IP Paging Zone Controller with InformaCast®

User's Guide

Getting Started

This step by step guide will help you setup and install your Wahsega IP Paging Zone Controller with InformaCast.

Important Notice

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Chapter 1
Overview

The Wahsega IP Paging Zone Controller with InformaCast® utilizes the power of the InformaCast Advanced Notification System for multiple notification scenarios, from bell schedules to emergency lockdowns. Right out of the box, the InformaCast server software will recognize and register the Wahsega IP Paging Zone Controller with InformaCast, so it will instantly be able to receive pages in high or low-quality audio, both live and pre-recorded.

The IP Paging Zone Controller with InformaCast is available in single-channel or two-channel configurations. The two-channel zone controller presents itself to the InformaCast server as two independent speakers, so the server can control each channel independently. This allows the user to play two separate audio announcements over speakers in different zones across multiple floors or multiple areas of a building.

The Wahsega IP Paging Zone Controller with InformaCast is perfect for schools or any other large, multi-building campus.

Functionality

- **Receive live or pre-recorded audio from the InformaCast server**
- **Available in single or two-channel configurations**
- **Simultaneously play up to 3 audio broadcasts per channel**
- **Built in Web server**
    - All configuration options accessible via easy-to-use HTTP web interface
- **Easy installation**
    - Standard 1U rack mount
- **PoE 802.3af powered**
    - 10/100 Ethernet port with Power-over-Ethernet (802.3af PoE)
    - +9V to +16V DC input (if not using PoE)
- **High-quality (44.1kHz) and low-quality (8kHz) InformaCast audio**
- **Multiple codecs for SIP calls, including G.711, G.726 (16/24/32/40kbps), G.722, DVI4 (narrow/HD/Ultra HD), Linear PCM, iLBC, SILK and Speex**
- **Reset to default software/configuration button**
- **Remote firmware upgradeable**

Quality Standards

- Wahsega Labs zone controllers 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 Labs' 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 Labs 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 Labs' 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 Labs 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 Labs products are designed, developed and manufactured in the USA.

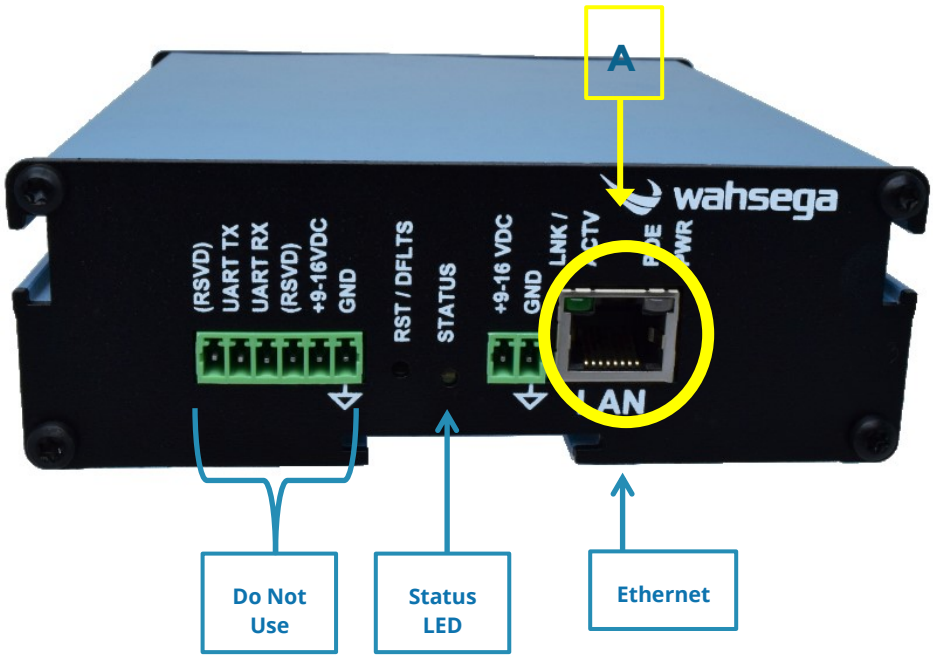
Chapter 2
General Hardware Installation

Wiring

Apply power to your zone controller using ***either*** **Option A** ***or*** **Option B**. The status LED will increase in brightness as the zone controller is powering up and will remain steadily lit when the unit is successfully powered.

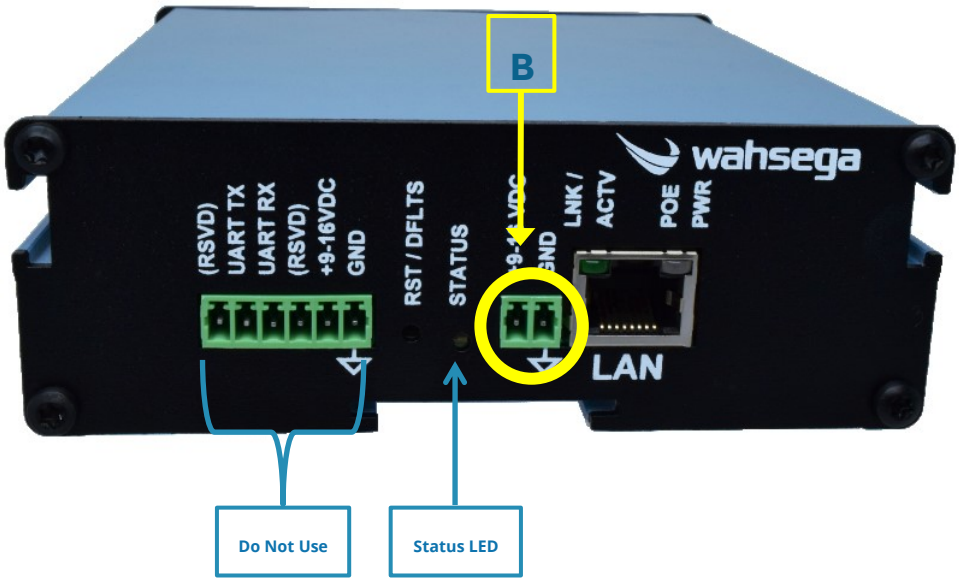
Power – Option A (preferred)

LAN - Using Power-over-Ethernet (PoE), route Cat 5 or Cat 6 Ethernet cable through a PoE injector to the LAN port.



Power – Option B

9-16V DC - If using 9-16V DC power instead of PoE, plug in via 2-pin PCB terminal connector.



