and shopping units and present them as distinct data metrics
  - Filter objects based on height, shape, and size (e.g., children, shopping carts, strollers, etc.)
  - Provide robust and accurate metrics across a broad set of environments (e.g., indoor/outdoor and high traffic)
- Provides optional Wi-Fi and BLE support with a USB Wi-Fi BLE dongle (2510 model only - dongle sold separately)

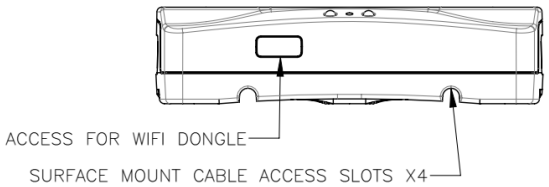
Hardware Components

The Brickstream sensor is boxed and shipped to a customer. To properly install the sensor, we recommend the purchase of an industry standard 802.3af PoE System. Depending on the method and location for installing the sensor, suitable mounting hardware is required (recessed mount, RAM mount, or outdoor mount). Mounting hardware is purchased separately.

The following image provides a diagram of the Brickstream sensor.



The 2510 model has access for USB Wi-Fi BLE dongle on the side



Software (Firmware) Components

> **Note:** The terms software and firmware are used interchangeably to refer to programming on the sensor.

The Brickstream sensor is loaded with the available software prior to being shipped to a customer. It may be necessary to update the software before installing the sensor. The factory default configurations are present on the sensor.

The sensor includes a web interface that can be accessed from any standard web browser that can access the network where the sensor is connected. The web interface provides configuration capabilities for the sensor.

> **Note:** The sensor's firmware version is in the footer of the sensor web interface.

An update to firmware may include a separate package to update drivers used by the sensor. See the sensor's Configuration Guide for steps on Upgrading Firmware.

Licensing

With the basic license, the 3D Gen 2 sensor includes:

- 1 count zone
- Tilt up to 10°
- Privacy
- Data encryption

With an advanced counting key license the sensor has access to the following features:

- Advanced counting up to 32 zones
- Tilt greater than 10°

With an advanced firmware key license the sensor has access to the basic and advanced counting features as well as the following:

- Queue software (up to 32 zones)
- Service software (up to 32 zones)
- Detection software (up to 32 zones)
- Traffic maps

Additional features can be activated through separate licenses, including:

- Employee filtering (2510 model only)
- Wi-Fi network connection (2510 model only)
- Tailgating detection
- Occupancy management

> **Note:** Contact your FLIR Brickstream sales representative for pricing and availability.

Data Quality

FLIR Brickstream people counting sensors deliver accuracy with an average error rate of ±5% under the following conditions:

- A minimum of 100 people are counted over the validation period.
- A maximum of 5,000 people are counted per hour moving through a 1 meter wide area at the time of crossing.
- Light levels are above 12.5 Lux/Lx.
- The sample set is restricted to adults between 150 cm and 200 cm tall walking less than 14 km/hour (8.7 mph). For example, children may not meet the height constraint and cyclists may not meet the velocity constraint.
- The sample set excludes people congregating in the entrance or doorway.
- The sensor configuration conforms to FLIR's recommendation for the specific environment.
- The sensor is operated within standard temperature and humidity levels (0°C to 40°C and 5% to 95%)
- The lens is appropriate for the mounting height and mounting angle.
- The sensor has a maximum of 5 degrees tilt and is mounted within recommended height ranges.
- The lenses are free from dirt, grease, or scratches to enable normal operation.
- The sensor can fully see people, unobstructed, in both lenses.
- There are no transparent or translucent objects (for example, glass) between the sensor and the people to be counted.
- The sensor has been properly calibrated and tracking quality has been verified.
- The counting lines are positioned so that a person is tracked for a minimum of 3 feet (90 cm) prior to crossing a line.

- People are walking on either a flat or an evenly sloped surface. All 4 feet (120 cm) on each side of the counting lines should have a maximum height variance of 12 inches (30 cm).
- There are additional caveats for outdoor deployments.

The following situations can impact performance:

Description	Impact	Automated Detection
Lighting level - too dark	Disables counting	Yes
Lighting level - too bright	Disables counting	Yes
Calibration failure	Disables counting	Yes
Shaking sensor	Unpredictable	No
Tall Moving Objects	Over counting	No
Uneven surface	Under counting	No
Heavy rain	Under counting	No
Dirty or scratched lens*	Under counting	No
Transparent or translucent objects	Unpredictable	No
Noisy data	Unpredictable	Yes

*Depending on the severity, this may appear as a calibration failure and be automatically detected.

Before You Begin

Before you begin installing a 3D Gen 2 sensor, be sure that you have the following:

- Access to a PoE-enabled source such as a switch or PoE injector
- Available ports on the PoE source
- UTP Category-5e (CAT5e) or greater cable
- All required permits in place for installation activities, as per local ordinances
- Network rules established and functioning
- USB Wi-Fi BLE dongle if using employee filtering (2510 model only)

> **Note:** You can significantly reduce the installation time by configuring all sensors with the appropriate network and configuration settings prior to arriving on site. For detailed instructions see Setting up the Sensor.

Planning the Solution Design

Using the 3D Gen 2 sensor requires following the instructions in this document to set up the sensor for communication, install the sensor, and then configure the supporting software. The following section provides guidelines, considerations, and procedures to ensure optimal planning of the solution design for your site. Detailed procedures for creating the zones to deliver the desired metrics are provided in the 3D Gen 2 sensor configuration guides.

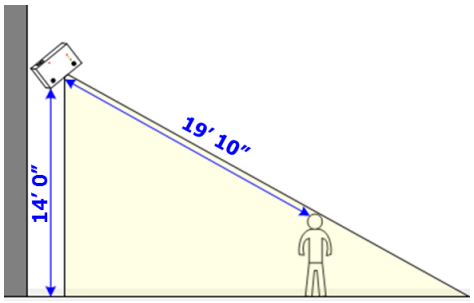
When planning the solution for a site, follow this process:

1. Selecting the Appropriate Lenses
2. Performing a Site Survey
3. Determining How Many Sensors You Need
4. Determining Installation Locations

Selecting the Appropriate Lenses

Generally speaking, the higher the sensor is mounted, the more it can see. There are limits, though: at some point the installation height becomes too high making people appear too small in the sensor view to be accurately tracked. This situation is resolved by using a lens with an increased focal length. Follow these guidelines when selecting the appropriate lenses:

- Choose the highest possible lens that gives you enough coverage area to observe the desired behavior from the installation height.
- For a tilted sensor, lens height is not just the vertical mounting height but how far away tracked objects are from the lens, as shown in the following example of oblique coverage:



This obliquely-mounted 3D Gen 2 2.5 mm lens is mounted 14 feet high, which is within specifications for that lens type. However, the individual we want to track is almost 20 feet away, far outside the 15-ft limit for the lens. The individual in this example would not be tracked accurately.

Oblique coverage can increase coverage substantially, but there are limitations:

- Generally a tilt of 5° to 10° does not impact accuracy.
- Greater than 10° tilts impact accuracy, especially in high-volume environments where occlusion is constantly present.

> **Note:** When tilting the sensor, the maximum tolerated installation height is reduced in correlation with the degree of tilt.

The mounting height determines the type of lens needed. Lens type as a function of mounting height determines coverage. Use the following tables to gauge the installation height ranges for the lenses available for the 3D Gen 2 sensor:

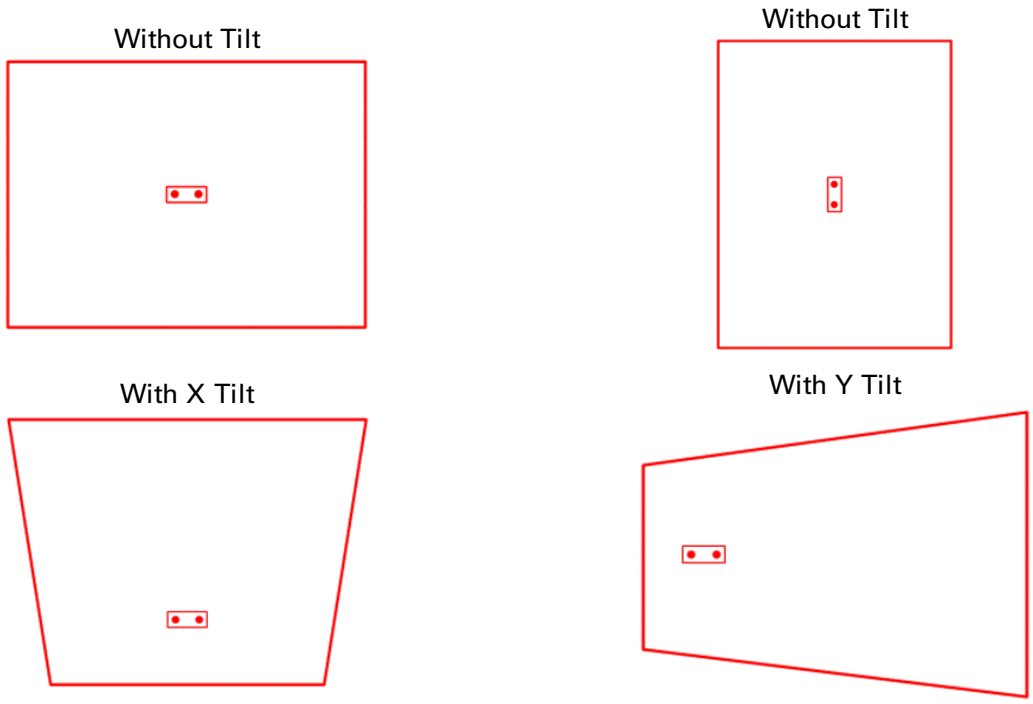
Lens Size	Min. Height	Max. Height
2.5 mm	2.2 m / 7.2 ft	7.0 m / 23.0 ft
6.0 mm	6 m / 19.7 ft	14 m / 45.9 ft

Height		3D Gen 2 Stereoscopic Lens Size	
Meters	Feet	2.5 mm	6.0 mm
2.2	7.2	3D Gen 2 2.5 mm	
2.5	8.25		
3.0	9.8		
3.5	11.5		
4.0	13.1		
4.5	14.8		
5.0	16.4		
5.5	18.0		
6.0	20		3D Gen 2 6.0 mm
6.5	21.3		
7.0	23.0		
7.5	24.6		
8.0	26.2		
8.5	27.9		
9.0	29.5		
9.5	31.2		
10.0	32.8		
10.5	34.4		
11.0	36.1		
11.5	37.7		
12.0	39.5		
12.5	41.0		
13.0	42.6		
13.5	44.3		
14.0	45.9		

Note: Detailed coverage tables are available in Lens Coverage.

Given the lens type, mounting height, and tilt, the coverage model can determine the floor area that a sensor can cover.

The following figures show the sensor location and coverage areas for sensors with and without tilt. Sensors without tilt have a rectangular coverage area with a 4:3 aspect ratio.



Tilting a sensor can increase coverage substantially, within limitations:

- Generally a tilt of 5° to 10° does not impact accuracy
- Tilt greater than 10° requires advanced licensing and impacts accuracy, especially in high-volume environments where occlusion is constantly present

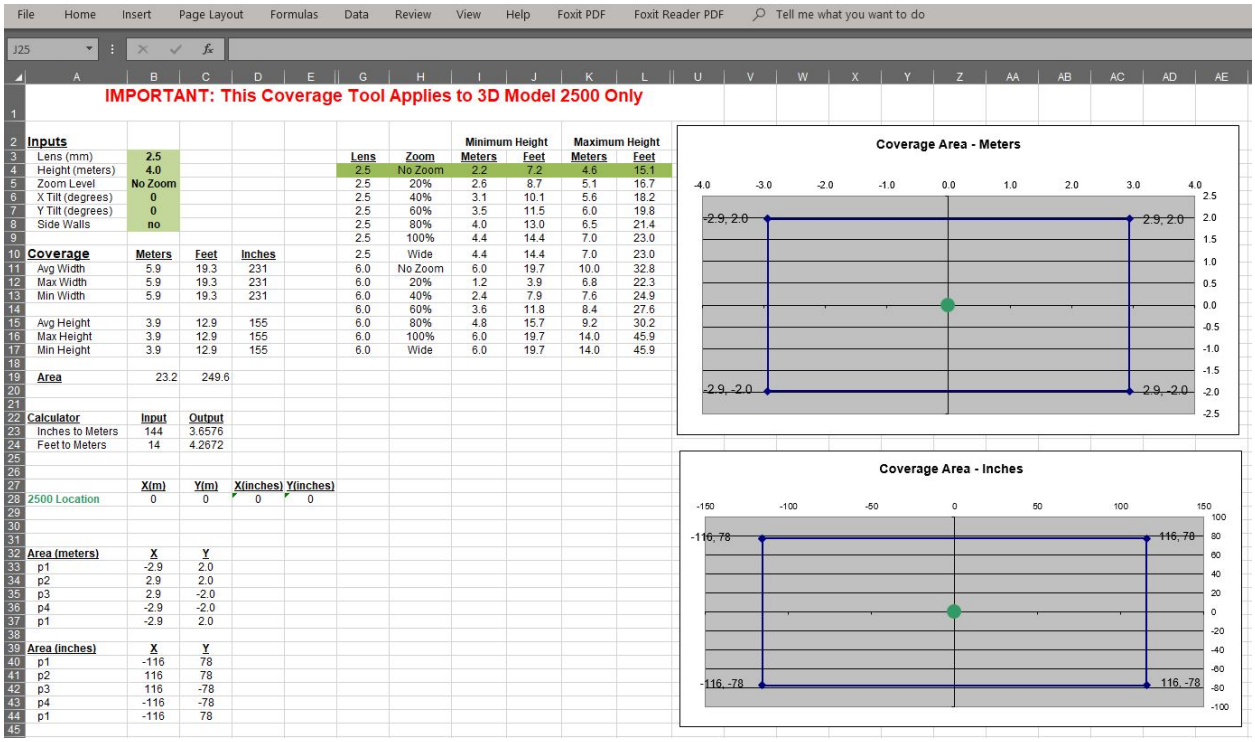
Additional tools available from your Brickstream Representative to assist you in determining coverage area include:

- Coverage Calculator for the sensor (shown below)
- Simple Installation Calculator (shown in Performing a Site Survey)
- Minimum Distance Calculator for sensor with tilt

Coverage Calculator

For exact coverage calculations, use the Coverage Calculator as follows:

1. Identify the dimensions of the desired coverage area.
2. Click the desired Coverage Tables tab to determine the correct lens type for the desired installation height.
3. Click the Coverage tab.



IMPORTANT: This Coverage Tool Applies to 3D Model 2500 Only

Inputs	
Lens (mm)	2.5
Height (meters)	4.0
Zoom Level	No Zoom
X Tilt (degrees)	0
Y Tilt (degrees)	0
Side Walls	no

Coverage	Meters	Feet	Inches
Avg Width	5.9	19.3	231
Max Width	5.9	19.3	231
Min Width	5.9	19.3	231
Avg Height	3.9	12.9	155
Max Height	3.9	12.9	155
Min Height	3.9	12.9	155
Area	23.2	249.6	

Calculator	Input	Output
Inches to Meters	144	3.6576
Feet to Meters	14	4.2672

	X(m)	Y(m)	X(inches)	Y(inches)
2500 Location	0	0	0	0

Area (meters)	X	Y
p1	-2.9	2.0
p2	2.9	2.0
p3	2.9	-2.0
p4	-2.9	-2.0
p1	-2.9	2.0

Area (inches)	X	Y
p1	-116	78
p2	116	78
p3	116	-78
p4	-116	-78
p1	-116	78

Lens	Zoom	Minimum Height Meters	Minimum Height Feet	Maximum Height Meters	Maximum Height Feet
2.5	No Zoom	2.2	7.2	4.6	15.1
2.5	20%	2.6	8.7	5.1	16.7
2.5	40%	3.1	10.1	5.6	18.2
2.5	60%	3.5	11.5	6.0	19.8
2.5	80%	4.0	13.0	6.5	21.4
2.5	100%	4.4	14.4	7.0	23.0
2.5	Wide	4.4	14.4	7.0	23.0
6.0	No Zoom	6.0	19.7	10.0	32.8
6.0	20%	1.2	3.9	6.8	22.3
6.0	40%	2.4	7.9	7.6	24.9
6.0	60%	3.6	11.8	8.4	27.6
6.0	80%	4.8	15.7	9.2	30.2
6.0	100%	6.0	19.7	14.0	45.9
6.0	Wide	6.0	19.7	14.0	45.9

4. In the Inputs area:
    a. Select a Lens (mm).
    b. Enter the installation Height (meters).
    c. Enter a digital zoom level. If no zoom level is needed for your mounting height, select No Zoom.
    d. If the sensor is tilted, enter the degree of tilt in X Tilt (degrees) or Y Tilt (degrees).
    e. If there are walls on any side of the sensor coverage area, select yes for Side Walls.

The calculations for average, maximum, and minimum widths and heights are calculated dynamically based on your inputs and display in the coverage area's columns.

Lens Coverage

The following tables provide the coverage measurements based upon the installation height for each 3D Gen 2 stereo lens.

> **Note:** All measurements are in meters, except for lens sizes which are in millimeters (mm).

About Coverage Widths

The coverage widths shown in the following tables include an extra meter from the coverage widths shown by default on the Coverage tab in the Coverage Calculator spreadsheet. This increased coverage assumes that there are walls bordering each side of the coverage width. Having walls on each side of

the coverage area allows additional coverage because an individual's center of mass can never be completely against the wall. It is typically at least half a meter from the wall.

> **Note:** Coverage models with extra width are not valid when using sensors side-by-side to cover larger counting areas.

2.5 mm Lenses

The following measurements apply for only the 2.5 mm stereo lenses:

Standard Mode

Sensor Installation Height (m)	Digital Zoom	Coverage Area Width (m)	Coverage Area Height (m)
2.2	No Zoom	1.5	1.0
2.3	No Zoom	1.8	1.2
2.4	No Zoom	2.0	1.3
2.5	No Zoom	2.2	1.5
2.6	No Zoom	2.5	1.6
2.7	No Zoom	2.7	1.8
2.8	No Zoom	3.0	2.0
2.9	No Zoom	3.2	2.1
3.0	No Zoom	3.5	2.3
3.1	No Zoom	3.7	2.5
3.2	No Zoom	3.9	2.6
3.3	No Zoom	4.2	2.8
3.4	No Zoom	4.4	3.0
3.5	No Zoom	4.7	3.1
3.6	No Zoom	4.9	3.3
3.7	No Zoom	5.2	3.5
3.8	No Zoom	5.4	3.6
3.9	No Zoom	5.6	3.8
4.0	No Zoom	5.9	3.9
4.1	No Zoom	6.1	4.1
4.2	No Zoom	6.4	4.3
4.3	No Zoom	6.6	4.4
4.4	No Zoom	6.8	4.6
4.5	No Zoom	7.1	4.8
4.6	No Zoom	7.3	4.9
4.7	20%	6.3	4.2
4.8	20%	6.5	4.4
4.9	20%	6.7	4.5
5.0	20%	6.9	4.6
5.1	20%	7.1	4.8
5.2	40%	6.2	4.2
5.3	40%	6.4	4.3
5.4	40%	6.6	4.4
5.5	40%	6.8	4.5
5.6	40%	6.9	4.7
5.7	60%	6.2	4.2
5.8	60%	6.4	4.3
5.9	60%	6.5	4.4
6.0	60%	6.7	4.5
6.1	80%	6.0	4.1
6.2	80%	6.2	4.1
6.3	80%	6.3	4.2
6.4	80%	6.4	4.3
6.5	100%	5.9	4.0
6.6	100%	6.0	4.0
6.7	100%	6.1	4.1
6.8	100%	6.3	4.2
6.9	100%	6.4	4.3
7.0	100%	6.5	4.4

In standard mode, when mounting higher than 4.6 m, digital zoom should be applied to maintain tracking accuracy.

Wide Mode

Sensor Installation Height (m)	Digital Zoom	Coverage Area	
		Width (m)	Height (m)
4.6	No Zoom	7.3	1.3
4.7	No Zoom	7.6	1.3
4.8	No Zoom	7.8	1.4
4.9	No Zoom	8.1	1.4
5.0	No Zoom	8.3	1.5
5.1	No Zoom	8.5	1.5
5.2	No Zoom	8.8	1.6
5.3	No Zoom	9.0	1.6
5.4	No Zoom	9.3	1.7
5.5	No Zoom	9.5	1.7
5.6	No Zoom	9.8	1.8
5.7	No Zoom	10.0	1.8
5.8	No Zoom	10.2	1.9
5.9	No Zoom	10.5	1.9
6.0	No Zoom	10.7	1.9
6.1	No Zoom	11.0	2.0
6.2	No Zoom	11.2	2.0
6.3	No Zoom	11.5	2.1
6.4	No Zoom	11.7	2.1
6.5	No Zoom	11.9	2.2
6.6	No Zoom	12.2	2.2
6.7	No Zoom	12.4	2.3
6.8	No Zoom	12.7	2.3
6.9	No Zoom	12.9	2.4
7.0	No Zoom	13.1	2.4

In wide mode, digital zoom is not required.

6.0 mm Lenses

The following measurements apply for only the 6.0 mm lenses:

Standard Mode

Sennsor Install Height (m)	Digital Zoom	Coverage		Sensor Install Height (m)	Digital Zoom	Coverage		Sensor Install Height (m)	Digital Zoom	Coverage	
		Width (m)	Height (m)			Width (m)	Height (m)			Width (m)	Height (m)
6.0	No Zoom	2.8	2.3	8.7	No Zoom	4.5	3.8	11.4	40%	4.5	3.7
6.1	No Zoom	2.9	2.4	8.8	No Zoom	4.6	3.8	11.5	40%	4.5	3.7
6.2	No Zoom	2.9	2.4	8.9	No Zoom	4.7	3.9	11.6	40%	4.6	3.8
6.3	No Zoom	3.0	2.5	9.0	No Zoom	4.7	3.9	11.7	60%	4.6	3.8
6.4	No Zoom	3.1	2.5	9.1	No Zoom	4.8	4.0	11.8	60%	4.7	3.8
6.5	No Zoom	3.1	2.6	9.2	No Zoom	4.9	4.0	11.9	60%	4.7	3.9
6.6	No Zoom	3.2	2.6	9.3	No Zoom	4.9	4.1	12.0	60%	4.7	3.9
6.7	No Zoom	3.2	2.7	9.4	No Zoom	5.0	4.1	12.1	60%	4.8	4.0
6.8	No Zoom	3.3	2.7	9.5	No Zoom	5.1	4.2	12.2	60%	4.8	4.0
6.9	No Zoom	3.4	2.8	9.6	No Zoom	5.1	4.2	12.3	60%	4.9	4.0
7.0	No Zoom	3.4	2.8	9.7	No Zoom	5.2	4.3	12.4	60%	4.9	4.1
7.1	No Zoom	3.5	2.9	9.8	No Zoom	5.3	4.4	12.5	80%	5.0	4.1
7.2	No Zoom	3.6	2.9	9.9	No Zoom	5.3	4.4	12.6	80%	5.0	4.2
7.3	No Zoom	3.6	3.0	10.0	No Zoom	5.4	4.5	12.7	80%	5.1	4.2
7.4	No Zoom	3.7	3.1	10.1	20%	4.5	3.7	12.8	80%	5.1	4.2
7.5	No Zoom	3.8	3.1	10.2	20%	4.6	3.8	12.9	80%	5.2	4.3
7.6	No Zoom	3.8	3.2	10.3	20%	4.6	3.8	13.0	80%	5.2	4.3
7.7	No Zoom	3.9	3.2	10.4	20%	4.7	3.9	13.1	80%	5.3	4.3
7.8	No Zoom	4.0	3.3	10.5	20%	4.7	3.9	13.2	80%	5.3	4.4
7.9	No Zoom	4.0	3.3	10.6	20%	4.8	4.0	13.3	100%	5.4	4.4
8.0	No Zoom	4.1	3.4	10.7	20%	4.9	4.0	13.4	100%	5.4	4.5
8.1	No Zoom	4.2	3.4	10.8	20%	4.9	4.1	13.5	100%	5.4	4.5
8.2	No Zoom	4.2	3.5	10.9	40%	4.2	3.5	13.6	100%	5.5	4.5
8.3	No Zoom	4.3	3.5	11.0	40%	4.3	3.5	13.7	100%	5.5	4.6
8.4	No Zoom	4.4	3.6	11.1	40%	4.3	3.6	13.8	100%	5.6	4.6
8.5	No Zoom	4.4	3.6	11.2	40%	4.4	3.6	13.9	100%	5.6	4.7
8.6	No Zoom	4.5	3.7	11.3	40%	4.4	3.7	14.0	100%	5.7	4.7

In standard mode, when mounting higher than 10.0 m, digital zoom should be applied to maintain tracking accuracy.

Wide Mode

Sensor Install Height (m)	Digital Zoom	Coverage		Sensor Install Height (m)	Digital Zoom	Coverage	
		Width (m)	Height (m)			Width (m)	Height (m)
10.0	No Zoom	5.4	1.4	12.1	No Zoom	6.8	1.7
10.1	No Zoom	5.5	1.4	12.2	No Zoom	6.8	1.7
10.2	No Zoom	5.5	1.4	12.3	No Zoom	6.9	1.8
10.3	No Zoom	5.6	1.4	12.4	No Zoom	7.0	1.8
10.4	No Zoom	5.7	1.4	12.5	No Zoom	7.0	1.8
10.5	No Zoom	5.7	1.4	12.6	No Zoom	7.1	1.8
10.6	No Zoom	5.8	1.5	12.7	No Zoom	7.1	1.8
10.7	No Zoom	5.8	1.5	12.8	No Zoom	7.2	1.8
10.8	No Zoom	5.9	1.5	12.9	No Zoom	7.3	1.9
10.9	No Zoom	6.0	1.5	13.0	No Zoom	7.3	1.9
11.0	No Zoom	6.0	1.5	13.1	No Zoom	7.4	1.9
11.1	No Zoom	6.1	1.6	13.2	No Zoom	7.5	1.9
11.2	No Zoom	6.2	1.6	13.3	No Zoom	7.5	1.9
11.3	No Zoom	6.2	1.6	13.4	No Zoom	7.6	2.0
11.4	No Zoom	6.3	1.6	13.5	No Zoom	7.7	2.0
11.5	No Zoom	6.4	1.6	13.6	No Zoom	7.7	2.0
11.6	No Zoom	6.4	1.6	13.7	No Zoom	7.8	2.0
11.7	No Zoom	6.5	1.7	13.8	No Zoom	7.9	2.0
11.8	No Zoom	6.6	1.7	13.9	No Zoom	7.9	2.0
11.9	No Zoom	6.6	1.7	14.0	No Zoom	8.0	2.1
12.0	No Zoom	6.7	1.7				

In wide mode, digital zoom is not required.

Performing a Site Survey

Perform a site survey to gather measurements necessary to determine sensor count, lens type, and mounting location. Site surveys mitigate risk encountered during installation. An estimate can be determined given a scaled floor plan and ceiling height at potential sensor mounting location. A site survey is especially important for a new site design where sites with similar designs do not exist in a customer blueprint database.

