System Administrator Guide
C4000 Series

Version 3.0

BOGEN®
COMMUNICATIONS, INC.

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Introducing the C4000 System

Nyquist C4000 is an Internet Protocol (IP) based solution for commercial paging and audio distribution applications (*Figure 1, "Example of C4000 Network"*). It addresses the unique communication needs of various types of businesses, including industrial facilities, transportation hubs, retailers, offices, restaurants, and bars.

Note: This manual describes the tasks, including configuration tasks, that you can perform if you are assigned an **Admin** role with proper permissions and if your station **Type** is an **Admin Web Interface**. If you are assigned a **User** role, refer to the *C4000 User Guide* and to *"Performing Tasks via the Dashboard" on page 338* of this manual. For information about station types, see *"Viewing Station Configuration Settings" on page 128*. For information about roles, see *"Managing Roles and Users" on page 213*.
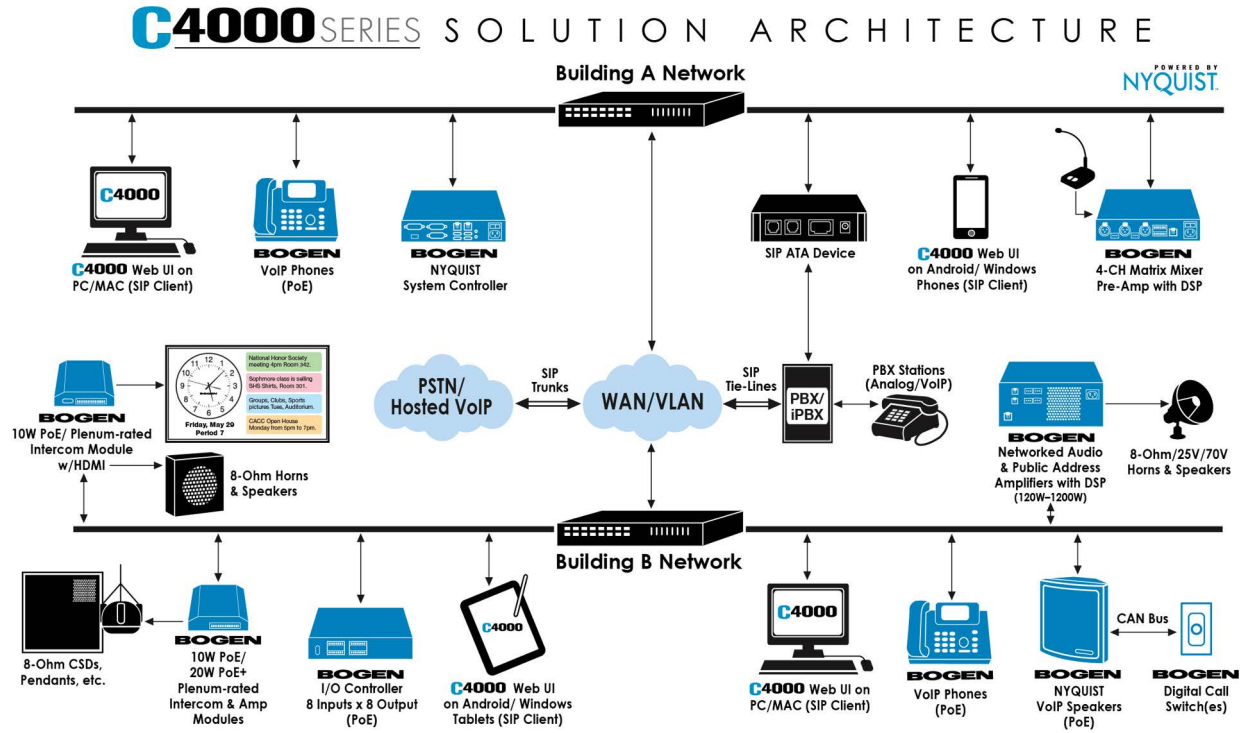
Figure 1. Example of C4000 Network

The heart of the C4000 system is a robust, state-of-the-art System Controller (NQ-SYSC-TRL) that is preinstalled with the Nyquist application software. The System Controller features an easy to use web-based graphical user interface (GUI) that is accessible through

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almost any personal computer (PC), tablet, or mobile device from any location in the connected world.

Figure 2. Nyquist System Controller

The solution features a built-in streaming Internet radio service – airable by TuneIn and optional custom-tailored music selections from SOUNDMACHINE, the premier music subscription service for business. Both services are perfect for a wide variety of background music applications. SOUNDMACHINE gives large and small retailers, restaurants, bars, or any other company looking to enhance their customer experience the ability to craft a seamless, engaging, and on-brand music experience using commercially licensed content.

Available feature-rich IP phones and purpose-built networked appliances provide convenient communication, control, and interoperability with third-party devices and systems such as access control, fire alarm, clock, and PBX systems.

The C4000 system supports the following hardware:

- PCs, tablets, and Android and Windows mobile phones that support the full Google Chrome web browser to access the C4000 Admin Web user interface (UI).
- C4000 certified Voice over IP (VoIP) phones (NQ-T1000)
- Nyquist appliances

For information about the Nyquist appliances that work with the C4000 system, visit:

http://www.bogen.com

Understanding System Requirements

The C4000 web-based UI requires a secure Hypertext Transfer Protocol Secure (https) type network connection to the C4000 System Server. Users can log in to the C4000 system using a Google Chrome web browser from a computer or tablet running either a Windows 8.1 (or later) or a Mac OS X 10.12.x (or later) operating system (OS). The UI can also be accessed via a Chrome browser enabled Android-based tablet or mobile device. To access the server, type your C4000 System Server's IP address (for example, 10.10.20.12).

Whitelisted Web Addresses

C4000 requires access to specific Uniform Resource Locators (URLs), commonly referred to as web addresses. Access to many of these web addresses is required during installation; access to other web addresses, such as the address for the Network Time Server (NTS) is required during runtime. The Information Technology (IT) department for the site must whitelist the web addresses so that they can be easily accessed as needed.

The following table lists the URLs that must be whitelisted.

Table 1. Whitelisted Web Sites

URL	Description
http://hostedactivation.com (specifically, http://hostedactivation.com/bogen)	Required for C4000 License support
http://downloads.digium.com	Required for updates from Digium
http://downloads.asterisk.org/ (specifically, http://downloads.asterisk.org/pub/ telephony/sounds/releases)	Required for Asterisk updates
http://www.pjsip.org/	Required for PJSIP updates
http://ftp.us.debian.org (specifically: http:// ftp.us.debian.org/debian/) http://deb.debian.org/debian/ https://deb.debian.org/debian/	Required during Linux package updates
http://security.debian.org (specifically: http://security.debian.org/)	Required during Linux package updates
stun01.sipphone.com stun:stun01.sipphone.com	Required for STUN based IP address resolution (This is used by the C4000 Web UI and should be enabled on the computer that runs the web UI.)

Table 1. Whitelisted Web Sites (Continued)

URL	Description
https://raw.githubusercontent.com/	Serves unprocessed versions of files stored in the GitHub repositories.
http://2431612419.airable.io https://2431612419.airable.io	airable URL for Internet-based-radio Audio Distribution
http://api.sound-machine.com https://api.sound-machine.com	SOUNDMACHINE URL for Internet-based-radio Audio Distributions
http://api.bogenedu.com/api/customers	Required for C4000 Warranty Support
http://bogen-ssu.bogen.com/	Bogen System Software Update server – Required for automatic Nyquist server software and Nyquist firmware software update notifications and downloads.
https://www.weather.gov/alerts	Required for displaying weather alerts.
https://ipapi.co	Required for automatically finding county code for alerts.
https://api.weather.gov	Required for obtaining alerts from the National Weather Service.
ns1.google.com resolver1.opendns.com	Required for obtaining the Nyquist server's public IP address for Audio Distribution streams and for automatically finding the county code for alerts.
dl-ssl.google.com	Required for Nyquist installation and updates to download and install Google Chrome browser.
linux.teamviewer.com	Required for Nyquist installation and updates to download and install TeamViewer software.

URLs that are entered on the C4000 System Parameters page are used during runtime and include the URLs for the NTS, the Session Traversal Utilities for (Network Address Translation (NAT) (STUN) server, and the Traversal Using Relays around NAT (TURN) server.

The default URLs for the STUN and TURN servers are not set. The default URL for NTS is pool.ntp.org.

Nyquist System Server Requirements

The following are the minimum requirements for the C4000 System Server if you elect to not use the Nyquist System Controller (NQ-SYSCTRL):

Table 2. Nyquist System Server Minimum Requirements

OS	Debian Linux OS (AMD 64-bit version) release 10.6
	Note: Refer to the most up to date release notes on the website (www.bogen-ip.com) for details about which Linux OS versions have been tested for use with the Nyquist system.
CPU	Quad-core Intel-based processor running at 3.0 GHz or higher
Hardware	Sound card with microphone port
Memory	8 GB RAM (Error Correcting Code (ECC) RAM is recommended for increased performance and reliability.)
Disk Storage	One 250 GB disk drive
	Some form of hardware-based RAID is recommended for redundancy and high availability.
	Consider using a larger drive if large amounts of audio (for example, voice mail, announcements, recordings, and music) are being stored on the system. Note that music, tones, and announcements created or stored as .wav files will be larger than if created or stored as MP3 files. Other factors that should be considered are:
	• How often will backups be performed?
	• Will the system be backed up locally or remotely on a detachable drive, Storage Area Network (SAN)/Network Attached Storage (NAS), or Network File System (NFS)?
	• How many users will have voicemail ability?
	• How long will voicemail messages be stored?
	• Will voicemail messages be part of the local system backups?
NIC	10/100/1000 MB Ethernet port (NIC is an acronyn for Network Interface Card)

Table 2. Nyquist System Server Minimum Requirements (Continued)

PCI Expansion Slots   One or more Peripheral Component Interconnect (PCI)/PCI Express (PCIe) slot if telephony network connectivity other than, or in addition to, SIP trunking is required; contact your Bogen Distributor for assistance in determining these telephony hardware needs.

Telephony Interfaces   One or more PCI/PCIe type third-party telephony interface cards (for example, Foreign Exchange Office (FXO), Foreign Exchange Subscriber (FXS), etc.) if telephony network connectivity other than, or in addition to, Session Initiation Protocol (SIP) trunking is required; contact your Bogen Distributor for assistance in determining these telephony hardware needs.

Network Application Services

Required application services will be installed automatically on the C4000 system server as part of the C4000 installation. All other listed network services must be already present or installed manually on the associated network. The following table lists the services and their locations:

Table 3. Network Application Services

Service	Description	Required	Location
Apache	Used as the web server to drive the C4000 web interface.	Mandatory	C4000 System Controller
DHCP	Supplies dynamic IP addresses to the C4000 System Controller and associated devices. (DHCP is the acronym for Dynamic Host Configuration Protocol.) It also supplies the Trivial File Transfer Protocol (TFTP) server IP address or host name to devices on the network via option_66.	Optional	Network

Table 3. Network Application Services (Continued)

Service	Description	Required	Location
DNS	Resolves host names to IP addresses. DNS is an acronym for Domain Name System, a hierarchical naming system for computers, servers, or other resources connected to either the Internet or to a private network.	Optional	Network
ICE STUN TURN	Resolves IP addresses behind Network Address Translation (NAT)/ firewall. - Interactive Connectivity Establishment - Session Traversal Utilities for NAT - Traversal Using Relays around NAT	Optional	C4000 System Controller/ Network
NTP	Provides date/time synchronization for the C4000 System Controller and the associated devices (IP Phones, appliances). (NTP is an acronym for Network Time Protocol.)	Mandatory	Network
SNMP	Provides the C4000 Linux server statistics via Simple Network Management Protocol (SNMP) v1 through Port 161.	Optional	C4000 System Controller
TFTP	TFTP is used by IP phone and C4000 device provisioning. A TFTP server runs on the C4000 System Controller on port 69 (the standard TFTP port #). Device provisioning files are stored on the C4000 System Controller in directory: `/srv/tftp`. This is the only directory exposed by the TFTP server.	Mandatory	C4000 System Controller

Network Ports

The following table lists the network ports required by the C4000 system controller and the associated devices.

Table 4. Network Ports Used by C4000

Service	Description	Port
Automatic Failover	Local ports used for Automatic Failover support. These only need to be available between the two servers.	5405,2224,3121
DHCP	Dynamic Host Configuration Protocol (Optional)	67, 68
DNS	Domain Name System (Optional)	53
DUNDI	Distributed Universal Number Discovery	4520
HTTP	Phone provisioning (HTTP is an acronym for Hypertext Transfer Protocol)	8088
HTTP	Provide access to Bogen product information	80
HTTPS	Secure HTTP	8089
HTTPS	Secure HTTP (HTTP over TLS/SSL); used to provide access to Bogen product information.	443
IAX	C4000 Inter-Facility Communications	4569
MGCP	Media Gateway Control Protocol (Optional)	2727
NTP	Network Time Protocol	123
ODBC	Database connection (ODBC is an acronym for Open Database Connectivity.)	3306
RTP	Audio Streams (RTP is an acronym for Real-Time Transport Protocol.)	10000-20000
Server Management	Local port used for server management DO NOT allow outside access to this port. During C4000 system controller installation, an IP filter rule is installed to block outside access to this port.	5038
SFTP	Provide access to Bogen product information.	22
SIP	Session Initiation Protocol (SIP) Transfer Control Protocol (TCP)/User Datagram Protocol (UDP) connections	5060
SIP over Web Services	SIP WS/WSS connections	8088
SNMP	Simple Network Management Protocol (Optional)	161
TFTP	TFTP connections	69

Using the Web-Based User Interface

The web-based UI is an interactive dashboard that presents system information and parameters in an easy to read and use format. The view of the dashboard varies depending upon the permissions (i.e., role) assigned to the user. See "Accessing the Dashboard" on page 12.

Client Requirements

The Nyquist web-based UI is accessed through a client, which can run on PCs, tablets, and Android, Apple, and Windows mobile devices that support the full Google Chrome web browser. In addition to supporting Chrome, the client must have a sound card, a microphone port, and the Certificate Authority (CA) that issued the server's Secure Sockets Layer (SSL) certificate, also known as a digital certificate.

The server's digital certificate is sent to the client (e.g., a web browser) to authenticate the identity of the C4000 web server. The client then uses the CA to authenticate the server's digital certificate, which verifies that the client is connecting to a valid server. If you do not install the CA, the browser will display a warning that it was unable to authenticate the server by displaying a red "Not secure" warning immediately to the left of the browser's address bar when you attempt to access the C4000 system server.

Installing Certificate Authority on Windows System

To download and install the Certificate Authority on a Windows device:

1   From your Chrome browser, type `http://<server>/ssl/bogenCA.crt` in the address bar, where <server> is the Nyquist system server's IP address (for example, `http://192.168.1.0/ssl/bogenCA.crt`).

2   Select the downloaded file and select **Open**.

3   Select Open when prompted with "Do you want to open this file?"

4   Select the **Install Certificate...** button. The Certificate Import Wizard starts.

5   Select **Current User**, and then select **Next**.

Note: To allow all users on this Windows client to access the Nyquist server, select **Local Machine** instead of **Current User**. You may be prompted for administrator credentials.

6   Select "Place all certificates in the following store", then select **Browse**.

7   Select **Trusted Root Certification Authorities**, and then select **OK**.

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8 Select **Next**.

9 Select **Finish**.

10 Restart the Chrome browser and log in to the C4000 web server.

Note: You can also download and install the Certificate Authority using a PowerShell command prompt or script, which involves fewer steps.

Execute the following PowerShell commands, replacing *<server>* with the IP address of the Nyquist server:

- `Invoke-WebRequest -Uri http://<server>/ssl/bogenCA.crt -OutFile $env:TEMP\bogenCA.crt`
- `Import-Certificate -CertStoreLocation cert:\CurrentUser\Root -FilePath $env:TEMP\bogenCA.crt`

These commands install the CA into the CurrentUser certificate store, which only applies to the current user. To install for all users on this machine, which requires administrator privileges to execute, replace **CurrentUser** with **LocalMachine** in the preceding commands.

These commands can also be executed remotely using PowerShell Remoting, which may be helpful if the certificate needs to be installed on many client machines.

Installing Certificate Authority on Mac System

To download and install the Certificate Authority on a Mac:

1 From your Chrome browser, type `http://<server>/ssl/bogenCA.crt` in the address bar, where <server> is the Nyquist system server's IP address (for example, `http://192.168.1.0/ssl/bogenCA.crt`).

2 Save the downloaded bogenCA.crt file to the desktop.

3 Double-click the certificate file on the desktop.
The Keychain Access App opens.

4 Double-click the certificate to reveal the trust settings.

5 Change the top trust setting to **Always Trust**.

6 Close the Trust Setting window and enter the computer administrative password to save.

7 Restart the Chrome browser and log in to the Nyquist web server.

Installing Certificate Authority on an Android Device

> *Note:* The Android device WiFi must be connected to the same network as the C4000 system server.

To download and install the Certificate Authority on an Android device:

1   From your Chrome browser, type `http://<server>/ssl/bogenCA.crt` in the address bar, where <server> is the Nyquist system server's IP address (for example, `http://192.168.1.0/ssl/bogenCA.crt`).

2   When prompted, select **Download**.

3   If prompted, verify your identity and enter your Personal Identity Number (PIN).

4   Type the certificate name and select **OK** to install it.

5   Verify the installation by selecting **Settings > Lock Screen and Security > Other Security Settings** >**View Security Certificates**.

6   Select the **User** column, select the certificate, and then select **Certificate details**.

Installing Certificate Authority on an iOS Device

> *Note:* The iOS device WiFi must be connected to the same network as the C4000 system server.

To download and install the Certificate Authority on an iPhone Operating System (iOS) device:

1   From your Chrome browser, type `http://<server>/ssl/bogenCA.crt` in the address bar, where <server> is the Nyquist system server's IP address (for example, `http://192.168.1.0/ssl/bogenCA.crt`).

2   Select **Continue**.

3   When the Install Profile window appears, select **Install**.

4   When the Warning screen appears, select **Install**.

5   Select **Install** again to install the profile.

6   Select **Done**.

7   Verify the installation by selecting **Settings > General > Profile**.

8   Select **Details**.

9   Select the certificate.

Accessing the Dashboard

> *Note:* Do not use third-party Chrome browser extensions with the Nyquist user interface.

To access your dashboard:

1 From your Chrome browser, type the C4000 System Controller's IP address in the address bar (for example, `https://192.168.1.0`) and press **Enter.**

2 On the Login page, type your username and password. (See *Figure 3, "Login Page".*)

3 Select **Login**.
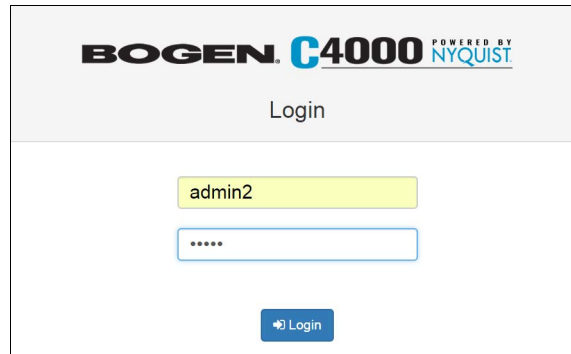
Figure 3. Login Page
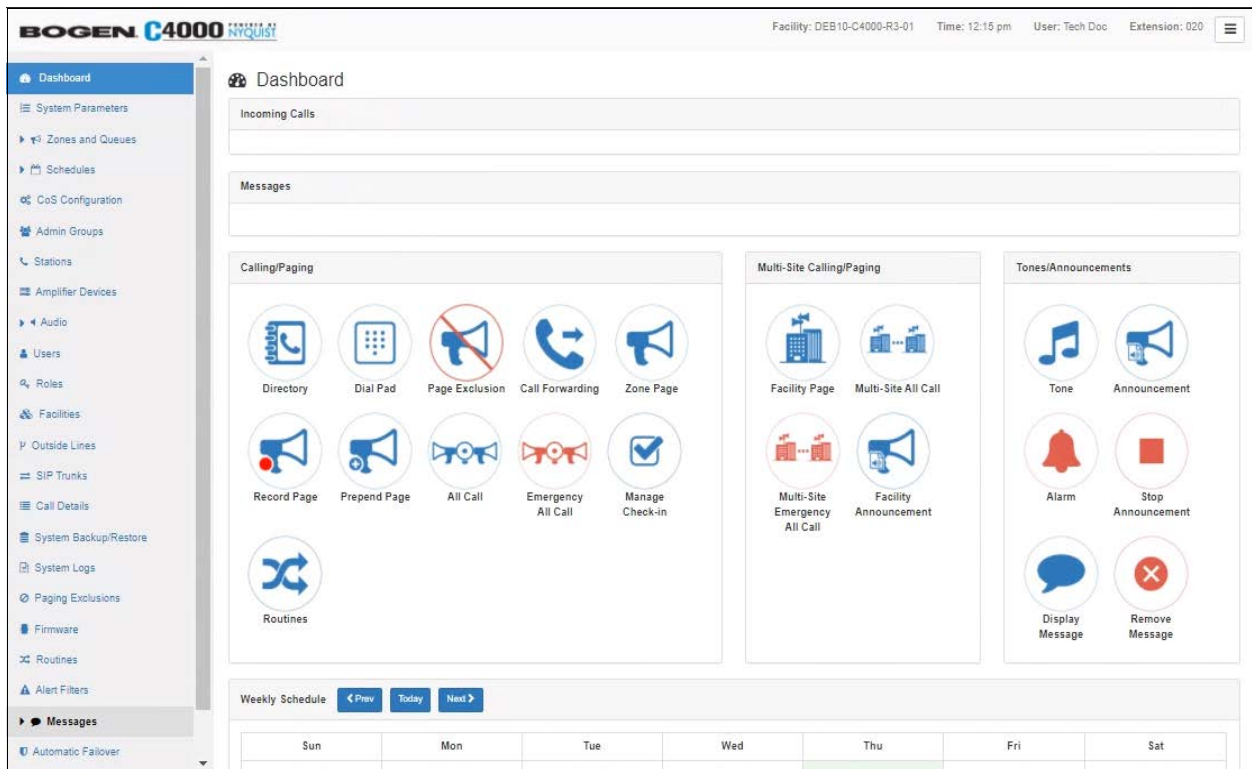
Figure 4. C4000 Dashboard

Note: The Nyquist system does not support opening multiple instances, or tabs, of the Nyquist Web UI for the same user.
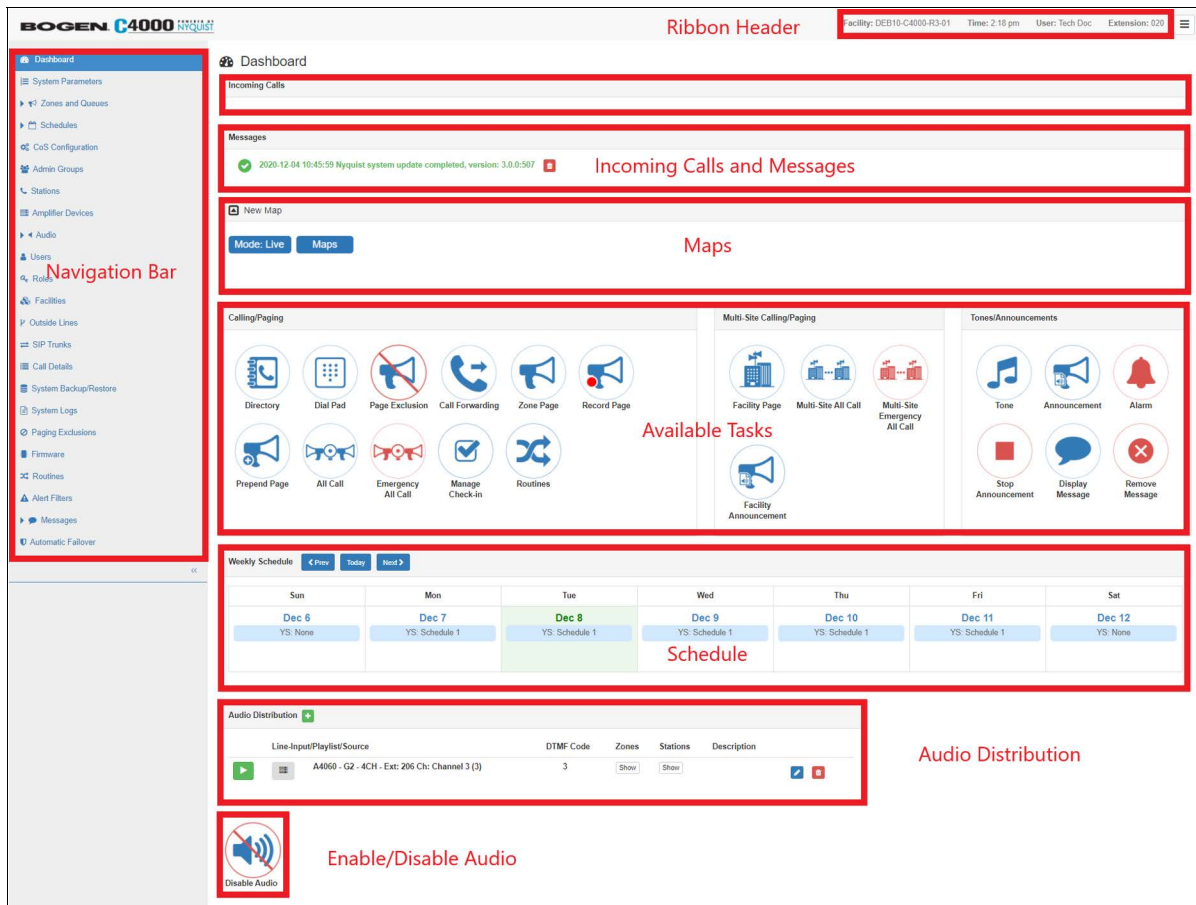
Figure 5. Dashboard Areas

The left side, or navigation bar, of the dashboard (*Figure 5, "Dashboard Areas"*), lists the areas of the C4000 system that you can access. Accessibility to C4000 features and functionality is controlled by the user's assigned role.

The right header ribbon provides the facility name, server time in hours and minutes, the username for the account and the extension for the station. The facility name and time will not appear if the screen is reduced in size, such as when viewing from a phone or tablet.

Incoming Calls and Messages appear on the top right dashboard pane. The Maps Panel appears below the Messages Panel.

When Maps is licensed and configured for a C4000 system, you can view the Maps Panel from the Dashboard. The panel appears below the Messages Panel.

The majority of the dashboard is set up to allow you to perform communications activities, view this week's schedules, and perform audio distribution.

The navigation bar does not appear for those users not authorized to make changes to the C4000 configuration. Instead, those users see only common tasks, such as calling an

extension. See "*Performing Tasks via the Dashboard" on page 338* for details about tasks that office staff commonly perform.

At the top of the dashboard, messages appear that can provide information about your system, such as any stations or devices that were connected to your server but now are not appearing to be connected or responding. (See "*Dashboard Messages" on page 331*.)

On the lower part of the dashboard are options for Audio Distribution and an **Enable/ Disable Audio** button that you can toggle to enable or disable audio.
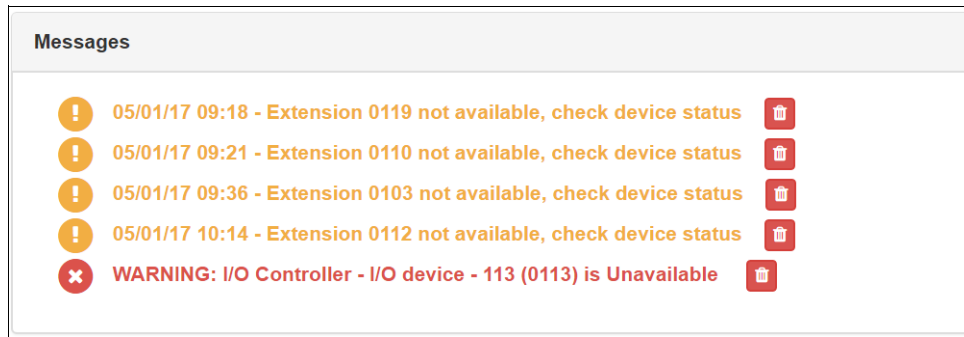
Figure 6. Dashboard Messages

For detailed information about performing tasks from the dashboard, see "*Performing Tasks via the Dashboard" on page 338*.

Making UI Selections

You can navigate and make UI selections by either using a mouse click or using touch-screen functionality. The UI provides buttons, which appear with a name and a graphic, and icons, which are graphics only.

Table 5. UI Icons

Icon	Description
	Add icon – Add an item.
	Edit icon – Edit an item.

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Table 5. UI Icons (Continued)

Icon	Description
🗑	**Delete** icon – Delete an item.
ℹ	**Information** icon – Provides additional information, such as viewing release notes for firmware (see *"Viewing Release Notes for Firmware" on page 120*).
↗	**Link** icon – Links to a web page that contains related information or functionality.

Configuring C4000

The following table provides the suggested order for setting up your system and directs you to specific sections of the C4000 documentation for step-by-step instructions.

Table 6. C4000 Setup Tasks

Task	Reference
Configure the servers for Automatic Failover, if the appropriate license has been purchased.	See *"Automatic Failover Configuration" on page 75*.
Set the dialing length and other System Parameters to the desired values.	See *"Setting System Parameters" on page 54*.
Set the Class of Service (CoS) configurations.	See *"Adding CoS Parameters for a Station" on page 93*.
Determine the number of Admin Phones and Web Admin stations and configure these stations.	See *"Adding a Station" on page 173*.
Determine the number of Admin Groups, if any, that you need and create them.	See *"Adding an Admin Group" on page 226*.

Table 6. C4000 Setup Tasks (Continued)

Task	Reference
If outside lines are being used, use the Discover Ports feature to configure outside lines and enable outside access for stations authorized to make or receive outside calls.	See *"Discover Ports" on page 115* and *"Editing Station Configuration Settings" on page 142*.
If staff IP phones will be used, determine how many are planned and configure these stations.	See *"Adding a Station" on page 173*.
If needed, configure the roles for the Web Admin interface.	See *"Adding a Role" on page 215*.
If needed, configure the users for the Admin Web Interface.	See *"Adding a User" on page 221*.
Use Nyquist DHCP Server for initial discovery of Nyquist appliances and VoIP phones.	See *"DHCP Server" on page 51*.
If using VoIP speakers, I/O Controllers, MMPAs, VoIP Intercom Modules, or Audio Power Amplifiers, configure the stations using C4000's Auto Discovery feature.	See *"Adding a Station" on page 173*.
Configure page, time, and audio zones and assign stations to these zones.	*Note:* If you want tones to interrupt active pages, you must create separate page and time zones and the time zones must be created first. Creating time zones first sets the priority of time zones over page zones. Stations can be in multiple zones. See *"Adding a Zone" on page 195*.
If using tones to announce an alarm or an event, define the tones that will be available for C4000.	See *"Adding Tones" on page 302*.
If using playlists with C4000, create playlists and download songs.	See *"Adding Songs" on page 260* and *"Creating a Playlist" on page 265*.
Define the site start and end dates.	See *"Reviewing and Editing a Schedule" on page 232*.

Table 6. C4000 Setup Tasks (Continued)

Task	Reference
Configure events for schedules, including tones and Scheduled Audio.	*Note:* If you want tones to play during active pages, you must create separate page and time zones and the time zones must be created first. Creating time zones first sets the priority of time zones over page zones. Stations can be in multiple zones. See *"Adding an Event" on page 237*.
Schedule holidays.	See *"Adding a Holiday" on page 245*.
If a SIP trunk is being used, add the SIP trunk configuration to C4000, configure the station to use the SIP trunk for 911 calls, and add the SIP registration password to the station parameters.	See *"Adding SIP Trunk Configuration Parameters" on page 99* and *"Editing Station Configuration Settings" on page 142*.
If the C4000 system server will manage multiple facilities, add each facility to the C4000 system.	See *"Adding a Facility" on page 126*.

Getting Help

Help is available through the C4000 Admin Web UI and through Bogen's Technical Support. Technical Support is available between 8:30 am and 6:00 pm, and on-call until 8 pm, Monday through Friday. Technical Support contact information is as follows:

> Tel: 1-800-999-2809
> Fax: 201-934-6532
> Email: Bogen Technical Support at applications@bogen.com

Online help is accessed from the menu that appears in the upper right portion of the Admin Web UI's navigation pane. The menu contains the following options:

- **About** – Displays the version number and contact information for Bogen Communications, Inc.

- **Help Topics** – Provides help topics on using the C4000 system.

- **Admin Manual** – Accesses the PDF of this manual.

- **Logout** – Logs you out of the C4000 system.

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Configuring Your System

The Admin Web UI allows you to configure most of your Nyquist system, set passwords for the system and various system features, and gracefully restart or power down the Nyquist server through **System Parameters** (see "*Setting System Parameters" on page 54*). System configuration also includes the following:

- Setting parameters for what actions can be done from a specific station (see "*Using CoS Configuration" on page 89*)

- Setting what permissions are assigned to a user (see "*Managing Roles and Users" on page 213*)

- Configuring facilities for a multi-site server (see "*Configuring Facilities" on page 122*)

- Setting up stations and zones (see "*Managing Stations, Zones, and Queues" on page 128*)

- Updating firmware for Nyquist devices and stations (see "*Configuring Firmware" on page 115*)

- Setting parameters for SIP trunks (see "*Managing SIP Trunks" on page 93*)

- Disabling an outside line (see "*Editing Outside Lines" on page 112*)

Understanding System Parameters

System parameters include key information that is unique to the system, including passwords, night ring characteristics, and telephony settings. (For more information on night ring behavior, see "*Setting Night Call Options" on page 28*.)

Viewing System Parameters

Viewing system parameters can aid in troubleshooting. For example, if your calls are not being routed to the proper day or night Admin Station, you should check that the system parameters settings for day start and night start time are correct.

Figure 7. System Parameters Page

To view System Parameters:

 From the navigation bar, select **System Parameters**.

The System Parameters page appears.

Using the System Parameters Page

From the System Parameters page, you can view many of the settings for the entire facility and perform the following tasks:

*   Export a report. (See *"Exporting a Report" on page 29*.)

*   Enter a product or feature license. (See *"Product License Activation Key" on page 32* or *"Appendix C: C4000 Software Licenses" on page 497*.)

*   Sort the menu. (See *"Changing the Navigation Bar Order" on page 36*.)

*   Restart the server. (See *"Restarting the Server" on page 36*.)

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- Monitor stations and set station supervision criteria. (See *"Station Supervision" on page 37*.)

- Configure settings for Simple Mail Transfer Protocol (SMTP) email notifications. (See *"Email Configuration" on page 40*.)

- Perform a system update. (See *"Performing a System Update" on page 42*.)

- Configure Automatic Software Download. (See *"Configuring Automatic Software Download" on page 46*.)

- Shut down the server. (See *"Shutting Down the Server" on page 49*.)

- Check internet site access. (See *"Check Internet Site Access" on page 49*.)

- Check the server status. (See *"Check Server Status" on page 50*.)

- Configure the local DHCP server. (See *"DHCP Server" on page 51*.)

The following table details the parameters that you can view from the System Parameters page:

Table 7. System Parameters Page

Name	Specifies the name given to the entire facility. The name can be up to 30 characters.
Day Start	Identifies when the system switches to its "Day" mode of operation and specifies the time period for which the day Admin Station is active. Telephones with night-only outside line access are prevented from placing outside line calls during this time. Valid times range from 00:00 to 23:58, but must be less than the Night Start time.
Night Start	Identifies when the system switches to its "Night" mode of operation and specifies the time period for which the night Admin Station is active. During this time, telephones with the night-only outside line access can place outside line calls. Valid times range from 00:01 to 23:59; but must be larger than the Day Start time.
Emergency-All-Call Multicast RTP IP Address	Identifies the IP address to use for multicast RTP paging for Emergency-All-Call. Receiving IP telephones must also have this IP address configured. Emergency all-call is a top priority all-call page. An all-call page is a simultaneous page to all speakers within a facility.
Emergency-All-Call Multicast RTP Port	Identifies the RTP port to use for multicast RTP paging for Emergency-All-Call. Receiving IP telephones must also have this RTP port configured.
Emergency-All-Call Cut Level (dB)	Sets the cut volume for Emergency-All-Call audio. The cut volume range is 0 to -42.

Table 7. System Parameters Page

All-Call Multicast RTP IP Address	Identifies the All-Call Multicast RTP IP address. Receiving IP telephones must also have this IP address configured.
All-Call Multicast RTP Port	Identifies the RTP port to use for multicast RTP paging for All-Call. Receiving IP telephones must also have this RTP port configured.
All-Call Cut Level (dB)	Sets the cut volume for All-Call audio. The cut volume range is 0 to -42.
Audio Distribution Multicast IP Address	Identifies the RPT multicast IP address to use for audio distribution to all stations. For more information about audio distribution, see *"Managing Audio" on page 253*.
Audio Distribution Multicast Port	Identifies the RPT multicast port to use for audio distribution to all stations.
Audio Distribution Cut Level (dB)	Sets the cut volume for audio distributions played to all stations (All Speakers). See *"Using Audio Distribution" on page 360* for information on controlling audio distribution played to zones. The cut volume range is 0 to -42.
Default Cut Level (dB)	Defines the default cut volume level for a new zone. The cut volume range is 0 to -42. For information about zones, see *"Viewing Zone Information" on page 194*.
Ambient Noise Sensor Multicast IP Address	Identifies the multicast IP address to use by ambient noise sensors (ANSs) to send volume data.
Ambient Noise Sensor Multicast Port	Identifies the multicast port number to be used by ANSs to send volume data.
Network Time Server	Identifies the IP address or the domain name of the NTP server to be used.

Table 7. System Parameters Page

Appliances Network Time Server Source	Identifies the time source for all appliances on the Nyquist network. The appliances may use one of the following sources: • nyquist When this option is selected, all Nyquist appliances will use the Nyquist system server as the NTP server; this is the default option. • dhcp When this option is selected, all Nyquist appliances will use the NTP server provided via DHCP Option 42. If the built-in Nyquist DHCP Server feature is being used, all Nyquist appliances will use the Nyquist server for NTP service via the Server IP Address. • ntpserver When this option is selected, all Nyquist appliances will use the Network Time Server defined in System Parameters.
Time Zone	Sets the time zone for the server.
Disable Preannounce Tone	Indicates if the preannounce tone is disabled. If disabled, the tone is not heard when connecting to a speaker or prior to a page.
Privacy Beep	Indicates if the privacy beep feature is on.
Use Network Time Server defined by DHCP	When enabled, the Network Time Server will be defined by DHCP.
Emergency Tone	Identifies the preannounce tone played before an Emergency-All-Call is made.
All Call Tone	Identifies the preannounce tone played before an All-Call is made.
Intercom Tone	Identifies the preannounce tone played before an intercom call is made.
Dialing Length	Specifies the number of digits required to dial within the system. Valid values are 3, 4, 5, or 6. If you change the dialing length, all Nyquist appliances and IP phones must be rebooted. A system backup is automatically created.

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Table 7. System Parameters Page

Default Codecs Allowed	Provides the default list of media CODECs to be used. A CODEC, or coder-decoder, is a device or computer program for encoding or decoding a digital data stream or signal.
Admin Queue Timeout	Specifies the maximum amount of minutes that a call switch or handset station can remain in an administrative queue. When the time is exceeded, the call switch or handset station is removed from the queue. Valid timeout values range from 1 to 999 minutes.
Night Ring Enabled	Indicates if a night ring is enabled. When enabled, you can optionally set a **Night Ring Admin** and option set one additional option from the following list: • **Night Ring All Stations** • **Night Ring Admin Group** • **Night Ring Zones** (For more information on night ring behavior, see "*Setting Night Call Options" on page 28*.)
Night Ring Admin	Identifies the specific Admin Station that handles outside line calls received during night hours. Outside line calls not answered with 15 seconds trigger ringing to all or selected stations. If **Night Ring Admin** is the only option set, then the specified Admin extension rings for 30 minutes and hangs up if the call is not answered within that time. *Note:* If **Night Admin** is also included in the call, both **Night Admin** and **Night Ring Admin** ring. An analog phone cannot be used as a Night Ring Admin even if the station has the admin Class of Service (CoS) enabled.
Night Ring All Stations	Indicates if all stations receive night rings during night hours. When enabled, any ringing station can answer the call. The specified stations will ring for up to 30 minutes, then hang up if the call is not answered within that time. *Note:* NQ-P0100 Matrix Mixer Pre-Amp stations will also ring.
Night Ring Admin Group	Identifies the Admin Group that handles outside line calls received during night hours. The Admin Group is called if the **Night Admin** and **Night Ring Admin** do not answer within 15 seconds. The specified stations will ring for up to 30 minutes, then hang up if the call is not answered within that time.

Table 7. System Parameters Page

Night Ring Zones Identifies which zones receive night rings when outside calls are received during night hours. The specified stations will ring for up to 30 minutes, then hang up if the call is not answered within that time.

Server IP Address Identifies the server's IP address. To change the server's IP address, select **Change Server IP Address** and then select the correct IP address from the menu that appears.

Parking Lot Defines the range of numbers to use for call parking. The first number listed is used to initiate call parking, which is a feature that allows you to put a call on hold at one telephone set and continue the conversation from any other telephone set.

Record Monitoring Indicates if call and location monitoring will be recorded.

Table 7. System Parameters Page

Emergency Link	Specifies the station that functions as the system's Emergency Link Station. An Emergency Link Station is the station that an emergency call (but not a 911 call) is routed to if the station's associated Admin Station is busy, rejects the call, or fails to answer within 15 seconds. A value of 999 means that this feature is disabled.
	If the Emergency Link Station is a ringable device (e.g., a Nyquist phone), the station will ring and the call will be displayed on the station's display (if so equipped) as an "Emergency Call."
	If the Emergency Link Station is not a ringable device (e.g., a Nyquist VoIP speaker), the station will auto-answer, pre-announcing the call as an "Emergency," and the Admin Station will continue to ring. The Admin Station can retrieve the call by answering it, and the Emergency Link Station device will then drop the call.
	As with any Emergency Call, all calls to an Emergency Link Station will be recorded.
	Note: The Emergency Link feature is not supported during the day for any station that has "Day Admin" set to "Admin Group"—nor during the night if "Night Admin" is set to "Admin Group"—as there would be no associated Admin Station from which to recover (i.e., to test for busy signal, call reject, etc.). If this feature is required for the Day or Night period, do not use the "Admin Group" setting for that period.
Max Restricted Digits	Specifies the maximum number of digits that can be dialed if a station has been assigned restricted outside line access.
CDR Storage Duration	Identifies the number of days that a record of call details will be kept. CDR is an acronym for Call Detail Record. The maximum value for CDR Storage Duration is 365.
Trunk Priority	Identifies the first trunk type to use for placing outbound calls.
Bump on Emergency	Indicates if emergency calls to the Admin Station will bump existing non-emergency calls.
Bump on 911	Indicates if outbound calls to 911 will bump trunk calls if no available outbound trunk is available.

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Table 7. System Parameters Page

Allow Local Emergency-All-Call Page Interrupt	When enabled, allows a locally initiated Emergency-All-Call page to interrupt an ongoing Multi-Site-Emergency-All-Call page or Emergency-All-Call page, after entering the system PIN code.
Allow Multi-Site-Emergency-All-Call Interrupt	When enabled, Emergency-All-Call pages can be interrupted by Multi-Site-Emergency-All-Call pages.
Auth Code	Allows you to enable additional features on a telephone when the walking CoS feature is enabled. The four-digit code activates features from the associated phone to the phone being used. (Auth is an abbreviation for Authorization.) If set to 0000, the walking CoS feature is disabled.
Call Assurance Audio	Identifies the audio to be played to the caller to indicate that the call has been placed.
Remote Facility CoS	Identifies the CoS for remote facility access.
Facility Password	Identifies the password to be used by facility servers that are registering with this server. The maximum password size is 12 characters.
RTP Start Port	Identifies the start port number for UDP RTP traffic. The default is 10000.
RTP End Port	Identifies the stop port number for UDP RTP traffic. The default is 20000.
Enable RTP Checksums	Indicates if UDP checksums are enabled for RTP traffic.
Enable ICE Support	Indicates if ICE support is enabled.
	Note: Disabling ICE support could result in audio issues when making calls using the Web Interface.
STUN Server	Identifies the host name or IP address for the STUN server that is used when determining the external IP address and port for an RTP session. (Port number is optional.) If omitted, the default value of 3478 is used.
TURN Server	Identifies the host name or IP address for the TURN server that is to be used as a relay. (Port number is optional.) If omitted, the default value of 3478 will be used.
TURN Username	Identifies the user name used to authenticate with the TURN server.

Table 7. System Parameters Page

TURN Password	Identifies the password used to authenticate with the TURN server.
Retention Recordings	Identifies the number of days to retain recordings. Recordings that are older than the retention period are automatically deleted.
Backup Retention System	Identifies the number of days to retain system backup files. System backups that are older than the retention period are automatically deleted, provided at least one system backup file remains.
Backup Retention Recordings	Identifies the number of days that backups of recordings are retained. Backups that are older than the retention period are automatically deleted.
Backup Retention Voicemail	Identifies the number of days that voicemail backups are retailed. Backups that are older than the retention period are automatically deleted.
Disable Emergency All-Call and Intercom when Audio Disabled	If **Audio Disabled** is enabled (see "*Enabling and Disabling Audio" on page 364*), this indicates whether or not Emergency All-Call and Intercom calls will also be disabled.

Setting Night Call Options

The way outside calls received during nighttime hours are handled depends on how you set up the Night Ring options on the System Parameters page. (See "*Using the System Parameters Page" on page 20*.) The following diagram illustrates how settings for these options affect night calls.
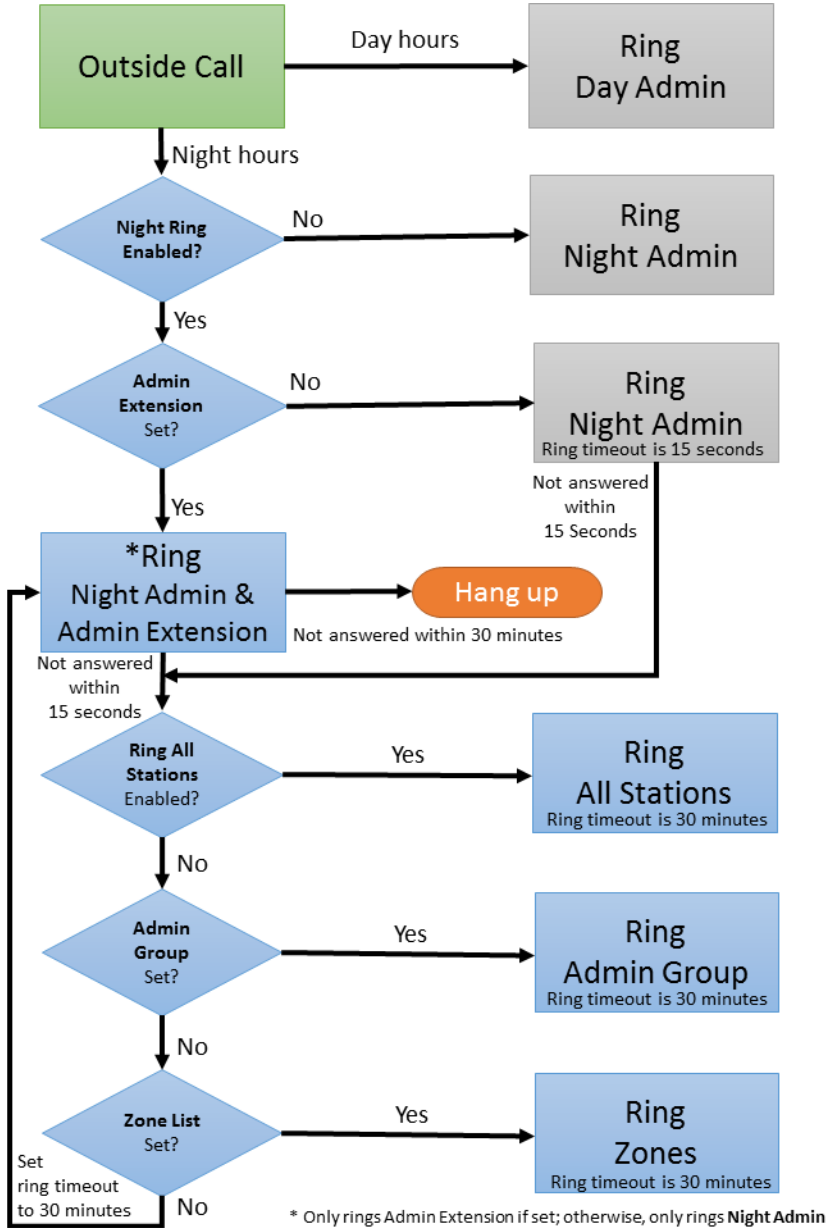
Figure 8. Night Ring Options

Exporting a Report

The Export Report feature creates a Microsoft Excel spreadsheet with tabs for each section of configurable variables such as, System Parameters, Zones, and Stations.

To export a report:

1   From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Export Report**.

3 When the **Excel** icon and report name appear in the lower left section of the System Parameters page, select the report. (See "*System Parameters Page with Excel Icon" on page 30*.)

4 You can also select the **Show all** button in the lower right of the page, and then select the report that you want to view.
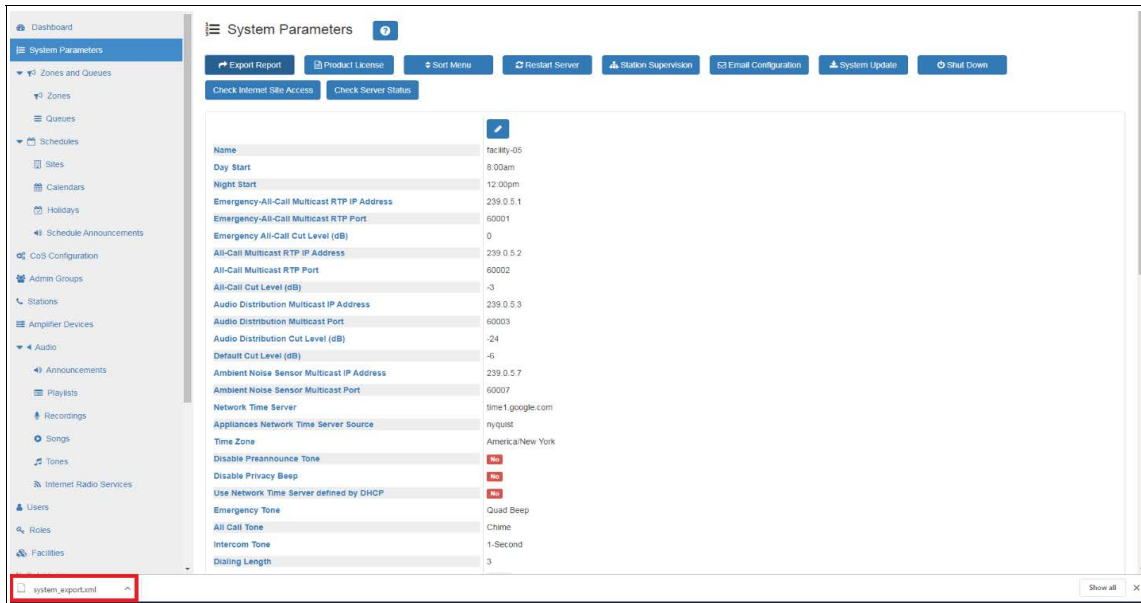
Figure 9. System Parameters Page with Excel Icon

Number	Extension	Name	Descriptio	Icon	Preannou	Type	Type Desc	Volume	Multicast	Multicast	Stations
1	00000991	Bldg 1	Test Zone	bullhorn		Paging+T	This zone	5	239.0.2.10	6010	101, 102, 103, 104, 110
2	00000992	Bldg 2	Test Zone	bullhorn		Paging+T	This zone	5	239.0.2.20	6020	120, 121, 122, 123, 124
3	00000993	Bldg 3	Test Zone	bullhorn		Paging+T	This zone	5	239.0.2.30	6030	107, 129, 131
4	00000994	Gym	Test Zone	bullhorn		Paging+T	This zone	5	239.0.2.40	6040	125, 126, 127, 128
5	00000995	Outdoor	Test Zone	bullhorn		Paging+T	This zone	5	239.0.2.50	6050	110, 124, 125, 129
6	00000996	All	Test Zone	bullhorn		Paging+T	This zone	5	239.0.2.60	6060	103, 104, 107, 110, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 131, 199
7	00000997	Zone 7	Zone 7	bullhorn		Paging+T	This zone	5	239.0.2.70	6070	300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310
8	00000998	Zone 8	Zone 8	bullhorn		Paging+T	This zone	5	239.0.2.80	6080	311, 312, 313, 314, 315, 316, 317, 318, 319
9	00000999	BBB Zone	BBB Zone	bullhorn		Paging+T	This zone	5	0.0.0.0		199

Figure 10. System Report

When the System Report appears, you can select a tab to view specific configuration settings.

Product License Activation Key

The Product License page allows you to activate, update, or release licenses, check Internet site access, and view current licensing information.
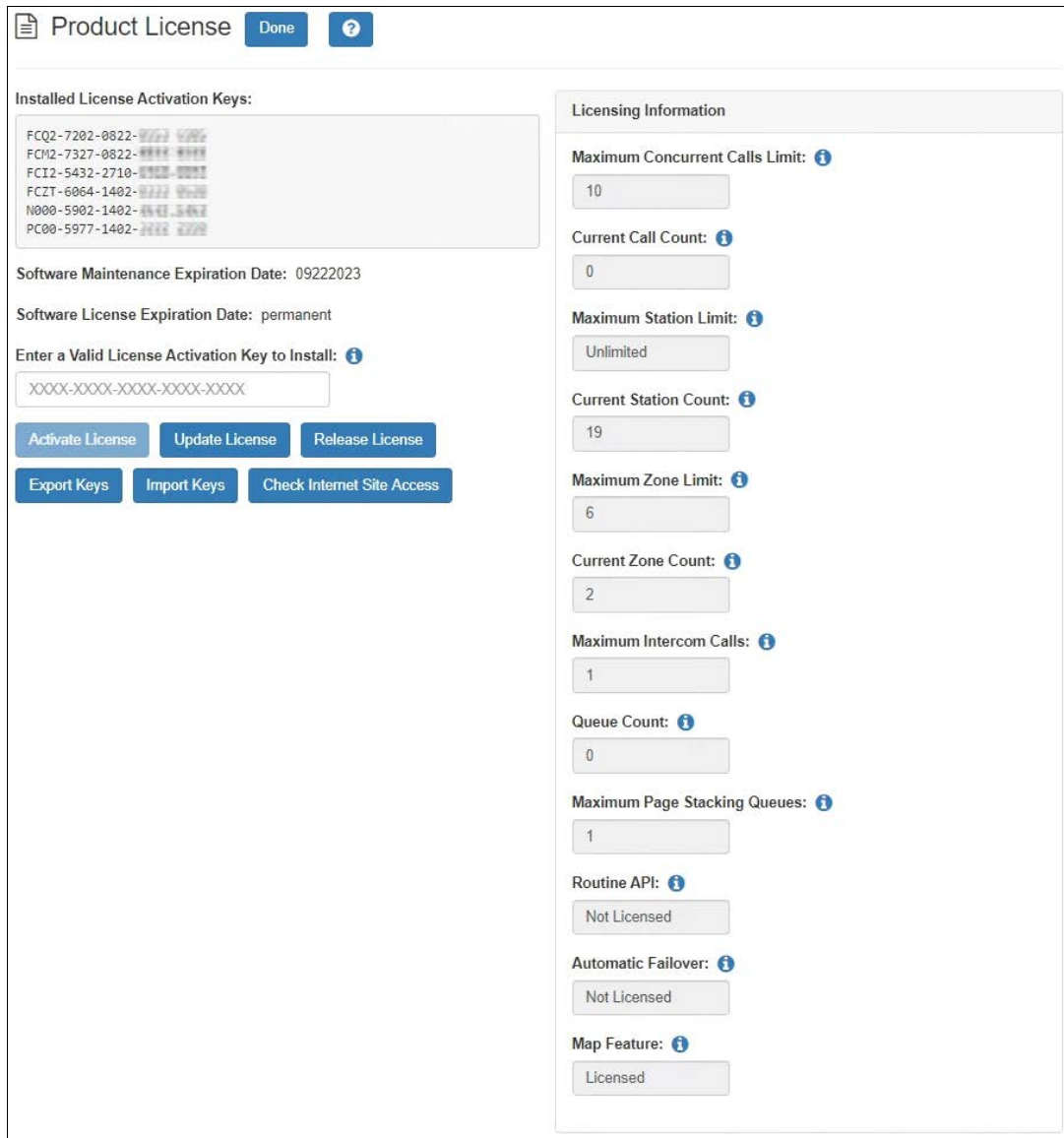
Figure 11. Product License Page

You must enter your product license activation key before you begin configuring the Nyquist system. Without a product license, you can only add a single station.

You can only enter one product activation key. Your product license specifies the number of maximum concurrent calls that can be made and the maximum number of stations that can be added to a system.

The Product License page provides the following information:

Table 8. Product License Parameters

Installed License Activation Keys	Provides the activation keys installed on your server. See *"Understanding Activation Keys" on page 35*.
Software Maintenance Expiration Date	Provides the expiration date in MMDDYYYY format for software maintenance. If software maintenance has expired, then your system will not allow software updates.
Software License Expiration Date	Provides the software license expiration date for demo mode in dd-mmm-yyyy format. This field appears only if you are in demo mode.
Activation Key	Enter the activation key for your product license or for optional features.

The Product License page also provides the following information about your currently installed license:

Table 9. Licensing Information

Maximum Concurrent Calls	Displays the maximum number of concurrent calls allowed. For this field, calls mean telephone calls, pages, tones, alarms, and announcements.
Current Call Count	Displays the number of open calls in the system.
Maximum Station Limit	Displays the maximum number of stations allowed for your licensed system or displays **Unlimited** if your system has no maximum station limit.
	A Nyquist station is a device used to access the web interface, a speaker, a phone, or a Nyquist appliance (except for an I/O Controller.
	If you need to increase your station limit, contact Tech Support.
Current Station Count	Displays the number of stations registered with your Nyquist system server.
Maximum Zone Limit	Displays the maximum number of zones (regardless of type) allowed for your licensed system.
	If you need to increase your zone limit, contact Tech Support.
Current Zone Count	Displays the number of stations registered with your Nyquist system server.

Table 9. Licensing Information (Continued)

Maximum Intercom Calls	Displays the maximum number of concurrent intercom calls allowed for your licensed system.
	If you need to increase this limit, contact Tech Support.
Queue Count	Displays the number of queues created for your system.
Maximum Page Stacking Queues	Displays the maximum number of zone queues allowed for your licensed system.
	If you need to increase this limit, contact Tech Support.
Automatic Failover	Displays **Licensed** if the Automatic Failover license is activated, otherwise is displays **Not Licensed**.
Routines API	Displays **Licensed** if the Routines API license is activated, otherwise it displays **Not Licensed**.
Map Feature	Displays **Licensed** if the Map Feature license is activated, otherwise it displays **Not Licensed**.

To enter a product license activation key:

1 From the navigation bar, select System Parameters.

2 From the System Parameters page, select **Product License**.

3 Type the activation key number.

4 Select one of the following buttons:

Activate License	This button becomes active only when data is entered into the Activation Key field. Select this button to activate the entered Activation Key.
Update License	Select this button to have the Nyquist server re-activate the Nodelocked license for the server. This can be done after **Release License** has been pressed.
Release License	Select this button if you want to release the license, which allows it to be moved to another server.
Export Keys	Select this button to export a list of Activation License Keys to a .tar file that can then be saved to another computer or copied to storage media that can be secured offsite.

Import Keys	Select this button to import stored Activation License Keys if the Nyquist server was replaced.
	Note: If you attempt to import a LAK that has not been released, the activation fails. You must release the nodelock LAK and manually type the nodelock key.
Check Internet Site Access	Select this button to verify that your Nyquist server can access URLs required to run properly, as well as status for the default gateway, Network Time Protocol server, and Domain Name Servers, and to display the Nyquist server's public IP address. For more information, see *"Check Internet Site Access" on page 49*.

5 Select **Done**.

Understanding Activation Keys

Three types of licenses may appear in the **Current Activation Keys** list or be on entered in the **Activation Key** field on the Product License page:

- Nodelocked License Activation Key
- Product License Activation Key
- Feature License Activation Key

A Nodelocked License Activation Key has an **N** in the first position. The Product License Activation Key for C4000 starts with **PC** and is followed by a numeral 0 through 9, depending on the software bundle that was purchased.

The Feature License Activation Key starts with **FC**. The third number in the Feature License Activation Key provides information about the feature purchased as described in the following table:

Table 10. Feature License Key Prefixes

Prefix	Meaning
FCCx	Concurrent Calls Expansion Pack List
FCDx	Software Maintenance Expansion; depending on the option purchased, 1, 3, or 5 years are added to the software maintenance period.
FCIx	Intercom Call License
FCMx	Map-based Paging License
FCQx	Queue Paging / Page Stacking License
FCTx	Text-to-Speech License

Table 10. Feature License Key Prefixes (Continued)

Prefix	Meaning
FCRA	Routines API License
FCUx	System Software License Bundle Upgrades
FCZx	Paging Zone License Expansion Package

For more information about licensing, see *"Appendix C: C4000 Software Licenses" on page 497*.

Changing the Navigation Bar Order

Through the System Parameters menu option, you can change the order of the selections that appear after Dashboard in the navigation bar.

To change the menu order:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Sort Menu**.

3 Drag and drop the menu items until you have them in the order you prefer.

4 Select **Done**.

To return to the default settings for the menu order:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Sort Menu** and then select **Reset Menu.**

3 Select **Done**.

Restarting the Server

Restarting the server should take less than a minute and is provided as a troubleshooting tool to use if the Nyquist system is not functioning. For example, if you are unable to page or make calls, you probably want to restart the server.

If you want to shut down the server, see *"Shutting Down the Server" on page 49*.

To restart the server:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Restart Server** and select one of the three options:

- **Graceful** – System will restart after all current calls are completed.
- **Now** – All current calls will be dropped.
- **Force** – Use only if **Graceful** and **Now** do not work. The **Force** option will resolve more issues than the **Graceful** and **Now** options, including issues involving Recorded Paging (Queues), Routines, and Audio Distribution. This option will cause any running Routines to be terminated and will then start all routines that include a **Reboot** trigger.

Station Supervision

You can set up parameters for alert notifications when a device, or station, goes offline. With this feature, you can set up email notifications, specify where records are to be stored, select what type of devices will be supervised, and select stations to be excluded from station supervision.

Figure 12. Edit Station Supervision

To set up station supervision parameters:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Station Supervision**.

3 Select desired options from the Edit Station Supervision page.

4 Select **Save**.

Table 11. Edit Station Supervision Parameters

Enable	Use the slider to enable or disable the station supervision feature and the associated alerts creation. By default, this feature is disabled.
Syslog Enable	Use the slider to select if alerts will be recorded in the syslog file.
Syslog Config	Use the slider to select **Yes** to enable syslog configuration by the station supervision feature or select **No** if you are doing your own syslog configuration.
Syslog Facility	Select the syslog facility that will be used to report alerts to syslog.
Use Email Configuration	Use the slider to select **No** if you want to use SMTP parameters from the /etc/msmtprc file. If the default **Yes** is used, SMTP parameters from the SMTP configuration list will be used.
Send Email To	*Note:* This option appears if **Use Email Configuration** is set to **No**. Enter email addresses separated by commas for all recipients who will receive an email message if a station goes down. If this field is left blank, email notification is disabled.
SMTP Account	*Note:* This option appears if **Use Email Configuration** is set to **Yes**. Specify the SMTP account that will be used for alert notification emails.
Email Subject	Enter a subject line to appear on the email notifications. The default is **C4000 Alert**.
Supervise Types	Select the station type or types that you want to be supervised.
Excluded Stations	Select the station extensions that are to be excluded from station supervision. If this option is left blank, no stations with the selected **Supervise Type** are excluded.

Email Configuration

Through the Email Configuration feature, you can configure settings for SMTP email notifications for when a station is not responding to the server. For example, if a DCS and speaker is off line, an automatic email can be sent to a facilities manager or IT personnel.

SMTP is an Internet standard for email transmission.

Figure 13. Edit Email Configuration

To set up email configuration:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Email Configuration**.

3 Select desired options from the Edit Email Configuration page.

4 Select **Save**.

Table 12. Edit Email Configuration

Send Test Email	Sends a test email using a saved Email Configuration. This allows you to quickly verify your email configuration settings for correctness by sending to an arbitrary email address using the configured email server and account.
Account	Enter the user-defined name for this account. The default account name is **Gmail**.
Host	Enter the SMTP server to send the email to. The value may be either a host name or a network address.
Port	Enter the port that the SMTP server uses to receive email transmissions. Typically, this is set to 25 form SMTP, 465 for SMTPS, or 587 for submission.
Auth	Use the slider to enable or disable SMTP authentication. By default, **Auth** is set to **On**, which is the recommended setting. When authentication is enabled, a user must provide a valid username and password to send email.
User	Enter the user name for SMTP authentication.
Password	Enter the password for SMTP authentication.
Show Saved Password	Select this button to show the saved password for SMTP authentication.
From	Enter the name that is to appear in the **From** field for the email.
To	Enter the email addresses for the recipients. Separate each email address by a comma.
TLS	Use the slide to enable or disable the use of TLS. When you have one email server send a message to another email server over TLS, the connection itself is encrypted so no one can intercept the payload information. But, the actual data itself is still unencrypted. It's secure and compliant because it was sent over an encrypted channel.

TLS STARTTLS	Use the slider to enable or disable the use of STARTTLS. STARTTLS is an email protocol command that tells an email server that an email client, including an email client running in a web browser, wants to turn an existing insecure connection into a secure one.
TLS Trust File	Enter the location for the CA-Certificate trust file. The default location is **/etc/ssl/certs/ca-certificates.crt**.
Domain	Specify the domain of the server that is initiating the SMTP connection. If the email is rejected due to anti-SPAM programs, this domain name is used as the fully qualified domain name for the SMTP EHLO command.

Performing a System Update
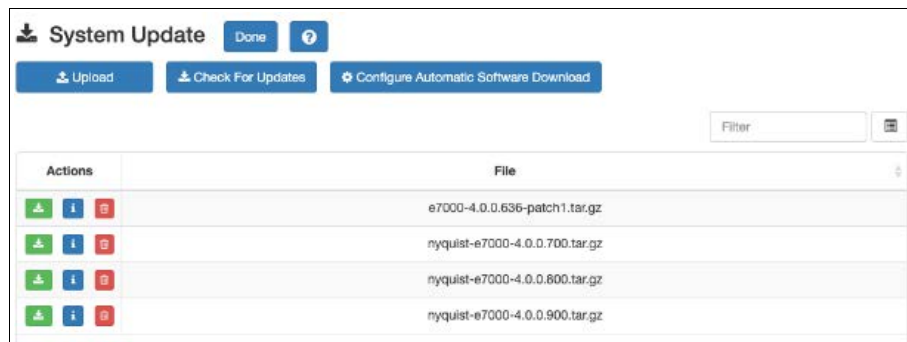
Figure 14. System Update

> *Note:* After a new software release is installed, permissions for features introduced by this new release must be set for the roles that will use these features. See "*Assigning and Editing Permissions" on page 216*

From the System Update screen, you can select to upload or check for new versions of the software or set configuration options for automatic software downloads.

> *Note:* New appliances may have been introduced in a newer server release than the release you are using. To use these appliances, you must perform a **System Update**.

Software updates can be a major release, a bug fix, or even an update that is created specifically for your system.

This feature updates the software and the configuration data.

A list of downloaded software appears on the System Update screen. When you first access the System Update screen, the list will show only the default file that was installed. You can select **Check for Updates** to obtain a list of software available for download or select **Upload** to browse for software files.

> *Note:* If your Software Update Subscription (SUS) has expired, you will receive a dashboard message explaining that you must contact your Bogen dealer to purchase a subscription renewal to access system updates.

To perform a system update:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **System Update**.

3 If you want the system to check for any new server software updates, select **Check for Updates**. A popup window appears with one of the following messages:

- *No Nyquist System Software updates available.* When this message appears, select **OK** to exist the popup window.
- *Can't check for updates. Check Internet connection and try again.*
- Nyquist System Software download successful.
- Nyquist System Software download failed, try again.

4 If you want to upload a file using the browser:

   a) Select **Upload**.

   b) Select **Choose file**.

   c) Locate the .tar file.

   d) Select **Upload**.

5 If you want to update your system, select the **Run Update** icon for the file that you want to use for the update.

> *Note:* During an update, volume control levels (Cut Levels) will be set to factory defaults. If you have changed these levels, you will need to make adjustments again.

A series of screens will appear when the System Update is running.
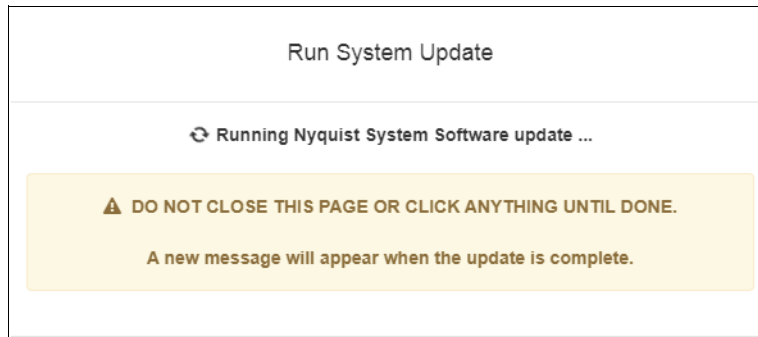
Figure 15. System Software Update Message

The first screen warns that the Nyquist System Software is being updated. Do not close the window or click anything on the computer screen until the update is completed.
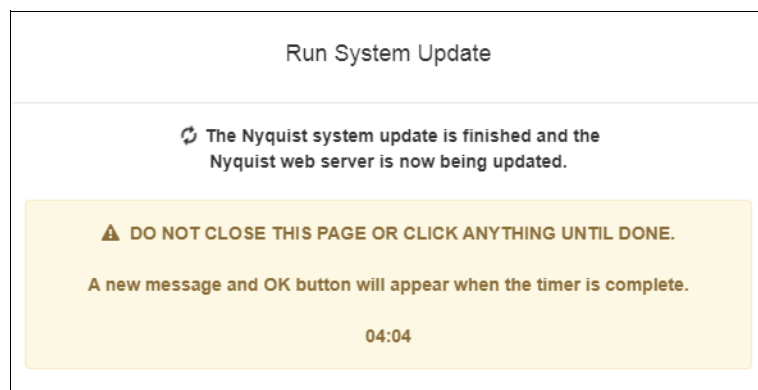
Figure 16. Nyquist Web Server Update Message

After the application software has been updated, the system will update any files, such as PHP files, needed for the Nyquist application. The screen that appears during this Nyquist web server update includes a progress clock that shows how many minutes and seconds remain before the update is complete. Again, do not close the message or click anything on the computer screen.
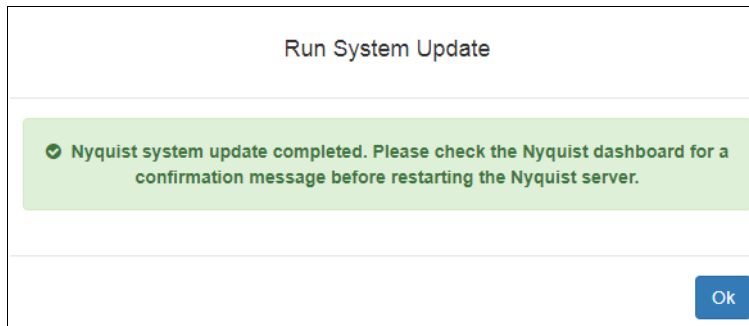
Figure 17. System Update Completed Message

When the system update completes, a message and an **OK** button appear. Select **OK** and check the Nyquist dashboard for a confirmation message before restarting the Nyquist server.
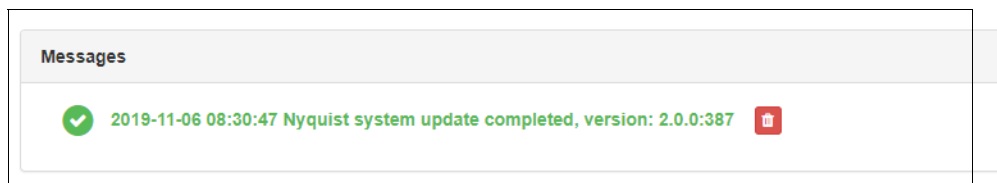
Figure 18. Dashboard Message After System Update

The dashboard message provides the date and time the update ran and the software version that was installed.

You might see a blank message box with an OK button. If so, click **OK**.

If a PHP message appears (like the one shown in *Figure 19, "PHP Message," on page 46*), press the refresh key (normally F5) repeatedly until the dashboard message appears.

```php
<?php

/**
 * Laravel - A PHP Framework For Web Artisans
 *
 * @package  Laravel
 * @author   Taylor Otwell <taylorotwell@gmail.com>
 */

/*
|--------------------------------------------------------------------------
| Register The Auto Loader
|--------------------------------------------------------------------------
|
| Composer provides a convenient, automatically generated class loader for
| our application. We just need to utilize it! We'll simply require it
| into the script here so that we don't have to worry about manual
| loading any of our classes later on. It feels nice to relax.
|
*/

require __DIR__.'/../bootstrap/autoload.php';

/*
|--------------------------------------------------------------------------
| Turn On The Lights
|--------------------------------------------------------------------------
|
| We need to illuminate PHP development, so let us turn on the lights.
| This bootstraps the framework and gets it ready for use, then it
| will load up this application so that we can run it and send
| the responses back to the browser and delight our users.
|
*/

$app = require_once __DIR__.'/../bootstrap/app.php';

/*
|--------------------------------------------------------------------------
| Run The Application
|--------------------------------------------------------------------------
|
| Once we have the application, we can handle the incoming request
```

Figure 19. PHP Message

Configuring Automatic Software Download

From the Configure Automatic Software Download screen, you can schedule your Nyquist server to automatically check for and download server or firmware software updates.

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Figure 20. Configure Automatic Software Download

To configure automatic software downloads:

1 Do one of the following:

   a) From the navigation bar, select **System Parameters**, then from the System Parameters page, select **System Update**.

   b) From the navigation bar, select **Firmware**.

2 Select **Configure Automatic Software Download**.

3 Complete the options on the Configure Automatic Software Download screen.

4 Select **Save**.

Table 13. Configure Automatic Software Download Options

Server Software Check	When set to **Yes**, the server automatically checks for Nyquist server software updates and posts notifications to the dashboard when new software is available.
Server Software Auto Download	When set to **Yes**, the server automatically downloads Nyquist server software updates and posts notifications to the dashboard.
Firmware Check	When set to **Yes**, the server automatically checks for Nyquist device firmware updates and posts notifications to the dashboard when new software is available.
Firmware Auto Download	When set to **Yes**, the server automatically downloads Nyquist device firmware updates and posts notifications to the dashboard.
Recurrence Minute	Select the minute setting for automatic checks and downloads to occur. This field is required.
Recurrence Hour	Select the hour setting for automatic checks and downloads to occur. This field is required.
Recurrence Day	Select the day of the month for automatic checks and downloads to occur. If left blank, the setting defaults to every day of the month.
Recurrence Month	Select the month for automatic checks and downloads to occur. If left blank, the setting defaults to every month.
Recurrence Day of Week	Select the day of the week for automatic checks and downloads to occur. If left blank, the setting defaults to every day of the week.

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Shutting Down the Server

Using the **Shutdown Server** button is the recommended way to gracefully stop Nyquist processes and power down the Nyquist server. Powering down the Nyquist server manually via the **Power** button is not recommended.

> *Note:* If you are using the System Controller, the **Shutdown Server** button powers the component down but does not toggle the **Power** switch. To turn the System Controller back on, you must toggle the switch to the **Off** position and then toggle it to the **On** position.

To shut down the Nyquist server:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Shutdown Server**.

3 When prompted, select **Continue**.

Check Internet Site Access

You can use the **Check Internet Site Access** button to verify that you Nyquist server can access URLs, commonly referred to as web addresses, that are required for Nyquist to run properly. This information can be used for resolving or debugging networking issues.

The **Check Internet Site Access** button appears on both the System Parameters page and on the Product License page.
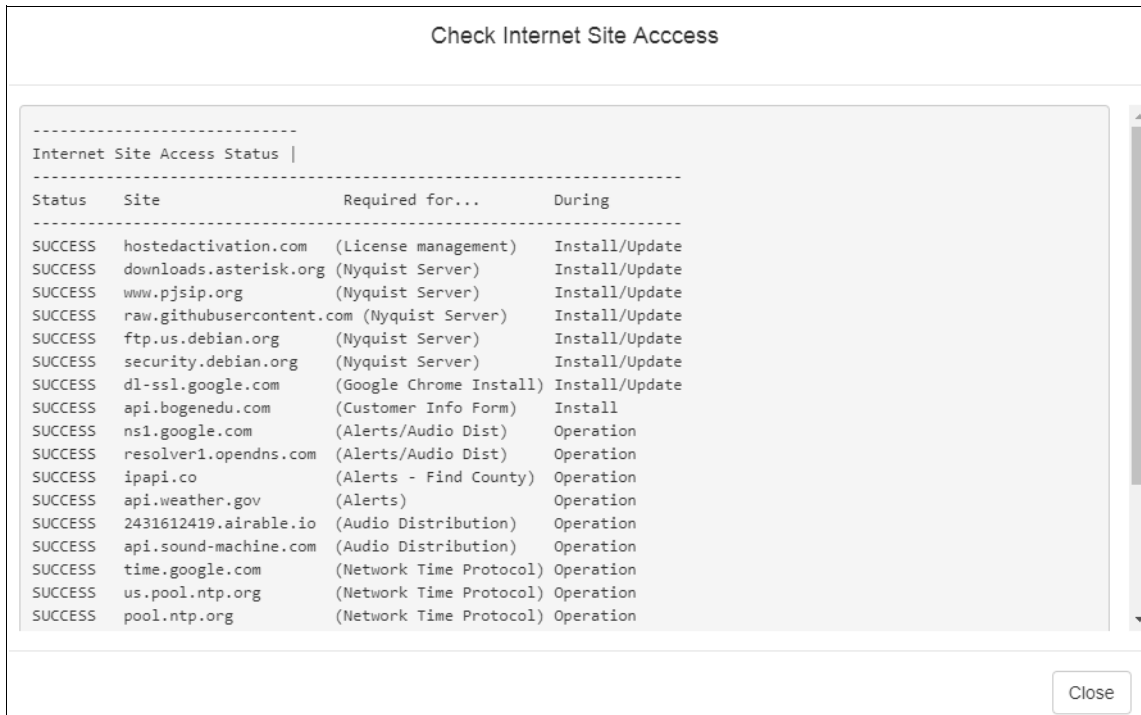
Figure 21. Check Internet Site Access

To check Internet site access:

1 From the navigation bar, select **System Parameters**.

2 Do one of the following:

   a) From the System Parameters page, select **Check Internet Site Access**.

   b) From the System Parameters page, select **Product License** and then select **Check Internet Site Access**.

3 When finished view the Check Internet Site Access display, select **Close**.

Check Server Status

The Check Server Status window shows if the default gateway, Network Time Protocol, and Domain Name Servers are configured and pingable; reports the network interface and routing tables status; displays the Nyquist server's public IP address and operation

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status; shows disk space utilization; and displays the Automatic Failover status (if the feature is enabled) as well as other server status details.


```
-----------------------------------------------------
| Nyquist Server Status | Fri Nov  8 09:00:39 EST 2019 |
-----------------------------------------------------

Nyquist Server's Public IP Address: 75.112.93.98

-------------------------
Network Interfaces Status
-------------------------

eth0      Link encap:Ethernet  HWaddr 74:e6:e2:d9:fa:36
          inet addr:10.10.10.168  Bcast:10.10.10.255  Mask:255.255.255.0
          inet6 addr: fe80::76e6:e2ff:fed9:fa36/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:14626756 errors:0 dropped:0 overruns:0 frame:0
          TX packets:13681673 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5249719340 (4.8 GiB)  TX bytes:7574141624 (7.0 GiB)
          Interrupt:20 Memory:f7f00000-f7f20000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
```

Figure 22. Check Server Status

To check server status:

1 From the navigation bar, select **System Parameters**.

2 From the System Parameters page, select **Check Server Status**.

3 When finished viewing the Check Server Status display, select **Close**.

DHCP Server

The Nyquist server provides a DHCP server that can be used during the initial setup of a Nyquist system. This can be very helpful in the discovery and configuration of the various Nyquist devices, as well as third-party devices like the Grandstream HT813, Cisco ATA devices, and VoIP phones. It also provides clients the Nyquist server's TFTP address to facilitate Nyquist device configuration.

The user would first configure the IP address and subnet mask for Port-A of the Nyquist server, then configure the DHCP service to provide a range of IP addresses that the server would assign to Nyquist and other network devices on that subnet. Once discovered, these devices can be configured, typically assigning each a static IP address.

This service would typically be disabled after all devices are discovered and configured. It could, however, be used permanently, providing dynamic IP addresses to Nyquist devices, if no other DHCP server is available and only Nyquist devices are on the subnet.

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Note: The DHCP server will use the same subnet mask as that which is configured for Port-A of this Nyquist server. This value can be viewed (usually in CIDR format) in the output of the **Check Server Status** command (see *"Check Server Status" on page 50*).

Figure 23. DHCP Configuration

Configuring the DHCP Server:

1 From the Navigator bar, select **System Parameters**.

1 From the System Parameters page, select **DHCP Server**.

2 If the DHCP Server has not yet been configured, you can populate the configuration properties with reasonable values by selecting the **Auto Configure** button.

3 Modify the values to the desired configuration. For details, see *"DHCP Configuration Parameters" on page 53*.

4 Press **Save** to persist the values.

5 To enable the DHCP feature and start allocating IP addresses via DHCP, toggle the **Enabled** switch to **Yes**, then press **Save**.

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Table 14. DHCP Configuration Parameters

Enabled	Enables or disables the DHCP server for the subnet connected to Port-A.

Warning	**When the DHCP server is enabled on Port-A, it will be authoritative! Do not enable the DHCP server if another DHCP server is already providing DHCP addresses to the subnet defined on Port-A.**

Default Lease Time	Length in seconds that will be assigned to a lease if the client does not request a specific expiration time. Decrease this value if you are only using the DHCP server to stage Nyquist devices.
Max Lease Time	Maximum length in seconds that will be assigned to a lease. Decrease this value if you are only using the DHCP server to stage Nyquist devices.
IP Range Start	Start of the IP address range from which to allocate addresses to devices on the Port-A subnet. After performing Auto Configure, you can increase this value to reserve a range of IP addresses on the subnet for fixed address assignments.
IP Range End	End of the IP address range from which to allocate addresses to devices on the Port-A subnet. After performing Auto Configure, you can decrease this value to reserve a range of IP addresses on the subnet for fixed address assignments.
Gateway	Gateway address sent to DHCP clients used for routing packets outside of the Port-A subnet. Auto Configure will set this value based on the current Port-A setup; you can still change it if needed.
Domain Name	Domain name for devices operating on the subnet, excluding hostname. Leave this parameter blank if the Port-A subnet is private and not included in DNS managed domain. If the server has a domain name set, Auto Configure will use the server value. This is typically left blank.
DNS Servers	Comma-delimited list of DNS servers that devices on the subnet can use to resolve hostnames. Auto Configure will set this value; you can change it if needed.
Save	Saves the specified DHCP configuration.

Table 14. DHCP Configuration Parameters

Auto Configure	This button selects appropriate DHCP configuration values based on the existing server configuration. These values can be modified by the user before saving the settings. *Note:* These values will not be saved until the user clicks the **Save** button.
Reset	Sets all fields to their default values.
DHCP Leases	Displays a list of network devices that have been allocated IP addresses by the DHCP server.
Auto Refresh	If set to On, the list of DHCP leases will be periodically refreshed.
Refresh	Immediately refresh the list of DHCP leases.
Mac Address	The MAC address of the network card of the DHCP client.
Hostname	The hostname of the DHCP client.
IP Address	The IP address of the DHCP client. A link icon which provides a hyperlink to the device is displayed next to the IP address.
Valid Until	The date and time when the DHCP lease expires.

Setting System Parameters

To set system parameters:

1 From the navigation bar, select **System Parameters**.
The System Parameters page displays all key system parameters.

2 To change the settings, select the **Edit** icon.

3 On the Edit System Parameters page that appears, make changes to the appropriate settings.

4 After entering all changes, select **Save**.

Using the Edit System Parameters Page

The Edit System Parameters page contains the parameters that can be set for the entire facility and is accessed by selecting the **Edit** icon on the System Parameters page. Through the Edit System Parameters page, you can also set passwords for the system and

various system features, including setting passwords for page and announcement types and alarms and tones.

Figure 24. Edit Systems Parameters Page

The following table describes the system parameters:

Table 15. Edit System Parameters Page

Name	Specifies the name given to the entire facility. The name can be up to 30 characters.
Day Start	Identifies when the system switches to its "Day" mode of operation and specifies the time period for which the day Admin Station is active. Telephones with night-only outside line access are prevented from placing outside line calls during this time. Use the down arrows to select the **Hour** and **Minute** values. Valid times range from 00:00 to 23:58, but must be less than the Night Start time.

