

Ava Installation & Configuration Guide

v4.5.2

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Introduction

The Ava Installation and Configuration Guide contains the instructions for initial installation of an Ava telepresence robot at a customer site, as well as information about configuration changes that may be necessary during Ava's life cycle.




References

The following documents are referenced in this document:

- **Unpacking Ava:** Instructions on unpacking Ava from its shipping container.
- **Ava Administrator's Guide:** Instructions on overall system configuration (including remote application information, managing users, etc.)
- **Ava Caretaker Poster:** Can be provided to local Caretakers as orientation on Ava's features.

Conventions

Throughout the manual the following conventions are used:

	This is a warning. If the person using the information ignores or violates this instruction, serious damage could result to the product or injury to the person.
	This is an alert. If the person using the information ignores or violates these instructions, some minor negative consequences could occur.
	This calls out supplemental information or information of particular note.

Comments and Suggestions

The Ava team welcomes your comments and suggestions for changes or additions to improve this manual. Please provide them to support@avarobotics.com.

Installation Process Overview

Installing Ava consists of the following steps:

1. Unpacking
2. Video codec installation (if not previously installed)
3. Battery Installation (if not previously installed)
4. Charging station installation
5. Configuration
6. Mapping
7. User configuration

To avoid setting Ava up in a public or high traffic area, you may want to install the batteries and configure Ava in a separate work area. This work area should have strong connectivity to the wireless network on which you will connect Ava and a place to plug in the charging station near a table or desk where you can do the configuration.

Ava comes packed in a large shipping crate. Ava and the charging station may be unpacked at receiving, or delivered in the crate to the work area. The project manager will discuss delivery timing and unpacking with you. Once you have installed the batteries and configured Ava, you will move Ava and its charging station to its operating area. There you will place the charging station in its final location. You may want to select the charging station location and determine the destinations before Ava arrives.



You must be able to roll Ava from the work area to the operating area. Ava cannot be lifted or maneuvered up or down stairs.

User configuration involves using the Ava Administrator Console to enter some information about people who will be teleporting into Ava ('remote users'), their video endpoint address, and the sites they can visit. Your system will come with your remote user information already configured. You can also use the Administrator Console to monitor the health of Ava and see what sessions are reserved or active.

Tools and Resources Needed

You will need the following for installation:

- Ava Telepresence Robot
- Ava's charging station
- Batteries (4 or 2, depending on configuration ordered)
- A compatible Cisco video conferencing codec
- A 3mm hex driver or Allen key
- An Ethernet cable
- A laptop with Google Chrome browser and an Ethernet port and access to the Internet
- The information required to connect Ava to the designated wireless network
- The video conferencing information needed for Ava's video codec to communicate with your remote users' video endpoints

If any questions or concerns arise during installation, email support@avarobotics.com for assistance.

Installing the Video Codec

If your robot came with the codec preinstalled, skip to the *Installing the Batteries* section.

Currently supported codecs are Cisco RoomKit Codec Plus and Cisco SX20. You can find instructions on how to install your desired codec in a separate document titled Cisco Codec Configuration.

Installing the Batteries

To install the batteries you will perform the following steps:

- Remove the rear half of the trim ring, rear base shell, and front base shell
- Raise the base cowl to the service position
- You can install either two or four batteries



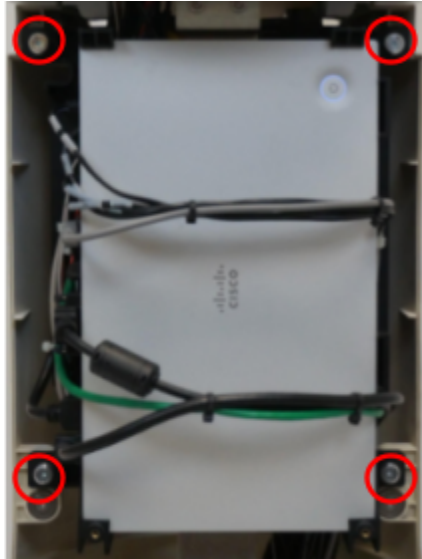
If you are installing two batteries, they should go on the robot's left side (your right side as you face the front of the robot).

1. The rear trim ring is held in place by magnets. To remove it, pull it away from the base.
2. Using the 3 mm hex Allen key provided with the Ava, unscrew the two screws holding the rear shell in place until they feel loose. Do not fully remove the screws from the shell as they are captive, meaning they will not fall out of the shell.



3. The rear shell is also held in place by magnets. Firmly pull it away from the robot.

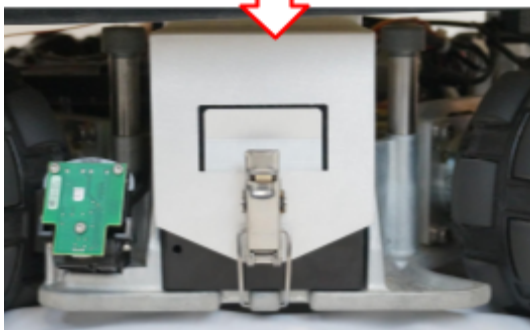
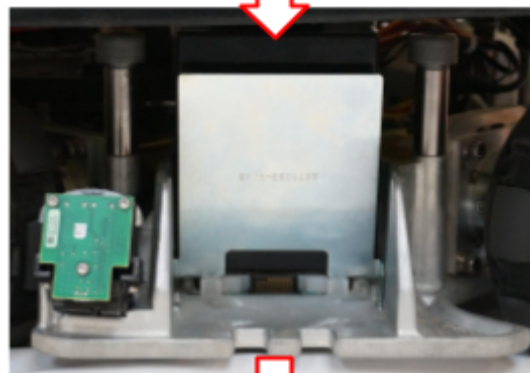
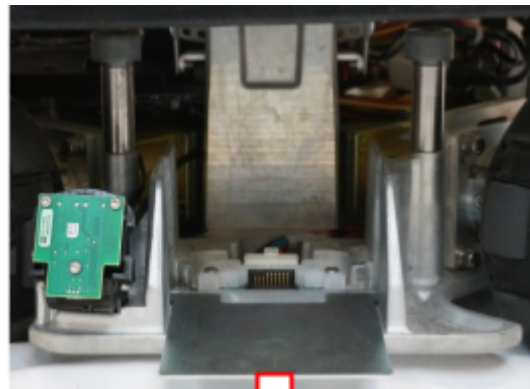
4. The front shell is held in place by four captive thumb screws, loosening them. The screws will move when they are fully detached from the shell. Pull the front shell away from the robot.



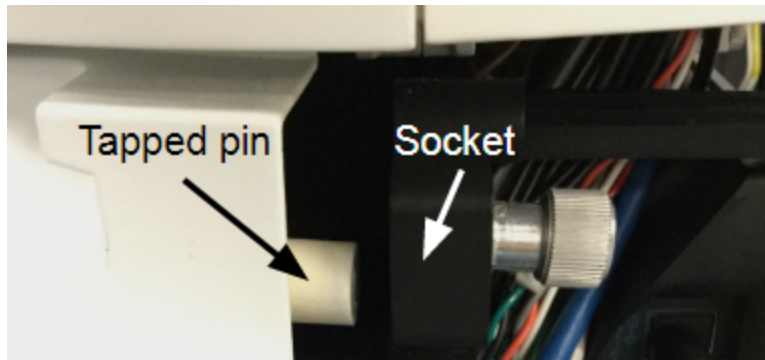
5. Hold each side of the bumper and lift the cowl until you hear it click into place. Don't be afraid to lift it firmly, as though you were trying to pick the robot up. The figure shows the cowl first lowered and then raised in its service position.



6. Ava has a battery compartment on each side. Unlatch one battery compartment by pulling the latch down.
7. Raise the compartment lid. You can tuck the latch into the cowl to hold the lid in place, but be careful not to dislodge the cowl from the service position. The inside divider flap will drop down.
8. Insert the first battery with the connector up and toward the back.
9. Raise the divider flap. You know the battery is correctly placed when you can raise the flap all the way.
10. Insert the second battery with the connector down and toward the back.
11. Lower the battery compartment cover. It will be a stiff fit. If you cannot get it all the way down, one of the batteries may not be correctly seated. Check the connector orientation.
12. Fit the latch loop over the hook in the base and flip the latch up.
13. Repeat to insert two batteries into the compartment on the other side.
14. Hold the cowl and press down gently to release it to its lowered position.



15. Fit the front base shell into place by inserting the four tapped pins on the shell into the four sockets on the frame (be careful that all wires are behind the shell magnets).
16. Tighten the four thumb screws. The screws have captured the back shell when they can't be pushed in and spring back.



17. Fit the rear base shell into place and tighten the two 3mm screws. Verify you can't pull the shell away from the frame.



You may want to remove the front trim ring so you can pinch the shells together. If you have trouble capturing the front shell, try adjusting the angle of the driver to modify the screw's position.

18. Replace the rear half of the trim ring.

Installing the Charging Station

Ava's charging station is an integral part of the Ava system. The charging station not only charges Ava's batteries but it also serves as Ava's home base. When a session ends, Ava is programmed to return to its charging station automatically.

The location and installation requirements for the charging station are designed to ensure that Ava can successfully engage with the station without causing unnecessary wear on or damage to the electrical contacts on either the robot or the charging station.

To install the charging station you will perform the following steps:

- Determine a location
- Install the charging station
- Engage Ava with the station and power Ava on

Location Selection

General Considerations

- The area must have strong connectivity with the WLAN.
- The area should have limited or normal foot traffic and not be a location where boxes or chairs are placed.
- The location is approximately central to Ava's destinations.
- Should be a location with level floors.
- The location should not be inside a room where a closed door might prevent Ava getting to a destination or returning to the charging station.
- Is a few feet away from offices or cubes, so that residents are not disturbed by Ava's travels.
- The location should not be in direct sunlight during Ava's operating hours.

Space Considerations

The charging station should be installed in a predetermined location with the following characteristics:

- Ideally in a space of 1m x 1m (~3ft x 3ft) against a wall and close to a power outlet
- At least 5.8" of clearance both in front and overhead (e.g. mindful of wall mounted display screen locations)
- Location should be easily accessible to the points of interest for remote users (e.g. not behind a doorway)

- Should not be placed somewhere with high chances of objects prevent movement (e.g. chairs moved onto charging station while Ava is out at a session)
- Power requirement: standard 110V/220V outlet

Important Safety Instructions

Please read these safety instructions carefully before installing the Ava charging station.



DO NOT EXPOSE THE ELECTRONICS OF THIS CHARGING STATION. THERE ARE NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. PLEASE ENSURE VOLTAGE RATING FOR ENCLOSED CHARGING STATION MATCHES STANDARD OUTLET VOLTAGE.

General Safety Instructions

- Read all safety and operating instructions before operating your robot.
- Retain the safety and operating instructions for future reference.
- Heed all warnings on your charging station.
- Follow all operating and use instructions.



The charging station wattage varies depending on the amount of charge on the batteries. The maximum draw is 650 W.

Installation

The charging station ships pre-assembled inside of the crate. Once you have removed the charging station from the crate, proceed as follows:

1. Place the charging station at its desired location.
2. Route the power cord along the base of the back of the platform wall, going in the direction of the outlet. Excess cord can be wrapped around the spindle.
3. Plug the charging station power cord into the outlet at whatever point in the procedure makes sense.
4. Verify that the charging station light is on.
5. Connect Ava with the charging station (use the handle when pushing Ava).

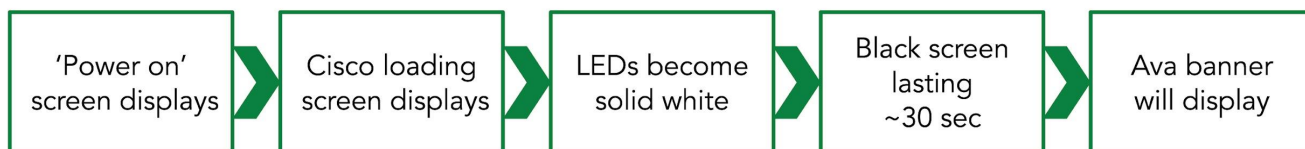


- The power rocker switch is to the back right when Ava is on the charging plate (lower left when facing Ava's back). Flip it to the 'on' position. Ava will boot up within 5 minutes.



Ava may not power on until it has been engaged with a powered charging station.

While the system is booting up, the screen will be raised and lowered on its lift and the LEDs will become solid white. During this process you will see the following screen progressions.



During setup, the final display will alternate between *Not connected to management server* and *Assistance required: Not localized on map* and Ava's LEDs will flash red. These faults will clear once Ava is connected to WiFi and the Ava Cloud Service, as described in the next section.

