

System Administrator Guide

C4000 Series

Version 6.0



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Introducing the C4000 System

Nyquist C4000 is a TCP/IP-based solution for commercial paging and audio distribution applications. It addresses the unique communication needs of various types of businesses, including industrial facilities, transportation hubs, retailers, offices, restaurants, and bars.

Note: This guide 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 410 of this manual. For information about station types, see “Viewing Station Configuration Settings” on page 148. For information about roles, see “Managing Roles and Users” on page 265.

The heart of the C4000 system is a robust, state-of-the-art System Controller (NQ-SYSCTRL) that comes preinstalled with the Nyquist application software. The System Controller features an easy-to-use web-based graphical user interface (GUI) accessible through almost any personal computer (PC), tablet, or mobile device from any location in the connected world.

Note: See “Network Application Services” on page 7 if you elect to *not* use the Nyquist System Controller (NQ-SYSCTRL).



Figure 1. Nyquist System Controller

The solution features a built-in streaming Internet radio service, *airable*, 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.

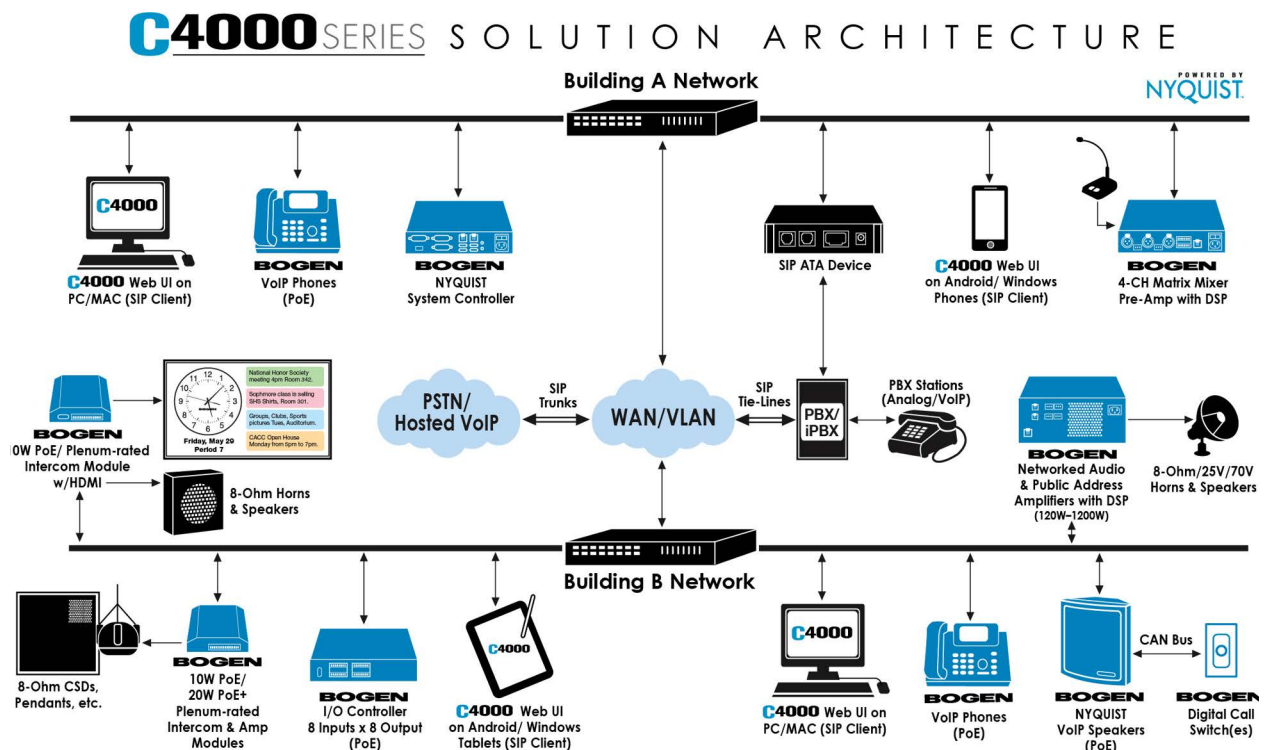


Figure 2. Example of C4000 Network

The C4000 system supports the following hardware:

- Desktops, laptops, tablets, and mobile phones (Android, Apple, and Windows) that support the full Google Chrome or Microsoft Edge web browser—or an Apple iPhone or iPad device running iOS 14 forward using the Safari browser—to access the C4000 Admin Web user interface (UI)
- C4000-certified Voice-over-IP (VoIP) phones
- Nyquist appliances

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

<https://www.bogen.com>

For information about training resources for the C4000 and other Bogen products, visit:

<https://www.bogen.com/eLearningQR>

Understanding System Requirements

The C4000 web-based UI requires a secure Hypertext Transfer Protocol Secure (https) network connection to the C4000. Users can log in to the C4000 using the Google Chrome or Microsoft Edge web browser from a computer or tablet running either the Windows 10 (or later) or Mac OS X 10.12.x (or later) operating system (OS), or using the Safari browser from an iPhone or iPad device running iOS 14 (or later). The UI can also be accessed via a Chrome or Edge browser-enabled Android-based tablet or mobile device.

To access the server, type your server's IP address (for example, 10.10.20.12) in your browser's address bar.

Whitelisted Web Addresses

The 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) are 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.

C4000 access to these URLs can be checked via the **Check Internet Site Access** feature on the **System Parameters** page or by pressing the **Check Internet Site Access** button on the **Network Wizard** page during product activation.

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 downloads from Digium Phone Module for Asterisk (DPMA)
http://downloads.asterisk.org/ (specifically, http://downloads.asterisk.org/pub/telephony/sounds/releases)	Required for sounds download

Table 1. Whitelisted Web Sites (Continued)

URL	Description
http://www.pjsip.org/	Required for PJSIP download
http://ftp.us.debian.org (specifically: http://ftp.us.debian.org/debian/)	Required during Linux package installation
http://deb.debian.org/debian/	
https://deb.debian.org/debian/	
http://security.debian.org (specifically: http://security.debian.org/)	Required during Linux package installation
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.)
https://raw.githubusercontent.com/	Serves unprocessed versions of files stored in the GitHub repositories.
http://2431612419.airable.io https://2431612419.airable.io	The <i>airable</i> URL for Internet-based-radio Audio Distributions
http://api.sound-machine.com https://api.sound-machine.com	The SoundMachine URL for Internet-based-radio Audio Distributions
http://api.bogenedu.com/api/customers http://bogen-ssu.bogen.com/	Required for C4000 warranty support Bogen System Software Update server. Required for automatic Nyquist server software and Nyquist firmware software update notifications and downloads.
https://www.weather.gov/alerts https://ipapi.co	Required for displaying weather alerts. Required for automatically finding county code for alerts.
https://api.weather.gov	Required for obtaining alerts from the National Weather Service.
http://openweathermap.org http://api.openweathermap.org	Required for obtaining current weather conditions.

Table 1. Whitelisted Web Sites (Continued)

URL	Description
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.

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 if you elect not to use the Nyquist System Controller (NQ-SYSCTRL):

Table 2. Nyquist System Server Minimum Requirements

OS	<p>Debian Linux OS (AMD 64-bit version) release 11.7 or a higher minor revision of release 11.</p> <p><i>Note:</i> Refer to the most up to date Release Notes on the www.bogen.com web site for details about which Linux OS versions have been tested for use with the C4000.</p>
CPU	<p>Quad-core Intel-based processor running at 3.0 GHz or higher</p>
Memory	<p>8 GB</p> <p>Error Correcting Code (ECC) RAM is recommended for increased performance and reliability.</p>
Disk Storage	<p>One 250 GB disk drive</p> <p>Some form of hardware-based Redundant Array of Independent Disks (RAID) is recommended for redundancy and high availability.</p> <p>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:</p> <ul style="list-style-type: none">• 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?
Network Interface Card (NIC)	<p>Minimum 1000 MB Ethernet port</p>

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 Dealer 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, SIP trunking is required; contact your Bogen Dealer for assistance in determining these telephony hardware needs.

Network Application Services

Required application services will be installed automatically on the C4000 as part of the Nyquist software installation. All other 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
DHCP	Supplies dynamic IP addresses to the C4000 system server 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 and/or C4000
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.	Mandatory ^a	Network

Table 3. Network Application Services (Continued)

Service	Description	Required	Location
ICE	Resolves IP addresses behind Network Address Translation (NAT)/firewall.	Optional	C4000 Network
STUN	<ul style="list-style-type: none"> • Interactive Connectivity Establishment 		
TURN	<ul style="list-style-type: none"> • Session Traversal Utilities for NAT • Traversal Using Relays around NAT 		
LDAP	LDAP is used by the C4000 to import users into the Nyquist system.	Optional	Network
NTP	Provides date/time synchronization for the C4000 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
TFTP	<p>TFTP is used by IP phone and C4000 device provisioning. A TFTP server runs on the C4000 on port 69 (the standard TFTP port #).</p> <p>Device provisioning files are stored on the C4000 in directory: /srv/tftp.</p> <p>This is the only directory exposed by the TFTP server.</p>	Mandatory	C4000

- a. Required for Nyquist software upgrades, updating license keys, adding new feature license keys, using Internet-based features, e.g., Internet Radio service, weather alerts, weather conditions, Routines API, Routine Webhook-Post action.

Network Ports

The following table lists the network ports required by the Nyquist System Controller and the associated devices.

Table 4. Network Ports Used by Nyquist

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
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	Inter-Facility Communications	4569
LDAP	Lightweight Directory Access Protocol	389
LDAP over TLS	Lightweight Directory Access Protocol over Transport Layer Security	389 (configurable)
NTP	Network Time Protocol	123
ODBC	Database connection (ODBC is an acronym for Open Database Connectivity.)	3306
RLM	Nyquist license activation via hostedactivation.com	5053
RSYNC	Used to synchronize files (Automatic Failover Only)	873
RTP	Audio Streams (RTP is an acronym for Real-Time Transport Protocol.)	10000–20000 (configurable)
secure-mqtt	Nyquist control messages between Nyquist server and Nyquist appliances	8883
Server Management	Local port used for server management DO NOT allow outside access to this port. During 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

Table 4. Network Ports Used by Nyquist

Service	Description	Port
SIP	Session Initiation Protocol (SIP) Transfer Control Protocol (TCP)/User Datagram Protocol (UDP) connections	5060, 5061
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 “Viewing Roles” on page 265.

Client Requirements

The Nyquist web-based UI is accessed through a client, which can run on PCs, Macs, and Android tablets and mobile devices that support the full Google Chrome or Microsoft Edge web browser, as well as the Safari browser from an iPhone or iPad device running iOS 14 (or later). In addition to supporting Chrome, Edge, or Safari, the client must have a sound card and a microphone.

The Bogen Certification Authority (CA) digital certificate must be installed on the client. This certificate is created by, and downloaded from, the Nyquist C4000 server and enables your browser to recognize the Nyquist web application as a trusted site.

For details on how to download and install the certificate to your client computers, see “Installing the Bogen Digital Certification Authority” on page 623.

Important: If one or more system updates have been installed since the last time the server’s certificate was generated, or if you receive an HTTP error or redirection when downloading the certificate file (e.g., 302 Found), you may need to generate a new server certificate before proceeding (see “Generate Server Certificate” on page 86 for details).

Accessing the Dashboard

Caution Do not use third-party browser extensions with the Nyquist user interface as they may interfere with functionality. If you have browser extensions that you want to use for non-Nyquist browsing, you may want to consider creating a Nyquist-specific browser profile for which all extensions are uninstalled or disabled. See your browser documentation for details.

To access your dashboard:

- 1 From your Chrome, Edge, or Safari browser, type the C4000 System Controller's IP address or DNS name into 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**.

Caution The use of a browser-based password manager that saves your credentials and auto-fills username and password fields can cause problems within the Nyquist web-based UI. There are numerous distinct passwords that are configured and used within the interface; automatically populating these fields incorrectly may prevent some features from operating correctly or result in unintentional changes to configured passwords. Unless autofill can be restricted to the Login page, it is safest to disable password management for the C4000 site.

- 4 If this user account is already logged in, on another machine or in another browser session, you will be prompted to logout the other session and continue. Selecting **No** will return you to the Login page.
- 5 Once logged in, if the current user account is still configured with Bogen's default password, a warning will be displayed reminding you to change the password. Select **OK** to continue.

Warning It is strongly recommended that you do *not* use the default password, as it is publicly available and, therefore, not secure.

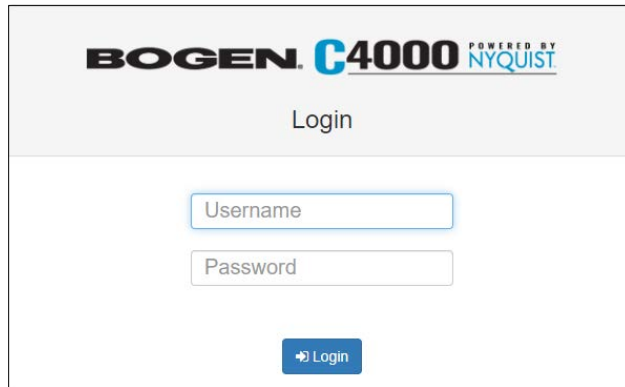


Figure 3. Login Page

Note: The Nyquist system does not support opening multiple sessions of the Nyquist Web UI. Logging into a second session will log off the first session (after user confirmation).

The dashboard that appears depends on whether your station is an **Admin Web Interface** or a non-administrator **Web Interface**.

If you are using the Admin Web Interface and have permissions for configuration tasks, your dashboard will appear as shown in *Figure 4, "C4000 Dashboard for Admin Web Interface," on page 13.*

BOGEN C4000 COMMUNICATIONS

Facility: Main Facility Time: 11:02 am User: Admin Extension: 832

Dashboard

Incoming Calls

Messages

Site

Calling/Paging

- Directory
- Dial Pad
- Page Exclusion
- Call Forwarding
- Zone Page
- Record Page
- Prepend Page
- All Call
- Emergency All Call
- Manage Check-in
- Routines

Multi-Site Calling/Paging

- Facility Page
- Multi-Site All Call
- Multi-Site Emergency All Call
- Facility Announcement

Tones/Announcements

- Tone
- Announcement
- Alarm
- Stop Announcement
- Display Message
- Remove Message

Weekly Schedule (New Today Next)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Apr 7	Apr 8	Apr 9	Apr 10	Apr 11	Apr 12	Apr 13

Audio Distribution

Line-Input/Playlist/Source	DTMF Code	Zones	Stations	Description
Beethoven	4	Show	Show	<input checked="" type="checkbox"/> <input type="checkbox"/>
SM Eagles	98	Show	Show	<input checked="" type="checkbox"/> <input type="checkbox"/>
Kate Bush	99	Show	Show	<input checked="" type="checkbox"/> <input type="checkbox"/>
WBUR 90.9 FM	3	Show	Show	<input checked="" type="checkbox"/> <input type="checkbox"/>

Disable Audio

Figure 4. C4000 Dashboard for Admin Web Interface

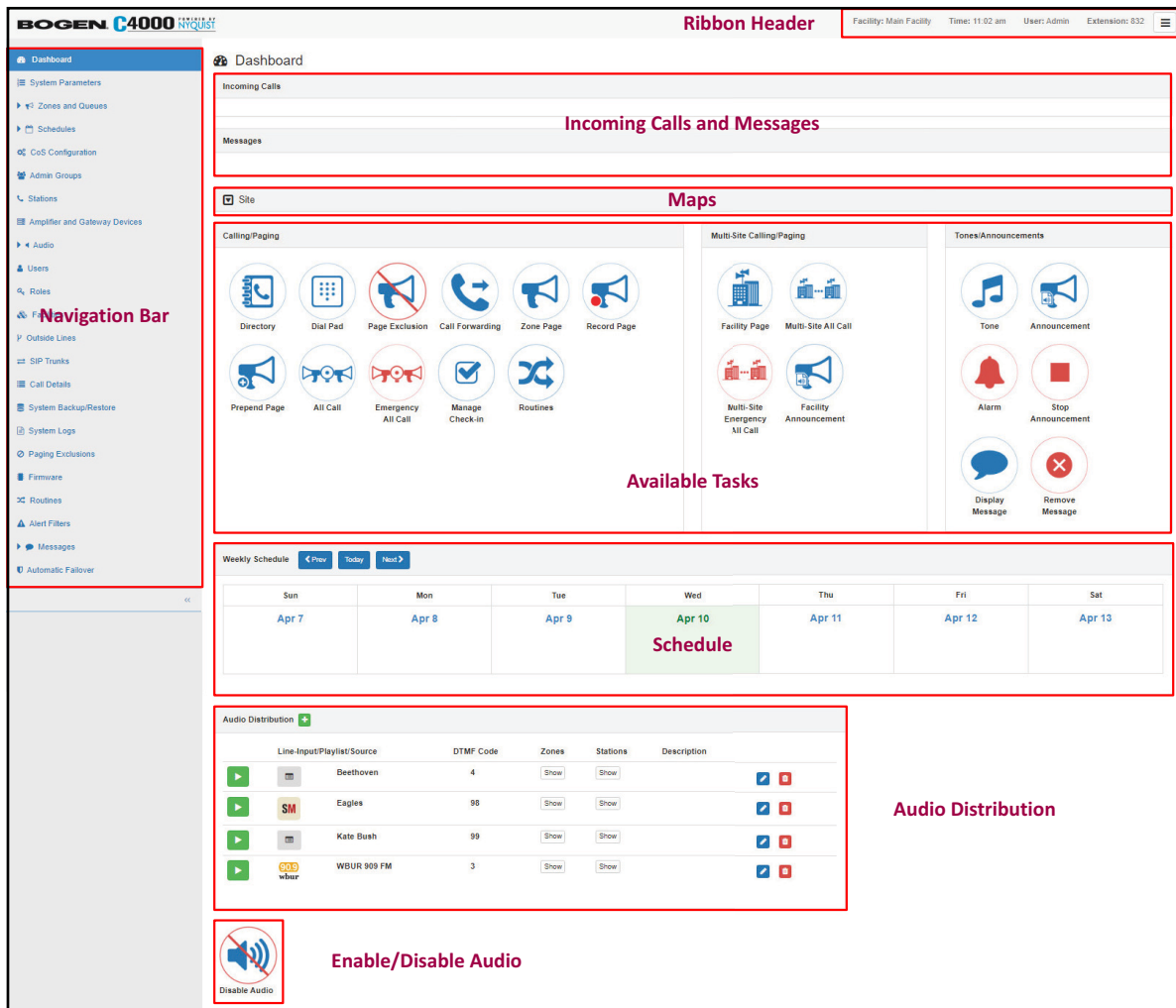


Figure 5. Dashboard Areas

The left side, or navigation bar, of the dashboard (Figure 5, "Dashboard Areas," on page 14) 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, the extension for the station, and the collapsed menu icon (aka "hamburger button"). The facility name and server 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 410 and *"Using the Maps Feature"* on page 444 for details about tasks that office staff commonly perform.

Tip: It may be helpful to distribute printouts of these sections of the manual—*"Performing Tasks via the Dashboard"* on page 410 and *"Using the Maps Feature"* on page 444—to front office staff.

At the top of the dashboard, messages appear that can provide information about your system (see *Figure 6, "Dashboard Messages,"* on page 15), 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 402.)

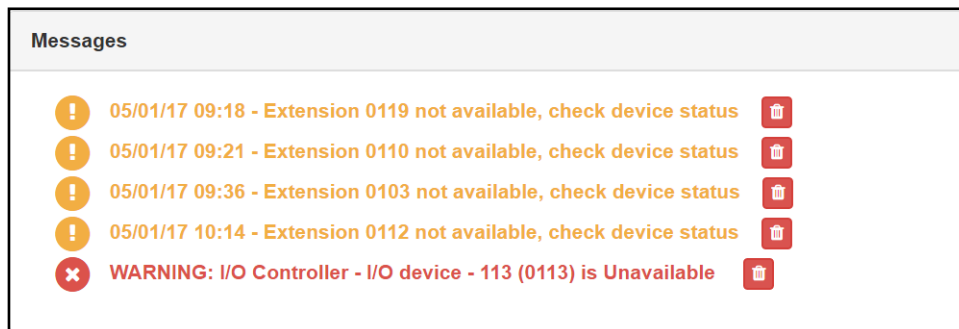


Figure 6. Dashboard Messages

If an I/O Controller rule's **Action** has been set to **Manual**, a dashboard button appears in the Output Control section of the dashboard that can be used to manually close or open specified output contact. (See *"Viewing I/O Controller Configuration Rules"* on page 164.)








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.

For detailed information about performing tasks from the dashboard, see *"Performing Tasks via the Dashboard"* on page 410.

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.
	Delete icon: Delete an item.
	Information icon: Provides additional information, such as viewing release notes for firmware (see <i>"Viewing Release Notes for Firmware" on page 137</i>).
	Link icon: Links to a web page that contains related information or functionality.
	Help icon: View feature help for the displayed page.
	Hamburger icon: Display a menu of options.

Configuring the C4000

Before configuring your C4000, you must first perform the initial setup, which is documented in the *Nyquist System Controller Setup Guide*. The initial setup process includes network configuration, among other things, some of which can only be performed through wizards. For example, configuring whether or not the C4000 will use a static IP address or DHCP can only be configured in the Network Wizard (which can also be accessed at <https://<server>/setup/network>).

You must configure your system and the C4000 features to best suit your organizational needs. For example, you must determine if your C4000 server is being used for just your site or for a multi-site environment.

Note: If the C4000 system server is used in a multi-site environment, All-Call and Emergency All-Call pages will be broadcast at all sites managed by that C4000 system server. If this is not the desired behavior, then each site should have its own C4000 system server. A single C4000 system server should not be used to manage multiple sites that are geographically separated because WLAN and power issues at one site could disrupt C4000 service at all locations.

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 <i>"Automatic Failover Configuration"</i> on page 90.
Set the dialing length and other System Parameters to the desired values.	See <i>"Setting System Parameters"</i> on page 70.
Set the Class of Service (CoS) configurations.	See <i>"Adding CoS Parameters for a Station"</i> on page 109.
Determine the number of Admin Phones and Web Admin stations and configure these stations.	See <i>"Adding a Station"</i> on page 198.
Determine the number of Admin Groups, if any, that you need and create them.	See <i>"Adding an Admin Group"</i> on page 282.
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 <i>"Discover Ports"</i> on page 131 and <i>"Editing Station Configuration Settings"</i> on page 162.
If staff IP phones will be used, determine how many are planned and configure these stations.	See <i>"Adding a Station"</i> on page 198.
If needed, configure the roles for the Web Admin interface.	See <i>"Adding a Role"</i> on page 266.
If needed, configure the users for the Admin Web interface.	See <i>"Adding a User"</i> on page 272.