Table 15. Edit System Parameters Page (Continued)

Night Start	Identifies when the system switches to its "Night" mode of operation and specifies the time period for which the night Admin Station is active. During this time, telephones with the night-only outside line access can place outside line calls. Use the down arrows to select the **Hour** and **Minute** values. Valid times range from 00:01 to 23:59; but must be larger than the Day Start time.
Emergency-All-Call Multicast RTP IP Address	Identifies the IP address to use for multicast RTP paging for Emergency-All-Call. Receiving IP telephones must also have this IP address configured.
Emergency-All-Call Multicast RTP Port	Identifies the RTP port to use for multicast RTP paging for Emergency-All-Call. Receiving IP telephones must also have this RTP port configured.
Emergency-All-Call Cut Level (dB)	Sets the cut volume for Emergency-All-Call audio. The cut volume range is 0 to -42.
All-Call Multicast RTP IP Address	Identifies the All-Call Multicast RTP IP address. Receiving IP telephones must also have this IP address configured.
All-Call Multicast RTP Port	Identifies the RTP port to use for multicast RTP paging for All-Call. Receiving IP telephones must also have this RTP port configured.
All-Call Cut Level (dB)	Sets the cut volume for All-Call audio. The cut volume range is 0 to -42.
Audio Distribution Multicast IP Address	Identifies the RPT multicast IP address to use for audio distribution to all stations
Audio Distribution Multicast Port	Identifies the RPT multicast port to use for audio distribution to all stations.
Audio Distribution Cut Level (dB)	Sets the cut volume for audio distribution. The cut volume range is 0 to -42.
Default Cut Level (dB)	Defines the default cut volume level for a new zone. The cut volume range is 0 to -42.
Ambient Noise Sensor Multicast IP Address	Identifies the multicast IP address to use by ANSs to send volume data.
Ambient Noise Sensor Multicast Port	Identifies the multicast port number to be used by ANSs to send volume data.

Table 15. Edit System Parameters Page (Continued)

Disable Preannounce Tone	Indicates if the preannounce tone is disabled. If disabled, the tone is not heard when connecting to a speaker or prior to a page.
Privacy Beep	Indicates if the privacy beep feature is on.
Emergency Tone	Identifies the pre-announce tone played before an Emergency-All-Call is made.
All Call Tone	Identifies the pre-announce tone played before an All-Call is made.
Intercom Tone	Identifies the pre-announce tone played before an intercom call is made.
Default Registration Password	Provides the default password to be used when adding a new station.
Default Codecs Allowed	Provides the default list of media codecs to be used.
Admin Queue Timeout	Specifies the maximum amount of minutes that a call switch or handset station can remain on an administrative queue. When the time is exceeded, the call switch or handset station is removed from the queue. Valid timeout values range from 1 to 999.
Night Ring Enabled	Indicates if a night ring is enabled. When enabled, you can optionally set a **Night Ring Admin** and optionally set one additional option from the following list: • **Night Ring All Stations** • **Night Ring Admin Group** • **Night Ring Zones** (For more information on night ring behavior, see "*Setting Night Call Options" on page 28*.)

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Table 15. Edit System Parameters Page (Continued)

Night Ring Admin	Identifies the specific Admin Station that handles outside line calls received during night hours. Outside line calls not answered with 15 seconds trigger ringing to all or selected stations. If **Night Ring Admin** is the only option set, then the specified Admin extension rings for 30 minutes and hangs up if the call is not answered within that time.

Note: If **Night Admin** is also included in the call, both **Night Admin** and **Night Ring Admin** ring. An analog phone cannot be used as a Night Ring Admin even if the station has the admin CoS enabled.

Night Ring All Stations	Indicates if all stations receive night rings during night hours. When enabled, any ringing station can answer the call. The specified stations will ring for up to 30 minutes, then hang up if the call is not answered within that time.

Note: NQ-P0100 Matrix Mixer Pre-Amp stations will also ring.

Night Ring Admin Group	Identifies the Admin Group that handles outside line calls received during night hours. The Admin Group is called if the **Night Admin** and **Night Ring Admin** do not answer within 15 seconds. The specified stations will ring for up to 30 minutes, then hang up if the call is not answered within that time.

Night Ring Zones	Identifies which zones receive night rings when outside calls are received during night hours. The specified stations will ring for up to 30 minutes, then hang up if the call is not answered within that time.

Parking Lot	Defines the range of numbers to use for call parking. The first number listed is used to initiate call parking, which is a feature that allows you to put a call on hold at one telephone set and continue the conversation from any other telephone set.

Record Monitoring	Indicates if call and location monitoring will be recorded.

Table 15. Edit System Parameters Page (Continued)

Emergency Link	Specifies the station that functions as the system's Emergency Link Station. An Emergency Link Station is the station that an emergency call (but not a 911 call) is routed to if the station's associated Admin Station is busy, rejects the call, or fails to answer within 15 seconds. A value of 999 means that this feature is disabled.
	If the Emergency Link Station is a ringable device (a Nyquist phone), the station will ring and the call will be displayed on the station's display (if so equipped) as an "Emergency Call." If the Emergency Link Station is not a ringable device (a Nyquist VoIP speaker), the station will auto-answer, pre-announcing the call as an "Emergency." The Admin Station will continue to ring if an emergency call is auto-answered by a non-ringable Emergency Link Station device. The Admin Station can retrieve the call by answering it, and the Emergency Link Station device will then drop the call. As with any Emergency Call, all calls to an Emergency Link Station will be recorded.
Max Restricted Digits	Specifies the maximum number of digits that can be dialed if a station has been assigned restricted outside line access.
DISA Password	Identifies the four-digit field used for Direct Inward Station Access (DISA).
Security DISA Password	Identifies the four-digit field used to access Nyquist through a security DISA line.
CDR Storage Duration	Identifies the number of days that a record of call details will be kept. The maximum value for CDR Storage Duration is 365.
Trunk Priority	Identifies the first trunk type to use for placing outbound calls.
Bump on Emergency	Indicates if emergency calls to the Admin Station will bump existing non-emergency calls.
Bump on 911	Indicates if outbound calls to 911 will bump trunk calls if no available outbound trunk is available.
Auth Code	Allows you to enable additional features on a telephone when the walking CoS feature is enabled. The four-digit code activates features from the associated phone to the phone being used.

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Table 15. Edit System Parameters Page (Continued)

Call Assurance Audio	Identifies the audio to be played to the caller to indicate that the call has been placed. To choose a new file, select **Choose File** and browse to select the new file to be used for the Call Assurance audio.
Facility Password	Identifies the password to be used by facility servers that are registering with this server. The maximum password size is 12 characters.
Remote Facility CoS	Identifies the CoS for remote facility access.
RTP Start Port	Identifies the start port number for UDP RTP traffic. The default is 10000.
RTP End Port	Identifies the stop port number for UDP RTP traffic. The default is 20000.
Enable RTP Checksums	Indicates if UDP checksums are enabled for RTP traffic. A checksum is a count of the number of bits in a transmission that is included with the transmission so that the receiver can check to see if the same number of bits arrived.
Enable ICE Support	Indicates if ICE support is enabled.
STUN Server	Identifies the host name or IP address for the STUN server that is used when determining the external IP address and port for a RTP session. (Port number is optional.) If omitted, the default value of 3478 will be used.
TURN Server	Identifies the host name or IP address for the TURN server that is to be used as a relay. (Port number is optional.) If omitted, the default value of 3478 will be used.
TURN Username	Identifies the user name used to authenticate with the TURN server.
TURN Password	Identifies the password used to authenticate with the TURN server.
Retention Recordings	Identifies the number of days to retain recordings. Recordings that are older than the retention period are automatically deleted. You can set a maximum retention period of 99,999 days.
Backup Retention System	Identifies the number of days to retain system backup files. System backups that are older than the retention period are automatically deleted, provided at least one system backup file remains. You can set a maximum retention period of 99,999 days.

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Table 15. Edit System Parameters Page (Continued)

Backup Retention Recordings	Identifies the number of days that backups of recordings are retained. Backups that are older than the retention period are automatically deleted, provided at least one backup remains. You can set a maximum retention period of 99,999 days.
Backup Retention Voicemail	Identifies the number of days that voicemail backups are retailed. Backups that are older than the retention period are automatically deleted, provided at least one backup remains. You can set a maximum retention period of 99,999 days.
System Password	Displays the password required if a user attempts to change an event schedule.
Multi-Site-Emergency-All-Call Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting a Multi-Site-Emergency-All-Call page. A four zero password (0000) requires the caller to enter 1 for confirmation when starting a Multi-Site-Emergency-All-Call page.
Multi-Site-All-Call Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting a Multi-Site-All-Call page. A four zero password (0000) requires the caller to enter 1 for confirmation when starting a Multi-Site-All-Call page.
Facility-Page Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting a Facility page. A four zero password (0000) requires the caller to enter 1 for confirmation when starting a Facility page.
Emergency-All-Call Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting an Emergency-All-Call page. A four zero password (0000) requires the caller to enter 1 for confirmation when starting an Emergency-All-Call page.
All-Call Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting an All-Call page. A four zero password (0000) requires the caller to enter 1 for confirmation when starting an All-Call page.

Table 15. Edit System Parameters Page (Continued)

Emergency-Announcement Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting or stopping an Emergency Announcement. A four zero password (0000) requires the caller to enter 1 for confirmation when starting or stopping an Emergency Announcement.
Announcement Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting or stopping an Announcement. A four zero password (0000) requires the caller to enter 1 for confirmation when starting or stopping an Announcement.
Facility-Announcement Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting or stopping a Facility Announcement. A four zero password (0000) requires the caller to enter 1 for confirmation when starting a Facility Announcement.
Facility-Emergency-Announcement Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting or stopping a Facility Emergency Announcement. A four zero password (0000) requires the caller to enter 1 for confirmation when starting a Facility Emergency Announcement.
Zone-Page Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting a zone page. A four zero password (0000) requires the caller to enter 1 for confirmation when starting a zone page.
Alarm Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting or stopping an Alarm. A four zero password (0000) requires the caller to enter 1 for confirmation when starting or stopping an Alarm.
Tone Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting or stopping a tone. A four zero password (0000) requires the caller to enter 1 for confirmation when starting or stopping a Tone.
Disable Emergency All-Call and Intercom when Audio Disabled	If **Audio Disabled** is enabled (see "*Enabling and Disabling Audio" on page 364*), this indicates whether or not Emergency All-Call and Intercom calls will also be disabled.
Zone Control Password	Identifies a password to access the Zone Control view (see "*Zone Control: Volume and Audio Distribution Panel" on page 67*).

The Edit System Parameters page also contains a section called System Tools. The following table describes parameters for this section.

Table 16. System Tools

Server IP Address	Identifies the Nyquist system server's IP address, which will be used by Nyquist devices to register with the Nyquist system server. To change the Server IP Address, select **Change Server IP Address**. On the Change Server IP Address page, use the down arrow to select a valid IP address.
	Note: If this Nyquist Server is configured for Automatic Failover (see "*Automatic Failover" on page 74*), this will show the Master IP address and the user should not attempt to change this value. If the Master IP address must be changed, you should:
	1 disable Automatic Failover,
	2 change the server IP address,
	3 and reconfigure Automatic Failure.
Use Network Time Server defined by DHCP	When enabled, the Network Time Server will be defined by DHCP.
Network Time Server	Identifies the IP address or the domain name of the Network Time Protocol (NTP) server to be used.
	To change the NTP server, enter the IP address or the domain name, and then select **Change Network Time Server**.

Table 16. System Tools (Continued)

Appliances Network Time Server Source	Identifies the time source for all appliances on the Nyquist network. The appliances may use one of the following sources:
	
	• **nyquist**
	  When this option is selected, all Nyquist appliances will use the Nyquist system server as the NTP server; this is the default option.
	
	• **dhcp**
	  When this option is selected, all Nyquist appliances will use the NTP server provided via DHCP Option 42. If the built-in Nyquist DHCP Server feature is being used, all Nyquist appliances will use the Nyquist server for NTP service via the Server IP Address.
	
	• **ntpserver**
	  When this option is selected, all Nyquist appliances will use the Network Time Server defined in System Parameters.
	
	To change the time source for the appliances, use the down arrow to select the desired source, and then select **Change Appliances Network Time Server**.

Server Date/Time	Identifies the date and time of the server. To change the Server Date/Time, use the **Calendar** icon to select the new date, and then select **Change Server Date/Time**.
Time Zone	Sets the time zone for the server. To change the time zone, select a new time zone from the drop-down menu, and then select **Change Time Zone**. *Note:* You must reboot the server after changing the time zone.
Dialing Length	Specifies the number of digits required to dial within the system. Valid values are 3, 4, 5, or 6. To change the dialing length, select a new value from the drop-down menu, and then select **Change Dialing Length**. You must reboot all Nyquist appliances and IP phones. A system backup is automatically created.
TeamViewer ID	Displays the TeamViewer remote control ID number assigned to the Nyquist server.

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Table 16. System Tools (Continued)

TeamViewer Enabled	Indicates if TeamViewer is enabled. Selecting **Yes** allows the Nyquist server to be controlled via TeamViewer, a software application used for remotely manipulating and trouble-shooting computer issues.
TeamViewer Password	To set a new password, enter the password and then select **Set Password**. Only alphanumeric characters are allowed for the password.
Routine API Key	The Routine API Key is used as an authorization passcode by Routine API (REST) calls. Every Routine API call must include an HTTP header called **Authorization** whose value is the string "Bearer xxxxxxxx", where xxxxxxxx is the Routine API Key. If this value is missing or incorrect, the call will fail. For further details, see *"Using the Routines API" on page 391*.
Reset	Invalidates the current Routine API Key and randomly generates a new one. This will prevent a potentially compromised key from being used, as all subsequent calls using the old key will fail. This new key should be securely communicated to all valid users of the Routine API.
	Be aware that this operation immediately invalidates the key. You will be prompted with a warning after clicking this button to prevent accidental resets.
Additional IP addresses to include in the SSL server certificate	Additional IP addresses, as a space-separated list, to include in the generated server certificate's Subject Alternative Names (SAN) field. This indicates to a client that this certificate is valid for a server at any of these IP addresses.
	This is primarily intended for adding an alternate IP address, such as a public-facing network connected to Ethernet Port-B.
	Note: Automatic Failover configurations automatically include the Master, Primary, and Secondary IP addresses in the SAN, so this need not be set explicitly.
Generate SSL Server Certificate	Generates a server certificate for this Bogen server. The certificate will include any additional IP addresses specified in the aforementioned "Additional IP addresses…" setting as part of the certificate's Subject Alternative Name (SAN) field.

Table 16. System Tools (Continued)

Download BogenCA Certificate	Initiates a download of the public Bogen Certificate Authority (CA). This CA should be installed on any devices that will connect to this Bogen server, whether through a browser or through the Routine API, so that they can authenticate it as a valid Bogen server.
Remote Calendar Control	Configures which Facilities, if any, will be allowed remote access to this system's Calendars.
	• **Disabled**: Remote Facilities are not permitted to control this system's calendar (although this Facility may still be able to access a remote Facility's calendar).
	• **Allow Facilities**: All enabled Facilities from the Facilities view are permitted to remotely access and control this system's calendar.
	• **Allow Access List**: All specified Facilities (as specified by IP addresses in the **Calendar Control Access List** field) are permitted to remotely access and control this system's calendar. See **Calendar Control Access List** for more information.
	Note: If none of the Facilities are using Automatic Failover, **Allow Facilities** is the easiest way to enable Remote Calendar Control. If any of the Facilities are using Automatic Failover, you will need to use **Allow Access List** to enable Remote Calendar Control.
	Note: Only users whose Role has the **Remote Calendar Control** permission will be able to access remote calendars.
Calendar Control Access List	This field is only shown if **Remote Calendar Control** is configured as **Allow Access List**.
	A space-separated list of IP addresses specifying the remote Facilities that are permitted to manage this system's calendar. This list should include the Primary IP Address, Secondary IP Address, and Server IP Address of each Facility that uses Automatic Failover, as well as the Server IP Address for each server that does not use Automatic Failover.
Update Remote Calendar Control	When pressed, the **Remote Calendar Control** and optional **Calendar Control Access List** changes will take effect.

Zone Control: Volume and Audio Distribution Panel

The Zone Control feature presents a simple user interface for controlling volume and audio distributions from any device that supports the Google Chrome browser. Small devices such as touch-screen tablets can be used to operate Zone Control via the Chrome browser.

The Zone Control feature can be used to perform the following:

- Change volume of Audio Distributions and Paging Zones
- Start and stop Audio Distributions

In addition, it has its own configuration settings view. It has two display page views:

- Settings / Zone Filter view (see *Figure 25, "Zone Control Settings and Zone Filter View," on page 69*)
- Zone View, including an Audio Distribution view (see *Figure 26, "Zone Control Zone View," on page 72*).

Initial Setup and Settings

The Zone Control feature does not use the same login model as the Nyquist application. All users share the same password, specified as Zone Control Password in the System Parameters Page (see *Figure 24, "Edit Systems Parameters Page," on page 55*). The first time a user logs in, they will be directed to the Settings page for initial setup.

To perform the initial user setup:

1   Using a Chrome-based web browser, enter:

    ```
    https://<Server-IP-Address>/zone-control/login
    ```

    where <Server-IP-Address> is replaced with the IP Address of your Nyquist server.

2   Enter a new username that has not previously been used.

Tip: The username can correspond to an actual user, but if the Zone Control view is to be shared by multiple users, it could correspond to a group, or even a location (e.g., Lobby, Studio3, Library, etc.).

3   Enter the Zone Control Password (see *Figure 24, "Edit Systems Parameters Page," on page 55*).

Note: This password is intended to secure the feature in general, and is used by all Zone Control users. Be sure to use a password that can be safely shared with anyone that is to use the Zone Control feature.

4 You are then presented with the Zone Control Settings and Zone Filter view (see *Figure 25, "Zone Control Settings and Zone Filter View," on page 69*).

5 Select the desired settings, as described in *Figure 17, "Zone Control Settings," on page 70*.

6 Use the Zone Filters to select the zones that you wish to display on the Zone View. The Zone Filter section displays a list of all audio distribution zones. Each includes a checkbox to enable or disable its display in the Zone View. The list also includes "All Speakers" zone (which controls Audio Distribution Cut Level in system settings). When an audio distribution zone is enabled, the audio distribution zone will be displayed on the Zone View.

7 If Display Paging Zones is enabled, you can select the Paging Zones that you wish to display on the Zone View. When a paging zone is enabled, the paging zone will be displayed on the Zone View.

8 When you are finished making changes to Settings and Zone Filters, press "Save".

9 The Zone View will then be displayed (see *Figure 26, "Zone Control Zone View," on page 72*).

Figure 25. Zone Control Settings and Zone Filter View

Table 17. Zone Control Settings

Station	The Admin Web Interface Station to be associated with this Zone Control login.
	The Station selected will be used to determine the CoS settings to be used to grant audio distribution permissions (see *Table 21, "CoS Configuration Page Parameters," on page 90*). The station extension will also appear in the Call Detail Records when an Audio Distribution is started or stopped.
	Tip: You may want to create a custom Admin Web Station with limited access, which will then be used by Zone Control users. Keep in mind, however, that these Stations will appear in other feature lists throughout the Nyquist system (e.g., Dashboard's Audio Distribution list).
	Tip: You can also create a custom Station for each Zone Control user. The advantage of this is that Call Detail Records entries can then track which users started and stopped Audio Distributions.
Display Audio Distributions	When enabled, the Zone View will display available audio distributions for all zones that are selected in the Zone Filter. The audio distributions list is displayed under the related audio distribution zone.
	When disabled, an audio icon (i.e., a musical note) will be displayed next to each audio zone. Selecting the icon will display a page that shows the audio distributions for that zone.
Display Paging Zones	When enabled, the Zone Filter list will include Paging Zones, to allow selected Paging Zones to be displayed on the Zone View.
	Note: When you change this setting, the Zone Filter list does not immediately display the available Paging Zones; you must Save the settings, then go back into the Settings page to view and update the Paging Zones in the Zone Filter list.
Display Volume Cut Level (dB)	When enabled, the Zone View will display the numeric value for Cut Level to the right of each volume slider.

Table 17. Zone Control Settings

Display Zones Header	When enabled, a header will be displayed on the top of the page that labels Zone columns (e.g. Name, Description, Cut Level (dB)).
Display Audio Distributions Header	When enabled, a header will be displayed above each audio distribution list that labels the columns in the list (e.g. Line-Input/Playlist/Source, Zones, Description). *Note:* The Zones column label is not displayed on the All Speakers zone because the audio is played to All Speakers, not to zones.

Zone View

The Zone View can be used to control speaker volumes and audio distributions.

To display the Zone View:

1 Enter the following into a Chrome-based browser:

```
https://<Server-IP-Address>/zone-control
```

Tip: To create a shortcut to the Zone View, you can create a Map Object with an "Open URL" Action to open this link from the Dashboard.

2 If you are not already logged in, the Zone Control page will prompt you for a username and the Zone Control password.

3 After you have logged in, the Zone View is displayed (see *Figure 26, "Zone Control Zone View," on page 72*).
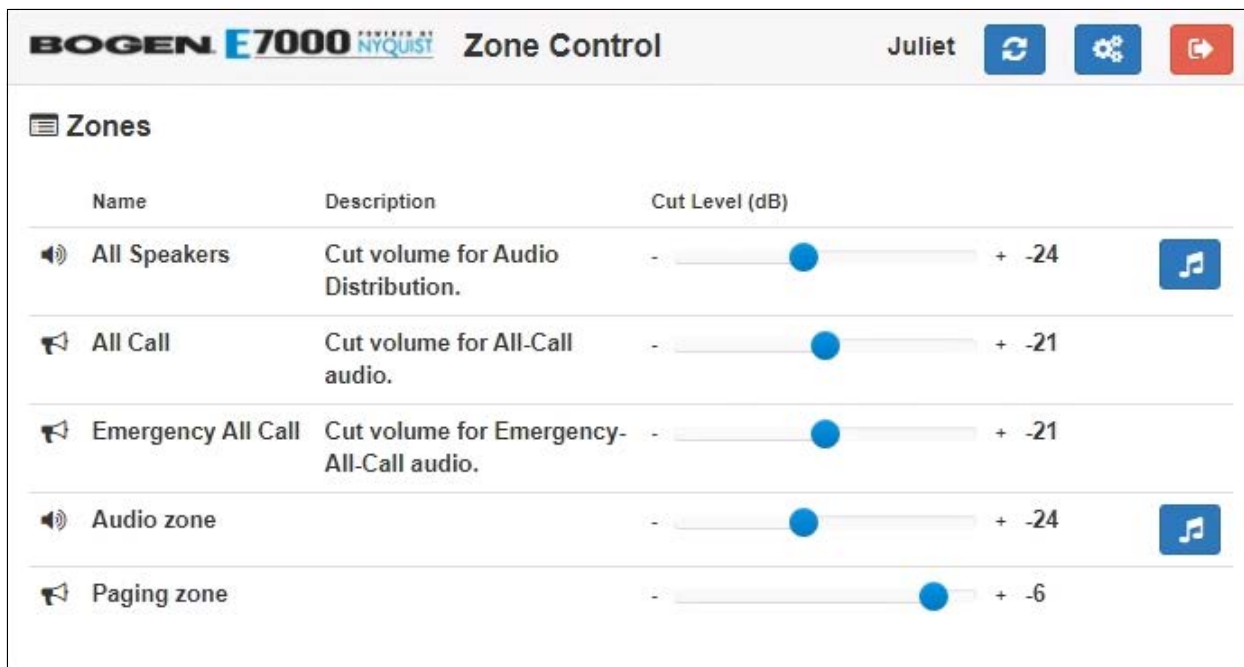
Figure 26. Zone Control Zone View

Table 18. Zone Control buttons

	Refresh: Press the Refresh button to have the Zone Controller refresh the volumes and autio distribution settings. *Note:* The status of zone volumes and audio distribution is *not* automatically updated. If a Nyquist web interface or scheduled event starts or stops an audio distribution, the state displayed on the Zone Controller may not be accurate. Whenever you wish to make a change to volume or audio distribution, you should press the refresh button first to ensure that you are starting with the correct state.
	Settings: Press the Settings button to access the Settings page for the logged in user.
	Logout: Press the Logout button to log out of the Zone Controller.

Table 18. Zone Control buttons

🎵	**Audio**: Press the Audio button to display the audio distributions that play to the selected Zone.

The Zone View displays the list of Zones that the user checked in the **Zone View Filter**.

Each listed Zone will include its name, a description, a volume slider, and an Audio icon (if **Display Audio Distributions** was disabled in the **Zone Control Settings**). The volume slider includes a cut-level value and a [-] on the left side and a [+] on the right side to decrease and increase the volume.

A zone's volume can be changed by simply sliding the volume control left or right for the desired zone. While using the slider, keep pressing the mouse or holding your finger down while sliding the volume left or right. When you lift up on the mouse or your finger, you will notice the volume change after a couple of seconds.

If you want to start or stop an Audio Distribution for a displayed zone, press the audio icon. After pressing the audio icon, a window will display a list of audio distributions that play to the selected Zone (see *"Audio Distribution Window" on page 73*). After the user presses start or stop for the desired audio distribution, the window closes and the Zone View is displayed.

If **Display Audio Distributions** is enabled under settings, you will see the available Audio Distributions displayed under each Zone, and can control (i.e., start and stop) the Audio Distribution from the Zone View.

Audio Distribution Window

The Audio Distribution window displays a list of Audio Distributions that play to the selected zone.

Each Audio Distribution in the list includes the start or stop button, a name, a zones list, and a description. The zones list works like the current Dashboard-based Audio Distribution zone list; it indicates when a distribution is being played to multiple zones.

Press the Start or Stop button for the desired Audio Distribution to start or stop.

After pressing Start or Stop for the desired audio distribution, the window closes and the Zone View is displayed.

Automatic Failover

Nyquist servers provide the ability to configure two Nyquist servers to act as a Master and Slave. If and when the Master Nyquist server fails, the Slave server can automatically take over, thereby ensuring reliable functionality.

The basic mechanism by which Automatic Failover works is conceptually very simple. Each of two servers, a primary and a secondary, are assigned IP addresses. A third IP address, known as the Master IP Address, is then assigned to the primary server. This master IP address is used by users and devices to access the Nyquist system, and the server providing service via the master IP address is known as the Master server. The secondary server is known as the Slave server, which monitors the Master server.

If the Master server fails for any reason, the Slave server detects the failure, assigns the master IP address to itself, and takes over as the Master. When the primary server recovers, the secondary server releases the master IP address, becoming the Slave, and the primary server reassigns the master IP address to itself, once again becoming the Master.

The Automatic Failover feature also includes another concept: Standby mode. A server in Standby mode will relinquish the Master role, if it is currently the Master, and will not resume as Master until explicitly removed from Standby. This is useful when you wish to force the secondary server to assume Master functionality, such as for primary server maintenance purposes.

Recoverable Failures

There are any number of server failures which will cause the Automatic Failover mechanism to promote the secondary server to Master. The following list is not comprehensive, but provides a number of examples.

Hardware Failures

- Catastrophic system controller failure causing server to no longer power up or boot
- Loss of power
- Damaged Ethernet hardware (NIC)
- Damaged RAM
- Ethernet cable no longer supplying network connection (e.g., cable pulled out, cable damaged, failed network switch, network switch isolated from network, etc.)
- Catastrophic SSD failure

Software Failures

- Catastrophic software failure that prevents system from booting

- Operating System failure (becomes unresponsive or reboots)
- Repeated Operating System service failures (e.g., web server, database server, DHCP server, etc.)
- Repeated Nyquist service failures (Communication service, Device Monitor, Queue Manager)
- System becomes unresponsive, due to software issue
- Disk full, resulting in software failures
- System Update being performed on Primary server (this is a normal cause of failover, though it's not really a failure.)

Note: Some of these conditions may only be temporary. The primary server may resume the primary role after a successful reboot or it becomes responsive again.

Automatic Failover Configuration

To use the Automatic Failover functionality, the administrator must configure the two servers with their static IP addresses—both on the same subnet—and with the master IP address. The administrator will then step the two servers through several coordination phases—Initialization, Database, Services, and Resources—at the end of which the primary server will be in master mode and the secondary server will be in slave mode, ready to take over and provide service.

Allocate three IP addresses to be used for the servers, all within the same subnet, and ensure that these addresses are reserved (i.e., will not be used by other machines or allocated by a DHCP server). You will also need to select an authentication password, which is used by each of the servers to verify that it is a legitimate failover partner.

If there are any firewalls between the primary and secondary servers, the following network ports must be opened for both in- and out-bound traffic before proceeding.

- UDP 5405
- TCP 2224
- TCP 3121

Note: The servers do not share USB-based audio files. If the primary server is using USB-based audio distribution files, make sure that the secondary server has an exact copy of the USB memory stick being used by the primary server.

To configure the primary and secondary servers:

1   Determine the IP addresses and authentication password to be used by the servers:

    •   Master IP address
    •   Primary IP address
    •   Secondary IP address
    •   Authentication password
        The authentication password must match on both the primary and secondary servers for the Automatic Failure mechanism to work.

2   Activate a Nyquist system controller to use as a primary server. Assign the master IP address (*not* the primary IP address) to Port-A of the system.

3   Activate a Nyquist system controller to use as a secondary server. Assign the secondary IP address to Port-A of the system.

4   Ensure the secondary server contains an **Automatic Failover** license before proceeding any further with the configuration process. This can be verified by clicking the **Product License** button on the **System Parameters** page of the secondary server. If the **Automatic Failover** property of the **Licensing Information** section shows "Licensed," the feature is enabled. Note the primary server will report this as "Not Licensed" until after **Automatic Failover** is fully configured. If needed, contact Bogen or an Authorized Reseller to purchase the **Automatic Failover License Key**.

5   Install the server's Certificate Authority on your local machine (see "*Installing Certificate Authority on Windows System" on page 9*).

Note: Browser security warnings will not immediately be eliminated as the servers may not yet have a certificate with the appropriate IP addresses associated with it, but these warnings should stop within the next couple steps.

Figure 27. Automatic Failover Configuration

Note: Subsequent instructions will indicate on which server to perform the operations, with sub-items providing the steps to perform.

6 *Primary server*

a) Open a browser window or tab and navigate to the Dashboard using the Master IP address, then to the **Automatic Failover** area.

b) Enter the hostname and IP address for each of the primary and secondary servers.

c) Enter the master IP address (i.e., the same address which your browser is currently addressing).

d) Enter the secret authentication password.

e) Press the **Save** button and wait for confirmation.

f) To continue the process on the primary server, you will need to login again using the *primary* IP address (instead of the *master* IP address).

7 *Secondary server*

    a) Open a new browser window or tab and navigate to the Dashboard using the secondary IP address, then to the **Automatic Failover** area.

> *Tip:* As you will be alternating between the primary and secondary servers frequently, it may be easiest to keep them in separate browser windows.

    b) Enter the hostname and IP address for each of the primary and secondary servers.

    c) Enter the master IP address.

    d) Enter the same secret authentication password used on the primary server.

    e) Press the Save button and wait for confirmation.

From this point forward, the **Setup Steps** section of the **Automatic Failover** page will indicate instructions to perform for each step. These instructions should directly correspond to the steps provided here.

This stage of the configuration process will walk you through a sequence of configuration steps, requiring you to alternate between the browser windows of the Primary and Secondary servers. The following table summarizes these Setup Steps (i.e., button clicks) and on which server (i.e., browser) each step should be performed.

Note that the sequence of buttons to be clicked for each stage (i.e., Initialization, Database, Services, and Resources) follows the same pattern:

- Primary Server, Primary Node button
- Secondary Server, Primary Node button
- Secondary Server, Secondary Node button
- Primary Server, Secondary Node button

Primary Server				Secondary Server			
#	Primary Node	#	Secondary Node	#	Primary Node	#	Secondary Node
1	Initialization	4	Initialization	2	Initialization	3	Initialization
5	Database	8	Database	6	Database	7	Database
9	Services	12	Services	10	Services	11	Services
13	Resources	16	Resources	14	Resources	15	Resources

8 *Primary server*

    a) Press the **Initialization** button under **Primary Node** and wait for confirmation.

9 *Secondary server*

    a) Press the **Initialization** button under **Primary Node** and wait for confirmation.

    b) Press the **Initialization** button under **Secondary Node** and wait for confirmation.

10 *Primary server*

a) Press the **Initialization** button under **Secondary Node** and wait for confirmation.

b) Press the **Database** button under **Primary Node**.

c) Refresh the web page until the **Database** button turns green. If errors are displayed, continue refreshing the web page until the **Database** button turns green.

11 Secondary server

a) Press the **Database** button under **Primary Node** and wait for confirmation.

b) Press the **Database** button under **Secondary Node**.

c) Refresh the web page until the **Database** button turns green. If errors are displayed, continue refreshing the web page until the **Database** button turns green.

12 Primary server

a) Press the **Database** button under **Secondary Node** and wait for confirmation.

b) Press the **Services** button under **Primary Node** and wait for confirmation.

13 Secondary server

a) Press the **Services** button under **Primary Node** and wait for confirmation.

b) Press the **Services** button under **Secondary Node** and wait for confirmation.

14 Primary server

a) Press the **Services** button under **Secondary Node** and wait for confirmation.

b) Press the **Resources** button under **Primary Node** and wait for confirmation. If errors are displayed, refresh the web page.

c) If a login screen is displayed, log back into the web interface, open the **Automatic Failover** area and confirm that the **Resources** button is green.

15 Secondary server

a) Press the **Resources** button under **Primary Node** and wait for confirmation.

b) Press the **Resources** button under **Secondary Node** and wait for confirmation.

16 Primary server

a) Press the **Resources** button under **Secondary Node** and wait for confirmation.

If all setup buttons are green at this point, the **Primary Node** is in master mode and the **Secondary Node** is in slave mode. The system has been successfully configured for Automatic Failover.

Figure 28. Automatic Failover Operations mode

Note: The page shown in *Table 28, "Automatic Failover Operations mode," on page 80* can only be seen by navigating to the Automatic Failover page via the Primary or Secondary IP address, *not* through the Master IP address. This page viewed via the Master IP address will provide links to these server-specific pages.

Table 19. Automatic Failover Parameters

Hostname	Name of the current server.
Operational Mode	Indicates the current state of the Automatic Failure configuration or operation on this server. Possible values are: • setup • master • slave • standby • maintenance
Primary Hostname	Name of the Primary server.
Secondary Hostname	Name of the Secondary server.
Master IP Address	The IP address that is used by Nyquist devices, the Nyquist web interface, SIP-based telephony devices, and Routine API clients of the Nyquist system to communicate with the Nyquist system. The Master IP Address is also known as the Server IP Address.
Primary IP Address	The IP address of the primary server, used for communicating with the secondary server and for performing specific Automatic Failover operations through the web interface.
Secondary IP Address	The IP address of the secondary server, used for communicating with the primary server and for performing specific Automatic Failover operations through the web interface.
Authentication Password	Password used for authentication between the primary and secondary servers.
Save	Saves the currently shown configuration settings.
Disable	Disables the Automatic Failover functionality for this server, returning this server to a standalone server. To temporarily disable Automatic Failover, use the Standby or Maintenance modes instead. **Caution** This action will completely remove the Automatic Failover configuration and is not reversible without performing the setup process over again.

Table 19. Automatic Failover Parameters

Setup Steps	Shows which setup step is currently being performed during the Automatic Failover setup process. Successfully completed steps are displayed in green.
Standby	Places the current server in Standby mode, which causes the server to surrender the Master role to the partner server and to subsequently refuse to accept the Master role.
Unstandby	Removes the current server from Standby mode and potentially resumes the Master role.
Maintenance	Places the current server in Maintenance mode.
	Note: Do not place your server into Maintenance mode unless instructed to do so by Technical Support.
	While in Maintenance mode, a server will neither assume nor relinquish the Master role due to failures, but will maintain its current role.
	For example, if the Primary server is in Maintenance mode and suffers a software error or controlled software restart, it will not relinquish the Master role to the Secondary server.
	Similarly, if the Secondary server has assumed the Master role and is then placed into Maintenance mode, it will *not* assume the Master role when the Primary server recovers until the Secondary server is taken out of Maintenance mode.
	Note: Although a server will not explicitly assume or relinquish the Master role while in Maintenance mode, the other server may still assume the Master role if the server in Maintenance mode is incommunicado due to a shutdown, reboot, or other network issues.
Unmaintenance	Removes the current server from Maintenance mode.
	Note: Do not place your server into Maintenance mode unless instructed to do so by Bogen Technical Support.
Refresh	Refreshes the Automatic Failover status. This clears previous failures that may have caused failover from Master to Slave.
Sync DB	Synchronizes the database between Master and Slave servers.

Automatic Failover Process

The failover process, once configured, will automatically occur if the primary server fails. The failure may be an internal error that is detected by the primary server itself, or it may be a catastrophic failure, such as a hardware failure, where the secondary server loses contact with the primary and assumes the Master role.

Warning	**It is STRONGLY recommended that system configuration changes NOT be made while the Secondary server is acting as the Master server. Any such changes will *not* be replicated to the Primary server. If changes must be made (e.g., while awaiting a replacement Primary server), be sure to perform the same changes on the Primary server when it is placed in service.**

Initiating a Server Shutdown

If you need to shutdown the primary server and you want the secondary server to provide service during the primary server's downtime, put the primary server into Standby mode by pressing the **Standby** button before performing the shutdown. Later, when the primary server boots up, it will remain in Standby mode. When you're ready for it to resume the master role, take it out of Standby mode by pressing the **Unstandby** button.

To shutdown the secondary server while it is in Slave mode, you can immediately perform the shutdown. Later, when the secondary server boots up, it will automatically resume in Slave mode.

To shutdown the secondary server while it is in Master mode, there are two possible scenarios. If the primary server is available, put the secondary server into Standby mode before performing the shutdown. Later, when the secondary server boots up, it will still be in Standby mode. When you're ready for it to resume the Slave role, take it out of Standby mode by pressing the **Unstandby** button. If the primary server is in Standby mode or not available, the secondary server will take the Master role and provide service.

Primary Server Permanent Failure

If the Primary server permanently fails, forcing the use of the Secondary server as the Master, you will need to setup a new System Controller to use as the Primary, disable Automatic Failover on the Secondary, and then perform the Automatic Failover configuration on the two servers.

Caution	**Although the secondary server will provide full functionality, the Automatic Failover license will not operate indefinitely without a primary server. Please contact Bogen or an Authorized reseller for information on replacing the primary server.**

Restore the System from a System Backup

To restore an Automatic Failover-configured system from a system backup, follow these steps:

1 Perform the system restore on the primary server using a system backup that was created after the **Automatic Failover** setup (see "*Restoring a Backup File" on page 320*).

2 On the **Automatic Failover** page of the primary server, press **Sync DB** under **Operation Commands** and wait until it finishes.

3 On the **Automatic Failover** page of the secondary server, press **Sync DB** under **Operation Commands** and wait until it finishes.

4 On the **Automatic Failover** page of the primary server, press the **Refresh** button.

5 On the **System Parameters** page, press **Check Server Status**.

6 In the **Automatic Failover Status** section, check that the following statements are true:

- "**MySQL Master Status, File**" is equal to "**MySQL Slave Status, Master_Log_File**"
- "**MySQL Master Status Position**" is equal to "**MySQL Slave Status, Read_Master_Log_Pos**"
- "**MySQL Slave Status, Slave_IO_Running**" is **Yes**
- "**MySQL Slave Status, Slave_SQL_Running**" is **Yes**

7 If any statements in step #6 are false, repeat the procedure starting with step #2

8 If statements listed in step #6 are not true, even after repeating the steps, contact technical support.

Note: System Restore will only restore configuration data; it will not repair all issues that may be related to the **Automatic Failover** feature. If system restore does not solve the problem you're experiencing, then disable the **Automatic Failover** feature and repeat the **Automatic Failover** setup process. If your problem is still not resolved, please contact technical support.

System Update Procedure

Warning	Please read the Release Notes for the system update that you're about to use. The release notes may include changes to this procedure.

The following procedure should be followed to perform System Updates on the Primary and Secondary servers when Automatic Failover is enabled:

1 **Update Primary Server**: Access the Primary server using the Primary server's IP address.

Note: While using the Automatic Failover feature, the system will not allow you to start a System Update from the Master IP Address.

2   *Optional step*: If you are performing system updates on systems that are currently providing service, place the Primary server into standby mode, and wait until the Secondary server has assumed the master role.

3   Start the System Update on the Primary server, wait until the update has finished.

4   In the unlikely event that the update fails, stop the procedure and contact Technical Support. The Secondary server will continue to provide service until the issue is resolved on the Primary server.

5   *Optional step*: If you placed the Primary server into standby mode, take the Primary server out of standby mode, and wait until the Primary server has assumed the master role.

Note: If the Primary server assumed the master role after the system update, this step can be skipped.

6   **Update Secondary Server**: Access the Secondary server using the Secondary server's IP address.

7   Start the System Update on the Secondary server, wait until the update has finished.

8   **Verify Operation**: Access the Primary server using the Primary server IP address.

9   On the **System Parameters** page, press **Check Server Status**.

10 In the **Automatic Failover Status** section, check that the following statements are true:

   • "**MySQL Master Status, File**" is equal to "**MySQL Slave Status, Master_Log_File**"
   • "**MySQL Master Status Position**" is equal to "**MySQL Slave Status, Read_Master_Log_Pos**"
   • "**MySQL Slave Status, Slave_IO_Running**" is **Yes**
   • "**MySQL Slave Status, Slave_SQL_Running**" is **Yes**

11 If any statements in the previous step are false, continue to the next step, otherwise the system update procedure is finished.

12 On the **Automatic Failover** page of the primary server, press **Sync DB** under **Operation Commands** and wait until it finishes.

13 On the **Automatic Failover** page of the secondary server, press **Sync DB** under **Operation Commands** and wait until it finishes.

14 On the **Automatic Failover** page of the primary server, press the **Refresh** button.

15 On the **System Parameters** page, press **Check Server Status**.

16 In the **Automatic Failover Status** section, check that the following statements are true:

- "**MySQL Master Status, File**" is equal to "**MySQL Slave Status, Master_Log_File**"
- "**MySQL Master Status Position**" is equal to "**MySQL Slave Status, Read_Master_Log_Pos**"
- "**MySQL Slave Status, Slave_IO_Running**" is **Yes**
- "**MySQL Slave Status, Slave_SQL_Running**" is **Yes**

17 If any statements in step #16 are false, repeat the procedure starting with step #12

18 If statements listed in step #16 are not true, even after repeating the steps, contact technical support.

Configuration Limitations

- Changes to NTP Server must be done on Primary and Secondary servers.
- Changes to Time Zone must be done on Primary and Secondary servers.
- Changes to TeamViewer configuration must be done on Primary and Secondary servers.

Failover Limitations

- Queued paging messages are not copied to the Secondary server. If the Secondary server becomes the Master server, the queued paging messages that were created on the Primary server will not be played.

- Ongoing Check-in processes are not migrated between Primary and Secondary servers. If a check-in is started on the Primary server, and during the check-in process the Secondary server becomes the Master, the current check-in process is not migrated to the Secondary server.

- Audio Distributions are terminated and no attempt is made to resume Audio Distributions that were playing before the failover.

- Routines that were operating are terminated, and thus the state of various features may not be updated if a Routine was responsible for updating the state. For example:
  - Display messages (missing delete command)
  - I/O Contact state (missing open/close command)

  One way to work around this issue is to create Routines with reboot triggers that are responsible for setting features to a known state after a failover occurs, when applicable.

- Recordings and Voicemail made while the Secondary server is providing service are not copied to the Primary server when it resumes service.

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Failover Routines and Triggers

The following table lists Routine triggers that can be used to execute Routines upon Automatic Failover events. The "Executed on node" column indicates on which node the Routine actions will execute.

Table 20. Failover Event Routine Triggers

Routine Trigger	Automatic Failover Event	Executed on node
af-primary-avail	The Secondary server is now able to contact the Primary server.	Secondary Primary (*rejoin)
af-primary-error	An error has occurred on the Primary server that requires attention.	[Not used in this release]
af-primary-master	The Primary server is now in master mode providing service.	Primary (Master)
af-primary-maint	The Primary server is now in maintenance mode. If the Primary server is currently the master, it will continue to provide service. While in maintenance mode, failover to the Secondary server will only occur if the Primary server is shutdown, reboots, or losses network connectivity. The server should not be left in maintenance mode unless instructed to do so by technical support.	Primary
af-primary-standby	The Primary server is now in standby mode and is not providing service.	Primary
af-primary-unavail	The Secondary server is unable to contact the Primary server. This may indicate a primary server failure or be due to a network connection issue on the primary or secondary server.	Secondary

Table 20. Failover Event Routine Triggers

af-secondary-avail	The Primary server is now able to contact the Secondary server.	Primary Secondary (*rejoin)
af-secondary-error	An error has occurred on the Secondary server that requires attention. Example: MySQL may be out of sync with Primary server.	[Not used in this release]
af-secondary-master	The Secondary server is now in master mode providing service.	Secondary (Master)
af-secondary-maint	The Secondary server is now in mainte-nance mode. If the Secondary server is currently the master, it will continue to provide service. If the Secondary server is currently the slave, it will not assume the master role if the Primary server fails. The server should not be left in maintenance mode unless instructed to do so by tech-nical support.	Secondary
af-secondary-slave	The Secondary server is now in slave mode, is not providing service, and is waiting for failover.	Secondary
af-secondary-standby	The Secondary server is now in standby mode, is not providing service, and is unavailble for failover.	Secondary
af-secondary-unavail	The Primary server is unable to contact the Secondary server. This may indicate a secondary server failure or be due to a network connection issue on the primary or secondary server.	Primary

 * rejoin - means that the node has rejoined after being offline

Recommendations

- If a Routine includes an action to display a message to GA10PV display devices, con-sider specifying a unique identifier for that message. This will make it easier to delete

the message when it is no longer relevant, such as when the failover state changes. For example, when the secondary server becomes the Master, a display message might be created for that event. Later, when the primary becomes Master again, a Routine started by the **af-primary-master** trigger will be able to delete the previously displayed message related to the secondary becoming the Master by using the message identifier specified by the secondary server when it created the message.

- Most triggers will *not* cause Routines to be executed on *both* servers. Keep that in mind when you're planning which actions to perform. For example, a Routine triggered by **af-secondary-slave** will execute actions only on the Slave server, so attempting to perform actions that affect Nyquist devices will not take affect because the Nyquist devices are only communicating with the Master server.

- Remember that Routines that execute on a non-Master node cannot display messages on, or otherwise communicate with Nyquist, devices.

- Every time a server becomes the Master, the **Reboot** trigger is also fired. This allows the **Reboot** trigger to be used to initialize the server environment. The **af-primary-master** and **af-secondary-master** triggers should be used for actions that should only occur when the failover mechanism has caused the switch.

- Whenever you use a Routine trigger related to a server being unavailable (e.g., **af-secondary-unavail**), keep in mind that the reason could be that the reporting server is no longer attached to a network and thus Routine actions that require network connectivity could fail.

  - Similarly, remember that the **af-secondary-unavail** and **af-primary-unavail** triggers may *both* fire, each on a different server, if both servers are still functioning but are unable to communicate for any reason. The Routines should be designed with this possibility in mind.

Tip: Whenever Routines are configured to be triggered by any of the Automatic Failover event triggers, we highly recommend that you thoroughly test everything to ensure that the expected actions are performed. It may be safest to test outside of normal operating hours.

Using CoS Configuration

Class of Service (CoS) configuration is used to define the Nyquist features that stations are permitted to use, and defines the Call in Level that stations will use when calling an Admin station. All stations in the Nyquist system must have an associated CoS that defines the feature privileges granted to the station. You can configure and assign an unlimited number of CoS definitions. Once created, a CoS can be assigned to a station as

a Day CoS and a Night CoS. (See "*Editing Station Configuration Settings" on page 142*.) Note that an analog phone cannot be used as a day or night admin.

Figure 29. CoS Configuration Page

The following table describes the CoS Parameters:

Table 21. CoS Configuration Page Parameters

Name	User provided name for the CoS.
Call in Level	For call switch and handset station types, identifies the call as Normal+Emergency, Urgent+Emergency, Emergency only, or Normal only. The system defaults to Normal+Emergency. Call in Levels are described as:
	• **Normal+Emergency**. Initiates a normal or emergency-level call. Pressing the call switch once or picking up the handset, triggers a normal-level call to the administrative phone. Pressing the call switch or flash hook four times, triggers an emergency-level call to the administrative phone.
	• **Urgent+Emergency**. Initiates an urgent or emergency-level call. Pressing the call switch or picking up the handset, triggers an urgent-level call to the administrative phone. Pressing the call switch or flash hook four times, triggers an emergency-level call to the administrative phone.
	• **Emergency Only**. Initiates an emergency level call by pressing the call switch one time or lifting the handset.
Zone Paging	Specifies if Zone Paging, Zone-based Announcements, and Record Announcements are enabled for the associated station.
All-Call Paging	Specifies if the associated station can simultaneously page or play announcements to all speakers within the facility.
Emergency All-Call	Specifies if the associated station can place a top priority all-call page.

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Table 21. CoS Configuration Page Parameters (Continued)

Inter-Facility Call/Page	Specifies if the associated station can call or page another facility.
Audio Distribution	Specifies if the associated station can use an audio source, such as a flash drive.
Remote Pickup	Specifies if the associated station can be answered remotely.
Join Conversation	Enables the caller to interrupt or join an existing call. If a call is placed to a busy station, the system waits 10 seconds and then bumps or interrupts the call with the new caller, or the caller can dial an access string to join the existing call. This feature applies to administrative display phones only.
Call Forwarding	Permits a user to redirect or route incoming calls to another station.
Walking Class of Service	Enables the manual override of telephone restrictions.
External Call Routing	Enables the station to transfer a call to an outside line.
Call Transfer/3-way Calling	Allows the associated station user to contact a third-party while on a call, establish a three-way conversation and then drop off allowing the two other parties to remain connected.
Manually Activate Tone Signals	Enables a user to initiate tones outside of the schedule.
Call Any Station	Enables a station to call any station.
Manage Recordings	Allows the station user to manage recordings, such as emergency call recordings.
Monitor Calls	Allows the station user to monitor active calls.
Monitor Locations	Allows the station user to monitor locations (not active calls).
Conference Admin	Allows the station user to join a conference as an administrator.
Conference User	Allows the station user to join a conference as a user.
Voicemail	Allows the station user to receive voicemail.

Table 21. CoS Configuration Page Parameters (Continued)

Record Calls	Allows the station user to begin recording an active call by pressing *3 any time during the call. This option is for use with admin phones when a Normal, Urgent, or Emergency intercom call is being made.
Activate Alarm Signals	Allows the station to activate alarms.
Disable Audio	Allows a station with contact closure to disable audio during a fire alarm or other emergency, allows an Admin web interface station to manually disable audio via the dashboard, and allows an Admin Phone to disable audio via DTMF code. *Note:* There also exists a related Role permission, Enable/Disable Audio Button, that determines whether or not users will see the Enable Audio and Disable Audio buttons on their Dashboard. The Role permission does not, however, prevent the user from using this feature through other mechanisms, such as via an Admin phone or the Routines API.
Enable Audio	Allows enabling of audio previously disabled during an emergency event, allows an Admin web interface station to manually enable audio via the dashboard, and allows an Admin Phone to enable audio via DTMF code. *Note:* See Disable Audio note regarding related Role permission.
Allow Callee Auto-answer	Allows call auto-answer by the callee for calls placed by this station.
Multi-Site Paging	Allows station to perform multi-facility paging and multi-facility announcements.
Inter-Facility Features	Allows the station to call extensions on remote facilities for voice mail and access to recorded calls and to stop audio.
Manage Output Contacts	Allows the station to activate or reset output contacts on I/O Controllers. For more information about managing output contacts, see *"Configuring I/O Controller Output Rules" on page 153*.
Execute Routines	Allows the station to execute routines via DTMF codes. For more information about managing routines, see *"Using Routines" on page 388*.

Editing CoS Parameters for a Station

To edit CoS Parameters for a station:

1 On the navigation bar, select **CoS Configuration**.

2 For the station that you want to edit CoS settings, select the **Edit** icon.

3 Make the desired changes. You can use the **All On** button to turn all features on or the **All Off** button to turn all features off. For information about the settings, see *Table 21, "CoS Configuration Page Parameters," on page 90*.

4 After all changes are made, select **Save**.

Deleting CoS Parameters for a Station

To delete CoS Parameters for a station:

1 On the navigation bar, select **CoS Configuration**.

2 For the station that you want to delete CoS settings, select the **Delete** icon.

3 When prompted, select **Delete**.

Adding CoS Parameters for a Station

To add CoS Parameters for a station:

1 On the navigation bar, select **CoS Configuration**.

2 Select the **Add** icon.

3 Complete Parameters for the station. For information about the settings, see*Table 21, "CoS Configuration Page Parameters," on page 90*.

4 After all changes are made, select **Save**.

Managing SIP Trunks

A SIP (Session Initiation Protocol) trunk is an IP-based network connection between Nyquist and an Internet Telephony Service Provider (ITSP), which is also known as a VoIP telephone service provider. It allows you to use VoIP telephony beyond the facility's fire-wall without the need for a Public Switched Telephone Network (PSTN), providing a con-figuration that is easier and less expensive to operate and maintain. SIP trunks can carry VoIP calls, Enhanced 911, and other real-time communications services.

A SIP Tie-Trunk (or a SIP Tie-Line) functions similarly to a SIP trunk, but serves as an IP based inter-connection between Nyquist and a local (premises-based) or hosted IP-PBX. For information about using SIP Tie-Trunks with Nyquist, refer to *"SIP Trunk Custom Configuration Settings" on page 101*.

Before you can set SIP parameters in Nyquist, you must first set up the system's DISA function by creating a station with the **Type** of **DISA Line**. (See *"Adding a Station" on page 173*.)

If you will require support from Bogen during the implementation process, you must install TeamViewer on the Nyquist system server and enable remote access capabilities in the LAN to allow a remote connection to the server. In addition, Wireshark must be installed in the Nyquist system server to allow packet inspection during SIP implementation and troubleshooting. It is recommended that the technician performing the install be skilled with SIP implementation and testing. The firewall setting must allow Port 5060 and Ports 10000 – 20000 for the RTP traffic. Any other type of SIP connectivity could be available via an individual case basis process.

How Nyquist Handles Incoming SIP Calls

Note: If a SIP trunk is configured but disabled in the Nyquist System Parameters, then incoming calls from the SIP trunk are ignored.

When a SIP trunk is enabled and Nyquist receives an incoming call on that SIP trunk, Nyquist routes the call based on the **Access** parameter set in the Nyquist SIP trunk's parameters. The **Access** parameter is set when editing or adding SIP trunk configuration (see *"Editing a SIP Trunk Configuration" on page 106* and *"Adding SIP Trunk Configuration Parameters" on page 99*) and must match the ITSP switch configuration.

Based on the **Access** parameter setting, Nyquist does one of the following:

- Routes the call to a DISA function/station
- Routes the call to a Security DISA function/station
- Routes the call to a defined Day Admin or Night Admin

The following **Access** settings route the incoming SIP trunk call to the DISA functionality:

- DISA – Bi-directional – No password
- DISA – Bi-directional – Password
- DISA – Incoming only – No password
- DISA – Incoming only – Password
- PBX Connection – Incoming only. Allow DISA, No password

- PBX Connection – Incoming only. Allow DISA, Password

When the Nyquist system receives an incoming call, the caller will hear a dial tone. The caller can then dial any Nyquist extension or any Dual Tone Multi-Frequency (DTMF) code that is associated with a Nyquist feature. For example, after hearing the dial tone, the caller can dial #0911 to start an Emergency All-Call page. (See *"Appendix B: Nyquist DTMF Feature Dialing Codes" on page 490* for a list of DTMF codes.)

When incoming calls are routed to the DISA function, the SIP trunk **Extension** setting is used to map the SIP trunk to a station of type **DISA Line**; the associated station's CoS configuration is used to determine what Nyquist functions the incoming DISA user is allowed to initiate. (See *"Adding CoS Parameters for a Station" on page 93*.) The **Extension** parameter is also used as the caller ID when a DISA user dials a station extension.

The following **Access** settings route the incoming SIP trunk call to Security DISA functionality:

- Security DISA – Bi-directional – Listen only
- Security DISA – Incoming – Listen only
- PBX Connection – Incoming only, security DISA

The caller must enter a valid extension to be monitored and can only listen to calls or station locations.

The following **Access** settings route the incoming SIP trunk call to the defined Day or Night Admin:

- Unrestricted
- Incoming Only

If the Day or Night Admin does not answer the incoming call, the call is routed, or rolled over, to the Admin Group. (See *"Using Admin Groups" on page 223*.)

If the call is not answered during night hours and the Night Ring option is enabled, the call is routed using the Night Ring functionality. (See *"Setting Night Call Options" on page 28*.)

How Nyquist Handles Outgoing SIP Calls

Nyquist users can initiate outside calls by dialing a number that starts with the outside call prefix (98). Outside calls are only sent to SIP Trunks that have one of the following **Access** settings:

- DISA – Bi-directional – No Password
- DISA – Bi-directional – Password
- Security DISA – Bi-directional – Listen only

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- Unrestricted

- Outgoing Only

> *Note:* Use the PBX Connection options only if the PBX accepts 7-digit and 10-digit domestic and 12-digit international PSTN telephone numbers and can initiate outbound calls to specified telephone numbers.

- PBX Connection – Bi-directional, No DISA

- PBX Connection – Bi-directional, Allow DISA, No password

- PBX Connection – Bi-directional, Allow DISA, Password

- PBX Connection – Bi-directional, Security DISA

When outside calls are placed, the outbound caller ID is set to the Direct Inward Dial (DID) defined for the SIP Trunk. (See *"Editing a SIP Trunk Configuration" on page 106* or *"Adding SIP Trunk Configuration Parameters" on page 99*.)

When **Access** is set to **911 Only**, only outgoing 911 calls may be routed on the associated SIP trunk. The **DID** parameter is not used for outgoing 911 calls; it is expected that the SIP trunk provider has mapped the Billing Telephone Number (BTN) to E911 service.

All outgoing calls are routed through the SIP trunk provider using the following SIP trunk configuration parameters:

- Host IP Address

- Username

- Password

If the SIP trunk provider expects all called numbers to be prefixed with a specific code, the **Dial Prefix** setting can be used to satisfy the requirement.

If the SIP trunk provider expects all called 7-digit numbers to be prefixed with a specific local area code, the **Local Area Code** setting can be used to satisfy the requirement. (See *"Adding SIP Trunk Configuration Parameters" on page 99*.)

Dialing PBX Extensions via Nyquist SIP Trunks

If the Nyquist system has one SIP trunk configured that is attached to a PBX system, Nyquist users can dial PBX extensions via the Nyquist SIP trunk. The SIP trunks can be setup using DAHDI hardware, Grandstream HT813 FXO ports, or configured SIP Trunks.

Calls initiated via the Nyquist system that start with *** will be routed through an available Nyquist SIP trunk, presumably to an attached PBX system.

For example, dialing ***123 will cause the Nyquist system to place a call to 123 using an available SIP trunk (which should be attached to a PBX system).

Any combination of characters can follow the *** prefix. This allows complete flexibility to match the dial plan syntax of the attached PBX system.

For example, if the PBX is programmed to accept calls to extensions when prefixed with #, the Nyquist user can dial ***#123 to place a call to extension 123.

Notes

- When a Nyquist station uses the *** prefix to dial a PBX extension via a Nyquist SIP trunk, the Nyquist station must have **Outside Access** enabled. If the calling station's **Outside Access** parameter is set to **No Access**, the calling station will hear "access denied" and the call will not be placed. Any choice other than **No Access** will allow the station to place calls using the *** prefix; but if the **Restricted Day/Night** options are used, they will also be in affect to control access to day or night only.

- The SIP Trunk DID field can be set to whatever value is required by the PBX system that will be receiving calls from the Nyquist system. For example, if the PBX system wants to see the Nyquist incoming call as extension 123, the SIP Trunk DID can be set to 123 to make sure that—from the PBX system's perspective—the incoming call is coming from the caller id equal to 123.

- To enable this feature, the SIP Trunk Access setting should use one of the available choices that start with "PBX Connection".

Limitations

- Only one PBX system connection via a single SIP trunk is supported. Multiple PBX system connections is not supported because Nyquist does not yet have a method to allow users to select a specific PBX system for calls to PBX systems using the *** prefix.

- Nyquist does NOT support the use of '***' to dial PBX extensions via SIP trunks if the Nyquist system is also being used to dial PSTN DIDs via a SIP trunk attached to the PSTN (e.g. using PSTN SIP Trunk provider, or FXO attached to PSTN, instead of being attached to a PBX system).

  On the other hand, If a PBX system is programmed to route incoming PSTN DID extensions through the PSTN, and Nyquist is attached to a single such PBX system, then Nyquist outbound calls via the PBX system are also supported.

Configuring SIP Tie-Trunks Between Nyquist and PBX Systems

If you want all incoming calls from the PBX to always use DISA to prompt the user for Nyquist dial codes, then use one of the **Access** options that starts with **DISA** (for example, **DISA – Incoming only - No password**).

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If you want all incoming calls from the PBX to directly pass in dial codes that have already been collected from the user by the PBX or created by the PBX, then choose one of the **Access** options that starts with **PBX Connection** (for example, **PBX Connection – Incoming only, Allow DISA, No password**).

When any of the following **Access** options are configured for the SIP Tie-Trunk, the Nyquist server expects that dialing digits are provided by the PBX system (the dialing digits should be included in the SIP INVITE from the PBX), and Nyquist will immediately initiate a Nyquist call based on the digits provided:

- PBX Connection – Incoming only, No DISA
- PBX Connection – Incoming only, Allow DISA, No password
- PBX Connection – Incoming only, Allow DISA, Password
- PBX Connection – Bi-directional, No DISA
- PBX Connection – Bi-directional, Allow DISA, No password
- PBX Connection – Bi-directional, Allow DISA, Password

If the PBX Connection option includes **Allow DISA**, the PBX may start the DISA function by sending dialing code 950. The DISA function will also be started if the PBX does not pass any dialing digits in the SIP INVITE.

If **PBX Connection – Incoming only, No DISA** is used, the SIP Trunk must still have a DISA station type linked to the SIP trunk extension to provide the Nyquist CoS settings to be used for incoming calls, but when incoming connections are made from the PBX, the Nyquist system will ignore dialing code 950. The DISA function cannot be requested if the **No DISA** option is used.

The dialing digits provided by the PBX can be any of the DTMF codes supported by the Nyquist system. Access to various Nyquist features is granted based on the Nyquist CoS settings of the DISA station extension defined in the SIP Trunk.

If the PBX is not able to pass through # in the dialing digits, alternate dialing codes may be used to replace Nyquist extensions that start with #. The following table describes the alternate dialing codes:

Table 22. Alternate Dialing Codes

Nyquist Feature	Dialing Code	Alternate Dialing Code
All-Call Page	#0	0000000
Emergency All-Call Page	#0911	951
Zone Page	#<zone number>	0000099<zone number>

When the following Access options are configured for the SIP Tie-Trunk, upon connection from the PBX system (via SIP INVITE), the Nyquist system automatically activates the Security DISA function:

- PBX Connection - Incoming only, security DISA
- PBX Connection - Bi-directional, Security DISA

The caller must enter an access PIN, followed by the extension number of the station to monitor.

Another available option for connecting Nyquist with PBX Systems is the use of the Grandstream HT813 FXO Port. Please see *"Using a Grandstream HT813 Adapter" on page 177* for details.

Adding SIP Trunk Configuration Parameters

Before adding a SIP trunk, the following parameters must be configured or known:

- Extension for the Nyquist DISA line station associated with the specified SIP trunk; the station will have **DISA Line** selected as **Type** (see *"Viewing Station Configuration Settings" on page 128*).
- Dial prefix and format used to connect to an outside line
- Local area code
- Username and password for the DISA line
- DID phone number associated with the DISA line
- Codecs allowed
- Admin Group set up for the SIP extension (see *"Using Admin Groups" on page 223*)

To add a SIP trunk:

1 On the navigation bar, select **SIP Trunks**.

2 On the SIP Trunks page, select the **Add** icon.

3 On the Add SIP Trunk page, complete the parameters. (See *"Adding SIP Trunk Configuration Parameters" on page 99.*)

4 Select **Save.**

Table 23. Add SIP Trunk Page Parameters

Name	Enter the name for the SIP trunk. The name cannot contain spaces or a slash (/) and cannot exceed 16 characters.
Extension	Select the DISA station extension that is associated with the SIP trunk.

Table 23. Add SIP Trunk Page Parameters (Continued)

Dial Prefix	Enter the dial prefix required by the ITSP to complete an outbound call over the SIP trunk. For example, :9, 9+1, etc.
Local Area Code	Enter the local area code if the ITSP requires 7-digit telephone numbers be prefixed with the area code. Otherwise, this field is left blank.
Enabled	Specify if the SIP trunk is enabled. The SIP trunk should be configured before it is enabled to avoid erratic system behavior.
Access	Select the outside access permissions for the SIP trunk. Options are: • 911 Only • DISA – Bi-directional – No password • DISA – Bi-directional – Password • DISA – Incoming only – No password • DISA – Incoming only – Password • Incoming Only • No Access • Outgoing Only • Security DISA – Bi-directional – Listen only • Security DISA – Incoming – Listen only • Unrestricted • PBX Connection – Incoming only, No DISA • PBX Connection – Incoming only, Allow DISA, No password • PBX Connection – Incoming only, Allow DISA, Password • PBX Connection – Incoming only, security DISA • PBX Connection – Bi-directional, No DISA • PBX Connection – Bi-directional, Allow DISA, No password • PBX Connection – Bi-directional, Allow DISA, Password • PBX Connection – Bi-directional, Security DISA
Username	Enter the user name that is required to access the SIP trunk.

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Table 23. Add SIP Trunk Page Parameters (Continued)

Password	Enter the password that is required to access the SIP trunk. The password is provided by the SIP trunk provider or hosted VoIP provider.
Password Confirmed	Re-enter the SIP trunk password.
Host	Enter the host name or IP address for the ITSP.
DID	Enter the 10-digit DID telephone number that the SIP trunk or hosted VoIP provider has assigned the SIP trunk, using the format NPANXXxxxx (that is, no spaces or dashes).
Day Admin	Select the Admin Station to call during daytime hours.
Night Admin	Select the Admin Station to call during nighttime hours.
Admin Group	Select the Admin Group to call if the day or night Admin Stations do not answer the call.
Call Recording	Provide if incoming and outgoing calls are to be recorded.
Allow	Provide a list of media codecs that are allowed. PSTN standard codecs are G.711 or ULAW.
Description	Provide user provided description for the SIP trunk.
Custom Settings	Provide custom setting configurations that are provided by Technical Support. (See "*SIP Trunk Custom Configuration Settings" on page 101*.)

SIP Trunk Custom Configuration Settings

The **Custom Settings** parameter can be used if additional parameters are needed during SIP trunk configuration to satisfy SIP trunk provider requirements. Bogen Technical Support will provide any necessary custom settings. In most cases, **Custom Settings** are not required.

Custom Settings can be entered when adding or editing SIP Trunk parameters (see "*Adding SIP Trunk Configuration Parameters" on page 99* or "*Editing a SIP Trunk Configuration" on page 106*) using the following format:

> :TABLE-NAME:<variable>=<value>:TABLE-NAME:

In this format, TABLE-NAME is one of the following:

- ENDPOINT
- AOR
- AUTH
- SIPTRUNK

Variable is a valid variable from one of the pjsip tables (ps_endpoints, ps_aors, ps_auths) or sip_trunk table.

Value is a valid value for a specified variable.

Contact Technical Support for information regarding Custom Settings for your specific IP-PBX type and configuration.

Registering as a Third-Party SIP Endpoint

You can configure a Nyquist SIP trunk to register with a third-party SIP endpoint with an IP-PBX. This will allow users to dial an IP-PBX defined extension to initiate Nyquist features, such as paging.

The steps to register the Nyquist SIP trunk as a third-party SIP endpoint for an IP-PBX are:

1 **Define a Third-Party SIP Phone/Endpoint on your IP-PBX system.** On the IP-PBX system, set up a third-party SIP phone/endpoint as you would for a standard single-line basic SIP IP phone with a username and password to use for authentication. Typically, the username would be the extension number. The Nyquist system will attempt to register with your IP-PBX system as a SIP endpoint extension using the provided username (extension) and password pair. Your IP-PBX users will dial the provided IP-PBX extension to access the Nyquist system.

2 **Define a DISA station on Nyquist system.** On the Nyquist System, create a **DISA Line** station **Type**. This station's extension will define the feature CoS permissions to be used when the IP-PBX calls into the Nyquist system.

Note: The station extension used for the DISA Line must be different than the extension being used by your IP-PBX.

3 **Define a SIP Trunk on Nyquist system.** Configure a Nyquist SIP Trunk using the username (PBX extension) and password that was defined on your IP-PBX in step 1.

For example, suppose the IP-PBX has defined extension 511 as the SIP endpoint with password **testpassword**. The Nyquist SIP trunk must use **511** in the **Name**, **Username**, and **DID** parameters on the Add SIP Trunk page. Nyquist station extension 500 is defined as a **DISA** station.

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When an IP-PBX user calls 511, the Nyquist system will see an incoming call to extension 511. Nyquist converts to the DISA station extension 500 (to provide CoS definitions for 511 and Caller-ID to the Nyquist system). DISA will be started, allowing the IP-PBX caller to initiate a feature on the Nyquist system. When DISA starts, the IP-PBX user hears a dial tone. The IP-PBX user can then enter DTMF/dial-pad based feature commands to start paging and other Nyquist features.

Table 24. Nyquist SIP Trunk Configuration

Name	511
	(Username/extension provided by IP-PBX)
Extension	500
	(DISA station extension defined on the Nyquist system. On Nyquist, it will look like the call came from this extension.))
Dial Prefix	NOT USED
Local Area Code	NOT USED
Enabled	Yes
Access	• PBX Connection – Incoming only, Allow DISA, No password
	• PBX Connection – Incoming only, Allow DISA, Password
Username	511
	(Username/extension provided by IP-PBX)
Password	testpassword
	(Password provided by IP-PBX)
Host	10.10.5.100
	(The IP-PBX's IP Address or fully qualified domain name, for example, myhost.mycompany.com)
DID	511
	(Username/extension provided by IP-PBX)
Day Admin	NOT USED
	(Pick any valid Nyquist Admin extension)
Night Admin	NOT USED
	(Pick any valid Nyquist Admin extension)
Admin Group	NOT USED
	(Pick any valid Nyquist Admin extension)

Table 24. Nyquist SIP Trunk Configuration (Continued)

Allow	g722
	(or ulaw or other codec if needed)
Custom Settings	:AUTH:realm='':AUTH:
	:SIPTRUNK:context='511':SIPTRUNK:
	Note: If you copy/paste these settings, delete the single quotes after pasting and replace them with single quotes. For some reason, the copy/paste operation does not successfully copy the single quotes; they get turned into a different character that looks like single quotes.
	Note: If realm=' ' does not work, try realm='<server_ip_address>' or realm='<server_hostname>'

Viewing SIP Trunks

To view available SIP trunks for your facility:

On the navigation bar, select **SIP Trunks**.

The following table describes the details that can be viewed for each SIP trunk:

Table 25. SIP Trunks Page Parameters

Name	Provides the name for the SIP trunk. The name cannot contain spaces or a slash (/).
Description	Provides user provided description for the SIP trunk.
Enabled	Specifies if the SIP trunk is enabled.
Status	Provides registration status of the SIP trunk. If the credentials are used by the SIP end point, the **Status** might be **Register**. If the SIP end point does not use credentials, the **Status** might be **Rejected** but this will not impede a successful SIP connection.

Table 25. SIP Trunks Page Parameters (Continued)

Access	Identifies the outside access permissions for the SIP trunk. Options are:
	• 911 Only
	• DISA – Bi-directional – No password
	• DISA – Bi-directional – Password
	• DISA – Incoming only – No password
	• DISA – Incoming only – Password
	• Incoming Only
	• No Access
	• Outgoing Only
	• Security DISA – Bi-directional – Listen only
	• Security DISA – Incoming – Listen only
	• Unrestricted
	• PBX Connection – Incoming only, No DISA
	• PBX Connection – Incoming only, Allow DISA, No password
	• PBX Connection – Incoming only, Allow DISA, Password
	• PBX Connection – Incoming only, security DISA
	• PBX Connection – Bi-directional, No DISA
	• PBX Connection – Bi-directional, Allow DISA, No password
	• PBX Connection – Bi-directional, Allow DISA, Password
	• PBX Connection – Bi-directional, Security DISA
Extension	Identifies the station extension that is associated with the outside line (DISA station mapping and caller ID for incoming DISA).
DID	Identifies the DID telephone number associated with the outside line. This number is assigned by the ITSP provider.
Username	Identifies the user name that is required to access the SIP trunk.
Host	Identifies the host name or IP address for ITSP.
Dial Prefix	Provides the prefix required by the ITSP to complete an outbound call over the SIP trunk. For example, :9, 9+1, etc.

Table 25. **SIP Trunks Page Parameters (Continued)**

Local Area Code   Provides the local area code if the ITSP requires the 7-digit telephone number be prefixed with the area code. Otherwise, this field is left blank.

Type   Identifies this system trunk's type as a SIP trunk.

Day Admin   Identifies the Admin Station to call during daytime hours.

Night Admin   Identifies the Admin Station to call during nighttime hours.

Admin Group   Identifies the Admin Group to call if the day or night Admin Stations do not answer the call.

Codecs Allowed   Provides a list of media codecs that are allowed. Codecs are separated by a semi-colon.

Call Recording   Indicates if incoming and outgoing calls are being recorded.

Custom Settings   Identifies custom setting configurations that are provided by Technical Support. For more information, refer to *"SIP Trunk Custom Configuration Settings" on page 101*.

Editing a SIP Trunk Configuration

You cannot edit the name given to a SIP trunk, but you can edit other fields, such as the Dial Prefix and Local Area Code.

Figure 30. Edit SIP Trunks Page

To edit a SIP Trunk's configuration:

1 On the navigation bar, select **SIP Trunks**.

2 On the SIP Trunks page, select the **Edit** icon for the SIP trunk that you want to edit.

3 On the Edit SIP Trunk page, make the desired changes. (See *Table 26*.)

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4   Select **Save**.

Table 26. Edit SIP Trunks Page Parameters

Name	Displays the name for the SIP trunk. This parameter cannot be edited.
Extension	Enter the Nyquist DISA station extension that is associated with the outside line (DISA station mapping and caller ID for incoming DISA).
Dial Prefix	Enter the dial prefix required by the ITSP to complete an outbound call over the SIP trunk. For example, :9, 9+1, etc.
Local Area Code	Enter the local area code if the ITSP requires the 7-digit telephone number be prefixed with the area code. Otherwise, this field is left blank.
Enabled	Specify if the SIP trunk is enabled. SIP trunks should be fully configured before they are enabled to avoid erratic system behavior.

Table 26. Edit SIP Trunks Page Parameters (Continued)

Access

Enter the outside access permissions for the SIP trunk. Options are:

- 911 Only
- DISA – Bi-directional – No password
- DISA – Bi-directional – Password
- DISA – Incoming only – No password
- DISA – Incoming only – Password
- Incoming Only
- No Access
- Outgoing Only
- Security DISA – Bi-directional – Listen only
- Security DISA – Incoming – Listen only
- Unrestricted
- PBX Connection – Incoming only, No DISA
- PBX Connection – Incoming only, Allow DISA, No password
- PBX Connection – Incoming only, Allow DISA, Password
- PBX Connection – Incoming only, security DISA
- PBX Connection – Bi-directional, No DISA
- PBX Connection – Bi-directional, Allow DISA, No password
- PBX Connection – Bi-directional, Allow DISA, Password
- PBX Connection – Bi-directional, Security DISA

Username

Enter the user name that is required to access the SIP trunk.

Change Password

Enter the password that is required to access the SIP trunk. The password is provided by the SIP trunk provider or hosted VoIP provider.

Confirm Password Change

Re-enter the SIP trunk password.

Host

Enter the host name or IP address for the ITSP.

DID

Enter the DID telephone number associated with the outside line.

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Table 26. Edit SIP Trunks Page Parameters (Continued)

Day Admin	Select the Admin Station to call during daytime hours.
Night Admin	Select the Admin Station to call during nighttime hours.
Admin Group	Select the Admin Group to call if the day or night Admin Stations do not answer the call.
Call Recording	Select if incoming and outgoing calls are to be recorded.
Allow	Enter a list of media codecs that are allowed. PSTN standard codecs are G.711 or ULAW.
Description	Edit user provided description for the SIP trunk.
Custom Settings	Edit custom setting configurations that are provided by Technical Support. For more information, refer to "*SIP Trunk Custom Configuration Settings" on page 101*.

Deleting a SIP Trunk Configuration

If you are no longer paying for or using a SIP trunk service via an external provider, you may want to delete a previously added SIP trunk.

To delete a SIP trunk:

1   On the navigation bar, select **SIP Trunks**.

2   On the SIP Trunks page, select the

3   **Delete** icon next to the SIP trunk that you want to delete.

4   Select **Delete**.

Viewing Outside Line Status

The status of every outside line in a facility can be quickly determined by using the Outside Lines feature.

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To view the outside lines:

On the navigation bar, select **Outside Lines**.

Table 27. Outside Lines Page Parameters

Name	Identifies the system port name for the outside line.
Description	Identifies the user provided description of the outside line's purpose.
Enabled	Specifies if the outside line is enabled.
Status	Provides the status of the line.
Port Type	Identifies system port type used for this line.
Access	Identifies level of access allowed on this outside line. Options are: • 911 Only • DISA – Bi-directional – No password • DISA – Bi-directional – Password • DISA – Incoming only – No password • DISA – Incoming only – Password • Incoming Only • No Access • Outgoing Only • Security DISA – Bi-directional – Listen only • Security DISA – Incoming – Listen only • Unrestricted • PBX Connection – Incoming only, No DISA • PBX Connection – Incoming only, Allow DISA, No password • PBX Connection – Incoming only, Allow DISA, Password • PBX Connection – Incoming only, security DISA • PBX Connection – Bi-directional, No DISA • PBX Connection – Bi-directional, Allow DISA, No password • PBX Connection – Bi-directional, Allow DISA, Password • PBX Connection – Bi-directional, Security DISA

Table 27. Outside Lines Page Parameters (Continued)

Dial Prefix	Identifies the digit or digits that must be dialed to obtain an outside line.
Extension	Identifies the station extension that is associated with the outside line (DISA station mapping and caller ID for incoming DISA).
DID	Identifies the DID telephone number associated with the outside line.
Day Admin	Identifies the Admin Station to call during daytime hours.
Night Admin	Identifies the Admin Station to call during nighttime hours.
Admin Group	Identifies the Admin Group to call if the day or night Admin Stations do not answer the call.

Editing Outside Lines

You can edit information or disable an outside line through the Edit Outside Line page.

To edit an outside line:

1 On the navigation bar, select **Outside Lines**.

2 Select the **Edit** icon next to the outside line name.

3 Make desired edits.

4 Select **Save**.

Figure 31. Edit Outside Line Page

Table 28. Edit Outside Line Page Parameters

Name   Identifies the system port name for the outside line. This
                            parameter cannot be edited.

Enabled   Specifies if the outside line is enabled.

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Table 28. Edit Outside Line Page Parameters (Continued)

Port Type   Identifies system port type used for this line. This parameter cannot be edited.

Access   Identifies level of access allowed on this outside line. Options are:

- 911 Only
- DISA – Bi-directional – No password
- DISA – Bi-directional – Password
- DISA – Incoming only – No password
- DISA – Incoming only – Password
- Incoming Only
- No Access
- Outgoing Only
- Security DISA – Bi-directional – Listen only
- Security DISA – Incoming – Listen only
- Unrestricted
- PBX Connection – Incoming only, No DISA
- PBX Connection – Incoming only, Allow DISA, No password
- PBX Connection – Incoming only, Allow DISA, Password
- PBX Connection – Incoming only, security DISA
- PBX Connection – Bi-directional, No DISA
- PBX Connection – Bi-directional, Allow DISA, No password
- PBX Connection – Bi-directional, Allow DISA, Password
- PBX Connection – Bi-directional, Security DISA

Dial Prefix   Identifies the digit or digits that must be dialed to obtain an outside line.

Extension   Identifies the station extension that is associated with the outside line (DISA station mapping and caller ID for incoming DISA).

Admin Group   Identifies the Admin Group to call if the day or night Admin Stations do not answer the call.

Day Admin   Identifies the Admin Station to call during daytime hours.

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Table 28. Edit Outside Line Page Parameters (Continued)

Night Admin	Identifies the Admin Station to call during nighttime hours.
DID	Identifies the DID telephone number associated with the outside line.
Description	Identifies the user provided description of the outside line's purpose.

Discover Ports

The Discover Ports feature allows Nyquist to automatically discover a new installed DAHDI PCI card and to automatically create entries for each port supported by the installed card. You can then edit each port with custom settings. The port name and port type are automatically set by Nyquist and cannot be changed.

Configuring Firmware

Firmware, computer software stored on a hardware device, can be updated for Nyquist stations through the Nyquist Admin Web UI or through the appliance's web UI. For information about the appliance's web UI, refer to the device's configuration manual.

> *Note:* Before configuring or using any Nyquist appliances, you must ensure that the appliance firmware is updated to the latest release. The latest firmware release can be obtained from the secured ES Dealers website: http://www.bogenedu.com/nyquist-secure-dealer-resources/

Through the Nyquist Admin Web UI, you can upload a firmware file to the Nyquist system server, download firmware to a station, view a list of stations that are linked to a firmware name, set default firmware for any stations to be added, and delete firmware entries.

You can also configure automatic software downloads (see *"Configuring Automatic Software Download" on page 46*).

For stations that are attached to a Networked Power Amplifier, such as an NQ-A2300, the firmware is updated to the amplifier and not to the individual station.

Viewing Firmware Stored on the Nyquist System Server

From the Firmware page, you can view a list of available firmware, bring up a list of devices that can be selected for updating firmware, set the file to the default firmware,

check for updates, view release notes, select to edit information about or delete firmware files on the Nyquist system server, and configure automatic software downloads.
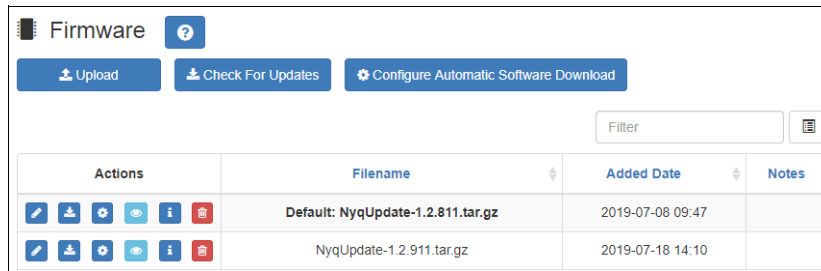

Figure 32. Firmware Page

To view firmware available for loading into Nyquist devices:
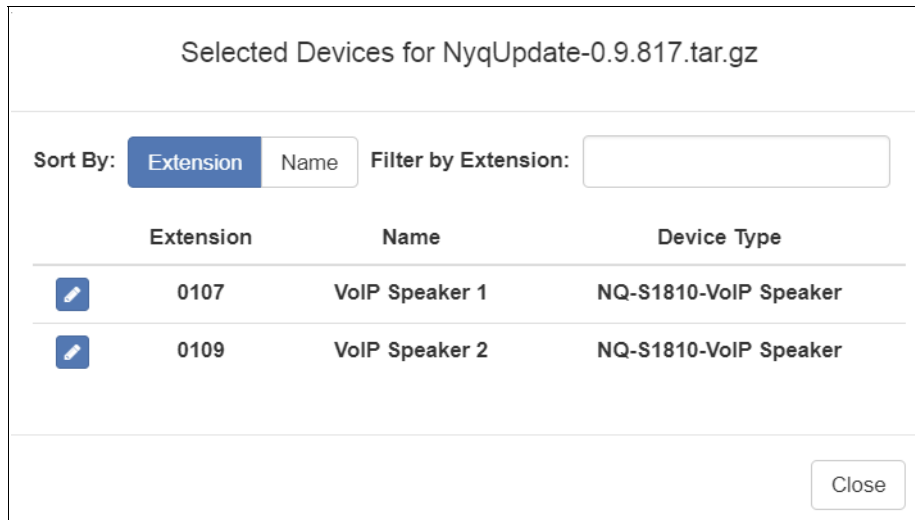
On the Navigation bar, select **Firmware**.

The following table describes the information provided for each available firmware file:

Table 29. Firmware Page Parameters

Filename	Provides the name of firmware file that is ready for install-ing to a Nyquist device.
Added Date	Provides the date that the firmware file was loaded to the Nyquist system server.
Notes	Provides notes entered by a user.

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Viewing Devices With a Specific Firmware Installed

You can obtain a list of all devices in your Nyquist system that have a specific firmware version installed.

Figure 33. Selected Devices for Firmware Version

To obtain a list of devices with the same firmware version installed:

1   On the Navigation bar, select **Firmware**.

2   On the Firmware page, select the **View Selected Devices** icon next to a listed firmware version.

A list of the devices that have the selected firmware version installed appears.

3   Select **Close** to return to the Firmware page.

Uploading New Firmware to the Server

The Firmware page contains an **Upload** button that allows you to upload new firmware files to your Nyquist server.

