



# Quick Start Installation Guide

## Open Area™ by Density

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*This product requires professional installation by qualified personnel. Additionally, it shall not be moved once installed without consultation of professional installers and/or Density representatives to maintain full functionality. Open Area is not considered a mobile device.*

# Pre-install Considerations

# 01

## Power & Networking

Open Area sensors require standard power-over-ethernet PoE 802.3af, which can be supplied by an Ethernet switch or a PoE injector. The sensor can be connected via a wired or wireless network. For additional information, please see our [Open Area Power Requirements](#) and our [Network Requirements](#).

## Device Placement

The total detection area beneath an Open Area sensor is called the FOV (Field of View). The higher the sensor height, the greater the FOV coverage. To detect occupancy and people with Open Area, the sensor needs a clear line-of-sight to people passing through the area of interest. Any object obstructing the path between the sensor and a person passing through an area of interest will affect the sensor's ability to accurately detect the presence of that person. Please refer to the Install Height Chart below to determine the minimum sensor height for your entryway.

## Device Height

To determine the sensor height, measure the ceiling height in the desired install location. The maximum recommended sensor height is 12ft (3.657 meters). Please refer to the table below for coverage characteristics based on sensor height.

Sensor Height (ft)	Radius (ft)	Coverage Area (sqft)
12	12ft	452 sqft
11	12ft	452 sqft
10	12ft	452 sqft
9	11ft 9in	380 sqft
8	10ft 5in	314 sqft
7	9ft 1in	254 sqft

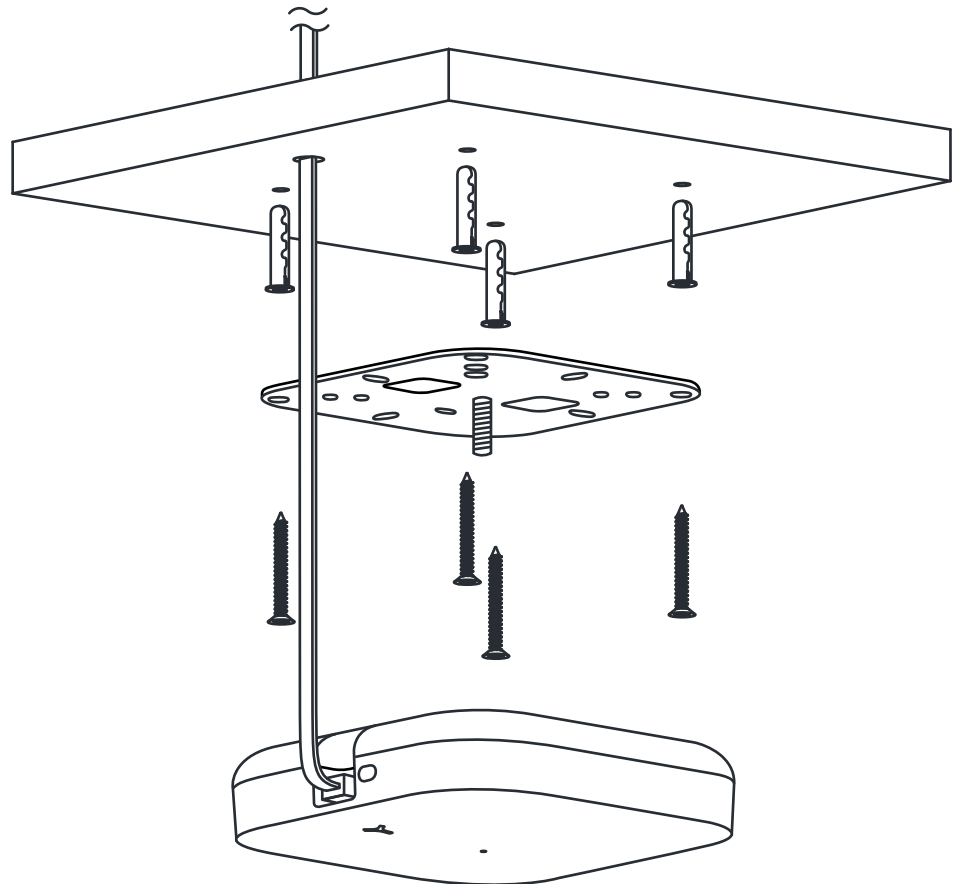
## Steps

- Take note of the device Serial Number, which can be found on the device label, you will need this information for the next section.
- Identify the location for the sensor, and perform ethernet cable run, following the building's cable and aesthetic standards.
- Fasten the supplied mounting bracket to the ceiling in the desired location, ensuring the ethernet cable can reach the device in its final position.
- Thread the sensor onto the mounting bracket. Screw the unit on all the way until it stops, then back it off to the prescribed location using the ethernet jack as the location guide.
- Position the sensor in one of four 90° increments, selecting an orientation that is closed to the ethernet cable, and take note of the sensor's position, using the Density logo as a guide.

