



Leveraging the Power of Video Analytics in Retail Environments

A March Networks guide to properly installing
the FLIR Brickstream® 3D Gen 2 Sensor

The sensor's stereoscopic lenses enable 3D analysis of the scene, offering the highest reliability in detecting objects.

Introduction

A modern video surveillance system is expected to deliver advanced functionalities on top of security benefits. Every vertical has particular needs. In the retail vertical, for instance, in addition to loss prevention and intrusion detection functionalities, March Networks® supports a growing number of requests to deliver business intelligence. Understanding how many people are in the shop during the day, measuring how long people stay in the queue before being serviced or how much time people spend in a specific area of the shop are key factors that can help drive marketing, sales and operations teams to deliver the best customer experience possible.

To deliver this data, March Networks has partnered with FLIR to integrate its Brickstream® 3D Gen 2 sensor.

This sensor gathers the following analytics:

- People counting
- Queue length
- Dwell/service times

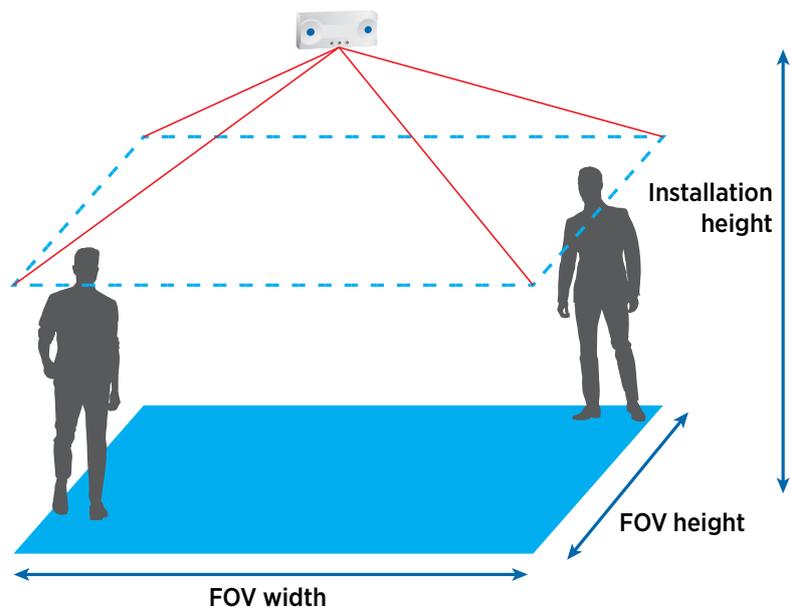
The sensor's stereoscopic lenses enable 3D analysis of the scene, offering the highest reliability in detecting objects matching the adult human body shape, and filtering out children and objects like shopping carts.

This document deals with the steps required to install and configure the FLIR Brickstream® 3D Gen 2 sensor to achieve the greatest accuracy in detection.

Brickstream installation

Properly mounting the sensor is extremely important; the sensor field of view (FOV) will need to completely cover the area of interest. It's easy to predict the area of coverage as a function of the installation height and sensor focal lens.

Figure 1: The Brickstream sensor's field of view (FOV) can be calculated based on the sensor installation height and focal lens. The FOV area is a rectangle (unless the sensor is tilted) with about 3/2 aspect ratio. Every person, with their head inside the monitored area, will be detected and analyzed.

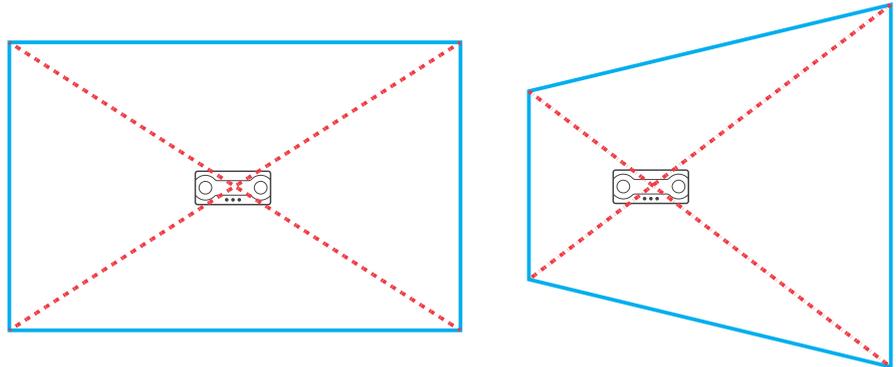


The Brickstream sensor is available in two different lens options: a 2.5 millimetre (mm) lens and a 6.0 mm lens.