To upload new firmware to the server:

1   On the navigation bar, select **Firmware**.

2   On the Firmware page, select **Upload**.

3   Navigate to the file that you want to upload.

4   Select **Upload**.

Checking for Updates

The Firmware page contains a **Check for Updates** button that allows you to check if new firmware is available and download updates that exist.

To check for firmware updates:

1 On the navigation bar, select **Firmware**.

2 On the Firmware page, select **Check For Updates**.
A popup window appears with one of the following messages:

- No firmware dates available
- Can't check for updates, check Internet connection, and try again
- Downloading firmware update
  If the system attempts to download a firmware update, you will receive a message that the firmware download was either successful or failed. In the case of a failure, you will be prompted to try again.

3 When prompted, select **OK**.

Selecting Devices for Firmware Update

You can select one or more devices for a firmware update.

Figure 34. Device Selection for Firmware Update

To select devices for firmware update:

1 On the navigation bar, select **Firmware**.

2 On the Firmware page, select the **Device Selection** icon next to the firmware version that you want to load.

3 Select the device or devices that you want to install the firmware to.

4 Select **Update**.
  You can select to install firmware to one device at a time. The Device Selection for firmware version screen remains until you select **Close**.

Setting Default Firmware

Through the Firmware page, you can set a firmware file as the default firmware for any new stations added to your Nyquist system.

To set a default firmware file:

1 On the navigation bar, select **Firmware**.

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2 On the Firmware page, select the **Set as Default Firmware** icon next to a listed file-
name.

> **Warning** **Completing this procedure will set the selected firmware file as the default
> firmware for all new devices, overriding the factory installed firmware.
> Ensure that the selected firmware version is compatible with your server's
> software version. To use some appliances, you may need to update your
> server software.**

3 Select **Yes** to continue.

Downloading Firmware to a Device

To download firmware from the Nyquist system server to a station:

1 On the navigation bar, select **Firmware**.

2 On the Firmware page, select the **Device Selection** icon next to a listed filename.

3 Select the **Update** icon next to the device that you are updating firmware for.

Editing Firmware

You can edit **Notes** for firmware, but you cannot change the **Filename** or **Added Date**
information.

To edit notes for firmware:

1 On the navigation bar, select **Firmware**.

2 Select the **Edit** icon next to the desired firmware file.

3 Make changes to the **Notes** parameter.

4 Select Save.

Viewing Release Notes for Firmware

Not all firmware versions have release notes. For those that do, you can view the release
notes by selecting the appropriate icon in the Actions column.

To view release notes for a firmware version:

1 On the navigation bar, select **Firmware**.

2 On the Firmware page, select the **Information** icon.

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3 After viewing the release notes, select **OK**.

Viewing Stations Linked to Firmware

To view stations linked to a specific firmware file:

1 On the navigation bar, select **Firmware**.

2 On the Firmware page, select the **View Selected Devices** icon next to a listed filename.

Deleting Listed Firmware

Note: Firmware cannot be deleted if it is associated with a device.

To delete a firmware file from the Nyquist system server:

1 On the navigation bar, select **Firmware**.

2 On the Firmware page, select the **Delete** icon next to the filename that you want to delete.

3 When prompted, select **Delete**.

Configuring Facilities

A facility is a building or group of buildings managed by a Nyquist system server.
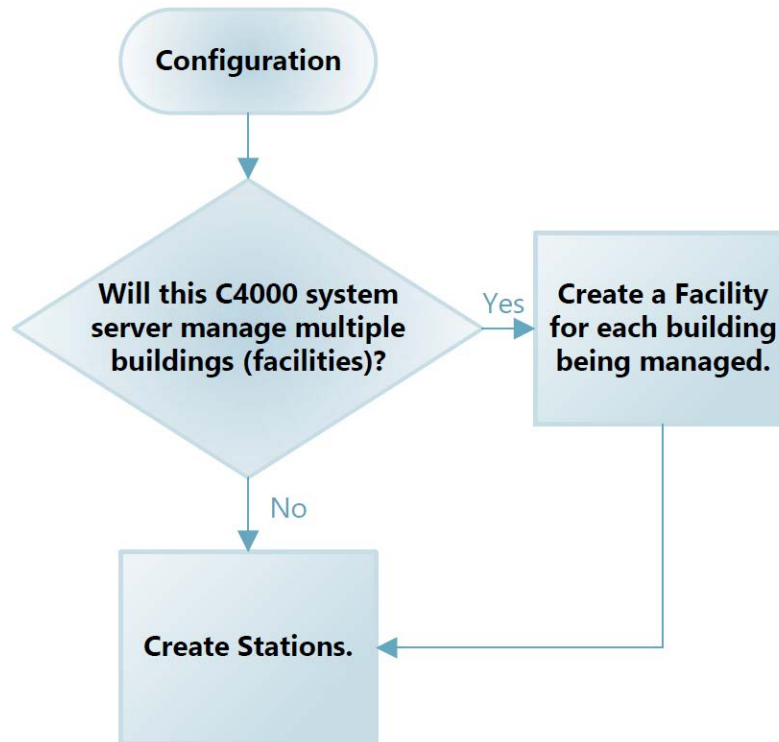
Figure 35. Facility Decision Chart

With **Facilities**, you can connect multiple Nyquist facilities (servers) to provide the following multi-site paging and calling features:

- Multi-Site Emergency-All-Call paging to all connected facilities in the Facilities list
- Multi-Site All-Call paging to all connected facilities in Facilities list
- Multi-Facility Paging to one or more selected Facilities
- Facility Announcement to one or more selected Facilities
- Paging to a specific facility in the Facilities list
- Intercom calls between stations in different facilities in the Facilities list
- Start Routines on one or more remote Facilities

For information about the Facilities list, see *"Viewing Facilities" on page 124*.

Any connected facility can perform multi-site paging (i.e., paging to all facilities listed in the Facilities list), provided the facility has at least one station with the necessary CoS per-

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missions enabled. If you are using an Admin Phone with the correct CoS permissions enabled, you can dial specific DTMF codes to perform various activities.

The following table provides a list of CoS permissions required and DTMF codes used for specific activities.

Table 30. Activities, CoS Permissions, and DTMF Codes

Activity	Required CoS Permissions	DTMF Syntax
Multi-Site Emer-gency-All-Call Page	Emergency All-Call, Multi-Site Paging	##0911
Multi-Site All-Call Page	All-Call Paging, Multi-Site Paging	##0
Facility All-Call Page	Inter-Facility Call/Page	##<Facility Number>
Multi-Facility Paging	Inter-Facility Call/Page	##<Facility-Number>*<Facil-ity-Number>…
Facility Announcement	Multi-Site Paging, Inter-Facil-ity Call/Page	*97<DTMF-Code>#<Facil-ity-Number>*<Facility-Num-ber>…
Intercom Call to Remote Facility	Inter-Facility Call/Page	##*<Facility Number>*<Station Extension Number>
Activate System Feature at Remote Facility	Inter-Facility Features	##*<Facility Number>*[900 – 999] ##*<Facility Number>*#<Feature Code> ##*<Facility Number>**<Feature Code> ##*<Facility Num-ber>*00000<Feature Extension>

For information about Facility Error Conditions, see *"Facility Error Conditions" on page 334.*

Your Nyquist network can use multiple servers that all have the same password, or you can set different passwords for each server.

Viewing Facilities

The Facilities page provides a quick view of the building or buildings served by your Nyquist system server.

Figure 36. Facilities Page

To view facilities:

  On the navigation bar, select **Facilities**.

Table 31 describes the Facility page parameters:

Table 31. Facilities Page Parameters

Page #	ID number for facility that is used when paging the facility.
Name	Displays the facility name of the remote server. Spaces in the name are replaced by dashes. The maximum facility name length is 30 characters.
Enabled	Specifies if the facility will register with the remote facility.
Host	Displays the host name or host IP address of the remote server.
Password	Displays the password that is used for the remote connection. The maximum password length is 12 characters.
Status	Displays the registration status of the local and remote facility peers. Some possible statuses are:

- **Registration request sent; remote not registered**— Indicates that a connection is not established between the facilities.

- **Registered; remote not registered**—Indicates that the local facility is registered with the remote facility but the remote facility is not registered with the local facility. This could be a temporary status captured during server startup, or it might result from the remote server not having the local facility properly configured.

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Table 31. Facilities Page Parameters (Continued)

- **Timeout; remote not registered**—Indicates that a connection is not established between facilities. This is probably due to a network connection issue or the remote facility may be down.

- **Timeout; remote 10.10.5.100 registered (OK (8 ms))**—Indicates that the remote facility has registered with the local facility and the connection is good, or OK, with 8 millisecond turnaround time (one-way connection).

- **Registered; remote 10.10.5.100 registered (OK (3 ms))**—Indicates that the local facility has registered with the remote facility, the remote facility has registered with the local facility, and the connection is OK with 3 millisecond turnaround time. This is the desired state, and it's OK if the reported millisecond turnaround time is not 3.

- **Rejected; remote not registered**—Probably indicates that the remote facility has disabled the local facility's configuration entry.

- **Registered; remote 10.10.5.100 registered (UNREACHABLE)**—Indicates that both ends are (or were) registered but the local facility cannot reach the remote. This is probably due to a network issue or the remote Nyquist system server is down.

Editing a Facility

From the Edit Facility page, you can change parameters for a facility managed by your Nyquist system server.

To edit a facility:

1 On the navigation bar, select **Facilities**.

2 Select the **Edit** icon next to the facility that you want to edit.

3 Make the desired changes. (See*Table 32, "Edit Facility Page Parameters," on page 126.*)

4 Select **Save**.

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Table 32. Edit Facility Page Parameters

Page	ID number for facility that is used when paging the facility.
Name	Displays the facility name of the remote server. Spaces in the name are replaced by dashes.
Enabled	Specifies if the facility will register with the remote facility.
Host	Displays the host name or host IP address of the remote server.
Password	Displays the password that is used for the remote connection.

Deleting a Facility

Note: You cannot delete a facility linked to a **Facility-Page** routine action **Type** (see "*Understanding Action Parameters" on page 414*).

To delete a facility:

1 On the navigation bar, select **Facilities**.
2 On the Facilities page, select the
3 **Delete** icon next to the facility that you want to delete.
4 When prompted, select **Delete**.

Adding a Facility

From the Add Facility page, you can add another building or group of buildings to the list of facilities managed by your Nyquist system server.

Figure 37. Add Facility Page

To add a facility:

1 On the navigation bar, select **Facilities**.

2 On the Facilities page, select the **Add** icon.

3 Complete the Add Facility parameters. (See*Table 33*.)

4 Select **Save**.

Table 33. Add Facility Page Parameters

Name	Enter the name of the remote facility. Spaces in the name are replaced by dashes. Maximum length is 30 characters.
Enabled	Specify if this facility will register with the remote facility.
Host	Enter the host name or host IP address of the remote server.
Password	Enter the password that is used for the remote connection. Maximum length is 12 characters.

Note: If you're planning to link more than 45 Facilities, you will need to use Facility Names and Facility Passwords that contain less than the maximum number of characters allowed. For example, if you're planning to link 78 Facilities, the maximum Facility Name length

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should be 12 and the maximum Facility Password length should be 12. If you are going to link more than 45 facilities, ask Technical Support to recommend the maximum character lengths to use for Facility Name and Password.

Managing Stations, Zones, and Queues

With Nyquist, you can divide your facility into zones to control paging and audio activities or features. For example, suppose you want to allow the use of an audio source, such as a flash drive, in a cafeteria but prevent it from being played in a conference room. This feature, called audio distribution, can be turned on by zone, so the cafeteria could be placed in a zone that allows audio distribution while conference rooms would not be placed into that zone.

No limit exists for the number of zones or for the number of stations that can be in a multicast zone. Performance limits do exist for unicast connections. The station limit for your system is determined by your Nyquist license. For licensing purposes, an I/O Controller is not counted as a station.

With the Page Queuing feature, you can record an unlimited number of pages or messages for queuing (stacking) for a specified zone or zones. A zone can only be added to a single queue, but a queue may have multiple zones associated with it. Zones must be created before a queue can be created.

A station can be in multiple zones.

A Nyquist station is:

- A device used to access the web interface
- A speaker
- A phone
- A Nyquist appliance

To manage stations and zones, you first add stations and then create zones that contain more than one station. You can add stations by allowing Nyquist to automatically discover the device type, MAC address, IP address, and serial number, or manually add these and other parameters. For more information about adding a station, see "*Adding a Station" on page 173*.

Viewing Station Configuration Settings

On the Stations page, you can:

- View all configured stations.

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- Edit a station's configuration. (See "*Editing Station Configuration Settings" on page 142.*)

- Exclude a station from paging. (See "*Excluding Stations from Paging" on page 188.*)

- View station status. (See "*Viewing Station Status" on page 190.*)

- Add new stations. (See "*Adding a Station" on page 173.*)

- View the status of Nyquist appliances, such as the I/O controller. (See "*Viewing Appliance Status" on page 192.*)

- Delete a station. (See "*Deleting a Station" on page 172.*)

Figure 38. Stations Page

To view all stations:

On the navigation bar, select **Stations**.

Station configuration information is described in *Table 34*:

Table 34. Station Configuration Page Parameters

Note: Some of the following fields do not appear when adding or editing stations that are of specific device types.

Extension	Specifies the unique multi-digit extension number for the station. Valid values range from 030 to 899 for three-digit dialing. The system can be configured to use three, four, five, or six-digit dialing.
	Note: Extensions 900 to 999 are reserved by Nyquist features; do not assign these extensions to stations.

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Table 34. Station Configuration Page Parameters (Continued)

Name

Specifies the name for the station. Names can contain up to 16 characters.

Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

Description

Provides a description for this station.

Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

Table 34. Station Configuration Page Parameters (Continued)

Type

Specifies the station type. Types include:

- Admin Phone
- Admin Web Interface
- Web Interface
- IP Phone
- Mobile Device
- VoIP Speaker Only
- Analog Call Switch & Speaker
- Digital Call Switch & Speaker
- Analog Phone

Note: An analog phone cannot be used as an admin destination (day or night admin) even if it has the correct CoS set. An analog phone cannot be added to a zone, cannot be used as an emergency, cannot be monitored, and cannot be a call forwarding target from an Admin Phone.

- DISA Line
- 911 Line
- I/0 Controller

Note: For licensing purposes, an I/O Controller is not counted as a station, so they do not subtract from the available station count set in the installed license.

- Matrix Mixer Pre-Amp
- Paging-Audio Amp
- Paging-Audio-Intercom Module
- Ambient Noise Sensor
- Push-To-Talk Microphone

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Table 34. Station Configuration Page Parameters (Continued)

Device Type   *Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, Web Interface, DISA Line, or Mobile Device.

Identifies the physical device used by the station. Device types include:

- Cisco ATA191-3PW-K9
- Cisco SPA112
- DAHDI FXS
- Grandstream HT813 Analog Phone FXS Port
- NQ-A2060[-G2]-Amplifier
- NQ-A2120[-G2]-Amplifier
- NQ-A2300[-G2]-Amplifier
- NQ-A4060[-G2]-Amplifier
- NQ-A4120[-G2]-Amplifier
- NQ-A4300[-G2]-Amplifier
- NQ-E7010-Input Output Controller
- NQ-GA10P-Intercom Module
- NQ-GA10PV-Intercom HDMI Module
- NQ-GA20P2-Amplifier with Line Output
- NQ-P0100-Matrix Mixer Pre Amp
- NQ-PA120 Public Address Mixer Amplifier
- NQ-PA240 Public Address Mixer Amplifier
- NQ-PA600 Public Address Mixer Amplifier
- NQ-S1810-E7020 VoIP Speaker CallSwitch
- NQ-S1810-VoIP Speaker
- NQ-S1810CT-G2 VoIP Ceiling Speaker Gen2
- NQ-S1810WT-G2 VoIP Wall Baffle Speaker Gen2
- NQ-T1000 IP Phone - Basic LCD Display
- Yeastar - TA2400 Analog FXS Port

Table 34. Station Configuration Page Parameters (Continued)

Port	*Note:* Nyquist only displays this field when adding or editing a **Type** of **Analog Phone** and a **Device Type** of **DAHDI FXS**.
	Identifies the system port name for the analog line.
MAC Address	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface or DISA Line.
	Specifies the Media Access Control (MAC) address, which is a unique identifier assigned to network interfaces for communications on the physical network segment.
Serial Number	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, Admin Phone, IP Phone, or DISA Line.
	Identifies the serial number for the device.
Facility	Identifies the facility where this station is installed.
Day CoS	Identifies CoS permissions that apply to this station during day time hours.
Night CoS	Identifies CoS permissions that apply to this station during night time hours.
Day Admin	*Note:* Nyquist does not display this field when adding or editing an I/O Controller, Matrix Mixer Pre-Amp, or NQ-GA20P2. An analog phone cannot be used as an admin destination (day or night admin) even if it has the correct CoS set.
	Identifies the Admin Station that covers this station during daytime hours.
	If Admin Group is specified, all the Admin Stations of the caller's Admin Group will be called instead of a single Admin Station. If the Admin Group includes web interface stations, they will be called directly, receiving the call as an incoming call pop-up dialog.
	Note: If Admin Group is specified, the Emergency Link feature is not supported for this the station. See the Emergency Link description on page 26 for further details.
	For more information about CoS, see "*Using CoS Configuration" on page 89*.

Table 34. Station Configuration Page Parameters (Continued)

Night Admin	*Note:* Nyquist does not display this field when adding or editing an I/O Controller, Matrix Mixer Pre-Amp, or NQ-GA20P2. An analog phone cannot be used as an admin destination (day or night admin) even if it has the correct CoS set.
	Identifies the Admin Station that covers this station during nighttime hours.
	If Admin Group is specified, all the Admin Stations of the caller's Admin Group will be called instead of a single Admin Station. If the Admin Group includes web interface stations, they will be called directly, receiving the call as an incoming call pop-up dialog.
	Note: If Admin Group is specified, the Emergency Link feature is not supported for this the station. See the Emergency Link description on page 26 for further details.
	For more information about CoS, see "*Using CoS Configuration" on page 89*.
Admin Group	*Note:* Nyquist does not display this field when adding or editing an I/O Controller, Matrix Mixer Pre-Amp, or NQ-GA20P2.
	Identifies the Admin Group associated with the station. The Admin Group is called if the Day Admin or Night Admin does not answer within 30 seconds.
Registration Password	(Add and Edit only) Provide the password used for SIP device registration. Default is **bogen**.
Show Password **Show Saved Password**	(Add and Edit only) Selecting this button shows the current password to the right of the button for 3 seconds. If at least one character is type in the password field, the button label dynamically changes from **Show Saved Password** to **Show Password**.
Registration Password Confirmation	(Add and Edit only) Retype the registration password.
Codecs Allowed	Identifies the list of CODECs supported by the device that is associated with this station.

Table 34. Station Configuration Page Parameters (Continued)

Voicemail Password	*Note:* Nyquist does not display this field when adding a VoIP Speaker Only, Call Switch & Speaker, I/O Controller, or Matrix Mixer Pre-Amp. (Add only) Provide the password used to access voicemail. This field can contain numeric characters only.
Voicemail Password Confirmation	(Add only) Re-type the voicemail password.
Show Password **Show Saved Password**	(Edit only) Selecting this button shows the current password to the right of the button for 3 seconds. If at least one character is type in the password field, the button label dynamically changes from **Show Saved Password** to **Show Password**.
Force Name	*Note:* Nyquist does not display this field when adding or editing a VoIP Speaker Only, Call Switch & Speaker, I/O Controller, or Matrix Mixer Pre-Amp. Forces the user to record his name when setting up voicemail.
Force Greeting	*Note:* Nyquist does not display this field when adding or editing a VoIP Speaker Only, Call Switch & Speaker, I/O Controller, or Matrix Mixer Pre-Amp. Forces the user to record a greeting when setting up voicemail.
Call Recording	*Note:* Nyquist does not display this field when adding or editing an I/O Controller, Matrix Mixer Pre-Amp, or NQ-GA20P2. Determines if all calls made and placed to this station are recorded.

Table 34. Station Configuration Page Parameters (Continued)

Paging	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, Web Interface, DISA Line, I/O Controller, 911 Line, or Analog Phone.
	When set to **Off**, the station does not receive tones from the schedules, All-Call pages, or Zone pages. However, the station will receive Emergency All-Call pages unless the station is a NQ-T1000 phone.
	If **Paging** is set to **On** for a NQ-T1000 phone, then this device will receive Emergency All-Call pages even if the station is in the Paging Exclusion list. This device will receive All-Call and zone paging provided the station is not in the Paging Exclusion list. If **Paging** is set to **Off**, then the station will not receive Emergency All-Call, All-Call, or zone paging.
Audio Distribution to All Speakers	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, Web Interface, DISA Line, I/O Controller, 911 Line, IP Phone, or Analog Phone.
	Determines if the station can receive audio distribution played to all stations. Audio distribution played to zones will still be received if the station is in the audio zone.
Intercom Cut Level (dB)	Specifies the volume cut level for intercom calls. The cut level can range from -42 to 0. The default level is -6.
Talkback Gain (dB)	*Note:* This field only applies if viewing, adding, or editing a station that is associated with an NQ-GA10P-Intercom Module.
	Indicates the gain that is to be applied to the talkback function for channels 1 and 2. Gain is the measure of the ability to increase the power or amplitude of a signal. The **Talkback Gain** can range from -12 to +20; default is set at 0.
Microphone Input Gain (dB)	*Note:* This field only applies if viewing, adding, or editing a station that is associated with an NQ-GA10P or an NQ-GA10PV Intercom Module and the station **Type** is **Push-To-Talk Microphone**.
	Indicates the gain that is to be applied to the microphone function for channels 1 and 2. Gain is the measure of the ability to increase the power or amplitude of a signal. The **Microphone Input Gain** can range from -12 to +20; default is set at 0.

Table 34. Station Configuration Page Parameters (Continued)

Outside Access

Note: Nyquist does not display this field when adding or editing an I/O Controller or Matrix Mixer Pre-Amp.

Identifies permissions for this station to place outside calls. Parameters are:

- No Access
- Restricted
- Restricted Day Only
- Restricted Night Only
- Unrestricted
- Unrestricted Day Only
- Unrestricted Night Only

911 Route

Note: Nyquist does not display this field when adding or editing a VoIP Speaker Only, Call Switch & Speaker, I/O Controller, or Matrix Mixer Pre-Amp.

Identifies where 911 calls placed by this station are routed, such as to a specific SIP trunk.

Auth Code

Note: Nyquist does not display this field when adding or editing an I/O Controller or Matrix Mixer Pre-Amp.

Allows the user to enable additional features on a phone when the walking CoS feature is enabled. The four-digit code activates features from the associated phone to the phone being used. If Auth Code is set to 0000, this feature is disabled.

Speaker Extension

Note: Nyquist does not display this field when adding or editing an I/O Controller or Matrix Mixer Pre-Amp.

Identifies the extension of the speaker associated with the station for speaker drop to phone feature and the toggle audio distribution feature (*9).

Table 34. Station Configuration Page Parameters (Continued)

VLAN Configuration	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, 911 Line, or DISA Line unless the Admin Phone or IP Phone is connected to a Yeastar TA2400 port. Specifies how the station receives its Virtual Local Area Network (VLAN) configuration. Options are: • Server • Network/Device • Disable
VLAN ID	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, 911 Line, or DISA Line unless the Admin Phone or IP Phone is connected to a Yeastar TA2400 port. Identifies the VLAN for this station. The VLAN ID parameters range from 2 through 4094 and pertain to the bridge's network interface (not to the ports or stations).
VLAN Priority	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, 911 Line, or DISA Line unless the Admin Phone or IP Phone is connected to a Yeastar TA2400 port. Identifies the priority for the port. Values range from 0 through 7.
Web Username	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, Admin Phone, IP Phone, 911 Line, or DISA Line unless the Admin Phone or IP Phone is connected to a Yeastar TA2400 port. When applicable, provides a username for logging into the web interface of the device hosting the station.
Web Password **Web Password Confirmation**	*Note:* These fields appear only when adding or editing a station, provided the station is not an Admin Web Interface, Admin Phone, IP Phone, 911 Line, or DISA Line unless the Admin Phone or IP Phone is connected to a Yeastar TA2400 port. When applicable, provides a password for logging into the web interface of the device hosting the station.

Table 34. Station Configuration Page Parameters (Continued)

Show Password **Show Saved Password**	(Add and Edit only) Selecting this button shows the current password to the right of the button for 3 seconds. If at least one character is type in the password field, the button label dynamically changes from **Show Saved Password** to **Show Password**.
Load Impedance	*Note:* This field appears only when adding or editing a station where the **Device Type** is NQ-A2060-Amplifier, NQ-A2120-Amplifier, NQ-A2300-Amplifier, NQ-A4060-Amplifier, NQ-A4120-Amplifier, NQ-A4300-Amplifier, NQ-PA120 Public Address Mixer Amplifier, NQ-PA240 Public Address Mixer Amplifier, or NQ-PA600 Public Address Mixer Amplifier. Provides impedance of the attached load. Select **High** for devices that use 25/70V and **Low** for devices that use 8 ohm.
Output Power (Watts)	*Note:* This field appears only when adding or editing a station for VoIP speakers, NQ-GA10P, NQ-GA10PV, NQ-GA20P2, or two- or four-channel amplifiers. Provides the channel output setting. Defaults and settings vary depending on the appliance. For VoIP speakers, NQ-GA10P, NQ-GA10PV, and NQ-GA20P2 devices, the available settings are: • 1/8 • 1/4 • 1/2 • 1 • 2 • 4 • 8 The default for these devices is 1/2. For the other applicable devices, the available settings increment by 1 and range from -6 to 6 with the default being 0.

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Table 34. Station Configuration Page Parameters (Continued)

Firmware	*Note:* Nyquist does not display this field when adding or editing an Admin Web Interface, Admin Phone, IP Phone, Mobile Device, or when adding or editing a Networked Power Amplifier.
	Provides information about firmware available for the station. A Nyquist appliance connected to the Nyquist network receives a configuration file from the Nyquist server that includes the latest firmware available from the server. If the firmware is later than the one installed on the appliance, an automatic firmware update occurs. To prevent an automatic update, you must leave this **Firmware** parameter empty.
Sites	Provides the sites that this station can view or edit on the Dashboard and in schedules.
Maps	*Note:* This parameter pertains only to stations licensed for the Maps feature.
	Provides the maps that this station is authorized to view from the dashboard.
Queue Zones	Provides the zone number for the station that will be used page queuing. If a zone number does not appear, the station user will be prompted to enter a zone number.
Announcement Zone	*Note:* This parameter appears only when adding or editing a station if the **Type** is set to **Admin Web Interface**, **Admin Phone**, **IP Phone**, **Analog Phone**, and **Mobile Device**. **Announcement Zone** overrides the **Play to Zone** set when creating an announcement.
	Select a zone number to be used as this station's default zone when playing announcements. If an **Announcement Zone** is not set, you will be prompted for a zone number when playing an announcement. (See "*Using Announcements" on page 287*.)

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Table 34. Station Configuration Page Parameters (Continued)

Announcement Zone Configuration Type

Note: This parameter appears only when adding or editing a station if the **Type** is set to **Admin Web Interface**, **Admin Phone**, **IP Phone**, **Analog Phone**, and **Mobile Device**.

Displays either **Fixed** or **Default**, depending on whether you can change the zone for announcements created by this station. If set to **Fixed**, the zone used to play announcements will always be the zone number provided for **Announcement Zone** and cannot be changed. If set to **Default**, the **Announcement Zone** value is used as the default zone, but you can set an announcement to play to another zone.

External Relay Trigger

Note: This parameter applies only to NQ-GA10P and NQ-GA10PV devices.

Specifies if the device should trigger an external relay when audio is present.

Dial Plan Type

Note: This parameter only appears when adding or editing a station with **Device Type** of **Cisco SPA112, Cisco ATA191-3PW-K9,** or **Grandstream HT813 Analog Phone FXS Port**.

Specifies whether the station uses the default or a custom dial plan or if it will automatically dial an extension when the phone is taken off hook. The **Dial Plan Type** options are:

- **Default**. When you select this option, the station has DTMF access to all Nyquist features.

- **Auto Dial**. When you select this option, you must add the extension that will be automatically dialed when the phone is taken off hook.

- **Custom**. When you select this option, the Dial Plan option appears and you can enter a custom dial plan string with a maximum of 255 characters.

Table 34. Station Configuration Page Parameters (Continued)

Auto Dial Extension	*Note:* This parameter only appears when adding or editing a station with **Device Type** of **Cisco SPA112, Cisco ATA191-3PW-K9,** or **Grandstream HT813 Analog Phone FXS Port** and **Auto Dial** has been selected as the **Dial Plan Type**.
	Specifies the station extension that will be automatically dialed when the phone is taken off hook.
Dial Plan	*Note:* This parameter only appears when adding or editing a station with **Device Type** of **Cisco SPA112, Cisco ATA191-3PW-K9,** or **Grandstream HT813 Analog Phone FXS Port**.
	This field will display **Nyquist Default** if the **Dial Plan Type** is set to **Default**.
	If the **Dial Plan Type** is set to **Auto Dial**, then **Dial Plan** is set to **S:1,(PO <:station extension>)**. For example, if you have entered **200** for the **Auto Dial Extension**, then this field displays **S:1,(PO <:200>)**.
	If **Dial Plan Type** is set to **Custom**, enter the custom dial plan string, which can contain up to 255 characters.
Description	Allows a user description for this station.

Editing Station Configuration Settings

The Edit Station page allows you to change a station's configuration settings. For example, if you want to disable paging for a station or change a station's access to an outside line, you edit the station's configuration settings.

Note: You cannot change the extension for a station linked to a routine (see *"Using Routines" on page 388*).

If the station **Type** is Admin Web Interface, Admin Phone, IP Phone, Analog Phone, or Mobile Device, you can set a default **Announcement Zone** and the **Announcement Zone Configuration Type**. If the **Announcement Zone Configuration Type** is set to **Fixed**, the zone used to play announcements will always be the zone number provided for **Announcement Zone** and cannot be changed. If set to **Default**, the **Announcement Zone** value is used as the default zone, but you can set an announcement to play to another zone.

If the station that you are editing is an I/O device, you can select to **Configure Rules** (see *"Configuring I/O Controller Input Rules" on page 150* or *"Configuring I/O Controller*

Output Rules" on page 153) or **Configure Schedule** (see "*Adding an I/O Contacts Output Daily Schedule" on page 158*).

If the station that you are editing is an MMPA, you can select to **Configure Mixer** (see "*Configuring Device for Push To Talk" on page 161*).

If the station that you are editing is an Intercom Module (NQ-GA10P, NQ-GA10PV), you can select to **Configure Intercom Module** ("*Configuring Intercom Module" on page 164*).

If the station that you are editing is an Intercom HDMI Module (NQGA10PV), you can select **Display Configuration** and set options for how the message and clock appear on the monitor.

Figure 39. Edit Station Page

To edit a station's configuration settings:

1 From the navigation bar, select **Stations**.

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2 Select the **Edit** icon for the station that you want to edit configuration settings.

3 Make desired changes. For information about the configuration settings, see *Table 34, "Station Configuration Page Parameters," on page 129*.

4 Select **Save**.

Viewing I/O Controller Configuration Rules

The I/O Controller allows Nyquist to recognize third-party switch contact closures and to provide external circuits. Configuration rules can be set for each input and output port on an I/O Controller, so, for example, you can set a rule that if a contact is opened than an alarm sounds or set a rule that if a doorbell rings, an Admin user can trigger another rule that opens the door.

Figure 40. Configure Controller Rules Page

To view the configuration rules for an I/O Controller:

1 From the navigation bar, select **Stations**.

2 Select the **Edit** icon for the desired I/O Controller.

3 On the Edit Station page, select **Configure Rules**.

4 When finished viewing, select **Done**.

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Table 35. Configure Controller Rules

Inputs	
Enabled	Indicates if a rule is enabled for this contact.
Contact #	Displays the assigned number for this contact. This parameter is automatically set and cannot be edited.
Contact Type	Indicates if the rule applies to an Input or Output. Input means a contact has closed on the I/O Controller. Output means that the contact closes when a matching activity occurs.
Extension	Displays the extension assigned to the I/O Controller.
Name	Displays the user-provided name for the contact.
Description	Displays the user-provided description for the contact.
Close Interval	Displays in milliseconds how long the contact remains open before input action is triggered.

Table 35. Configure Controller Rules (Continued)

Action   Displays the action, if any, that is to be taken when the contact is closed. Options are:

- **Audio** – Starts audio distribution to all stations (using previously selected playlist or matrix mixer input channel).

Note: The I/O Controller can only be used to start audio distribution to all stations; it cannot stop the audio to all stations. Another method must be used to stop the audio such as selecting **Stop** from the Admin Web Interface or Admin Phone.

- **Alarm** – Plays the alarm file selected as the **Action ID**.
- **Announcement** – Plays the announcement file selected as the **Action ID**.
- **Disable-Audio** – Disables all audio in the Nyquist system, performing the same action as when the **Disable Audio** button on the dashboard is selected. This action can be used by an external emergency system (for example, fire alarms) to disable all Nyquist audio, which includes: Audio Distribution, Tones, Alarms, Paging.

Note: This contact closure action will only initiate the disabling of audio, it will not restore the audio. To restore audio, use a different contact with the action **Enable Audio**, or enable audio via an Admin Web Interface or Admin Phone.

- **Other** – Used when you don't want to take one of the available actions, but you do want to close a contact, create a dashboard message, or send an email when the contact is closed.
- **Tone** – Plays the tone file selected as the **Action ID**.
- **Enable-Audio** – Enables all audio in the Nyquist system, performing the same action as when the **Enable Audio** button is selected on the dashboard.

Action ID   Displays identifier for action, such as an alarm or tone number.

Note: This parameter is only available for Alarm, Announcement, and Tone actions.

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Table 35. Configure Controller Rules (Continued)

Alarms   Displays the alarm file that plays.

Note: This parameter is only available for an Alarm **Action**.

Announcements   Displays the announcement that plays.

Note: This parameter is only available for an Announcement **Action**.

Tones   Displays the tone that plays.

Note: This parameter is only available for a Tone **Action**.

Program Distribution   Specifies the audio source from a list of available sources.

Note: This parameters is only available if the **Action** is set to **Audio**.

Stop On   Specifies how the action is stopped. If set to **Manual Control**, you must manually stop the action. If set to **Contact Open**, the action automatically stops when the contact is opened.

Zones   Displays the zones that are affected by the action.

Note: This parameter is only available for Alarm, Announcement, and Tone actions.

Close Extension   Specifies which extension of the output contact to close.

Dashboard Type   Specifies if the message appears in the dashboard message pane alone or also in a popup message.

Dashboard Title   Specifies the user-provided title that appears for the dashboard message.

Dashboard Scope   Specifies which devices receive the message. Options are:

- **All** – All web interface dashboards will receive the message.

- **Admin** – Only Admin web interface dashboards will receive the message.

Dashboard Text   Specifies the user-provided text that appears for the dashboard message.

Table 35. Configure Controller Rules (Continued)

Dashboard Style	Specifies the icon and color coding that appear with the message. Options are: • Basic • Success • Info • Warning • Danger
Email	Specifies an email address for notification when an I/O contact is closed.
Email Account	Specifies the SMTP account to use for sending email.
Outputs	
Contact #	Displays the assigned number for this contact. This parameter is automatically set and cannot be edited.
Enabled	Indicates if a rule is enabled for this contact.
Name	Displays the user-provided name for the contact.
Description	Displays the user-provided description for the contact.

Table 35. Configure Controller Rules (Continued)

Action	Displays the system action for closing the output contact. Options are:

- **911** – Starts or stops a call to 911.

- **Audio** – Starts or stops audio distribution to all stations (using previously selected playlist or matrix mixer input channel).

- **Alarm** – Starts or stops the alarm file selected as the **Action ID**.

- **Announcement** – Starts or stops the announcement file selected as the **Action ID**.

- **All-Call** – Starts or stops an All-Call page.

- **Multi-Site-All-Call** – Starts or stops a Multi-Site All-Call page.

- **Multi-Site-Emergency-All-Call** – Starts or stops a Multi-site Emergency-All-Call page.

- **Emergency-Call** – Starts or stops an Emergency Call.

- **Emergency-All-Call** – Starts or stops an Emergency-All-Call page.

- **Hourly** – Specifies the minutes and seconds when the **Action** occurs.

- **Audio-Disabled** – Disables or enables all audio in the Nyquist system. Contact is closed when audio is disabled; open when audio is enabled.

- **No Action** – Is the default action for outputs that have yet been configured.

- **Page** – Starts or stops a zone page.

- **Tone** – Starts or stops the tone file selected as the **Action ID**.

- **Manual** – Creates a dashboard button that can be used to manually close or open specified output contact.

Note: When a system activity is started, the output contact is closed; the contact is opened when the system activity ends.

Action Id	Displays the action identifier (such as an alarm number) for the output contact action.

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Table 35. Configure Controller Rules (Continued)

Zones	Provides a list of paging zones that trigger an output. If blank, all zones are affected. *Note:* This field does not appear if **Action** is set to **Page**.
Duration	Displays the duration of the contact closure in milliseconds. A value of 0 leaves the contact closed.
On Time	Specifies the minutes and seconds when the **Action** is set for **Hourly**. When set to 00:00, hourly closure is not enabled.
Days	Specifies the days of the week that the hourly closure of contact occurs.
Control Stations	Provides a list of stations that can manually control the output contact.
Close Button Label	Displays the user-provided label for the Dashboard button that is associated with the closing of an output contact. The duration for the contact must be set to 0 for this label to appear.
Open Button Label	Displays the user-provided label for the Dashboard button that is associated with the opening of an output contact. The duration for the contact must be set to 0 for this label to appear.

Configuring I/O Controller Input Rules

You can configure eight input rules for each I/O Controller.

To configure an I/O Controller Input Rule:

1 From the navigation bar, select **Stations**.

2 Select the **Edit** icon for the desired I/O Controller.

3 On the Edit Station page, select **Configure Rules**.

4 Select the Edit icon for the input contact that you want to configure.

5 On the Edit Controller Rule page, complete the desired Input Contact Rule Parameters.

6 Select **Save**.

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Table 36. Input Contact Rule Parameters

Enabled	Indicates if a rule is enabled for this contact.
Contact Number	Displays the assigned number for this contact. This parameter is automatically set and cannot be edited.
Contact Type	Displays if the contact is an input or output contact. This parameter is automatically set and cannot be edited.
Extension	Displays the station extension. This parameter is automatically set and cannot be edited.
Name	Displays the user-provided name for the contact.
Description	Displays the user-provided description for the contact.
Close Interval	Displays in milliseconds how long the contact remains open before input action is triggered.

Table 36. Input Contact Rule Parameters (Continued)

Action	Displays the action, if any, that is to be taken when the contact is closed. Options are:
	• **Audio** – Starts audio distribution to all stations (using previously selected playlist or matrix mixer input channel).
	Note: The I/O Controller can only be used to start audio distribution to all stations; it cannot stop the audio to all stations. Another method must be used to stop the audio such as selecting **Stop** from the Admin Web Interface or Admin Phone.
	• **Alarm** – Plays the alarm file selected as the **Action ID**.
	• **Announcement** – Plays the announcement file selected as the **Action ID**.
	• **Disable-Audio** – Disables all audio in the Nyquist system, performing the same action as when the **Disable Audio** button on the dashboard is selected. This action can be used by an external emergency system (for example, fire alarms) to disable all Nyquist audio, which includes: Audio Distribution, Tones, Alarms, Paging.
	Note: This contact closure action will only initiate the disabling of audio, it will not restore the audio. To restore audio, use a different contact with the action **Enable Audio**, or enable audio via an Admin Web Interface or Admin Phone.
	• **Other** – Used when you don't want to take one of the available actions, but you do want to close a contact, create a dashboard message, or send an email when the contact is closed.
	• **Tone** – Plays the tone file selected as the **Action ID**.
	• **Enable-Audio** – Enables all audio in the Nyquist system, performing the same action as when the **Enable Audio** button is selected on the dashboard.
Alarms	Displays the alarm file that plays.
	Note: This parameter is only available for an Alarm **Action**.
Announcements	Displays the announcement that plays.
	Note: This parameter is only available for an Announcement **Action**.

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Table 36. Input Contact Rule Parameters (Continued)

Tones	Displays the tone that plays.
	Note: This parameter is only available for a Tone **Action**.
Zones	Displays the zone that is affected by the action.
	Note: This parameter is only available for Alarm, Announcement, and Tone actions, and only a single zone can be added for an input rule.
Close Extension	Specifies which contact will close.
Dashboard Type	Specifies if the message appears in the dashboard message pane alone or also in a popup message.
Dashboard Title	Specifies the user-provided title that appears for the dashboard message.
Dashboard Scope	Specifies which devices receive the message. Options are:
	• All – All web interface dashboards will receive the message.
	• Admin – Only Admin web interface dashboards will receive the message.
Dashboard Text	Specifies the user-provided text that appears for the dashboard message.
Dashboard Style	Specifies the icon and color coding that appear with the message. Options are:
	• Basic
	• Success
	• Info
	• Warning
	• Danger
Email	Specifies an email address for notification when an I/O contact is closed.

Configuring I/O Controller Output Rules

You can configure eight output rules for each I/O Controller.

To configure an I/O Controller Output Rule:

1 From the navigation bar, select **Stations**.

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2   Select the **Edit** icon for the desired I/O Controller.

3   On the Edit Station page, select **Configure Rules**.

4   Select the Edit icon for the output contact that you want to configure.

5   On the Edit Controller Rule page, complete the desired Output Contact Rule Parameters.

6   Select **Save**.

Table 37. Output Contact Rule Parameters

Enabled	Select if a rule is to be enabled for this contact.
Contact Number	Displays the assigned number for this contact. This parameter is automatically set and cannot be edited.
Contact Type	Displays if the contact is an input or output contact. This parameter is automatically set and cannot be edited.
Extension	Displays the station extension. This parameter is automatically set and cannot be edited.
Name	Provide a name for the contact.
Description	Provide a description for the contact.

Table 37. Output Contact Rule Parameters (Continued)

Action	Select the Nyquist system activity that will close the output contact when the activity starts and open the output contact when the activity stops.

Note: If duration is greater than 0, the output contact opens after duration milliseconds even if the system activity is still ongoing. When a system activity is started, the output contact is closed; the contact is opened when the system activity ends.e

Options are:

- **911** – Starts or stops a call to 911.
- **Audio** – Starts or stops audio distribution to all stations (using previously selected playlist or matrix mixer input channel).
- **Alarm** – Starts or stops the alarm file selected as the **Action ID**.
- **Announcement** – Starts or stops the announcement file selected as the **Action ID**.
- **All-Call** – Starts or stops an All-Call page.
- **Multi-Site-All-Call** – Starts or stops a Multi-Site All-Call page.
- **Multi-Site-Emergency-All-Call** – Starts or stops a Multi-site Emergency-All-Call page.
- **Emergency-Call** –Starts or stops an Emergency Call.
- **Emergency-All-Call** – Starts or stops an Emergency-All-Call page.
- **Hourly** – Specifies the minutes and seconds when the **Action** occurs.
- **Audio-Disabled** – Disables or enables all audio in the Nyquist system. Contact is closed when audio is disabled; open when audio is enabled.
- **No Action** – Is the default action for outputs that have yet been configured.
- **Page** – Starts or stops a zone page.
- **Tone** – Starts or stops the tone file selected as the **Action ID**.
- **Manual** – Creates a dashboard button that can be used to manually close or open specified output contact.

On Time	Use the down arrows to select the **Minute** and **Second** if the **Action** is set for **Hourly**. When set to 00:00, hourly closure is not enabled.

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Table 37. Output Contact Rule Parameters (Continued)

Days	Specify the days of the week that the hourly closure of contact occurs. This parameter appears only if the **Action** is set to **Hourly**.
Zones	Specify which paging zones trigger the output contact closure if the **Action** is set to **Page**. If left blank, any zones started trigger the output contact closure.
Tones	Specify which tone to play if the **Action** is set to **Tone**.
Announcements	Specify which announcement to play if the **Action** is set to **Announcement**.
Alarms	Specify which alarm to play if the **Action** is set to **Alarm**.
Program Distribution	Specify which audio distribution file to play if the **Action** is set to **Audio**.
Duration	Provide the duration of the contact closure in milliseconds. A value of 0 leaves the contact closed.
Control Stations	Select the stations that can manually control the output contact. A button for manually setting the output contact appears on the dashboard.
Close Button Label	Provide a label for the Dashboard button that is associated with the closing of an output contact. The duration for the contact must be set to 0 for this label to appear.
Open Button Label	Provide a label for the Dashboard button that is associated with the opening of an output contact. The duration for the contact must be set to 0 for this label to appear.

Using Nyquist to Open a Secured Door

One example of the configuration and use of the I/O Controller is the opening of a secured, or locked, door. The I/O Controller can be connected to a doorbell that, when pressed, sends a dashboard message to Admin Stations that someone wants to gain access through a secured door. You or other Admin users can then select an **Activate** button that unlocks the door and allows entry to the secured area.

In this example, the dry contact connection of the doorbell would be wired to an I/O Controller input terminal and the secured door's relay driver would be wired to an I/O Controller's output terminal. (Refer to *NYQUIST Input/Output Controller NQ-E7010 Installation and Use*.)

Follow the steps for configuring an I/O Controller Input Configure Rule (see "*Configuring I/O Controller Input Rules" on page 150*) using the following parameters:

- For **Close Interval**, enter how long (in milliseconds) the input contact must remain closed before the input action is triggered. In most cases, .

- For **Action**, select **Other**.

- For **Close Extension**, select that extension, or station number, for the I/O Controller connected to the output contact that, when closed, will open the door.

- For **Close Contact**, select the **Output Contact #** that is to be closed when Activate is pressed on the dashboard message.

- For **Duration**, enter the number of milliseconds required for the door open circuit to open the door.

- For **Dashboard Type**, select **io-contact**.

- For **Dashboard Title**, enter a title for the dashboard popup message (for example, **Front Door**).

- For **Dashboard Text**, enter the message that you want displayed on the dashboard popup message (for example, **Front doorbell activated; press "Activate" to open the front door**.

- For **Dashboard Style**, select **basic**.

When configured properly, the doorbell sounds and a message appears when the doorbell is pressed.
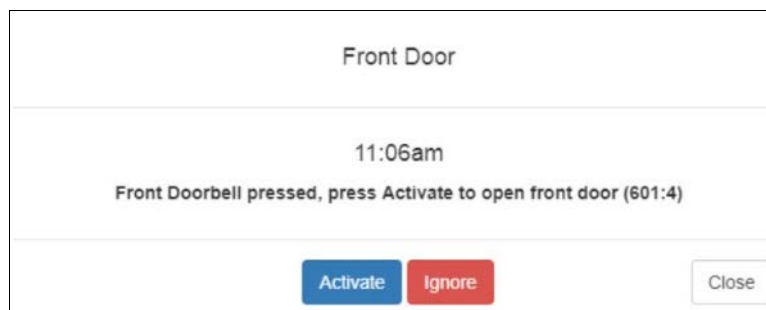
Figure 41. Example of Dashboard Message

If you select **Activate**, the door opens. If you select **Ignore**, the door remains closed and the popup message disappears.

Viewing an I/O Controller Schedule

You can view all contact closures set for specific dates and times using the Configure Schedule button on the I/O Controller's Edit Station page. For information about sched-

uling a output contact event, see "*Adding an I/O Contacts Output Daily Schedule" on page 158.*

Figure 42. Output Contacts Daily Schedule – I/O Device Page

To view contact closure schedules for an I/O Controller:

1 On the navigation bar, select **Stations**.

2 Select the **Edit** icon for the desired I/O Controller.

3 On the Edit Station page, select **Configure Schedule**.
The I/O Contacts Output Daily Schedule page appears.

Table 38. I/O Contacts Output Daily Schedule Page

Contact #	Displays the assigned number for the contact. This parameter is automatically set and cannot be edited.
Description	Displays the user-provided description for the contact.
Enabled	Indicates if a contact activity event is enabled.
State	Displays if the closure is open or closed.
Activity Time	Displays the time to change the contact event in HH:MM:SS format.
Days	Displays the day or days of the week that the event is to be executed.
Duration	Displays the duration of the contact closure in milliseconds. A value of 0 means that the contact remains closed until an open event occurs.

Adding an I/O Contacts Output Daily Schedule

Contact closures can be set for specific dates and times using the **Configure Schedule** button on the I/O Controller's Edit Station page. For example, suppose you want to schedule an output that unlocks a door at 7:30 each weekday morning. You can set up an

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output contact closure schedule for 7:30 am Monday through Friday. When the Activity Time occurs, the contact is closed, which in turn triggers a third-party contact switch that closes the door.

Figure 43. Add Output Contact Event Page

To add an output daily schedule for an I/O contact:

1 On the navigation bar, select **Stations**.

2 Select the **Edit** icon for the desired I/O Controller.

3 On the Edit Station page, select **Configure Schedule**.

4 On the I/O Contacts Output Daily Schedule page, select the **Add** icon.

5 Complete the parameters on the Add I/O Contact Output Event page.

6 Select **Save**.

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Table 39. Add or Edit I/O Contact Output Event Parameters

Contact #	Select the contact number for this contact.
Enabled	Select to enable the contact activity event.
State	Select the state for this new output event from the drop-down menu. Options are: • On – The contact is closed. • Off – The contact is open.
Activity Time	Enter the time to change the contact event, using the down arrows to make the appropriate selections in the **Hour**, **Minute**, and **Second** fields.
Duration	Enter the duration of the contact closure in milliseconds. A value of 0 means that the contact remains closed until an open event occurs.
Days	Enter the day or days of the week that the event is to be executed.
Description	Enter a description for the contact event. This field is required.

Editing the Daily Schedule for an I/O Contact

The Edit Output Contact Event - I/O Controller page allows you to change the parameters, such as duration, for an I/O contact's daily schedule.

To edit an output daily schedule for an I/O contact:

1 On the navigation bar, select **Stations**.

2 Select the **Edit** icon for the desired I/O Controller.

3 On the Edit Station page, select **Configure Schedule**.

4 On the I/O Contacts Output Daily Schedule page, select the **Edit** icon next to the contact that you want to edit.

5 Make desired changes to the Edit I/O Contact Output Event page. (For information about the parameters for this page, see *Table 39*.)

6 Select **Save** to return to the I/O Contact Output Daily Schedule page.

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Deleting an I/O Contacts Output Daily Schedule

You can delete an output contacts daily schedule that is no longer needed from the station's Output Contacts Daily Schedule page.
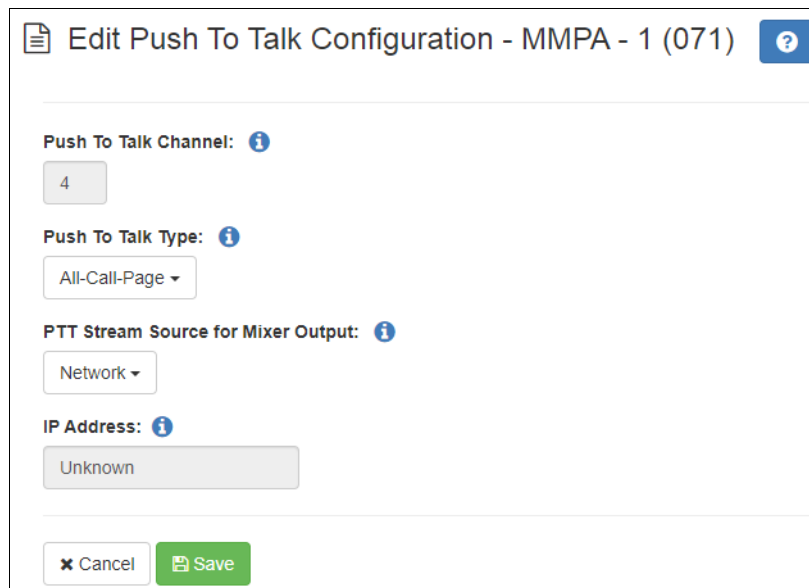
To delete an output daily schedule for an I/O contact:

1   On the navigation bar, select **Stations**.

2   Select the **Edit** icon for the desired I/O Controller.

3   On the Edit Station page, select **Configure Schedule**.

4   On the I/O Contacts Output Daily Schedule page, select the **Delete** icon next to the contact that you want to delete.

5   When prompted, select **Delete**.

Configuring Device for Push To Talk

Configuring a Matrix Mixer Pre-Amp or a Public Address Mixer Amplifier for Push To Talk is a two-step process. The first part is done through the Admin Web UI and pertains to enabling a **Push To Talk Channel** and selecting a **Push To Talk Type**.

The second step is done through the appliance's web UI and involves enabling the Line Out for the selected channel.

Figure 44. Push to Talk Configuration Page

To edit Push to Talk configuration for a Matrix Mixer Pre-Amp:

1 On the navigation bar, select **Stations**.

2 Select the **Edit** icon for the Matrix Mixer Pre-Amp that you want to configure.

3 Select **Configure PTT**.

4 Select parameters from the Edit Push To Talk Configuration page. (For information on editing mixer channels, see *"Configuring Intercom Module" on page 164*.

5 Select **Save**.

To edit Push to Talk configuration or a public address mixer/amplifier:

1 On the navigation bar, select **Amplifier Devices**.

2 For the public address mixer amplifier that you want to configure, in the **Manage** column, select **Configure PTT**.

3 Select parameters from the Edit Push To Talk Configuration page. (For information on editing an amplifier, see *"Editing an Amplifier" on page 210*.)

Note: For the PTT Output setting to work correctly on the public address mixer/amplifier, the Line-Out and Speaker-Out must be disabled on the appliance's DSP Router (see *"Configuring Push to Talk for a Public Address/Mixer Amplifier" on page 210*).

---

4 Select **Save**.

Table 40. Edit Push To Talk Configuration Parameters

Push To Talk Channel	Channel 4 is the only available PTT channel.
Push To Talk Type	Select the type of activity that is performed when the button is pressed on the microphone. Options are:

- All-Call-Page
- Emergency-All-Call-Page
- Line-Output
- Zone-Page
- Record-Zone-Page
- Multi-Site-All-Call-Page
- Multi-Site-Emergency-All-Call-Page

Table 40. Edit Push To Talk Configuration Parameters (Continued)

PTT Stream Source for Mixer Output	This field does not appear if Push To Talk Type is set to Record-Zone-Page. Select whether the PTT stream sent to the MMPA output is to be **Analog** or **Network**. If **Analog** is selected, the analog input is directly routed to the output and network output is suspended to devices directly attached to the MMPA. If **Network** is selected, the PTT input is routed through the network, which could create a small, noticeable delay. *Note:* If the **Push To Talk Type** is set to **Line-Output**, this field is automatically set to **Analog** and cannot be edited.
Push To Talk Zone	This field appears only if **Push To Talk Type** is set to **Zone-Page**. Select the zone to page.
PTT Output	Selects the amplifier output used for locally playing PTT initiated paging, provided **Push To Talk Type** is not **Line-Output**. Options are: • Both • Line-Out • None • Speaker-Out If **Push To Talk Type** is set to **Record-Zone-Page**, then this parameter should be set to **None** unless you do want to also play it live.
PTT Extension	The station extension that the PTT configuration is associated to.
IP Address	Displays the IP address of the mixer, if known, and a **Link** button that allows you to start the mixer's UI. If the Nyquist server has not discovered the mixer's IP address, the **Link** button does not appear.

Configuring Intercom Module

If you have added an NQ-GA10P Intercom Module as a Push-To-Talk (PTT) microphone, you can select the type of page that can be made when the PTT mic is active and what zone the page will be made to.

Figure 45. Edit Intercom Module Configuration

To edit an intercom module:
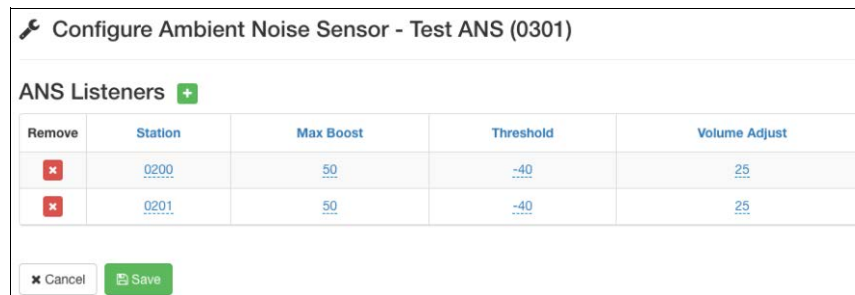
1   On the navigation bar, select **Stations**.

2   Select the **Edit** icon for the intercom module that you want to configure.

3   Select **Configure Intercom Module**.

4   After making your edits on the Edit Intercom Module Configuration page, select **Save**.

Table 41. Edit Intercom Module Configuration Parameters

Push To Talk Type	Select the type of pages that can be made from the Mic. Options are:
	• All-Call-Page
	• Emergency-All-Call-Page
	• Zone-Page
	• Record-Zone-Page
	• Multi-Site-All-Call-Page
	• Multi-Site-Emergency-All-Call-Page
Push To Talk Zone	Use the drop-down arrow to select a zone to receive the page. Only one zone can be selected.

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Configuring Ambient Noise Sensor

The Ambient Noise Sensor ensures that page announcements and music are audible even during periods of high noise levels by continuously monitoring the ambient noise level through a microphone module and adjusting the paging signal level for that area's amplifier channel.

Figure 46. Configure Ambient Noise Sensor

This feature requires that an ANS500M Ambient Sound Microphone be attached to an intercom module station type. For installation instructions, refer to the *NQ-GA10P, NQ-GA10PV VoIP Intercom Module Installation and Use* manual.

You must set the **Ambient Noise Sensor Multicast IP Address** and **Ambient Noise Sensor Multicast Port** system parameters (see "*Setting System Parameters" on page 54*).

Then, create a station with **Type** as **Ambient Noise Sensor** and **Device Type** as **NQ-GA10P-Intercom Module** (see "*Adding a Station" on page 173*).

To configure ANS parameters:

1 On the navigation bar, select **Stations**.

2 Select the **Edit** icon for the **Ambient Noise Sensor** station.

3 Select **Configure**.

4 Select the **Add** icon to add an ANS Listener.

An ANS Listener is a station that will receive Sound Pressure Level (SPL) reports from the ANS. For example, suppose you have speakers in a warehouse area that you want the volume to automatically adjust when noisy machines are operating. You would add the speaker stations as ANS Listeners. When the SPL in the warehouse increases, the ANS reports the increase to the ANS Listeners and the speakers' volumes are adjusted automatically.

5 Set the ANS parameters for the ANS Listener.

6 If you want to remove a station from the ANS Listener list, select the **Remove** icon on the station's row.

7 When all edits are made, select **Save**.

Table 42. Configure Ambient Noise Sensor Parameters

Station	Displays the extension number of the station that is an ANS Listener. A station can only listen to one ANS.
Max Boost (dB)	Displays the maximum dB gain adjustment allowed. Setting this parameter to 0 disables any volume adjustments from the ambient noise sensor. The default value is 20 dB.
Threshold (dBFS)	Displays the dB value at which point the device will adjust the volume to compensate for the increased ambient noise volume. This value should be between -40 and 0 dB. A fairly noisy environment is around -20 dB; quiet environments are in the range of -40 dB. The default value is -20 dB.
Volume Adjust (dB)	Displays the amount of decibels to stay above the ambient noise level. Setting this to 0 disables any volume adjustments from the ANS. The default value is 12 dB.
Sample Length(s)	Displays the ambient noise sampling length, which can range from 1 to 20 seconds. Short lengths provide quicker response to changes in the ambient noise; longer lengths will ignore sudden, short fluctuations in the ambient noise.

Configuring Intercom HDMI Module Display Options

Note: When a NQ-GA10PV boots up, it queries the attached display and sets the display mode settings to the highest compatible setting (1080@30Hz or 1080@24Hz). If the display does not support either of those settings, the attached display is set to the highest non-compatible setting and a message appears that lists this unsupported resolution and the resolutions that are supported.

If you have a NQ-GA10PV Intercom HDMI Module **Device Type**, you can set display types for the connected monitor, including the type of clock and display colors that appear.

Options configured for the station affect the overall appearance of the display, such as the background color for the display and fonts used to display date and event. Options for specific messages are set through the **Display Message** option on the dashboard (see *"Creating a Display Message via the Dashboard" on page 448*).

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Figure 47. Display Configuration for GA10PV Station

To configure display options:

1 On the navigation bar, select **Stations**.

2 Select the **Edit** icon for the intercom HDMI module that you want to configure.

3 Select **Display Configuration**.

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4 After making your edits on the Display Configuration page, select **Save**.

Table 43. Display Configuration

Type	Select one of the five layouts available:
	• **Analog Clock**. Displays an analog clock on the left side of the display screen.
	• **Digital Clock**. Displays a digital clock on the top of the screen.
	• **Messages 1 Column**. Displays messages only in a single column.
	• **Messages 2 Columns**. Displays messages only in two columns.
	• **Messages 3 Columns**. Displays messages only in three columns.
Date Format	Select the format for displaying the date. Available formats are:
	• DDD, MMM DD
	• MMM DD, YYYY
	• DD MMM YY
	• DD MMM YYYY
	• DD/MM/YY
	• DD/MM/YYYY
	• MM/DD/YY
	• MM/DD/YYYY
Show Date	Use the slider to select if the date will be displayed.
Show Event	Use the slider to select if the event will be displayed. (See "*Understanding Event Settings*" on page 238.)
Show Seconds	Use the slider to select if seconds will be displayed on the clock.
Background Color	Select a background color for the display. You can select a color by:
	• Using the color picker
	• Entering a hex color (for example: #000000, for black)
	• Entering an RGB color (for example: rgb(0,0,0) for black)
	• Entering a color alias name (for example: red, blue, etc.)
	For more information, see "*Using Color in Display Messages*" on page 451.

Table 43. Display Configuration (Continued)

Text Color   Select a color for the text. You can select a color by:

- Using the color picker

- Entering a hex color (for example: #000000, for black)

- Entering an RGB color (for example: rgb(0,0,0) for black)

- Entering a color alias name (for example: red, blue, etc.)

For more information, see *"Using Color in Display Messages" on page 451*.

Text Font   Select a font for the text from the drop-down list. Available fonts are:

Comic-Relief

Courier-Prime

Gelasio

Liberation Sans

Linux Libertine

Text Size   Enter the text size. Text size is based on font points with 72 points being an inch.

Time Format   Select whether the time is to appear in 12 or 24 hour format.

Time Color   Select the color for the time display. You can select a color by:

- Using the color picker

- Entering a hex color (for example: #000000, for black)

- Entering an RGB color (for example: rgb(0,0,0) for black)

- Entering a color alias name (for example: red, blue, etc.)

For more information, see *"Using Color in Display Messages" on page 451*.

Table 43. Display Configuration (Continued)

Time Font   Select a font for the time from the drop-down list. Available fonts are:

> Comic-Relief
>
> Courier-Prime
>
> Gelasio
>
> Liberation Sans
>
> Linux Libertine

Time Size   Select the font size for the time.

If you select to use an analog clock, the clock appears on the left side of the HDMI connected display and messages appear on the right side. If you select to use a digital clock, the time appears on the top of the display and the messages appear beneath.
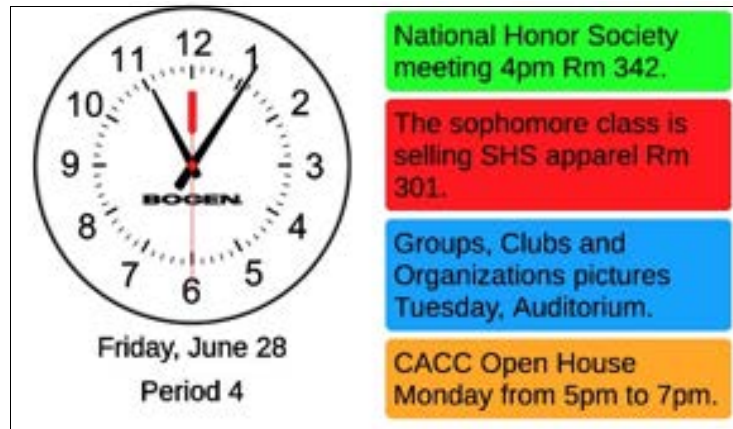
Figure 48. Example of Display with Analog Clock

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Figure 49. Example of Display with Digital Clock

Figure 50. Example of Single Column Display

Figure 51. Example of Two Column Display
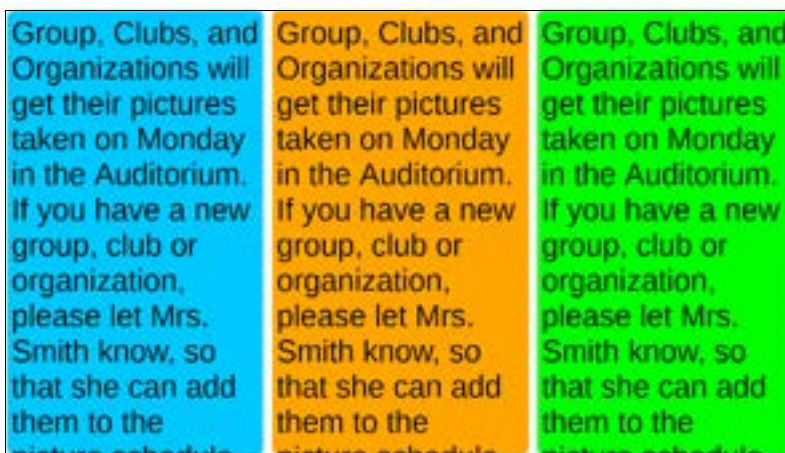
Figure 52. Example of Three Column Display

Deleting a Station

Note: You cannot delete a station that is used in a routine **Action** (see *"Understanding Action Parameters" on page 414*).

When you delete a station, all of its settings are deleted and the station will not be able to register with the Nyquist system server. If it's an admin station, you may not be able to delete it until you delete all associations that the Admin Station has (for example, member of Day Admin, Night Admin, Night Ring, or Admin Group).

After you delete a second station from an SPA112, the Nyquist system server reboots the SPA112. If the Nyquist system server does not know the SPA112's IP Address, you must reboot the SPA112 device for the changes to take effect on the SPA112.

When a station is deleted from an SPA112, it can take several minutes for the changes to show up on the SPA112's web interface. When the second station is deleted from the SPA112, the remaining station is set up on the first port (Phone 1) even if that station was previously set up on the second port (Phone 2). If this situation occurs, move the attached phone cable from Phone 2 to Phone 1.

To delete a station's configurations:

1 On the navigation bar, select **Stations**.

2 Select the **Delete** icon for the station that you want to delete configuration settings.

3 When prompted, select **Delete**.

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Adding a Station

Using the Nyquist system server's automatic discovery feature is the preferred method of adding a station. If you manually add a station, you risk having the MAC address entered incorrectly, which would prevent the station from functioning properly.

If the station **Type** is Admin Web Interface, Admin Phone, IP Phone, Analog Phone, or Mobile Device, you can set a default **Announcement Zone** and the **Announcement Zone Configuration Type**. If the **Announcement Zone Configuration Type** is set to **Fixed**, the zone used to play announcements will always be the zone number provided for **Announcement Zone** and cannot be changed. If set to **Default**, the **Announcement Zone** value is used as the default zone, but you can set an announcement to play to another zone.

To view and add discovered stations:

1   On the navigation bar, select **Stations**.

2   On the Stations page, select **New Stations**.

3   From the New Stations page, select the **Add** icon next to the station that you want to configure.

4   Complete the configuration parameters that are not automatically filled. Parameters are described in *Table 34, "Station Configuration Page Parameters," on page 129*.

Note: If this new appliance is replacing an existing one, see "*Swapping a Nyquist Device*" on page 173.

5   Select **Save**.

To manually add a station:

1   On the navigation bar, select **Stations**.

2   Select the **Add** icon.

3   Complete the configuration parameters for the new station. Parameters are described in *Table 34, "Station Configuration Page Parameters," on page 129*.

4   Select **Save**.

Swapping a Nyquist Device

Through the **New Stations** option, you can replace an existing device with a new device. This option allows you to replace a device, such as VoIP speaker, with a new device of the same type and maintain the original device's extension and configuration.

Note: You can replace a VoIP speaker with a VoIP speaker G2 and replace a VoIP speaker G2 with a VoIP speaker G2. You cannot, however, swap a VoIP speaker G2 with an earlier generation VoIP speaker.

You can also use the **New Stations** option to replace an audio power amplifier with another amplifier, regardless of type. For example, you can replace an NQ-A2060 amplifier with an NQ-A2300 amplifier.

Select **Swap** under the **Action** column to switch a discovered appliance for an appliance that was previously added to the database but now needs to be removed. For example, the old device may have stopped working and new hardware is replacing the broken device.

Using a Cisco SPA112 Adapter

The Cisco SPA112 is an Analog Telephone Adapter (ATA) that allows an analog phone to access IP phone services through two standard telephone RJ-11 phone ports.

The following limitations exist when the Cisco SPA112 is used as a Nyquist Admin Phone station:

- Call queuing is not supported.

- Call waiting is limited to one call. If the Admin Phone is associated with an Admin Group, a call made to the Admin Phone when the phone is already on a call will automatically ring the Admin Group. If the Admin Phone is not associated with an Admin Group and receives a call when already on a call, a beep sounds on the Admin Phone to indicate a call is on call waiting.

- When you add two stations to an SPA112 device, you must enter the same MAC address for both ports.

- The station number with the lowest numerical value will be set up on the first port (Phone 1) of the SPA112.

- After you add or delete a second station to or from the SPA112, the Nyquist system server reboots the SPA112. If the Nyquist system server does not know the SPA112's IP address you must manually reboot the SPA112 device for the changes to take effect on the SPA112.

- When a station is added to the SPA112, the web password is changed to **bogen**. You can change the web password when adding or editing the station.

- If you configure two stations on the same SPA112, the web password is set to the station with the highest station number, even if the other station has a different web password defined. Ensure that the same web password is entered for both stations on the SPA112.

- When you delete the second station from the SPA112, the remaining station is set up on the first port (Phone 1) even if that station was previously set up on the second port

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(Phone 2). If this situation occurs, move the attached phone cable from Phone 2 to Phone 1.

- When you configure two stations on the same SPA112, the second station (Phone 2) uses port # 5061.

- It can take several minutes for changes to show up on the SPA112's web interface when adding, modifying, or deleting stations to or from an SPA112.

- When you add a station to an SPA 112 for the first time, you must reboot the SPA112 after adding the station with the Nyquist web UI before the SPA112 will retrieve its configuration information.

- If station VLAN settings are provided and two stations are defined on the SPA112, the VLAN settings from the station with the lowest station number are used. The best practice is to ensure that both stations on the SPA112 use the same VLAN settings.

Refer to the *Cisco Small Business SPA100 Series Phone Adapters Administration Guide* for instructions on connecting the ATA.

To add a Cisco SPA112 station:

1   On the navigation bar, select **Stations**.

2   Select the **Add** icon.

Note: If Use Network Time Server defined by DHCP is set to Yes on the Nyquist system server, the Cisco SPA112's NTP server configuration is not changed; otherwise the device's NTP server is set to the Nyquist system server's defined NTP server.

---

3   Complete the configuration parameters for the new station:

   a   For **Type**, select **Admin Phone** or **IP Phone**.

   b   For **Device Type**, select **Cisco SPA112**.

   c   For **MAC Address**, enter the MAC address of the Cisco SPA112.

   For all other parameters, see *Table 34, "Station Configuration Page Parameters," on page 129*.

4   Select **Save**.

5 From your web browser, enter the IP address of the Cisco SPA112 device.

Figure 53. Cisco SPA112 Logon Window

6 Log into the device.
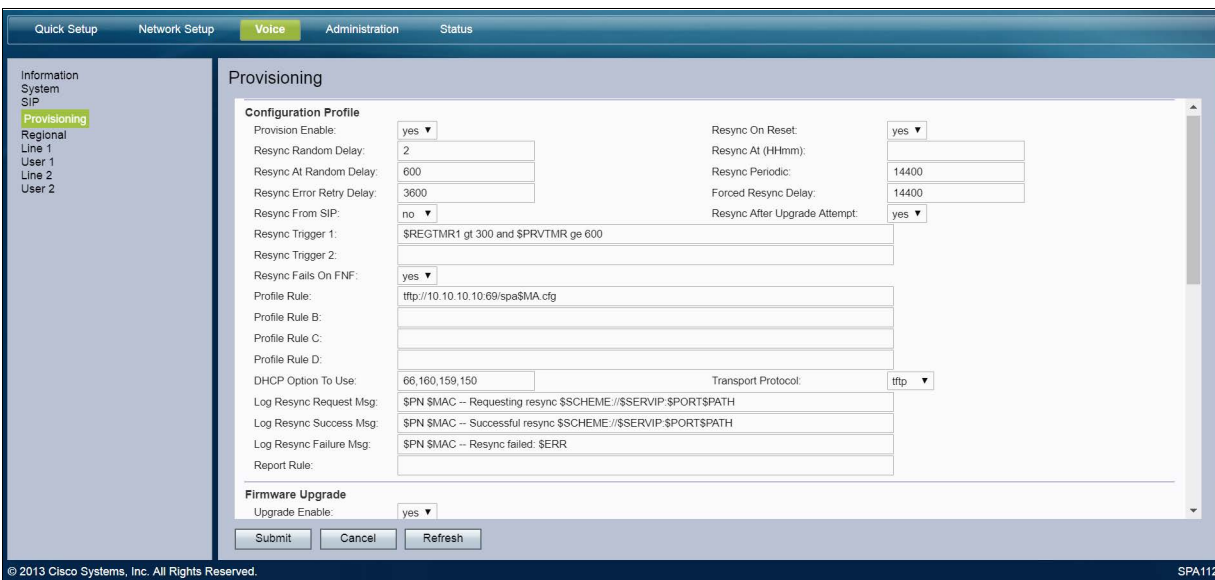
Figure 54. Provisioning Settings

7 Select the **Voice** tab, and then select **Provisioning**.

8 Set **Transport Protocol** to **tftp**, and then select **Submit**.

9 Select the **Administrator** tab, and then select **Reboot** to reboot the device.

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10 Log into the device. The C4000 system server will have set the following parameters:

- Quick Setup -> Line 1 -> Proxy
- Quick Setup -> Line 1 -> Display Name
- Quick Setup -> Line 1 -> User ID
- Quick Setup -> Line 1 -> Password
- Quick Setup -> Line 1 -> Dial Plan
- Network Setup -> Internet Settings -> Optional Settings -> Host Name
- Network Setup -> Time Settings -> Time Server -> Manual
- Network Setup -> Time Settings -> Time Server (IP or Hostname)
- Network Setup -> Auto Recovery After Reboot -> Yes (checked)
- Network Setup -> Advanced Settings -> VLAN -> Enable VLAN
- Network Setup -> Advanced Settings -> VLAN -> VLAN ID
- Voice -> Provisioning -> Resync Trigger 1
- Voice -> Provisioning -> Profile Rule -> "tftp://NyquistServerIP:69/spa$MA.cfg"
- Voice -> Provisioning -> Resync From SIP -> "no"
- Voice -> Line 1 -> Mailbox ID -> Nyquist-station-extension-number
- Voice -> Line 1 -> Mailbox Subscribe URL -> Nyquist-server-ip-address
- Voice -> Line 1 -> Proxy -> Nyquist-server-ip-address
- Voice -> Line 1 -> Subscriber Information -> Display Name, User ID, Password
- Voice -> Line 1 -> Dial Plan
- Administration -> Management -> User List -> password for username = admin

11 For the **Dial Plan**, use the following:

**S:5,
(911|91x.|*92x.|*94x.|*96x.|##0911S0|#0911S0|#x.|*xxx|#xxx|987*x.|98x.|*x.|*990|*991x.|7*x.|
971x.|972x.|973x.|974x.|978x.|xxx|##x.#x.|##*x.x.|904x.|904x.|3*xxxx*xxx.|942#x.#x.|943#x.#
x)**

12 Log out of the device.

Using a Grandstream HT813 Adapter

The Grandstream HT813 Analog Telephone Adapter (ATA) provides one analog telephone FXS port and one PSTN line FXO port.

For further details about this product, refer to the following product documentation provided by Grandstream:

- `https://www.grandstream.com/sites/default/files/Resources/HT813_User_Guide.pdf`

- `https://www.grandstream.com/sites/default/files/Resources/HT813_Administra-tion_Guide.pdf`
- `https://www.grandstream.com/support/resources/?title=HT813`

Setting up the HT813 for use by the Nyquist system

Users can choose to use the FXS port, the FXO port, or both ports (FXS and FXO).

1 Start with basic device setup using the HT813 web interface
   (see "*Basic HT813 Setup" on page 178*)

2 Configure a Nyquist Station to use the HT813 FXS port
   (see "*Configure station to use HT813 FXS port" on page 179*)

3 Configure a Nyquist SIP Trunk to use the HT813 FXO port
   (see "*Configure SIP Trunk to use HT813 FXO port" on page 181*)

Basic HT813 Setup

1 Plug an Ethernet cable into the HT813's WAN Port. The cable should be connected to a switch that is connected to your Nyquist server network.

2 Power up the HT813 by plugging it in.
   By default, the HT813 will request an IP address from a DHCP server over the WAN port.

3 Upgrade the HT813 firmware to version 1.0.5.2 or greater.
   `https://www.grandstream.com/support/firmware`

Note: Upgrading to this version is very important, the Nyquist system will not be able to properly configure the device if it is not using this firmware version or greater.

4 If DHCP is used in the Nyquist network and the DHCP server provides the Nyquist server's TFTP IP address via option 66, skip to step #7.

5 On the HT813 "Basic Settings" page, configure the HT813's static IP address.

6 On the HT813 "Advanced Settings" page, select TFTP for Firmware Upgrade and Provisioning and then enter the Nyquist server's IP address in the "Config Server Path:" field (see "*Grandstream Device Configuration Advanced Settings" on page 179*).

7 You are now ready to configure the FXS and FXO ports by using the Nyquist server web interface. See "*Configure station to use HT813 FXS port" on page 179* and "*Configure SIP Trunk to use HT813 FXO port" on page 181* for details.

Figure 55. Grandstream Device Configuration Advanced Settings

Configure station to use HT813 FXS port

1   From the navigation bar, select **Stations**.

2   From the Station page, select the **Add** icon.

3   Add a new Station for the FXS port using the station settings specified in the following table, "*Add Station Properties to use HT813 FXS port" on page 179* (which only explains HT813-specific fields).

4   Press the **Save** button.

5   Reboot the HT813 device (see "*HT813 Device Reboot Required after making changes" on page 183*).

Table 44. Add Station Properties to use HT813 FXS port

Type	Select either "Admin Phone" or "IP Phone".
Device Type	Select "Grandstream HT813 Analog Phone FXS Port".

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Table 44. Add Station Properties to use HT813 FXS port

MAC Address	Enter the HT813's LAN MAC Address.
	This address can be obtained by viewing the HT813's Status page (see "*Grandstream Device Configuration Status Page" on page 181*).
	Please make sure you enter the LAN MAC Address, not the WAN MAC Address.
	Note: The HT813 uses the LAN MAC Address for configuration file names, even when the WAN Port is used to connect it to the network.
VLAN Configuration (optional)	If a VLAN is going to be used, you can enter the VLAN information.
Registration Password	Enter a password that the HT813 will use to register with the Nyquist server. This password is used for SIP-based registration with the Nyquist server.
Web Password	Enter a new password to be used by the HT813's web interface.
	Since the default password for the HT813 web interface is 'admin', we strongly recommend that you change it for security reasons.
	Note: Changing the "Web Username" is not supported. Any value you enter in the "Web Username" field that differs from 'admin' will be ignored.
Dial Plan Type	You may change the dial plan type to meet your requirements.
	If you choose "Auto Dial", you can then select an "Auto Dial Extension". If you select "Auto Dial" and select an "Auto Dial Extension", *do not* change the data that is automatically entered into the "Dial Plan" field.
	If you select "Custom" to create a custom dial plan, refer to the Grandstream HT813 Administration Guide (`https:// www.grandstream.com/sites/default/files/Resources/ HT813_Administration_Guide.pdf`) for details on the Dial plan format used by the HT813. You will also need to understand the DTMF codes used by the Nyquist system to create a valid dial plan (see "*Appendix B: Nyquist DTMF Feature Dialing Codes" on page 500*).

Figure 56. Grandstream Device Configuration Status Page

Configure SIP Trunk to use HT813 FXO port

1   From the navigation bar, select **SIP Trunks**.

2   From the SIP Trunks page, select the **Add** icon.

3   Add a new SIP Trunk for the FXO port, using the SIP Trunk settings specified in the following table, "*Add SIP Trunk Properties to use HT813 FXO port" on page 182*.

4   Press the **Save** button.

5   Reboot the HT813 device (see "*HT813 Device Reboot Required after making changes" on page 183*).

Note: The NT813 cannot be rebooted via the Nyquist system. You can reboot the HT813 by performing a power cycle, or you can initiate a reboot via the HT813's Advanced Settings page of the web interface (see "*Grandstream Device Configuration Advanced Settings" on page 179*).

Table 45. Add SIP Trunk Properties to use HT813 FXO port

Name	The name *must* match the following format: ht813-\<last-8-digits-of-HT813-LAN-MAC-Address\> Example: If the HT813's LAN MAC Address is 000b82e9e6d1, the name must be: ht813-82e9e6d1 *Note:* Lowercase characters must be used in the MAC address portion, and a dash must be included between the ht813 portion and the MAC address portion.
Extension	Select a previously created DISA Station extension.
Username	Set this equal to the SIP Trunk's Name field. Example: ht813-82e9e6d1
Host	Set this to the IP address of the HT813 WAN Port IP Address. The WAN port IP address can be obtained by viewing the HT813's web interface Status page (see "*Grandstream Device Configuration Status Page" on page 181*).
DID	For a PSTN-based POTS line connection (assuming the FXO port is plugged into a standard POTS line), set this value to match the POTS line phone number, including area code. Whenever a standard POTS line is used, this value will not change the outbound Caller-ID, because it is already assigned by the POTS line. If the FXO is connected to a PBX system, the DID may affect the Caller-ID seen by the PBX.
Allow	Set this field to "ulaw" only, no other value is supported.
Custom Settings	While displaying the HT813's Status page, copy the MAC Address information from the HT813's Status page into the "Custom Settings" field. Sample MAC Address information copied from HT813 Status page: WAN – 00:0B:82:E9:E6:D2 LAN – 00:0B:82:E9:E6:D1

Caution	**If you forget to add the MAC address information into the Custom Settings field, the configuration will not properly create a valid SIP Trunk for the FXO port.**

Custom Settings (for SIP Trunk - FXO Port)

First, make sure that the HT813's MAC address information is the first information included in the Custom Settings field. This is mandatory. You can use copy/paste to transfer this information directly from the HT813's Status page into the custom settings field; the extra spaces and dashes are automatically handled by the custom settings parser.

Example MAC address information taken from HT813 web interface Status page:

```
WAN – 00:0B:82:E9:E6:D2 LAN – 00:0B:82:E9:E6:D1
```

Custom P-Value Parameters

In addition, with consultation from Bogen Technical Support, custom parameters for configuring the HT813 can be included in the custom settings field after the MAC Address information.

Example one:

```
WAN – 00:0B:82:E9:E6:D2 LAN – 00:0B:82:E9:E6:D1
:PVALS:(P100]0(/P100]:PVALS:
```

Example one will set P100 to 0 on the HT813 device.

Example two:

```
WAN – 00:0B:82:E9:E6:D2 LAN – 00:0B:82:E9:E6:D1
:PVALS:
(P100]1(/P100]
(P200]10.10.5.2(/P200]
:PVALS:
```

Example two will set P100 to 1 and P200 to 10.10.5.2 on the HT813 device.

The use of P-value custom parameters is not required by the Nyquist system when the FXS and FXO ports are used as designed to integrate with the Nyquist system.

For further details about custom parameters, contact Bogen Technical Support.

HT813 Device Reboot Required after making changes

After making any changes to a SIP Trunk or Station related to an HT813 device, the HT813 device must be manually rebooted by power cycling the device (Nyquist has no way to instruct the device to reboot). To power cycle the device, unplug it, wait a few seconds, then plug it back in. While powering up, the HT813 device will read the configuration file from the Nyquist server and apply any changes that were made to SIP Trunks that affect the FXO port, and apply any changes that were made to a Nyquist Station that affect the FXS port.

You can also initiate a reboot by using the HT813's web interface, Advanced Settings page (see "*Grandstream Device Configuration Advanced Settings" on page 179*). Press the "Reboot" button at the bottom of the configuration menu to reboot the ATA remotely. The web browser will then display a message window to confirm that reboot is underway. Wait 30 seconds to log in again.

HT813 Firmware Updates

6   The Nyquist system is not responsible for maintaining available firmware for the HT813 or responsible for upgrading the HT813 firmware. The customer has sole responsibility for maintaining and upgrading the HT813 firmware. Customers can use the HT813 user interface to upgrade the firmware and to initiate automatic upgrade using Grandstream's servers.

Using the Yeastar TA2400

The Nyquist Series supports the use of the Yeastar TA2400 FXS VoIP Gateway to integrate 24 standard analog phones into you IP communications system.

> *Note:* Quantum/Multicom MCESS and MCWESS phones are not supported by this device.

To install the gateway, refer to the *Yeastar TA Series Analog VoIP Gateway Installation Guide* (`https://www.yeastar.com/download/Yeastar_TA_Series_Installation_Guide_en.pdf`).

