wahsega

# Carina IP Display

# *User's Guide*

## Getting Started

This step-by-step guide will help you setup and install your Wahsega Carina IP Display.

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# Chapter 1
# Overview

The Wahsega product line offers the highest quality two-way audio and durability in the industry today. Each and every Wahsega product is designed, developed and manufactured in the USA, ensuring a superior product at the best price available in the market.

# Carina IP Display Functionality

The initial functions of Wahsega's Carina IP Display include:

**Centralized Event Manager configuration**

- Event Manager auto-detects each Carina IP Display on the network
- All configuration options accessible via Carina Event Manager's centralized HTTP Web interface
- Bulk configuration options available for quick and easy setup
- Mic and speaker volume control within configuration webpages
- Remote firmware upgradeable
- Time set by network SNTP Server – no manual adjustments needed
- Able to receive live or pre-recorded audio from Event Manager
- Can play scheduled bell and event alerts from Event Manager

**SIP intercom**

- IP paging speaker
- Crystal clear audio
    - Multiple mono audio codecs to choose from
    - Environmental noise suppression
- Extensive interoperability with most SIP servers and PBXs
- Peer-to-peer (P2P) mode available for decentralized communication

**Simple installation**

- Power-over-Ethernet (PoE 802.3af) powered
- Four rear mounting brackets with two positions for easy installation with a standard 2-gang electrical back box or wall surface mounting
- Wiring access through rear or either side via raceway knockouts

**Indoor temperature range (-40°C to +60°C)**

**Industry-leading standby power of < 2W**

## Primary inputs

- Built-in microphone
    - Available push-button override for sound reinforcement
- Two onboard relays for door lock control

## Secondary inputs

- Second RJ45 connector for easy installation and expansion
    - Able to drive second Wahsega Extension Speaker (WL-SPKR-22-A or WL-SPKR-SMT-A) up to 20m away via Cat5e or Cat6 cable
- Compatible with standard call buttons
    - Advanced call button functionality, designed to reduce false alarm triggers (short press vs. long press)
- Classroom sound reinforcement via optional audio input wallplate
    - Audio input
    - Volume control
    - Activation button
    - LED indicator
    - Line-in microphone

## Multiple display options

- Individual text color, scroll speed, and duration configuration available for each separate Event
- Display 12- or 24-hour clock with four or six numerals
- Built-in light sensor for energy-reducing auto-dim setting
- Text display configurable for scrolling of page by page mode
- 32,768 LED colors
- 32 x 64 resolution
- One to three lines of text display
- Text display up to 5” high

## Three built-in LED flashers

- Two color-configurable LED flashers
- One white LED flasher
- Configure flash color, speed and duration for each Event

# Quality Standards

- Wahsega products achieve the highest standards of performance in the market by utilizing our complete quality assurance program encompassing software testing, product design and a multistage automated factory test program.

- Wahsega's ultimate goal is to provide a solution that is both cost effective and unsurpassed in quality. By leveraging existing relationships with suppliers to guarantee premium components at the lowest possible prices, we are able to ensure Wahsega products are the finest quality in the market while still offered at highly competitive prices directly to installers.

- In order to achieve the greatest possible voice clarity, all voice and related algorithms have been individually tested to ensure the highest potential MOS score. The accumulated error syndrome, which can cause poor voice quality, is mitigated through this testing process.

- Wahsega's engineering team utilizes a wide array of dedicated test servers to pull and build the various software projects multiple times per day. Each automatic build is then run through an extensive set of automated test cases to ensure the highest performance of each and every firmware version released. This test case coverage is expanded on a continual basis.

- All Wahsega products are 100% factory tested at the board level through a bed of nails full functional test, not just an "is it close enough?" flying probe test. Every finished product is 100% tested again after the final assembly via an automated test station to ensure the highest production quality product for installers.

- To assure the highest quality standards, all Wahsega products are designed, developed and manufactured in the USA.

# Chapter 2
# User Experience

The Carina Small IP Display supports registration with both SIP and the Wahsega Carina Event Manager. With network connectivity, scrolling LED display and built-in speaker, the Wahsega IP Display broadcasts both audible and visible messages from the Event Manager to classroom occupants. LED text and flasher color, brightness and duration are all configurable for individual Event Manager messages.  A built-in microphone allows for two-way SIP communication, and Event Manager's NTP server provides an accurate time and date display when streaming messages are not present. The Carina IP Display can even power a second, analog Wahsega speaker up to 20 meters away via PoE cable, increasing audio coverage in the space without requiring an additional cable home run.

Powered via Power over Ethernet (PoE 802.3af), the IP Display is simple to install and is easily programmed via Event Manager's configuration webpages. The IP Display also works with standard panic buttons to trigger an outbound SIP call. With Wahsega's advanced panic button functionality, a brief button press places a call to one preconfigured number—such as the front office—while a longer press-and-hold will call a second, preconfigured panic number. This feature significantly reduces false alarm panic calls. Two onboard relays can be activated by SIP calls or Multicast broadcasts, triggering door locks or other devices during emergencies.

Wahsega's Carina Event Manager will automatically detect and register the IP Display, making system initialization a breeze. Global and individual programming options within the Event Manager make setup quick and efficient. Both audible and visual feedback at the display let installers know when their system is up and running.

# Software Capabilities

Wahsega's Carina IP Display is configured centrally at the Carina Event Manager, which allows bulk configuration as well as individual customization. This allows access to various settings such as network/IP address, SIP account and Event Manager configuration, intercom/speaker behavior, panic button call numbers, and administrative functions such as firmware upgrade and configuration backup/restore. The configuration is stored in a .JSON file, which is human readable and can be edited by site administrators.

The IP Display's configuration is also accessible using an HTTP Web interface, viewable from any Web browser on the same LAN. However, all Carina devices should be configured within the Carina Event Manager's configuration webpages whenever possible. Any configuration changes to the IP Display's individual webpages will be overwritten by the Event Manager.

# Getting Started

1. All Carina devices should be configured within the Carina Event Manager's configuration webpages. While it is possible to make changes at the device's own webpages, any configuration changes to the device's webpages will be **overwritten** by the Event Manager.

2. Locate and note your IP Display's MAC address. It is printed on a white sticker located on the rear of the device.

3. Connect the IP Display's main Ethernet port—labeled *LAN*—to a network using a Power-over-Ethernet (PoE) Ethernet connection. When connected, it will power on immediately, and the *LINK/ACTV* status LED will begin to blink.

4. Your Carina Event Manager will automatically detect the IP Display when you power up and connect to the network via PoE.

5. On the Event Manager's Web interface, navigate to the Devices page to discover your IP Display's IP address. Look for the device matching the MAC address you just noted.

