# GREENLEE®

## COMMUNICATIONS

# AirScout®

# AirScout® Enterprise Instruction Manual

# Contents

# OVERVIEW

Thank you for purchasing Greenlee Communications AirScout® Enterprise!

## Description

This solution is designed to assist with installation, troubleshooting, and validation of enterprise-grade Wi-Fi® systems to maximize user performance and experience.

## Safety

Safety is essential in the use and maintenance of Greenlee tools and equipment. This instruction manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

**Do not discard this product or throw away!**
For recycling information, go to www.greenlee.com.

# IMPORTANT SAFETY INFORMATION

┌─────────────────────────────────────────────────────────────┐
| ⚠ **WARNING** |
├─────────────────────────────────────────────────────────────┤
| Read carefully all the safety information below before using AirScout. |
| |
| Failure to follow these safety instructions could result in fire, electric shock, injury, or damage to the AirScout equipment or other property. |
└─────────────────────────────────────────────────────────────┘

## Operation

1. Charge all units for at least two hours before using.

2. Use the enclosed power supply adapter and connect it to the carry case.

3. The LED on the side of the carry case will turn on red while at least one unit is charging. The LED will turn green when charging is complete.

## Specifications

Power input:

　Carry case:  11 to 15 VDC, 2.5 A maximum.

　AirScout Master Controller 300 (ASM300):  11 to 15 VDC, 1 A.

　AirScout Client 300 (ASC300):  5.00 ±0.5 V, 1 A.

Operating temperature:  0 to +60 °C (+32 to +140 °F).

Charging temperature:  −10 to +55 °C (+14 to +131 °F).

Operating humidity: 90% max, non-condensing.

Storage temperature:  −20 to +70 °C (−4 to +158 °F).

All parts are intended for indoor use only in dry conditions.

If soiled, clean the case only with a damp cloth and soap or mild detergent; ensure the product is fully dry before use.

## Power Adapters

AirScout devices will operate from the internal battery or an external power supply. The master will accept the 12 VDC external power adapter supplied with the product.

### AirScout 306 External Power Supply

12 VDC output, universal input (90~240 VAC) with interchangeable blades.

**CAUTION:** Use only Greenlee power adapters supplied with the kit. The use of any unauthorized power supplies is not recommended. As such, Greenlee is not responsible for any malfunction.

### Automobile 12 V Power Adapter

12 VDC input, 5 A maximum.

**CAUTION:** Use only the power adapters supplied with the kit. The use of any unauthorized power supplies is not recommended. As such, Greenlee is not responsible for any malfunction.

## Battery

AirScout master and client devices contain a lithium polymer cell that is permanently installed. **CAUTION:** Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions. This battery is not serviceable by the customer. The lithium polymer cell was tested in accordance with UL2054 and IEC 62133, and it has a capacity below 15.7 Wh. If service is required, contact Greenlee for your nearest authorized repair center.

• The battery must be recycled or disposed of separately from household waste.

• For more information go to www.greenlee.com.

### Charging

AirScout batteries should be charged after each day of use. The AirScout 306 product includes a carry case with charge capability. When master and client devices are in the carry case and the carry case is connected to the external power supply or the automotive 12 VDC adapter, the devices will charge. The carry case LED will indicate charge status.

• Off indicates power is not present.

• Solid red indicates that one or more devices are charging.

• Solid green indicates that all devices are charged.

## Compliance

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65 and RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20 cm (8 in) or more away from person's body (excluding extremities: hands, wrists, feet and ankles).

### Canadian Department of Communications Industry Canada Notice (Canada only)

This Class B digital apparatus complies with Canadian ICES-003.

### FCC Rules, Part 15

This device complies with Part 15 of FCC Rules and Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference, including interference that may cause undesired operation.

### EU Compliance

Greenlee Textron Inc. hereby declares that the AirScout kit is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC and the R&TTE Directive. A copy of the full Declaration of Conformity may be downloaded from www.greenleecommunications.com/support/compliance.

## Limited Warranty Summary

Greenlee Textron Inc. warrants the included product and accessories against defects in materials and workmanship for one year from the date of original purchase. Greenlee does not warrant against normal wear and tear, nor damage caused by accident or abuse. All items are produced in accordance with Greenlee's production instructions and tested to perform as specified. Greenlee Textron Inc. is an ISO 9001 approved company. Full warranty text and details can be viewed at www.greenleecommunications.com.

# HARDWARE COMPONENTS

AirScout Enterprise consists of the following hardware components:

• AirScout test hardware, including:
  - AirScout Master Controller 300 (ASM300), referred to in this manual as "master".
  - At least one AirScout Client 300 (ASC300), referred to in this manual as "client".
• A PC or tablet, referred to in this manual as BYOD (Bring Your Own Device).

## ASM300 AirScout Master Controller 300 (master)

The master is a compact, battery-powered 802.11 Wi-Fi access point (AP) test device providing a premises-wide solution for optimizing Wi-Fi installations and diagnosing Wi-Fi problems. The master, coupled with client devices, provides a client-side view of the Wi-Fi network, simultaneously measuring signal quality, congestion, interference, and application level performance throughout the entire premises.



**Master Front View**
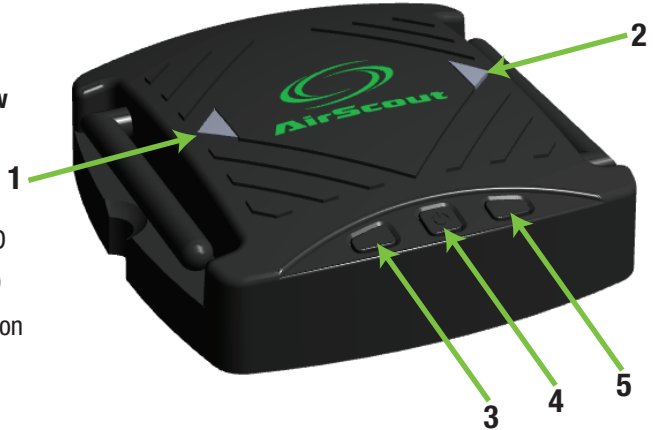
1   Device Status LED
2   Power Status LED
3   Identification Button
4   Power Button
5   Pairing Button
6   10/100/1000 Ethernet
7   12 VDC Power Input

**Master Rear View**
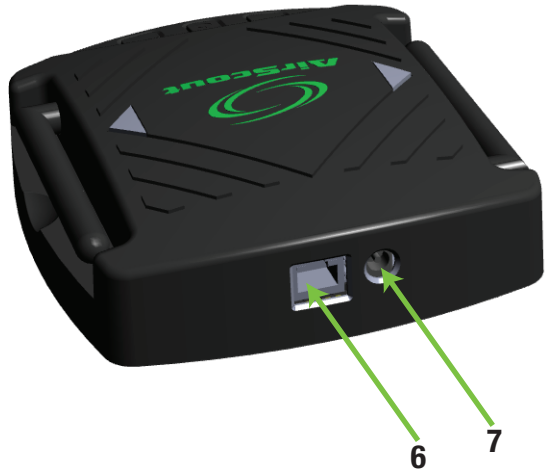
## ASC300 AirScout Client 300 (client)

The client is a compact, battery-powered 802.11 Wi-Fi client test device that communicates with the master. AirScout can simultaneously test a premises using one to 30 client devices, providing needed coverage throughout the premises.

**Client Front View**

**1** Device Status LED
**2** Power Status LED
**3** Identification Button
**4** Power Button
**5** Pairing Button
**6** Micro USB Power Input

**Client Rear View**

# APPLICATION REQUIREMENTS

The AirScout Enterprise application requirements for the operating systems supported include: Windows 7, 8, 10 – minimum 1 GB hard drive space, 4 GB memory, dual-core Intel processor @ 1.5 GHz or greater with 3D graphics acceleration enabled.

# INSTALLATION

Download the AirScout Enterprise application from the Greenlee Communications website at http://www.greenleecommunications.com/. Then click on the "Support" tab at the top of the page and select "Software Updates". Register for an account if you do not have one.

Once the AirScout Enterprise package is downloaded, it is installed with the InstallShield Wizard. While all attempts have been made to include the installer with all the required application dependencies, it is important to remain connected to the Internet during this process in case other dependencies need to be installed. The installation procedure is similar to installing any other Microsoft Windows application.

1. Start the installer by double clicking the "AirScout Setup" icon. A warning about the software coming from an untrusted publisher may appear at this point, depending on your version of Windows. Click on the "More Options" link and select "Install Anyway" to trust the publisher.

2. The installer now starts installing the application dependencies. The actual application will be installed once this is finished.
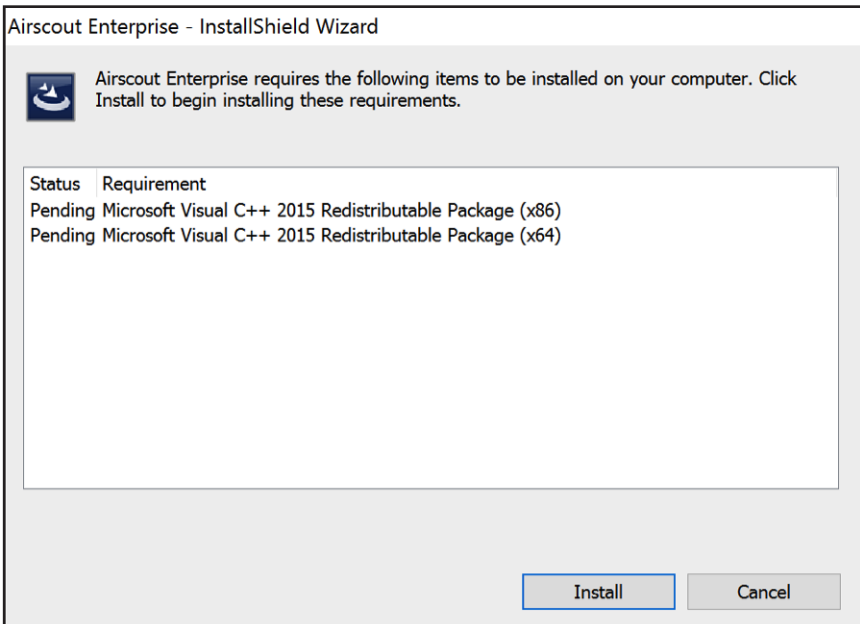
3. The installer might reboot your computer to finish installing these dependencies. Upon reboot, the installer launches automatically and continues the installation.



**Welcome to the InstallShield Wizard for Airscout Enterprise**

The InstallShield(R) Wizard will install Airscout Enterprise on your computer. To continue, click Next.

WARNING: This program is protected by copyright law and international treaties.

4. Press **Next** to continue installation.

5. The installer now shows you details regarding the installation, including the installation location.
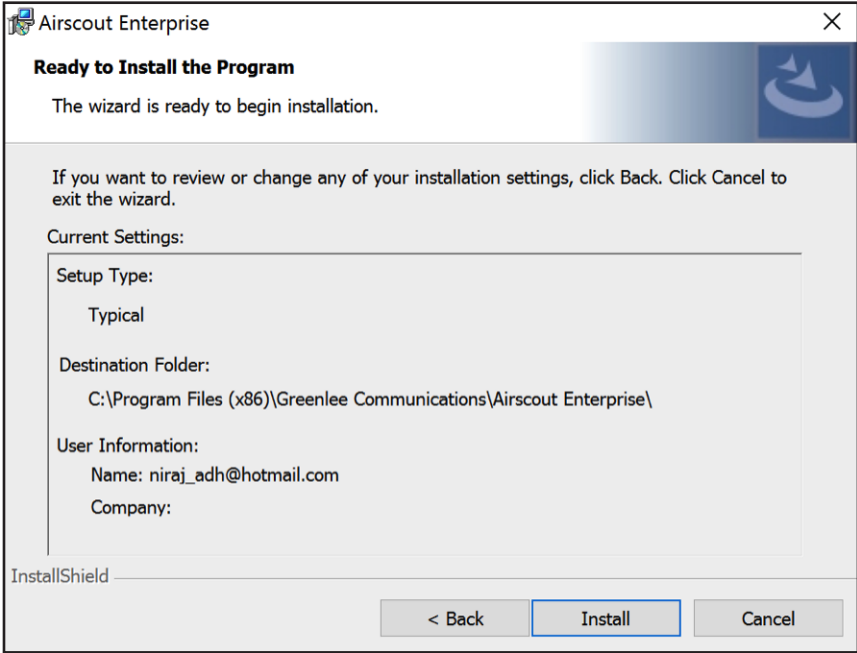


When you select **Install**, the installer begins copying files to complete the installation.