Preparing for a site survey

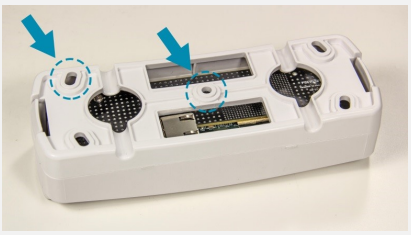
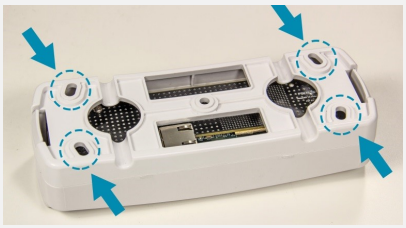
Follow these steps when planning a site survey:

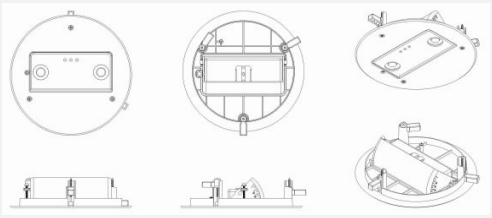
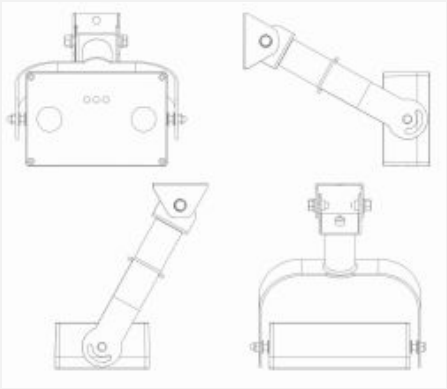
1. Coordinate and schedule an on-site visit.
2. Gather all available information prior to going on site.
3. Establish site access protocols and any special conditions that must be followed to physically visit the location.
4. Review project requirements, needed coverage areas, and network connectivity strategy.
5. Review the mounting options, as described in the following section.

Types of mounts

Mount types required for each sensor installation at a site are identified in the Site Installation Specification.

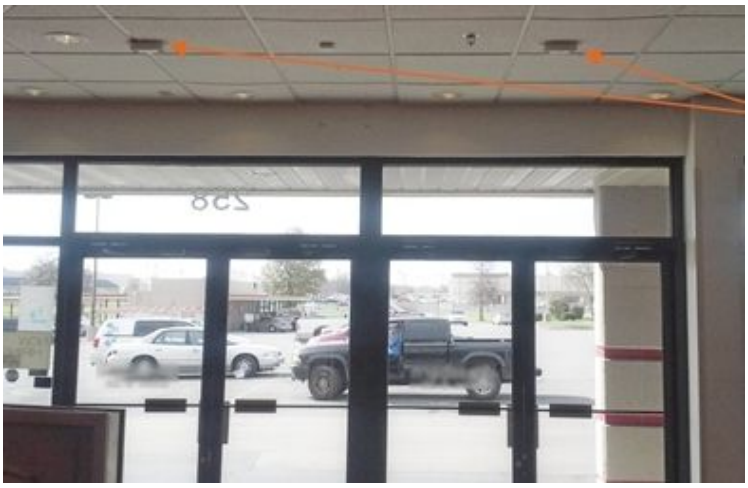
The following is a description of mounts used with the 3D Gen 2 sensor.

Mount Type	Application	Examples
Surface	The 3D Gen 2 sensor has an integrated surface mounting bracket which requires no separate hardware. It can easily be affixed to the ceiling, and allows the for the cabling to be hidden through the back of device for a clean appearance. External side wiring is also possible. (A) If installing below a wooden joist, use two No. 8 (5 mm) type screws, one for the center and one on any of the four corners. (B) If installing below a dry wall, use four No. 8 (5 mm) screws, one in each corner.	A  B 

Mount Type	Application	Examples
Recessed	Used for aesthetically pleasing, low-profile mounting in a drop ceiling. Available as X-axis tilt. Depending on the ceiling surface, additional reinforcement may be required.	
Outdoor	Used primarily for outdoor mounting, but can be used indoors.	
Pendant with RAM mount	Used in situations where the mount must fully articulate both X axis and Y axis, by applying the RAM mount to a CCTV pole and then applying the sensor to the RAM mount's universal camera mount. (Note: FLIR does not sell RAM mounts.)	

Field Samples

Surface Mount



Recessed Mount

RAM Mount

Gathering Information During a Site Survey

Information from the site survey defines and quantifies the physical space within which resides the opportunity to provide data/metrics on human behavior within that space. You must determine the areas of interest where that behavior happens and how many sensors are needed to provide coverage over the areas of interest. Thoroughness and accuracy is critical. When you arrive on site to perform a site survey, be sure to do the following:

1. Determine the best sensor mounting solution for the type of ceiling at the site.
2. Visually check the floor for slope. The sensor assumes zero slope.
3. Review physical locations for network connectivity.
4. Locate the network head-end, technical closets, and tech rooms.
    a. What is the distance from head-end to door(s) for home run cable estimates? Will it be greater than 100 m? Each cable run exceeding 100 m requires a power extender.
    b. What network equipment is available? Evaluate the number of ports available and PoE capabilities.
    c. Is local power available? How many outlets are there? Do they function 24 hours daily or on a timer?
5. Look for general impediments to installation for better preparation.
6. Gather all necessary measurements.

You can use the installation planning calculators (shown below) to collect the data in the orange fields as a basis of calculating lens size, coverage, number of sensors required, and installation distances.

> **Note:** If you are installing in a physical environment/door counting that is standard for all locations, you can use the Simple Installation Planning Calculator to determine the number of sensors needed, given the ceiling height at the sensor installation and the width of the entry way.

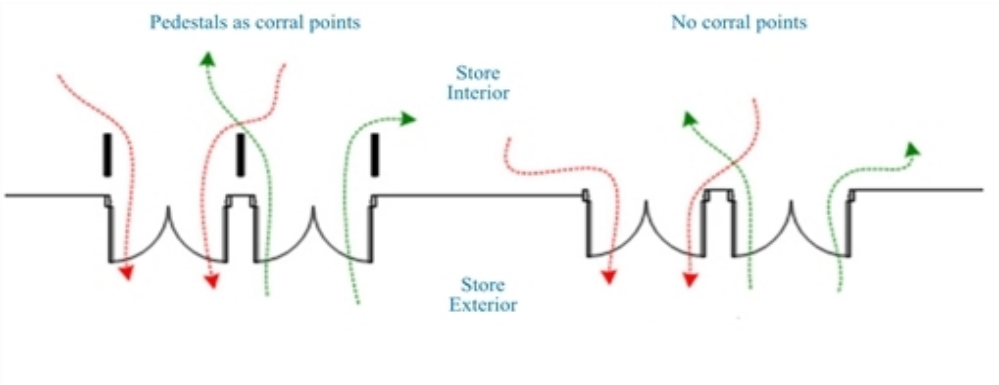
Store Number	Store Name	Mount Type	Door ID	Door Width (in)	Device Mounting Height (in)	Enable Extra Wall Coverage?
						☐
						☐
						☐
						☐
						☐
						☐

Model & Lens Type (mm)	Base Coverage Depth (in)	Base Coverage Length (in)	Extra L Wall Coverage (in)	Extra R Wall Coverage (in)	Exact Devices Required	Total Door Devices	Distance From Entry/Exit	Maximum Distance Between Devices

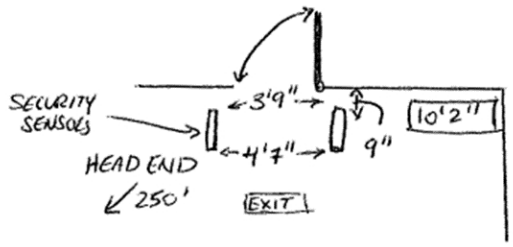
Warning! Measurements and other assumptions from the site survey should always be validated when installer arrives on site for installation if a site survey has been bypassed.

Verify Site Accessibility

1. Identify the lift equipment needed for the installation.
2. Identify the path for necessary equipment to get into the building and perform the installation.
3. Verify if there are any restrictions on when equipment can be brought into the environment.
4. Take the following into consideration for coverage area of sensors placed at doorways, referring to door inspection considerations:
   - Door width — Wider doorways may require more than one sensor.
   - Door type — Sliding doors, single or double doors, and the direction the door swings affect sensor placement.
   - Distance between doors — Can one sensor cover multiple doors, or are multiple sensors required to ensure adequate coverage?
   - Traffic corral points, such as anti-theft pedestals and displays can affect the desired coverage area.
   - Ideally, elongate the coverage area over the length of the common path as people walk through the door.



5. Placement of ceiling fixtures and other objects suspended from the ceiling can affect sensor coverage ares. Take the following into account when considering the impact of a site's ceiling fixtures on the requirements for sensors:
    - Identify all ceiling fixtures such as lighting, signage, and HVAC equipment that are attached to the ceiling in the area where the sensor will be installed.
    - Ask for a Reflective Ceiling Plan (RCP) if possible.
    - It is critical to know how far ceiling fixtures hang down from the ceiling and the exact locations.
6. Take photos of door, ceiling, queue, service, and head-end, as well as referential photos to improve usefulness, zoomed out to ensure that both floor and ceiling can be seen in the photo.
    - Low-resolution setting is optimal (800 x 600) to avoid photos with large file sizes.
    - Photograph the same subject from multiple angles — front, side, and angled views.
    - Only take close-up photos of specific elements where detail is required (outlets, network switches, etc.) and include a zoomed-out view as well.
7. Use a standardized site survey document to ensure all necessary data is collected and retained.

Site Information	
Site Name	ACME WIDGET WAREHOUSE
Site Address	1322 NORTH AVENUE, ATLANTA, GA, 30313
Site Contact	GEORGE BURDELL
Site Operating Hours	M-F 9-10 SAT 10-9 SUN 11-6
Survey Time/Date	3/17/09 10:18AM
Door 1	
Ceiling Height	10'2"
Ceiling Composition	SYNTHETIC DROP TILE (2'x2') WHITE
Door Type	SWING-OUT SINGLE
Door Width	3'9"
Floor Slope?	NONE
Head-End Distance	~250'
Other Notes	EXIT SIGN HANGS DOWN 12", 18" WIDE. CENTERED ON DOOR, 7'6" INSIDE STORE FROM DOORWAY
Door 1 Sketch	

8. Identify and gather information about any additional space to be used for the solution.

Creating the Solution Design

After the initial planning work is complete, the site survey is used to create a complete solution design that specifies each sensor required and its exact placement within the floor plan, as well as all materials necessary to implement the solution. This information described in the following sections is given to the installation team.

After the Site Survey

The site survey provides input for the system design for the site. The output of system design is a bill of materials (BOM) and an installation document showing sensor locations.

Design Document	Line Items
Bill of Materials	Number of sensors
	Sensor model number(s), as determined by mounting height
	Sensor power and networking
	Mount type and number of mounts
	Additional infrastructure, such as cabinets, cables, etc.
Installation document, such as a Site Installation Specification, typically showing sensor locations on a top-down floor plan	Use: Visio / AutoCAD / other
	Floor plan and coverage must be scaled
	Show measurements from at least two fixed objects (walls, doors) to identify the precise location on the ceiling where the sensor should be installed
	Specify ceiling heights

Determining How Many Sensors You Need

To Determine...	You Need to Know...
The number of and type of sensors needed	The height of the ceiling at the door/coverage area
	The width of the door/coverage area
	The current (or planned) location(s) and heights of ceiling fixtures in the area(s) where the sensor(s) will be installed
How to connect to and get data from the sensors	How the sensors will be networked
	Where the network connection/POE source will be located (for cabling)
	A general idea of the cabling scope

You can gather this information from the following sources:

- Created and provided by someone else:
  - Floor Plans – General Layout
  - Reflective Ceiling Plans (RCP's)

- Previous Site Survey Output
- Existing Pictures

- Gathered and obtained by you via on-site inspection

Determining Installation Locations

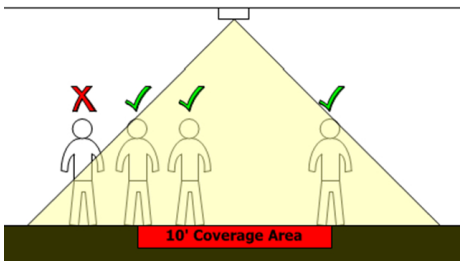
After you have determined how many sensors are needed, you must determine the optimal location for installing each sensor to capture the desired behavior within the area of interest:

1. Refer to the site survey information to determine the installation height for the sensor in this area of interest.
2. Determine the desired coverage area where the behavior to be captured would occur in the area of interest.
3. Determine the number of sensors required to completely cover the area of interest. For instance, if the area of interest is 12′ x 32′ and the coverage area at the installed height is 12′ x 16′ then it would require two sensors to cover the area end-to-end.
4. Identify the optimal location for placing each sensor in the physical space, where the desired behavior would be as close the center as possible. Understand that the sensor's optimal placement may also create issues with/for other objects within the view of the sensor. See Identifying the Optimal Installation Location.

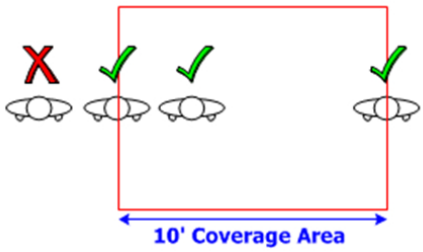
Determining Sensor Tracking Coverage Areas

The sensor identifies an object as a person by height calculations and identifying the center of mass. To be tracked, a person must be in the sensor's view from head to feet. Red coverage box in the following figures shows where people will be tracked. If a person's center of mass is within the red coverage box, they are tracked by the sensor. However, even if *most* of a person is viewable through the sensor (e.g., from shoulders down to feet), they still may not be tracked.

Elevation view

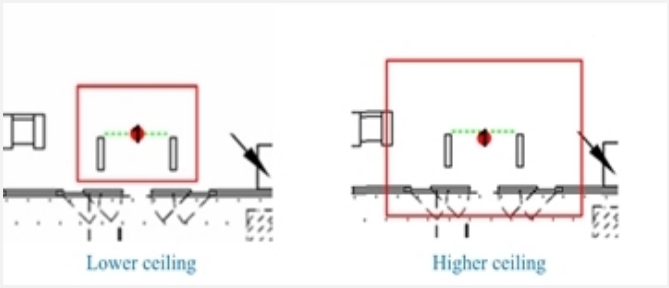
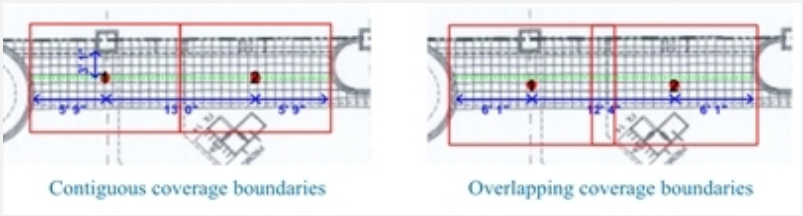
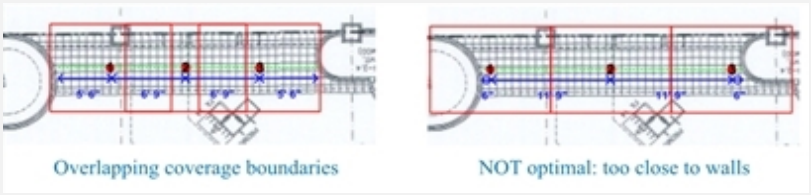


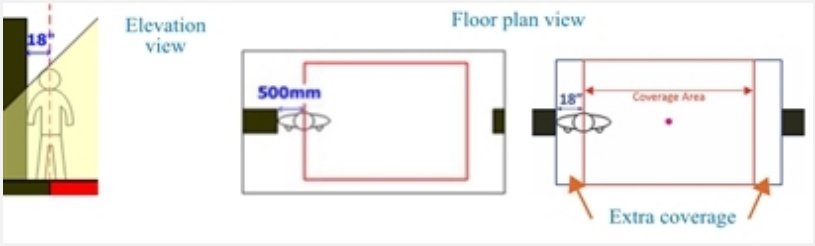
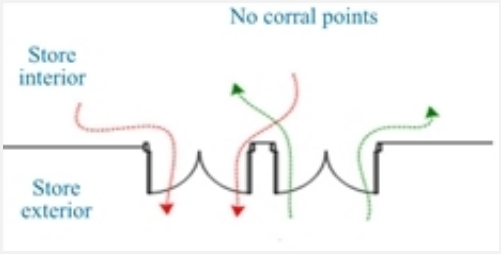
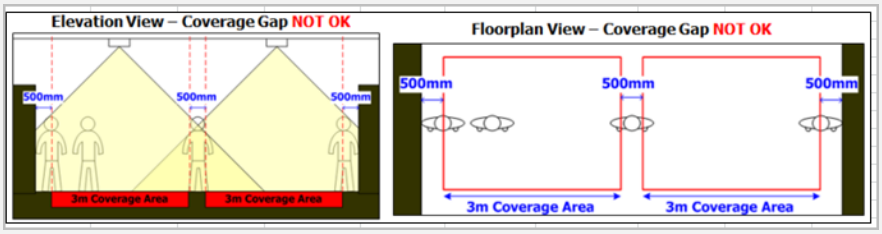
Floor plan view



Identifying the Optimal Installation Location

The best location is where the coverage gives you the view to capture the desired behavior and deliver the desired metrics. For optimal performance, follow Mounting a 3D Gen 2 Sensor. Existing physical characteristics of the site may present design challenges.

Qualifying Position	Considerations
Entrance	Position sensors directly over proposed counting line locations to maximize opportunity for acquisition. This is more important in lower ceilings where coverage is limited. When coverage is not an issue, ensure sensor is mounted over 1m from walls and moving doors for optimal performance. Ceiling height affecting coverage area 
Wide doorway	Use two sensors side-by-side to cover the wide doorway. Contiguous coverage between the sensors is necessary to eliminate gaps. Wide doorway coverage 
	When possible, avoid positioning sensors 1m or less from the door edge (in mall-type stores) – use more overlap instead. Optimal position for edge location 

Qualifying Position	Considerations
Side/extra wall coverage	Extra coverage can be gained in open entrances that have hard obstacles on the sides of the entrances, such as mall entrances, as people approach the entrance walls. Since most people's center of mass rarely comes within 0.5 m (18 in.) of a wall beside them, extra coverage is gained at the walls. This only holds true at the walls — not at coverage boundaries between two sensors. So, if you install two sensors, the extra coverage gained at the walls is still only the 0.5 m (18 in.) beside the walls. Side wall coverage gains  These coverage gains are most likely in the following situations: ■ Doorways with swinging or sliding doors ■ Doorways with security panels ■ Areas of low traffic (under 50 tracks per hour) Side wall coverage gains are only possible in situations where the track crosses the sensor's field of vision for the amount of the minimum track distance threshold, which by default is 90 cm (3 ft). NO side wall coverage gains  NO coverage gains between two sensors 

Verifying the Solution Design

Before beginning the installation process, perform the following steps to verify the design solution for quality assurance:

1. Confirm that the design has the same information as the Site Survey Output (e.g. ceiling heights, number of doors, or checkout lanes).
2. Confirm that each sensor is being installed within allowable specifications for the chosen lens type at the identified height of installation.
3. Confirm that the coverage area defined for the sensor's view is correct and that coverage sees the amount of space needed to capture the desired behavior at:
    - Doors
    - Queues
    - Points of Interest
4. Complete a risk assessment to identify any potential view obstructions in site photographs. Give special consideration to:
    - Changing ceiling heights
    - Physical objects in the view of the sensor, such as columns, cash delivery tubes, large signs or light fixtures, etc.
5. Verify that the Site Installation Specifications correctly identifies the number of sensors and that the orientation for each sensor is correct.

Setting up the Sensor

Using the Brickstream sensor requires following the instructions in this book to preconfigure and install the sensor, and then configure the supporting firmware. The following section provides you with step-by-step instructions for configuring the sensor's network connectivity, pointing it to the servers, and setting the various options for delivering the data from the sensor.

Using the Web Interface

The Brickstream sensor includes the browser-based web interface, which allows you to configure and manage the sensor directly. Be sure that your computer meets the following browser requirements so that you can fully access the web interface.

Browser Requirements

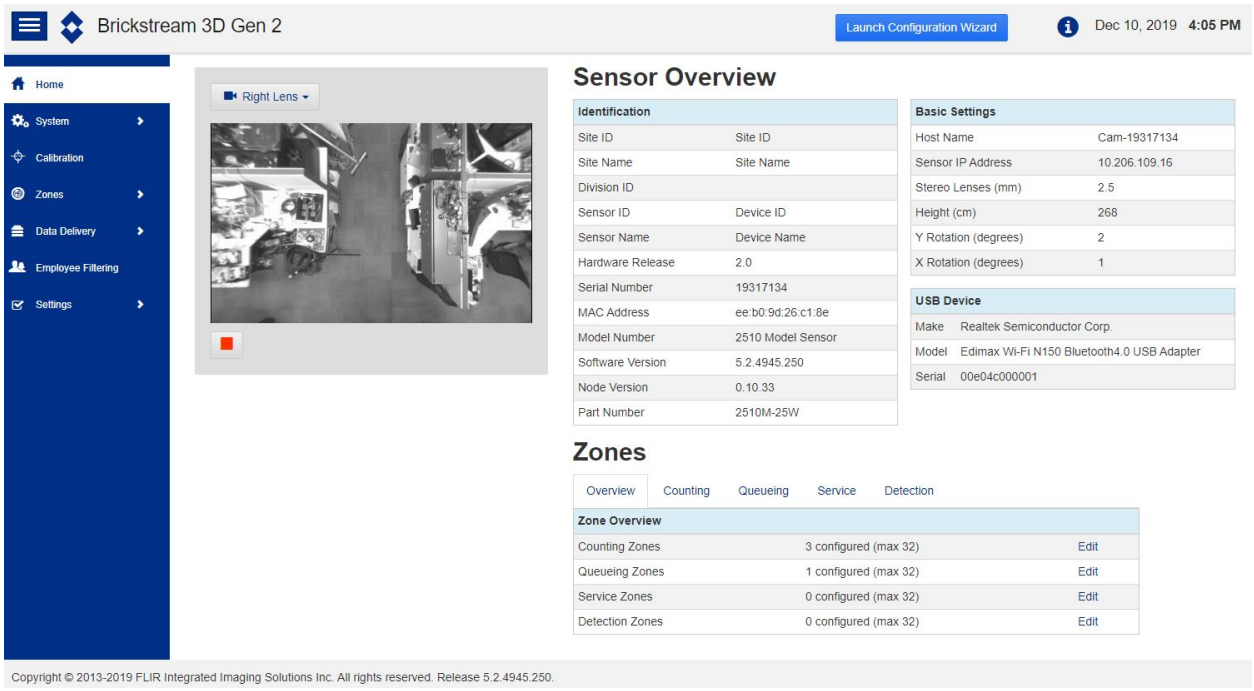
The following browsers are compatible with the sensor web interface:

Platform	Browsers	Versions
Mac	Safari	Current
Windows	Internet Explorer	10.0 and newer
	Mozilla Firefox	20.0 and newer
	Google Chrome	55 and newer

Accessing the Web Interface

To access the web interface to preconfigure the sensor, use the default IP address of 192.168.1.7. All sensors are shipped to customers with this default IP address. Refer to Setting the Network IP Address for detailed instructions on how to change the default IP address to a client network IP address.

> **Note:** The sensor's firmware version is in the footer of the sensor web interface.



Navigation

The web interface consists of the following menu options with supporting submenus.

Menu Item	Uses
Home	Provides access to video and data streams, an overview information about the sensor, and links to edit counting, queuing, service, and detection zones
System	Importing and exporting sensor configurations, and licensing, upgrading, and remotely rebooting the sensor, accessible from the System submenu items
Calibration	Setting the height detection and filter parameters to achieve optimal tracking and performance levels from the sensor
Zones	Setting up counting, queuing, service, and detection zones, as well as configuring path linking, and zone parameters that the sensor uses to monitor activity and service metrics, accessible from the Zones submenu items
Data Delivery	Configuring delivery settings for batch data, email, FTP, real time data, traffic (flow) maps, alerts, digital I/O, and AVI capture intervals, as well as accessing instant retrieval of data to send immediately, accessible from the Data Delivery submenu items
Settings	Establishing network connectivity, time synchronization, Device Manager connectivity, configuration of tracks, destinations for logs, password protection, and privacy options, accessible from the Settings submenu items
Information (top right icon)	Accessing logs and diagnostic information about the sensor

Functions of the Web Interface Buttons

The web interface offers the following methods to store changes to the sensor's configuration file.

Button	Description
Save	Uses the permanent, non-volatile memory (Flash) of the sensor to store the effects of a change. Saved values are applied and become the new reset values for the **Reset** button.
Reset	Restores the previewed or changed values back to the last saved values.
Defaults	Restores the current values back to the factory defaults. The values are not permanently saved until you click the **Save** button.

Preconfiguration Process

If the sensor is preconfigured to be accessible on the site network, skip this section and go to Using the Configuration Wizard.

Before installing the sensor at a customer site, complete the following preconfiguration process. During the preconfiguration stage, the Power-over-Ethernet (PoE) connection is set up, the sensor IP address is updated, and basic configuration settings are set up on the sensor. Refer to Powering the 3D Gen 2 Sensor for more information regarding the PoE connection set up.

Setting the Network IP Address

The sensor is shipped with a default IP address of 192.168.1.7. You need to set the sensor to use the IP address assigned by your Network Administrator so that it is accessible from your network. The following instructions describe how to connect to the sensor with a standalone PC for the purpose of changing the sensor's default IP address.

If your network uses 192.168.1.x as the default gateway, skip this section and go to Setting up a LAN or Wi-Fi Connection.

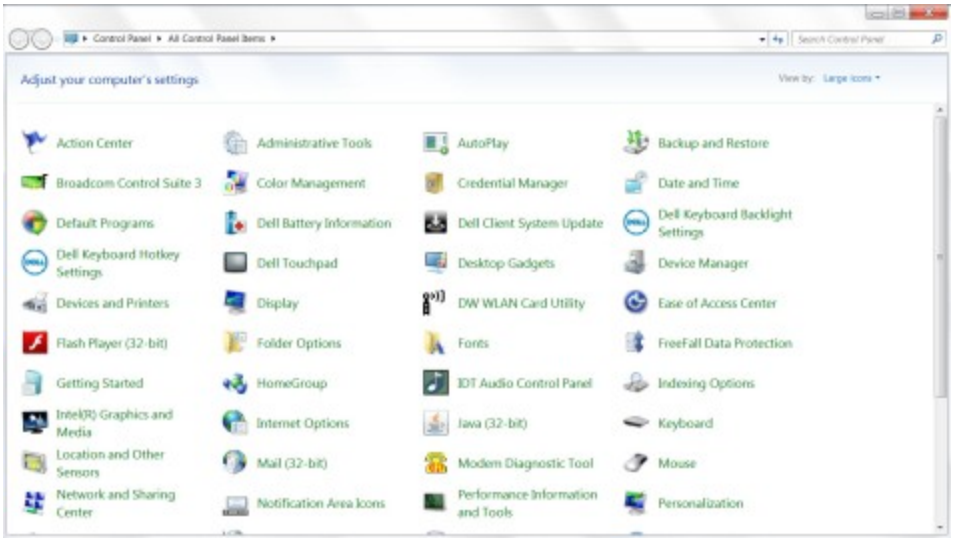
Connecting to the Sensor using Default Settings

Use the following steps to connect to the default IP address location of the new sensor.

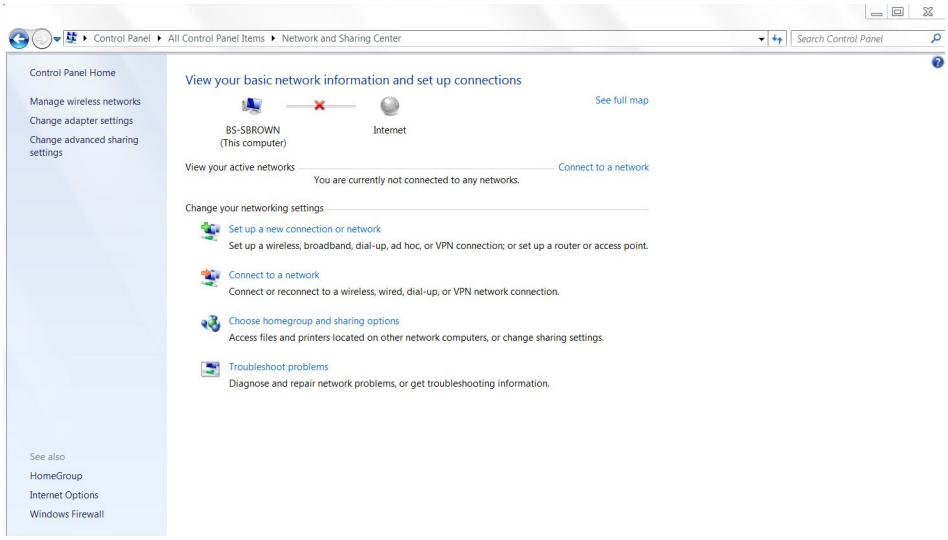
1. Turn on your PC, if it is not already powered.
2. Disconnect the CAT5e Ethernet cable from your PC.
3. Disable any wireless connections that you may have.