6. Following the instructions in the next sections, change Event Manager settings for your IP Display as needed.

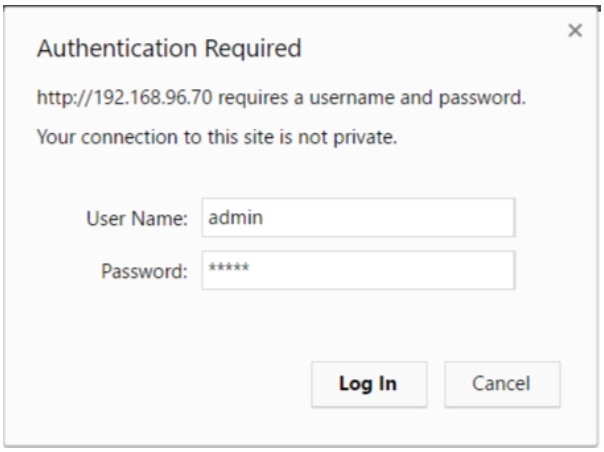
7. To apply changes and settings to your IP Display, save changes and reprovision your IP Display. This is an important step! ***Your changes in Event Manager will not take effect until you have reprovisioned the endpoint.***

# Endpoint Configuration Without Carina Event Manager

If needed, individual endpoint configuration is available via the IP Display's individual webpages. **However, if users choose to make configuration changes in the IP Display's webpages, *those changes will not be recognized by the Event Manager and will be overwritten by any configuration changes made to the endpoint in the Event Manager.*** For best results, all configuration changes should be made at the Event Manager and not at the speaker's individual configuration webpage.

1. To access the individual IP Display webpages, navigate to its IP address in your Web browser (for example, http://123.456.78.9). Wahsega recommends using Chrome or Firefox for best results.

2. When you access the configuration webpages, the IP Display will ask for a username and password. The default username and password are *admin* and *admin*.




3. On the left side of the page is the Status bar. It shows the IP Display's current *System* information such IP address, MAC address, system time and uptime. The IP Display's SIP account status (default status is *unconfigured* and *unregistered*) is listed under *Accounts*.

4. To change the IP address settings, go to the *Network* page and modify settings in the *WAN* section. To set the network for DHCP, click the *Dynamic IP* radio button. For static IP addressing, click the *Static IP* radio button and fill in the relevant IP address fields with values from your network administrator.

5. Set time and date and change username or password on the *System* page. Please note that the Carina Event Manager may be used as a system NTP server for consistent date and time display across the network. Simply enter *carina.wahsega.local* as the NTP server and make sure that NTP is enabled for this endpoint.

6. To change the SIP account settings, go to the *Accounts* page and modify settings in the account. Most users will only need to set *Username/Number* (the phone number or extension assigned to this IP Display), *Domain* (the hostname or IP address of your SIP server) and *Password* (password for this SIP extension, if needed). You may also provide a *Display Name*, which may be used by your SIP server depending on its configuration.

   If your SIP server or proxy server requires an authentication username that is different from the name entered in *Username/Number*, enter it under the *Authentication Username* field.

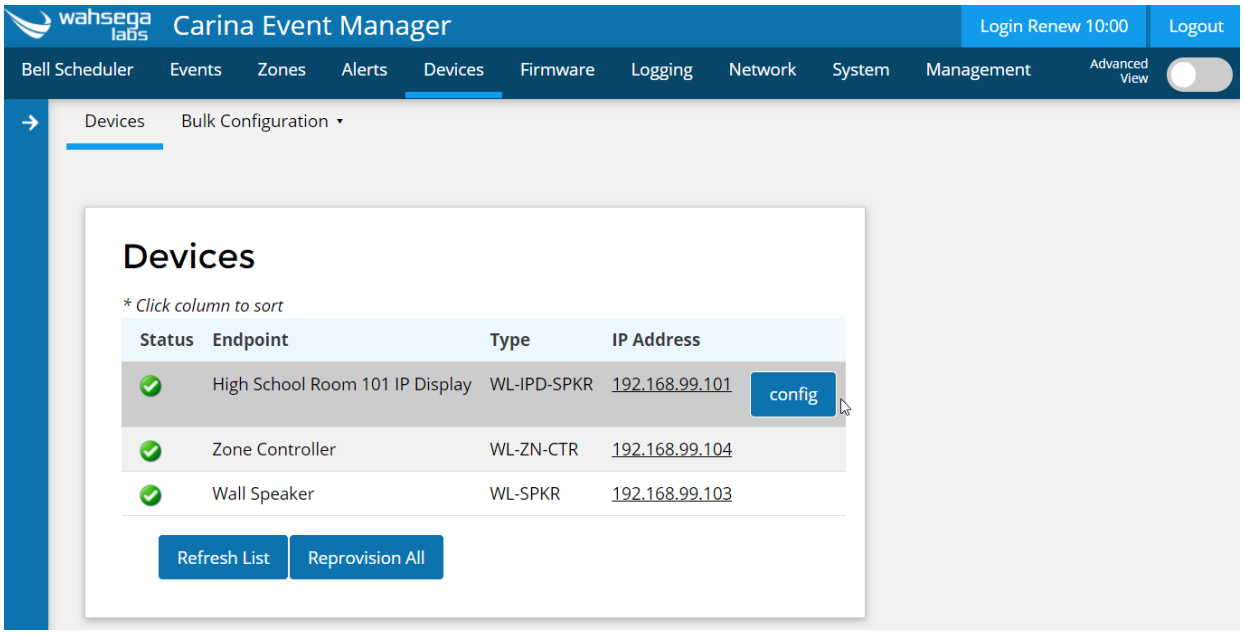
7. Configure default LED display settings, including text color and brightness, on the *Display* page.