6.  Upon completion, the installer indicates it has finished installation. Select **Finish** to complete installing the application.
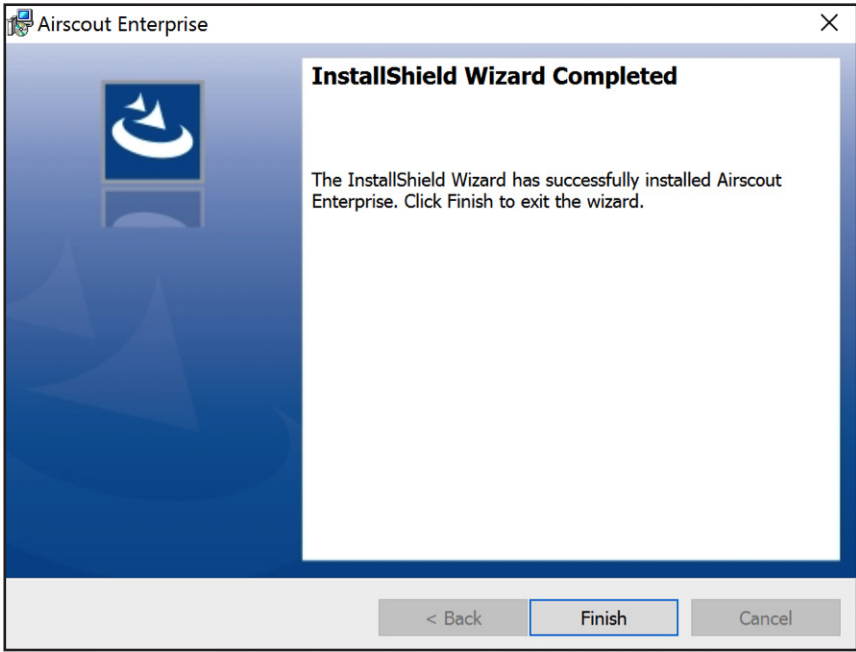


7.  The installer creates a desktop shortcut with which you can launch the application.

# AIRSCOUT HARDWARE OPERATION

## Turning Power On

Press the center power button on either the master or client. The right side power status LED turns green, and the left side device status LED turns solid white, indicating the device is powering up. The master and client are ready for testing after approximately 50 seconds.

## Turning Power Off

Press and hold the center power button on either the master or client for approximately two seconds to power off.

## Power Status LED

The power status LED is located on the right side of both master and client devices:

1. Green (solid) – indicates the device is operating and the battery voltage is satisfactory.

2. Orange (solid) – indicates the device is operating and the battery voltage is low.

3. Blue (solid) – indicates the device is charging. Charging can occur while the unit is on or off.

## Device Status LED

The device status LED is located on the left side of both master and client devices:

1. White (solid) – indicates the device is powering up.

2. Off – indicates the client and master are not connected.

   • client is not paired to a master

   • client is out of radio range from the paired master

   • master is not connected to any client devices

3. Green (solid) – indicates the client and master are connected and the devices are idle.

4. Green (blinking) – indicates that a test is in progress or the devices are in pairing mode.

5. Green/White (blinking) – indicates the master is attempting to send results to the tablet but the tablet is not currently connected. If the tablet is in the proximity of the master and this state persists, the tablet may have associated with a different access point. Refer to "Connecting a Tablet or PC to the AirScout" to restore the connection.

6. Purple (blinking) – indicates location mode is active.

## Connecting a Tablet or PC to the AirScout

When prompted by the AirScout Enterprise application, the tablet or PC must be connected to a master device. Refer to the rear label of the master to identify the SSID and Password necessary to connect your tablet or PC to AirScout.

1. On the tablet or PC, navigate to the Wi-Fi settings menu.

2. Ensure Wi-Fi is enabled.

3. From the available networks select the SSID of the master.
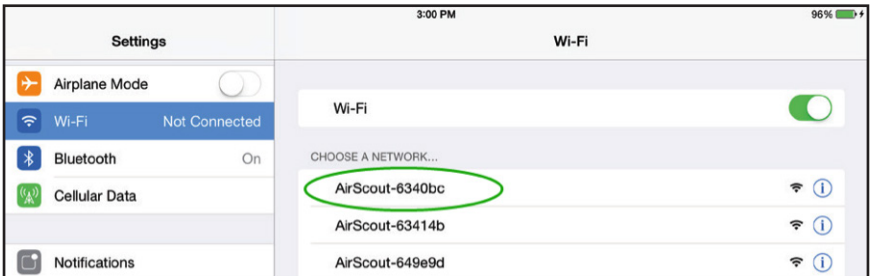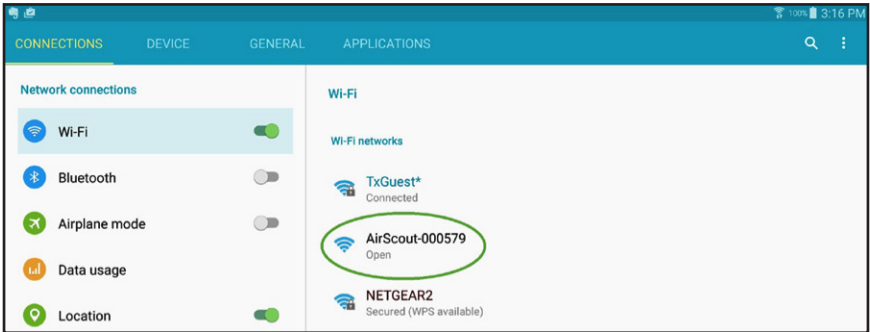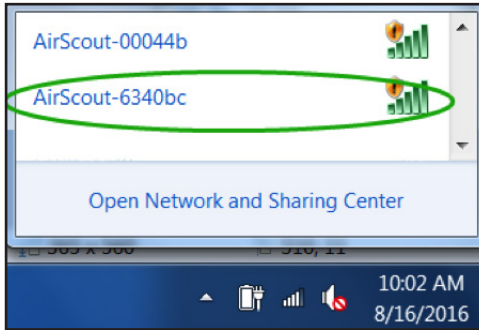






4. Once the tablet or PC is connected, the AirScout SSID appears in the connected list.

*Note: Depending on the tests selected to run, during testing the AirScout master may change its Wi-Fi connection to the tablet. If the BYOD is in the presence of an alternate known Wi-Fi network or a carrier Wi-Fi hot spot, the BYOD may switch connections without your knowledge, preventing the AirScout from re-establishing a connection. When this happens, the AirScout master will indicate it is trying to re-establish a connection and the application will inform the user that the connection has been lost. To avoid this situation, navigate to the Wi-Fi settings menu, "forget" known networks, and disable auto connections to carrier Wi-Fi hot spots.*

## Pairing Clients to a Master

A master device can manage up to 30 connected clients. When pairing the AirScout solution, all client devices may be paired to a master simultaneously. To ensure client devices pair to the correct master, only pair one AirScout solution at a time if AirScout kits are within radio range of each other. The client cannot discriminate between two masters that are both in pairing mode. Prior to pairing, ensure that the client and master devices are in close proximity and the battery is not low.

1. Ensure all devices are powered on and the right side power status LED is green.

2. To start the pairing process, press the pairing button on the master device; the left side device status LED begins blinking green to indicate pairing mode is active.

3. While the master is in pairing mode, press the pairing button on one or more client devices; their device status LEDs begin blinking green to indicate pairing mode is active.

4. Once pairing is complete, each client device status LED turns solid green, indicating that pairing was successful.

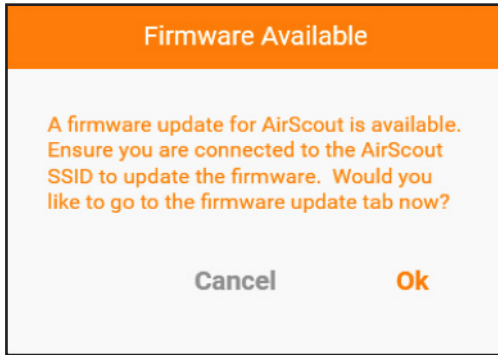5. The master remains in pairing mode for two minutes.

## Un-pairing Clients from a Master

Client devices may be un-paired from a master using the AirScout application.

# APPLICATION USE

## Firmware Updates

The AirScout application alerts the user when new device firmware is available.



Prior to updating the AirScout ASM300 and ASC300 firmware, ensure the BYOD is connected to the master device and all client devices are connected to the master. The latest firmware is automatically downloaded to the BYOD from the cloud, based on the user that is logged in and their licensing permissions. To view/update the firmware on the ASM300 and ASC300 devices, follow these steps.

1. Press the Firmware button, located in the upper right corner of the application. The Badge indicates that there is a firmware update available.

2. The Firmware view appears.
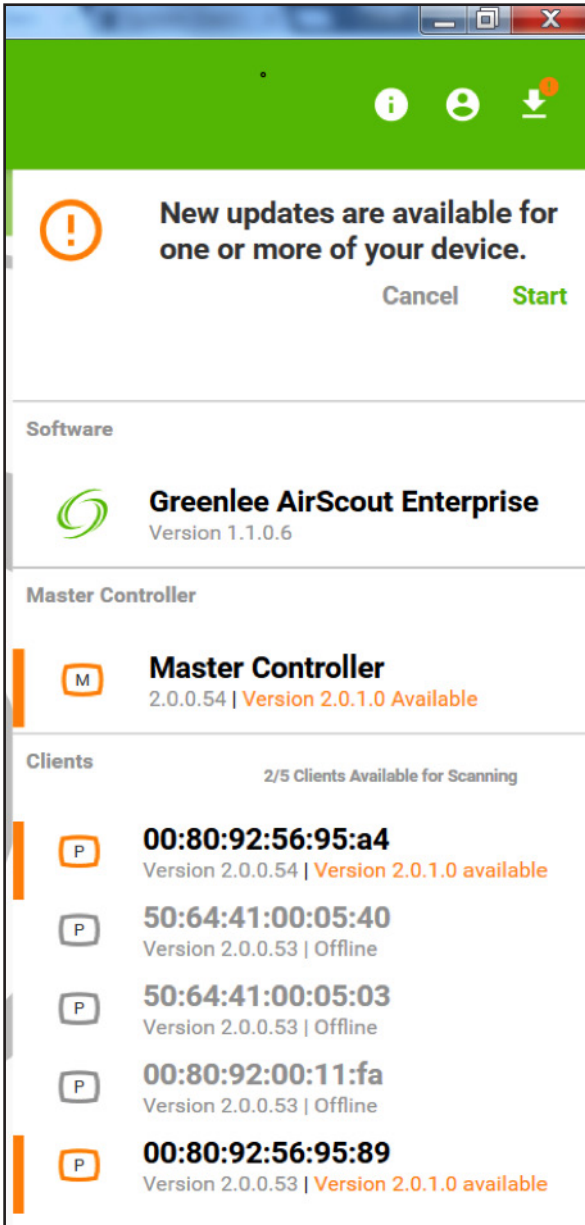


3. Devices that are up to date are shown in green. Devices that can be updated to more recent firmware are shown in orange. Gray devices are paired clients that are currently not connected or powered on.