> **Note:** No other network connections may be active during this process.

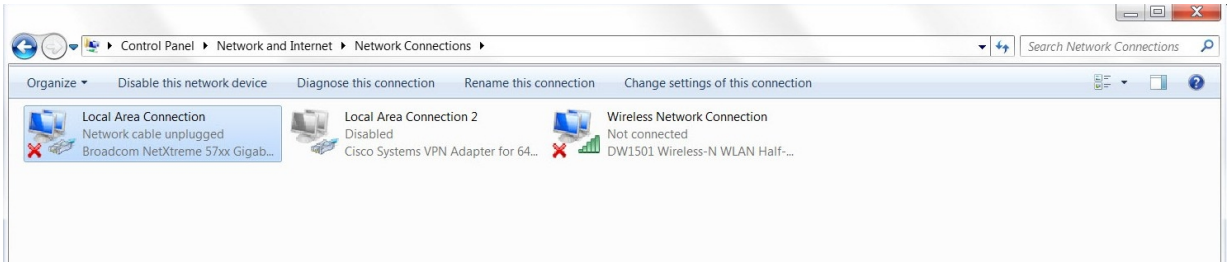
4. Click the **Start** icon and select **Control Panel** from the desktop of your PC. The **Control Panel** opens.



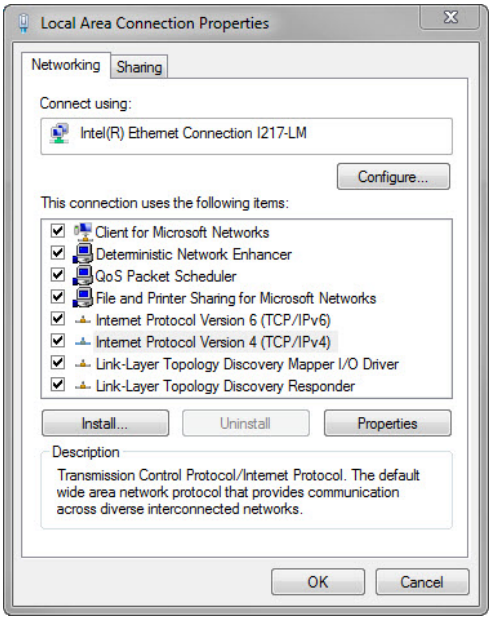
5. Double-click **Network and Sharing Center**. The **Network and Sharing Center** opens.



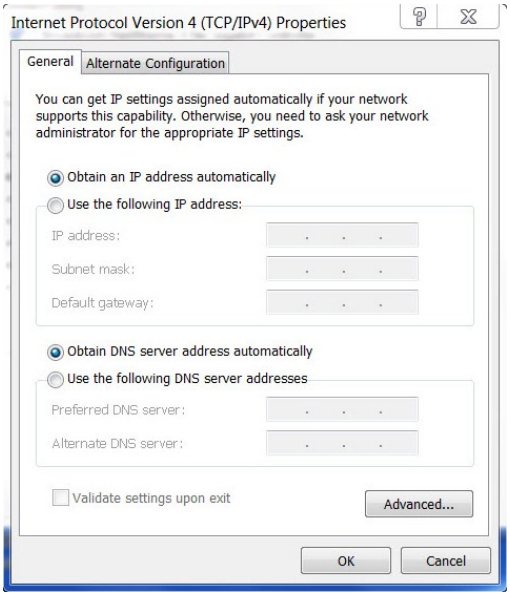
6. Click **Change adapter settings** in the left upper pane. The following window opens.



7. Click **Wireless Network Connection** and then click **Disable this network device**, if applicable.
8. Right-click on **Local Area Connection** and choose **Properties**. The **Local Area Connection Properties** window opens.



9. Select **Internet Protocol Version (TCP/IPv4)** and click **Properties**. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window opens.

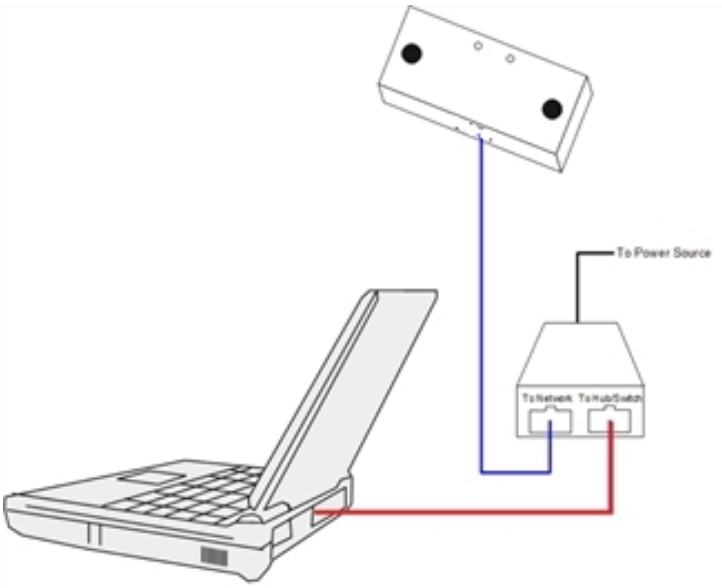


10. Take note of the current settings in this window so that you can change them back after you set the network parameters on the sensor. If these settings are not configured to be obtained automatically, record the initial values here:

TCP/IP Setting	Initial Value on PC
IP address	
Subnet mask	
Default gateway	
Preferred DNS server	

TCP/IP Setting	Initial Value on PC
Alternate DNS server	

11. Select **Use the following IP address**.
12. In the **IP address** field enter a new IP address in the range of 192.168.1.x where x is not 7 or 10. The last octet (final three digits) of your PC's IP address should be different from that of the sensor (i.e., sensor = 192.168.1.7 and PC = 192.168.1.11). The **Subnet Mask** field is automatically populated with 255.255.255.0.
13. Click **OK**. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window closes.
14. Click **Close**. The **Local Area Connection Properties** window closes.
15. Connect the sensor to your PC as shown and described in the following figure.



16. Plug the PoE injector into a power outlet.
17. Plug a CAT5e Ethernet cable from the port of the sensor to the **To Network** or **LAN/DC** or **OUT** port of the PoE injector.
18. Plug a CAT5e Ethernet cable from the **Hub/Switch** or **LAN** or **IN** port of the PoE injector to the Ethernet port in your PC.

> **Note:** The port labels may vary depending on the manufacturer of the PoE injector.

Using the Configuration Wizard

The Brickstream sensor web interface has a configuration wizard to help guide you through the set up of the sensor including calibration. All of the settings available in the wizard are also accessible on pages in the web interface. Both the wizard and the pages can be used to modify the settings at any time during the sensor's use.

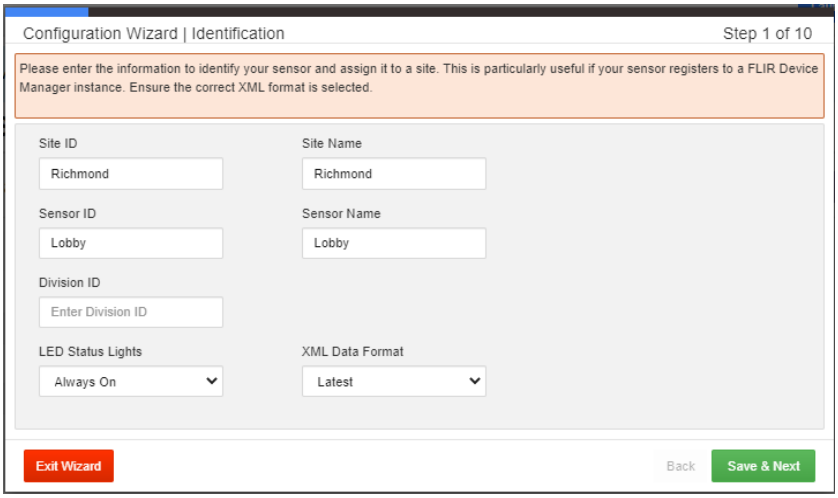
Before beginning the setup, ensure you have configured a PC to connect to the default IP address of the sensor, described in Setting the Network IP Address. If your network uses 192.169.1.x as the default gateway, you do not need to do this step.

Each page of the wizard has a Save button that progresses you to the next page. If you exit the wizard without using all the pages, information you have saved to that point is in effect and not discarded.

1. Open a web browser and enter **http://192.168.1.7** into the URL address bar, and then press **Enter**. The main page of the 3D Gen 2 web interface opens.
2. In the top right, click Launch Configuration Wizard.

Step 1 of 10—Identification

1. On the Identification page, enter the information to identify the sensor with a site and division. This information is particularly useful if using the sensor with the FLIR Device Manager.
2. Select from the drop-down whether LED status lights remain always on (default) or if they should turn off after a selected time.
3. Select from the drop-down the XML data format to use. The default (and recommended) selection is Latest.
4. Click **Save & Next**.



Note: This information is also on the Settings->Device Identification page.

Step 2 of 10—Date and Time

The date and time of the sensor can be set automatically through the time server or manually through the web interface. FLIR recommends using a time server as a manual setting is subject to drift and can become inaccurate.

> **Note:** The sensor does not have an internal clock and so does not increment time when powered off.

When the sensor starts up it attempts a time sync with the time server. If a sync is not possible, the sensor reverts to the last known time until the next successful sync. If the sensor was shut down due to loss of power, the last known time may be inaccurate. If automatic time syncing fails, a manual time setting is necessary.

1. From the **Time Zone** drop-down, select the time zone of the sensor's site.
2. From the **Time Server Protocol** drop-down, select an appropriate protocol.
3. In the **IP or Host Name** field, enter the IP address of the server to be used for time sync.

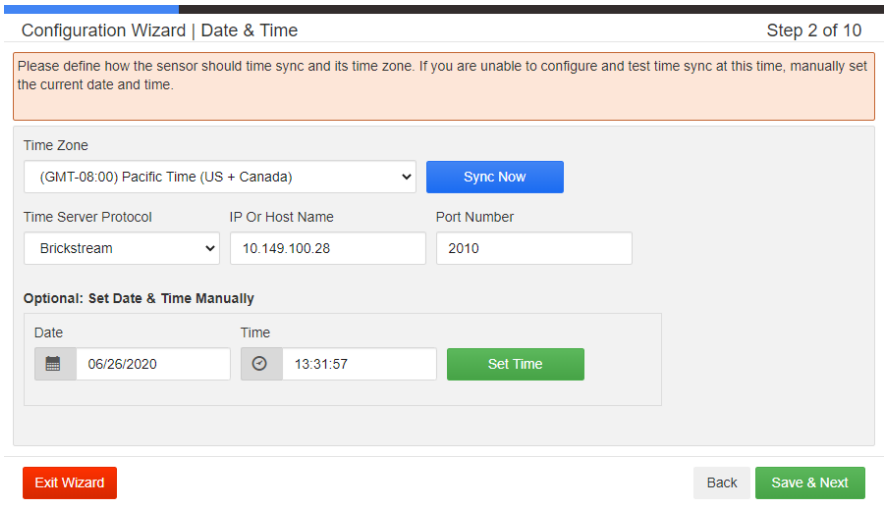
> **Note:** The time server should run on a server that is either on the same network as the sensor (requires no internet connectivity) or on a server that has a public IP address (requires internet connectivity). The time server sets the sensor time to UTC time, therefore the time server can be running in any time zone.

4. In the **Port Number** field, enter the port number from which the sensor should attempt to get a time synchronization. The default port depends on the protocol selected:

Protocol	Default Port
Brickstream	2010
Daytime	13
SNTP	123

Note: To use the Brickstream proprietary time sync protocol you must use Device Manager to provide the time sync. The time synchronization port and data delivery port can be sent to the same IP address and port if necessary, except when opting for either daytime or SNTP protocol.

5. Click **Sync Now** to test the connection of the time sync server. A time sync request is immediately sent to the IP address and port specified. A success or failure message is displayed at the top of the page depending on the synchronization outcome.
6. Alternatively, you can set the date and time manually and click **Set Time**.
7. Click **Save & Next**.



Note: This information is also on the Settings->Basic Settings page, Date and Time tab.

Step 3 of 10—User Management

The web interface can be password protected to prevent unauthorized users from accessing the sensor. When enabled, the web interface prompts users for a username and password before allowing them to view any of the sensor's web pages. By default, password protection is disabled.

The user defined in the Configuration Wizard is an administrator who has access to all the features of the sensor. An operator user with access limited to daily tasks or maintenance of the sensor, and a viewer user with access limited to the occupancy dashboard, can be created on the Basic Settings - Web Server tab. See Setting the Web Server Information.

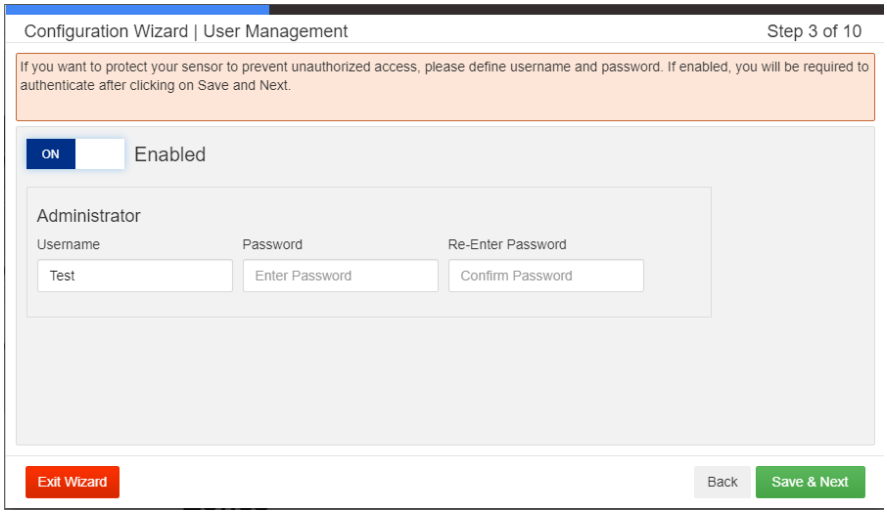
1. Click the **Enabled** switch to ON.

   The fields become active.

2. In the **Username** field, enter a username.

> **Note:** Both Username and Password fields are case sensitive.

3. In the **Password** field, enter a password. Passwords can be up to 16 characters. Valid characters are 0-1, A-Z, a-z, and any of the following special characters:
   @ !#$%'()*+,-./:;|=^~?_
4. In the **Re-Enter Password** field, re-enter the password.
5. Click **Save & Next**. You are then prompted to enter the name and password for authentication.



> **Note:** This information is also on the Settings->Basic Settings page, Web Server tab.

Step 4 of 10—Privacy Settings

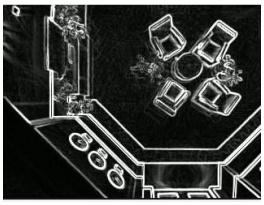
Warning! After saving the privacy settings, removing the privacy settings requires using the physical Reset button on the sensor.

Privacy options allow you to prevent AVI captures from the sensor and to mask live video image streams to prevent anyone from viewing images from the sensor.

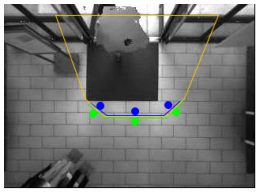
1. Select the video overlay from the following options:

None (default)

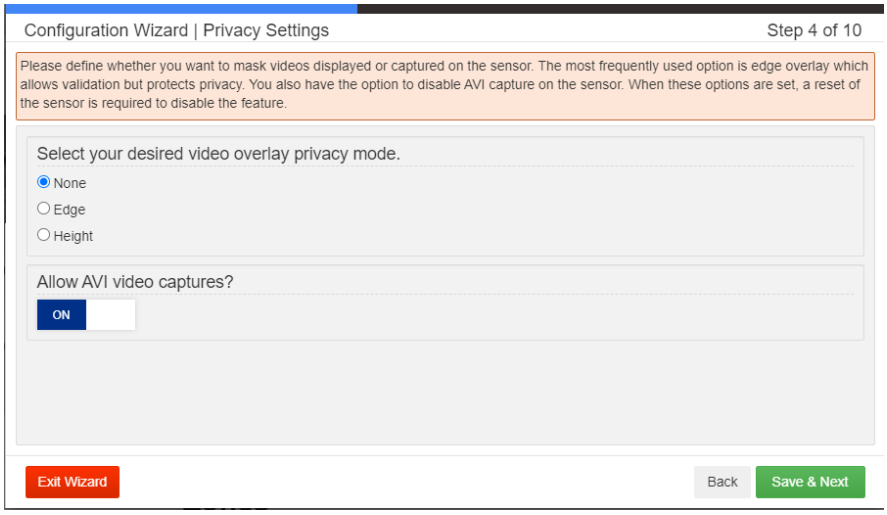
Edge



Height



2. AVI Capture is enabled by default. To disable, click the **AVI Capture** switch to OFF.
3. Click **Save & Next**.

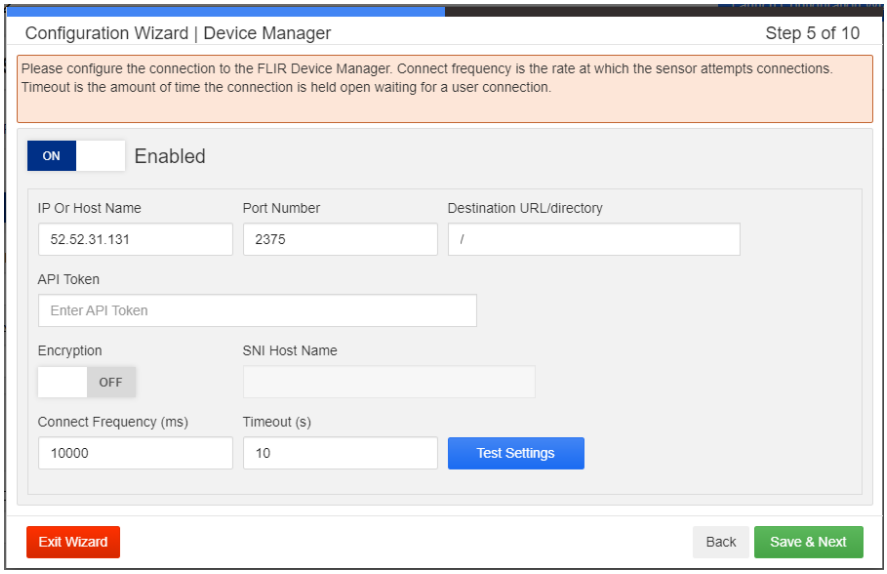


Note: This information is also on the Settings->Basic Settings Privacy page.

Step 5 of 10—Device Manager

If using the FLIR Device Manager, enter the following information to point the sensor to the Device Manager Server.

1. Click the **Enabled** switch to ON. The fields become active.
2. In the **IP or Host Name** field, enter the IP address or name of the host where the Device Manager Server is running.
3. In the **Port Number** field, enter the port number that you used when you started the Device Manager Server or use the port number provided to you by your Network Administrator. The default value is **2375**.
4. In the **API Token** field, enter the token. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
5. To enable encryption, click the **Encryption** switch to ON and enter the **SNI Host Name**. An encrypted connection to the Device Manager is supported on Device Manager version 5.0 or later.
6. In the **Connect Frequency** field, enter the frequency (in milliseconds) that the sensor checks the Device Manager Server for connection requests. The default value is 10000.
7. The default setting for **Timeout** is 60 seconds. If your network is slower, increase this value to prevent the sensor from timing out before connecting to the Device Manager server.
8. Click **Test Settings** to test the connection of the Device Manager server. A Device Manager server request is immediately sent. A success or failure message is displayed at the top of the page depending on the outcome.
9. Click **Save & Next**.

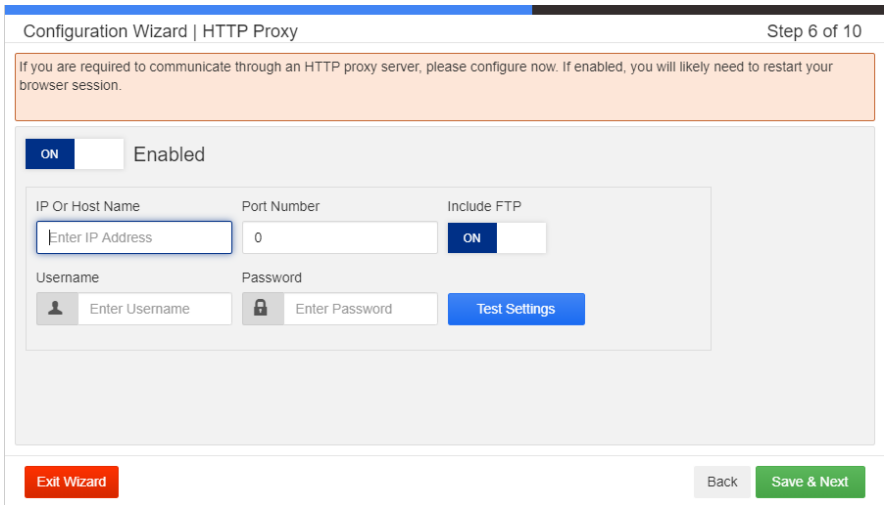


Note: This information is also on the Settings->Basic Settings page, Device Manager tab.

Step 6 of 10—HTTP Proxy

The sensor supports using an HTTP proxy server for network access.

1. Click the **Enabled** switch to ON. The fields become active.
2. In the **IP or Host Name** field, enter the IP address or host name for the proxy server.
3. In the **Port Number** field, enter the port number to be used for accessing the proxy server.
4. By default, FTP traffic is included with traffic routed through the proxy. If you want to exclude both AVI and data delivery via FTP from using the proxy server, click the **Include FTP** switch to OFF to disable it.
5. Enter the username and password.
6. To confirm that the settings are correct, click **Test Settings**.
7. Click **Save & Next**.

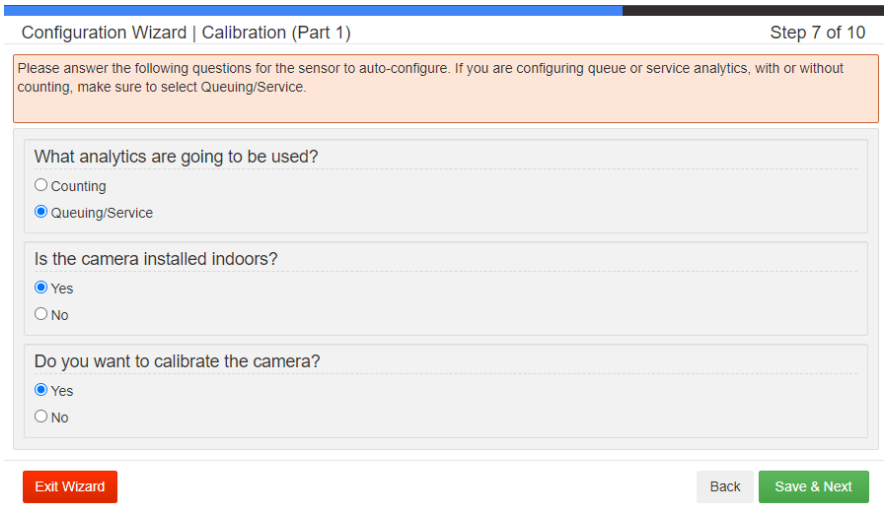


Note: This information is also on the Settings->Basic Settings page, HTTP Proxy tab.

Step 7 of 10—Calibration (Part 1)

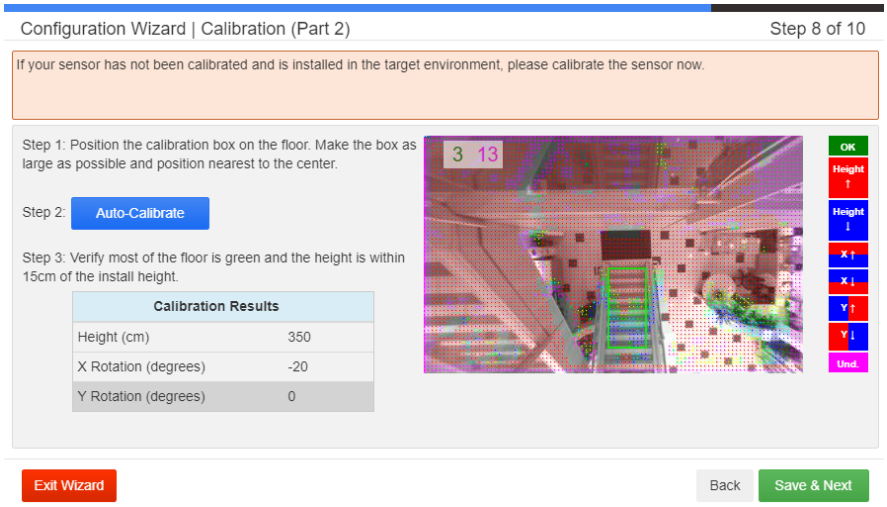
To begin the calibration process, answer three questions. The answers help set parameters to appropriate values for your installation and application.

1. What analytics are going to be used?
   - Counting
   - Queuing/Service. Select this option if configuring queue or service analytics (with or without counting)
2. Is the camera installed indoors?
3. Do you want to calibrate the camera?
   - If you select No, the wizard skips step 8.
4. Click **Save & Next**.



Step 8 of 10—Calibration (Part 2)

1. In the video pane, position the green box following these guidelines:
    a. Ensure that area within the box is as large as possible while only containing the floor, no walls or other objects, and minimal or no pink shaded (undefined) areas.
    b. If the box includes displays, walls, other objects, or pink shaded areas, click it and drag to a different section of the image. If needed, you can click on the corners of the calibration box and resize it, or click in the middle of the box and move the entire box so that it only covers the floor.
2. Click **Auto-Calibrate**. After several seconds, the sensor automatically calculates the height (cm), and X and Y rotation.
3. Look at the height and rotation numbers to ensure that they are reasonable using the following guidelines:
    - Calculated height should be within 20% of visual height estimate.
    - X and Y rotation should be within 10 degrees of visual angle estimate.
4. Click **Save & Next**.



Note: This information is also on the Calibration page.

Step 9 of 10—Data Delivery

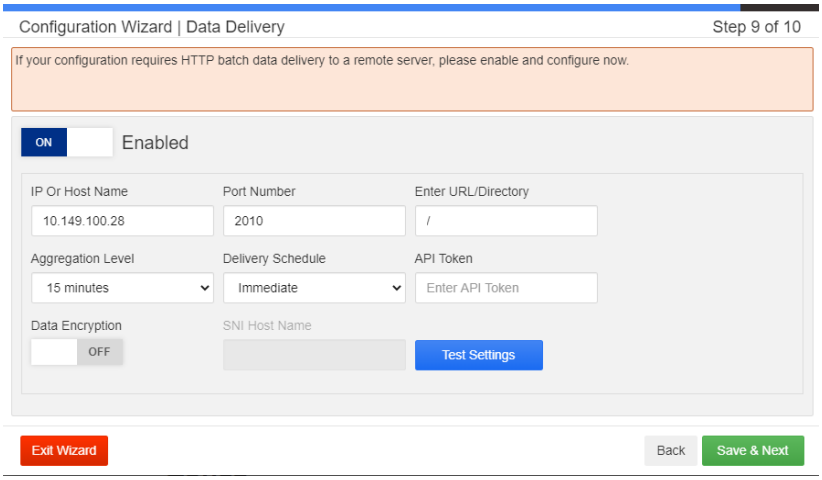
1. Click the **Enabled** switch to ON. The fields become active.
2. In the **IP or Host Name** field, enter the IP address of the server to receive data from the sensor.
3. Enter the **Port Number** to which the sensor should attempt to deliver data.
4. If the sensor needs to send data feeds to a specific URL address in the HTTP POST, in the **Destination URL/directory** field, enter the URL address.