*Note: You will need to specify the sensor's install position in a later step, during unit setup.*

- Allow for the device to power on, and confirm that you are able to see the device's LED. Depending on whether the unit has already been pre-provisioned, the LED should either turn solid blue, indicating it is ready to be provisioned, blinking blue, indicating the unit is being provisioned by the Density Cloud, or solid white, indicating the unit has been successfully provisioned.

*Note: If connecting via WiFi, the unit LED may be solid red to indicate the device does not yet have a working network connection. Please proceed to the Unit Setup steps below.*



*Note: This step is only necessary if you are connecting to WiFi or if the ethernet did not automatically connect. If the unit is already connected and online, please proceed to the next section.*

Density sensors are set up and configured using the Density Unit Setup App, available for iOS and Android devices. The Density Setup App connects to the sensor via Bluetooth and assigns a network and doorway to the unit. The app also configures and improves the accuracy of the sensor via Advanced Setup tools.

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## WiFi Setup

1. Download the Setup App by going to [mobile.density.io](https://mobile.density.io).
2. Log in using your Density Dashboard account credentials. Contact [support@density.io](mailto:support@density.io) if you need an account.
3. Stand near your sensor with Bluetooth turned on.
4. Click **Scan for Sensors** and select an unassigned device.  
  
*If you need to identify which sensor you are setting up, select a sensor from the list, then click **Locate** on the top right corner, and the sensor's LED light will flash.*
5. Click **Setup this sensor**.
6. Click **Add a Network Template > WiFi**.
7. Click **Scan for Wifi Network** and select your network.
8. Name the network template something you will remember. You can apply the same template to all sensors using that network.
9. Enter your password and click **save** (Note: We highly recommend using DHCP for your setup).
10. Select the WiFi template you just created and click **Yep, looks good**.
11. Your sensor's LED will flash as it provisions. Once the LED is solid white, go to the next step - **Adding the Sensor to the Density App**.

*If your sensor's LED is any color besides white, follow the troubleshooting steps in this help article: [Why is my Open Area sensor offline?](#)*

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## Ethernet Setup

1. Download the Setup App by going to [mobile.density.io](https://mobile.density.io).
2. Log in using your Density Dashboard account credentials. Contact [support@density.io](mailto:support@density.io) if you need an account.
3. Stand near your sensor with Bluetooth turned on.
4. Click **Scan for Sensors** and select an unassigned device.  
  
*If you need to identify which sensor you are setting up, select a sensor from the list, then click **Locate** on the top right corner, and the sensor's LED light will flash.*
5. Click **Setup this sensor**.
6. If you are connecting with DHCP, click the **Automatic ethernet template > Yep, looks good**. Jump to step 11.
7. If you are using static provisioning, click **Add a Network Template > Ethernet** (Note: We highly recommend using DHCP for your setup).
8. Name the template something you will remember. You can apply the same network template to all sensors using those credentials.
9. Enter your password and static provisioning details, then click **save**.
10. Select the Ethernet template you just created and click **Yep, looks good**.
11. Your sensor's LED will flash as it provisions. Once the LED is solid white, go to the next step.

*If your sensor's LED is any color besides white, follow the troubleshooting steps in these help articles: [Why is my Open Area sensor offline?](#) (steps for each LED color) or [Ethernet Troubleshooting Guide for Open Area Sensors](#) (Ethernet troubleshooting for IT engineers).*

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# Adding the Sensor to the Density Dashboard

# 04

Once the sensor has been installed, powered, and successfully connected to the network, you are ready to position it on a floorplan and begin streaming device data.

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## Steps

1. Sign in to the [Density Dashboard](#). If you have already created your building structures, skip to step 7.
2. Click the **Gear** icon in the top right, then click **Locations**. (Note: You must have admin or owner permissions)
3. Create your building hierarchy by clicking **Add a campus** or **Add a building**. (Open Area floorplans require building and floor levels at a minimum)
4. For each building and floor, add the capacity under **General > Meta information** for reporting to work properly.
5. Check the time zone under **Operating Hours**.
6. Once you have added in all the information, click **Apply Changes**.
7. Go to **Open Area**.
8. Select your building from the drop-down on the top left.
9. Click the floor > **Upload a floorplan**. (.png or .pdf files accepted)
10. Zoom in and out of your floorplan using pinch gestures on a trackpad or by clicking **cmd + scroll** on a mouse (See **Keyboard Shortcuts** on the bottom center of the page for more shortcuts).
11. Move to the area of your floorplan to add a sensor and click **OA** next to **Add a Sensor** on the top left.
12. Click the estimated location on the floor plan.
13. Drag the sensor to the correct location.  
  