To configure the Yeastar TA2400 for use with the Nyquist, you first set up the Yeastar TA2400 to retrieve configuration from the Nyquist server. (See "*Connect the Yeastar TA2400 to the Nyquist Server" on page 184*.) Then, you add a station that uses a port on the TA2400 via the Nyquist Admin UI. (See "*Adding a Station that Uses a Yeastar TA2400 Port" on page 185*.)

You also can use the Yeastar TA2400 web interface to view port status. (See "*Viewing Yeastar TA2400 Status" on page 186*.)

Connect the Yeastar TA2400 to the Nyquist Server

Setting up the Yeastar TA2400 to retrieve information from the Nyquist server is done through the Yeastar TA2400 web interface.

Follow instructions in the *Yeastar TA Series Analog VoIP Gateway Installation Guide* for getting an IP address for the Yeastar TA2400 and for logging into the Yeastar TA2400 web interface.

Figure 57. Yeastar Auto Provisioning Settings

To set up the Yeastar TA2400:

1 From the Yeastar TA2400 web interface, select **System**.

2 Under **System Preferences**, select **Auto Provision Settings**.

3 In **Provision Method**, change **Server URL** to **Yes**.

4 In **Server Address**, select the **Server URL** field and type **tftp://** followed by the IP address of the Nyquist server and /. For example: **tftp://10.10.5.2/**.

5 Leave **User Name** and **Password** blank.

6 In the **Interval of time** field, enter **60**.

7 Select **Save**.

8 Select **Apply Changes**.

9 Under **System Preferences**, select **Reset and Reboot**.

10 If prompted, select **OK**.

Adding a Station that Uses a Yeastar TA2400 Port

To add a station that uses a Yeastar TA2400 port to your Nyquist system, follow the procedures for adding a station (See "*Adding a Station" on page 173*).

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When you select **Yeastar-TA2400 Analog FXS Port** as the **Device Type**, you must select the **Port Number** that the station is attached to from the drop-down list. Valid values are 1 through 24.

> *Note:* Port number 1 must always be used.

If you have only one phone attached to the TA2400, it must be attached to port 1. If you have multiple phones attached to the TA2400, one must be attached to port 1 but the use of the other ports can be random. For example, you can have phones attached to port 1, 2, 5, and 10. However, you cannot attach phones to just ports 2, 5, and 10 since that combination does not include phone 1.

The following rules apply when adding a station to a Yeastar TA2400 port:

- **Device Type** is **Yeastar-TA2400 Analog FXS Port**.

- You can select **Admin Phone** or **IP Phone** for **Type**.

- **MAC Address** is a required field. If you are adding the first station for this **MAC Address**, the **Port Number** is automatically set to **1**.

- **Paging** is set to **No** and cannot be changed.

- **Multicast Audio Distribution** is set to **No** but does not appear on the **Add Station** or **Edit Station** pages.

- Volume controls do not appear.

- **Codecs Allowed** is set to **g722** and cannot be changed.

- If you enter 1 for **Port Number**, the Admin Web UI displays the **VLAN settings**, **Web Username**, and **Web Password** fields.

- Stations attached to the Yeastar TA2400 are not available for ringing during Night Ring operations.

- You can associate an external station speaker to a TA2400 port by selecting a **Speaker Extension**.

- After adding a station, the Yeastar TA2400 must be manually rebooted via the Yeastar TA2400's web interface.

- The Nyquist **Appliances Network Time Server Source** will be used to configure the Network Time Service on the Yeastar TA2400. (See "*Using the Yeastar TA2400" on page 184*.)

- The Yeastar TA2400 time zone will be set to match the Nyquist server's time zone.

Viewing Yeastar TA2400 Status

You can use the Nyquist Station Status feature to view overall status of the Yeastar TA2400 device. (See "*Viewing Station Status" on page 190*.)

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You can obtain status of the individual ports through the Yeastar TA2400 UI.

Port	UP/Down/Break	Name	Status	Voice Mail(New/Old)	Off-hook/On-hook
1	Up	Yeastar301	OK	--	On Hook
2	Up	Yeastar302	OK	--	On Hook
3	Up	Yeastar303	OK	--	On Hook
4	Up	Yeastar304	OK	--	On Hook
5	Up	Yeastar305	OK	--	On Hook

Figure 58. FXS Port Status

To view port status:

1 From the Yeastar TA2400 web interface, select **Status**.

2 Select **Port Status**.
Parameters that can be viewed and a description of the possible statuses are described in *Table 46 on page 187*.

Table 46. Port Status Parameters

Port	Provides the port number for the associated station.
Up/Down	Displays **Up** if the FXS module is working. Otherwise, displays **Down**.
Name	Provides the name of the station.
Status	Shows the state of the port Possible statuses are: • **OK**. Registration is successful, and the port is ready for use. • **Unreachable**. The FXS module cannot determine the status of the port. • **Request Sent**. A request for registering the port has been transmitted to the FXS module. • **Waiting for authentication**. The FXS module is verifying that the correct password and user name have been entered. • **Failed**. The port registration has failed.

Table 46. Port Status Parameters (Continued)
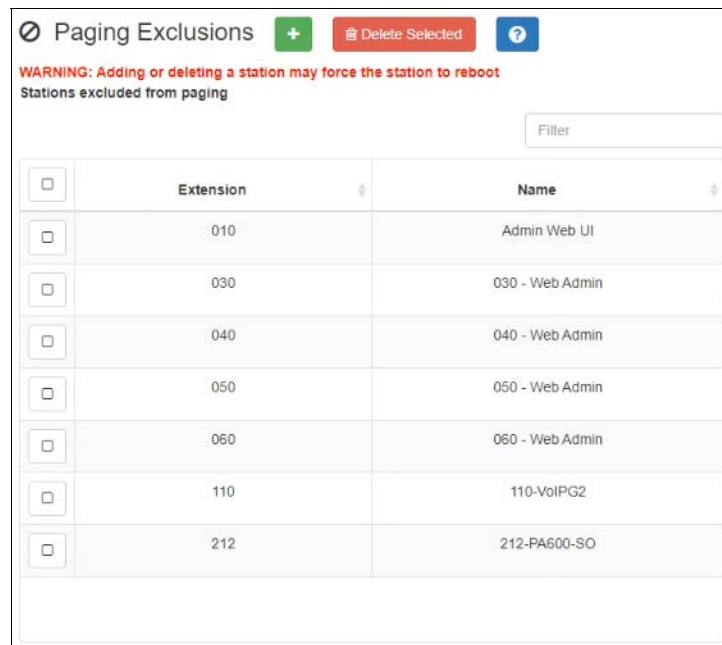
Voice Mail (New/Old)	This field is not used.
Off hook/On hook	**On Hook** appears if the FXS port is idle. **Off Hook** appears if the FXS port is busy.

Excluding Stations from Paging

Stations can be excluded from paging except for Emergency All Call pages. Emergency All Call pages will be sent and heard at the station even if that station is set to exclude paging.

Stations excluded from paging are also excluded from receiving audio distribution, even if the station's **Multicast Audio Distribution** parameter is enabled, the station is a member of a zone being used for Audio Distribution, or both.

If you exclude a station from paging and the station is included in a **Time** or **Paging+Time** zone, the station does not receive tones either.

Figure 59. Paging Exclusions Page

To add a station to the Page Exclusions list (i.e., exclude it from paging):

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1 Select **Paging Exclusions** from the navigation bar.

    a) Alternatively, select **Dashboard** from the navigation bar and select **Page Exclusion** in the **Calling/Paging** area.

2 Select the **Add** (+) button to display the **Add Paging Exclusions** popup.

3 Optionally, filter the displayed list of stations by extension or name.

4 Select one or more stations.

    • Click **Toggle All** to select (or deselect) the entire list of stations.

5 Select the **Add Exclusions** button to add the selected stations to the Page Exclusions list.
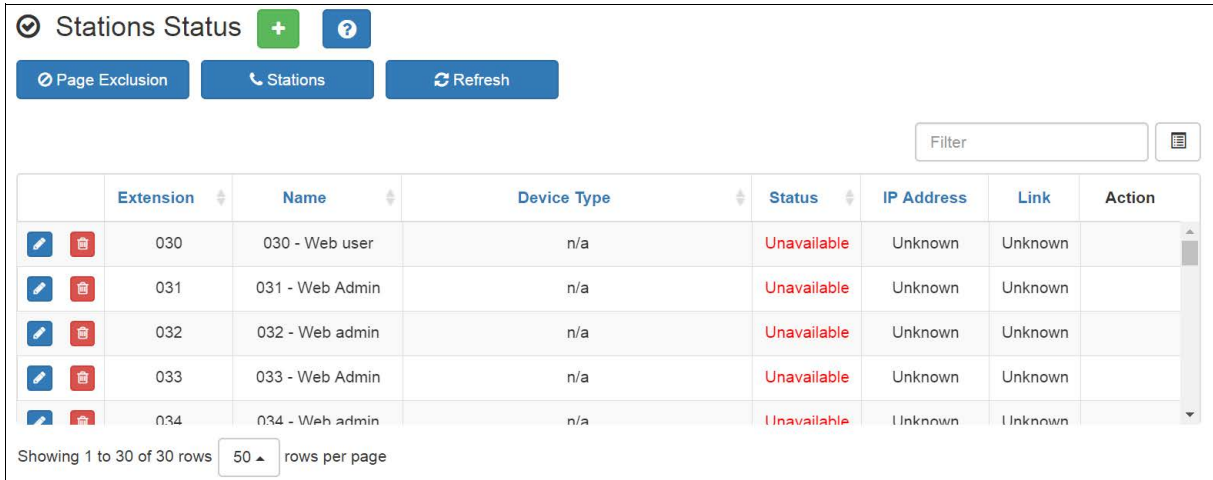
Warning	**Adding or deleting a station from the page exclusions list may force the station to reboot.**

To remove a station from the Page Exclusions list:

1 Select **Paging Exclusions** from the navigation bar.

    • Alternatively, select **Dashboard** from the navigation bar and select **Page Exclusion** in the **Calling/Paging** area.

2 Select one or more extensions to be deleted from the exclusion list.

    • Optionally, toggle the checkbox in the header row above the selection checkboxes to select (or deselect) the entire list of stations.

3 When all selections are ready, click **Delete Selected** to remove the selected extensions from the list.

Viewing Station Status

The Station Status feature allows you to quickly assess the status of all stations.

Figure 60. Station Status Page

To view station status:

1   On the navigation bar, select **Stations**.

2   Select **Stations Status**.

The following information appears for all stations:

Table 47. Station Status Page Parameters
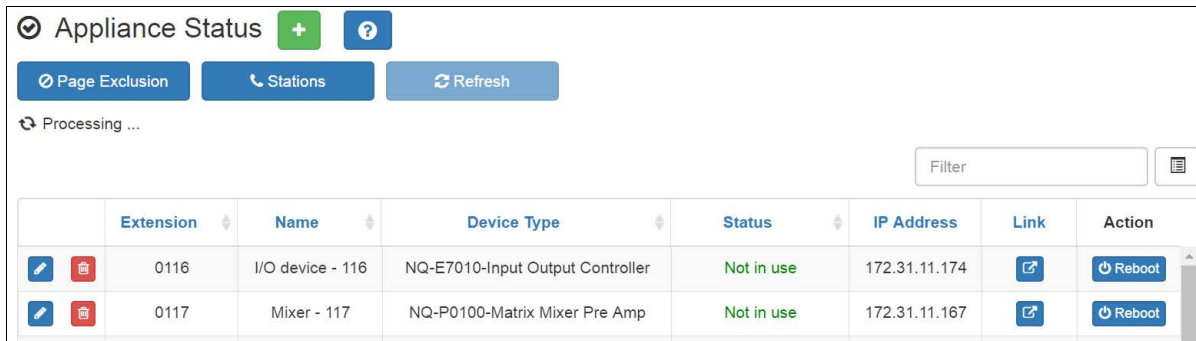
Extension	Specifies the unique multi-digit extension number for this station. Valid values range from 001 to 899 for three-digit dialing. The system can be configured to use three, four, five, or six digit dialing.
Name	Specifies the name for the station. Names can be up to 16-characters in length.
Device Type	Specifies the Device Type, such as NQ-P0100 Matrix Mixer Pre Amp.

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Table 47. Station Status Page Parameters (Continued)

Status   Shows the current state of the station. Possible statuses are:

- **Not in use**. This status indicates that the station is registered with the Nyquist system server and is not on a call.

- **In use**. This status indicates that the station is off hook and either placing a call or in a call, such as an intercom call, page, or using a Nyquist feature.

- **Ring+Inuse**. Indicates that the station is off hook, on a call, and ringing (at least one incoming call is ringing the station).

- **Ringing**. Indicates that the station is on hook and ringing (at least one incoming call is ringing the station).

- **Unavailable**. Indicates that the station is not registered with the Nyquist system server and is unavailable. A station in this status is unable to receive calls and most likely cannot place calls.

IP Address   Provides the IP address of the station.

Link   If the device can be configured or managed via an appliance web UI, this provides a login window for the device. After you enter your **Username** and **Password**, the web UI for the device appears.

Action   Provides a **Reboot** button for Nyquist devices that have an IP address. Selecting this button reboots the device.

Viewing Appliance Status

The Appliance Status feature allows you to quickly view the status of appliances such as I/O controllers and Matrix Mixer Pre-Amps without having to set a filter or manually search for each appliance.

Figure 61. Appliance Status Page

To view appliance status:

1 On the navigation bar, select **Stations**.

2 Select **Appliance Status**.

The following information appears for each appliance recognized by the Nyquist system server:

Table 48. Appliance Status Page Parameters

Extension	Specifies the unique multi-digit extension number for this station. Valid values range from 001 to 899 for three-digit dialing. The system can be configured to use three, four, five, or six digit dialing.
Name	Specifies the name for the station. Names can be up to 16-characters in length.
Device Type	Identifies the type of appliance such as NQ-E7010-Input Output Controller.

Table 48. Appliance Status Page Parameters (Continued)

Status	Shows the current state of the appliance. Possible statuses are:
	• **Not in use**. This status indicates that the station is registered with the Nyquist system server and is not on a call.
	• **In use**. This status indicates that the station is off hook and either placing a call or in a call, such as an intercom call, page, or using a Nyquist feature.
	• **Unavailable**. Indicates that the station is not registered with the Nyquist system server and is unavailable.
	• **Unknown**. The server is unable to determine the state of the device.
IP Address	Provides the IP address of the appliance.
Link	If the device can be configured or managed via an appliance web UI, this provides a login window for the device. After you enter your **Username** and **Password**, the web UI for the device appears.
Action	Provides a **Reboot** button for Nyquist devices that have an IP address. Selecting this button reboots the device.

You can return to the Stations page by selecting **Stations**.

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Viewing Zone Information

From the Zones page you can select to add, edit, or delete zones and view parameters for all existing zones.

Figure 62. Zones Page

To view existing zones:

1   On the navigation bar, expand **Zones and Queues**.

2   Select **Zones**.
Zone information is described in *Table 49*.
Details about each zone can be viewed in either table format or in a card view by zone format.

3   To change the format used for the view, select the **Filter** icon.

Table 49. Zone Page Parameters

Icon	Displays a visual icon that represents the zone or zone type. For example, the **Cutlery** icon can be used for a zone that contains the cafeteria, while a **Briefcase** icon can be used for a zone that contains executive offices.
Number	Displays a number associated with the zone. This number can have up to five digits.
Name	Identifies the zone by the user-created name. The name can be alphanumeric (such as Bldg 1) and contain up to 30 characters.

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Table 49. Zone Page Parameters (Continued)

Type	Identifies the zone as being able to receive paging, time, audio, or a combination of paging, time, or audio.
Preannounce Tone	Identifies what, if any, tone should play before a paging announcement.
Cut Level (dB)	Sets the device volume cut level to be used when devices included in the zone receive pages, time scheduled tones, manually activated tones, and announcements. The cut level can range from -42 to 0.
Audio Distribution Cut Level (dB)	Sets the volume cut level to be used when devices in the zone receive audio distribution and scheduled audio (see "*Using Audio Distribution" on page 360*). The cut level can range from -42 to 0.
Stations	Displays the extensions included in the zone when **Show** is selected.
Description	Provides a description of the zone when **Show** is selected.
Multicast IP Address	Identifies the IP address for multicast calls to the zone.
Multicast Port Number	Identifies the port number for multicast calls to the zone.

Adding a Zone

To perform this procedure, you must have permission to add zones.

Note: The maximum number of zones that a Nyquist appliance can be enrolled in is 24; Admin Phones can be enrolled in a maximum of seven zones. An error displays if you attempt to add a Nyquist station to a zone and it is already enrolled in the maximum number of zones.

The number of zones that your Nyquist system can have depends on your license. (See "*Paging Zone License Expansion Package (NQ-C4000PZX)" on page 500*.)

When you create a zone, you select whether the zone will allow manual paging (Paging zone), scheduled tones (Time zone), audio distribution (Audio zone), or any combination of manual paging, scheduled tones, and audio distribution.

Table 50. Audio Activities by Zone Type

Zone Type	Type of Audio	Audio Activities
Paging	Caller speaking (optionally after a pre-announcement audio clip)	One-way calls that allow the caller to speak an announcement to all stations (i.e., speakers) of Paging-type zones.
Time	Tones	Scheduled events, routines, I/O contact closures, and manually initiated tones play to stations of Time-type zones. *Note:* These are known as "Time" zones because most Tones are played by scheduled events.
Audio	Audio distribution (usually music)	Scheduled events, routines, I/O contact closures, and manually initiated audio distributions play to stations of Audio-type zones.

If you want tones to play during active pages, you must create separate Paging and Time zones, and the Time zones must be created first. Creating Time zones first sets the priority of Time zones over Paging zones.

Note that a given station can be in multiple zones.

Figure 63. Add Zone Page

To add a zone:

1 On the navigation bar, expand **Zones and Queues**.

2 Select **Zones**.

3 Select the **Add** icon.

4 Complete all parameters for the zone. Parameters are described in*Table 51*.

5 Select **Save**.

Table 51. Add Zone Page Parameters

Icon

Use the drop-down menu to select a visual icon that represents the zone or zone type. For example, the **Cutlery** icon can be used for a zone that contains the cafeteria, while an **Eraser** icon can be used for a zone that contains only classrooms.

Number

Enter a number associated with the zone. A zone number can contain a maximum of five digits.

Name

Enter a name for the zone. The name can be alphanumeric (such as Bldg 1) and contain up to 30 characters.

Cut Level (dB)

Set the device volume cut level to be used when devices included in the zone receive pages, time scheduled tones, manually activated tones, and announcements. The cut level can range from -42 to 0.

Audio Distribution Cut Level (dB)

Set the volume cut level to be used when devices in the zone receive audio distributions and scheduled audio (see *"Using Audio Distribution" on page 360*). The cut level can range from -42 to 0.

Type

Identifies the zone as being able to receive paging, tones, audio, or a combination of paging, tones, and audio. Options are:

• Paging

• Time

• Audio

• Paging+Time

• Paging+Audio

• Paging+Time+Audio

• Audio+Time

Note: If you want tones to play during active pages, you must create separate paging and time zones and the time zones must be created first. Creating time zones first sets the priority of time zones over page zones. Stations can be in multiple zones, and you can create a paging zone (or a Paging+Audio zone) and a time zone (or Audio+Time zone) that contain the same stations.

Table 51. Add Zone Page Parameters (Continued)

Stations	Add extensions for the stations to be included in the zone.
	Note: An analog phone station cannot be added to a zone.
Preannounce Tone	Use the drop-down menu to select what, if any, tone should play before a paging announcement.
Multicast IP Address	Enter the IP address for multicast calls to the zone.
Multicast Port Number	(Optional) Enter the port number for multicast calls to the zone
	Note: This field is required if a Multicast IP Address is entered. The port number must be an even number. Port numbers are assigned in increments of four. If a zone was created with the Multicast Port Number of 6004, the next available Multicast Port Number would be 6008. Not using multicast when a zone has many stations can cause performance issues.
Description	Provide a description of the zone.

Editing Zone Configuration

The Edit Zone page allows you to change zone parameters, including adding or deleting stations from the zone. You must be logged in with a role that has permission to edit a zone before completing this procedure.

Note: You cannot edit a zone number for a zone that is linked to a routine.

To edit a zone:

1 On the navigation bar, expand **Zones and Queues**.

2 Select **Zones**.

3 Select the **Edit** icon for the zone.

4 Complete all parameters for the zone.
Parameters are described in *Table 51, "Add Zone Page Parameters," on page 198*.

5 Select **Save**.

Deleting a Zone

You can delete a zone that is no longer being used.

> *Note:* You cannot delete a zone that is linked to a routine.

To delete a zone:

1 On the navigation bar, expand **Zones and Queues**.

2 Select **Zones**.

3 Select the **Delete** icon for the zone.

4 When the confirmation page appears, select **Delete**.

Viewing Queues

> **Warning** Changes to queues – including adding a queue, modifying an existing queue, or deleting a queue – will result in the deletion of all recorded pages that have not yet played. Changes should only be done after business hours or during a small maintenance window that does not exceed 5 minutes.

If you have the appropriate license, you can use the Page Queuing feature. To determine the maximum queues allowed by your system, view your **Maximum Page Stacking Queues** on the Product License page (see "*Product License Activation Key" on page 32*).

With the Page Queuing feature, you can record an unlimited number of pages or messages for queuing (stacking) for a specified zone or zones. A zone can only be added to a single queue, but a queue may have multiple zones associated with it. Zones must be created before a queue can be created.

Page Queuing is designed to eliminate feedback that can occur if a page is made in an area where a microphone and speaker are in close proximity. With page queuing, the page does not start until you (or the user recording the page) has indicated that the recording is completed.

Page Queuing also prevents page overlapping since pages sent to a queue play one at a time.

The Page Queuing feature differs from the Schedule Announcement (see "*Using the Schedule Announcement Feature" on page 247*) and Record Announcement (see "*Monitoring/Recording" on page 493*) features. The Schedule Announcement feature allows you to

specify a date and time when the announcement is to be played, and the DTMF Code *990 allows a user to use the admin phone to record an announcement that is played immediately after it is recorded.

> *Note:* When you record an announcement by dialing *990 or by selecting **Record Announcement** on the Admin phone's **Announce** menu, the initial DTMF Code for the recorded and saved announcement will be set to the Announcement's row ID. You can change the DTMF Code after the announcement is saved by editing the announcement in the web interface **Announcements** view.
>
> The saved announcement has **Play to Zone** set to blank (no zone selected). This means that when you play an announcement via an IP phone **Announcement** menu selection, you will be asked to enter a zone number (where 0 = All Speakers). You can define a permanent zone number for the saved announcement by updating **Play to Zone** after the recorded announcement has been saved.

Using the DTMF Codes *991 or *991* {Zone Number} or selecting **Record Page** from the Admin Phone or the Admin web UI allows you to initiate a queued page.

When the DTMF Code #{Zone Number} is used to initiate a zone page, Nyquist will start a queued page if the zone belongs to a queue. If you want to start a real-time page to the zone instead, dial #{Zone Number}*.

With the Page Queuing feature, the recorded page is placed in a zone's queue. The pages in the zone's queue are played in the order that they are placed in the queue.

A live page started on a zone that is playing a recorded page will cause the recorded page to be terminated and sent back to the queue. The interrupted message will play again, from the beginning of the message, when the zone becomes idle. Multi-Site Emergency-All-Call, Multi-Site All-Call, Emergency All-Call, All-Call, Alarm, Tone, and Emergency Announcement will also interrupt any playing recorded zone messages. All re-queued interrupted messages will play again, from the beginning of the message, when the zones becomes idle.

Selecting **Disable Audio** will cause all recorded messages to stop. The messages will resume play from the beginning when audio is re-enabled.

For information about recording pages, see "*Record Page" on page 341*.

Figure 64. Queues

To view existing queues:

1   On the navigation bar, expand **Zones and Queues**.

2   Select **Queues**.
    Table 52 describes the Queue information:

Table 52. Queues Page Parameters
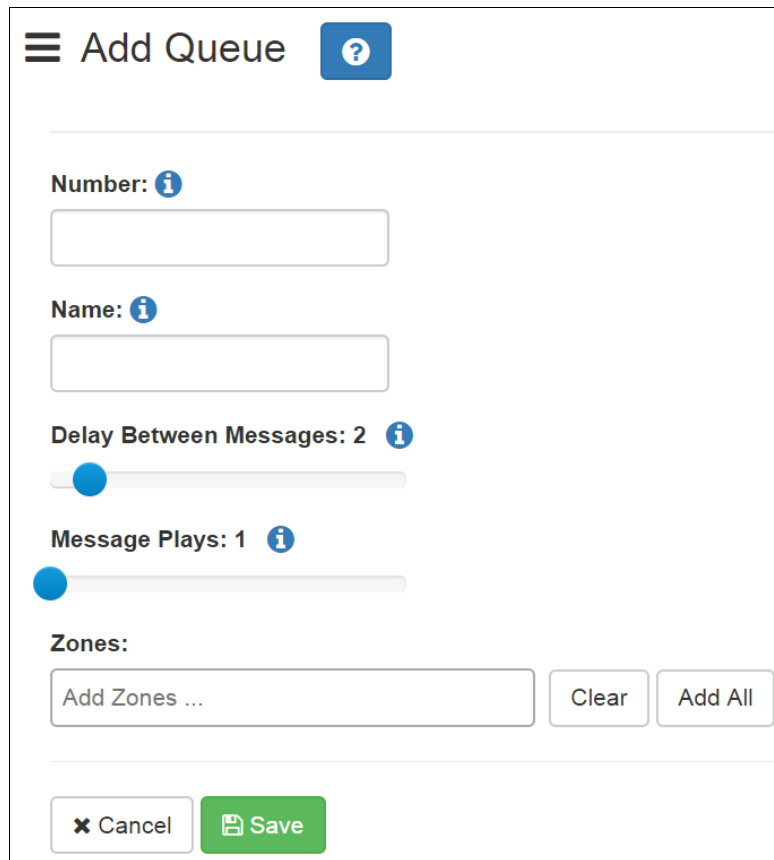
Number	Number that the user assigns to the queue.
Name	Name that the user assigns to the queue.
Delay Between Messages	Number of seconds to pause between pages. The delay can range between 1 and 10 seconds. The default is 2 seconds.
Message Plays	How many times each page in the queue will play. The number can range between 1 and 3. The default is 1, which means that the message plays only one time.
Zones	Select **Show** when viewing a queue to see the list of zones assigned to the queue. When adding a queue, only zones not already assigned to a queue and that are **Paging**, **Paging+Time**, **Paging+Audio**, and **Paging+Time+Audio** type appear in the drop-down menu.
	Note: A zone can only be associated to a single queue.

Adding a Queue

Depending upon your license, you can create multiple queues for stacking pages, and a queue may have one or more zones. However, a zone can only be associated with a single queue.

> **Warning**   Changes to queues – including adding a queue, modifying an existing queue, or deleting a queue – will result in the deletion of all recorded pages that have not yet played. Changes should only be done after business hours or during a small maintenance window that does not exceed 5 minutes.

Figure 65. Add Queue

To create a queue:

1   On the navigation bar, expand **Zones and Queues**.

2   Select **Queues**.

3 Select the **Add** icon.

4 Complete the Add Queue parameters. (See "*Queues Page Parameters" on page 202*.)

5 Select **Save**.

◦

Editing a Queue

You can edit a queue to change any of its parameters.

Warning	Changes to queues – including adding a queue, modifying an existing queue, or deleting a queue – will result in the deletion of all recorded pages that have not yet played. Changes should only be done after business hours or during a small maintenance window that does not exceed 5 minutes.

To edit a queue:

1 On the navigation bar, expand **Zones and Queues**.

2 Select **Queues**.

3 Select the **Edit** icon next to the queue that you want to modify.

4 Make desired changes to the queue parameters. (See *Table 52, "Queues Page Parameters," on page 202*.)

5 Select **Save**.

Deleting a Queue

You can delete a queue that is no longer needed.

Warning	Changes to queues – including adding a queue, modifying an existing queue, or deleting a queue – will result in the deletion of all recorded pages that have not yet played. Changes should only be done after business hours or during a small maintenance window that does not exceed 5 minutes.

To delete a queue:

1 On the navigation bar, expand **Zones and Queues**.

2 Select **Queues**.

3 Select the **Delete** icon next to the queue that you want to delete.

4 When prompted, select **Delete**.

Managing Amplifiers

You can assign stations to an audio power amplifier or a public address/mixer amplifier provided the amplifier has an available port. The station must be assigned manually but the amplifier itself can be automatically discovered by your Nyquist system.

Viewing Amplifiers

Through the Amplifier Devices page, you can view information about all audio power amplifiers and public address/mixer amplifiers configured for your Nyquist system, select to add, edit, or delete these devices, select to manage stations for an amplifier, and select to configure Push To Talk parameters for an amplifier.

Figure 66. Amplifier Devices

To view amplifiers attached to your network:

On the navigation bar, select **Amplifier Devices**.

Table 53 describes the parameters for each amplifier:

Table 53. Amplifier Devices Page

Name	Provides a name for the amplifier.
Device Type	Provides the type of device, such as NQ-A2120-Amplifier.
Manage	Provides a link to the **Station Management** and, if applicable, **Configure PTT** tools for the amplifier.

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Table 53. Amplifier Devices Page (Continued)
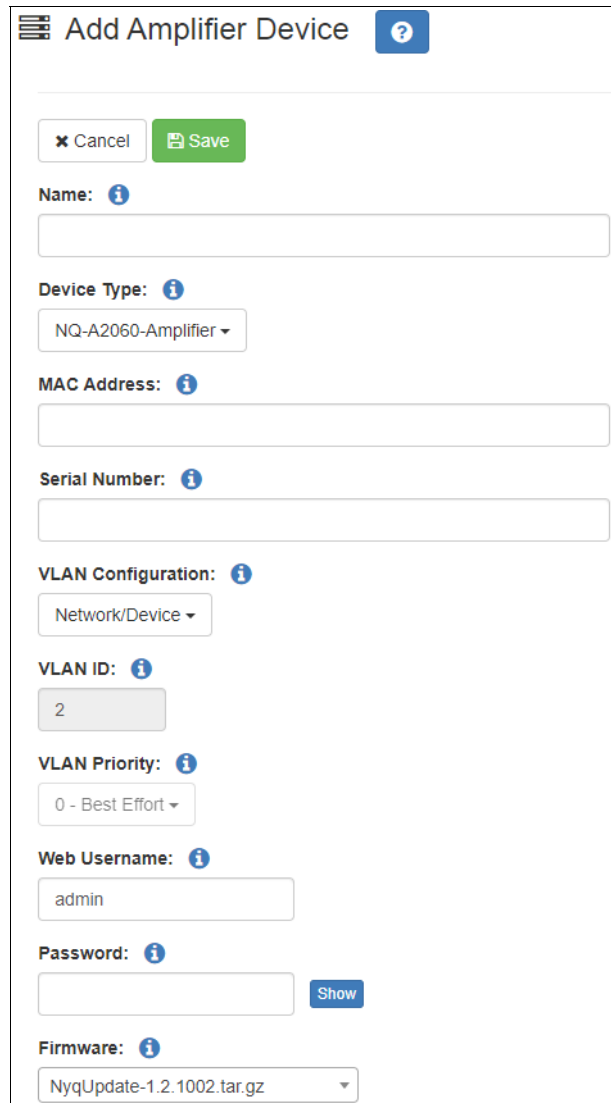
Action	Provides a **Reboot** button to select the if amplifier needs to be rebooted.
MAC Address	Provides the MAC address for the amplifier.
Serial Number	Provides the serial number of the amplifier.
IP Address	Provides the IP address of the amplifier.
Link	Provides link to the amplifier's UI.
Status	Provides the status of the amplifier. Possible statuses include: • **Unknown**. The server is unable to determine the state of • the device. • **Unreachable**. The server is unable to ping the device. • **Registering**. More than one IP address has been found. Stations may still be registering with new IP addresses. • **Up: # of # stations**. Indicates the number of registered available stations attached to the amplifier. If the numbers do not match, then one or more stations attached to the amplifier is not available for service. The station or stations may be in the process of registering, or if the condition persists, there may be a configuration error.
Description	Select **Show** to view the user-provided description of the device.
VLAN Configuration	Provides how the VLAN configuration is set. Options are: • Server • Network/Device • Disabled
VLAN ID	Provides the VLAN for the amplifier. The LAN ID parameters range from 2 through 4094 and pertain to the amplifier's network interface (not to the ports or stations). *Note:* This field can only be changed when the **Server** option is used for **VLAN Configuration**.
VLAN Priority	Provides the priority for the port. Values range from 0 through 7. *Note:* This field can only be changed when the **Server** option is used for **VLAN Configuration**.
Web Username	Provides the username for logging into the amplifier's web UI.

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Table 53. Amplifier Devices Page (Continued)

Web Password	Provides the password for logging into the amplifier's web UI. Select **Show** to reveal a previously set password.
Firmware	Provides information about firmware that is loaded onto the amplifier.
Number of Stations	Provides the number of stations associated to the device. This number limits the number of associated stations that can be added to the amplifier. The number is usually provided by the amplifier during device discovery so changing the number is not necessary. Do not change this number unless you are manually adding the amplifier (not using device discovery) or have been instructed to change it.
Channels	Displays the channels configured on the amplifier via the switch.

Adding an Amplifier

From the Add Amplifier Device page, you can add a new audio power amplifier to your Nyquist system.

Figure 67. Add Amplifier

To add an amplifier:

1 On the navigation bar, select **Amplifier Devices**.

2 On the Amplifier Devices page, select the **Add** icon.

3 Complete the parameters on the Add Amplifier Device page. (See *Table 54.*)

4 Select **Save**.

After you save the information, the Station Management page appears so that you can add stations and select the settings to be applied to these new stations (see *"Using Station Management for Amplifiers" on page 211*).

Table 54. Add Amplifier Parameters

Name	Enter a name for the amplifier.
Device Type	Select the type of device. Options are: • NQ-A2060-Amplifier • NQ-A2120-Amplifier • NQ-A2300-Amplifier • NQ-A4060-Amplifier • NQ-A4120-Amplifier • NQ-A4300-Amplifier • NQ-PA120 Public Address Mixer Amplifier • NQ-PA240 Public Address Mixer Amplifier • NQ-PA600 Public Address Mixer Amplifier
MAC Address	Enter the IP address for the amplifier.
Serial Number	Enter the serial number of the amplifier.
VLAN Configuration	Select how the VLAN configuration is set. Options are: • Server • Network/Device • Disabled
VLAN ID	Select the VLAN for the amplifier. The LAN ID parameters range from 2 through 4094 and pertain to the amplifier's network interface (not to the ports or stations). *Note:* This field can only be changed when the **Server** option is used for **VLAN Configuration**.
VLAN Priority	Select the priority for the port. Values range from 0 through 7. *Note:* This field can only be changed when the **Server** option is used for **VLAN Configuration**.
Web Username	When applicable, provides a username for logging into the web interface of the device hosting the station.

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Table 54. Add Amplifier Parameters (Continued)

Password	Provide a password for logging into the amplifier's web UI. Select Show to reveal a previously set password.
Firmware	Provides information about firmware that is loaded onto the amplifier.
Number of Stations	Show how many stations are associated to the device based on the number of ports.
Channels	Select the number of channels configured on the amplifier via the switch position.
Description	Provide a description of the device.

Editing an Amplifier

The Edit Amplifier Device page allows you to change parameters for an amplifier. You can also select the **Station Management** button to associate stations to the amplifier.

To edit an amplifier:

1   On the navigation bar, select **Amplifier Devices**.

2   On the Amplifier Devices page, select the **Edit** icon.

3   Complete the parameters on the Edit Amplifier Device page. The are the same parameters found on the Add Amplifier page. (See *Table 54, "Add Amplifier Parameters," on page 209*.)

4   Select **Save**.

Configuring Push to Talk for a Public Address/ Mixer Amplifier

As with the Matrix Mixer Pre-Amp, configuring a Public Address Mixer Amplifier for Push To Talk is a two-step process. The first step is done through the Admin Web UI and pertains to enabling a **Push To Talk Channel** and selecting a **Push To Talk Type**.

The second step is done through the appliance's web UI and involves enabling the Line Out for the selected channel.

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For the first step, see "*Configuring Device for Push To Talk" on page 161*.

For the second step, refer to the appropriate appliance configuration manual.

If you select **Analog** for **PTT Stream Source for Mixer Output** on the server side, you must disable Line-Out and Speaker-Out for channel 4 (**A4-LO** and **A4-SO**) on the appliance's DSP **Router** to prevent hearing PTT on both the speaker and line-out.
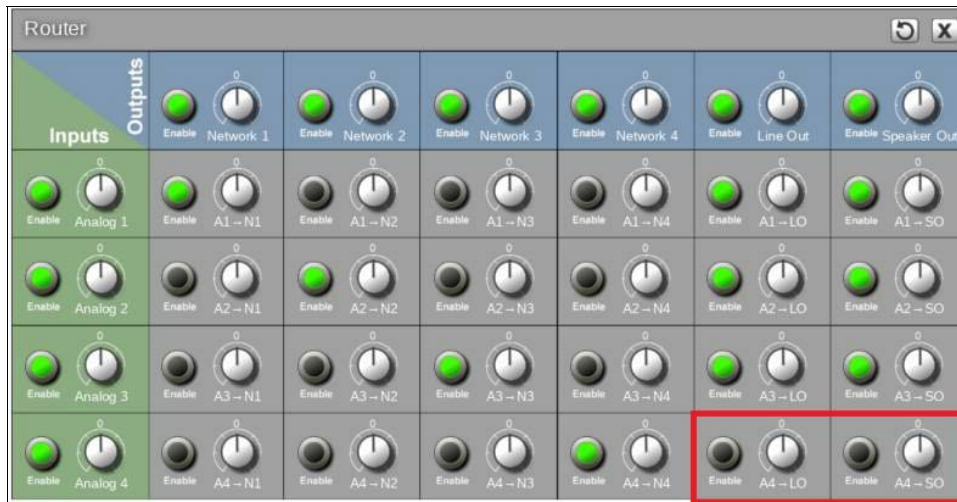
Figure 68. Router Settings on Appliance UI

When Line-Out and Speaker-Out are disabled on the router, the **PTT Output** set on the Edit Push To Talk Configuration page works (see "*Configuring Device for Push To Talk" on page 161*).

Using Station Management for Amplifiers

Depending on the **Device Type**, the Station Management screen for an amplifier can show either Ports, listed as **Port A** to **Port D**, or **Speaker Out** and **Line Out**.

The number of ports that appear for an amplifier in the Station Management page depends on the number of ports allowed by the device type. For example, the A2120

Audio Power Amplifier will have only two ports appear on the Station Management page while the four-channel A4120 Audio Power Amplifier, will have four ports.

Figure 69. Station Management for Two-Channel Amplifier

If you select Station Management for a Public Address/Mixer Amplifier (NQ-PA120, NQ-PA240, or NQ-PA600), the Speaker Out and Line Out appear.

To use Station Management for amplifiers:

1 On the navigation bar, select **Amplifier Devices**.

2 Select **Station Management** for the desired amplifier.

> *Note:* The Station Management page for amplifiers automatically appears when you create a new amplifier. See "*Adding an Amplifier" on page 208*.

3 If you want to delete a port:

a) Select the **Delete** icon next to the port.

b) When prompted, select **Delete**.

4 If you want to edit a station, select the **Edit** icon next to the port and follow the steps for editing a station (see "*Editing Station Configuration Settings" on page 142*).

5 Select **Done**.

Deleting an Amplifier Device

You can delete an amplifier device through the Amplifier Devices page.

To delete an amplifier:

1 On the navigation bar, select **Amplifier Devices**.

2   On the Amplifier Devices page, select the **Delete** icon next to the amplifier that you want to delete.

When prompted, select **Delete**.

3

Managing Roles and Users

Nyquist uses roles to control system configuration, access, and use. When you create a user, you assign a role that determines what the user sees from the dashboard and what tasks the user can perform.

Nyquist provides four default roles. These roles can be edited or deleted by anyone assigned permissions to do so. Of the default roles, only the Admin role has the ability to add users and to add, edit, and delete roles.

Table 55. Default Roles

Admin	Has access to the entire system and can perform all tasks.
OpTech	Can operate the system and view, but not change, system configurations.
Operator	Can operate the system, but cannot view or change system configurations.
User	Can only operate specific parts of the system.

Viewing Roles

The default roles of Admin and OpTech can view existing roles. If you are assigned one of these roles or a user created role that allows it, you can assign View Roles permissions to other roles.

Figure 70. Roles Page

To view roles:

On the navigation bar, select **Roles**.

The Roles page appears. *Table 56* describes the parameters that appear on this page.

Table 56. Roles Page Parameters

Permissions	When the icon is selected, displays the Edit Admin Permissions page where the permissions assigned to this role can be viewed or changed.
Name	Displays the nomenclature created for the role. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Label	Displays the role name that is used when creating a user. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Description	When the **Show** button is selected, displays a brief description of the role. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
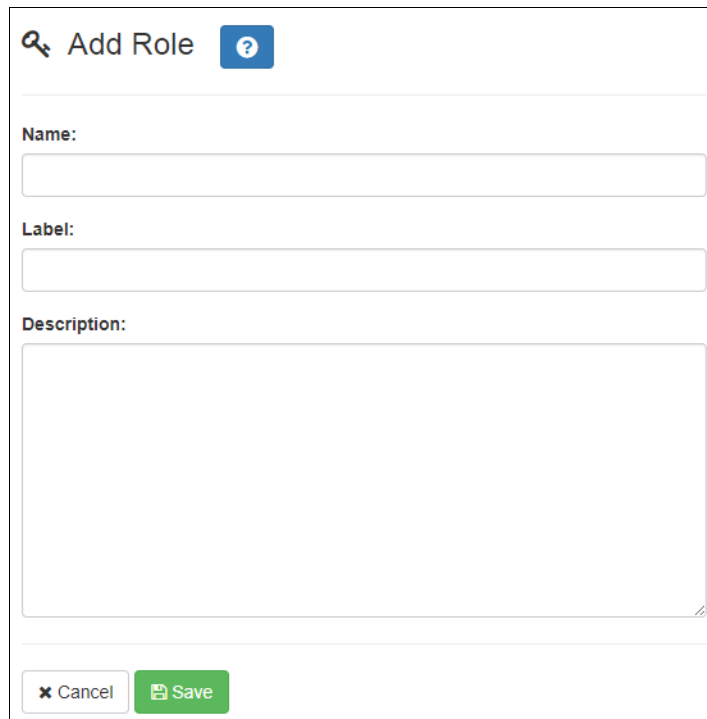
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Adding a Role

If none of the default roles have the exact permissions that you want for a role, you can edit the permissions for a default role or create a new role. For example, only the Admin default role has the ability to create a new station and to add a new user. You could edit the permissions for an existing role or create a new role specifically for use when adding stations or users. (For information about adding stations, see "*Adding a Station" on page 173*.)

Figure 71. Add Role Page

Note: To perform this task, you must be logged in with a role that has permission to add other roles.

To add a role:

1 On the navigation bar, select **Roles**.

2 On the Roles page, select the **Add** icon.

3 On the Add Role page, add the name, label, and description for this role. (See *Table 56, "Roles Page Parameters," on page 214*.)

4 Select **Save**.

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5 On the Roles page, select the **Permissions** icon for the role just added.

6 Set permissions for this role. (See "*Assigning and Editing Permissions" on page 216*.)

7 Select **Save**.

Editing a Role

You may want to change the names, labels, and descriptions assigned to a role for clarity purposes. For example, you could rename the default role "User" to "Agent." In some cases, you may want to change the permissions assigned to an existing role. In both of these scenarios, you would edit a role.

> *Note:* To perform this task, you must be logged in with a role that has permission to edit other roles.

To edit a role:

1 On the navigation bar, select **Roles**.

2 On the Roles page, select the **Edit** icon next to the role that you want to edit.

3 On the Edit Role page, make any desired changes to the Name, Label, and Description fields. (See *Table 56, "Roles Page Parameters," on page 214*.)

4 Select **Save**.

5 On the Roles page, select the **Permissions** icon.

6 On the Edit Permissions page, make desired changes.

7 Select **Save**.

Assigning and Editing Permissions

Selecting the **Permissions** icon for a role displays the Edit Permissions page, which allows you to set parameters such as the ability to edit or view Schedule Settings. Permission parameters differ depending upon the option. For example, permissions for the Dashboard and for most Dashboard features are limited to View while available permissions for Schedule Announcements include Create, Delete, Edit, and View.
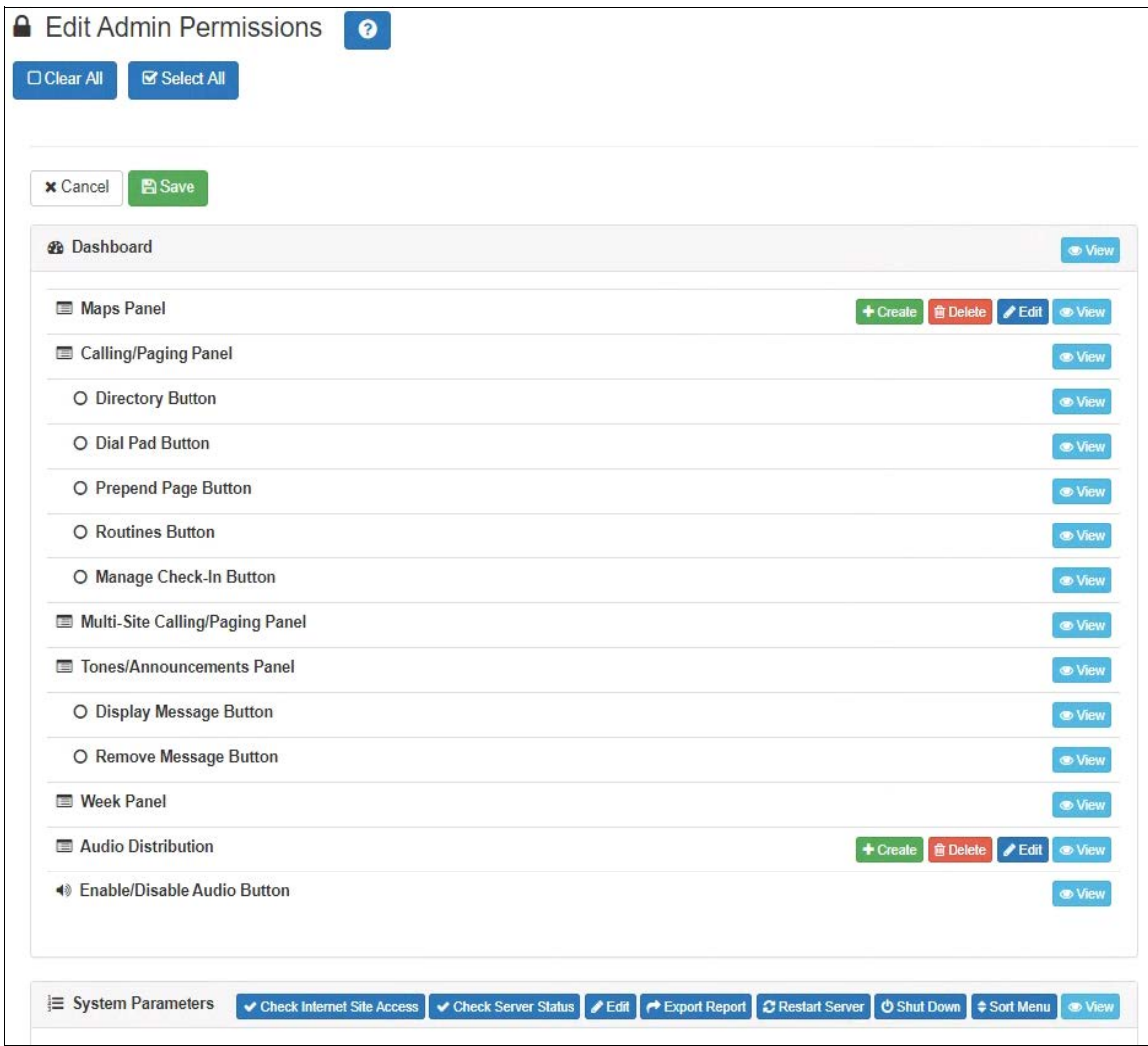
Figure 72. Edit Permissions Page

Table 57. Color Coding for Permission Buttons

	Create a new item, such as a new user.
	Delete an item.
	Edit an item.
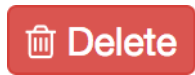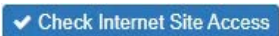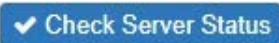
217

Table 57. Color Coding for Permission Buttons (Continued)

👁 **View**	View an item.
🔧 **Manage**	Manage items. This option pertains only to playlists.
⇄ **Import/Export**	Import or export a system backup file.
⚙ **Settings**	Set parameters for system backup jobs.
⬛ **Restore**	Restore a system backup.
⬍ **Sort Menu**	Change the order of the navigation bar menu.
⚙ **System Update**	Import a system update.
✔ **Check Internet Site Access**	Verify Nyquist server can access URLs required to run properly. For details, see "*Check Internet Site Access*" *on page 49*.
✔ **Check Server Status**	Checks the status of network devices and configurations. For details, see "*Check Server Status*" *on page 50*.
↗ **Export Report**	Exports an Excel spreadsheet with configuration information. For details, see "*Exporting a Report*" *on page 29*.
⟳ **Restart Server**	Restarts the Nyquist server. For details, see "*Restarting the Server*" *on page 36*.
⏻ **Shut Down**	Shuts down the Nyquist server. For details, see "*Shutting Down the Server*" *on page 49*.

> *Note:* To perform this task, you must be logged in with a role that has permission to assign or edit permissions.

To assign or edit permissions:

1   On the navigation bar, select **Roles**.

2 On the Roles page, select the **Permissions** icon next to the role for which you are assigning or editing permissions.

3 On the Edit Permissions page, select the appropriate buttons to assign permissions to the role.

4 Select **Save**.

Deleting a Role

If a role is not being used by your organization or the Nyquist system, you can delete the role, provided that role is not associated with a user.
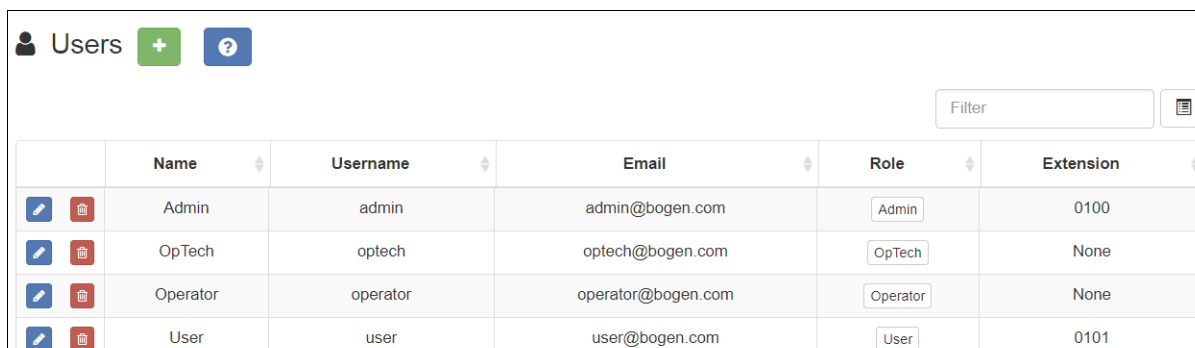
> *Note:* A warning appears if you attempt to delete a role that is associated with a user.

To delete a role:

1 On the navigation bar, select **Roles**.

2 On the Roles page, select the **Delete** icon next to the role that you want to delete.

3 When prompted, select **Delete**.

Viewing Users

Users are personnel who are authorized to use Nyquist. When you create a user, you assign the user a role that determines what the user sees from the Dashboard and what tasks the user can perform on the Nyquist system. You can only create a user if you have been assigned the default Admin role or a new role that provides permissions to create a user.

Figure 73. Users Page

To view users:

 On the navigation bar, select **Users**.
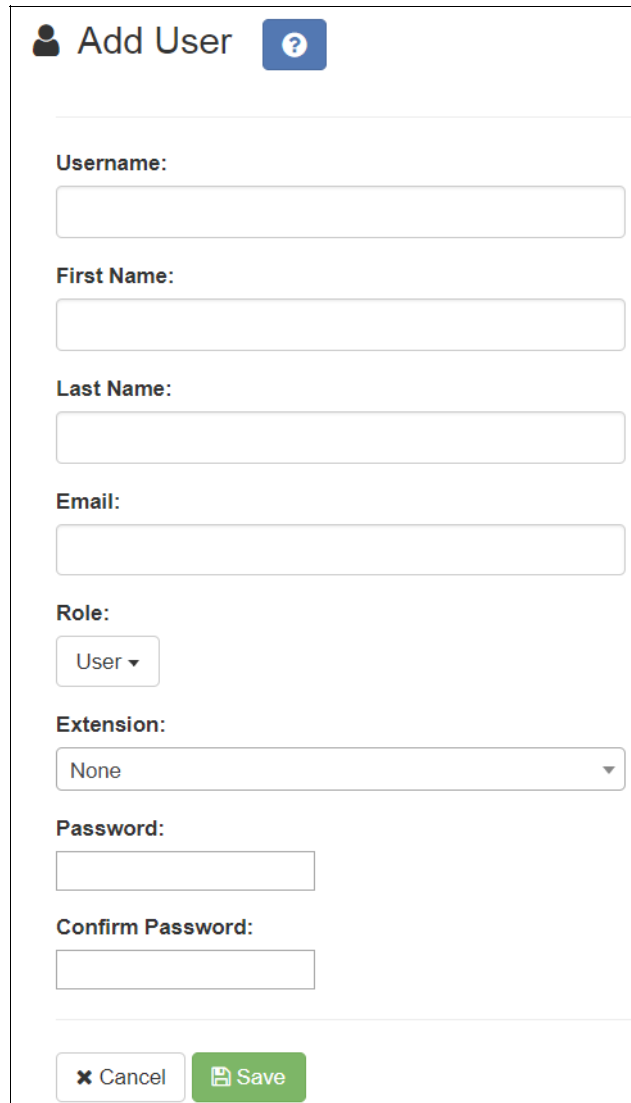
The following table describes the information displayed for each user.

Table 58. User Page Parameters

Name	Displays the name of the user.
Username	Displays the username used by this user to log onto the system.
Email	Displays the email address for the user.
Role	Displays the role assigned to the user.
Extension	Displays the extension used by the user.

Adding a User

When you add a user, you assign a role, which provides a set of permissions for the user. (See *"Viewing Roles" on page 214*.)

Figure 74. Add User Page

Note: You must have permissions to create a user before performing this procedure. (See *"Assigning and Editing Permissions" on page 216*.)

To add a user:

1 On the navigation bar, select **Users**.

2 On the Users page, select the **Add** icon.

3 Complete the parameters on the Add User page.

4 Select **Save**.

Understanding User Information

The following information parameters appear when adding or editing user information.

Table 59. Add or Edit User Page Parameters

Username	Provide the username used by this user to log onto the system. *Note:* The username field is case sensitive.
First Name	Provide the first name of the user.
Last Name	Provide the last name of the user.
Email	Provide the email address of the user.
Role	Select the user's role from the drop-down menu.
Extension	Select the station extension for the user from the drop-down menu.
Change Password	Enter the new password. *Note:* The password field is case sensitive.
Confirm Password Change	Re-enter the new password.

Deleting a User

You should delete a user when they are no longer authorized to use the Nyquist system. For example, if a receptionist accepts a position at another site, the receptionist's user account should be deleted from your Nyquist system.

To delete a user:

1 On the navigation bar, select **Users**.

2 On the Users page, select the **Delete** icon next to the user that you want to delete.

3 When prompted, select **Delete**.

Editing User Information

If you have Admin permissions, you can change a user's information, including email address, password, and role.

To edit a user's information:

1 On the navigation bar, select **Users**.

2 On the Users page, select the **Edit** icon next to the user whose information you want to change.

3 On the Edit User page, make the desired changes. (See *Table 59, "Add or Edit User Page Parameters," on page 222*.)

4 Select **Save**.

Using Admin Groups

You can place Admin Stations into Admin Groups, which are used if incoming calls are not answered by the assigned Admin Station or the Day or Night Admin associated with the Admin Station. Admin Groups act as an always-answer feature by providing an alternate list of Admin Stations. If an incoming call is not answered by the assigned Admin Station within 30 seconds for normal calls or 15 seconds for emergency calls, all Admin Stations in the Admin Group will ring.

If Call Forwarding is enabled at the Admin Station, Nyquist tries the forwarded extension. If that station does not answer or is busy, the call timeout is reduced to 15 seconds. After 15 seconds, the call rolls over to the Admin Group.

In addition, if an emergency level call receives no answer, the Admin Group will ring if the Day Admin or Night Admin does not answer.

You can assign Admin Stations to multiple Admin Groups. A Day or Night Admin can also be assigned to one or more Admin Groups.

Viewing Admin Groups

Through the Admin Groups page, you can view, add, edit, or delete Admin Groups.
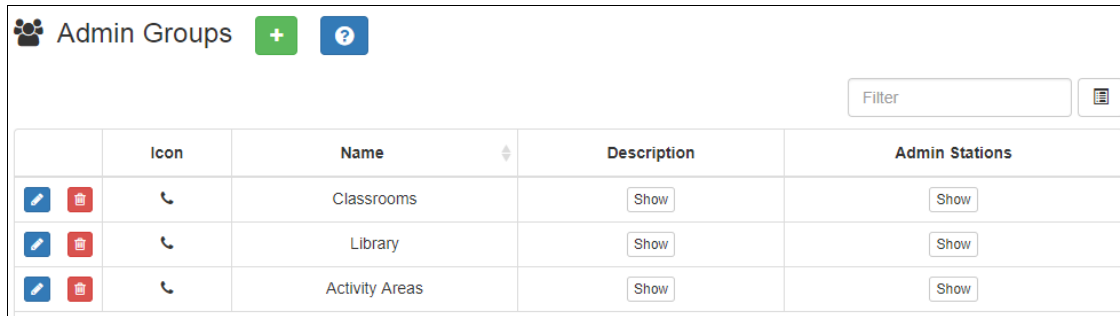

Figure 75. Admin Groups Page

To view Admin Groups:

 On the navigation bar, select **Admin Groups**.

The following table describes the information that appears on the Admin Groups page:

Table 60. Admin Groups Page Parameters

Icon	Displays the icon that is associated with the Admin Group.
Name	Identifies the name of the Admin Group.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Description	Provides a description of the Admin Group when the **Show** icon is selected.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Admin Stations	Provides a list of the Admin Stations in the group when the **Show** icon is selected.

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Editing an Admin Group

You can use the Edit Admin Group page to change the name, icon, and description of an Admin Group. You can also use this page to add or delete Admin Stations from the Admin Group.

Figure 76. Edit Admin Group Page

You can also add an Admin Station to an Admin Group when adding or editing a station. (See "*Adding a Station" on page 173* and "*Editing Station Configuration Settings" on page 142*.)

> *Note:* Nyquist does not display the Admin Group parameter when adding or editing an I/O Controller or Matrix Mixer Pre-Amp as a station.

To edit an Admin Group:

1   Select the **Edit** icon next to the group that you want to edit.

2   On the Edit Admin Group page, make desired changes.

3   After all changes have been made, select **Save**.

Table 61. Edit Admin Group Page Parameters

Name	Type the name of the Admin Group.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Icon	Use the drop-down menu to select the icon that you want associated with the Admin Group.
Admin Stations	Provide a list of the Admin Stations you want to have in this group. You can select **Add All** to select all Admin Stations, or you can select the Admin Stations list to view all available Admin Stations and select the ones you want to include in this group.
Description	Provide a description of the Admin Group.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

Deleting an Admin Group

You cannot delete an Admin Group if it is associated with a station, an outside line, or a Day or Night Admin. If necessary, first edit a station, an outside line, or a Day or Night Admin to delete the before attempting to delete the Admin Group. (See "*Editing Outside Lines" on page 112*, "*Setting System Parameters" on page 54*, or "*Editing Station Configuration Settings" on page 142*.)

To delete an Admin Group:

1 Select the **Delete** icon next to the group that you want to delete.

2 When prompted, select **Delete**.

Adding an Admin Group

You can create an Admin Group and assign Admin Stations to it. No limit exists for the number of Admin Groups that you can create, and an Admin Station can belong to multiple Admin Groups.

If you want to route 911 calls from an extension (station) to an Emergency Group, create an Admin Group called Emergency. Then, configure the station to use this group for its **911 Route**. (See "*Editing Station Configuration Settings" on page 142*.)

To add an Admin Group:

1   On the navigation bar, select **Admin Groups**.

2   On the Admin Groups page, select the **Add** icon.

3   Enter the parameters on the Add Admin Groups page.

4   Select **Save**.

Table 62. Add Admin Groups Page Parameters

Name	Enter the name of the Admin Group.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Icon	Select an icon associated with an Admin Group. Associating an icon to an Admin Group offers a visual key to the type of group.
Admin Stations	Provide a list of Admin Stations that are to be included in this Admin Group. Only Admin Station types, such as a Web Admin UI or an Admin Phone, can be selected.
Description	Provide a description of the Admin Group.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

Managing Schedules

The Schedules feature allows you to set tones and announcements to be played at specific times and in specific zones, set up holiday schedules, maintain calendar features, and schedule announcements, including recurring announcements.

Through the web-based UI, you can associate events (such as a tone that signals the end of visiting hours) to a schedule, select how a schedule appears on your dashboard, and edit event settings that include:

• Event name

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- Signal time
- Zone
- Tone
- Scheduled Audio

Understanding Sites Page

Through the Sites page, you can select start and end dates for a schedule or choose to create a non-ending schedule, select a name for the site, and select a color that appears for the site schedule on the dashboard.
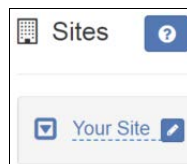

Figure 77. Sites Page

You can then create one or more schedules and select the appropriate schedule for specific days of the week.

Figure 78. Creating a Schedule

To create a schedule:

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1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 If you want, rename Your Site by selecting the **Edit** icon next to the site name, and then typing the new name in the Edit Site Name popup.

Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

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4 Select the arrow next to the site name and then select the appropriate settings for this site. (See *Table 63, "Settings Page Parameters," on page 229*.)

Using Site Settings

The Sites page provides parameters that can be added, viewed, and changed for a schedule. The following table describes these parameters:

<div align="center">

Table 63. Settings Page Parameters

</div>

Day of the Week	Under Assign Schedules, select the schedule that is to be used for that day from the drop-down menu.
Start/End Dates	Use the slider to set to **On** if you want to enter start and end dates. If set to **Off**, the schedule continues indefinitely.
Start Date	*Note:* This option appears only if **Start/End Dates** is set to **On**. Under Site Year, use the calendar to select the start date for this schedule. By default, today's date appears. When selecting a new **Start Date**, the date cannot be before the **End Date**.
End Date	*Note:* This option appears only if **Start/End Dates** is set to **On**. Under Site Year, use the calendar to select the end date for this schedule. By default, today's date appears. The **End Date** must be after the **Start Date**.
Calendar Color	Use the drop-down menu to select the color for this schedule that is used when the schedule appears on the dashboard's calendar view.

From the Sites page, you can also view, add, edit, or delete a schedule for a facility or view events for a schedule.

Renaming a Site

You can rename a site to quickly identify the facility or site that the schedule is for.
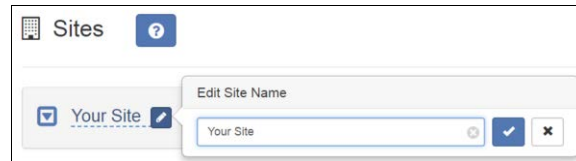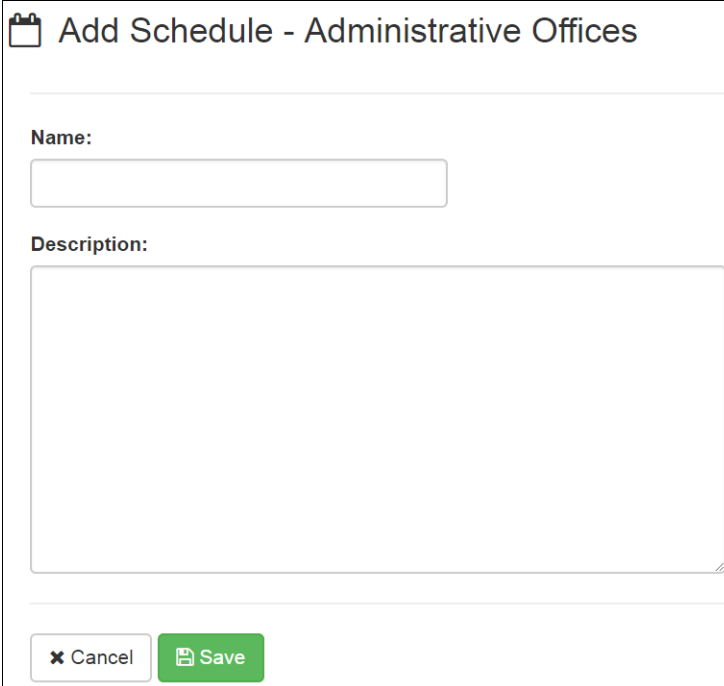

Figure 79. Edit Site Name

To rename a site:

1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 Select the **Edit** icon next to the site name.

4 In the Edit Site Name popup box, type the new name.

Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

5 When done, select the **Check** icon.

Adding a Schedule

You can add multiple schedules for a site. For example, you may have different schedules set up for Tuesday and Thursday than you have for the rest of the week.

Figure 80. Add Schedule Page

To add a schedule:

1   On the navigation bar, expand **Schedules**.

2   Select **Sites**.

3   Select the down arrow next to the site name.

4   Select the **Add** icon next to **Manage Schedules**.

5   On the Add Schedule page, enter the **Name** and **Description** for the schedule.

Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

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6   Select **Save**.

Replacing a Schedule

If you attempt to delete a schedule that is in use, you are provided a chance to replace the schedule with another. If you select to delete rather than replace, then all matching default schedules and calendar exceptions are set to **None**. (See "*Deleting a Schedule" on page 240*.)

To replace a schedule:

1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 Select the down arrow next to the site name.

4 Select the **Delete** icon for the schedule.

5 When prompted, select **Replace**.

6 When prompted, use the drop-down menu to select the replacement schedule.

7 Select **Confirm Replace**.

Reviewing and Editing a Schedule

Through the Sites page, you can select the start and end dates for the schedules, a name for the site, and a color that appears for the site schedule on the dashboard. You can then create one or more schedules and select the appropriate schedule for specific days of the week.

Any changes made to the Sites page affect the schedule going forward. For example, if you change the schedule for Tuesday and Thursday from Regular Day to Early Day, all Tuesdays and Thursdays until the End Date will use the Early Day schedule. If you want to change the schedule for days in a specific week, then you use the Calendars feature to create an exception. (See "*Using the Calendars Feature" on page 240*.)

To review and edit a schedule:

1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 Select the down arrow next to the site name.

4 Make desired changes to the Sites settings. (See "*Using Site Settings" on page 229*.)

Viewing Events for a Schedule

An event is the scheduled sounding of a tone or the playing of Scheduled Audio. You add events to a schedule. For example, you can schedule a tone to sound at 8 am as an event such as the start of a shift. You can add a second event that has the tone sound at 10 am for a scheduled break.

Figure 81. Events Page

To review events for a schedule:

1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 Select the down arrow next to the site name.
Schedules that are associated with the site appear on the Edit Settings page.

4 To view the events for a schedule, select the **Edit** icon for a schedule.

The Events page appears. *Table 64* describes the parameters for this page:

Table 64. Events Page Parameters

Name	Specifies the name for the event.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Signal Time	Specifies the time for this event to start using the HH:MM:SS format.

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Table 64. Events Page Parameters

Zone   Specifies the zones to be included in this event.

Note: If you want tones to play during active pages, you must create separate page and time zones and the time zones must be created first. Creating time zones first sets the priority of time zones over page zones. Stations can be in multiple zones. See "*Adding a Zone" on page 195*.

Note: You can select **Add All** to have all zones appear in the zone field, and then remove a zone by selecting the **X** for a zone. You can also delete zones by placing your cursor in the Zones field and pressing the **Delete** key.

Tone   Select the desired tone for this event.

Scheduled Audio   Specifies if the event includes Scheduled Audio, and if so, what playlist, Matrix Mixer Pre-Amp channel, or amplifier is used for this event. If an Airable/SOUNDMACHINE source is selected, the Scheduled Audio list includes selections to start or stop the audio stream.

Display Event Name   Specifies if the event name will appear on the GA10PV displays associated to the event zone or zones.

If you schedule an event with **Display Event Name** enabled, the event remains on the display connected to the NQ-GA10PV until the next scheduled event replaces it. To clear the event name from the display, create another scheduled event with the **Name** set to **No-Event**.

Routines   Specifies the routine(s) that will start when the event starts.

Editing Name and Description for a Schedule

You may want to edit a schedule's name and description to make it more descriptive. For example, if you originally created a schedule called Wednesday for an early release day, you may want to rename it Early Release.
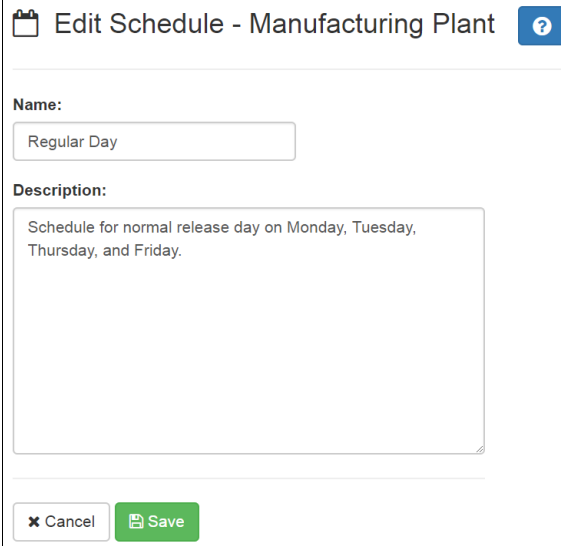

Figure 82. Edit Schedule Page
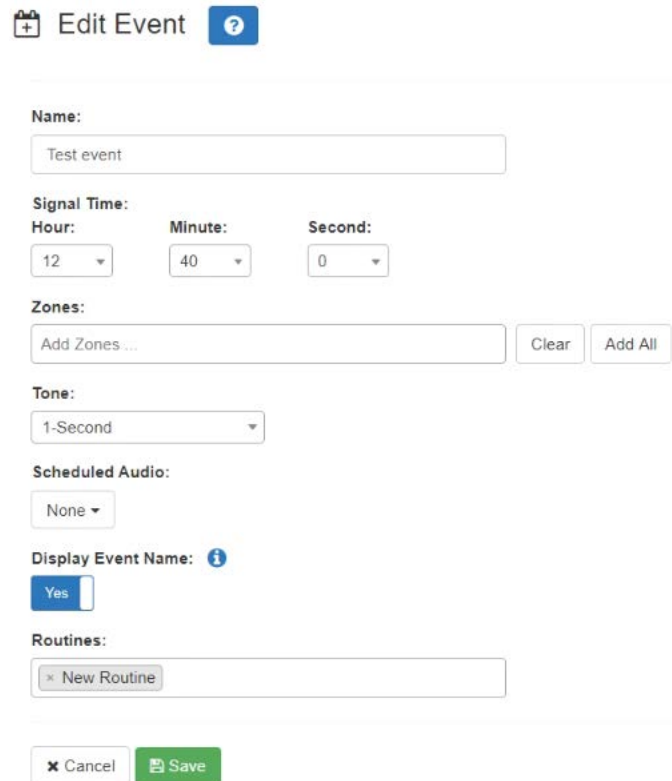
To edit a schedule's name and description:

1   On the navigation bar, expand **Schedules**.

2   Select **Sites**.

3   Select the down arrow next to the site's name.

4   Under Manage Schedules, select the **Edit** icon for the schedule.

5   On the Events page, select the **Edit** icon for the schedule.

6   On the Edit Schedule page, make the desired changes to the **Name** and **Description** fields.

Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

---

7   Select **Save**.

Editing an Event

The Edit Event page allows you to change the parameters for events. For example, you may want to change the playlist for Scheduled Audio for the lunch period. Or, you might want to add or remove zones affected by an event.

Figure 83. Edit Event Page

To edit an event:

1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 Select the down arrow next to the site name.

4 Select the **Edit** icon for the schedule.

5 On the Events page for the schedule, select the **Edit** icon for the event that you want to edit.

6 On the Edit Event page, make the desired changes. (See *Table 65, "Event Settings Page Parameters," on page 238*.)

7 Select **Save**.

Deleting an Event

You can delete an event from a schedule when the event is no longer needed or wanted. For example, suppose your site's schedule was set up to have warning bells that ring five minutes before a shift starts. If you decide to end the use of warning bells, you would delete each warning bell event from the schedule.

To delete an event:

1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 Select the down arrow next to the site name.

4 Select the **Edit** icon for the schedule.
Events that are associated with the schedule appear on the Events page.

5 Select the **Delete** icon for the event that you want to delete from the schedule.

6 When prompted, select **Delete**.

Adding an Event

When a schedule is created, it has no events, which are specific times when tones play. After you create a schedule, you add events through the Add Event page.

To add an event to a schedule:

1 On the navigation bar, expand **Schedules**.

2 Select **Sites**.

3 Select the down arrow next to the site name.

4 Select the **Edit** icon for the schedule you want to add an event to.

5 Select the **Add** icon.

6 Complete the parameters on the Add Event page. (See *Table 65*.)

7 When completed, select **Save**, or if you want to add another event to this schedule, select **Save and Create Another** and return to Step 6.

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Understanding Event Settings

Event settings appear when adding or editing an event.

Table 65. Event Settings Page Parameters

Name	Specifies the name for the event.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Signal Time	Specifies the time for this event to start using the HH:MM:SS format. If you want the event to start at 08:15:15, you would use the down arrows to make the appropriate selections in the **Hour**, **Minute**, and **Second** fields.
Zone	Specifies the zones to be included in this event.
	Note: You can select **Add All** to have all zones appear in the zone field, and then remove a zone by selecting the **X** for a zone. You can also delete zones by placing your cursor in the Zones field and pressing the **Delete** key.
Tone	Select the desired tone for this event. If an audio distribution entry from the **Scheduled Audio** menu is selected, this field is not required.
Scheduled Audio	Specifies if the event includes Scheduled Audio, and if so, what playlist, Matrix Mixer Pre-Amp channel, or amplifier is used for this event. You can also select to stop the Scheduled Audio by selecting **Stop Playlist** or **Stop Line-Input**.
	If an Airable/SOUNDMACHINE source is selected, the Scheduled Audio list includes selections to start or stop the audio stream. This list only includes Airable/SOUNDMACHINE selections that apply to the specific time zone. If the Audio Distribution zone selected includes a time zone and another zone type, such as Paging, that is not for time, the audio distribution does not appear in this **Scheduled Audio** list.

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Table 65. Event Settings Page Parameters (Continued)

Display Event Name	Specifies if the event name will appear on the GA10PV displays associated to the event zone or zones.
	Note: If you schedule an event with **Display Event Name** enabled, the event remains on the display connected to the NQ-GA10PV until the next scheduled event replaces it. To clear the event name from the display, create another scheduled event with the **Name** set to **No-Event**.
Amplifiers/Matrix Mixers	Specifies the amplifiers or Matrix Mixer Pre-Amp and its associated station number. This parameter appears only if **Scheduled Audio** is set to **Start Line-Input**.
Input Channel	Specifies the matrix channel being used for input. This parameter appears only if **Scheduled Audio** is set to **Start Line-Input**.
Routines	Specifies one or more **Routines** to be executed when this event starts.
	Note: If a specified routine is disabled, it will not execute, but will not be removed from the trigger.

An event with **Stop Playlist**, **Stop Line-Input**, or **Stop <Airable/SOUNDMACHINE source>** should be created for each Scheduled Audio start command to ensure the Scheduled Audio stops when you want. If an associated **Stop** event is not in the schedule, Scheduled Audio started by a scheduled event will not stop playing.

If you want to start Scheduled Audio without also playing a tone, set **Tone** to **No Tone**.

You can use the scheduling feature to schedule audio distribution using Scheduled Audio; when using Scheduled Audio in a scheduled event to schedule audio distribution, set **Tone** to **No Tone**. Zone numbers are not required.

If several overlapping scheduled events use Scheduled Audio and have overlapping zones defined, a scheduled Scheduled Audio event will not start the audio if an existing Scheduled Audio event is already playing to a zone defined in the scheduled event. Error messages will be displayed on the dashboard whenever overlapping zones prevent Scheduled Audio from starting. Ensure that scheduled events with Scheduled Audio do not use the same zones during the same time frames.

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Deleting a Schedule

If you have the correct permissions, you can delete a schedule that is no longer being used. When you delete a schedule, you delete all associated schedules, ed events, and schedule exceptions.

To delete a schedule:

1   On the navigation bar, expand **Schedules**.

2   Select **Sites**.

3   Select the **Delete** icon next to the schedule that you want to delete.

4   When prompted, select **Delete**.

Using the Calendars Feature

Nyquist provides a calendar view of the schedule used for past days, the schedule for the current and future days, and the scheduled holidays. The view is for the current month, but you can use the **<Prev>** and **<Next>** buttons to display other months.

Figure 84. Calendars Page

The Calendars feature also provides a quick way to change the schedule. For example, if you normally use an Early Release schedule for Wednesdays but want to use this schedule for Monday through Friday for the last week of the year, you can use the Calendars feature to create exceptions for your schedule.

To view or change a monthly calendar:

1   On the navigation bar, expand **Schedules**.

2   Under Schedules, select **Calendars**.

3   Select the **Facility** whose calendar you wish to view.

Note: If the **Remote Calendar Control** setting for the selected Facility does not allow access to your Nyquist server, an error will be displayed and your Facility selection will be rejected.

4   Select either **Top View** or the tab that displays your site's name.

5   To change the schedule for the current or future dates, make sure you are the tab for your site and use the drop-down menu for the date or dates to select the replacement schedule.

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6 To view events scheduled for a date, make sure you are on the **Top View** tab and select the date. Events for the schedule are detailed in the Schedule page that appears.

7 When done viewing events, select **Close**.

Schedule Page Parameters

The Schedule page appears when viewing events for a date from either the monthly view (see "*Using the Calendars Feature" on page 240)* or from the dashboard's This Week's Schedules section (see "*Viewing the Schedule for the Week" on page 360*).

Figure 85. Schedule Page

The Schedule page displays the name, the day, and the date of the schedule. It also contains the following parameters:

Table 66. Schedule Page Parameters

Time	Identifies the time of the event start in HH:MM:SS format.
Name	Identifies the user provided name for the event.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Zones	Identifies the zones and types of zones that are specified for this event.

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Table 66. Schedule Page Parameters (Continued)

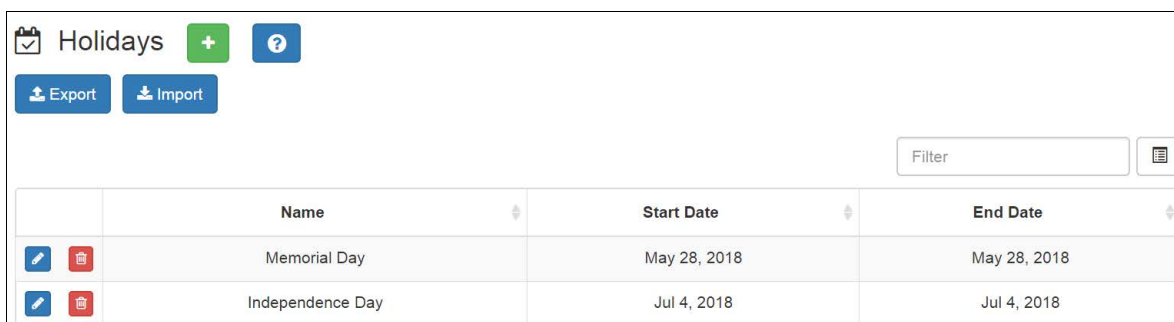|	
Tone	Identifies the name of the tone used for this event.
Scheduled Audio	Identifies a playlist, Matrix Mixer Pre-Amp channel, amplifier, or Airable/SOUNDMACHINE source to use if the Scheduled Audio feature is used for this event. Otherwise, the option appears as **None**.

Using the Holidays Management Tool

Holidays, which can be a single day or a range of dates, often require changes in schedule assignments. The holidays management tool allows you to enter ranges of days when all schedules are turned off and to add these holidays to the calendar via the Schedules feature. You can also export a holiday schedule as a .csv file and import the holiday schedule file to another Nyquist server.

Holidays override other schedules that are set for a date range.

Viewing Holidays

Holidays affect the schedule of each facility managed by your Nyquist server. The Holidays page displays a list of all holidays that have been set up for the Nyquist system. Holidays take precedent over regular schedules. For example, suppose you configure Mondays to use a schedule called Regular that has tones sounding throughout the day to mark the ending and beginning of shift changes. If you set a holiday for Monday, May 28, then the holiday "overrules" the Regular schedule and tones do not sound during that day.

Figure 86. Holidays Page

To view holidays:

1   On the navigation bar, expand **Schedules**.

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2 Select **Holidays**.

A listing of holidays and the parameters associated with these holidays appears.

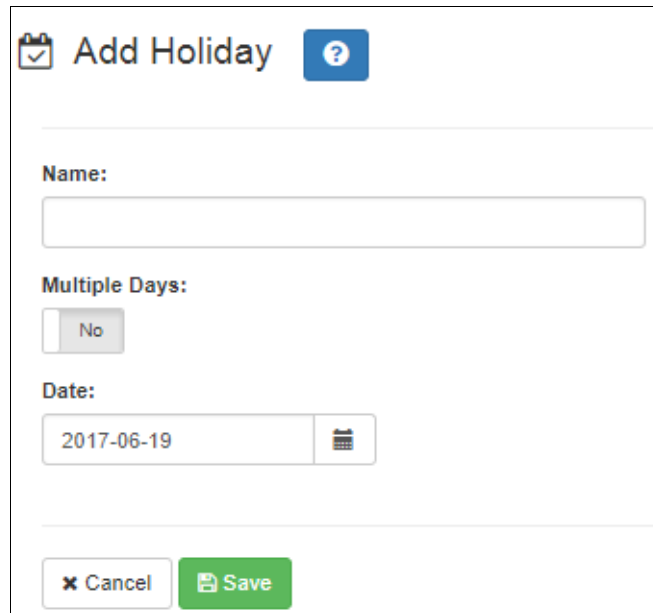The following table describes these parameters:

Table 67. Holiday Parameters

Name	Provides the name of the holiday.
Multiple Days	*Note:* Appears only when adding or editing a holiday.
	Indicates if the holiday includes multiple days (such as spring break). If No is selected, then the **Start Date** appears as **Date** and **End Date** does not appear.
Start Date	Provides the start date of the holiday.
	Note: For holidays that do not involve multiple days, this field appears as **Date**.
End Date	Provides the end date of the holiday.
	Note: For holidays that do not involve multiple days, this field does not appear.

The Holidays page also contains **Export** and **Import** buttons that allows you to easily capture holiday settings and import them to other System Controllers.

Adding a Holiday

You can create a holiday for any day that the schedule should be turned off, including state and federal holidays. Holidays automatically appear on the dashboard and on the Calendar views.

Figure 87. Add Holiday Page

To add a holiday:

1   On the navigation bar, expand **Schedules**.

2   Select **Holidays**.

3   On the Holidays page, select the **Add** icon.

4   Enter the parameters for the holiday. (See *Table 67, "Holiday Parameters," on page 244*.)

5   Select **Save**.

Deleting a Holiday

You may need to delete a holiday in cases such as when a manager's workday is rescheduled to a regular day to make up for an earlier site closure due to inclement weather.

To delete a holiday:

1   On the navigation bar, expand **Schedules**.

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2   Select **Holidays**.

3   On the Holidays page, select the **Delete** icon next to the holiday that you want to delete.

4   When prompted, select **Delete**.

Editing a Holiday

You can edit a holiday if you need to change the name or start or end dates for the holiday.

To edit a holiday:

1   On the navigation bar, expand **Schedules**.

2   Select **Holidays**.

3   On the Holidays page, select the **Edit** icon next to the holiday that you want to edit.

4   On the Edit Holiday page, make the desired changes. Parameters for the holiday are described in *Table 67, "Holiday Parameters," on page 244*.

5   After all changes have been made, select **Save**.

Exporting Holidays

To aid in configuring multiple Nyquist servers or System Controllers that share the same holiday schedule, Nyquist allows you to export the holiday schedule to a .csv file.

To export the holiday schedule:

1   On the navigation bar, expand **Schedules**.

2   Select **Holidays**.

3   Select **Export**.
       The holidays.csv file will be sent to your Downloads folder.

Importing Holidays

If you have exported a holiday schedule created at one Nyquist server System Controller, you can import that schedule to another Nyquist server or System Controller.

You can also create a custom holiday .csv file using the following conventions:

•   Create four columns with each column separated by commas.

•   Insert a line return at the end of each row.

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- Set the first column 0 because it will be replaced by an autogenerated value when the file is imported into the database.

- For first, second, and third columns, enclose the entries in double quotes (").

- In the second column, provide the holiday name.

- Enter the start date in the third column using the format YYYY-MM-DD.

- Enter the end date in the fourth column using the format YYYY-MM-DD. For a one day holiday, the start and end dates will be the same.