Configuring Ava

Overview

Before configuration, you should have installed batteries and placed Ava on the charging station. The configuration process for Ava is as follows:

- Connect your laptop to Ava's internal network via Ethernet cable
- Configure Ava to connect to your Wi-Fi Network and the Ava Cloud Service
- Configure the video codec



Ava uses a static IP address of 172.18.0.1. The vast majority of laptops will work without configuration. If this step fails for your laptop, please look at Appendix C to configure a static IP address on your laptop.

Configure the Network & Ava Cloud Service

This section only describes the parts of the Ava Configuration Interface (ACI) required to connect Ava over your wireless network to the Ava Cloud Service. For details on other parts of the interface see *Appendix A: Ava Configuration Interface Guide*.

1. Remove the front half of Ava's trim ring by pulling it away from the robot.
2. Using an Ethernet cable, connect your laptop to the left Ethernet access port.



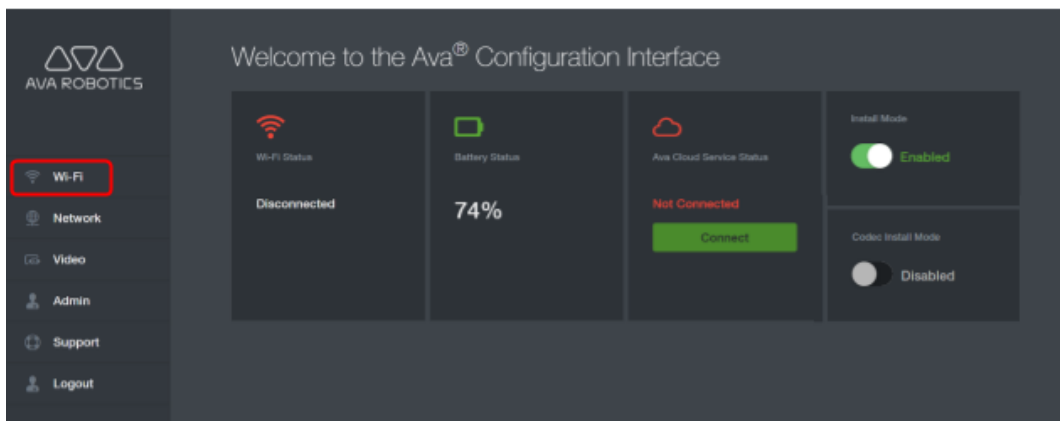
3. Open the browser on your laptop and enter the address: <http://172.18.0.1:82>



Ava uses a static IP address of 172.18.0.1. The vast majority of laptops will work without configuration. If this step fails for your laptop, please look at Appendix C to configure a static IP address on your laptop.

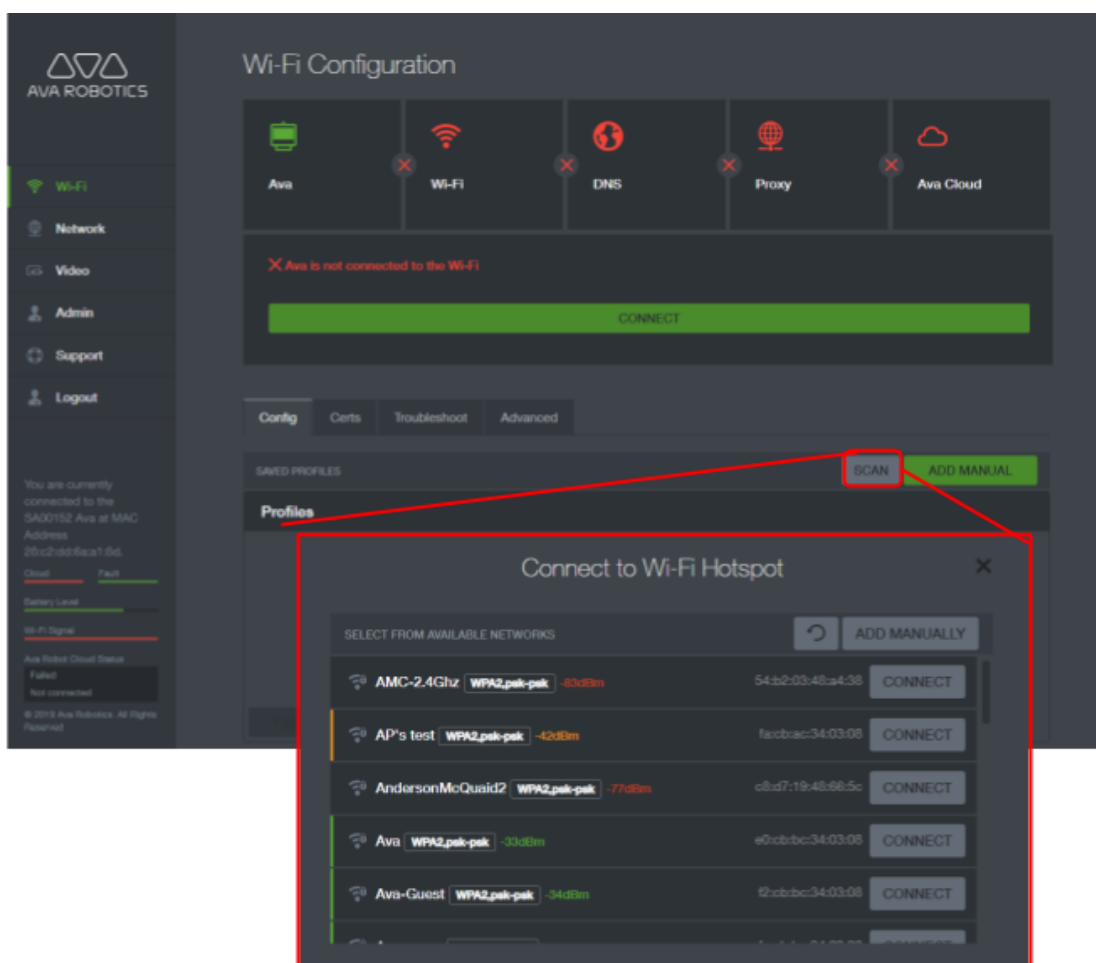
4. Enter username admin, password avar0b0t and click **LOG IN**.
5. The ACI opens with a home page, where you can see overall robot status. By the end of the configuration process, all robot statuses will be green.

6. Click **Wi-Fi** on the left to bring up the Wi-Fi page.

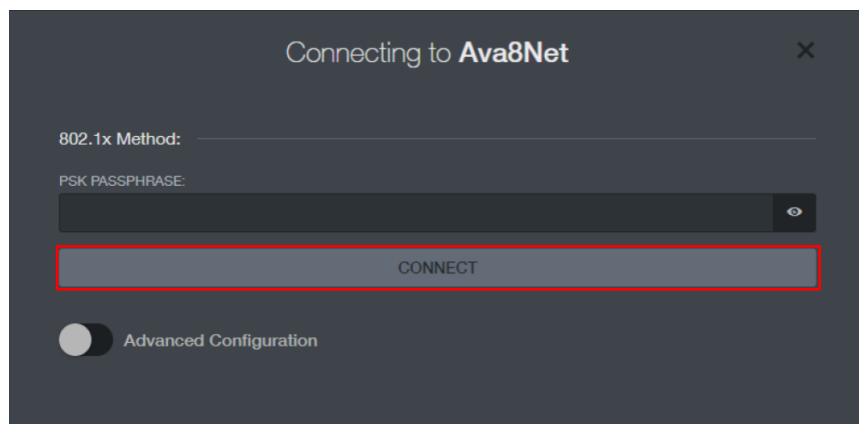


7. On the Wi-Fi page, click **Scan** to bring up a list of available networks.

8. Click **Connect** next to Ava's target network to bring up a parameters dialog.



9. Enter the necessary configuration information and click **Connect**. Shown below is WPA2/PSK, see *Appendix A: Ava Configuration Interface Guide* for additional configuration information based on the authentication type and protocol.



Connecting to **Ava8Net**

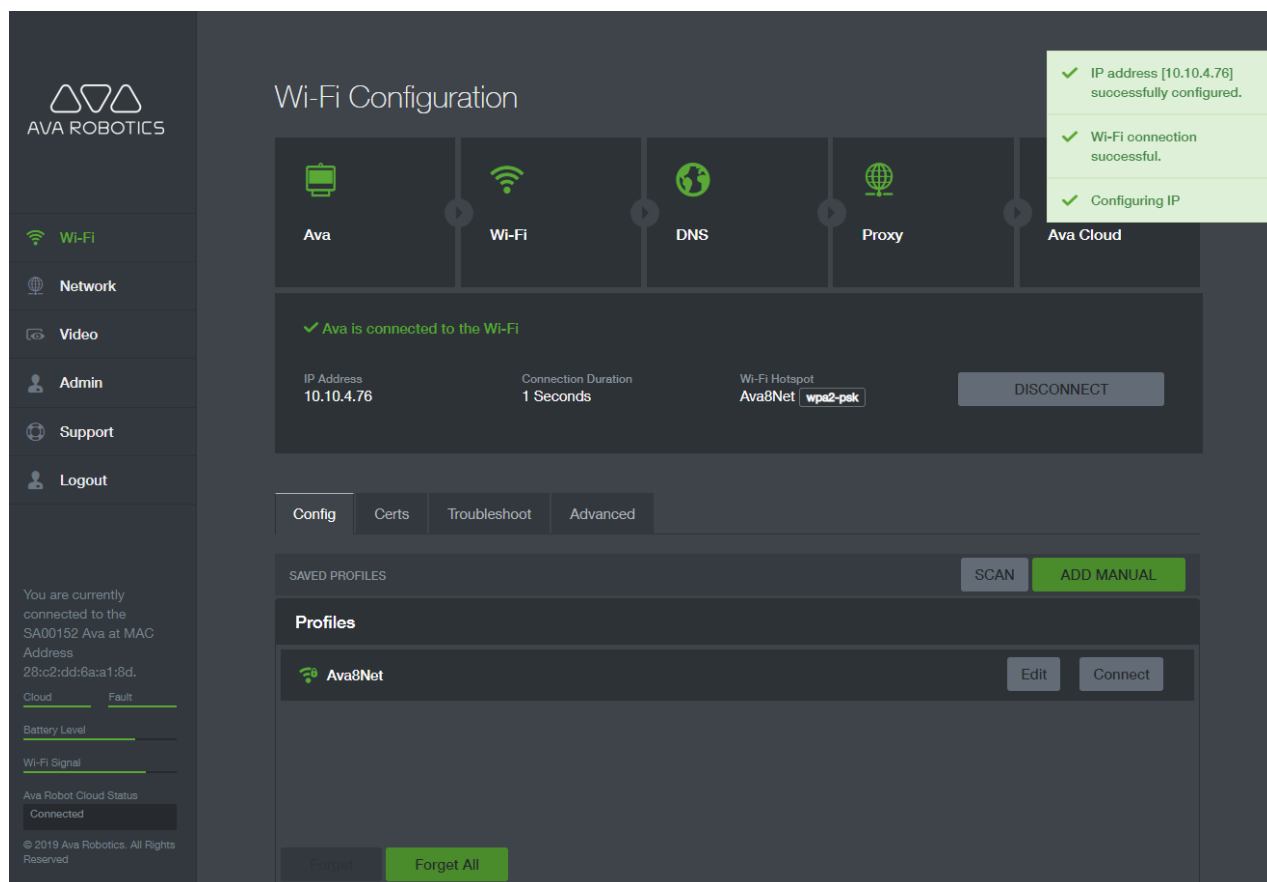
802.1x Method: _____

PSK PASSPHRASE: _____

CONNECT

☐ Advanced Configuration

As the system is connecting, the icons will turn green and feedback on the configuration will appear. The parameters you entered are saved as a profile. Depending on the authentication type and wireless network used, it may take up to a minute to obtain the complete connection.