4. To update the connected devices, press the **Start** button.

5.  The progress of the update is shown.
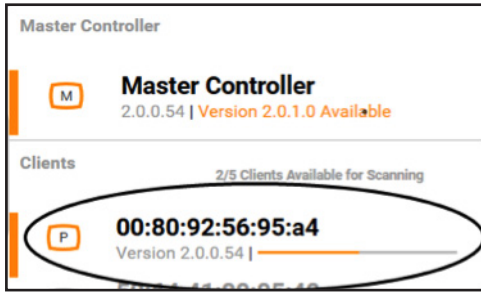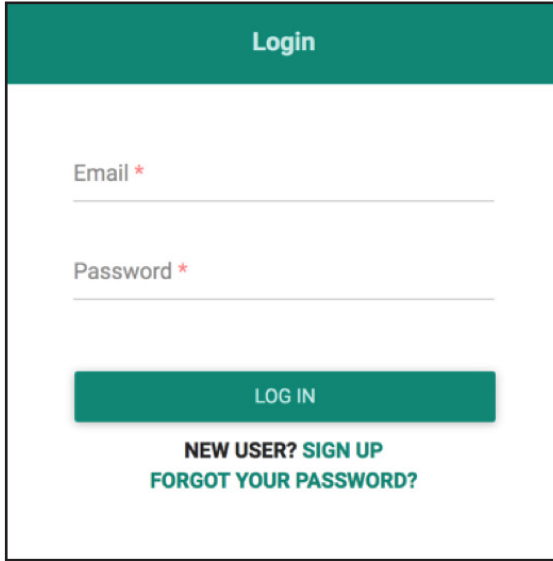


6.  After the update is complete, AirScout displays client device and firmware status.
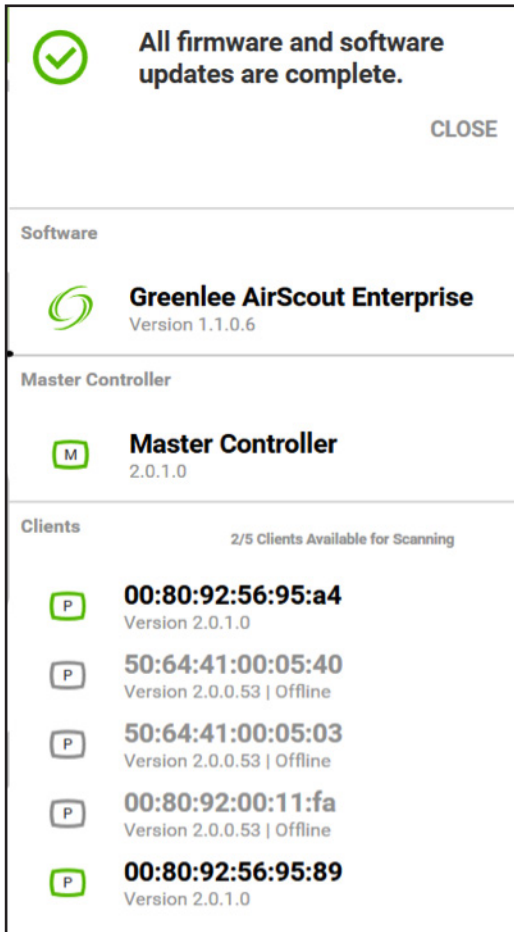
## Creating a Cloud Account and Setting Up a License

To create a cloud account, use either the browser on your device or the application itself.

If you prefer to set up an account with the web browser on your device, enter the cloud URL into your browser:  http://airscoutenterprisestaging.cloudapp.net/ and click **SIGN UP**.



First, select the role for the user. The roles are described below:

• Vendor administrator:  Select this role to indicate this account will be serving as an administrator to a particular user group (such as a company-wide administrator). This is useful for administering licenses and managing technician accounts within your domain.

• Technician:  Select this role to indicate this account will be serving as a technician. The technician may sign up without a vendor administrator email for a trial license, but this will be required after the trial expires.

Next, for technician roles, enter the vendor administrator email address if known. If not, this can be left blank for a trial license.
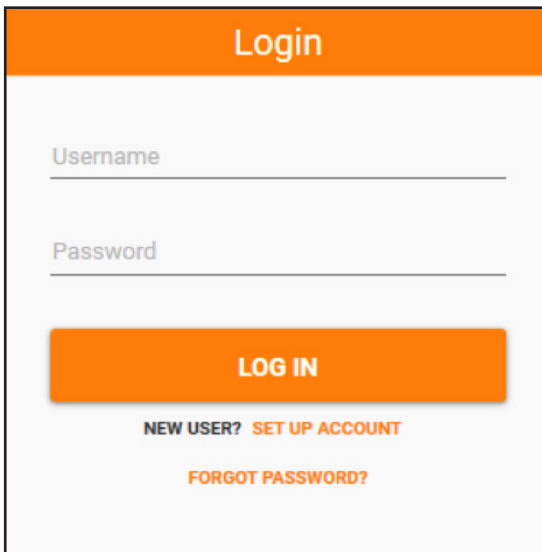
Then, fill out the remaining form to finalize the account setup. The email address entered will be used for validation of the account. Once entry of all the fields is completed and the account has been signed up, check the email account used for an email from AirScout Enterprise for account activation. The email contains a link that needs to be opened to complete registration.

1. Click the "Licenses" tab and **+** to create a license. Select license type; i.e., individual or company. Select the firmware version for that license and fill in other details. Press **save** to create the new license with selected firmware.

2. Press the "Vendors" tab to navigate to the vendors page and click the **+** symbol, which enables the user to add vendor. Fill in the username, email, phone, and address fields for new vendor, and select recently created license for the "Assign license" field and assign number of licenses. Press **save** to create vendor. Vendor admin user will be created automatically with email address provided for that vendor.

3. Now, the user needs to confirm their email address by clicking the confirmation link sent to their email address to set the password. (Use a different browser or private mode to confirm the account if you are still logged in to the system as the super admin.)

## Logging in

For login, the BYOD should always be connected to the Internet. However, after the first login attempt, the credentials are cached on the application and the user will not be required to log in again upon the next application launch. Launch the application on the BYOD, and use the recently created account to log in.



In the application, a new account can be created by clicking the **SET UP ACCOUNT** button if the user knows the vendor email. Click the **SIGN UP** button, fill in the required field, and press the **Create & login** button to create a new user under given vendor email.

Use **FORGOT PASSWORD?** to reset the password. It requests an email associated with an account to send a temporary link that will reset the password.
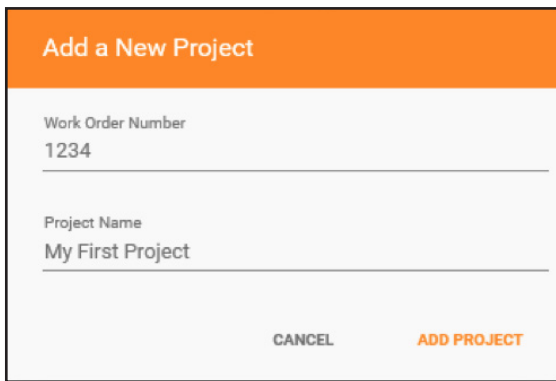
## Adding a Project

Add a project by clicking on the "Click to Add Project" button, which is located at the top right corner below the User and Firmware buttons. The button is highlighted in a red circle in the figure below.



A pop-up window appears with two input fields. Enter the "Project Work Order Number" and "Project Name" and press **ADD PROJECT**. The Project Work Order Number can be numeric or alphanumeric.
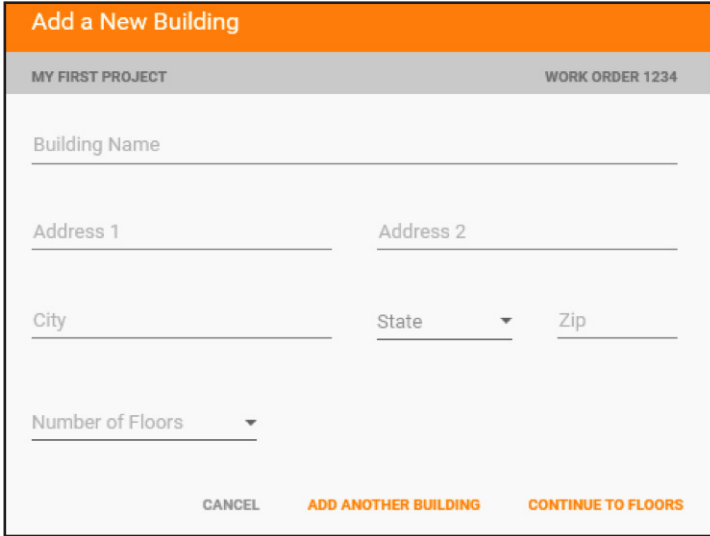
*Important:* *Project Work Order Number must be unique.*



## Adding a Building

To add a building inside an existing project, press the **+** button, which is located at the top right corner below the User and Firmware buttons. The button is highlighted in a red circle in the figure below.
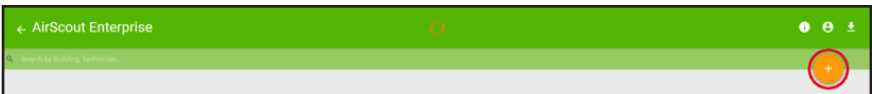
After **+** is pressed, a pop-up window appears. Fill out the Building Name, Address, and Number of Floors.



Click the **CONTINUE TO FLOORS** button to create the building and go to the Project setup page.

Click the **ADD ANOTHER BUILDING** button to create multiple buildings.

## Adding a Floorplan

Add a floorplan only inside an existing building. Select an existing building or create a new one.

After opening the building, there is an "Add Floorplan" button. Hover the mouse over the button to reveal the various options to import the floorplan onto the building.
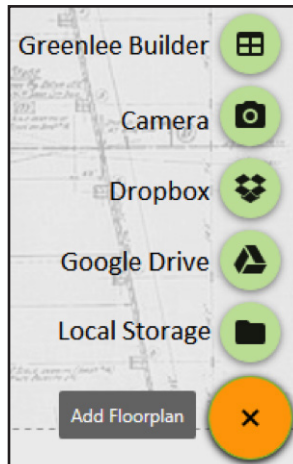
### *Selecting Floorplan from Greenlee Builder*

Click on the icon ⊞ to bring up the Greenlee Builder pop-up window. There are five floorplan shapes from which to choose.
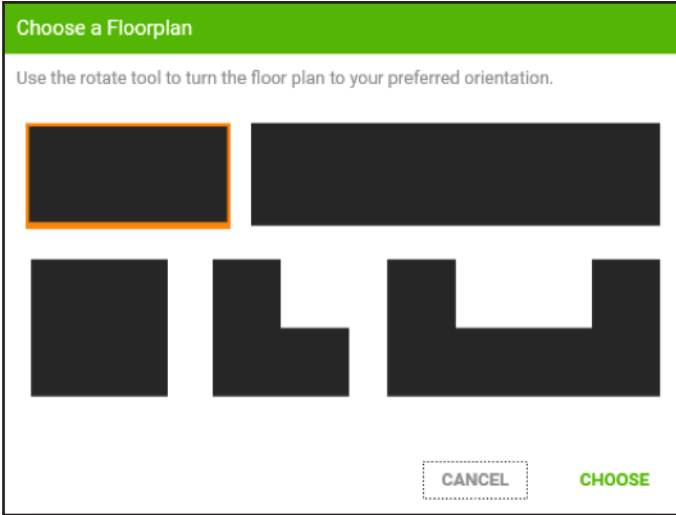


Select the required floorplan and click on the **CHOOSE** button. The user will be taken to the selected floorplan view.
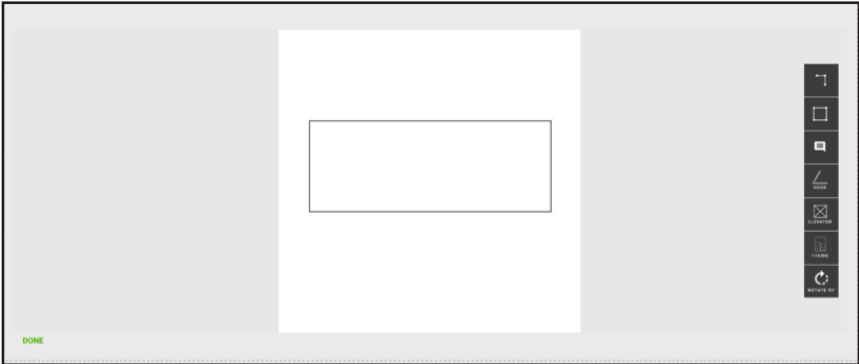


There is tool box to the right of the screen.