Most of the time, the 2.5 mm focal lens is the preferred option as it can cover a wide installation height, ranging from 2.2 metres (m) to 7 m. The FOV has roughly a 3/2 aspect ratio and ranges from 1.5 m x 1 m when mounted at 2.2 m, up to 7.3 m x 4.9 m when mounted at 4.6 m. Using digital zoom, it's possible to use the same lens to cover up to a 7 m installation height, with a FOV of 6.5 m x 4.4 m. The 6.0 mm lens option has to be used for installations above 7 m and up to 14 m. An excel spreadsheet is available to precisely calculate the FOV in any condition.

In some cases, it could be advantageous to tilt the sensor to increase the coverage in one direction. Tilting the sensor up to 10° does not impact its accuracy

Figure 2: Standard Brickstream FOV shape (left). Tilting the sensor (right), it's possible to enlarge the FOV area in one direction. This option could be useful for queue monitoring.



March Networks Sales Engineers can assist with mounting the device at a specific tilt angle by offering a free blueprint for a 3D printed adapter. Contact your March Networks representative for more information.

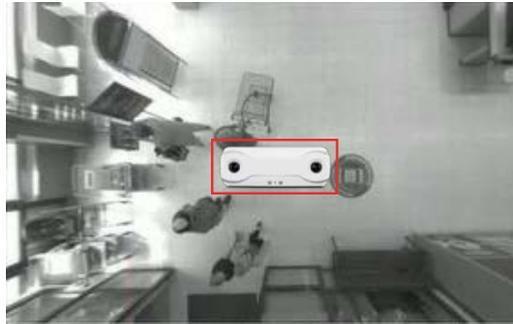
Figure 3: In blue, a 3D-printed prototype of the tilted mounting adapter for the standard Brickstream backplate. Tilt angle can be in both directions if required.



Figure 4: When coverage is not an issue, ensure the sensor is mounted over 1 m from walls and moving doors for optimal performance.

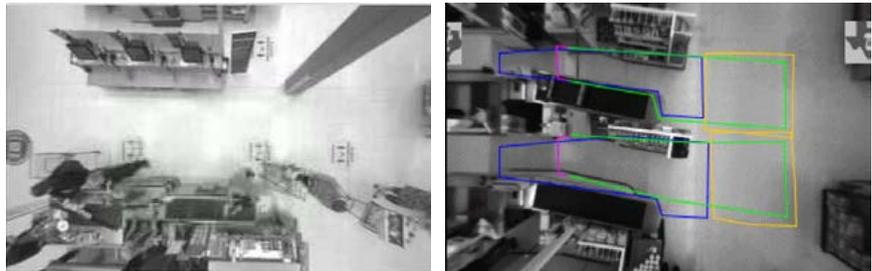
Here are some tips to properly install the sensor for people counting and queue monitoring:

- **People counting:** Usually the best position is about 1 m away from the virtual line or door where people are entering.



- **Queue monitoring:** In this case, it's imperative to put a primary focus on the area in front of the checkout station as most of the people will wait there. Tilting the sensor could be helpful in this scenario.

Figure 5: A poor installation (left), cutting the right part of the queue and providing unreliable queue numbers. A correct FOV (right) (taken from the Brickstream manual). In the correct installation, the tail of the queue is correctly monitored.



Brickstream initial setup

Once the Brickstream sensor is properly mounted, the next step is to ensure a proper initialization is performed, following the guidelines provided by the available documentation. These include:

- Network settings
- Date and time synchronization
- Device identification

The next steps are:

- Ensuring the sensor is running the latest firmware version
- Ensuring the sensor has the necessary analytic engine unlocked

You are encouraged to contact March Networks technical support team for assistance or visit the March Networks Partner Portal to download firmware and device documentation.

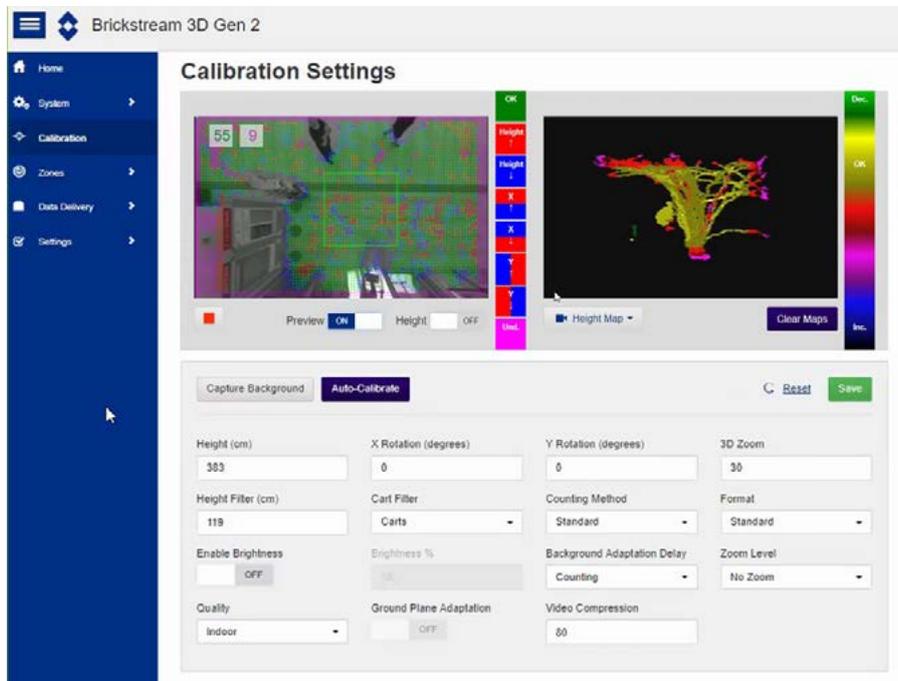
At this point the device is ready to perform the initial calibration. This step is of utmost importance to ensure the sensor will be able to correctly identify human shapes and perform the required analytics capture.