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Wi-Fi Configuration

✓ IP address [10.10.4.76] successfully configured.
✓ Wi-Fi connection successful.
✓ Configuring IP

Ava is connected to the Wi-Fi

IP Address: 10.10.4.76 | Connection Duration: 1 Seconds | Wi-Fi Hotspot: Ava8Net wpa2-psk | DISCONNECT

Config | Certs | Troubleshoot | Advanced

SAVED PROFILES | SCAN | ADD MANUAL

Profiles

Ava8Net | Edit | Connect

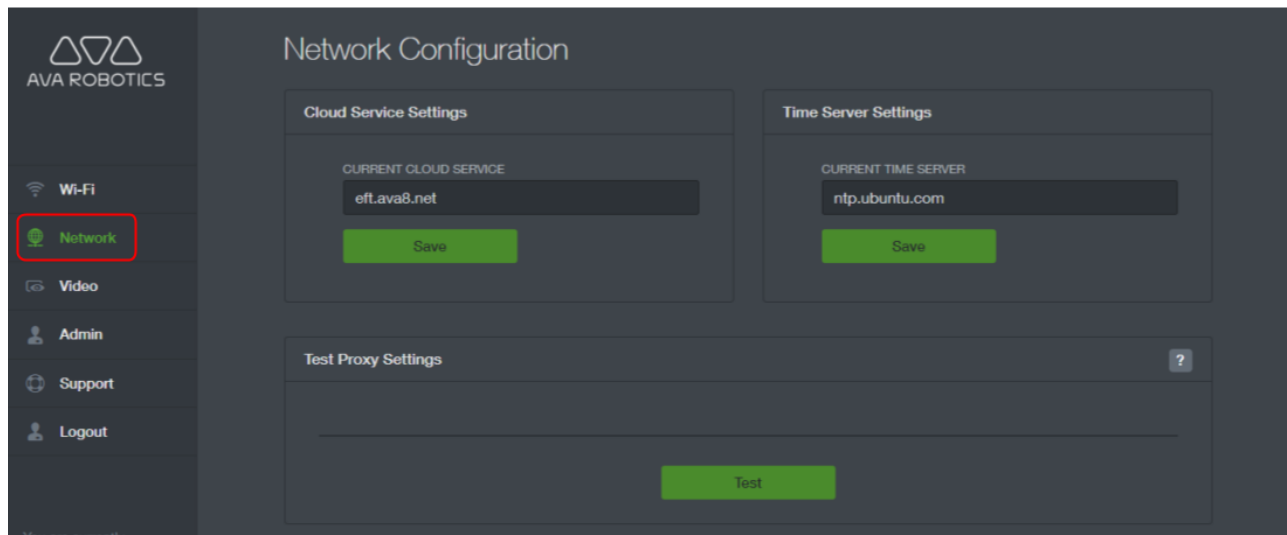
Forget | Forget All

You are currently connected to the SA001S2 Ava at MAC Address 28:c2:dd:6a:a1:8d.
Cloud | Fault | Battery Level | Wi-Fi Signal | Ava Robot Cloud Status: Connected
© 2019 Ava Robotics. All Rights Reserved

If you do not connect successfully, try clicking **Edit** next to the profile and checking and re-entering the parameters. If you still cannot connect contact Ava support.

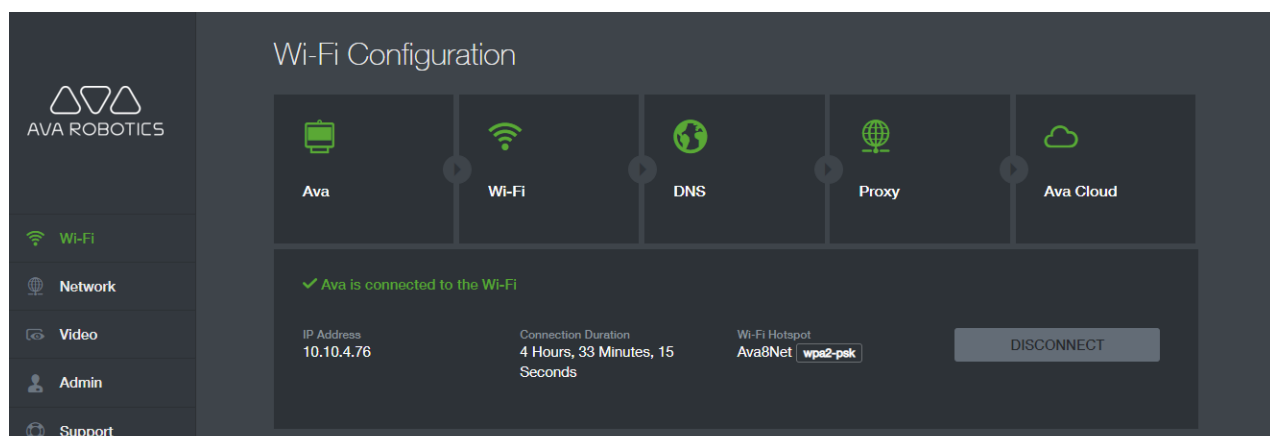
To delete a profile click **FORGET** at the end of the profile list. You may need to scroll down to see the control. Click **FORGET ALL** to delete all profiles.

10. Click **Network** to change to the Network page.



11. On the Network page, enter the name of the Ava Cloud Service instance you received from Ava Robotics (format usually "<ID string>.ava8.net") and click **Save**. You are informed that the update was successful.

12. Click **Wi-Fi** to return to the Wi-Fi page. All connection icons should now be green.



13. Disconnect the Ethernet cable from Ava and reinstall its front trim ring.

Configure the Video Codec

If Ava came with the codec installed, you can skip this section.

If you installed the codec or will be registering the codec to your own video infrastructure, you can find instructions for your codec in the document titled Cisco Codec Configuration.

Mapping

Ava learns its operating area and is therefore able to navigate autonomously based on an internal map. This map is learned by Ava when it first arrives at its host site, and can be done in one of two versions: extended mapping or express mapping.

Extended mapping results in a comprehensive map of the entire operation space. This mapping type is performed by trained Service Engineers and can be done on-site or remotely, depending on the agreed deployment service model. Your project manager will work with Ava Robotics to confirm the plan to execute mapping.

Express mapping results in up to nine preset destinations. Ava can then only travel from the charging station to these destinations. Express mapping can only be completed onsite. This method is currently in beta so, if you're interested in express mapping please reach out to support@avarobotics.com and we will provide the appropriate instructions and support.

Finalizing Installation

Finishing an installation consists of the following activities:

- Final system verification
- Check in with project manager
- Clean up the work area

Final System Verification

Final system verification consists of a remote user initiating an ad hoc session with Ava through an Ava App, and Ava successfully initiating a video conference call with the remote user's video endpoint. The remote user in this step may be the installer.

During the video conference the following should be tested:

- Camera tilt and zoom
- Autonomous driving to a destination
- Manual driving for a short distance
- Peripheral cameras
- Audio (both on remote user and installer side)

Work Area Clean-Up

Work area clean-up involves both packing up all tools and materials that were used during installation and disposing of any packing materials. Finally, discuss with the Ava Project Manager if the crate is expected to be shipped back.

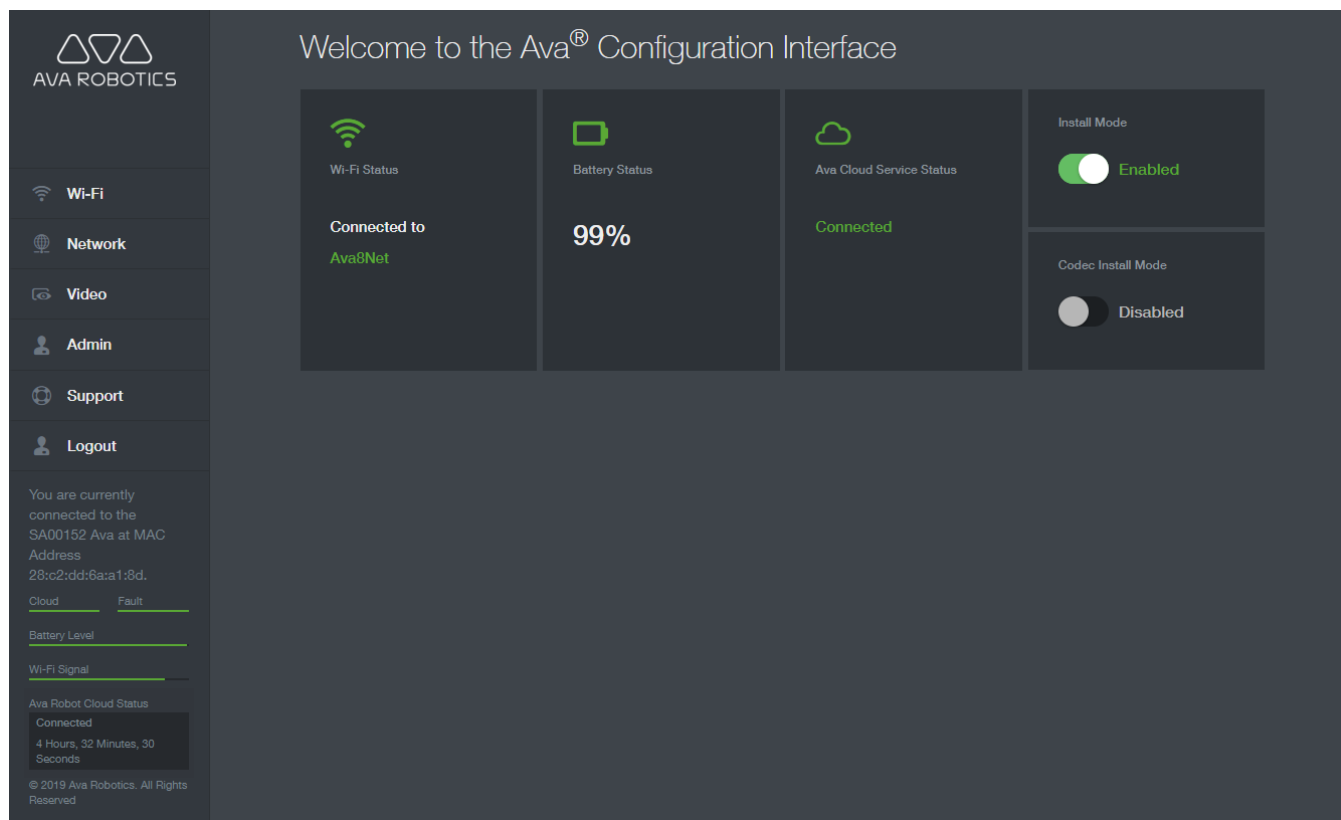
Appendix A: Ava Configuration Interface Guide

The Ava Configuration Interface (ACI) provides direct access to Ava's configuration parameters and provides feedback on Ava's current status. This guide provides additional detail not found in the configuration instructions found in the main part of this document.

Configuration typically occurs during installation, when the installer is connected by Ethernet cable to Ava. However, Ava administrators can also access the ACI through the Ava Cloud Service Administrator Console, as long as Ava is connected to the Cloud Service. This reference is intended for Ava administrators, as a supplement to the *Ava Administrator's Guide*.

ACI Home Page

The Ava Configuration Interface Home Page is designed to provide a snapshot of Ava's status.



The ACI Home Page contains both information and controls. Hover over any of the items in the left navigation bar to see additional information.

- Ava identity: Ava ID and MAC address
- Wi-Fi Status: server name (banner) and signal strength
- Battery status: charge level
- Ava Cloud Service connection status and length of connection
- Ava system fault status (**Note:** as of software version 3.0, this is always green regardless of Ava's status.)

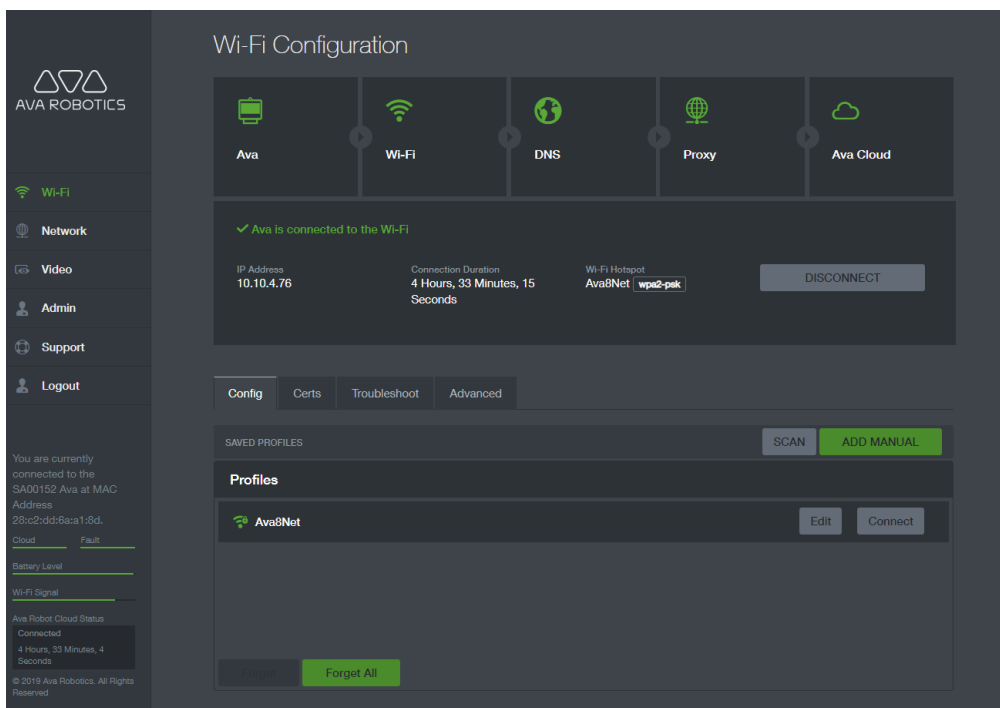
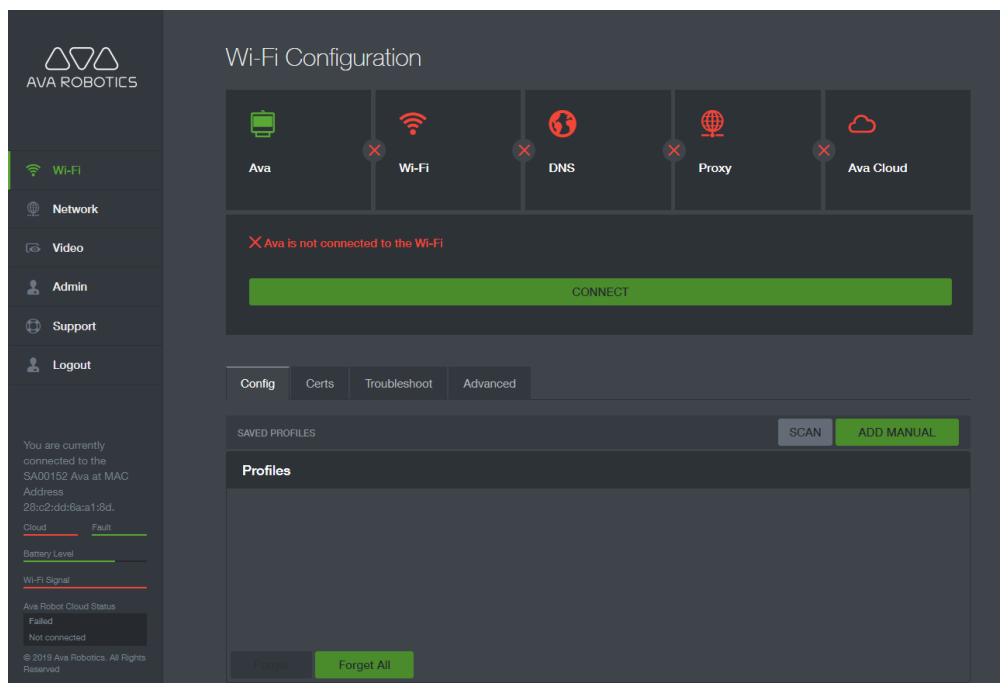
Two controls are included in the banner. Change these controls only if instructed by Ava Support:

- Install mode status (default: Enabled): if enabled, once Ava is on a wireless network to which the installer has access, the installer can connect to the ACI and the codec configuration interface wirelessly through the IP address assigned to the robot. Typically installers disable this after installation. The status persists across reboots.
- Video codec install mode status (default: Disabled): turns off a process in the Ava base software that has been found to interfere with video codec software updates in some cases.



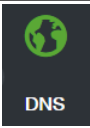
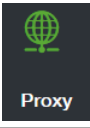
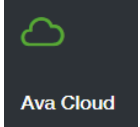
ACI functionality is grouped on pages, accessed through the left navigation bar. This reference document describes the functionality provided on each page. Step-by-step procedures to install a new Ava are provided in the *Ava Installation Guide*.

Wi-Fi Configuration

The Wi-Fi Configuration page provides functionality to connect an Ava to a wireless network. The screenshots below show the Wi-Fi Configuration page for a disconnected Ava and the page for an Ava that is completely connected through to the Ava Cloud Service.



Typically the blocks across the top of the page remain green unless the underlying infrastructure supporting one of the connections changes. The table below shows what each block reports, and possible causes if a block is red and the previous blocks are green. Blocks downstream from a red block will always be red.

	Reports	If Red, Possible Cause
	Health of Ava's Wi-Fi and internal networking components	An internal problem with hardware.
	Connection to wireless infrastructure	Ava has not joined a wireless network. Out of range of signal.
	Connection to customer's network backbone (green = received an IP address)	Problem with corporate network.
	Connection through the customer's firewall and to Internet	Local internet access is down. Proxy configuration (if applicable) is incorrect.
	Connection to the Ava Cloud Service	Cloud Service address not yet configured on Ava. Ava not provisioned on Cloud Service. Cloud Service not available.

When Ava is connected additional information is provided across the top of the Wi-Fi page, including connected IP address, connection duration, and Wi-Fi hotspot name and security settings.

Configuration parameters are saved as a wireless network profile once Ava successfully connects using those parameters. There may be a slight delay between connection and the profile being displayed in the list. This is extremely useful when testing Ava on a new network, as you can easily reconfigure Ava to connect to the old network by simply selecting the old profile and clicking **Connect**. You can also edit an existing profile. To delete a profile, click on it and click **Forget**. Clear all profiles using **Forget All**.

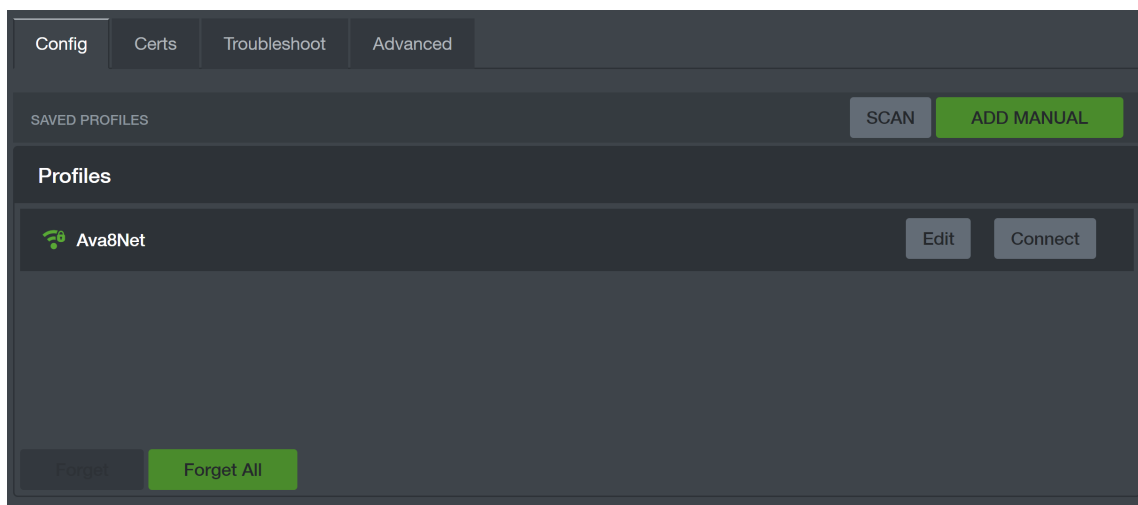
The Wi-Fi Configuration page has three tabs:

- **Config:** Used to select a wireless network and configure Ava to connect to it. Advanced parameters on the Config tab are used to configure Ava as a proxy client or assign it a static IP.
- **Certs:** See installed certificates and delete certificates. In this version of the software, new certificates are uploaded from the Config tab, not the Certs tab.
- **Troubleshoot:** Future functionality.

Config Tab

The Config tab below provides functionality to:

- Connect to a WLAN
- Configure Ava as a proxy client
- Configure Ava with a fixed IP address



Proxy and Fixed IP parameters are configured by enabling Advanced Configuration on the Certs tab. See the *Advanced Configuration* section for more information about proxy and other parameters.


Scan vs. Manual Configuration

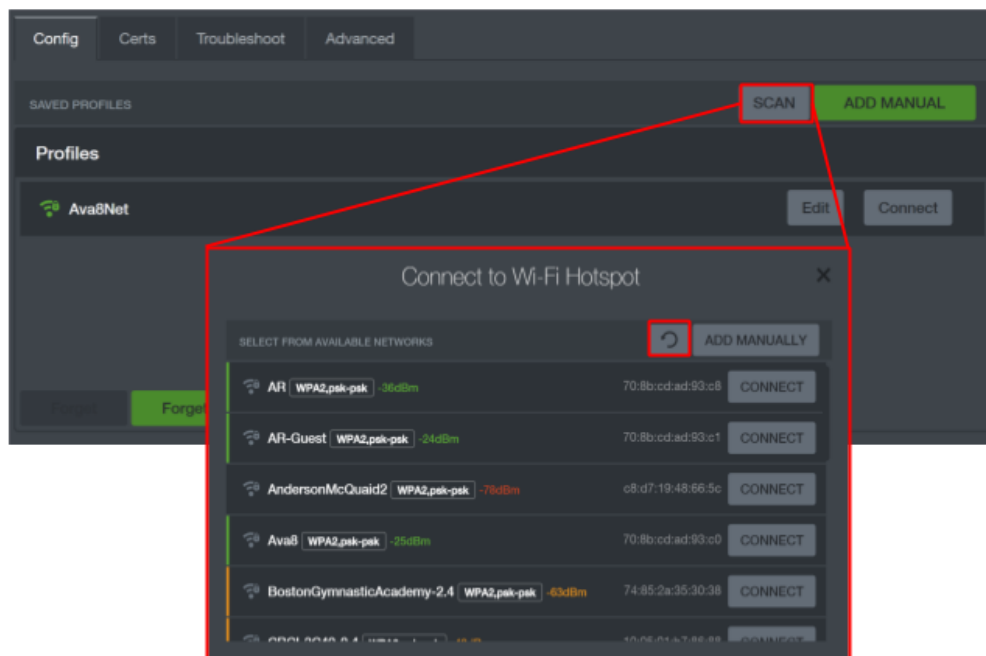
When adding a new network, you can either:

- Scan to discover available networks, or
- If the network is not discoverable, enter network information manually.

In either case, the parameters depend on the type of network. These examples use PSK security, see the *802.1x Methods* section for more information about parameters for that security type.

To connect to a network available with scan:

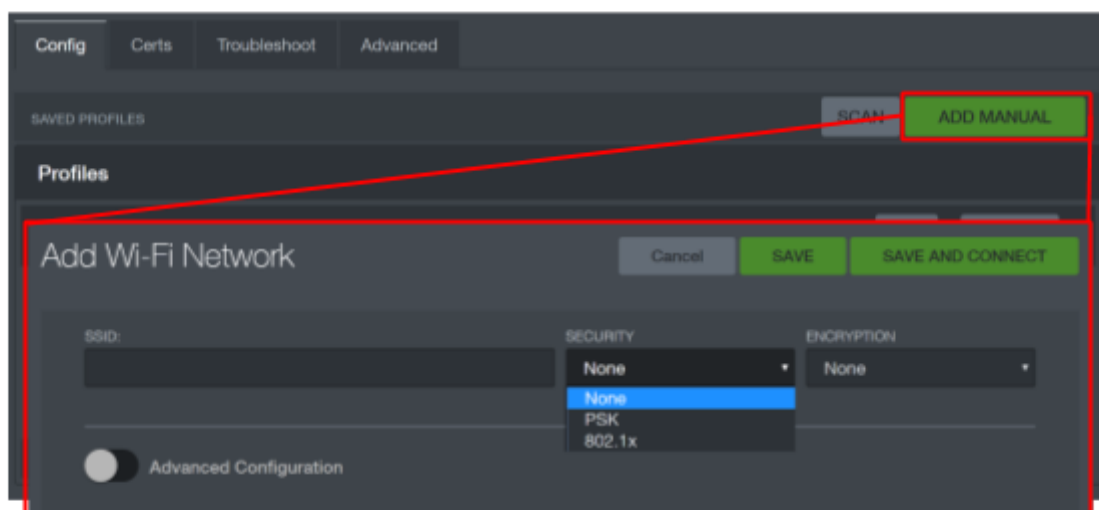
1. On the Config tab, click **Scan** to bring up a list of available networks.
2. Click **Connect** next to the target network to bring up a parameters dialog. Click  to refresh the list.



3. You are prompted for required parameters, based on the network authentication method. Enter the parameters and click **Connect**.

To add a network manually:

1. On the Config tab, click **Add Manual** to bring up a parameters dialog.



2. Enter the SSID.
3. Select a Security protocol: None, PSK, or 802.1x
4. Select an Encryption Protocol: None, AES, or TKIP
5. You are prompted for required parameters, based on the security and encryption parameters you have selected. Enter the parameters and click **Save and Connect**.

802.1x Methods (Beta)

802.1x authentication is currently in beta; please share your experience with Ava Support at support@avarobotics.com.



When connecting to a network requiring a certificate, the CA cert must be pre-installed, you cannot yet be prompted for it.

