

# WAVE Wireless Presentation Platform



## Version Information

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Version	Release Date	Notes
1	Aug 2021	Release
2	Sept 2021	Updated for firmware release 1.0.1 - added Miracast PIN support
3	Oct 2021	Updated for new format and firmware release 1.1.0 - OCS support
4	Jan 2022	Updated for firmware release 1.2.0 - Instructor screen display control and new welcome screen customization.
5	Aug 2022	Updated for firmware release 1.3.0 to include 802.1x security in <b>Network</b>

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## Operating Notes

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**IMPORTANT:** Visit <https://atlona.com/product/at-wave-101> for the latest firmware updates and User Manual.

## Warranty

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To view the product warranty, use the following link or QR code:

<https://atlona.com/warranty/>.

## Important Safety Information



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT OPEN ENCLOSURE OR EXPOSE TO RAIN OR MOISTURE. NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.



The information bubble is intended to alert the user to helpful or optional operational instructions in the literature accompanying the product.

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all instructions.
- 5 Do not use this product near water.
- 6 Clean only with a dry cloth.
- 7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8 Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9 Do not defeat the safety purpose of a polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the product.
- 11 Only use attachments/accessories specified by Atlona.
- 12 To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.
- 13 Unplug this product during lightning storms or when unused for long periods of time.
- 14 Refer all servicing to qualified service personnel. Servicing is required when the product has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the product, the product has been exposed to rain or moisture, does not operate normally, or has been dropped.



## FCC Compliance

FCC Compliance and Advisory Statement: This hardware device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed or used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: 1) reorient or relocate the receiving antenna; 2) increase the separation between the equipment and the receiver; 3) connect the equipment to an outlet on a circuit different from that to which the receiver is connected; 4) consult the dealer or an experienced radio/TV technician for help. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Where shielded interface cables have been provided with the product or specified additional components or accessories elsewhere defined to be used with the installation of the product, they must be used in order to ensure compliance with FCC regulations.

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## Introduction

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The Atlona **AT-WAVE-101** is a wireless presentation and collaboration platform designed for easy content sharing with iOS®, Android™, Mac®, Chromebook™, and Windows® devices. The WAVE-101 allows up to four presenters to share their content simultaneously on-screen, with an Instructor Mode available for managing additional presenters and selecting which to be displayed. Wireless BYOD interfacing is simply enabled through the device's native casting protocol (such as AirPlay®, Google Cast™, or Miracast™), without the need to install an app. For hands-free, effortless user operation, Dynamic Layout Mode™ is an innovative feature of the WAVE-101 that automatically adapts the on-screen layout to new incoming or disconnected source content. The WAVE-101 is equipped with a host of other convenient features for integrators and end users, including programmable display control, display of user-uploaded images and video media, YouTube Live streaming, support for cloud-based digital signage applications, and much more.

## Features

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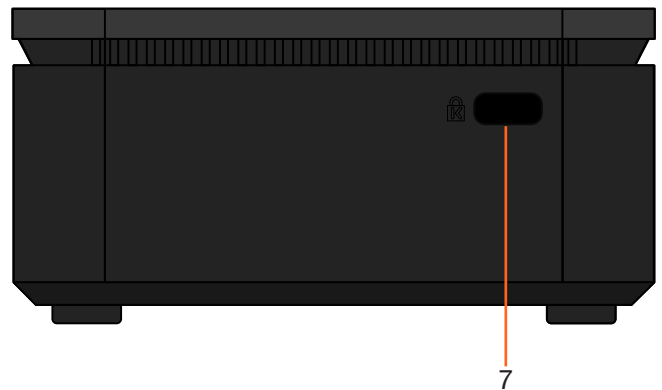
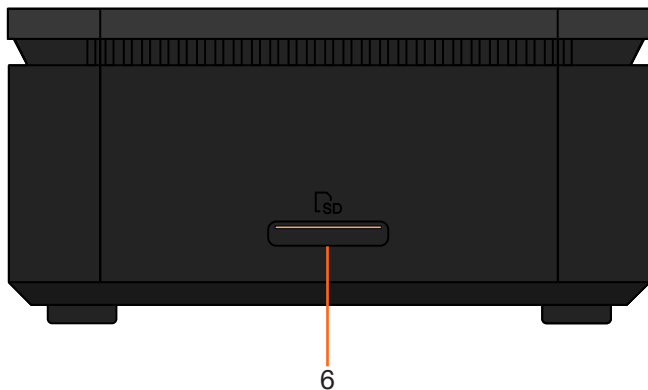
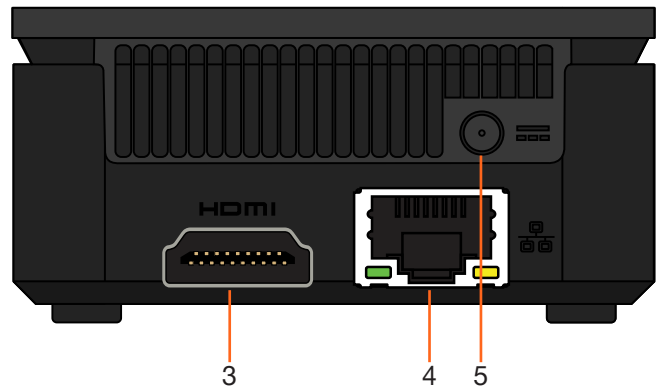
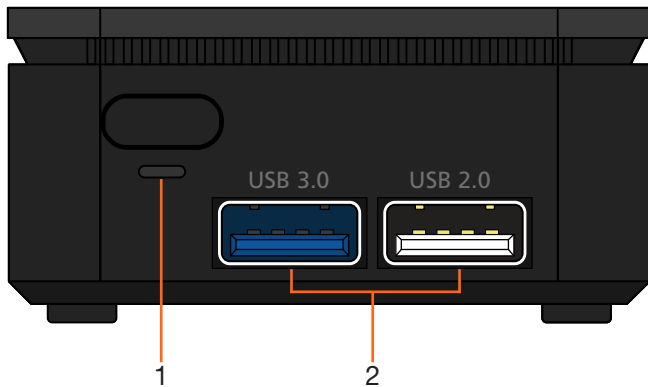
- Wireless AV platform enables simultaneous content sharing for up to four 1080p presenters.
- Wireless screen casting with iOS, Android, Mac, Chromebook, and Windows devices through native AirPlay, Google Cast, or Miracast protocols.
- Dynamic Layout Mode™ (patent pending) automatically adapts to incoming or disconnected source content, to optimize the way the content is presented on the screen.
- Selectable, fixed static layout modes available to determine the number of visible on-screen presenters.
- Instructor Mode allows a user to manage content, adjust audio volume, upload and play media content, stream YouTube, and switch between layouts.
- Supports YouTube Live streaming.
- Supports cloud-based digital signage platforms.
- Local storage available for playback of images and video.
- Optional Wi-Fi access point access point with built-in firewall.
- Apple® iBeacon® device discovery speeds up connectivity for iOS devices and Mac computers.
- Supports Miracast over Infrastructure for use of facility Wi-Fi or Ethernet network.
- Wireless AV interfacing can be selectively enabled or disabled for each native platform.
- Supports wireless video up to 1080p30 4:2:0 (up to 1080p60 with Miracast).
- Secure wireless and content sharing with randomly generated passwords and PIN codes (for AirPlay and Miracast Infrastructure & P2P), and a configurable firewall.
- Supports industry-standard, network security features and protocols such as WPA2-PSK, IEEE 802.1x network port security (Ethernet port only), and AES-128 encryption.
- Programmable IP, RS-232 (with optional adapter), or TCP Proxy (port 9001) display control based on time schedules.

## Package Contents

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- 1 x AT-WAVE-101
- 1 x VESA mount
- 1 x USB Wi-Fi adapter
- 2 x Mounting screws
- 1 x 12V DC power supply
- 1 x Installation Guide

## Panel Description



### 1 Power Button and LED

Use this button to power the unit off, it must be held for 4 seconds to turn the unit off. The LED will illuminate green when the unit is on.

### 2 USB

Connect optional USB Wi-Fi adapter (included) here and/or USB to RS-232 adapter (purchased separately). If needed, the USB ports are compatible with USB hubs for expanding the amount of USB ports.

### 3 HDMI OUT

Connect to an HDMI display.

### 4 ETHERNET

Connect to a network switch for content, control, and/or discovery.

### 5 12V DC

Connect the included 12V DC power supply from this port to a wall outlet.

### 6 SD Slot

For future use.

### 7 Kensington Lock

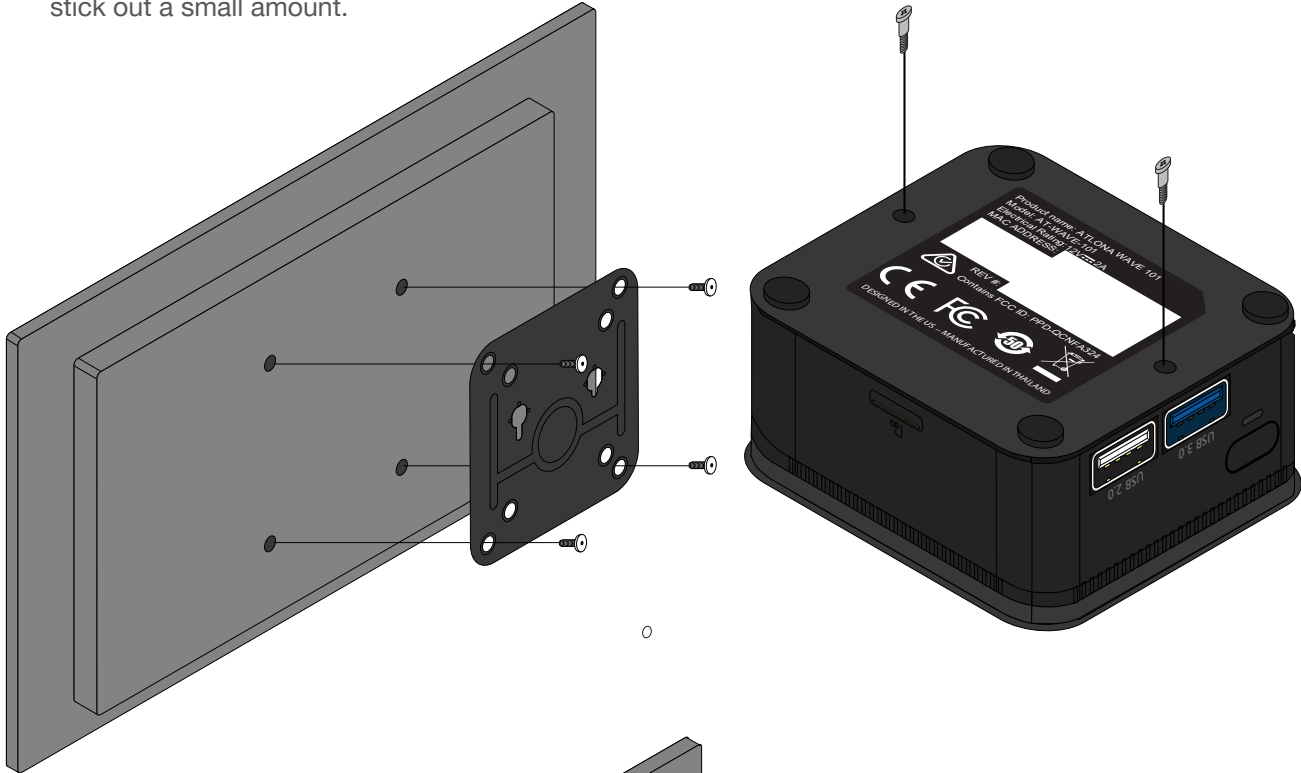
Connect a Kensington lock from this port to a table, desk, etc to avoid unwanted removal.

