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# Bastille

## SENSOR-2 Installation Manual

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**NOTE: Need Bastille Trademark info and patent info plus anything else that council advises.**

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## REVISION HISTORY

Rev		Date
0.1	First draft.	10-17-18
0.2	Replaced old pictures. Added new pictures	10-26-18
0.3	Added FCC label info for Scanning Receiver function	11-19-19
0.4	Edit FCC label info	11-20-19
0.5	Corrected FCC ID for Wifi/BT module	12-03-19
0.6	Added Compliance Responsible Party information	1-3-2020

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## 1. OVERVIEW

The Bastille Networks Sensor provides protocol agnostic visibility of the Radio Frequency spectrum from 50MHz through 6GHz. It is designed for use in commercial settings where wireless security is of paramount concern and real-time threat monitoring is desired.

This manual provides an overview of how to plan and install Bastille Networks Sensor to provide robust and effective coverage of the protected space.

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## 2. SITE PLANNING

### 2.1. REQUIRED INFRASTRUCTURE

The Sensor requires wired network connectivity in the form of ethernet, preferably 1G-Base-T, but also 100MBase-T, and a routable path for it to reach public IPv4 address space. It can be powered by Power-over-Ethernet (PoE) that is compliant to at least the 802.3at specification. Optionally, it can be powered from a DC power supply that provides 44VDC to 56VDC and a minimum of 26W of power.

### 2.2. LOCATION

Since the Sensor is a radio receiver the best locations place as little obstruction between the areas to be protected and the Sensor so that signals arrive by a direct path and as strong as possible to maximize range.

Of greatest concern are metal and other conductive materials which actively shield signals from reaching the Sensor. Air handling duct work, glass tinted with a metallic coating, re-enforcing steel in concrete, and large metal office furniture (such as filing systems) are all common examples of surfaces that will actively prevent signals from passing through and possibly reflect them in different directions.

Of lesser but still significant concern are non-conductive dense materials such as concrete, stone, masonry or earth that will strongly attenuate radio signals that pass through them.

The Sensor is constructed from special materials that convey fire resistance without impeding RF signals such that the Sensor can be located in air handling spaces (or plenums) which are governed by special fire and building codes. These commonly occur above suspended false ceilings or below raised floors in buildings.