EAP-PEAP

Parameters:


- The username
- The password
- Optional: access to the CA certificate file if one is required (supported formats are pem, der, pkcs#7, and pkcs#12)

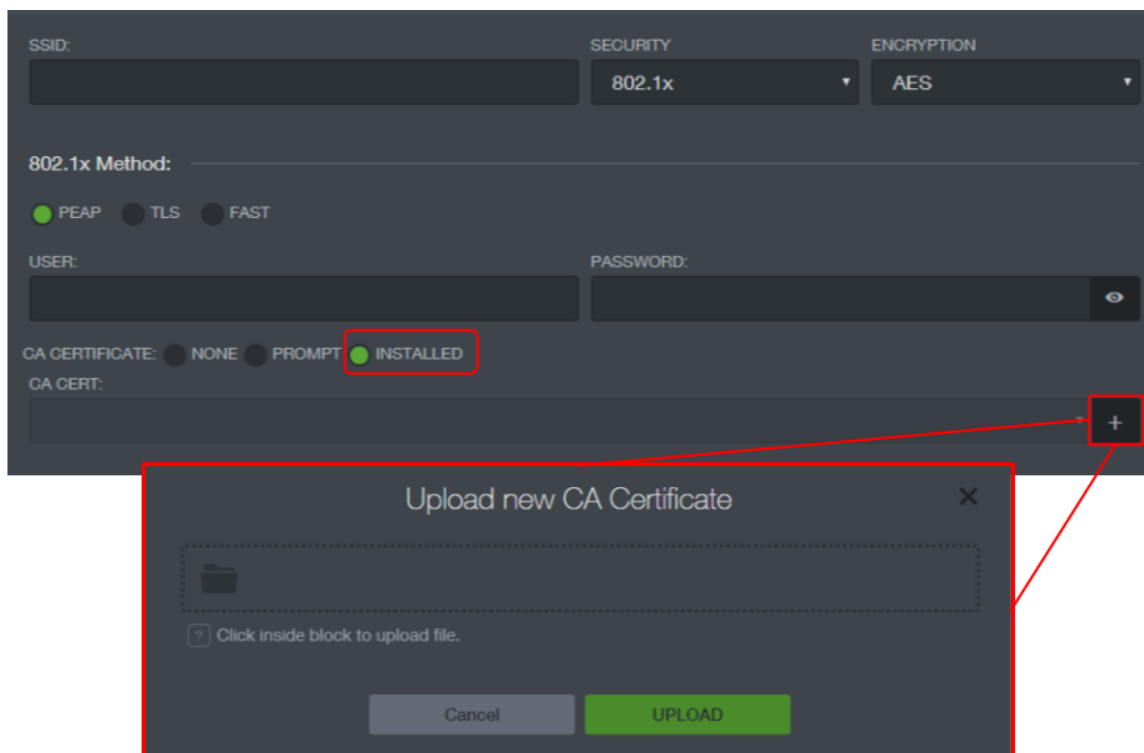
1. Make sure that PEAP is selected as the method.

2. Enter the username. Usernames may be case-sensitive.

3. Enter the password. Passwords are case-sensitive – click and hold  to reveal.

4. If you are using a CA certificate:

- a. Click **INSTALLED** (**PROMPT** is reserved for future functionality).
- b. Click  at the end of the CA Cert field to open an upload dialog.
- c. Click inside the block, navigate to the file location, select the file, and click **Open**.



- d. Click **Upload**. The ACI displays a success indicator and then the name is displayed in the CA Cert field.

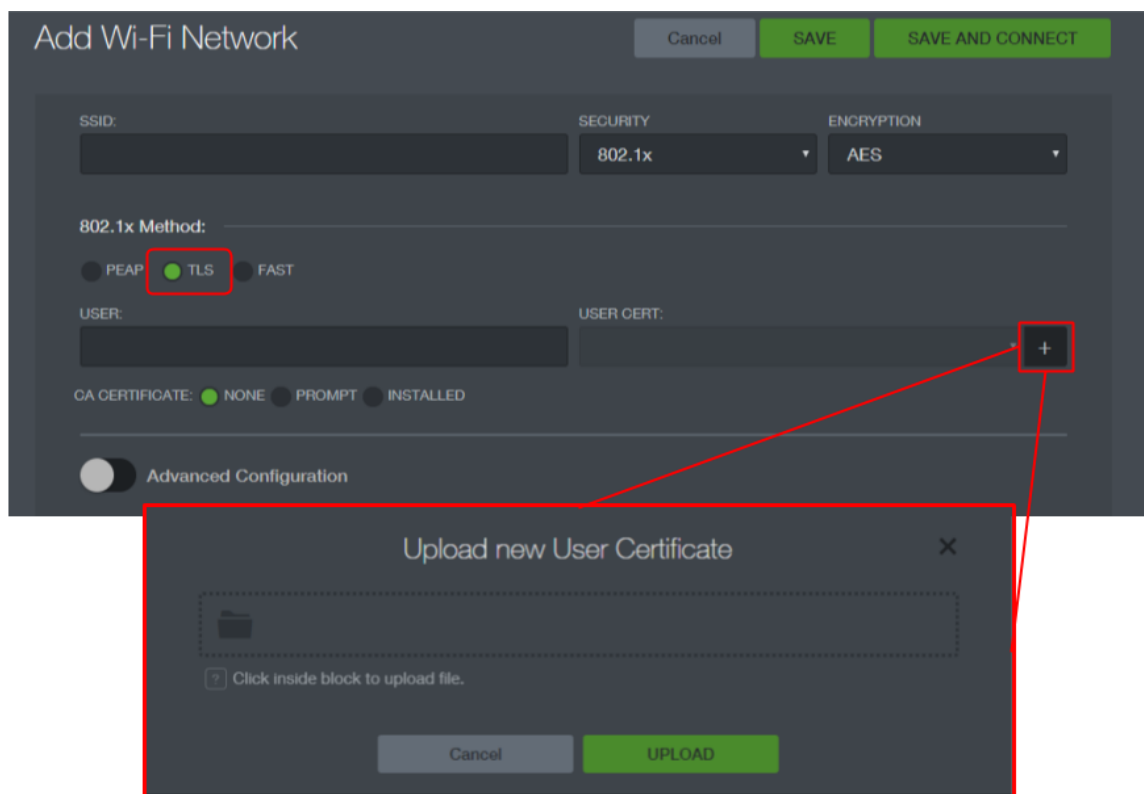
EAP-TLS


In EAP-TLS, a username is created for Ava, and then a certificate is generated for that identity. Ava uses the user certificate to prove its identity to the network.

Parameters:

- Network SSID (if hidden network)
- The username
- Access to the PKCS#12 (pfx) archive containing the user private key and certificate (and optionally containing a server certificate)
- The password with which the PKCS#12 archive was protected. If not available, contact the person who generated the certificate.

1. Make sure that TLS is selected as the method.
2. Enter the username and user cert.



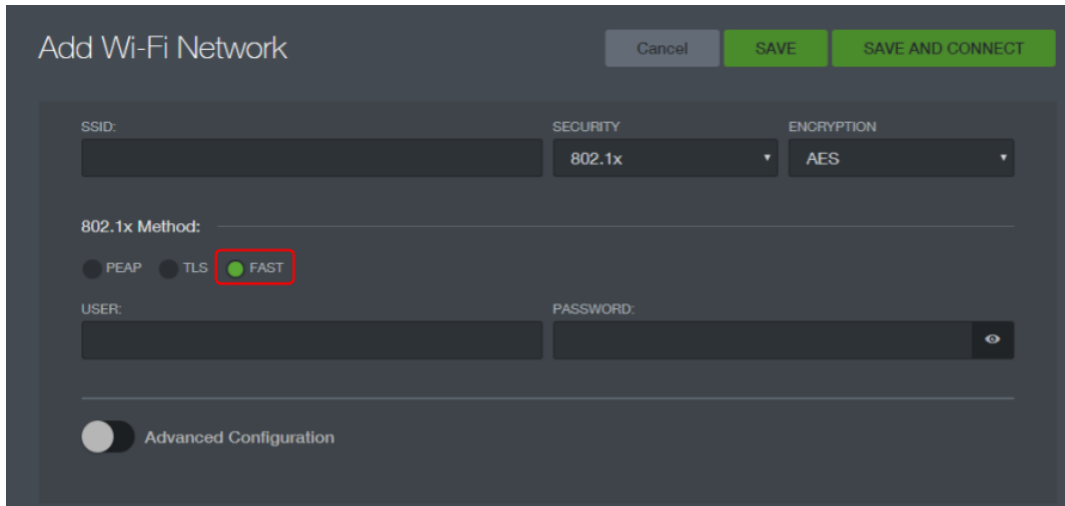
3. Click  at the end of the User Cert field to open an upload dialog.
4. Click inside the block, navigate to file location, select the pfx file, and click **Open**.
5. Click **Upload**. The ACI displays a success indicator and then the name is displayed in the User Cert field.
6. Enter the password for the PKCS#12 archive.
7. Leave CA Certificate set to **None**.
8. Hit **Save and Connect**. If Ava connects and then immediately disconnects, a proxy server needs to be added. If Ava remains connected, WiFi setup is complete.
9. To add the proxy server, edit the WiFi Profile. Open Advanced Settings and select **Automatic Configuration** as the proxy type. Type in the proxy URL and hit **Save and Connect**.

EAP-FAST


Parameters:

- Username
- Password

1. Make sure that FAST is selected as the method.

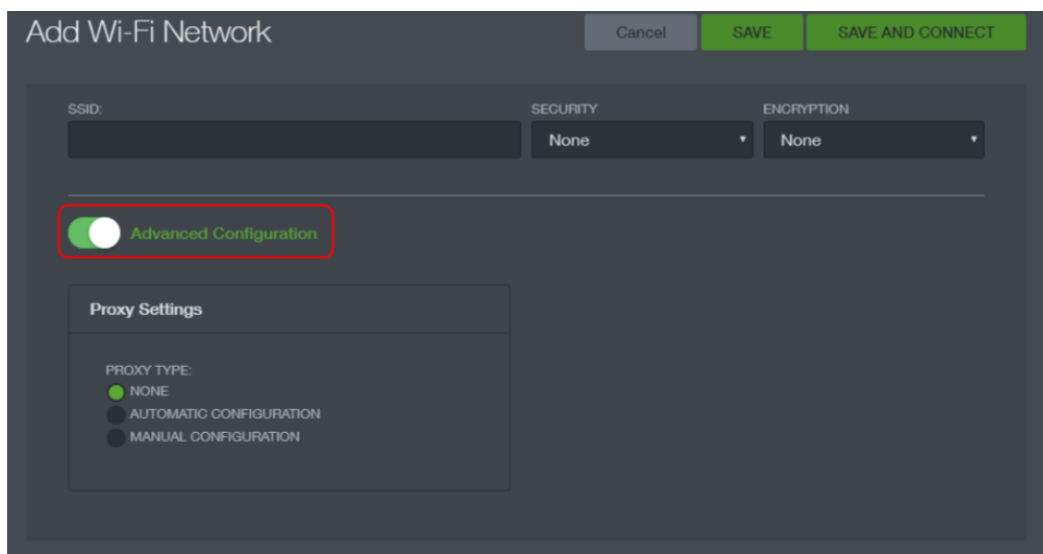


2. Enter the username.

3. Enter the password. Passwords are case-sensitive – click and hold  to reveal.

Wi-Fi Advanced Configuration

To see the Advanced Configuration parameters, on the Config tab enable **Advanced Configuration**.



Proxy Configuration

If your infrastructure includes a proxy server and Ava has not been configured as a client, you will be able to connect Ava to the WLAN but still not be able to connect to the Ava Cloud Service.



If you enter proxy configuration parameters but still fail to connect to the Internet, proxy test functionality is available on the Network tab.

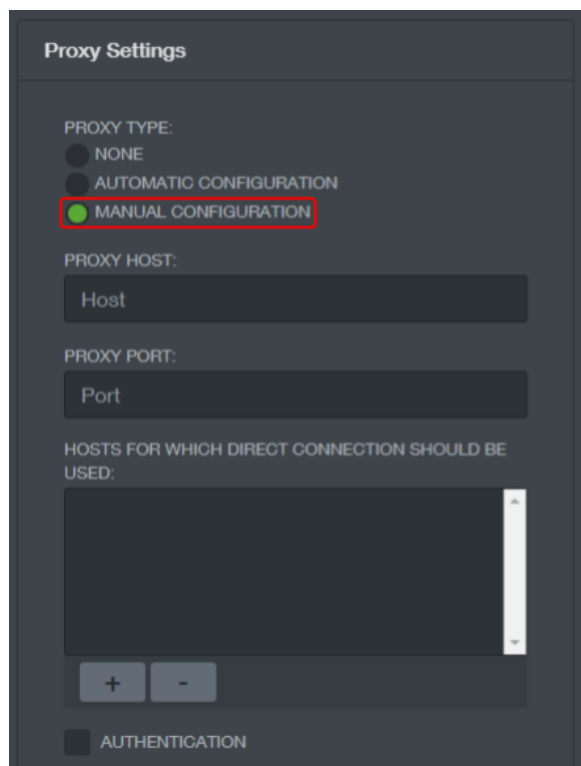
In order to configure Ava as a proxy client, determine which proxy configurations to use:

- Automatic proxy configuration using WPAD/DNS.
- Automatic proxy configuration using DNS but specifying the URL to the proxy configuration file.
- Manually configured HTTPS proxy, with exclusions for destination hosts and networks that should be accessed without a proxy server (certain Ava hosts are always specified).
- Optional username/password authentication.