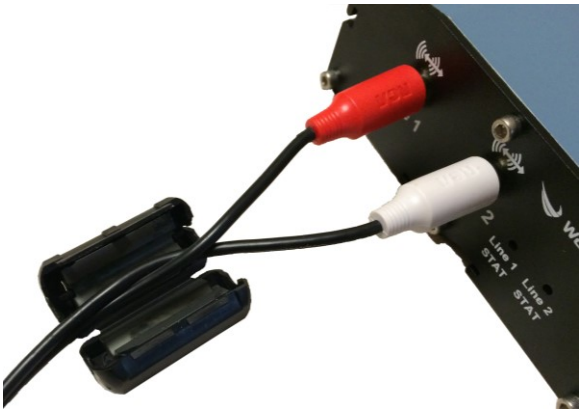
Audio Outputs

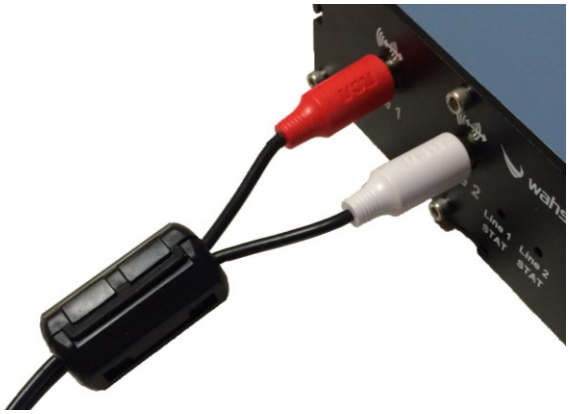
Line 1 & Line 2 – Connect unbalanced, mono audio line out via RCA mono connectors. Configure audio settings in software as described in *Chapter 4: Configuration and Web Interface*.

Line 1 STAT & Line 2 STAT – Lit when audio is streaming.

Ferrite Clamp

Secure included ferrite clamp over both cables within 4” of connectors, as shown below.



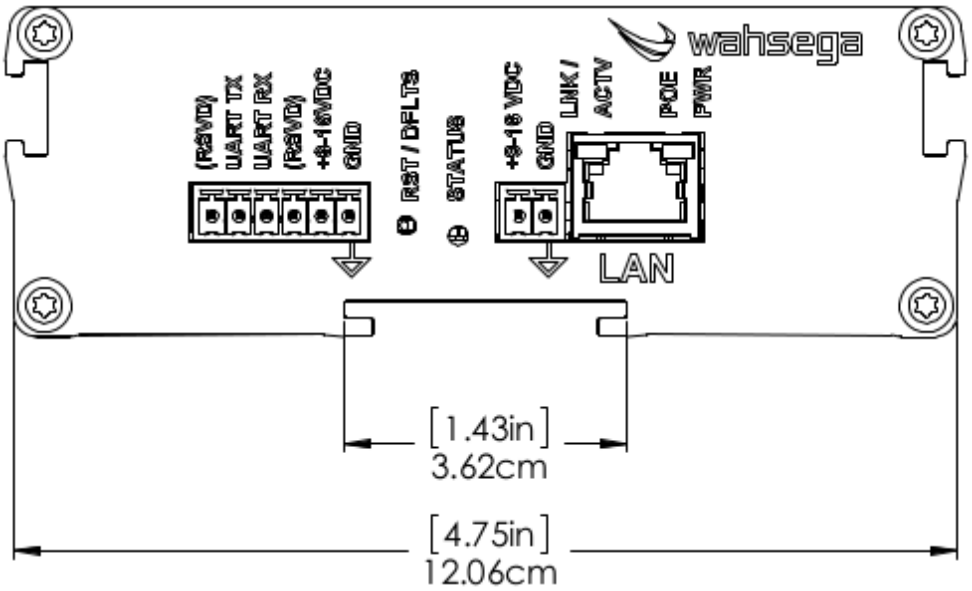


1U Rack Mounting

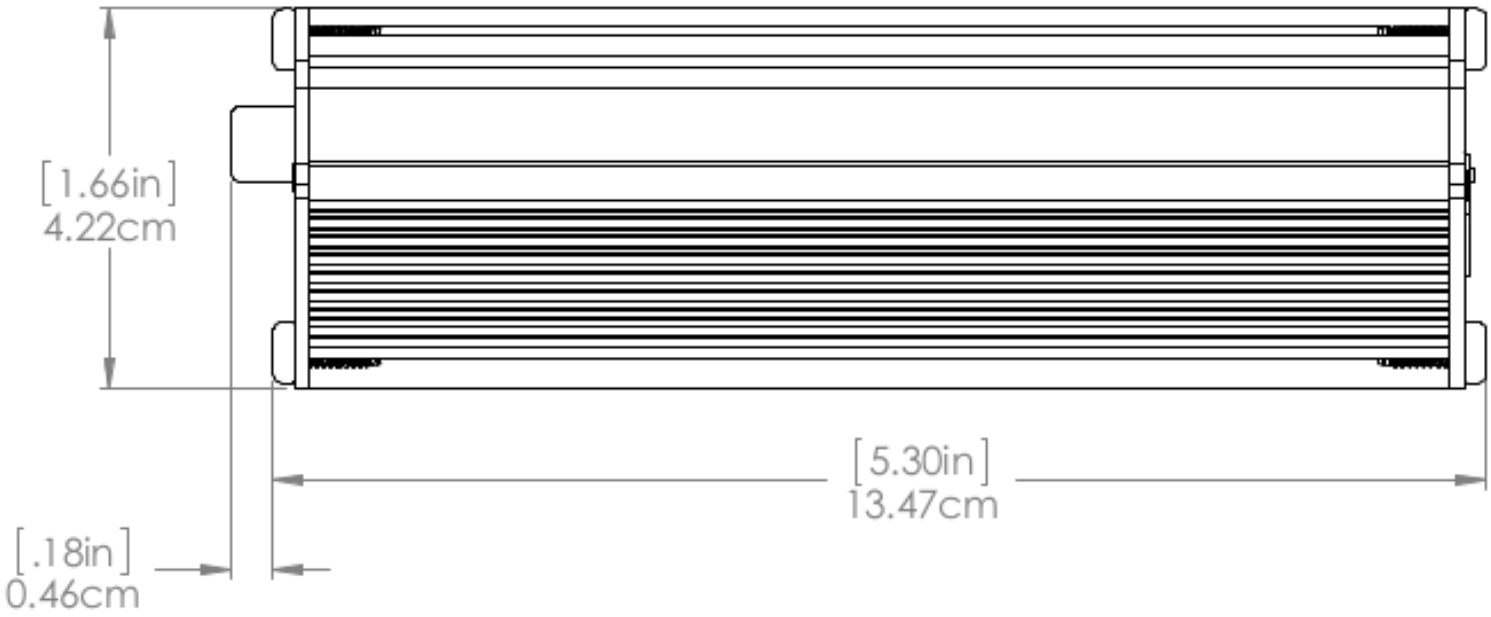
The zone controller has 1U rack mount slots for easy mounting in any orientation on bottom or side.