8. Load new firmware, backup configuration, or restore a configuration file on the *Management* page.

# Chapter 3
# Configuration in Event Manager

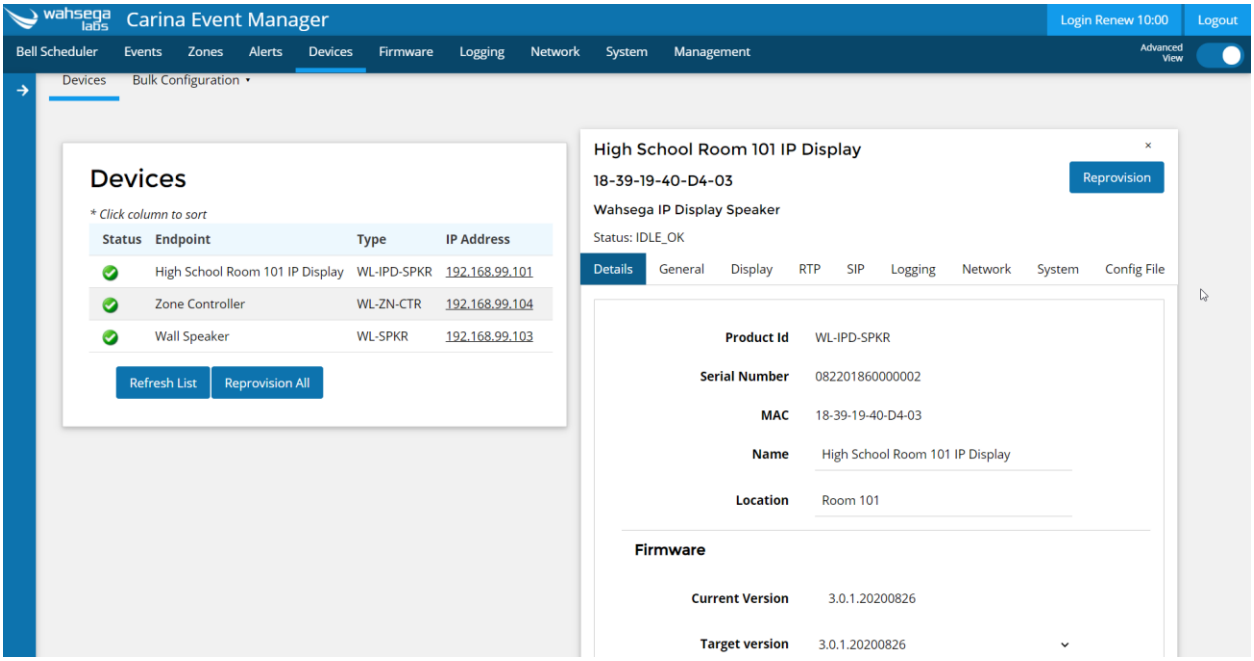
The Carina IP Display should be configured within the Carina Event Manager configuration webpages. Event Manager automatically detects each Carina IP Display on the same network, and it provides bulk or individual configuration options. Wahsega recommends using a Chrome or Firefox browser for best results.

# Individual Device Configuration



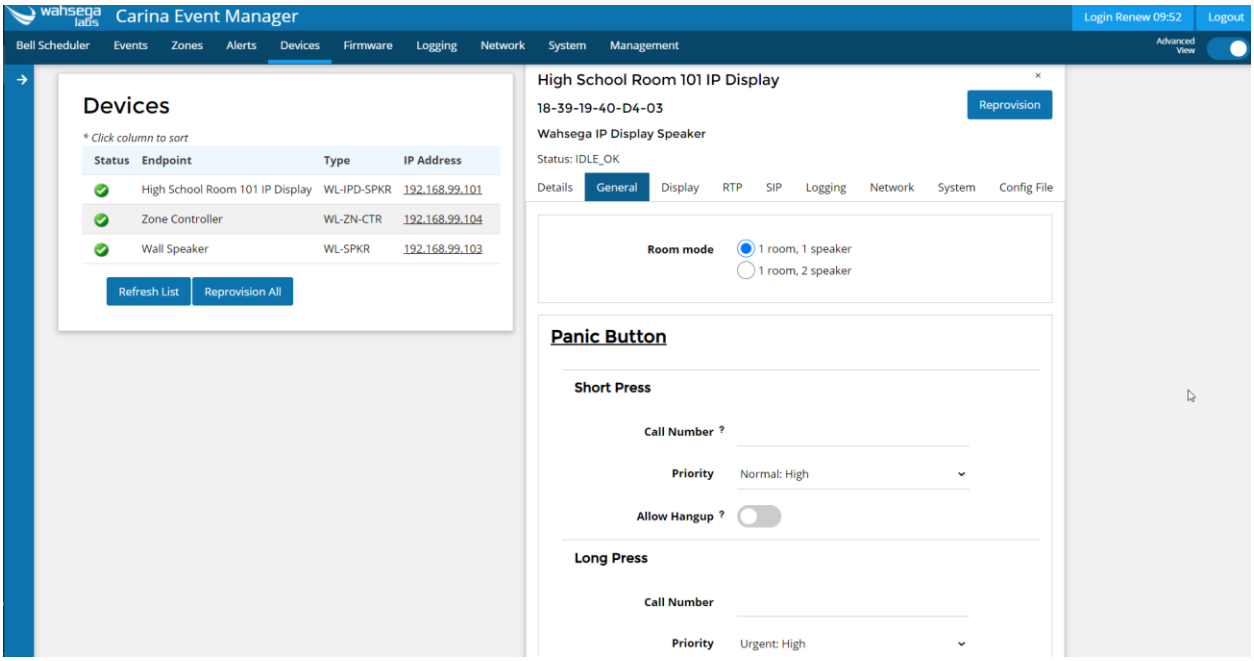

Navigate to the *Devices* page on your Event Manager and click the

button next to the IP Display you'd like to configure.




## Details

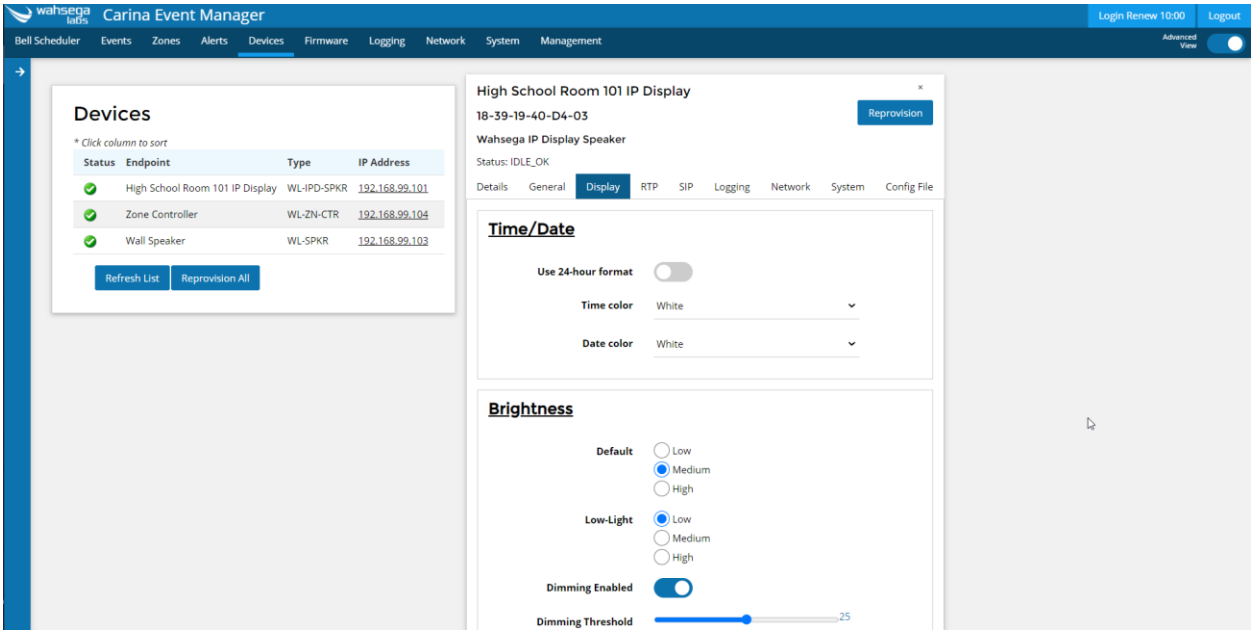
- **Name –** Give this IP Display a unique name for your reference.
- **Location –** Physical location of IP Display, for user reference.
- **Firmware**
    - **Current Version –** Firmware version this IP Display is currently running
    - **Target Version –** Firmware version this IP Display should be running currently or upon next reprovisioning cycle. Target version “Not Set” will keep this device at Current Version upon reprovisioning.