Table 6. C4000 Setup Tasks

Task	Reference
Use Nyquist DHCP Server for initial discovery of Nyquist appliances and VoIP phones.	See <i>"DHCP Server"</i> on page 50.
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 <i>"Adding a Station"</i> on page 198.
Configure page, time, and audio zones and assign stations to these zones.	<i>Note:</i> 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 <i>"Adding a Zone"</i> on page 231.
If using tones to announce an alarm or an event, define the tones that will be available for C4000.	See <i>"Adding Tones"</i> on page 366.
If using playlists with C4000, create playlists and download songs.	See <i>"Adding Songs"</i> on page 323 and <i>"Creating a Playlist"</i> on page 327.
Define the site start and end dates.	See <i>"Reviewing and Editing a Schedule"</i> on page 288.
Configure events for bell schedules, including tones and Scheduled Audio.	<i>Note:</i> 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 <i>"Adding an Event"</i> on page 293.
Schedule holidays.	See <i>"Adding a Holiday"</i> on page 301.
If a SIP trunk is being used, add the SIP trunk configuration to the C4000 and configure the station to use the SIP trunk for 911 calls.	See <i>"Adding SIP Trunk Configuration Parameters"</i> on page 115 and <i>"Editing Station Configuration Settings"</i> on page 162.
If the C4000 system server will manage multiple facilities, add each facility to the C4000 system.	See <i>"Adding a Facility"</i> on page 141.

Getting Help

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

Telephone: 1-800-999-2809
Technical Support: www.bogen.com/contact-tech-support
Online training: www.bogen.com/product-training
Email: support@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 LLC, links to the various license agreements, and a link to the Bogen eLearning website.
- **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.

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 70). System configuration also includes the following:



- Setting parameters for what actions can be done from a specific station (see *"Using CoS Configuration"* on page 104)
- Setting what permissions are assigned to a user (see *"Managing Roles and Users"* on page 265)
- Configuring facilities for a multi-site server (see *"Configuring Facilities"* on page 137)
- Setting up stations, zones, and queues (see *"Managing Stations, Zones, and Queues"* on page 147)
- Updating firmware for Nyquist devices and stations (see *"Configuring Appliance Firmware"* on page 131)
- Setting parameters for SIP trunks (see *"Managing SIP Trunks"* on page 109)
- Disabling an outside line (see *"Editing Outside Lines"* on page 128)

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 22.)

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.

System Parameters  

Parameter	Value
Name	Main Facility
Day Start	8:00am
Night Start	5:00pm
Emergency-All-Call Multicast RTP IP Address	239.1.1.1
Emergency-All-Call Multicast RTP Port	6000
Emergency All-Call Cut Level (dB)	-35
All-Call Multicast RTP IP Address	239.1.1.2
All-Call Multicast RTP Port	6004
All-Call Cut Level (dB)	-33
Audio Distribution Multicast IP Address	239.1.1.3
Audio Distribution Multicast Port	6008
Audio Distribution Cut Level (dB)	-31
Default Cut Level (dB)	-25
Ambient Noise Sensor Multicast IP Address	None
Ambient Noise Sensor Multicast Port	None
Network Time Server	pool.ntp.org
Appliances Network Time Server Source	nyquist
Time Zone	America/Los Angeles
Disable Preannounce Tone	No
Disable Privacy Beep	Yes
















-  Check Internet Site Access
-  Check Server Status
-  Custom Configuration
-  Device Discovery
-  DHCP Server
-  Email Configuration
-  Export Report
-  LDAP
-  Network Traffic Capture
-  Product License
-  Restart Server
-  Shut Down
-  Sort Menu
-  Station Supervision
-  System Update

Figure 7. System Parameters Page

To view System Parameters:

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

The System Parameters page appears. For details, see *Table 20, "Edit System Parameters Page,"* on page 72 and *Table 21, "System Tools,"* on page 83.

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 23.)
- Enter a product or feature license. (See *"Product License"* on page 24 or *"C4000 Software Licenses"* on page 645.)
- Sort the menu. (See *"Changing the Navigation Bar Order"* on page 29.)
- Restart the server. (See *"Restarting the Server"* on page 30.)

- Monitor stations and set station supervision criteria. (See *"Station Supervision"* on page 30.)
- Configure settings for Simple Mail Transfer Protocol (SMTP) email notifications. (See *"Email Configuration"* on page 33.)
- Check for and perform system updates. (See *"Performing a System Update"* on page 36.)
- Configure Automatic Software Download. (See *"Configuring Automatic Software Download"* on page 43.)
- Shut down the server. (See *"Shutting Down the Server"* on page 45.)
- Check Internet site access. (See *"Check Internet Site Access"* on page 46.)
- Check the server status. (See *"Check Server Status"* on page 47.)
- Configure the local DHCP server. (See *"DHCP Server"* on page 50.)
- Modify custom configuration settings. (See *"Custom Configuration"* on page 48.)
- Capture network traffic on the Nyquist system. (See *"Network Traffic Capture"* on page 53.)
- Configure LDAP. (See *"Lightweight Directory Access Protocol (LDAP)"* on page 59).
- Configure NQ-S1810WBC Flasher behavior for Nyquist system audio events. (See *Table* on page 68).

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 21.) The following diagram illustrates how settings for these options affect night calls.

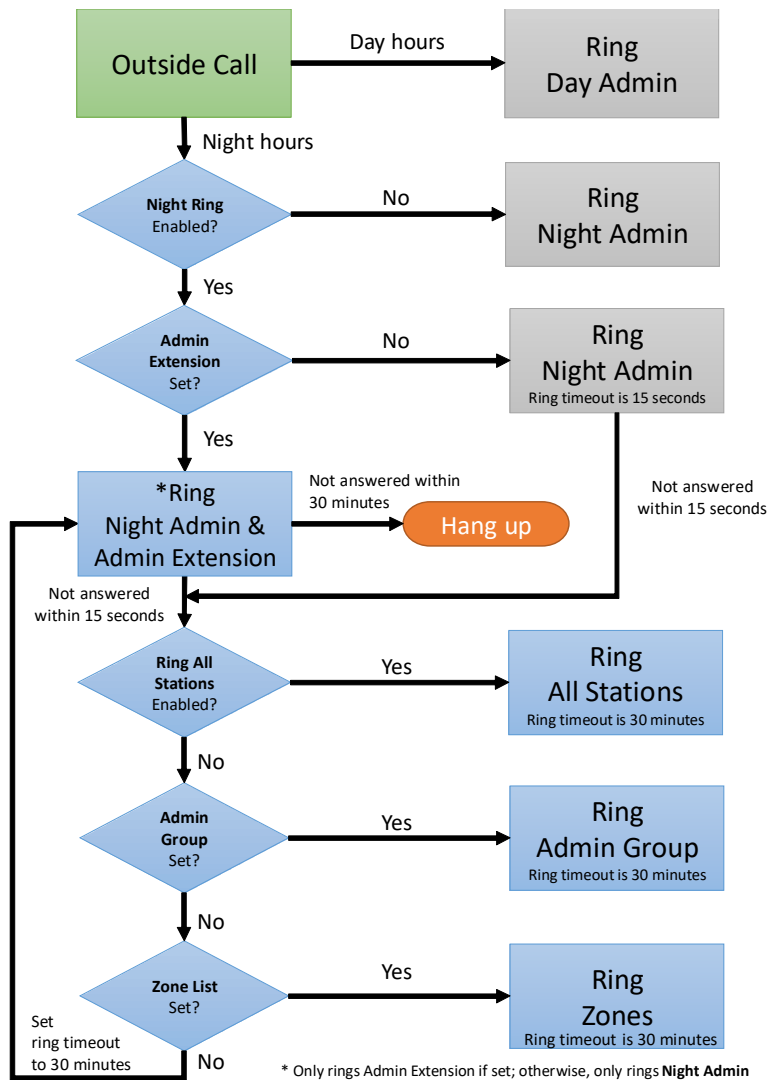


Figure 8. Night Ring Options

Exporting a Report

The Export Report feature generates an XML file in a Microsoft Excel format with a tab for each section of configurable variables, such as System Parameters, Zones, Stations, etc.

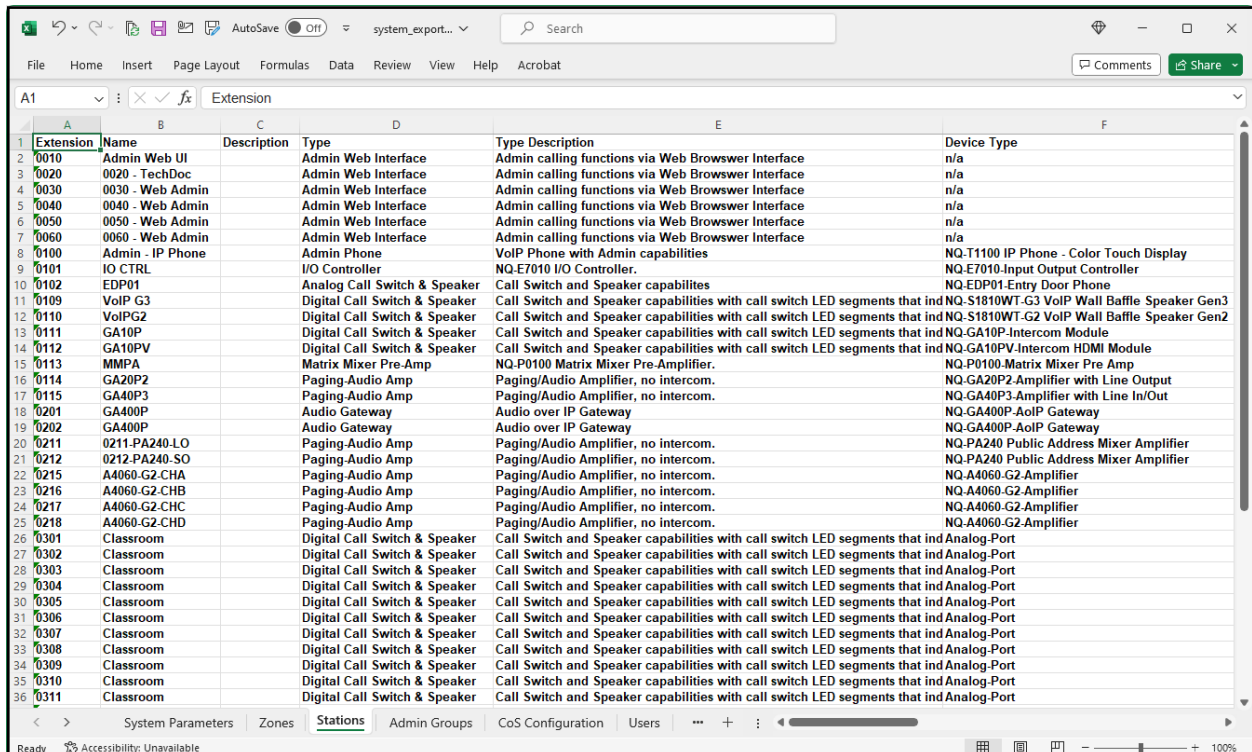
To export a report:

- 1 From the navigation bar, select **System Parameters**.
- 2 From the *System Parameters* page, select **Export Report**.

Warning This report contains decrypted passwords, API keys, and other security-sensitive information.

- 3 You may be prompted whether or not to download `system_export.xml`. If so, select an option to save the file.
- 4 Open the Excel application and open the downloaded file (typically located in the Downloads directory) to view the report (see *Figure 9, "System Report,"* on page 24).

Tip: If you would like to access this report but do not have Excel available, please contact your Bogen dealer or Bogen Technical Support for assistance.



Extension	Name	Description	Type	Type Description	Device Type
0010	Admin Web UI		Admin Web Interface	Admin calling functions via Web Browser Interface	n/a
0020	0020 - TechDoc		Admin Web Interface	Admin calling functions via Web Browser Interface	n/a
0030	0030 - Web Admin		Admin Web Interface	Admin calling functions via Web Browser Interface	n/a
0040	0040 - Web Admin		Admin Web Interface	Admin calling functions via Web Browser Interface	n/a
0050	0050 - Web Admin		Admin Web Interface	Admin calling functions via Web Browser Interface	n/a
0060	0060 - Web Admin		Admin Web Interface	Admin calling functions via Web Browser Interface	n/a
0100	Admin - IP Phone		Admin Phone	VoIP Phone with Admin capabilities	NQ.T1100 IP Phone - Color Touch Display
0101	IO CTRL		I/O Controller	NQ.E7010 I/O Controller.	NQ.E7010.Input Output Controller
0102	EDP01		Analog Call Switch & Speaker	Call Switch and Speaker capabilities	NQ.EDP01.Entry Door Phone
0109	VoIP G3		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	NQ.S1810WT-G3 VoIP Wall Baffle Speaker Gen3
0110	VoIPG2		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	NQ.S1810WT-G2 VoIP Wall Baffle Speaker Gen2
0111	GA10P		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	NQ.GA10P-Intercom Module
0112	GA10PV		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	NQ.GA10PV-Intercom HDMI Module
0113	MMPA		Matrix Mixer Pre-Amp		NQ.P0100.Matrix Mixer Pre Amp
0114	GA20P2		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.GA20P2.Amplifier with Line Output
0115	GA40P3		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.GA40P3.Amplifier with Line In/Out
0201	GA400P		Audio Gateway	Audio over IP Gateway	NQ.GA400P.AoIP Gateway
0202	GA400P		Audio Gateway	Audio over IP Gateway	NQ.GA400P.AoIP Gateway
0211	0211-PA240-LO		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.PA240 Public Address Mixer Amplifier
0212	0212-PA240-SO		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.PA240 Public Address Mixer Amplifier
0215	A4060-G2-CHA		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.A4060-G2.Amplifier
0216	A4060-G2-CHB		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.A4060-G2.Amplifier
0217	A4060-G2-CHC		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.A4060-G2.Amplifier
0218	A4060-G2-CHD		Paging.Audio Amp	Paging/Audio Amplifier, no intercom.	NQ.A4060-G2.Amplifier
0301	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0302	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0303	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0304	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0305	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0306	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0307	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0308	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0309	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0310	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port
0311	Classroom		Digital Call Switch & Speaker	Call Switch and Speaker capabilities with call switch LED segments that ind	Analog-Port

Figure 9. System Report

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

Product License

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

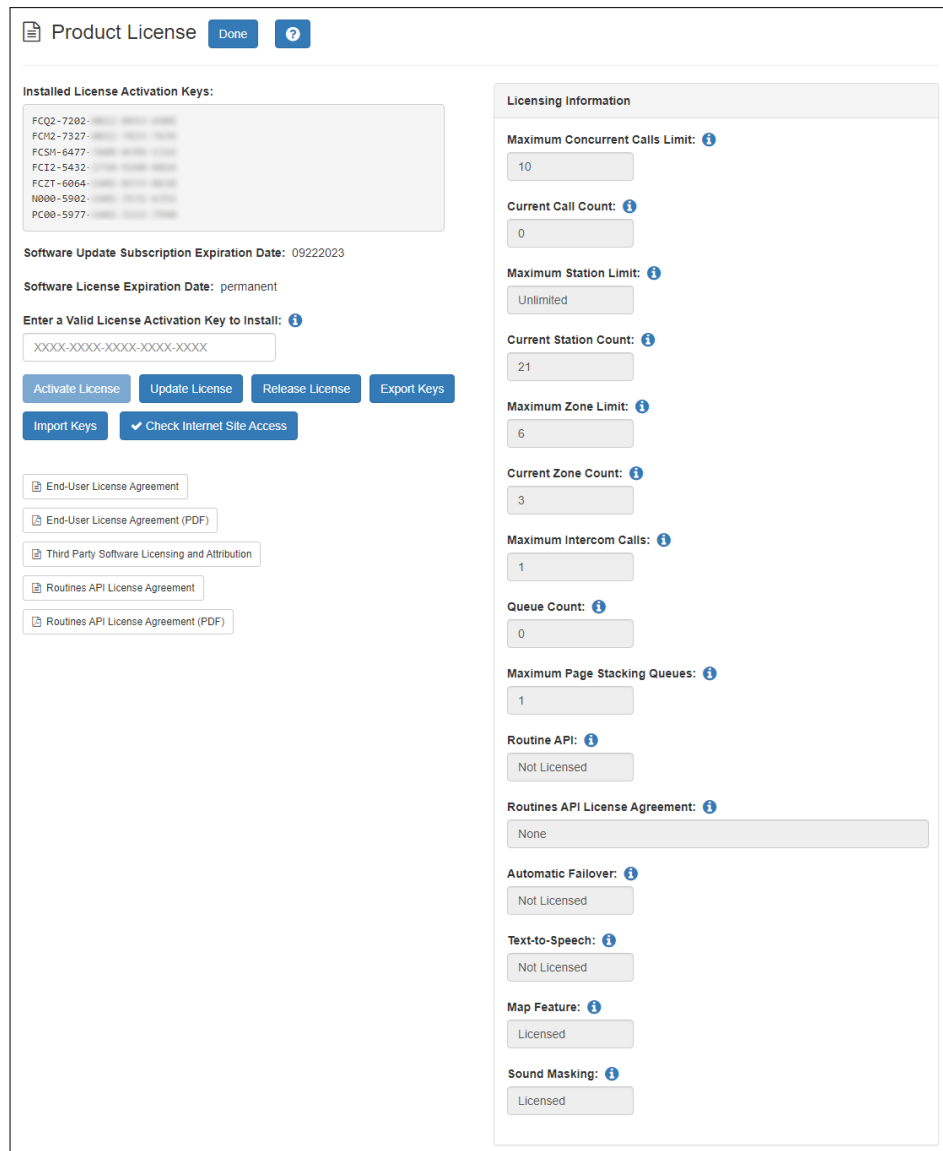


Figure 10. Product License Page

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 and any number of additional optional feature licenses. 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 7. Product License Parameters

Installed License Activation Keys	Provides the activation keys installed on your server. See <i>"Understanding Activation Keys"</i> on page 28.
Software Update Subscription Expiration Date	Provides the expiration date in MMDDYYYY format for your software update subscription. If it 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. If not in demo mode, "permanent" is displayed.
Enter a Valid License Activation Key to Install	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 8. Licensing Information

Maximum Concurrent Calls Limit	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 active 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.

Table 8. Licensing Information (Continued)

Current Zone Count	Displays the number of stations registered with your Nyquist system server.
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 zone 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.
Routines API	Displays Licensed if the Routines API license is activated, otherwise it displays Not Licensed .
Routines API License Agreement	If the license has been accepted, displays the user name and user ID, as well as the date, time, and time zone when the license agreement was accepted; otherwise, displays None .
Automatic Failover	Displays Licensed if the Automatic Failover license is activated, otherwise it displays Not Licensed .
Text-to-Speech	Displays Licensed if the Text-to-Speech license is activated, otherwise it displays Not Licensed .
Map Feature	Displays Licensed if the Map Feature license is activated, otherwise it displays Not Licensed .
Sound Masking	Displays Licensed if the Sound Masking 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:

Table 9. Product License buttons

Activate License	<p>This button becomes active only when data is entered into the Activation Key field. Select this button to activate the entered Activation Key.</p> <p><i>Note:</i> Before activating a license key, use Check Internet Site Access (described below) to ensure that your Nyquist server can access hostedactivation.com.</p>
Update License	<p>Select this button to have the Nyquist server reactivate the Nodelocked license for the server. This can be done after Release License has been pressed.</p> <p><i>Note:</i> Before updating a license key, use Check Internet Site Access (described below) to ensure that your Nyquist server can access hostedactivation.com.</p>
Release License	<p>Select this button if you want to release the license, which allows it to be moved to another server.</p> <p><i>Note:</i> Before releasing a license key, use Check Internet Site Access (described below) to ensure that your Nyquist server can access hostedactivation.com.</p>
Export Keys	<p>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 off-site.</p>
Import Keys	<p>Select this button to import stored Activation License Keys if the Nyquist server was replaced.</p> <p><i>Note:</i> 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.</p>
Check Internet Site Access	<p>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 "<i>Check Internet Site Access</i>" on page 46.</p>

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 the numerals 01 through 04, depending on the software bundle that was purchased.

The various Feature License Activation Keys start with **FC**. The third and fourth alphanumeric characters in the Feature License Activation Key provide information about the feature(s) purchased as described in the following table:

Table 10. Feature License Key Prefixes

Prefix	Meaning
FCCx	Concurrent Calls Expansion Pack License
FCDx	Software Update Subscription (SUS) Extension Extends the current SUS expiration date of a Bundle-x system by 3 years (e.g., if the system's current SUS expiration is 3/14/2024, installing this license key will extend it to 3/14/2027).
FCIx	Intercom Call License
FCMx	Map-based Paging License
FCQx	Queue Paging / Page Stacking License
FCTx	Text-to-Speech License
FCRA	Routines API License
FCUx	System Software License Bundle Upgrades
FCZx	Paging Zone License Expansion Pack
FCSM	Sound Masking License

For more information about licensing, see *"C4000 Software Licenses"* on page 645.

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 45*.

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.

The screenshot shows the 'Edit Station Supervision' configuration interface. It features several sections with toggle switches and dropdown menus. The 'Enable' section has a 'Yes' toggle. The 'Syslog Enable' section has a 'No' toggle. The 'Syslog Config' section has a 'Yes' toggle. The 'Syslog Facility' section has a dropdown menu set to 'local7'. The 'Use Email Configuration' section has a 'Yes' toggle. The 'SMTP Account' section has a dropdown menu set to 'bogenorlando'. The 'Email Subject' section has a text input field containing 'Nyquist Alert'. The 'Supervise Types' section has a list of two items: 'Paging-Audio-Intercom Module' and 'Paging-Audio-Intercom-Display Module'. The 'Excluded Stations' section has a text input field containing 'Add station exclusions ...'. At the bottom, there are 'Cancel' and 'Save' buttons.

Figure 11. 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 <code>/etc/msmtp.rc</code> file. If the default Yes is used, SMTP parameters from the SMTP configuration list will be used.
Send Email To	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. <i>Note:</i> This option appears if Use Email Configuration is set to No .
<hr/> <i>Tip:</i> To send a text message, use one of the email address formats described in <i>Table 125, "Email Address Formats for Cellular Carriers,"</i> on page 518. <hr/>	
SMTP Account	Specify the SMTP account that will be used for alert notification emails. <i>Note:</i> This option appears if Use Email Configuration is set to Yes .
Email Subject	Enter a subject line to appear on the email notifications. The default is Nyquist 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

The Email Configuration feature can be used to send SMTP email notifications when a station is not responding to the server. For example, if a Digital Call Switch (DCS) and speaker is offline, an automatic email can be sent to a facilities manager or IT personnel.

SMTP is an Internet standard for email transmission.

The screenshot shows the 'Edit Email Configuration' page. At the top left is a 'Send Test Email' button. Below it are several configuration fields, each with an information icon (i):

- Account:** Input field containing 'username@gmail.com'.
- Host:** Input field containing 'smtp.gmail.com'.
- Port:** Input field containing '587'.
- Auth:** Toggle switch set to 'On'.
- Username:** Input field containing 'username@gmail.com'.
- Password:** Input field with masked characters and a 'Show Password' button.
- From:** Input field containing 'username@gmail.com'.
- To:** Input field containing 'username@gmail.com'.
- TLS:** Toggle switch set to 'On'.
- TLS STARTTLS:** Toggle switch set to 'On'.
- TLS Trust File:** Input field containing '/etc/ssl/certs/ca-certificates.crt'.
- Domain:** Empty input field.