# Installation

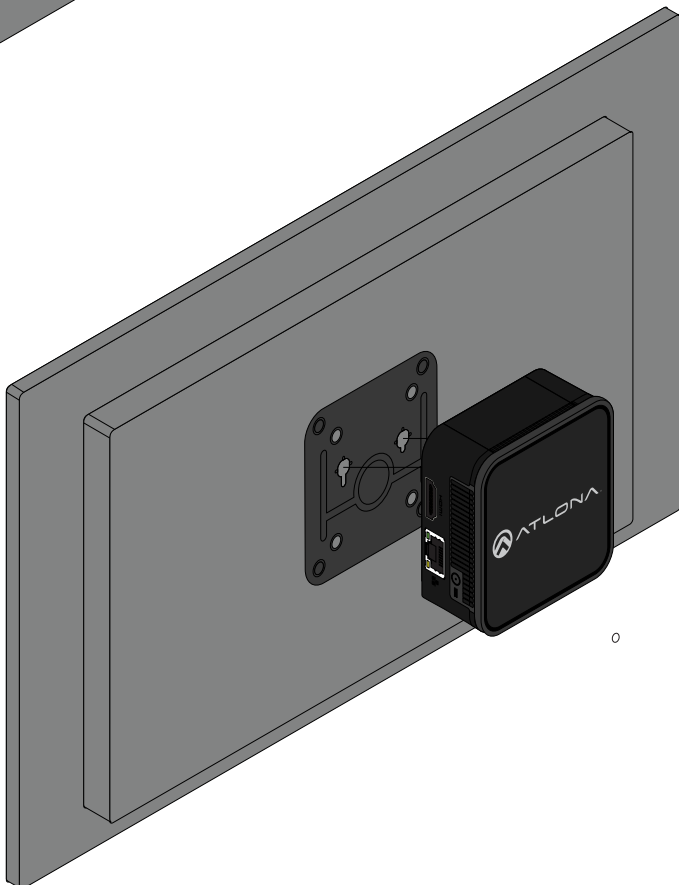
## Mounting Instructions

The AT-WAVE-101 comes with a standard VESA mount, for mounting to displays, monitors, etc.

- 1 Attach the VESA mount to the mounting surface using 4 screws (not included).
- 2 Turn the WAVE-101 upside down and attach the two included screws to the bottom of the unit. The screws will stick out a small amount.



3. Turn the WAVE-101 so that the screws line up with the large oblong shaped holes on the VESA mount and mount the unit to the mounting plate. The unit should slide down if fully on the VESA mount.





### Connection Instructions

- 1 \*Optional\* Connect a network switch to the Ethernet port, for A/V streams, IP control, and system configuration.
- 2 \*Optional\* Connect USB Wi-Fi adapter to one of the USB ports for connecting to an existing wireless network (Connect mode) or creating a wireless network (Access Point mode).
- 3 \*Optional\* For RS-232 display control, connect a USB to RS-232 adapter to one of the USB ports.
- 4 Connect an HDMI cable from the HDMI output port to the display.
- 5 Connect the included 12V DC power supply from the power port to a compatible power outlet.

### IP Modes

#### DHCP

By default, the AT-WAVE-101 is set to DHCP mode. In this mode, when the WAVE-101 is connected to the Local Area Network (LAN), it will automatically be assigned an IP address by the DHCP server (if available). This IP will display on the splash screen on the display or can be scanned for on the network.

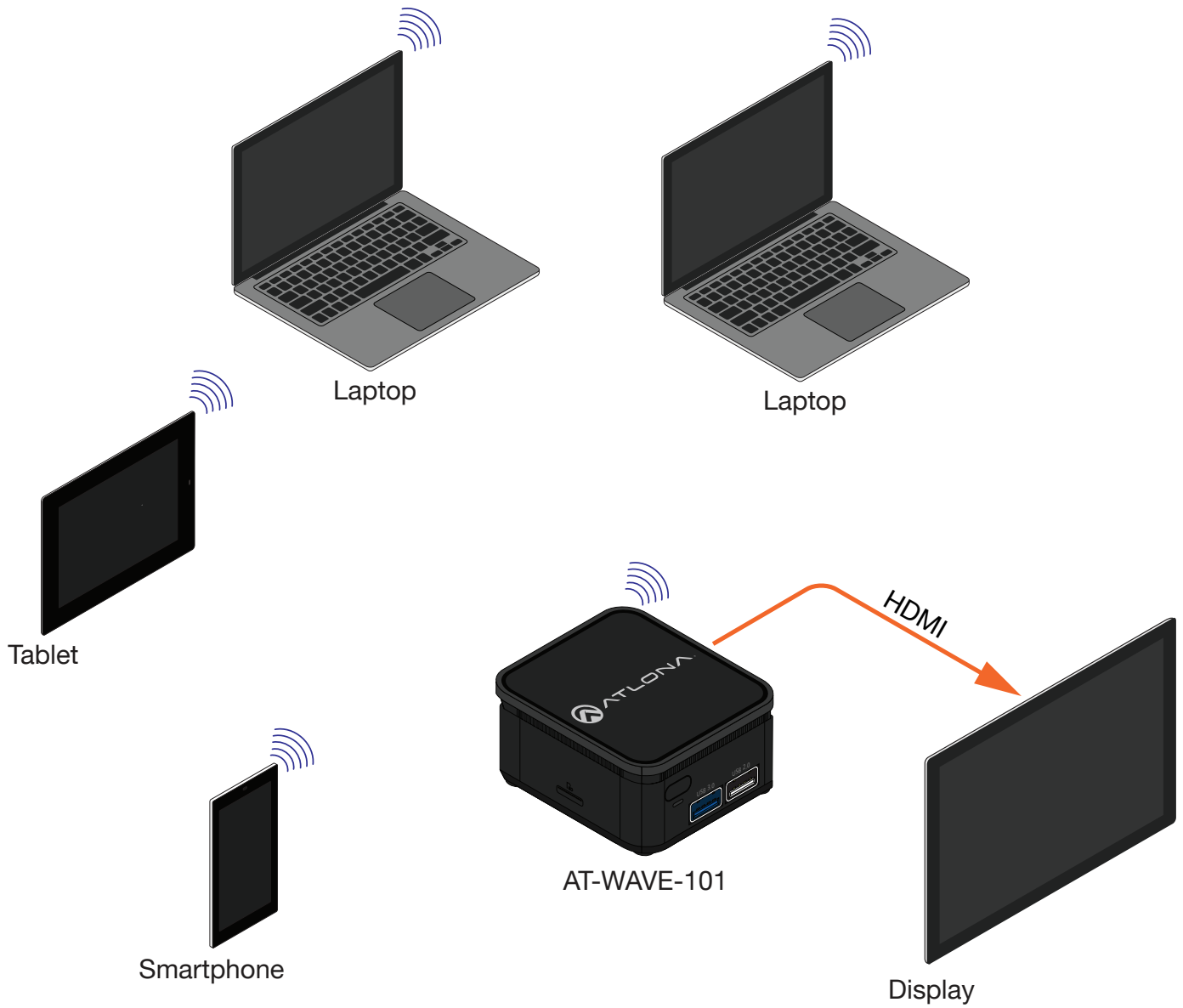
#### Static

If a static IP is required, the WAVE-101 can be set to static IP mode within the **Network** section of the webGUI.

#### Auto

If AT-WAVE-101 is unable to detect a DHCP server within 15 seconds, then the unit will use a self-assigned IP address within the range of 169.254.xxx.xxx with a subnet of 255.255.255.0

**Connection Diagram**



# Casting

The AT-WAVE-101 has the ability to connect to devices on the network or through a wireless access point. Windows, Chrome OS, Android, iOS, and macOS can all cast through the WAVE-101 to the connected display.

## Miracast™

Miracast provides a way to wirelessly transmit content from Windows laptops and some android devices to displays.

**NOTE:** Miracast has two casting types, Peer-to-Peer (P2P) and Miracast over Infrastructure (MICE). P2P transmits over its own created wireless access point, while Miracast over Infrastructure (recommended) uses the current network to connect to devices. Only one P2P connection can be open at one time. If WAVE-101 is connected to a P2P connection, it will not be discoverable to other devices. Miracast over Infrastructure can have multiple connections.

Displaying Miracast devices can be set up in more than one way. Two methods are discussed below. The first method is the most direct method.

### Method 1

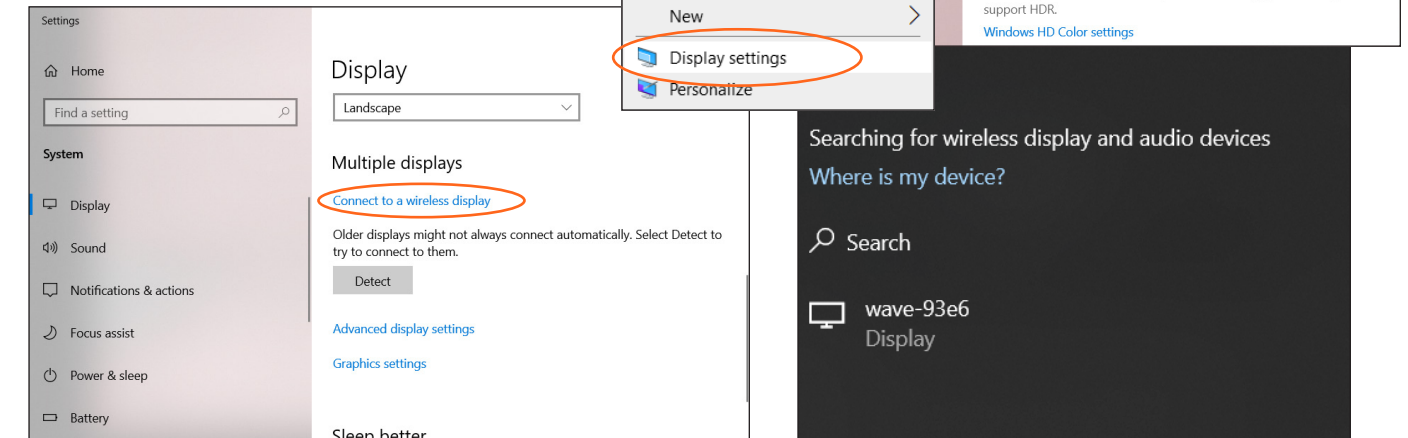
- 1 Press **Windows** + **K** keys, simultaneously.
- 2 The list of available devices will be displayed on the right-hand side of the screen. Select the WAVE-101 hostname from the list.

To disconnect, simply press the disconnect button in the top center of the screen.



### Method 2

- 1 Right-click on the Windows Desktop and select **Display Settings** from the pop-up menu. A new window will appear
- 2 Scroll down on the Display window until reaching the section header Multiple displays.
- 3 Select the **Connect to a wireless display** link.
- 4 A new selection menu will open on the left side of the screen. Select the **wave-xxxx** device from the list.



To disconnect, simply press the disconnect button in the top center of the screen.

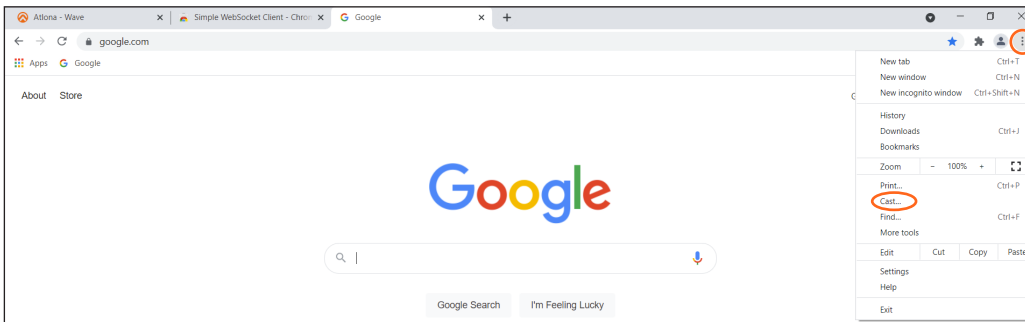


## Google Cast™

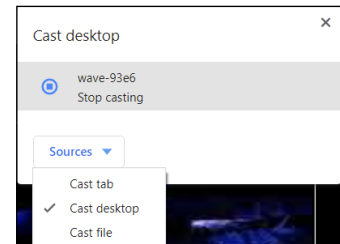
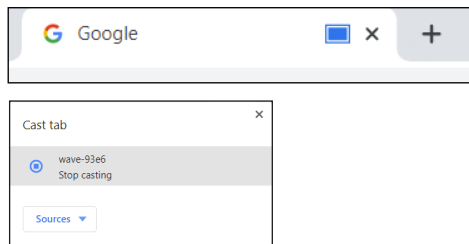
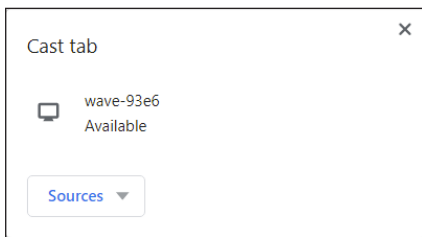
Google Cast provides a way to send content from Google Chrome browsers and/or Android devices to the display wirelessly.

### Chrome

- 1 Make sure both the WAVE-101 and the device running the chrome browser are on the same network.
- 2 Launch Google Chrome.
- 3 Locate and select the triple dot icon in the upper right corner of the browser.



4. Click the **Cast...** option from the drop-down menu. A new pop up will appear.
- 5 Select the WAVE from the **Cast tab**. A blue screen icon will appear on the tab while casting.