## General

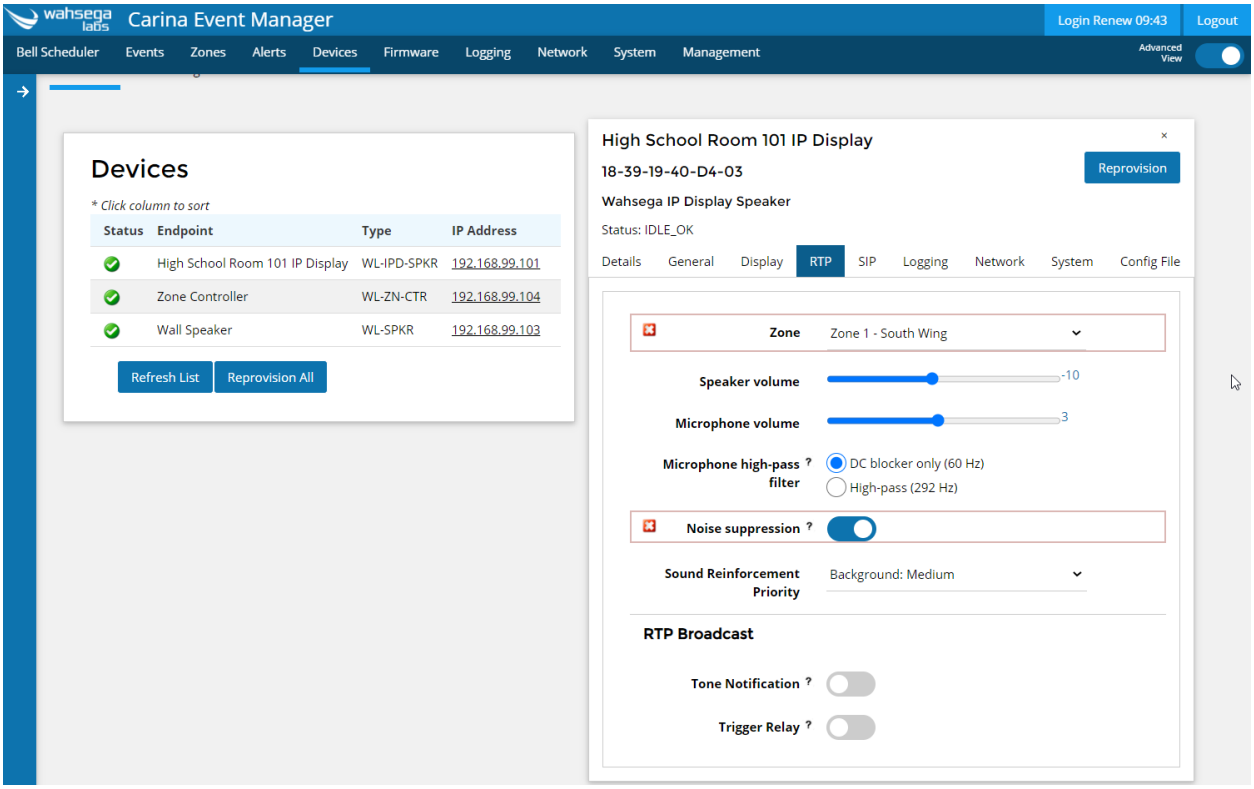
- **Room Mode**
    - **1 room, 1 speaker –** Single IP Display, no Extension speaker
    - **1 room, 2 speaker –** IP Display with connected Extension speaker (WL-SPKR-xx-A) for additional audio coverage
- **Panic/Call Button**
    - **Short-press –** Configure speaker behavior for the outbound SIP call when a connected call/panic button is pressed for *less than two (2) seconds*.
        - **Call Number –** The number or extension to call with a short button press.
        - **Priority –** Set priority level for this call.
        - **Allow Hangup? –** A button press during an active call or call attempt will hang up the call if allowed here. The call will continue until the remote party hangs up if not allowed.

- **Long Press –** Configure speaker behavior for the outbound SIP call when a connected call/panic button is pressed for *two (2) or MORE seconds*.
    - **Call Number –** The number or extension to call with a long button press.
    - **Priority –** Set priority level for this call.
    - A button press during an active call or call attempt will NEVER hang up a long press call. The call will continue until the remote party hangs up.




## Display

- **Time/Date –** Configure time and date settings for this IP Display.
    - **Use 24-hour format –** If unchecked, time will be displayed using AM and PM.
    - **Time color –** Choose LED color for time display. Default color is white.
    - **Date color –** Choose LED color for date display. Default color is white.
- **Brightness –** Set LED display brightness and dimming.
    - **Default –** Choose Low, Medium, or High default LED brightness.
    - **Low-Light –** Choose LED behavior in low light conditions if desired.
    - **Dimming Enabled –** Enable or disable display's auto-dim function.
    - **Dimming Threshold –** Set threshold for auto-dim.