At the bottom of the form are 'Cancel' and 'Save' buttons.

Figure 12. 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 (see *Table 12 on page 34*).

4 Select **Save**.

Caution This email configuration can be used for any of several notifications (e.g., station supervision, I/O controller input and output notifications, custom routines, etc.). To disable email notifications, do not change the email configuration, as it may be used for other notifications. Instead, update the configuration of the notifications to be disabled.

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 (e.g., smtp.gmail.com).
Port	Enter the port that the SMTP server uses to receive email transmissions. Typically, this is set to 25 for 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.
Username	Enter the username for SMTP authentication.
Password	Enter the password for SMTP authentication. <i>Note:</i> The password cannot contain single- or double-quote characters. <i>Note:</i> Certain email servers, such as Gmail, do not support use of the standard user password and instead require the use of an App Password. For details on how to obtain a Gmail App Password, see https://support.google.com/mail/answer/185833 .
Show Password	Select this button to show the password entered for SMTP authentication. <i>Note:</i> For security reasons, only the currently entered password will be displayed, not the saved password.

Table 12. Edit Email Configuration (Continued)

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. <hr/> <i>Tip:</i> To send a text message, use one of the email address formats described in <i>Table 125, "Email Address Formats for Cellular Carriers,"</i> on page 518. <hr/>
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

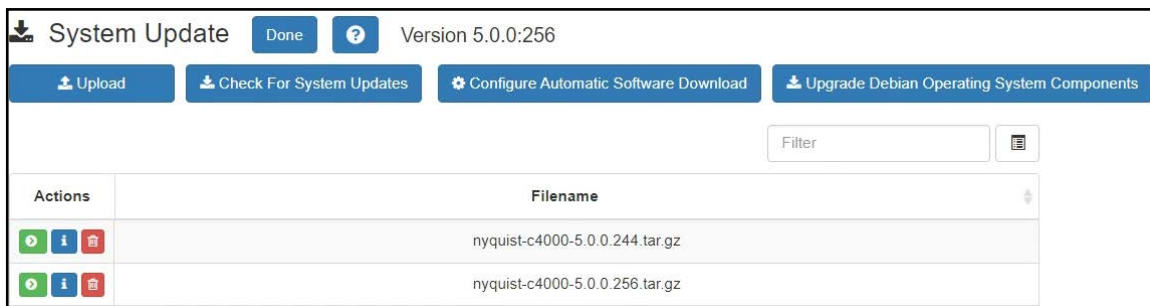


Figure 13. System Update

This feature updates the server software and configuration data for the C4000 server. From the System Update screen, you can choose to upload or check for new versions of the software as well as 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 major releases, bug fixes, or even updates that are created specifically for your system.

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 268

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 system update packages.

Note: Shortly before your Software Update Subscription (SUS) expires, you will receive a dashboard message explaining that you must contact your Bogen dealer to purchase a subscription renewal to access system updates. The message will include the subscription renewal part number (based on the number of currently licensed zones) and your Product License Key, both of which should be included when contacting your Bogen dealer.

Before performing a system update, you should perform the following tasks:

- 1 Perform a system backup and export the backup (see “*Backing Up Your Nyquist System and Files*” on page 384).

- 2 Export your product license activation keys (see *"Product License" on page 24*).
- 3 Execute **Check Internet Site Access** (see *"Check Internet Site Access" on page 46*) and ensure that all sites with "Install/Update" in the "During" column are accessible from the Nyquist server (i.e., Status is "SUCCESS").
- 4 If you are using the Automatic Failover feature (see *"Automatic Failover" on page 88*), execute **Check Server Status** (see *"Check Server Status" on page 47*) before you update the Primary server and verify that `Slave_IO_Running` and `Slave_SQL_Running` are both Yes. If one of these has No instead of Yes, perform a **Sync DB** operation between the Primary and Secondary servers before performing the system update. This is to ensure that your Secondary server contains the most update-to-date configuration data, as the Secondary server will temporarily become the Master server while the Primary sever is being updated.

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 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` or `.tar.gz` 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.

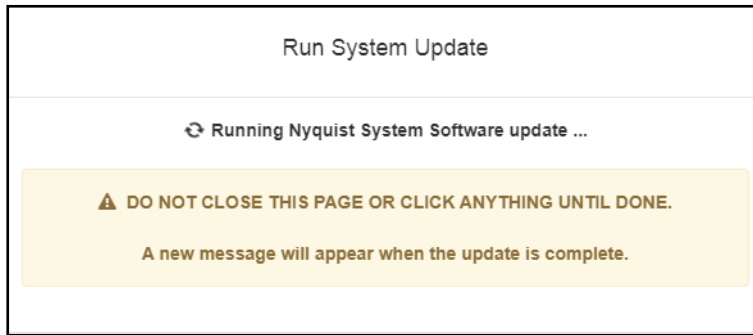


Figure 14. System Software Update Message

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.

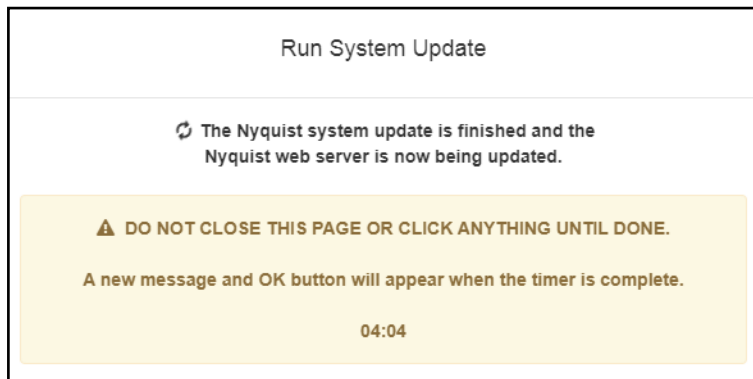


Figure 15. Nyquist Web Server Update Message

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.

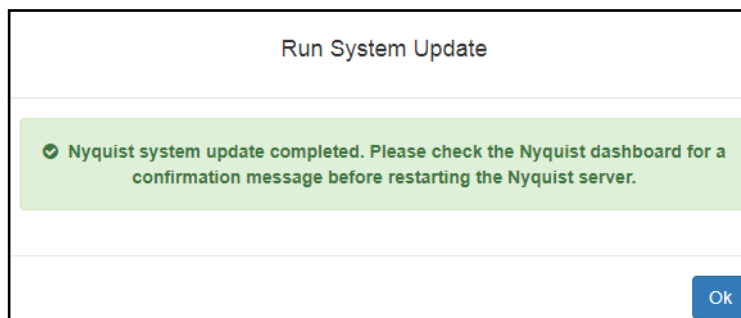


Figure 16. System Update Completed Message

- 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.

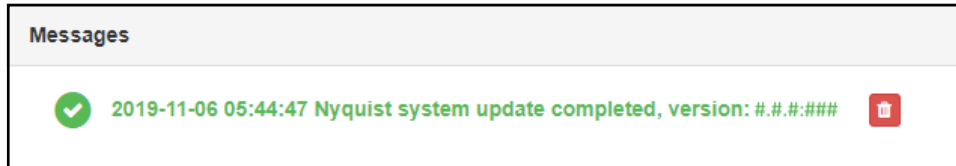


Figure 17. Dashboard Message After System Update

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 18, "PHP Message,"* on page 39), press the refresh key (typically F5) repeatedly until the dashboard message appears.

```
<? 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 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 18. PHP Message

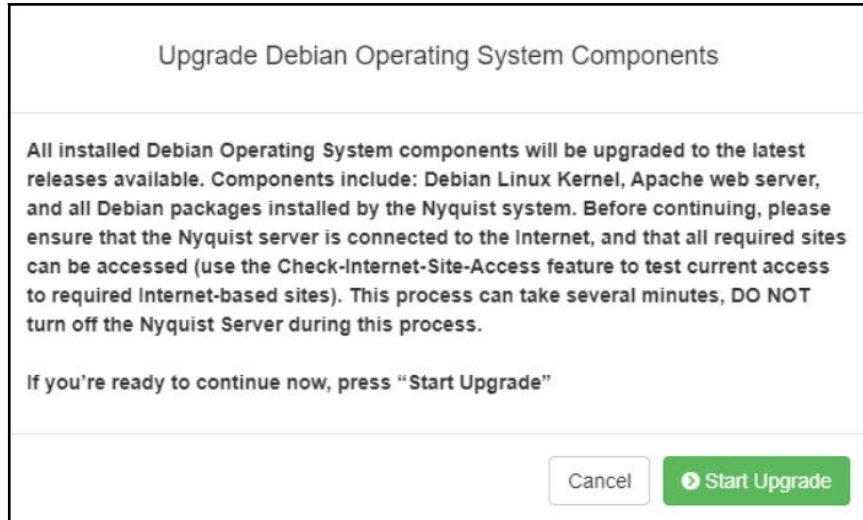
- 9 Once the update has completed, we recommend regenerating the System Controller's server certificate. From the **System Parameters** page, select the **Edit** button, then select the **Generate Server Certificate** button.

Upgrade Debian Operating System Components

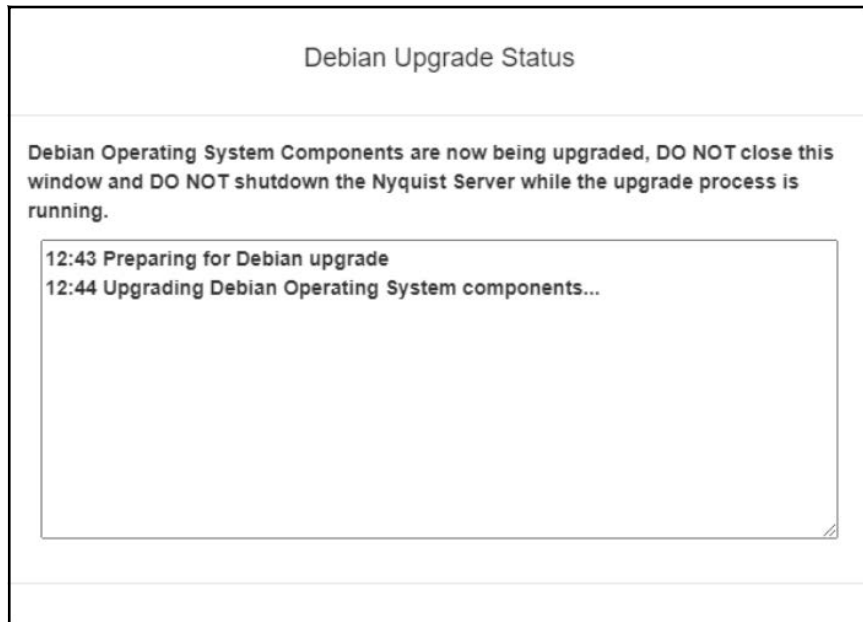
You can use the **Upgrade Debian Operating System Components** feature to ensure that all Debian Operating System components (i.e., Linux Kernel, installed packages) are updated to the major Debian release version currently being used by the Nyquist system. Keeping Debian up-to-date can help improve security by ensuring that the latest versions of the Linux kernel and installed Debian packages are installed on the Nyquist server, as oftentimes these upgrades include security fixes. If a new vulnerability arises with the Debian Linux Kernel, Debian system, or installed Debian packages, you will be able to upgrade all Debian operating system components on the Nyquist server.

Use the following steps to upgrade the Debian Operating System components on your Nyquist server:

- 1 The Nyquist server will not be fully operational during the Debian Upgrade, so make sure you have a maintenance window available during a time when the Nyquist server is not needed. It is impossible to predict how long the upgrade process will take; it could take five minutes, or it could take over an hour.
- 2 On the *System Parameters* page, press the **Check Internet Site Access** button and verify that the following sites can be accessed:
 - deb.debian.org
 - security.debian.org
 - dl-ssl.google.com
 - bogen-ssu.bogen.com
- 3 Press the **Upgrade Debian Operating System Components** button on the *System Update* page, found under System Parameters.
- 4 Read the displayed text (see image below).
- 5 If you're ready to start the upgrade process, press the **Start Upgrade** button; otherwise press the **Cancel** button:

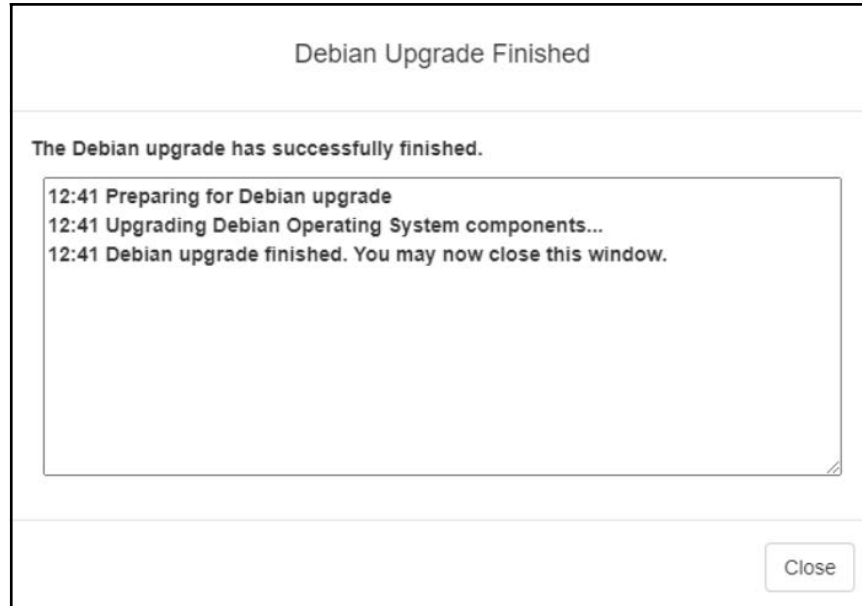


- 6 After you press Start Upgrade, a window entitled *Debian Upgrade Status* will open that displays the status of the Debian upgrade process:



Warning DO NOT shutdown the Nyquist Server while the upgrade process is running.

- 7 When the upgrade finishes, the *Debian Upgrade Finished* window will be displayed:



After the upgrade is finished, you may be instructed to shutdown and power-cycle the Nyquist server to complete the upgrade process.

After performing the Debian Upgrade, you can view a list of the Debian operating system components that were upgraded by displaying the `dpkg.log` file found in the **System** section of the *System Logs* page.

During the Debian upgrade process, one of the following messages may be displayed:

- ***Upgrading Debian Operating System components...***

This message indicates that the Debian operating system is currently being upgraded. DO NOT power off or shutdown the Nyquist server.

- **Debian upgrades disabled by Bogen Administrator. No changes made.**

This message indicates that the Debian operating system was not upgraded because Bogen has temporarily stopped Debian upgrades while possibly investigating a Debian upgrade issue.

- **Unable to access: `deb.debian.org`**

This message indicates that the Debian operating system upgrade was not performed because your Nyquist server is not able to access the Debian upgrade server. Check your Internet connection and firewall settings, then try again.

- **Unable to access: `bogen-ssu.bogen.com`**

This message indicates that the Debian operating system upgrade was not performed because your Nyquist server was not able to access the Bogen Communications System Software Update server. Check your Internet connection and firewall settings, then try again.

- **Please shutdown and power-cycle the Nyquist server to finish the Debian upgrade.**

This message indicates that the Debian operating system upgrade was successful and that your Nyquist Server must be shutdown and power-cycled to finish the upgrade process.

1 Shutdown your Nyquist Server by first selecting **Shut Down** in the *System Parameters* page.

2 After all lights have turned off on the Nyquist Server, turn off the power by flipping the power switch to the off position, wait 10 seconds, then turn the power back on by flipping the power switch to the on position.

- **WARNING: Possible Debian upgrade issues encountered. Contact Bogen Technical Support for assistance.**

This message indicates that an unexpected issue was encountered during the Debian upgrade process. To resolve the issue, please contact Bogen Technical Support for assistance.

- **Apache web server was upgraded, restarting Apache server.**

This message indicates that the Apache web server (used by the Nyquist web interface) was upgraded and restarted.

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.

Important: Downloaded software will *not* be automatically installed.

Configure Automatic Software Download

Server Software Check: ?

Server Software Auto Download: ?

Firmware Check: ?

Firmware Auto Download: ?

Recurrence Minute:

 Recurrence Minute is required.

Recurrence Hour:

 Recurrence Hour is required.

Recurrence Day:

 Not selecting a day will default to every day.

Recurrence Month:

 Not selecting a month will default to every month.

Recurrence Day of Week:

 Not selecting a day of week will default to every day of the week.

Figure 19. 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.

Shutting Down the Server

Using the **Shut Down** 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 **Shut Down** 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 **Shut Down**.
- 3 When prompted, select **Continue**.

Check Internet Site Access

You can use the **Check Internet Site Access** button to verify that your 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.

Internet Site Access Status				
Status	Site	Required for...	During	IP Address
SUCCESS	hostedactivation.com	(License management)	Install/Update	69.28.84.25
SUCCESS	downloads.asterisk.org	(Nyquist Server)	Install/Update	oss-downloads.sangoma.com. 165.22.184.19
SUCCESS	www.pjsip.org	(Nyquist Server)	Install/Update	23.108.108.200
SUCCESS	raw.githubusercontent.com	(Nyquist Server)	Install/Update	185.199.109.133 185.199.111.133 185.199.108.133 185.199.110.133
SUCCESS	ftp.us.debian.org	(Nyquist Server)	Install/Update	64.50.233.100 64.50.236.52 208.80.154.139
SUCCESS	deb.debian.org	(Nyquist Server)	Install/Update	debian.map.fastlydns.net. 151.101.42.132
SUCCESS	security.debian.org	(Nyquist Server)	Install/Update	151.101.2.132 151.101.130.132 151.101.194.132 151.101.66.132
SUCCESS	dl-ssl.google.com	(Google Chrome Install)	Install/Update	dl-ssl.l.google.com. 142.251.2.190 142.251.2.93 142.251.2.136

Figure 20. 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 viewing the Check Internet Site Access display, select **Close**.

Check Server Status

The Check Server Status window:

- shows if the default gateway, Network Time Protocol (NTP) server, and Domain Name Servers (DNS) are configured and reachable (via ping);
- reports the network interface and routing tables status;
- displays the Nyquist server's public IP address, operation status, and software component versions;
- shows disk space utilization;
- warns if one or more stations are still using the default password;
- indicates which, if any, events are scheduled on overlapping zones, meaning that two or more target zones include the same station (see *"Zone Overlap Messages" on page 408*);
- and displays the Automatic Failover status (if the feature is enabled) as well as other server status details.

```

Check Server Status

-----
Nyquist Server Status - Wed Sep 27 11:36:55 PDT 2023
NQ-C4000 6.0.0:261
System Controller Serial Number: 1916HAN06637
-----

Debian 10.11 - Linux kernel version:
4.19.0-19-amd64 #1 SMP Debian 4.19.232-1 (2022-03-07) x86_64 GNU/Linux

Nyquist Server's Public IP Address: 172.71.153.42
Nyquist Server's Hostname: nq-sysctrl-0030180f5c8f