> **Note:** Use '/' if you have not been directed to change this field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

5. From the **Aggregation Level** list select how often to aggregate the count report in minutes (1, 5, 15, 30, or 60).
6. From the **Delivery Schedule** list choose how frequently to deliver the aggregated data sets (Immediate - 1 minute, Immediate - aggregation, 15 minutes, 30 minutes, or 60 minutes). The metric data is delivered at this interval and at the aggregation level you selected in the previous step. The immediate selection randomizes the delivery time over a 1 minute window (Immediate - 1 minute) or over the aggregation level window (Immediate - aggregation).

> **Note:** The sensor delivers at a random frequency over the selected interval in order to limit the number of concurrent connections required on the server side.

7. In the **API Token** field, enter the token. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
8. If you want the batch data stream to be encrypted:
    a. Click the **Data Encryption** switch to ON.
    b. In the **SNI Host Name** field, enter the Server Name Indication (SNI) hostname or IP address for the host.
9. Click **Test Settings** to confirm entries.
10. Click **Save & Next**.



Note: This information is also on the Data Delivery->Batch page.

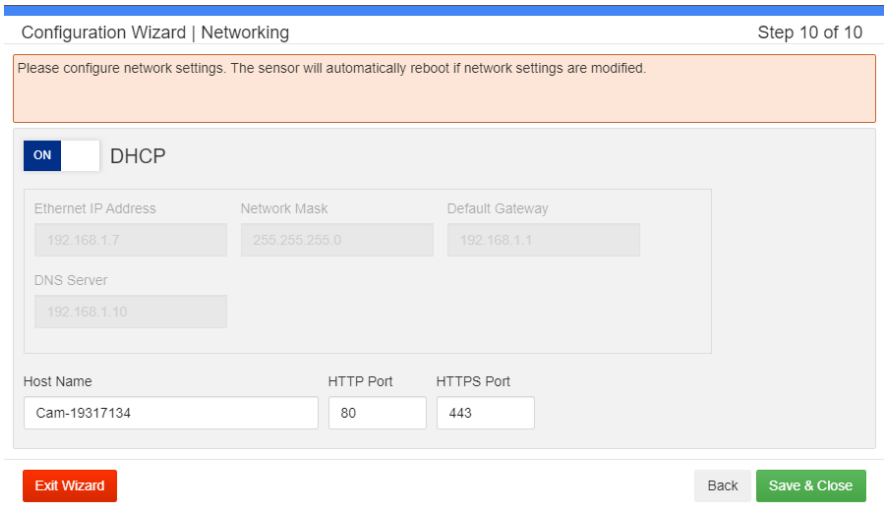
Step 10 of 10—Networking

The networking step allows you to set the IP address for the sensor or to use DHCP if your network has a DHCP server. If using Wi-Fi, exit the wizard and go to the Settings->Basic Settings page, Wi-Fi tab.

> **Note:** Saving changes to the networking settings automatically reboots the sensor.

1. If using a DHCP server, click the DHCP switch to ON.
2. If using a fixed IP address, click the DHCP switch to OFF and enter the following:
   - Sensor IP Address
   - Network Mask
   - Default Gateway
   - DNS Server
3. Enter the HTTP/HTTPS settings:
   - Host Name
   - HTTP Port
   - HTTPS Port
4. Click **Save & Close**.

> **Note:** If you change the IP address on a sensor and save your changes, you lose connectivity to the sensor for several seconds while it is being enabled with the new IP address.



> **Note:** This information is also on the Settings->Basic Settings page, IP Settings tab and Web Server tab.

Configuring the Basic Settings

The Basic Settings page allows you to define the:

- networking configuration (LAN or Wi-Fi)
- web server location
- date and time synchronization
- logging delivery
- Device Manager server
- HTTP proxy

> **Note:** These settings, except for Wi-Fi and logging, are also available through the Configuration Wizard.

There is a **Reset** link on every Basic Settings tab that returns you to the last saved settings. You may have to refresh the page.

Setting up a LAN or Wi-Fi Connection

The sensor is shipped with a default IP address of 192.168.1.7. You need to set the sensor to use the IP address assigned by your Network Administrator so that it is accessible from your network. The connection to the network can be wired (LAN) or wireless (Wi-Fi). If both LAN and Wi-Fi are configured for use the networks must be on different subnets and the routers or switches must be able to manage the same device on two different subnets.

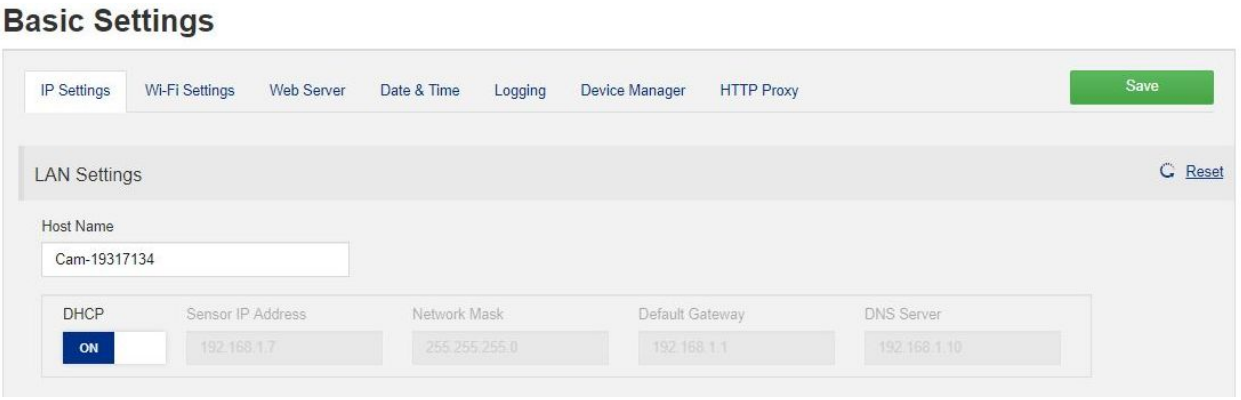
> **Note:** Saving changes to the networking settings automatically reboots the sensor.

Setting up a LAN connection can be done on the Basic Settings page or in the Configuration Wizard. Setting up Wi-Fi can only be done on the Basic Settings page.

> **Note:** Wi-Fi is available for sensors equipped with a USB Wi-Fi BLE dongle and Wi-Fi license. Check the Home page to verify the dongle is active. Connection to a Power over Ethernet (PoE) device is still required to power the sensor but a LAN connection is not required.

Using a LAN

1. On the **Settings>Basic Settings** page, if not already there, click the **IP Settings** tab.



2. The **Host Name** field is prepopulated with Cam-<sensor serial number>.
3. If your network uses DHCP, click the **DHCP** switch to ON. You do not need to enter any further information.

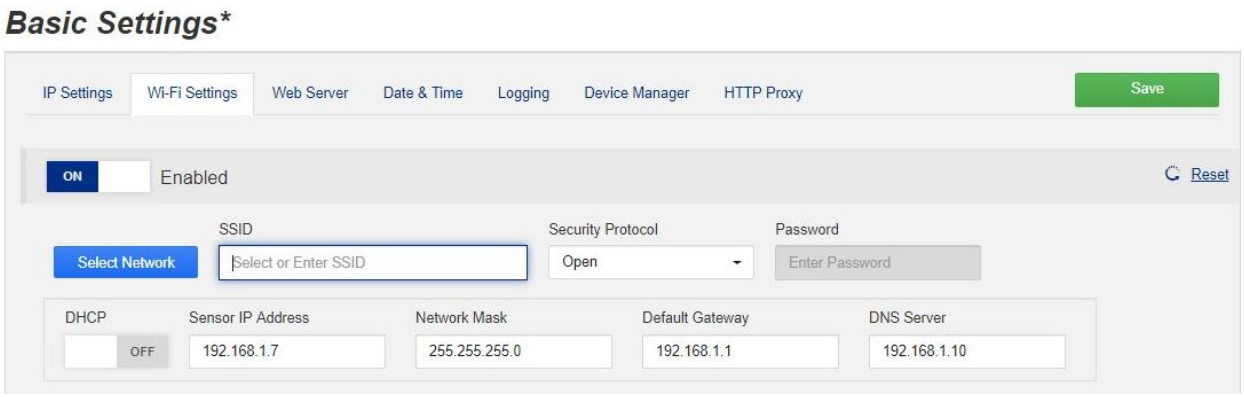
> **Note:** Even if your network is DHCP enabled, be sure to work with your network administrator to reserve a range of IP addresses for sensors at this location before choosing to use DHCP with the sensors.

> **Note:** Path linking is not supported on sensors that use a DHCP server for their IP addresses.

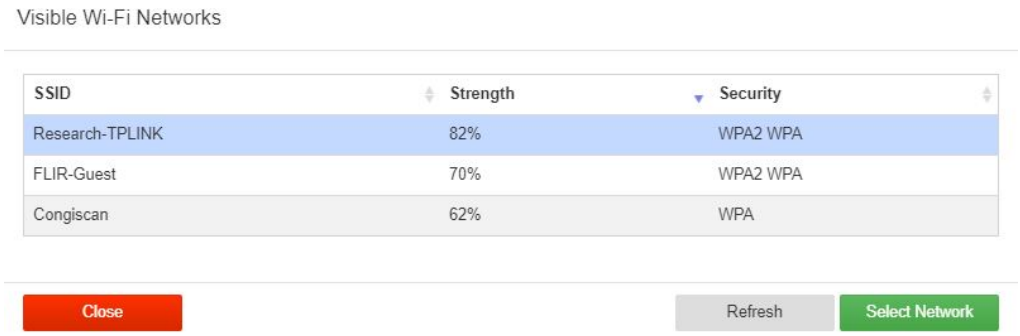
4. If your network does not use DHCP, click the switch to OFF and enter the following information:
   - Sensor IP Address
   - Network Mask
   - Default Gateway
   - DNS Server
5. Click **Save**.

Using Wi-Fi

1. On the **Settings>Basic Settings** page, click the **Wi-Fi Settings** tab.



2. Click the **Enabled** switch to ON. The fields become active.
3. If you are within range of the Wi-Fi network:
   a. Click **Select Network**. The Visible Wi-Fi Networks dialog opens.



   b. From the list, click your choice and click **Select Network**. (If the list does not contain your Wi-Fi network, click **Refresh**.)
   c. The SSID and Security Protocol are populated with your network selection.
4. If you are not in range of the Wi-Fi network:
   a. In the **SSID** field, enter the ID for the network.
   b. From the **Security Protocol** drop-down, select a protocol: Open, WEP, WPA, or WPA2.
5. If your protocol is Open, skip to Step 6, otherwise, enter the **Password**.
6. If your network uses DHCP, click the **DHCP** switch to ON. You do not need to enter any further information.

> **Note:** Even if your network is DHCP enabled, be sure to work with your network administrator to reserve a range of IP addresses for sensors at this location before choosing to use DHCP with the sensors.

> **Note:** Path linking is not supported on sensors that use a DHCP server for their IP addresses.

7. If your network does not use DHCP, click the switch to OFF and enter the following information:
   - Sensor IP Address
   - Network Mask
   - Default Gateway
   - DNS Server
8. Click **Save**.

Setting the Web Server Information

The sensor runs a web server to display the web pages. Web server settings include the ability to set password protection for three classes of user that access the sensor and the ability to upload TSL/SSL security certificates.

Server Configuration

Web server settings also include the ability to upload a PEM certificate and PEM key for TLS/SSL security. This allows users the flexibility to create and manage their own certificates and to update certificates that expire.

Certificates must be in PEM format. The file names must be cert.pem and key.pem.

Uploading certificate files is optional. FLIR provides a default set of files on the sensor. If there are no user-uploaded files, or if the uploaded files are incorrectly formatted or incompatible with each other, the sensor reverts to the default set of files.

Upgrading or downgrading the firmware version retains the user's uploaded files. Once uploaded, files can only be overwritten; they cannot be removed.

A user must be an administrator to be able to upload certificate files.

User Management

The sensor supports three distinct users with different levels of access.

An **Administrator** user is for setup operations and has access to all pages of the web interface and all features on the sensor.

An **Operator** user is for daily functions and maintenance of the sensor and has access to:

- Home page
- System—Histograms
- System—Reboot
- Calibration
- All zone pages
- Data Delivery—AVI capture
- Employee Filtering

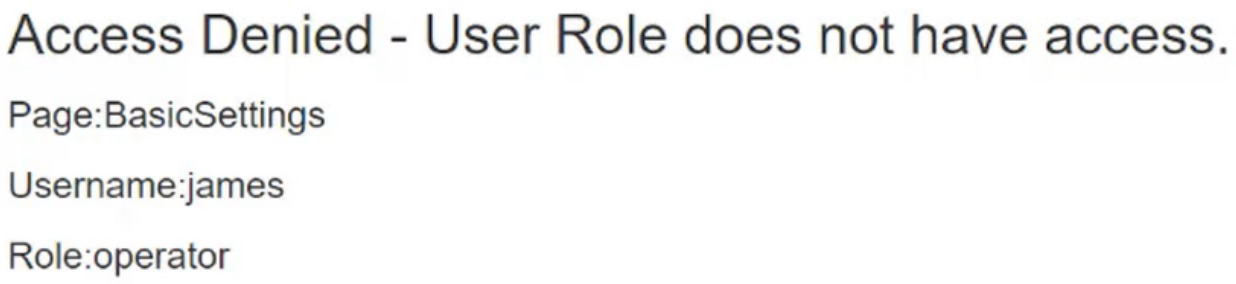
- Settings—Tracking
- Information—Logs
- Information—Diagnostics

A **Viewer** user can only view the Occupancy dashboard. No other functions are accessible.

You cannot create an operator or viewer without creating an administrator, but you can have only an administrator. If password protection is not enabled, access to all pages and features is as would be for an administrator.

User activity is logged with the username identifying who performed the action.

Operators and viewers cannot navigate to pages they do not have access to as the UI hides links to the administrator features. Nor can they view a page by entering the URL. Attempts to access invalid pages are logged and the user sees an Access Denied page.

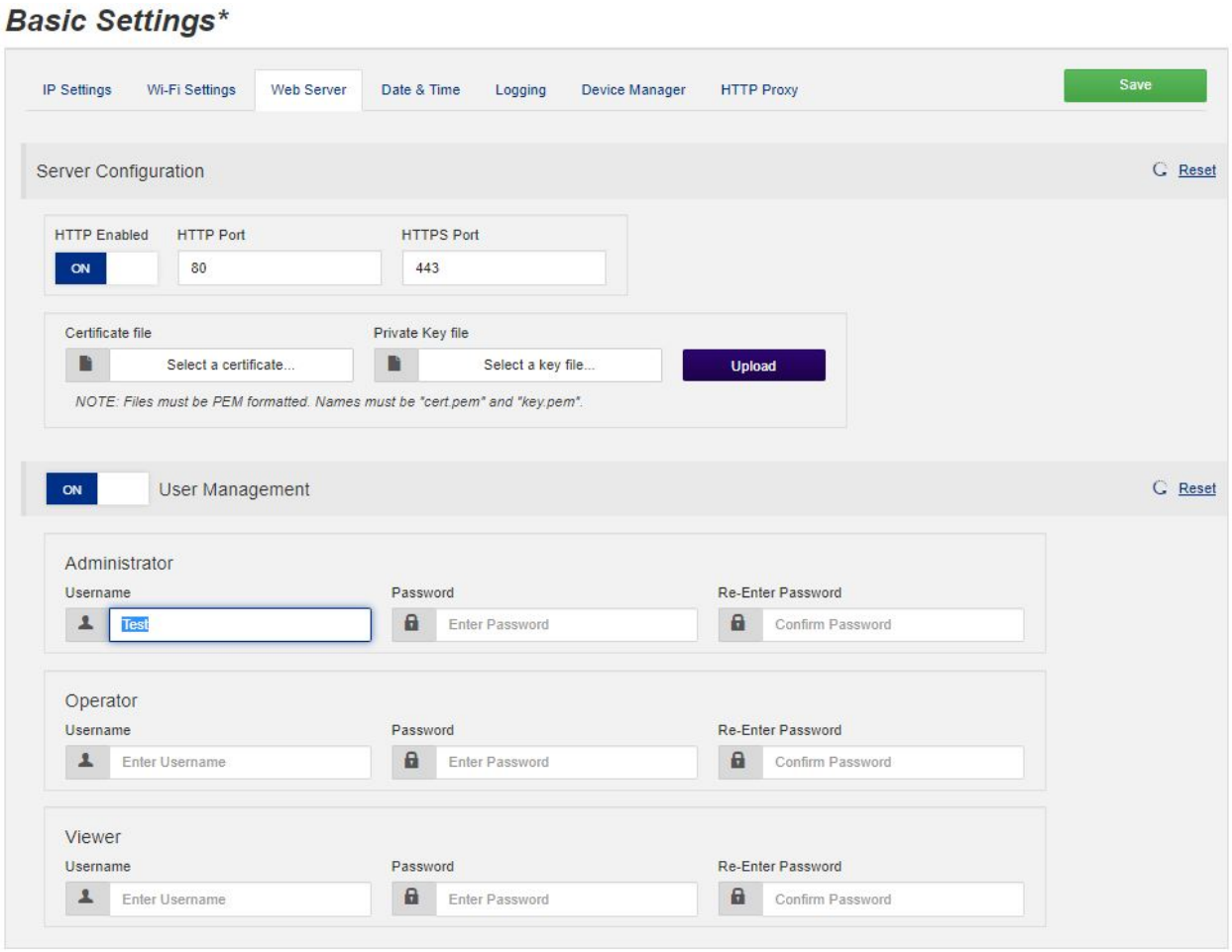


Usernames and passwords are case sensitive.

Passwords must be at least 8 characters long and contain at least one letter, one number, and one of the following special characters:

! # $ / % ' ( ) [ ] { } + - . , | = < > _ * ; ~ ? ^

1. On the **Settings>Basic Settings** page, click the **Web Server** tab.



2. If necessary to change from the defaults, enter the **HTTP Port** and **HTTPS Port**.
3. To disable HTTP, click the **HTTP Enabled** switch to OFF.
4. Click **Select a certificate** to browse to your PEM formatted certificate file. File name must be cert.pem.
5. Click **Select a key** file to browse to your PEM formatted key file. File name must be key.pem.
6. Click **Upload** to upload the certificate and key.
7. Click the **User Management** switch to ON. The fields become active.
8. For the Administrator user:
    a. In the **Username** field, enter a username.
    b. In the **Password** field, enter a password. Passwords must be at least 8 characters long and contain a letter, a number, and one of the following special characters:
    ! # $ / % ' ( ) [ ] { } + - . , | = < > _ * ; ~ ? ^
    c. In the **Re-Enter Password** field, re-enter the password.

9. For the Operator user:
    a. In the **Username** field, enter a username.
    b. In the **Password** field, enter a password. Passwords must be at least 8 characters long and contain a letter, a number, and one of the following special characters:
    ! # $ / % ' ( ) [ ] { } + - . , | = < > _ * ; ~ ? ^
    c. In the **Re-Enter Password** field, re-enter the password.
10. For the Viewer user:
    a. In the **Username** field, enter a username.
    b. In the **Password** field, enter a password. Passwords must be at least 8 characters long and contain a letter, a number, and one of the following special characters:
    ! # $ / % ' ( ) [ ] { } + - . , | = < > _ * ; ~ ? ^
    c. In the **Re-Enter Password** field, re-enter the password.

> **Note:** Both Username and Password fields are case sensitive.

11. Click **Save**. An authentication dialog appears.

12. Enter your saved credentials and click **Sign in**. If entering the operator's credentials, your access to features is restricted to the operator level.

If you lose your username or your password contact PCT-Support@flir.com.

Once logged in, a user stays logged in as long as the browser window is open and for an additional 30 minutes after the window is closed. Users can explicitly log out by clicking the Sign out button on the left menu bar.

To delete an operator you must be signed in as administrator. On the Basic Settings Web Server tab, clear the operator username field and click Save.

Note: Password fields intentionally appear blank for saved users.

Setting the Date and Time

The date and time of the sensor can be set automatically through the time server or manually through the web interface. FLIR recommends using a time server as a manual setting is subject to drift and can become inaccurate.

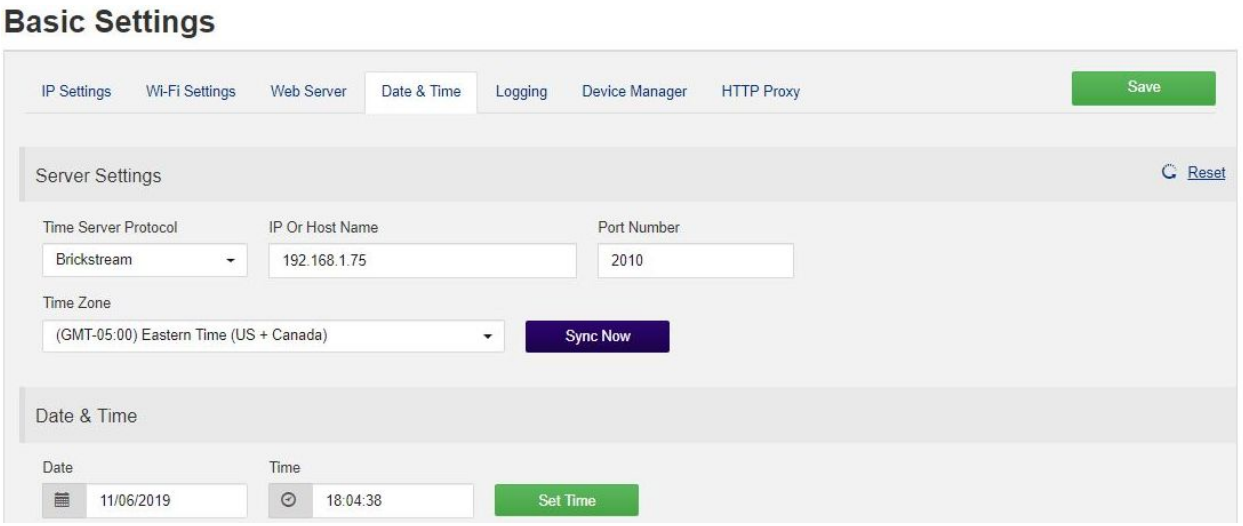
Note: The sensor does not have an internal clock and so does not increment time when powered off.

When the sensor starts up it attempts a time sync with the time server. If a sync is not possible, the sensor reverts to the last known time until the next successful sync. If the sensor was shut down due to loss of power, the last known time may be inaccurate. If automatic time syncing fails, a manual time setting is necessary.

Setting the date and time can be done on the Basic Settings page or in the Configuration Wizard.

Automatic Time Synchronization

1. On the **Settings>Basic Settings** page, click the **Date & Time** tab.



2. From the **Time Server Protocol** drop-down, select an appropriate protocol.

> **Note:** Contact your Network Administrator to determine which time server protocol and time server IP address to use. If there is no time server on the site network, go to Manual Time Setup.

3. In the **IP of Host Name** field, enter the IP address of the server to be used for time sync.

> **Note:** The time server should run on a server that is either on the same network as the sensor (requires no internet connectivity) or on a server that has a public IP address (requires internet connectivity). The time server sets the sensor time to UTC time, therefore the time server can be running in any time zone.

4. Enter the **Port** number from which the sensor should attempt to get a time synchronization. The default port depends on the protocol selected:

Protocol	Default Port
Brickstream	2010
Daytime	13
SNTP	123

> **Note:** To use the Brickstream proprietary time sync protocol you must use Device Manager to provide the time sync. The time synchronization port and data delivery port can be sent to the same IP address and port if necessary, except when opting for either daytime or SNTP protocol.

5. From the **Time Zone** drop-down, select the time zone of the sensor.
6. Click **Save**.
7. Click **Sync Now** to test the connection of the time sync server. A time sync request is immediately sent to the IP address and port specified on the **Date and Time Info** page. A success or failure message is displayed at the top of the page.

Manual Time Setup

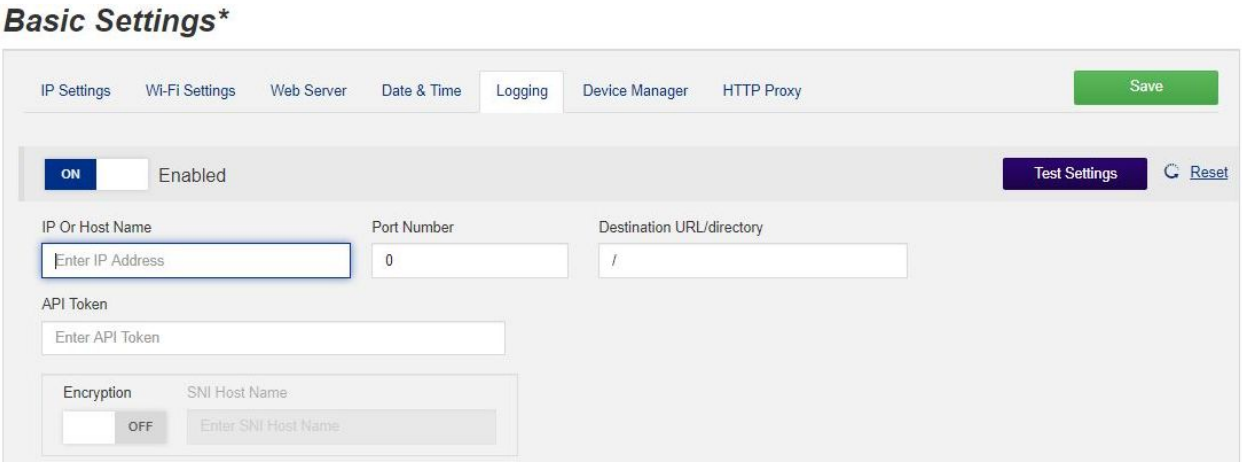
> **Note:** This is a one-time setting when time synchronization is not used. Manual time setup is subject to time drift.

1. In the **Date** field, enter the current date.
2. In the **Time** field, enter the current time.
3. Click **Set Time**.

Setting the Delivery Address for Logging

To receive and archive logs and alert messages, you must have an application running on the server that parses the XML files and writes them to a database or a log file.

1. On the **Settings>Basic Settings** page, click the **Logging** tab.



2. Click the **Enabled** switch to ON. The fields become active.
3. In the **IP or Host Name** field, enter the IP address of the server to receive data from the sensor.
4. In the **Port Number** field, enter the port number to which the sensor should attempt to deliver XML log and diagnostic data.
5. In the **Destination URL/directory** field, enter the URL if the sensor needs to send data to a specific URL in the HTTP POST. Set it to / if you have not been directed to change this field

> **Note:** This feature allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. In the **API Token** field, enter the API token. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.