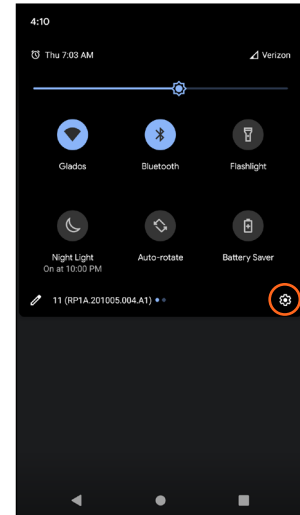
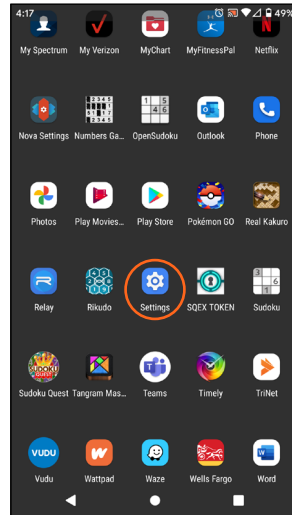
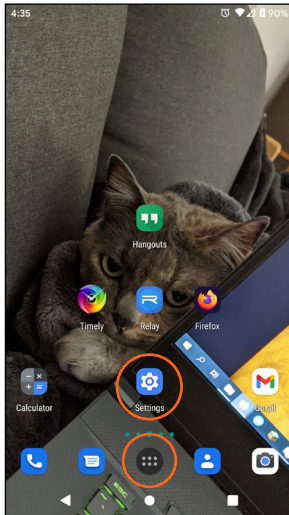
**NOTE:** By default, the browser will cast the current tab. By selecting the Sources menu, the desktop can be set as the cast source.

To stop casting, select WAVE from the Cast Tab again.

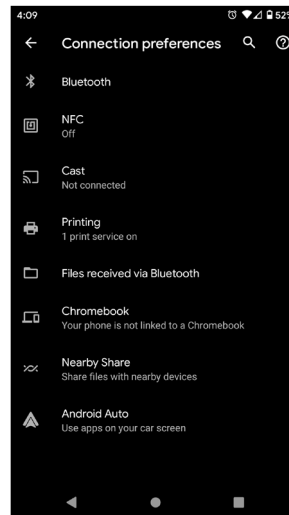
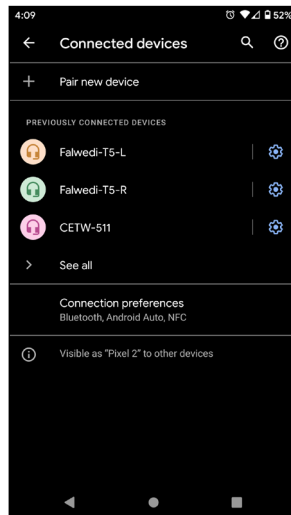
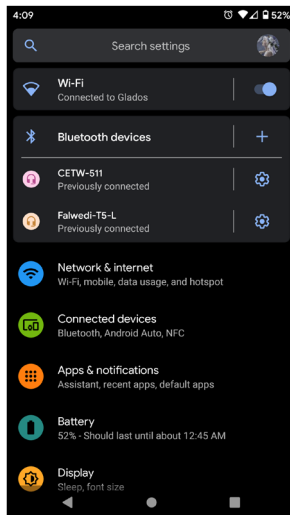
## Android

Most Android devices have the ability to use Google Cast. The first time for casting will have different steps than future casting.

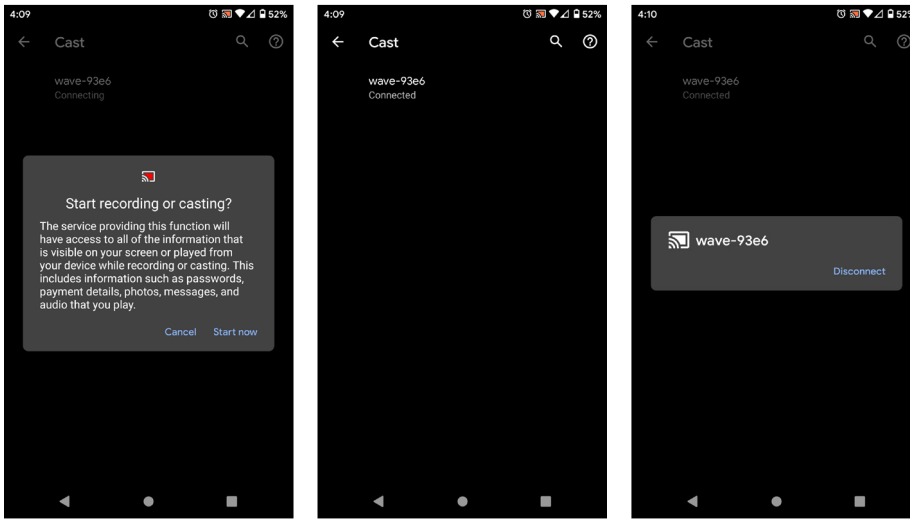
- 1 Open **Settings** on the android device. This can be found either in the App Drawer, on the home screen if the settings app has been added there, or in the top menu that can be accessed by swiping down.



2. Select **Connected devices** from the menu.
- 3 Select **Connection preference** from the new screen.
- 4 Select **Cast** from the menu.
- 5 A list of compatible devices will appear. Select **wave-xxxx** from the list. A pop up will appear.



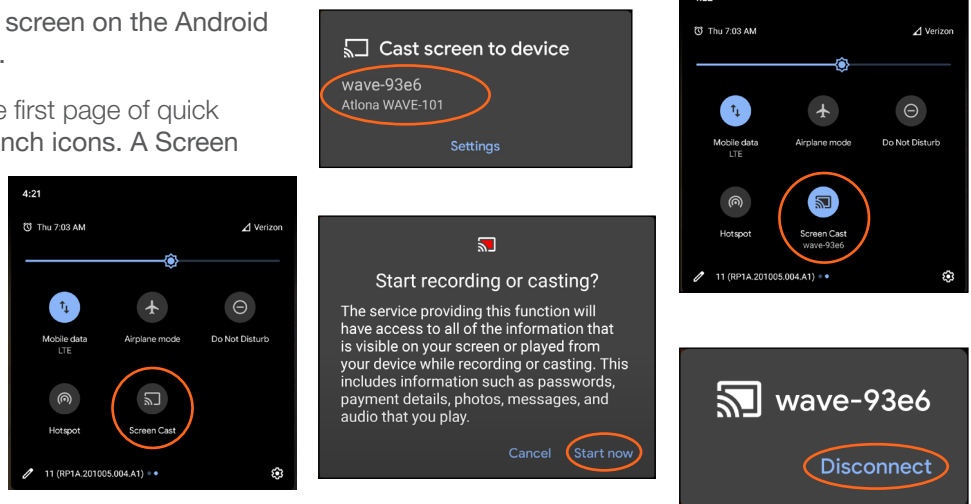
6. Press the **Start now** button. Once the unit is casting it will show connected on the Cast screen.



To disconnect, select **wave-xxxx** from the cast menu, a pop up will appear. Select **Disconnect** and it will stop casting from the android device.

After the first casting, an icon will appear in the top menu for quick and easy casting.

- 1 Swipe down from the top of the screen on the Android device. Quick settings will open.
- 2 \*Optional\* Swipe left (if not in the first page of quick settings) to go to more quick launch icons. A Screen Cast icon should display.
3. Select Screen Cast. A pop up will appear.
- 4 Select wave-xxxx from the cast device menu.
- 5 Select Start now. The Screen Cast icon will turn blue when casting.



Select **Screen Cast** and press **Disconnect** on the pop up to end casting.

## AirPlay®

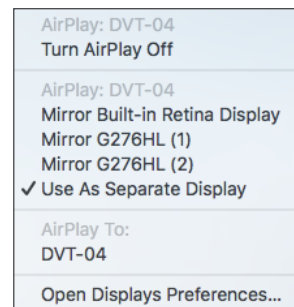
### OS X Devices

AirPlay® is only supported on Mountain Lion 10.8 or later. To determine if AirPlay is supported on the system being used, click **System Preferences > Displays**. If the “Show mirroring options in the menu bar when available” checkbox is not displayed, then AirPlay is not supported.

- 1 Make sure both the WAVE-101 and the AirPlay device are on the same network.
- 2 Select either **Mirror** or **Use as Separate Display** (extending) to cast over AirPlay.
  - **Mirroring**  
Click the **AirPlay icon** in the menu bar and select the desired content to be mirrored.
  - **Extending**  
Click the **AirPlay icon** and select **Use As Separate Display** from the menu, to extend the desktop to another display.



To turn off AirPlay, select the **AirPlay icon** and press **Turn AirPlay Off**.



### iOS Devices

AirPlay is only supported on iOS 10 or higher.

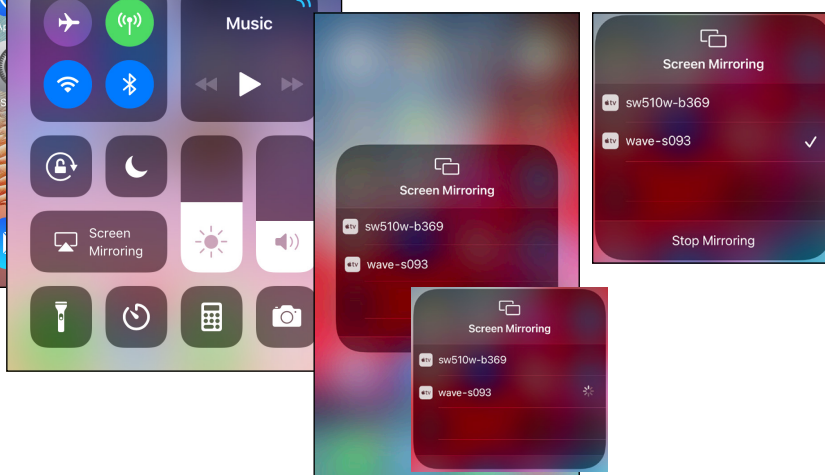
- 1 Make sure both the WAVE-101 and the iOS device are on the same network.

#### iOS 11.0.3 or later



2. Once connected, open the **Control Center**.
- 3 Select **Screen Mirroring**. A pop up will appear with a list of available AirPlay devices.
- 4 Select **wave-xxxx** from the list of devices. A check mark will appear once WAVE-101 is connected to the iOS device.

To turn off AirPlay, select the **Stop Mirroring** button.



## Control

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WAVE-101 has the ability to be controlled and to schedule on/off commands for the display.

### Unit

WAVE-101 can be controlled using the built in webGUI or websocket.

#### Websocket

The unit can be controlled using websocket. The commands can be found within the API at [https://atlon.com/pdf/AT-WAVE-101\\_API.pdf](https://atlon.com/pdf/AT-WAVE-101_API.pdf).

#### WebGUI

The unit has a built in web UI that will allow for unit configuration. See the WebGUI section, [Settings](#), for more information.

### Display

#### RS-232

The WAVE-101 can send On/Off commands to the display using an USB to RS-232 adapter (not included). This can be set to a schedule through the webGUI [Display](#) control section or websocket (using the API found at [https://atlon.com/pdf/AT-WAVE-101\\_API.pdf](https://atlon.com/pdf/AT-WAVE-101_API.pdf)).

#### TCP Proxy


This unit has the ability to translate IP data to RS-232 through ports 9001. This enables control of devices through TCP/IP that only have RS-232 ports. The unit will take the commands sent to port 9001 and send them to the corresponding port. A USB to RS-232 adapter (not included) will be required to use TCP Proxy.

#### IP

The WAVE-101 can send On/Off commands to the display using the display's IP address. This can be set to a schedule through the webGUI [Display](#) control section or websocket (using the API found at [https://atlon.com/pdf/AT-WAVE-101\\_API.pdf](https://atlon.com/pdf/AT-WAVE-101_API.pdf)).

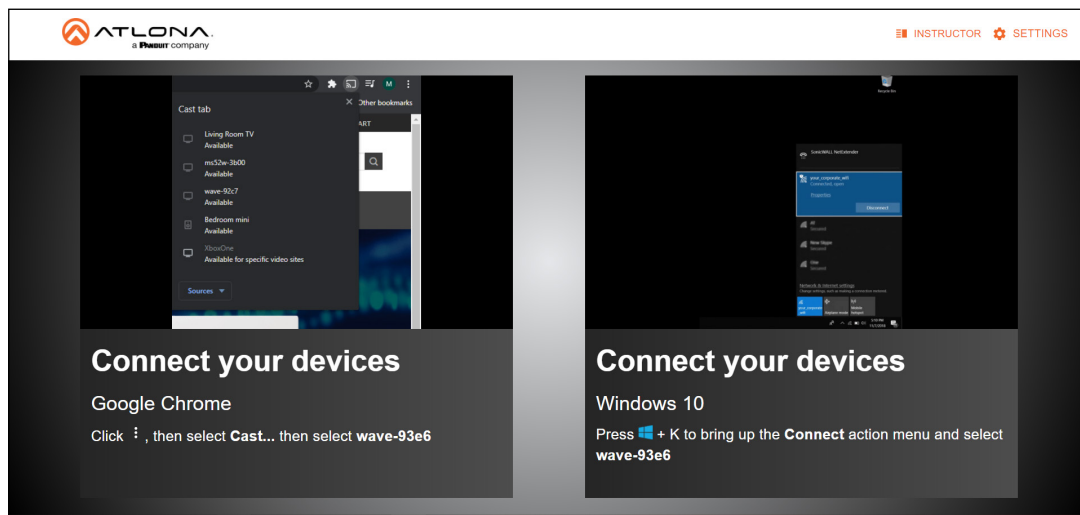


## WebGUI

 **NOTE:** If the WAVE-101 is connected to the same network via Connect Mode and Ethernet; the WebGUI will not be accessible.