-----
Network Interfaces Status
-----
1: lo: [LOOPBACK,UP,LOWER_UP] mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp3s0: [BROADCAST,MULTICAST,UP,LOWER_UP] mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:30:18:0f:5c:8f brd ff:ff:ff:ff:ff:ff
    inet 192.168.90.10/24 brd 192.168.90.255 scope global dynamic noprefixroute enp3s0
  
```

Figure 21. 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**.

Custom Configuration

You can use the **Custom Configuration** button to customize any of the following three configuration files:

- *Actions and Custom Variables*
Allows you to enter custom variable settings for Nyquist and Debian Linux-related services, as recommended by Bogen Technical Support.
- *Simple Network Management Protocol (SNMP) Configuration*
Allows you to customize the SNMP configuration (e.g. setup private community string passwords, enable SNMP traps, etc.).
- *Syslog Configuration*
Allows you to configure how system log entries are sent to remote hosts that manage syslogs of remote devices.

Note: To use Custom Configuration, the Custom Configuration permission must be enabled for the user.

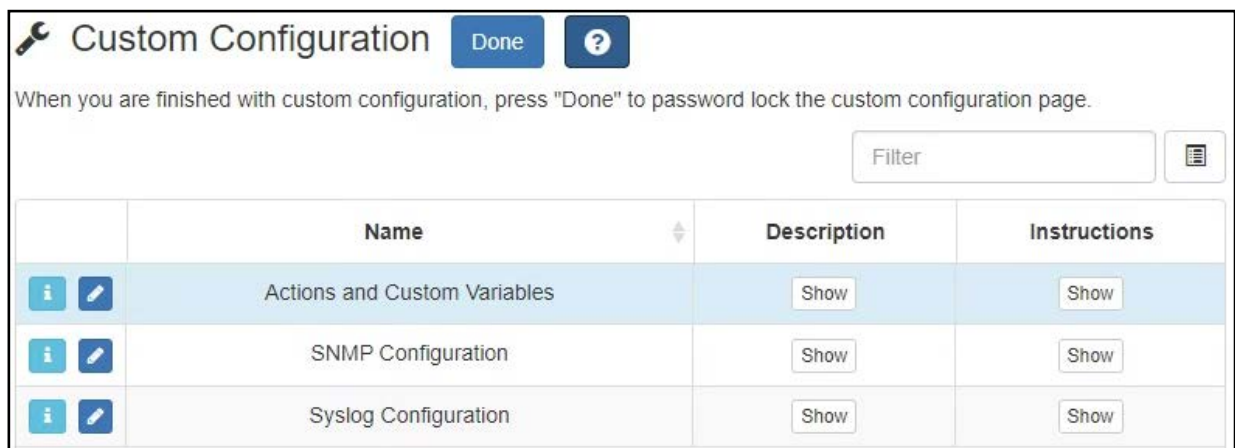


Figure 22. Custom Configuration

To edit custom configuration files:

- 1 From the navigation bar, select **System Parameters**.
- 2 From the System Parameters page, press the **Custom Configuration** button.
- 3 You will be prompted to enter your login password. After you enter your password, the web interface will display a list of configuration files that can be edited.
- 4 Move your mouse pointer over the description field of a configuration file to read the description for the configuration file.
- 5 Move your mouse pointer over the instructions field of a configuration file to read instructions related to editing the configuration file.
- 6 Press the information icon to view configuration file details.
 - a) To edit a configuration file, press the **Edit** icon for one of the configuration files. A new window will open with the content of the configuration file.
 - b) Make changes to the configuration file to meet your requirements.
 - c) When you're finished making changes, press **Save and Implement Now** or **Save and Implement Later**. You can press **Cancel** if you want to abandon your changes.
- 7 Press the Custom Configuration page's **Done** button to relock the page.

Table 14. Custom Configuration options

Save and Implement Now	Saves your configuration changes and forces the Nyquist system to immediately implement the changes.
Save and Implement Later	Saves your configuration changes, but the Nyquist system will not immediately implement the changes. In this case, the changes will be implemented the next time the Nyquist server is rebooted or the next time you edit the file and press Save and Implement Now .

Important: If you are using Automatic Failover, changes made within the *Actions and Custom Variables* section will be automatically synchronized to the secondary server, except for the `purge_old_updates` and `fix_swap_issue` variables, which will still need to be manually replicated. Changes made to the SNMP Configuration and Syslog Configuration sections will also need to be manually replicated.

Warning In most cases, the Nyquist system will not validate the changes you make to configuration files; it is your responsibility to ensure the validity of changes that you make.

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 with the Nyquist server's TFTP address to facilitate Nyquist device configuration.

Tip: The Nyquist C4000 server's TFTP service provides autoconfiguration information for many Nyquist devices. Its DHCP server uses extended DHCP option 66 to provide the address of its TFTP service to these devices. Many Nyquist and non-Nyquist devices can use the TFTP service to automatically retrieve configuration settings and notify the C4000 of their address, thereby simplifying the initial discovery and configuration of these devices.

This mechanism is referenced in many Nyquist device guides under their **TFTP Server from DHCP** configuration setting.

If you choose to use your router's DHCP server during the device discovery process, many professional-grade routers allow you to configure extended DHCP option 66 to provide the IP address of the Nyquist server. This mechanism can greatly simplify many configuration operations.

The user would first configure a static IP address and subnet mask for Port-A of the Nyquist server, possibly using the Network Wizard (<http://<server>/setup/network>), 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. However, if no other DHCP server is available and only Nyquist devices are on the subnet, it could be used permanently, providing dynamic IP addresses to Nyquist devices.

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 47).

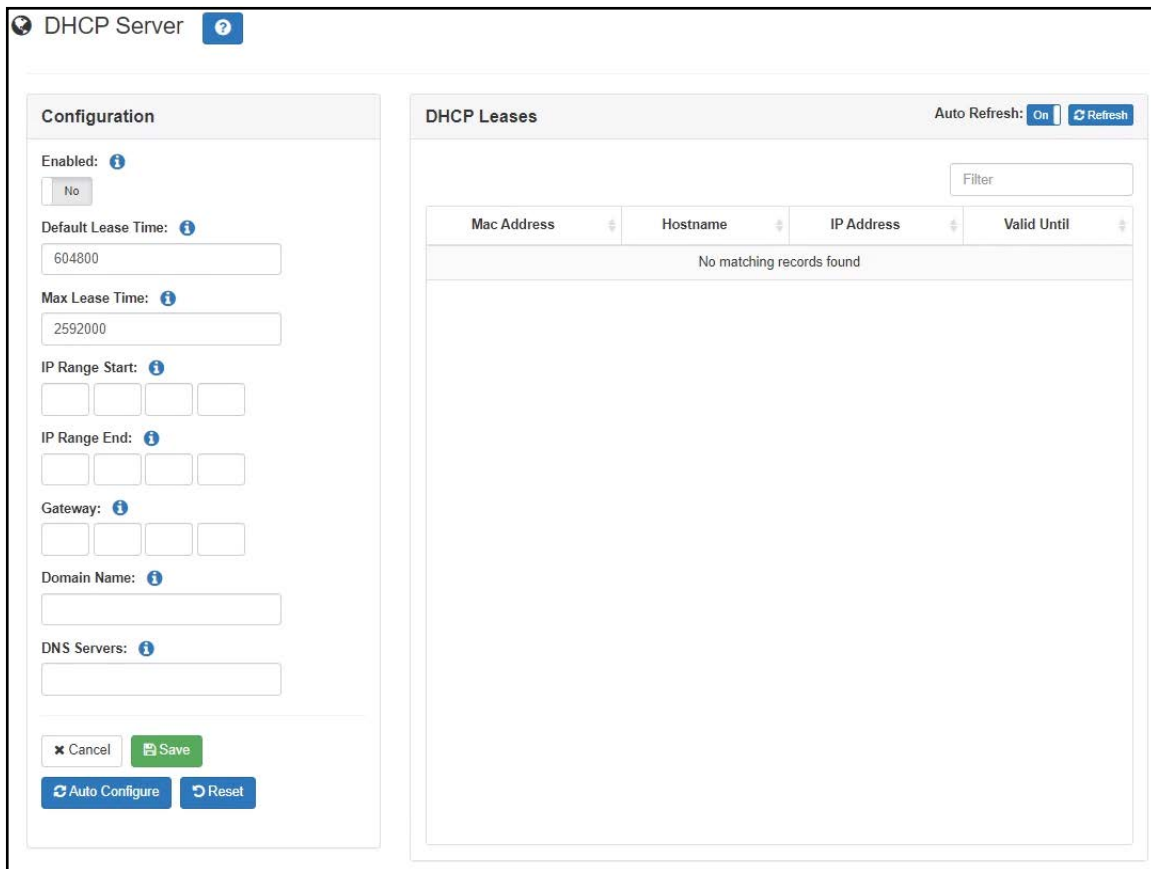


Figure 23. DHCP Configuration

Configuring the DHCP Server:

- 1 From the Navigator bar, select **System Parameters**.
- 2 From the System Parameters page, select **DHCP Server**.
- 3 If the DHCP Server has not yet been configured, you can populate the configuration properties with reasonable values by selecting the **Auto Configure** button.
- 4 Modify the values to the desired configuration. For details, see *"DHCP Configuration Parameters"* on page 52.
- 5 Press **Save** to persist the values.
- 6 To enable the DHCP feature and start allocating IP addresses via DHCP, toggle the **Enabled** switch to **Yes**, then press **Save**.

Table 15. DHCP Configuration Parameters

Enabled	Enables or disables the DHCP server for the subnet connected to Port-A. <hr/> Warning When the DHCP server is enabled on Port-A, it will be authoritative! Do <i>not</i> enable the DHCP server while another DHCP server is providing DHCP addresses to the subnet defined on Port-A. <hr/>
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. <i>Note:</i> If you are setting up the Nyquist DHCP server to provide IP Addresses and TFTP Server IP Address to Nyquist appliances, the Gateway IP address must be set to the Nyquist server's IP address; if you leave it blank, paging and audio distribution will not function. If you're using the Automatic Failover feature, the Gateway address must be set to the Master IP Address.
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.

Table 15. DHCP Configuration Parameters

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.
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. <i>Note:</i> 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.

Network Traffic Capture

The **Network Traffic Capture** tool can be used to capture the network traffic present on the Nyquist system, typically for the purpose of troubleshooting networking issues. Network Traffic Capture uses the `tcpdump` command to capture network traffic to a PCAP file that will be downloaded to your computer. The PCAP file can be viewed by any application that can read PCAP files (e.g., Wireshark).

To use the Network Traffic Capture tool to capture network traffic:

- 1 Navigate to the *System Parameters* page.
- 2 Press the **Network Traffic Capture** button, the **Network Traffic Capture** popup window will be displayed.

Network Traffic Capture

The Network Traffic Capture feature uses [tcpdump](#) to capture network traffic into a PCAP file that can be viewed with any application that can read PCAP files. See [tcpdump](#) documentation for information related to the **Options** and **Expression** fields.

Capture Seconds (default: 900): i

Tcpdump Options (optional): i

Tcpdump Expression (optional): i

- 3** Optionally change the parameters to meet your capture requirements (see *Table 16, "Network Traffic Capture Parameters,"* on page 55):
If you leave all fields blank, the default action is to capture all packets on all interfaces for 15 minutes.

Table 16. Network Traffic Capture Parameters

Capture Seconds The number of seconds to capture network traffic.
If left blank, network traffic will be captured for 15 minutes (900 seconds).
Note: The network capture will automatically stop if available disk space goes below 10 GB.
Default: 900

Caution Long capture periods may result in a very large capture file, so make sure your server has sufficient disk space (see *“Check Server Status”* on page 47 to determine the Nyquist server’s available disk space).

Tcpdump Options Command line options to apply to the `tcpdump` command (see <https://www.tcpdump.org/manpages/tcpdump.1.html> for further details). Only a few of the `tcpdump` options are supported, and none of the print-related modifier options are supported. If left blank, `-i any` is automatically used to capture network packets on all interfaces.
Default: `-i any`

Note: As a result of the implementation-specific context in which `tcpdump` is executing, the following options are *not* supported:

```
--monitor-mode --relinquish-privileges=user  
-W -G -F -I -r -z -Z -V
```

Caution Do not specify options unless you are knowledgeable about the `tcpdump` command. See *“Useful tcpdump options”* on page 58.

Tcpdump Expression An optional expression to use on the `tcpdump` command. The expression is used to further filter the network traffic that you wish to capture.

For more information regarding expression syntax and use, consult the `tcpdump` documentation (see <https://www.tcpdump.org/manpages/pcap-filter.7.html>) as well as the `tcpdump` example expressions shown below.

- 4 Press **Start** to begin the network traffic capture.

The window will now include a **Cancel** and **Stop** button, and inform you that the capture is running.

Note: If errors exist in values supplied in the Options or Expression field, the errors will be displayed in the text window and the capture will not be started.

The screenshot shows a dialog box titled "Network Traffic Capture". It contains a text area with the following text: "The Network Traffic Capture feature uses **tcpdump** to capture network traffic into a PCAP file that can be viewed with any application that can read PCAP files. See **tcpdump** documentation for information related to the **Options** and **Expression** fields." Below this text are three input fields: "Capture Seconds (default: 900):" with an information icon, "Tcpdump Options (optional):" with an information icon, and "Tcpdump Expression (optional):" with an information icon. At the bottom of the dialog, there is a text area containing "Network Traffic Capture Running ...". At the very bottom, there are four buttons: "Close", "Cancel" (with a red background and a white 'x' icon), "Stop" (with a red background and a white square icon), and a refresh icon.

- 5 Once the capture has started, you can either wait for the capture to complete, or press the **Close** button, allowing you to use the Nyquist dashboard to start Nyquist features while the network capture continues. After pressing **Close**, when you're ready to download the capture file, you can return to *Network Traffic Capture*. When you return, if the capture has finished, you can press the **Download** button to download the PCAP file. If the capture is still running, you will receive the following message asking you if you want to stop the capture.

The screenshot shows a dialog box titled "Network Traffic Capture". It contains a text area with the following text: "A network capture is already running; would you like to stop the currently running capture?". At the bottom right of the dialog, there are two buttons: "No" (with a red background) and "Yes" (with a green background).

After stopping the capture by pressing **Yes**, you can then press the **Download** button on the Network Traffic Capture tool. If you press **No** instead, the network capture will continue.

- 6 While network traffic is being captured (and you have not pressed **Close**), you can press the **Stop** button to stop capturing traffic before the capture seconds has elapsed.
- 7 If, for any reason, you no longer want the captured network traffic, press **Cancel** to stop the capture process. Canceling the capture will not download the capture file; instead, the capture file will be deleted.
- 8 After the network capture has completed, the capture file will be downloaded to your client computer.

Network Traffic Capture

The Network Traffic Capture feature uses **tcpdump** to capture network traffic into a PCAP file that can be viewed with any application that can read PCAP files. See [tcpdump](#) documentation for information related to the **Options** and **Expression** fields.

Capture Seconds (default: 900):

Tcpdump Options (optional):

Tcpdump Expression (optional):

```
tcpdump -G 900 -W 1 -w <pcap-file> -i any
tcpdump: listening on any, link-type LINUX_SLL (Linux cooked), capture size 262144 bytes
Maximum file limit reached: 1
46820 packets captured
52493 packets received by filter
0 packets dropped by kernel
```

- 9 When the capture has finished, information regarding the number of packets captured will be displayed. If you notice that “packets dropped by kernel” is greater than zero (0), be aware that not all packets were captured, most likely due to very busy network activity as seen by the Nyquist server.

Tip: You can try to fix a dropped packets issue by using the `tcpdump -B` option to increase the buffer size.

- 10** After the PCAP file has been download to your computer, you can press the **Delete PCAP** button to delete the PCAP file from the Nyquist server (to save disk space). If you do not delete the PCAP file, you can return to the *Network Traffic Capture* tool in the future and download it again, or delete it. The next time you start a download, any previous PCAP files are automatically deleted.

Useful tcpdump options

- To view the current version of the tcpdump command, enter the following into the **Tcpdump Options** field:

```
--version
```

This is useful to ensure that you're referencing the correct version of the tcpdump documentation.

- To view the list of available network interfaces, enter the following into the **Tcpdump Options** field:

```
-D
```

This is useful if you wish to use interface filters in the **Tcpdump Expression** field.

Sample output:

```
1.enp3s0 [Up, Running]
```

```
2.enp4s0 [Up, Running]
```

```
3.any (Pseudo-device that captures on all interfaces) [Up, Running]
```

In the above example on Nyquist System Controllers, enp3s0 is Port-A, enp4s0 is Port-B, and any refers to both interfaces.

In very rare cases on Nyquist System Controllers, you may see eth0 and eth1 instead; in this case, eth0 is Port-A and eth1 is Port-B.

- To capture packets from only a specific network interface, enter the following into the **Tcpdump Options** field, where <interface-name> is the name of the interface (as returned by the aforementioned -D option, e.g., enp3s0):

```
-i <interface-name>
```

Example tcpdump expressions

To capture all packets to and from IP address 192.168.90.15:

```
net 192.168.90.15
```

To capture RTP packets:

```
portrange 10000-20000
```

To capture SIP packets:

```
port 5060
```

To capture SIP and RTP packets:

```
udp port 5060 or udp portrange 10000-20000
```

Caution If the C4000 does not have at least 10 GB of available disk space, the network capture will not start (see *“Check Server Status”* on page 47 to determine the Nyquist server’s available disk space).

In general, the largest consumers of disk space are: old system backups, obsolete system updates, obsolete firmware updates, audio files (e.g., announcements, tones, songs), and recorded voice conversations.

You can manually remove system backups (see *“Deleting a Backup File”* on page 386); obsolete system updates (see *“Performing a System Update”* on page 36); obsolete firmware updates (see *“Deleting Listed Firmware”* on page 137); and unneeded announcements (see *“Deleting an Announcement”* on page 363), tones (see *“Deleting a Tone”* on page 375), songs (see *“Deleting a Song”* on page 325), and voice recordings (see *“Managing Recordings”* on page 376).

To automatically remove obsolete Nyquist system updates, you can set `purge_old_updates=true` in the Actions and Custom Variables (see *“Custom Configuration”* on page 48).

Lightweight Directory Access Protocol (LDAP)

The Nyquist C4000 can be configured to obtain user account and group information from an Active Directory (AD) server using the LDAP protocol. This minimizes or eliminates the need to maintain user information in the Nyquist system. Once configured, users can be imported from the AD server, assigned to Nyquist roles, and authenticated upon login. It can also be configured to regularly update this information from the AD server (based on a configured schedule).

Important: Nyquist servers currently only support LDAP connections to a Microsoft Active Directory (AD) server.

LDAP ?

Active Directory Configuration

Enabled: i

Host: i

Username Path: i

Password: i

Port: i

Base DN (Base Search Path): i

Filter: i

Timeout: i

Use TLS: i

Enable Auto Import/Sync Schedule: i

Schedule Minute: i

Not selecting a minute will default to every minute.

Schedule Hour: i

Not selecting an hour will default to every hour.

Schedule Day: i

Not selecting a day will default to every day.

Schedule Month: i

Not selecting a month will default to every month.

Schedule Day of Week: i

Not selecting a day of week will default to every day of the week.

LDAP Tools

Test LDAP Connection: i

Import/Sync Active Directory Users: i

Install TLS CA Certificate: i

✔ TLS CA Certificate is installed.

Laravel Log: i

File Path:

Figure 24. LDAP Settings

Table 17. Active Directory Configuration Settings

Enabled	Indicates if user account information will be retrieved from an Active Directory server via LDAP.
Host	The IP address or hostname of the Active Directory server.
Username Path	<p>Specifies the user name of the Active Directory user account to be used to make the LDAP queries against the Active Directory server.</p> <p><i>Note:</i> This value can be specified using the X.500 Directory Specification Distinguished Name (DN) format, User Principal Name (UPN) format, or down-level logon name format.</p> <p>The following are examples of valid values:</p> <pre>CN=admin,DC=bogen,DC=com admin@bogen.com bogen\admin</pre>
Password	The password of the user specified in Username Path .
Port	The TCP and UDP port on which the LDAP service is available. This is typically port 389 (or port 636 for LDAP over TLS).
Base DN (Base Search Path)	<p>The Active Directory directory to be used as the base path in which to search for users.</p> <p><i>Note:</i> This value is specified as an X.500 Directory Specification Distinguished Name (DN) value.</p> <p>The following is an example of a valid value:</p> <pre>OU=nyquist,DC=bogen,DC=com</pre>

Table 17. Active Directory Configuration Settings (Continued)

Filter	<p>Specifies an Active Directory filter string to specify which Active Directory users will be imported as Nyquist users. This filter is applied to the Base DN. If no filter is specified, all entries found within the Base DN path will be included.</p> <hr/> <hr/> <p><i>Important:</i> This value must not include carriage return or line feed characters.</p> <hr/> <hr/> <p>Caution Once a user has been imported, that user will not be removed from the Nyquist Users list if, in the future, that user no longer matches this filter (e.g., if the Active Directory directory entries have changed or this filter has changed).</p> <hr/> <hr/> <p>For a detailed discussion on LDAP syntax filter strings, see “LDAP Syntax Filter” on page 65.</p>
Timeout	<p>The number of seconds to wait for a response from the LDAP server.</p>
Use TLS	<p>Indicates whether or not to use TLS to establish a secure connection to the Active Directory server whenever Active Directory users are imported or synchronized.</p> <hr/> <hr/> <p><i>Important:</i> A TLS Certification Authority (CA) certificate must be uploaded via Install TLS CA Certificate for a TLS connection to be established.</p> <hr/> <hr/>
Enable Auto Import/Sync Schedule	<p>If enabled, the C4000 will periodically update the list of users from the Active Directory server. The configurable details of the schedule are only visible when enabled.</p>
Schedule Minute	<p>Sets one or more minutes after the hour on which the scheduled Import/Sync operation will occur.</p> <p>If left blank, the operation will default to every minute.</p>
Schedule Hour	<p>Sets one or more hours of the day on which the scheduled Import/Sync operation will occur.</p> <p>If left blank, the operation will default to every hour.</p>

Table 17. Active Directory Configuration Settings (Continued)

Schedule Day	Sets one or more days of the week on which the scheduled Import/Sync operation will occur. If left blank, the operation will default to every day.
Schedule Month	Sets one or more months of the year on which the scheduled Import/Sync operation will occur. If left blank, the operation will default to every month.
Schedule Day of Week	Sets one or more days of the week on which the scheduled Import/Sync operation will occur. If left blank, the operation will default to every day of the week.

For further details about the X.500 Directory Specification Distinguished Name (DN) format, the following may be helpful:

- <https://learn.microsoft.com/en-us/previous-versions/windows/desktop/ldap/distinguished-names>
- <https://datatracker.ietf.org/doc/rfc4514/>
- <https://ldap.com/ldap-dns-and-rdns>

There are several tools provided to assist in configuring the C4000 to interoperate with LDAP/Active Directory, as described in "LDAP Tools" on page 63.

Table 18. LDAP Tools

Test LDAP Connection	Uses the LDAP configuration settings to verify that a connection can be successfully made to the Active Directory server using the specified host, username path, password, and port. The operation and completion status of the connection attempt will be displayed next to this button for approximately five seconds.
-----------------------------	--

Important: The connection attempt will be made using the saved configuration values, not necessarily the displayed values. Be sure to save any configuration changes before testing.

Table 18. LDAP Tools (Continued)

**Import/Sync
Active Directory
Users**

Imports the user accounts specified by the Active Directory host and Base DN (and filtered by the Filter Path) into the Nyquist server's Users list. If user accounts have already been imported, they will be synchronized (i.e., updated based on the Username).

The operation and completion status of the import operation will be displayed next to this button for approximately five seconds.

Important: The import/sync operation will be made using the saved configuration values, not necessarily the displayed values. Be sure to save any configuration changes before importing.

**Upload TLS CA
Certificate**

Uploads a PEM file containing the public Certification Authority (CA) certificate of the Active Directory server. If **Use TLS** is enabled, the uploaded CA certificate will be used to validate the Active Directory server connection whenever Active Directory users are imported or synchronized.

Note: An adjacent message will indicate whether or not a CA certificate has been installed.

Laravel Log

This section allows you to view the current and archived laravel.log files in the **File Path** edit box. These provide details on LDAP operations that have been performed and/or failed. Selecting a log file will display its contents in the text box below.

There are three buttons that provide extra functionality:

Top: Scrolls the log file listing to the top of the file.

Bottom: Scrolls the log file listing to the bottom of the file.

Export: Exports the displayed log file to a text file. Be sure to select the log file in the **Laravel Log** combo box first.

Importing the Active Directory Server's TLS Certification Authority

To securely connect to an Active Directory server using TLS (which is highly recommended), **Use TLS** must be enabled and the Active Directory server's CA certificate must be uploaded to the C4000 so it can validate the identity of the server. A PEM file containing the CA certificate can be uploaded via the **Upload TLS CA Certificate** button.

For details on how to obtain the Active Directory CA certificate, please refer to Microsoft's documentation.

Once the CA certificate has been exported to a CER file, it can be converted to a PEM file by renaming the file to <cacertfile>.pem. Import the CA certificate into the LDAP settings via the **Upload TLS CA Certificate** button in **LDAP Tools** (see *Figure 18, "LDAP Tools,"* on page 63).

LDAP Syntax Filter

You may want to include restrictions to limit which Active Directory entries are imported as users into your Nyquist system. LDAP filters are very flexible, allowing for very precise specification of which users to include and/or exclude.

The following Microsoft article provides detailed descriptions and numerous examples of LDAP syntax filters for the Active Directory platform which may be helpful:

<https://social.technet.microsoft.com/wiki/contents/articles/5392.active-directory-ldap-syntax-filters.aspx>

Important: Keep in mind that changing the Filter Path will not remove Users that were previously imported but no longer match the filter. If you do not wish to keep those user accounts in the Nyquist system, you will need to manually delete them. If you do keep them, remember that they will *not* be synchronized if they do not match the currently specified LDAP filter.

Tip: For details on the LDAP filter capabilities and syntax, see RFC4515 (<https://www.rfc-editor.org/rfc/rfc4515>) or search the web for "LDAP filters" (e.g., <https://ldap.com/ldap-filters>). Note that Microsoft's Active Directory supports several platform-specific extensions that may be relevant (see <https://learn.microsoft.com/en-us/windows/win32/adsi/search-filter-syntax>).

Note: The C4000 automatically disables or enables Nyquist users based on the status of the corresponding Active Directory accounts, so there should be no need to filter based on the ACCOUNTDISABLE bit of the Active Directory userAccountControl attribute.

LDAP Filter Examples

The following are examples of LDAP syntax filters that may be helpful. They do not show the full capabilities of the LDAP syntax filter mechanism, but are provided simply for illustrative purposes. They assume an LDAP structure in which all users and groups are defined within CN=users,DC=bogen,DC=com. The structure of your LDAP environment will be different.

The following LDAP filter retrieves all users that are direct members of the Engineering group:

```
(memberOf=CN=Engineering,CN=users,DC=bogen,DC=com)
```

Note: The `memberOf` property of an LDAP user object specifies a list of groups to which the user belongs.

The following Active Directory-specific example—which uses a Microsoft LDAP extensible matching rule to perform a recursive search—retrieves all users that are direct *or indirect* members of the Engineering group, which includes members of any group that is a direct or indirect member of the Engineering group:

```
(memberOf:1.2.840.113556.1.4.1941:=CN=Engineering,CN=users,DC=bogen,DC=com)
```

Tip: For more information on Microsoft Active Directory's extensible matching rules (e.g., the dot-separated series of number in the previous example), see https://learn.microsoft.com/en-us/openspecs/windows_protocols/ms-adts/0bb88bda-ed8d-4af7-9f7b-813291772990. The one shown in the previous example, LDAP_MATCHING_RULE_TRANSITIVE_EVAL (1.2.840.113556.1.4.1941), is documented at https://learn.microsoft.com/en-us/openspecs/windows_protocols/ms-adts/1e889adc-b503-4423-8985-c28d5c7d4887.

The following example queries the Active Directory for all users in the Engineering or Operations groups:

```
(|(memberOf:1.2.840.113556.1.4.1941:=CN=Engineering,CN=users,DC=bogen,DC=com)  
(memberOf:1.2.840.113556.1.4.1941:=CN=Operations,CN=users,DC=bogen,DC=com))
```

The following example further restricts users to those that have an object category of "person", an object class of "user", and are members of the Engineering or Operations groups:

```
(&(objectCategory=person)(objectClass=user)(|(memberOf:1.2.840.113556.1.4.1941:=CN=Engineering,CN=users,DC=bogen,DC=com)(memberOf:1.2.840.113556.1.4.1941:=CN=Operations,DC=users,DC=bogen,DC=com)))
```

Testing an LDAP syntax filter

There are many tools available for viewing Active Directory structures and data, such as:

- Microsoft's LDP (available as part of the RSAT feature),
- Sysinternals Active Directory Explorer (<https://learn.microsoft.com/en-us/sysinternals/downloads/adexplorer>),
- the PowerShell ActiveDirectory module (for command-line access), and
- many other tools, such as those listed at <https://ldap.com/ldap-tools>.

These tools can be very useful for exploring your Active Directory/LDAP structure to help you define your filters, and some (e.g., LDP, PowerShell, etc.) can be helpful for experimenting with LDAP filter expressions.

For example, the following PowerShell script (PowerShell is built into Windows and available on most other platforms) shows a useful technique for testing an LDAP filter without actually importing the users. Modify the `$user` and `$adserver` values to the appropriate values for your environment, and modify the `$ldapfilter` as needed to experiment with different filter values. (These commands can be executed as a script or at the command line.)

Important: If executing from a Windows client environment (i.e., not Windows Server), this PowerShell code requires that Remote Server Administration Tools (RSAT) be installed. For details on installing RSAT, see <https://learn.microsoft.com/en-US/troubleshoot/windows-server/system-management-components/remote-server-administration-tools>.