- To add a door, click on the icon ∠ and then drag and drop it on the floorplan.
- To add an elevator, click on the icon ⊠ and then drag and drop it on the floorplan.
- To add stairs, click on the icon ▤ and then drag and drop it on the floorplan.
- To rotate the floorplan 90° clockwise, click on the icon ↻ .

After making the necessary changes, click the **DONE** button to continue.

### *Importing Floorplan through Dropbox*

Click on the icon ✿ to bring up the Dropbox pop-up window. Two pop-up windows appear. Sign in to the Dropbox account from where the user plans to import the floorplan.
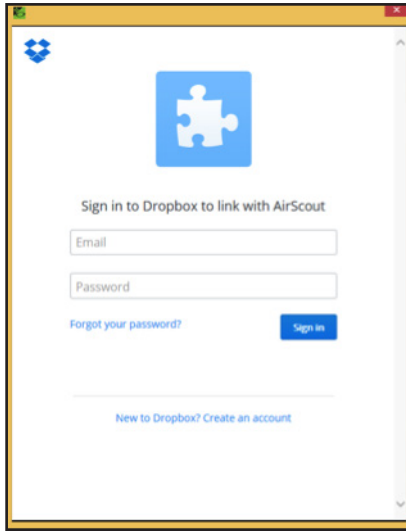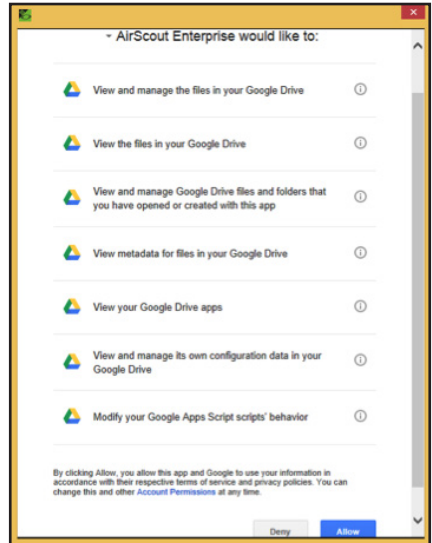


After the user has successfully signed in, the files (png, jpg, and pdf) and folders available in the user's dropbox are shown in the "Import from Dropbox" pop-up.
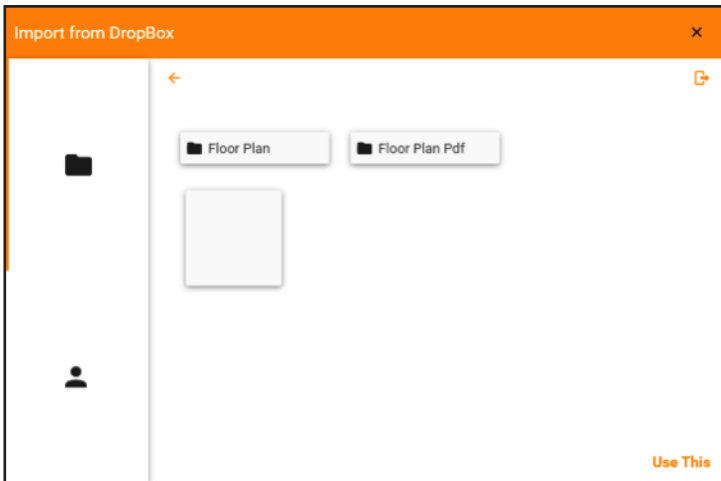


Select the required floorplan file and click the **Use This** button to import the floorplan. The user can also select files from the "Shared Folder" by selecting the shared 👤 option.

### *Importing Floorplan through Google Drive*

Click on the icon ▲ to bring up the Google Drive pop-up window. Two pop-up windows appear. Sign in to the Google account from where the user plans to import the floorplan. There is another step where the user has to give permissions to the application.
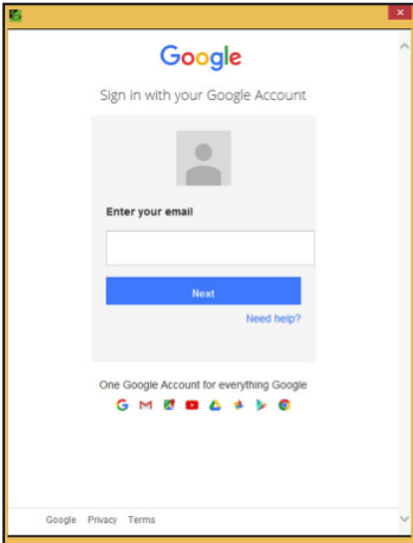


After the user has successfully signed in, the files (png, jpg, gif, and pdf) and folders available in the user's dropbox are shown in the "Import from Google Drive" pop-up.
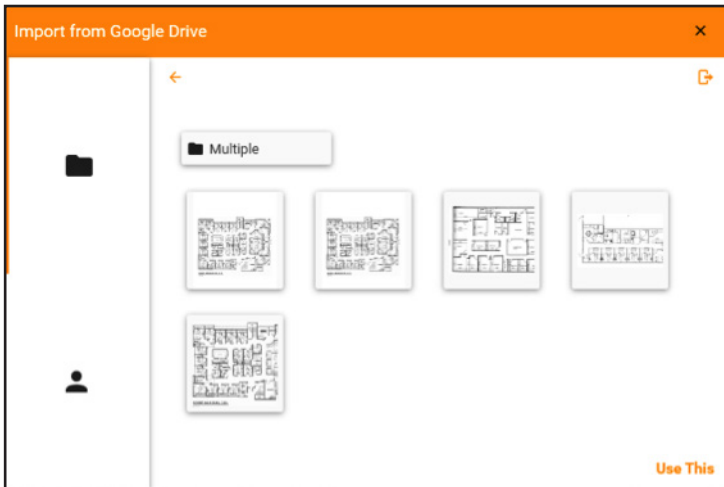


Select the required floorplan file and click the **Use This** button to import the floorplan. The user can also select files from the "Shared Folder" by selecting the shared 👤 option.

### *Importing Floorplan through Local Storage*

Click on the icon ▆ to bring up the Local Storage pop-up window.

Select the required floorplan file and click **Open** to import it.

### Cropping the Floorplan

After importing the floorplan, the user is able to crop the required section of the floorplan.

*Note: This process is not needed when importing the floorplan from the Greenlee Builder option.*

A green lined selection box appears on the floorplan.
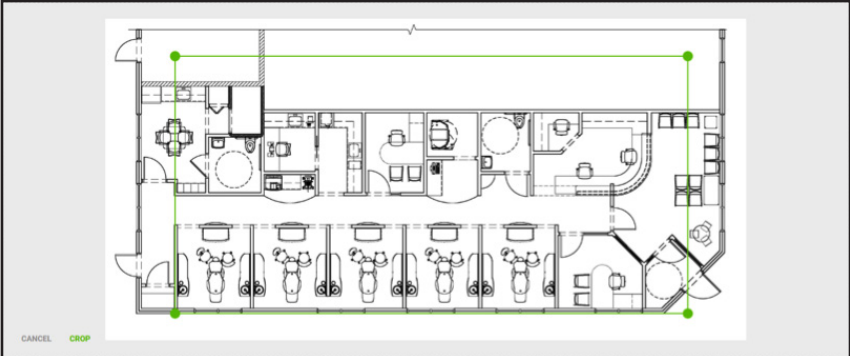


The user may change the size by dragging the green dots, which are at every corner of the selection box. After adjusting the size of the selection box, click on the **CROP** button to crop the floorplan.

The cropped floorplan is displayed on a new screen with four options: FILTER, UNDO, DONE, and CANCEL.
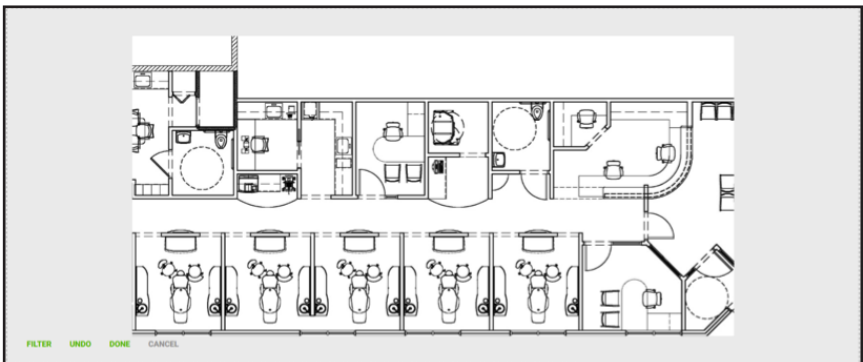
- To remove noise/distortion in the floorplan, click the **FILTER** button. This filters the floorplan image.

- To revert back the changes made by the FILTER option, click the **UNDO** button.

- To cancel and select a new floorplan or adjust cropping of the floorplan images, click the **CANCEL** button.

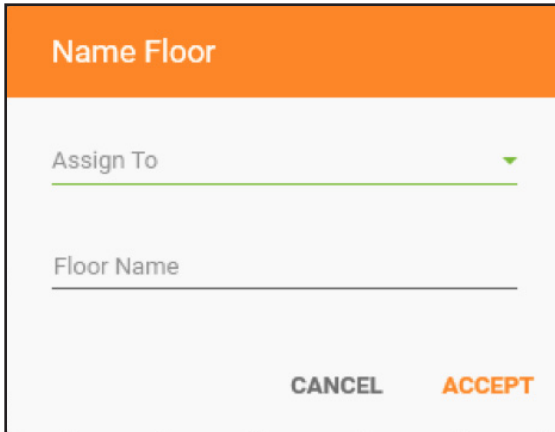- To accept the changes, click the **DONE** button.

**Defining a Boundary**

The next screen indicates an option to define a boundary. The user may define a boundary by tapping the vertices representing the boundary of the floorplan to be considered in the analysis. This process helps to provide a more precise mapping of coverage while improving the accuracy of the recommended AP placement for the floor.

Once finished defining the area of the boundary, click on the square icon to permanently set the boundary.
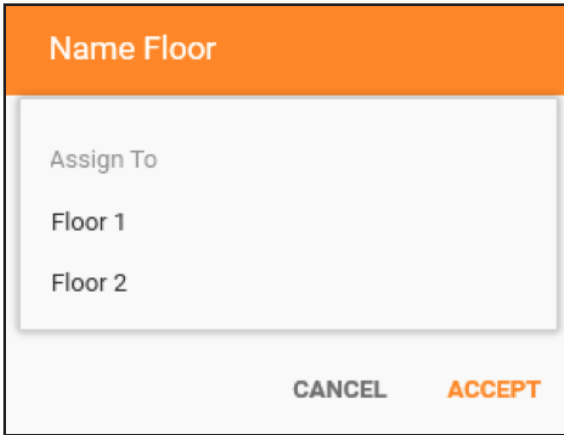
**Assigning Floor and Setting Scale**

After clicking **DONE**, a new pop-up box is displayed, with options to assign floorplan to the floors and naming of the assigned floor.