The WAVE-101 includes a built-in webGUI, which allows easy remote management and control of all features. Follow the instructions below to access the webGUI.

- 1 Make sure that an Ethernet cable is connected between the **Ethernet** port on the AT-WAVE-101 and the network.
- 2 There are three ways to get to the webGUI: scan the QR code on the connected display's screen, type the url on the display's screen into a web browser, or use an IP scanner to determine the IP address of the unit. A landing page will display.



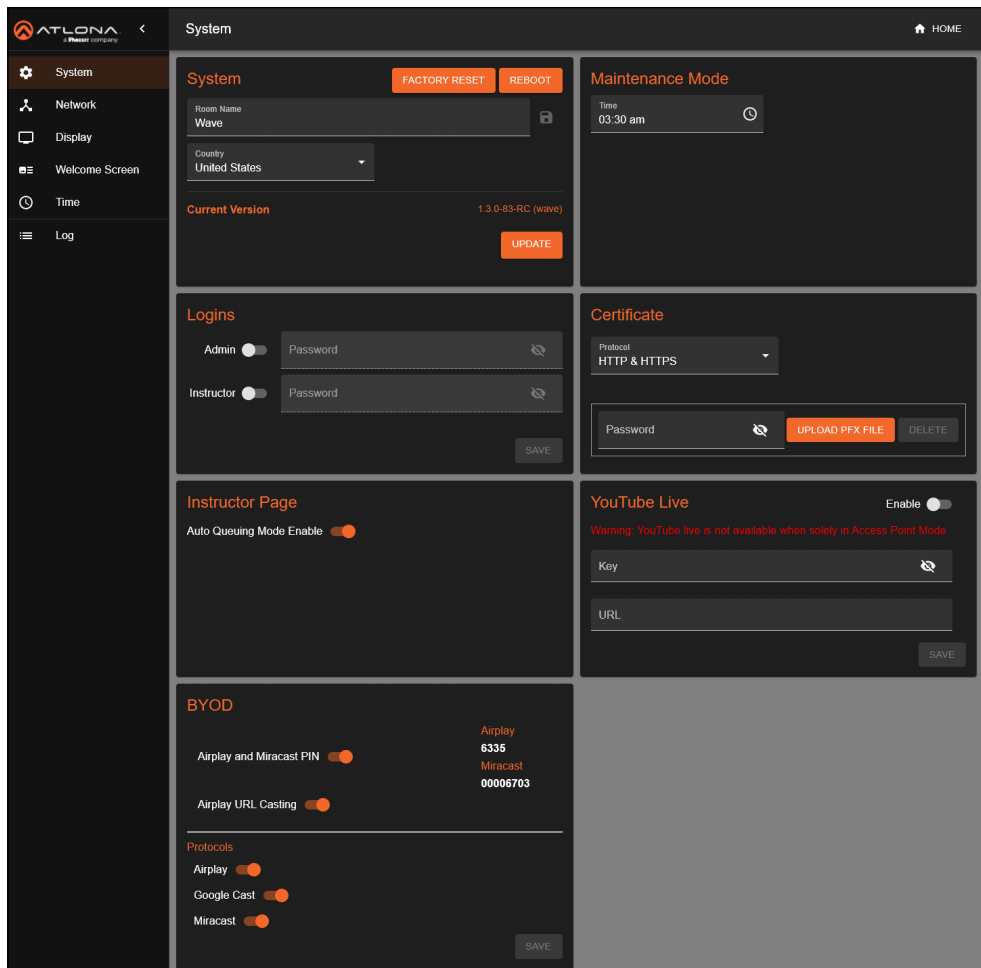
The landing page will provide quick instructions for connecting to the WAVE-101 for casting. This page will display instructions based on the type of device connected. **e.g.** When a Windows OS device is connected it will display instructions for Miracast and, if connecting to the WAVE-101 using a Chrome browser, Chrome cast.

From here, there are two navigation options: Instructor page and Settings page. To configure the WAVE-101 (including display control) select **Settings**. For a user based content display and control area, select **Instructor**. It is best to go to the Settings first to set up the WAVE-101 exactly as needed prior to the first use of Instructor Mode.

## Settings

Settings provides a way to set things such as logins, network settings, customized home screens, and more.

### System



### System

Factory Reset - Select this button, if wanting a clean slate after going through and changing the settings of the WAVE-101. A pop up will appear to verify a reset is what is needed, select the FACTORY RESET link to confirm the reset.

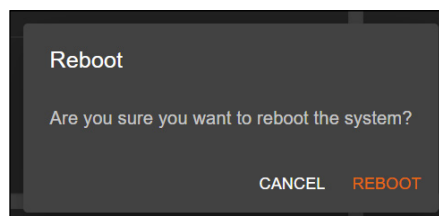
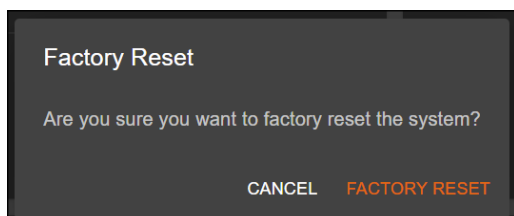
**NOTE:** If a PFX file has been uploaded to the WAVE-101, the reset will remove the file.

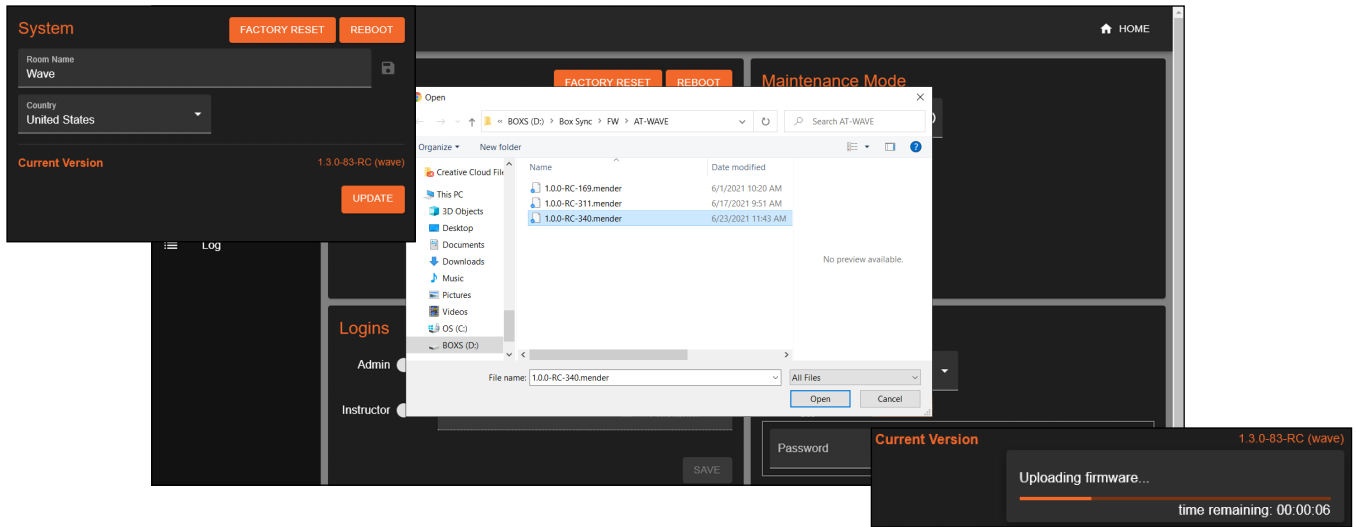
Reboot - When pressed, a pop up will appear to confirm the choice. Press the REBOOT button to reboot the WAVE-101.

Room Name - Type the name of the room here. Hit the disk icon to save the name change. This will appear at the top of the Welcome Screen.

Country - Set the country of the unit, this is especially important if using WAVE-101 as a Wi-Fi access point, so that the unit will adapt its configuration to match the region.

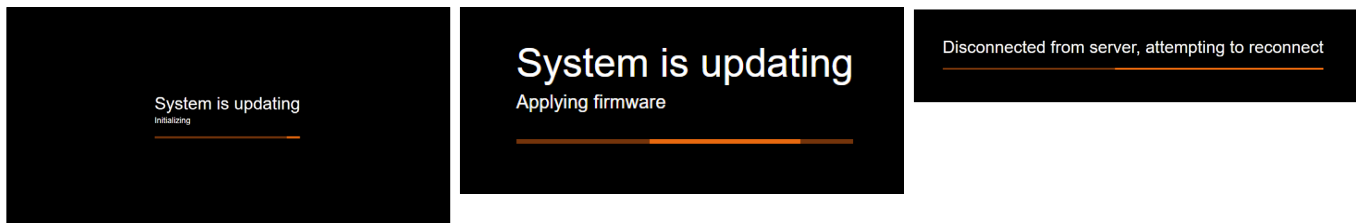
**NOTE:** Changing the country may cause the WAVE-101's wireless access point to become disabled due to a channel mismatch. If this occurs, a new channel will need to be selected from the Network section.



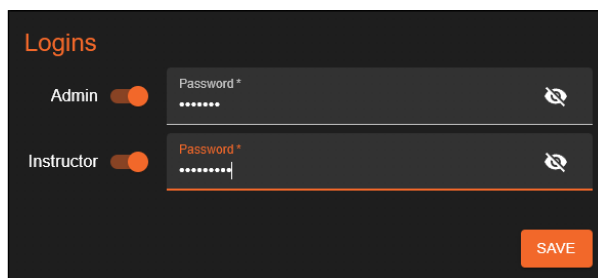


### Current Version

The current version will display to the right of the Current Version label. To verify that the most recent version is being used, check the Firmware tab on the product page located at: <https://atlona.com/product/at-wave-101/>. If there is a new firmware, download it to the local computer. This file will be a .zip, it will need to be unzipped for updating. Once downloaded and unzipped, press the **Update** button. A folder will pop up. Locate the recently saved file on the computer and select the **Open** button. The firmware will start uploading and little status bar will display.



Once the update starts, the page will switch to an all black screen with a progress bar (which will appear on both the web browser and HDMI output if connected). This process can take up to five minutes. Once the firmware has been applied to the unit, it will go through a reboot process, this will display a Disconnected from server, attempting to reconnect message. Once it has rebooted, the unit will return to the System page.



### Logins

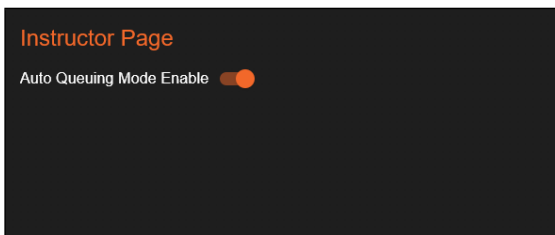
By default, logins will be disabled.

Admin - Select the slider to enable password protection for the settings and API area. Type the new password into the field next to Admin to password protect the Settings area.

Instructor - Select the slider to enable password protection of the instructor area. This will make a password required when accessing the Instructor page.

Select the Save button once passwords are written. If Admin is set to password protection, once saved it will navigate to the login page where the password will need to be entered to get back into settings.

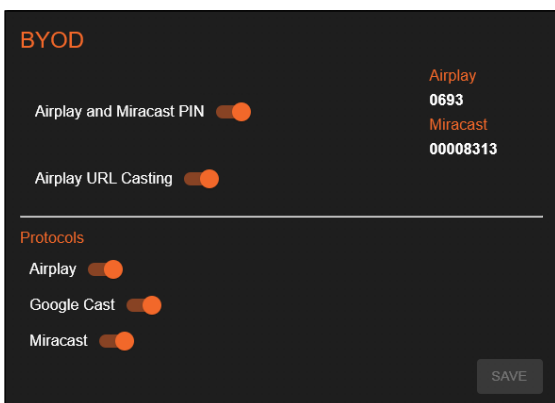
**NOTE:** Instructor password cannot be enabled unless Admin password has been enabled as well.



### Instructor Page

By default, Auto Queuing Mode will be disabled.