*You can use reference points to determine the exact location. Use a fixed point (e.g., a wall, column, or door) and measure the distance from that point to the sensor. Add the reference point and measurements to the floorplan by clicking the ruler icon on the top left and then clicking **Add a Ruler**.*
14. Fill in the required fields:
  - a. Serial number: Found on the box or by using the Setup App. In the app, scan for nearby sensors. Select one from the list, then click Locate in the top right of the app. The sensor that matches that serial number will blink.
  - b. Sensor height: Distance from floor to bottom of the sensor.
  - c. Rotation: The arrow in the sensor's circle on the floorplan should face the opposite direction as the ethernet cable. Correct rotation is required for data validation.
15. Click **Done**.

## Step 1: Confirm data is streaming in the expected location

### Steps

1. Log in to your [Dashboard](#) and go to **Open Area**.
2. Select your building from the dropdown and click on the floorplan.
3. Check that you are in **Planning** mode on the top right. Your sensors and their assigned locations should already be loaded on your floor plan by Density.
4. Locate an object marked in the floorplan that you'd expect to be accurately represented (column, door, or corner of a wall) in the floorplan.
5. Select the **Space** icon and select a circle.
  - a. If it is an enclosed room with one sensor, use the box shape to cover the entire room.
6. Create the circle on or near the object you've identified on the floorplan.

*If the object is located inside an overlapping field of view of two or more sensors, be sure to disconnect one sensor before testing.*
7. Select a sensor you'd like to test to by clicking on its field of view (the gray circle). Click the **Streaming** button.
8. Walk to the area and ensure that the sensor streams data within the circle and the space registers when you walk inside the marked object space.
9. When you confirm data is streaming in the correct location, lock the sensor by clicking the lock icon in the sensor details window.
10. Repeat for each sensor.

### To adjust sensors

1. Select the serial ID in the left panel or click anywhere in the specific sensor's field of view.
2. A pop-out window appears that enables you to:
  - a. Change sensor's height. (*Sensor height impacts its field of view*)
  - b. Change sensor's rotation. (*The arrow in the Open Area circle on the floorplan should face the opposite direction as the ethernet cable. Correct rotation is required for data validation*)
  - c. Detach serial ID from sensor location if it is incorrect.

### If your sensor data isn't showing inside the space you drew:

1. Check that you have the correct sensor serial number for that location.
2. Adjust the rotation of the sensor until the arrow is pointing in the same direction as installation.
  - a. The arrow in the sensor's circle on the floorplan should face the opposite direction as the ethernet cable. Correct rotation is required for data accuracy.
3. Ensure the sensor location is in the correct place by comparing the physical measurement of the sensor to the reference point measurements.
  - a. To see the reference points, click on the sensor's field of view (grey circle).

## Step 2: Confirm the Field of View (FOV) and the installation height

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### Steps

1. Walk from the center of your selected sensor to the edge of the FOV (edge of the gray circle).
2. Repeat, walking north, south, east, and west.
  - a. If the edge of the field of view extends into another room or is blocked by an obstruction, data may not stream to the edge of the FOV.
3. Ensure you can see yourself moving in each direction.

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### If your sensor is showing data but not near the edges:

If the sensor data looks otherwise correct, this could be the result of an inaccurate installation height. Please verify the height of the sensor, and run the field of view (FOV) confirmation step again.

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### If your sensor consistently shows data, but there are some blind spots:

If the sensor data looks mostly correct but does not stream data in specific areas, this could result from objects interfering with the sensor signal. Please ensure there are no metallic or similarly dense objects between you and the sensor.

Alternatively, this could be a result of excessive noise in that area. Please reach out to [support@density.io](mailto:support@density.io) if you think you're experiencing this issue.

## Step 3: Confirm overlapping sensor position (applicable to multi-sensor spaces)

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### Steps

1. Choose one pre-verified sensor and another overlapping sensor, ensure they're streaming data.
2. Draw a rectangular space perpendicular to the sensor that overlaps both FOVs.
3. Draw a single circular space anywhere within the overlapping FOV.
4. Walk through the rectangular space.
5. Ensure the streaming data is moving in the same direction.
6. Walk to the circular space.
7. Once in the space, ensure the space lights up, and the sensor overlap is aligned.

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### If my sensor data isn't moving in the same direction:

Adjust the rotation of the sensor until the arrow is pointing in the same direction as the sensor's physical location. The arrow in the sensor's circle on the floorplan should face the opposite direction as the ethernet cable.

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### If sensor data isn't showing inside the space I drew:

Ensure the unverified sensor location is correctly placed in the application by comparing the physical measurement of the sensor to the reference point measurements in the application.