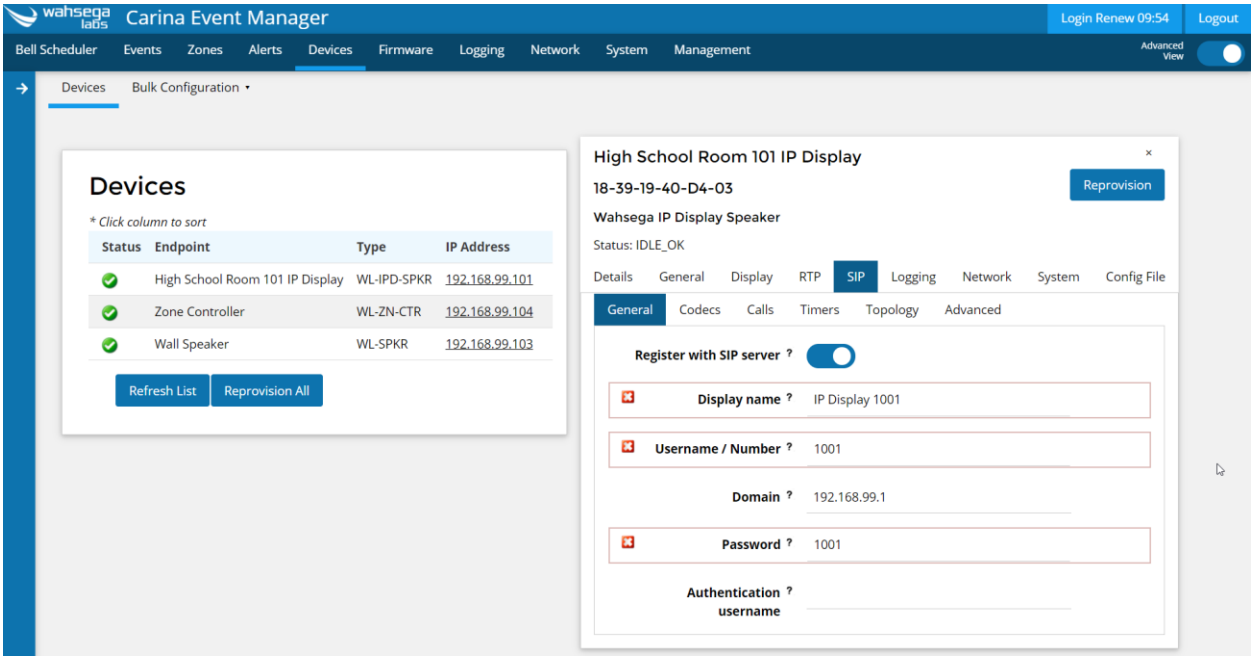



## RTP

Configure RTP multicast broadcast settings and audio for pages and announcements.

- **Zone –** Which preconfigured Event Manager Zone will this IP Display belong to? Each endpoint may belong to *one* Zone as well as the All-Call group.
- **Speaker Volume –** Volume level of speaker for incoming SIP calls and RTP multicast broadcasts.
- **Microphone Volume –** Volume of the integrated microphone, used in SIP calls.
- **Microphone high-pass filter –** Eliminates low-frequency noise that can make speech difficult to understand during SIP calls.
    - **DC blocker only** eliminates hum from power lines, while leaving other low-frequency sounds intact.
    - **High-pass** mode eliminates most noise below standard telephone frequencies.

- **Noise suppression –** Eliminates background noise (such as a steady hum, people or noises in the background, or machinery) from the device's microphone during a SIP call. This only affects audio on the remote side of the call; the local side is unaffected.
- **Sound Reinforcement Priority –** The priority level of local audio from the Sound Reinforcement Panel, if connected and in use.
- **RTP Broadcast –** Settings specifically for incoming RTP multicast broadcasts
    - **Tone Notification –** When enabled, a tone is played before the RTP broadcast begins.
    - **Trigger Relay –** When enabled, the IP Display's onboard relay will be triggered for the duration of the RTP broadcast.




## SIP

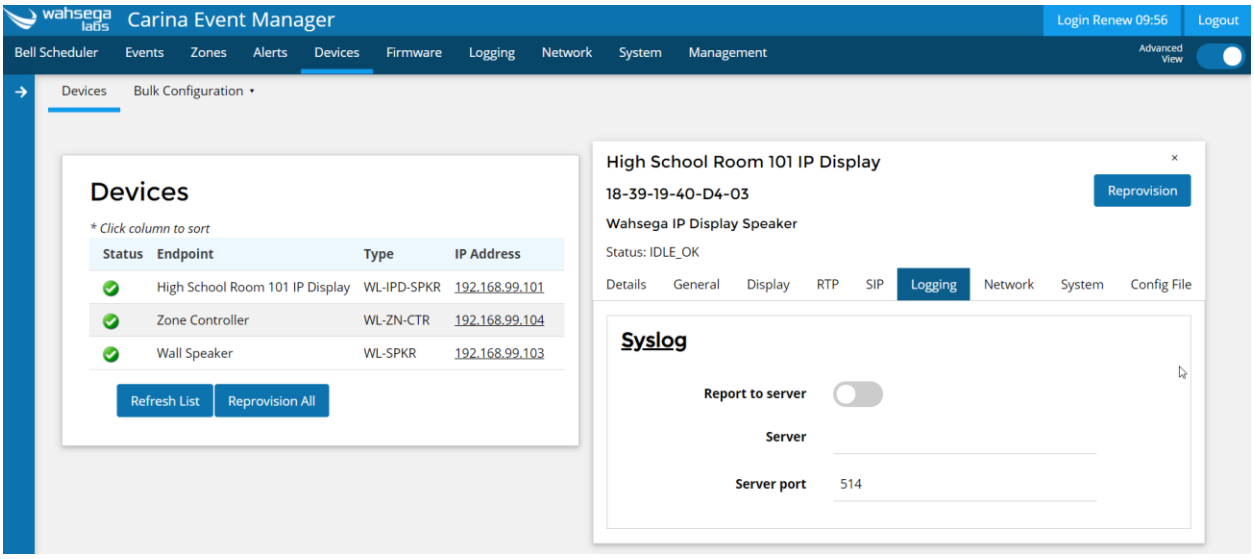
Configure registration and for two-way SIP calls.

- **General**
  - **Register with SIP server –** Enable to register this IP Display's SIP extension with your SIP server.
  - **Display name –** Name to be displayed as the caller ID.
  - **Username/Number –** Username, phone number or extension of the SIP account.
  - **Domain –** Domain of the account (e.g., IP address of your SIP server).
  - **Password –** The password used to register this account with the SIP server, if needed.
  - **Authentication username –** By default, authentication is done with the Username/Number above. Fill in the Authentication Username if a different username is needed.

- **Codecs –** The Codec List is shown in preferred order from top to bottom. This list may be rearranged by dragging and dropping the codecs within the list.
    - Available codecs are: G.722 HD, DVI4 HD, G.726 fixed payload, DVI4 Narrowband, G.711 uLaw, G,711 aLaw, G.729, OPUS.
- **Calls –** Configure display behavior for inbound and outbound calls.
    - **Relay control –** When enabled, the IP Display's onboard relay will be triggered for the duration of an active SIP call.
    - **Inbound –** Adjust settings for inbound calls.
        - **Allowed –** When inbound calls are set to "not allowed," the calls will be rejected immediately.
        - **Priority –** Priorities determine which audio event will take precedence over other audio events. A higher priority event will take over a lower priority event. If two events of the same priority occur, they will be handled in the order received.
        - **Auto-Answer –** When Auto-Answer is not enabled, an inbound call will continue ringing until the Incoming Call Timeout occurs. Auto-answer is enabled by default when inbound calls are allowed.
        - **Tone Notification –** When enabled, a tone will be played out the speaker just before a call goes active.
    - **Outbound –** Adjust settings for outbound calls, if a call/panic button is connected to this IP Display.
        - **Allowed –** When disabled, outbound calls by any means from this IP Display are prevented.
- **Timers**
    - **Call Attempt Timeout –** An unanswered outbound call attempt will be automatically cancelled when this timer expires. Default is 180 seconds.