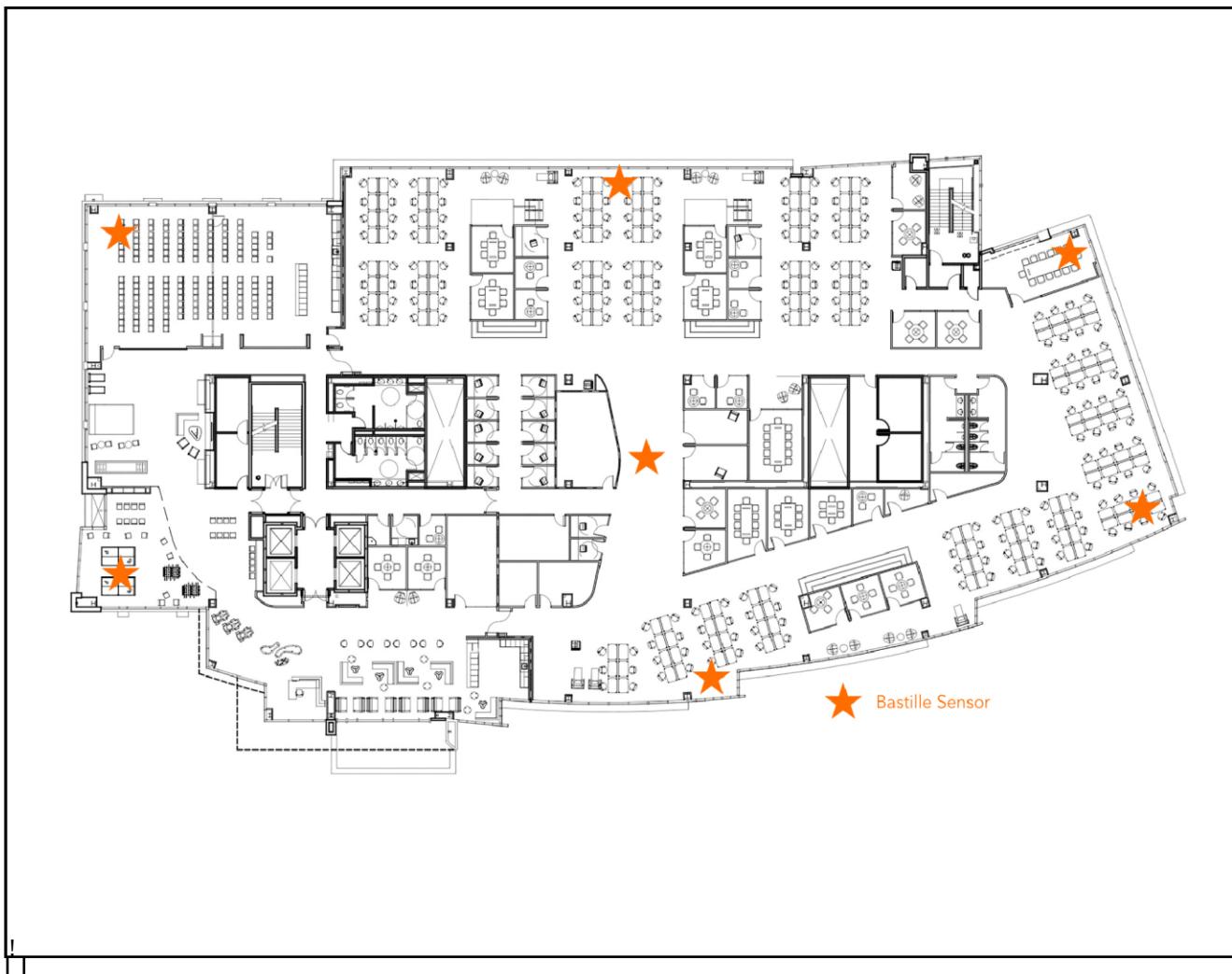
The Sensor whilst durable is not constructed for use in a wet, humid or outdoor environment, and care should be taken when siting it that it is not subject directly or indirectly to water condensation. It should not be sited in a health care facility where it will be subject to regular wet cleaning procedures as part of a disinfection and sterilization program.

The Sensor is not designed to operate in hazardous locations where specific fire or explosion hazards may exist due to flammable gases, vapors, dusts, fibers etc.

## 2.3. DENSITY AND DISTRIBUTION

To localize signals effectively, the Sensors need to be loosely distributed in a basic geometric arrangement.

The perimeter of the space to be protected should be ringed with Sensors at an approximate 15-25 meter interval (50-80 feet). In addition, at least 1 more Sensor should be placed towards the center of the protected space.



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## 2.4. SENSOR ORIENTATION

The Sensor contains a number of antennae that work best when the Sensor is mounted on a horizontal plane. In a desktop or underfloor application, the Sensor should be mounted in a non-inverted orientation. In a ceiling mount or above ceiling mount application, the Sensor should be mounted in an inverted orientation.

The Sensor is not designed for wall mounted applications and should not be mounted in this orientation.

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## 3. SENSOR INSTALLATION

### 3.1. DESKTOP

The Sensor can be placed upright (non-inverted) directly on a smooth flat surface. The Sensor's enclosure was designed to allow sufficient airflow to cool the system while fully operational, without any need for risers or stand offs.



**Figure 1. Desktop Mounted Sensor**

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## 3.2. CEILING

The Bastille Networks Sensor is designed for installation in a variety of ceiling mount locations and is certified to UL2043 standard for installation in an air handling space. In all cases, the installation location should provide an adequate flow and volume of air for cooling of the Sensor, and under no circumstances should any of the case air vents be obstructed.

When installing a Sensor in a ceiling location care should be taken to ensure that the Sensor is mounted securely.