The Ava supports a number of authentication protocols. Protocol selection is automatic. The proxy server presents a list of acceptable authentication protocols, and the robot chooses one and starts the handshake process.

For automatic configuration, optionally enter the URL to the proxy configuration file. Check **Use Authentication** if the proxy server requires a username and password.

For manual configuration, enter at minimum the **Proxy Host** and **Proxy Port**. Optionally add hosts for which direct connection should be used. Check **Authentication** if the proxy server requires a username and password.



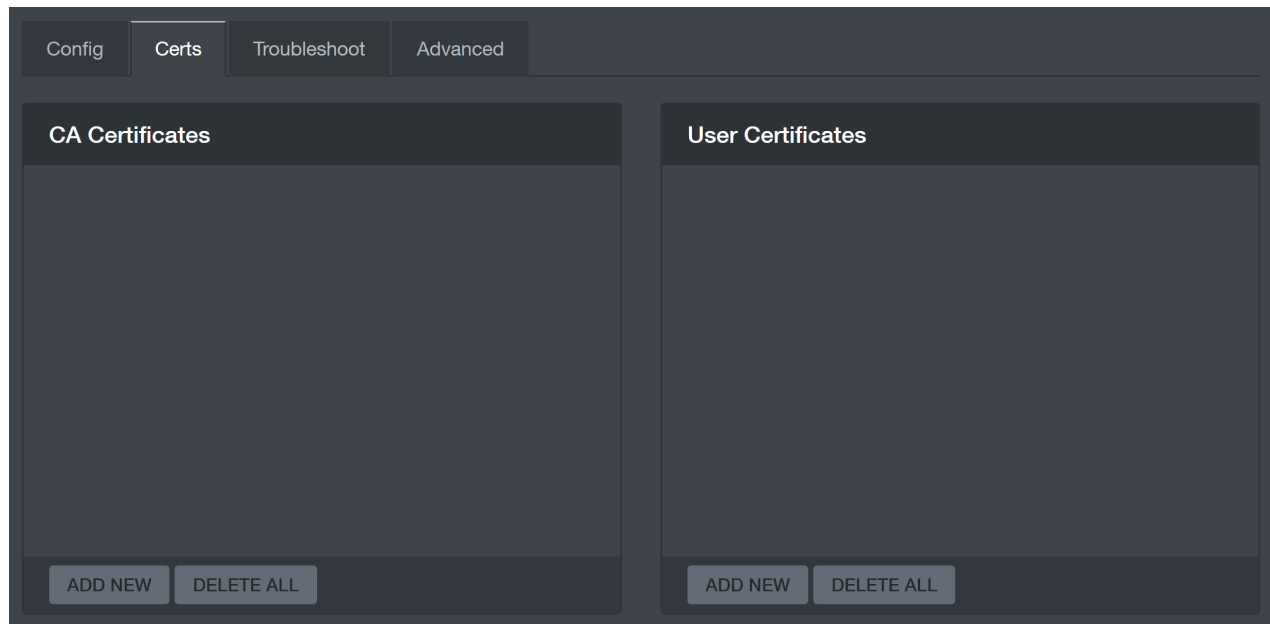
The image shows a 'Proxy Settings' configuration window with a dark grey background. At the top, the title 'Proxy Settings' is displayed. Below it, the 'PROXY TYPE:' section contains three radio button options: 'NONE', 'AUTOMATIC CONFIGURATION', and 'MANUAL CONFIGURATION'. The 'MANUAL CONFIGURATION' option is selected, indicated by a green dot and a red rectangular highlight. Below this, the 'PROXY HOST:' section has a text input field containing the word 'Host'. The 'PROXY PORT:' section has a text input field containing the word 'Port'. Below these, the 'HOSTS FOR WHICH DIRECT CONNECTION SHOULD BE USED:' section features a large, empty text area with a vertical scrollbar on the right. At the bottom of this section are two buttons, '+' and '-'. Finally, at the very bottom, there is a checkbox labeled 'AUTHENTICATION' which is currently unchecked.

Certs Tab

Use the Cert tab to see and delete certificates.



Only upload certificates from the Config tab during the configuration process, not from the Certs tab. Although the **Add New** functionality appears to work, the configuration process does not recognize certificates uploaded by this method.



Hover over the certificate see additional function icons:



Click to delete the certificate.



Click to see certificate information.

Troubleshoot Tab

The Troubleshoot tab contains settings and logs that can be used in troubleshooting Ava.

The screenshot shows the 'Troubleshoot' tab in the Ava configuration interface. At the top, there are four tabs: 'Config', 'Certs', 'Troubleshoot' (which is active), and 'Advanced'. Below the tabs, the 'Wi-Fi Log' section displays a log of events in a dark-themed text area. The log shows the successful configuration of IP address [10.10.4.26], the DHCP lease, and the successful connection of the Wi-Fi supplicant. Below the log, there is a section titled 'You can troubleshoot the Wi-Fi by Wireless Capture. It will capture:' followed by a list of capture options: Channel, Channel width, and Filter Options (Frame Type, Packet Size, etc.). Below this list, there are two dropdown menus for 'FREQUENCY BAND' and 'CHANNEL', both set to 'Select One'. To the right of these dropdowns are 'Start' and 'Stop' buttons. Below the dropdowns is a 'Syslog Information' section with a large, empty text area for logging. At the bottom right of this section is a 'Save Local' button. At the very bottom of the interface, there is a 'Log Level' dropdown set to 'LOG_DEBUG' and a green 'Save' button.

Config Certs **Troubleshoot** Advanced

Wi-Fi Log

```
IP address [10.10.4.26] successfully configured.: {"params": "Array\n\n  [description] => Successfully obtained DHCP lease.\n  [event] => ip_configured\n  [level] => 6\n  [params] => Array\n    (\n      [ipv4_address] => 10.10.4.26\n      [method] => dhcp\n    )\n  [set] => anm_event\n"}\n\nConfiguring IP: {"params": "Array\n\n  [description] => Obtaining DHCP lease\n  [event] => configuring_ip\n  [level] => 6\n  [params] => Array\n    (\n      [method] => dhcp\n    )\n  [set] => anm_event\n"}\n\nWi-Fi connection successful.: {"params": "Array\n\n  [description] => Ava Supplicant connected\n  [event] => ...
```

You can troubleshoot the Wi-Fi by Wireless Capture. It will capture:

- Channel
- Channel width
- Filter Options (Frame Type, Packet Size, etc.)

FREQUENCY BAND

Select One

CHANNEL

Select One

Start Stop

Syslog Information

Save Local

Log Level: LOG_DEBUG Save

Wi-Fi and Syslog Information

Ava Support will contact you should Wi-Fi logs or Syslog Information be required.

Advanced Tab

The Advanced tab contains settings that affect Ava's roaming, or moving an established signal from one access point to another.

Note: this tab is not present in software configured for Hidden SSID (non-broadcast SSID).

The screenshot shows the 'Advanced' configuration tab with two main sections: 'Roaming Configuration' and 'Scanning Configuration'. The 'Roaming Configuration' section includes a 'Channel Steering' toggle set to 'Enabled', and three input fields for 'ROAM RSSI (-99-1):' (value: -70), 'ROAM RSSI TIME (0-10):' (value: 10), and 'ROAM HYSTERESIS (0-50):' (value: 3). The 'Scanning Configuration' section includes a 'DWELL TIME:' input field (value: 200) and a 'Save' button. Both sections have their own 'Save' buttons at the bottom.

Roaming Configuration

Roaming causes a transient penalty in video quality, so this setting to alter Ava's response to the signal RSSI (Received Signal Strength Indicator) should not be used unless video deterioration or loss is experienced.

Channel Steering (default enabled): determines the order the Ava will use in trying to associate with an AP when roaming is triggered. Most APs operate in both 2.4 GHz and 5 GHz using a distinct BSSID (basic service set identifier) for each band. In general, communication at 5 GHz is preferred. The Ava constantly scans 5 GHz and 2.4 GHz BSSIDs, and ranks the results in a scan results table. With channel steering on, all 5 GHz BSSIDs are ranked higher than 2.4 GHz BSSIDs. With channel steering off, BSSIDs are ranked based only on RSSI, which may result in some 2.4 GHz BSSIDs being ranked higher than, and thus tried before, some 5 GHz BSSIDs. Disable only if you know that Ava is operating in an area where all 5 GHz BSSIDs have poor signal strength.

Roam RSSI (default -70 dBm): affects the aggressiveness of roaming. The higher the value (further from -90 dBm) the more often the roam. Bear in mind that roams could momentarily negatively affect the quality of the video stream. Temporarily set to a lower value if you are

configuring and testing Ava in an area with weak signal strength, to prevent roaming attempts from interfering with video testing. After changing, click **Save** under that setting's column.

Roam RSSI Time (default 10): Future functionality

Roam Hysteresis (default 3dB): Future functionality

Scanning Configuration

Dwell Time (default 200ms): The amount of time to spend on each channel. Increasing dwell time increases the overall scan time. In environments where APs are not sending beacon frames as often as expected and the Ava fails to discover APs known to be present, increasing dwell time can improve the probability of discovering the APs.

Network Configuration

The Network Configuration page provides the interface for changing the Ava Cloud Service address, the Time Server Settings, and also contains proxy test functionality. In general, only change these parameters when instructed by Ava Support.

If you are changing more than one parameter, click **Save** for each one.

Cloud Service Settings

Enter the name of the Ava Cloud Service (provided by Ava Support) and click **Save**.



Ava must be connected to the Internet when changing this parameter. Configuration functionality checks for an Internet connection before storing the service name, and generates an error if one is not found.

Time Server Settings

Setting a time server allows the robot to accurately capture the time. This is useful when a user reports a problem so that Ava Support can correlate the user report with robot logs for troubleshooting.

Ava is shipped with a default time server of `ntp.ubuntu.com` or `us.pool.ntp.org`. Please make sure to configure Ava for an NTP server that is accessible at the installation site.

Test Proxy Settings

Do not use this functionality unless instructed by Ava Support.

Video Configuration

The Video Configuration page changes settings on the Ava base, not on the video codec. Use the codec configuration interface to change the codec configuration.

The screenshot shows the 'Video Configuration' page of the Ava Robotics interface. The page is divided into several sections:

- Codec Selection:** A dropdown menu labeled 'SELECT CODEC' with 'Cisco' selected. A green 'Save' button is below it.
- Codec Settings:** Fields for 'ADMIN USERNAME' (admin) and 'ADMIN PASSWORD' (masked with dots). A green 'Save' button is below.
- Codec Mac Address Settings:** A field for 'CODEC MAC ADDRESS' (18:8B:9D:4A:93:5B). A green 'Save' button is below.
- On Screen Branding:** A toggle for 'USE CUSTOM IMAGES' is set to 'Disabled'. Below are four fields for 'Custom PNG file #1' through '#4', each with a '+' button to add a file.
- Digital Signage Video:** A field for 'YOUTUBE PLAYLIST ID' (PLTqGwluoHsAqWjZf9NOsa1aKmb4jNL48). A green 'Save' button is below.

On the left side, there is a sidebar with navigation links: Wi-Fi, Network, Video (highlighted), Admin, Support, and Logout. Below these links, there is a status section showing 'You are currently connected to the SB00155 Ava at MAC Address 28:c2:dd:d6:01:94.' and 'Cloud' status (Connected). At the bottom of the sidebar, it says '© 2019 Ava Robotics. All Rights Reserved.'

Codec Selection & Settings

The Video Configuration page is used to configure the video codec administrator username and password, as well as MAC address, that Ava should use to control the video codec.

Currently, supported codecs are Cisco SX20s and RoomKit Codec Plus. Select "Cisco SX20" in drop-down for either one.