Auto Queuing Mode Enable - Select the slider to enable and disable the auto queuing mode on the instructor's page. When enabled, new content will be added to the queue on the side of the instructor page, instead of directly to the HDMI display.



### BYOD

AirPlay and Miracast PIN slider - Select to enable AirPlay and Miracast PIN support. The pin will appear on the top right of the Welcome Screen when an AirPlay or Miracast (P2P or Infrastructure) source is detected.

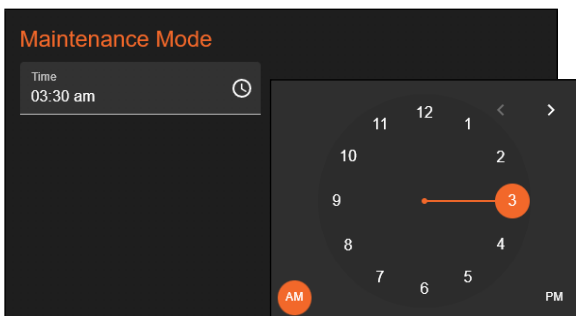
Airplay URL Casting - Select to enable or disable Airplay URL Casting.

**NOTE:** It is recommended to disable this feature when using auto-queuing.

**NOTE:** Goggle Cast does not support PIN functionality.

### Protocols

Airplay, Chromecast, Miracast - Select each individual slider to enable (orange) or disable (grey) each casting protocol.

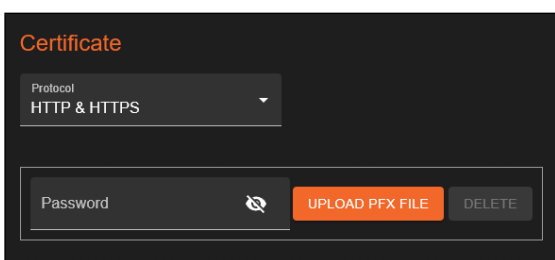


### Maintenance Mode

By default, Maintenance Mode will be set to 3:30am.

Maintenance mode will go through and clear out all erroneous data and left over media in the queue, then reboot the system.

Time - Select the time field to set the time maintenance mode will start. A pop up will appear with an easy to use clock for selecting the time.



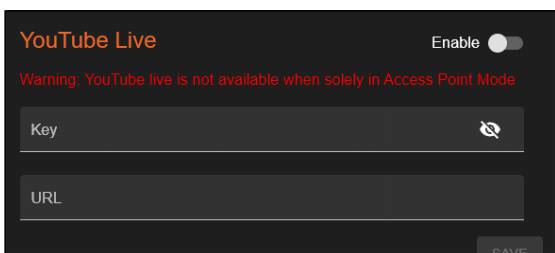
### Certificate

Protocols - Select between HTTP & HTTPS and HTTPS only in this drop down.

Password - Set the password for the uploaded PFX file.

Upload PFX File - Upload an already created PFX file. A folder will pop up, select the file from the local computer and press open.

Delete - If the current PFX file is no longer desired, press the Delete button to remove it from the system.



### YouTube Live

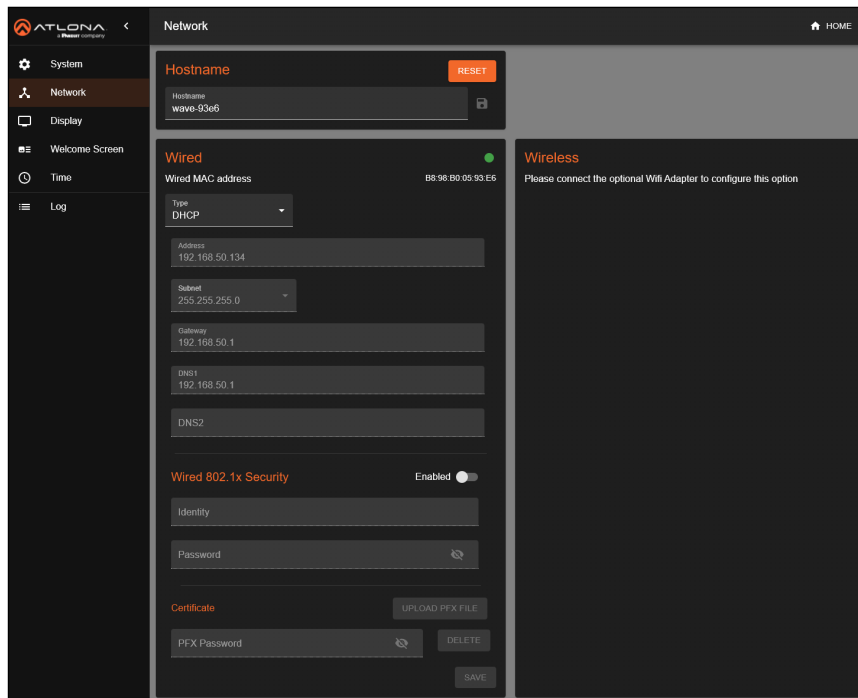
Enable slider - Select the slider to enable or disable the ability to stream live through YouTube. When disabled, the option will not appear on the Instructor page. It is recommended to keep this option disabled if YouTube Live is not going to be used.

Key - The key will come from YouTube and takes a day to activate. It is best to set up the YouTube live account before proceeding with this step.

URL - Provide the URL associated with the YouTube live stream.

Save - Once all the information is entered, select this button to make the changes live on the WAVE.

## Network



### Hostname

Reset - This button will reset the host name back to the default setting which is wave-xxxx (the last 4 of the MAC address of the unit).

Hostname - Type in the name that will appear on the network and in casting. Once set, select the disk icon to save the change.

### Wired

Status circle - The circle to the top right will display the status of the Ethernet port. Green means signal is good, yellow means the connection may be connecting, and red means there is a signal error on the LAN port.

Wired MAC Address - This will display the Ethernet MAC address of the unit.

Type - Select between DHCP (default) and Static IP modes.

- DHCP will receive an IP from the local network, all the information will display in the network fields. In this mode it cannot be altered and will appear greyed out.
- Static will allow the IP, Subnet, Gateway, and DNS servers to be manually entered.

### Wired 802.1x Security

Enabled slider - This will turn orange when 802.1x is enabled, setting the unit to be able to talk to the authentication server through the network switch.

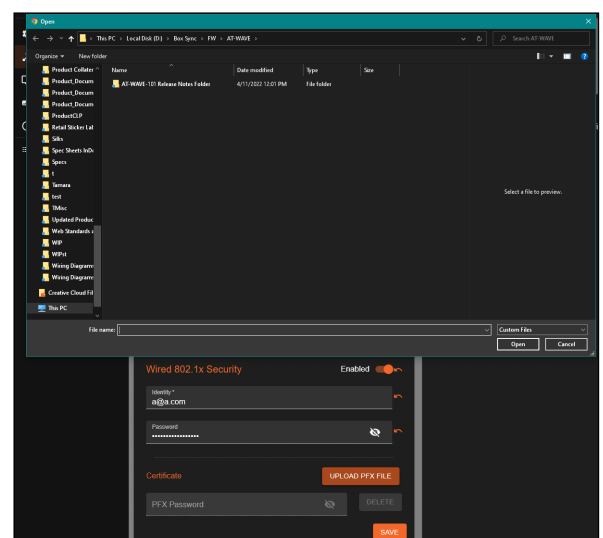
Identity - Enter the client identity information here.

Password - Enter the client password here.

Upload PFX File - Select this to upload the certificate file from the local computer. This file should be provided by the network administrator before network set up.

PFX Password - Enter the password associated with the PFX file uploaded to the unit.

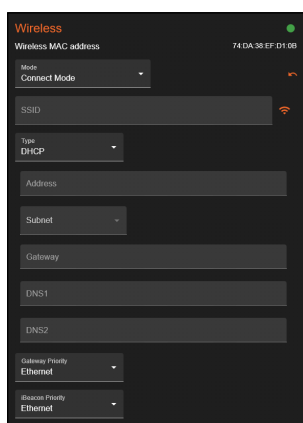
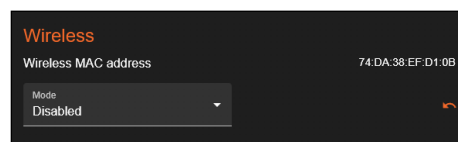
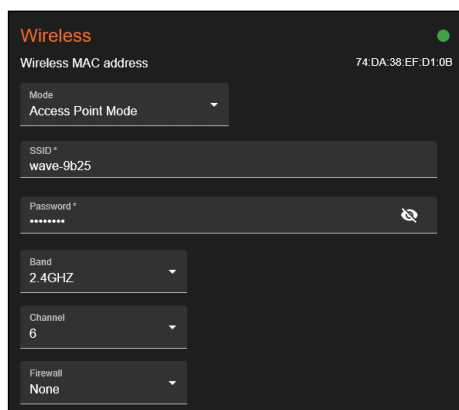
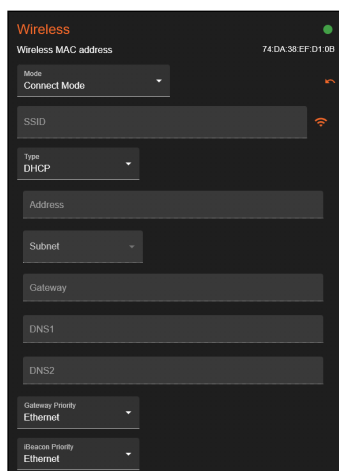
Delete - Select this to delete the current PFX file on the AT-WAVE-101.



Save - Select the save button to push these settings to the unit.

## Wireless

This section will remain empty until the included wireless dongle is connected to one of the USB ports. Once connected it will default to Access Point Mode, but there will be two other options: Connect Mode and Disabled. It is recommended to disable this option if neither Access Point Mode or Connect Mode are needed.



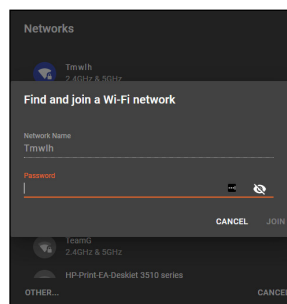
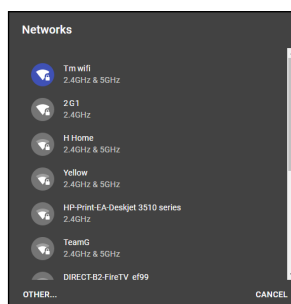
### Connect Mode

When this mode is enabled, select the orange Wi-Fi icon, a pop up will appear that will ask for a network to be chosen.

Select the correct Wi-Fi network and then enter the password when prompted.

Once saved, the network information will appear below it. By default it will be set to DHCP.

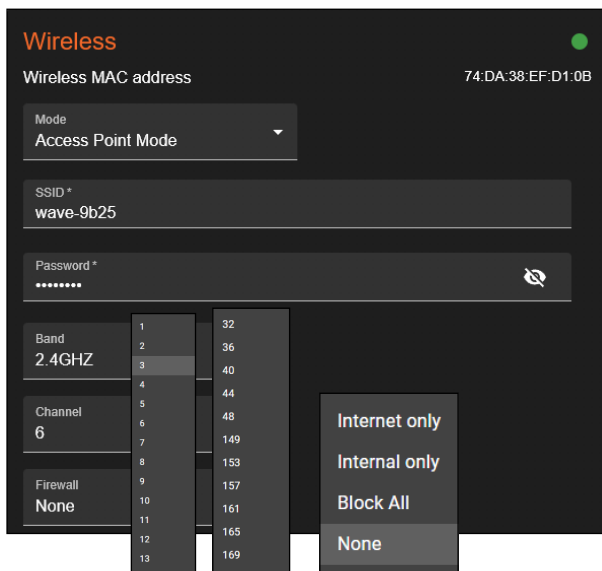
Like in the wired section, this can be set to static and the information for the connection set manually.



**NOTE:** If the WAVE-101 was previously in Access Point Mode prior to selecting Connect Mode, it will not scan for existing Wireless Access Points. The SSID/Password will have to be entered manually. To scan for available Wireless Access Points, change the mode to Disabled, press save, then select Connect mode.

Gateway Priority and iBeacon Priority - Select which pathway will have priority connection for the wave, the Ethernet port (recommended) or the Wi-Fi port.

Save - Select the save button to push these settings to the unit.



### Access Point Mode

When this mode is selected, it will create a Wi-Fi access point for other devices to connect to.

SSID - This is the name that will appear to other devices as a Wi-Fi SSID.

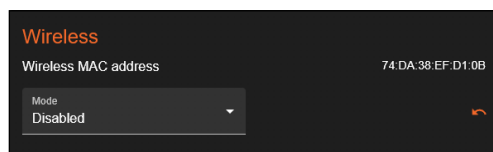
Password - Set a password to avoid unwanted users onto the network.

Band - Set the access point to be either 2.4GHz or 5GHz (based on region).