```
# Specify the AD server address and credentials
$adserver = '192.168.11.25'
$user = 'read-only-admin@bogen.com'
$cred = Get-Credential -UserName $user

# Specify the LDAP filter to test. Remember: no line breaks!
$ldapfilter = '&(objectCategory=person)(objectClass=user)
(|(memberOf:1.2.840.113556.1.4.1941:=CN=Software,OU=Bogen,DC=nyquist-
testlab,DC=com)(memberOf:1.2.840.113556.1.4.1941:=CN=System Test,OU=Bogen,DC=nyquist-
testlab,DC=com)))'

# Use the filter to retrieve a list of users.
Get-ADUser -Server $adserver -AuthType Negotiate -Credential $cred -LDAPFilter $ldapfilter
```

Tip: You can append "`| Format-Table`" to the `Get-ADUser` command to view the results as a table or "`| Out-GridView`" to view the results in a spreadsheet-like window.

Note: This code explicitly specifies the `-Server` parameter of the `Get-ADUser` cmdlet, which is unnecessary if the current environment is part of the AD domain.

NQ-S1810WBC Flasher Configuration

The flashers of any NQ-S1810WBC speakers attached to the Nyquist system can be configured to indicate the activation of Nyquist audio events, such as Emergency-All-Call Page, Emergency Announcement, Alarm, etc.

⚙️ NQ-S1810WBC Flasher Configuration Done ?

This view uses inline-editing. Changes are saved instantly.

Event Type	Flasher Pattern	Number of Flasher Pattern Cycles	Flasher Color	Message Priority
Emergency-All-Call Page	Quad	0	Red	6
All-Call Page	Fast	0	Amber	4
Emergency Announcement	Triple	0	Red	5
Normal Announcement	Slow	0	Amber	4
Alarm	Fast	0	Red	5
Tone	Slow	0	Amber	3
Check-In	None (disabled)	0	Blue	6
Night-Ring	Quad	0	Blue	3
Zone-Page	Slow	0	Green	3

Figure 25. NQ-S1810WBC Flasher Configuration

To configure the NQ-S1810WBC flasher parameters:

- 1 From the navigation bar, select **System Parameters**.
- 2 From the *System Parameters* page, select **NQ-S1810WBC Flasher Configuration**.
- 3 On the *NQ-S1810WBC Flasher Configuration* page that appears, make the desired changes. For parameter descriptions, see *Table 19 on page 69*.

Table 19. NQ-S1810WBC Flasher Configuration

Event Type	The audio event during which the NQ-S1810WBC flashers can be enabled.
Flasher Pattern	<p>Specifies the on/off pattern the flasher will display.</p> <p>Valid values are:</p> <ul style="list-style-type: none">• No Change: The message will not cause the selected flasher to change from its current flasher setting.• Off: The selected flasher will be turned off unless a higher priority message is using the flasher. When the flasher is turned off, it will remain off until another message is sent with a new flasher setting.• Slow: The selected flasher will blink at a rate of once per second for the duration of the message.• Fast: The selected flasher will blink at a rate of twice per second for the duration of the message.• Double: Flash two (2) times within one second with a 1-second pause and repeat.• Triple: Flash three (3) times within 1.5 seconds with a 1-second pause and repeat.• Quad: Flash four (4) times within two seconds with a 1-second pause and repeat.
Number of Flasher Pattern Cycles	<p>Specifies the number of times that the flasher pattern will repeat.</p> <p>Valid values are 1 through 65536 or specify zero (0) to flash continuously for the duration of the message.</p>

Table 19. NQ-S1810WBC Flasher Configuration (Continued)

Flasher Color	Specifies the color of the LED flasher. Valid values are: <ul style="list-style-type: none">• Amber• Blue• Green• Orange• Red• Violet• White• Yellow
Message Priority	Specifies the display message priority for the flasher, where zero is the lowest and six is the highest. For details, see <i>"Message Priorities and Precedence"</i> on page 559.

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.

☰ Edit System Parameters ?

✕ Cancel
Save

Name: ⓘ

Day Start: ⓘ
Hour: **Minute:**

Night Start: ⓘ
Hour: **Minute:**

Emergency-All-Call Multicast RTP IP Address: ⓘ

Emergency-All-Call Multicast RTP Port: ⓘ

Emergency-All-Call Cut Level (dB): -35 ⓘ

All-Call Multicast RTP IP Address: ⓘ

All-Call Multicast RTP Port: ⓘ

All-Call Cut Level (dB): -33 ⓘ

Audio Distribution Multicast IP Address: ⓘ

Audio Distribution Multicast Port: ⓘ

Audio Distribution Cut Level (dB): -31 ⓘ

Default Cut Level (dB): -25 ⓘ

System Tools ⓘ

Server IP Address: ⓘ

Change Server IP Address

Use Network Time Server defined by DHCP: ⓘ
 No

Network Time Server: ⓘ
 Current NTP Server: 198.137.202.32
 Current NTP Server Name: 198.137.202.32...

Change Network Time Server

Appliances Network Time Server Source: ⓘ

Change Appliances Network Time Server

Server Date/Time: ⓘ 1:35:35 PM PDT
 📅
Change Server Date/Time

Time Zone: ⓘ

Change Time Zone

Dialing Length: ⓘ

Change Dialing Length

Figure 26. Edit Systems Parameters Page

The following table describes the system parameters:

Table 20. 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.
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 and 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. Bogen suggests an address in the range 239.0.0.0–239.255.255.255, but recommends consulting with your IT department to avoid conflicts.
Emergency-All-Call Multicast RTP Port	Identifies the first of four RTP ports to use for multicast RTP paging for Emergency-All-Call. Receiving IP telephones must also have this RTP port configured. Recommended range: 6000 to 7499 Suggested value: 6000 (i.e., ports 6000–6003)
<hr/> <p>Caution Ensure that this port range does not overlap other port range assignments, such as All-Call Multicast RTP Port, Audio Distribution Multicast Port, RTP Start Port through RTP End Port, or Multicast ports used for Zones.</p> <hr/>	
Emergency-All-Call Cut Level (dB)	Sets the cut volume for Emergency-All-Call audio. The cut volume range is –42 to 0 dB.

Table 20. Edit System Parameters Page

All-Call Multicast RTP IP Address	<p>Identifies the All-Call Multicast RTP IP address. Receiving IP telephones must also have this IP address configured.</p> <p>Bogen suggests an address in the range 239.0.0.0–239.255.255.255, but recommends consulting with your IT department to avoid conflicts.</p>
All-Call Multicast RTP Port	<p>Identifies the first of four RTP ports to use for multicast RTP paging for All-Call. Receiving IP telephones must also have this RTP port configured.</p> <p>Recommended range: 6000 to 7499</p> <p>Suggested value: 6004 (i.e., ports 6004–6007)</p> <hr/> <p>Caution Ensure that this port range does not overlap other port range assignments, such as Emergency-All-Call Multicast RTP Port, Audio Distribution Multicast Port, RTP Start Port through RTP End Port, or Multicast ports used for Zones.</p> <hr/>
All-Call Cut Level (dB)	<p>Sets the cut volume for All-Call audio. The cut volume range is –42 to 0 dB.</p>
Audio Distribution Multicast IP Address	<p>Identifies the RTP multicast IP address to use for audio distribution to all stations (All Speakers). For more information about audio distribution, see <i>"Managing Audio"</i> on page 315.</p> <p>Bogen suggests an address in the range 239.0.0.0–239.255.255.255, but recommends consulting with your IT department to avoid conflicts.</p>
Audio Distribution Multicast Port	<p>Identifies the first of four RTP multicast ports to use for audio distribution to all stations.</p> <p>Recommended range: 6000 to 7499</p> <p>Suggested value: 6008 (i.e., ports 6008–6011)</p> <hr/> <p>Caution Ensure that this port range does not overlap other port range assignments, such as Emergency-All-Call Multicast RTP Port, All-Call Multicast RTP Port, RTP Start Port through RTP End Port, or Multicast ports used for Zones.</p> <hr/>

Table 20. Edit System Parameters Page

Audio Distribution Cut Level (dB)	<p>Sets the cut volume for audio distributions played to all stations (All Speakers). The cut volume range is -42 to 0 dB.</p> <p>See <i>"Using Audio Distribution"</i> on page 438 for information on controlling audio distribution played to zones.</p>
Default Cut Level (dB)	<p>Defines the default cut volume level for a new zone. The cut volume range is -42 to 0 dB.</p> <p>For information about zones, see <i>"Viewing Zone Information"</i> on page 230.</p>
Ambient Noise Sensor Multicast IP Address	<p>Identifies the multicast IP address to use by ambient noise sensors (ANSs) to send volume data.</p>
Ambient Noise Sensor Multicast Port	<p>Identifies the multicast port number to be used by ANSs to send volume data.</p>
Disable Preannounce Tone	<p>Indicates if the preannounce tone is disabled. If disabled, the tone is not heard when connecting to a speaker or prior to a page.</p>
Disable Privacy Beep	<p>Indicates if the privacy beep feature is disabled.</p>
Emergency Tone	<p>Identifies the preannounce tone played before an Emergency-All-Call is made.</p>
All Call Tone	<p>Identifies the preannounce tone played before an All-Call is made.</p>
Intercom Tone	<p>Identifies the preannounce tone played before an intercom call is made.</p>
Intercom Wait Tone	<p>Indicates if an intercom caller will hear a continuous ringing while the call is being initiated which stops when the connection to the call recipient is established.</p> <p><i>Note:</i> The "ringing" is not a typical ringtone. It does not include the silence between rings. Instead, the user will hear a continuous ring until the call is established and ready for communication. The length of the ringing depends on the length of the Intercom Tone specified in the system parameters (see above).</p>
Appliance Backup Scheduled Tone	<p>Identifies the tone played by appliances if they are unable to communicate with the C4000 System Controller at the scheduled time.</p> <p><i>Note:</i> The device will continue to play scheduled tones for up to 72 hours.</p>

Table 20. Edit System Parameters Page

Default Registration Password	<p>Provides an optional default SIP registration password to be used when adding new stations.</p> <p>The Nyquist controller remembers the station-specific SIP registration password of <i>each</i> SIP station that will register with it for SIP communications. Specifying a Default Registration Password simplifies the process of adding a new station.</p> <p>If the station's Registration Password is not specified, the Nyquist controller's Default Registration Password will be used. However, if the Nyquist controller's Default Registration Password is not specified, the station's Registration Password is required.</p> <p>The minimum length is five characters.</p>
Default Codecs Allowed	<p>Provides the default list of media codecs to be used.</p>
Admin Queue Timeout	<p>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 minutes.</p>
Night Ring Enabled	<p>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:</p> <ul style="list-style-type: none">• Night Ring All Stations• Night Ring Admin Group• Night Ring Zones <p>(For more information on night ring behavior, see <i>"Setting Night Call Options"</i> on page 22.)</p>
Night Ring Admin	<p>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.</p> <p><i>Note:</i> 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.</p>

Table 20. Edit System Parameters Page

Night Ring All Stations	<p>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.</p> <p><i>Note:</i> NQ-P0100 Matrix Mixer Pre-Amp stations will also ring.</p>
Night Ring Admin Group	<p>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.</p>
Night Ring Zones	<p>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.</p>
Parking Lot	<p>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.</p>
Record Monitoring	<p>Indicates if call and location monitoring will be recorded.</p>

Table 20. Edit System Parameters Page

Emergency Link	<p>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.</p> <p>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."</p> <p>If the Emergency Link Station is not a ringable device (a Nyquist VoIP speaker), the station will auto-answer, preannouncing 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.</p> <p>As with any Emergency Call, all calls to an Emergency Link Station will be recorded.</p>
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 System 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 days.
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.

Table 20. Edit 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 Page 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.
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 value is 10000.
RTP End Port	Identifies the stop port number for UDP RTP traffic. The default value is 20000.
<hr/> <hr/>	
Caution	Ensure that the port range from RTP Start Port to RTP End Port does not overlap other port range assignments, such as Emergency-All-Call Multicast RTP Port , All-Call Multicast RTP Port , Audio Distribution Multicast Port , or Multicast ports used for Zones.
<hr/> <hr/>	
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.

Table 20. Edit System Parameters Page

Enable ICE Support	<p>Indicates if Interactive Connectivity Establishment (ICE) support is enabled.</p> <p><i>Note:</i> Disabling ICE support could result in audio issues when making calls using the Web Interface.</p>
STUN Server	<p>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 will be used.</p>
TURN Server	<p>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.</p>
TURN Username	<p>Identifies the user name used to authenticate with the TURN server.</p>
TURN Password	<p>Identifies the password used to authenticate with the TURN server.</p>
Retention Recordings	<p>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.</p>
Backup Retention System	<p>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.</p>
Backup Retention Recordings	<p>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.</p>
Backup Retention Voicemail	<p>Identifies the number of days that voicemail backups 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.</p>
System Password	<p>Displays the password required whenever a user is prompted for the System Password.</p>

Table 20. Edit System Parameters Page

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 password of four zeros (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 password of four zeros (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 password of four zeros (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 password of four zeros (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 password of four zeros (0000) requires the caller to enter 1 for confirmation when starting an All-Call page.
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 password of four zeros (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 password of four zeros (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 password of four zeros (0000) requires the caller to enter 1 for confirmation when starting a Facility Announcement.

Table 20. Edit System Parameters Page

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 password of four zeros (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 password of four zeros (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 password of four zeros (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 password of four zeros (0000) requires the caller to enter 1 for confirmation when starting or stopping a Tone.
Audio Distribution Password	Identifies the 4-digit password to use if a caller is required to enter a password when starting or stopping an audio distribution. A password of four zeros (0000) requires the caller to enter 1 for confirmation when starting or stopping an audio distribution.
Disable Emergency All-Call and Intercom when Audio Disabled	If Audio Disabled is enabled (see <i>"Enabling and Disabling Audio"</i> on page 441), 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 <i>"Zone Control: Volume and Audio Distribution Panel"</i> on page 377).
Enable Callback Request Indicator	Indicates if the Callback Request Indicator feature is enabled for this system (see <i>"Managing Calls via the Dashboard"</i> on page 430). <i>Note:</i> This feature only applies to Digital Call Switch G2 stations with a CoS-based call-in level of Normal+Emergency or Urgent+Emergency.
Callback Request Indicator Expiration	Identifies for how many hours a Callback Request Indicator will remain active before being turned off. A value of zero (0) indicates no expiration.

Table 20. Edit System Parameters Page

Enable Queued Paging Instruction Message	When enabled (Yes), verbal instructions are provided before a queued message is recorded via Record Page. When disabled (No), only a beep tone is played to indicate the start of recording.
Enable Queue All-Call Page	When enabled (Yes), All-Call pages will be recorded and queued for playing to all speakers. Queued All-Call pages have higher priority than queued zone pages and will interrupt any that are currently playing, which will be replayed after completion of the All-Call page.

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

Table 21. System Tools

Server IP Address

Identifies the Nyquist system server IP address that will be used by Nyquist devices to register and communicate with the Nyquist system server.

Note: This is the IP address to specify as an appliance's **TFTP Server**, from which it can retrieve its *Configuration* settings via the **Get Configuration from Server** button.

The C4000's IP configurations for both Port A and Port B are specified using the Network Wizard, which can configure each port to either use a static IP address or obtain its IP configuration from an external DHCP server (or, for Port B, to disable it).

The **Change Server IP Address** button provides the option to select which previously configured C4000 IP address Nyquist devices will register and communicate with. Use the mouse or down arrow to select which IP address (i.e., which Ethernet port, Port A or Port B) to use.

Caution The Nyquist DHCP service does not operate on the Port B network. If the Nyquist DHCP service is needed, do not select the Port B IP address.

Note: If this Nyquist Server is configured for Automatic Failover (see "Automatic Failover" on page 88), 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 (via the Network Wizard),
- 3 and reconfigure Automatic Failure.

Tip: The network settings (i.e., IP address, subnet, gateway, DHCP server, and/or DNS servers) of both network ports can be viewed and changed using the Network Wizard, which can be accessed via the following URL:

<https://<server>/setup/network>

Use Network Time Server defined by DHCP

When enabled, the Network Time Server will be defined by DHCP.

Table 21. System Tools (Continued)

Network Time Server	<p>Identifies the IP address and/or the domain name of the Network Time Protocol (NTP) server to be used.</p> <p>To change the NTP server, enter the IP address or the domain name, and then select Change Network Time Server.</p>
Appliances Network Time Server Source	<p>Identifies the time source for all appliances on the Nyquist network. The appliances may use one of the following sources:</p> <ul style="list-style-type: none">• 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. <p>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.</p>
Server Date/Time	<p>Identifies the date and time of the server.</p> <p>To change the Server Date/Time, use the Calendar icon to select the new date, and then select Change Server Date/Time.</p>
Time Zone	<p>Sets the time zone for the server.</p> <p>To change the time zone, select a new time zone from the drop-down menu, and then select Change Time Zone.</p> <p><i>Note:</i> You must reboot the server after changing the time zone.</p>

Table 21. System Tools (Continued)

Dialing Length	<p>Specifies the number of digits required to dial within the system. Valid values are 3, 4, 5, or 6.</p> <p>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.</p>
Routine API Key	<p>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 <i>"Using the Routines API"</i> on page 469.</p>
Reset	<p>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.</p> <p>Be aware that this operation immediately invalidates the key. You will be prompted with a warning after clicking this button to prevent accidental resets.</p>
Additional IP addresses and/or DNS names to include in the Server Certificate	<p>Additional IP addresses and/or DNS names, 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 or DNS names. A domain wildcard may be included (e.g. *.your-domain.com).</p> <p>This is primarily intended for adding an alternate IP address and/or DNS name, such as a public-facing network connected to Ethernet Port-B or a valid DNS name, that your site is supporting for the Nyquist server.</p> <p><i>Note:</i> Automatic Failover configurations automatically include the Master, Primary, and Secondary IP addresses in the SAN, so this need not be set explicitly.</p>

Table 21. System Tools (Continued)

Generate Server Certificate

Generates a server certificate for this Bogen server. The certificate will include any additional IP addresses and/or DNS names specified in the aforementioned "Additional IP addresses..." setting as part of the certificate's Subject Alternative Name (SAN) field.

Important: After a system update, the bogenCA.crt file needs to be recreated before it can be downloaded to a client again (see "Client Requirements" on page 10). Use this button to regenerate the certificate.

Download Bogen CA Certificate

Initiates a download of a CRT file containing the public Bogen Certification Authority (CA) certificate. This CA certificate 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.

Table 21. System Tools (Continued)

Calendar Control Access List	<p>This field is only shown if Remote Calendar Control is configured as Allow Access List.</p> <p>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.</p>
Update Remote Calendar Control	<p>When pressed, the Remote Calendar Control and optional Calendar Control Access List changes will take effect.</p>
Nyquist Control Password	<p>Specifies a password used to secure Nyquist control messages between the C4000 controller and associated Nyquist appliances. The password specified on each Nyquist appliance must match the password specified here for that appliance to support certain Nyquist features, such as sound masking, amp protection mode, and station check-in.</p> <p>The specified password must be exactly 20 characters long and include uppercase, lowercase, and numeric characters.</p> <p><i>Note:</i> This password cannot be set unless the current user's password has been modified from the default value. Similarly, this password cannot be set on a Nyquist appliance unless the Web Password for that appliance's Station, Amplifier, or Gateway device has been changed from the default value.</p>
Save Password	<p>Saves the value specified in the Nyquist Control Password field as the current Nyquist control password.</p> <hr/> <p>Warning After the password has been modified and saved, features that depend on this password will not work until this password has been updated on all Nyquist devices.</p> <hr/>
Show Saved Password	<p>Displays the current Nyquist control password.</p>

Table 21. System Tools (Continued)