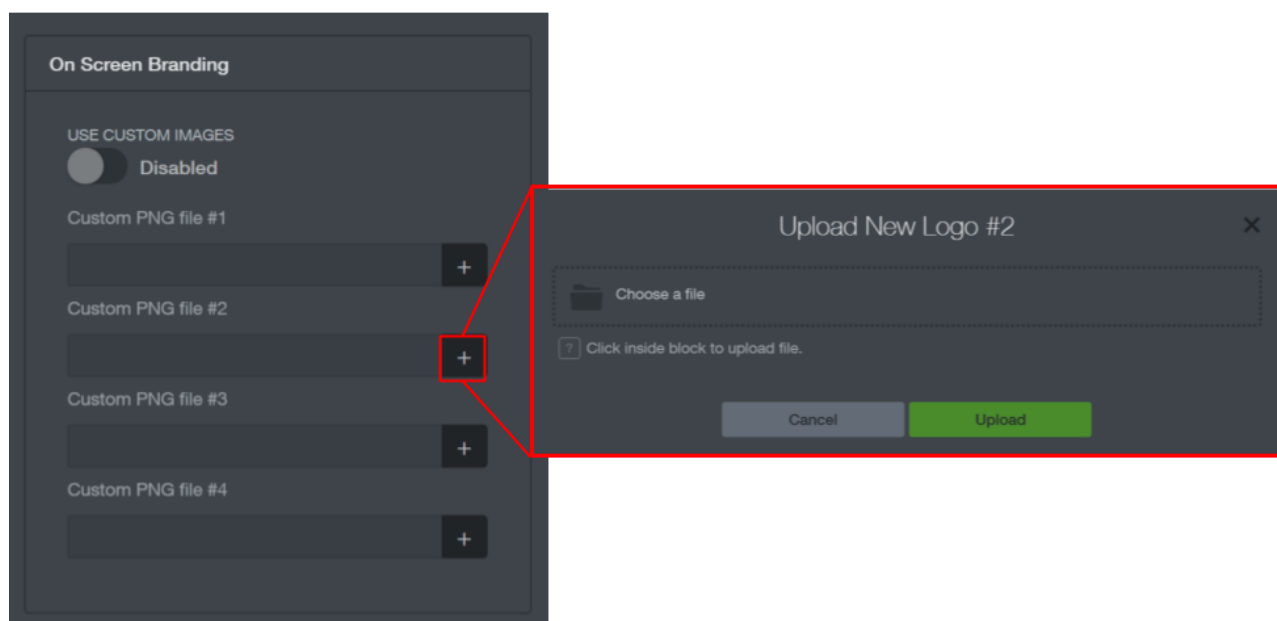
For Ava Telepresence Robots that have a codec managed by Ava Support, the username and password will be provided by Ava Robotics. If the codec is being managed by a site IT administrator, use the codec default account information to access the configuration page

and set the desired username and password. If any changes are made, update them to match in the respective area of the ACI and click **Save** after changing any value.

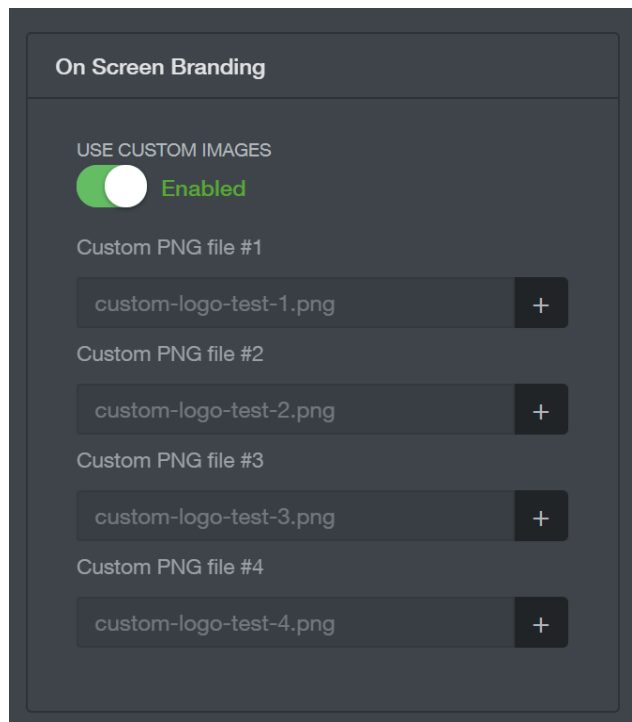
On Screen Branding

Ava telepresence robots display on screen branding when not being used in a session. The default branding screens are of the Ava Robotics logo. To create custom on screen branding, (4) 1920px x 1080px PNG files are needed. These 4 files will be played in a loop. To customize the branding:

1. Click **+** at the end of the Custom PNG file field to open an upload dialog.
2. Click inside the block, navigate to file location, select the PNG file, and click **Open**.
3. Click **Upload**. The ACI displays a success indicator and then the name is displayed in the Custom PNG file field.



4. Repeat steps 1-3 to upload the 4 PNG files.
5. Click **Upload**. The ACI displays a success indicator and then the name is displayed in the Custom PNG file field.
6. Toggle the switch under Use Custom Images to **Enable**. The toggle will only be usable once all 4 image files have been uploaded.



To disable custom on screen branding and enact the standard Ava Robotics branding, toggle the switch to **Disable**.

Digital Signage Video

Ava telepresence robots are able to play video(s) on screen when it is not being used in a session. The video(s) are played from a YouTube playlist, which can be configured by an administrator. There are two steps to configure this capability: creating a YouTube playlist for the video(s) you want to play and configuring Ava to play this playlist.

Configuring a YouTube Playlist

In a YouTube account that you manage, set up a playlist containing the video(s) you want to play. You can follow the instructions on YouTube and many blogs on how to upload and manage videos.

The videos need to meet the following minimum criteria:

- In Distribution Options, allow embedding
- Must be Public or Unlisted (not Private)

For most effective presentation of the message, it is recommended that the video(s):

- Be uploaded in HD 720
- Have duration of under 1 minute

After the playlist is created, it will be accessible via a link that looks like this example:

<https://www.youtube.com/playlist?list=PLTqGwluoHsArbj31MSWf3Kt6LbWcTMN8t>

The **playlist ID** is the string that starts after the "=" sign. In the above example, it is PLTqGwluoHsArbj31MSWf3Kt6LbWcTMN8t.

Configuring Ava to Play the Video(s)

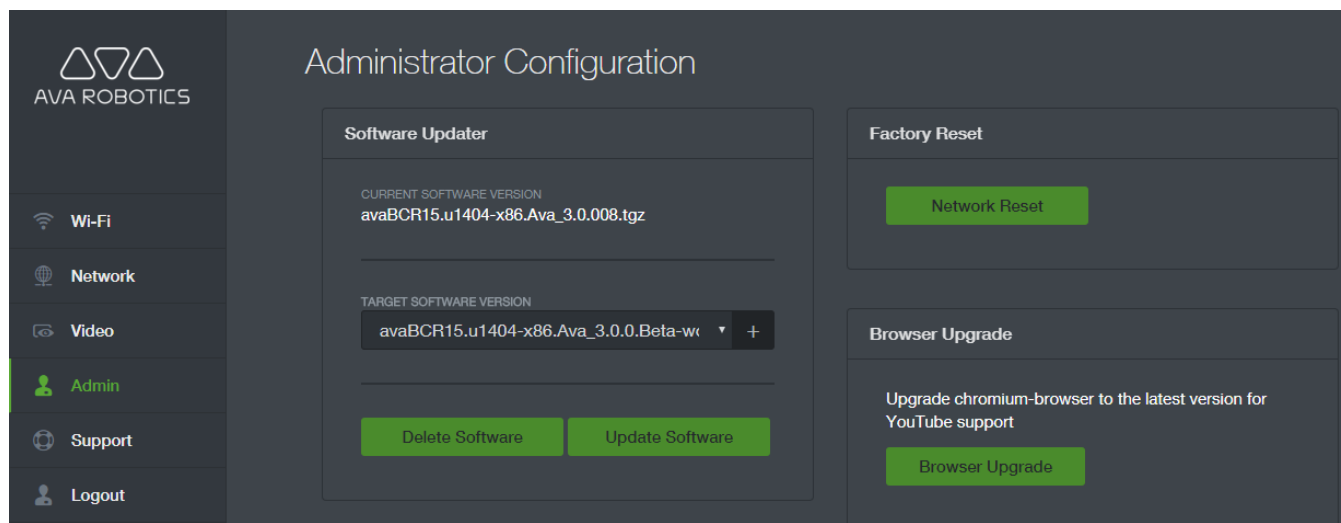
On the bottom right of the Video tab you will see a box titled "Digital Signage Video". Copy and paste the playlist ID into the box and hit Save. Ava will now play on its screen the videos in the playlist in a loop.

Administrator Configuration

The Administrator Configuration page displays the current software version and supports updating and cleaning out configurations. Do not use the functionality on this page unless instructed by Ava Support.



The Network Reset function clears all network connection information – certificates, profiles, and current settings - and disconnects users from the network. Do not use unless instructed by Ava Support.



Software Updater

Software is generally updated from the Ava Cloud Service; however, in the rare case an update via the ACI is necessary, Ava Support will contact you with instructions on how to use this functionality.

Factory Reset

Selecting this will reset all configured settings. Do not use this functionality unless instructed by Ava Support.

Browser Upgrade

Ava uses Chromium browser to display robot screens. On occasion, this browser will need to be upgraded. Do not use upgrade the browser unless instructed by Ava Support.

Ava Support

The Ava Support page displays version information for both software and firmware components, and allows you to download a zip file containing support information.

There are also multiple restart options. Do not use any unless instructed to by Ava Support.

Ava Support

CODEC_FIRMWARE ce9.3.1.61bfa3834f2	MEGABOARD_HW_REV F
BIOS 22.0.9 07/21/2014	MEGABOARD_DRIVE_MOTORS Ametek
LASERFIRMWARE 2.22.0000	APPLICATIONPACKAGE Ava_4.0.0.9
MEGABOARD_FIRMWARE 1.2.2	SOFTWAREUPDATER Ava_3.5.5
MEGABOARD_BOOTLOADER 1.0.2	CURRENTIMAGE avaBCR15.u1404-x86.Ava_4.0.0.9.tgz
MEGABOARD_CHARGERBOARD 0.0.0	MEGABOARDFIRMWARE 1.2.2

Download Support Content

[Download](#)

Restarter

Software Restart [Go](#)

You are currently connected to the SA00152 Ava at MAC Address 28:c2:dd:6a:a1:8d.

Cloud ● Fault ●

Battery Level ●

Wi-Fi Signal ●

Ava Robot Cloud Status
Connected
15 Hours, 8 Minutes, 45 Seconds

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Download Support Content: Generates support content and then downloads a file named *support.zip* to your computer's download folder. The zip file contains various tables and logs useful for Ava Support to debug problems. Ava Support may ask you to obtain this file if Ava is not connected to the Cloud Service.

Appendix B: Troubleshooting

This section is intended to help you quickly solve simple problems. The following information is included:

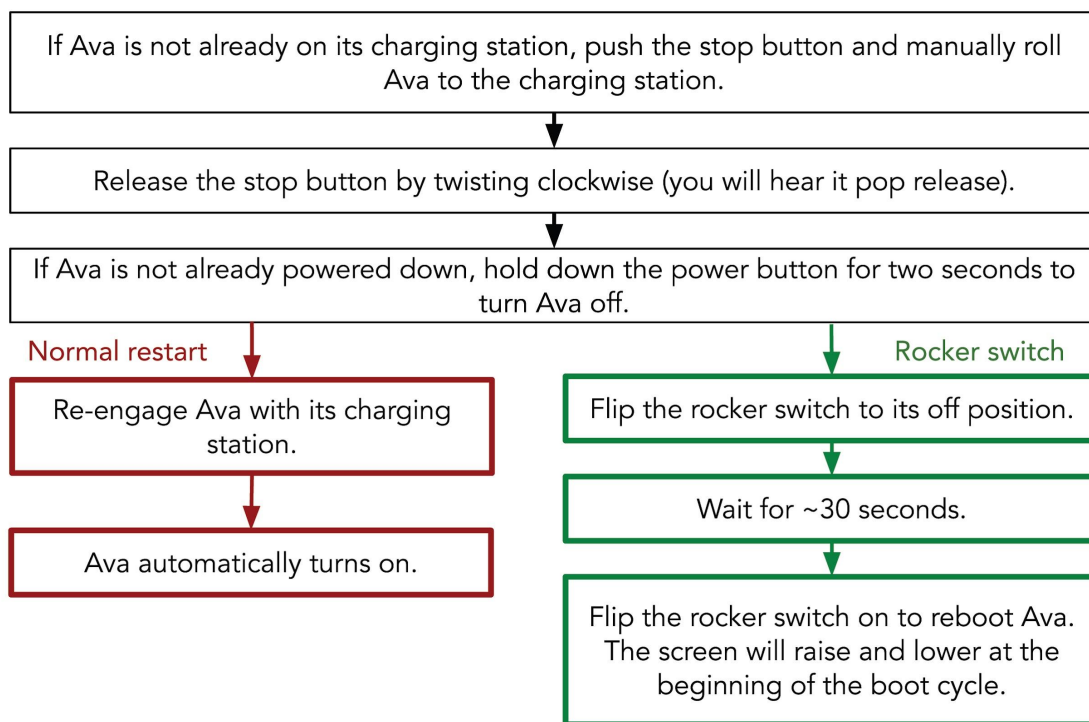
- **Rebooting Ava:** Standard instructions for performing a full reboot of the system. These instructions are also included on the *Ava Caretaker Poster*.
- **Understanding Ava's Availability:** Details on when Ava becomes unavailable and behavior at the end of a session.
- **Local Symptoms:** Solutions to situations that arise when using Ava.

Ava's LED lights can be used as a troubleshooting tool. The following table provides details on LED color/fade and the corresponding robot behavior. If LEDs are red, Ava will not move.