To import a holiday schedule:

1 On the navigation bar, expand **Schedules**.

2 Select **Holidays**.

3 Select **Import**.

4 Select **Choose file** and navigate to select the .csv file that you want to import.

5 If you want to delete all existing holidays before importing the file, use the slider to select **Yes**.

6 Select **Import**.

Using the Schedule Announcement Feature

After an announcement has been created via the Audio feature, you can schedule it to play via the Schedules feature. For information about the Audio feature, refer to "*Managing Audio*" *on page 253.*
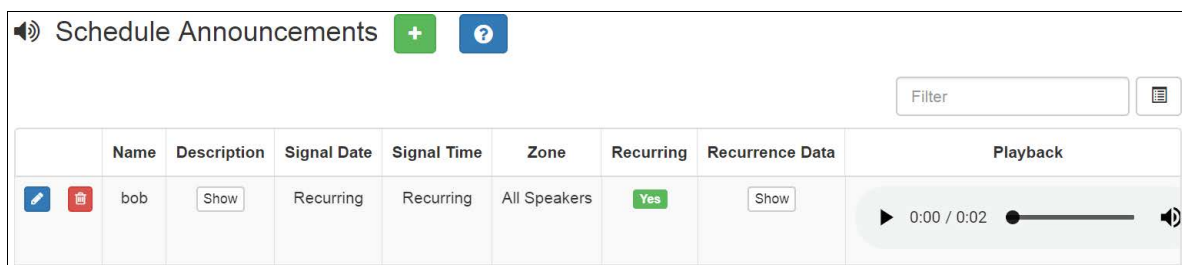

Figure 88. Schedule Announcements Page

To view schedule announcements:

1 On the navigation bar, expand **Schedules**.

2 Select **Schedule Announcements**.

The Schedule Announcements page appears. This page displays the following information about all scheduled announcements:
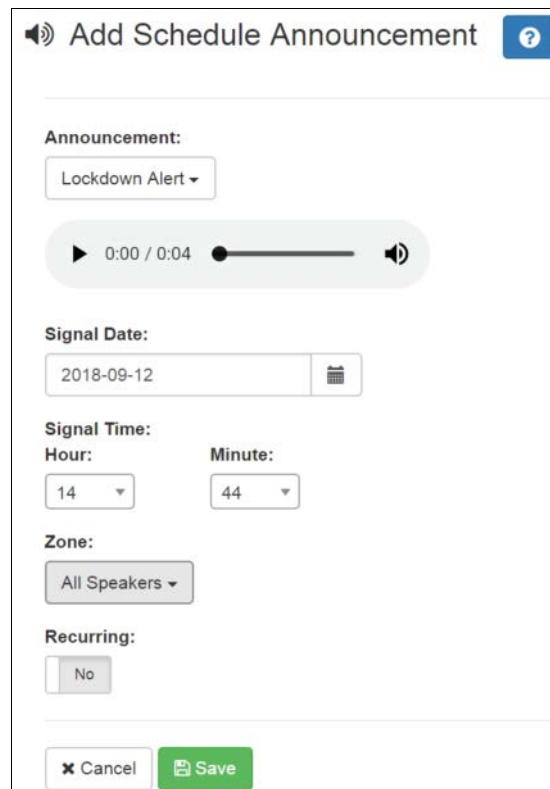
Table 68. Schedule Announcements Page Parameters

Name	Displays the name of the announcement.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	The type of announcement; either **Normal** or **Emergency**.
Description	Displays the description of the announcement.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Signal Date	Displays the date that the announcement is to play.
Signal Time	Displays the time the announcement is to play in HH:MM:SS format.
Zone	Displays the zone that is to receive this announcement.
Recurring	*Note:* If an announcement is already playing, a recurring announcement will not play until its next scheduled occurrence.
	Indicates if the announcement is scheduled to reoccur.
Recurrence Data	Displays data, such as the start and end dates, for the recurring announcement when you roll over or select the **Show** button.
Playback	Allows you to manually play the announcement. Selecting the down arrow in this field also allows you to download and save the announcement.

Adding a Schedule Announcement

On the Schedule Announcements page you can create a schedule announcement. When you schedule an announcement, you select the date and time the announcement plays,

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how many times it plays, and the zone that it plays in. Instead of selecting a single zone, you can select **All Speakers**.

> *Note:* You must create an announcement before you can create a schedule announcement. (See "*Adding an Announcement" on page 289*.)

Figure 89. Add Schedule Announcement Page

To add a schedule announcement:

1   On the navigation bar, expand **Schedules**.

2   Select **Schedule Announcements**.

3   On the Schedule Announcements page, select the **Plus** icon.

4   On the Add Schedule Announcement page, complete the parameters.

5   Select **Save**.

Table 69. Add Schedule Announcement Parameters

Announcement	Use the drop-down menu to select the announcement that you want to schedule.
Signal Date	Use the calendar or type to select the date that the announcement is to play.
Signal Time	Select the **Hour** and **Minute** from the corresponding drop-down menus.
Zone	Select either **All Speakers** or a specific zone that is to receive this announcement.
Recurring	Use the slider to indicate if the announcement will be scheduled to recur.
Recurrence Start Date	*Note:* This field appears only if **Recurring** has been set to **Yes**. Use the calendar or type to select the start date for this recurring announcement.
Recurrence End Date	*Note:* This field appears only if **Recurring** has been set to **Yes**. Use the calendar or type to select the end date for this recurring announcement.
No End Date	Use the slider to select **Yes** if you want this announcement to recur indefinitely.
Recurrence Second	*Note:* This field appears only if **Recurring** has been set to **Yes**. Select the **Second** from the corresponding drop-down menu.
Recurrence Minute	*Note:* This field appears only if **Recurring** has been set to **Yes**. Select the **Minute** from the corresponding drop-down menu. If you do not select a minute, the default will be every minute.
Recurrence Hour	*Note:* This field appears only if **Recurring** has been set to **Yes**. Select the **Hour** from the corresponding drop-down menu. If you do not select an hour, the default will be every hour.

Table 69. Add Schedule Announcement Parameters (Continued)

Recurrence Day	*Note:* This field appears only if **Recurring** has been set to **Yes**.
	Use the drop-down menu to select the day of the month that the announcement will recur. Not selecting a day will default to every day.
Recurrence Month	*Note:* This field appears only if **Recurring** has been set to **Yes**.
	Use the drop-down menu to select the month that the announcement will play. Not selecting a month will default to the announcement playing every month.
Recurrence Day of the Week	*Note:* This field appears only if **Recurring** has been set to **Yes**.
	Use the drop-down menu to select the day of the week that the announcement will play. No selecting a **Recurrence Day of the Week** will default to the announcement playing on each day.

Deleting a Schedule Announcement

To delete a schedule announcement:

1 On the navigation bar, expand **Schedules**.

2 Select **Schedule Announcements**.

The Schedule Announcements page appears. This page displays information about all scheduled announcements.

3 Select the **Delete** icon next to the schedule that you want to delete.

4 When prompted, select **Delete**.

Editing a Schedule Announcement

From the Edit Schedule Announcement page, you can change the selected announce-ment, the date and time the announcement is set to play, and the zones in which the announcement is scheduled to play.

Note that if you change the zone for a Schedule Announcement that is currently playing, the announcement will play to both the original zone and to the new zone. To stop the

announcement from playing to the original zone, you must use the stop announcement feature (see "*Managing Announcements via the Dashboard" on page 353*).

To edit an announcement:

1   On the navigation bar, expand **Schedules**.

2   Select **Schedule Announcements**.

3   Select the **Edit** icon next to the schedule that you want to edit.

4   Make the desired changes. (See*Table 69, "Add Schedule Announcement Parameters," on page 250*.)

5   After making the desired changes, select **Save**.

Retrieving First and Last Scheduled Events

You can retrieve an .xml file that provides the first and last events for a daily schedule or shows that the active schedule for the day is a holiday. This information could be used to schedule the opening of facility doors before the first scheduled event and the closing of facility doors after the last scheduled event.

To retrieve this information:

1   On your browser, type the IP address of your Nyquist server followed by the following:

:8088/static/schedules-boundary.xml

> *Note:* Do not include a space between the server's IP address and the colon (:).

2   Press **Enter**.

If your Nyquist server manages multiple sites, the start and end events appear for each site. (See *Figure 90, "Schedules Information for Multiple Sites"*.) If the day has been scheduled as a holiday, the word "Holiday" appears in the .xml file. (See *Figure 91, "XML Output for a Holiday"*.)

Figure 90. Schedules Information for Multiple Sites

Figure 91. XML Output for a Holiday

Managing Audio

With Nyquist's audio file management feature, you can:

• Specify an audio program for distribution to stations or zones.

- Record and play tones and announcements to stations or zones.

- Manage recordings of telephone calls made to and from stations.

Audio programs for distribution to stations or zones can include line-input from the MMPA, Nyquist 2-channel or 4-channel amplifiers, user supplied songs or playlists, and Internet Radio Services. The Audio Distribution, tones, and announcement files added through the audio file management feature can be set through the Schedules feature to automatically play during specified times. (See *"Managing Schedules" on page 227*.) Through the Internet Radio Services, you can listen to live radio stations and add media catalogs and music services without updating devices or software.

Default tone and song files include white noise and pink noise that allows you to tune paging and Audio Distribution volumes.

Note: Before using the audio file management feature, make sure that stations and zones have been configured (see *"Managing Stations, Zones, and Queues" on page 128*) and that the station you are using to start announcements, tones, or Audio Distribution has the appropriate CoS parameters set (see *"Using CoS Configuration" on page 89*).

Audio Distribution

Suppose you want to use an audio source, such as a radio station accessed via the Internet, in a cafeteria but prevent that source from being played in a conference room. This feature, called Audio Distribution, can be turned on by zone (an area or group of stations) or stations (group of devices such as VoIP speakers). You can add the speakers, or stations, in the cafeteria to a zone that allows Audio Distribution while the speakers in a conference room would not be placed into that zone.

Audio Distribution involves creating a playlist or selecting an input source and specifying which zones hear the playlist or input source. Through the Scheduled Audio feature, Audio Distribution can be tied to a specific event in a schedule (see *"Adding an Event" on page 237*).
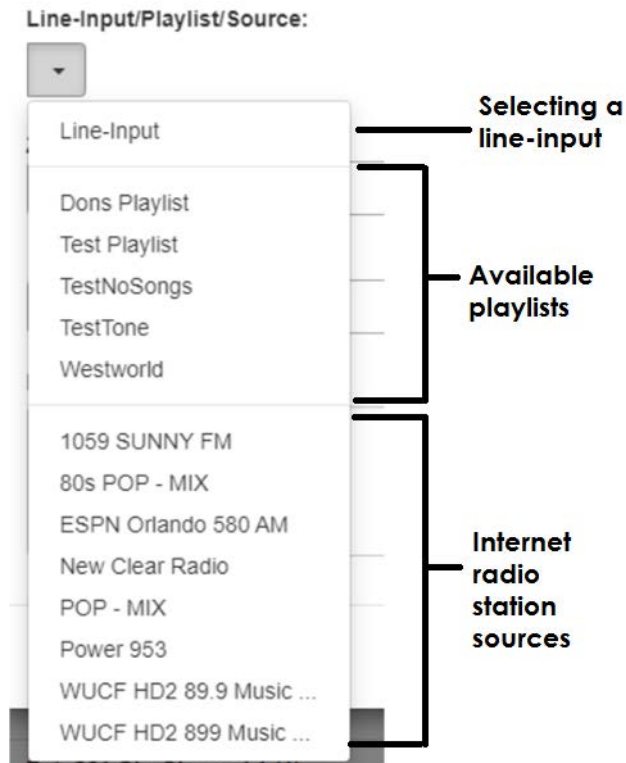
Figure 92. Audio Distribution Sources

Audio Distribution sources can include:

- Audio from two-channel or four-channel audio power amplifiers or MMPAs Line Inputs
- User-supplied music (songs and playlists)
- Internet Radio Services
- SoundMachine Stations

Managing Line-Input Sources

Figure 93. Line-Input Sources

If your Nyquist system uses two-channel or four-channel audio power amplifiers or MMPAs, these stations will appear as sources for Line-Input when creating Audio Distri-
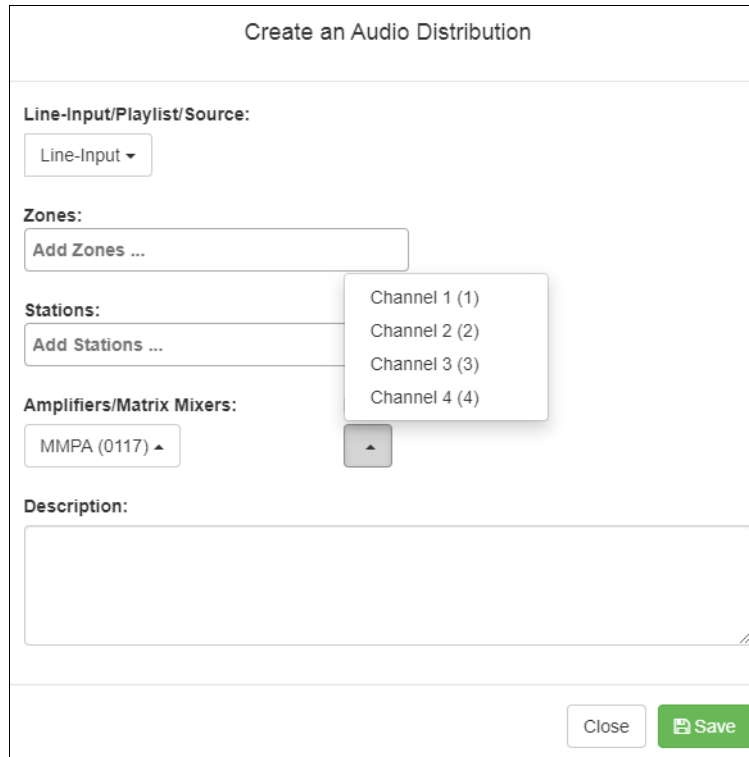
bution.

Figure 94. Available Channels for an MMPA

The available Input Channel selections can range from 1 or 2 for an amplifier or 1 to 4 for an MMPA.
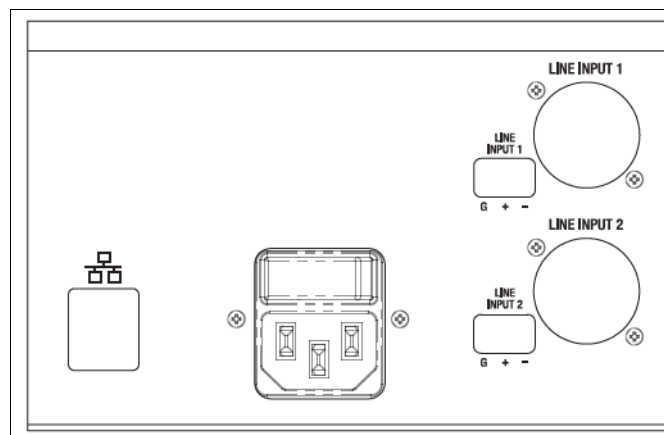

Figure 95. Line Input for NQ-A4300 Audio Power Amplifier

The amplifiers and MMPAs must be configured at the device, using either XLR or Phoenix (but not both) as the input.

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The Amplifiers/Matrix Mixers and Input Channel selections are made when creating an audio distribution.

Managing Songs

The songs feature allows you to select songs that can be added to a playlist; the playlist can then be selected to play manually or during scheduled events such as lunch time. You can store songs on a USB memory stick; these songs can then be played via the playlists feature (see "*Playing Songs Directly from a USB Memory Stick" on page 259*).

By default, white noise and pink noise songs are provided to help tune the volume of an Audio Distribution zone. (See "*Tuning Volume with White or Pink Noise" on page 327*.)

Viewing the Song List

From the Songs page, you can add, edit, or delete a song. If you delete a song that is in a Playlist, the song is automatically removed from the Playlist.

Figure 96. Songs Page

To view the song list:

1   On the navigation bar, expand **Audio**.

2   Select **Songs**.

The following table describes the information provided about each song:

Table 70. Songs Page Parameters

Title	Displays the user provided song title.
Artist	Displays the name of the musician performing the song.
Album	Displays the name of the album the song is from.

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Table 70. Songs Page Parameters (Continued)

Track Number	Displays the track on the album for the song.
Length	Provides the length of the song in seconds.
Genre	Displays the music genre, or category, for the song.
Year	Displays the year the song was recorded.
Playback	Allows you to manually play the song. Selecting the **Menu** icon in this field also allows you to download and save the song.

Playing Songs Directly from a USB Memory Stick

You can use a USB memory stick as storage for songs that can be played via the playlists feature.

To add songs and create a playlist for a USB memory stick, you must create a root file on the USB memory stick called MusicLibrary.txt. This file can contain the following entries:

* playlistname=<text entered by customer>
* createplaylist=no
* useexistingplaylist=yes

If **createplaylist=no** is found in MusicLibrary.txt, a playlist is not created for the imported files.

If **useexistingplaylist=yes** is used, new songs will be added to the playlist defined by the playlistname option.

Music files must be on the root directory of the USB memory stick. Valid formats for these files are mp3, wav, and aac.

The Nyquist server automatically mounts the USB memory stick, adds all songs found in the root directory to the songs list, and creates a playlist for the added songs. The default name for the playlist is **USB Music Library**.

Note: If you use a USB memory stick as storage for songs on a playlist and the USB memory stick is removed from the USB drive, the meta data for the songs and the playlist still resides in the Nyquist song list and playlist, but Audio Distribution cannot play. For this reason, we recommend never removing the memory stick from the computer.

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Uploading Songs from a USB Memory Stick

You can upload songs to the Nyquist system from a USB memory stick.

To upload songs from a USB memory stick:

1   On the navigation bar, expand **Audio**.

2   Select **Songs**.

3   Select the **Add** icon.

4   From the Add Song page, ensure **Multiple Songs** is set to **Yes**.

5   Insert the memory stick.

6   For the **File Upload** parameter, select **Choose file** and navigate to the USB memory stick.

7   Select **Save**.

8   Select **Save**.

Adding Songs

You can add songs from your local computer or from removable media, such as a Flash drive. You can add a song to playlists as part of the Add Song process or you can add a song to a playlist later through the **Playlists** menu.

You can select to add one song or multiple songs.

Nyquist can use any ID3 tag data and save that automatically. An ID3 tag acts as a container file within an MP3 audio file and commonly contains the title, artist name, album, track data, year, and genre.

Figure 97. Add Song Page

To add a song file:

1 On the navigation bar, expand **Audio**.

2 Select **Songs**.

3 On the Songs page, select the **Add** icon.

> *Note:* If the imported song file contains meta data, Nyquist automatically fills in the Title, Artist, Album, Track Number, Year, and Genre after you press the **Save** button. If no meta data exists, the song **Title** is set to **Untitled** and the other parameters are left blank. Most MP3 files do contain meta data. You also can choose to not fill in the parameters.

4 On the Add Song page, complete the parameters. If you want to add multiple songs, ensure that you select **Yes** for **Multiple Songs**. Then, use the Shift or Control keys when selecting multiple files. Parameters do not appear when using the **Multiple Songs** option.

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After completing all changes, select **Save**. The song or songs will be copied onto the Nyquist system.

Table 71. Add Song Page Parameters

Multiple Songs	Allows you to select multiple songs.
Title	Displays the user provided song title.
Artist	Displays the name of the musician performing the song.
Album	Displays the name of the album the song is from.
Track Number	Displays the track on the album for the song.
Year	Displays the year the song was recorded.
Genre	Displays the music genre, or category, for the song.
File Upload	Allows you to select the song that you want to upload.
Playlists	Select the playlists that you want to add the song to. You can select multiple playlists, select all playlists by selecting **Add All**, or use the **Clear** button to remove the playlists.
File Upload	Select **Choose file** and navigate to select the file to upload. This option allows you to select files not only from your computer but also from a USB flash drive inserted in your computer.

Editing Song Information

Through the Edit Song page, you can edit the information that appears on the Songs page for a particular song or replace the downloaded file with another.

To edit the information associated with the song file:

1 On the navigation bar, expand **Audio**.

2 Select **Songs**.

3 On the Songs page, select the **Edit** icon next to the song that you want to edit information for.

4 On the Edit Song page, make changes to the parameters.

5 After completing all changes, select **Save**.

Table 72. Edit Song Page Parameters

Title	Displays the user provided song title.
Artist	Displays the name of the musician performing the song.
Album	Displays the name of the album the song is from.
Track Number	Displays the track on the album for the song.
Year	Displays the year the song was recorded.
Genre	Displays the music genre, or category, for the song.
File Upload	Allows you to select the song that you want to upload.
Playlists	Allows you to add or remove the song from playlists.

Deleting a Song

Through the Songs page, you can delete a song from your Nyquist system. If you delete a song that is in a Playlist, the song is automatically removed from the Playlist.

To delete a song:

1 On the navigation bar, expand **Audio**.

2 Select **Songs**.

3 On the Songs page, select the **Delete** icon next to the song that you want to delete.

4 When prompted, select **Delete**.

Managing Playlists

You can create and manage playlists that contain multiple songs to use for scheduled events and dashboard Audio Distribution entries. You can select a playlist when creating an event. (See section "*Adding an Event" on page 237.)*

Viewing Playlists

Through the Playlists page, you can view all playlists available to your Nyquist system and create, delete, and manage a playlist. With the Manage Playlist feature, you can add, delete, or change the order of a playlist's songs.

Figure 98. Playlists Page

To view playlists:

1 On the navigation bar, expand **Audio**.

2 Select **Playlists**.

The Playlists page appears. The following table describes the information that appears on this page:

Table 73. Playlists Page Parameters

Manage	When selected, this option displays the songs that can be dragged and dropped to and from the playlist.
Name	Displays the user provided name for the playlist.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Description	When **Show** is selected, the user provided description of the play list appears.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

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Table 73. Playlists Page Parameters (Continued)

Scheduled Audio Repeat	When enabled, the playlist audio will be repeated after all songs have been played. When disabled, Scheduled Audio will automatically stop after the last song has been played from the playlist. When disabled, a corresponding stop event is not needed when Scheduled Audio is started via the schedule.
	Note: When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.
Scheduled Audio Shuffle	When enabled, the order in which the songs are played is shuffled. When disabled, the playlist songs will be played in the order that they appear in the playlist.
	Note: When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.

Creating a Playlist

When you add a playlist, you first create the playlist container and then you use the Manage tool to add songs to the playlist. To add songs to a playlist, you must have access to songs that have been downloaded to your Nyquist network or to removable media, such as a Flash drive.

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Figure 99. Add Playlist Page

To add a playlist:

1 On the navigation bar, expand **Audio**.

2 Select **Playlists**.

3 Select the **Add** icon.

4 On the Add Playlist page, complete parameters for this playlist. (See *Table 74, "Add Playlist Parameters," on page 267*.)

5 Select **Save**.

Table 74. Add Playlist Parameters

Name	Displays the user provided name for the playlist.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Scheduled Audio Repeat	When enabled, the playlist audio will be repeated after all songs have been played. When disabled, Scheduled Audio will automatically stop after the last song has been played from the playlist. When disabled, a corresponding stop event is not needed when Scheduled Audio is started via the schedule.
	Note: When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.
Scheduled Audio Shuffle	When enabled, the order in which the songs are played is shuffled. When disabled, the playlist songs will be played in the order that they appear in the playlist.
	Note: When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.
Description	When **Show** is selected, the user provided description of the play list appears.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

Adding Songs to a Playlist

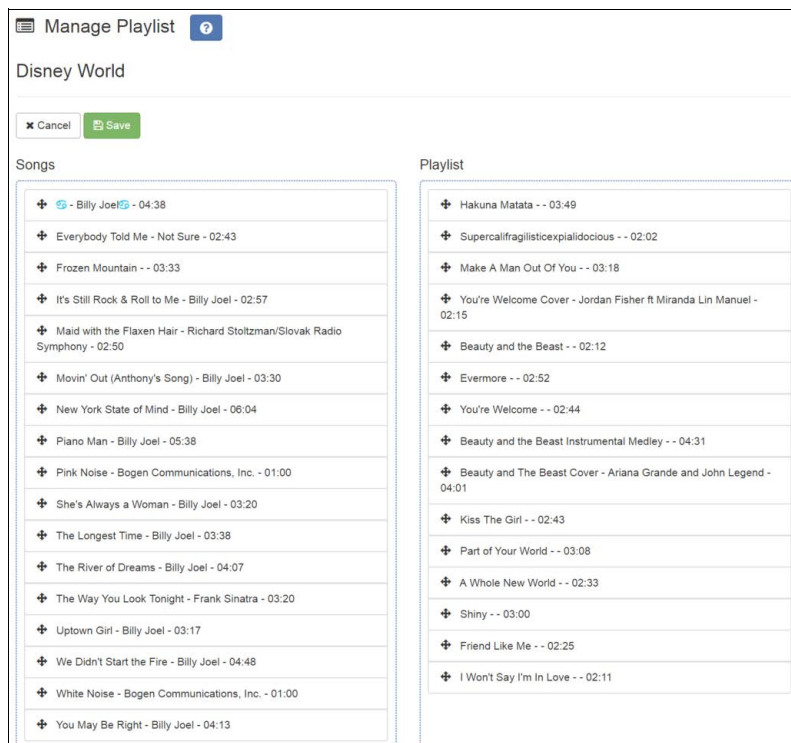After you create a playlist, use the Manage tool to add songs to the playlist.

Figure 100. Manage Playlist Page

To add songs to a playlist:

1 On the navigation bar, expand **Audio**.

2 Select **Playlists**.

3 On the Playlists page, select the **Manage** icon next to the playlist that you want to add songs to.

4 On the Manage Playlists page, drag and drop the song you want to add from the Songs field to the Playlist field.

5 After all desired songs have been added to the Playlist, select **Save**.

Changing Song Order in a Playlist

You can use the Manage tool to change the order of songs in a playlist.

To change the song order:

1 On the navigation bar, expand **Audio**.

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2 Select **Playlists**.

3 On the Playlists page, select the **Manage** icon next to the playlist for which you want to change song order.

4 On the Manage Playlists page, drag and drop the songs into the order that you want.

5 Select **Save**.

Deleting a Song from a Playlist

You can use the Manage tool to remove a song from a playlist.

To delete a song from a playlist:

1 On the navigation bar, expand **Audio**.

2 Select **Playlists**.

3 On the Playlists page, select the **Manage** icon next to the playlist.

4 Drag and drop the song from the Playlist field to the Songs field.

5 After all desired changes are completed, select **Save**.

Editing a Playlist

The **Edit** icon allows you to edit the parameters for a playlist. To change the order of songs in a playlist, see *"Adding Songs to a Playlist" on page 268*. To delete a song from a song list, see *"Deleting a Song from a Playlist" on page 269*.

To edit a playlist:

1 On the navigation bar, expand **Audio**.

2 Select **Playlists**.

3 Select the **Edit** icon next to the playlist.

4 On the Edit Playlist page, make desired changes to the parameters. (For more information about the parameters, see *Table 74, "Add Playlist Parameters," on page 267*.)

5 Select **Save**.

Deleting a Playlist

You can delete a playlist provided the playlist is not being used with an I/O Controller Input or Output Rule.

To delete a playlist:

1 On the navigation bar, expand **Audio**.

2 Select **Playlists**.

3 Select the **Delete** icon next to the playlist.

4 When prompted, select **Delete**.

Using Internet Radio Services

Through the Internet Radio Services, you can add online content, such as music services and Internet radio, using Airable by TuneIn. With this service, you can listen to live radio stations and add media catalogs and music services without updating devices or software.

You can navigate through the catalog of radio stations by:

- Genre
- Language
- Location
- Quality
- Popularity

You can also search the catalog for particular artists or songs.

Being able to use the Internet Radio Services feature depends on the permissions assigned to the role you are associated with.

Figure 101. Internet Radio Services Permissions

For information about assigning permissions to roles, see "*Assigning and Editing Permissions" on page 216*.

Viewing Internet Radio Services

If you have **View** permission for the Internet Radio Services, you can view a list of radio stations that can be accessed through your system as well as information about each station. Through the Internet Radio Services page, you can also select to manage credentials for services such as SOUNDMACHINE. (See *"Managing Credentials" on page 275*.)
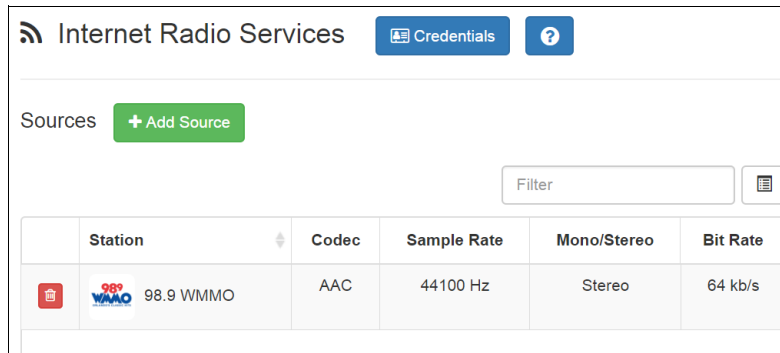

Figure 102. Internet Radio Services View

To view Internet Radio Services added to your system:

1 On the navigation bar, expand **Audio**.

2 Select **Internet Radio Services**.

The following parameters appear for each source configured for your Nyquist system:

Table 75. Internet Radio Services

Station	Displays the icon, name, and description of the radio station.
Codec	Displays how the streaming media is compressed and decompressed.
Sample Rate	Displays the number of samples of audio carried per second.
Mono/Stereo	Displays if the signal is being transmitted by a single channel (mono) or by two channels (stereo).
Bit Rate	Displays the bit rate used to transmit the streaming media.

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Adding a Source

You can select to add an Internet radio source or a service, such as SOUNDMACHINE. The screen that appears when you select **Add Sources** also allows you to manage credentials or sign up for SOUNDMACHINE.
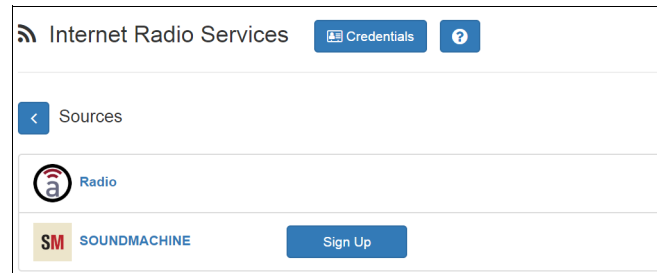

Figure 103. Add Source Page

To add a source:

1 On the navigation bar, expand **Audio**.

2 Select **Internet Radio Services**.

3 On the Internet Radio Services window, select **Add Sources**.

4 Select from the list of Sources.

5 If you select **Radio**, do the following:

    a) Select how you want to select a source. Options are:

Table 76. Radio Source Parameters

Local stations   Select to view a list of stations near your location.

Popular stations   Select to view stations considered to be the most popular.

Trending   Select to view the stations that are gaining momentum.

High quality   Select to view the stations with a high sound quality.

New stations   Select to filter the list of stations by new stations added to Internet Radio Services.

Filter   Select to filter the list of stations by **Location**, **Language**, or **Genre**.

Search   Select to enter a search term.

    b) When the list of stations that meet the selected criteria appear, select the station that you want.

    c) Select **Add Source** for each source (aac or mp3) that you want.

6 If you select **SOUNDMACHINE**, do the following:

    a) Select how you want to open a source. Selections are:

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Genres	Displays a list of genres, such as **Blues** and **Pop**, which you can select to drill down genre choice even further.
Stations	Displays categories for stations, such as **Country**, which you can select to drill down to select a specific album or song.
My Stations	Displays radio stations that you added through the SOUNDMA-CHINE web site.
Mixes	Displays categories of stations that combine, or mix, music genres. Mixes can be created using your SOUNDMACHINE account and SOUNDMACHINE user interface. All Mixes that you create in your SOUNDMACHINE account will be available in the Mixes list. Mixes allow you to select albums and songs to include in the Mix.
Music Selection Schedules	Displays the Schedules that have been created through SOUND-MACHINE. (See *"Using SOUNDMACHINE Music Selection Schedules" on page 278*.)
	Schedules allow the playing of specific stations or mixes during specific times of the day. For example, you can play soft jazz music during morning hours and select a different genre mix for mid-day.
	When you create a Music Selection Schedule, you cannot have any empty time periods or Audio Distribution will stop when the empty time period is encountered.
	The Music Selection Schedules that you create appear as **Line-Input/Playlist/Source** selections for Audio Distribution. (See *"Using Audio Distribution" on page 360*.)
Logout	Select to log out of SOUNDMACHINE.

b) Drill down until you can select a specific album or song.

c) Select **Add Source**.

Deleting a Source

To delete a source:

1 On the navigation bar, expand **Audio**.

2 Select **Internet Radio Services**.

3 On the Internet Radio Services window, select the **Delete** icon next to the source that you want to delete.

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4 When prompted, select **Delete**.

Managing Credentials

If you have been assigned permissions, you can view, add, edit, and delete logon credentials needed to access the SOUNDMACHINE service.

For information about roles and permissions, see *"Assigning and Editing Permissions" on page 216*.

Viewing Credentials

The Credentials list allows a quick view of the users who have logon credentials.

To view the Credentials list:

1 On the navigation bar, expand **Audio**.

2 Select **Internet Radio Services**.

3 Select **Credentials**.
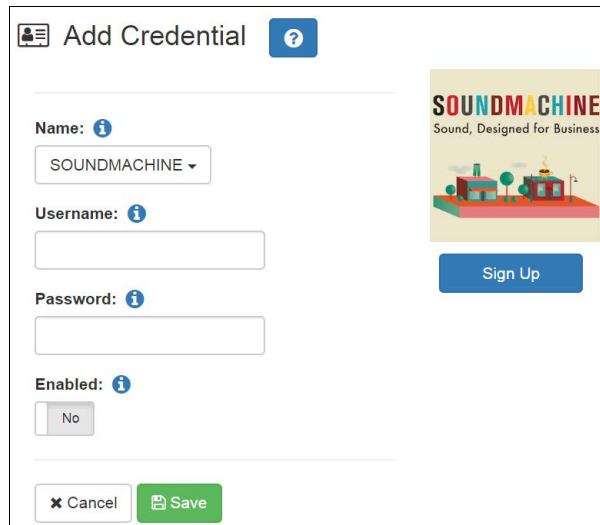
The Credentials list displays the following information:

Table 77. Credentials Parameters

Name	Displays the name of the service, such as SOUNDMACHINE.
Enabled	Indicates if the account is enabled for this service.
Username	Provides the **Username** for the account.

Add Credentials

You can create a user account that allows a user to use an Internet Radio Service, such as SOUNDMACHINE. You can also use the Add Credential page to sign up for SOUNDMA-CHINE.

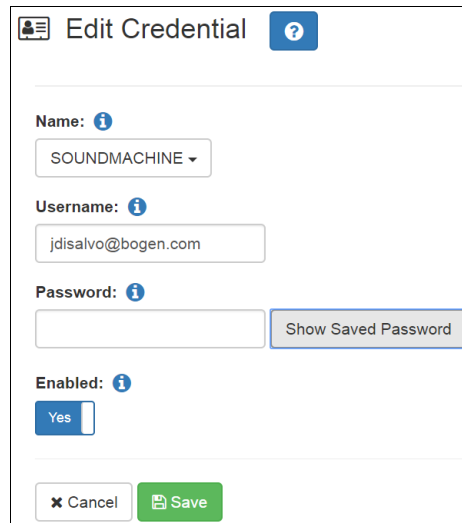**Figure 104. Add Credential**

To create an account:

1 On the navigation bar, expand **Audio**.

2 Select **Internet Radio Services**.

3 Select **Credentials**.

4 Select the **Add** icon.

5 Complete the following parameters:

Table 78. Add Credential Parameters

Name	Use the drop-down arrow to select the name of the service.
Username	Enter the username for this account.
Password	Enter the password for this account.
Enabled	Select **Yes** to enable this account.

Edit Credential

If you have the appropriate permissions, you can edit a user's credentials for accessing SOUNDMACHINE, including viewing or changing a user's password and enabling or disabling their use of the service.

Figure 105. Edit Credential

To edit an account:

1   On the navigation bar, expand **Audio**.

2   Select **Internet Radio Services**.

3   Select **Credentials**.

4   Select the **Edit** icon next to the account that you want to edit.

5   Make the desired changes. (See *Table 79.*)

6   Select **Save**.

Table 79. Edit Credentials Parameters

Name	Use the drop-down arrow to select the name of the service.
Username	Enter the username for this account.

Table 79. Edit Credentials Parameters

Password	Enter the password for this account.
	Select **Show Saved Password** to view an existing password for the account being edited.
Enabled	Select **Yes** to enable this account.

Delete Credentials

You can delete a user's credentials to access SOUNDMACHINE.

To delete an account:

1   On the navigation bar, expand **Audio**.

2   Select **Internet Radio Services**.

3   Select **Credentials**.

4   Select the **Delete** icon next to the account that you want to edit.

5   When prompted, select **Delete**.

SOUNDMACHINE Sign Up

You can sign up for SOUNDMACHINE via the Add Source (see "*Adding a Source" on page 272*) or Add Credential (see "*Add Credentials" on page 276*) windows.

To sign up for SOUNDMACHINE:

1   On the navigation bar, expand **Audio**.

2   Select **Internet Radio Services**.

3   Do one of the following:

   •   Select **Add Source**.

   •   Select **Credentials** and then select the **Add** icon.

4   Select **Sign Up**.

5   When the SOUNDMACHINE and BOGEN page appears, follow the on-screen instructions.

Using SOUNDMACHINE Music Selection Schedules

Schedules that you create using the SOUNDMACHINE web-based user interface appear as **Music Selection Schedules** in the Nyquist Admin Web UI. You can select a Music

Selection Schedule to play as Audio Distribution. (See "*Using Audio Distribution" on page 360*.)

When you create a Music Selection Schedule, you cannot have any empty time periods or Audio Distribution will stop when the empty time period is encountered.

You cannot name a Music Selection Schedule using all special characters; the name must contain at least one alpha or numeric character or the Music Selection Schedule will not appear.

Scheduled Audio takes priority over a Music Selection Schedule. For information about Scheduled Audio, refer to "*Understanding Event Settings" on page 238*.

Creating an Audio Distribution

Figure 106. Audio Distribution Portion of Dashboard

To use the Audio Distribution feature, you must have the proper CoS configuration on your station. See "*Editing CoS Parameters for a Station" on page 93* if you need to change your station's CoS.

Figure 107. Audio Distribution Set in CoS

You must also be assigned a Role that has permissions to create Audio Distribution.

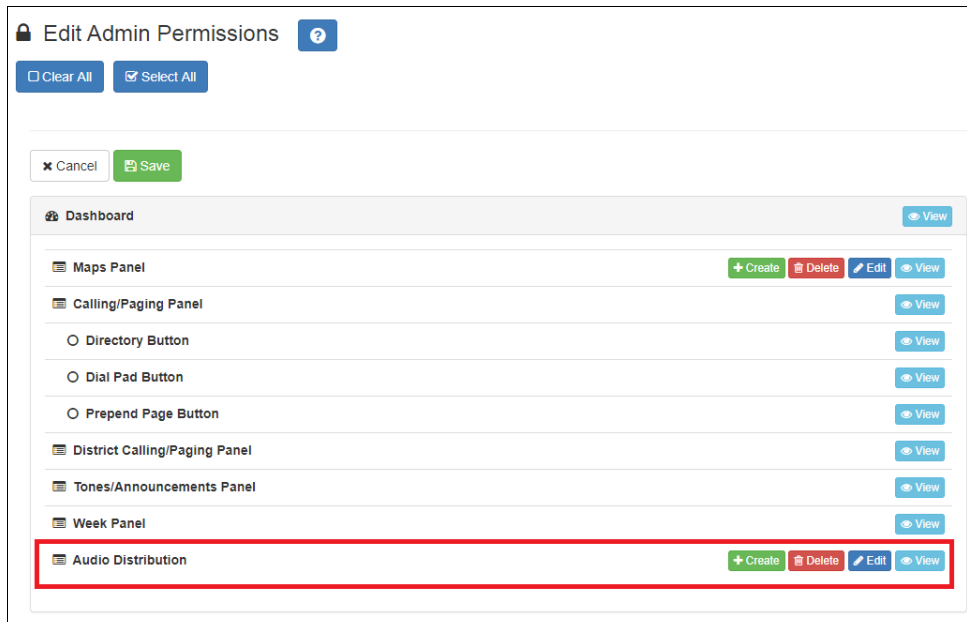**Figure 108. Role Permissions for Audio Distribution**

Figure 109. Create an Audio Distribution

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To create an Audio Distribution:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Select the **Add** icon next to **Audio Distribution**.

3 Complete the Create an Audio Distribution parameters (see *Table 80*).

> *Note:* If you are using at least one Nyquist Matrix Mixer Pre-Amp, Line-Input appears as a Line-Input/Playlist/Source option.

4 Select the **Zones** and **Stations**.

5 If you select **Line-Input** as the Input Source/Playlist, select the **Amplifiers/Matrix Mixers** and **Input Channel**.

6 If you select a playlist and want to shuffle the song order, set **Shuffle** to **Yes**.

7 Select **Save**.

8 To end the playing of audio, select the **Stop** icon next to the playlist.
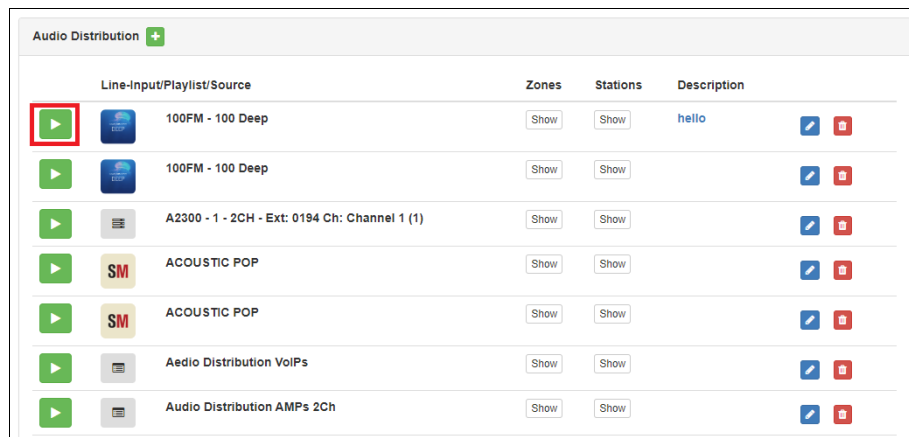
Table 80. Create an Audio Distribution Parameters

Line-Input/Playlist/Source	Use the **Line-Input/Playlist/Source** drop-down menu to select the audio source. Audio sources can include a line-input from an MMPA or amplifier, available playlists previously created for your system, or Internet radio station sources.
Zones	Select **All Speakers** or a specific zone or zones where you want the audio to play.
Stations	Select the stations where you want the audio to play.
Amplifiers/Matrix Mixers	Select the Amplifier or Matrix Mixer to use as the audio source.
Input Channel	Select the Input Channel to be used as the audio source.
Shuffle	If you select a playlist and want to shuffle the song order, set **Shuffle** to **Yes**.
Description	Add a description for the Audio Distribution. For example, you may want to note that the audio is for lunchtime.

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Starting and Stopping Audio Distribution

Starting and stopping Audio Distribution can be done manually (via the Nyquist web interface dashboard or Zone Control feature) or automatically (via scheduled events, NQ-E7010 I/O controller input-contact closure rules, or Routines).

A list of existing Audio Distributions appears on the dashboard. An existing Audio Distribution can be edited or deleted, provided it is not currently playing, by selecting the **Edit** or **Delete** icon next to the Audio Distribution.

Figure 110. Audio Distribution Play Icon

To manually start and stop Audio Distribution:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Select the **Play** icon next to the Audio Distribution that you want to start.

3 To end the playing of audio, select the **Stop** icon next to the playlist.

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Figure 111. Adding Scheduled Audio

To automatically schedule audio as part of an event, follow the steps for creating an event, ensuring that you set the **Scheduled Audio** for the playlist, Matrix Mixer Pre-Amp channel, or amplifier to be used for this event. For more information, see *"Adding an Event" on page 237*.

You also can select to stop the **Scheduled Audio** by selecting **Stop Playlist** or **Stop Line-Input**.

If an Airable/SOUNDMACHINE source is selected, the Scheduled Audio list includes selections to start or stop the audio stream. This list only includes Airable/SOUNDMACHINE selections that apply to the specific zone. If the Audio Distribution zone selected includes

a time zone and another zone type, such as Paging, that is not for time, the audio distri-
bution does not appear in this **Scheduled Audio** list.
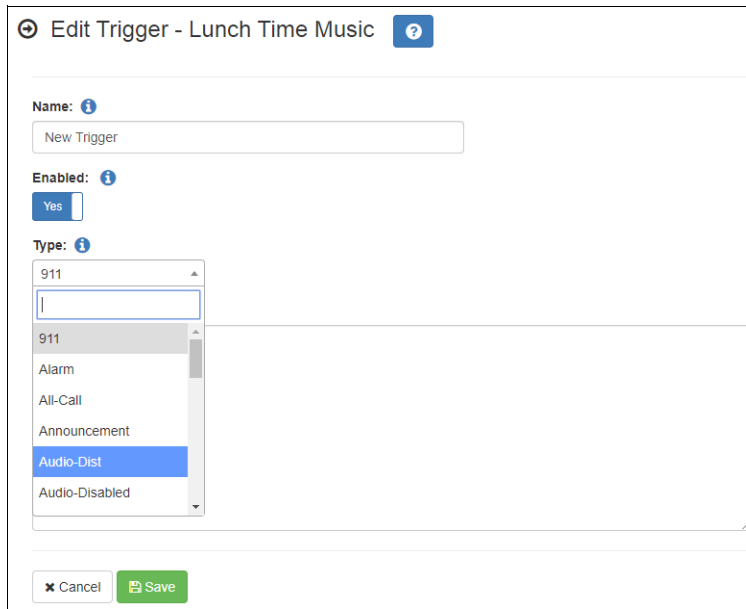
Figure 112. Adding Audio-Dist Trigger

The Routines feature lets you automatically start one or more actions using Audio Distri-
bution (Audio-Dist) as a trigger. For example, maybe you want a bell or tone to sound in
the kitchen when the lunchtime music begins to alert kitchen staff that orders will soon
be coming. To do this, you can create a routine, add an **Audio-Dist** trigger **Type**, and
then create an action that plays a tone. See *"Adding a Routine" on page 395* for more
information about creating a routine.)
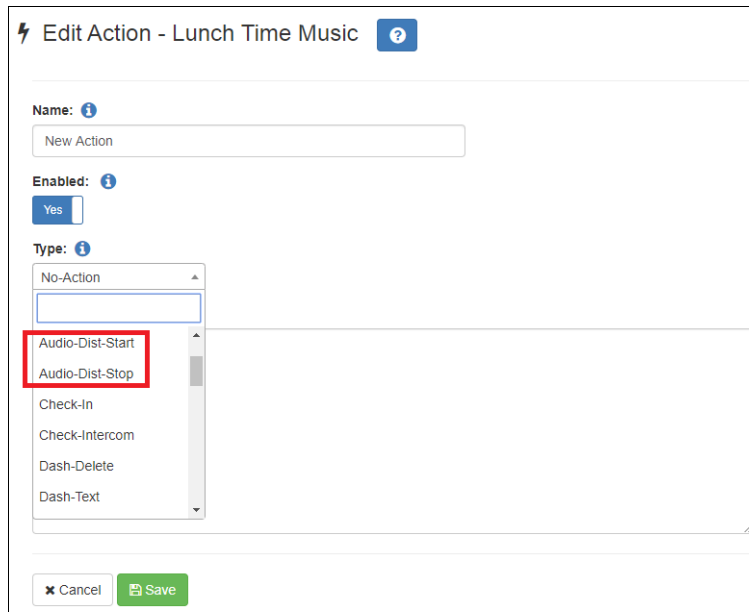
Figure 113. Audio Distribution Actions

You can create a routine that uses an action of either **Audio-Dist-Start** to start audio distribution or **Audio-Dist-Stop** to stop audio distribution.

You can also allow third-party systems, such as access control systems, to start a routine via I/O Controller Input Contact closure, or you can remotely start a routine using the Routines API.

For more information about using routines, see "*Using Routines" on page 388*.

Other Features and Audio Distribution

Audio Distribution will be paused automatically by higher priority feature activation (for example, All-Call Page, Paging, Tones) and will automatically resume when the higher priority feature is finished.

Audio Distribution volume to all speakers can be changed by setting **Audio Distribution Cut Level (dB)**, available in **System Parameters**. The Audio Distribution volume to zones can be changed by setting **Audio Distribution Cut Level (dB)** in **Edit Zone**. For information about editing a zone, see "*Editing Zone Configuration" on page 199*.

All Nyquist stations are pre-programmed to receive Audio Distribution to All Stations. To disable Audio Distribution to a specific station, change **Multicast Audio Distribution** to **No** on the Edit Station page (see "*Editing Station Configuration Settings" on page 142*).

Any Admin web UI user may stop the Audio Distribution if his or her station has the **Audio Distribution** CoS Configuration parameter enabled.

Scheduled Audio has a higher priority than Audio Distribution. If you are playing Audio Distribution and an event with Scheduled Audio interrupts, the Audio Distribution briefly plays between the tone and the Scheduled Audio.

A playlist will continue playing until manually stopped.

Audio Distribution Status

When you start Audio Distribution, a popup window appears letting you know that Audio Distribution was enabled.
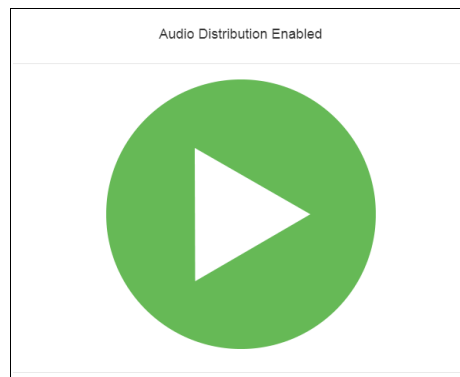
Figure 114. Audio Distribution Enabled

A popup window also appears when you stop Audio Distribution.
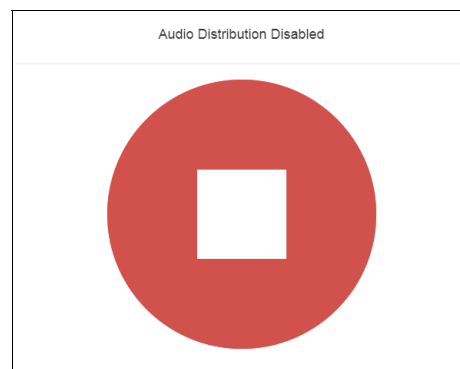
Figure 115. Audio Distribution Disabled

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When Audio Distribution is enabled, an informational message appears in the Messages window of the Admin Web UI dashboard, indicating the song that is currently playing and to which speakers (all or selected) and to which zones audio is playing to.
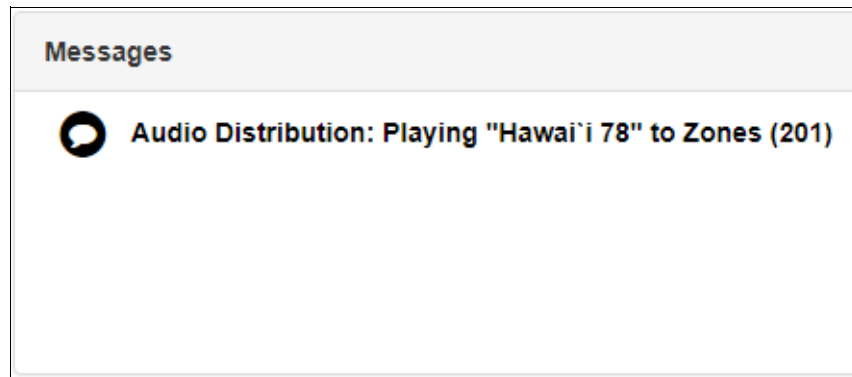
Figure 116. Audio Distribution Status

Using Announcements

Announcements are prerecorded audio files that can be scheduled to play during specific times and in specific zones, played manually via the dashboard, or played via routine actions. Announcements can be either normal announcements, such as prerecorded announcements about upcoming site events, or emergency announcements, such as pre-recorded shelter in place announcements that can be played during events such as tornado warnings or active shooter scenarios.

Announcements can also precede a page.

Through the Nyquist web-based UI, you can add, edit, delete, and play announcements.

Announcements, Facilities, Zones, and Priorities

You can select to play an announcement to a zone, to all speakers, or to one or more facilities. The Nyquist system also supports the simultaneous playing of multiple announcements to different zones.

However, there are some set rules and priorities that govern how and when announcements play. For example, announcements played via an I/O controller can be played to a selected zone but not to **All Speakers**.

When you attempt to play a non-emergency, or **Normal**, announcement to a zone, you will receive a busy signal if any of the following are true:

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- An announcement, page, or recorded page is being played on the zone.
- An announcement is being played to **All Speakers**.
- An Alarm, Tone, All-Call, or Emergency All-Call is being played.

A **Normal** announcement plays to **All Speakers** only if all zones are idle and no higher level audio is playing. You will receive a busy signal if any of the following are true:

- A **Normal** or **Emergency** announcement is already playing to **All Speakers**.
- An announcement is already playing to a zone.
- A page or queued page is already playing to a zone.
- An Emergency-All-Call, All-Call, Alarm, or Tone is already playing.

If you attempt to play an emergency announcement to a zone or to **All Speakers**, you will receive a busy signal if any of the following are true:

- An emergency announcement is already playing to the zone or to **All Speakers**.
- An Emergency All-Call is already playing.

If you attempt to play an emergency announcement to a zone or to **All Speakers** that is already playing a non-emergency announcement, an alarm or tone, a page or queued page, or an All-Call, the emergency announcement takes priority. A currently playing non-emergency announcement, alarm or tone, page or queued page, or All-Call will stop playing.

An **Emergency** announcement can be played on a zone while a Normal announcement plays on a different zone. Multiple **Emergency** and **Normal** announcements can be played to different zones (but not to **All Speakers**).

Facility Announcement Priorities

When making announcements to remote facilities, there is the possibility that one or more facilities may be unable to make the announcement due to higher priority features that are currently executing at that facility.

When you attempt to play a non-emergency, or **Normal**, announcement to remote facilities, you will receive a busy signal for any of the following scenarios.

- The local facility is targeted and it is executing a higher priority feature.
- Only one remote facility is targeted and it is executing a higher priority feature.

For all other scenarios, you will hear "Announcement on" and any facilities that were unable to play the announcement will record a busy status in the Call Details Record. This implies that when the local facility and one or more remote facilities are targeted, the busy signal and "Announcement on" indicators reflect the status of the local facility only; the announcement may or may not have played at the remote facilities.

Setting Up Facility Announcements

For announcements that will be played across remote facilities, ensure that the announcement has been added to each remote facility and that each has the same DTMF Code.

Because remote facility announcements cannot be stopped the same way as local announcements, announcements configured for continuous play (i.e., "Times to Play" property equal to zero) should not be used as facility announcements.

Tip: If you wish to play an announcement continuously on the local facility, yet use the same announcement remotely via Facility Announcements, configure two versions of the announcement at each facility: one for continuous play (i.e., "Times to Play" equals zero) and one for non-continuous play (i.e., "Times to Play" is non-zero). Ensure the DTMF code for the non-continuous announcements have the same value at each facility. Only the non-continuous version of the announcement will be displayed for play to remote facilities.

Adding an Announcement

You can upload an announcement, which can be an audio recording, such as a message or tone. The announcement can be scheduled to play at certain times and in certain zones.

Through the Add Announcement page, you can also enter text to be converted into speech provided you have the feature license that allows this option.

Figure 117. Add Announcement Page

To upload an announcement file:

1 On the navigation bar, expand **Audio**.

2 Select **Announcements**.

3 On the Announcements page, select the **Add** icon.

4 Complete the parameters on the Add Announcement page. (See *Table 81, "Add Announcement Page Parameters," on page 291*.)

5 Select **Save**.

Table 81. Add Announcement Page Parameters

Name	Provide a name for the announcement. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Use the drop-down menu to select if the announcement is Normal or Emergency.
DTMF Code	Provide a DTMF code for this announcement to use when manually starting the announcement from an Admin Phone. The number can have from 1 to 10 digits. You cannot assign the same DTMF code to multiple announcements. *Note:* When you record an announcement by dialing *990 or by selecting **Record Announcement** on the Admin phone's **Announce** menu, the initial DTMF Code for the recorded and saved announcement will be set to the announcement's row ID. You can change the DTMF Code after the announcement is saved by editing the announcement in the web interface **Announcements** view. The saved announcement has **Play to Zone** set to blank (no zone selected). This means that when you play an announcement via an IP phone **Announcement** menu selection, you will be asked to enter a zone number (where 0 = All Speakers). You can define a permanent zone number for the saved announcement by updating **Play to Zone** after the recorded announcement has been saved.
File Upload	Select **Choose File**, navigate to the audio file for this announcement, and then select the file. Nyquist supports both WAV and MP3 file formats. *Note:* This option appears only if you have selected the **File Upload** tab.
Times to Play	Select the number of times the announcement will play. Parameters are between 0 and 10. *Note:* A setting of 0 results in the playing continuously until it is manually stopped via the dashboard. *Note:* Announcements configured for continuous playback should not be used with the Facility Announcement feature.

Table 81. Add Announcement Page Parameters (Continued)

Time Between Repeats (seconds)	Select the time in seconds between replaying of the announcement. You can select between 0.5 and 5.0 in 0.5 increments.
Text-To-Speech	Type the text that you want converted to speech for this announcement. Ensure that the **File Upload** parameter is blank. The system will generate a .wav file. *Note:* This field appears only if you have the Text-To-Speech feature license.
Play to Zone	Select either **All Speakers** or a specific zone for this announcement to play. *Note:* If the **Type** for the station is set to **Admin Web Interface**, **Admin Phone**, **IP Phone**, **Analog Phone**, or **Mobile Device** and an **Announcement Zone** was set for the station, the **Announcement Zone** overrides the **Play to Zone**.
Description	Provide a description of the announcement. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

Using SSML for Text-to-Speech Entries

You can use Speech Synthesis Markup Language (SSML), an XML-based markup language for speech synthesis applications, when typing text that you want converted to speech for announcements. You can use SSML formatting to insert pauses, adjust speech rate, adjust voice pitch, adjust output volume, add emphasis to speech, or spell words phonetically. The following table provides examples of SSML formats that can be used when adding announcements.

Table 82. SSML Formats for Text-to-Speech Entries

Insert Silence/Pauses

- This is not <break strength='none' /> a pause.
- This is a <break strength='x-weak' /> phrase break.
- This is a <break strength='weak' /> phrase break.
- This is a <break strength='medium' /> sentence break.
- This is a <break strength='strong' /> paragraph break.
- This is a <break strength='x-strong' /> paragraph break.
- This is a <break time='3s' /> three second pause.
- This is a <break time='4500ms' /> 4.5 second pause.
- This is a <break /> sentence break.

Adjust Speech Rate

- I am now <prosody rate='x-slow'>speaking at half speed.</prosody>
- I am now <prosody rate='slow'>speaking at 2/3 speed.</prosody>
- I am now <prosody rate='medium'>speaking at normal speed.</prosody>
- I am now <prosody rate='fast'>speaking 33% faster.</prosody>
- I am now <prosody rate='x-fast'>speaking twice as fast</prosody>
- I am now <prosody rate='default'>speaking at normal speed.</prosody>
- I am now <prosody rate='.42'>speaking at 42% of normal speed.</prosody>
- I am now <prosody rate='2.8'>speaking 2.8 times as fast</prosody>
- I am now <prosody rate='-0.3'>speaking 30% more slowly.</prosody>
- I am now <prosody rate='+0.3'>speaking 30% faster.</prosody>

Table 82. SSML Formats for Text-to-Speech Entries (Continued)

Adjust Voice Pitch

- <prosody pitch='x-low'>This is half-pitch</prosody>
- <prosody pitch='low'>This is 3/4 pitch.</prosody>
- <prosody pitch='medium'>This is normal pitch.</prosody>
- <prosody pitch='high'>This is twice as high.</prosody>
- <prosody pitch='x-high'>This is three times as high.</prosody>
- <prosody pitch='default'>This is normal pitch.</prosody> <prosody pitch='-50%'>This is 50% lower.</prosody>
- <prosody pitch='+50%'>This is 50% higher.</prosody>
- <prosody pitch='-6st'>This is six semitones lower.</prosody>
- <prosody pitch='+6st'>This is six semitones higher.</prosody>
- <prosody pitch='-25Hz'>This has a pitch mean 25 Hertz lower.</prosody>
- <prosody pitch='+25Hz'>This has a pitch mean 25 Hertz higher.</prosody>
- <prosody pitch='75Hz'>This has a pitch mean of 75 Hertz.</prosody>

Table 82. SSML Formats for Text-to-Speech Entries (Continued)

Adjust Output Volume	• <prosody volume='silent'>This is silent.</prosody> • <prosody volume='x-soft'>This is 25% as loud.</prosody> • <prosody volume='soft'>This is 50% as loud.</prosody> • <prosody volume='medium'>This is the default volume.</prosody> • <prosody volume='loud'>This is 50% louder.</prosody> • <prosody volume='x-loud'>This is 100% louder.</prosody> • <prosody volume='default'>This is the default volume.</prosody> • <prosody volume='-33%'>This is 33% softer.</prosody> • <prosody volume='+33%'>This is 33% louder.</prosody> • <prosody volume='33%'>This is 33% louder.</prosody> • <prosody volume='33'>This is 33% of normal volume.</prosody>
Add Emphasis to Speech	• This is <emphasis level='strong'>stronger</emphasis> than the rest. • This is <emphasis level='moderate'>stronger</emphasis> than the rest. • This is <emphasis level='none'>the same as</emphasis> than the rest.
Spell Words Phonetically	You say <phoneme ph='t ah0 m ey1 t ow0'>tomato</phoneme>, I say <phoneme ph='t ah0 m aa1 t ow0'>tomato</phoneme>

Viewing Announcements

Through the Announcements page, you can view a list of all announcements that are available for scheduling, delete an announcement, and select to edit or add an announcement.

Figure 118. Announcements Page

To view a list of all announcements that are available for scheduling:

1 On the navigation bar, expand **Audio**.

2 Select **Announcements**.

The following parameters appear for each announcement file:

Table 83. Announcements Page Parameters

Name	Displays the user provided name of the announcement file.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Displays if the announcement is a **Normal** or an **Emergency** announcement.
DTMF Code	Displays the DTMF code used to manually start the announcement via the dashboard dial pad or IP phone keypad.
Creation Date/Time	Displays when the announcement was created.
Created By	Displays the extension that is to be considered the source of the announcement for CoS considerations.

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Table 83. Announcements Page Parameters (Continued)

Times to Play	Displays the number of times the announcement will play. This number can range from 0 through 10. *Note:* A setting of 0 results in the announcement playing continuously until it is manually stopped via the dashboard. *Note:* Announcements configured for continuous playback should not be used with the Facility Announcement feature.
Times Between Repeats (seconds)	Displays the time in seconds before replaying the announcement.
Play to Zone	Displays either **All Speakers** or a specific zone for this announcement to play. *Note:* If the **Type** for the station is set to **Admin Web Interface**, **Admin Phone**, **IP Phone**, **Analog Phone**, or **Mobile Device** and an **Announcement Zone** was set for the station, the **Announcement Zone** overrides the **Play to Zone**.
Description	Provides a description of the announcement. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Playback	Allows you to manually play the announcement. Selecting the **Menu** icon and then the down arrow in this field also allows you to download and save the announcement.

Editing Announcements

From the Edit Announcement page, you can edit an audio file's parameters such as times to play.

To edit an announcement:

1   On the navigation bar, expand **Audio**.

2   Select **Announcements**.

3   On the Announcements page, select the **Edit** icon next to the announcement that you want to edit.

4   Make the desired changes.

5   Select **Save**.

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Table 84. Edit Announcement Page Parameters

Name	Displays the user provided name of the announcement file.
	Note: Valid characters include uppercase letters (A-Z), low-ercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Indicates if the announcement is a **Normal** or an **Emergency** announcement.
DTMF Code	DTMF code for this announcement to use when manually starting the announcement from an Admin Phone. The number can have from 1 to 10 digits. You cannot assign the same DTMF code to multiple announcements.
	Note: When you record an announcement by dialing *990 or by selecting **Record Announcement** on the Admin phone's **Announce** menu, the initial DTMF Code for the recorded and saved announcement will be set to the announcement's row ID. You can change the DTMF Code after the announcement is saved by editing the announcement in the web interface **Announcements** view.
	The saved announcement has **Play to Zone** set to blank (no zone selected). This means that when you play an announcement via an IP phone **Announcement** menu selection, you will be asked to enter a zone number (where 0 = All Speakers). You can define a permanent zone number for the saved announcement by updating **Play to Zone** after the recorded announcement has been saved.
Created By	Displays the number for the station used to create or download the announcement.
	Note: This field cannot be edited.
Times to Play	Select the number of times the announcement will play. Parameters are between 0 and 10.
	Note: A setting of 0 results in the playing continuously until it is manually stopped via the dashboard.
	Note: Announcements configured for continuous playback should not be used with the Facility Announcement feature.
Times Between Repeats (seconds)	Select the time in seconds between replaying of the announcement. You can select between 0.5 and 5.0 in 0.5 increments.

Table 84. Edit Announcement Page Parameters (Continued)

Play to Zone Select either **All Speakers** or a specific zone for this announcement to play. You can leave this field blank if you want the Nyquist server to prompt for a zone number to use whenever an announcement is started from an IP phone. This will allow callers to direct the announcement to any zone desired at the time it is played.

Note: If the **Type** for the station is set to **Admin Web Interface**, **Admin Phone**, **IP Phone**, **Analog Phone**, or **Mobile Device** and an **Announcement Zone** was set for the station, the **Announcement Zone** overrides the **Play to Zone**.

Description Provides a description of the announcement.

Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.

Deleting an Announcement

Note: You cannot delete an announcement that is used in a routine with an **Announcement** action **Type** (see *"Understanding Action Parameters" on page 414*).

To delete an announcement that is associated with a schedule, you must delete the schedule announcement first and then delete the announcement. To delete the schedule announcement, see *"Using the Schedule Announcement Feature" on page 247*.

To delete an announcement:

1 On the navigation bar, expand **Audio**.

2 Select **Announcements**.

3 On the Announcements page, select the **Delete** icon next to the announcement that you want to delete.

4 When prompted, select **Delete**.

Creating Temporary Announcements from Routines

It is also possible to create and play an Announcement within a Routine. These announcements are known as Temporary Announcements because they are transient announcements that do not persist and are only usable within that Routine.

Creating a temporary announcement is quite simple. Within the Actions of a Routine, simply include three or more actions in the following sequence:

1 One **New-Announcement** action. This indicates the beginning of a temporary announcement.

2 One or more **Add-Announcement-Audio** actions. These actions specify the audio to be included in the announcement. Each one specifies one of the following Audio Source Types and the corresponding information:

Table 85. Add-Announcement-Audio audio sources

Announcement	Specifies a predefined Announcement (see "*Viewing Announcements" on page 296*).
Number	Specifies a number to be spoken. This includes whether to pronounce the number one digit at a time (e.g., a phone number) or as a number (e.g., a temperature) and whether or not to pronounce the fractional part of the number (i.e, to the right of the decimal point).
Text-to-Speech	Specifies the text to be spoken using text-to-speech (TTS) technology. This text can optionally include SSML formatting (see "*Using SSML for Text-to-Speech Entries" on page 292*).

3 One **Play-Announcement** action. This is the action that will actually pronounce the announcement.

4 To pronounce several announcements, the previous steps can be repeated multiple times within the same Routine.
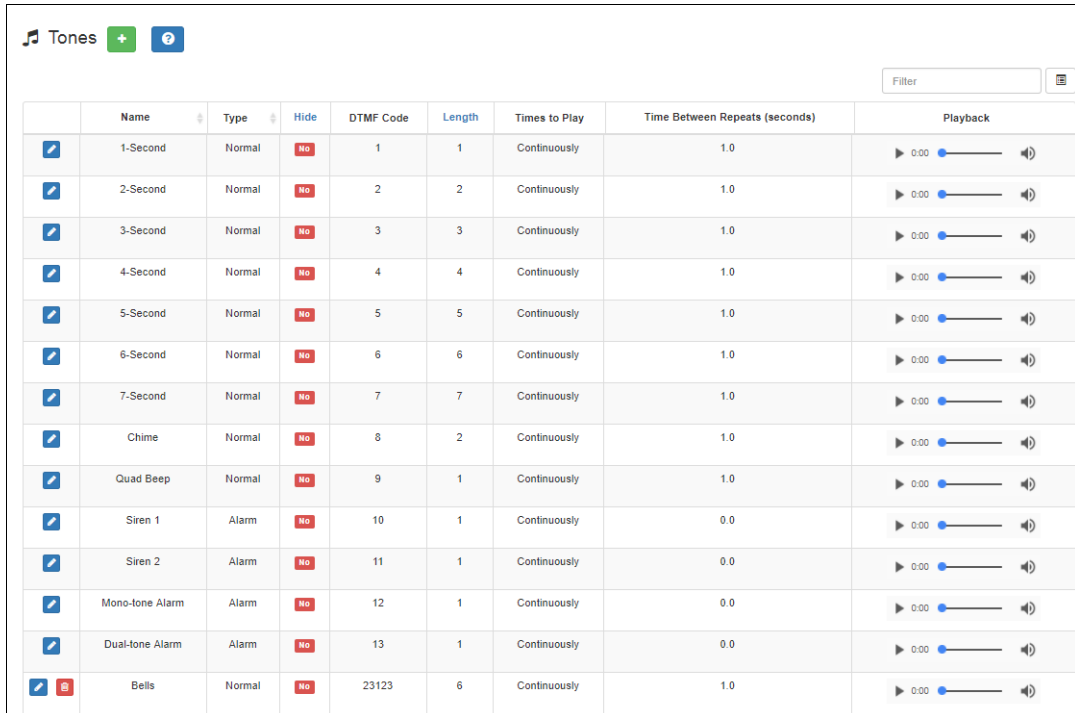
For further details on these Announcement action types, see *Table 108, "Action Types and Parameters," on page 415*.

Managing Tones

Nyquist provides tones that can be used with events, such as schedules, or as audio indicators, such as alarms. You can also download and generate customized tones or select to use a line input channel as the tone source. Default tones include white noise and pink noise that you can use to tune paging volumes for time-based zones. (See "*Tuning Volume with White or Pink Noise" on page 327*.)

Viewing Available Tones

Through the Tones page, you can view a list of available tones, delete user-provided tones, or select to add or edit a tone. You cannot delete a default tone, but you can prevent it from being viewed on the dashboard or on Admin Phones that have a tones/alarms menu. A hidden tone still appears on the Tones page.

Figure 119. Tones Page

To view tones:

1   On the navigation bar, expand **Audio**.

2   Select **Tones**.

The following table describes the tones parameters that appear.

Table 86. Tones Page Parameters

Name	Provides a name for the announcement file.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Displays the tone type as Normal or Alarm.
Hide	Specifies if the tone should be hidden from the dashboard view or Admin Phone menu.
DTMF Code	Provides the DTMF code used with manual dial pad announcement or tone activation.
Length	Time in seconds that the tone plays.
Times to Play	Displays the number of times the tone plays. Parameters are 0 to 10.
	Note: A setting of 0 results in the tone playing continuously until it is manually stopped via the dashboard.
Time Between Repeats (seconds)	Displays the time in seconds before the tone is replayed. You can select between 0.5 and 5.0 in 0.5 increments.
Playback	Allows you to manually play the tone. Selecting the **Menu** icon in this field also allows you to download and save the announcement.
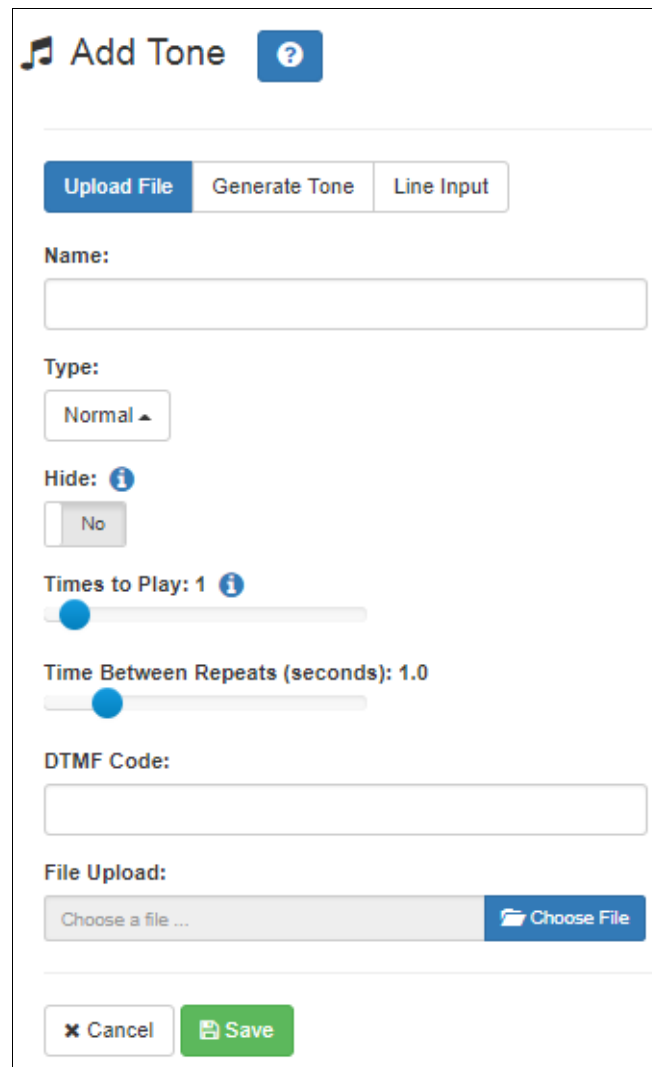
Adding Tones

Nyquist provides three ways of adding a tone:

- Uploading a file that is located on your network, local computer, or removable media, such as a Flash drive (see "*Uploading Tones" on page 303*).

- Generating a one frequency tone that can be saved (see "*Generating Tones" on page 304*).

- Using a line input channel from a two-channel or four-channel audio power amplifier or MMPA which will provide a real-time tone (see "*Using Line Input for Tones" on page 307*).

In each scenario, you are adding a tone to your Nyquist system that can be used later via either a schedule (see "*Understanding Event Settings" on page 238*) or manual tone activation (see "*Managing Tones via the Dashboard" on page 352*).

Uploading Tones

Figure 120. Add Tone – Upload File

To upload a tone:

1 On the navigation bar, expand **Audio**.

2 Select **Tones**.

3 On the Tones page, select the **Add** icon.

4 On the Add Tone page, ensure **Upload File** is selected.

5 Complete the parameters.

6 Select **Save**.

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Table 87. Add Tone Page Parameters (Upload)

Name	Provide a name for this tone. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Use the drop-down menu to select if the tone is **Normal** or **Alarm**.
Hide	Specify if the tone is to be hidden or displayed on the dashboard view.
Times to Play	Select the number of times the tone will play. Parameters are 0 through 10. *Note:* A setting of 0 results in the tone playing continuously until it is manually stopped via the dashboard.
Time Between Repeats (Seconds)	Select the time in seconds between replaying of the tone. You can select between 0.5 and 5.0 in 0.5 increments.
DTMF Code	Provide the DTMF code used when manually activating the tone via dashboard dial pad or IP phone keypad.
File Upload	Select **Choose File**, navigate to the audio file, and then select the file.

Generating Tones

Generating a one frequency tone is another way add a tone if you do not want to use the default tones and do not have a way to upload a tone from a network or removable media location.

Figure 121. Add Tone – Generate Tone

To generate a tone:

1 On the navigation bar, expand **Audio**.

2 Select **Tones**.

3 On the Tones page, select the **Add** icon.

4 On the Add Tone page, select **Generate Tone**.

5 Complete the parameters.

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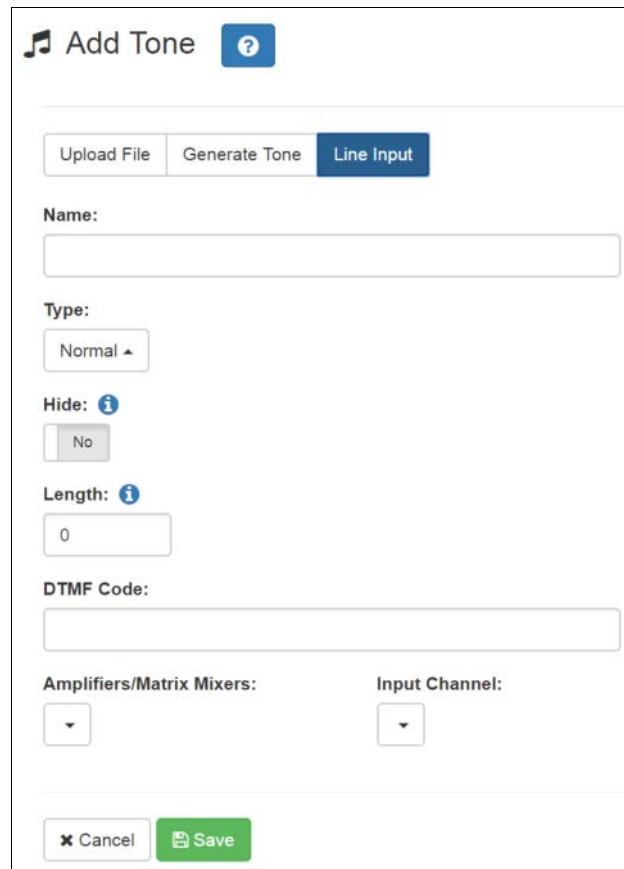
6 Select **Save**.

Table 88. Add Tone Page Parameters (Generate)

Name	Provide a name for this tone.
	Note: Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Select if the announcement to follow is a normal or an emergency announcement.
Hide	Specify if the tone is to be hidden or displayed on the dashboard view.
Frequency (Hz)	Enter the frequency for the tone. You can select a frequency from 300 to 2000 Hz.
Duration (seconds)	Enter the time in seconds that the tone is to play.
Times to Play	Select the number of times the file will play. Parameters are 0 through 10.
	Note: A setting of 0 results in the file playing continuously until it is manually stopped via the dashboard.
Time Between Repeats (seconds)	Select the time in seconds between replaying of the file. You can select between 0.5 and 5.0 in 0.5 increments.
DTMF Code	Provide the DTMF code used when manually activating the tone via dashboard dial pad or IP phone keypad.

Using Line Input for Tones

Selecting Line Input from the Add Tone page allows you to select a two-channel or four-channel audio power amplifier or MMPA channel to use as a real-time source for a tone.

Figure 122. Add Tone – Line Input

To add a line input tone:

1 On the navigation bar, expand **Audio**.

2 Select **Tones**.

3 On the Tones page, select the **Add** icon.

4 On the Add Tone page, select **Line Input**.

5 Complete the parameters.

6 Select **Save**.

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Table 89. Add Tone Page Parameters (Line Input)

Name	Provide a name for this tone. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Select if the announcement to follow is a normal or an emergency announcement.
Hide	Specify if the tone is to be hidden or displayed on the dashboard view.
Length	Enter the number of seconds for the tone to play. The length can range from 0 to 999999. *Note:* A setting of 0 results in the file playing continuously until it is manually stopped via the dashboard.
DTMF Code	Provide the DTMF code used when manually activating the tone via dashboard dial pad or IP phone keypad.
Amplifiers/Matrix Mixers	Use the drop-down menu to select the two-channel or four-channel audio power amplifier or MMPA and its associated station number.
Input Channel	Specify the matrix channel being used for input.

Editing Tones

You can edit parameters of existing tones, but which parameters can be changed depends on whether the tone is a default tone or a user added tone. For example, you cannot change the **Name** for a default tone, but you can change that parameter for a tone that you added. Some parameters appear only for Line Input tones.
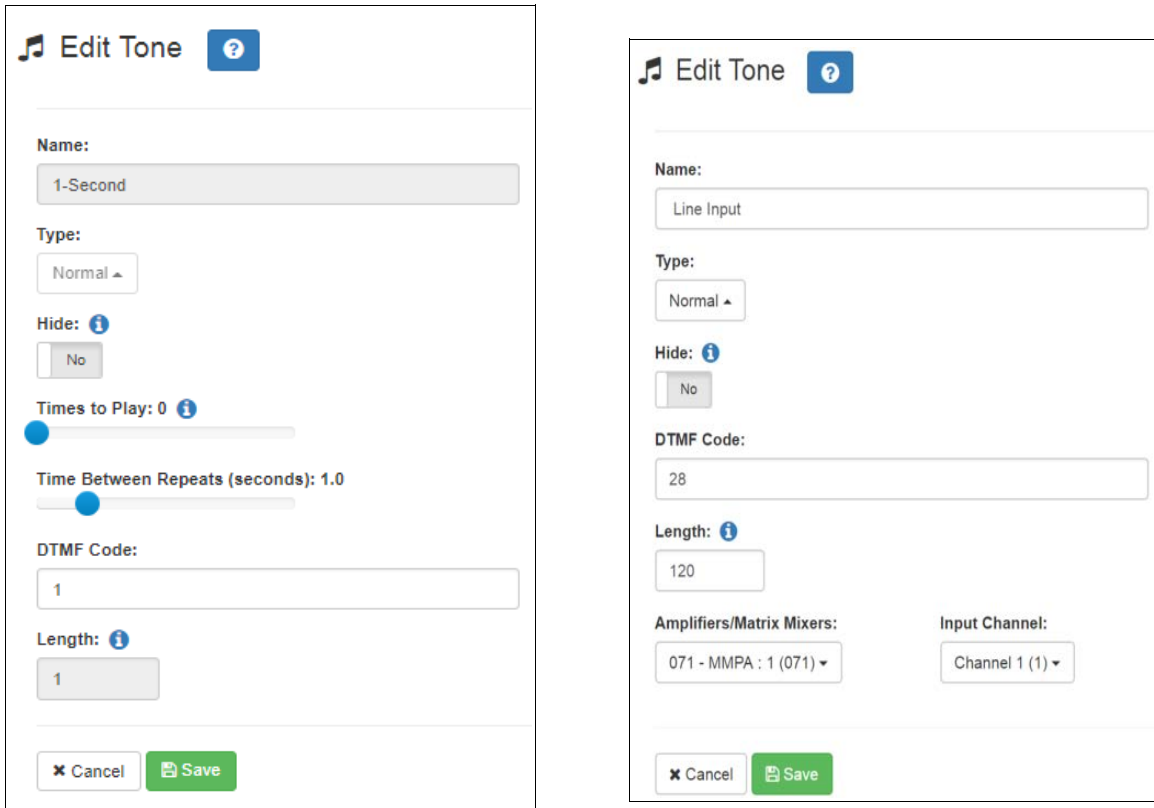
Figure 123. Edit Tone Pages

To edit a tone:

1 On the navigation bar, expand **Audio**.

2 Select **Tones**.

3 On the Tones page, select the **Edit** icon.

4 On the Edit Tone page, make changes to the parameters.

5 After completing all changes, select **Save**.

Table 90. Edit Tone Page Parameters

Name	Displays the name for this tone. *Note:* This parameter cannot be changed for default system Tones. *Note:* Valid characters include uppercase letters (A-Z), lowercase letters (a-z), numerals (0-9), space, and the following special characters: **!@$*?-.,**.
Type	Use the drop-down menu to select if the tone is Normal or Alarm.
Hide	Specifies if the tone is to be hidden from the dashboard view.
Times to Play	Displays the number of times the tone will play. Parameters are 0 through 10. *Note:* A setting of 0 results in the tone playing continuously until it is manually stopped via the dashboard. This parameter does not appear for Line Input tones.
Time Between Repeats (second)	Displays the time in seconds between replaying of the tone. You can select between 0.5 and 5.0 in 0.5 increments. *Note:* This parameter does not appear for Line Input tones.
DTMF Code	Provides the DTMF code used when manually activating the tone via dashboard dial pad or IP phone keypad.
Length	Provides the length of the tone. *Note:* This parameter cannot be changed except for Line Input tones.
File Upload	Select **Choose File**, navigate to the audio file, and then select the file if you want to choose a new file. *Note:* This parameter appears only for user-provided tones but not for Line Input tones.
Amplifiers/Matrix Mixers	Specifies the two-channel or four-channel audio power amplifier or MMPA and its associated station number. *Note:* This parameter appears only for Line Input tones.
Input Channel	Specifies the matrix channel being used for input. *Note:* This parameter appears only for Line Input tones.

Deleting a Tone

> *Note:* You cannot delete a tone that is used in a routine with a **tone** action **Type** or if the tone is used as an alarm in an **Alarm** action **Type** (see "*Understanding Action Parameters" on page 414*).

You can only delete user-added tones.

To delete a tone:

1   On the navigation bar, expand **Audio**.

2   Select **Tones.**

3   On the Tones page, select the **Delete** icon next to the tone that you want to delete.

4   When prompted, select **Delete**.

Tone Operational Notes and Limitations

- The system supports a single Manual tone playing at a time. If a tone is already playing (regardless of destination), a caller that attempts to start a second manual tone will receive a busy signal.

- If a specific zone is not specified, the tone will play to all Time type zones. In this case, if a queued page is playing in a Time type zone, the queued page will be stopped and re-queued.