Assign a floor to the current floorplan from the "Assign To" dropdown list.

## Name Floor

Assign To

Floor 1

Floor 2
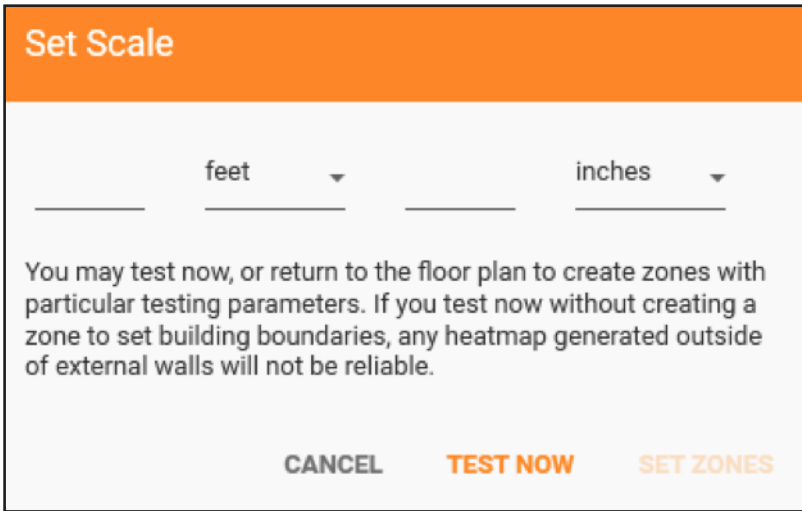
CANCEL     **ACCEPT**

Assign a floor name to the current selected floor.

Click **ACCEPT** to save the changes and move on to the next step, or click **CANCEL** to close the pop-up window and return back to the floorplan.The user will be prompted to set the scale for the floorplan after the cropping process has been completed.

The user is then prompted with a pop-up message stating "Measure the wall or surface, then drag and drop your cursor along the image to set the image scale." Click **OK** to move on to set the scale.

## Set Scale

Measure a wall or surface, then drag and drop your cursor along the image to set the image scale.

**OK**
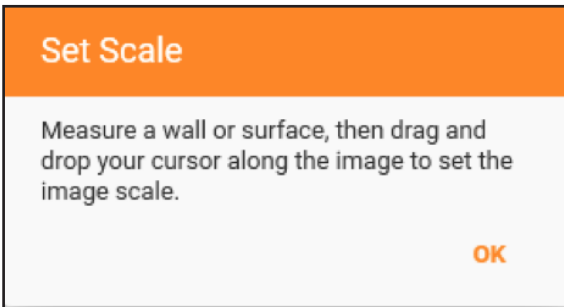
Drag and drop the mouse cursor from one point to another in the floorplan. After the mouse cursor has been dropped, a pop-up window appears for entering the scales in imperial or metric system.



After entering the scales, click the **TEST NOW** button to continue to the Set Test Parameters section.

# Selecting Test Parameters

### Measurements

- After setting the scale, set the test parameters for the current test. The user may run tests for connection bands 2.4 GHz, 5 GHz, or both. There is a checkbox under the connection field to select the band.
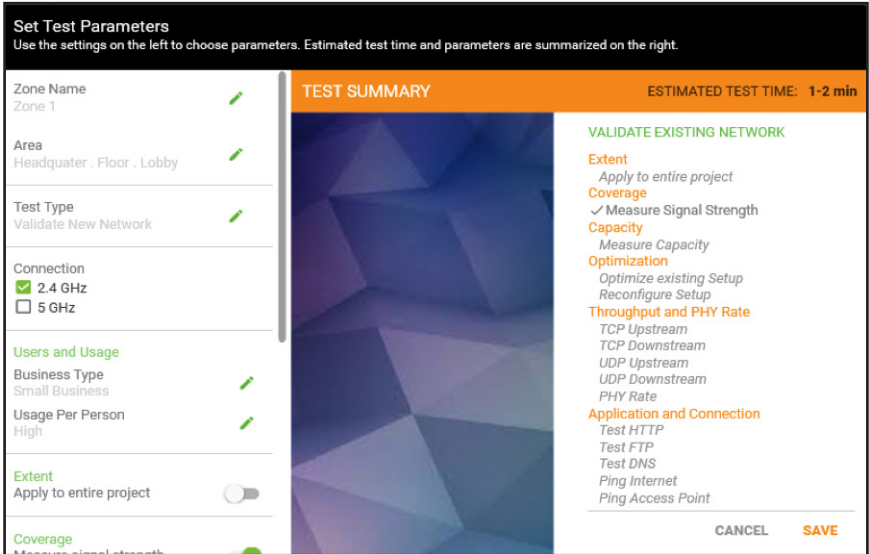


- To measure signal strength, simply slide the toggle button labeled "Measure Signal Strength" to the right. The toggle button is on when it turns green. This measurement is sufficient to recommend optimal placement but will not provide throughput/capacity analysis.

- Slide the toggle button labeled "Measure Capacity" to the right to choose the measurements of TCP Downstream and Ping Access Point. This measurement option provides throughput/capacity analysis, but takes longer than just measuring for coverage.

- Parameters that are chosen on the left side for the test are displayed on the right side in dark gray with a check mark next to the respective test type.

**Test Type**

- There are two types of tests available: Validate New Network and Validate Existing Network. The Validate New Network test type uses the master as a surrogate for an access point and the associated clients to run the test. The Validate Existing Network test allows the user to connect the master to the access point network and enable the clients to connect to the access points to run the test.

- Click the edit button (pencil icon) of "Test Type" to change the test type. For the Validate Existing Network test, the user needs to fill in the SSID and password of the access point network. More details on how to set up this test are provided in the next section.

- Pressing the **SAVE** button prompts a new dialog box to instruct the connection of AirScout to the BYOD. Pressing **CANCEL** redirects to the set scale page.

## Connecting AirScout to the Application to Run the Test

### Validate New Network Test – Testing a New Network with the Master-as-AP

After setting up the test parameters and selecting the "Validate New Network" option, the user is taken to a new screen where status of the connection between master and BYOD is shown.
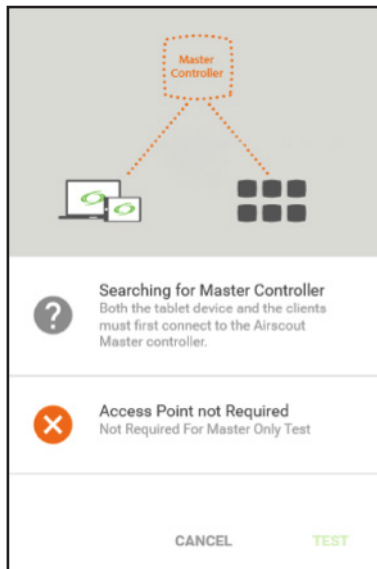


Initially, if the master is not connected with the BYOD, the application on the BYOD will search for the master. A message is displayed to indicate this status. Now connect the master to the BYOD. Access the BYOD's Wi-Fi network settings and connect to the master's SSID, which will be in the format AirScout-XXXXXX. XXXXXX contains the last six digits of the master's 2.4 GHz MAC address. You can also find the SSID on the white label affixed to the bottom of the master.

If the master device is not found, a warning message is displayed.
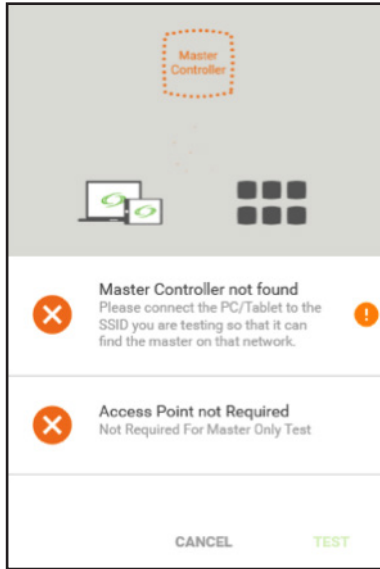


Click on icon **!** to display additional information on how to connect to the master device.



Click the **GOT IT** button to go back to the previous screen.

After successfully connecting to the master, the message is updated on the pop-up window as "Master Controller found" with a green check mark.
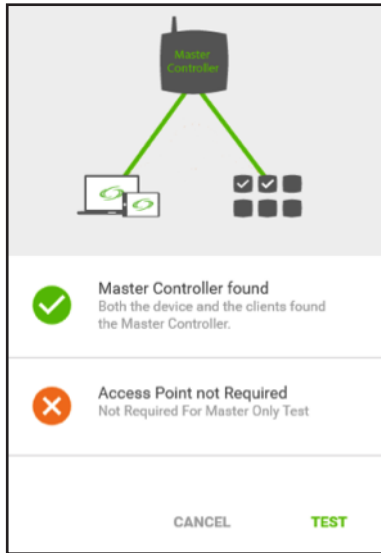


Click the **TEST** button to go to the Testing page.

**Validate Existing Network Test – Testing an Existing Network**

Unlike the Validate New Network test, the Validate Existing Network test requires that the clients be "provisioned" to leave the master's Wi-Fi control network and join the existing network instead. It is important to follow the directions carefully in this section to ensure the clients and the master are properly connected to the existing network for the duration of the test. While most networks under test will be relatively straightforward to connect, highly-custom networks may require additional Information Technology (IT) expertise to assist with connecting AirScout to the network.

For this test, the master needs to be connected via Ethernet to the existing network infrastructure and be able to obtain a local IPv4 address on the LAN via the Dynamic Host Configuration Protocol (DHCP), while maintaining a fully available bi-directional Internet Protocol (IP) route between the clients, who will connect to the network wirelessly via the deployed access points. Most access points often reside on a single Local Area Network (LAN) segment, or multiple subnets with routable interfaces set up at the boundaries. Other access point networks may rely on singular or multiple Virtual Local Area Network (VLAN) identifiers and VLAN trunks to connect such segments at the Ethernet/MAC layer of the protocol stack. The figures on the next page illustrate some common connection methods.

**Access Points**

**Switch**
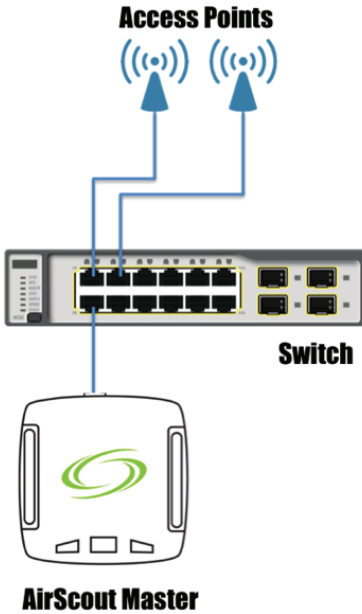
**AirScout Master**

- AirScout master connected to switch.
- AirScout gets IP address from DHCP server on switch or other server on the LAN segment.
- Access points fully reachable and routable to the master.
- Clients who join access points can send packets directly to master on same LAN segment.