Update Nyquist Devices	Updates the Nyquist control password on connected Nyquist devices using the current Nyquist control password.
	<hr/> Warning Nyquist devices that are not currently connected will not be updated. These may need to be updated manually on the device's web interface, or use this button again when they are connected. <hr/>
Schedule Site Settings: Label Singular	Specifies a word or phrase to be used throughout the schedules in place of the word "site."
Schedule Site Settings: Label Plural	Specifies a word or phrase to be used throughout the schedules in place of the word "sites."
Schedule Site Settings: Icon	Specifies the icon to be used throughout the schedules to represent one or more sites.
Schedule Site Settings: Save Settings	Apply changes to the site labels and icons.

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 server 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 flash drive 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 Certification Authority on your local machine (see “Installing the Bogen Digital Certification Authority” on page 623).

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.

Primary Node	Secondary Node
Initialization	Initialization
Database	Database
Services	Services
Resources	Resources

Current Setup Step Instructions:
No matching Hostname.

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

<u>Primary Server</u>				<u>Secondary Server</u>			
#	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.

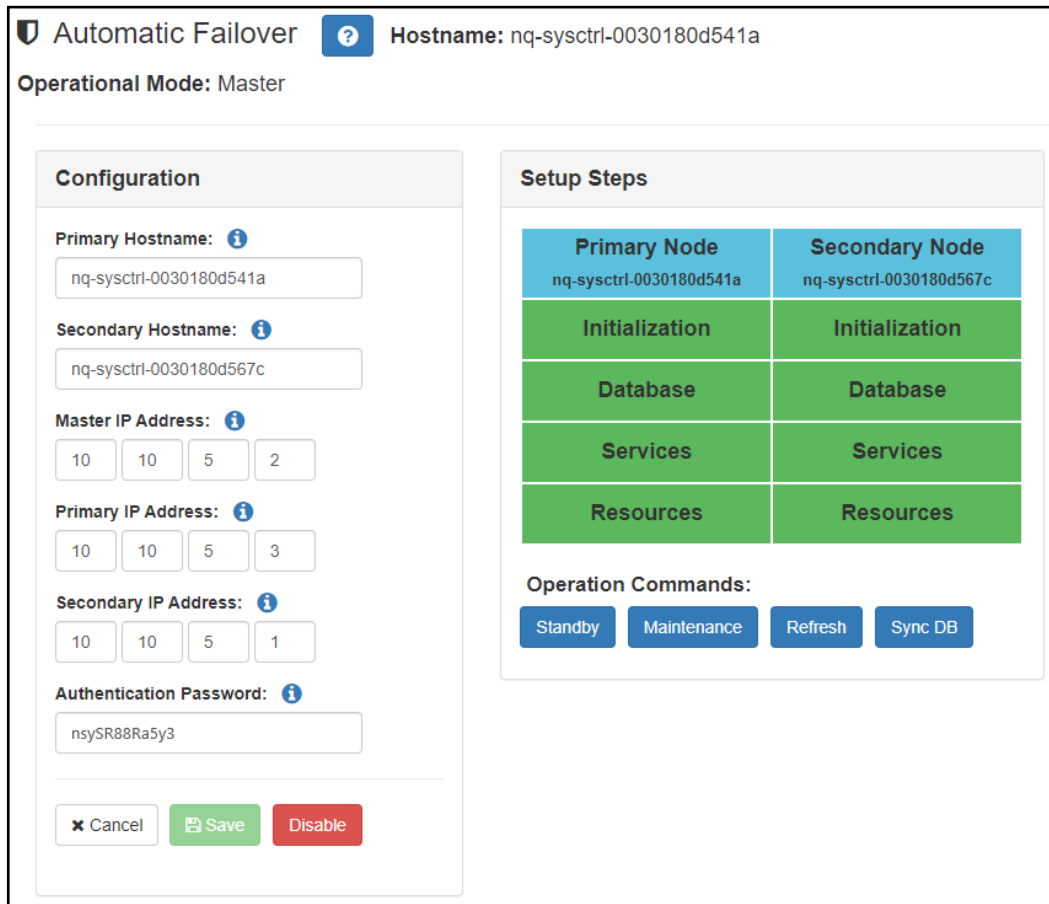


Figure 28. Automatic Failover Operations mode

Note: The Automatic Failover page can be accessed via the Primary or Secondary IP address, or via the Master IP address. When accessed via the Primary or Secondary IP address, it displays and allows the user to access the Operation Commands, as shown in *Figure 28*. When accessed via the Master IP address, links to the Primary and Secondary servers are shown instead.

Table 22. 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: <ul style="list-style-type: none">• 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.

Table 22. Automatic Failover Parameters

Disable	<p>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.</p> <p>Caution This action will completely remove the Automatic Failover configuration and is not reversible without performing the setup process over again.</p>
Setup Steps	<p>Shows which setup step is currently being performed during the Automatic Failover setup process. Successfully completed steps are displayed in green.</p>
Standby	<p>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.</p>
Unstandby	<p>Removes the current server from Standby mode and potentially resumes the Master role.</p>
Maintenance	<p>Places the current server in Maintenance mode.</p> <p><i>Note:</i> Do not place your server into Maintenance mode unless instructed to do so by Technical Support.</p> <p>While in Maintenance mode, a server will neither assume nor relinquish the Master role due to failures, but will maintain its current role.</p> <p>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.</p> <p>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.</p> <p><i>Note:</i> 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.</p>
Unmaintenance	<p>Removes the current server from Maintenance mode.</p> <p><i>Note:</i> Do not place your server into Maintenance mode unless instructed to do so by Bogen Technical Support.</p>

Table 22. Automatic Failover Parameters

Refresh	Refreshes the Automatic Failover status. This clears previous failures that may have caused failover from Master to Slave.
Sync DB	<p>Synchronizes the database between Master and Slave servers.</p> <p>To synchronize the databases, first execute Sync DB while logged into the Primary server IP address. Wait for confirmation that the operation has completed, then execute Sync DB while logged into the Secondary server IP address.</p> <p><i>Note:</i> You <i>must</i> execute the Sync DB command on the Primary server first.</p>

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 391).
- 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 applied to both Primary and Secondary servers.
- Changes to Time Zone must be applied to both Primary and Secondary servers.
- Changes made via Custom Configuration must be applied to both 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.

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 23. 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]

Table 23. Failover Event Routine Triggers

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
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)

Table 23. Failover Event Routine Triggers

af-secondary-maint	The Secondary server is now in maintenance 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 technical 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 unavailable 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, consider 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 effect 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 162.) Note that an analog phone cannot be used as a day or night admin.

Name	Call in Level	Zone Paging	All-Call Paging	Emergency All-Call	Inter-Facility Call/Page	Audio Distribution	Remote Pickup	Join Conversation	Call Forwarding	Walking Class of Service	External Call Routing	Call Transfer/3-way Calling	Manu
Admin Phone	Normal+Emergency	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Classroom	Normal+Emergency	No	No	No	No	No	No	No	No	No	No	No	
No Privs	Normal+Emergency	No	No	No	No	No	No	No	No	No	No	No	

Figure 29. CoS Configuration Page

The following table describes the CoS parameters:

Table 24. CoS Configuration Page Parameters

Name	User provided name for the CoS.
Call in Level	<p>For call-switch station types, identifies the call as Normal+Emergency, Urgent+Emergency, or Emergency-Only.</p> <p>The system defaults to Normal+Emergency.</p> <ul style="list-style-type: none">• Normal+Emergency: Initiates a normal- or emergency-level call. Pressing the Analog/Digital Call Switch once triggers a normal-level call to the administrator. Pressing a Digital Call Switch three times, or pressing an Analog Call Switch four times, triggers an emergency-level call to the administrator. <p>After placing a normal-level call with a Digital Call Switch, before it has been answered, the call can be elevated to an emergency-level call by pressing the call switch one more time.</p> <p>After placing a normal-level call with an Analog Call Switch, before it has been answered, the call can be elevated to an emergency-level call by pressing the call switch four times.</p> <ul style="list-style-type: none">• Urgent+Emergency: Initiates an urgent- or emergency-level call. Pressing the Analog/Digital Call Switch once triggers an urgent-level call to the administrator. Pressing a Digital Call Switch three times, or pressing an Analog Call Switch four times, triggers an emergency-level call to the administrator. <p>After placing an urgent-level call with a Digital Call Switch, before it has been answered, the call can be elevated to an emergency-level call by pressing the call switch one more time.</p> <p>After placing an urgent-level call with an Analog Call Switch, before it has been answered, the call can be elevated to an emergency-level call by pressing the call switch four times.</p> <ul style="list-style-type: none">• Emergency Only: Initiates an emergency-level call by pressing the call switch one time.

Note: The Callback Request Indicator feature cannot be used with stations that have Call in Level set to **Emergency Only**.

Table 24. CoS Configuration Page Parameters

Call in Level (cont'd)	<p><i>When an emergency call is placed to an Admin:</i></p> <ul style="list-style-type: none">• Caller ID will include "Emergency".• Timeout to roll over to Admin Group for unanswered call to Admin is 15 seconds instead of 30 seconds.• Routines with Emergency-Call trigger will execute.• I/O controllers will be notified that Emergency Call was placed.• Station recording will be automatically enabled.• If Emergency Link is enabled, Emergency Link Station will be called.• If Bump on Emergency is enabled, existing Admin Call currently connected to Normal call will be bumped.
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.
Inter-Facility Call/Page	Specifies if the associated station can call or page another facility.
Audio Distribution	Specifies if the associated station can start and stop audio distributions.
Remote Pickup	Specifies if the associated station can remotely answer internal and incoming outside line calls by dialing 7*<extension-to-pickup>.
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.

Table 24. CoS Configuration Page Parameters

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.
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.

Table 24. CoS Configuration Page Parameters

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. <i>Note:</i> 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 <i>"Configuring I/O Controller Output Rules" on page 174.</i>
Execute Routines	Allows the station to execute routines via DTMF codes. For more information about managing routines, see <i>"Using Routines" on page 466.</i>

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 24, "CoS Configuration Page Parameters," on page 105.*
- 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 24, "CoS Configuration Page Parameters," on page 105.*
- 4 After all changes are made, select **Save**.

Managing SIP Trunks

A Session Initiation Protocol (SIP) 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 configuration 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 interconnection 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 117.*

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 198.*)

It is recommended that the technician performing the installation 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, 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 122* and *"Adding SIP Trunk Configuration Parameters" on page 115*) 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 *"Nyquist DTMF Feature Dialing Codes" on page 632* 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 which Nyquist functions the incoming DISA user is allowed to initiate. (See *"Adding CoS Parameters for a Station" on page 109*.) 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 279.)

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 22.)

Note: For incoming calls over SIP Trunks, authorization is based on *IP Address* or *Host-name*, as defined in the SIP Trunk's **Host** configuration field. Since incoming call authorization is based on *IP Address* or *Hostname*, the SIP Trunk provider or PBX is not required to register with the Nyquist system to place calls into the Nyquist system. The Nyquist system permits SIP INVITES from the **Host** defined in the SIP Trunk configuration.

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
- 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 122 or *"Adding SIP Trunk Configuration Parameters"* on page 115.)

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 115.)

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.
- If the PBX extension length matches the Nyquist Dialing Length, you can add Admin PBX Extension stations to the Nyquist system to allow Nyquist users to call the PBX extension via the Admin PBX Extension without the need to use the *** prefix. For example, if your PBX has extensions 401, 402, and 403, and the Nyquist Dialing Length is three (3), you can add three Nyquist Admin PBX Extension stations using 401, 402, and 403 as the extensions. After that, Nyquist users can simply dial 401 to call PBX extension 401, 402 to call PBX extension 402, and 403 to call PBX extension 403.
- 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 DID's 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**).

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, alternative dialing codes may be used to replace Nyquist extensions that start with #. For details, see *"Alternate Dialing Codes" on page 643*).

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 205* 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 148*).
- 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 279*)

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 115*.)
- 4 Select **Save**.

Table 25. 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.
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.

Table 25. Add SIP Trunk Page Parameters (Continued)

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: <ul style="list-style-type: none">• 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.
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.

Table 25. Add SIP Trunk Page Parameters (Continued)

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	Indicates if incoming and outgoing calls are to be recorded.
Allow Outbound Intercom Calls	Indicates if call-switch-based stations are allowed to place calls to PBX-based Admin extensions via the SIP Trunk using Day/Night Admin-PBX-Extension. See "Routing Intercom Calls to PBX Extensions via SIP Trunk" on page 222) for further details.
Allow	Provide a list of media codecs that are allowed. <hr/> <i>Tip:</i> The PSTN standard codec, G.711, can be specified via either the <i>alaw</i> or <i>ulaw</i> companding algorithm. <hr/>
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 117.)

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 115 or "Editing a SIP Trunk Configuration" on page 122) using the following format:

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

where TABLE-NAME is ENDPOINT, AOR, AUTH, OR SIPTRUNK; <variable> is a valid variable from one of the pjsip tables (i.e., ps_endpoints, ps_aors, ps_auths) or the sip_trunk table; and <value> is a valid value for the specified variable.

Contact Bogen 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.

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 26. 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	<ul style="list-style-type: none"> • 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 26. Nyquist SIP Trunk Configuration (Continued)

Allow	g722 (or ulaw or other codec if needed)
Custom Settings	:AUTH:realm= ' ':AUTH: :SIPTRUNK:context= ' 511 ':SIPTRUNK: <i>Note:</i> 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 27. 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 27. SIP Trunks Page Parameters (Continued)

Access	Identifies the outside access permissions for the SIP trunk. Options are: <ul style="list-style-type: none">• 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 27. 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.
Allow Outbound Intercom Calls	Indicates if call-switch-based stations are allowed to place calls to PBX-based Admin extensions via the SIP Trunk using Day/Night Admin-PBX-Extension. <i>See "Routing Intercom Calls to PBX Extensions via SIP Trunk" on page 222) for further details.</i>
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 <i>"SIP Trunk Custom Configuration Settings"</i> on page 117.

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.

⇐ Edit SIP Trunk ⓘ

✕ Cancel Save

Name: ⓘ
TestSipTrunk

Extension: ⓘ
500

Dial Prefix: ⓘ
9+1

Local Area Code: ⓘ
201

Enabled: ⓘ
Yes

Access: ⓘ
Unrestricted ▾

Username: ⓘ
test

Change Password: ⓘ
[Empty]

Confirm Password Change:
[Empty]

Host: ⓘ
192.168.17.12

DID: ⓘ
9734346056

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 28*.)

4 Select **Save**.

Table 28. 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 28. Edit SIP Trunks Page Parameters (Continued)

Access	<p>Enter the outside access permissions for the SIP trunk. Options are:</p> <ul style="list-style-type: none">• 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	<p>Enter the user name that is required to access the SIP trunk.</p>
Change Password	<p>Enter the password that is required to access the SIP trunk. The password is provided by the SIP trunk provider or hosted VoIP provider.</p>
Confirm Password Change	<p>Re-enter the SIP trunk password.</p>
Host	<p>Enter the host name or IP address for the ITSP.</p>
DID	<p>Enter the DID telephone number associated with the outside line.</p>

Table 28. 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 Outbound Intercom Calls	Indicates if call-switch-based stations are allowed to place calls to PBX-based Admin extensions via the SIP Trunk using Day/Night Admin-PBX-Extension. See <i>"Routing Intercom Calls to PBX Extensions via SIP Trunk" on page 222</i> for further details.
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 <i>"SIP Trunk Custom Configuration Settings" on page 117</i> .

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.

To view the outside lines:

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

Table 29. 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: <ul style="list-style-type: none">• 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 29. 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 30. 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.
Port Type	Identifies system port type used for this line. This parameter cannot be edited.

Table 30. Edit Outside Line Page Parameters (Continued)

Access	Identifies level of access allowed on this outside line. Options are: <ul style="list-style-type: none">• 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.
Night Admin	Identifies the Admin Station to call during nighttime hours.

Table 30. Edit Outside Line Page Parameters (Continued)

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 newly 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 Appliance Firmware

Firmware, computer software stored on a hardware device, can be updated for Nyquist appliances 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 guide.

Note: Before configuring or using any Nyquist appliances, you should ensure that the appliance firmware is updated to the latest release. The latest firmware release can be obtained from the following website: <https://www.bogen.com/c4000-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 43).

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.

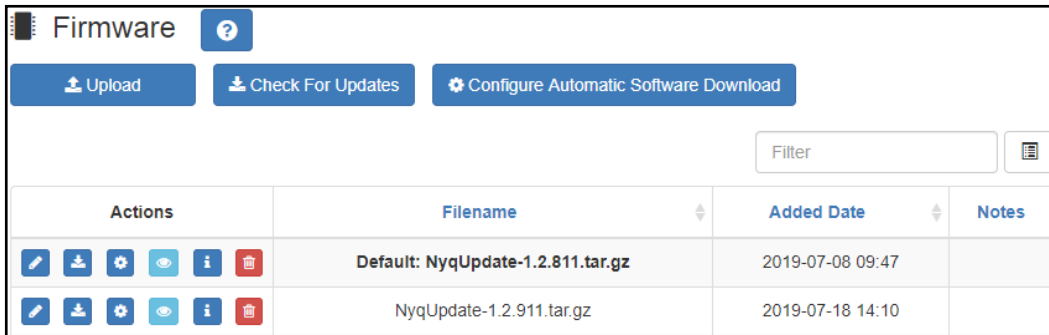


Figure 32. Firmware Page

To view firmware available for loading into Nyquist devices:

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

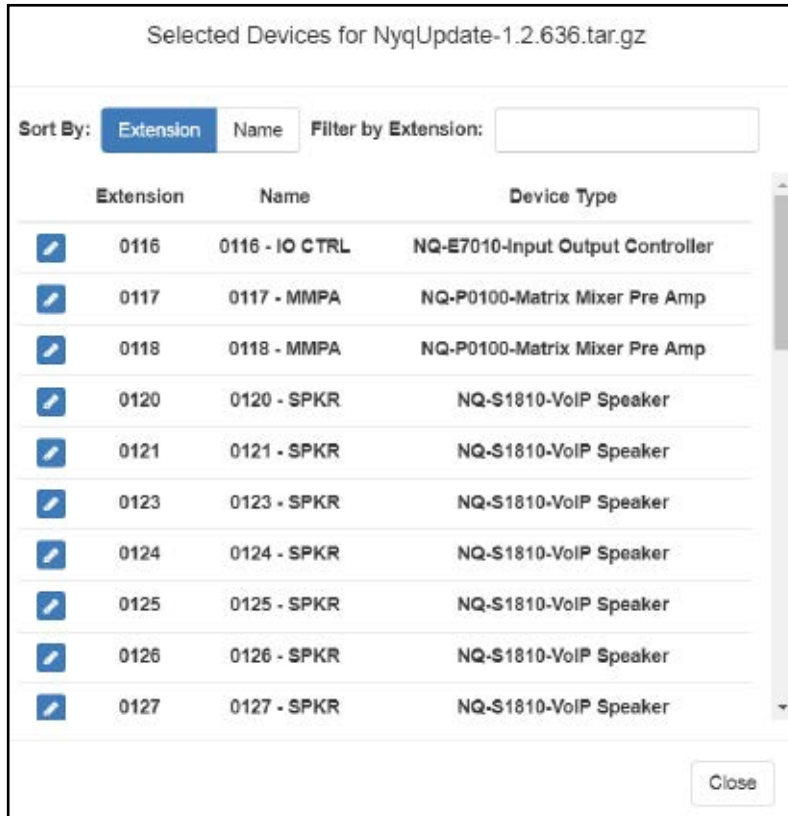
The following table describes the information provided for each available firmware file:

Table 31. Firmware Page Parameters

Filename	Provides the name of firmware file that is ready for installing 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.

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.



Extension	Name	Device Type
0116	0116 - IO CTRL	NQ-E7010-Input Output Controller
0117	0117 - MMPA	NQ-P0100-Matrix Mixer Pre Amp
0118	0118 - MMPA	NQ-P0100-Matrix Mixer Pre Amp
0120	0120 - SPKR	NQ-S1810-VolP Speaker
0121	0121 - SPKR	NQ-S1810-VolP Speaker
0123	0123 - SPKR	NQ-S1810-VolP Speaker
0124	0124 - SPKR	NQ-S1810-VolP Speaker
0125	0125 - SPKR	NQ-S1810-VolP Speaker
0126	0126 - SPKR	NQ-S1810-VolP Speaker
0127	0127 - SPKR	NQ-S1810-VolP Speaker

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**.

Note: The upload could take as much as a couple minutes. The Upload dialog will automatically close when the upload has completed.

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.

Extension	Name	Device Type	Firmware	
<input type="checkbox"/>	101	101 - VoIP SPKR	NQ-S1810-VolP Speaker	1.2.350
<input type="checkbox"/>	102	102 - VoIP SPKR	NQ-S1810-VolP Speaker	1.2.350
<input type="checkbox"/>	103	103 - VoIP SPKR	NQ-S1810-VolP Speaker	1.2.350
<input type="checkbox"/>	104	104 - VoIP SPKR	NQ-S1810-VolP Speaker	1.2.350
<input type="checkbox"/>	141	141 - I/O : 1	NQ-E7010-Input Output Controller	1.2.350
<input type="checkbox"/>		Name	Device Type	Firmware
<input type="checkbox"/>	A2300 - 1 : 1CH	NQ-A2300-Amplifier		1.2.350
<input type="checkbox"/>	A2120 - 1 : 2CH	NQ-A2120-Amplifier		1.2.350

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.

Important: Selecting a new default does not change the firmware version currently configured and used by existing devices. It only applies to devices added after the default has been changed.

To set a default firmware file:

- 1 On the navigation bar, select **Firmware**.
- 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.
- 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 site with one or more buildings managed by a single Nyquist system server.

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 139*.

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 permissions 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.

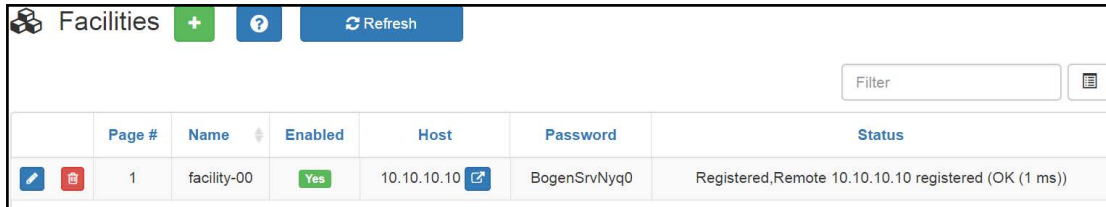
Table 32. Activities, CoS Permissions, and DTMF Codes

Activity	Required CoS Permissions	DTMF Syntax
Multi-Site Emergency-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-Page-Number>
Multi-Facility Paging	Inter-Facility Call/Page	## <Facility-Page-Number> * <Facility-Page-Number> ...
Facility Announcement	Multi-Site Paging, Inter-Facility Call/Page	*97 <DTMF-Code> # <Facility-Page-Number> * <Facility-Page-Number> ...
Intercom Call to Remote Facility	Inter-Facility Call/Page	##* <Facility-Page-Number> * <Station Extension Number>
Activate System Feature at Remote Facility	Inter-Facility Features	##* <Facility-Page-Number> *[900 – 999] ##* <Facility-Page-Number> *# <Feature Code> ##* <Facility-Page-Number> ** <Feature Code> ##* <Facility-Page-Number> *00000 <Feature Extension>

For information about Facility Error Conditions, see *“Facility Error Conditions” on page 406*.

Viewing Facilities

The Facilities page provides a quick view of the building or remote facilities (Nyquist servers) that are connected to this Nyquist server.



Page #	Name	Enabled	Host	Password	Status
1	facility-00	Yes	10.10.10.10	BogenSrvNyq0	Registered, Remote 10.10.10.10 registered (OK (1 ms))

Figure 35. Facilities Page

To view facilities:

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

Table 33 describes the Facility page parameters:

Table 33. 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. Your Nyquist network can use multiple servers that all have the same password, or you can set different passwords for each server. The maximum password length is 12 characters.
Status	Displays the registration status of the local and remote facility peers. Some possible statuses are: <ul style="list-style-type: none">• Registration request sent; remote not registered: Indicates that a connection is not established between the facilities.

Table 33. Facilities Page Parameters

- **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.
- **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 connected to your Nyquist system server.

Note: You cannot edit a facility linked to a **Facility-Page** routine action **Type** (see "Understanding Action Parameters" on page 495).

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 34, "Edit Facility Page Parameters," on page 141.)