### 3.2.1. MOUNT KIT

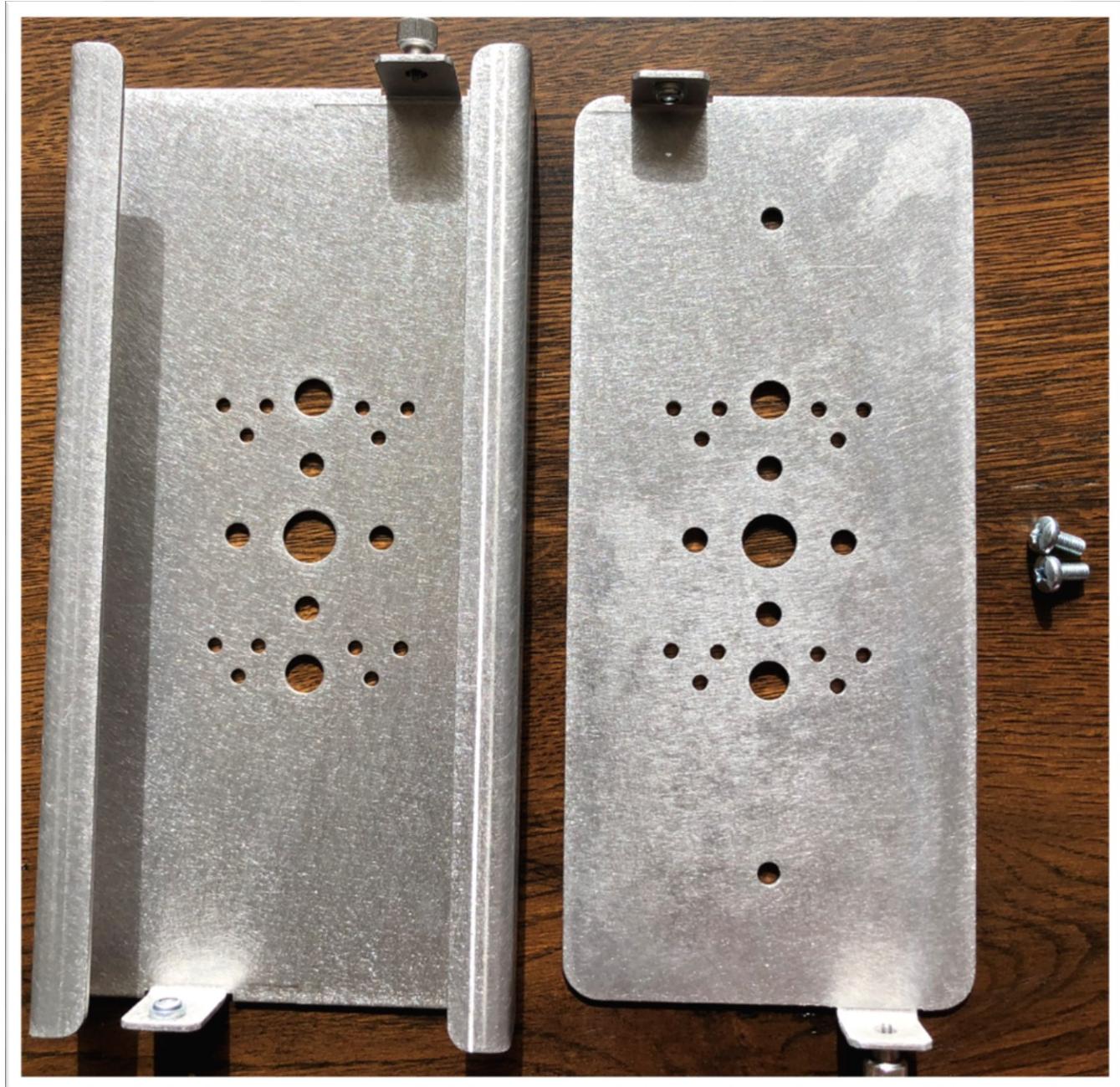
Bastille Networks offers a mounting kit (P/N MOUNT-03) that provides a versatile solution to attaching to typical commercial ceiling tile grids or above ceiling mounting features. The Bastille Networks MOUNT-03 kit contains:

1 Adapter Plate

1 Mounting Plate

2 M5x10mm pan head screws

The MOUNT-03 kit is shown in Figure 2 below.