**Access Points**

**Access Points**

**Switch 1**

**Switch 2**

Bridge or VLAN Trunk
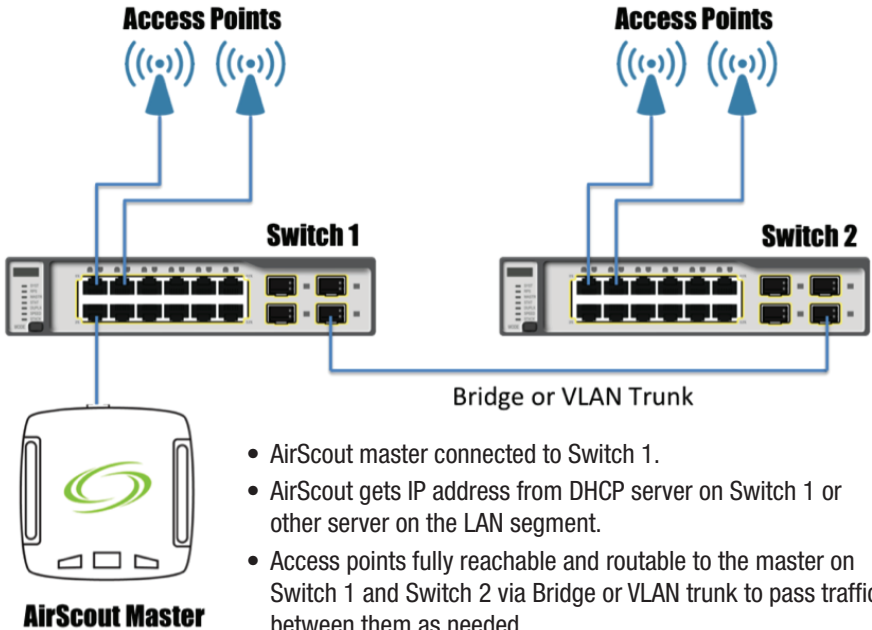
**AirScout Master**

- AirScout master connected to Switch 1.
- AirScout gets IP address from DHCP server on Switch 1 or other server on the LAN segment.
- Access points fully reachable and routable to the master on Switch 1 and Switch 2 via Bridge or VLAN trunk to pass traffic between them as needed.
- Clients who join access points connected to any switch can send packets directly to master on same LAN segment.

*Important:* *If the network under test is comprised of different LAN segments that provide connections to different sections of the building and these segments are not fully IP routable between them, the master will not be able to maintain a seamless connection to the clients as they move through the building. In this case, it is best to test each segment separately by connecting the master to each segment's wired connection point.*

After setting up the test parameters by entering the SSID and password for the "Validate Existing Network" in Test Type, the user is taken to a new screen where status of the connection between Master and BYOD is shown.
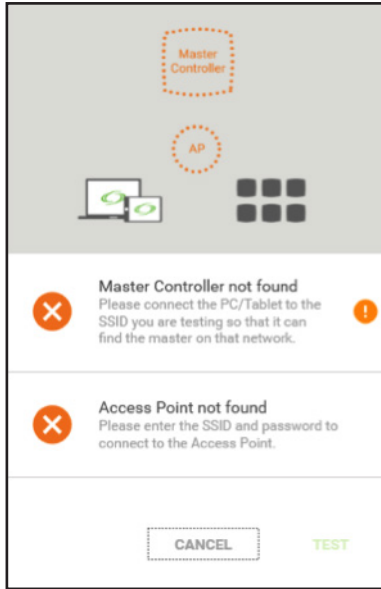


Note that this screen is different from the case where the master is being used as a surrogate AP.

It is important to follow the process to provision the clients to ensure success during this process.

1. First, bring the master, clients, and BYOD into the area where the wired connection will be available for the master to connect via Ethernet.

2. Then, make sure the BYOD is connected to the AirScout SSID. If it is not, open the Wi-Fi settings for the BYOD and set it to connect to the AirScout SSID.

Once this is done, plug the Ethernet cord from the existing network into the master's Ethernet port. Once the master obtains an IP address from the local network, "Access Point Found" with a green checkbox should appear as in the image below.

Now access the Wi-Fi settings in the BYOD and connect it to the network SSID mentioned in the message in the pop-up window (e.g., "Bajra Mac" in the case for the image below).
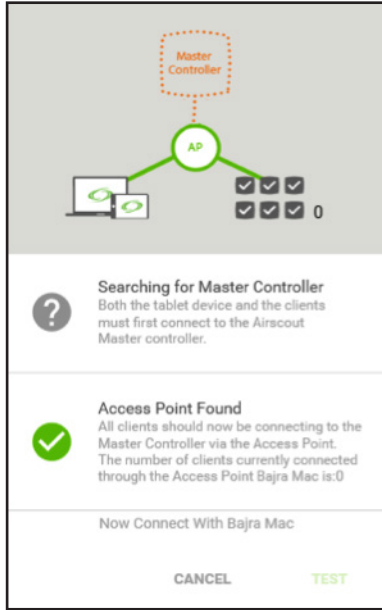


After the connection has been established, a message appears stating "Now Master is connected via AP" and both the messages above have green check marks, indicating the user can continue to the Test page.
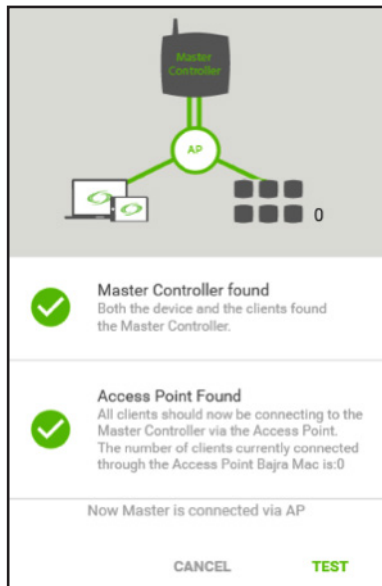
***Important:*** *This screen indicates that for the currently connected access point for the BYOD and the clients there is a fully routable connection between the master, clients, and BYOD. However, remember that if the network is split into different segments that are not IP-routable, you will not be able to test with the master in its current physical location. The clients can indicate a connection issue by showing only one steady green light on the right side of the top cover – remember that a fully connected state for a client will indicate both LED lights on the top cover steady green.*

Click the **TEST** button to continue to the Testing section.

## Running a "Validate New Network" Test with the Master-as-AP

### Pre-planning/Recommended Placements

In the testing view, a toolbox is available to the right of the screen.



To place the master device on the floorplan, click on the icon **AP** and drag and drop it on the floorplan page. The master appears as a black AirScout device with a blue diamond. Physically move the master to the point on the floor where the icon indicates on the floorplan. For best results, it is ideal to place the master as high as possible, using a pedestal or temporarily mounting to the ceiling, as the RF coverage is maximized.

To add clients to the floorplan, press the ID button on any client device for a moment until the left-side LED on the top cover starts flashing purple. The ID button is located left of the power button. The client icon will appear on the floorplan page after the LED starts flashing. The clients appear on the floorplan as a black AirScout device with a green diamond.

The application also provides assistance on AP Placement & Client Placement. There are slider buttons at the bottom of the screen to activate this feature. **This feature is only intended to give the user a rough approximation of recommended access point placements – it is understood that other constraints such as building requirements, budget, or time may limit the number of AP locations actually placed or tested.**

The recommendations are based on best practices for Wi-Fi enterprise installations to maximize coverage.
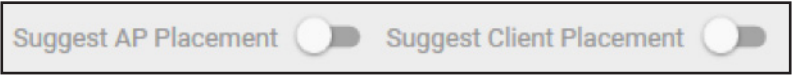


Tap or slide the "Suggest AP Placement" button. There will be suggestions made by the application on AP placement. Tap or slide the "Suggest Client Placement" button. There will be suggestions made by the application on client placement.

The user can place the master in the location (denoted by AP in the figure below) suggested by the application. Similarly, the white dots are the suggested location for the clients. The suggestion appears according to the scale set for the floorplan.
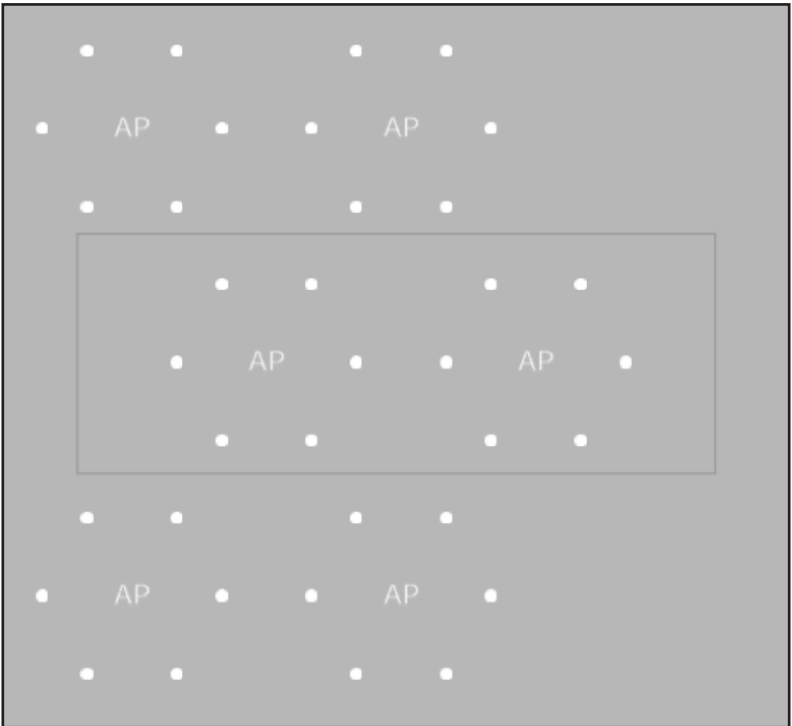


After placing the master and clients, press the orange **Start Test** button near the bottom right of the floorplan to start the test. A "Test Started" message will appear temporarily to indicate the start of the test under the floorplan.

**Test Flow Execution**

After starting the test, a progress bar appears on the top of the floorplan. A pop-up message appears when the test is completed, which shows the following message.
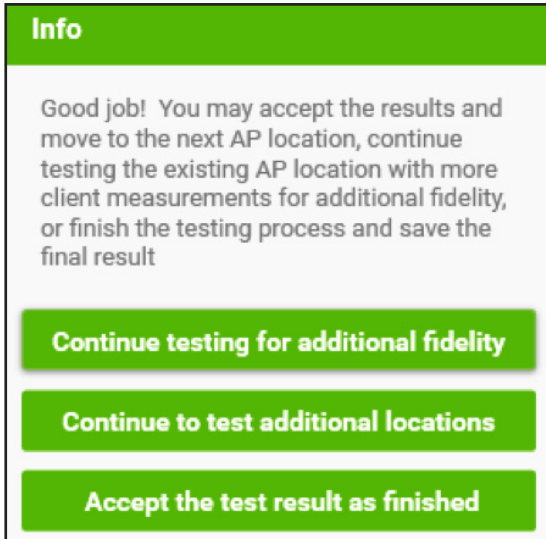


At this point, the user may pick up all the placed clients. Several options are available:

• Click **Continue testing for additional fidelity** to run another test by placing clients in the same floor while leaving the master in its current location. This type of test can improve the resolution of the heatmap if there are more areas to test that contain additional blockages or other impairments to signal.

• Click **Continue to test additional locations** to run another test by placing the master in a new AP location and placing the clients in new locations.

• By pressing **Accept the test result as finished**, the current results are saved and the test is considered complete. Once saved, the application redirects to the report page to view the results.

**Moving Between Locations**

During the process of testing, the use of a cart is recommended to move the clients and/or master from one location of the building to the next if the building is larger than 5000 square feet or has multiple floors.

## Running a Validate Existing Network Test

### Pre-planning/Recommended Placements

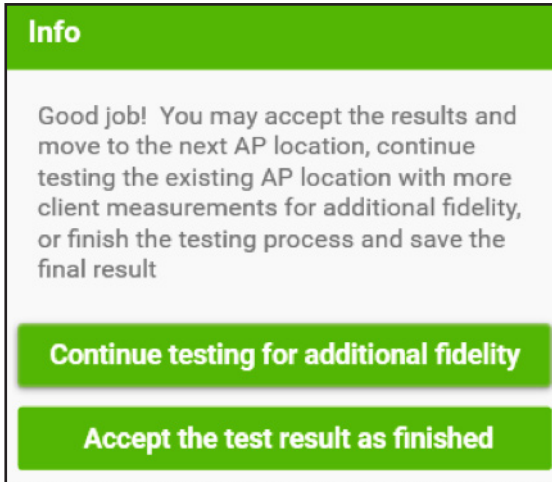In the testing view, a toolbox is available to the right of the screen.