Dimensions

Width



Depth and Height



Chapter 3
User Experience

Software Capabilities

The zone controller's configuration is accessible using an HTTP web interface, viewable from any web browser on the same LAN.

This allows access to various settings such as network/IP address and InformaCast instance configuration, audio output settings, 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.

Getting Started

1. Connect the IP Paging Zone Controller's Ethernet port to a network using a Power-over-Ethernet (PoE) Ethernet connection. When connected, it will power on immediately and the indicator light will begin to blink.

2. Locate and note your zone controller's MAC address. It is printed on a white sticker on the bottom of the device. A single-channel zone controller will have one MAC address, and a two-channel zone controller will have two MAC addresses.

3. Use the InformaCast server to discover your zone controller's IP address. Look for the device matching the MAC address(es) you noted above. Your zone controller—whether single channel or two-channel—will only have one IP address.

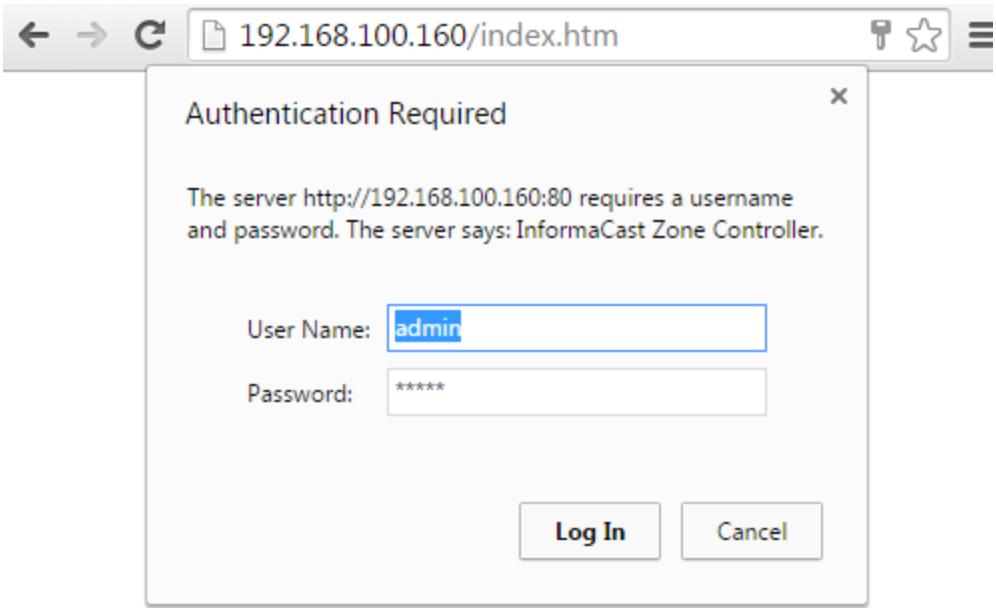
4. When it boots, the zone controller uses DHCP by default to automatically obtain a suitable IP address on your local area network (LAN). If a DHCP server is not available or cannot be reached, the zone controller will fall back to a randomly chosen IP address in the `169.254.0.0/16` range as per RFC 3927.

   If you cannot discover the zone controller on the InformaCast server, you can:

   - consult your DHCP server's logs to determine its IP address;
   - use a network discovery app app (such as Fing on iOS and Android mobile device or LanScan from the Apple OS X App Store); or
   - use Wireshark to observe the DHCP network traffic.

5. After you determine the zone controller's IP address, navigate to that IP address in your web browser (for example, http://123.456.78.9).

6. When you access the web pages, the zone controller will ask for a username and password. The default username and password are "admin" and "admin".



7. On the right side of the page is the Status bar. It shows the zone controller's current system information (current IP address, system time), SIP account status, and registration status and Ethernet MAC address of each InformaCast instance.

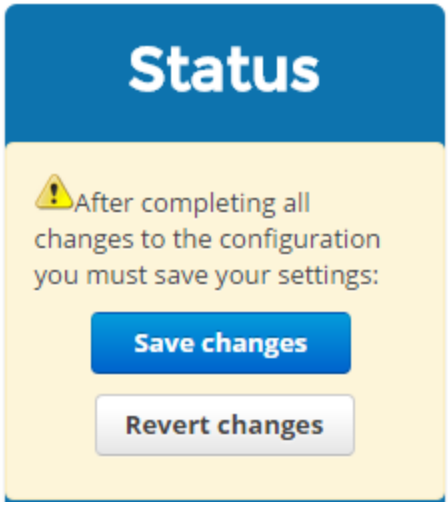
8. To change the IP address settings, go to the Network tab and modify settings in the "WAN" section. To set the network for DHCP, click the "Dynamic IP" radio button. For static IP addressing, click the "Static IP" radio button and fill in the relevant IP address fields with values from your network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

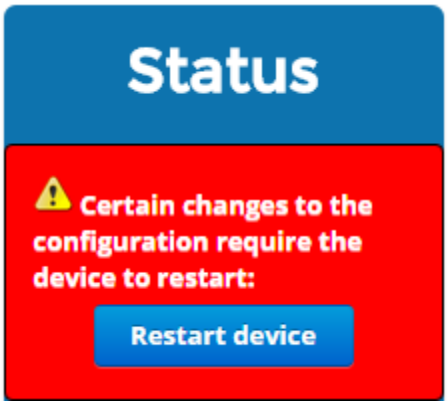
9. After configuring the network settings for your zone controller, use the configuration settings described in the next section to customize the InformaCast instances and audio levels.