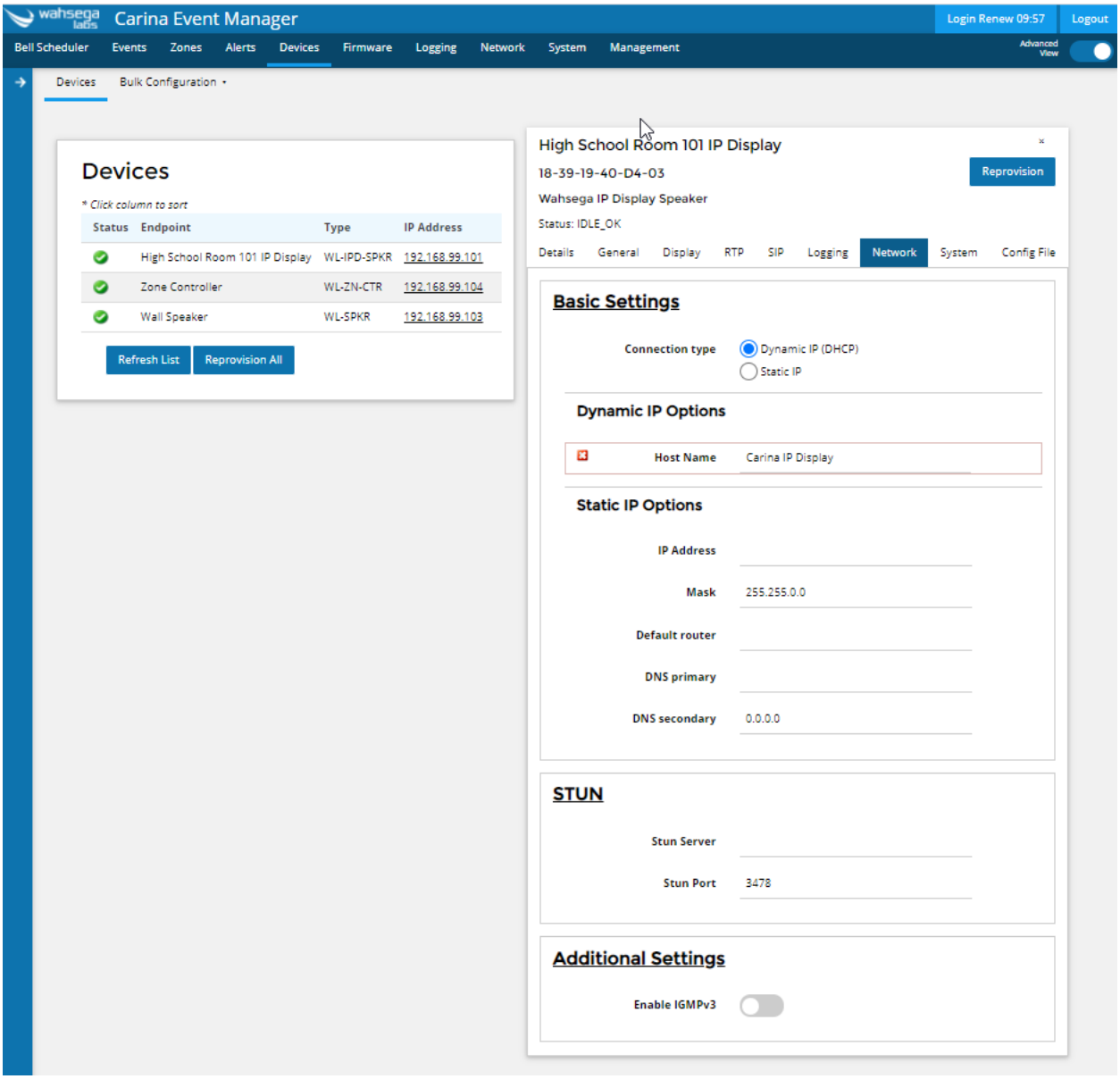
- **Incoming Call Timeout –** An unanswered inbound call attempt will be automatically cancelled when this timer expires.
- **Call Active Timeout –** An active call will be automatically terminated when this timer expires.

- **Topology**
  - **SIP transport mode –** Select mode to match your SIP server's SIP transport mode.
  - **Secure RTP –** Disabled by default.
  - **Local Port –** Enter local port if needed.
  - **Use STUN –** When enabled, the SIP client will use the public IP address of this device when communicating with the SIP server instead of its private IP address. *Note: STUN must also be configured on the Network page if this is checked.*
- **Advanced**
  - **Proxy –** When set, all SIP traffic will be sent through the proxy server, no matter the Domain setting.
  - **Proxy port –** If set to 0, the default proxy port of 5060 will be assumed. Default value is 0.
  - **Registration lifetime –** Interval, in seconds, the SIP client will re-register with the SIP server. Default value is 3600.
  - **Keep-alive –** When enabled, the SIP client will periodically send a keep-alive message to the server. This is useful when connecting to a server across a NAT connection, or in keeping a TCP connection to the SIP server active.
  - **Silence suppression –** When enabled, RTP packets are not sent when silence is detected.




## Logging

- **Syslog –** Syslog is a network protocol to enable system logging from a device to a network server. This may be used to aid in diagnosing the behavior of a device.
    - **Report to server –** Enable to begin logging to a network server. Default value: Disabled.
    - **Server address –** The IP address or URL of the syslog server.
    - **Server port –** The port (if needed) for the syslog server.




## Network

- **Basic Settings**
  - **Connection Type –** Choose DHCP or Static IP.
  - **Dynamic IP Options –** If you choose to use DHCP to assign an address automatically. Note that when using DHCP, the IP address for your IP Display may change. However, a new IP address will not affect configuration settings made through your Event Manager.

- **Host Name** – Set host name to change how this device is listed in your DHCP server, if desired.

▪ **Static IP –** Choose this to enter IP address settings manually.