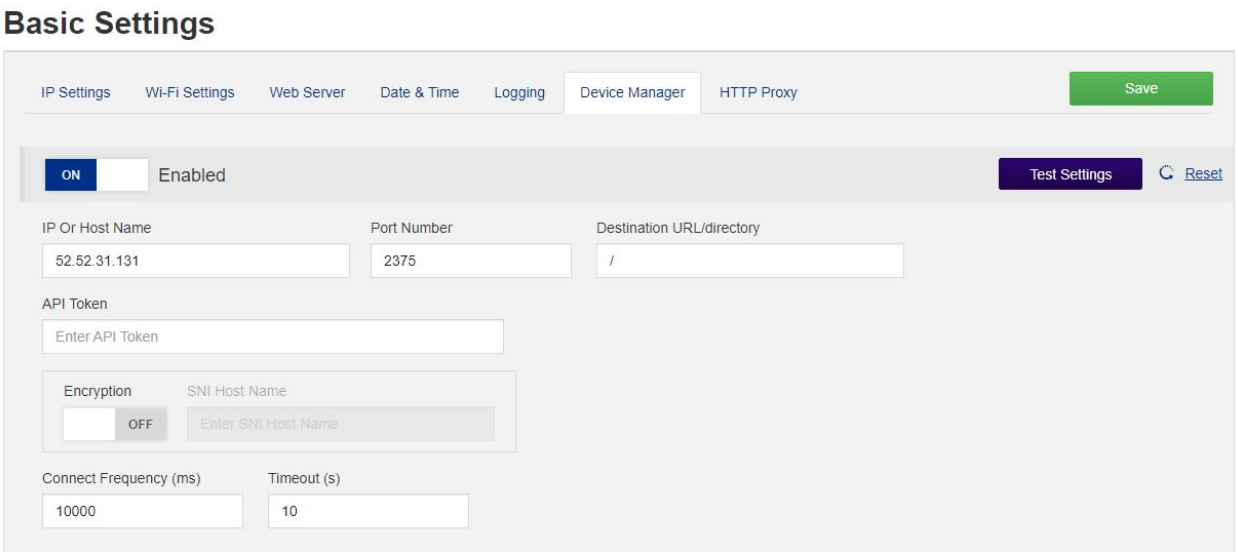
7. To enable encryption of the logging data stream:
   a. Click the **Encryption** switch to ON.
   b. In the **SNI Host Name** field, enter the Server Name Indication (SNI) for the host.
8. Click **Test Settings** to test the connection of the logger server. A logger request is immediately sent to the IP address and port specified. A success or failure message is displayed at the top of the page.
9. Click **Save**.

Setting the Device Manager Server

You can point the Brickstream sensor to the Device Manager Server.

Device Manager settings can be done on the Basic Settings page or in the Configuration Wizard.

1. On the **Settings>Basic Settings** page, click the **Device Manager** tab.



2. Click the **Enabled** switch to ON. The fields become active.
3. In the **IP or Host Name** field, enter the IP address or host name where the Device Manager Server is running.
4. In the **Port Number** field, enter the port number used for the Device Manager Server (may be provided by your Network Administrator).
5. In the **API Token** field, enter the token. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
6. To enable encryption, click the **Encryption** switch to ON and enter the **SNI Host Name**. An encrypted connection to the Device Manager is supported on Device Manager version 5.0 or later.
7. In the **Connect Frequency** field, enter the frequency (in milliseconds) that the sensor checks the Device Manager Server for connection requests. The default value is **10000**.

> **Note:** For large-scale implementations, we recommend setting this value as 20000 to reduce server load and network traffic.

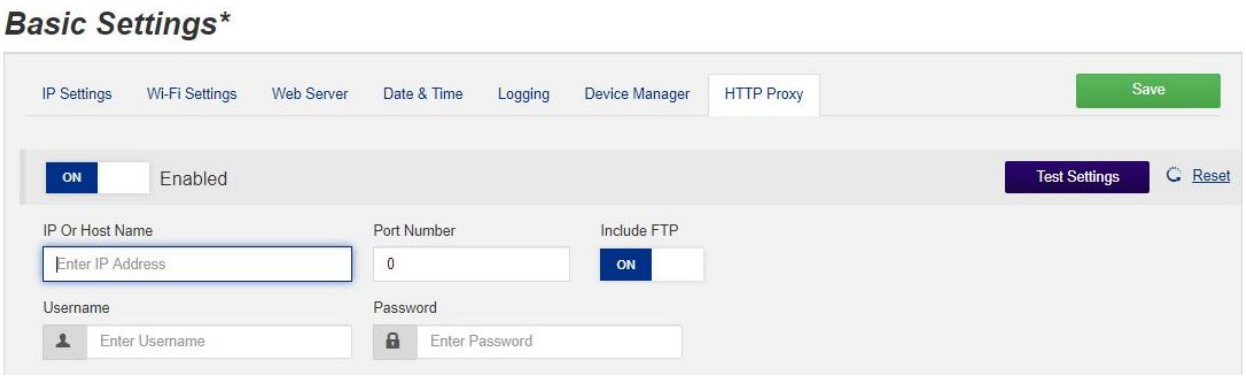
8. The default setting for **Timeout** is 10 seconds. If your network is slower, increase this value to prevent the sensor from timing out before connecting to the Device Manager server.
9. Click **Test Settings** to test the connection of the Device Manager server. A Device Manager server request is immediately sent. A success or failure message is displayed at the top of the page.
10. Click **Save**.

Configuring Proxy Settings

The sensor supports using an HTTP proxy server for network access.

Configuring proxy settings can be done on the Basic Settings page or in the Configuration Wizard.

1. On the **Settings>Basic Settings** page, click the **HTTP Proxy** tab.



2. Click the **Enabled** switch to ON. The fields become active.
3. In the **IP or Host Name** field, enter the IP address or host name for the proxy server.
4. In the **Port Number** field, enter the port number to be used for accessing the proxy server.
5. By default, FTP traffic is included with traffic routed through the proxy. If you want to exclude both AVI and data delivery via FTP from using the proxy server, click the **Include FTP** switch to OFF.
6. Enter the **Username** and **Password**.
7. Click **Test Settings**.
8. Click **Save**.

Defining the Device Identification

The Device Identification page allows you to identify the sensor and the site location, as well as specify the XML data format.

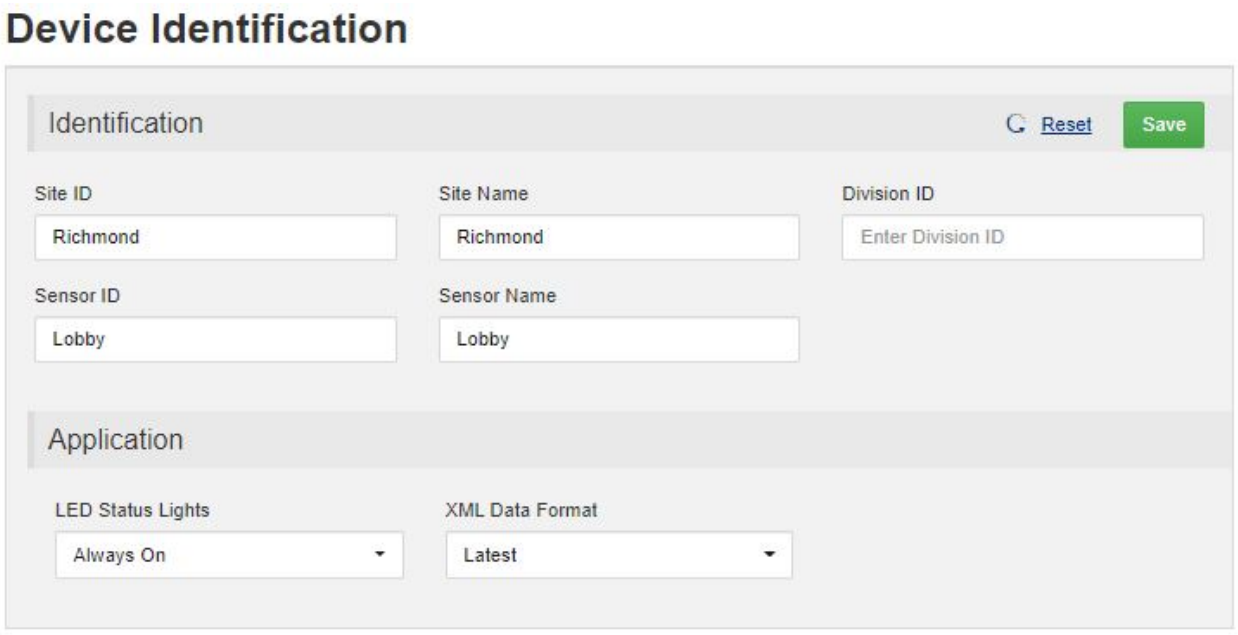
If you are using the Brickstream Device Manager to store metric data, you should set the Site ID. The Device Manager attempts to match the Site ID to a Site ID in the Operational Database in order to auto-

register the sensor to a site. Please consult the Device Manager documentation, or contact support for assistance.

> **Note:** These settings are also available through the Configuration Wizard.

There is a **Reset** link that returns you to the last saved settings. You may have to refresh the page.

1. Open the web interface to the **Settings> Device Identification** page.



2. Enter the following information:
   a. **Site ID**—classification for a store or site number.
   b. **Site Name**—classification for a store or site name.
   c. **Division ID**—classification to identify this sensor within a group of locations.
   d. **Sensor ID**—an alphanumeric code to uniquely identify the sensor within a site.
   e. **Sensor Name**—a brief name for the sensor.
3. From the **LED Status Lights** drop-down, select if you want LED lights to be always on, or to turn off after a defined time following a reboot. If a time is selected, the LED lights are on during the reboot to verify the startup sequence and then turn off once the selected time has passed.
4. From the **XML Data Format** drop-down, select a format to use for output data. The default (and recommended) selection is Latest. More detailed information about XML formats can be found in the *Programmer's Guide*.
5. Click **Save**.

Setting Data Delivery Options

The sensor supports the following data delivery options:

- Setting Batch Data Streaming Options
- Setting Real Time Data Delivery Options
- Setting Alert Delivery Options
- Setting Email Delivery Options
- Setting FTP Delivery Options
- Setting Traffic Map Delivery

Metric data is buffered in on-board memory for up to 200 days, following these rules:

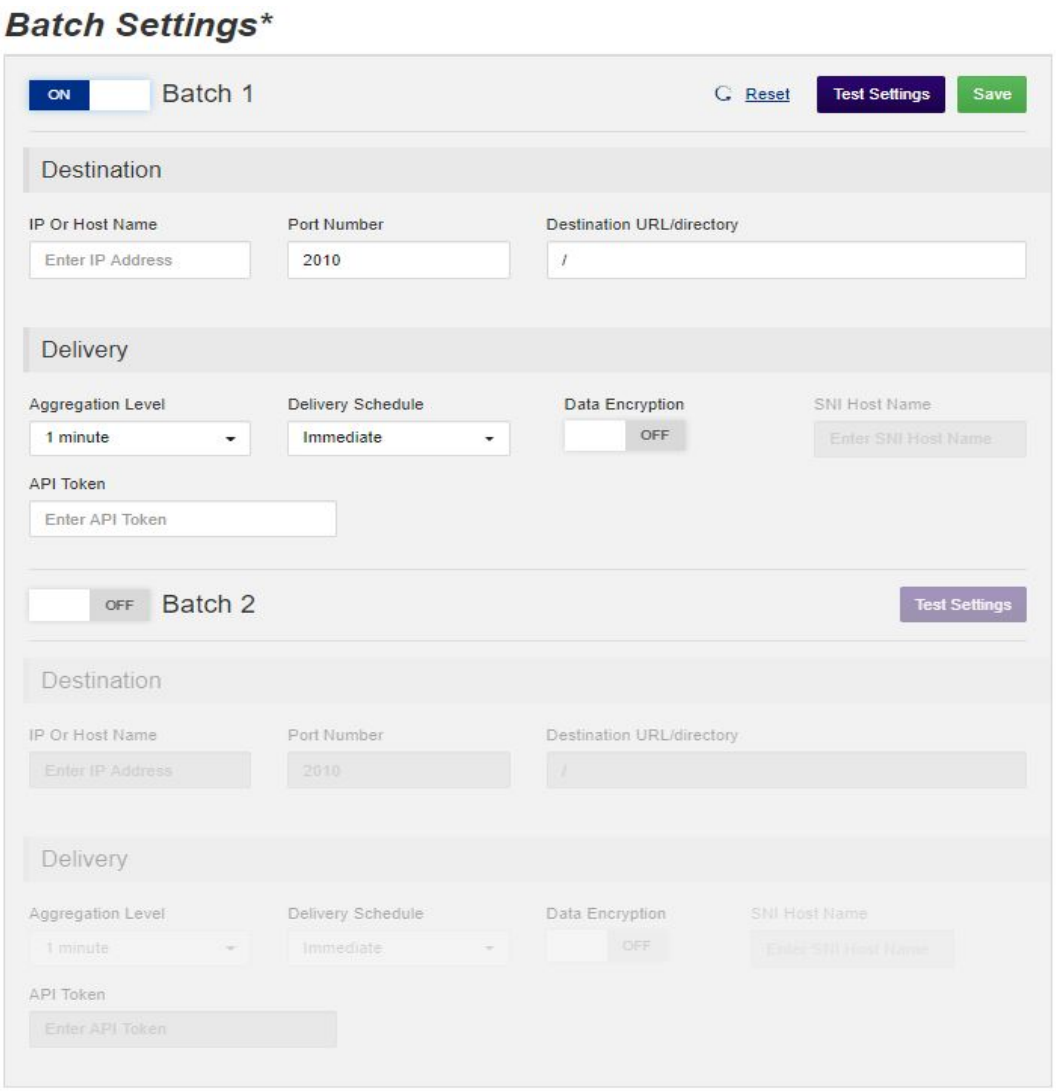
- Aggregation level has no effect on the 200-day limit.
- Oldest data is always overwritten first.
- Power loss does not flush the metric buffer.

Delivery Mechanism	Delivery Policy
Batch Data Streaming	Server acknowledgment required
Real Time Data Streaming (HTTP)	Server acknowledgment required
Real Time Data Streaming (VLI)	No server acknowledgment required
Alert Delivery Data Streaming	No server acknowledgment required
Email Delivery	No retry policy
FTP Delivery	Configurable retry policy

Setting Batch Data Streaming Options

The sensor can deliver batch data to up to two servers. Set the batch data delivery options as follows.

1. Open the web interface to the **Data Delivery> Batch** page.
2. Click the **Batch 1** switch to ON.



3. In the **IP or Host Name** field, enter the IP address of the server to receive data from the sensor.
4. Enter the **Port number** to which the sensor should attempt to deliver data.
5. If the sensor needs to send data feeds to a specific URL address in the HTTP POST, in the **Destination URL/directory** field, enter the URL address.

> **Note:** Use '/' if you have not been directed to change this field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. From the **Aggregation Level** list select how often to aggregate the count report in minutes (1, 5, 15, 30, or 60).

7. From the **Delivery Schedule** list choose how frequently to deliver the aggregated data sets (Immediate - 1 minute, Immediate - aggregation, 15 minutes, 30 minutes, or 60 minutes). The metric data is delivered at this interval and at the aggregation level you selected in the previous step. The immediate selection randomizes the delivery time over a 1 minute window (Immediate - 1 minute) or over the aggregation level window (Immediate - aggregation).

> **Note:** The sensor delivers at a random frequency over the selected interval in order to limit the number of concurrent connections required on the server side.

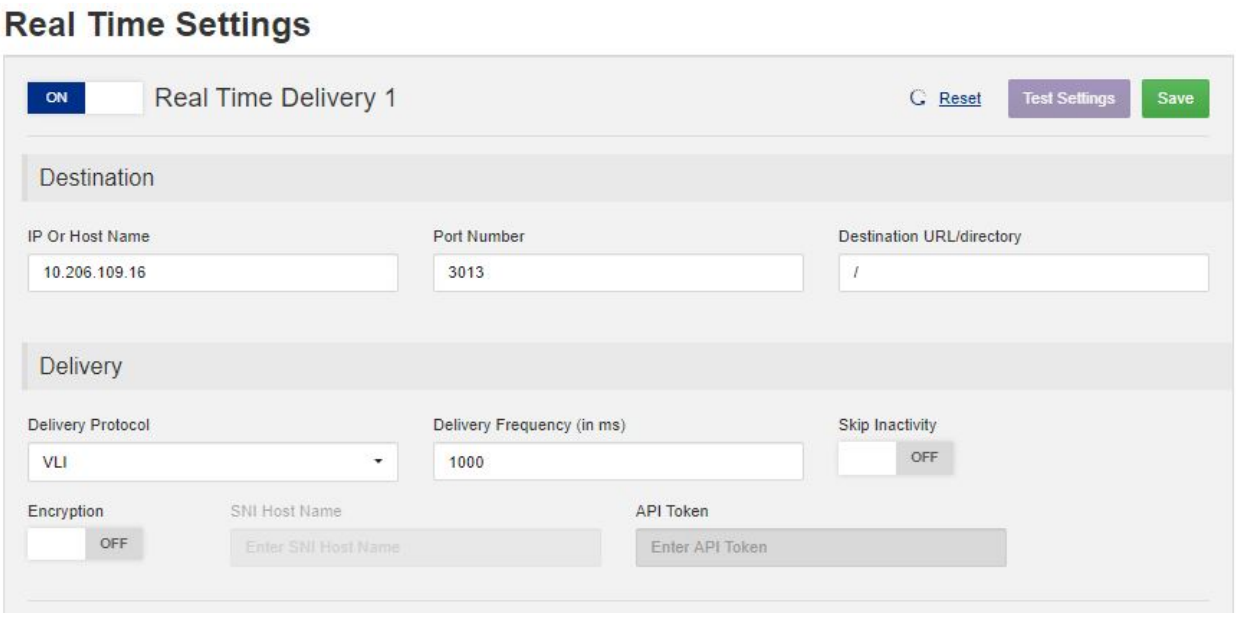
8. If you want the batch data stream to be encrypted:
    a. Click the **Data Encryption** switch to ON.
    b. In the **SNI Host Name** field, enter the Server Name Indication (SNI) hostname or IP address for the host.
9. In the **API Token** field, enter the token. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
10. If you want to send batch data to a second server, click the **Batch 2** switch to ON, and then repeat the steps for the second server.
11. Click **Test Settings** to confirm entries.
12. Click **Save**.

Setting Real Time Data Delivery Options

The sensor sends real-time data feeds to server applications that reside in a store or at a site providing real-time dashboard capabilities for analysis or presentation purposes. For the occupancy feature, real time data delivery must be enabled on the metric server sensor and all related sensors.

> **Note:** Data is not buffered, therefore, retransmission of lost data packets is not supported.

1. Open the web interface to the **Data Delivery> Real Time** page.



2. Click the **Real Time Delivery 1** switch to ON.

   The fields become active.

3. In the **IP or Host Name** field, enter the IP address of the server to receive data feeds from the sensor.
4. In the **Port number** field, enter the port number to which the sensor should attempt to deliver data feeds.
5. If the sensor needs to send data feeds to a specific URL address in the HTTP POST, in the **Destination URL/directory** field enter the URL address.

> **Note:** Use '/' if you have not been directed to change this field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. From the **Delivery Protocol** drop-down select the desired delivery protocol.

Option	Description
VLI	The XML data is sent as a raw TCP/IP data packet. The XML data is prepared with a 4 byte VLI which contains the length of the XML file to follow. The VLI interface does not require an acknowledgment.
HTTP	The XML data is contained within an HTTP POST — the same HTTP structure as a standard post to the server. The application must return an HTTP acknowledgment.

7. In the **Delivery Frequency** field, enter the number of milliseconds between connection attempts from the sensor to the Device Manager Server.

The default value is 1,000 ms (1 second).

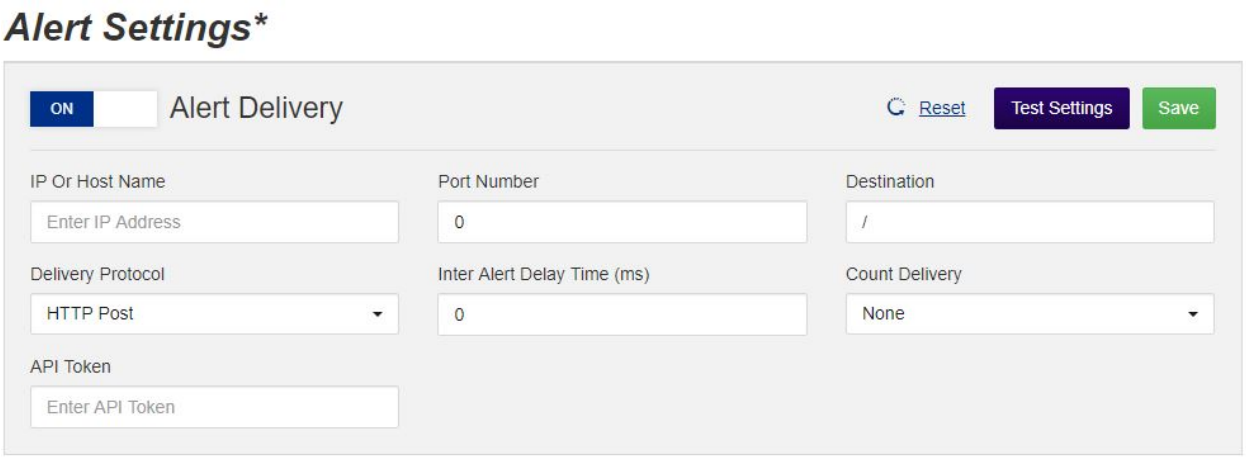
8. To only send updates if the count changes in any zone, click the **Skip Inactivity** switch to **ON**.
9. If you want the data stream to be encrypted:
   a. Click the **Encryption** switch to ON.
   b. In the **SNI Host Name** field, enter the Server Name Indication (SNI) hostname or IP address for the host.
10. In the **API Token** field, enter the token. The Delivery Protocol must be set to HTTP for this field to be active. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
11. Click **Test Settings** to confirm entries.
12. If required, repeat steps 2 to 11 to enter information for a second Real Time Delivery.
13. Click **Save**.

Setting Alert Delivery Options

The sensor can deliver individual alert messages each time a count line is crossed. This alerting system is typically used to allow integrators to set up tripwire logic in which the sensor sends an alert when the count lines are crossed to indicate intrusions or behavioral alerts.

1. Open the web interface to the **Data Delivery> Alerts** page.
2. Click the **Alert Delivery** switch to ON.

   The fields become active.



3. In the **IP or Host Name** field, enter the IP address of the server to receive alerts from the sensor.
4. In the **Port number** field, enter the port number to which the sensor should attempt to deliver alerts.
5. If the sensor needs to send alerts to a specific URL address in the HTTP POST, in the **Destination** field, enter the URL address.

> **Note:** Use '/' if you have not been directed to change this

field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. From the **Delivery Protocol** drop-down, select the desired alert protocol.

Option	Description
VLI	Sends alert as plain text with a variable length indicator (VLI) at the beginning of the message.
HTTP POST	Sends an HTTP POST to the URL address specified in the **Destination** field.
TCP	Sends alerts via TCP data delivery method, which is compatible with the AXIS camera alert delivery message format. See the *Programmer's Guide* for more details.
HTTP	Sends an HTTP GET to the URL address specified in the **Destination** field. The specific page request is defined on the **Counting** page.

7. In the **Inter Alert Delay Time** field, enter the number of milliseconds the alert system delays between sending consecutive alerts. This threshold is used when multiple people cross the count lines at the same time or close together. The sensor buffers and sends each alert when the delay time expires. Accepted values are from 0 to 30,000 milliseconds.
8. From the **Count Delivery** drop-down, select **None**, **Counts**, or **Counts with MAC** to set whether the alert message should contain the total count values for the count lines and if this should include the MAC address.

Note: If enabled, the alert message contains the total enter and/or exit counts since the last reboot. The number is not the daily count total.

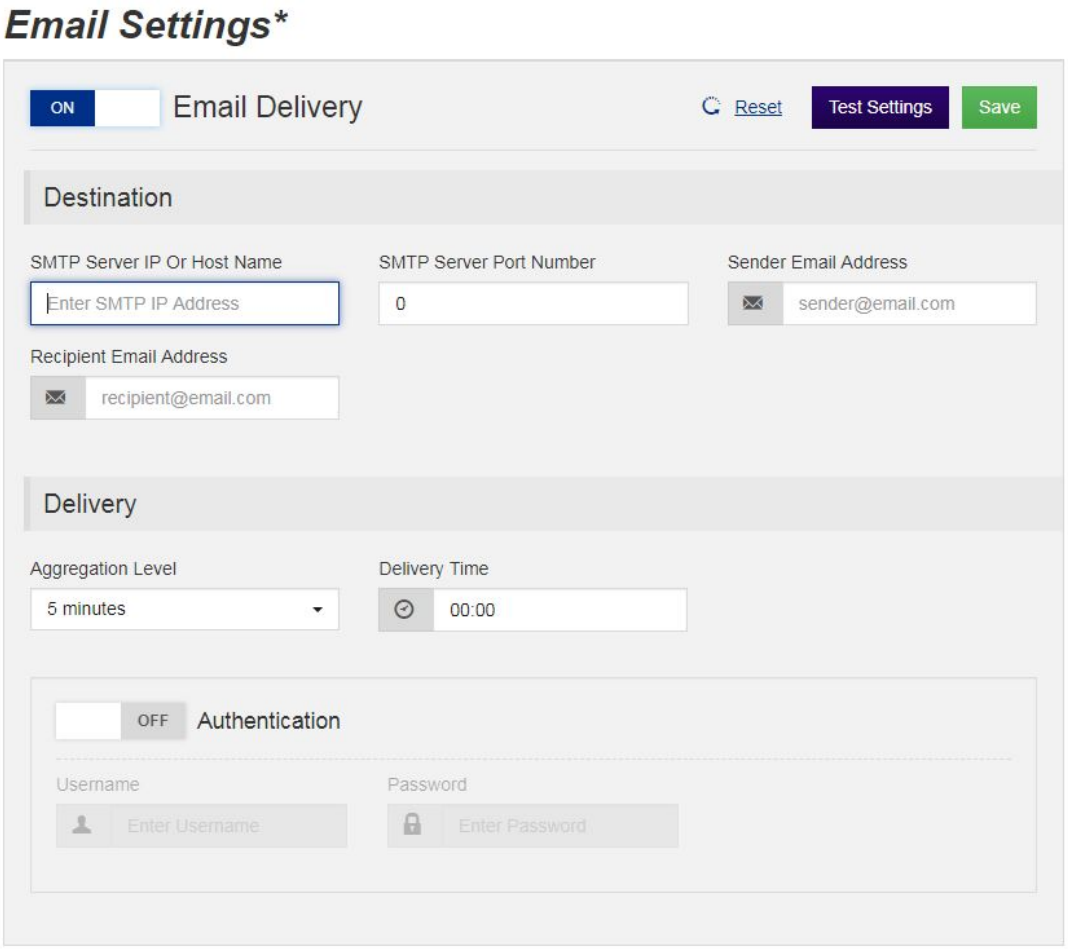
9. In the **API Token** field, enter the token. The Delivery Protocol must be set to HTTP or HTTP Post for this field to be active. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
10. Click **Test Settings** to confirm entries.
11. Click **Save**.

Setting Email Delivery Options

The sensor can automatically send aggregated daily metric data to an email account.

1. Open the web interface to the **Data Delivery> Email** page.
2. Click the **Email Delivery** switch to ON.

   The fields become active.



3. In the **SMTP server IP or Host Name** field, enter the IP address or Host Name of the SMTP Server.
4. In the **SMTP server port number** field, enter the port number used by the server.

> **Note:** If you type a host name for the SMTP Server field, you must also enter a valid DNS Server IP address on the IP Settings page.

5. In the **Sender Email Address** field, enter the email address of the person that is sending the email.
6. In the **Recipient Email Address** field, enter the email address of the person to receive the email.

> **Note:** The field must contain a valid email address on the SMTP server.

> **Note:** The field must contain a valid email address on the SMTP server.

7. From the **Aggregation Level** drop-down, select an aggregation level for the count report email (5 mins, 15 mins, 30 mins, 60 mins, and daily.)

> **Note:** Depending on which option is selected, the sensor sends you an email listing the metric data at the aggregation level selected over the previous 24 hours. For counting, if you select daily, the email contains a single enter and exit count for the previous 24 hour period.

8. In the **Delivery Time** field, enter the time (in 24 hour format) at which the sensor should send the email. The aggregate email contains data from midnight to midnight during the previous calendar day. For example, if the Delivery Time is set for 18:00, the sensor sends the count data for the previous day at 6 PM every day.
9. If your SMTP server requires an authentication password, click the **Authentication** switch to ON, otherwise skip to next step.

   The **Username** and **Password** fields become active.