Chapter 4
Configuration and Web Interface

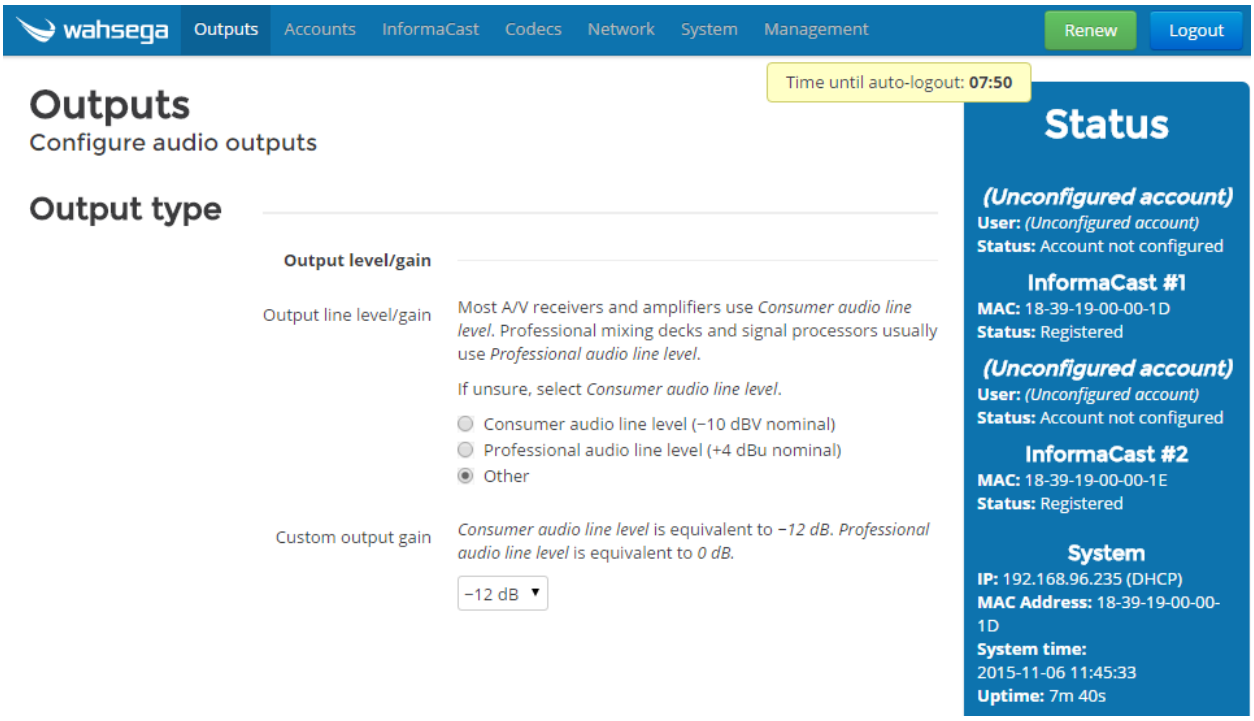
The web interface is a set of web pages used to configure the various settings available on the zone controller. It allows the zone controller to be configured from any computer or device with a web browser.

As you configure various settings, note that you will be prompted to save changes and/or restart your device for those changes to take effect.





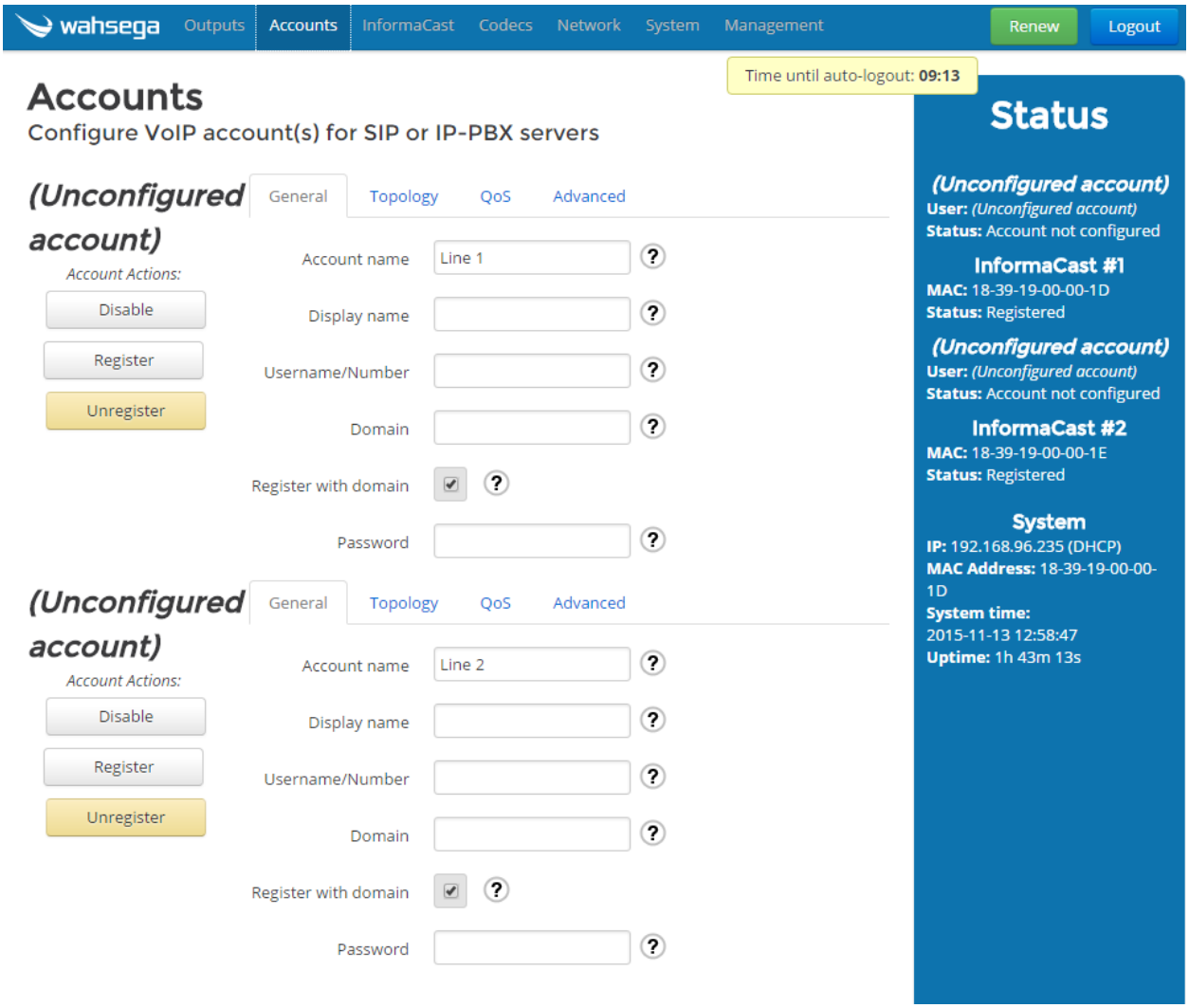
Output Settings



The *Outputs* page configures settings for audio outputs.