**Figure 2. Bastille MOUNT-03 Kit**

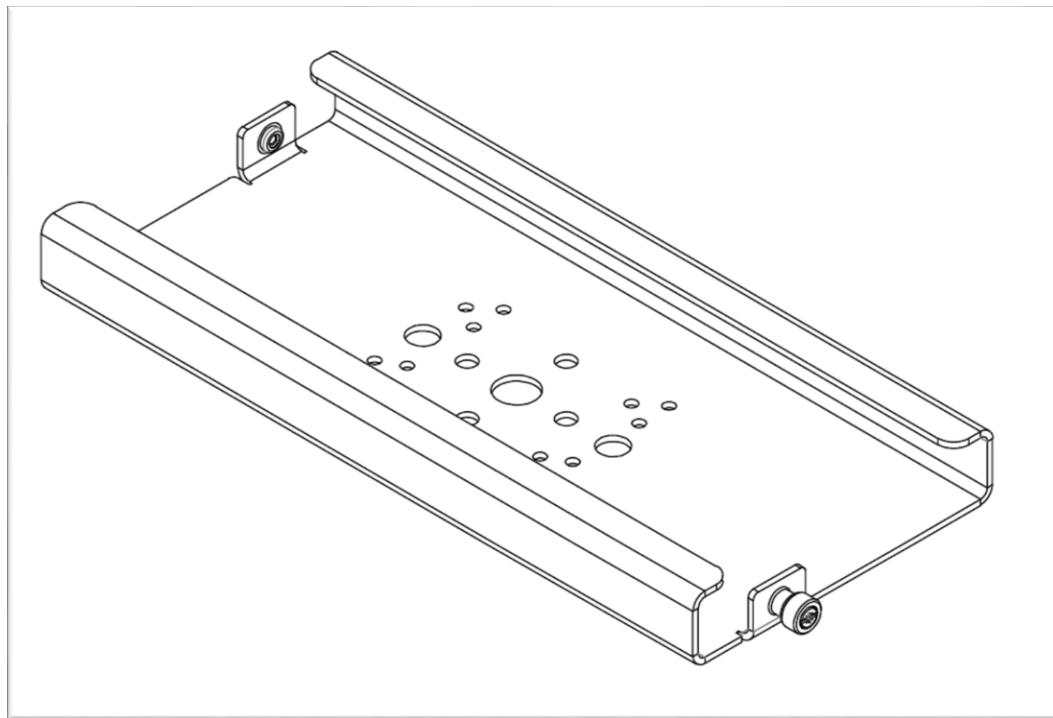
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### 3.2.1.1 SENSOR-02 ADAPTER PLATE

The Adapter Plate is C-shaped aluminum piece that is pre-drilled with holes that match a variety of de facto industry standard hardware. There is an embedded nut on one end of the Adapter Plate, and a captive thumb screw on the other end. The holes in the Sensor-02 Adapter Plate match the holes in the Sensor-01 Mounting Plate (shown in Figure 4 below), which allows the Sensor-02 Adapter Plate to be used with the various Bastille Networks ceiling mount methods approved for Sensor-01, including:

- Unistrut
- Threaded rod
- I-Beam
- Etc

See Sensor-01 Installation Manual for details about the above ceiling mount methods.



**Figure 3. Sensor-02 Adapter Plate**

The Sensor-02 Adapter Plate mounts to a ceiling structure with the bent edges facing down.