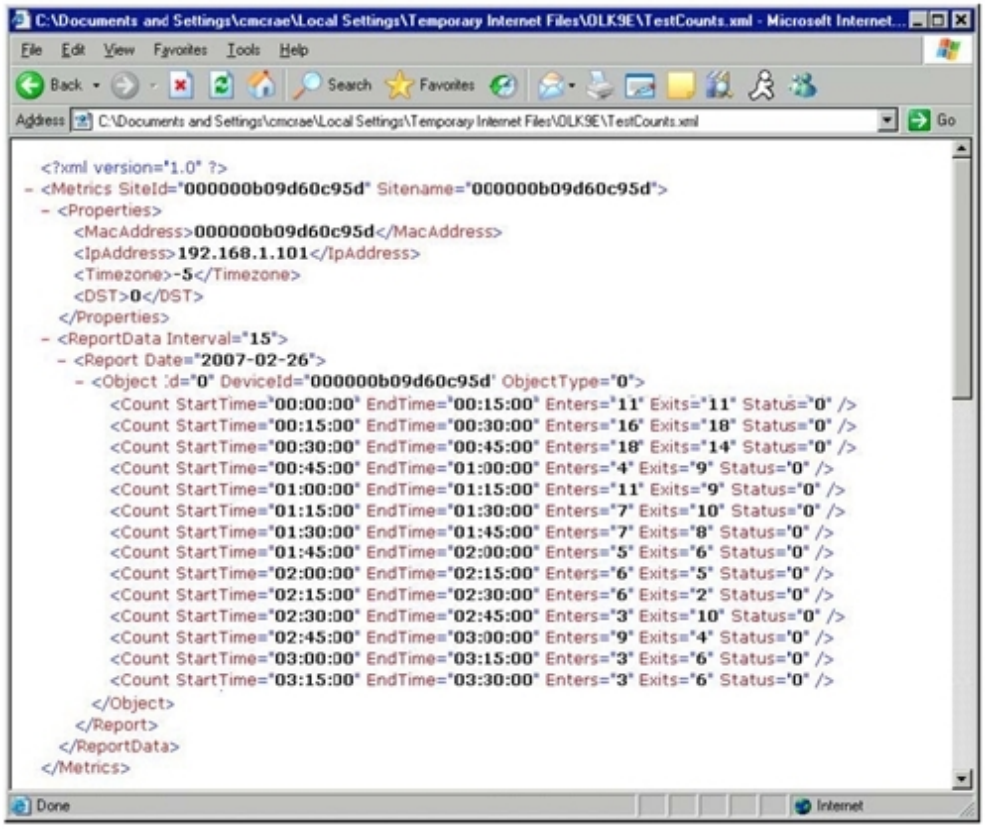
   a. In the **Username** field, enter the username for your SMTP Server.

   b. In the **Password** field, enter the password for your SMTP Server.
10. Click **Test Settings**. A test email is sent to the email address entered in the **Recipient email address** field.

    A confirmation message appears.
11. Click **Save**. A confirmation message appears.

> **Note:** If you receive an error message, see *Troubleshooting*.

12. If possible, check the recipient's email to ensure that the test email arrives.



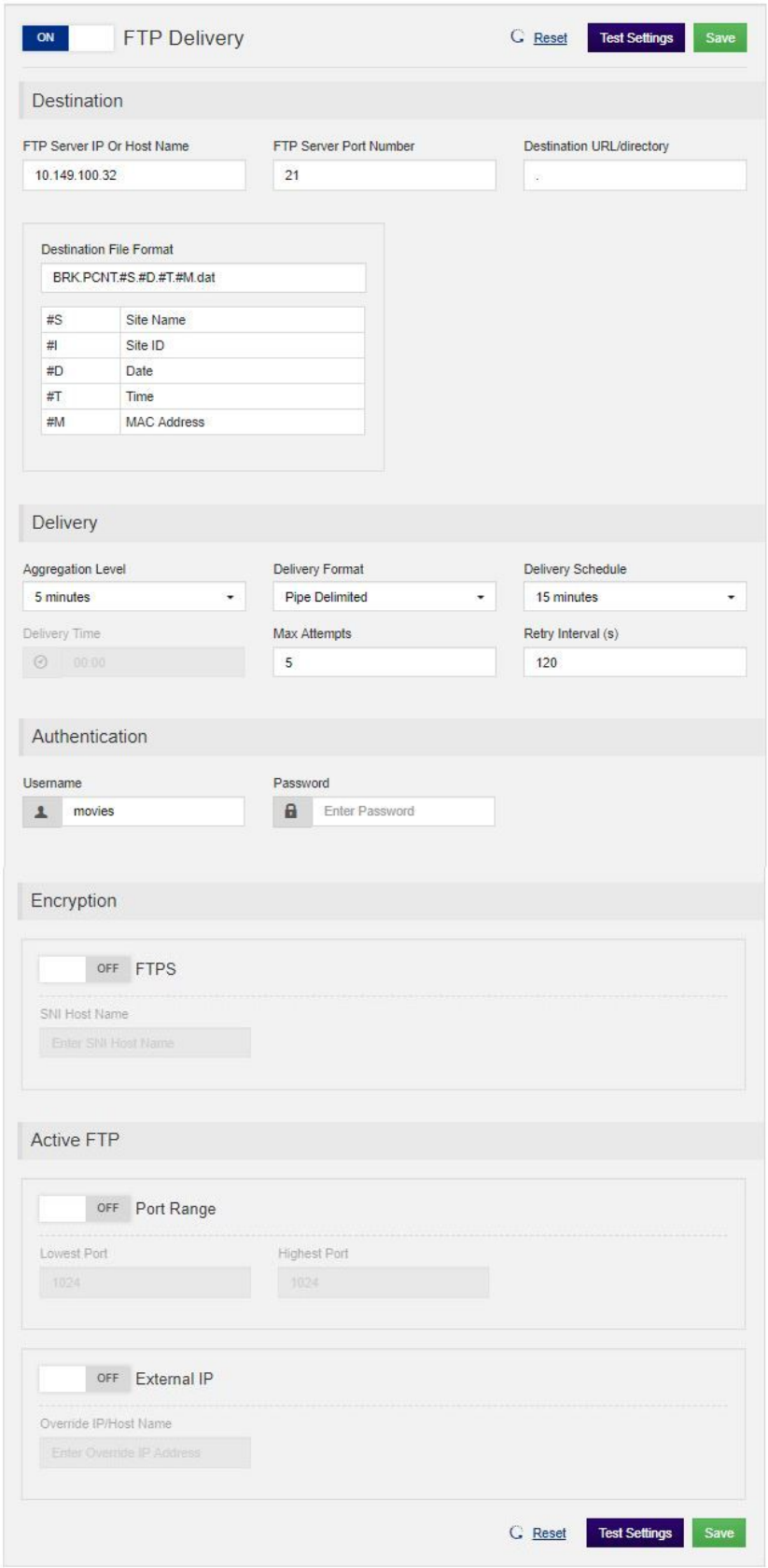
Setting FTP Delivery Options

The 3D Gen 2 sensor can also automatically deliver metric files to an FTP server at an hourly or daily interval.

1. Open the web interface to the **Data Delivery> FTP** page.
2. Click the **FTP Delivery** switch to ON.

   The fields become active.

FTP Settings



> **Note:** At the time that FTP delivery is initially enabled, the sensor tries to establish an FTP connection first via the passive FTP protocol. If delivery via passive FTP fails, then the sensor attempts to establish a connection via the active FTP protocol using the IP address with the **full range** of ports for the sensor, unless the **Lowest Port** and **Highest Port** are explicitly set in the **Active FTP** settings area, as detailed later in this procedure.

3. In the **FTP server IP or Host Name** field, enter the IP address of the FTP server.
4. In the **FTP Server Port Number** field, enter the server's port number for FTP (typically 21).
5. If the FTP files should arrive at a specific URL address or directory on the destination server, in the **Destination URL/directory** field enter the URL or path. Use the default value of '/' if you have not been directed to change this field. If this field is left blank, files are delivered to the FTP root directory for the user.
6. In the **Destination File Format** field, define the file naming convention for the data files in the field.

   You can choose to include several variables from the sensor by entering a "#" followed by the one letter variable. Any characters that you type that are not immediately preceded by a "#" are included in the file name as normal text.

> **Note:** The web interface prohibits you from using file names that contain Microsoft Windows reserved characters (/,\,?,&,*,:,|,",<,>) or spaces. See the following table for variable definitions.

Variable	Definition
#S	Inserts the **Site Name** from the **Settings** > **IP Settings** page
#I	Inserts the **Site ID** from the **Settings** > **IP Settings** page
#D	Inserts the date of the data contained in the sent data file formatted YYMMDD
#T	Inserts the time of the last data bucket included in the sent data file formatted HHMMSS
#M	Inserts the MAC address (formatted XX-XX-XX-XX-XX-XX) of the sensor that is sending the data file

For the following examples, assume the site name is set to Grocery1 and the site ID is set to 987.

File Naming Convention Field	Resulting File Name
#S.PCNT.#I.#D.#T.#M.dat	Grocery1.PCNT.987.090226.140000.00-b0-9d-70-01-05.dat

File Naming Convention Field	Resulting File Name
#S_#I_#T	Grocery_987_140000
countdata-#S-#I-#D#T.txt	countdata-Grocery1-987-090226140000.txt
#T#D_#M.csv	140000090226_00-b0-9d-70-01-05.csv

7. In the **Delivery** area, from the **Aggregation Level** drop-down, select the level at which you want the metric data to be stored in the files.

   The sensor can store data in intervals of 5, 15, 30, and 60 minutes.

8. From the **Delivery Format** drop-down, select the format for the data files sent over FTP.

Format Option	Description
Pipe Delimited	The Pipe Delimited format sends data for each report zone with the relevant information separated by a pipe character '|'.
XML	The XML format sends metric data in an XML file similar to the XML packets that are sent out using the Batch Data Streaming option. See the *Programmer's Guide* for more information on the XML format.

9. From the **Delivery Schedule** drop-down, select the frequency at which the FTP file is sent. You can have an FTP file delivered each hour, or you can have the file delivered once daily at a scheduled time.
10. If you selected daily delivery in the previous step, in the **Delivery Time** field enter a delivery time, using 24-hour notation. (Note: if aggregation is set to 60 minutes, the delivery time should be set to after midnight.)
11. In the **Max Attempts** field, enter the maximum number of times the sensor should attempt to connect to the FTP server to send the files in the case of a failure.

> **Note:** If this field is set to zero, the sensor continues to retry indefinitely until it successfully sends the file.

12. In the **Retry Interval** field, enter the amount of time, in seconds, the sensor waits before attempting to reconnect to the FTP server. This value can range from 1 to 599 seconds.
13. In the **Authentication** area, in the **Username** field, enter the FTP username used to log.
14. In the **Password** field, enter the password for this username.
15. In the **Encryption** area click the **FTPS** switch to ON to enable the encrypted FTPS protocol to deliver the data.
16. If you are using a SSL Virtual Host and Server Name Identification, in the **SNI Host Name** field, enter the host name.
17. To use active FTP with a limited port range that is used for connections:
    a. In the **Active FTP** area click the **Port Range** switch to ON.
    b. In the **Lowest Port** and **Highest Port** fields, enter the port range.

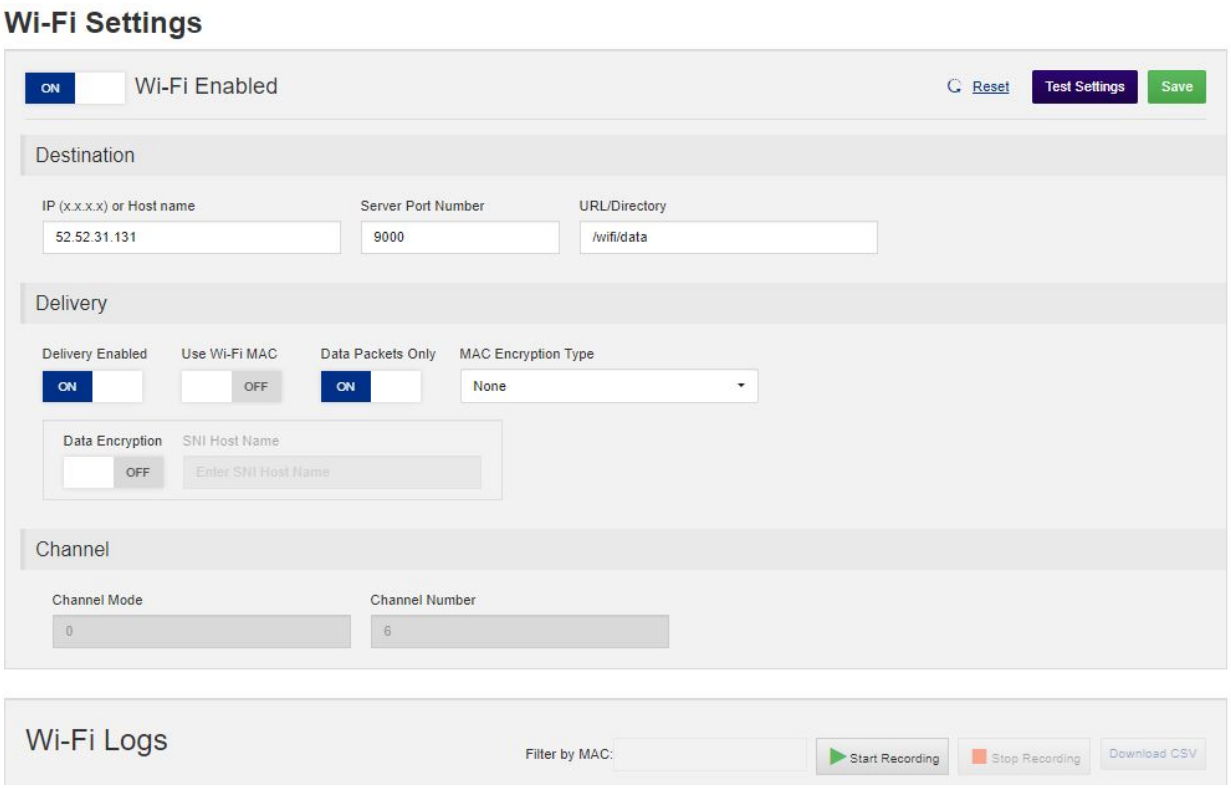
18. To pass an IP address that differs from the sensor IP address to the firewall and FTP server:
    a. Click the **External IP** switch to ON.
    b. In the **Override IP/Host Name** field, enter an IP address.
19. Click **Test Settings** to confirm entries.
20. Click **Save**.

> **Note:** If you encounter any error messages when setting the FTP connections seeTroubleshooting FTP Connections.

Setting Wi-Fi Options

The sensor can track Wi-Fi sources and send this data to a server.

1. Open the web interface to the **Data Delivery> Wi-Fi** page.



2. Click the **Wi-Fi Enabled** switch to ON. When ON, the sensor enables its Wi-Fi antenna and tracks Wi-Fi sources.

   The fields become active.
3. In the **IP or Host Name** field, enter the IP address of the server to receive data from the sensor.
4. In the **Server Port Number** field, enter the port number to which the sensor should attempt to deliver data.

5. If the sensor needs to send data feeds to a specific URL address in the HTTP POST, in the **Destination URL/directory** field enter the URL address.

> **Note:** Use '/' if you have not been directed to change this field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. Click the **Delivery Enabled** switch to ON to have the data delivered.
7. Click the **Use Wi-Fi MAC Address** switch to ON if using the Wi-Fi MAC Address. If OFF, the sensor's MAC Address is used. Both MAC addresses are visible on the sensor's home page.
8. Leave the **Data Packets Only** switch at ON (default) to post packets to the server only when data has been captured. Switch to OFF if you want posts made to the server even if the data payload is empty.
9. If you want the MAC address to be encrypted, from the **Encryption Type** drop-down select an encryption algorithm.
10. Click the **Data Encryption** switch to ON to have the data delivered over an SSL connection. Enter the SNI Host Name.
11. Click **Test Settings** to confirm entries.
12. Click **Save**.

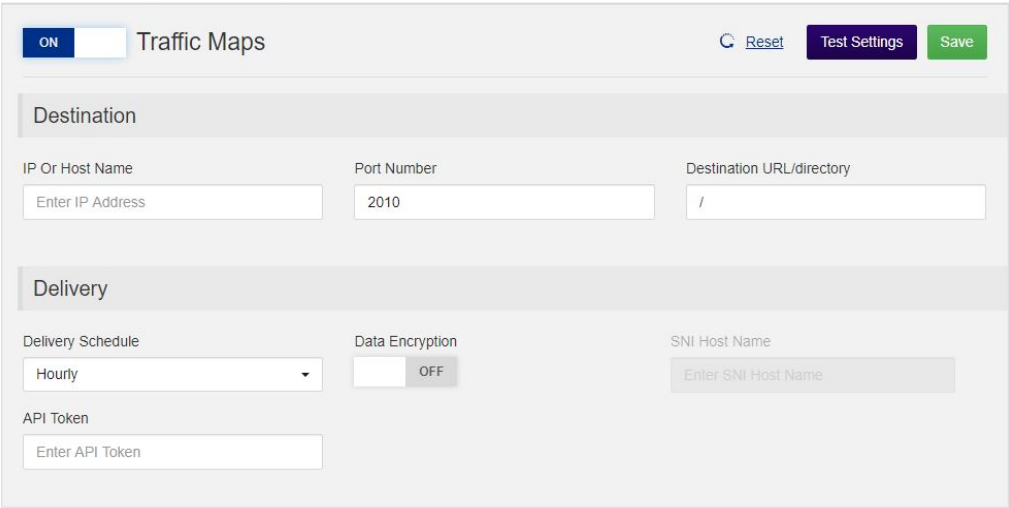
Setting Traffic Map Delivery

The sensor sends XML data packets containing traffic and dwell map metric data to a configured delivery address and port number at a configurable time interval. Use the Traffic Maps Settings page to set and edit this information.

1. Open the web interface to the **Data Delivery > Traffic Maps Settings** page.
2. Click the **Traffic Maps** switch to ON.

   The fields become active.

Traffic Maps Settings*



> **Note:** If traffic map delivery is disabled, no traffic map data is delivered to the Floorplan Editor or to the Traffic Map Analysis web tool.

3. In the **IP Or Host Name** field, enter the IP address of the server to receive data from the sensor.
4. In the **Port Number** field, enter the port number to which the sensor should attempt to deliver data.
5. In the **Destination URL/directory** field, enter the URL if the sensor needs to send data to a specific URL in the HTTP POST.

> **Note:** Use '/' if you have not been directed to change this field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. From the **Delivery Schedule** drop-down, select how frequently to deliver the data.

   The delivery schedule can be either hourly or daily. The sensor attempts to send the previous hour's data approximately on the hour or the previous day's data at midnight. The start time to send is randomized so not all sensors send at the same time. A sensor makes up to 3 attempts to send the data over 15 to 20 minutes. After a successful send, or after three failed attempts, the sensor deletes that batch of data. Once deleted the data cannot be recovered.

> **Note:** The choice of Delivery Schedule is the smallest increment for viewing the data stream of Traffic Maps in the Device Manager's Floorplan Editor, and also in the Traffic Map web tool.

7. To encrypt the data:
   a. Click the **Data Encryption** switch to ON.
   b. In the **SNI Host Name** field, enter the host name to use a SSL Virtual Host and Server Name Identification for the encrypted data.

> **Note:** This field is only accessible if data encryption is enabled.

8. In the **API Token** field, enter the token. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
9. Click **Test Settings** to confirm entries.
10. Click **Save**. A confirmation message appears.

Setting Available Sensor Data Options

The sensor can create on-demand data delivery requests for a specific range of dates and times in a designated format for sensors that have at least one data delivery method configured. See Setting Data Delivery Options for details.

> **Note:** The amount of days and data that can be retrieved is based on the amount of activity tracked and the number of zones set on the sensor. The average amount of days that can be retrieved is 50 days. Contact your technical support representative PCT-Support@flir.com for information on projecting the actual number of days of data possible in a specific scenario.

1. Open the web interface and then click **Data Delivery> Send Now**.
2. From the **Delivery Method** drop-down, select a format for data delivery. The options depend on which data delivery options are enabled on the **Data Delivery** page:
   - Email
   - FTP
   - Batch 1
   - Batch 2

3. In the **Start Date** field, enter the date to begin retrieving metric data.
4. In the **Start Time** field, enter the time to begin retrieving metric data.
5. In the **End Date** field, enter the date to stop retrieving metric data.
6. In the **End Time** field, enter the time to stop retrieving metric data.
7. Click **Send Data Now** to submit this request

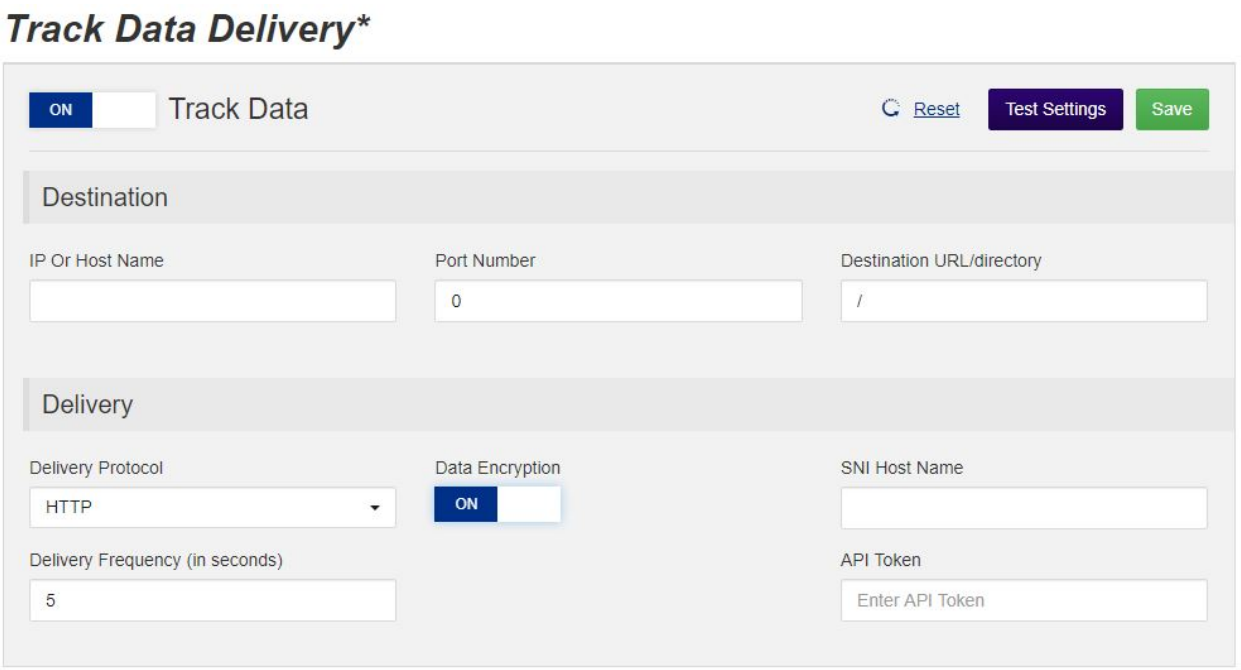
   A confirmation message appears.

Setting Track Data Delivery Options

The sensor can send track data feeds to server applications that reside in a store or at a site. Track data is collected for a configurable length of time (default is 5 seconds) and includes the coordinates of every object tracked relative to the sensor.

> **Note:** For details about track data including the data schema and format, see the *Track Data Technical Note*.

1. Open the web interface to the **Data Delivery> Track Data** page.



2. Click the **Track Data** switch to ON.

   The fields become active.
3. In the **IP or Host Name** field, enter the IP address of the server to receive data feeds from the sensor.
4. In the **Port Number** field, enter the port number to which the sensor should attempt to deliver data feeds.

5. If the sensor needs to send data feeds to a specific URL address in the HTTP POST, in the **Destination URL/directory** field enter the URL address.

> **Note:** Use '/' if you have not been directed to change this field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. From the **Delivery Protocol** drop-down select the desired delivery protocol.

Option	Description
VLI	The XML data is sent as a raw TCP/IP data packet. The XML data is prepared with a 4 byte VLI which contains the length of the XML file to follow. The VLI interface does not require an acknowledgment.
HTTP	The XML data is contained within an HTTP POST — the same HTTP structure as a standard post to the server. The application must return an HTTP acknowledgment.

7. In the **Delivery Frequency** field, enter the number of seconds between connection attempts from the sensor to the server.

   The default value is 5 seconds.

8. If you want the batch data stream to be encrypted:
   a. Click the **Data Encryption** switch to ON.
   b. In the **SNI Host Name** field, enter the Server Name Indication (SNI) hostname or IP address for the host.
9. In the **API Token** field, enter the token. The Delivery Protocol must be set to HTTP for this field to be active. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
10. Click **Test Settings** to confirm entries.
11. Click **Save**.

Setting Tailgating Delivery Options

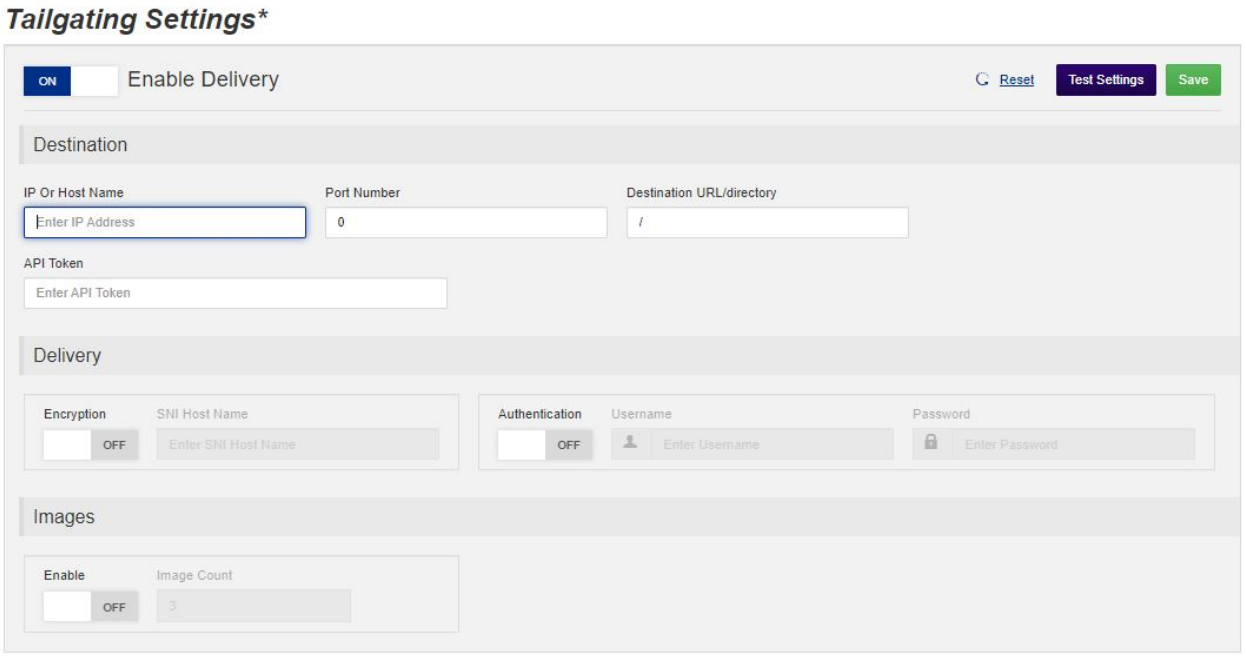
Some locations require individuals to swipe a ticket or badge on an access gate for entry or exit. A tailgating event occurs when an individual enters or exits without swiping the gate. This could be:

- An individual crosses the threshold without swiping
- Two or more individuals cross the threshold on a single access swipe

The sensor can detect tailgating events and trigger alerts. The alert identifies that a tailgating event took place but does not identify how many people crossed the threshold. The alert can be configured to send one to five images of the event.

To generate data, tailgating must be enabled on a counting zone.

1. Open the web interface to the **Data Delivery> Tailgating** page.



2. Click the **Enable Delivery** switch to ON.

   The fields become active.