Channel - Select one of the channels in the drop down list. This list will display only channels that are compatible with the region the WAVE-101 is in. If the country hasn't already been set, return to the System page and set the country.

Firewall - Set what the user will have access to via the Ethernet port.

- Internet only - Will allow the user to access off network content (such as YouTube, google, etc) but will not allow them internal content access.
- Internal only - Will allow the user to access only things on the network (things such as YouTube, google, etc are blocked in this mode).
- Block All - Will not allow users to access anything through the Wi-Fi Access Point.
- None - Will disable the firewall and allow the user to access anything.

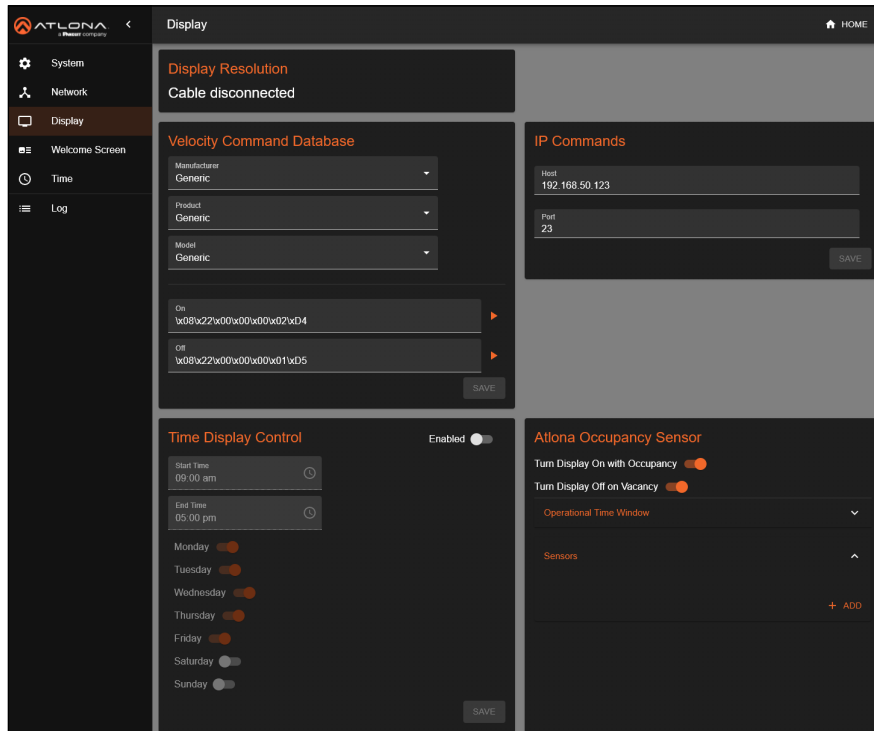


### Disabled

Selecting this mode will disabled all Wi-Fi functions until the time a different mode is selected.

Select save when anything new is selected in the options. This will push the changes to the WAVE unit.

## Display

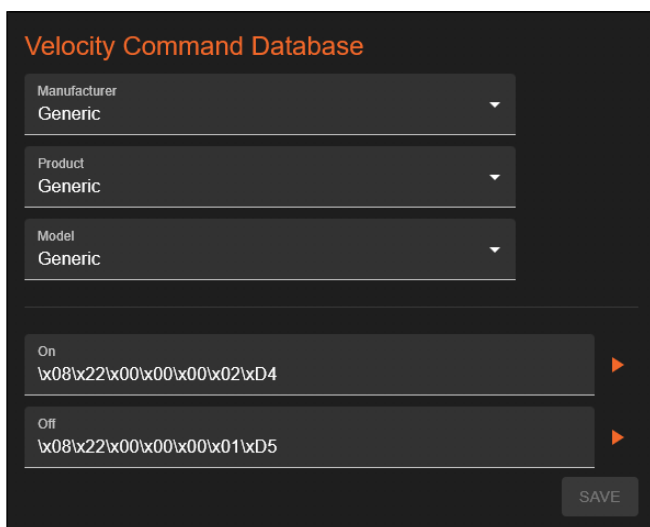
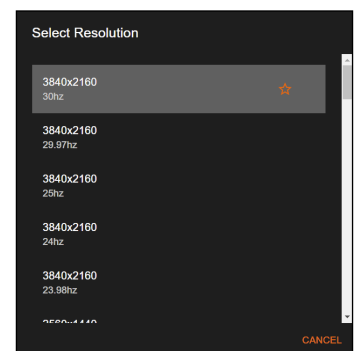


### Display Resolution

Connect a display to be able to select the resolution to pass through. The recommended resolution will be selected by default.



... button - Select this button to display a list of compatible resolutions. A star will appear next to the recommended default resolution.



### Velocity Command Database

The WAVE-101 has a built in database with preprogrammed commands for a wide variety of Manufacturers and their products. This saves time on having to refer back to other manuals to set the on/off commands. These commands will send over IP unless a USB to RS-232 adaptor (sold separately) is connected, then a drop down will appear on the top right to select between IP and RS-232.

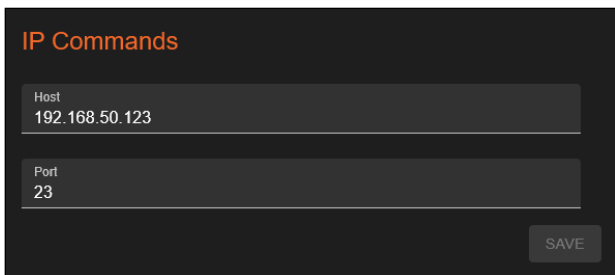
Manufacturer, Product, Model - Select each option in sequence from top to bottom. New options will

appear on each selection. If the manufacturer, product, or model is not listed, Generic can be used to do a custom command.

On/Off - These fields will autopopulate with the command for Power On and Power Off. Commands will only need to be manually entered if the display is not found in the built in list.

Send button - Select the orange triangle next to the command to send the command to the display. This will allow the command to be tested to ensure it will work later.

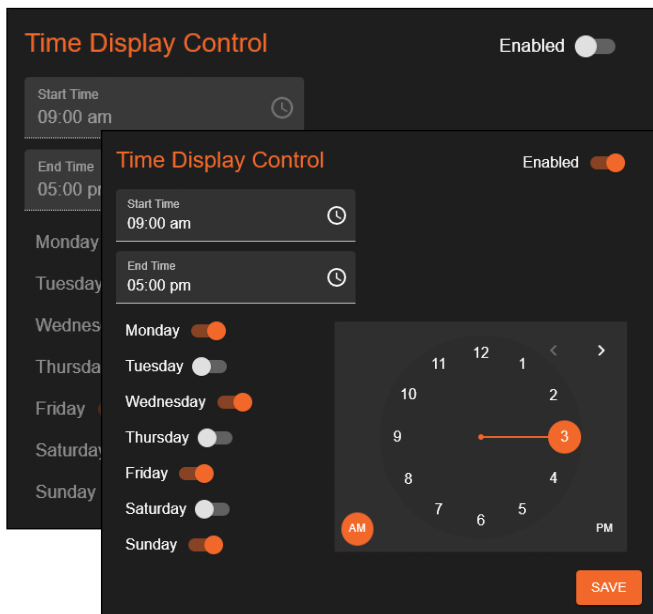




### IP Commands

IP Address and Port - Type in the IP address and port of the display for commands to be sent to.

**NOTE:** Once set up, new options will appear on the instructor's page.



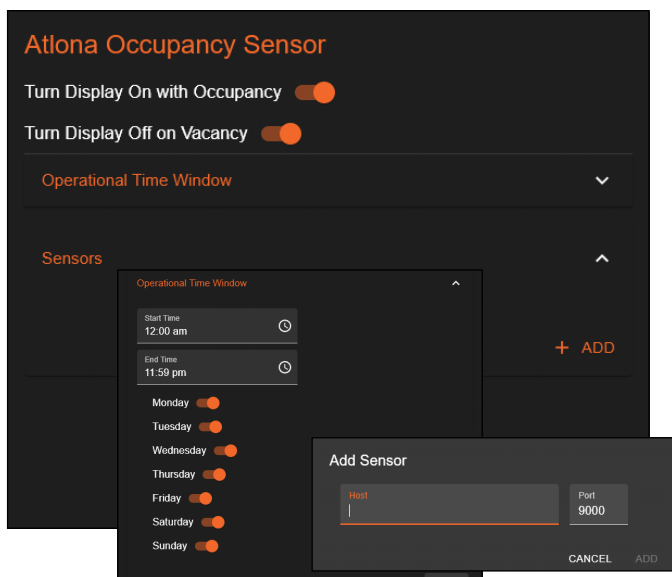
### Time Display Control

Enable this section to have the Power On/Off command automatically sent to the display at a certain time of day on different days of the week.

**NOTE:** If content is actively being displayed during the off time, the WAVE-101 will delay the power off sequence until all content has been disconnected from the system.

Start/End Time - Select the field for a clock pop up to appear. This will allow the start or stop time to be set easily.

Days - Select the sliders next to the days of the week to have the automatic on/off command to be sent. The slider will be orange when enabled and grey when disabled.



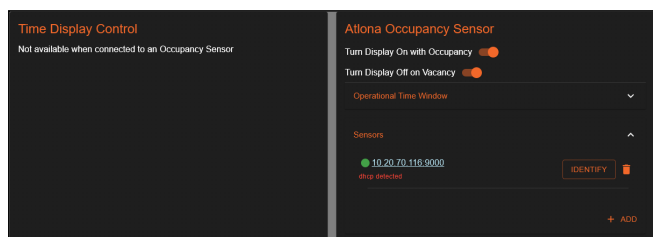
### Atlona Occupancy Sensor

Turn Display On on Occupancy - When enabled, the WAVE-101 will send the display on command after the AT-OCS-900N detects motion in the room.

Turn Display Off on Vacancy - When enabled, the WAVE-101 will send the display off command after the OCS-900N has detected no motion in the room for a specific amount of time (set on the OCS-900N).

Operational Time Window - Set the date and time that the On/Off auto commands will be active on motion detection.

Sensors - Select the + ADD button to link an OCS-900N to the WAVE-101. A pop up will appear to type the IP Address into. Multiple OCS-900Ns can be linked to a single WAVE-101 for larger rooms.

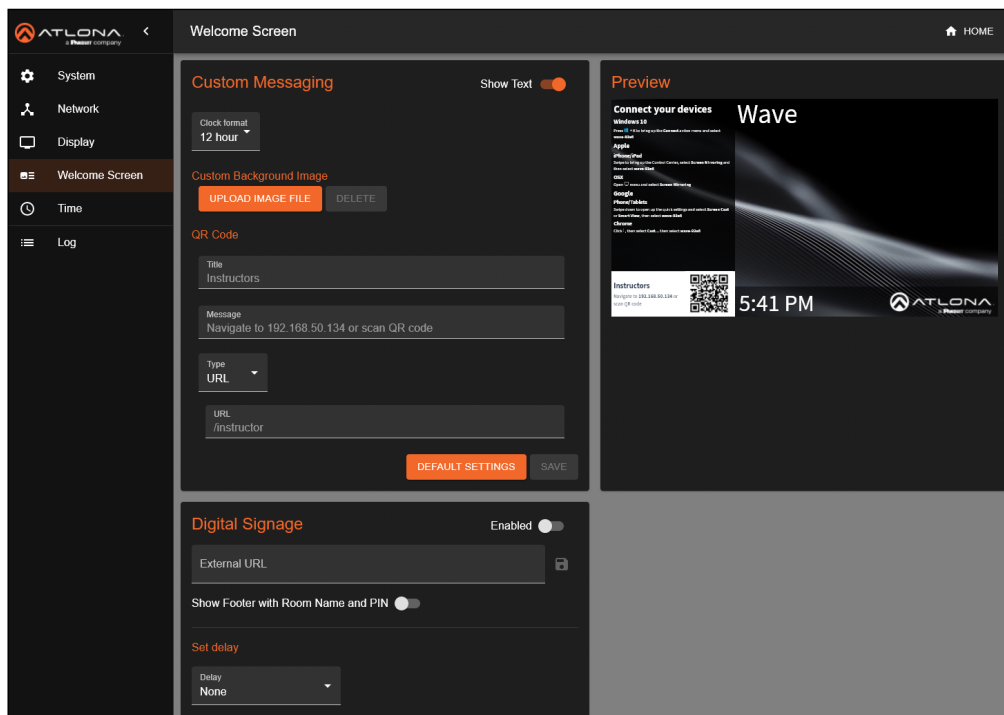


Once added, Time Display Control will no longer be available and two additional options will appear next to the OCS labels.

Identify - When selected, the OCS-900N leds will blink to help determine which OCS is being talked to by WAVE-101.

Delete (trash can) - Pressing this will unsync the OCS-900N from the WAVE-101. Time Display Control will become available again with no OCS units synced.