- **Line level –** Select the audio line level for your application. If you are unsure of line level, choose "Consumer line level."
    - **Consumer audio line level** = -10 dBV nominal
    - **Professional audio line level** = +4 dBu nominal
    - **Other** = Choose a custom level from the dropdown menu below.
- **Custom output gain –** If a level other than -10 dBV or +4 dBu is needed, select "Other" and choose line level here.
    - Output level ranges from -30dB to +6dB.

Account Settings



The *Accounts* page configures one or two VoIP accounts for SIP or IP-PBX servers.

- **Account Name –** The name used to identify the SIP account. It will only be shown on this page and in configuration and system logs.

- **Display Name –** The name to report to the SIP server, which may be shown to other callers (depending on the SIP server's configuration).

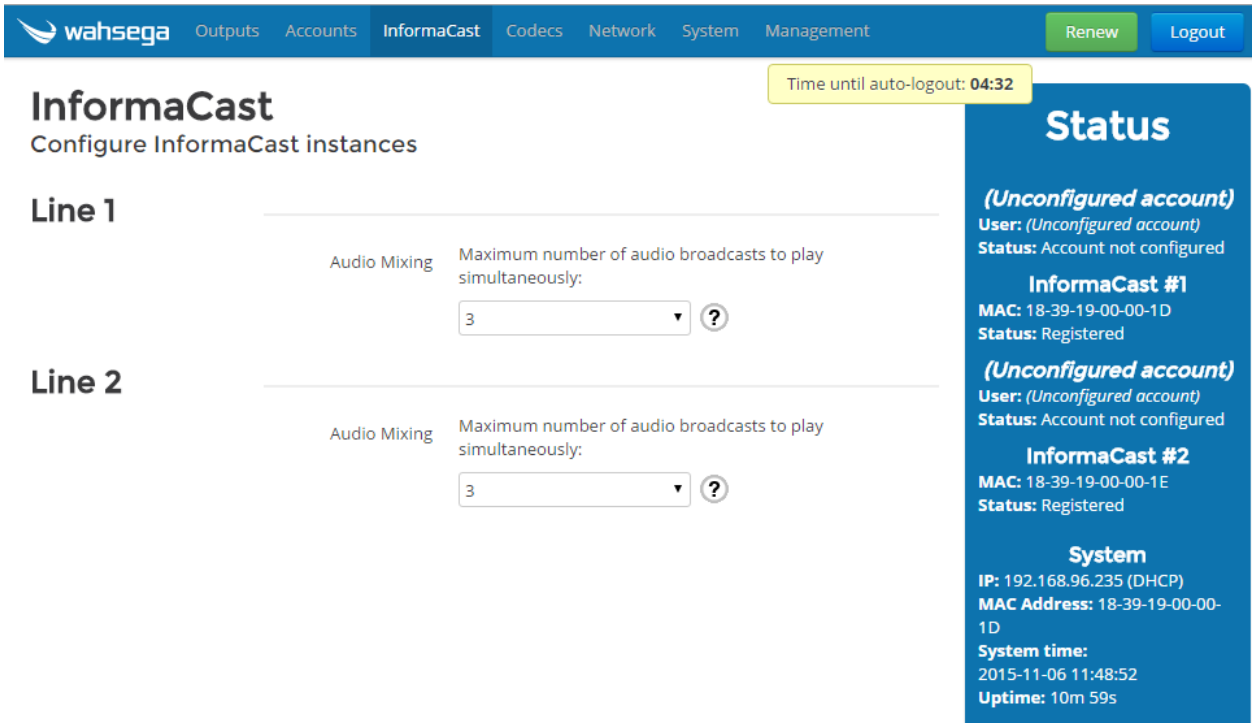
- **Username/Number –** The phone number or extension this phone is configured with on the SIP server.

- **Domain –** The hostname or domain name of the SIP server. Not used in peer-to-peer (P2P) mode.

- **Register with domain –** If checked, the account must register with a server to send or receive calls. If unchecked, the account will operate in P2P mode

- **Password –** If the SIP server requires a password to authenticate, enter it here. By default, authentication is done with the *Username/Number* above. If a different username should be used for authentication, enter it in *Authentication Username* under the *Advanced* tab above.

InformaCast Settings



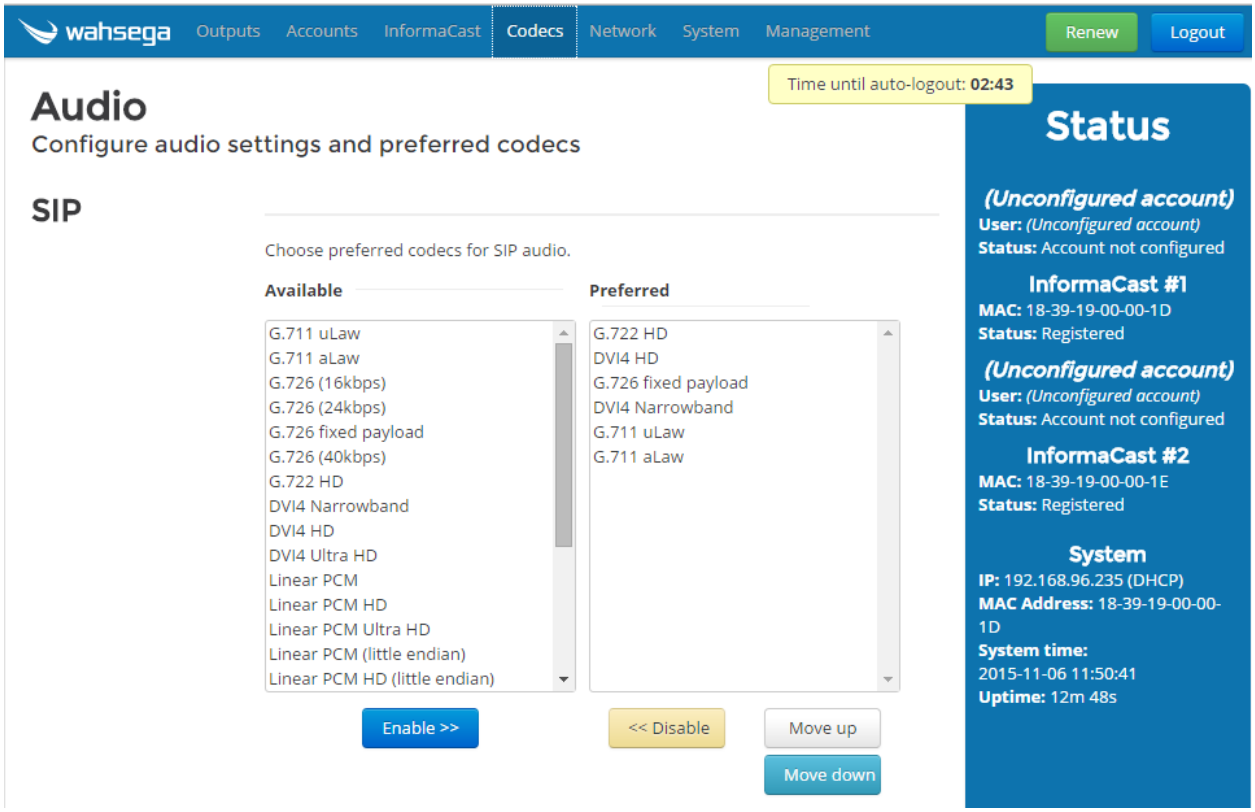
The *InformaCast* page configures settings for each line's InformaCast instances.