First, it is important to identify where the access points on the floor are located. This is so AirScout can use this information to identify those access points on the floorplan by their MAC address to provide the best optimization for both channel and placement.

To place an access point, click on the icon **AP** and drag and drop it on the floorplan page. The access point appears as a circular wireless radio icon. Continue dragging access points to the floorplan to match the number that are deployed on the floor.

To add clients to the floorplan, simply press the ID button on any client device for a moment until the left-side LED on the top cover starts flashing purple. The ID button is located left of the power button. The client icon will appear on the floorplan page after the LED starts flashing. The client appears on the floorplan as a black AirScout device with a green diamond. Continue placing more clients for improved fidelity.

**Test Flow Execution**

After starting the test, a progress bar appears on the top of the floorplan. A pop-up message appears when the test is completed, which shows the following message.

**Info**

Good job! You may accept the results and move to the next AP location, continue testing the existing AP location with more client measurements for additional fidelity, or finish the testing process and save the final result

**Continue testing for additional fidelity**

**Accept the test result as finished**

At this point, the user may pick up all the placed clients. Several options are available:

• Click **Continue testing for additional fidelity** to run another test by placing clients in the same floor but in different locations. This type of test can improve the resolution of the heatmap or broaden the range covered if there are more areas to test that contain additional blockages or other impairments to signal.

• By pressing **Accept the test result and finished**, the current results are saved and the test is considered complete. Once saved, the application redirects to the report page to view the results.

**Moving Between Locations**

During the process of testing, the use of a cart is recommended to move the clients from one location of the building to the next if the building is larger than 5000 square feet or has multiple floors.

## Report Views

The report view within the application provides a single view where performance metrics can be analyzed. Upon finishing a test, this view launches with a heatmap showing signal strength at the center of the page.

Because AirScout analyzes many different types of devices in both bands, a Device Class dropdown selector appears at the top right side to view performance metrics relevant to the different device types.

AirScout has the ability to draw dynamic heatmaps based on metrics such as signal strength, throughput, and latency. A legend for the current heatmap metric is shown on the right side. On the left side, menus for Data Type and Build Your Own Analysis are shown.
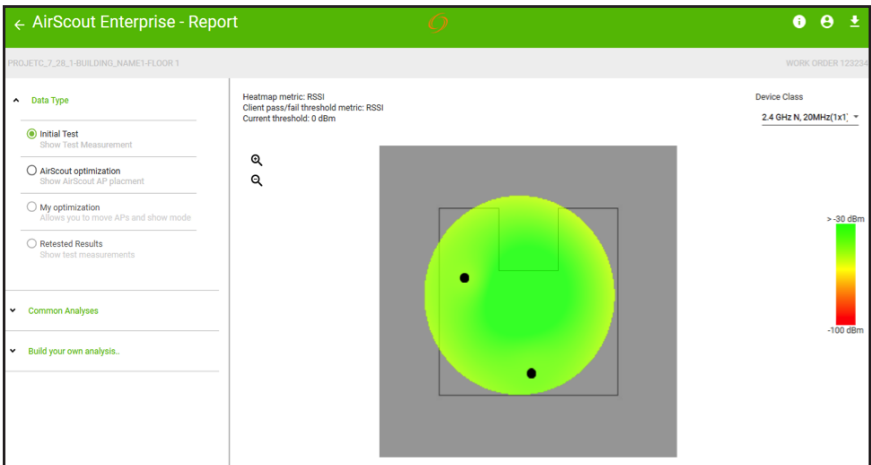


### Heatmap Metrics and Pass/Fail Criteria

Heatmaps are drawn based on the selected metric within the "Build Your Own Analysis" tab. In the upper left corner of the heatmap area the user can see information related to the current heatmap metric shown. In addition, the analysis engine provides a method to define pass/fail criteria for individual client measurements. This pass/fail criteria can be set independently of the heatmap metric, providing a rich multidimensional view.

In the heatmap view area, the upper left side contains information on the heatmap metric and the client pass/fail threshold metric, with the current threshold for pass/fail shown.

    Heatmap metric:  RSSI
    Client pass/fail threshold metric:  RSSI
    Current threshold:  0 dBm

The user may select the appropriate radio button to view a heatmap of Signal Strength, TCP Downstream Throughput, Latency, and Signal to Noise Ratio (SNR) and set client pass/fail criteria for the same metrics.



In the heatmap section, a slider can be used to set the heatmap threshold. Based on this threshold, the heatmap will redraw the red/yellow/green areas. This is especially useful in performing margin analysis.

The heatmap threshold value for different measurements is defined for the following range:

Signal strength:  -1 dBm to -100 dBm
Latency:  1 ms to 1000 ms
SNR:  1 dB to 100 dB

Throughput heatmaps are based on the measured value by the client for different device classes and traffic types. The pre-defined traffic types defined by AirScout Enterprise include 4K video, HD video, SD video, and web browsing/email.

In the client pass/fail section, there is a slider for the client pass/fail threshold in which the user can view the conditions of satisfying this threshold for a particular value. Before checking the pass/fail criteria, click any client ⬣ within the heatmap and check the value of the different measurements made for that client. A "passing" measurement indicates a black dot on the heatmap where the client is located. A "failing" measurement is shown by a red dot within the black dot for the client location.
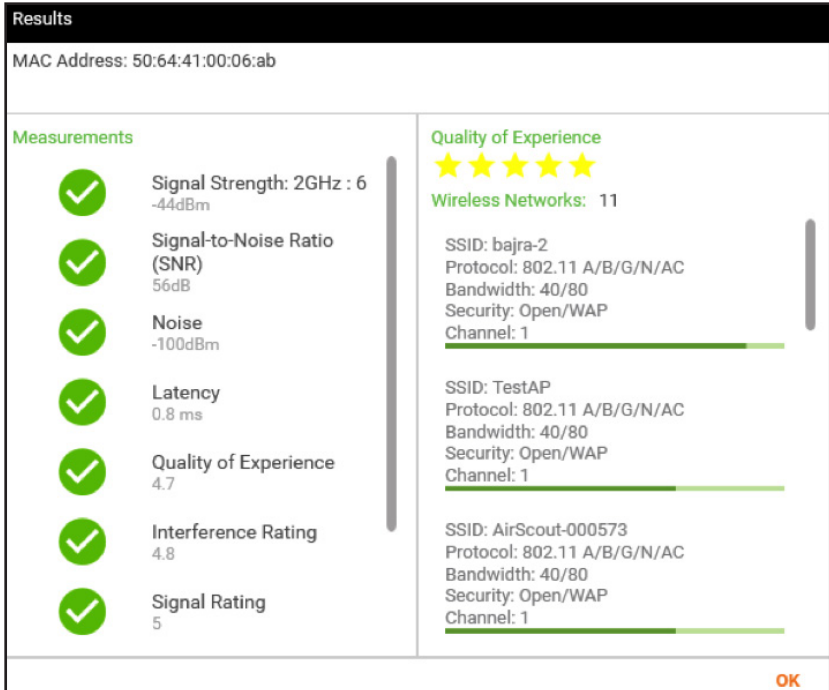


The criteria for passing/failing for the various metrics is defined as follows:

- For signal strength (RSSI):
  If RSSI ≥ threshold value, PASS
  If RSSI < threshold value, FAIL

- For throughput :
  If throughput ≥ threshold value, PASS
  If throughput < threshold value, FAIL

- For latency:
  If latency ≥ threshold value, FAIL
  If latency < threshold value, PASS

- For SNR:
  If SNR ≥ threshold value, PASS
  If SNR < threshold, FAIL

# AIRSCOUT ENTERPRISE CLOUD USAGE

There are two types of roles available for users of AirScout Enterprise in the cloud: vendor administrators and technicians. Vendor administrators may access license information and create new technician accounts in addition to viewing reports generated by all technicians under them.

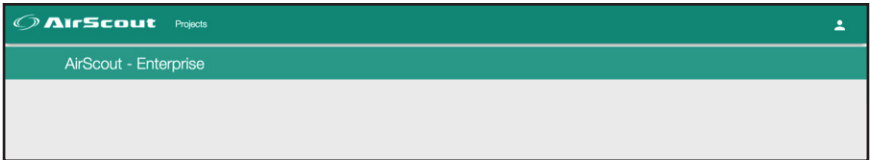To access the cloud, point your browser to:

https://airscoutenterprise.textron.com

and use your credentials to get logged in.

### Technician Portal

The technician portal can be accessed by logging in with technician credentials.

For a regular technician the portal will show a list of projects assigned to or started by them.



They may access existing projects they have defined along with all results generated from any tests belonging to those projects.

### Vendor Administrator Portal

Vendor administrators have the ability to manage users (technician(s)/other vendor admin(s) for the same subscription). A vendor administrator can view projects/reports created by all users that have been linked to their account.
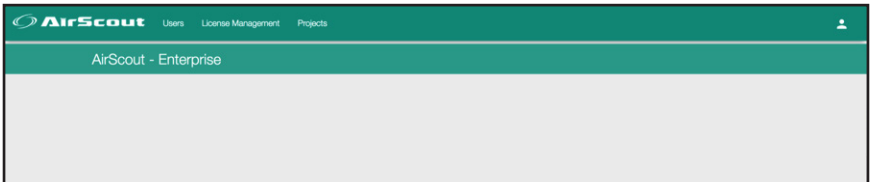
## Accessing a Project

To access a project in the cloud, click "Projects" on the navigation bar. To edit a project name or change the status between "Open" and "Closed", click on the project name ("Vista" in this case, as shown below). A project with "Open" status will be accessible to the user to add buildings or run additional tests, but a project with "Closed" status will not allow additional buildings or tests to be added to the project. Click **SAVE** to save changes.
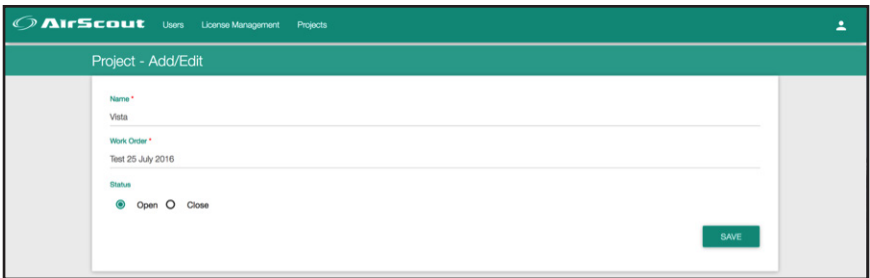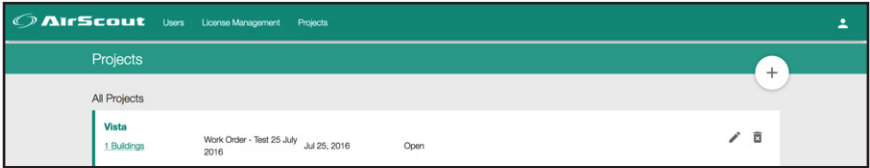




To access project tests or buildings, click "{n} buildings", where "n" refers to the number of buildings in the project.
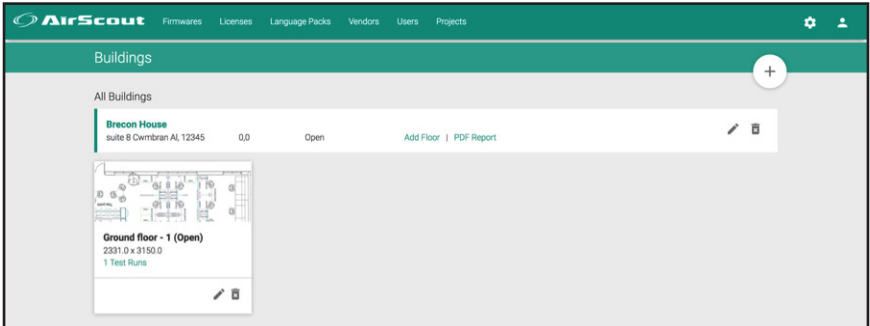


In the example above, there is one building defined. Note that other floors may be added to the building by clicking **Add Floor**.