If the LEDS are...	It means Ava is...
Solid white	Travelling, waiting, or in session.
Brightening/fading white, alternating sides	Connected to its charging station.
Solid red	Motionless with its stop button engaged.
Flashing red	Experiencing a system problem.

Rebooting Ava

Some problems in the field can be resolved by rebooting Ava. Do not reboot Ava unless you are asked to. To reboot Ava follow the specified restart type:



While the system is rebooting:



During the reboot you will see transitional screens briefly displayed. If you see these screens, no action is required, the system will complete its reboot in under 3 minutes.

Understanding Ava's Availability

Ava's availability for a new session, and behavior when a session is about to end, depends upon other sessions that may be scheduled, the number of Avas in the pool, and remaining battery power. In an installation with more than one Ava installed and available, the one closest to chosen destination and with sufficient battery power is the one dispatched for a session.

Scheduled Session Behavior

When a remote user schedules a session, an Ava must be available for the full duration of the schedule request (one hour by default). Otherwise the calendar indicates no robot is available.

An Ava is committed to a scheduled session 10 minutes before the session is due to begin. At that time it is removed from the resource pool and cannot be used for an immediate session.

In this 10 minute period Ava leaves for the session destination and the remote user can check in to the session.

If the remote user has scheduled a session, and has not checked in to the session 15 minutes after the session was scheduled to begin, that Ava is released for use. It will return to the charging station, but a new session can be initiated with it at any time, even while it is travelling. If the remote user attempts to check in after the 15 minutes has expired, the App displays, “Attempting to satisfy late check-in for reservation.” while availability is assessed.

Immediate Session (Teleport Now) Behavior

If a remote user begins an immediate session, the default duration is one hour. However, if a robot is not available for the full hour but one is available for more than 10 minutes, the immediate session will begin but with a shorter duration. The end of session warning behavior then proceeds as indicated under *Active Session Behavior* below.

Active Session Behavior

Once in a session, the remote user can get an end of session warning. Whether or not the warning is displayed and the amount of advance notice provided can be configured in the Ava App under Settings > Teleport. The default is five minutes before the end of the session. The audible warning sounds even if the device’s display is off, as long as the App is in an active session and the display was turned off while the user was on a session interface. The warning does not sound/display unless the user is in a session interface. The audible warning does not sound if the device has been muted.

If no session is scheduled for at least 15 minutes after the current session is due to end, the following scenarios can occur. These examples assume there is only one robot in the pool.

- The remote user is in the session and extends the session either in response to the end of session warning or proactively through the session timer. The amount of time available for the extension depends on future scheduled sessions. For example, if the current session is due to end at 10:00 and another session is scheduled to begin at 10:30, the user can extend the session for 30 minutes.
- The remote user is in the session but either ignores the end of session dialog and warning tone or does not have the end of session warning turned on. The session automatically extends for 15 minutes.
- The remote user leaves the active session interface in the App, for example to check email, then re-enters the App but does not resume the session. The session automatically extends 15 minutes.
- The remote user leaves the App and does not re-open it. The session ends at the scheduled time.

In the single robot example, if a session is scheduled to begin within 15 minutes of the end of the current session, the session will always end on schedule. If the remote user attempts to extend the session proactively, the response indicates that no more time is available. Similarly, the end of session warning does not offer the option of extending the session, but indicates that the session is about to end.

Local Symptoms



If Ava is smoking or smells bad, immediately power it down with the power button and flip the rocker switch off. If it is engaged with the charging station, manually pull it off. Call Ava Support.

Ava Display Reads “Connection Issues: Not connected to management server”

The display may alternate with “Assistance Required: Not Localized on Map.” This problem can have a variety of causes that generally fall into one or more of four areas:

1. A problem internal to the robot, for example the WGB has failed in some way.
2. A problem with the environment, for example the wireless network is down or one part of the site has weak access.
3. A problem with the handshaking or authentication, for example a certificate or a password expires.
4. A problem with the Ava Cloud Service, for example the server is down.

When the installation was designed, the charging station was located in an area with strong wireless connectivity. The charging station can therefore be used as a testing base.

1. Have the Caretaker push the robot back to its charging station and verify that the robot is powered on. Does the problem clear?

Yes: To verify that the problem is solved, have a remote user drive the robot to a destination, then end the session. Verify that the robot returns to the charging station. If the fault does not recur, problem solved. If the fault recurs, contact Technical Support.
No: Contact Technical Support.

Before contacting Ava Support, you may wish to review the following:

- Verify that Ava’s wireless network is up.
- Verify that nothing in the wireless handshaking/authentication chain has changed. Has a password or a certificate expired?
- Verify that the Ava Cloud Service is available by trying to connect through the IT Administrator Console. If unavailable, Cloud Service may be temporarily down.

- If the robot is connected at its charging station, but loses connectivity elsewhere, determine if the problem happens reproducibly at the same location.

Ava Display Reads “Assistance Required: Not Localized on Map”

This message may alternate with “Connection issues: Not connected to management server” when Ava is not connected to the Ava Cloud Service. Use this diagnostic tree if “Not localized on map” is the only error message on Ava’s screen.

1. If Ava is off its charging station and displaying this message, Ava probably got lost in its map. If Ava is found in this scenario, locate Ava, press the emergency stop button on the back of the robot, and manually push Ava back to the charging station. Once at the charging station, release the emergency stop by twisting the knob clockwise (you will hear it pop release). Wait a minute or two. Does the message clear?

Yes: The immediate problem is solved. If the problem recurs, contact Ava Support.

No: Contact Ava Support.

2. Ava’s getting mis-localized frequently when first driving off of its charging station. Has the location of Ava’s charging station changed?

Yes: Provide Ava Support with the updated charging station location.

No: Contact Ava Support.

Ava Display Reads “Assistance Required: Disabled due to a Hardware Fault”

Should Ava have a hardware fault, information on which components have faulted can be found in the Administrator Console. If Ava is in this fault state, contact Ava Support and provide the module reporting the fault from the IT Administrator’s Console. You may be asked to reboot the robot before Ava Support goes into a more detailed analysis of the problem. Follow the instructions in *Rebooting Ava* if a reboot is requested.

Ava Appears to be Without Power

Diagnosing this problem requires determining if Ava’s batteries are failing to charge, and if so, if that problem is internal to Ava or with the charging station.

1. Is Ava’s charging station plugged into a power outlet?

Yes: Proceed to 2.

No: Plug the charging station in and engage Ava with the charging station. Ava should power on. Proceed to 3.

2. Is Ava connected to the charging station and powered on?

Yes: Contact Ava Support.

No: Have the Caretaker engage Ava with its charging station and make sure the rocker switch is on. Ava should power on. Proceed to 3.

3. Once Ava appears to have power, after an hour verify that Ava drives to a destination and returns.

Yes: Ava had run out of power. Problem is solved.

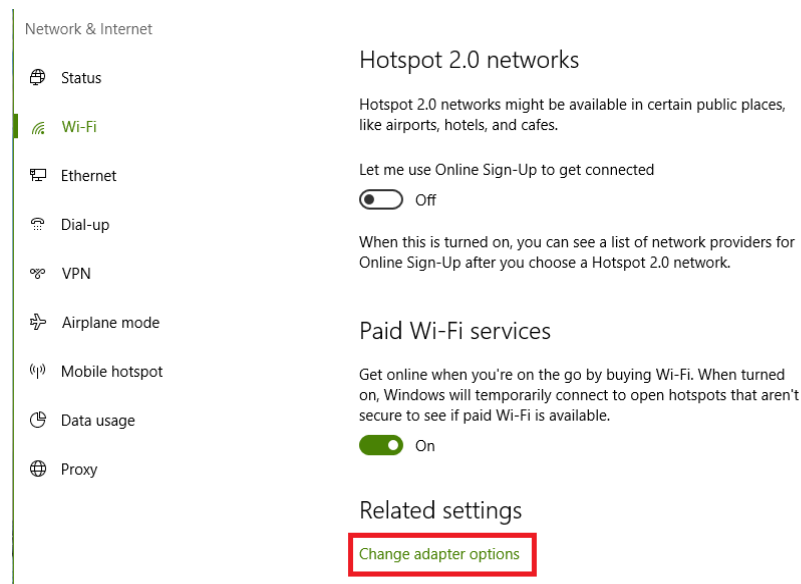
No: Ava's batteries are failing to charge. Contact Ava Support.

Ava Isn't Connecting to a Saved Network

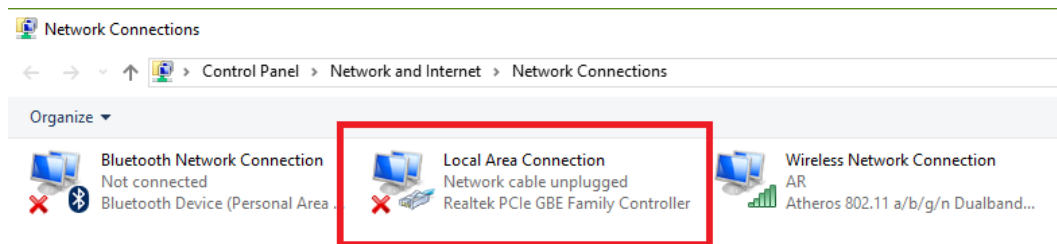
When changing networks, if Ava isn't connected to a saved profile select the network SSID and click **Forget**. Next, click **Scan**, select the SSID, and enter the password/authentication information. Ava should connect. If Ava does not connect, check with IT to see if the network password has been changed before contacting Ava Support.

Appendix C: Laptop Static IP Address Configuration

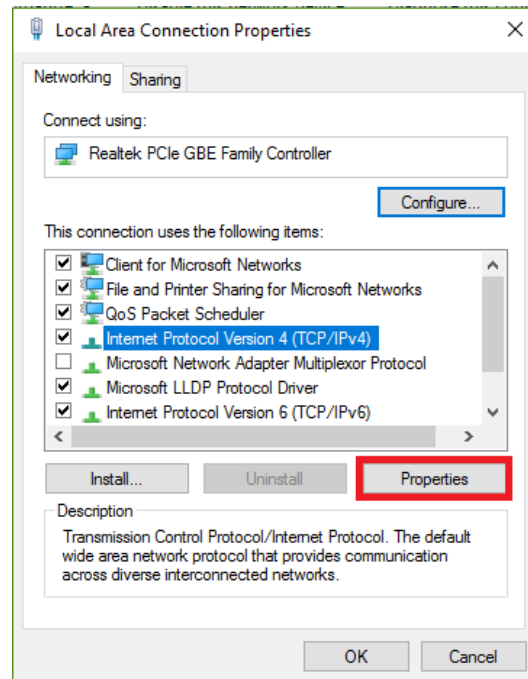
1. Open Wi-Fi Settings and scroll down to **Change Adapter Options**. (This can also be reached through Control Panel > Network and Internet > Network and Sharing Center > Change Adapter Settings).



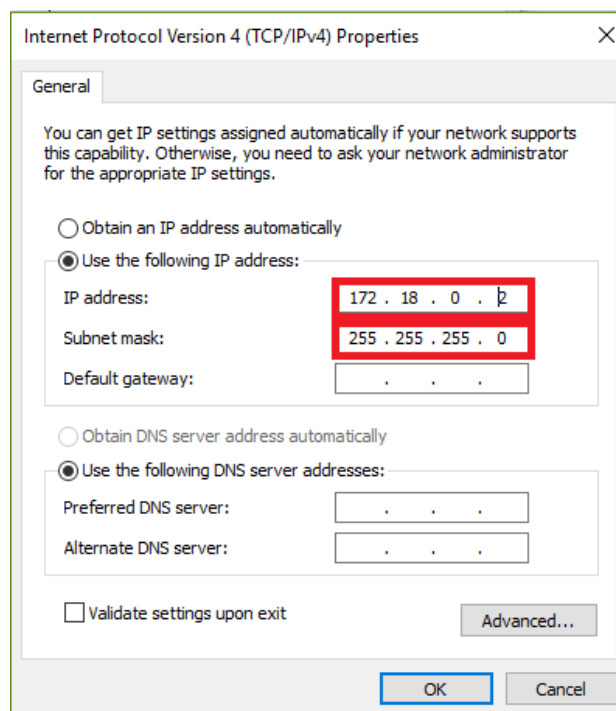
2. In the resulting window, double-click **Local Area Connection**. You will probably have more than one Local Area Connection. Open the first one in the list.



3. In the Local Area Connection window, click **Properties**.
4. In the Properties window click **Internet Protocol Version 4 (TCP/IPv4)** and then click **Properties**.



5. In the Properties window, click **Use the following IP address:** and enter 172.18.0.2. Click on the subnet mask field. Change the value to 255.255.255.0. Click **OK**.



6. Click **Close** in the Local Area Connection Properties window.
7. Click **Close** in the Local Area Connection window.