- **Audio Mixing –** Maximum number of audio broadcasts (one to three) to play simultaneously on this channel. ***Note 1***

    - To disable audio mixing, choose "1."

Note 1: While the maximum number of simultaneous audio broadcasts over both channels on each device is six (6), ***the maximum number of simultaneous high-quality (44.1 kHz) audio broadcasts is two (2) per device,*** regardless of whether the broadcasts are on the same channel or on different channels.

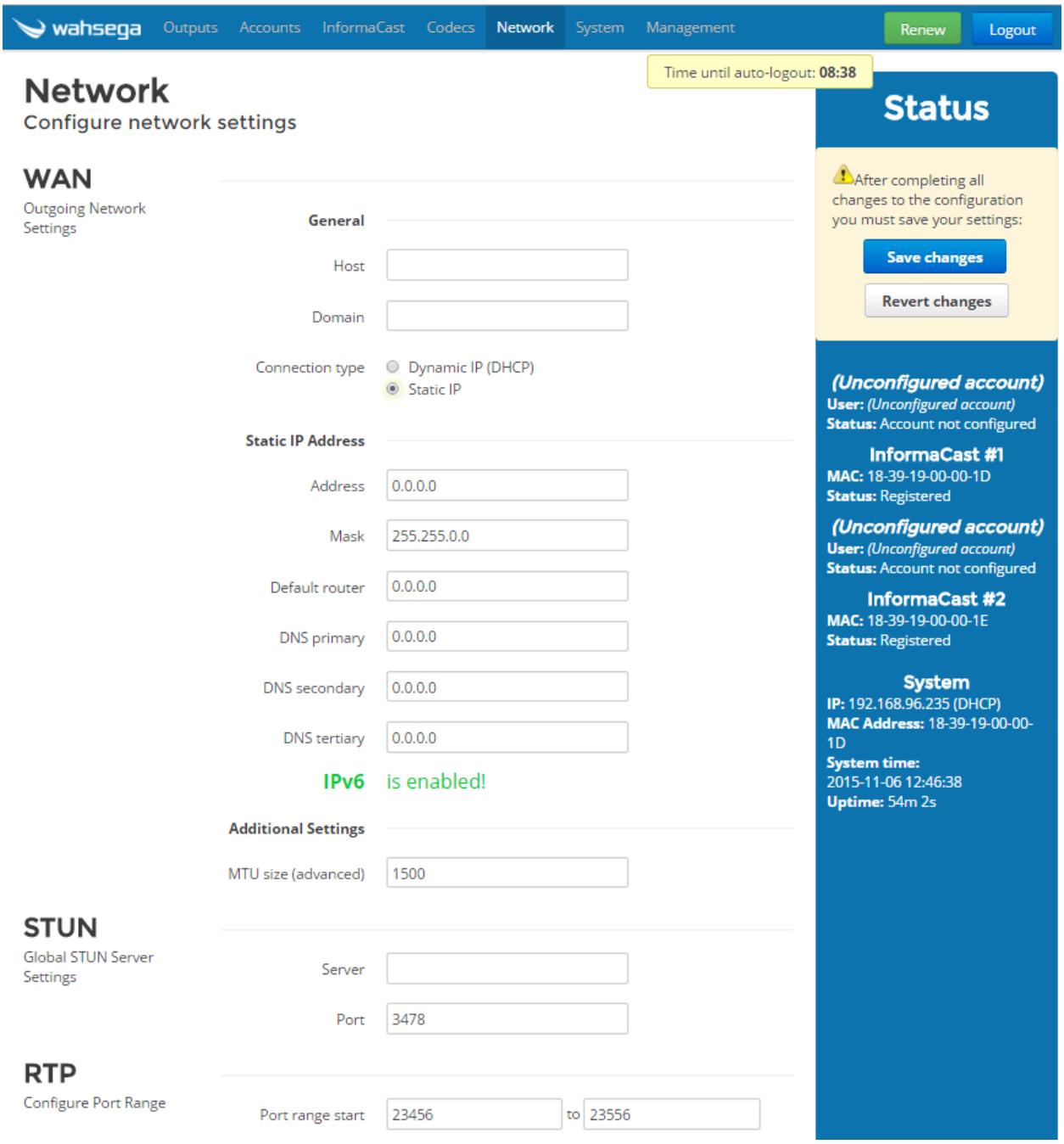
Codec Selection



The *Codecs* page configures audio settings and preferred codecs.

- **Choose preferred codecs –** These settings enable/disable audio codecs and set their order of use. The system tries codecs at the top of the "Preferred" list before trying codecs at the bottom of the list.
    - To add an available codec to the "Preferred" list, select the available codec, and click "Enable."
    - To remove a codec from the "Preferred" list, highlight the codec you'd like to remove, and click "Disable."
    - To change the priority of codecs in the "Preferred" list, highlight the codec you'd like to move, and click "move up" or "Move down."

Network Configuration



The *Network* page configures settings for TCP/IP networking.

WAN

- **Connection Type**

    - **Dynamic IP –** Choose this to use DHCP to assign an address automatically. Note that when using DHCP, you will have to determine the IP address assigned to the zone controller using your DHCP server or through some other method in order to access the configuration web pages in the future.