## Welcome Screen



### Custom Messaging

The options selected here will appear in the bottom left hand corner of the screen with the QR code.

Show Access Point SSID slider - Toggle this slider to display or remove the SSID for the WAVE access point on the welcome screen.

Clock format - Switch between 12 hour and 24 hour format for display. e.g. 5:21 or 17:21.

Custom Background Image - Upload a custom background image for the welcome screen. Images can be .PNG, .JPG, .JPEG, or .BMP.

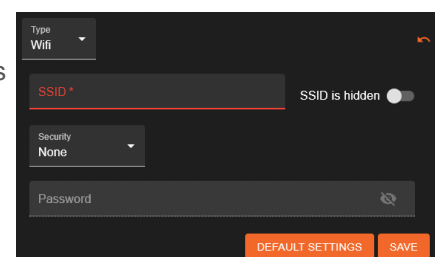
Delete - Remove the custom background image from the Wave.

Title - Type in the header that will be displayed in bold in the top left of the white box.

Message - The information written here will appear below the header in the white box.

Type - Select between URL and Wifi

- URL - The URL typed in here will translate into a scannable QR code. The default scan will bring the user to the WAVE-101 landing page.
- Wifi - This will embed the wifi information and password into the QR code so when it is scanned, it will log the user onto the same network as the WAVE-101.



### Digital Signage

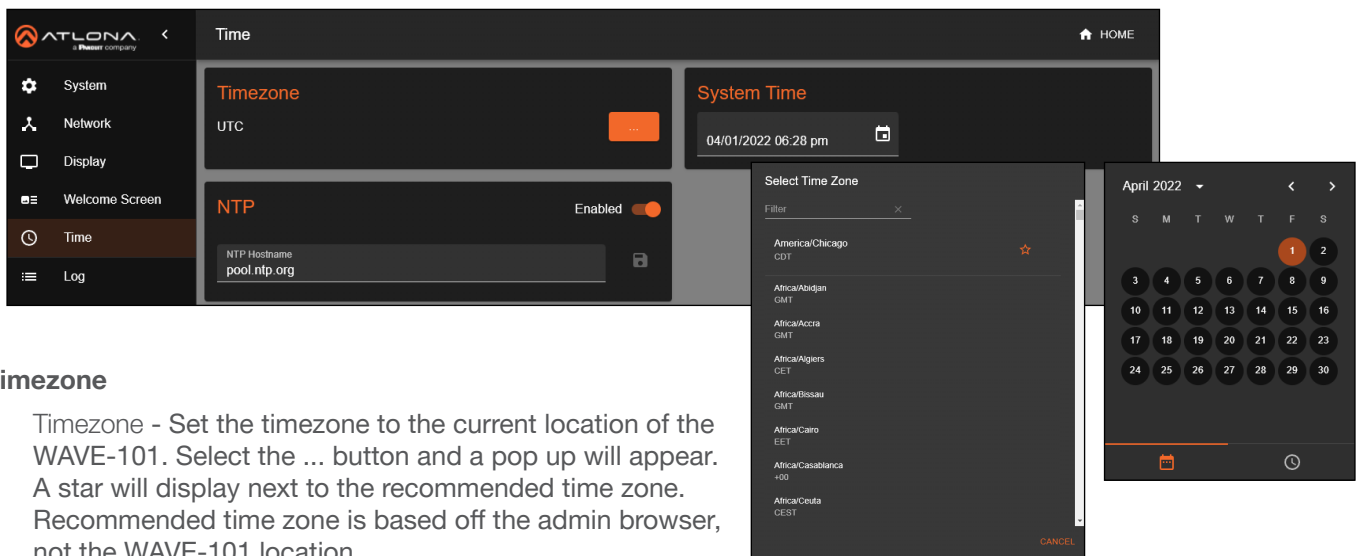
When enabled, this will replace the regular welcome screen with a custom page.

External URL - Type in the URL where the custom welcome screen is located.

Show Footer with Room Name and PIN - Enable or disable this to display room information at the bottom of the custom welcome screen.

Set delay - By default the delay is set to 0, which means it will automatically switch the default welcome screen to the digital signage screen when the current presentation is done. By setting this from 0 seconds to an hour, the custom digital signage screen will not appear for an hour after all queued (if enabled) presentations are completed. The default Atlona Welcome screen will display while digital signage is not displaying.

## Time



### Timezone

Timezone - Set the timezone to the current location of the WAVE-101. Select the ... button and a pop up will appear. A star will display next to the recommended time zone. Recommended time zone is based off the admin browser, not the WAVE-101 location.

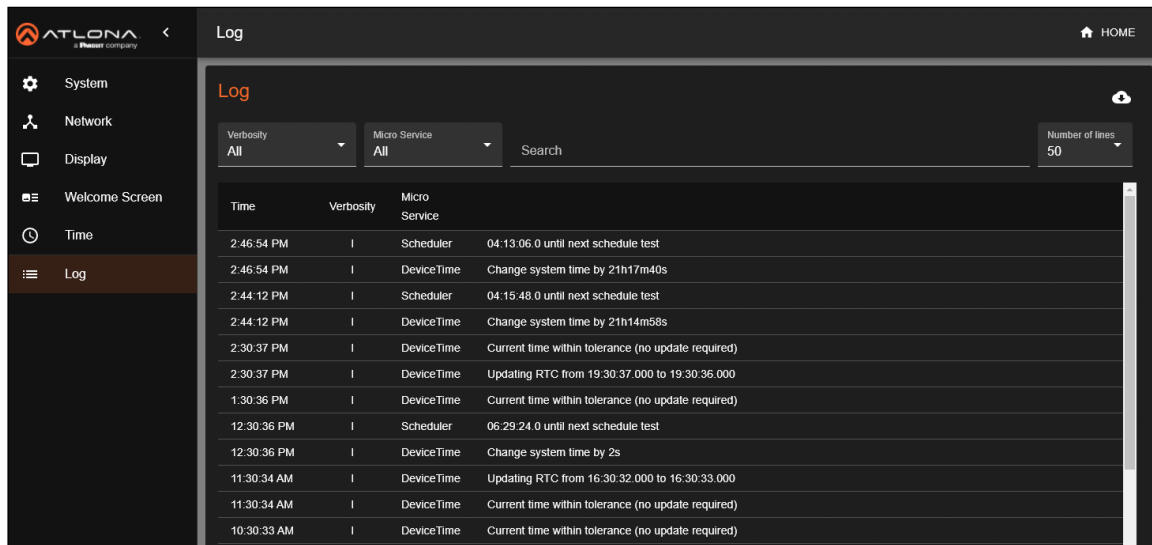
### NTP

NTP Hostname - If the unit has internet or internal NTP server access, it can be set to sync to a server as well. Select the slider to enabled it, then enter the server information into the Hostname field. Press the disk icon next to the field to save.

### System Time

... button - If no NTP server is available, select the ... button to set the date and time of the unit. A pop up will appear with a calendar to select the date, select the clock icon to adjust the time. It is recommended not to use this section, if an NTP server available.

## Log



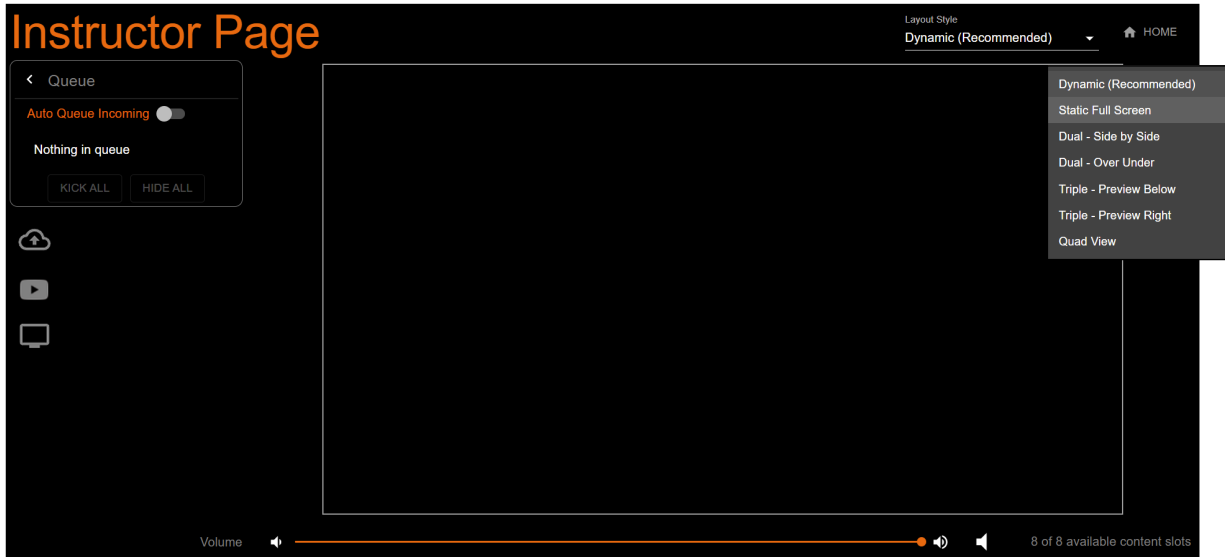
Time	Verbosity	Micro Service	
2:46:54 PM	I	Scheduler	04:13:06.0 until next schedule test
2:46:54 PM	I	DeviceTime	Change system time by 21h17m40s
2:44:12 PM	I	Scheduler	04:15:48.0 until next schedule test
2:44:12 PM	I	DeviceTime	Change system time by 21h14m58s
2:30:37 PM	I	DeviceTime	Current time within tolerance (no update required)
2:30:37 PM	I	DeviceTime	Updating RTC from 19:30:37.000 to 19:30:36.000
1:30:36 PM	I	DeviceTime	Current time within tolerance (no update required)
12:30:36 PM	I	Scheduler	06:29:24.0 until next schedule test
12:30:36 PM	I	DeviceTime	Change system time by 2s
11:30:34 AM	I	DeviceTime	Updating RTC from 16:30:32.000 to 16:30:33.000
11:30:34 AM	I	DeviceTime	Current time within tolerance (no update required)
10:30:33 AM	I	DeviceTime	Current time within tolerance (no update required)

## Log

The unit logs will display on this page. Anytime a change is made, the system will record it in the logs. To download the logs, press the cloud button with a down arrow. A folder will open and an area on the local computer will be selectable to save to.

## Instructor

The Instructor Page provides a user interface for displaying and controlling content.



### Layout Style

**Dynamic** - Will adjust the screen automatically for incoming streams and select between the layout style the best suits the content.

**Static Full Screen** - Will display only one stream of content on the display.

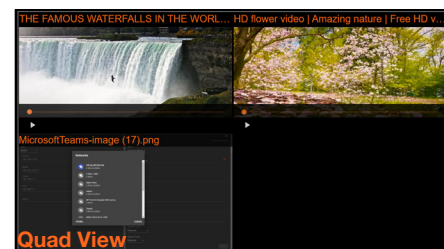
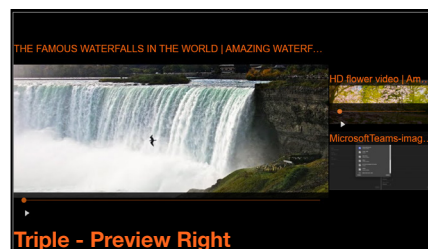
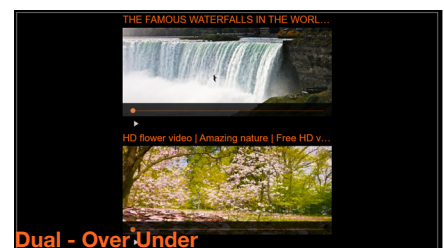
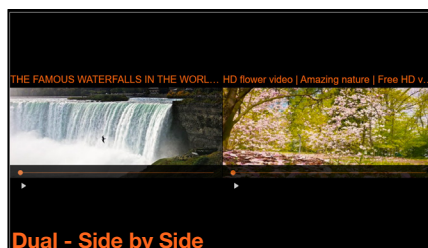
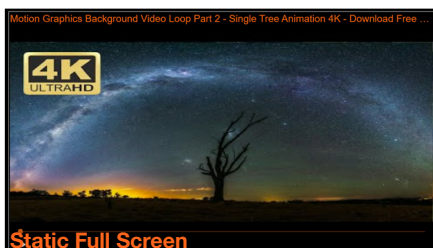
**Dual - Side by Side** - Will display two streams of content in a 50/50 side by side split on the display.