- If a specific zone is specified, the tone will play to the specified zone. In this case, if a queued page is playing in the specified zone, the queued page will be stopped and re-queued. If queued pages are playing in time type zones not equal to the specified zone, those queued pages will continue to play, along with the manual tone to the specified zone.

- If a specific zone is specified, the dashboard message will use the following format:

  Tone (<station_extension> -> <zone_name>): <tone_name>

  For example:

  Tone (100 -> Library): Chime

- Routine triggers that use the tone trigger type do not include a zone filter, thus tone based routine triggers are activated whenever a tone is played to any zone.

- Specifying a zone to manually play a tone is not supported by Nyquist I/O Controller Rules. If you need to direct a manual tone to a specific zone in response to an I/O Controller input closure, use a routine for that purpose. The routine should trigger based on the I/O controller input closure, and include an action to start the manual tone to a specified zone.

Managing Recordings

If your Nyquist systems allow call recording and one or more stations have been configured for recording telephone calls, then you can manage these recordings through Nyquist's audio file management feature.

For more information about configuring Nyquist for call recording, see "*Using the Edit System Parameters Page" on page 54*. For information about configuring a station for call recording, see *Table 34, "Station Configuration Page Parameters," on page 129*.

Through the audio file management feature, you can playback an individual call, delete selected recordings, or delete all recordings.
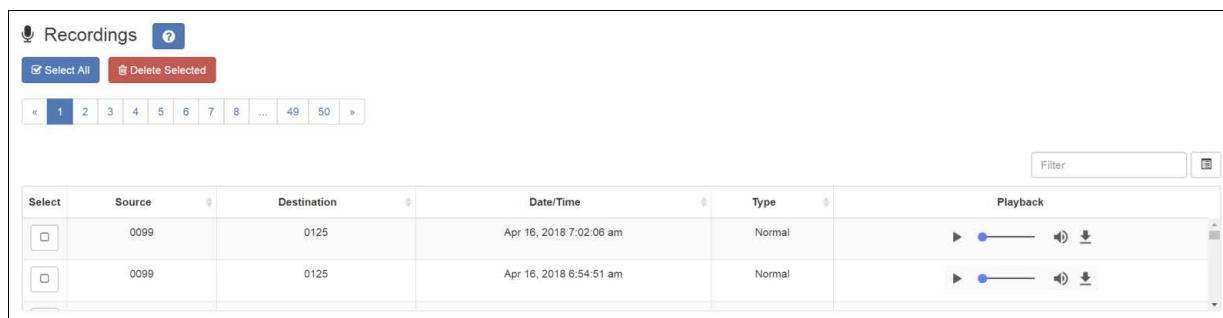
Figure 124. Recordings Page

To manage recordings:

1   On the navigation bar, expand **Audio**.

2   Select **Recordings**.

3   To playback a call, select the **Play** button in the Playback column for the call that you want to hear.

4   To delete a selected call or multiple calls, select the check box in the Select column for each call that you want to delete, and then select **Delete Selected**.

5   To delete all calls, select **Select All**, and then select **Delete Selected**.

The Recordings page provides the following information for recorded calls:

Table 91. Recordings Page Parameters

Select	Allows you to use the check box to select a call for deletion.
Source	Identifies the extension or number that placed the call.
Destination	Identifies the extension that received the call.

Table 91. Recordings Page Parameters (Continued)

Date/Time	Identifies the date and time that the call was received.
Type	Identifies the type of call, such as Normal.
Playback	Allows you to play the recording.

Maintenance and Troubleshooting

This section provides detail instructions on several of the Nyquist features that are designed to help maintain and troubleshoot your system.

Backing Up Your Nyquist System and Files

You can create a full system backup of all configuration settings, back up only voice mail files, or back up only recordings. You can also schedule an automatic full system backup. Information backed up during a full system backup includes any custom alarm, tones, announcements, and music files. Phone calls and location recordings are not backed up.

You should do a system backup after a change is made to system programming, includ-ing station and zone configuration. You should also do a system backup before updating your system to a new Nyquist release.

You can set retention periods for each type of backup. (See "*Setting System Parameters" on page 54*.)

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Viewing System Backup Files

The System Backup/Restore page allows you to see all backup files available for restore.
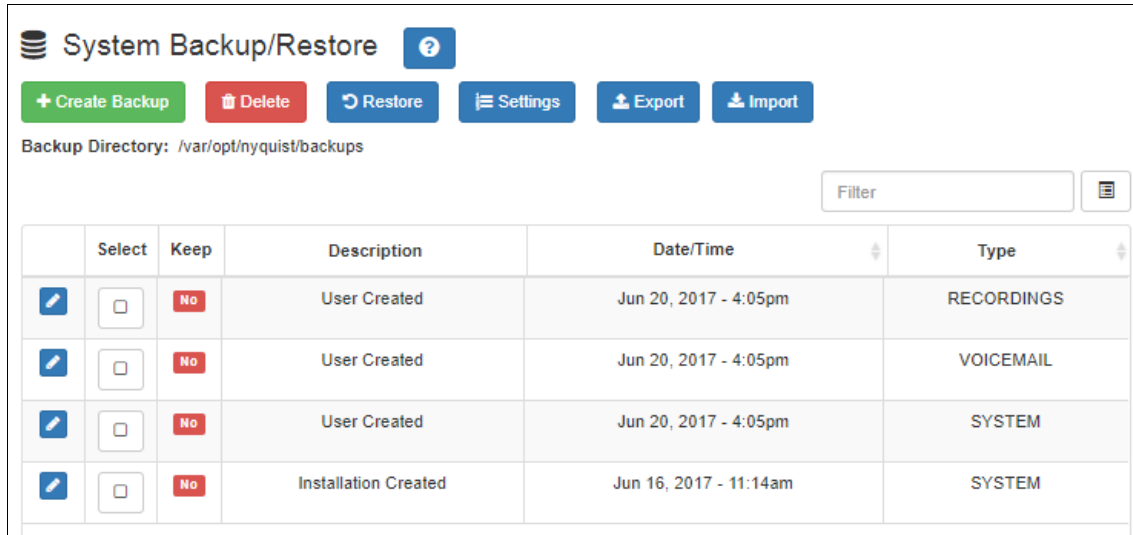
Figure 125. System Backup/Restore Page

To view system backup files:

On the navigation bar, select **System Backup/Restore**.

The following table describes the information that appears for each file:

Table 92. Viewing Backup File Data

Select	Indicates if the file has been selected for restore, export, edit, or delete.
Keep	Indicates if the backup file is to be kept even if older than the retention period. See *"Using the Edit System Parameters Page" on page 54* for information about setting retention periods of for system, recordings, or voicemail backups.
Description	Indicates if the backup was created by Nyquist or the user.
Date/Time	Provides the month, day, year, and time that the job was created.
Type	Indicates what data was backed up. Options are System, Recordings, and Voicemail.

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Creating a Backup File

You can manually create a backup of all system files, voicemail files, or recordings.

Figure 126. Create Backup Page

To create a backup file:

1 On the navigation bar, select **System Backup/Restore**.

2 On the System Backup/Restore page, select **Create Backup**.

3 On the Create Backup popup window, select one of the following options:

- System
- Voicemail
- Recordings

The new backup file appears in the System Backup/Restore list.

Deleting a Backup File

You can delete a single backup file or select to delete multiple backup files. By default, Nyquist does not automatically purge a backup file, even if the file has passed its retention period (see "*Using the Edit System Parameters Page" on page 54*). However, you can select to delete any files; the system will warn you if you select to delete a file marked to keep.

To delete a backup file:

1 On the navigation bar, select **System Backup/Restore**.

2 On the System Backup/Restore page, select the backup file or files that you want to delete.

3 Select **Delete**.

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4 When prompted, select **Delete**.

Editing System Backup/Restore Information

You can edit the description of user, system, and installation created backup or restore files.

Figure 127. Edit System Backup/Restore Page

To edit the file's description:

1 On the navigation bar, select **System Backup/Restore**.

2 On the System Backup/Restore page, select the **Edit** icon next to the desired file.

3 Edit the description.

4 Select **Save**.

Table 93. Edit System Backup/Restore Parameters

Type
Displays the file type, such as **FULL** for a full backup. This parameter cannot be edited.

Date/Time
Displays the date and time that the file was created. This parameter cannot be edited.

Keep
Select **Yes** if you want to have Nyquist keep the file even if the retention period has expired. Nyquist keep at least one backup file even if the retention period has expired.

Description
Provides a system or user provided description. By default, the description is **User Created** for user created backup or restore files, **System Created** for backups automatically created based on specified settings, or **Installation Created** for backups created via the installation process

Editing Backup Settings

Backup settings allow you to schedule an automatic backup and set specific backup parameters for system backups, including the backup directory where the files will be stored.

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Figure 128. Edit Backup Settings Page

To edit backup settings:

1   On the navigation bar, select **System Backup/Restore**.

2   On the System Backup/Restore page, select **Settings**.

3   Make desired changes.

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4 Select **Save**.

Table 94. Backup Settings Page Parameters

Backup Directory	Displays current path for backup file.
New Backup Directory	Enter new path for backup file, if applicable.
Auto Backup	Indicates if the backup is to be automatically generated.
Minute	Specifies the minute the backup job runs. If you do not select a minute, the system defaults to 0.
Hour	Specifies the hour that the backup job runs. Selections are formatted with the hour and either am or pm. The default setting is 1 am.
Day	Specifies the day of the month that the backup job runs. The system defaults to every day.
Month	Specifies the month the job is to run. The system defaults to every month.
Day of the Week	Specifies the day of the week that the job is to run. The system defaults to every day.

Exporting a Backup File

You can export a backup file as a .gz file, which can be stored on the Admin Station or downloaded to removable media, such as a thumb drive, to be stored off site.

To export a backup file:

1 On the navigation bar, select **System Backup/Restore**.

2 On the System Backup/Restore page, select the backup file that you want to export.

3 Select **Export**.

Once saved, an **Excel** icon with the downloaded report name appears in the lower left section of the Windows or MAC OS X web browser window, giving you the option to open the report. For Android devices, files are automatically downloaded and saved to the device's Download folder.

Restoring a Backup File

You can restore the facility configuration to that saved during a system backup. You can also restore voicemail or recordings backups.

> *Note:* System backups created by older versions of the Nyquist software are only compatible with the same Nyquist release or with Nyquist releases greater than C4000 release 3.0.0. This means that system backups created prior to release 3.0.0 can be restored on Nyquist systems currently running release 3.0.0 or greater. When a system backup from a previous release is used, the system backup configuration data will automatically be upgraded to the new release.

To restore a file:

1   On the navigation bar, select **System Backup/Restore**.

2   On the System Backup/Restore page, select the backup file that you want to restore.

3   Select **Restore**.

4   When prompted, select **Restore**.

A dialog box appears notifying you that the restore is in progress. If the restore dialog box disappears and a login screen appears, log back into the system.

When the restore is completed, a new message appears on the dashboard to indicate the restore is completed.

Importing a Backup File

You can import a backup file that was previously exported. You can then select to restore this file.
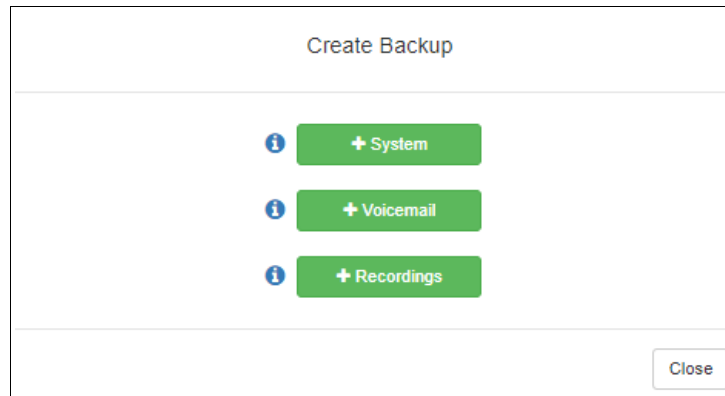
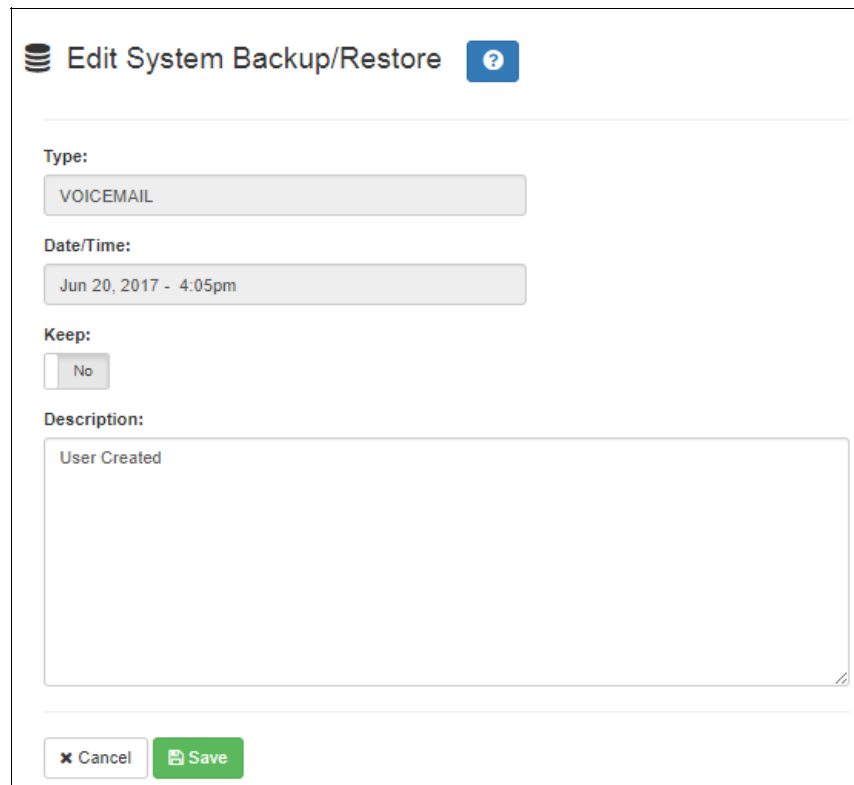*To import a backup file:*

1   On the navigation bar, select **System Backup/Restore**.

2   On the System Backup/Restore page, select **Import**.

3   Select **Choose file**, and then navigate to the backup file that you want to import.

4   Select **Open**.

5   Select **Import**.

Using System Log Files

A log file records either events or messages that occur when software runs and is used when troubleshooting the system. The following parts of the Nyquist system generate log files:

- Server (This provides access to the Debian Linux OS server log files.)
- Nyquist C4000 (This provides access to the Nyquist application log files.)
- Web Server (This provides access to the web server log files.)

From the web-based UI, system logs can be viewed directly or exported via download to your PC, Mac, or Android device and then copied to removable media or attached to an email to technical support.

Table 95. System Logs

File	Description
Server	
mysql.log	Contains a general record of what mysql is doing (connect, disconnect, queries).
btmp	Contains information about failed login attempts.
auth.log	Contains system authorization information, including user logins and authentication methods that were used.
messages	Contains global system messages, including the messages that are logged during system startup. Items logged in the messages file include cron, daemon, kern, auth, and so on.
debug	Contains errors and debug information.
daemon.log	Contains information logged by the various background daemons that run on the system.
alternatives.log	Contains information by the update-alternatives, which maintain symbolic s determining default commands.
mysql.err	Contains a record of mysql errors that occur when the server is running.
dpkg.log	Contains information that is logged when a package is installed or removed using dpkg command.

Table 95. System Logs (Continued)

File	Description
dmesg	Contains kernel ring buffer information. When the system boots up, the screen displays information about the hardware devices that the kernel detects during the boot process. These messages are available in the kernel ring buffer, and whenever a new message comes, the old message gets overwritten.
user.log	Contains information about all user level logs.
fontconfig.log	Logs use of fontconfig program to configure or substitute fonts to other programs.
kern.log	Contains information logged by the kernel and recent login information for all users.
syslog	Contains list of errors that occur when the server is running and server start and stop records.
lastlog	Contains information on the last login of each user.
aptitude	Records information about packages installed or upgraded on the server.
faillog	Contains user failed login attempts.
wtmp	Contains historical record of users logins at which terminals, logouts, system events, and current status of the system, and system boot time
Nyquist C4000	
checkin	Contains historical record of actions that occurred during a Check-In. (See "*Check-In Log and Call Detail Records" on page 475*.)
messages	Contains messages generated by Nyquist.
nyquist_af_alerts.log	Contains Automatic Failover alerts, used by Technical Support to help diagnose any issues.
nyquist_af_status.log	Contains Automatic Failover status updates, which includes all server state transitions that have been performed (e.g., Secondary becomes Master, Primary placed into Standby mode, etc.).
nyquist_af_setup.log	Contains Automatic Failover setup information, used by Technical Support to help diagnose any issues.

Table 95. System Logs (Continued)

File	Description
api_log	Contains a record of all commands received from 3rd-party systems to the Routines API.
Web Server	
error.log	Contains information about errors that the web server encountered when processing requests, such as when files are missing.
other_vhosts_access.log	Contains access records for vhosts that don't define their own logfiles.
access.log	Contains access records for the web server.

Viewing System Log Files

You can view a specific log for the Linux server, Nyquist server, or web server.
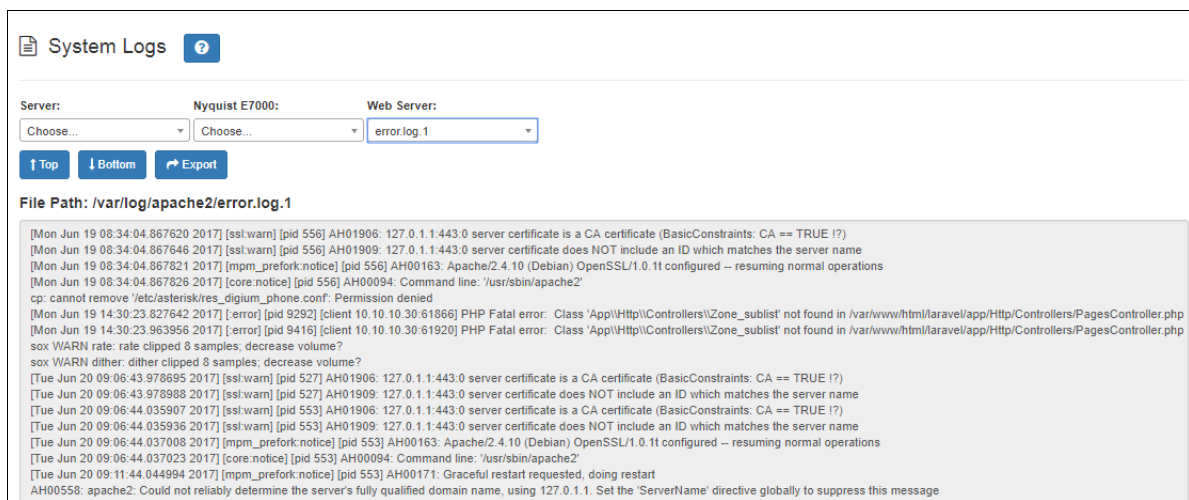
Figure 129. System Logs

To view a log file:

1 On the navigation bar, select **System Logs**.

2 Use the drop-down menu of the desired server to select the specific log file that you want to view.

The file path and contents appear on the System Logs page.

Exporting a Log File

To export a log file:
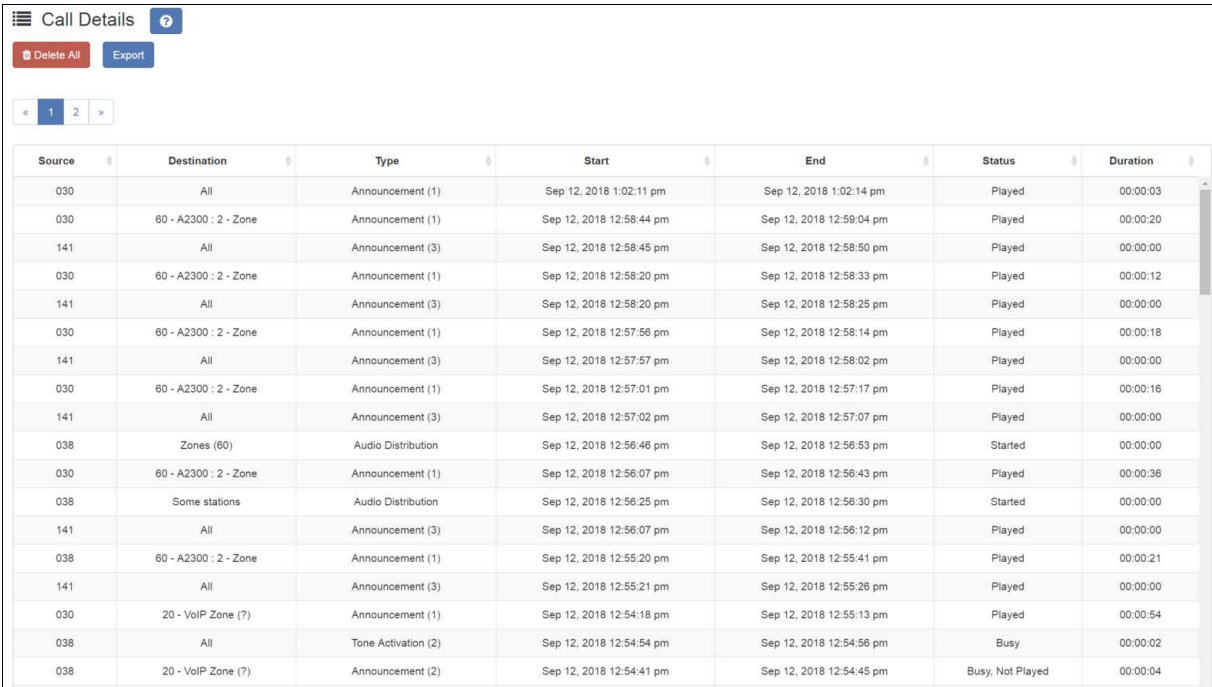
1 On the navigation bar, select **System Logs**.

2 Use the drop-down menu of the desired server to select the log file that you want to export.

3 Select **Export**.

When the Save As dialog box appears, you can select where to download or save the log file.

Once saved, an **Excel** icon with the downloaded report name appears in the lower left section of the Windows or MAC OS X web browser window, giving you the option to open the report. (See *"Exporting a Report" on page 29*.) For Android devices, files are automatically downloaded and saved to the device's Download folder.

Using the Call Details Feature

The Call Details feature allows you to view or print detail records of every call in a facility in a call log format. Calls include scheduled announcements, paging, and internally and externally made or received telephone calls.

Figure 130. Call Details Page

Viewing Call Detail Records

To view the call detail records for the facility:

On the navigation bar, select **Call Details**.

The following table describes the Call Details parameters:

Table 96. Call Details Page Parameters

Source	Provides the extension where the call originated or the station that recorded a page for page queuing.
Destination	Provides either the extension to which the call was directed, or the target zone or facilities of the page or announcement. A **Destination** of **None entered** means that an invalid zone was entered, while **All** means all stations were targeted.
Type	Provides the type of call, such as Emergency Call, Admin Call, Announcement, and so on.
Start	Provides the date and time that the call began.
End	Provides the date and time that the call ended.
Status	Provides information about whether the call was answered or not answered. For queued pages, the status could be: • **Played** – Page was successfully recorded and was played to the specified zone. • **Queued** – Page was successfully recorded and is queued for playing to the specified zone. • **Not Recorded** – Either zone was not defined or the user hung up without pressing # after the recording. • **Timed Out** – Page timed out and was not saved either because there was more than 60 seconds of silence or because the recording exceeded 60 minutes in length. • **Requeued** – Page message was interrupted while being played and was returned to the queue.
Duration	Provides the number of hours, minutes, and seconds that the call lasted.

Exporting and Printing a Call Log

To export and print a call details report:

1 On the navigation bar, select **Call Details**.

2 Select **Export**.

When the Save As dialog box appears, you can name the report and select where the report is to be downloaded or saved. The default name is call_details_(date in the yyyymmddhhhmmss format).csv.

3 On the lower left of the page, select the Excel spreadsheet.

4 On the Excel spreadsheet, select **Page Layout** and set the desired parameters.

5 Select **File**, and then select **Print**.

For more Excel parameters, refer to the Microsoft documentation or Microsoft Help.

Deleting All Call Records

To delete all call detail records:

1 On the navigation bar, select **Call Details**.

2 Select **Delete All**.

3 When prompted, select **Delete**.

Tuning Volume with White or Pink Noise

Nyquist provides white noise and pink noise files to help tune, or adjust, the volume of speakers in a zone.

White noise has equal energy for each frequency that the human ear can hear. Pink noise sounds less harsh than white noise because humans hear in octaves (the doubling of a frequency band). The energy in pink noise decreases by half as the frequency doubles, making the noise sound more balanced.

Both white and pink noise files are provided by default in Nyquist as both tones and songs. You can use the tone files as a tone generator to help adjust volume and frequency for pages in time-based zones. You can use the song files to help adjust volume and frequency in audio zones that play audio distribution.

Remember that when creating, editing, or viewing a zone, the **Type** identifies the zone as being able to receive paging, time, audio, or a combination of paging, time, or audio. (See *"Viewing Zone Information" on page 194*.)

To start a white noise or pink noise file as a tone, follow the steps listed in *"Managing Tones via the Dashboard" on page 352*, selecting either the White Noise or Pink Noise file.

To play a white noise or pink noise file to a zone that plays audio distribution, first create a playlist that contains the white or pink noise song (see *"Creating a Playlist" on page 265*)

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and then follow the steps listed in *"Using Audio Distribution" on page 360* to start the audio distribution.

If the zone can receive a combination of paging, time, and audio, you should use both the tone files and the song files to tune the speaker volume.

Troubleshooting Common Issues

The following table provides some possible causes and solutions for common Nyquist issues.

Table 97. Common Issues

Issue	Possible Cause	Possible Solution
This station is not connected to the server.	The Bogen root certificate has not been installed correctly, or the browser has not refreshed the certificate information.	Follow the instructions for installing the Bogen certificate (see *"Client Requirements" on page 9*). If the certificate has already been installed, use Ctrl+Shift+Del, clear the "Cookies and other site data," and retry. The browser may need to be restarted. *Note:* Accessing the application from an incognito browser session may provide more accurate validation of certificate issues.
Day calls are not being routed to the proper Admin Station.	The system parameters that affect day calls being routed to an Admin Station may be incorrectly set.	On the navigation bar, select **System Parameters**, and then review the Day Start time. If the time is not properly set to when the Admin Station should receive the day calls, select the **Edit** icon and enter the correct time for Day Start.

Table 97. Common Issues (Continued)

Issue	Possible Cause	Possible Solution
Night calls are not being routed to the proper Admin Station.	The system parameters that affect night calls being routed to an Admin Station may be incorrectly set.	On the navigation bar, select **System Parameters**, and then review the Night Start time. If the time is not properly set to when the Admin Station should receive the day calls, select the **Edit** icon and enter the correct time for Night Start.
The Nyquist server is not getting the correct date and time.	Either the Network Time Server being used is incorrect or the server date and time is incorrect.	On the navigation bar, select **System Parameters**, and then review the parameters set for the NTP server and for the server date/time. Select the **Edit** icon and make any necessary changes.
An extension is not able to initiate non-emergency calls during the day.	The station may not have the correct CoS assigned to allow Normal+Emergency calls.	On the navigation bar, select **CoS Configuration**. Note which configurations allow a Call in Level of Normal+Emergency. Next, select **Stations**, navigate to the station's extension number, and then use the slider to determine what the station's Day CoS is. If the station's Day CoS does not allow the correct Call in Level, select the **Edit** icon, and then select a CoS configuration that has the correct Call in Level.

Table 97. Common Issues (Continued)

Issue	Possible Cause	Possible Solution
The station is not receiving Audio Distribution.	The station is on the Paging Exclusion list.	Remove the station from the Paging Exclusion list. (See "*Excluding Stations from Paging*" on page 188.)
	The station is not a member of audio distribution zone.	Add the station to an audio distribution zone. (See "*Editing Zone Configuration*" on page 199.)
	The station's **Multicast Audio Distribution** parameter is disabled.	Enable the station's **Multicast Audio Distribution** parameter. (See "*Editing Station Configuration Settings*" on page 142.)
	Multicast IP packets are being blocked or not routed.	Ensure that multicast IP packets are flowing between the Nyquist server and Nyquist stations.
When the button on the DCS is touched, the DCS's LED changes from solid blue to solid green as if a normal call is being made. However, no call is made.	The DCS may be attached to a device that is not configured to support the **Digital Call Switch & Speaker** station **Type**.	Determine what **Device Type** the DCS is attached to and use the Stations list to determine if the **Type** is set as **Digital Call Switch & Speaker**. (See "*Viewing Station Configuration Settings*" on page 128.)

Dashboard Messages

The Admin web UI dashboard and the Admin Phone display error, warning, and information messages during Nyquist operations. Error and warning messages include notices that an operation failed and information about why the failure occurred. You can delete these messages using the Delete icon (if shown), but you may want to note the error and pass the information about the error to system administrator or information technology personnel.

Informational messages often provide status about an operation or condition and are usually cleared automatically when an operation completes. The following table describes the informational messages that may appear:

Table 98. Dashboard Informational Messages

Message	Meaning
Alarm active (<extension>): <alarm-name>	The listed extension is starting an alarm.
Tone active (<extension>): <tone-name>	The listed extension is starting a tone.
Page active (<extension>): Zone: <zone-number> - <zone-name>	The listed extension is starting a page for the listed zone.
Announcement active (<exten­sion>): <announcement-name>	The listed extension is starting the listed announcement.
Emergency Announcement active (<extension>): <e-announce­ment-name>	The listed extension is starting the listed emergency announcement.
All-Call active (<extension>)	The listed extension is starting an All-Call page.
Emergency All-Call (<extension>)	The listed extension is starting an Emergency All-Call page.
Scheduled Announcement active	A scheduled announcement is playing.
Multi-Site Emergency All-Call active (<extension>)	The listed extension is starting a multiple site Emergency All-Call page.
Multi-Site All-Call active (<exten­sion>)	The listed extension is starting a multiple site All-Call page.
Multi-Site Page [<site(s)>] (<exten­sion>)	The listed extension is starting a page for the listed site(s).

Table 98. Dashboard Informational Messages (Continued)

Message	Meaning
Multi-Facility Announcement (<announcement>) [<site(s)>] (<extension>)	The listed extension is starting the specified announcement DTMF code at the listed site(s).
Facility All-Call active (<extension>) -> <facility-name>	The listed extension is starting a facility-wide All-Call page.
Audio Distribution: Playing <song-name> to Zone (<zone-number(s)>)	The Audio Distribution feature is playing the listed song to the listed zone. The message may optionally include "and All Speakers" or "and selected stations."
Audio Enabled	Audio (paging, Scheduled Audio, audio distribution) is enabled. See "*Enabling and Disabling Audio" on page 364* for more information.
Audio Disabled	Audio (paging, Scheduled Audio, audio distribution) is disabled. See "*Enabling and Disabling Audio" on page 364* for more information.
System is running in demonstration mode	All Nyquist functions are enabled but the maximum station count is set to 6 and the maximum number of simultaneous calls is set to 2.

User-created messages set up for I/O Controller rules also appear on the dashboard. See "*Configuring I/O Controller Input Rules" on page 150* and "*Configuring I/O Controller Output Rules" on page 153* for additional information.

User-created messages set up by Routines also appear on the dashboard. See the Dash-Text command in *Table 108, "Action Types and Parameters," on page 415* for additional information.

911 Call Errors

The following errors may occur when an extension attempts to place a 911 call:

• Call to 911 from <extension> failed due to no outbound lines available.

• Call to 911 from <extension> failed due to no 911 access.

The first message means that all outbound lines from the facility are currently busy. To prevent this error from occurring, set the **Bump on 911** system parameter to **Yes**. (See "*Using the System Parameters Page" on page 20*.) You also want to ensure that outside line access is enabled. (See "*Editing Outside Lines" on page 112*.)

If the second error message appears, then the station, or extension, attempting to make the 911 call does not have the 911 Route parameter and Outside Access parameters correctly set. (See "*Editing Station Configuration Settings*" on page 142.)

Maximum Concurrent Call Error

If you reach your maximum concurrent call limit, the following error message appears:

Maximum concurrent calls reached. Contact Customer Service to increase maximum concurrent calls limit.

In this case, calls include telephone calls, pages, tones, alarms, and announcements.

To view the concurrent call limit set for your system:

1 From the navigation bar, select **System Parameters**.

2 Select **Product License**.
The **Maximum Concurrent Calls Limit** appears under **Licensing Information**.

The limit is based on your licensing set up and can only be changed by contacting Customer Service.

If you are using the Record Page feature, you must be below your concurrent calls limit by two calls for the page to play. Otherwise, the page remains in the queue.

Equipment Errors

The following table describes equipment error messages that may appear:

Table 99. Equipment Related Errors

Error	Cause
NOTICE: Server was restarted due to error. Contact Technical Support.	The server probably experienced a crash. Contact Technical Support to ensure that the crash did not cause any issues. Note that the server may also restart during an install or upgrade.
<date time> Extension <extension number> not available, check device status.	You may be experiencing connectivity issues that prevents the station from being registered with the Nyquist server. You may want to reboot the device to see if that takes care of the problem.

Table 99. Equipment Related Errors (Continued)

Line-Input busy (Matrix Mixer: <mixer extension>. Channel: <mixer channel number>.	You are attempting to use an input channel that is already in use.
WARNING: I/O Controller - <name> (<controller extension>) is Unavailable.	If it is listed as unavailable, the device is not registered with the Nyquist server.
WARNING: I/O Controller - <name> (<controller extension>) is Unknown.	The server is unable to determine the state of the device.
WARNING: I/O Controller - <name> (<controller extension>) is Unreachable.	The device is registered with the Nyquist server but cannot be reached (communication to device fails). This situation is probably due to a network or cable issue or the device is rebooting.

Facility Error Conditions

If you cannot reach a facility that is listed and enabled in the Facilities list, the following error messages appear on the Admin dashboard or the Bogen Admin IP phone:

- WARNING: Not registered with Facility: <Facility-Name>
- WARNING: Remote Facility not registered: <Facility-Name>
- WARNING: Remote facility not registered with this Facility: <Facility-Name>

Error messages also appear when multi-site and facility calls are initiated but cannot be completed due to issues with the remote facility.

To troubleshoot these error messages:

1 On the navigation bar, select **Facilities**.

2 Ensure the **Status** for the facility appears as **Enabled** and that the following facility parameters are correct:

3 Password

4 Name

5 Host (Host Name or IP address)

6 If parameters are incorrect, select the **Edit** icon for the facility and make the necessary changes. (See *"Editing a Facility" on page 125*.)

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In addition to performing the troubleshooting steps through the Nyquist Admin Web UI, do the following:

- Check for network issues (Local Area Network (LAN), Wide Area Network (WAN), VLAN, ports) that are preventing facility servers from communicating with each other.
- Ensure that you can access and operate the remote Nyquist facility server by logging on to the Admin Web UI for that server and attempting to initiate a call or page.

Automatic Failover Messages

There are a number of messages that will be shown on the Dashboard to reflect changes to the Automatic Failover status. Each will be prefixed with an icon, date, time, and "Automatic Failover - ".

Some messages will only be shown while the user is logged into a server by the Primary or Secondary IP address, while others are only shown when logged into the server by Master IP address.

Tip: When accessed via the Master IP address, the Operation Commands section of the Automatic Failover page provides a direct link to the Primary and Secondary servers,

Table 100. Automatic Failover Dashboard Messages

Message	Type	Server(s)
Lost contact with Primary node	Warning	Secondary Master
Lost contact with Secondary node	Warning	Primary Master
Ethernet Port-A network failure, Primary node not providing service	Warning	Primary
Ethernet Port-A network failure, Secondary node not available	Warning	Secondary
Primary node not providing service	Warning	Primary
Warning: Secondary node is starting service. Please contact technical support and avoid making configuration changes.	Warning	Secondary Master

Table 100. Automatic Failover Dashboard Messages

Message	Type	Server(s)
Warning: Secondary node is now providing service. Please contact technical support and avoid making configuration changes.	Warning	Secondary Master
Primary node is starting service	Information	Primary Master
Primary node is now providing service	Success	Primary Master
Secondary node is now in slave mode	Success	Secondary
Primary node is now in standby mode	Warning	Primary
Secondary node is now in standby mode	Warning	Secondary

Changing a System Controller's IP Address

If you need to change the IP address for the Nyquist System Controller, run the Setup Assistant to reconfigure network settings.

To change the System Controller's IP Address:

> **Warning**   **If your system is currently configured to use the Automatic Failover feature, you must first disable the Automatic Failover feature before you change the Server's IP address. After you change the Server's IP address, you will need to reconfigure the Automatic Failover feature.**

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1   Type `https://<ip-address>/setup/network` in the web browser's address bar. If you are configuring the System Controller for the first time, replace **<ip-address>** with **192.168.1.10**, otherwise use the previously configured IP address of the server.

Figure 131. Network Wizard

2   Complete the wizard and select **Save and Reset Network Interfaces**.

    Resetting the network interfaces will take several minutes. A progress bar will appear on the screen.

3   Log into your Nyquist server using the System Controller's new IP address.

4   On the System Parameters page, check the current value of **Server IP Address** to make sure it matches the new Server IP address. If it does not match, then change it to the new Server IP address.

Note: After using the Network Wizard to change the Server's IP Address (and/or Port-B IP address), if you have previously entered IP addresses into the **Additional IP Addresses to include in the Root SSL certificate** field (on the System Parameters page) and you still need the SSL certificate to include those IP addresses, you will need to edit the System Parameters (see "*Setting System Parameters" on page 54*) and press the **Generate Root SSL Certificate** button to re-create the certificate with the new Server IP Address and additional IP addresses listed in **Additional IP Addresses to include in the Root SSL certificate** (see page 65).

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Performing Tasks via the Dashboard

Note: This section is intended as a quick operations guide for personnel who use the Nyquist dashboard. For information about starting routines, refer to *"Using Routines" on page 388*. For information about managing Check-In, refer to *"Manage Check-In" on page 465*.

You can use the dashboard for most daily tasks, such as:

- Starting intercom pages
- Recording pages
- Starting or stopping alarms, tones, or announcements
- Placing, answering, or disconnecting telephone calls
- Using page exclusion
- Viewing the schedules for the week
- Performing audio distribution
- Managing display messages
- Managing Check-in
- Starting routines

Note: For information about managing display messages, see *"Managing GA10PV Display Messages" on page 445*.

What items appear on your dashboard depends on your assigned permissions. (See *"Managing Roles and Users" on page 213 and "Using CoS Configuration" on page 89*.)
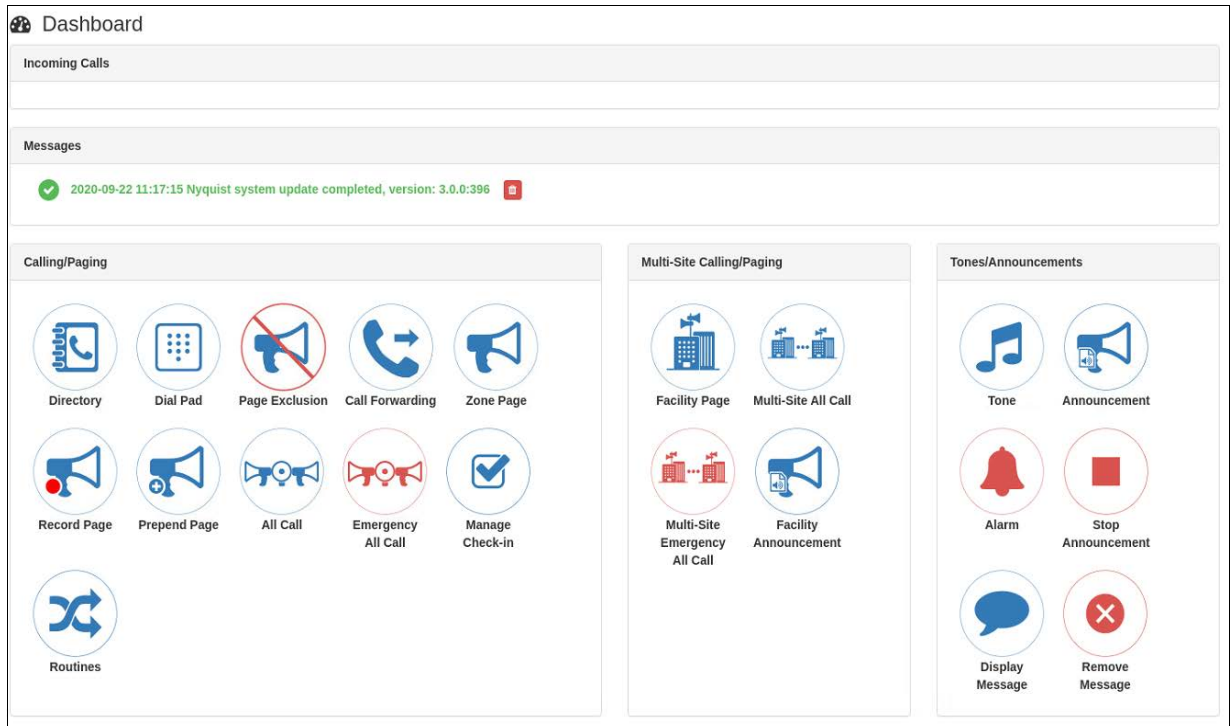
Figure 132. Nyquist Dashboard

Starting Pages

Depending on how your Nyquist system is set up, you can start Normal, All Call, and Emergency All Call pages for a specific zone, the entire facility, or multiple sites. You can also select an announcement to play before you make a page.

Single-Zone Paging
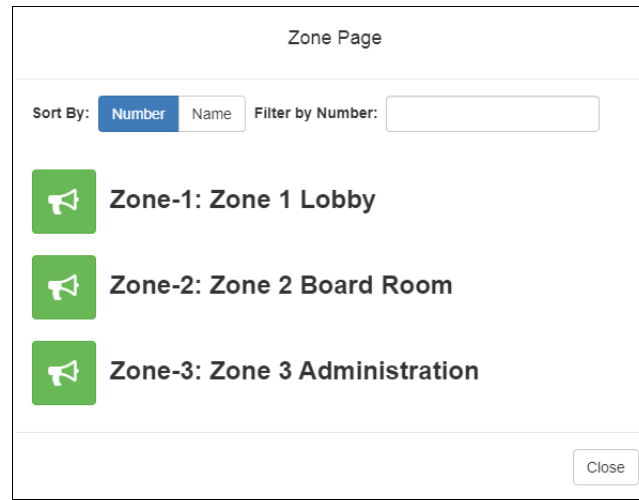
Figure 133. Paging Single Zone

To make a single-zone page via the dashboard:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Zone Page**.

3 On the Page popup, select the zone that you want to page.

Note: You can sort the zones by Name or Number.

---

4 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

5 If prompted, enter 1 for confirmation.

6 If prompted, allow Nyquist to use the microphone associated with your station.

> **Warning** **If you turn off the microphone on your computer, you cannot start audio distribution, tones, alarms, and so on. When attempting to make a call with the computer's microphone turned off, Nyquist automatically hangs up the call. If you make a second call, the dashboard displays a message that the phone is in use. Also, when the microphone is off and a bell tone comes in, Nyquist rings as opposed to auto answering.**

7 After you hear the tone, speak into the microphone.

8 Select **End Call** to end the page.
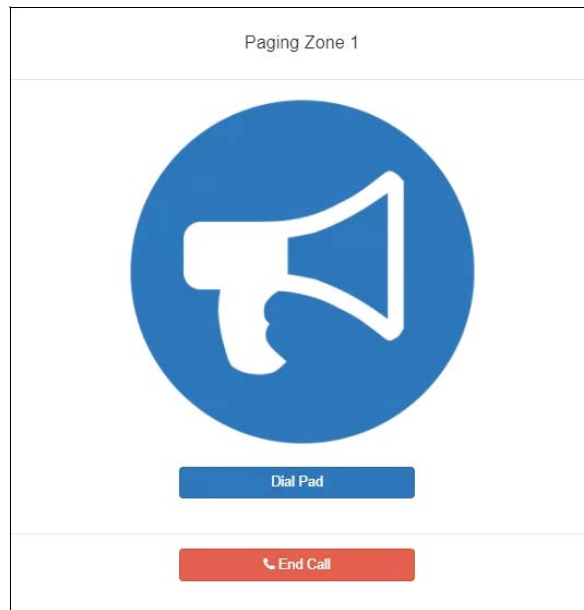
Figure 134. End Call

Record Page

You can record a page to be added to a zone queue. The maximum recording time for a page is 60 minutes; if the recording exceeds 60 minutes, it will time out and not be saved. If the recording is silent for 60 seconds, it will time out and not be saved.
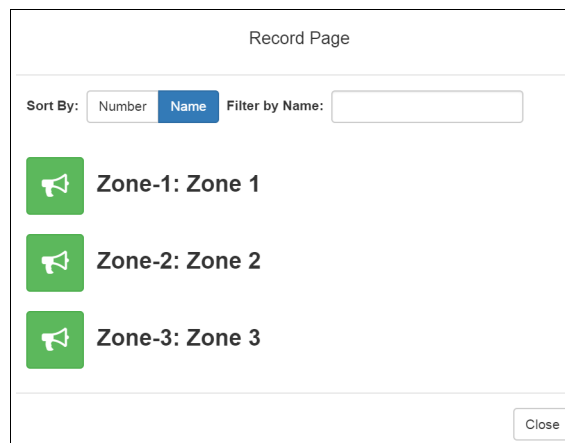
Figure 135. Record Page

The pages in the zone's queue are played in the order that they are placed in the queue.

A live page started on a zone that is playing a recorded page will cause the recorded page to be terminated and sent back to the queue. The interrupted message will play again, from the beginning of the message, when the zone becomes idle. Multi-Site Emergency-All-Call, Multi-Site All-Call, Emergency All-Call, All-Call, Alarm, Tone, and Emergency Announcement will also interrupt any playing recorded zone messages. All re-queued interrupted messages will play again, from the beginning of the message, when the zones becomes idle.

Selecting **Disable Audio** will cause all recorded messages to stop. The messages will resume play from the beginning when audio is re- enabled.

To record a page for page queuing:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.

2   Under Calling/Paging, select **Record Page**.

3   On the Record Page popup, select the zone that you want to page.

Note: You can sort the zones by Name or Number.

---

4   Wait for the tone and then record your message.

5   Hang up to end the recording.

Note: Pressing any key terminates the recording without adding the page to the queue.

Prepend Page

You can prepend a page with a special announcement. For example, if you have a pre-recorded weather alert announcement, you can prepend that announcement file so that it plays first as you prepare to make a page.
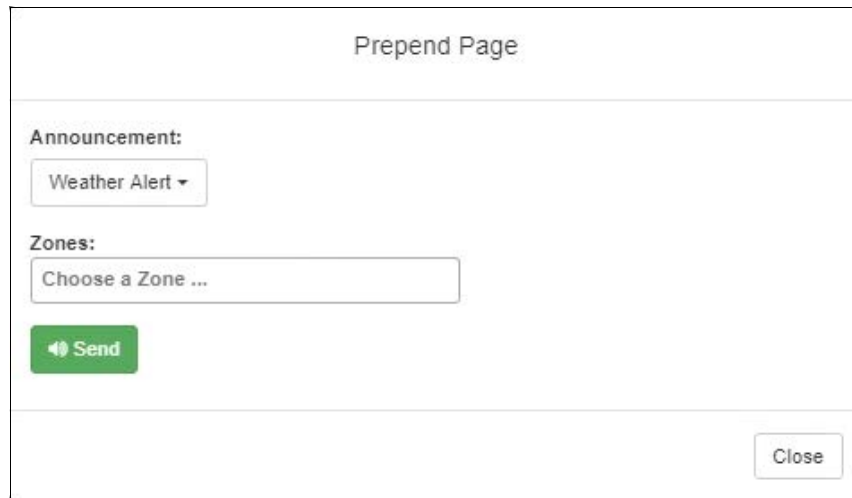
Figure 136. Prepend Page

To prepend a page:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Prepend Page**.

3 On the Prepend Page popup, select the zone that you want to page.

4 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

5 If prompted, enter 1 for confirmation.

6 If prompted, allow Nyquist to use the microphone associated with your station.

7 After the prepend announcement ends, speak into the microphone.

8 Select **End Call** to end the page

All Call Paging

All Call paging is a simultaneous page to all facility stations, unless the station has been excluded from pages. An All Call page takes higher priority over zone paging.

Figure 137. All Call

To start an All Call page:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **All Call**.

3 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

4 If prompted, enter 1 for confirmation.

5 If prompted, allow Nyquist to use the microphone associated with your station.

Warning	**If you turn off the microphone on your computer, you cannot start audio distribution, tones, alarms, and so on. When attempting to make a call with the computer's microphone turned off, Nyquist automatically hangs up the call. If you make a second call, the dashboard displays a message that the phone is in use. Also, when the microphone is off and a bell tone comes in, Nyquist rings as opposed to auto answering.**

6 After you hear the tone, speak into the microphone.

7 Select **End Call** to end the page.

Emergency All Call Paging

An Emergency All Call page is a high priority page that is transmitted to all stations, even those stations that have been set up for page exclusion.
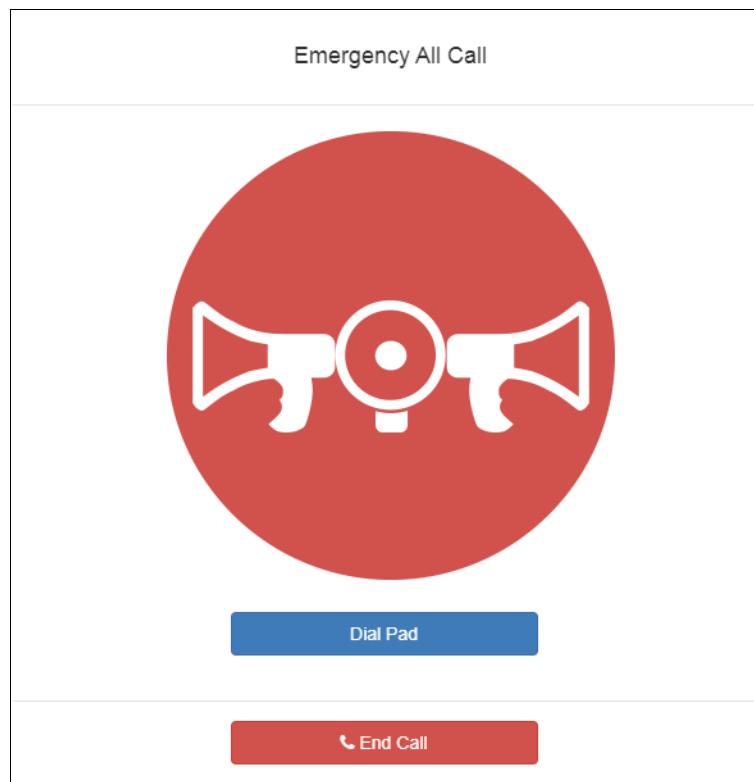
Figure 138. Emergency All Call

To start an Emergency All Call page:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Emergency All Call**.

3 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

4 If prompted, enter 1 for confirmation.

5 If prompted, allow Nyquist to use the microphone associated with your station.

6   After you hear the tone, speak into the microphone.

7   Select **End Call** to end the page.

Facility Paging

If your system is configured to use multiple facilities, you can start a Facility Page. For information about configuring facilities, see "*Configuring Facilities" on page 122*.
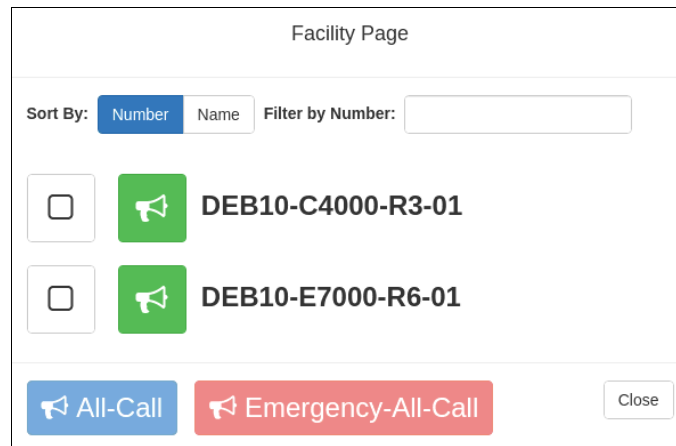
Figure 139. Facility Page

To start a facility page:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.

2   Under Multi-Site Calling/Paging, select **Facility Page**.

3   On the Facilities page, select one or more facilities that you want to page. Note that you can sort and filter the facilities by Name or Number.

4   Select All-Call or Emergency-All-Call, depending on whether you want to make a normal or emergency page.

Tip: As an alternative to the previous two steps, you can select the green announcement button for a specific facility to place an immediate non-emergency page to only that facility.

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5. If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

6. If prompted, enter 1 for confirmation.

7. If prompted, allow Nyquist to use the microphone associated with your station.

Warning	If you turn off the microphone on your computer, you cannot start audio distribution, tones, alarms, and so on. When attempting to make a call with the computer's microphone turned off, Nyquist automatically hangs up the call. If you make a second call, the dashboard displays a message that the phone is in use. Also, when the microphone is off and a bell tone comes in, Nyquist rings as opposed to auto answering.

8. After you hear the tone, speak into the microphone.

9. Select **End Call** to end the page.

Multi-Site All Call Paging

If your station's CoS allows multi-site paging, you can start a Multi-Site All Call page. (See "*Using CoS Configuration" on page 89* for information about setting up CoS for multi-site paging.)
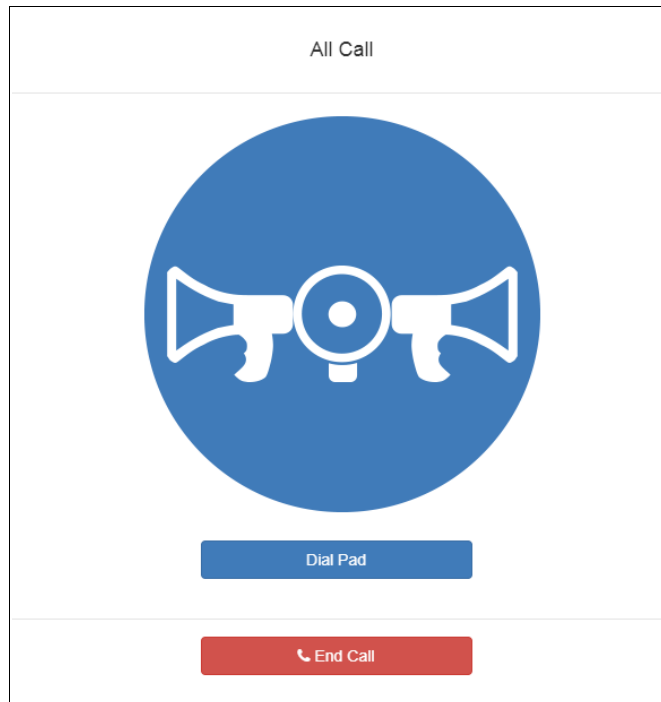
Figure 140. Multi-Site All Call

To start a Multi-Site All Call page:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.

2   Under Multi-Site Calling/Paging, select **Multi-Site All Call**.

3   If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

4   If prompted, enter 1 for confirmation.

5   If prompted, allow Nyquist to use the microphone associated with your station.

> **Warning**   **If you turn off the microphone on your computer, you cannot start audio distribution, tones, alarms, and so on. When attempting to make a call with the computer's microphone turned off, Nyquist automatically hangs up the call. If you make a second call, the dashboard displays a message that the phone is in use. Also, when the microphone is off and a bell tone comes in, Nyquist rings as opposed to auto answering.**

6   After you hear the tone, speak into the microphone.

7   Select **End Call** to end the page.

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Multi-Site Emergency All Call

If your station's CoS allows multi-site paging, you can start a Multi-Site Emergency All Call page. A Multi-Site Emergency All Call page has priority over any other pages. (See "*Using CoS Configuration" on page 89* for information about setting up CoS for multi-site paging.)
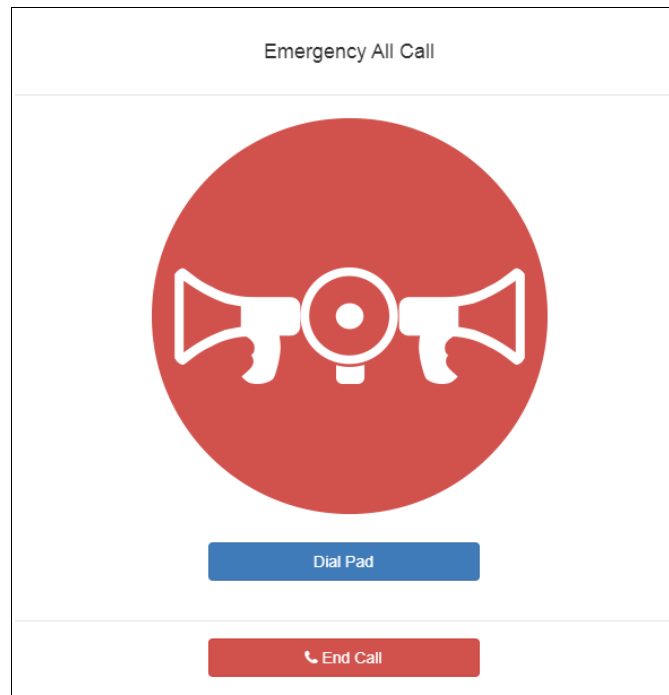
Figure 141. Multi-Site Emergency All Call

To start a Multi-Site Emergency All Call page:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Multi-Site Calling/Paging, select **Multi-Site Emergency All Call**.

3 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

4 If prompted, enter 1 for confirmation.

5 If prompted, allow Nyquist to use the microphone associated with your station.

Warning	If you turn off the microphone on your computer, you cannot start audio distribution, tones, alarms, and so on. When attempting to make a call with the computer's microphone turned off, Nyquist automatically hangs up the call. If you make a second call, the dashboard displays a message that the phone is in use. Also, when the microphone is off and a bell tone comes in, Nyquist rings as opposed to auto answering.

6 When the Emergency page appears, select **OK**.

7 After you hear the tone, speak into the microphone.

8 Select **End Call** to end the page.

Inter-Facility Calling and Paging Passwords

Using the **Edit System Parameters** page (see "*Edit System Parameters Page" on page 55*), you can configure the system to require that a password be entered for calling, paging, or making announcements to the local facility, remote facilities, or both. When starting pages or announcements at multiple facilities, if the local facility is included, it is quite possible for more than one password to be required—one for the local facility, one for the remote facilities—even though only one operation is being performed.

For example, both the All-Call (local) and Facility Page (remote) passwords may be required for a Multi-Site All Call Page operation. Similarly, the Emergency-All-Call (local) and Multi-Site-Emergency-All-Call (remote) passwords may be required for a Multi-Site Emergency All Call page.

To avoid this confusion, particularly when an emergency may be involved, the Nyquist system only requires one password to be entered in these scenarios. If only one of the two locations (i.e., local or remote) requires a password, the user will be prompted for that one. If both require a password, the user will be prompted for the password associated with the remote facility operation (e.g., Facility Page or Multi-Site-Emergency-All-Call password), as operations on a remote facility are typically more restricted.

Tip: To prevent accidental remote facility paging, you should set Facility-Page Password and Multi-Site-Emergency-All-Call Password to 4-digit passwords in **Edit System Parameters** (see "*Edit System Parameters Page" on page 55*).

Managing Alarms via the Dashboard

Alarms are audio files used to indicate a situation, such as a fire. When you elect to sound an alarm, only the tones with a type of Alarm appear in the selection list.
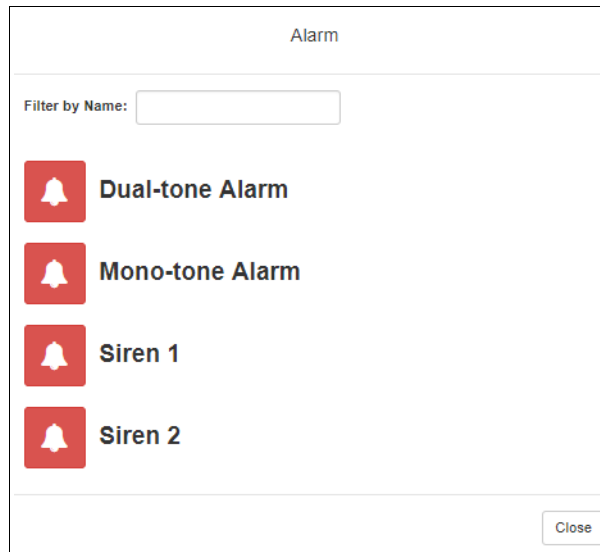
Figure 142. Alarm Page

To start and stop an alarm:

1   On the navigation bar, select **Dashboard**.

2   Under Tones/Announcements, select **Alarm**.

3   On the Alarm page, select the alarm that you want to sound.
       The **Alarm** icon changes from a red bell to a red box.

4   If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

5   If prompted, enter 1 for confirmation.

6   Select the **Alarm** icon to end the alarm.

Managing Tones via the Dashboard

Tones are similar to alarms, but are usually used to signal an announcement or time-based event. Starting a tone, sends a tone to all zones with a **Type** of **Time** or a combination of **Time** and **Paging**, **Audio**, or both.
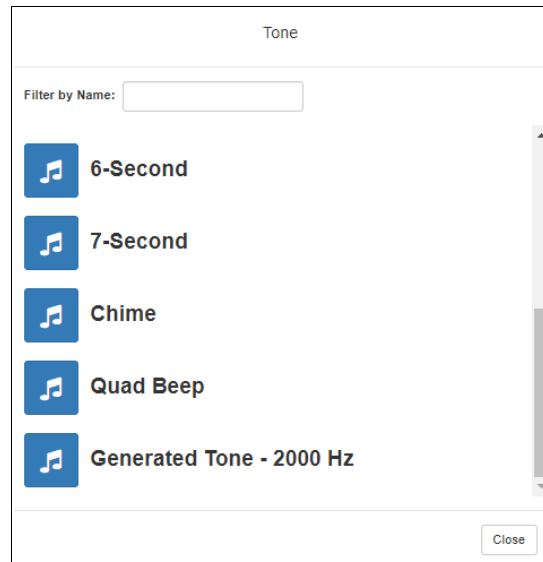
Figure 143. Tone Page

To start and stop a tone:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Tones/Announcements, select **Tone**.

3 Select the zone at which you want the tone to play, or select All Time Zones.

Note: The only zones that are available are those with a Type of Time.

4 On the Tone page, select the tone that you want to sound.

Only tones that have not be hidden appear. (See *"Managing Tones" on page 300* for information about hiding tones.)

Note: When a tone is started, the Tone icon on the Dashboard changes from a blue note to a red box to indicate that pressing the button will stop the Tone that is currently playing.

> *Note:* Tones play continuously if one of three conditions exist: Its **Type** is **Alarm**, times to play is set to 0, or length is set to 0.

5 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

6 If prompted, enter 1 for confirmation.

7 Select the **Tone** icon to end the tone.
A tone will stop playing automatically after it has reached its number of times to play. (See *"Managing Tones" on page 300.)*

Managing Announcements via the Dashboard

You can start previously recorded announcements from the dashboard and select the zone where the announcement will play.
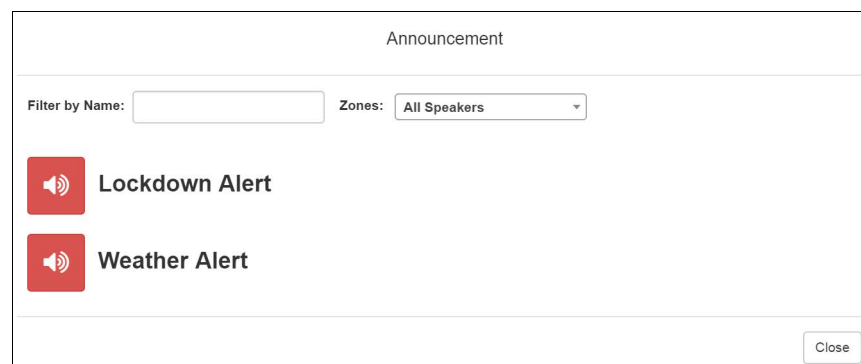
Figure 144. Announcement Page

To start and stop an announcement:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under **Tones/Announcements**, select **Announcement**.

3 On the Announcement page, use the **Zones** drop-down menu to select the zone where the announcement will play.

4 Select the announcement that you want to start.

5 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

6 If prompted, enter 1 for confirmation

7 To end the announcement, select **Stop** (or **Close**, if the **Dial Pad** is displayed).

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8 You can also stop an announcement by performing the following steps:

   a) Under **Tones/Announcements**, select **Stop Announcement**.

   b) Follow screen prompts.

An announcement will end automatically after it has reached its number of times to play. (See *"Using Announcements" on page 287*.)

If multiple announcements are playing, you can select to stop a specific announcement or to stop all active announcements.

To stop an announcement when multiple announcements are running:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under **Tones/Announcements**, select **Stop Announcement**.

3 On the Stop Announcement page, select the announcement that you want to stop or select **Stop All Announcements**.

4 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

Facility Announcement

If your system is configured with multiple facilities, you can use the Facility Announcement feature to play a predefined announcement at any one or more facilities.

Because the announcement will play simultaneously but independently at each facility, there are several behaviors of which the user should be aware:

- The announcement will *not* be synchronized across speakers from different facilities. If there are locations that are within hearing range of speakers from more than one facility, this could result in overlapping but unsynchronized audio playback.

- When playing announcements at remote facilities, the actual Announcement Audio to be played at each facility is determined by the DTMF code of the selected announcement. If a remote facility is configured with a different Announcement Audio for that DTMF code than that of the local facility, that facility will play a different audio announcement.

- Stopping the announcement through the Dashboard will only stop the audio for the current facility. To stop the announcement at other facilities, the user must log into the Dashboard of each facility and stop the announcement using the Stop Announcement button. For this reason, it is strongly recommended announcements *not* be configured

for continuous play (i.e., "Times to Play" equal to zero) if they will be used for multi-facility announcements.

Figure 145. Facility Announcement

To start a facility announcement:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Multi-Site Calling/Paging, select **Facility Announcement**.

3 Select the announcement that you want to play from the Announcement drop-down.

4 Select one or more of the specified facilities at which the announcement is to be played. Selecting **All Facilities** will select all the facilities for you. Note that you can sort and filter the list of facilities by Name or Number.

5 Select the **Start Announcement** button.

Tip: As an alternative to the previous two steps, you can select the green announcement button next to a listed facility to immediately start the announcement at that one single facility.

6 If you must enter a password to complete this task, select **Dial Pad** and enter the 4-digit password.

7 If prompted, enter 1 for confirmation.

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> **Warning**   **If you turn off the microphone on your computer, you cannot start audio distribution, tones, alarms, and so on. When attempting to make a call with the computer's microphone turned off, Nyquist automatically hangs up the call. If you make a second call, the dashboard displays a message that the phone is in use. Also, when the microphone is off and a bell tone comes in, Nyquist rings as opposed to auto answering.**

8   If prompted, allow Nyquist to use the microphone associated with your station.

Note: See *"Facility Announcement Priorities" on page 288* for details on how to determine if the announcement was successfully played.

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9   To end the announcement at the current facility, select Stop (or Close, if the Dial Pad is displayed).

Managing Calls via the Dashboard

Nyquist provides two ways to place a call via the dashboard:

- Through the use of a directory
- Through the use of a dial pad

Note: Placing intercom calls requires an Intercom License.

Placing Call Using Directory

The Nyquist directory is a list of all stations that can receive calls. These can include computers with the Admin Web UI, telephones, VoIP speakers, or digital call switches and speakers.
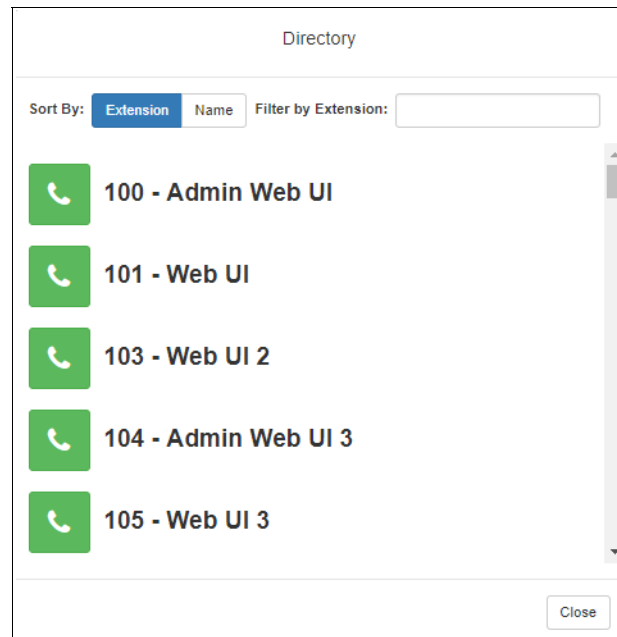
Figure 146. Directory Page

To place a call using the directory:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Directory**.

3 On the Directory popup, select the extension that you want to call.
Note that you can sort the list of extensions by extension number or name.

4 Select **End Call** to end the call.

Placing Call Using Dial Pad

To place a call using the Dial Pad:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Dial Pad**.

3 Dial the extension or number that you want and select **Send**.

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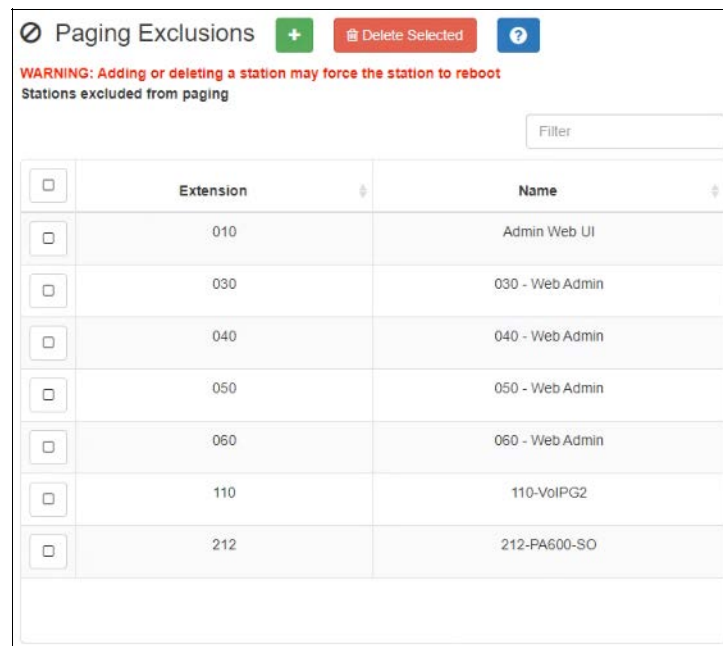
4 Select **End Call** to end the call.

To answer a call from another extension:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Select **Answer**.

3 Select **End Call** to end the call.

Using Page Exclusion

You can exclude stations from paging except for Emergency-Level All-Call pages. Emergency-Level-All-Call pages will be sent and heard at the station even if that station is set to exclude paging.

Figure 147. Paging Exclusions Page

To exclude a station from paging via the dashboard:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under **Calling/Paging**, select **Page Exclusion**.

3 Optionally, filter the displayed list of stations by extension or name.

4 Select one or more stations to be excluded. Click **Toggle All** to select (or deselect) the entire list of stations.

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5 Select the **Add Exclusions** button to add the selected stations to the Page Exclusions list.
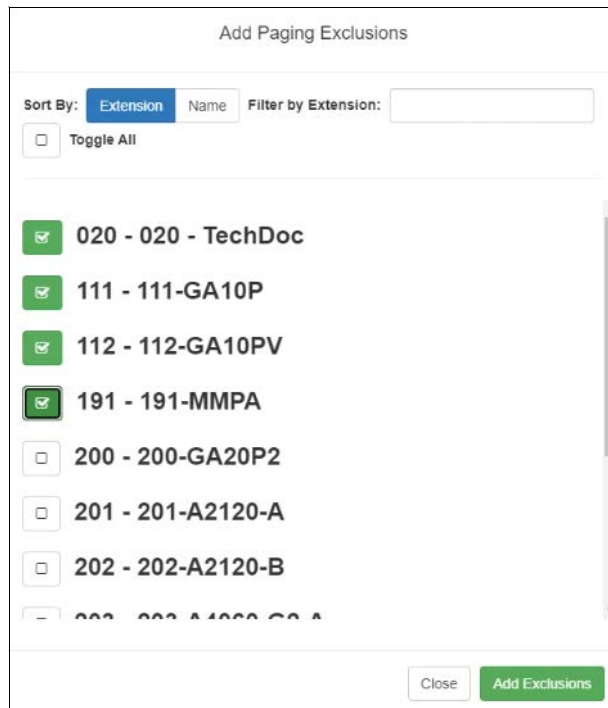
Figure 148. Add Paging Exclusion Page

> **Warning** Adding or deleting a station from the page exclusions list may force the station to reboot.

Deleting From Page Exclusion List

To delete an extension from the Page Exclusion list:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Page Exclusion**.

3 Select one or more extensions to be deleted from the exclusion list.

   a) Optionally, toggle the checkbox in the header row above the selection checkboxes to select (or deselect) the entire list of stations.

4 When all selections are ready, click **Delete Selected** to remove the selected extensions from the list.

Viewing the Schedule for the Week

From the dashboard, you can view this week's schedule or use the **Prev** and **Next** buttons to view the schedule for other weeks. If you select a specific schedule for a day, you can also view details of that schedule.

Figure 149. Schedule Page

To view this week's schedule:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Scroll to the This Week's Schedules section.

3 To view details of a schedule, select a schedule listed or use the **Prev** or **Next** buttons to navigate to the desired schedule and select that schedule.

   The Schedule page appears. (See "*Schedule Page Parameters" on page 242*.)

4 Select **Close** when done viewing.

Using Audio Distribution

Audio distribution specifies an audio program for distribution to stations or zones. It involves creating a playlist or selecting an input source and specifying which zones or stations hear the playlist or input source. Through the Scheduled Audio feature, audio distri-

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bution can be tied to a specific event in a schedule. For information about the Scheduled Audio feature, see *"Understanding Event Settings" on page 238*.

Note: Before using the Audio Distribution feature, make sure that stations and zones have been configured and that the station you are using to start Audio Distribution has the appropriate Class of Service (CoS) parameters set.

Figure 150. Create an Audio Distribution

Note: If an audio distribution playlist that has a station assigned to it is playing, you cannot play another audio distribution playlist with a station assigned.

To create an audio distribution:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Select the **Add** icon.

3 Use the **Line-Input/Playlist/Source** drop-down menu to select the audio source. Audio sources can include a line-input from a Matrix Mixer Pre-Amp, available playlists previously created for your system, or Internet radio station sources.
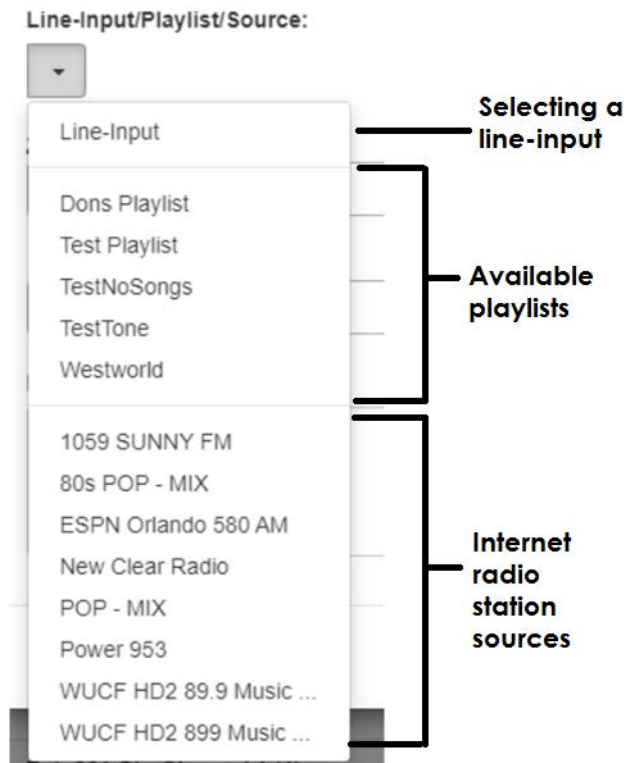
Figure 151. Audio Distribution Sources

Note: If you are using at least one Nyquist Matrix Mixer Pre-Amp, Line-Input appears as a Input Source/Playlist option.

4 Select the **Zones** and **Stations**.

5 If you select **Line-Input** as the Input Source/Playlist, select the **Amplifiers/Matrix Mixers** and **Input Channel**.

6 If you select a playlist and want to shuffle the song order, set **Shuffle** to **Yes**.

7 Select **Save**.

8 To end the playing of audio, select the **Stop** icon next to the playlist.

To start a previously created audio distribution:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Select the Play icon next to the audio distribution that you want to start.

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3 To end the playing of audio, select the **Stop** icon next to the playlist.

An existing Audio Distribution can be edited or deleted, provided it is not currently playing or linked to a routine, by selecting the **Edit** or **Delete** icon next to the Audio Distribution.

When Audio Distribution is enabled, an informational message appears in the Messages window of the Admin Web UI dashboard, indicating the song that is currently playing and to which speakers (all or selected) and to which zones audio is playing.

Audio distribution will be paused automatically by higher priority feature activation (for example, All-Call Page, Paging, Tones) and will automatically resume when the higher priority feature is finished.

Audio Distribution may also be started or stopped using Admin Phones.

Audio Distribution volume to all speakers can be changed by setting **Audio Distribution Cut Level**, available in **System Parameters**. The Audio Distribution volume to zones can be changed by setting **Audio Distribution Cut Level** in **Edit Zone**. For information about editing a zone, see "*Editing Zone Configuration" on page 199*. Audio Distribution volume can also be changed using the Zone Control feature (see "*Zone Control: Volume and Audio Distribution Panel" on page 67*).

All Nyquist stations are preconfigured to receive Audio Distribution to All Speakers (stations). To disable Audio Distribution to All Speakers for a specific station, change **Audio Distribution to All Speakers** to **No** on the Edit Station page.

Any Admin web UI or Admin phone user may start or stop an Audio Distribution if his or her station has the **Audio Distribution** CoS Configuration parameter enabled.

Audio Distributions continue playing until manually stopped or until stopped by a scheduled event, I/O Controller Input rule, or Routine.

If you use a USB memory stick as storage for songs on a playlist, and the USB memory stick is removed from the USB drive, the metadata for the songs and the playlist still resides in the Nyquist song list and playlist, but audio distribution cannot play the songs. The USB memory stick must remain inserted into the system to provide the system access to the songs.

Audio Distribution can be started and stopped via routines. For information about starting or stopping audio distributions via a routine, see "*Using Routines" on page 388*.

Enabling and Disabling Audio

If a station's CoS has been set up to enable and disable audio, then **Enable Audio** and **Disable Audio** icons appear in the lower section of the dashboard. These icons allow a station to control audio for the system during events such as fire alarms. Selecting **Disable Audio** stops all audio output on the system—such as Scheduled Audio, audio distribution, and paging—and prevents future audio output until **Enable Audio** is selected. Alternatively, audio can be enabled or disabled from a Routine via the Enable-Audio or Disable-Audio actions.

If you select **Disable Audio**, you must select **Continue** when prompted to stop audio.

The *Disable Emergency All-Call and Intercom when Audio Disabled* system setting (see "*Edit System Parameters Page" on page 55*) also affects the behavior of the **Disable Audio** feature. When set to "**Yes**", the system will also disable Emergency All-Call pages and intercom calls, otherwise these actions will still be allowed. The default value is "**No**."

When *Disable Emergency All-Call and Intercom when Audio Disabled is* set to "**Yes**", the following Nyquist features will be blocked:

• Incoming calls from PSTN-based callers

• Outgoing calls to PSTN-based numbers

• Outgoing calls to 911

• Incoming DISA calls

• Intercom call from station

• All-Call

• Emergency-All-Call

• Zone Page

• Record Zone Page

• Record Message

• Facility Zone Page

• Facility Intercom Call

• Alarms

• Tones

• Multi-site Emergency All-Call

• Intercom calls to/from remote facilities

• Station monitoring (Spy)

• Audio Distribution

• Call to retrieve voicemail

- Playback Recorded Messages
- Start/Join Audio Conference

When a caller initiates one of the above features, they will hear the following message before the feature is blocked:

"Audio disabled due to fire alarm activation."

The following Nyquist features will be blocked without playing the message:

- Routine-based automatic outgoing call and announce
- Routine-based calls not initiated by an actual caller.
- Scheduled Announcements
- Scheduled Bells and Tones
- Scheduled Audio
- Zone pages from recorded pages (they get re-queued)
- Check-in

The following features are still enabled:

- Call Forwarding setup and status
- Change Bell Schedule (via DTMF or Admin phone menu)

Manually Controlling Output Contacts

If you are using the Nyquist I/O Controller to recognize third-party contact closures, you can manually control output contacts.

Prerequisites for using manual controls are adding an I/O Controller as a station and configuring a controller rule for at least one output contact with the Action set as Manual. (See *"Configuring I/O Controller Output Rules" on page 153*.)
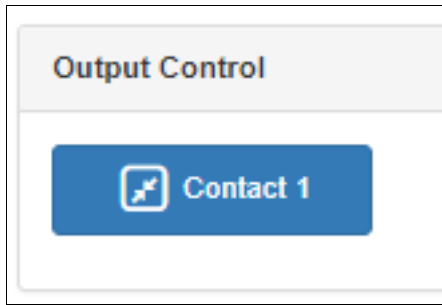
Figure 152. Output Control Section
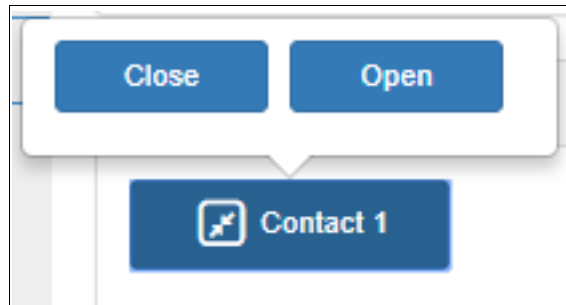
Figure 153. Manual Control Buttons

To manually control an output contact:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 In the Output Contact Control section, select the desired contact.

> *Note:* If you have set up a rule with a duration of 0, then selecting the contact displays two buttons–one for opening and one for closing the circuit. If duration is set to a number other than 0, you can only close the circuit.

Select the button for the action that you want. The button labels are set in the rule for the output contact.

Using the Maps Feature

With the Maps feature, you can select rooms, buildings, or other defined areas, such as loading zones, from a graphic image to start intercom calls or pages. You can use the Maps view to display Check-In status, listen to specific areas, and if the area has a camera, view video of the area. You can also create buttons to open a URL or execute a previously created routine.

To use the Maps feature, you must have the appropriate license and permissions (see *"Map-Based Paging License (NQ-C4000MBP)" on page 500* and *"Assigning Maps Panel Permissions" on page 369*).

When setting maps up in a Nyquist system environment, you can import JPEG or PNG graphics of your facility, buildings, rooms, or objects, such as icons or landmarks. You can then set up various defined action objects. Action objects are interactive shapes on the map that allow the starting of intercom calls, zone pages, announcements, and even routines.

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Each map can have an unlimited number of levels, each level having its own image, action items, and optionally more nested levels. For example, an office administrator could navigate to the map of a building, then the map of a specific floor in that building, and then the map of a specific room on the selected floor. For locations that are frequently called or paged, a defined action object can be placed as a button on a top level or sub level view so that navigating through multiple levels of maps is not required to initiate a call or a page. The action object button can even be configured to be viewable on all levels, which makes that object visible at every nested level of the map.

In addition, Nyquist also supports the ability to create multiple top-level maps, such as for multi-site campuses. Each site can define its own map objects and restrict calls and paging to its own administrator, as well as having its own hierarchy of nested levels.

Tip: Although the Maps feature is designed to display buttons on a map, the map image is not strictly required. You may want to create one or more "maps" or map levels that only contains buttons and behave as custom control panels. For example, a map could contain buttons to activate one or more frequently used Routines, call frequently used extensions. or page a predefined subset of facilities. Several maps of this type could be used as a customized menu of virtual dashboards, even including links to switch between menus.