    - **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 zone controller! Double-check that the settings you enter are correct before rebooting the zone controller to apply them.*

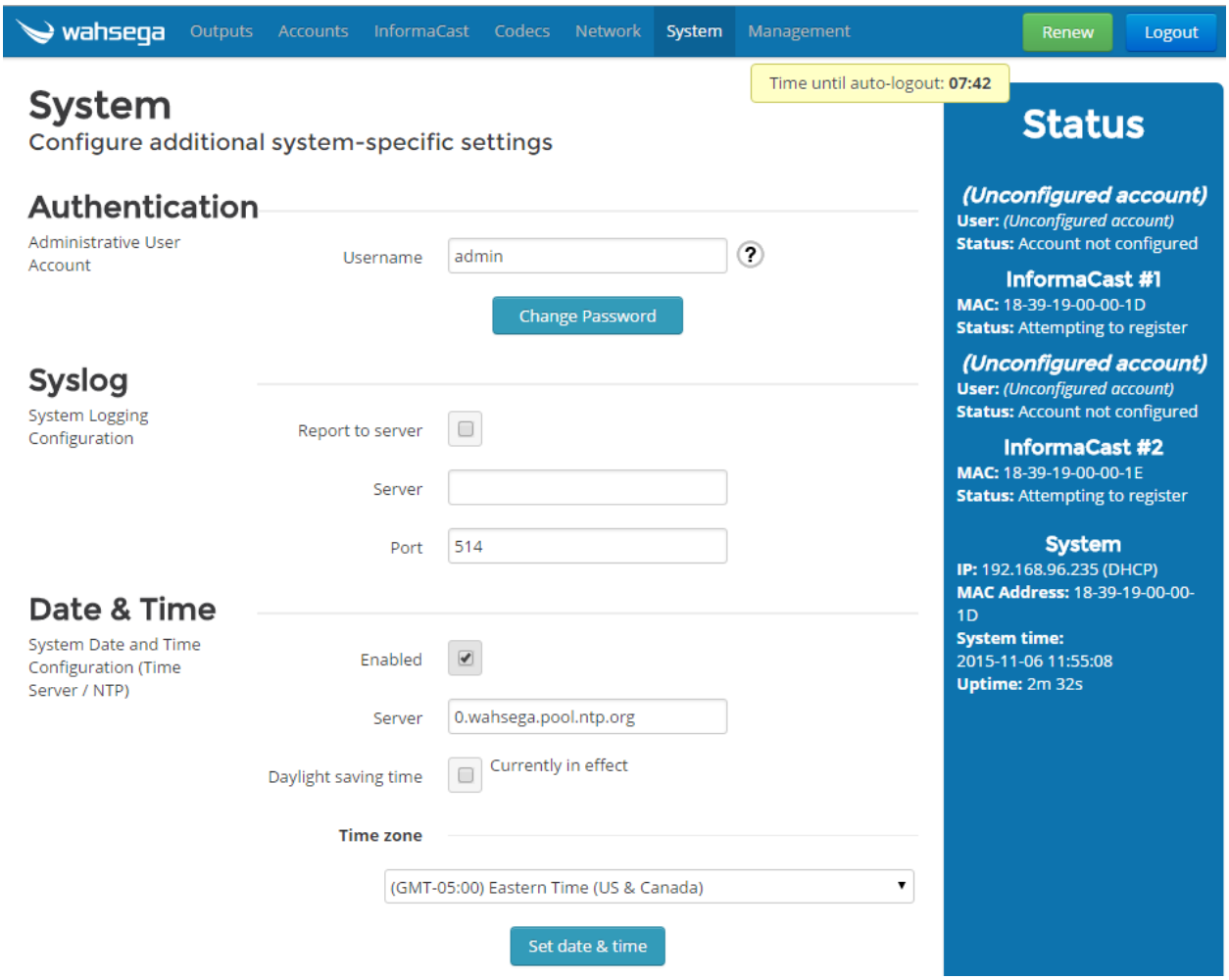
STUN

- **Server/Port –** If you are using a STUN server, enter your STUN server information here. STUN servers may be required to operate with a public SIP server from behind a NAT or router.

RTP

- **Port Range –** Select the UDP port range to use for sending RTP audio network traffic during a call.

General System Configuration



The *System* page configures settings for the zone controller's operating system and other administrative functions.

Authentication

Username – Set the username and password used on the configuration web pages and Telnet shell. Default username is “admin”.

Password – Change password for configuration webpage login here if desired. Default password is “admin”.

Syslog

Report to server - Configures a syslog server that can receive system logs from the zone controller. This requires a PC or server running a syslog server to receive and store the logs.

Date & Time

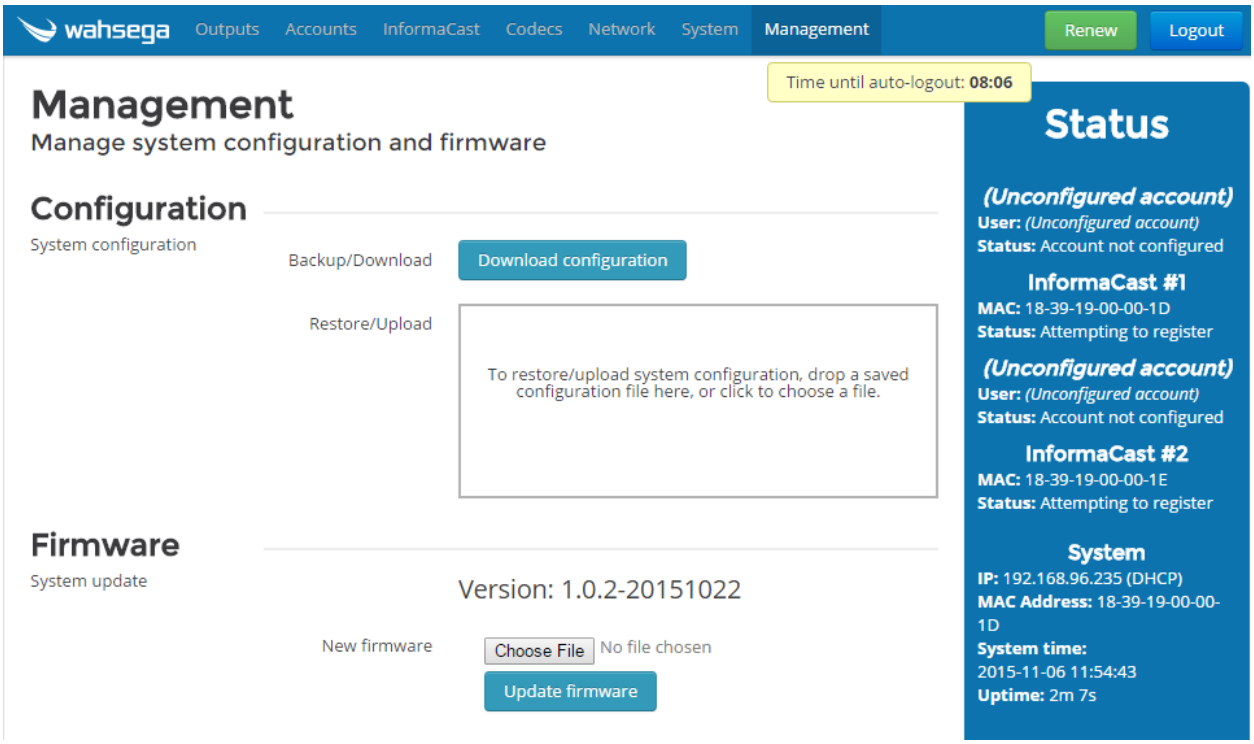
- **NTP Enabled –** Automatically determines the time of day using an NTP server. This is recommended, as the zone controller does not have a battery-backed clock.