- *Warning: If you enter a configuration that is not accessible from your network, you may be unable to communicate with the IP Display! Double-check that the settings you enter are correct before reprovisioning the IP Display to apply them.*

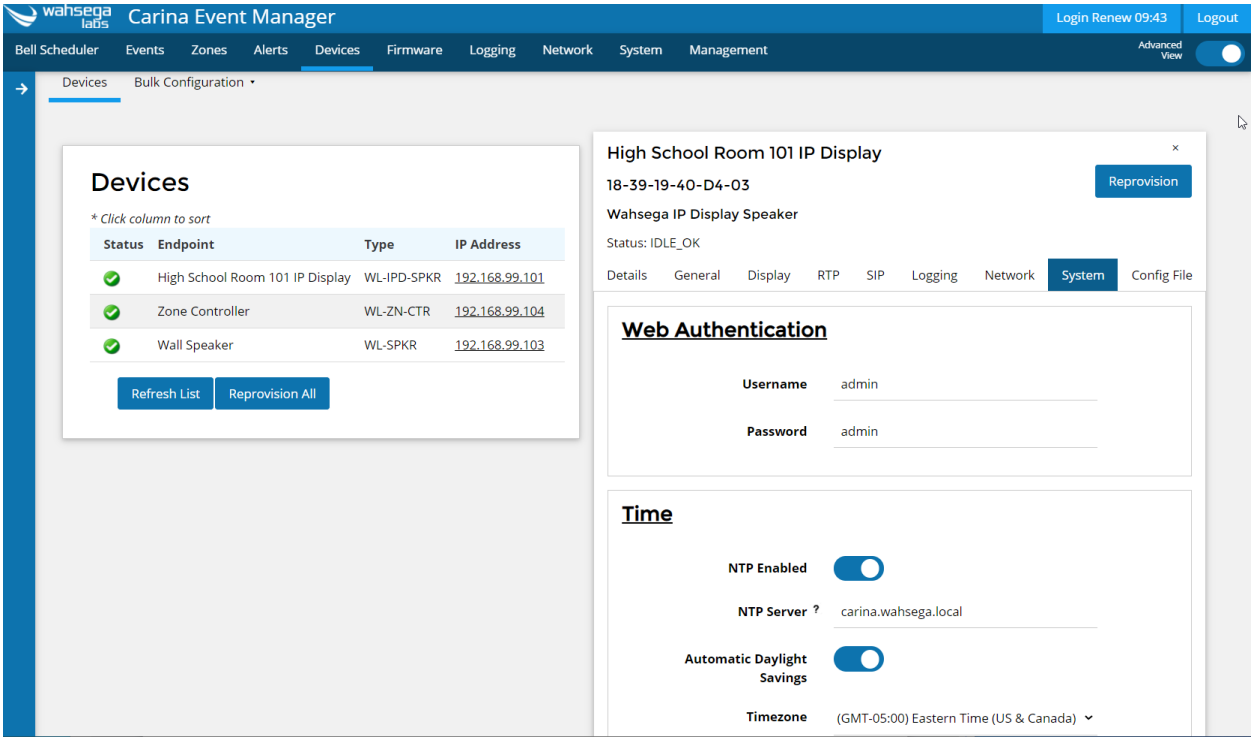
- **STUN**

▪ **Server/Port –** Enter your STUN server here if applicable. STUN servers may be required to operate with a public SIP server from behind a NAT or router.

- **Additional Settings (advanced)**

▪ **Enable IGMPv3 –** Check to enable IGMP version 3 on your IP Display. If unchecked, IGMP version 2 (IGMPv2) will be used. Default setting is *disabled*. If you know that your routers have IGMPv3 enabled, you can safely enable this setting. *If unsure, leave disabled* to ensure support with routers that only use IGMPv2.

▪ **MTU size –** Maximum transmission unit allowed on the Ethernet connection. The standard for Ethernet networks is 1500, and you *should not change this value* unless directed by your network administrator.



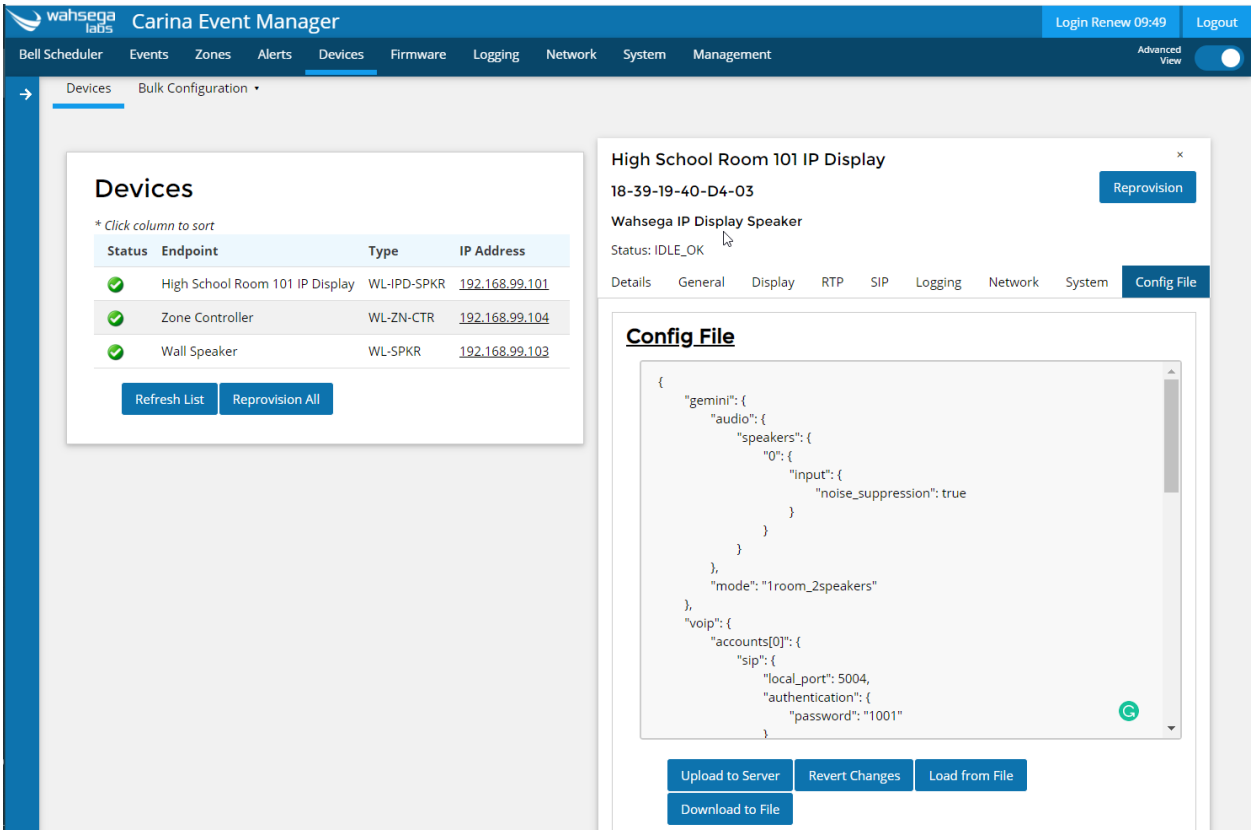

## System

- **Web Authentication**
  - **Username –** Change username for this IP Display, if desired. Default username is *admin*.
  - **Password –** Change password for this IP Display, if desired. Default password is *admin*.