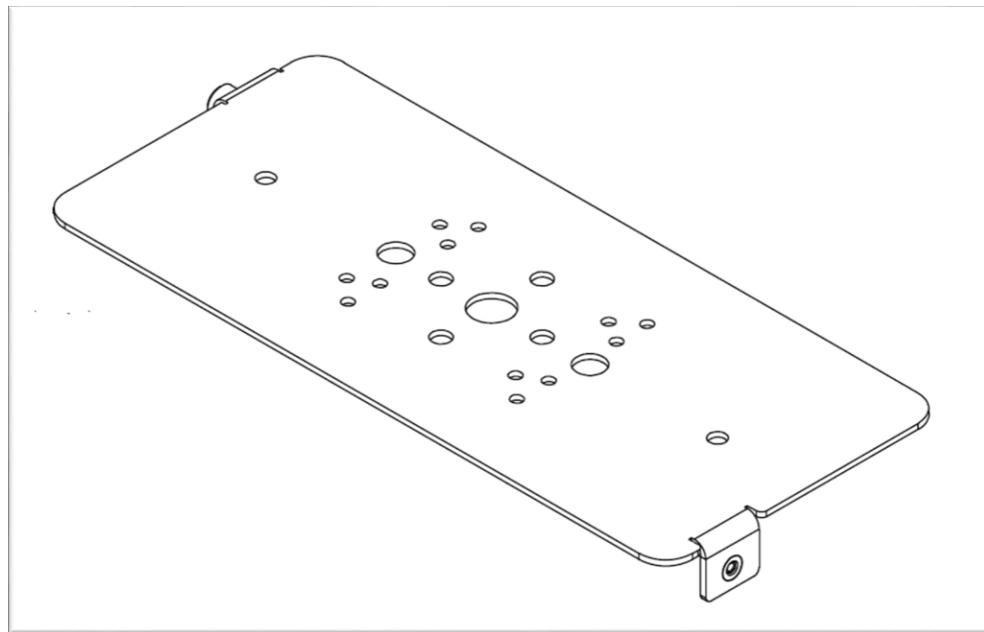


**Figure 4. Sensor-01 Mounting Plate (shown for reference only)**

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### 3.2.1.2 SENSOR-02 MOUNTING PLATE

The Sensor-02 Mounting Plate is a flat piece of aluminum with tabs on the short edges that house an embedded nut and a captive thumb screw. The hole pattern on the Sensor-02 Adapter Plate is duplicated on the Sensor-02 Mounting Plate to allow air to flow out of the Sensor-02 enclosure. There are two additional holes used to attach the Sensor-02 Mounting Plate to the Sensor-02 enclosure using two M5 pan head screws. The tabs should point away from Sensor-02 enclosure when properly installed, and the M5 screws should be hand tight (see Figure 5 below).