- **Server –** Enter NTP server address here. Default server is `0.wahsega.pool.ntp.org`.

- **Daylight saving time –** Select this only if daylight saving time is currently in effect in your location.

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

Firmware Management



The *Management* page has functions for managing the zone controller's configuration and firmware.

Configuration

- **Backup/Download –** Use this to retrieve a copy of the zone controller's current configuration and save to disk.

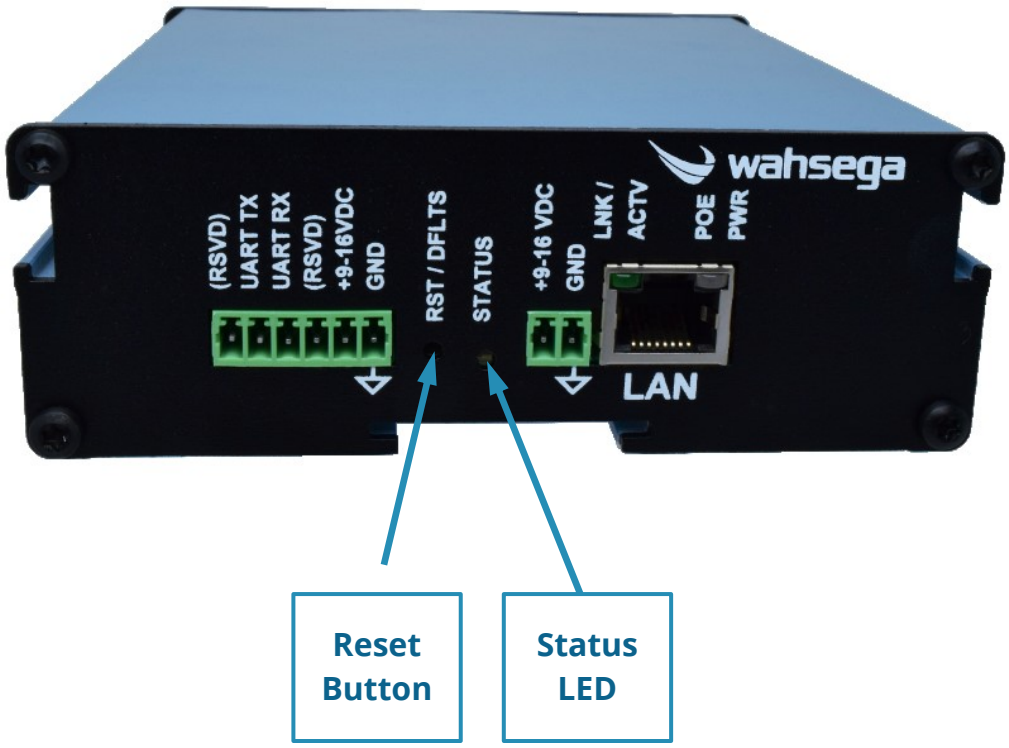
- **Restore/Upload –** Use this to upload a valid configuration file (file type `.JSON`) that was retrieved and saved from a zone controller. *Note that a reboot will be required before the settings take effect.*

Firmware

- **New firmware –** Use this to upload new firmware.
  DO NOT UNPLUG THE ZONE CONTROLLER OR INTERRUPT THE FIRMWARE UPGRADE PROCESS BEFORE IT COMPLETES, OR IT MAY BE RENDERED UNUSABLE.

Appendix A
Factory Reset

Software-Based Factory Reset



If you need to erase the configuration settings in your zone controller for any reason, you can do so in one of two ways. **Option A** returns all settings to factory default, and **Option B** returns only select settings to factory default.

Option A - Steps for activating a full factory reset:

1. Start with the zone controller powered off.

2. Using either wiring method described in Chapter 2: General Hardware Installation, apply power to your zone controller. As soon as power is applied, hold the reset button until the status light begins to blink.

3. Once the light starts blinking, continue to hold the button for **at least 5 seconds**. ***Note 2***

4. After 5 seconds, the status light will flash rapidly to indicate that the file system has been reformatted and all data has been erased from your device. ***Note 3***

5. Unplug and restart your zone controller for the new settings to take effect. You have successfully reset your configuration!

Note 2: If you release the button early, the zone controller will proceed with normal startup.

Note 3: If the status light instead begins to blink more slowly, the reset was not successful. Unplug and restart your device, and then attempt a reset once again.

Option B - Steps for activating a partial factory reset:

1. While the unit is running and the status LED is steadily lit, press and hold the reset button.

2. Continue to hold down the button as the status light first turns off and then begins to advance through reset options. Every 5 seconds, the status light will blink to indicate a different reset option as described below.

   1 blink = Reset type 1

   - Erases network configuration, reverting back to defaults *for network configuration only*. All other configuration settings remain unchanged.

   2 blinks = Reset type 2

   - Erases all configuration settings, reverting back to factory defaults. All other system files remain unchanged.

3. Release the button when you reach the type of reset you need. ***Note 4***

4. The status light will flash rapidly to indicate that the selected settings have successfully been erased. ***Note 5***

5. Restart your zone controller for the new settings to take effect. You have successfully reset your configuration!

Note 4: If you release the button before the LED begins to blink, nothing will be reset, and you will not need to reboot.

Note 5: If the status light begins to blink more slowly after you release the button, the reset was not successful. Unplug and restart your device, and then attempt a reset once again.