- **Time**
  - **NTP Enabled –** When enabled, the system will query the NTP (network time protocol) server for the current time. The timezone and daylight savings time configuration is handled separate from the NTP time. Default value: Enabled
  - **NTP Server –** The Wahsega Event Manager can behave as an NTP server. To take advantage of this, endpoints are best configured to use the default value**.**
    Default value: *carina.wahsega.local*

- **Automatic Daylight saving time –** Select this only if daylight saving time is currently in effect in your location.
  For more information about DST rules and dates, see http://www.nist.gov/pml/div688/dst.cfm.

- **Time zone –** Select the region that most closely matches your time zone. (Note that daylight saving time is *not* automatically applied based on region.)




## Config File

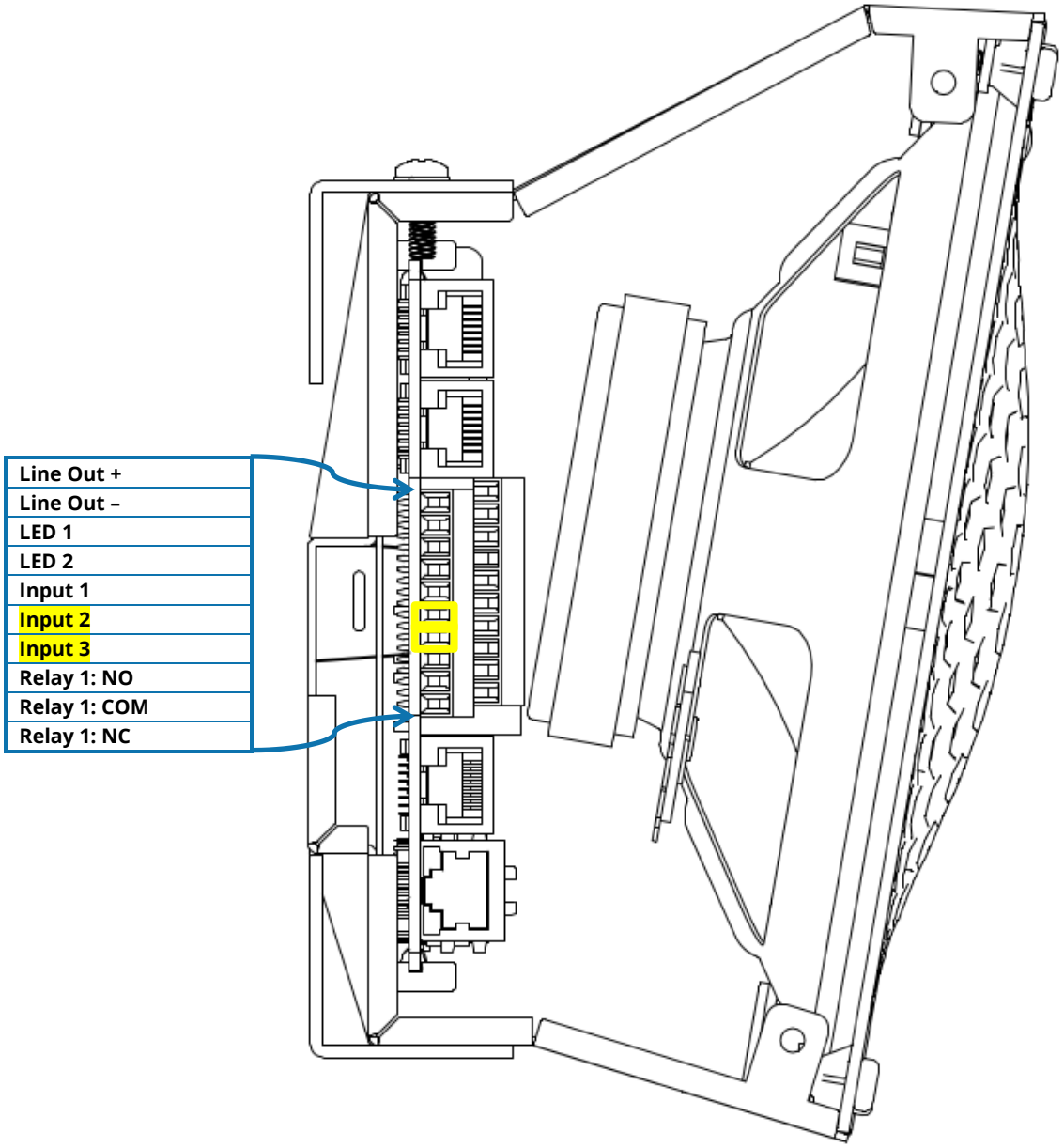
Users may choose the advanced option to manually edit or load a JSON configuration file here.

- **Upload to Server** – Loads changes made here to the Event Manager server, to take effect immediately.
- **Revert Changes –** Delete any changes made in this session and revert to currently loaded configuration file.
- **Load from File –** Load a JSON configuration file for an IP Display into this speaker.
- **Download to File –** Download this IP Display's current info.json configuration file.

# Appendix A
# Restoring Factory Settings

## Software-based Factory Reset

If you need to erase the configuration settings in your Wahsega IP Display, you can do so by following the steps below.



**Steps for activating a full factory reset:**

1. Start with the PoE cable unplugged and the IP Display powered **off**.
2. Jumper Input 3 and Input 4 (highlighted in yellow, above).
3. While jumper is in place, plug in the PoE cable and apply power to your IP Display.
4. Once power is applied, continue to hold the jumper in place for **at least five (5) seconds.**
5. After 5 seconds, the status light will flash to indicate that the file system has been reformatted and all data has been erased from the device.
6. Remove jumper and restart your IP Display for the new settings to take effect.
7. If you have previously changed the IP address of your IP Display to a static IP address, keep in mind that restoring factory default settings will return your IP Display to dynamic IP (DHCP) mode. You will need to use the new, dynamic IP address to gain access to your IP Display's configuration webpages once again.

# Carina IP Display

WL-IPD-SPKR-510-CAR-F

WL-IPD-SPKR-520-CAR-F

WL-IPD-SPKR-540-CAR-F

WL-IPD-SPKR-510D-CAR-F

## User's Guide

**Version 3.0.1.20200827**