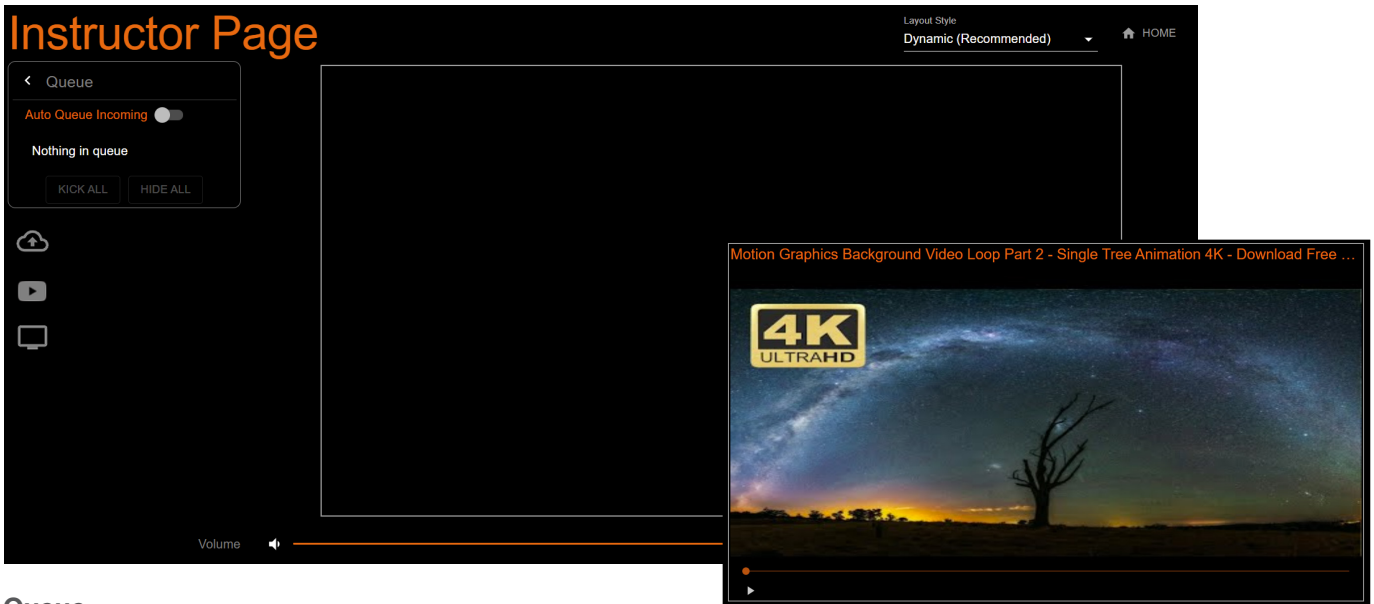
**Dual - Over Under** - Will display two streams of content in a 50/50 top and bottom split on the display.

**Triple - Preview Below** - Main content will display in a large section of top, with two other streams will display previews on the bottom under the main content.

**Triple - Preview Right** - Main content will display in a large section of the left, with two other streams displaying as previews on the right side of the display.

**Quad View** - Will display up to four screens evenly on the display.



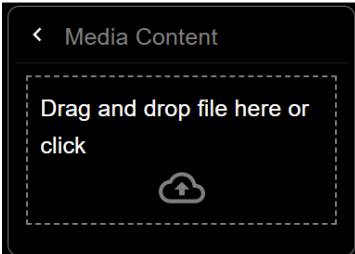


### Queue

Auto Queue Incoming - Enable this to place things in queue when added. When disabled, anything added or dragged into the media content will automatically display on screen.

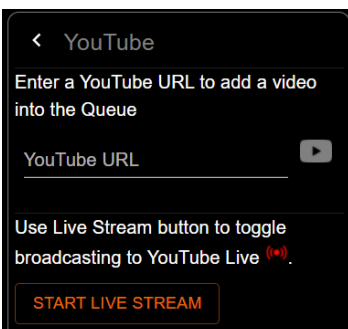
Kick All - Selecting this button will remove everything from the queue.

Hide/Show All - Click Hide All to collapse this field and hide everything in queue. When things are hidden, the button will change to Show All, select it to display all the content currently in queue.



### Media Content

Cloud with up arrow - Select the cloud icon to open the area for local media content. Click to select a file from the local computer or drag and drop a file into the dotted square field.



### YouTube

YouTube URL - Select the large YouTube icon to open the area for YouTube content. Copy and paste the URL for the video content onto the line and then press the small YouTube icon to add it to queue or to autoplay.

**NOTE:** Videos will not autoplay. Select the play button in the preview field to start the video.

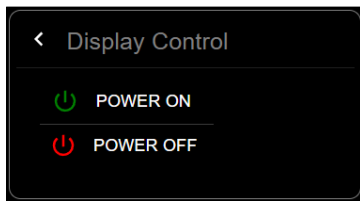
\*Optional\* Start Live Stream - When YouTube Live is enabled in settings, select this button to display the live stream on the HDMI display.

### Video Content \*In the preview field when a local or YouTube video is loaded\*

Preview - The thumbnail for the video or YouTube video will display in the preview field. The content will be displayed on the HDMI display only.

Play - Select the white triangle at the bottom left below the video preview to start playing. It will change to a pause (I I) symbol when playing.

Video Slider - Drag the orange dot or click on a point in the slider bar to adjust video to a specific play point.



### Display Control

This will display only once display control is set up. If using IP control, an IP address and port must be entered for this section to be displayed.

Power On - Selecting this button will send the preset up display on command.

Power Off - Selecting this button will send the preset up display off command.



### Status

Volume - The volume can be adjust here by either using the audio icons on either side of the bar or dragging the volume dot across the volume bar to the desired level.

Mute - Mute and unmute audio using the audio icon on the far right.

Content slots - At the bottom right corner, a message will display for how many content streams are available to be added.

# Appendix

## Specifications

System	
Operating System	Linux
Processor	Intel® Celeron N4120
Memory	4 GB LPDDR4 (2400)
Storage	64 GB eMMC
Cooling	Fan w/sink

BYOD	
Interface	Wireless LAN (optional-included), Gigabit LAN
Casting Protocols	Miracast, Google Cast, and AirPlay
Wireless Resolution	See casting protocol specification
Visible wireless streams	Up to 4

Supported Local Media Formats	
Video	.MP4, Quicktime
Image	.JPEG, .PNG, .GIF

Video		
Signal Type	Input - Wireless	
	Output - HDMI	
Copy Protection	No	
Pixel Clock	600 MHz	
UHD/HD/SD	3840x2160@60/59.9/50/30/29.97/25/ 24/23.98 Hz 1080p@60/59.9/50/30/29.97/25/ 24/23.98 Hz 1080i@30/29.97/25 Hz	720p@60/59.94/50 Hz 576p@50 Hz 576i@25 Hz 480p@60/59.96 Hz 480i@30 Hz
VESA All resolutions are 60 Hz	2560x1600 1920x1200 1680x1050 1600x1200 1440x900 1400x1050 1280x1024	1280x800 1366x768 1360x768 1152x864 1024x768 800x600 640x480
Color Space	RGB	
Chroma Subsampling	4:4:4	

Audio	
HDMI Pass-Through Formats	PCM 2.0
Bit Rate	2 Mbps max
Sample Rate	32 kHz, 44.1 kHz

USB	
Port	2 x Type A USB
Signal	1 x 2.0 1 x 3.0
Maximum Data Rate	2.0 - 480 Mbps 3.0 - 5 Gbps



Network	
Port	1 x RJ45, Wireless
Standards and Protocols	HTTPS, mDNS, SSL, HTTP/S, WS/WSS, 802.1x (wired only)
Speeds	10/100/1000 Mbps
Wireless Security	WPA / WPA2-PSK
Internal wireless protocol	802.11 b/g/n/ac dual band Wireless LAN
External wireless protocol	802.11 b/g/n/ac dual band Wireless LAN
Addressing	DHCP, Static – selectable through API and built-in web server

Wi-Fi	Frequency Range/Band	Power Output	Number of Channel/s	Channel Spacing	Modulation Type
WLAN (Internal)	2412 ~ 2483.5MHz	802.11b (11Mbps, CCK): 18 dBm ± 1.5 dBm	11: (Ch. 1-11) – USA 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan	5 MHz	CCK, DQPSK, DBPSK
		802.11g (6, 9, 18, 24Mbps, OFDM): 18 dBm ± 1.5 dBm			64QAM, 16QAM, QPSK, BPSK
		802.11g (36Mbps, OFDM): 17 dBm ± 1.5 dBm			
		802.11g (48Mbps, OFDM): 16 dBm ± 1.5 dBm			
		802.11g (54Mbps, OFDM): 15 dBm ± 1.5 dBm			
		802.11n (HT20, MCS0): 18 dBm ± 1.5 dBm			
		802.11n (HT20, MCS7): 15 dBm ± 1.5 dBm			
		802.11n (HT40, MCS0): 17 dBm ± 1.5 dBm			
	802.11n (HT40, MCS7): 15 dBm ± 1.5 dBm	9/2	20 MHz	64QAM, 16QAM, QPSK, BPSK  BPSK, QPSK, 16QAM, 64QAM  256QAM, 64QAM, 16QAM, QPSK, BPSK	
	802.11a (6, 24, 36Mbps): 13 dBm ± 1.5 dBm				
	802.11a (48Mbps): 12 dBm ± 1.5 dBm				
	802.11a (54Mbps): 10.5 dBm ± 1.5 dBm				
	802.11n (HT20, MCS0): 13 dBm ± 1.5 dBm				
	802.11n (HT20, MCS7): 10 dBm ± 1.5 dBm				
	802.11n (HT40, MCS0): 12 dBm ± 1.5 dBm				
	802.11n (HT40, MCS7): 10 dBm ± 1.5 dBm				
	802.11ac (HT20, MCS7): 10 dBm ± 1.5 dBm				
	802.11ac (HT20, MCS8): 9 dBm ± 1.5 dBm				
	802.11ac (HT40, MCS8): 8 dBm ± 1.5 dBm				
	802.11ac (HT40, MCS9): 7 dBm ± 1.5 dBm				
802.11ac (HT80, MCS8): 7 dBm ± 1.5 dBm					
802.11ac (HT80, MCS9): 6 dBm ± 1.5 dBm					
Bluetooth	2402 ~ 2480MHz	4.5 ~ 11.5 dBm (BR), 1.5 ~ 8.5 dBm (EDR)	79	1 MHz	GFSK, π/4-DQPSK, 8-DPSK
Bluetooth LE	2402 ~ 2480MHz	-1 ~ 6 dBm	40	2 MHz	GFSK, π/4-DQPSK, 8-DPSK
WLAN (USB Dongle)	2400 ~ 2483.5MHz	11b (11Mbps): 16dBm±1.5dBm	13/9	5 MHz	DSSS/OFDM
		11g (54Mbps): 14dBm±1.5dBm			
		11n (20MHz, MCS7): 14dBm±1.5dBm			
		11n (40MHz, MCS7): 14dBm±1.5dBm			
	5150 ~ 5825MHz	11a (54Mbps): 12dBm±1.5dBm	9/2	20MHz	OFDM / QPSK / 16QAM / 64QAM / 256QAM
		11n (20MHz, MCS7): 12dBm±1.5dBm			
11n (40MHz, MCS7): 12dBm±1.5dBm					
11ac (80MHz, MCS9): 10dBm±1.5dBm					

RS-232	
Port	1 x USB (adapter sold separately)
Default Parameters	9600, 8, N, 1
Use	1-way connected display control and monitoring
Baud Rates	2400, 4800, 9600, 19200, 38400, 57600, 115200
Data flow	Bidirectional

Resolution / Distance	4K/UHD - Feet / Meters		1080p - Feet / Meters	
HDMI IN/OUT	15	5	30	10

Buttons and Indicators	
<b>Control Buttons:</b> Power	1 - momentary, tact-type
<b>Function Indicators:</b> PWR	1 - LED, green

Temperature	Fahrenheit	Celsius
HDMI OUT	1 - Type A, 19-pin female	
USB HUB	2 - Type A, 4-pin female	
LAN	1 - RJ45, 1000Base-T	
Lock	1 - Kensington Lock	
DC 12V	1 - 12V DC 2 A	

Temperature	Fahrenheit	Celsius
Operating	32 to 122	0 to 50
Storage	-4 to 140	-20 to 60
Humidity (RH)	20% to 60%, non-condensing	

Power	
Consumption	General Load: 10.2 W Max Load: 17 W
Supply	Input: 100 - 240 V AC, 50/60 Hz Output: 12 V / 2 A DC

Dimensions	Inches	Millimeters
H x W x D	1.32 x 2.76 x 2.76	33.4 x 70 x 70

Certification	Pounds	Kilograms
Device	0.57	0.26

Certification	Description
Device	CE, FCC, UKCA, RCM, China RoHS
Power Supply	KC, UL, ETL, RCM, CE, FCC, TUV Safety, NOM, CCC, EAC, BSMI, PSE

Warranty	
Device	3-year limited