Maps Panel Overview
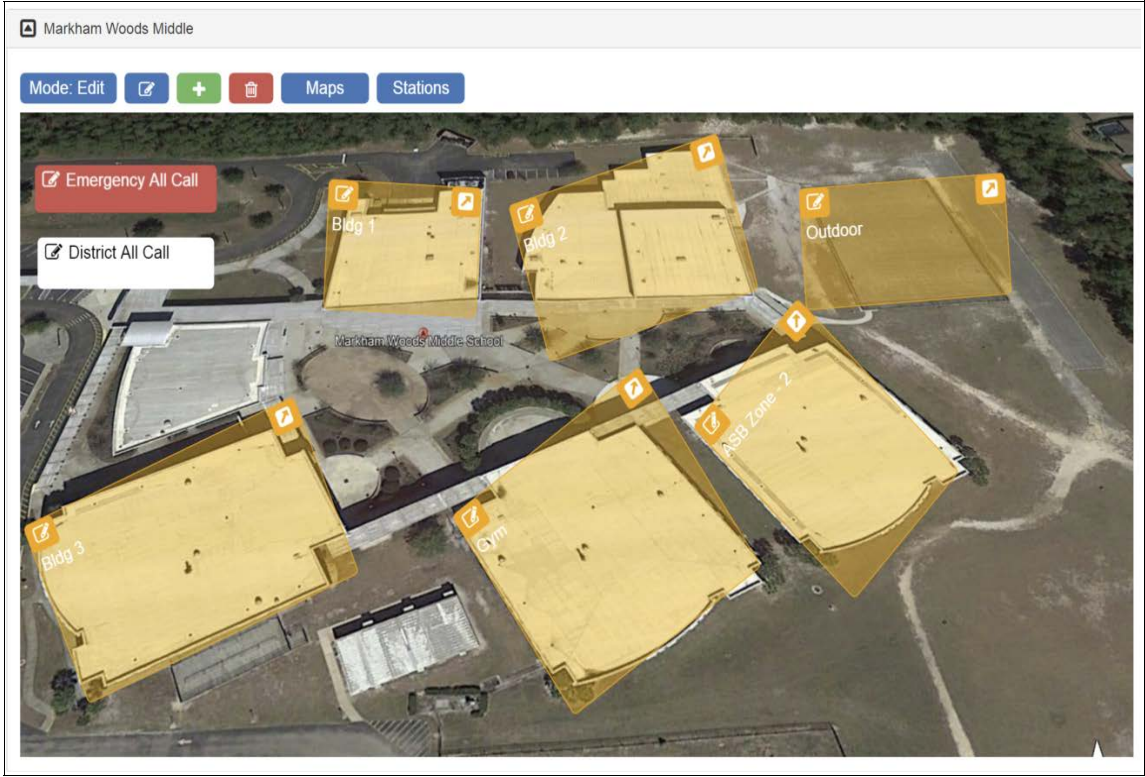
Figure 154. Maps Panel

When Maps is licensed and configured for a Nyquist system, you can view the Maps Panel from the Dashboard. In addition to the site map and defined action objects, various buttons and icons appear on the area above the graphic. These buttons can vary depending on the various parameters set for your system. Possible buttons and icons are as follows:

Mode: Edit	Indicates which mode your system is in. The **Mode** can be either **Edit** or **Live**. If you are not authorized to edit the Maps parameters or to set up defined action objects, the Mode button does not appear.
	Select this **Edit** icon if you want to edit the currently displayed map. This icon does not appear if you are in **Live** mode.
	Select this **Add** icon if you want to add a new map. This icon does not appear if you are in **Live** mode.

Select this **Delete** icon if you want to delete a map. This icon does not appear if you are in **Live** mode.

Select the **Maps** button to select which map you want to have appear on the Dashboard.

Select the **Stations** button to view which stations are allowed to add defined action objects or make other changes to the map. This icon does not appear if you are in **Live** mode.

Configuring Parameters for the Maps Feature

To use the Maps feature:

- You must have the Nyquist C4000 Maps-Based Paging feature license.
- You must have the correct Maps Panel permissions set.
- You must be associated to a station that has the necessary CoS configuration.
- The station **Type** for the associated station must be either an **Admin Web Interface** or a **Web Interface**.
- You must select a map on the associated station.

Assigning Maps Panel Permissions

Importing graphics and creating defined action objects are restricted to users associated with roles with **Create** and **Edit** Maps Panel permissions. A user only requires **View** Maps Panel permissions to use the Maps feature for initiating pages and calls and viewing Check-In status.

> *Note:* To perform this task, you must be logged in with a role that has permission to assign or edit permissions.

To set Maps Panel Permissions:

1   On the navigation bar, select **Roles**.

2   On the Roles page, select the **Permissions** icon next to the role for which you are assigning or editing permissions.

3 On the Edit Permissions page, select the appropriate buttons to assign Maps Panel permissions to the role.

4 Select **Save**.

Setting CoS Configurations for the Station

The **All Call** and **Emergency All Call** buttons do not appear in the Maps panel section of the Dashboard if the correct CoS parameters are not set for the station. The ability to call any station or to initiate zone paging are also set for the station through **CoS Configuration**.

To set CoS Parameters for the Map Feature:

1 On the navigation bar, select **CoS Configuration**.

2 Select the **Add** icon.

3 Complete Parameters for the station.

For information about the settings, see *Table 21, "CoS Configuration Page Parameters," on page 90*.

4 After all changes are made, select **Save**.

Assigning the Default Map

Your Dashboard will not show the Maps Panel until you have selected at least one map for your station. You must assign the default map (Site) to the station first. You can then create a new map for your station.

To assign the default map:

1 On the navigation bar, select **Stations**.

2 If you are adding your station, select the **Add** icon and ensure that the **Type** is **Admin Web Interface** or **Web Interface**. Then, complete all of the options for your station.

3 If you are editing your station, select the **Edit** icon next to your station.

4 Scroll to the **Maps** parameter and select the default map.

5 Select **Save**.

Adding a Site Graphic
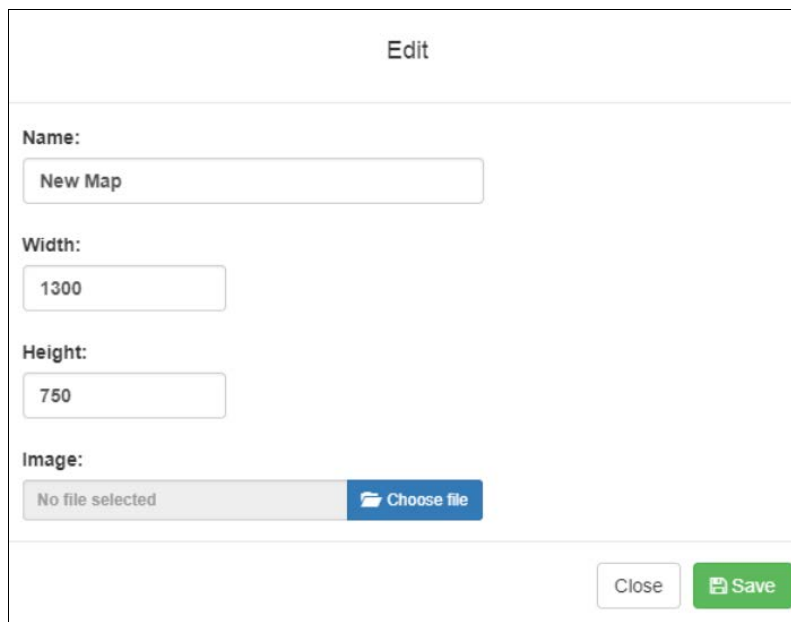
You can add a site graphic to your Nyquist system UI by uploading a PNG or JPEG file.

To add a graphic:

1 On the navigation bar, select Dashboard.

2 If the Site section is collapsed, expand it by clicking the down-arrow link.

3 Ensure the **Mode** is **Edit**.

> *Note:* If you do not have create or edit permissions, the **Mode** button does not appear.

4 Select the **Edit** icon.

5 Enter the parameters (see *Table 101, "Edit Image Parameters," on page 372*).

6 Select **Choose file** and navigate to the desired file.

7 Select **Save**.

Figure 155. Edit Dialog Box

Table 101. Edit Image Parameters

Name	Enter a name for the image, such as the name of the site. The maximum character length for this parameter is 20.
Width	Enter the width for the image canvas. This width will be the canvas size for all views that appear when drilling down into the map.
Height	Enter the height for the image canvas. This height will be the canvas size for all views that appear when drilling down into the map.
Image	Displays the file name for the image. Select **Choose** file to navigate to the desired file.

Adding a Defined Action Object

After the top level graphic has been added, you can create defined action objects on the graphic map and then select image files to appear when the object is selected. For example, if your top level graphic is a site graphic that shows multiple buildings you might

want to make each building a defined action object. Each building could then have multiple defined action objects, such as multiple zones or stations.

> *Note:* If you move a defined action object or button outside of the map's dimensions or too far to the edge of the map image, you may not be able to use or even see the button. In this situation, you must edit the map's dimensions to view the object or button and then move it to within the map image.
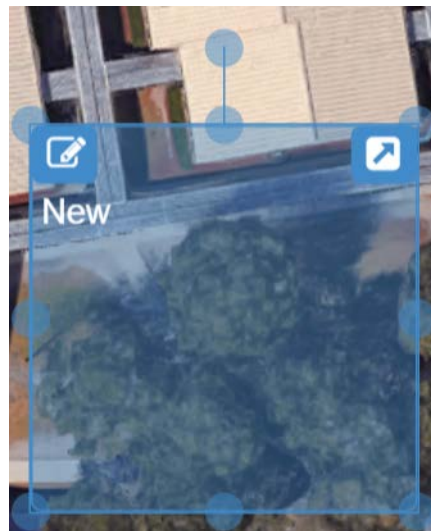
Figure 156. Defined Action Object

> *Note:* Stations and zones must first be added to your Nyquist system before they can be added to a graphic as a defined action object.

To add a defined action object to a graphic:

1 From the dashboard, ensure the **Mode** is **Edit**.

2 Double-click the map. A rectangle appears.

3 Drag the rectangle to the desired location.

4 Resize the rectangle by selecting a point marked by circle and dragging the point. You can select circle outside the rectangle to rotate the image as needed.

5 Repeat steps 1-4 for each selectable object desired.

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Assigning an Image to Defined Action Object

You can assign an image to a defined action object. For example, if the main image is of a site, you can add a defined action object for a building on the site graphic. The selectable object for the building can be assigned a graphic that depicts rooms inside the building.

To assign an image to a defined action object:

1 From the dashboard, ensure the **Mode** is **Edit**.

2 Select the selectable object.

3 Select the **Edit** icon next to the **Mode** button.

4 On the Edit screen that appears, provide a name for the object and then select **Choose file** and navigate to the location of the image file.

5 Select **Save**.

Editing a Defined Action Object

Editing a defined action object allows you to choose how the object appears on the Map panel and what action is assigned to the object.

Figure 157. Defined Action Object With Edit Icon (Left Corner)

To edit a defined action object:

1 From the dashboard, ensure the **Mode** is **Edit**.

2 Click the **Edit** icon on the selectable object.

3 Complete the Edit Map Object parameters.

4 Select **Save**.

Figure 158. Edit Map Object Dialog Box

Table 102. Edit Map Object Parameters

Name	Enter a name for the selectable object. The name can have up to 40 characters.
Show Name	Select **No** if you do not want the name to appear on the map. The default is **Yes**.
View on All Levels	Select Yes if you want this object to appear on all levels of the current map. *Note:* This does not make the object appear on all maps, only on all levels of the current map.
Type	Select **Rectangle** if you want the object to cover a building or site. Select **Button** if you want the object to become a button that is associated with an action. For more information about buttons, see "*Creating a Defined Action Object Button*" on page 378.

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Table 102. Edit Map Object Parameters (Continued)

Action

Select what action is to be assigned to this object. Options are:

- **None**. By default, no action is associated with the object.

- **Call**. If you select this option, a drop-down menu appears so that you can select an **Extension** for the object. Extensions must have previously been associated to a Nyquist system station when stations were created.

- **Page**. If you select this option, a drop-down menu appears so that you can select a **Paging Zone** for this option. Zones must have previously been created and stations added to the zones before a zone can be associated to a defined action object.

- **All Call**. Creates a button to use for making an All Call page.

- **Emergency All Call**. Creates a button to use for making an Emergency All Call page.

- **Multi-Site All Call**. Creates a button to use for making a Multi-Site All Call page.

- **Multi-Site Emergency All Call**. Creates a button to use for making a Multi-Site Emergency All Call page.

- **Facility All-Call Page**. Creates a button to use for making a Facility All-Call Page. If this option is selected, you must also select a **Facility**.

- **Facility Zone Page**. Creates a button to use for making a Facility Zone Page. If this option is selected, you must also select a **Facility**.

- **Facility Station Call**. Creates a button to use for calling a specific station in a facility. If this option is selected, you must also select a **Facility** and an **Extension**.

- **Open URL**. Creates a button to use to open a URL. If this option is selected, you must also enter the web address or other web resource that you want the button to open in the **URL** field.

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Table 102. Edit Map Object Parameters (Continued)

- **Execute Routine**. Creates a button that starts a specified routine. If this option is selected, you must also select the specific **Routine**.

- **Select-Facility**. Creates a button with a round, selectable control, displayed in the top left corner, which can be checked or unchecked by the operator to select the associated facility. This selection will later be used when a button with the **Page-Selected-Facilities** or **Announce-Selected-Facilities** action is clicked. If this action is selected, you must also specify the associated **Facility**.

- **Page-Selected-Facilities**. Creates a button used for paging all the **Facilities** selected via the aforementioned **Select-Facility** action.

- **Announce-Selected-Facilities**. Creates a button used for playing an announcement at all the **Facilities** selected via the **Select-Facility** action.

- **Page-Facilities**. Creates a button used to page all of the specified **Facilities**. If this action is selected, you must specify one or more **Facilities.**

- **Announce-Facilities**. Creates a button used to play an announcement at all the specified **Facilities**. If this action is selected, you must specify one or more **Facilities**.

Extension	Use the drop-down menu to select an extension. This option appears only if **Action** is set to **Call**, **Page**, or **Facility Station Call**.
Width	Enter the desired width in pixels. Width must be a number 70 or above.
Height	Enter the desired height in pixels. Height must be a number 30 or above.
Rotation	Enter the desired angle of the object in degrees. The available range is 0 to 359.
Facility (or Facilities)	Use the drop-down menu to select one (or more) of the displayed facilities. This option appears only if Action is set to **Select-Facility, Page-Facilities, Announce-Facilities, Facility All-Call Page**, **Facility Zone Page**, or **Facility Station Call**.

Table 102. Edit Map Object Parameters (Continued)

Announcement	Use the drop-down menu to select the announcement to play.
	This option appears only if Action is set to **Announce-Facilities** or **Announce-Selected-Facilities**.
Paging Zone	Select the zone in which to play the page.
	This option appears only if Action is set to **Page**.
Zone Number	Enter the zone number of the remote facility at which to play the page.
	This option appears only if Action is set to **Facility Zone Page**.
URL	Enter the full name of the URL that you want to open when this button is clicked. This option appears only if **Action** is set to **Open URL**.
Routine	Select the routine that you want to execute when this button is selected. This option appears only if **Action** is set to **Execute Routine**.
Color	Use the drop-down menu to select a color for this object. The default color is Green. Other options are: • Blue • Brown • Gray • Orange • Pink • Purple • Red • White • Yellow

Creating a Defined Action Object Button

Instead of associating a defined action object to a particular object on a map or a graphic, you can create a defined action object that serves as a button. For example, suppose you have layers of maps that include the buildings and each floor in a building, but you most frequently call one or two extensions. Rather than drilling down multiple maps or objects each time you call an extension, you can create a defined action object that is associated

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with that extension. The selectable object can be named for the extension and placed on the first level graphic.

Another reason for creating a defined action object that serves as a button would be if your Nyquist system server is managing multiple sites on a single campus. All Call and Emergency All Call pages would go to all stations on the Nyquist system. If you want to make a page to all stations of a single site in a multiple site campus, you can create a defined action object that starts a page to all stations in that site only.

Opening a URL

If you select **Open URL** as the **Action** for a defined action option button, you can use the button to open a specific web page or to reference a specific application, such as a video feed from a classroom. The full name, or path of the URL, must be entered in the URL field (see *Table 102, "Edit Map Object Parameters," on page 375*). For example, to access the main Bogen web site, you would enter `http://www.bogen.com/`.

When the **Open URL** button is selected in **Live** mode, the web page opens a new tab in the browser.

Execute Routine

If you select **Execute Routine** as the **Action** for a defined action option button, you can use the button to manually start a routine.

Only routines that have been previously created, are **Enabled**, and have **Allow DTMF** set to **Yes** appear in the **Routine** list on the Edit Map Object popup (see *Table 102, "Edit Map Object Parameters," on page 375*). For information about enabling routines and the **Allow DTMF** option, see *Table 104, "Routines Parameters," on page 394*.

Starting Pages and Announcements via the Map Feature

Depending on the parameters set, you can start pages to an individual zone, start pages and announcements to multiple selected facilities, start All Call pages, or start Emergency All Call pages.

Zones must be created and stations added to the zones before the zones can be associated to a defined action object or paged via the Maps feature. For information about creating zones, see *"Managing Stations, Zones, and Queues" on page 128*.

Page an Individual Zone

If the **Action** for a defined action object is set to **Page**, then a **Page** icon appears in the left side of a defined action object.

Figure 159. Page Icon

To page an individual zone using the Maps feature:

1 From the dashboard, ensure the **Mode** is **Live**.

2 Click the **Page** icon on the defined action object.

Page or Play Announcement at Multiple Selected Facilities

There are two ways in which users can page or play an announcement at multiple selected facilities simultaneously via the map. One provides a button that will page or play an announcement at a predefined list of facilities. The other allows the user to select one or more facilities on the map, then click a button to page or play an announcement at each of those facilities.
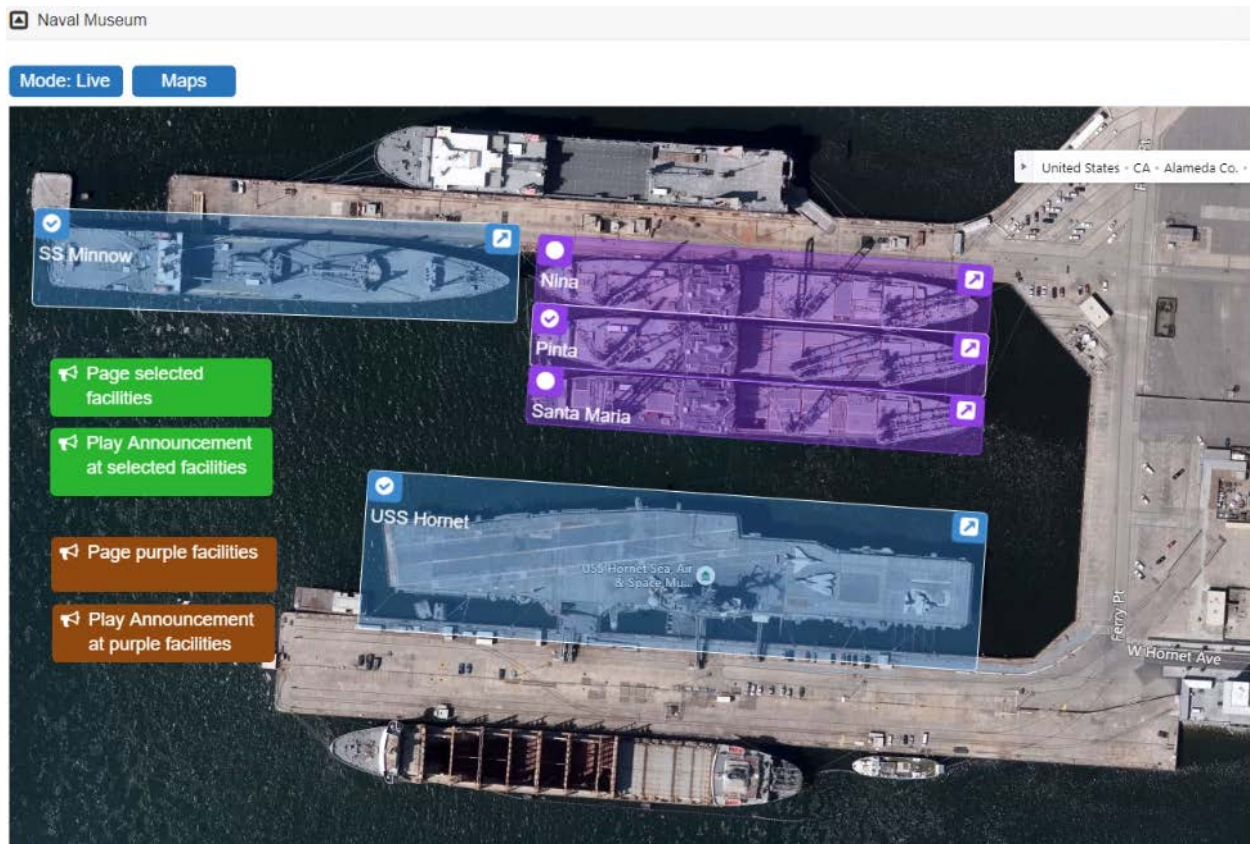
Figure 160. Paging or playing an announcement to multiple selected facilities

Page or play announcement at a predefined list of facilities

The map must have a map object button defined with the **Page-Facilities** or **Announce-Facilities** action and one or more selected facilities, which when clicked, will page or play an announcement at the specified facilities. In the example shown in *Figure 160*, two examples are shown as small brown buttons.

To start a Facility Page or Facility Announcement:

1 From the dashboard map, ensure the map's **Mode** is **Live**.

2 Select the **Page-Facilities** or **Announce-Facilities** button.

3 Follow subsequent audio instructions.

Page or play announcement at a user-selected list of facilities

The map must have at least two map objects defined:

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- One or more map objects with the **Select-Facility** action, each of which corresponds to a specific facility. The user can select any number of these objects to specify which facilities will receive the page or announcement. In the example shown in *Figure 160*, there are five of these map objects shown as blue and purple rectangles, each corresponding to a ship.

- One map object with the **Page-Select-Facilities** or **Announce-Select-Facilities** action, which when clicked will initiate a page or an announcement to the selected facilities. In *Figure 160*, two examples are shown as small green buttons.

To start a Selected Facilities Page or a Selected Facilities Announcement:

1   From the dashboard map, ensure the map's **Mode** is **Live**.

2   Select the circular icon in the top left corner of one or more map objects, which should then display a check mark in the circle.

3   Select the **Page-Select-Facilities** or the **Announce-Select-Facilities** button.

4   Follow subsequent audio instructions.

Start All Call or Emergency All Call Pages

CoS parameters must be set before you can create **All Call** and **Emergency All Call** buttons that will appear in the Maps panel section of the Dashboard. (See *"Setting CoS Configurations for the Station" on page 370*.)

An All Call page is made to all zones associated with your Nyquist system server unless a zone is excluded from paging. An Emergency All Call page is made to all zones associated with the Nyquist system server; page exclusion does not affect Emergency All Call pages.

If you are using the same server on a multiple site campus and do not want the pages to go to all sites, you can create a zone for all stations in an individual site.

To start an All Call or Emergency All Call page:

1   From the dashboard, ensure the **Mode** is **Live**.

2   Select either **All Call** or **Emergency All Call**.

Calling an Extension via the Maps Feature

If the **Action** for a defined action object is set to **Call**, then a **Call** icon appears in the left side of a defined action object.
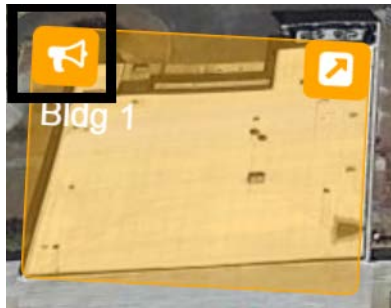

Figure 161. Call Icon

To call an extension using the Maps feature:

1 From the dashboard, ensure the **Mode** is **Live**.

2 Click the **Call** icon on the defined action object.

If a Camera URL value was provided in the definition of the Map Object, a Camera icon appears on the action object (or in the hamburger menu of the object). Clicking this Camera icon will open a browser tab or window to the Camera URL.

To open the Camera URL using the Maps feature:

1 From the dashboard, ensure the **Mode** is **Live**.

2 Click the **Camera** icon on the defined action object.

Tip: Although specifically intended for a camera, the Camera URL could be any URL. For non-camera URLs, however, you probably want to use an Open URL action Map Object to avoid confusion for users.

Using Maps for Check-In
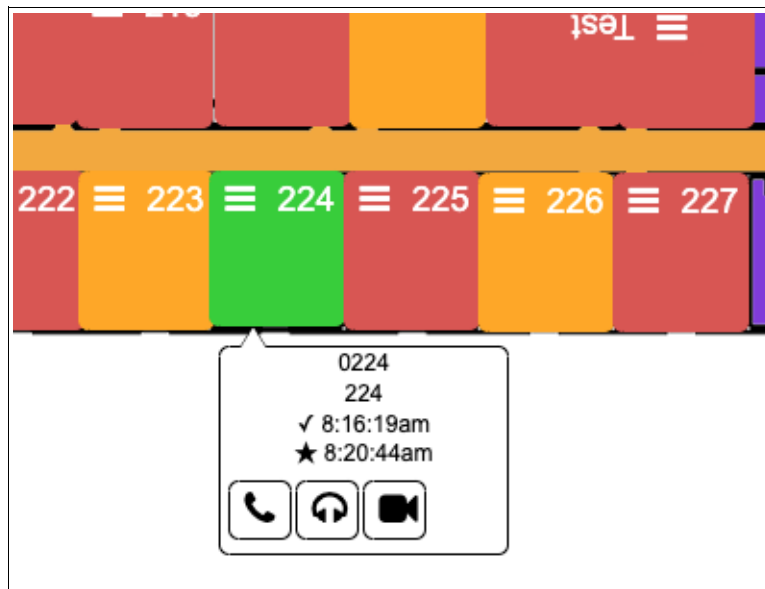
Figure 162. Maps Check-In View

From the Maps view, you can monitor Check-In or start a routine that starts or stops Check-In.

To use Maps for Check-In, the following conditions must be met:

- You have permissions configured to view maps (see "*Assigning and Editing Permissions" on page 216*).

- Your station Type is **Admin Web Interface** or **Web Interface** (see "*Editing Station Configuration Settings" on page 142*).

- Check-In has been configured for your system (see "*Configuring Check-In" on page 471*).

- You have an available map that shows the rooms or areas that you want to monitor (see "*Adding a Site Graphic" on page 371*).

- You have created a map object for each station that you want to monitor (see "*Creating a Map Object for Check-In" on page 385*).

To use a routine to start or stop Check-In, the routine must have been previously created with either a trigger or an action Type of Check-In. (see "*Adding a Routine" on page 395*).

Note: You can only listen in areas or rooms that allow two-way communications; in other words, the station in that room must be associated with a speaker with a microphone.

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Creating a Map Object for Check-In

To create a map object for an area or room, first follow the steps for adding an action object to your map (see "*Adding a Defined Action Object" on page 372*).

To edit a defined action object:

1 From the dashboard, ensure the **Mode** is **Edit**.

2 Click the **Edit** icon on the selectable object.

3 Complete the Edit parameters, ensuring that **Action** is set as **Call**. (See *Table 102, "Edit Map Object Parameters," on page 375* for more information about the available parameters.

4 Select **Save**.

Note: You must create a defined action object for each room or area that you want to monitor.

Monitoring Check-In

Figure 163. Map Object in Live Mode

When Check-In is active, the Map panel changes to **Live** Mode and the Map objects for all stations being monitored will no longer show the **Edit** icon. Instead, you will see icons for Call, Listen, Video, and Information.

The **Listen** icon only works if the station is associated with a speaker that allows two-way communication. The **Video** icon only works with Map objects that have been configured with a Video URL (*Table 102, "Edit Map Object Parameters," on page 375*). If the Map object isn't large enough to display the icons, a hamburger menu (also known as a three-line menu or menu button) appears in the top right corner.

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Figure 164. Map Object With Hamburger Menu
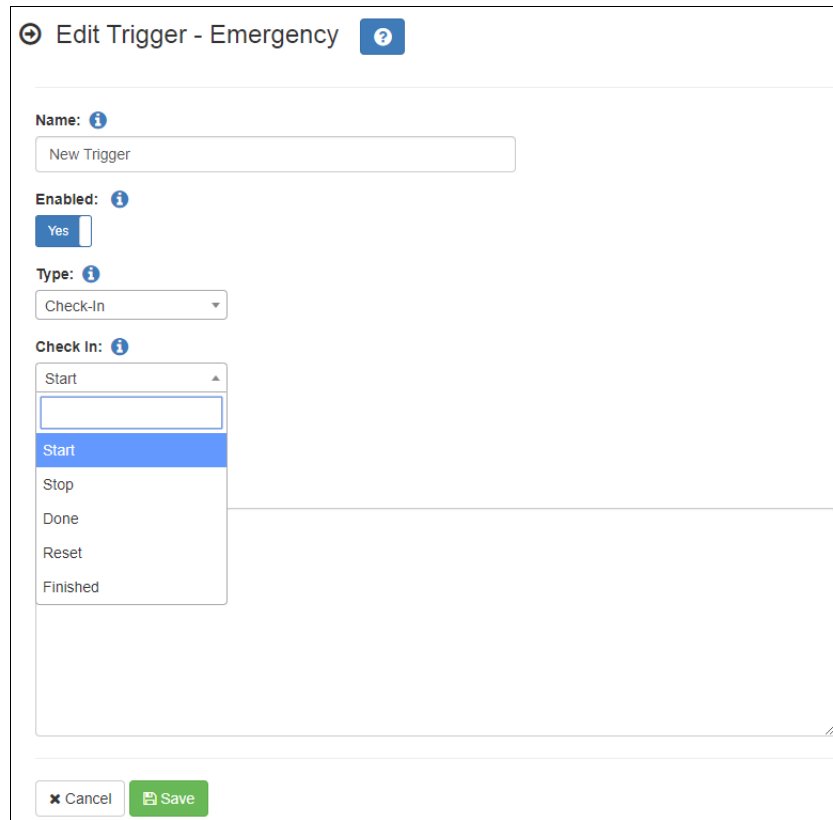
From the hamburger menu, you can select the desired action.

During Check-In, the colors on the station map objects will change to reflect what appears on the Check-In view:

Color	Status
Green	Checked in
Red	Not checked in
Gray	Check-in is not expected because the station is either on the vacant or excluded lists.

A vacant station can check in. The text **Was Vacant** will then appear in the button information.

Using Check-In Routines from Maps View

Figure 165. Check-In Options for Trigger

Provided routines have been created for either trigger or action Check-In types, you can start a routine to do one of the following:

- Start check-in.
- Stop check-in.
- Change check-in status to **Done**.
- Reset check-in status of stations.
- Change check-in status to **Finished**.

Routines must be created in the Routines view and **Execute Routine** must be selected as the Maps object's **Action** (see "*Execute Routine" on page 379*).

Deleting a Defined Action Object

If you have delete permission for the Maps feature, you can delete a defined action object.

To delete a defined action object:

1 From the dashboard, ensure the **Mode** is **Edit**.

2 Double-click the **Menu** icon in the defined action object that you want to delete.

3 Select **Delete**.

4 When prompted, select **Delete** again.

Deleting a Graphic

If you have delete permission for the Maps feature, you can delete a graphic.

To delete a graphic:

1 From the dashboard, ensure the **Mode** is **Edit**.

2 Select the **Delete** icon.

3 From the Delete Map prompt, select **Delete**.

Using Routines

A routine automatically starts a procedure, or sequence of actions, that the Nyquist system executes as a result of an input trigger. Routines can support your crisis plans for situations such as lockdown, weather events, or emergency evacuation.

> *Note:* You should *always* run a test of a routine after creating or editing it.

A routine can be started manually via the Admin Phone or the Admin Web UI.

A routine can also be automatically started:

- by an event, such as playing a specific announcement,
- via third-party switch contact closures recognized by the Nyquist I/O Controller,

- or via a Routines API that can be used by third-party systems, including fire systems, access control systems, and video security systems.

A routine that has **Allow DTMF** enabled does not need a trigger. However, most routines will have at least one associated trigger and one or more actions. For example, if an administrator manually triggers a lockdown routine, several actions could result, such as:

- Play a lockdown announcement
- Display lockdown instructions on monitors connected to NQ-GA10PV devices.
- Close I/O controller output contacts to trigger third-party systems that lock doors
- Initiate the check-in process
- Start an emergency all call announcement

To use the Routines feature, you must have the appropriate permissions (see *"Assigning and Editing Permissions" on page 216*) and the station being used to start the routine must have the CoS parameter **Execute Routines** enabled. (see *"Using CoS Configuration" on page 89*).

To allow a third-party system to start a routine via the Routines API, you must enable **Allow API** for the routine.

You can import or export routines by selecting the appropriate button from the **Routines** view. When importing a routine, the routine file must have a .sql extension. See *"Exporting a Routine" on page 443* or *"Importing a Routine" on page 445* for more information.

Starting and Stopping a Routine from the Admin Web UI

You can manually start a routine that has **Allow DTMF** enabled and stop a running routine from the Admin Web UI.

In addition to the routine needing **Allow DTMF** enabled, the Admin Web UI must have **Execute Routines** CoS enabled (see *"Using CoS Configuration" on page 89*).

To start a routine from the Admin Web UI:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Routines**.

3 Select one of the listed routines.

To stop a routine from the Admin Web UI:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2   Under Calling/Paging, select **Routines**.

3   Select **Routines Manager**.

4   Select the routine that you want to stop.

> *Note:* Stopping a routine does not reverse any actions that the routine has already started. You may need to clear the actions manually.

5   Select **Yes**.

Starting and Stopping a Routine from the Admin Phone

You can manually start a routine that has **Allow DTMF** enabled from an Admin Phone by doing one of the following:

• Dial *94<Routine-DTMF-Code>.

• Select the **Routines** menu from the Admin Phone and then select the routine that you want to start.

> *Note:* Only routines with **Allow DTMF** enabled appear in the menu.

In addition to the routine needing **Allow DTMF** enabled, the Admin Phone must have **Execute Routines** CoS enabled (see *"Using CoS Configuration" on page 89*).

If you disconnect the call during a routine, the routine continues until finished. If the routine includes **Pause** actions, the call will not disconnect until all **Pause** actions have been executed.

A routine started from the Admin Phone may end with any of the following page commands, provided the Admin Phone has the appropriate CoS enabled:

• All-Call

• Emergency-All-Call

• Facility-Page

• Multi-Site-All-Call

• Multi-Site-Emergency-All-Call

• Zone-Page

You can stop a specific routine by dialing one of the following:

• *95<Routine-DTMF-Code>

- 0000095<Routine-DTMF-Code>

Note: If the **Allow DTMF** parameter for the specified routine is set to **No**, you will be prompted to enter the system password.

Using the Routines API

The Routines API is an HTTP-based interface accessible to any client capable of making a web request. Using this interface, you can remotely start a routine from a web browser, a custom script, an application, or even a command prompt. You can even allow a third-party system, such as an access control system, to start routines.

To execute a routine through the **Routines API**, there are a number of prerequisite conditions and configuration settings.

- The Bogen Root Certificate Authority SSL certificate must be installed on the client computer (i.e., the computer making the request). For details, see "*Client Requirements" on page 9*.

- The global **Enable Routines API** setting must be enabled on the Routines page (see "*Viewing Routines" on page 394*).

- The routine to be executed must have the **Allow API** parameter enabled (see "*Editing a Routine" on page 396*).

- The routine's station, set via its **Extension** setting, must meet the following conditions:

   - The **Type** setting must be "Admin Web Interface" or "Web Interface" (see "*Editing Station Configuration Settings" on page 142*).

   - The **Execute Routines** setting must be enabled for the **CoS Configuration** specified by the station's **Day CoS** and/or **Night CoS** settings (see "*Using CoS Configuration" on page 89*).

- The routine cannot end with a paging action or any call type action that requires a user to speak.

Starting a Routine via the Routines API

A routine is started through the Routines API by sending an HTTPS GET command to the server. The specific routine to execute and several parameters are passed as part of the URL, but for security reasons, the authorization information is passed in an HTTPS-encrypted header.

The **Routine API Key** property, which can be found on the **Edit System Parameters** page, is used as a passcode, authorizing the caller to perform the specified actions. It

must be included in the "Authorization" HTTP header of each **Routines API** web request, and its value must be a string, formatted as "Bearer *<routine-api-key>*". Note that the same value is used by all clients of the **Routines API**, so if this value is changed, all clients must be updated.

The URL of a Routines API web request must take the following form:

```
https://<server>/routine/api/<dtmf_code>/<password>/<delay_flag>/<p1>/<p2>
```

- <server>: The Nyquist server's IP address.
- <dtmf_code>: The DTMF code of the Routine to be executed.
- <password>: Set to "0" (zero).
- <delay_flag>: Can be 1 (ON) or 0 (OFF). A setting of 1 returns the status to the caller after the routine finishes (a synchronous call), while a setting of 0 returns the status immediately after the routine starts (an asynchronous call).
- <p1>: A value that can replace the $apiParam1 variable in an action field.
- <p2>: A value that can replace the $apiParam2 variable in an action field.

The parameters <p1> and <p2> are passed through the URL to the routine. That routine can reference these values by using the variables $apiParam1 and $apiParam2 within specific fields of the Routine Actions. See *Table 103 on page 393* for details about which fields of which Routine Actions can use the $apiParam1 and $apiParam2 variables.

Note: Some value must be provided for both <p1> and <p2>. If either parameter will not be used, specify a value of "0" (zero).

Note: For backward compatibility with earlier product releases, the password associated with the routine's extension can be specified in the <password> parameter and the <p1> and <p2> parameters can be removed. Although this request format is still supported, it is not recommended, as it is significantly less secure.

To invoke a routine, submit an HTTPS web request to the server, formatted as described in *"Starting a Routine via the Routines API" on page 391*. For example, to execute a routine associated with DTMF code 3333 on server 192.168.0.1 with a Routine API Key of '1ed163a71c6695f42035ebade76f1968', while passing 'abc' and 'xyz' as parameters p1 and p2, you can use either of the following techniques.

- **Technique 1 (curl)**: At a command prompt, execute the following command:

```
curl --ssl-no-revoke -H "Accept: application/json" -H "Content-Type:
application/json" -H "Authorization: Bearer
1ed163a71c6695f42035ebade76f1968" https://192.168.0.1/routine/api/3333/
0/1/abc/xyz
```

Example response:

```
{"status":"success","message":"Test routine. p1 = abc, p2 = xyz"}
```

- **Technique 2 (PowerShell)**: At a PowerShell prompt, execute the following command:

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```
Invoke-RestMethod -Uri https://192.168.0.1/routine/api/3333/0/1/abc/xyz
-UseBasicParsing -Headers @{ Authorization =
"Bearer 1ed163a71c6695f42035ebade76f1968" }
```

Example response object:

```
status  message
------  -------
success Test routine. p1 = abc, p2 = xyz
```

| Warning | The Routine API Key is an application passcode and must be kept confidential. If this key has been compromised—such as by making a non-secure request (i.e., using HTTP instead of HTTPS), thus exposing the key in an unencrypted format over the internet—it should be considered unsafe, and it should be invalidated by generating a new key using the Routine API Key's Reset button on the System Parameters Edit page. All Routine API clients will subsequently need to use the new API Key value. |

Tip: These techniques can be useful for testing a newly developed Routine. They allow you to execute it from a command line without having to initiate the actual trigger. The Routines button on the Dashboard can similarly be used for such testing. Be aware, however, that the variables available to the Routine may be different when invoked through the Routines API than when invoked through a trigger.

Table 103. Routine Actions and Routine API parameters

Routine Action	Routine Action field(s) able to use $apiParam1 and $apiParam2
Add-Announcement-Audio	Text-To-Speech
Dash-Text	IDENT
	Text
Dash-Delete	IDENT
Display-Msg	IDENT
	Text
Display-Msg-Delete	IDENT
Email	Subject
	Text

Viewing Routines

Selecting **Routines** from the navigation bar allows you to view and edit existing routines and to create new routines.

Figure 166. Routines

To view existing routines:

1 On the navigation bar, select **Routines**.

The Routines page displays the following parameters for each routine:

Table 104. Routines Parameters

Enable Routines API	Toggle button that enables or disables ability of clients to activate routines by using a **Routines API** web request (see "*Starting a Routine via the Routines API" on page 391*).
	Note: This is a system-wide setting, not specific to a routine.
Triggers button	Click to select or add **Triggers** that will start the routine.
Actions button	Click to select or add **Actions** that will occur as part of the routine.
Name	Displays the routine's name.
Extension	For routine actions that require a CoS permission, this is the station extension to use for granting the required permissions. The extension is also used as the Caller ID wherever Caller ID is displayed. If the caller's extension is used, this field must be blank.
	Note: Either this field or **Use Callers Extension** must be set or the routine is invalid.
Enabled	Specifies if the routine is enabled. Routine is disabled by default.

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Table 104. Routines Parameters (Continued)

Use Caller's Extension	Specifies that the caller's extension is to be used instead of the station extension. This option may be appropriate when a routine is expected to be executed by a caller dialing a DTMF code or when a routine trigger is associated with an event that involves a caller (for example, All-Call, Zone Page) who has sufficient CoS permissions to execute the routine's actions. If **Extension** is used, this field must not be set. This field is enabled by default. *Note:* Either this field or **Extension** must be set or the routine is invalid.
Allow DTMF	Specifies if the routine can be manually started by dialing the routine's DTMF code from an Admin Phone. This field is disabled by default.
DTMF Code	Specifies the number to use when manually starting the routine from an Admin Phone or by the Routine API. The number can have from 1 to 10 digits. You cannot assign the same DTMF code to multiple routines.
Allow API	Specifies if the routine can be executed via the Routines API. The Routines API is an application programming interface that allows a third-party application, such as a fire alarm system, to start a Nyquist routine.
Allow Multiple	Specifies if multiple instances of the routine can run at the same time. This field is enabled by default. If disabled, the system allows only one instance of the routine to execute regardless of how many times a routine might be triggered while already executing.
Description	Select **Show** to view a description of the routine.

You can also select the **Triggers** button to select or add triggers to start the routine or select the **Actions** button to select or add **Actions** that will occur as part of the routine.

Adding a Routine

Adding a routine creates a **New Routine** on the Routines page. By default, this new routine is not enabled. It also has no **Triggers** or **Actions**.

To add a routine:

1 On the navigation bar, select **Routines**.

2 On the Routines page, select the **Add** icon.

The Edit Routine page appears (see "*Editing a Routine" on page 396*).

> *Note:* When a Routine is added, edited, or deleted, all Admin phones will automatically be rebooted to update their **Routines** menu.

Editing a Routine

Editing a routine allows you to change the **Name** from **New Routine** to a more descriptive name. The Edit Routine page allows you to set other parameters for the routine (see *Table 104, "Routines Parameters," on page 394*).

Figure 167. Edit Routine

To edit a routine:

1   On the navigation bar, select **Routines**.

2   On the Routines page, select the **Edit** icon.

3   Complete the changes for the parameters on the Edit Routines page (see *Table 104, "Routines Parameters," on page 394*).

4   Select **Save**.

Deleting a Routine

Use caution when deleting routines. If you delete a routine and then recreate it, you may need to assign a new DTMF Code if the previous code was assigned to another routine.

To delete a routine:

1 On the navigation bar, select **Routines**.

2 On the Routines page, select the **Delete** icon next to the routine that you want to delete.

3 When prompted, select **Delete**.

Creating and Executing Multi-Site Routines

You can create a routine to be started on one or more remote sites, such as a lockdown routine to be started at all sites in a district.

To create such a routine, you would select the **Routine** action **Type** (see *"Actions" on page 409* and *"Understanding Action Parameters" on page 414*). You can select to execute the action on the local facility, a specific facility, or all facilities. If you want to execute the routine on multiple, but not all, facilities, you must create a separate action for each facility (using **Routine** action **Type**).

When you select a specific facility, you can enter the DTMF code of the routine. A routine with that DTMF code must exist on that facility.

Routines that are triggered by another site will not execute calling or paging type actions. Also, the receiving facility must have **Use Caller Extension** disabled.

> *Note:* There will be a one-second delay between execution of one **Routine** action and another **Routine** action. So, if you execute a multi-site routine for 10 sites, there will be 10-second delay between when the routine starts on the first facility and when it starts on the tenth facility. To eliminate this delay, you can select **All Facilities** and then ensure that a routine with the specified DTMF does not exist on the sites that you do not want to run the routine. If **All Facilities** is selected, the remote routines start at the same time.

Call Detail Records

Call Detail Records (CDRs) are created when a routine is started. When started on a local facility, the **Destination** field will show **Local Facility** and the **Type** field will show **Start Routine (<routine-DTMF-code>)**.

When a routine is started on a selected remote facility, the CDR will show the remote facility name in the **Destination** field and **Start Remote Routine (<routine-DTMF-code>)** in the **Type** field.

When a routine is started on all facilities, the CDR will show **All Facilities** in the **Destination** field and **Start Remote Routine (<routine-DTMF-code>)** in the **Type** field.

For more information about view CDRs, see "*Viewing Call Detail Records" on page 325*.

Allowing Input Contact Closure to Initiate Ring-Tone to Speakers

Through the Routines feature, you can let an input contact closure initiate the playing of a ringtone to designated stations.

To do this, create a routine (see "*Adding a Routine" on page 395*) that uses **Play-Ringtone** as the action **Type** (see "*Understanding Action Parameters" on page 414*). For the **Action**, select **Start**. Select the **Zones** that contain the speakers you want to play the ringtone.

To stop the ringtone, create a second routine that is triggered when the contact opens and uses the **Stop** for the **Action**.

Using Triggers

A trigger is an event that starts a routine. By default, when you create a routine, it has no trigger or actions.

A trigger can have up to two parameters. For example, you can create a trigger that uses a specific Announcement. The first parameter would be the **Announcement Type** (Number) and the second parameter would be the **Announcement**.

Viewing Triggers for a Routine

Figure 168. Triggers

To view triggers for a routine:

1 On the navigation bar, select **Routines**.

2 Select **Triggers** for the routine that you want to view triggers for.

If a trigger has been added for the selected routine, information about the trigger appears (see *Table 105, "Triggers," on page 400*).

From the Triggers page, you can also add a trigger or select the **Actions** button to add actions that the selected routine will perform.

3 Select **Done** when finished viewing.

Table 105. Triggers

Name	Displays the user-provided name for the trigger.
Enabled	Specifies if the trigger is enabled. When enabled, the trigger will cause the routine to begin when the trigger event occurs.
Type	Displays the system event that triggers the routine. Type can be one of the following:

- 911

- AF-Primary-*

- AF-Secondary-*

- Alarm

Table 105. Triggers (Continued)

- All-Call
- Announcement
- Audio-Disabled
- Audio-Enabled
- Audio-Dist (Audio Distribution)
- Check-in
- Emergency-Call
- Emerg-All-Call
- Facility Page
- Facility Status Down
- Incoming-Call
- Input-Contact-Closed
- Input-Contact-Opened
- Intercom-Call
- Multi-Site-All-Call
- Multi-Site-E-All-Call
- Night-Ring
- Reboot
- Schedule-Activated
- Scheduled-Tone
- Sched-Event (Scheduled Event)
- Scheduled-Tone
- Station-Status-Up
- Station-Status-Down
- Tone
- Urgent-Call
- Zone-Page

Parameter 1   Displays the first parameter for the specified trigger if required. For example, if a trigger involves the closing of a contact on an I/O Controller, Parameter 1 is the name of the I/O Controller. For more information about Parameter 1 options, see *"Understanding Trigger Parameters" on page 404*.

Table 105. Triggers (Continued)

Parameter 2	Displays the second parameter for the specified trigger if required. For example, if a trigger involves the closing of a contact on an I/O Controller, Parameter 2 is the specific contact or contacts of the device. For more information about Parameter 2 options, see *"Understanding Trigger Parameters" on page 404*.
Description	Displays the description entered by the user for the selected trigger.

Adding a Trigger

One or more triggers, which are events that start a routine, can be added to a routine. When adding a trigger, you can set up to two parameters for the trigger (see *"Understanding Trigger Parameters" on page 404*).

To add a trigger:

1 On the navigation bar, select **Routines**.

2 Select **Triggers** for the routine that you want to add a trigger for.

3 Select the **Add** icon.

   The Edit Trigger page appears.

4 Complete the parameters for the new trigger (see *"Editing a Trigger" on page 402*).

5 Select **Save**.

Editing a Trigger

Editing a trigger allows you to change the **Name** from **New Trigger** to a more descriptive name, such as Fire Alarm Activated. The Edit Trigger page allows you to set other parameters for the trigger.

Figure 169. Edit Trigger

To edit a trigger:

1 On the navigation bar, select **Routines**.

2 Select **Triggers** for the routine that you want to edit a trigger for.

3 Select the **Edit** icon.

4 Complete parameters for the trigger. (See *Table 105, "Triggers," on page 400*.)

5 Select **Save**.

Deleting a Trigger

To delete a trigger:

1 On the navigation bar, select **Routines**.

2 Select the Delete icon next to the trigger that you want to delete.

3 When prompted, select **Delete**.

Understanding Trigger Parameters

A trigger can have up to two parameters, depending on the **Type** selected.

When viewing triggers, the parameters appear as **Parameter 1** and **Parameter 2**. On the Edit Trigger page, though, the parameter names and available selections change based on the **Type**. For example, if **Alarm** is selected as **Type**, a field called **Alarm** appears with a drop-down menu that shows all of the tones with **Type** set to **Alarm** on the Tones page (see *"Viewing Available Tones" on page 301*).

If you select the trigger **Type** to **Announcement**, the **Announcement Type** field appears. The selection for **Announcement Type** will appear as **Parameter 1** on the Triggers page. For some Announcement Types, additional information is needed. For instance, if you select **Normal-Zone** as the **Announcement Type** on the Edit Trigger page, the **Zone** field appears. From the Zone field, you can select **All Speakers**, **Any Zone**, or a specific zone.

Some triggers have no parameters. For example, if you select **Emerg-All-Call** for **Type**, no parameters are applicable.

The following table describes the trigger **Type** and any applicable parameters.

Table 106. Trigger Types and Parameters

Type	Parameter 1	Parameter 2
911	None	None
AF-Primary-*	None	None
AF-Secondary-*	None	None
Alarm	Alarm • Selected alarm • Any	None
All-Call	None	None

Table 106. Trigger Types and Parameters (Continued)

Type	Parameter 1	Parameter 2
Announcement	Announcement type	
	• Any	None
	• Number	Announcement
	• Normal-Any	None
	• Normal-Zone	Zone • All Speakers • Any Zone • Selected Zone
	• Emergency-Any	None
	• Emergency-Zone	Zone • All Speakers • Any Zone • Selected Zone
Audio-Dist *Note:* This type of routine must have an extension defined and **Use Caller's Extension** must be set to **No**. If you want to trigger on a Scheduled Audio that uses a playlist, make the playlist an Audio Distribution selection and then schedule the Audio Distribution instead of the play-list.	Audio Distribution Com-mand • Start • Stop	Audio Distribution Selec-tion • Any • Selected Audio Distri-bution
Audio Disabled	None	None
Audio Enabled	None	None

Table 106. Trigger Types and Parameters (Continued)

Type	Parameter 1	Parameter 2
Check-In *Note:* Done indicates that all stations that were expected to check in have done so. Finished indicates that the check-in process was manually finished by an admin user at the completion of check-in.	Check In • Start • Stop • Done • Finished • Reset	Stations • Any • Selected station or stations
Emergency-Call *Note:* When both Callers and Called are specified, the trigger occurs when an intercom call involves a specified caller OR a specified called party.	Callers • Any • Selected station or stations	Called • Any • Selected station or stations
Emerg-All-Call	None	None
Facility Page	Facility • Any • Selected facility number	None
Facility Status Down *Note:* This type of routine must have an extension defined and Use Caller's Extension must be set to No. If displaying messages, delete messages first using IDENT, then create messages with IDENT set. **Warning Routines will be triggered every 60 seconds. Make sure that repeating actions make sense.**	Facility • Any • Selected facility number	None

Table 106. Trigger Types and Parameters (Continued)

Type	Parameter 1	Parameter 2
Incoming-Call *Note:* Incoming-Call triggers on incoming calls from the PSTN (from SIP or DAHDI trunks) that are received by an Admin station. (The Admin station rings and the call must be answered). Incoming-Call does not trigger on incoming DISA or Security DISA calls.	None	None
Input-Contact-Closed *Note:* If it is possible for the input contact to be repeatedly closed or opened in a very short time frame, consider setting **Allow Multiple** to **No** so the routine prevents multiple invocations from simultaneously occurring.	IO Controller • Selected IO Controller	Input Contacts • Selected input contact or contacts
Input-Contact-Opened *Note:* If it is possible for the input contact to be repeatedly closed or opened in a very short time frame, consider setting **Allow Multiple** to **No** so the routine prevents multiple invocations from simultaneously occurring.	IO Controller • Selected IO Controller	Input Contacts • Selected input contact or contacts
Intercom-Call	Callers • Any • Selected station or stations	Called • Any • Selected station or stations
Multi-Site-All-Call	None	None
Multi-Site-E-All-Call	None	None

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Table 106. Trigger Types and Parameters (Continued)

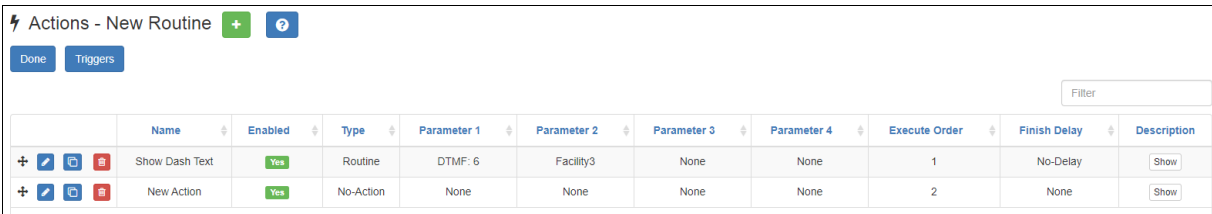| Type	Parameter 1	Parameter 2
Night-Ring *Note:* Use the Action **Ring-Wait** to detect when a call has been answered or disconnected. See *"Understanding Action Parameters" on page 414* for more information. A routine that uses the night-ring trigger *must* have **Use Caller's Extension** disabled and an assigned Extension with the proper CoS.	None	None
Reboot *Note:* Routines with this trigger will execute whenever the Nyquist server reboots. To use this trigger, you must have an extension defined and disable **Use Caller's Extension**.	None	None
Schedule-Activated *Note:* This trigger will start an associated routine every day at midnight when the schedule defined by parameter 1 is activated for the day, or when the schedule defined in parameter 1 is manually activated via the Admin web interface or Admin Phone.	Holiday or Schedule Name	None
Sched-Event	Scheduled Event • Any • Selected event	None

Table 106. Trigger Types and Parameters (Continued)

Type	Parameter 1	Parameter 2
Scheduled-Tone *Note:* This type of routine must have an extension defined and "Use Callers Extension" must be set to "No".	Tone • Any • Selected tone	None
Station-Status-Up *Note:* You must define an extension in the routine and disable **Use Caller's Extension**.	Stations • Any • Selected station or stations	None
Station-Status-Down *Note:* This type of routine must have an extension defined and **Use Caller's Extension** must be set to **No**.	Stations • Any • Selected station or stations	None
Tone	Tone • Any • Selected tone	None
Urgent-Call *Note:* When Callers and Called are both specified, the trigger occurs when intercom call involves a specified caller OR a specified called party	Callers • Any • Selected station or stations	Called • Any • Selected station or stations
Zone-Page	Zone • Any • Selected zone	None

Actions

An action is an activity or task that the system performs as the result of a trigger starting a routine. For example, a routine that uses a selected tone for the trigger could have audio distribution start as the action.

Viewing Actions for a Routine

Figure 170. Actions

To view actions for a routine:

1 On the navigation bar, select **Routines**.

2 Select **Actions** for the routine that you want to view actions for.

> If an action has been added for the selected routine, information about the action appears (see *Table 107, "Actions," on page 410*).

> From the Actions page, you can also add an action or select the **Triggers** button to add triggers that the selected routine will perform.

3 Select **Done** when finished viewing.

Table 107. Actions

Name	Displays Name of the action.
Enabled	Move the slider to **Yes** to enable this action.

Table 107. Actions (Continued)

Type

Note: Depending on the Type, additional parameters may be set (see *"Understanding Action Parameters" on page 414*).

Displays the type of action. Type can be one of the following:

- Add-Announcement-Audio
- Alarm
- All-Call
- Announcement
- Audio-Dist-Start (Audio Distribution Start)
- Audio-Dist-Stop (Audio Distribution Stop)
- Call-And-Announce
- Check-In
- Check-intercom
- Dash-Delete (Dashboard Text Delete)
- Dash-Text (Dashboard Text)
- Disable-Audio
- Display-Msg (Display NQ-GA10PV Message)
- Display-Msg-Delete (Delete NQ-GA10PV Message)
- Enable-Audio
- Email
- Emergency-Call
- Emerg-All-Call (Emergency All-Call)
- Facility-Page
- Feature-Wait
- Intercom-Call
- Intercom-Wait
- Multi-Site-All-Call
- Multi-Site-E-All-Call
- New-Announcement
- No-Action
- Output-Contact-Close
- Output-Contact-Open
- Page-Exclusion
- Pause
- Play-Announcement
- Play-Ringtone
- Ring-Wait
- Routine
- Routine-Enable
- Routine-Disable
- Tone
- Urgent Call
- Zone-Page

Parameter 1

Displays the first parameter for the specified action type if required. For example, if Routine is selected as action **Type**, then the DTMF Code for the routine appears as Parameter 1.

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Table 107. Actions (Continued)

Parameter 2	Displays the second parameter for the specified action type if required. For example, if **Routine** is selected as the action **Type**, then either **Local** or a specific facility appears as Parameter 2.
Parameter 3	Displays the third parameter for the specified action type if required.
Parameter 4	Displays the fourth parameter for the specified action type if required.
Execute Order	Displays the order that the action should be executed.
Finish Delay	Specifies if the routine should wait until this action is completed before starting the next action.
Description	Displays the user provided description for the action.

Adding an Action

One or more actions can be added to a routine. When adding an action, you can set up to four parameters for the action (see "*Understanding Action Parameters" on page 414*).

To add a trigger:

1 On the navigation bar, select **Routines**.

2 Select **Actions** for the routine that you want to add an action for.

3 Select the **Add** icon.

 The Edit Action page appears.

4 Complete the parameters for the new action (see *Table 107, "Actions," on page 410*).

5 Select **Save**.

Editing an Action

Editing an action allows you to change the **Name** from **New Action** to a more descriptive name, such as Announcement. The Edit Action page allows you to set other parameters for the action.

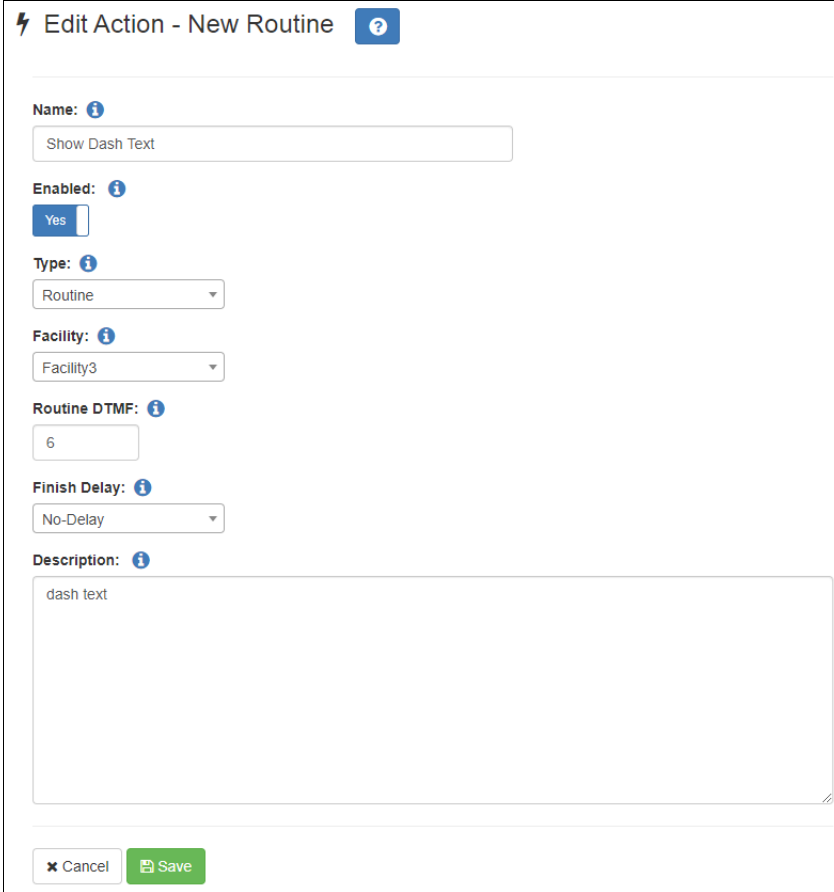**Figure 171. Edit Action**

To edit an action:

1   On the navigation bar, select **Routines**.

2   Select **Actions** for the routine that you want to edit an action for.

3   Select the **Add** icon.

   The Edit Action page appears.

4   Complete the parameters for the action (see *Table 107, "Actions," on page 410*).

5   Select **Save**.

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Cloning an Action

If an action is used more than once in a routine, you might want to clone the action rather than create a new action. Cloning an action creates a duplicate of the selected action and places the duplicate at the end of the action list.

You can edit a cloned action if you want to change any of the parameters, such as duration.

To clone an action:

1 On the navigation bar, select **Routines**.

2 Select **Actions** for the routine that has the action you want to clone.

3 Select the **Clone** button ( ) for the action that you want to duplicate.

Understanding Action Parameters

An action can have up to four parameters, depending on the **Type** selected.

When viewing actions, the parameters appear as **Parameter 1**, **Parameter 2**, **Parameter 3**, and **Parameter 4**. On the Edit Action page, though, the parameter names and available selections change based on the **Type**. For example, if **Alarm** is selected as **Type**, a field called **Alarm** appears with a drop-down menu that shows all of the tones with **Type** set to **Alarm** on the Tones page (see *"Viewing Available Tones" on page 301*). With this type of action, you can also set the **Duration**, which appears on the Actions page as **Parameter 3**. Parameters 2 and 4 are not used for this type of action, but you can set a **Finish Delay**, which establishes if the routine should wait until this action is completed before starting the next action.

Some actions have no parameters. For example, if you select **All-Call** for **Type**, no parameters are applicable.

The following table describes the action **Type** and any applicable parameters.

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Table 108. Action Types and Parameters

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Add-Announcement-Audio Adds audio to a temporary announcement. This must be preceded by a **New-Announcement** action followed by zero or more **Add-Announcement-Audio** actions and finally a **Play-Announcement** action.	Audio Source Type • Announcement • Number • Text-to-Speech (TTS)	Announcement to play (depends on Audio Source Type) Announcement • Selected announcement Number • Numeric value • Variable Text-to-Speech • Text, with optional TTS formatting (see *"Using SSML for Text-to-Speech Entries" on page 292*) The following variables can be used for Number or Text-to-Speech announcements: $apiParam1 $apiParam2 $caller $called $contact $station	Pronounce fractions (used only when Audio Source Type is Number) • 0 = No • 1 = Yes	Announce number as (used only when Audio Source Type is Number): • Number • Digits
Alarm *Note:* In addition to the parameters, you also can set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**.	Alarm • Selected alarm	None	Duration • Number of seconds for action to continue; default is 86400 seconds (24 hours)	None

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Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
All-Call *Note:* All-Call must be the last action in a routine. In addition to the parameters, you also can set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**.	None	None	None	None
Announcement *Note:* In addition to the parameters, you also can set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**.	Announcement • Selected announcement	Zone • All speakers • Selected zone	Duration • Number of seconds for action to continue; default is 86400 seconds (24 hours) *Note:* The announcement will stop when the duration length is reached, regardless of the length of the announcement.	None
Audio-Dist-Start *Note:* In addition to the parameters, you can also set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**	Audio Distribution • Selected Audio Distribution	None	None	None
Audio-Dist-Stop *Note:* In addition to the parameters, you can also set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**	Audio Distribution • Selected Audio Distribution • All	None	None	None

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Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Call-And-Announce	Number to Call • 911 • Station Extension • A local 7-digit phone number prefixed with 98 • A local 10-digit phone number prefixed with 98 • A long distance 10-digit phone number prefixed with 981 *Note:* If the specified number to call is not a station extension, then at least one outgoing SIP trunk or Outside Line DAHDI port must be available, and the CoS of the Routine extension must match the extension defined by the SIP trunk or Outside Line DAHDI port.	Announcement to Play • Selected announcement	Play Count • Continuous Play • Number of times to play *Note:* If left blank or set to zero (0), the announcement plays continuously until the called number hangs up. If you are playing the announcement to a station that cannot disconnect the call (such as a speaker), specify the number of times to play the announcement.	None

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Check-In *Note:* In addition to the parameters, you can also set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**	Check In • Start • Stop • Done • Finish • Wait • Station • Vacancy-Add • Vacancy-Delete • Reset • Exclude-Add • Exclude-Delete	Stations • Selected Stations *Note:* Used when Parameter 1 is Station, Vacancy-Add, Vacancy-Delete, Exclude-Add, or Exclude-Delete.	None	None
Check-Intercom	None	None	None	None
Dash-Delete *Note:* This action type is for deleting messages from the web interface dashboard. When calls are placed from outside the system, displays the phone number of the caller. The number used for Number is based on the order the message was created; the third message created would be identified as number 3.	Dash Delete			
	• LIFO (Last In, First Out)	None	None	None
	• FIFO (First In, First Out)	None	None	None
	• IDENT	Identifier The following variables can be used: $apiParam1 $apiParam2 $caller $called $contact $facility $eventid $eventname $scheduleid $station $toneid $tonename $zone	None	None
	• Number	Number	None	None

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Dash-Text *Note:* This action type is for adding messages to web interface dashboards.	Style • Basic • Danger • Info • Success • Warning	Identifier The following variables can be used: $apiParam1 $apiParam2 $caller $called $contact $facility $eventid $eventname $scheduleid $station $toneid $tonename $zone *Note:* This parameter is optional.	Scope • All • Admin	Text *Note:* When entering the text to display, you can use variables, such as $caller. When $caller is used in the Text parameter for dashboard and NQ-GA10PV display messages, the variable is replaced by the ID of the caller that triggered the routine. When calls are placed from outside the system, displays the phone number of the caller. The following variables can be used: $apiParam1 $apiParam2 $caller $called $contact $date1 $date2 $date3 $df-avail $facility $eventid $eventname $namecaller $namecalled $scheduleid $schedulename $toneid $tonename $station $time1,$time2 $uptime $zone

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Disable Audio *Note:* In addition to the parameters, you can also set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**	None	None	None	None

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Display-Msg *Note:* Use this action **Type** to create a routine for displaying emergency alerts from the National Weather Service (NWS). See *"Setting Variables for the Display Message" on page 481* for descriptions about the variables used in an Alerts routine. This action Type allows you to set the Display Time in seconds, Priority, text, and message style settings (background color, font, font size, font color, font styles). For more information about message settings, see *"Using Color in Display Messages" on page 451*.	Zones • All Displays • Selected zone or zones	Identifier *Note:* This parameter is optional and is designed for use to identify a message for deletion. The following variables can be used: $apiParam1 $apiParam2 $caller $called $contact $toneid $tonename $facility $eventid $eventname $scheduleid $station $zone	Stations • Selected NQ-GA10PV station • $called • $caller *Note:* Using the $called variable allows a single Intercom-call triggered routine to handle all NQ-GA10PV displays.	Includes the following fields, which were entered when the Action was created: Display Time, Priority, Text to display, Text style settings. Display time, Message type, Image type, Image priority, Message image The Text field may use any of the following variables (availability based on trigger): $alerts $apiParam1 $apiParam2 $autobgcolor * $autofontcolor * $autopriority $auto_resize $caller $called $calltypechar * $calltypeshort * $calltypelong * $contact $date1 $date2 $date3 $df-avail $eventid $eventname $facility $namecaller $namecalled $schedulename $station $time1 $time2 $toneid $tonename $uptime $zone * = Available only for emergency-call and urgent-call triggers

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Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
If you plan to use **Display Message Delete** to delete display message manually, set duration to 0 (which means do not automatically delete message.) When entering the text to display, you can use variables, such as $caller. When $caller is used in the Text parameter for dashboard and NQ-GA10PV display messages, the variable is replaced by the ID of the caller that triggered the routine. When calls are placed from outside the system, displays the phone number of the caller. You can also use basic HTML tags, such as: • <b> for bold • <i> for italic • <u> for underline				

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Dis-play-Msg-Delete *Note:* GA10PV Dis-play Messages created by a Rou-tine that expire during the Rou-tine's execution remain in the undeleted mes-sages list until deleted with a **Dis-play-Msg-Delete** action. When using **LIFO**, **FIFO**, or **NUMBER** to delete display messages, you will still need to exe-cute a delete com-mand for any display messages that have expired during the Rou-tine's execution.	Display Message Delete			
	• LIFO	None	None	None
	• FIFO	None	None	None
	• IDENT	Identifier The following vari-ables can be used: $apiParam1 $apiParam2 $caller $called $contact $facility $eventid $eventname $scheduleid $station $toneid $tonename $zone	None	None
	• PARAM	Zones *Note:* This field is optional.	Stations *Note:* This field is optional.	None
	• NUMBER	Number	None	None
Enable-Audio *Note:* You can set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**.	None	None	None	None

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Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Email *Note:* In addition to the parameters, you can also set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**.	Send Email To • None • Default *Note:* This field cannot be edited when **Use Email Configuration** is set to **Yes**. You can use this parameter to send a text message to a cellphone (see *"Using Email Action to Send Text Message"* on page 430.	Subject The following variables can be used: $apiParam1 $apiParam2 $caller $called $contact $date1 $date2 $date3 $df-avail $facility $eventid $eventname $namecaller $namecalled $schedulename $station $time1 $time2 $toneid $tonename $uptime $zone *Note:* The availability of variables is based on the trigger type.	Text The following variables can be used: $apiParam1 $apiParam2 $caller $called $contact $date1 $date2 $date3 $facility $eventid $eventname $namecaller $namecalled $schedulename $station $time1 $time2 $toneid $tonename $zone *Note:* The availability of variables is based on the trigger type.	None
Emergency-Call	Placed by • Calling Station • Selected Station *Note:* If Calling Station is used, this action must be the last action in the routine and must be executed via DTMF code.	None	None	None
Emerg-All-Call *Note:* This action must be the last action in a routine.	None	None	None	None

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Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Facility-Page *Note:* This action must be the last action in a routine.	Facility • Selected facility	None	None	None
Feature-Wait	Feature Wait • 911 *Note:* 911 waits for the specific caller to disconnect. • Alarm • Announce-ment • All-Call • Disable-Audio • Emerg-All-Call • Facility-Page *Note:* Facil-ity-Page should only be used when the trigger is also Facility-Page. • Multi-Site-All-Call • Multi-Site-E-All-Call • Tone • Zone-Page	Maximum Wait Time • Number of seconds to wait for feature to complete; default is 86400 seconds (24 hours) *Note:* A value of 0 means to wait until the feature has completed regardles of the time it takes to complete. If the feature is not active, the routine continues to the next action.	None	None
Intercom-Call	Placed by • Calling Station • Selected Sta-tion *Note:* If Calling Station is used, this action must be the last action in the routine and must be executed via DTMF code.	Received by • Station that received the call	None	None

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Intercom-Wait *Note:* This action can be used to wait for an Intercom Call to be disconnected or for the end of a Real-Time (not queued) Zone Page by caller.	None	None	None	None
Multi-Site-All-Call *Note:* This must be the last action in a routine.	None	None	None	None
Multi-Site-E-All-Call *Note:* This must be the last action in a routine.	None	None	None	None
New-Announcement Creates a temporary announcement to be played by the routine. This must be followed by at least one **Add-Announcement-Audio** actions and a **Play-Announcement** action.	Announcement Type • Emergency • Normal	Zone • Selected zone number • All speakers (0)	Number of times to play announcement • Number of times to play (1-60)	Silence time between repeats (seconds) • Decimal number between 1.0 and 10.0
No-Action	None	None	None	None

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Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Output-Con-tact-Close	IO Controller • Selected IO Controller	Output Contacts • Selected output contact or contacts	Duration • Number of seconds for action to continue *Note:* Duration of 0 will cause the contact or contacts to momentarily close. Leaving Duration blank will cause the contact to stay close; use **Output-Con-tact-Open** to reopen the contact.	None
Output-Con-tact-Open	IO Controller • Selected IO Controller	Output Contacts • Selected output contact or contacts	None	None
Page-Exclusion	Page Exclusion • Add • Delete	Stations • Selected station or stations	None	None
Pause *Note:* If pausing is used in a DTMF-based routine that ends with paging, the page will not start until all pauses have bee executed. If a DTMF-based routine does not end in a page, the call will not disconnect until all pauses have been executed.	Duration • Number of seconds to pause	None	None	None

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Play-Announcement *Note:* This must be preceded by a **New-Announcement** action and at least one **Add-Announcement-Audio** actions.	None	None	None	None
Play-Ringtone *Note:* Using this action type will not trigger a routine that has a night-ring trigger.	Action • Start • Stop	Zones • All speakers • Selected zone	Timeout (Seconds) *Note:* Blank or 0 means no timeout.	
Ring-Wait *Note:* Waits for caller's ring to end.	None	None	None	None
Routine *Note:* In addition to the parameters, you can also set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**. All trigger parameters and trigger types from the selected routine pass to the new routine so both routines have the same trigger context.	Routine • Selected Routine If Facility or All Facilities is selected as Parameter 2, then Parameter 1 changes to: Routine DTMF • DTMF of Routine to execute on remote Facilities	Facility • Local • Selected Facility • All Facilities	None	None

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Routine-Disable *Note:* If the routine that invokes this action does not execute for any reason (e.g., the server is down), the selected routine will *not* be disabled, even after the server resumes.	Routine • Selected routine	None	None	None
Routine-Enable *Note:* If the routine that invokes this action does not execute for any reason (e.g., the server is down), the selected routine will *not* be enabled, even after the server resumes.	Routine • Selected routine	None	None	None
Tone *Note:* In addition to the parameters, you can also set a **Finish Delay**, of either **No-Delay** or **Wait-Until-Done**.	Tone • Selected tone	Zone • Selected zone All zones of type Time	Duration • Number of seconds for action to continue; default is 86400 seconds (24 hours)	None
Urgent Call	Placed by • Calling Station • Selected Station *Note:* If Calling Station is used, this action must be the last action in the routine and must be executed via DTMF code.	None	None	None

Table 108. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Zone-Page *Note:* This must be the last action of the routine. Dashboard messages created during the routine will be deleted when the user disconnects the call.	Zone • Selected zone	None	None	None

Using Email Action to Send Text Message

You can use the **Email** action **Type** to send a situation specific message an email address outside the Nyquist system and to send a text message to a cellphone. For text messages, the cellular server provider receives the email message and converts it to text.

The following table provides formats to use in the **Send Email To** field when creating or editing an **Email** action **Type**:

Table 109. Email Address Formats for Cellular Carriers

Cellular Carrier	Format
AT&T	<phone number>@txt.att.net
T-Mobile	<phone number>@tmomail.net
Sprint	<phone number>@messaging.sprintpcs.com
Verizon	<phone number>@vtext.com **OR** <phone number>@vzwpix.com
Virgin Mobile	<phone number>@vmobl.com

How Actions Impact Other Actions

When creating a routine, you must take into account how an action impacts other actions in the routine. For example, if you want an announcement to play after an alarm, you want to ensure that the alarm ends before the announcement begins. Otherwise, the

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announcement may not be heard. In this scenario, you would want to ensure that the action to play an announcement *waits* until the alarm ends.

Check-Intercom, Intercom-Wait, Ring-Wait Action Types

If a routine's trigger **Type** is **Intercom-Call**, the routine's action **Type** could be **Check-Intercom**, **Intercom-Wait**, or **Ring-Wait**. Each of these action types depend on the status of the **Callers** – parameter 1 for the trigger (see "*Understanding Trigger Parameters" on page 404*).

The **Check-Intercom** action **Type** checks to see if the trigger caller is on an active intercom call. If the trigger caller is on an active intercom call, the routine executes subsequent actions. If the trigger caller is not on an active intercom call, the routine terminates and remaining actions will not be executed. You may want a routine to execute a **Check-Intercom** action **Type** before executing **Intercom-Wait** to ensure that the trigger caller is on an active intercom call.

The **Intercom-Wait** action **Type** waits for the trigger caller's call to finish. After the call finishes, the routine executes subsequent actions. If the call finishes before **Intercom-Wait** action **Type** is executed, the routine executes subsequent actions without delay.

The **Ring-Wait** action **Type** waits for the trigger caller's ringing to finish. After the ringing stage of a call ends, the routine executes subsequent actions. If the call is answered before the **Ring-Wait** action **Type** executes, the routine executes subsequent actions without delay.

A sample scenario using these three actions is a routine that is executed by the Intercom-Call trigger Type. The routine contains actions to be performed to indicate a ringing call The routine waits for the ring to finish (Ring-Wait action Type). When the ring finishes, the routine executes additional actions and then checks to see if the call was answered (Check-Intercom action Type). If the call was not answered (no active intercom call), the routine terminates. Otherwise, it executes additional actions before waiting for the call to finish (Intercom-Wait action Type), and then when the call is finished, the routine executes the remaining actions.

Note: The check and wait actions described in this section are always related to the caller that triggered the routine. The routine settings for **Extension** and **Use Caller's Extension** are not related to these wait actions; the check and wait actions will always be evaluated based on the trigger caller regardless of the routine's **Extension** or **User Caller's Extension** settings.

Check-In Action Type with Check In Set to Wait

When the routine includes a **Check-In** action **Type** and **Check-In** (parameter 1) is **Wait**, the routine pauses the execution of subsequent actions until the Check-in process is no longer active. When the Check-In process is **Finished** or you select **Stop**, **Finish**, or **Reset**, the routine resumes executing actions that follow a finished Check-In process such as: announcing Check-In completed to Admin Station speakers or displaying Check-in completion messages on web interface dashboards or GA10PV displays.

Check-In action **Type** with **Check-In** set to **Wait** does not differentiate between the Check-in process moving to the **Finished** state or having been manually stopped or finished.

> *Note:* If you want to execute routine Actions after all stations have checked in (**Check-In** status is **Done**), create a routine with trigger **Type** set to **Check-In** and **Parameter 1** set to **Done**.

For more information about the Check-In process, see *"Manage Check-In" on page 465*.

Feature-Wait Action Type with 911

You may want to include the **Feature-Wait** action **Type** in a routine that is triggered by a 911 call to pause subsequent actions until the 911 call ends. In this scenario, set **Feature Wait** (parameter 1 of the **Feature-Wait** action **Type**) to **911**.

After the 911 call ends, the routine executes subsequent actions. The **911** trigger **Type** can execute routines when any caller dials 911, so multiple routines (one for each active 911 call) could execute.

Feature-Wait Action Type with Alarm

If you want to pause subsequent routine actions until the alarm finishes playing, use the **Feature-Wait** action **Type** with **Feature Wait** (parameter 1) set to **Alarm**. If no alarm is playing when the **Feature Wait** action executes, the routine does not wait for an alarm. Instead, it continues executing subsequent actions.

If you want to ensure that the routine includes an active alarm, use **Alarm** as the trigger **Type** (see *"Understanding Trigger Parameters" on page 404*).

If you do not need the routine to wait until the alarm finishes, you can still use **Feature-Wait** as the action **Type** and **Alarm** as **Feature Wait** and set **Maximum Wait Time** (action parameter 2) to the desired amount of time to wait.

Feature-Wait Action Type with Announcement

If you want *all* active Normal and Emergency announcements to complete before con-
tinue with subsequent routine actions, use the **Feature-Wait** action **Type** with **Feature
Wait** (parameter 1) set to **Announcement**.

This action will not allow you to specify which announcement type or which announce-
ment to wait for. The **Announcement** trigger **Type** does allow you to specify an
announcement type or number (see "*Understanding Trigger Parameters" on page 404*).
However, if the routine uses **Feature-Wait** action **Type** with **Feature Wait** set to
Announcement and multiple announcements start, then the routine will pause until *all*
announcements have completed.

Feature-Wait Action Type with All-Call

If you want a routine to pause until an active All-Call page completes, use the **Fea-
ture-Wait** action **Type** with **Feature Wait** (parameter 1) set to **All-Call**.

If no All-Call page is playing when the **Feature Wait** action executes, the routine does not
wait for an All-Call page. Instead, it continues executing subsequent actions.

If you want to ensure that the routine includes an All-Call page, use **All-Call** as the trigger
Type.

If you do not need the routine to wait until the All-Call page finishes, you can still use
Feature-Wait as the action **Type** and **All-Call** as **Feature Wait** and set **Maximum Wait
Time** (action parameter 2) to the desired amount of time to wait.

Feature-Wait Action Type with Disable-Audio

If you want a routine to pause until audio is re-enabled, use the F**eature-Wait** action
Type with **Feature Wait** (parameter 1) set to **Disable-Audio**.

If audio is enabled when the **Feature Wait** action executes, the routine does not wait for
audio to be disabled. Instead, it continues executing subsequent actions.

Feature-Wait Action Type with Emerg-All-Call

If you want a routine to pause until an active Emergency All-Call page completes, use the
Feature-Wait action **Type** with **Feature Wait** (parameter 1) set to **Emerg-All-Call**.

If no Emergency-All-Call page is playing when the **Feature Wait** action executes, the rou-
tine does not wait for an Emergency-All-Call page. Instead, it continues executing subse-
quent actions.

If you want to ensure that the routine includes an Emergency-All-Call page, use
Emerg-All-Call as the trigger **Type**.

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If you do not need the routine to wait until the Emergency-All-Call page finishes, you can still use **Feature-Wait** as the action **Type** and **Emerg-All-Call** as **Feature Wait** and set **Maximum Wait Time** (action parameter 2) to the desired amount of time to wait.

Feature-Wait Action Type with Facility-Page

You can use the **Feature-Wait** action **Type** with **Feature Wait** (parameter 1) set to **Facility-Page** in a routine that is triggered by a facility page. The routine will pause subsequent actions until the facility page completes. If no facility page is playing when the Feature Wait action executes, the routine does not wait for a facility page. Instead, it continues executing subsequent actions.

Note: Only routines with the trigger **Type** set to **Facility Page** can use this action.

If you do not need the routine to wait until the facility page finishes, you can still use **Feature-Wait** as the action **Type** and **Facility Page** as **Feature Wait** and set **Maximum Wait Time** (action parameter 2) to the desired amount of time to wait.

Feature-Wait Action Type with Multi-Site-All-Call

If you want a routine to pause until a Multi-Site-All-Call page completes, use the **Feature-Wait** action **Type** with **Feature Wait** (parameter 1) set to **Multi-Site-All-Call**.

If no Multi-Site-All-Call page is playing when the **Feature Wait** action executes, the routine does not wait for a Multi-Site-All-Call page. Instead, it continues executing subsequent actions.

If you want to ensure that the routine includes a Multi-Site-All-Call page, use **Multi-Site-All-Call** as the trigger **Type**.

This action will only wait on a Nyquist system that starts the Multi-Site-All-Call. Remote sites that are included in a Multi-Site-All-Call only see a playing All-Call; they do not see it as a Multi-Site call. In this case, this action will have no affect.

If you do not need the routine to wait until the Multi-Site-All-Call page finishes, you can still use **Feature-Wait** as the action **Type** and **Multi-Site-All-Call** as **Feature Wait** and set **Maximum Wait Time** (action parameter 2) to the desired amount of time to wait.

Feature-Wait Action Type with Multi-Site-E-All-Call

If you want a routine to pause until a Multi-Site Emergency All-Call page completes, use the **Feature-Wait** action **Type** with **Feature Wait** (parameter 1) set to **Multi-Site-E-All-Call**.

If no Multi-Site Emergency All-Call page is playing when the **Feature Wait** action executes, the routine does not wait for a Multi-Site Emergency All-Call page. Instead, it continues executing subsequent actions.

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If you want to ensure that the routine includes a Multi-Site Emergency All-Call page, use **Multi-Site-E-All-Call** as the trigger **Type**.

This action will only wait on a Nyquist system that starts the Multi-Site Emergency All-Call. Remote sites that are included in a Multi-Site Emergency All-Call only see a playing Emergency-All-Call; they do not see it as a Multi-Site Emergency All-Call. In this case, this action will have no affect.

If you do not need the routine to wait until the Multi-Site-Emergency-All-Call page finishes, you can still use **Feature-Wait** as the action **Type** and **Multi-Site-E-All-Call** as **Feature Wait** and set **Maximum Wait Time** (action parameter 2) to the desired amount of time to wait.

Feature-Wait Action Type with Tone

If you want a routine to pause until a tone finishes, use the **Feature-Wait** action **Type** with **Feature Wait** (parameter 1) set to **Tone**.

If no tone is playing when the **Feature Wait** action executes, the routine does not wait for a tone to start. Instead, it continues executing subsequent actions.

If you want to ensure that the routine includes the playing of a tone, use **Tone** as the trigger **Type**.

If you do not need the routine to wait until the tone finishes, you can still use **Feature-Wait** as the action **Type** and **Tone** as **Feature Wait** and set **Maximum Wait Time** (action parameter 2) to the desired amount of time to wait.

Feature-Wait Action Type with Zone

If you want all zone pages to complete before continuing with subsequent routine actions, use the **Feature-Wait** action **Type** with **Feature Wait** (parameter 1) set to **Zone**.

This action will not allow you to specify a zone. The **Announcement** trigger **Type** does allow you to specify a zone (see *"Understanding Trigger Parameters" on page 404*). However, if multiple routines triggered by a zone page use **Feature-Wait** action **Type** with **Feature Wait** set to **Zone** and multiple zone pages start, then all routines triggered by the start of a zone page will pause until the multiple zone pages have completed.

Zones and Stations Parameters for Deleting Display Messages

If you set Parameter 1 of **Display-Msg-Delete** action **Type** to **PARAM**, the options used for Zones and Stations determine which messages, if any, a routine automatically deletes

from the dashboard and NG-GA10PV video displays. For example, if you leave **Zones** blank and set **Stations** to All, then messages that have no zones defined but do have stations defined will be deleted.

The following table describes how the combination of **Zones** and **Stations** settings are used to select messages for deletion:

Table 110. Selecting Messages for Deleting

Zones	Stations	Messages Selected for Deletion
<blank>	<blank>	No messages
<blank>	All	Messages that have no zones defined and any stations defined
Any	<blank>	Messages that have any zones defined and no stations defined
Any	All	All Messages
Selected zone or zones	<blank>	Messages that have specified zones defined and no stations defined
Selected zone or zones	All	Messages that have specified zones defined and any stations defined (including none)
Selected zone or zones	Selected station or stations	Messages that have specified zones defined and specified stations defined
<blank>	Selected station or stations	Messages that have no zones defined and specified stations defined
Any	Selected station or stations	Messages that have any zones defined (including none) and specified stations defined

Using Variables for Dashboard and NQ-GA10PV Text Parameters

You can add variables to text messages for the Admin Web UI dashboard, the video display connected to the NQ-GA10PV, and email messages. When a trigger starts a routine that includes a text message for display, the variable is replaced. For example, if the routine uses the variable $date1, that variable is replaced by the current date in the format YYYY-MM-DD when the routine is started.

The availability of specific variables is based on the trigger that started the routine (see *Table 111, "Variables, Definitions, and Availability," on page 437*).

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When using variables, be sure to allow enough room for the message text, including the new text replaced by the variable. For dashboard messages, the maximum text that can be displayed is 255 characters per message. The character limit for the NQ-GA10PV display is 4096 characters, but the actual limit will vary due to font style and size. You should test your message display to ensure it fits into the available space.

Table 111. Variables, Definitions, and Availability

Variable	Definition	Routine Triggers for Which Variable Is Available
$alerts(?,?)	When used in the **Text** field of a **Display-Msg**, NWS alerts will display on the video connected to the NQ-GA10PV (see "*Setting Variables for the Display Message" on page 481*).	Always available *Note:* Reboot trigger is recommended.
$apiParam1	Used only by the Routines API, this parameter can be specified as part of the Routines API URL and referenced by the Routine Action. For details, see "*Using the Routines API" on page 391*.	• Routines API
$apiParam2	Used only by the Routines API, this parameter can be specified as part of the Routines API URL and referenced by the Routine Action. For details, see "*Using the Routines API" on page 391*.	• Routines API
$autobgcolor	When appended to the end of text, the message's background color automatically appears as red for Emergency-Call, yellow for Urgent-Call, or the font color set in Display-Msg action for Intercom-Call. *Note:* Use only $autobgcolor or $autofontcolor, but not both.	• Emergency-Call • Intercom-Call • Urgent-Call

Table 111. Variables, Definitions, and Availability (Continued)

Variable	Definition	Routine Triggers for Which Variable Is Available
$autofontcolor	When appended to the end of text, the message's font color automatically appears as red for Emergency-Call, yellow for Urgent-Call, or the font color set in Display-Msg action for Intercom-Call. *Note:* Use only $autobgcolor or $autofontcolor, but not both.	• Emergency-Call • Intercom-Call • Urgent-Call
$autoprior-ity(E,U,N)	When appended to the end of text field, the message's priority is changed where E is replaced by a priority for Emergency calls, U is replaced by a priority for Urgent calls, and N is replaced by a priority for Normal calls. For example. $autopriority(5,4,3) will set Emergency-Call triggered Dash-Msg to priority 5, Urgent-Call triggered Dash-Msg to priority 4, and Intercom-Call triggered Dash-Msg to priority 4. If the (E,U,N) parameters are not present, the priorities will be 4,3,2.	• Emergency-Call • Intercom-Call • Urgent-Call
$auto_resize(N)	When used in the **Text** field of a **Display-Msg**, automatically resizes the display message by decreasing the font size if needed to better fit the message to the screen but will keep the font size to at least N (see "*Setting Variables for the Display Message*" on page 481).	Always available

Table 111. Variables, Definitions, and Availability (Continued)

Variable	Definition	Routine Triggers for Which Variable Is Available
$caller	Extension number of caller that triggered execution of the routine; when calls are placed from outside the system, displays the phone number of the caller	• Alarm • All-Call • Announcement • Check-In • Disable-Audio • Enabled-Audio • Emergency-Call • Emerg-All-Call • Facility Page • Incoming-Call • Intercom-Call • Multi-Site-All-Call • Multi-Site-E-All-Call • Night-Ring • Tone • Urgent-Call • Zone-Page
$called	Extension number of called station	• Emergency-Call • Intercom-Call • Urgent-Call
$calltypechar	Replaced by E for Emergency-Call, U for Urgent-Call, or left blank for Intercom-Call.	• Emergency-Call • Intercom-Call • Urgent-Call
$calltypelong	Replaced by Emergency for Emergency-Call, Urgent for Urgent-Call, or left blank for Intercom-Call.	• Emergency-Call • Intercom-Call • Urgent-Call

Table 111. Variables, Definitions, and Availability (Continued)

Variable	Definition	Routine Triggers for Which Variable Is Available
$calltypeshort	Replaced by Emerg for Emergency-Call, Urg for Urgent-Call, or left blank for Intercom-Call.	• Emergency-Call • Intercom-Call • Urgent-Call
$contact	I/O Controller's input contact number that triggered execution of the routine	• Input-Contact-Closed • Input-Contact-Opened
$date1	Current date in YYYY-MM-DD format	Always available
$date2	Current date in MM-DD-YYYY format	Always available
$date3	Current date in DD-MM-YYYY format	Always available
$df-avail	Available disk space displayed in either M for megabytes or G for gigabytes.	All triggered routines that include one of the following actions: • Dash-Text • Display-Msg • Email
$eventid	Scheduled Event ID (integer)	• Scheduled-Event
$eventname	Scheduled Event Name	• Scheduled-Event
$facility	Name of facility that is being paged or that current status is being provided for	• Facility Page • Facility Status Up • Facility Status Down
$namecalled	Station name for caller that triggered execution of the routine	• Emergency-Call • Intercom-Call • Urgent-Call

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Table 111. Variables, Definitions, and Availability (Continued)

Variable	Definition	Routine Triggers for Which Variable Is Available
$namecaller	Called station's name	• Alarm • All-Call • Announcement • Check-In • Disable-Audio • Enabled-Audio • Emergency-Call • Emerg-All-Call • Facility Page • Intercom-Call • Multi-Site-All-Call • Multi-Site-E-All-Call • Night-Ring • Tone • Urgent-Call • Zone-Page
$schedulename	Activated schedule name	• Schedule-Activated
$station	Station, such as the I/O Controller, that triggered executon of the routine, or that current status is being provided for	• Input-Contact-Closed • Input-Contact-Opened • Station-Status-Up • Station-Status-Down
$time1	Current time in 12-hour format	Always available
$time2	Current time in 24-hour format	Always available
$toneid	Tone's identifier	• Scheduled-Tone
$tonename	Tone's name	• Scheduled-Tone

Table 111. Variables, Definitions, and Availability (Continued)

Variable	Definition	Routine Triggers for Which Variable Is Available
$uptime	Indicates how long the Nyquist server has been running, since the last reboot (e.g., "up 4 hours, 44 minutes")	All triggered routines that include one of the following actions: • Dash-Text • Display-Msg • Email
$zone	Announcement zone or page zone that triggered execution of the routine	• Announcement • Zone-Page

Using Variables in Dashboard and NQ-GA10PV Identifiers

You can use the following variables in the **Identifier** field (Parameter 2) of **Display-Msg**, **Display-Msg-Delete**, **Dash-Text**, and **Dash-Delete** action types:

- $apiParam1
- $apiParam2
- $caller
- $called
- $contact
- $eventid
- $eventname
- $facility
- $scheduleid
- $station
- $toneid
- $tonename
- $zone

An **Identifier** can have a maximum character length of 255 characters. When using variables, be sure the names that will replace the $facility and $zone variables to not exceed this maximum character length.

Using Variables in Display-Msg Text

Note: This section describes variables that are only available for use in the **Display-Msg** action type if the routine trigger is **Intercom-Call**, **Urgent-Call**, or **Emergency-Call**.

You can use the following variables in the **Text** field of only the **Display-Msg** action type:

- $calltypechar
- $calltypeshort
- $calltypelong
- $autobgcolor
- $autofontcolor
- $autopriority(E,U,N)

These variables allow you to set the priority and appearance of the NQ-GA10PV display messages for emergency, urgent, or intercom calls. For more information about these variables, see *"Using Variables for Dashboard and NQ-GA10PV Text Parameters" on page 436.*

Reordering Actions

You can reorder actions in a routine but should exercise care. Some actions must be the last action in a routine (see *"Understanding Action Parameters" on page 414*).

To reorder an action:

1 On the navigation bar, select **Routines**.

2 Select **Actions** for the routine that you want to reorder actions for.

3 Click the Move icon (✛) next to the action that you want to move and drag the action to the desired location.

4 When you have completed reordering the actions, select **Done**.

Exporting a Routine

You can export routines to share with Bogen Technical Support for debugging issues or to later import them to other servers.

To export multiple routines, you must first add your server's IP address to Chrome settings.

To add your server's IP address:

1 Open your Chrome browser and type the following in the address line:

chrome://settings/content/popups

2 On the Search Setting pane, select **Add**.

3 On the Add a site popup, type the server's IP address and select **Add**.
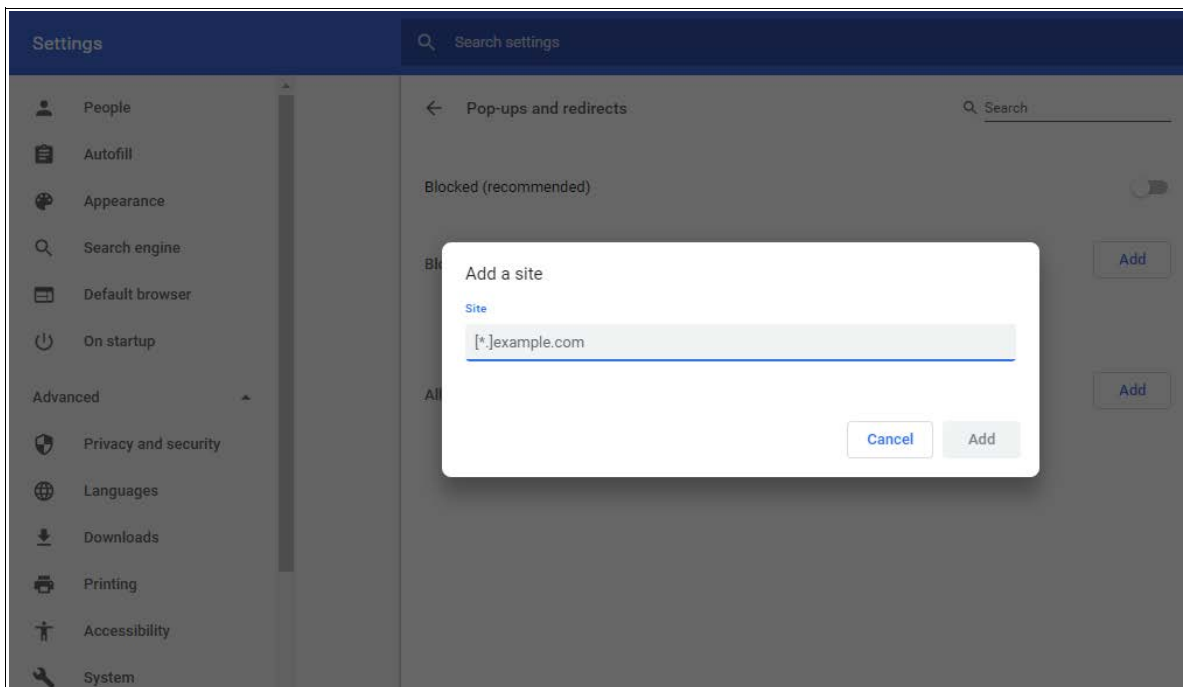
Figure 172. Add a Site

To export a routine:

1 On the navigation bar, select **Routines**.

2 Select the routine or routines that you want to export.

3 Select **Export**.
The .sql file will be saved to the **Downloads** folder on the server and can then be copied to a shared directory or to removable media.

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Importing a Routine

You can import a routine that was created from other Nyquist server to your Nyquist server.

> *Note:* After importing a routine, you must ensure that parameters are correct for the server since the server that created the routine will not have the same station, zone, or audio files as the server to which you are importing the routine. Imported routines must be enabled and the DTMF code will need to be changed if the same code is already being used on the server.
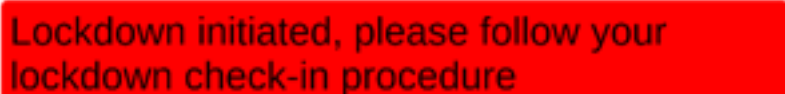
To import a routine:

1 On the navigation bar, select **Routines**.

2 Select **Import**.

3 From the Import popup window that appears, select **Choose file**.

4 Use the browser window to select the routine that you want to import.

5 Select **Import**.

Managing GA10PV Display Messages

It is possible to send messages and images to one or more NQ-GA10PV devices, either manually or through a triggered Routine. Messages containing text and sent manually can be defined and sent as needed. To send messages using triggered Routines, and to define messages that can be used at a later time, you can create **Message Templates**. If a message is to include an image, whether to be sent immediately or within a template, you must first define a **Message Image**, which can then be used in the message or message template.

The **Display Message** option allows you to create impromptu messages that will display on monitors connected to NQ-GA10PV devices in a selected zone, in multiple zones, or to specific devices. When creating the message, you can set several options, including when and how long the message is displayed and the appearance of the message. You can also remove messages from the message queue.

Figure 173. Example of Priority Message in Fullscreen

The station's **Display Configuration** option controls the overall appearance of the display (e.g., what type of clock appears, whether an event or the date appears, and the background color of the screen). For information about setting the display configuration for an NQ-GA10PV, see *"Configuring Intercom HDMI Module Display Options" on page 166*.

The **Message Templates** option allows you to create and save messages in advance, which can be easily sent later. Sending a **Message Template** simply fills in a form with the saved message data. You must specify the zone and/or stations where the message will appear, override any other properties from the **Message Template** (if desired), and send it.

Saved **Message Templates** can also be used in **Routines** (see *"Using Routines" on page 388*), which allows messages to be sent automatically in response to various system events. When used this way, the Routine definition specifies the zone and/or stations where the message will appear and can optionally override other template properties.

Note: This discussion refers to GA10PV Display Messages, not the Messages section shown at the top of the Dashboard. For information on these Dashboard Messages, see *"Dashboard Messages" on page 331*.

Message Priorities and Precedence

Multiple messages can be displayed on an NQ-GA10PV at the same time. It is even possible to queue up more messages than can be displayed at one time. Because of this, we need to determine a message's precedence. Messages with a higher precedence are displayed before messages with lower precedence, and can even override and interrupt a lower precedence message.

Note: The term "priority", as used here, refers to a numeric value assigned to a message. The term "precedence" refers to the determination of which message will be displayed over another message after evaluation of the assigned message priorities and other related factors, as described below.

There are several factors that affect the precedence and display of a message.

The first factor is the message **Priority**. This is a number from zero (0) through six (6), where zero is the lowest priority and six the highest.

The second factor is the **Image Priority**, which applies only to Image type messages, and is applied when two messages have the same message priority. This is either **Text Over Image** or **Image Over Text**. The first implies that text messages have precedence over this image message, while the second implies this image message has precedence over text messages.

The third factor does not actually affect the precedence, but is relevant in that it determines where an image is displayed, which can affect whether or not other messages can

be seen. The **Image Type** of a message can be either **Right**, **Left**, or **Full Screen**. **Right** and **Left** specify on which half of the screen the image will be displayed, while **Full Screen** specifies that the image will cover the entire screen. Since text messages display on the right side of the screen, an image displayed on the left side can show both messages simultaneously, while an image displayed on the right side or full screen will be subject to the precedence rules.

Message Precedence Rules

The following set of rules determine which messages have precedence and how they are to be displayed:

- Text messages are sorted in descending order by priority, and otherwise in the order they were sent.
- If two messages of the same type (Image or Text) have the same priority, the newer one has precedence.
- If an image message and a text message have the same priority, the Image message's **Image Priority** property determines which has precedence:
    - **Text Over Image**: Text message has precedence.
    - **Image Over Text**: Image message has precedence.
- Full Screen image messages take precedence over everything except another Full Screen image message, for which normal rules of precedence are applied.
- Priority five (Exclusive) messages always display alone, which prevents all lower precedence messages from being displayed.
- For Analog Clock view:
    - An image message can display simultaneously on the left while another message is displayed on the right. Multiple image messages are prioritized according to normal rules. If there are no image messages displayed on the left, the clock will be displayed.
    - Image messages displayed on the right along with text messages based on normal rules of precedence.
- For multi-column and Digital Clock views:
    - Only text or Full Screen image messages are displayed.

Note: Even when a message is not visible, usually due to a higher priority message being displayed, its expiration timer is still ticking, so it may display for shorter than the intended duration or not at all.

Creating a Display Message via the Dashboard

Figure 174. Display Message

> *Note:* You also can add display messages through routine actions (see "*Adding an Action" on page 412.*)

To create a display message:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under **Tones/Announcements**, select **Display Message.**

3 On the Display Message page, complete the options for the new message.

4 To save the message and send it immediately, select **Send and Save**. The **Name** field must be specified to save a message.

5 To send the message immediately without saving it, select **Send**.

> *Note:* The options set through the Display Message page are for the message only. If you want to change how the clock, date, and other display features appear, you must set configuration options for the NQ-GA10PV station (see *"Configuring Intercom HDMI Module Display Options" on page 166*).

Table 112. Display Message Options

Name	Specifies a name for this message. This is used if the message is to be saved.
Identifier	Used to identify the message so it can be deleted by a Routine action.
Type	Select the type of message to be sent: • **Text**: A text message will be displayed. • **Image**: An image will be displayed.
Text	Type the message that is to appear on the display monitor. You can format text using basic HTML tags, such as: • **bold** • <i>*italic*</i> • <u><u>underline</u></u> • styled text *Note:* Be aware that entering a new line, even within HTML tags, will create a new line in the final message.
Expiration Mode	Select the mode for setting the message's expiration. Options are: • **Display Time**. Uses **Display Time (seconds)** to set the expiration. • **Manually Removed**. Sets the expiration time to Never. You must use the **Remove Message** button remove a message from the message queue, or the message can be removed by a Routine Action using the display message **Identifier**. • **Date/Time**. By default, the current date and time appears in the **Date/Time** field.

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Table 112. Display Message Options (Continued)

Display Time (seconds)	Appears only if **Expiration Mode** is set to **Display Time**. Sets the length of time for the message to be displayed before it expires. Time can range from 1 to 99999.
Expiration Date/ Time	Appears only if **Expiration Mode** is set to **Date/Time**. By default is set to the current date and time. To change the date, select the calendar and pick the date and time.
Zones	Select the zone or zones. Messages will be sent to the display devices in the selected zones.
Stations	The message is sent to the specified stations and any stations that belong to the specified zones.
Priority	Select the message priority, which can range from **0 (Lowest)** to **6 - (Fullscreen)**. Priority **6 - (Fullscreen)** is the highest priority, and when a message is assigned this priority, only the messages with this priority appear on the display with the Scheduled Event Name and Date being temporarily removed. If Priority **5 (Exclusive)** is selected, the Scheduled Event Name and Date remain on the display, but all other messages with lower priorities are removed.
Image Type	If the Type field was set to **Image**, select one of the following values to specify how the image will be displayed: • **Full Screen (1920x1080)**: Image will be displayed full screen. • **Left (925x1040)**: Image will be displayed on the left side of the screen. • **Right (925x1040)**: Image will be displayed on the right side of the screen.
Image Priority	Select the image priority for this message, which determines precedence when an Image message and Text message have the same message priority: • **Text Over Image**: Text message will be given precedence. • **Image Over Text**: Image message will be given precedence.
Message Image	The name of the saved **Message Image** to be displayed. For more information, see *"Create or Edit a Message Image" on page 460*.

Table 112. Display Message Options (Continued)

Background Color	Select the color for the message background. You can select a color by: • Using the color picker • Entering a hex color (for example: #000000, for black) • Entering an RGB color (for example: rgb(0,0,0) for black) • Entering a color alias name (for example: red, blue, etc.) For more information, see "*Using Color in Display Messages" on page 451*.
Font	Select the down arrow to view a list of available fonts and then select the desired font for the message text. Available fonts are: Comic-Relief Courier-Prime Gelasio Liberation Sans Linux Libertine
Font Size	Enter the desired font size.
Font Color	Select the color for the message text. You can select a color by: • Using the color picker • Entering a hex color (for example: #000000, for black) • Entering an RGB color (for example: rgb(0,0,0) for black) • Entering a color alias name (for example: red, blue, etc.) For more information, see "*Using Color in Display Messages" on page 451*.
Font Styles	Place your cursor in the **Add Styles** box to select **Bold** or **Italic**. Otherwise, the **Font Style** remains at Regular.

Using Color in Display Messages

You can select colors for display messages three different ways:

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- Background, text, and time colors via GA10PV **Display Configuration** (see "*Configuring Intercom HDMI Module Display Options" on page 166*)

- Background and font colors for individual messages by selecting **Display Message** from the dashboard (see "*Creating a Display Message via the Dashboard" on page 448*)

- Background and font colors for individual messages via the **Display-Msg** routine action **Type** (see *Table 108, "Action Types and Parameters," on page 415*).

You can select colors by:

- Using the color picker

- Entering a hex color (for example: #000000, for black)

- Entering an RGB color (for example: rgb(0,0,0) for black)

- Entering a color alias name (for example: red, blue, etc.)

When you enter a color alias name, the corresponding hex color code appears in the text portion of the color field and the swatch (color box) portion changes to the selected color. When entering a color alias, you cannot use spaces, and the system only accepts the default color alias listed in the following table:

Table 113. Default Color Alias

Color Alias	Corresponding Hex Code	Color Alias	Corresponding Hex Code
aliceblue	f0f8ff	antiquewhite	faebd7
aqua	00ffff	aquamarine	7fffd4
azure	f0ffff	beige	f5f5dc
bisque	ffe4c4	black	#000000
blanchedalmond	ffebcd	blue	#0000ff
blueviolet	8a2be2	brown	a52a2a
burlywood	deb887	cadetblue	5f9ea0
chartreuse	7fff00	chocolate	d2691e
coral	ff7f50	cornflowerblue	6495ed
cornsilk	fff8dc	crimson	dc143c
cyan	00ffff	darkblue	00008b
darkcyan	008b8b	darkgoldenrod	b8860b
darkgray	a9a9a9	darkgreen	006400
darkkhaki	bdb76b	darkmagenta	8b008b

Table 113. Default Color Alias (Continued)

Color Alias	Corresponding Hex Code	Color Alias	Corresponding Hex Code
darkolivegreen	556b2f	darkorange	ff8c00
darkorchid	9932cc	darkred	8b0000
darksalmon	e9967a	darkseagreen	8fbc8f
darkslateblue	483d8b	darkslategray	2f4f4f
darkturquoise	00ced1	darkviolet	9400d3
deeppink	ff1493	deepskyblue	00bfff
dimgray	696969	dodgerblue	1e90ff
firebrick	b22222	floralwhite	fffaf0
forestgreen	228b22	fuchsia	ff00ff
gainsboro	dcdcdc	ghostwhite	f8f8ff
gold	ffd700	goldenrod	daa520
gray	#808080	green	#00ff00
greenyellow	adff2f	honeydew	f0fff0
hotpink	ff69b4	indianred	cd5c5c
indigo	4b0082	ivory	fffff0
khaki	f0e68c	lavender	e6e6fa
lavenderblush	fff0f5	lawngreen	7cfc00
lemonchiffon	fffacd	lightblue	add8e6
lightcoral	f08080	lightcyan	e0ffff
lightgoldenrodyellow	fafad2	lightgreen	90ee90
lightgrey	d3d3d3	lightpink	ffb6c1
lightsalmon	ffa07a	lightseagreen	20b2aa
lightskyblue	87cefa	lightslategray	778899
lightsteelblue	b0c4de	lightyellow	ffffe0
lime	00ff00	limegreen	32cd32
linen	faf0e6	magenta	ff00ff

Table 113. Default Color Alias (Continued)

Color Alias	Corresponding Hex Code	Color Alias	Corresponding Hex Code
maroon	800000	mediumaquamarine	66cdaa
mediumblue	0000cd	mediumorchid	ba55d3
mediumpurple	9370d8	mediumseagreen	3cb371
mediumslateblue	7b68ee	mediumspringgreen	00fa9a
mediumturquoise	48d1cc	mediumvioletred	c71585
midnightblue	191970	mintcream	f5fffa
mistyrose	ffe4e1	moccasin	ffe4b5
navajowhite	ffdead	navy	000080
oldlace	fdf5e6	olive	808000
olivedrab	6b8e23	orange	#ffa500
orangered	ff4500	orchid	da70d6
palegoldenrod	eee8aa	palegreen	98fb98
paleturquoise	afeeee	palevioletred	d87093
papayawhip	ffefd5	peachpuff	ffdab9
peru	cd853f	pink	ffc0cb
plum	dda0dd	powderblue	b0e0e6
purple	#800080	red	#ff0000
rosybrown	bc8f8f	royalblue	4169e1
saddlebrown	8b4513	salmon	fa8072
sandybrown	f4a460	seagreen	2e8b57
seashell	fff5ee	sienna	a0522d
silver	c0c0c0	skyblue	87ceeb
slateblue	6a5acd	slategray	708090
snow	fffafa	springgreen	00ff7f
steelblue	4682b4	tan	d2b48c
teal	008080	thistle	d8bfd8

Table 113. Default Color Alias (Continued)

Color Alias	Corresponding Hex Code	Color Alias	Corresponding Hex Code
tomato	ff6347	transparent	transparent
turquoise	40e0d0	violet	ee82ee
wheat	f5deb3	white	#ffffff
whitesmoke	f5f5f5	yellow	#ffff00
yellowgreen	9acd32		

Removing Messages from the Dashboard

The **Remove Message** window allows you to remove multiple messages from the display message queue. It is also the only way to expire a message that was created using **Manually Removed** as the **Expiration Mode**.
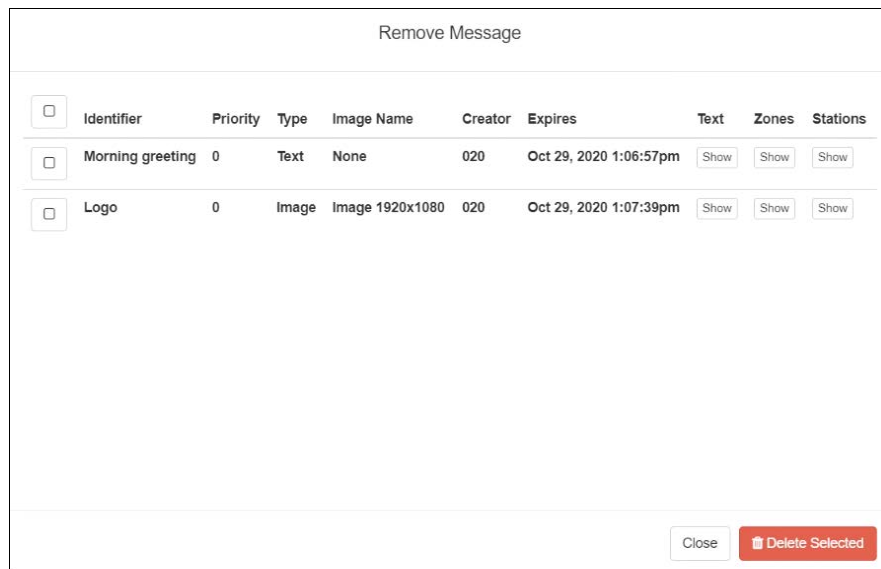
Figure 175. Remove Message

To remove a message via the Remove Message button:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.

2   Select the **Remove Message** button from the Tones/Announcements section.

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3 Select one or more messages to be removed.

4 Select the **Delete Selected** button.

Removing an Event Name from a Display

If you create a scheduled event with **Display Event Name** enabled, the event remains on the display that is connected to an NQ-GA10PV until the next scheduled event replaces it.

To clear the event name from the display, create another scheduled event with the **Name** set to **No-Event**.

For information on creating scheduled events, see "*Adding an Event" on page 237*.

Viewing Message Templates

The **Message Templates** page allows you to quickly view saved message details; create a message to be added to the database; and edit, delete, or send a message. Messages appearing on the **Message Templates** page also include messages that were started using the **Send and Save** button on the Display Message popup (see "*Creating a Display Message via the Dashboard" on page 448*).

Figure 176. Message Templates

To view saved message templates:

1 From the navigation bar, select **Messages** then **Message Templates**.

The **Message Templates** page displays the following fields for each saved message:

Table 114. Message Templates

Edit button	Edits the message template.
Delete button	Deletes the message template.
Send button	Displays the Display Message page, from which a message can be sent (see "*Display Message Options" on page 449* for further details).
Name	Specifies a name for this message.
Identifier	Used to identify the message so it can be deleted by a Routine action.
Type	The type of message to be sent:
	• **Text**: A text message will be displayed.
	• **Image**: An image will be displayed.
Text	Place the mouse over the **Show** icon to view the text message that is to appear on the display monitor. For Image messages, this does nothing.
Priority	Displays the message priority, which can range from **0 (Lowest)** to **6 - (Fullscreen)**. Priority **6 - (Fullscreen)** is the highest priority, and when a message is assigned this priority, only the messages with this priority appear on the display with the Scheduled Event Name and Date being temporarily removed. If Priority **5 (Exclusive)** is selected, the Scheduled Event Name and Date remain on the display, but all other messages with lower priorities are removed.
Duration	Sets the length of time in seconds for the message to be displayed before it expires. Time can range from 1 to 99999.
Background Color	Displays the color for the message background. For more information, see "*Using Color in Display Messages" on page 451*.
Font	Specifies the font for the message text.
Font Size	Specifies the font size for the message text.

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<p align="center">**Table 114. Message Templates**</p>

Font Color

Displays the color for the message text.

For more information, see "*Using Color in Display Messages" on page 451*.

Font Styles

Displays the style (bold, italic) for the text. If blank, the message will use the regular style.

Image Type

If the Type field was set to Image, displays one of the following values to specify how the image will be displayed:

- **Full**: Image will be displayed full screen. This value is also shown for text message templates.
- **Left**: Image will be displayed on the left side of the screen.
- **Right**: Image will be displayed on the right side of the screen.

Message Image

For text message templates, "None" is shown. For image templates, the Name of the image to be displayed.

Image Priority

Displays the image priority for this message, which determines precedence when an Image message and Text message have the same message priority:

- **Text Over Image**: Text message will be given precedence.
- **Image Over Text**: Image message will be given precedence.

Viewing Message Images

The **Message Images** page allows you to quickly view message image details; create a message to be added to the database; and edit, delete, or send a message. Messages appearing on the **Message Templates** page include messages that were started using the **Send and Save** button on the Display Message popup (see "*Creating a Display Message via the Dashboard" on page 448*).

Figure 177. Message Images

To view saved message images:

1 From the navigation bar, select **Messages** then **Message Images**.

The **Message Images** page displays the following fields for each saved image:

Figure 178. Message Images properties

Edit button	Edits the message image.
Delete button	Deletes the message image.
Name	Name of the message image.
File Name	Name of the image file for this message image. This field is a link, which allows you to see a preview of the image.
Type	Format of the image. Allowed image formats include:
	• PNG
	• JPEG
Width	Image width (in pixels).
Height	Image height (in pixels).

Creating a Message Template via the Message Templates Page
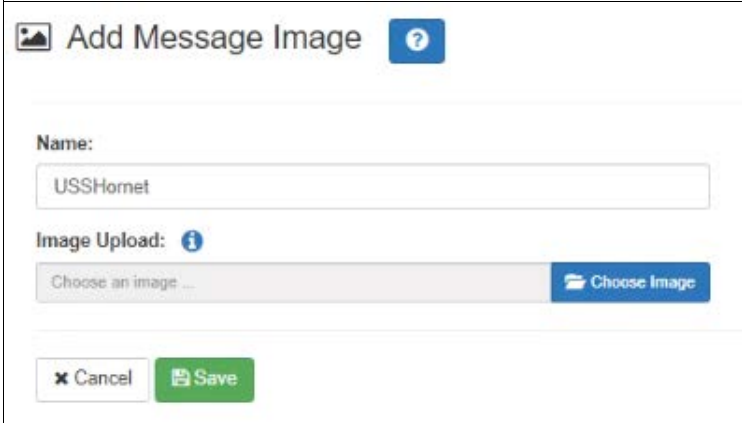
You can create messages in advance which can be easily selected for use when needed. Selecting a saved message fills in a form with the message data. Information about which

zones or stations will receive the message, though, is not included in this form. You spec-ify the zone or station when you send the message.

These saved messages can also be used in Routines (see *"Using the Routines API" on page 391*).

Create or Edit a Message Image

If the message is to display an image, you must first define one or more Message Images. An image can be used by one or more message templates, or even by an ad-hoc Display Message command.

Figure 179. Add Message Image

To create (or edit) a message image:

1 On the navigation bar, select **Messages**, then **Message Images**.

2 Select the **Add** icon (or the Edit icon next to an existing **Message Image**).

3 Assign a name for this image.

4 Select the **Choose Image** button and select an image file to upload.

Note: An image to be used in a message must be in the PNG or JPEG format. The PNG for-mat has the advantage of supporting transparency, which allows the background to dis-play through the image.

Note: The image must have dimensions of either 925x1040 or 1920x1080, depending on whether it will be used full screen (1920x1080) or half screen (925x1040).

5 Select **Save**.

Create or Edit a Message Template

A Message Template predefines a message and all of its properties so that it can easily be sent at a later time, whether manually or from a triggered Action in a Routine.

Figure 180. Add Message Template

To create (or edit) a message template:

1 On the navigation bar, select **Messages**, then **Message Templates**.

2 Select the **Add** icon (or the Edit icon next to an existing **Message Template)**.

3 Provide a descriptive **Name** for the image.

4 Complete the options on the **Add Message Template** page.

5 Select **Save**.

Note: You can edit saved messages, but if the message is called by a routine, it won't be dynamically updated when the routine starts.

Table 115. Add/Edit Message Template parameters

Name	Specifies a name for this message. This is used if the message is to be saved.
Identifier	Used to identify the message so it can be deleted by a Routine action.
Type	Select the type of message to be sent:
	• **Text**: A text message will be displayed.
	• **Image**: An image will be displayed.
	This value will determine which of several following parameters will be displayed.
Text	Type the message that is to appear on the display monitor.
	You can format text using basic HTML tags, such as:
	• **bold**
	• <i>*italic*</i>
	• <u>underline</u>
	• styled text
	Note: Be aware that entering a new line, even within HTML tags, will create a new line in the final message.
Priority	Select the message priority, which can range from **0 (Lowest)** to **6 - (Fullscreen)**. Priority **6 - (Fullscreen)** is the highest priority, and when a message is assigned this priority, only the messages with this priority appear on the display with the Scheduled Event Name and Date being temporarily removed. If Priority **5 (Exclusive)** is selected, the Scheduled Event Name and Date remain on the display, but all other messages with lower priorities are removed.
Display Time (seconds)	Sets the length of time for the message to be displayed before it expires. Time can range from 1 to 99999.

Table 115. Add/Edit Message Template parameters

Image Type   Select the image type to specify how the image will be displayed:

- **Full Screen (1920x1080)**: Image will be displayed full screen.
- **Left (925x1040)**: Image will be displayed on the left side of the screen.
- **Right (925x1040)**: Image will be displayed on the right side of the screen.

Image Priority   Select the image priority for this message, which determines precedence when an Image message and Text message have the same message priority:

- **Text Over Image**: Text message will be given precedence.
- **Image Over Text**: Image message will be given precedence.

Message Image   Select the image to be displayed for this message from the list of **Message Images**. Note that the dimensions of this image must match the dimensions implied by the **Image Type**.

Background Color   Select the color for the message background. You can select a color by:

- Using the color picker
- Entering a hex color (for example: #000000, for black)
- Entering an RGB color (for example: rgb(0,0,0) for black)
- Entering a color alias name (for example: red, blue, etc.)

For more information, see "*Using Color in Display Messages" on page 451*.

Table 115. Add/Edit Message Template parameters

Font	Select the down arrow to view a list of available fonts and then select the desired font for the message text. Available fonts are:

Comic-Relief

Courier-Prime

Gelasio

Liberation Sans

Linux Libertine

Font Size	Enter the desired font size.
Font Color	Select the color for the message text.

You can select a color by:

- Using the color picker
- Entering a hex color (for example: #000000, for black)
- Entering an RGB color (for example: rgb(0,0,0) for black)
- Entering a color alias name (for example: red, blue, etc.)

For more information, see *"Using Color in Display Messages" on page 451*.

Font Styles	Place your cursor in the **Add Styles** box to select **Bold** or **Italic**. Otherwise, the **Font Style** remains at Regular.

Sending a Message from the Message Templates Page

You can send a message based on a previously created Message Template from the **Message Templates** page.

To send a message based on a previously created Message Template:

1 On the navigation bar, select **Messages,** then **Message Templates**.

2 Select the **Send** icon next to the Message Template that you want your new message based on.

3 On the **Display Message** popup, select the zones or stations to which you want the message to be sent.

Note: The selected zones and station will not be saved.

4 Make changes to the message options as needed (see *"Display Message Options" on page 449*).

5 Select **Send**, or if you have made changes and want those changes to be saved to the Message Template, select **Send and Save**.

Deleting a Saved Message Template

To delete a saved Message Template:

1 On the navigation bar, select **Message Templates**.

2 Select the **Delete** icon next to the Message Template that you want to delete.

3 When prompted, select **Delete**.

Manage Check-In

Manage Check-In allows you to quickly obtain status of specific areas—such as class-rooms, offices, or break rooms—within a facility during a check-in event. Examples of check-in events include:

- Weather-related shelter in place

- Safety related lockdown

- Fire evacuation (Staff member performs check-in to indicate room has been evacuated.)

- Room occupancy (Staff member checks room in with start of each class period.)

During a check-in event, users check in by initiating a Normal call to their assigned Admin Station, such as the front office, using either their Nyquist phone or a digital or analog call switch associated with their intercom speaker or station.

During Check-In, a Normal call initiated by a station to the Admin Station places a station in checked-in status. Additional Normal calls made following a check-in are processed as Normal calls to the Admin Station.

You can also elect to enable audio feedback that tells the staff member they have successfully checked in.

Calls placed to perform **Manage Check-In** are not applied towards the system's Current Call Count. Urgent and Emergency calls can still be placed by stations and are not included as part of Manage Check-In.

As long as Privacy Mode is not enabled and a room's device allows two-way transmission, you can select to use Spy Mode to listen to the room (see "*Using Spy Mode" on page 470*).

Viewing Check-In Status

For administrators, the Manage Check-In feature provides a color-coded view of which classrooms have checked in, classrooms or stations that are not part of the check-in process, and those that should check-in but have not yet done so.

> *Note:* You also can use the Maps feature to view check-in status. For more information, see "*Using Maps for Check-In" on page 384*.
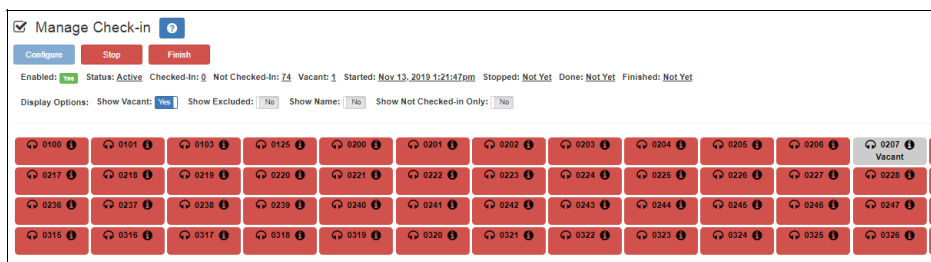
Figure 181. Manage Check-In

To view check-in status:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Manage Check-In**.

A separate tab appears so that you can toggle the dashboard and Manage Check-In views.

The status of each station appears in a color-coded box. The following table explains the use of colors to describe status:

Table 116. Color-coded Check-In Status

Color	Status
Green	Checked in

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Table 116. Color-coded Check-In Status (Continued)

Color	Status
Red	Not checked in
Gray	Check-in is not expected because the station is either on the vacant or excluded lists.

You also can select the following **Display Options**:

Table 117. Check-In Display Options

Show Vacant	When enabled, stations in the Vacancy List appear in the color-coded display.
Show Excluded	When enabled, stations in the Exclusion List appear in the color-coded display.
Show Name	When enabled, the station's name appears along with the station's extension number. Displaying the name is useful if you are not sure where a station is located when only the extension number is displayed.
Show Not Checked In Only	*Note:* **Show Vacant** and **Show Excluded** options are disabled when this option is selected.
	When enabled, only the stations that have not checked in are listed. This option may be preferable if a large number of stations are managed by your Nyquist server, and you want to quickly view which stations have not checked in.

Additional information that appears on the Manage Check-In window includes:

- Status of check-in process such as **Active**
- Number of stations that have checked in
- Number of stations that have not yet checked in
- Number of vacant stations
- Date and time check-in started
- If check-in has been manually stopped or is done.

Manage Check-in also allows you to use Spy Mode on a station or room, provided the privacy feature has not been activated and the station device allows two-way transmission.

Stations typically excluded from the check-in process would include stations assigned to hallway speakers or amplifiers or areas that were scheduled to be vacant when the

check-in procedure began. For more information, see "*Managing Exclusion and Vacancy Lists" on page 472*.

Starting Check-In

You can manually start the Check-In procedure from the Admin Web UI. Check-In can also be started via the Routines feature (see "*Using Routines" on page 388*.)

Check-In does not play any audio instruction announcements or send any text instructions to web interface stations or GA10PV display stations. If you want audio instruction announcements or text instructions on web interface stations or GA10PV display stations, set up a routine that includes audio instructions in an announcement or text instructions to be sent to web interface dashboards and GA10PV displays. The routine can be triggered by a Check-in **Start**, or the Check-in can be started by the routine.
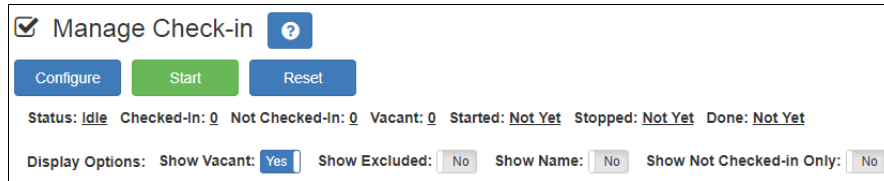
Figure 182. Manage Check-In When Idle

To manually start Check-In:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Manage Check-In**.

3 On the Manage Check-In page, select **Start**.

When Check-In starts, the **Start** button changes to a **Stop** button and the red squares that represent occupied classrooms or areas begin changing to green squares as staff members begin checking in.

Station Check-In

During Check-In, a Normal call placed by a station to the Admin Station places a station in check-in status. If two-step check-in is used, a second Normal call verifies the check-in status.

After a station has successfully checked in, additional Normal calls will go through as normal calls to the Admin station. Stations can still place Urgent or Emergency calls during the Check-in process, even if the station has not checked in.

If audio prompt feedback is enabled and a station checks in, the caller hears a confirmation prompt. If audio feedback is disabled, stations checking in with digital call switches

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will still see a ringing status (flashing green) for about 2 seconds while checking in. Stations checking in with IP phones will notice a call lasting about 2 seconds before automatic hang up.

A **VoIP Speaker Only** station that does not have a call switch can still participate in the check-in process if an I/O controller Input contact is connected to a switch present in the room that contains the **VoIP Speaker Only** station. In this case, the I/O controller Input contact closure can trigger a Routine that performs a check-in.

In this scenario, the routine Trigger **Type** is set to **Input-Contact-Closed** (see "*Understanding Trigger Parameters" on page 404*) and the routine Action **Type** is **Check-In** with **Station** set to the VoIP Speaker Only station extension (see "*Understanding Action Parameters" on page 414*).

If a station with call switch is configured to only place Urgent or Emergency calls, the station cannot participate in the Check-in process. This station should either be added to the Exclusion List (see "*Managing Exclusion and Vacancy Lists" on page 472*), or, if you wish to include the station in the Check-in process, the station's CoS configuration should be changed to allow Normal calls to be placed by the station (see "*Editing CoS Parameters for a Station" on page 93*).

Check-In Done and Finish

After all stations included in the Check-In process have checked in, the Manage Check-In **Status** changes to **Done**.

Since stations that were not expected to check in may do so, check-in is not completed until you select the **Finish** button.

Selecting the **Finish** button can trigger a routine if you have a routine that uses **Check-In** as the trigger **Type** and **Finished** as **Check-In**. (See "*Understanding Trigger Parameters" on page 404* for more information.)

Stopping the Check-In Process

You can end an active Check-In process by selecting the **Stop** button on the Station Check-in view. An active Check-In process can also be stopped by a Routine action.

When stopping Check-In via a routine, the Action **Type** is **Check-In** and the **Check In** option is **Stop** (see "*Understanding Action Parameters" on page 414*).

After the Check-in process has been stopped, all Normal station calls resume as normal calls to the Admin Station, and the Check-in process **Status** becomes **Idle**.

Resetting the Check-In Process

During either an active or idle Check-In process, you can clear all station check-in statuses and allow all Normal calls to resume as normal calls to the Admin Station by selecting the **Reset** button on the Station Check-in view. You can also reset the Check-In process by a Routine action. When resetting Check-In via a routine, the Action **Type** is **Check-In** and the **Check In** option is **Reset** (see "*Understanding Action Parameters" on page 414*).

Using Spy Mode

You can use Spy Mode to listen to a station as long as Privacy Mode is not enabled and the station device allows two-way transmission.

This feature adds a step toward verifying that the room's occupants are safe.
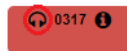
Figure 183. Listen In, or Spy Mode, Button

To activate Spy Mode:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Manage Check-In**.

3 On the Manage Check-In page, select the **Listen In** icon for the station you want to monitor.

4 When the dial pad appears, dial 978.

> *Note:* Spy Mode monitoring cannot be used on a station that has been set to Privacy Mode.

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Configuring Check-In

To use the check-in process, the user must have appropriate permissions assigned (see "*Assigning and Editing Permissions" on page 216*).

Figure 184. Configure Check-in

To configure check-in options:

1 If not already on your dashboard, select **Dashboard** from the navigation bar.

2 Under Calling/Paging, select **Manage Check-In**.

3 On the Manage Check-In page, select **Configure**.

4 Complete the configuration options.

5 Select **Save**.

Table 118. Check-In Configuration Options

Enabled	Specifies if Manage Check-In can be used. If **Disabled**, you can configure Manage Check-In options but you cannot start the check-in process.
Enable Audio Prompts and Confirmation Messages	Specifies if audio files will be used as part of Manage Check-In. When enabled, audio prompts and audio feedback play at stations when the stations perform check-in. If disabled, no audio prompts or audio feedback are played on the station. When feedback is disabled, stations checking in with digital call switches will see a ringing status (flashing green) for about 2 seconds while checking in. Stations checking in with IP phones will notice a call lasting about 2 seconds.
Automatically Stop Audio Distribution	When enabled, all currently playing audio distributions will be stopped when a check-in process is started.
Vacancy List	Specifies the stations to be added to the Vacancy List (see "*Managing Exclusion and Vacancy Lists" on page 472*).
Exclusion List	Specifies the stations to be added to the Exclusion List (see "*Managing Exclusion and Vacancy Lists" on page 472*).

Managing Exclusion and Vacancy Lists

A station added to the Vacancy List and a station added to the Exclusion List both appear gray on the Admin Station's Check-In page if the Check-In page is configured to display these lists (see "*Configuring Check-In" on page 471*). The difference between the two lists, though, is that stations on the Exclusion List should always be excluded from the check-in process. Those on the Vacancy List, are stations (classrooms or areas) that normally would be checking in but may be vacant when the check-in process is started.

A station on the vacancy list can still check in. This could occur during an emergency situation where a normally vacant classroom becomes the closest temporary shelter. An occupant could perform a check-in to let administrators know that the room is occupied and secure.

Excluded stations should include stations not physically located in a classroom, such as speakers located in a hallway. Excluded stations also include stations assigned to appliances, such as power amplifiers and MMPAs.

You can add or delete a station to the Exclusion or Vacancy Lists by:

- Using **Manage Check-In** via the Admin Web UI
- Using the **Routines** feature

To add a station to the Exclusion List via the Admin Web UI:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.
2   Under Calling/Paging, select **Manage Check-In**.
3   On the Manage Check-In page, select **Configure**.
4   Add desired station or stations to the Exclusion List.
5   Select **Save**.

To add a station to the Exclusion List via a routine:

1   Add or edit a routine that has **Check-In** as an **Action Type** (see "*Actions" on page 409*).
2   For **Check In**, select **Exclude-Add**.
3   For **Stations**, select the stations that you want to exclude from Manage Check-In.
4   Select **Save**.

To remove a station from the Exclusion List via the Admin Web UI:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.
2   Under Calling/Paging, select **Manage Check-In**.
3   On the Manage Check-In page, select **Configure**.
4   Remove the desired station or stations from the Exclusion List.
5   Select **Save**.

To remove a station to the Exclusion List via a routine:

1   Edit a routine that has **Check-In** as an **Action Type** (see "*Actions" on page 409*).
2   For **Check In**, select **Exclude-Delete**.
3   For **Stations**, select the stations that you want to remove from Manage Check-In Exclusion List.
4   Select **Save**.

To add a station to the Vacancy List via the Admin Web UI:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.
2   Under Calling/Paging, select **Manage Check-In**.

3   On the Manage Check-In page, select **Configure**.

4   Add desired station or stations to the Exclusion List.

5   Select **Save**.

To add a station to the Vacancy List via a routine:

1   Add or edit a routine that has **Check-In** as an **Action Type** (see "*Actions" on page 409*).

2   For **Check In**, select **Vacancy-Add**.

3   For **Stations**, select the stations that are expected to be vacant.

4   Select **Save**.

To delete a station from the Vacancy List via the Admin Web UI:

1   If not already on your dashboard, select **Dashboard** from the navigation bar.

2   Under Calling/Paging, select **Manage Check-In**.

3   On the Manage Check-In page, select **Configure**.

4   Select the stations that you want to remove from the Vacancy List.

5   Select **Save**.

To delete a station to the Vacancy List via a routine:

1   Edit a routine that has **Check-In** as an **Action Type** (see "*Actions" on page 409*).

2   For **Check In**, select **Vacancy-Delete**.

3   For **Stations**, select the stations you want to remove from the Vacancy List.

4   Select **Save**.

Creating and Using Multiple Check-In Routines

You can create check-in routines for multiple purposes and to ensure that the vacancy and exclusion lists are accurate.

You should create separate routines for drills and each type of emergency check-in. For example, a fire drill could use audio explaining that it was a drill and would not include an actual 911 call where a routine used for evacuating during an actual fire could include a 911 call.In this scenario, the word "drill" should appear in the name.

If you want to create routines for accurate exclusion and vacancy lists, use descriptive names such as "Fire Drill Period 1." Each routine should include a **Check-In** action **Type** that uses **Vacancy-Add** and a separate **Check-In** action **Type** that uses **Vacancy-Delete**.

Figure 185. Example of Check-In Routine Action

Check-In Log and Call Detail Records

Manage Check-In writes data to a log file (see "*Using System Log Files" on page 321*) and creates a Call Detail Record (see "*Viewing Call Detail Records" on page 325*). You can export and print the check-in log file using the **Export** button (see "*Exporting and Printing a Call Log" on page 326*). You can also copy the displayed log file information and paste it into another application.

Each logged event starts with a date and time stamp, followed by the station extension that created the event, and ending with optional event related information. For example:

2019-04-26 15:40:31 - 100 Start

The following event types are logged:

- Start

- Check-in

- Stop

- Reset

- Done

- Vacancy Add

- Vacancy Delete

- Exclude Add

- Exclude Delete

The **Done** event includes the elapsed time for the Check-in process (amount of time between Check-in **Start** and **Done**). The extension will always be 000 because this event is created by the system and not a specific station. For example:

2019-04-26 15:43:32 - 000 Done (elapsed time: 0h:3m:10s)

On the Call Detail Records, the detail record **Type** is set to **Check in** when a station checks in.

Managing Alerts

You can use Alert Filters and routines to manage if and how specific Emergency Alert System (EAS) events appear on the video display connected to the NQ-GA10PV. Your Nyquist server reads these EAS events, which include non-weather-related alerts, from the NWS.

> *Note:* Nyquist can only display weather or other emergency alerts from the National Weather Service (NWS) if your Nyquist server has an Internet connection and has access to necessary websites (see "*Whitelisted Web Addresses" on page 7*).

To display EAS events:

1 Decide which alerts you want to monitor and enable filters for those alerts, such as severity, certainty, and urgency (see "*Alert Filters Configuration" on page 478*).

2 Create a routine (see "*Adding a Routine" on page 395*).

3 Set the routine's **Allow Multiple** field to No.

4 *Optional*: If you will be using the Dashboard's Routines button to test this routine, set Allow DTMF to true.

5 Create at least one action for the routine that uses **Display-Msg** for the action **Type** (see "*Actions" on page 409*).

6 Ensure the Text for the action contains the $alerts() variable and related parameters for the alerts you want to display (see *"Setting Variables for the Display Message" on page 481*).

7 Create a trigger of type **Reboot** to start the routine.

Note: The trigger type may not seem intuitive, but the trigger is what starts the *monitoring* for EAS events, not the EAS event itself. Other trigger types can be used, but Reboot best ensures the system is always monitoring for EAS events.

Tip: To test your Alerts routine, use a demonstration alert code (see *"Demonstration Alerts" on page 484*) for the $alerts variable's <County-Code> parameter (see *"Setting Variables for the Display Message" on page 481*) and execute the routine using the Dashboard's Routines button. To initiate the routine this way, Allow DTMF must be enabled for the routine. Be sure to change the <County-Code> back to its normal value after testing is complete.

Understanding Event Types

The EAS has created specific event types for monitoring that include:

• Weather-Related Events, such as a Tornado Warning

• Non-Weather-Related Events, such as a Shelter in Place Warning for non-weather situations

• Administrative Events, such as an Administrative Message

Note: Non-Weather-Related Events and Administrative Events are only provided if the EAS has supplied that information to the NWS. Therefore, local Amber Alerts and Shelter in Place Warnings for non-weather situations may not be provided in your area.

Event types are categorized as:

• **Advisory**. An event that is not life-threatening but could cause inconvenience.

• **Warning**. An event that poses a significant threat to public safety or property and has a high probability of occurrence or is occurring.

• **Watch**. Conditions are favorable for the event occurring; does not mean the event will occur but it is possible.

• **Emergency**. An event that by itself would not kill or injure or cause property damage, but indirectly may cause other things to happen that result in a hazard.

• **Statement**. A message containing follow up information to a warning, watch, or emergency.

• **Message**. Non-weather related messages, such as an Amber Alert.

- **Test**. An administrative event for a monthly or weekly test of the emergency alert system.

The specific criteria for issuing an emergency alert is dependent upon your location.

Alert Filters Configuration

The Common Alerting Protocol (CAP) is an international standard format for emergency alerting and public warning. It is designed for all hazards related to weather events, earthquakes, tsunami, volcanoes, public health, power outages, and many other emergencies.

CAP elements and values are used when configuring alert filters for your Nyquist system.

> *Note:* You must have **Edit** permissions to enable and set Alert Filters Configuration. For more information, refer to "*Assigning and Editing Permissions" on page 216*.

Figure 186. Alert Filters Configuration

To configure alert filters:

1 On the navigation bar, select **Alert Filters**.

2 Select which alert will trigger a display message by selecting **Enabled** for the **Event Type** and then selecting the values of the CAP elements to filter for that **Event Type**.

For descriptions of weather-related event types, refer to the following website:

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https://www.weather.gov/lwx/WarningsDefined

For descriptions of non-weather-related event types, refer to the following website:

https://www.weather.gov/meg/nonwxrelatedemergmesg

Figure 187. Sample Alert With Elements Defined

Elements and their values are described in the following table:

Table 119. CAP Elements and Values

Element	Available Values
Severity	• **Extreme** - Extraordinary threat to life or property
	• **Severe** - Significant threat to life or property
	• **Moderate** - Possible threat to life or property
	• **Minor** – Minimal to no known threat to life or property
	• **Unknown** - Severity unknown
Certainty	• **Observed** – Determined to have occurred or to be ongoing
	• **Likely** - Probability is greater than or equal to 50%
	• **Possible** - Probability is less than 50%
	• **Unlikely** - Not expected to occur
	• **Unknown** - Certainty unknown
Urgency	• **Immediate** - Responsive action should be taken immediately
	• **Expected** - Responsive action should be taken soon (within next hour)
	• **Future** - Responsive action should be taken in the near future
	• **Past** - Responsive action is no longer required
	• **Unknown** - Urgency not known
Response	• **Shelter** – Take shelter in place or per instruction
	• **Evacuate** – Relocate as instructed in the instruction
	• **Prepare** – Make preparations per the instruction
	• **Execute** – Execute a preplanned activity identified in instruction
	• **Avoid** – Avoid the subject event as per the instruction
	• **Monitor** – Attend to information sources as described in instruction

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Note: The Severity, Certainty Urgency, and Response values only appear in the Alert message if the INCLUDES_CODES option is included in the $alerts parameters list (see "*Setting Variables for the Display Message" on page 481*).

Setting Variables for the Display Message

You can use the following variables in the **Text** field of a **Display-Msg** to have NWS alerts automatically appear on the video display connected to the NQ-GA10PV:

- $alerts

- $auto_resize

The $auto_resize variable must be immediately followed by a number in parentheses, for example, $auto_resize(20). In this example, Nyquist automatically resizes the display message by decreasing the font size if needed to better fit the message to the screen but will keep the font size to at least 20.

> *Note:* The font size will automatically resize to 20 if the Alert message has these following parameters:
>
> - Priority is smaller than 6.
>
> - Text length is longer than 1500 characters.
>
> - The text has more than 500 capital letter characters.
>
> The font size also automatically resizes to 20 if needed, even if the $auto_resize variable is not specified.

The $alerts variable is also immediately followed by one or more parameters in parentheses. The available parameters are:

- **AUTO_FIND_COUNTY**. Automatically discovers the county code associated with the Nyquist server's public IP address.

> *Note:* This option is not recommended if the server's physical location is in a different county from your facility, if your server resides in the cloud, or if you are tracking alerts for multiple facilities and those facilities are not in the same county. Instead, find and use your county code.

- **AUTO_COMPRESS_<Integer>**. Automatically compresses the display message if the number of lines in the message exceeds the <Integer> value. For example, AUTO_-COMPRESS_15 will cause messages that contain more than 15 lines to be compressed by removing end-of-line characters (lines will run together, separated by a space instead of end-of-line). The resulting message will perhaps be more difficult to read than the original. Use this option if you want to ensure that messages will fit on the

screen. You may need to experiment to determine a suitable value for <Integer>. You can combine this option with the $auto_resize variable.

Note: Font sizes are set in the Display Message options (see *"Creating a Display Message via the Dashboard" on page 448*. For weather alerts, the following settings are recommended for the Liberation Sans font:

- 30 - When not using the AUTO_COMPRESS_<Integer> option of the $alerts variable and not using the $auto_resize variable. A font size of 30 will ensure that the actual lines from the NWS will fit on each line displayed.
- 65 - When using AUTO_COMPRESS_15 and $auto_resize(25) variable.
- 40 - When using AUTO_COMPRESS_25 and $auto_resize(25) variable.
- 70 - When using AUTO_COMPRESS_<Inter> and $auto_resize variable with display message priority of 6.

- **<County-Code>**. Displays weather alerts for the specified county. An example county code for Orange County, Florida is FLC095.

Note: To find county codes (also know as zones), perform the following:

1 Using a web browser, enter the following URL into the address bar:

`https://alerts-v2.weather.gov`

2 Select "By Filter" (on left hand side of page)

3 Select "Add Filter"

4 Select "By Location"

5 Select "Zones"

6 In the "Select NWS zone(s)" field enter your two letter state abbreviation, county name or other identifier to search for your county". For example: Entering "Orange County" will display several counties that share that name. If "FLC095 - Orange County, FL" were the desired county, then FLC095 should be used by the Nyquist system.

- **INCLUDE_CODES**. Displays the Severity, Certainty, Urgency, and Response codes on the Alerts header for each alert displayed on the NQ-GA10PV display (see *Figure 187, "Sample Alert With Elements Defined," on page 479*).
- **INCLUDE_COUNTY**. Displays the county code on the Alerts headers. This is useful if you have several Alert related routines that use different county codes.
- **INCLUDE_INSTRUCTIONS**. Displays instructions that came with the weather alerts. If you want to display the exact instructions provided by the NWS, then add the

INCLUDE_INSTRUCTIONS option. Instructions are usually obvious (like seek shelter, stay indoors, stay hydrated). However, instructions can be verbose and, while they can provide valuable information, verbose instructions could cause the messages to be too large to display properly.

- **REPEAT_<Integer>**. Automatically repeats the alert processing and re-displays any resulting alerts every <Integer> seconds. Previous alerts are automatically removed from displays. This option provides a convenient way to check for and display alerts at a regular interval without having to create a routine loop and without having to worry about deleting previous or expired alerts. When this option is used, no subsequent actions will be executed in the Routine that executes the **Display-Msg** action. Since alert processing requires Internet access processing, Bogen recommends a minimum <Integer> value of 60 seconds. Using less than 60 seconds may significantly impact your network and Nyquist server processing utilization.

- **UPDATE_CACHE**. Nyquist caches the found county code so the system does not have to search more than one time.

  If your county code changes, you can include the option **UPDATE_CACHE** along with **AUTO_FIND_COUNTY** to have the system discover the county code and cache the new value.

Note: You should delete the **UPDATE_CACHE** option after use; otherwise, the Nyquist system searches for the county code each time alerts are retrieved.

When using INCLUDE_COUNTY

--- ALERT (ALERT_FLC095) --- Severe Thunderstorm Warning
(Severe,Observed,Immediate,Shelter) ← **When using INCLUDE_CODES**
At 321 PM CDT, a severe thunderstorm was located over Madison Lake,
or 9 miles east of Mankato, moving east at 30 mph.
HAZARD...Ping pong ball size hail and 60 mph wind gusts.
SOURCE...Radar indicated.
IMPACT...People and animals outdoors will be injured. Expect hail
damage to roofs, siding, windows, and vehicles. Expect wind
damage to roofs, siding, and trees.
Locations impacted include...
Madison Lake, Elysian, Lake Jefferson, Mankato Airport, Smiths Mill
and Greenland.
Instructions: ← **When using INCLUDE_INSTRUCTIONS**
For your protection move to an interior room on the lowest floor of a
building.
--- ALERT (ALERT_DEMO14) --- Tornado Warning
(Extreme,Observed,Immediate,Shelter)
The National Weather Service in The Twin Cities has issued a
* Tornado Warning for...
Southwestern Le Sueur County in south central Minnesota...
Northeastern Blue Earth County in south central Minnesota...
* Until 345 PM CDT.
* At 312 PM CDT, a severe thunderstorm capable of producing a tornado
was located near Kasota, or near Mankato, moving southeast at 15
mph.
HAZARD...Tornado and quarter size hail.

Figure 188. How Parameters Affect Display

A sample alert string is:

$alerts(FLC095,INCLUDE_CODES,AUTO_COMPRESS_15,REPEAT_60)

This string will display alerts for county FLC095 (Orange County, Florida) every 60 seconds including the Severity, Certainty, Urgency and Repose codes, while automatically compressing alerts that have more than 15 lines.

Demonstration Alerts

Several demonstration, or sample, Alerts are available for display. These samples represent typical alerts sent by the NWS for various alert types.

You can access these by replacing the <County-Code> with ALERT_DEMO<number> where <number> is replaced with a number between 1 and 20 (for example, ALERT_DE-MO10). Bogen recommends that you try each demonstration alert to help you get familiar with the alert format, the available $alerts options, and font sizing.

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Appendix A: Acronyms & Abbreviations

A

ANS	Ambient Noise Sensor
API	Application Programming Interface
ASB	Analog Station Bridge
ATA	Analog Telephone Adapter
Auth	Authorization

B

BTN	Billing Telephone Number

C

CAN	Controller Area Network
CAP	Common Alerting Protocol
CDR	Call Detail Record
CODEC	Coder-Decoder
CoS	Class of Service
CPU	Central Processing Unit

D

DCS	Digital Call Switch
DHCP	Dynamic Host Configuration Protocol
DID	Direct Inward Dial
DISA	Direct Inward Station Access
DNS	Domain Name System
DSP	Digital Signal Processing
DTMF	Dual Tone Multi-Frequency

485

DUNDI	Distributed Universal Number Discovery

E

EAS	Emergency Alert System
ECC	Error Correcting Code

F

FXO	Foreign Exchange Office
FXS	Foreign Exchange Subscriber

G

GND	Ground
GUI	Graphical User Interface

H

HTTP	Hypertext Transfer Protocol
HTTPS	HTTP Secure

I

I/O	Input/Output
ICE	Interactive Connectivity Establishment
iOS	iPhone Operating System
IP	Internet Protocol
IRS	Internet Radio Services
IT	Information Technology
ITSP	Internet Telephony Service Provider

J

K

L

LAK	License Activation Key
LAN	Local Area Network
LED	Light Emitting Diode

M

MAC	Media Access Control
MGCP	Media Gateway Control Protocol
MMPA	Matrix Mixer Pre-Amp

N

NAS	Network Attached Storage
NAT	Network Address Translation
NFS	Network File System
NIC	Network Interface Card
NTP	Network Time Protocol
NTS	Network Time Server

O

| ODBC | Open Database Connectivity |
| OS | Operating System |

P

| PBX | Private Branch Exchange |
| PC | Personal Computer |

PCI	Peripheral Component Interconnect
PCIe	PCI Express
PIN	Personal Identity Number
PoE	Power over Ethernet
PSTN	Public Switched Telephone Network
PTT	Push-To-Talk

Q

R

RAID	Redundant Array of Independent Disks
RGB	Red-Green-Blue
RTP	Real-Time Transport Protocol

S

SAN	Storage Area Network
SIP	Session Initiation Protocol
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SSL	Secure Sockets Layer
STUN	Session Traversal Utilities for Network Address Translation (NAT)

T

TCP	Transport Control Protocol
TFTP	Trivial File Transfer Protocol
TLS	Transport Layer Security
TURN	Traversal Using Relays around Network Address Translation (NAT)

U

UDP	User Datagram Protocol
UI	User Interface
URL	Uniform Resource Locators
USB	Universal Serial Bus

V

VLAN	Virtual Local Area Network
VoIP	Voice over Internet Protocol

W

WAN	Wide Area Network

X

XML	Extensible Markup Language

Y

Z

Appendix B: Nyquist DTMF Feature Dialing Codes

The use of feature dial codes is restricted by a station's CoS assignments.

DTMF code descriptions are usually shown using the following syntax:

<DTMF dial sequence> "–" <description> { "(CoS: "<required CoS>")" | <notes> }

Alarm/Tone Activation

CoS: Activate Alarm Signals | Manually Activate Tone Signals

*91{DTMF-Code} – Start Alarm specified by {DTMF-Code}

96{DTMF-Code}{Zone} – Start Tone specified by {DTMF-Code}, play to {Zone}

*96{DTMF-Code} – Start Tone specified by {DTMF-Code}

*96 – Prompts user to enter a tone number and tone parameters (e.g., times to play) and starts the tone at all Time-type zones

Announcements

*92{DTMF-Code} – Start Announcement specified by {DTMF-Code} to station's configured "Announcement Zone" (CoS: All-Call Page)

> **Note:** If "Announcement Zone" is not configured, the caller will be prompted to enter a zone number.

92{DTMF-Code}{Zone} – Start Announcement specified by {DTMF-Code}, play to {Zone} (CoS: Zone Paging)

*97{DTMF-Code}#0 – Start Announcement specified by {DTMF-Code} to all Facilities (including local facility) (CoS: Multi-Site Paging, Inter-Facility Call/Page)

*97{DTMF-Code}#{Facility-Page-Number} – Start Announcement specified by {DTMF-Code} to Facility specified by {Facility-Page-Number} (CoS: Inter-Facility Call/Page)

97{DTMF-Code}#{Facility-Page-Number}{Facility-Page-Number}... – Start Announcement specified by {DTMF-Code} to dialed Facilities (CoS: Multi-Site Paging, Inter-Facility Call/Page)

> **Note:** Use "0" for {Facility-Page-Number} to include the local facility. The number of dialed digits cannot exceed 70 digits.

Calling

<extension> – Call <extension> speaker (intercom, auto-answer) (CoS: Call Any Station)

*<extension> – Call <extension> ringer (telephonic, ringing)   (CoS: Call Any Station)

*#<extension> – Join conversation at <extension> (CoS: Join Conversation)

##*<Facility-Number>*<extension> – Call <extension> at <Facility-Number>

981AAANNNNNNN – Place long distance call with area code (AAA = Area code, NNNN-NNN = number)

98AAANNNNNNN – Place local ten-digit call with area code

98NNNNNNN – Place local seven-digit call

98911 – Place 911 emergency call

911 – Place 911 emergency call

**** – Place Emergency call to designated Admin station

***<DTMF-Codes> – Place call to PBX system (via SIP Trunk) by dialing <DTMF-Codes>

> **Note:** <DTMF-Codes> can be as simple as an extension number on the attached PBX system.

Call Forwarding

CoS: Call Forwarding

970 – Call Forwarding Menu

971{extension} – All-Calls (CFALL)

972{extension} – When Busy (CFBS)

973{extension} – When No Answer (CFNA)

974{extension} – When Busy or No Answer (CNBN)

975 – Cancel Call Forwarding

976 – Call Forwarding Status (Caller only)

977 – Call Forwarding Status (All users)

Call Parking/Call Pickup

DTMF: #72 – Park call (during call)

To pick up a parked call, dial the parked call's extension (by default, extensions 21-29) that was provided when the call was parked using #72. The parking lot extensions can be changed at the Admin Web UI through **System Parameters**.

7*{extension} – Call pickup {extension} when ringing (CoS: Remote Pickup)

Call Transfer

CoS: Call Transfer

DTMF: #1<extension number> – Blind transfer (during call)

DTMF: *1<extension number> – Attended transfer (during call)

DTMF: *2 – Complete attended transfer, dropping out of call

DTMF: *3 – Complete attended transfer, but stay in the call

DTMF: *4 – Swap to the other party (during attended transfer)

*3   – Transfer (drop) call from Speaker to associated Phone

– Transfer (drop) call from Speaker to associated Phone

DTMF: #1<speaker-extension> – Transfer call from Phone to associated Speaker

Conferencing

**{number} – Create/Enter Dynamic Conference {number} (CoS: Conference Admin/Conference User)

> **Note:** If the conference owner enters 0000 as the password, the conference will be deleted. If an Admin station user type enters 0000 as the password but is not the conference owner, the user will be prompted for the system password. If the correct system password is entered, the conference will be deleted.

**0 – Start system playback of list of created conferences that includes the conference number and the extension that created the conference

Monitoring/Recording

978{extension} – Monitor call or location at {extension} (CoS: Monitor Calls/Locations)

> **Note:** Spy Mode monitoring cannot be used on a station that has been set to Privacy Mode.

DTMF: 4 – Enable "spy mode" (MUTE) during call monitoring

DTMF: 5 – Enable "whisper mode" during call monitoring

DTMF: 6 – Enable "barge mode" during call monitoring

*990 – Record Message (Announcement) (CoS: All-Call Paging)

> **Note:** When you record an announcement by dialing *990 or by selecting **Record Announcement** on the Admin phone's **Announce** menu, the initial DTMF Code for the recorded and saved announcement will be set to the announcement's row ID. You can change the DTMF Code after the announcement is saved by editing the announcement in the web interface **Announcements** view.
>
> The saved announcement has **Play to Zone** set to blank (no zone selected). This means that when you play an announcement via an IP phone **Announcement** menu selection, you will be asked to enter a zone number (where 0 = All Speakers). You can define a permanent zone number for the saved announcement by updating **Play to Zone** after the recorded announcement has been saved.

999 – Playback recorded calls (CoS: Manage Recordings)

(MENU: 1–Emergency, 2–Monitored, 3–Urgent, 4–Standard)

DTMF: *3 – Start/Stop recording (DTMF used during a call.) (CoS: Record Calls)

Paging

Note: The "##" prefix is used to indicate multi-facility paging operations.

##0911 – Multi-Site Emergency All-Call Page (CoS: Emergency All-Call and Multi-Site Paging)

##0 – Multi-Site All Call Page (CoS: All-Call Paging and Multi-Site Paging)

#0911 – Emergency All-Call Page (CoS: Emergency All-Call)

##0912{Facility-Page-Number}*{Facility-Page-Number}... – Multi-Facility Emergency All-Call Page (CoS: Emergency All-Call)

951 – Emergency All-Call Page (CoS: Emergency All-Call)

#0 – All-Call Page (CoS: All-Call Paging)

#00 – All-Call Page (CoS: All-Call Paging)

0000000 – All-Call Page (CoS: All-Call Paging)

#{Zone} – Page to {Zone Number} (CoS: Zone Paging)

#{Zone}* – Real-time Page to {Zone} that belongs to a queue (CoS: Zone Paging)

##{Facility Number} – All-Call Page to {Facility Number} (CoS: Inter-Facility Call/Page)

##{Facility-Page-Number}*{Facility-Page-Number}... – Multi-Facility All-Call Page (CoS: Inter-Facility Call/Page)

##{Facility Number}#{Zone Number} – Zone Page to {Zone Number} at {Facility Number}(CoS: Inter-Facility Call/Page)

##{Facility Number}#{Zone Number}* – Real-time page to {Zone Number} that belongs to a queue at {Facility Number} (CoS: Inter-Facility Call/Page)

*991 – Record page; system will prompt for Zone Number (CoS: Zone Paging)

991{Zone Number} – Record page for {Zone Number} (CoS: Zone Paging)

> **Note:** The next two DTMF codes only work if made from the same extension that created the recorded page.

494

*992 – Cancel Recorded Page (CoS: Zone Paging)

992{Zone Number} – Cancel Recorded Page for {Zone Number}

Voicemail

CoS: Voicemail

900 – Voicemail for current caller

904{extension} – Voicemail for specified {extension}

904{extension}* – Leave voicemail for specified {extension}

Walking CoS

CoS: Walking Class of Service

3*{authCode}*{extension} – Current IP phone's extension becomes {extension}

If **Auth Code** is set to 0000 in the Admin Web UI's **System Parameters**, this feature is disabled.

Dial Codes Used for Simulating Calls to Admin Station from Station Call Switches

> **Note:** During the Check-In process, a Normal call starts the check-in process for a station.

 0   - Normal call to admin

*0   - Emergency call to admin

*00 - Urgent call to admin

*000 - Outside line calling in (uses night-ring logic)

Routines

CoS: Execute Routines

*94<Routine-DTMF-Code> – Execute Routine with <Routine-DTMF-Code>

0000094<Routine-DTMF-Code> – Execute Routine with <Routine-DTMF-Code>

> **Note:** Only routines with **Allow DTMF** can be executed from the Admin Phone.

*95<Routine-DTMF-Code> – Stop Routine with <Routine-DTMF-Code>

0000095<Routine-DTMF-Code> – Stop Routine with <Routine-DTMF-Code>

> **Note:** If the **Allow DTMF** parameter for the specified routine is set to **No**, you will be prompted to enter the system password.

Audio Distribution

CoS: Audio Distribution

987*{DTMF-Code} – Start Audio Distribution for {DTMF-Code}

980*{DTMF-Code} – Stop Audio Distribution for {DTMF-Code}

920 – Stop ALL Scheduled Audio

Miscellaneous Dial Codes

#*349 – Restart Nyquist system server

*9 – Toggle Audio Distribution to associated speaker

0000097 – Disable Audio (CoS: Disable Audio)

0000098 – Enable Audio (CoS: Enable Audio)

920 – Stop Scheduled Audio

942#{extension}#{contact-number} – Close {contact-number} on I/O Controller {extension} (For example, dialing 942#120#1 closes contact number 1 on I/O Controller 120.)

943#{extension}#{contact-number} – Open {contact-number} on I/O Controller {extension} (For example, dialing 943#120#1 opens contact number 1 on I/O Controller 120.)

Appendix C: C4000 Software Licenses

This appendix describes the software licenses available for the C4000 series.

Note: Nyquist C4000 software licenses do not expire and no annual license renewal fees are charged. However, a Software Update Subscription (SUS) is required to receive future Nyquist software updates and new feature releases. All C4000 software license bundles include an initial 3-year subscription to software updates. A SUS expiration warning notice will appear on the Admin Station dashboard 90 days prior to expiration. If the SUS expires, the Nyquist system will continue to operate, but software updates will not be allowed until the SUS is updated via purchase and activation of a 3-year Extended System Software Update license (NQ-C4SWUP3YRBx, where "x" indicates the applicable C4000 system license bundle).

Nodelocked License Activation Key

A Nodelocked License Activation Key (LAK) is preloaded on the Nyquist System Controller, and if a customer prefers to install the Nyquist C4000 application software on his or her own server, he or she must obtain a Nodelocked LAK from Bogen Technical Support and install it as part of the Nyquist C4000 server setup. The format for this LAK is **NXXX-XXXX-XXXX-XXXX-XXXX**.

Note: LAKs use the 0 character representing the number zero; they do *not* use the letter O.

Product License Activation Key (NQ-C4000-B1, B2, B3, B4)

C4000 product LAKs begin with the letters PC followed by a two digit numeric designation that denotes a specific C4000 product bundle (01 - 04). The C4000 Product LAK activates the C4000 bundle. The format for this LAK is PC##-XXXX-XXXX-XXXX-XXXX. The # is a numerical value of 01 through 04 and represents the bundle purchased. The Product LAK must be entered before entering any Feature LAKs.

When the product LAK is first activated, the SUS expiration date is automatically set to 3 years from the date of activation. Re-activating the key will not reset this expiration date. However, 3-year Extended System Software Update licenses can be purchased and

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installed (for example, NQ-C4SWUP3YRBx, where "x" indicates the applicable C4000 system license bundle). See "System Software Update Subscriptions (NQ-C4SWUP3YRB1, B2, B3, B4)" on page 499.

Feature License Activation Keys

Feature LAKs begin with the letters **FC** followed by a two character alpha-numeric designation that denotes the specific system feature or option.

Concurrent Call License Expansion Package (NQ-C4000CCLX)

This LAK uses the format FCC0-XXXX-XXXX-XXXX-XXXX.

Concurrent Call Licenses are sold in expansion packs of 10.

The following items each require and consume one or more Concurrent Call Licenses:

- All Call (1)
- Emergency All Call (1)
- Multi-Site All Call (1)
- Multi-Site Emergency All Call (1)
- Multi-Facility Pages (1)
- Multi-Facility Announcements (1)
- Zone Page (1)
- Intercom Call (1)
- Station-to-Station Call (1)
- Recording an announcement (1)
- Recorded Page (2)
- Retrieving a vmail message (1)
- Scheduled Events (for example, Tones or Announcements) (1 per active event)
- Audio Distribution (1 to start or stop the audio distribution; once the audio is streaming, no associated call count is consumed)
- Call Monitoring/Recording (1 in addition to the 1 for the call itself)
- DISA Station Monitoring (2)

- Executing routine via DTMF (1)

> **Note:** If the routine ends with a call type, it does not consume an additional call. In this case, starting the routine consumes a call, but the call action takes over the call at the end of the routine.

- Executing routine on remote facilities (2)

System Software Update Subscriptions (NQ-C4SWUP3YRB1, B2, B3, B4)

This LAK uses the format FCDX-XXXX-XXXX-XXXX-XXXX.

There are four available 3-Year SUS Extension licenses—one for each C4000 software license bundle type. For example: if the system's current SUS expiration is 3/31/2022, the NQ-C4SWUP3YRB1 license extends the SUS expiration date of a Bundle-1 system until 3/31/2025.

SUSs encompass bug fixes, feature enhancements, and all standard new features introduced in subsequent releases of the product.

Any hardware that may be associated with a new feature is excluded and must to be purchased separately.

Intercom Call License (NQ-C4000ICL)

This LAK uses the format FCIX-XXXX-XXXX-XXXX-XXXX.

This license adds talk back, or intercom, capability to a single station.

Intercom calling is disabled by default on every C4000 system. Installing this license enables intercom calling (that is, talkback operation) between any two applicable Nyquist devices (VoIP phones, VoIP speakers, VoIP Intercom Modules, Web UI dashboard, etc.). Each NQ-C4000ICL license key installed and added to a system incrementally increases the concurrent Intercom Call limit by 1. For example, installing 3 NQ-C4000ICL licenses will permit up to 3 concurrent intercom calls on a system.

> **Note:** The Intercom Call limit can never exceed the system's maximum Concurrent Call limit. **Intercom Call Limit** and **Intercom Call Count** are displayed on the Product License page (see "Product License Activation Key (NQ-C4000-B1, B2, B3, B4)" on page 497).

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Map-Based Paging License (NQ-C4000MBP)

This LAK uses the format FCM0-XXXX-XXXX-XXXX-XXXX.

This is a one-time, system-wide license required to enable interactive Map Based Paging in a C4000 system.

Paging Zone License Expansion Package (NQ-C4000PZX)

This LAK uses the format FCZ0-XXXX-XXXX-XXXX-XXXX.

This license increases the zone count of any Bundle-1, Bundle-2, or Bundle-3 system by 3 zones. This allows any of these systems to be grown or expanded in 3-zone increments (For example, if a Bundle-2 system's current zone count is 9, installing this upgrade will increase it to 12 zones).

The licensed number of Page Zones (**Maximum Zone Limit)** and **Current Zone Count** are displayed on the Product License page (see "Product License Activation Key (NQ-C4000-B1, B2, B3, B4)" on page 497).

Queued Paging/Page Stacking License (NQ-C4000QPL)

This LAK uses the format FCQ0-XXXX-XXXX-XXXX-XXXX.

Queued Paging/Page Stacking is disabled by default on every C4000 system. Queue Paging allows multiple users to simultaneously page to the same zone or zones and is an effective way to eliminate feedback in areas where a paging device (phone, microphone, etc.) may be in close proximity to speakers receiving the page. Installing this license enables Queued Paging/Page Stacking on the system and allows the user to create one page stacking queue. Each NQ-C4000QPL license key installed and added to a system incrementally increases the page stacking queue limit by 1. For example, installing 3 NQ-C4000QPL licenses will permit up to 3 separate page stacking queues to be created on a system.

The Page Queuing feature emulates the functions of the BOMDMU and Digital Feedback Terminator (DFT) in legacy PCM2000 and UTI1/UTI312 analog paging applications.

The licensed number of paging queues (**Maximum Page Stacking Queues)** and **Queue Count** are displayed on the Product License page (see "Product License Activation Key (NQ-C4000-B1, B2, B3, B4)" on page 497.)

Text-To-Speech License (NQ-C4000TTS)

This LAK uses the format FCT0-XXXX-XXXX-XXXX-XXXX.

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This is a one-time, system-wide license required to enable TTS-based announcements and messaging in a C4000 system.

Automatic Failover License (NQ-C4000AFL)

This LAK uses the format PCAF-XXXX-XXXX-XXXX-XXXX.

This license is required to enable the Automatic Failover (AF) capability of the Nyquist server in an C4000 system. The AF feature requires customers to purchase a secondary standby System Controller (or server) on which to install this S/W license. An AF S/W license is not required to be purchased for the Nyquist system's primary server.

Routines API License (NQ-C4000API)

This LAK uses the format FCRA-XXXX-XXXX-XXXX-XXXX.

This license is required to enable the API for 3rd-party access to Routines on an C4000 system. Only one (1) license is required regardless of how many 3rd-parties access/use the API.

System Software License Bundle Upgrades

These system upgrade LAKs use the format FCU#-XXXX-XXXX-XXXX-XXXX, where # indicates the number of the software bundle the system configuration will be upgrade to–for example, from Bundle-1 to Bundle-2.

NQ-C4000-B12UP Nyquist C4000 Series System Software License Bundle Upgrade - B1-B2

- Upgrades a Bundle-1 system to a Bundle-2 configuration by increasing the current zone count of the Bundle-1 system by 6 zones. For example, if a Bundle-1 system's current zone count is 3, installing this upgrade will increase it by 6 to 9 zones).

- Extends the current SUS expiration date by 1 year. For example, if the system's current SUS expiration is 3/31/2022, installing this upgrade will extend it to 3/31/2023.

NQ-C4000-B23UP Nyquist C4000 Series System Software License Bundle Upgrade - B2-B3

- Upgrades a Bundle-2 system to a Bundle-3 configuration by increasing the current zone count of the Bundle-2 system by 15 zones. For example, if a Bundle-2 system's current zone count is 9, installing this upgrade will increase it by 15 to 24 zones.

- Extends the current SUS expiration date by 1 year. For example, if the system's current SUS expiration is 3/31/2022, installing this upgrade will extend it to 3/31/2023.

Nyquist C4000 Series System Software License Bundle Upgrade - B3-B4

- Upgrades a Bundle-3 system to a Bundle-4 configuration by increasing the current zone count of the Bundle-3 system to virtually unlimited zones. For example, if a Bundle-3 system's current zone count is 24, installing this upgrade will enable it to support a virtually unlimited number of zones.

- Extends the current SUS expiration date by 1 year. For example, if the system's current SUS expiration is 3/31/2022, installing this upgrade will extend it to 3/31/2023).

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