**Figure 5. Sensor-02 Mounting Plate**

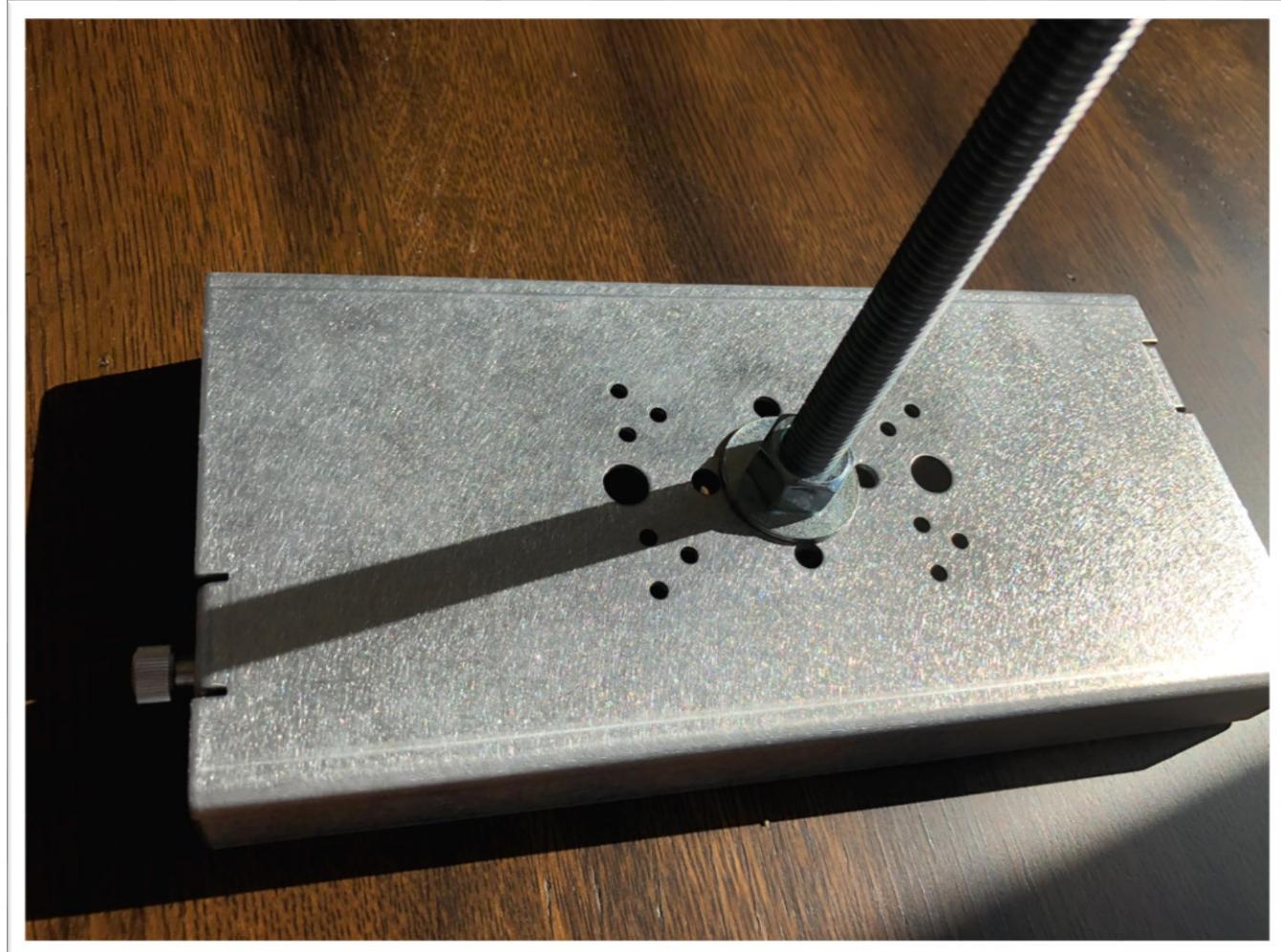


**Figure 6. Sensor with Mounting Plate**

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To install the Sensor-02 to the ceiling, first choose an appropriate ceiling mount structure and secure the Sensor-02 Adapter Plate to it.

The following example shows two nuts and two washers that are used to attach the Sensor-02 Adapter Plate to a  $\frac{1}{2}$ " diameter threaded rod.



**Figure 7. Sensor-02 Adapter Plate Attached to Threaded Rod (top view)**



**Figure 8. Sensor-02 Adapter Plate Attached to Threaded Rod (bottom view)**

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Then simply slide the Sensor (with the Mounting Plate) to the Adapter Plate, making sure the thumbscrew on the Mounting Plate is on the same side as the nut on the Adapter Plate. Secure the Sensor-02 to the Adapter Plate using the two thumb screws on both ends.



**Figure 9. Insert Mounting Plate to Adapter Plate.**



**Figure 10. Mounting Plate Fully Inserted to Adapter Plate.**

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## APPENDIX A - SPECIFICATIONS

<b>Category</b>	<b>Specification</b>
Size	298mm x 298mm x 132mm
Weight	6.2 lbs
Operating Environment	0 – 40°C, 0-90% RH
Power Consumption	20W typical at 25°C, 25W maximum
DC Input Jack	44-56V, 25W min (use CUI SD150-48-U-P5 AC Adapter or equivalent)
POE	802.3at compliant
Indications	Ethernet LINK/ACT LED, RGB status LED
Control	Reset button
Connectors	RJ-45, Auxiliary DC Input Jack

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## APPENDIX B - REGULATORY INFORMATION

FCC ID: 2AIJ5-SENSOR2

CONTAINS FCC ID: PD98265NG

Responsible Party Contact Information

Bastille Networks

1000 Marietta St., #224

Atlanta, GA 30318

Phone: (800) 530-3341

### Federal Communication Commission - Declaration of Conformity

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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

Warning: Modification of this device to receive cellular radiotelephone service signals is prohibited under FCC Rules and Federal Law.