- 4 Select **Save**.

Table 34. 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 495).

To delete a facility:

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

Adding a Facility

From the Add Facility page, you can add another Nyquist facility to the list of facilities connected to your Nyquist system server.

The screenshot shows a form titled "Add Facility" with a blue question mark icon. The form has the following fields and controls:

- Name:** A text input field with an information icon.
- Enabled:** A checkbox labeled "No" with an information icon.
- Host:** A text input field with an information icon.
- Password:** A text input field with an information icon.
- Buttons:** "Cancel" (with a close icon) and "Save" (with a save icon).

Figure 36. 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 35*.)
- 4 Select **Save**.

Table 35. 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

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.

Appliance Discovery Wizard

The **Nyquist Appliance Discovery and Network Settings Configuration Wizard** can be used at any time to discover Nyquist appliances on the network (via Port A and optionally Port B) and change the appliances' network settings. The available options for an appliance are:

- Enable or disable DHCP on the appliance.
- If DHCP is disabled, specify the appliance's static IP configuration, including a static IP address, subnet netmask, and gateway IP address.
- Specify a TFTP server IP address, or indicate that DHCP option 66 will be used to obtain it.

Caution Configuring any address *other* than the Nyquist server for DHCP option 66 will cause problems with device discovery and autoconfiguration.

The wizard can be accessed via the **Device Discovery** button, which can be found on the *Stations*, *New Stations*, *Stations Status*, *Amplifier and Gateway Devices*, and *Appliance Status* pages. Alternatively, it can be accessed directly via the following URLs:

`https://<server>/setup/discovery`

`http://<server>/setup/discovery`

The wizard will first ask if Nyquist appliances will be configured to receive IP addresses and (optionally) the TFTP server IP address from the DHCP server or if they will be explicitly configured.

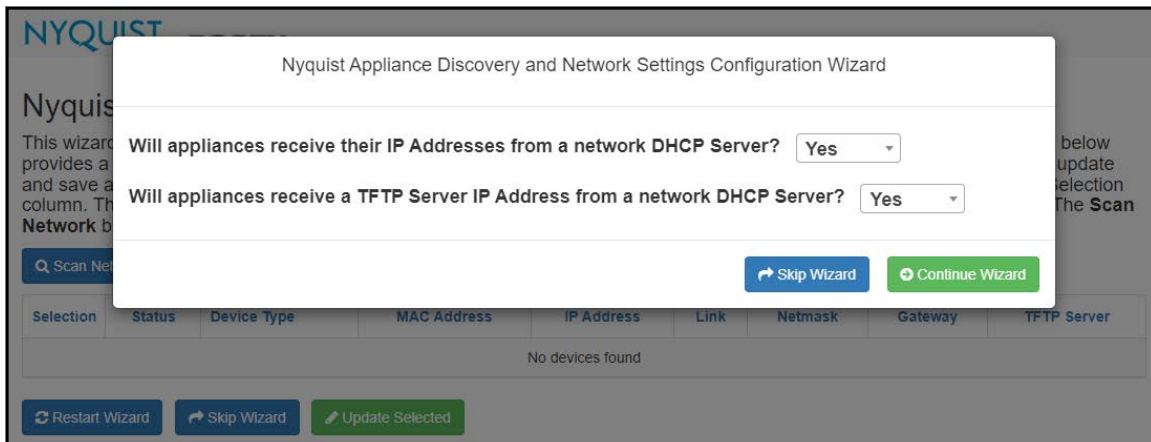


Figure 37. Network Appliance Discovery and Network Settings Configuration Wizard (start)

- *Will appliances receive their IP Addresses from a network DHCP Server?*
No allows the user to configure the IP Address, Netmask, and Gateway settings for discovered Nyquist appliances.
Yes indicates that these settings will be configured by the DHCP server.
 This option corresponds to the **DHCP Enabled** option on the *Network Settings* page of the appliance's web interface.
- *Will appliances receive a TFTP Server IP Address from a network DHCP Server?*
No allows the user to configure the TFTP Server address for discovered Nyquist appliances.
Yes indicates that the TFTP server address will be configured by the DHCP server. This option is not available if *Will appliances receive IP Addresses from a DHCP Server?* is set to **No**.
 This option corresponds to the **TFTP Server from DHCP** option on the *Network Settings* page of the appliance's web interface.

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Nyquist Appliance Discovery and Network Settings Configuration Wizard

This wizard helps users find Nyquist Appliances on their network and change Nyquist Appliance Network Settings. The table below provides a list of Nyquist Appliances found on the network (Port-A Only scanned by default). Inline editing allows the user to update and save available settings for multiple devices. The **Update Selected** button saves settings for all devices checked in the Selection column. The **Restart Wizard** button reloads the page and allows the user to answer the two DHCP server questions again. The **Scan Network** button clears the table, searches for Nyquist Appliances, and loads new data into the table.

Q Scan Network Include Port-B in Scan: No

Selection	Status	Device Type	MAC Address	IP Address	Link	Netmask	Gateway	TFTP Server
<input type="checkbox"/>								
<input type="checkbox"/>	✔	NQ-GA10P-Intercom Module	64cfd9d4a412	192.168.90.12	Link	Set by DHCP Server	Set by DHCP Server	Set by DHCP Server
<input type="checkbox"/>	✔	NQ-E7010-Input Output Controller	883f4a9d636b	192.168.90.13	Link	Set by DHCP Server	Set by DHCP Server	Set by DHCP Server
<input type="checkbox"/>	✔	NQ-A2060-G2-Amplifier	a406e92d503f	192.168.90.15	Link	Set by DHCP Server	Set by DHCP Server	Set by DHCP Server

Restart Wizard Skip Wizard Update Selected

Figure 38. Network Appliance Discovery and Network Settings Configuration Wizard (appliances)

After scanning the network, the wizard will present a list of all Nyquist appliances found on the network(s). Depending on which options were selected at the beginning of the wizard, one or more configurable settings may be available for each appliance.

Table 36. Nyquist Appliance Discovery and Network Setting Wizard Configuration Settings

Scan Network	Initiates a network scan to identify Nyquist appliances on the attached network(s).
Include Port-B in Scan	If set to Yes , both network ports (A and B) on the C4000 will be scanned for Nyquist appliances. If set to No (the default), only port A will be scanned. This takes effect the next time Scan Network is selected.
Selection	Select one or more appliances that will be updated when the Update Selected button is clicked.
Status	Indicates the status of the appliance. Possible values are: <ul style="list-style-type: none"> • Device Ready • Update Complete • Updating Device • Update Error
Device Type	The type of Nyquist appliance discovered.

Table 36. Nyquist Appliance Discovery and Network Setting Wizard Configuration Settings

Create	The Create button will be displayed next to the Device Type if the C4000 does not already have a station configured for this appliance. Selecting this button will create a new Station for the appliance.
MAC Address	Displays the MAC address of the appliance. This helps identify specific devices when installing multiple devices of the same type.
IP Address	Displays the current IP address of the appliance. If DHCP will not be used, selecting this value allows the IP address to be modified. IP addresses will not be changed until Update Selected is clicked.
<hr/> <hr/> Warning Be careful to avoid specifying a currently used IP address (e.g., when swapping IP addresses) as this could result in IP address conflicts. <hr/> <hr/>	
Link	This provides a login window for the appliance. After you enter your Username and Password , the web UI for the device appears.
Netmask	If DHCP will not be used for this appliance, the IP subnet mask must be specified.
Gateway	If DHCP will not be used for this appliance, the gateway IP address must be specified.
TFTP Server	If the appliance will not receive the TFTP server IP address from the DHCP server, its IP address must be specified.
Restart Wizard	Selecting this button restarts the Appliance Discovery Wizard.
Skip Wizard	Exits the wizard and displays the C4000 Dashboard.
Update Selected	Updates appliances for which the Selected box is checked with the provided values.

Managing Stations, Zones, and Queues

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 the conference room would *not* be placed in that zone.

There is no limit to 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.

Note: A station can be in multiple zones.

A Nyquist station can be:

- 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 one or more stations. You can add stations by allowing the Nyquist server 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 198*.

Speaker Extension Muting

When a station that is associated with a Speaker Extension initiates a page, the associated speaker will be muted during the page. This is to prevent the creation of an audio feedback loop.

All paging types are supported: Emergency-All-Call, All-Call, Zone-Page, Facility Pages that include the local facility, Multi-Site All-Call, and Multi-Site Emergency-All-Call. The associated speaker is muted for Facility Page to eliminate possible interference from local pages while the station is performing the Facility Page.

Viewing Station Configuration Settings

On the Stations page, you can:

- View all configured stations.
- Edit a station's configuration. (See *"Editing Station Configuration Settings"* on page 162.)
- Exclude a station from paging via the **Page Exclusion** button. (See *"Excluding Stations from Paging"* on page 224.)
- Initiate the *Device Discovery Wizard* via the **Device Discovery** button. (See *"Appliance Discovery Wizard"* on page 143.)
- Access the *Simplified Configuration* page via the **Simplified Configuration** button. (See *"Simplified Configuration"* on page 236.)
- View station status via the **Stations Status** button. (See *"Viewing Station Status"* on page 226.)
- Add new stations via the **New Stations** button. (See *"Adding a Station"* on page 198.)
- View the status of Nyquist appliances, such as the I/O controller, via the **Appliance Status** button. (See *"Viewing Appliance Status"* on page 228.)
- Edit a station. (See *"Editing Station Configuration Settings"* on page 162.)
- Delete a station. (See *"Deleting a Station"* on page 197.)
- View device status information for the station. (See *"Displaying Device Status"* on page 237.)

	Extension	Name	Description	Type	Device Type	MAC Address
	None	Sound Mask	Show	Sound Masking	NQ-A2120-G2-Amplifier	None
	None	Sound Mask A	Show	Sound Masking	NQ-A2120-G2-Amplifier	None
	0010	Admin Web UI	Show	Admin Web Interface	n/a	None
	0020	0020 - TechDoc	Show	Admin Web Interface	n/a	None
	0030	0030 - Web Admin	Show	Admin Web Interface	n/a	None
	0040	0040 - Web Admin	Show	Admin Web Interface	n/a	None
	0050	0050 - Web Admin	Show	Admin Web Interface	n/a	None
	0060	0060 - Web Admin	Show	Admin Web Interface	n/a	None
	0100	Admin - IP Phone	Show	Admin Phone	NQ-T1100 IP Phone - Color Touch Display	001565f30b3b
	0101	IO CTRL	Show	I/O Controller	NQ-E7010-Input Output Controller	f0b5d14bc2b6
	0102	EDP01	Show	Analog Call Switch & Speaker	NQ-EDP01-Entry Door Phone	a8e77def08eb

Figure 39. Stations Page

To view all stations:

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

The following table, *Table 37*, describes station configuration information:

Table 37. Station Configuration Page Parameters

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

- Edit** Edit the station.
- Delete** Delete the station.
- Device Status** Display the device status for this station.

Table 37. Station Configuration Page Parameters

Extension	<p>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.</p> <p><i>Note:</i> Extensions 900 to 999 are reserved by Nyquist features; do not assign these extensions to stations.</p>
Name	<p>Specifies the name for the station. Names can contain up to 16 characters.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Description	<p>Provides a description for this station.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>

Table 37. Station Configuration Page Parameters

Type	Specifies the station type. Types include:
<i>Note:</i> The available Type options are determined by the indicated Device Type, which should be specified first.	<ul style="list-style-type: none">• Admin Phone• Admin Web Interface
<i>Note:</i> Once the station has been added, this setting cannot be modified.	<p><i>Note:</i> A station of type Admin Phone or Admin Web Interface is generally referred to as an "Admin Station." Although most capabilities of these station types can be explicitly granted to other station types, the typical usage is to use one of these types for stations that will be used for administrative purposes.</p> <ul style="list-style-type: none">• Admin PBX Extension• IP Phone• Mobile Device• VoIP Speaker Only• Analog Call Switch & Speaker• Digital Call Switch & Speaker• Analog Phone <p><i>Note:</i> An analog phone cannot be used as an Admin Phone 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.</p> <ul style="list-style-type: none">• DISA Line• 911 Line• I/O Controller <p><i>Note:</i> 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.</p> <ul style="list-style-type: none">• Matrix Mixer Pre-Amp• Paging-Audio Amp• Paging-Audio-Intercom Module• Ambient Noise Sensor• Push-To-Talk Microphone• Audio Gateway• Sound Masking

Table 37. Station Configuration Page Parameters

Device Type

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

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

- Cisco ATA191/192-3PW-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-EDP01-Entry Door Phone
- NQ-GA10P-Intercom Module
- NQ-GA10PV-Intercom HDMI Module
- NQ-GA20P2-Amplifier with Line Output
- NQ-GA400P-AoIP Gateway
- NQ-GA40P3-Amplifier with Line In/Out
- 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-S1810CT-T1 VoIP Ceiling Speaker with Transformer
- NQ-S1810WBC VoIP Wall Baffle Combo Spkr/Clock/Msg
- NQ-S1810WT-G2 VoIP Wall Baffle Speaker Gen2
- NQ-S1810WT-G3 VoIP Wall Baffle Speaker Gen3
- NQ-T1000 IP Phone - Basic LCD Display
- NQ-T1100 IP Phone - Color Touch Display
- NQ-T2000 IP Phone - Basic LCD Display
- NQ-ZPMS Zone Paging Microphone Station
- Yeastar-TA2400 Analog FXS Port

Table 37. Station Configuration Page Parameters

Port	<p>Nyquist only displays this field when adding or editing a Type of Analog Phone and a Device Type of DAHDI FXS.</p> <p>Identifies the system port name for the analog line.</p>
MAC Address	<p><i>Note:</i> Nyquist does not display this field when adding or editing an Admin Web Interface, Admin PBX Extension, Analog Phone, Mobile Device, Paging-Audio Amp, or DISA Line.</p> <p>Specifies the Media Access Control (MAC) address, which is a unique identifier assigned to network interfaces for communications on the physical network segment.</p>
Serial Number	<p><i>Note:</i> Nyquist does not display this field when adding or editing an Admin Web Interface, Admin Phone, IP Phone, or DISA Line.</p> <p>Identifies the serial number for the device.</p>
Facility	<p>Identifies the facility where this station is installed.</p>
Day CoS	<p>Identifies CoS permissions that apply to this station during day time hours.</p>
Night CoS	<p>Identifies CoS permissions that apply to this station during night time hours.</p>
Day Admin	<p><i>Note:</i> Nyquist does not display this field when adding or editing an Admin PBX Extension, I/O Controller, Paging Audio Amp, or Matrix Mixer Pre-Amp. An analog phone cannot be used as an admin destination (day or night admin) even if it has the correct CoS set.</p> <p>Identifies the Admin Station that covers this station during daytime hours.</p> <p>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.</p> <p><i>Note:</i> If Admin Group is specified, the Emergency Link feature is not supported for this the station. See the Emergency Link description on page 77 for further details.</p> <p>For more information about CoS, see "Using CoS Configuration" on page 104.</p>

Table 37. Station Configuration Page Parameters

Night Admin	<p><i>Note:</i> Nyquist does not display this field when adding or editing an Admin PBX Extension, I/O Controller, Paging Audio Amp, or Matrix Mixer Pre-Amp. An analog phone cannot be used as an admin destination (day or night admin) even if it has the correct CoS set.</p> <p>Identifies the Admin Station that covers this station during nighttime hours.</p> <p>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.</p> <p><i>Note:</i> If Admin Group is specified, the Emergency Link feature is not supported for this the station. See the Emergency Link description on page 77 for further details.</p> <p>For more information about CoS, see <i>"Using CoS Configuration" on page 104.</i></p>
Admin Group	<p><i>Note:</i> Nyquist does not display this field when adding or editing an Admin Phone, Admin Web Interface, Admin PBX Extension, I/O Controller, Paging Audio Amp, or Matrix Mixer Pre-Amp.</p> <p>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.</p>
Registration Password	<p>(Add and Edit only) Specify the password that this station will use when it registers with this Nyquist server as a SIP client. The Nyquist server will remember the registration password for each station.</p> <p>If Registration Password is unspecified, the Default Registration Password will be used (see Table 20, <i>"Edit System Parameters Page," on page 72</i>). If the Default Registration Password is not specified, Registration Password is required.</p> <p>The minimum length is five characters.</p>
Registration Password Confirmation	
Show Password	<p>(Add and Edit only) Selecting this button shows the current password to the right of the button for four seconds. If at least one character is typed in the password field, the button label dynamically changes from Show Saved Password to Show Password.</p>
Show Saved Password (Registration Password)	
Codecs Allowed	<p>Identifies the list of codecs supported by the device that is associated with this station.</p>

Table 37. Station Configuration Page Parameters

Voicemail Password	<i>Note:</i> Nyquist does not display this field when adding a VoIP Speaker Only, Call Switch & Speaker, I/O Controller, or Matrix Mixer Pre-Amp.
Voicemail Password Confirmation	(Add only) Provide the password used to access voicemail. This field can contain numeric characters only.
Show Password	(Add and Edit only) Selecting this button shows the current password to the right of the button for four seconds. If at least one character is typed in the password field, the button label dynamically changes from Show Saved Password to Show Password .
Show Saved Password (Voicemail Password)	
Force Name	<i>Note:</i> 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	<i>Note:</i> 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	<i>Note:</i> Nyquist does not display this field when adding or editing an I/O Controller, Paging Audio Amp or Matrix Mixer Pre-Amp. Determines if all calls made and placed to this station are recorded.
Paging	<i>Note:</i> 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 or NQ-T2000 phone. If Paging is set to On for a NQ-T1000 or NQ-T2000 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.

Table 37. Station Configuration Page Parameters

Audio Distribution to All Speakers	<p><i>Note:</i> 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.</p> <p>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.</p>
Intercom Cut Level (dB)	<p>Specifies the volume cut level for intercom calls. The cut level can range from -42 to 0. The default level is -6.</p>
Talkback Gain (dB)	<p><i>Note:</i> This field only applies if viewing, adding, or editing a station that is associated with an NQ-GA10P or an NQ-GA10PV Intercom Module.</p> <p>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.</p>
Microphone Input Gain (dB)	<p><i>Note:</i> 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.</p> <p>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.</p>
Outside Access	<p><i>Note:</i> Nyquist does not display this field when adding or editing an I/O Controller or Matrix Mixer Pre-Amp.</p> <p>Identifies permissions for this station to place outside calls. Parameters are:</p> <ul style="list-style-type: none">• No Access• Restricted• Restricted Day Only• Restricted Night Only• Unrestricted• Unrestricted Day Only• Unrestricted Night Only

Table 37. Station Configuration Page Parameters

911 Route	<p><i>Note:</i> 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.</p> <p>Identifies where 911 calls placed by this station are routed, such as to a specific SIP trunk.</p>
Auth Code	<p><i>Note:</i> Nyquist does not display this field when adding or editing an I/O Controller or Matrix Mixer Pre-Amp.</p> <p>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.</p>
Speaker Extension/Mute Speaker	<p><i>Note:</i> Nyquist does not display this field when adding or editing an I/O Controller or Matrix Mixer Pre-Amp.</p> <p>Identifies the extension of the speaker associated with the station for speaker drop-to-phone feature and the toggle audio distribution feature (*9).</p> <p><i>Note:</i> Only one speaker extension can be associated with a station.</p> <p><i>Note:</i> When a station that is associated with a Speaker Extension initiates a page, the associated speaker will be muted during the page to prevent feedback. For details, see “<i>Speaker Extension Muting</i>” on page 147.</p>
VLAN Configuration	<p><i>Note:</i> 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.</p> <p>Specifies how the station receives its Virtual Local Area Network (VLAN) configuration. Options are:</p> <ul style="list-style-type: none">• Server• Network/Device• Disabled
VLAN ID	<p><i>Note:</i> 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.</p> <p>Identifies the VLAN for this station. The VLAN ID parameters range from 2 through 4094 and pertain to the device’s network interface (not to the ports or stations).</p>

Table 37. Station Configuration Page Parameters

VLAN Priority	<p><i>Note:</i> 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.</p> <p>Identifies the priority for the port. Values range from 0 through 7.</p>
Web Username	<p><i>Note:</i> 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.</p> <p>When applicable, provides a username for logging into the web interface of the device hosting the station.</p>
Web Password Web Password Confirmation	<p><i>Note:</i> 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.</p> <p>When applicable, provides a password for logging into the web interface of the device hosting the station.</p> <p>The minimum length is five characters.</p>
Show Password Show Saved Password (Web Password)	<p>(Add and Edit only) Selecting this button shows the current password to the right of the button for four seconds. If at least one character is typed into the password field, the button label dynamically changes from Show Saved Password to Show Password.</p>
Load Impedance	<p><i>Note:</i> 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.</p> <p>This field is used to select the impedance of the attached load.</p> <p>Select High for devices that use 25V/70V and Low for devices that use 4 Ω or 8 Ω.</p>

Table 37. Station Configuration Page Parameters

Output Power (Watts)	<p><i>Note:</i> This field appears only when adding or editing a station for VoIP speakers, NQ-S1810WBC, NQ-GA10P, NQ-GA10PV, NQ-GA20P2, NQ-GA40P23, two- or four-channel amplifiers, or NQ-PAxxx amplifiers.</p> <p>Selects the channel output power setting.</p> <p>Defaults and settings vary depending on the appliance.</p> <p>For example, VoIP speakers, NQ-GA10P, and NQ-GA10PV devices allow options of 1/8, 1/4, 1/2, 1, 2, 4, and 8W, while NQ-GA20P2 devices also allow 16W and NQ-GA40P3 devices also allow 16W and 32W.</p> <p>The default for these devices is 1/2.</p> <p>For the other applicable devices, the available settings increment by 1 and range from -6 to +6 dB with the default being 0.</p>