Brickstream configuration

The Brickstream sensor setup page offers an auto calibration function, which usually provides excellent results. Just ensure the green box doesn't include any object except the floor and no moving pixels before hitting the auto calibrate button.

Figure 6: The Brickstream sensor calibration page. Here it's possible to initialize the basic analytic engine to track objects. You can repeat this step multiple times to ensure you get consistent auto-detected Height and Rotation values.



After saving the calibration and acquiring the background, it's possible to observe the visual results available in the right video cell. In particular:

- Select **Height Map** to check all people are tracked with a gold color

Figure 7: By selecting **Height Map** in the right panel, the page will show a cumulative picture of moving object traces. Ensure the color is gold for all the traces generated by people moving in the area.

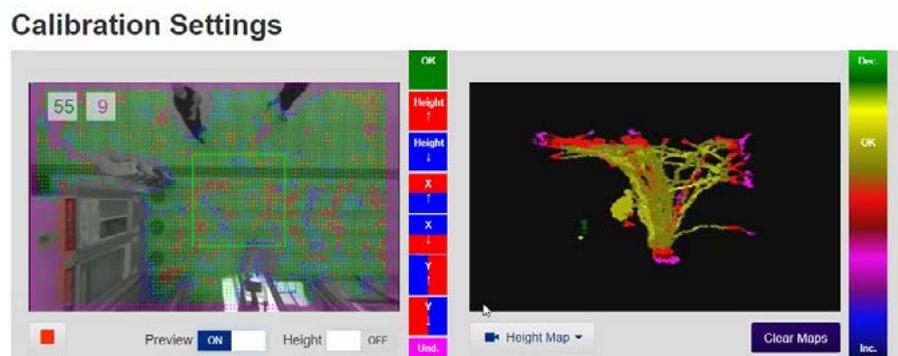


Figure 8: By selecting **Traffic** in the right panel, the page will show the paths of all detected objects. This is particularly helpful to determine where to position the people counting lines.

- Select **Traffic** to get a cumulative picture showing the path of all detected objects

Calibration Settings

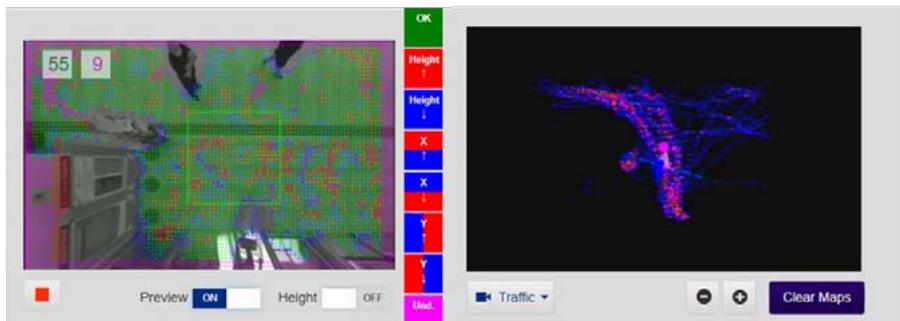


Figure 9: **3D Tracking** marks any moving object with a circle and draws a line from where the tracking starts.

- Select **3D Tracking** to see in real time how the sensor tracks moving objects inside the monitored area

Calibration Settings



Once such checks provide reasonable results, it's possible to move to the zone configuration, where the chosen algorithm can be enabled and configured. This step is important to ensure overall optimal results. For the details we recommend you refer to the specific manuals or engage our technical support team for further assistance.

Conclusion

The FLIR Brickstream® 3D Gen 2 sensor is a very powerful device, able to deliver state-of-the-art analytics and business intelligence when paired with March Networks Searchlight for Retail software.

Retailers in particular benefit from this data, but it's also possible to use this solution in any context requiring accurate, anonymous information on how people move into, around and out of physical places. The Brickstream sensors are compatible with March Networks recorders, Searchlight application software and the Health Compliance Solution.

Please speak to your March Networks Sales Engineering representative for more information.