3. In the **IP or Host Name** field, enter the IP address of the server to receive data feeds from the sensor.
4. In the **Port Number** field, enter the port number to which the sensor should attempt to deliver data feeds.
5. If the sensor needs to send data feeds to a specific URL address in the HTTP POST, in the **Destination URL/directory** field enter the URL address.

> **Note:** Use '/' if you have not been directed to change this field. This allows your IT department to use the same port for multiple sensors and filter the traffic by the URL in the HTTP POST.

6. In the **API Token** field, enter the token. An API token is a cryptic string of up to 255 characters, used to authenticate access to the HTTPS server.
7. If you want the batch data stream to be encrypted:
   a. Click the **Data Encryption** switch to ON.
   b. In the **SNI Host Name** field, enter the Server Name Indication (SNI) hostname or IP address for the host.

8. If using authentication:
    a. Click the **Authentication** switch to ON.
    b. Enter a **Username** and **Password**.
9. If you want to send one or more image snapshots of a tailgaiting event:
    a. Click the Images **Enable** switch to ON.
    b. Select the number of images (1 to 5) to be delivered in the alert.
10. Click **Test Settings** to confirm entries.
11. Click **Save**.

Installing the 3D Gen 2 Sensor On-Site

The proper installation and use of the 3D Gen 2 sensor requires accessories that provide:

- A way to mount the sensor
- Network connectivity
- A power source, such as:
  - A Power-over-Ethernet (PoE) switch
  - A PoE injector

The following section provides an overview of the different PoE devices and mounts that are available for use with the 3D Gen 2 sensor.

Powering the 3D Gen 2 Sensor

Industry standard 802.3af PoE connections (with CAT5e Ethernet cable) are supported to facilitate the combined power and network connection to the 3D Gen 2 sensor.

> **Note:** The 3D Gen 2 sensor is PoE Class 2, so the PoE must support Class 2 or higher.

Brickstream 3D Gen 2 sensors equipped with a USB Wi-Fi BLE dongle that are using Wi-Fi for connectivity still need to be powered with a PoE device.

Cabling Guidelines

> **Note:** All connections use standard CAT5e or higher Ethernet cables. No special cables are necessary.

We recommend you follow these industry standard guidelines to ensure that cabling meets sensor and network requirements:

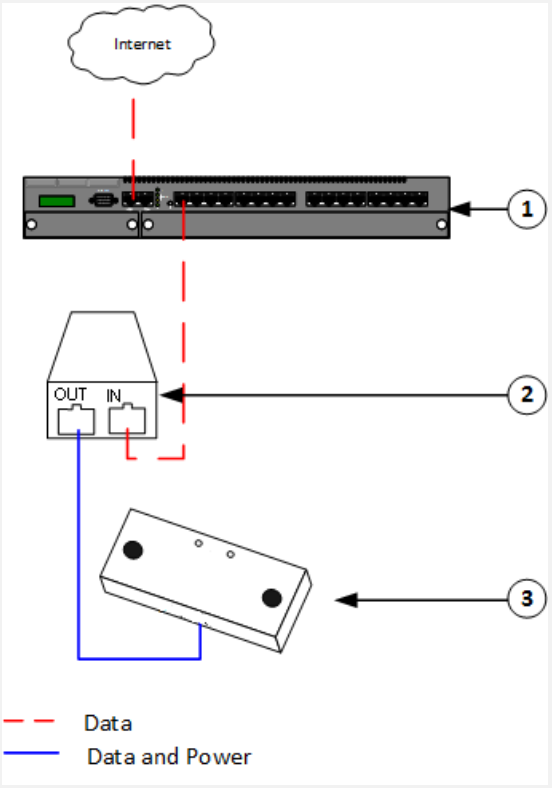
- Cable should be installed per the Customer's corporate standards, using plenums, conduits, and other approved pathways to be used as needed.
- Home-run cables (terminating at the head end) must include a 3 m (~10 ft) service loop on the sensor end to provide flexibility in relocating the biscuit mount if needed in future for any reason.
- We recommend using patch panels at the head-end and optional biscuit mounts at the sensor end of the home-run cables.
- Installer-provided patch cables 1 m to 2 m (3–6 ft) long should connect patch panels to POE switches.

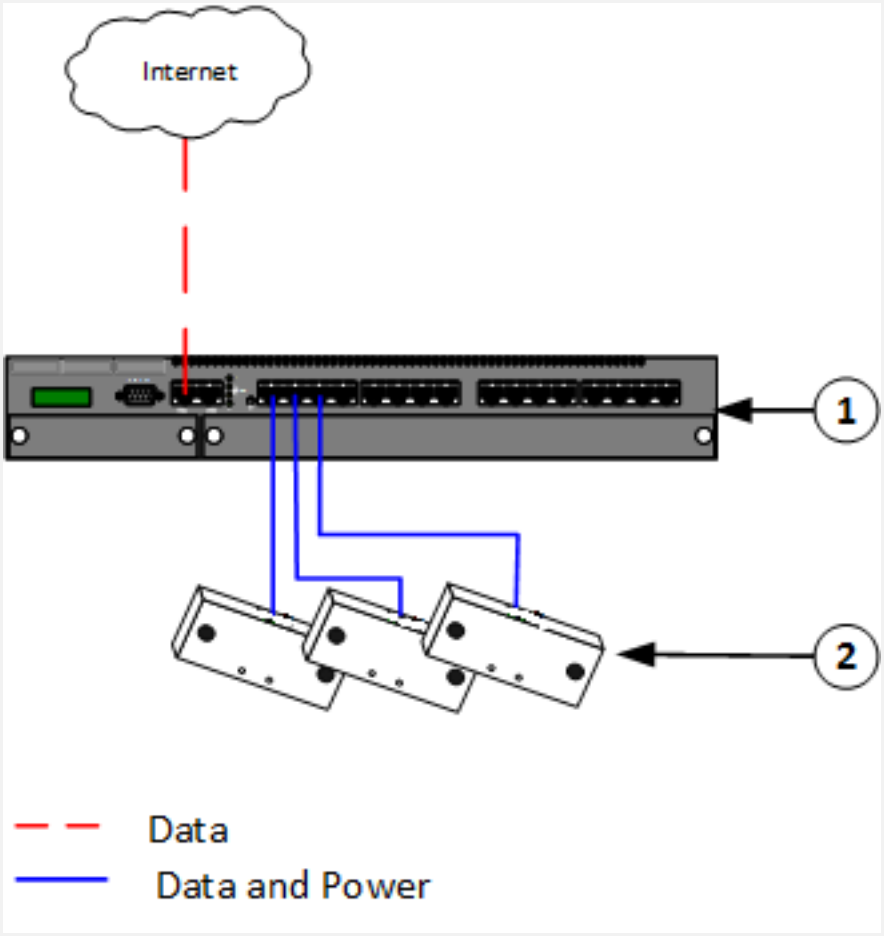
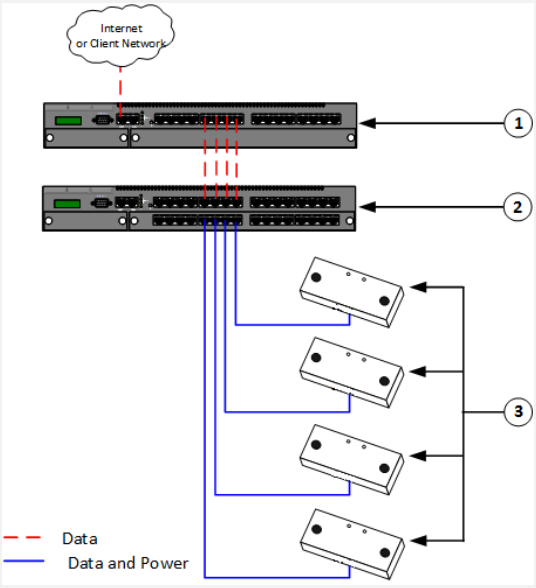
- Installer-provided patch cables 3 m to 4.6 m (10–15 ft) should connect biscuit mounts to sensors installed on RAM mounts.
- All cables at both head end and sensor end of the home run should be tied to create a neat and clean look for maintenance.
- All CAT5e cable runs must be fully tested and results provided on request.

Biscuit Mount

PoE Connection Options

The following table describes how to connect the 3D Gen 2 sensor to the network/PoE cables using one of the following methods.

Option	Connect Using...	Diagram	Legend
1	Single-port PoE injector		1. Ethernet switch 2. Single-port PoE Injector 3. 3D Gen 2 sensor

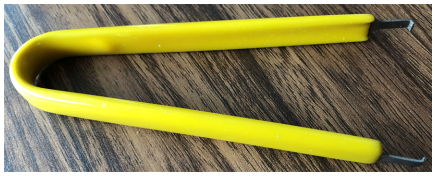
Option	Connect Using...	Diagram	Legend
2	Endspan PoE switch		1. PoE switch 2. 3D Gen 2 sensor
3	Multi-port midspan PoE injector		1. Ethernet switch 2. Multi-port PoE injector 3. 3D Gen 2 sensor

Enabling Wi-Fi/BLE Features (2510 model only)

If using Wi-Fi or BLE features on the 3D Gen 2 2510 model, you must insert the dongle into the USB port. This can be done before or after installation.

The USB port is on the side of the 2510 model as shown.

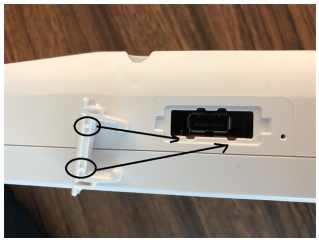
Remove the tab with a tool. To prevent theft, the USB Wi-Fi BLE dongle is designed to be difficult to remove. If necessary to remove the dongle use a tool as shown.



Insert the USB Wi-Fi BLE dongle into the tab. Ensure the dongle is the right side up to fit into the port.

Insert the tab back into the sensor.

The tab can only be inserted if the notches align with the case as shown.



Reboot, or power up the sensor.

Once inserted, the presence of the USB device appears on the sensor's home page.

USB Device	
Make	Realtek Semiconductor Corp.
Model	Edimax Wi-Fi N150 Bluetooth4.0 USB Adapter
Serial	00e04c000001

Mounting a 3D Gen 2 Sensor

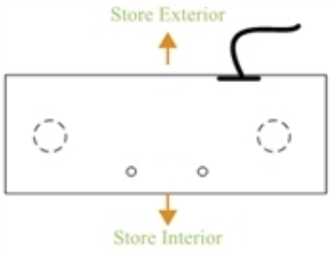
The type of lens that is used in the 3D Gen 2 sensor or the placement of the sensor determines what type of mount is used to support your installation. Refer to Selecting the Appropriate Lenses to ensure that you have the appropriate lens for each installation height and door width.

The following is a description of the basic mounting guidelines for installing the 3D Gen 2 sensor. See also mounting information in Planning the Solution Design.

> **Note:** It is important to work with your sales engineer to determine optimal coverage, placement, and mounting.

- The sensor must be within 30 cm (1 ft) radius of the specific sensor installation specification measurements.
- The sensor must be mounted within 5 cm (1.97 in.) of specified height range supported by the size of lenses used.
- X tilts must be within 1 degree of specification.
- Mount in a downward-looking orientation and level in both tilt and yaw such that it is looking straight down, if possible.
- Avoid including a side wall in the sensor's field of view.
- Avoid the sensor's field of view looking through a glass wall or large window.
- If a sensor is installed over a door where permanent or patterned mats are present under its direct view, it may improve tracking to rotate the sensor slightly by 5 degrees.
- At installation sites where level, 0 degree downward-looking mounting is not possible, mounting at an angle is supported up to 10 degrees with the basic license. Additional license key required for mounting angles greater than 10 degrees.
- Mount in such a way that the area of interest is positioned at, or very close to the center of the sensor field of view.
- Mounting bracket or mounting holes should provide adequate space to allow for one 10/100BaseT CAT5e cable to be run above the mounting location.
- Maintenance loops of CAT5e cable at least 1 m (3 ft) should be bundled and stored in the ceiling above the mounting location when using recessed mounting brackets.
- Allow clearance for hanging signs in a 1:1 rise-to-run ratio of the distance from the potential obstruction for straight-downward viewing sensors. You can also use the Minimum Distance Calculator (available from your FLIR Brickstream representative) for more accurate positioning.
- If you cannot see both stereoscopic lenses of the sensor when looking up at it from the area you want to monitor, the view is obstructed and requires adjustment to surrounding objects, adjustment to sensor installation height, or use of the Minimum Distance Calculator.
- Prior to cutting a hole for the recess mount, verify that there is hollow ceiling space at least 5.7 cm (2.25 in) deep behind the recess mounting location.
- Integrated surface mounts should be used in a plaster ceiling where screws can be securely attached into the ceiling.

- If an integrated surface mount is used in drop ceilings, it may be safer to add some sort of backing (metal t-bar or plywood) behind the ceiling tile to prevent the sensor from falling out, if there is risk that the ceiling tile may get wet or rot.
- Be consistent in the way the sensors are oriented within a given project to minimize confusion among the team members installing and implementing the sensors.
- Avoid sensor placement that includes swinging/glass doors in the sensor's field of view.
- It is critical that there is a clear choke-point — a point which all traffic you wish to be measured is forced through — to ensure accurate count data.
- The sensor installed at an entrance or exit for counting applications should be mounted so that you can see the complete doorway from the lens. The coverage model should cover the entire entryway corridor, following the rule of thumb for coverage of 20% door and 80% floor, as shown in the following figures.



Installing the Sensor

The following steps provide the recommended work flow for the installation process. For details pertinent to a specific circumstance, contact your Brickstream sales engineer or technical support.

Note: To ensure accurate calibration, allow the sensor to acclimatize for at least one hour before installation.

Warning!
The 3D Gen 2 sensor is carefully calibrated during manufacturing. If the sensor is dropped or heavily impacted during installation, the calibration can be compromised causing the sensor to require replacement. Please handle these units carefully during installation to avoid damage. We recommend leaving each sensor in its box until it is attached to the installed mount.

1. Ensure that a site survey is performed by qualified technicians to determine where cables should be dropped in consideration of lens coverage specifications. The site survey outcome provides information to build a site design with a Specification document and Bill of Materials (BOM)

identifying:

- Types of sensors required to meet the coverage needs for the areas of interest.
- Size of lenses required for each area of interest, based on ceiling height, clearance, and other considerations, such as those described in Mounting a 3D Gen 2 Sensor
- The number of sensors required to adequately cover all areas of interest.
- Installation positions, as defined by at least two measurements from permanent fixtures in the coverage area, such as walls.
- Installation mounts that are needed.

2. Use dimensions shown in the design drawings to locate the installation position for each sensor.

> **Warning!**
> Sensors are available in multiple lens types, with the desired lens size and type determined by the ceiling height at each installation location. This means the sensors are NOT interchangeable and must be installed at the location specified on the design documents. The labels on the boxes reference the specific location in the design drawings at which each sensor should be installed, typically using SD-xx to identify each sensor, where xx is the sensor # in the design.

3. Verify that there are no obstructions preventing mounting in the desired location, as described in detail in Mounting a 3D Gen 2 Sensor.
4. Run the CAT5e cable from the PoE source to each installation position.
5. Unpack mounting hardware.
6. Carefully unpack the sensors and inspect for physical damage prior to installation.

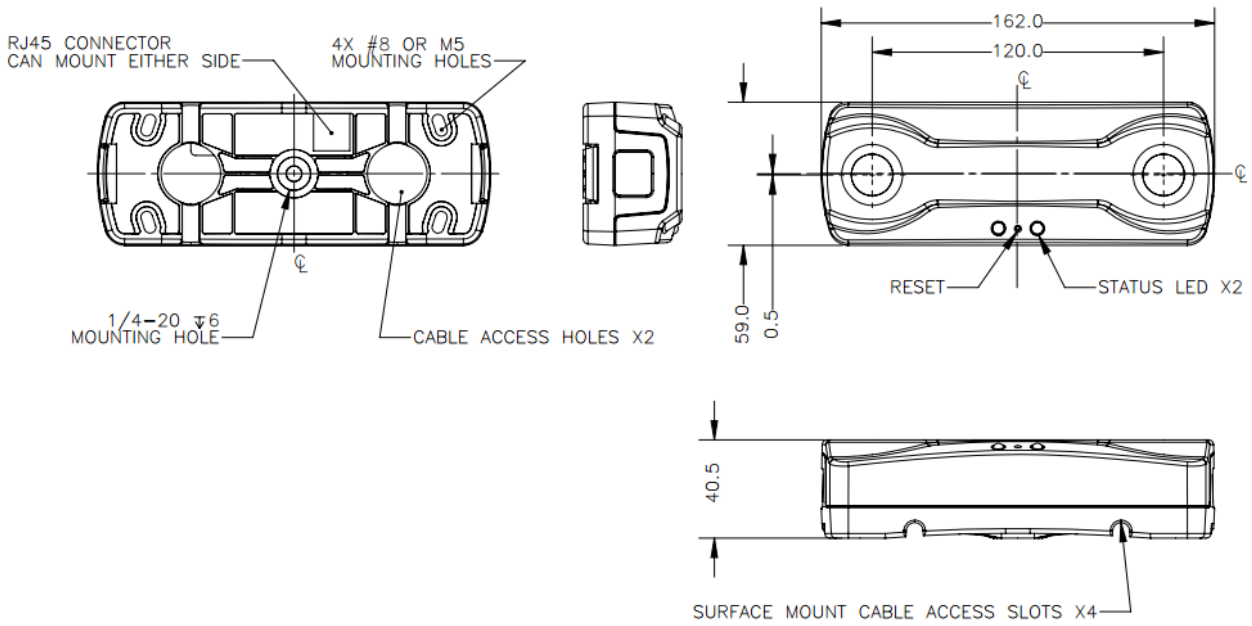
> **Warning!** Do not touch or press on any of the lenses, because any fingerprint or the slightest shift in orientation can compromise calibration, resulting in inaccurate tracking.

7. For each surface mount, perform Installing a Surface Mount.

Installing a Surface Mount

A drilling template for surface mounts is available from your FLIR representative.

Note: For accurate size of the cutting template, the template must be printed at 100% (no scaling) on legal (8.5 x 14") paper. For greater durability, choose a paper weight greater than 30 lbs.



The surface mount is an integrated bracket for installing 3D Gen 2 sensors externally.

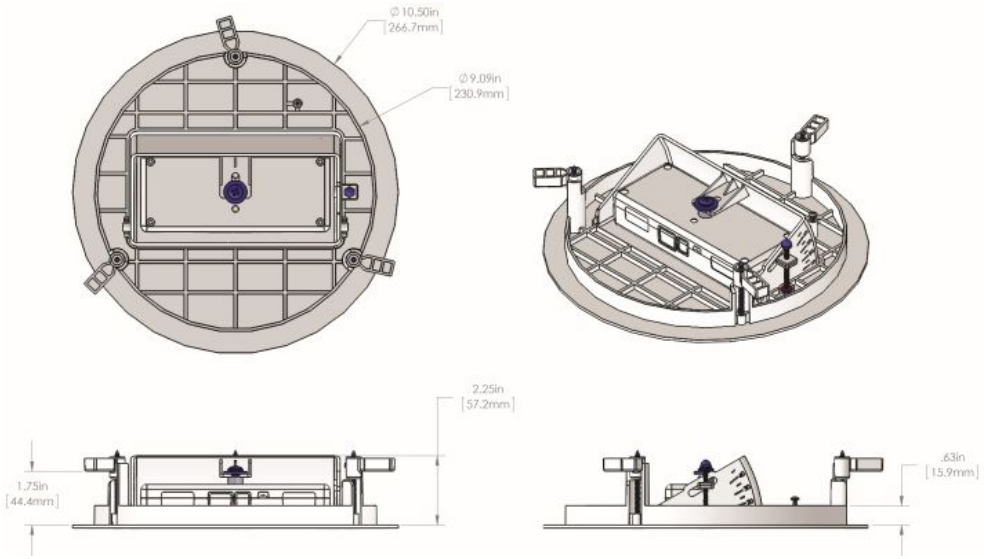
Item	Specification
Drilling hole diameter	5 mm (0.195 inches)
Tilt	0 degrees
Hardware required (not provided)	2 screws less than 5 mm (0.195 inches) appropriate for surface to which bracket will be attached

Installing a Recessed Mount

The following diagrams provide detailed information about the recessed mounts available for the 3D Gen 2 sensor. A cutting template for recessed mounts is available from your FLIR Brickstream representative.

Note: For accurate size of the cutting template, the template must be printed at 100% (no scaling) on tabloid (11 x 17") paper. For greater durability, choose a paper weight greater than 30 lbs.

The 9-inch recessed mount is a custom-made bracket for installing 3D Gen 2 sensors. The following diagrams provide measurements and installation reference for the 9-inch recessed mounts.



Item	Specification X-tilt Carriage
Recess depth	57 mm (~2.25 inches)
Mounting hole diameter	231 mm (~9.0 inches)
Visible diameter	267 mm (~10.5 inches)
Tilt	Up to 50 degrees
Hardware required	2 x ¼"-20 thread x 3/8' machine screws

Follow these steps to install a 3D Gen 2 recessed mount:

1. Remove from the ceiling the tile that is to be used for the mount location.
2. If the tile material requires reinforcing, apply backer board to the tile where the recessed mount will be installed, trimming the backer board for exact fit.
3. Measure the distance from the edge of the tile to the center of the sensor location.
4. Use the Recessed Mount Cutting template included at the end of this document to ensure correct size and shape for cutting the tile and backer board.
5. Cut through tile and backer board following the line drawn from the template.
6. Use twine or safety wire (as per local building standards and regulations) to secure the recessed mount to a permanent structure inside the ceiling, such as a beam.
7. Carefully remove protective lens caps on the sensor, being careful not to touch the surface of the lens.
8. Remove the carrier tray from the mount.
9. Carefully center the sensor in the mount.
10. Ensure that the LEDs are clearly visible through the small holes in the carrier.
11. Use the hardware provided in the zip-closure bag to secure the sensor in the carrier.

Note: If you have additional self-adhesive foam tape, you can optionally add a strip on the short perpendicular plane to aid in alignment before inserting the screw assembly.

12. Place the assembled sensor and carrier into the mount and secure the mount in place.
13. Insert the recessed mount into the hole that was cut into the tile and backer board.
14. Connect the CAT5e Ethernet cable to the sensor.

Note: Ensure that a maintenance loop of at least 3 ft (or 1 m) is included in the CAT5e cable.

15. Confirm that the LEDs are blinking green, which indicates a network connection. See LED Boot Sequence for detailed LED information.
16. Secure the mount to the tile with the provided hardware.
17. Review design details to confirm that the mounted sensor is oriented correctly relative to the doors and/or entrance, and make any final adjustments to the position of the mount in the tile.
18. If necessary, adjust the tilt of the sensor in the mount using the screw and degree markings on the mount.
19. If required, contact the Remote Support team to confirm that the sensor is online and displaying the correct field of view.
20. Attach the extra label (if provided) to the outer surface of mount for future support and troubleshooting purposes.

Installing a RAM Mount

Note: FLIR does not sell RAM mounts.

Installing Brickstream 3D Gen 2 in an open ceiling requires pole drops to install the sensors at the designed height, typically 4.2 m (13 ft 9 in.) Above Finished Floor (AFF). Brickstream offers proprietary mounts for surface and recessed installations; however, open-ceiling mounting can use common hardware parts standard to the industry that conform to each client's requirements and match the current infrastructure. The installation partner is responsible for:

- Identifying and obtaining materials used to install 3D Gen 2
- Ensuring that local construction codes and safety procedures are followed

Note: An acceptable 3D Gen 2 installation must also meet all criteria listed in the requirements section of this document.

Requirements

To ensure successful installation, the following requirements must be met:

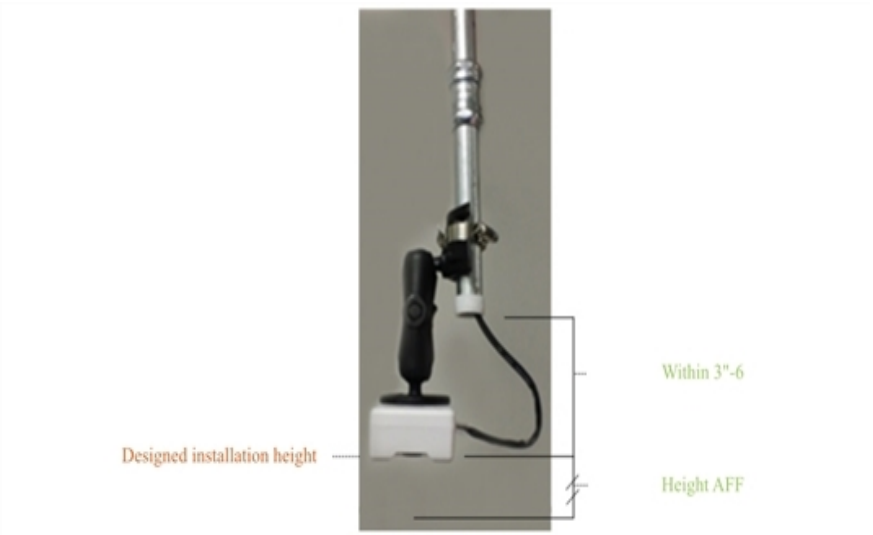
- Unless mentioned differently on the design, 3D Gen 2 needs to be installed at 4.2 m (13 ft 9 in.) AFF to the bottom of the 3D Gen 2.
  - The RAM mount used to attach the 3D Gen 2 to the pole allows for additional drop.
  - Final height to the bottom of the pole AFF should be within 7.6 cm to 15.2 cm (3 to 6 in.) above the 3D Gen 2 install height.
- Poles/sensors must be positioned as per design to capture the precise areas of interest.
- Mounting hardware must be able to accommodate the RJ-45 connector on the patch cables.
- Pole diameter must be no less than 1.9 cm (¾") and no greater than 3.8 cm (1 ½").
- Installed 3D Gen 2 must not have any movement or swaying from normally occurring conditions including nearby fan operation and air circulation.

Warning! It is very important that poles are secured in place to ensure accurate performance of the 3D Gen 2. Any movement of the 3D Gen 2 affects its coverage of the areas of interest, and the precision of the analytics may be dramatically decreased.

- Installations must be uniform throughout (i.e. poles hanging same length, mounts set on same sides, cables looped similarly etc.) and neatly assembled.
- Installation methods must comply with current national and site regulations and shall be carried out by technicians who are appropriately qualified.
- Safety cables and other preventive measures should be used at the discretion of the end client and their chosen installation partner.

Installation Instructions

1. Terminate the CAT5e from the home run (network closet) into a CAT5e Surface Mount Jack (Biscuit Jack) above each sensor's location.
2. Run a patch cable through the EMT down to the 3D Gen 2 as shown in the following image.



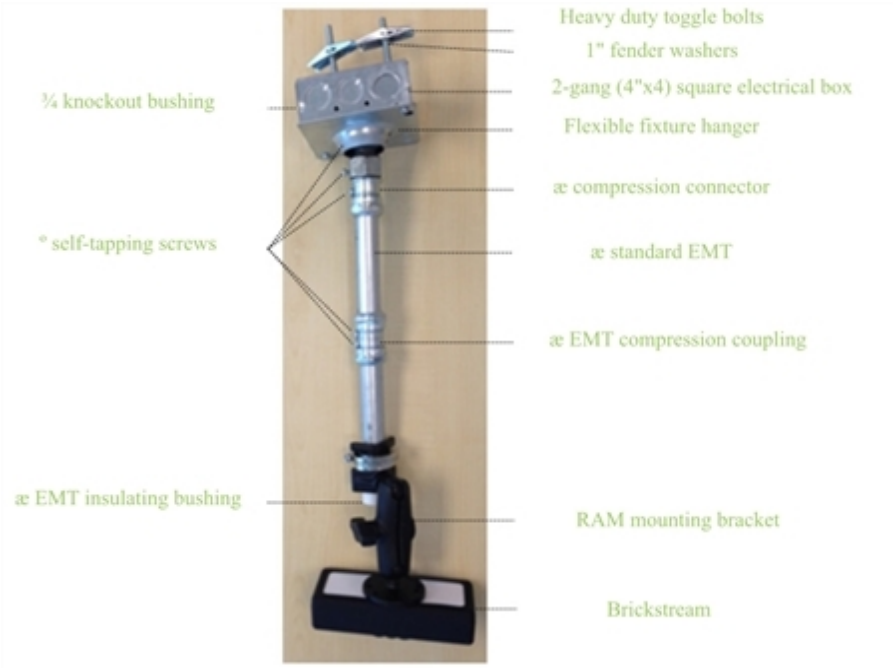
3. Attach the 3D Gen 2 to the mounting bracket.