The **PDF Report** link takes you to the PDF report generator.

If any test has been performed on the floor, the "{n} Test Runs" link will appear below the floor name. Following the link will take you to the listing of the test runs.
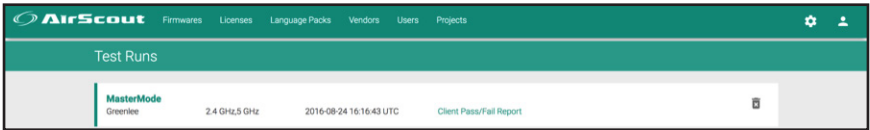


A test run can be of two distinct types.

• SSIDMode tests are performed against an existing network or a third-party vendor-supplied access point.

• MasterMode tests are performed against the AirScout master used as a surrogate AP.

Clicking on **SSIDMode** or **MasterMode** will bring up the next page which categorizes the test types into Coverage, Capacity, or Optimization.

You may also click on **Client Pass/Fail Report** to go to the result viewer which resembles to the one found in the AirScout application.



• Coverage tests include Signal Strength (RSSI) and Access Point survey tests that contain information on the other existing WiFi networks detected during the test.

• Capacity tests include throughput testing (over TCP and/or UDP protocols) and latency measurements (Ping Access Point).

• Optimization includes the results for an optimization based on the access points placed on the floorplan, including placement and channel plan.

## PDF Report Generation

This can be accessed by following the **PDF Report** link on the building listing page. In the reports view, click the **+** button to generate a new report.
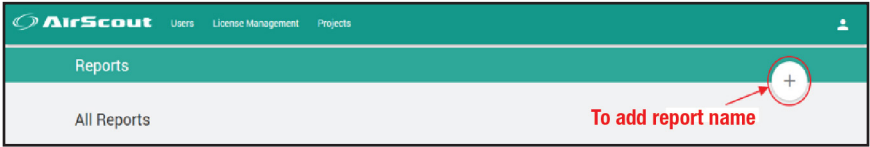


A dialog box appears to name the report, which is then generated. The PDF generator allows multiple actions to be taken on the report.

The report can be:

1. Viewed as a HTML document on the browser itself.

2. Viewed as a PDF document.

3. Downloaded onto the device.

4. Sent to any valid email address as an attachment. (If the size of the report is higher than 10 megabytes, a public link will be sent to the specified email address.)
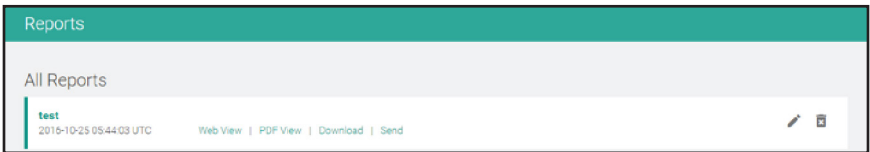


Upon clicking **Send**, a dialog box to send PDF reports to any email address appears. You may send the report to multiple recipients by comma separating the destination email addresses.
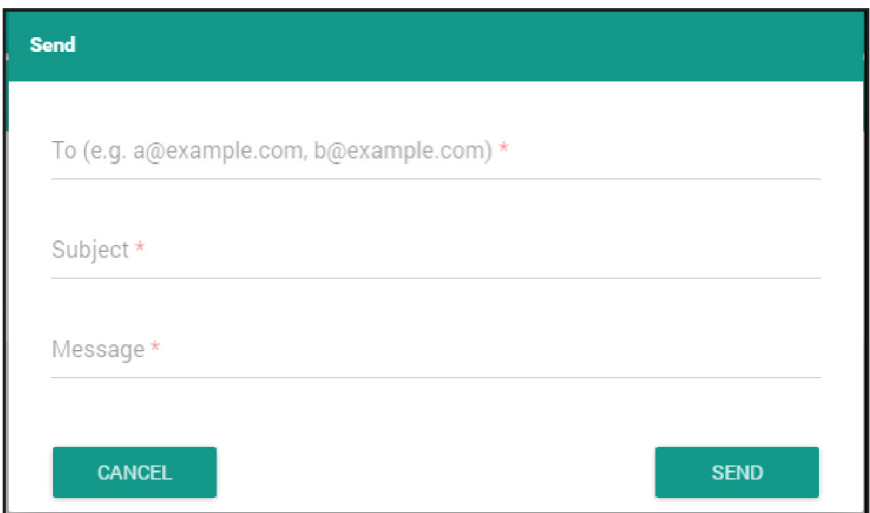
## Vendor Administrator Account Features

A vendor administrator account has access to the following:

1.  Management of users (technician accounts).

2.  Management of licenses that have been purchased for the vendor.

3.  Project reports for each and every report generated by technicians.



To manage users, click on the "Users" link on the navigation bar. If there are no users, click **+** to add one.
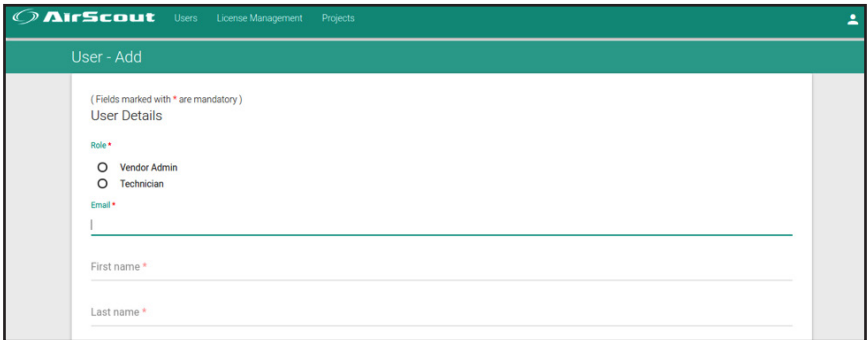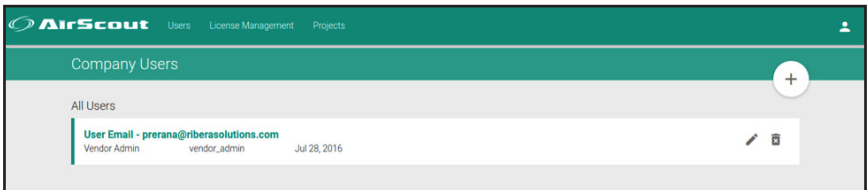




A vendor admin may create vendor administrators or technicians. If a vendor administrator is created, the newly created vendor administrators have equal privileges to its creator (the old vendor administrator).

To create the user, fill out the form fields and click **SAVE**. Upon creation of the user, an email confirmation will be sent to the specified email address. The user can confirm their account by following the instructions received in the email.

## Creating a New Project in the Cloud

Similar to the application, the cloud also enables creation of projects.

You can find the "Projects" page on the navigation bar at the home screen. This link will lead you to the page where projects are listed. New projects can also be created by clicking the **+** button on the top right corner.

Fill out appropriate information on the dialog to then create a project. You might want to leave the radio button selected to "Open" to mark that the project is incomplete and may be edited.

## Accessing/Editing Prior Projects

You can edit the project name and status by clicking on the "pencil" icon. Projects can be deleted by pressing on the "trash can" icon.
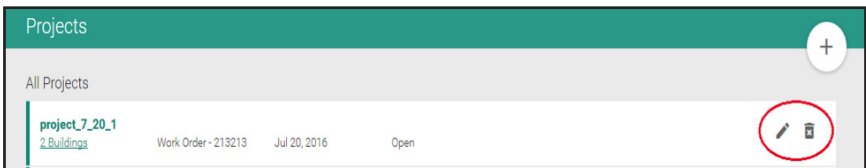


The count of buildings that belong to a project is shown right under the project name. Following the link leads to the "Buildings" page for that project.

The "Building" page displays each building inside the project along with the number of floors it has. Each floor is displayed as a tile.

The **+** icon at the right end (shown in the image below) can be used to add floors to the corresponding building as required.

The tile shows a glimpse of the originally imported floorplan image, its dimension in pixels, and number of test runs performed on the floor.

The "n Test Run" link on the same tile is clickable to explore more information about the test runs performed on the particular floor.
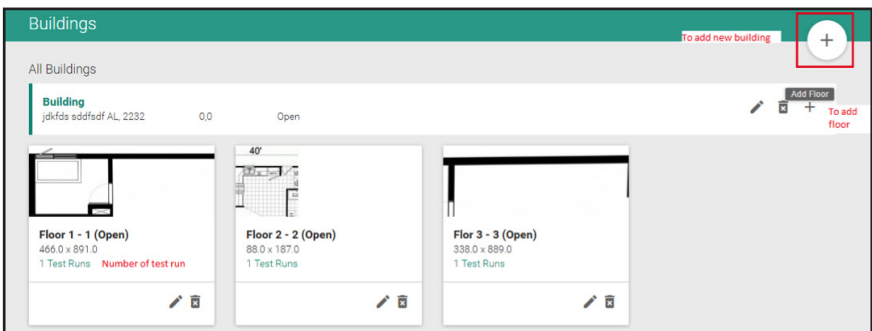
## Troubleshooting

If you are having trouble with your AirScout Enterprise solution, this section provides some techniques to resolve common problems.

### Application

*Problem: The application will not install on my device/computer.*

*Resolution:*

1. Ensure that your device meets the minimum requirements for the application. This includes checking the memory, hard drive space, and/or CPU speed and ensuring the proper amount is free.

2. If you have run out of hard drive space, try to free up space that meets the minimum requirements and attempt to reinstall the software.

### Connecting AirScout to the Application

*Problem: The AirScout logo at the top of the page is orange, indicating the AirScout is not connected to the application.*

*Resolution:*

1. Ensure that the device running the application has a Wi-Fi card and is connected to the Wi-Fi network "AirScout-XXXXXX" where XXXXXX is the last six digits of the master MAC address.

2. Firmware may not be up to date. Please check the firmware updater page in the application to see if the master and clients are up to date.

3. Restart the device, application, master, and clients (by power cycling) and attempt to reconnect to the AirScout SSID once the restart is complete.

### During Testing

*Problem: The AirScout logo at the top of the page is orange, indicating the AirScout is not connected to the application.*

*Resolution:*

During the course of master-as-AP testing, the AirScout master intermittently switches bands to conduct measurements. As a result, some devices may jump to another available Wi-Fi network. To resolve, forget the network in the connection profile, or just reconnect to the AirScout SSID in 1-2 minutes when it comes back. The application will update the results accordingly and you should be able to proceed with the next step of testing.

## Connecting the Master to Another Network

*Problem:  The application is stuck on the screen, indicating that the master controller is not found, but the access point network is connected.*

*Resolution:*

1. Make sure that the master, clients, and application/device are present in the same area, within range of the master's Wi-Fi signal, and that the application is currently connected to the AirScout SSID.

2. Ensure that the master is plugged into the access point network and maintains an IP route in both directions for all access points connected to the network.

a. If there is not a route available due to access control restrictions, firewalls, or other network configuration issues, please consult the manuals for the network equipment and/or IT professionals who installed or manage the network.

3. Switch the application device's Wi-Fi network to the access point Wi-Fi network.

4. The master will be found on the access point network and, as long as an IP route is available, the error should clear.