> **Note:** The mounting bracket used to attach the Brickstream sensor to the installed pole will be provided by Brickstream along with the 3D Gen 2.
> Ordering information: RAM STRAP BASE WITH 1/4″-20 STUD
> Part Number: RAM-B-108U-BIT1

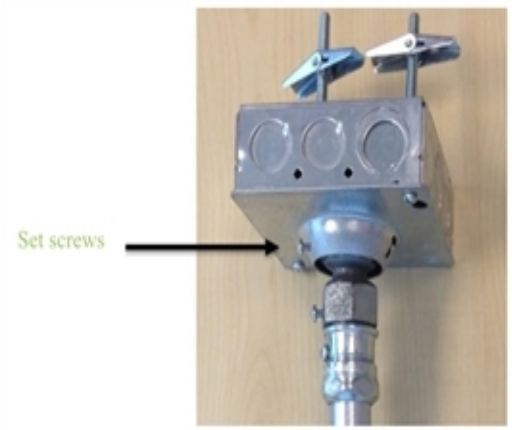
4. Attach and secure the mounting bracket to the pole.
5. Connect the CAT5e cable to the 3D Gen 2.
6. Carefully remove protective lens caps on the sensor, being careful not to touch the surface of the lens.

Recommendations

A sample mounting solution that has been used to install the 3D Gen 2 in an open ceiling environment is shown here:



This solution requires that the flexible fixture hanger is drilled out slightly so that the RJ-45 connectors (Ethernet connector) will fit through. This solution works especially well on ceilings with slope due to the flexible functionality of the hanger. However, once the 3D Gen 2 is installed, it is critical that a set screw be added into the ball of the hanger to prevent any further movement, as shown in the following image:



Note: This set screw should be applied in all circumstances including straight down installations to prevent movement.

Installing an Outdoor Mount

Features and Components

- Uses ¼"-20 screw to mount from bracket to sensor
- Water resistant enclosure
- Hardware for applying the mount not included

LED Boot Sequence

The following is the normal startup (boot) sequence for a 3D Gen 2 sensor.

1. All LED lights blink green.
2. All LED lights illuminate solid green for five seconds.
3. All LED lights blink green for four seconds.
4. All LED lights illuminate solid green for three seconds.
5. All LED lights blink green in application counting sequence: one second on, three seconds off.
6. Status LED 1 blinks green indicating that the sensor is able to connect to a server for time sync, data, logging, or proxy. If it is not able to connect to *any* of these types of servers, LED 1 blinks amber.

LED lights may turn off after booting up if configured to do so in Defining the Device Identification .

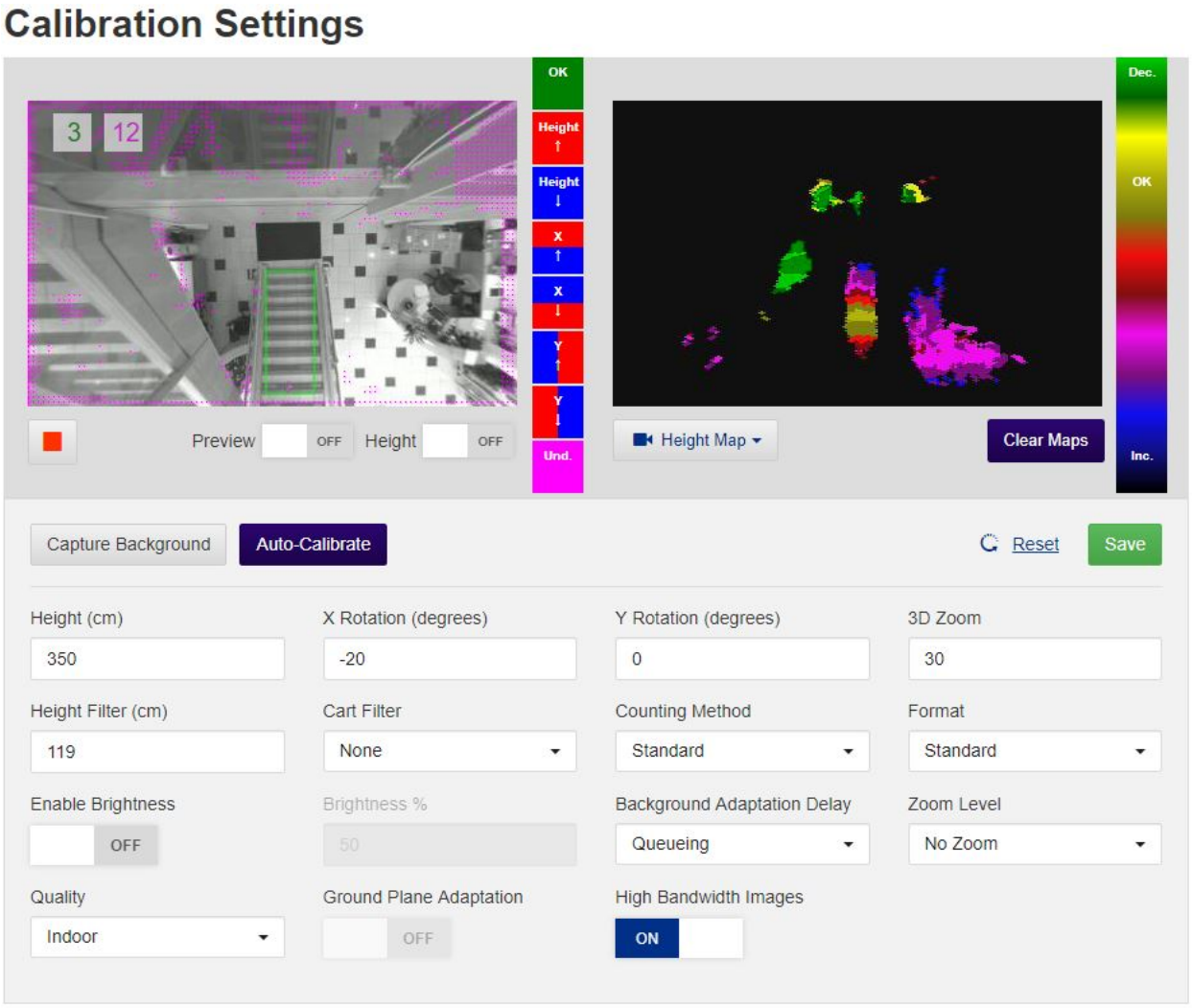
Calibrating a Sensor

Calibration can also be done using the Configuration wizard.

In a high percentage of installations, the sensor can self-calibrate its mounting height and X and Y rotation. We recommend that you attempt auto calibration before manually setting the sensor height and rotation.

Complete the following steps to perform calibration.

1. Open the web interface.
2. Click **Calibration**. The **Calibration** page opens.



3. If necessary, change the **Format** from Standard to Wide. Wide format can be used when the sensor is mounted between 4.6 and 7 meters for the 2.5 mm lens or between 10 and 14 meters for the 6.0 lens. This optimizes the field of view and allows for coverage of wide entrances by a single sensor.
4. In Standard mode, if necessary, adjust the **Zoom Level**. By default no zoom is used. When the sensor is mounted higher, the zoom should be increased to maintain tracking accuracy. Refer to Selecting the Appropriate Lenses to determine which zoom level is appropriate for your mounting height and lens. Select whether to use digital zoom of 20%, 40%, 60%, 80%, or 100% and click **Save**.
5. In the Video Pane, configure the calibration box.

Follow these guidelines when configuring the green box for calibration:

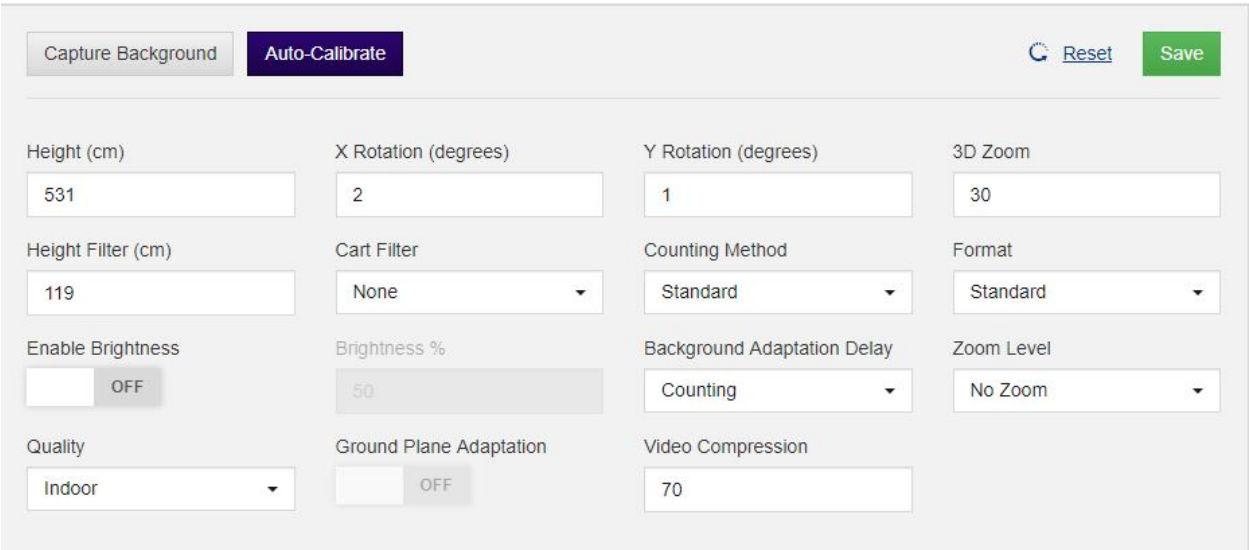
a. Ensure that area within the green calibration box contains only the floor, no walls or other objects, and minimal or no pink shaded (undefined) areas.

b. If the box contains only floor and minimal pink shaded areas, continue to step 4.

c. If the box includes displays, walls, other objects, or pink shaded areas, click it and drag to a different section of the image. If needed, you can click on the corners of the calibration box and resize it, or click in the middle of the box and move the entire box so that it only covers the floor.

> **Note:** For the most accurate calibration results, make the green calibration box as large as possible while still covering only the floor area.

6. Click **Auto-Calibrate**. After several seconds, the sensor automatically calculates the height (cm), and X and Y rotation.
7. Look at the height and rotation numbers to ensure that they are reasonable using the following guidelines:
   - Calculated height should be within 20% of visual height estimate.
   - X and Y rotation should be within 10 degrees of visual angle estimate.



8. Click the **Preview** switch to ON.

This switches the sensor into a color-coded preview mode that allows you to verify that your calibration was successful.

9. If you are not satisfied with the calibration numbers or the height is zero, click **Auto-Calibrate** to try the calibration again.

> **Note:** To ensure consistency, perform auto calibration several times to make sure that the sensor is returning consistent (not exact) information.

10. If calibration numbers seem repeatedly inaccurate, or if you cannot fit the green box into an area of the floor:
    a. Select **Calibration Preview**, if not already enabled.
    b. Manually set the sensor height and rotation to achieve an acceptable calibration image.
    c. Save the results.
11. Adjust the Advanced Settings as necessary.

Field	Description
Zoom Level	Select whether to use digital zoom of 20%, 40%, 60%, 80%, or 100%. Note that saving a new zoom level requires a recalibration of the sensor. Zones may need to be reconfigured.

Field	Description
Background Adapation Delay	Sets the sensor background adaptation mode for counting or queuing. **Queuing**: choose this option if the configuration uses queuing, tracking, combined counting and queuing, etc. **Counting**: choose this option if the configuration uses only counting (default).
Quality	Select whether the sensor is in an **Indoor**, **Outdoor**, or **Custom** setting.
Ground Plane Adaptation	Enable **only** if the sensor is an outdoor or custom installation where the operating temperature of the sensor can change significantly. Changes in temperature can affect the optics and calibration of the sensor. This switch is enabled only if Quality is set to Outdoor or Custom.
Counting Method	Select either **Standard** (uses standard distance between individuals) or **Couples** (decreases the threshold used to differentiate between individuals). Couples prevents under counting in environments where pairs of people walking arm-in-arm or very close together .
Cart Filter	Select **Carts** to eliminate tracks created by shopping carts
Height Filter (cm)	By default, the sensor counts any object that exceeds 120 cm (4 feet) in height. If you want to track shorter objects (for example children or strollers), change the **Height Filter** setting (cm).
3D Zoom	This sets the scaling for the real-world tracking image displayed on the Counting and Queuing pages. This field is automatically set based on the height and tilt returned by the sensor calibration.
Enable Brightness	Set to ON to adjust the brightness percentage value.
Brightness %	Sets brightness of the sensor image, unless Auto-Exposure is enabled on the Tracking page. If a scene is too dark, you should increase the brightness setting.
High Bandwidth Images	Default is ON. This setting affects the compression

12. Click **Save**.

> **Note: Reset** restores the last saved sensor configuration (all parameters). This can be used when you preview calibration changes and decide to revert back to a previously saved version.

13. To optimize tracking accuracy, ensure the background is clear of all people and objects and click **Capture Background** to capture a new background image using the newly saved calibration.
14. Verify the calibration settings by observing someone with a known height passing through the sensor's field of vision, or by monitoring that the heights of people in the view are within a reasonable range. A good calibration shows a high percentage of yellow in the map pane.

15. You may need to adjust the height value on the calibration page up or down if people are not being detected at their correct heights. This fine tuning of the recorded height value is a normal and important part of the calibration process.

3D Gen 2 Sensor Specifications

This section provides the following specifications for the 3D Gen 2 sensor:

Network Requirements

The primary data format of the sensor is XML data packets containing various metrics such as arrival/exit counts, queue lengths, wait times, and service times. No personally-identifiable information is collected or transmitted.

Data Stream	Purpose
Time synchronization stream	To maintain accurate date and time
Diagnostics stream	Transmitting messages and alerts
Sensor management stream	Enterprise-level administration
On-demand remote video capture and transmission stream	Accuracy validation

Average Bandwidth Requirements

Data Description	Frequency	Average Bandwidth Required
Use of Web-Based Configuration Utility	Initial	~128 kbps
Transmission of Validation Video	Initial	~128 kbps[a]
Transmission of XML Data, Time Sync, Diagnostics, Sensor Management	Ongoing	~0.25 kbps per sensor[b]

Initial Bandwidth Requirements

Bandwidth requirements for the sensor are at their highest during and immediately following installation. These heightened requirements are due to the need to access the sensor's on-board

[a]Assumes single-zone counting captured/delivered at 5-min/15-min intervals

[b]Assumes 15-min time sync intervals, 15-min diagnostics intervals, and 30-sec proxy intervals

web-based configuration utility as well as capture and transmit a period of raw video during validation to assess system accuracy.

Ongoing Bandwidth Requirements

To minimize bandwidth requirements on an on-going basis, 3D Gen 2 is capable of transmitting metric data in configurable increments. Independently-configurable data capture and data transmission frequencies reduce network overhead, and semi-random distribution of data packets decreases peaks in network demand. On an on-going basis, each sensor only requires about 0.05 kbps of bandwidth for analytics.

Logical Port Specifications

The following logical ports are the default configuration for the 3D Gen 2 sensor.

Data Description[a]	Default Port	Protocol	Direction
XML data, time synchronization, diagnostics/logging	TCP 2010[b]	HTTP	Outbound
Validation video	TCP 21	FTP	Outbound
	TCP 990	FTPS	
Software upgrade	UDP 69	TFTP	Outbound & inbound
Software upgrade, web-based configuration utility	TCP 80	HTTP	Inbound
	TCP 443	HTTPS [c]	Inbound
Ping	ICMP		Inbound
Device Manager (optional)	TCP 2375	HTTP	Outbound

[a] All listed port numbers are configurable.

[b] Used by Device Adapter, but can be sent over another port as desired.

[c] We recommend using HTTPS for all data traffic to provide optimal security of your data.

Connectivity

For optimal network performance, we recommend a high-speed DSL or T1 connection, or better.

Item	Specification
Cabling	Category 5e (CAT5e) or better
Ethernet	Single channel 10/100 Mbps Ethernet or higher
Power	IEEE 802.3af PoE Type 1, Class 2
Addressing	DHCP or Static IP
Protocols	TCP/IP, DHCP, HTTP Proxy
Time Synchronization	SNTP, Daytime Protocol, Proprietary
Data Delivery	HTTP, SMTP, FTP
Secure Data Delivery	HTTPS, FTPS[a]
Software Upgrade	TFTP, HTTP, HTTPS
WiFI/BLE Support	Optional (2510 model only)

[a]FTPS is different than SFTP. Brickstream does not currently support the SFTP protocol.

Technical Specifications

Item	Specification
Dimensions	59 x 162 x 40.5 mm 2.3 x 6.4 x 1.6 in.
Lens Options	2.5 mm supporting heights from 2.2 m to 7.0 m (7.2 ft to 23 ft) 6.0 mm supporting heights from 6 m to 14 m (19.7 ft to 45.9 ft)
Enclosure	White plastic (all models) or black plastic (2510 model only)
Field Upgradeable	Supports software upgrades over TFTP, HTTP, and HTTPS
Power	PoE (Class 2, Type 1 PD)
Power Consumption	6 W maximum
Weight	0.6 pounds / 0.25 kg
LEDs	2 tri-state status indicators
Emissions Compliance	Complies with CE rules and Part 15 Class A of FCC Rules
Operating Temperature	0° to 45° C 32° to 113° F
Storage Temperature	-30° to 65° C -22° to 149° F
Memory	512 MB RAM
MicroSD Support	8 GB microSD card
Operating System	Linux
Certifications	FCC Part15 Class A, cUL CE mark CE Class A UL, CB

Shipping Weight

This section provides shipping weight for the 3D Gen 2 sensor and its accessories.

Item	Shipping Weight	
	Boxed	Unboxed
3D Gen 2 sensor		0.6 pounds / 0.25 kg
Outdoor mount	1.454 kg / 51.2 oz	1.191 kg / 42.0 oz
Recessed mount, 9 in.	.737 kg / 26 oz	.377 kg / 13.3 oz

Components

Lenses

Specification	Monochrome Lenses
Function	Behavior analytics
Quantity	2
Focal Length Options	2.5 mm 6.0 mm
Image Sensor	752 x 480 pixels Wide VGA High Dynamic Range (HDR)
Resolution	0.4 megapixels
Video Compression	None
Typical minimum operating light level	2 Lux

LED Functionality

This section provides a detailed explanation of the LED light functions on the 3D Gen 2 sensor.

LED lights may turn off after booting up if configured to do so in Defining the Device Identification .

Status LED	Illumination	Indication
1	Blinking amber at three-second intervals	Connected with neither the time sync server nor the data server
	Blinking green at three-second intervals	Connected to time sync and/or data servers
2	Red	Operating with factory-default IP address (192.168.1.7)
	Progressive	Indicates whether the sensor has reverted back to its default factory settings and is also used with the manual reset button. See Resetting the Sensor.

Note: Contact Brickstream Support if you see a different LED combination than what is documented.

Part Numbers

Item	Description	Part Number
Brickstream 3D Gen 2	Brickstream 3D Gen 2 Stereo 2.5 mm White	BPC-2500-25W
	Brickstream 3D Gen 2 Stereo 2.5 mm White with Wi-Fi BLE	BPC-2510M-25W
	Brickstream 3D Gen 2 Stereo 2.5 mm Black with Wi-Fi BLE	BPC-2510M-25B
	Brickstream 3D Gen 2 Stereo 6.0 mm White	BPC-2500-60W
	Brickstream 3D Gen 2 Stereo 6.0 mm White with Wi-Fi BLE	BPC-2510M-60W
	Brickstream 3D Gen 2 Stereo 6.0 mm Black with Wi-Fi BLE	BPC-2510M-60B
Mounts	Brickstream Recessed mount with tilt	BPC-2500-RCMT
	Brickstream Outdoor mount enclosure	BPC-2500-OTMT

Troubleshooting

Troubleshooting FTP Connections

The following errors may occur when configuring the FTP delivery options.

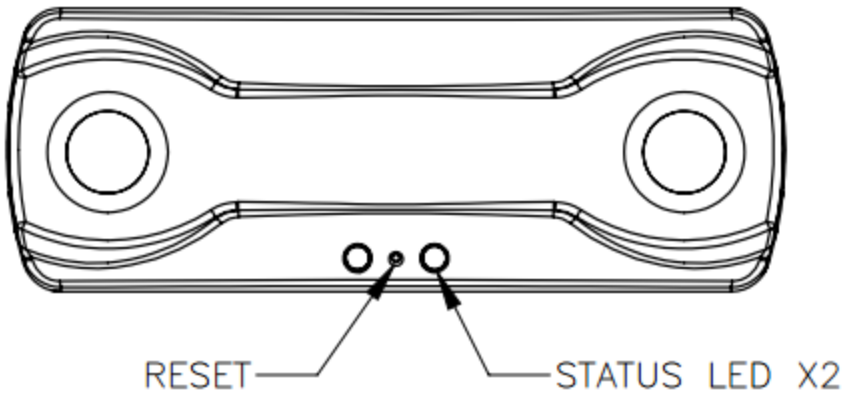
Error	Cause
Failed to connect 36	Incorrect Server IP Address
Failed to connect 64	Incorrect Port Number
Failed to connect 530 password not accepted	Incorrect Username and/or Password

Resetting the Sensor

The 3D Gen 2 sensor has a small reset button in between the two LED lights that allows you to do the following tasks:

- Reset the sensor network configuration by resetting the IP address of the sensor to 192.168.1.7.
- Reset all sensor parameters and the network configuration to factory defaults, deletes all zones, and resets the license code.
- Reset Privacy Options.

Warning! Resetting the sensor can cause data loss. To avoid accidental loss of data, if you have not performed a reset on a 3D Gen 2 sensor before, contact Brickstream Support to walk you through resetting the sensor in the safest manner.



The following steps describe how to reset the 3D Gen 2 sensor:

1. Insert a paper clip into the reset button on the 3D Gen 2 sensor and depress the button until the desired color illuminates on LED 2, then release the button. Use the following chart to determine how long to hold in the reset button.

> **Note:** LED 2 shows a sequence of colors depending on how long you depress the Reset button.

Function	3 Seconds	6 Seconds	12 Seconds
LED Color	Green	Amber	Green/ Amber
Reset IP address to 192.168.1.7	X	X	
Restore factory default settings		X	
Delete configured zones		X	
Reset licensing		X	
Reset all privacy options		X	X

2. The desired LED color illuminates and stays lit for 10 seconds, ***during which time you must press and release the Reset button again to confirm the action***. After confirming the action, the sensor executes the action and reboots the sensor.

> **Note:** If the firmware is corrupted and your sensor constantly reboots, unplug the sensor, press and hold the reset button while plugging in the sensor, and then complete the reset steps.

> **Note:** Contact Brickstream Support if you see a different LED combination than what is documented.

Troubleshooting Firmware Upgrades when Using a TFTP Server

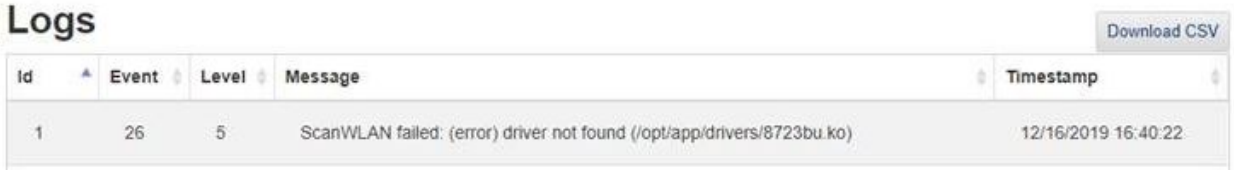
If you have trouble downloading the file, complete the following steps to test the TFTP Server install.

1. Open a MS-DOS prompt and navigate to any directory that is in your system path (e.g. c:\window\system32).
2. Issue the following command “tftp -i <PC IP Address> <Source Filename> <Destination Filename>. If the command is successful, you see “Transfer Successful: ##### bytes in ## seconds, ###### bytes.

> **Note:** The source filename and destination filename must be different.

Troubleshooting Wi-Fi or BLE Errors

Inconsistent performance of the wireless network may be an indication of a driver being out of date or missing. Users may also see an error message in the logs, such as the following:



Sometimes a firmware upgrade may also require a separate update to the drivers used by the sensor for all the features in that firmware to work properly.

The FLIR Brickstream support website contains links to download firmware and driver updates, or contact your FLIR Brickstream representative for assistance.

Drivers can be updated using the same method as upgrading firmware.

Troubleshooting Low-Ceiling Installations

The accuracy of the 3D Gen 2 can be compromised if the sensor is installed on a ceiling less than Brickstream's minimum supported mounting height. The main issue with installing at a height below the minimum supported height is the distance between the sensor and the objects being tracked has to be at least 30 cm. If the object being tracked is less than 30 cm away from the sensor, the accuracy can be compromised. See Lens Coverage for the minimum mounting height for your model.

Relocation Solution

Consider an alternative, higher sensor placement that allows the same flow of traffic. Another mounting option that may provide more distance between the sensor and the objects being tracked is the recessed mount. Refer to Mounting a 3D Gen 2 Sensor for more information.

Tracking Configuration Solution

If you cannot relocate the sensor to a higher installation location with a view of the same flow of traffic and the sensor is mounted within 10% of the minimum recommended mounting height of 2.4 m:

1. Go to the 3D Tracking Configuration page.
2. On the Stereo tab, leave the **Max Disparity** setting at the default of 32 pixels for a mounted height of 2.4 m.
3. Verify that the pink percentage on the **Calibration** page is still in an appropriate range after making the adjustments.

Resolving Inoperable 3D Gen 2 Issues

The following topics will help you troubleshoot problems you may experience with the sensor. Please review these topics before submitting a Support ticket or RMA form to FLIR.

Power Issue

Follow these steps to troubleshoot sensor power issues.

1. Determine if the sensor will power on at all.

IF...	THEN...
The sensor powers on	Go to the Connectivity Issue topic.
The sensor does not power on	Try a different Power-over-Ethernet (POE) source. If it still doesn't power on, contact PCT-Support@flir.com for additional assistance.

2. Verify if the sensor ever worked.

IF...	THEN...
The sensor previously worked	Identify the changes that were made that may have caused it to stop working.
The sensor never worked	Contact PCT-Support@flir.com.

Connectivity Issue

Follow these steps to troubleshoot sensor connectivity issues.

1. Determine if you can connect to the sensor on the IP address that you believe it uses.

IF...	THEN...
You can connect to the sensor	Try to browse to the IP address. If the 3D Gen 2 web interface displays, connectivity is not the root issue. Go to Software/Firmware Issue.
You cannot connect to the sensor	Perform a manual reset to green so the IP address resets to 192.168.1.7. See Resetting the Sensor.

> **Warning!** Ensure that you are on a 192.168.1.xx network then attempt to connect to that IP address. If not, see Setting the Network IP Address.

2. If you still cannot access the sensor, record the sequence and display of the lights on the sensor when the sensor is powered on after you have performed in the preceding steps.
3. Contact PCT-Support@flir.com to receive additional assistance based on these findings.

Software/Firmware Issue

Follow these steps to determine whether the root cause is a software issue.

1. If the sensor has been manually reset to RED (as described in Resetting the Sensor), contact your FLIR Brickstream Representative.
2. What software version is currently on the sensor? Verify the version of software that the sensor is running by checking the Release number displayed in the footer of the 3D Gen 2 web interface. Contact PCT-Support@flir.com with this information to receive additional instructions.