Firmware	<p><i>Note:</i> 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.</p> <p>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.</p>
Sites	<p>Provides the sites that this station can view or edit on the Dashboard and in schedules.</p> <p>For NQ-T1100 and NQ-ZPMS Admin Phones, this setting also specifies the site schedules that will be displayed on the phone's display and included in the phone's Schedules menu.</p>
<p><i>Note:</i> The C4000 can be configured to use a different word or phrase in place of "Sites" in most places within the application (see the Schedule Site Settings settings in <i>Table 21, "System Tools,"</i> on page 83).</p>	
Maps	<p><i>Note:</i> This parameter is only displayed for Admin Web Interface stations, and only if the Map feature has been licensed for use.</p> <p>Provides the maps that this station is authorized to view from the dashboard.</p>

Table 37. Station Configuration Page Parameters

Queue Zone	Provides the default zone number for the station that will be used for page queuing (Record Page feature). If a zone number does not appear, the station user will be prompted to enter a zone number.
Announcement Zone	<p><i>Note:</i> 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, or Mobile Device.</p> <p>Announcement Zone overrides the Play to Zone set when creating an announcement.</p> <p>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 350.)</p>
Announcement Zone Configuration Type	<p><i>Note:</i> 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, or Mobile Device.</p> <p>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.</p>
External Relay Trigger	<p><i>Note:</i> This parameter only applies to NQ-GA10P, NQ-GA10PV, NQ-GA400P, NQ-S1810CT-G2 Gen2 VoIP Speaker, and NQ-S1810WT-G2 VoIP Speakers.</p> <p>Specifies if the device should trigger an external relay when audio is present.</p>

Table 37. Station Configuration Page Parameters

Dial Plan Type	<p><i>Note:</i> This parameter only appears when adding or editing a station with Device Type of Cisco SPA112, Cisco ATA191/192-3PW-K9, or Grandstream HT813 Analog Phone FXS Port.</p> <p>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:</p> <ul style="list-style-type: none">• 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.
Auto Dial Extension	<p><i>Note:</i> This parameter only appears when adding or editing a station with Device Type of Cisco SPA112, Cisco ATA191/192-3PW-K9, or Grandstream HT813 Analog Phone FXS Port and Auto Dial has been selected as the Dial Plan Type.</p> <p>Specifies the station extension that will be automatically dialed when the phone is taken off hook.</p>
Dial Plan	<p><i>Note:</i> This parameter only appears when adding or editing a station with Device Type of Cisco SPA112, Cisco ATA191/192-3PW-K9, or Grandstream HT813 Analog Phone FXS Port.</p> <p>This field will display Nyquist Default if the Dial Plan Type is set to Default.</p> <p>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>).</p> <p>If Dial Plan Type is set to Custom, enter the custom dial plan string, which can contain up to 255 characters.</p>
Description	<p>Allows a user description for this station.</p>

Table 37. Station Configuration Page Parameters

Annunciation Station	<p>Specifies the speaker station at which a call-in announcement will be played (“Call from station <calling-extension>”) when <i>this</i> station receives a call.</p> <p>Available options include stations of the following Types:</p> <ul style="list-style-type: none">• VoIP Speaker Only• Analog Call Switch & Speaker• Digital Call Switch & Speaker• Paging-Audio Amp• Paging-Audio-Intercom Module <p><i>Note:</i> If the annunciation station is already busy when a call is received, the announcement will not be played.</p> <hr/> <p><i>Important:</i> Emergency All Call pages will temporarily disable call-in announcements.</p> <hr/>
Add Phase Shift	<p>Indicates whether the generated masking signal will be phase shifted (Yes) or not (No).</p> <p><i>Note:</i> This parameter only appears when adding or editing a Sound Masking station.</p> <hr/> <p>Warning If downward-facing speakers are installed and two amplifier stations are used within the same masking zone, it is critical that either the stations come from different amplifiers (preferable) or the Add Phase Shift setting for the two stations are configured differently (i.e., one Yes, one No). Otherwise, there will be phasing issues or uncontrollable variations in masking levels.</p> <hr/>

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 466).

Table 38. Station Type-specific Configuration Options

Station Type	Available Option(s)
<ul style="list-style-type: none"> • Admin Web Interface • Admin Phone • IP Phone • Analog Phone • Mobile Device 	<p>Announcement Zone Configuration Type and Announcement Zone</p> <p>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.</p>
<ul style="list-style-type: none"> • I/O Controller 	<p>Configure Rules (see "Configuring I/O Controller Input Rules" on page 170 or "Configuring I/O Controller Output Rules" on page 174)</p> <p>Configure Schedule (see "Adding an I/O Contacts Output Daily Schedule" on page 180)</p>
<ul style="list-style-type: none"> • MMPA 	<p>Configure PTT (see "Configuring Devices for Push-To-Talk" on page 182)</p>
<ul style="list-style-type: none"> • Intercom Module (NQ-GA10P, NQ-GA10PV) 	<p>Configure Intercom Module (see "Push-To-Talk Configuration for GA10P or GA10PV Intercom Module" on page 185)</p>
<ul style="list-style-type: none"> • Intercom HDMI Module (NQ-GA10PV) 	<p>Display Configuration and options to configure how the message and clock appear on the monitor (see "Configuring Intercom HDMI Module Display Options" on page 188).</p>
<ul style="list-style-type: none"> • NQ-S1810WBC VoIP Wall Baffle Combo Spkr/Clock/Msg 	<p>WBC Display Configuration (see "Configuring WBC Display Options" on page 195 and "NQ-S1810WBC Flasher Configuration" on page 68)</p>

Figure 40. Edit Station Page

To edit a station's configuration settings:

- 1 From the navigation bar, select **Stations**.
- 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 37, "Station Configuration Page Parameters," on page 149.*
- 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 an alarm sounds, or set a rule that if a doorbell rings an Admin user can trigger another rule that opens the door.

Configure Controller Rules - 0101-IO-CTRL (0101)																			
Inputs																			
Contact #	Enabled	Name	Description	Close Interval	Action	Action Id	Stop On	Zones	Close Extension	Close Contact	Duration	Dashboard Type	Dashboard Title	Dashboard Scope	Dashboard Text	Dashboard Style	Email	Email Account	Synchronize Time
1	Yes	Contact 1	Show	0	Alarm	13	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:00:00
2	Yes	Contact 2	Show	0	Other	None	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:00:00
3	Yes	Contact 3	Show	0	Other	None	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:00:00
4	Yes	Contact 4	Show	0	Other	None	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:00:00
5	Yes	Contact 5	Show	0	Other	None	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:00:00
6	Yes	Contact 6	Show	0	Other	None	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:00:00
7	Yes	Contact 7	Show	0	Other	None	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:00:00
8	Yes	Contact 8	Show	0	Sync-Clock	None	Manual Control	Show	None	None	0	none		Admin	Show	basic			00:30:00

Outputs												
Contact #	Enabled	Name	Description	Trigger	Trigger Id	Zones	Duration	On Time	Days	Control Stations	Close Button Label	Open Button Label
1	Yes	Contact 1	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open
2	Yes	Contact 2	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open
3	Yes	Contact 3	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open
4	Yes	Contact 4	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open
5	Yes	Contact 5	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open
6	Yes	Contact 6	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open
7	Yes	Contact 7	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open
8	Yes	Contact 8	Show	No Trigger	None	Show	0	00:00	Sun	Show	Close	Open

Figure 41. 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**.

Table 39. Configure Controller Rules

Inputs	
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.
Close Interval	Displays how long the input contact must remain closed (in milliseconds) before the Action is started by the I/O Controller.

Table 39. Configure Controller Rules

Action	<p>Displays the action, if any, that is to be taken when the contact is closed. Options are:</p> <ul style="list-style-type: none">• Audio: Starts the selected audio distribution specified by the Program Distribution field. <p><i>Note:</i> When an audio distribution is started, it can be set to stop when the input contact opens, or manually by using the Admin Web Interface or Admin Phone.</p> <ul style="list-style-type: none">• Alarm: Plays the alarm file selected by the Action ID.• Announcement: Plays the announcement file selected by 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. <p><i>Note:</i> 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.</p> <ul style="list-style-type: none">• 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 by 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.• Sync-Clock: Sets the Nyquist server's system time to the value specified in Synchronize Time.
Action ID	<p>Displays identifier for action, such as an alarm or tone number.</p> <p><i>Note:</i> This parameter is only available for Alarm, Announcement, and Tone actions.</p>
Stop On	<p>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.</p>

Table 39. Configure Controller Rules

Zones	<p>Displays the zones that are affected by the action.</p> <p><i>Note:</i> This parameter is only available for Alarm, Announcement, and Tone actions.</p>
Close Extension	<p>Specifies the target I/O Controller to use/operate.</p>
Close Contact	<p>Specifies contact number to close.</p>
Duration	<p>Displays duration of contact closure in milliseconds. A value of 0 means leave contact closed.</p>
Dashboard Type	<p>Specifies if the message appears in the dashboard message pane alone or also in a popup message.</p>
Dashboard Title	<p>Specifies the user-provided title that appears for the dashboard message.</p>
Dashboard Scope	<p>Specifies which devices receive the message. Options are:</p> <ul style="list-style-type: none">• All: All web interface dashboards will receive the message.• Admin: Only Admin web interface dashboards will receive the message.
Dashboard Text	<p>Specifies the user-provided text that appears for the dashboard message.</p>
Dashboard Style	<p>Specifies the icon and color coding that appear with the message. Options are:</p> <ul style="list-style-type: none">• Basic• Success• Info• Warning• Danger
Email	<p>Specifies an email address for notification when an I/O contact is closed.</p> <hr/> <p><i>Tip:</i> To send a text message, use one of the email address formats described in <i>Table 125, "Email Address Formats for Cellular Carriers,"</i> on page 518.</p> <hr/>
Email Account	<p>Specifies the SMTP account to use for sending email.</p>

Table 39. Configure Controller Rules

Synchronize Time If the Action is Sync-Clock, this field specifies the time to which the Nyquist clock should be set when the contact closes.

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 39. Configure Controller Rules

Trigger	<p>Displays the Nyquist system activity that will close the output contact when the activity starts, and will open the output contact when the activity stops.</p> <p><i>Note:</i> 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.</p> <p>Options are:</p> <ul style="list-style-type: none">• 911: A call to 911 has been initiated.• Audio: The selected Program Distribution has started playing.• Alarm: The selected Alarm has been activated.• Announcement: The selected Announcement has been started.• All-Call: An All-Call page has been started.• Multi-Site-All-Call: A Multi-Site All-Call page has been started.• Multi-Site-Emergency-All-Call: A Multi-Site Emergency All-Call page has been started.• Emergency-Call: An Emergency Call has been started.• Emergency-All-Call: An Emergency-All-Call page has been started.• Hourly: Close the contact hourly at the specified minute and second.• Audio-Disabled: Audio has been disabled.• No Trigger: This is the default trigger for outputs that have not yet been configured.• Page: A zone page has been started to the specified Zones.• Tone: The specified Tone has been started.• Manual: Creates a dashboard button that can be used to manually close or open specified output contact.
Trigger Id	Displays the Activity identifier for the output contact trigger (e.g., Alarm number).
Zones	<p>Provides a list of paging zones that trigger an output. If blank, all zones are affected.</p> <p><i>Note:</i> This field only appears when Trigger is set to Page.</p>
Duration	Displays the duration of the contact closure in milliseconds. A value of 0 leaves the contact closed.

Table 39. Configure Controller Rules

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 a unique input rule for each of the I/O Controller's eight inputs.

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** (see Table 40, "Input Contact Rule Parameters," on page 170).
- 6 Select **Save**.

Table 40. 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.

Table 40. Input Contact Rule Parameters

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	Specifies how long the input contact must remain closed (in milliseconds) before the Action is started by the I/O Controller.

Table 40. Input Contact Rule Parameters

Action

Specifies 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 manually 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.
- **Sync-Clock:** Sets the Nyquist server's system time to the value specified in **Synchronize Time**.

Alarms

Specifies the alarm file that plays.

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

Announcements

Specifies the announcement that plays.

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

Table 40. Input Contact Rule Parameters

Tones	Displays the tone that plays. <i>Note:</i> This parameter is only available for a Tone Action .
Program Distribution	Specifies which audio distribution to play. <i>Note:</i> This parameter is only available if the Action is set to Audio .
Stop On	Sets how the Action is stopped. Options are: <ul style="list-style-type: none">• Manual Control: You must manually stop the action.• Contact Open: Action automatically stops when the relevant input contact is opened.
Zones	Specifies the zone that is affected by the action. <i>Note:</i> This parameter is only available for Alarm, Announcement, and Tone actions, and only a single zone can be added for an input rule.
Synchronize Time	Specifies the time to which the Nyquist clock should be set when the relevant input contact closes.
Close Extension	Specifies which target I/O Controller to use/operate.
Close Contact	Specifies which contact number to close on the target I/O Controller.
Duration	Specifies duration of target output contact closure in milliseconds. A value of zero (0) means leave contact closed.
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: <ul style="list-style-type: none">• 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 40. Input Contact Rule Parameters

Dashboard Style	Specifies the icon and color coding that appear with the message. Options are: <ul style="list-style-type: none">• Basic• Success• Info• Warning• Danger
Email	Specifies an email address for notification when an input contact is closed. <hr/> <i>Tip:</i> To send a text message, use one of the email address formats described in <i>Table 125, "Email Address Formats for Cellular Carriers," on page 518.</i> <hr/>
Email Account	Specifies the SMTP account to use for sending email.

Configuring I/O Controller Output Rules

You can configure a unique output rule for each of the I/O Controller's eight outputs.

To configure an I/O Controller Output 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 output contact that you want to configure.
- 5 On the Edit Controller Rule page, complete the desired Output Contact Rule Parameters (see *Table 41, "Output Contact Rule Parameters," on page 174*).
- 6 Select **Save**.

Table 41. 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.

Table 41. Output Contact Rule Parameters

Contact Type	Displays that the contact is an 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.
Trigger	Select the Nyquist system activity that will close the output contact when the activity starts, and will open the output contact when the activity stops.

Note: If duration is greater than 0, the output contact opens after the specified number of 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.

Options are:

- **911:** A call to 911 has been initiated.
- **Audio:** The selected Program Distribution has started playing.
- **Alarm:** The selected Alarm has been activated.
- **Announcement:** The selected Announcement has been started.
- **All-Call:** An All-Call page has been started.
- **Multi-Site-All-Call:** A Multi-Site All-Call page has been started.
- **Multi-Site-Emergency-All-Call:** A Multi-Site Emergency All-Call page has been started.
- **Emergency-Call:** An Emergency Call has been started.
- **Emergency-All-Call:** An Emergency-All-Call page has been started.
- **Hourly:** Close the contact hourly at the specified minute and second.
- **Audio-Disabled:** Audio has been disabled.
- **No Trigger:** This is the default trigger for outputs that have not yet been configured.
- **Page:** A zone page has been started to the specified Zones.
- **Tone:** The specified Tone has been started.
- **Manual:** Creates a dashboard button that can be used to manually close or open specified output contact.

Table 41. Output Contact Rule Parameters

On Time	Use the down arrows to select the Minute and Second if the Trigger 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. This parameter appears only if the Trigger is set to Hourly .
Zones	Specifies which paging zones trigger the output contact closure if the Trigger is set to Page . If left blank, any zones started trigger the output contact closure.
Tones	Specifies which tone triggers the output contact closure when the Trigger is set to Tone .
Announcements	Specifies which announcement triggers the output contact closure when the Trigger is set to Announcement .
Alarms	Specifies which alarm triggers the output contact closure when the Trigger is set to Alarm .
Program Distribution	Specifies which audio distribution triggers the output closure when the Trigger is set to Audio .
Duration	Provide the duration of the contact closure in milliseconds. A value of 0 leaves the contact closed until the triggering event ends.
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.

Sample I/O Controller Configuration Rules

The following sections describe scenarios that can be achieved using I/O Controller Configuration Rules.

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 170) using the following parameters:

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

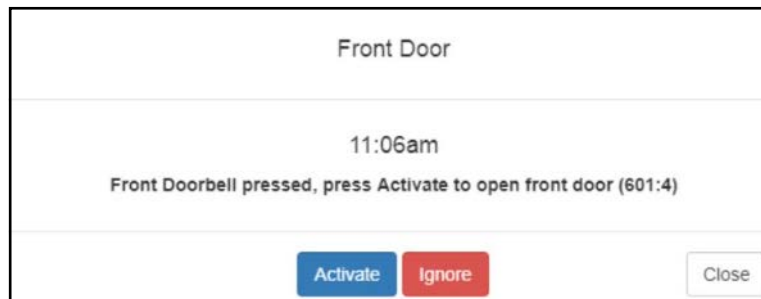


Figure 42. Example of Dashboard Message

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

Synchronizing Nyquist Server Time to an I/O Input Contact Closure

An I/O Controller Input Contact can be used to synchronize the Nyquist server's clock to a specified time whenever the I/O Input Contact is closed.

You can create an I/O Controller Input Rule using action **Sync-Clock**, defining the **Synchronize Time** property as the value (i.e., time) to which the Nyquist system clock should be set when the I/O Contact closes. The **Synchronize Time** field is expressed in 24-hour military time format: HH:MM:SS.

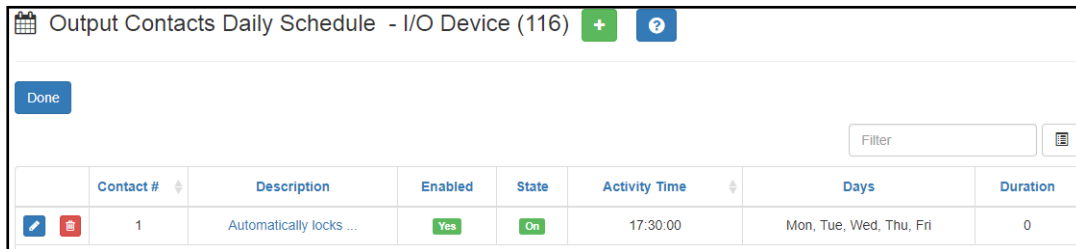
For example, if the **Synchronize Time** is defined as "23:00:00", when the I/O Contact closes, the Nyquist server's system clock will be set to 23:00:00 (or 11:00:00 p.m.).

Caution Only the time will be set on the Nyquist server, not the date. This could cause issues if the contact closure occurs shortly before or after 00:00:00 (server time), as clock drift may result in a different date than intended. For best results, set the **Synchronize Time** at least several minutes before or after midnight.

Important: Set the Input Contact's **Close Interval** to at least 1000 (1 second) to compensate for the 1-second delay when setting the **Synchronize Time** field. Setting the clock happens very fast, the only delay you should see is the Close Interval delay.

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 scheduling a output contact event, see "Adding an I/O Contacts Output Daily Schedule" on page 180.



Contact #	Description	Enabled	State	Activity Time	Days	Duration
1	Automatically locks ...	Yes	On	17:30:00	Mon, Tue, Wed, Thu, Fri	0

Figure 43. 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 42. 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 output contact closure schedule for 7:30 a.m. Monday through Friday. When the Activity Time occurs, the contact is closed, which in turn triggers a third-party contact switch that unlocks the door.

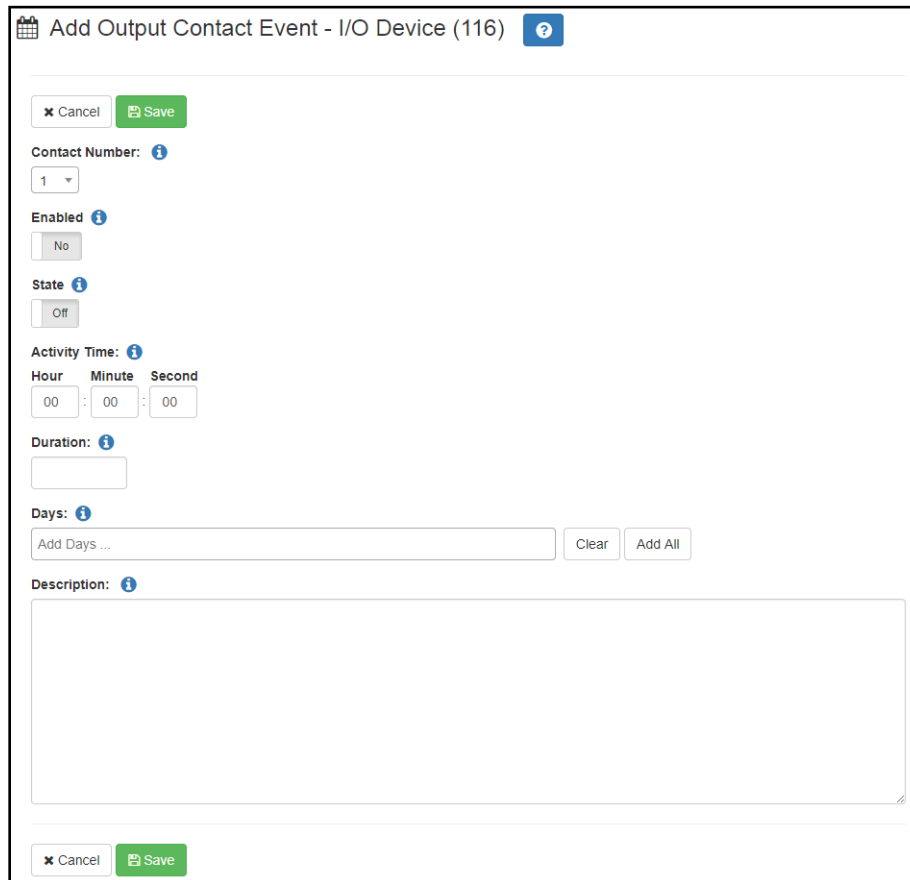


Figure 44. Add Output Contact Event Page

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 (*Table 43, "Add or Edit I/O Contact Output Event Parameters," on page 181*).

- 6 Select **Save**.

Table 43. 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: <ul style="list-style-type: none">• 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 43, "Add or Edit I/O Contact Output Event Parameters," on page 181.*)
- 6 Select **Save** to return to the I/O Contact Output Daily Schedule page.

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 Devices for Push-To-Talk

Push-To-Talk (PTT) functionality can be configured for the Matrix Mixer Pre-Amp and the GA10P/GA10PV Intercom Modules.

Push-To-Talk Configuration for a Matrix Mixer Pre-Amp (MMPA)

The screenshot shows a web interface titled "Edit Push To Talk Configuration". It features several configuration options, each with an information icon (i) to its right:

- Push To Talk Channel:** A text input field containing the number "4".
- Push To Talk Type:** A dropdown menu currently showing "Zone-Page".
- PTT Audio Source for Mixer Output:** A dropdown menu currently showing "Analog".
- PTT Output:** A dropdown menu currently showing "Line-Out".
- Push To Talk Zone:** A dropdown menu currently showing "Zone-1: Zone 1".
- IP Address:** A text input field with a blue copy icon to its right.

At the bottom of the form, there are two buttons: a grey "Cancel" button and a green "Save" button.

Figure 45. Push-To-Talk Configuration Page (MMPA)

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 Specify parameters from the Edit Push To Talk Configuration page. For details, see *Table 44, "MMPA Push-To-Talk Configuration Parameters," on page 184.*
- 5 Select **Save**.

Table 44. MMPA Push-To-Talk Configuration Parameters

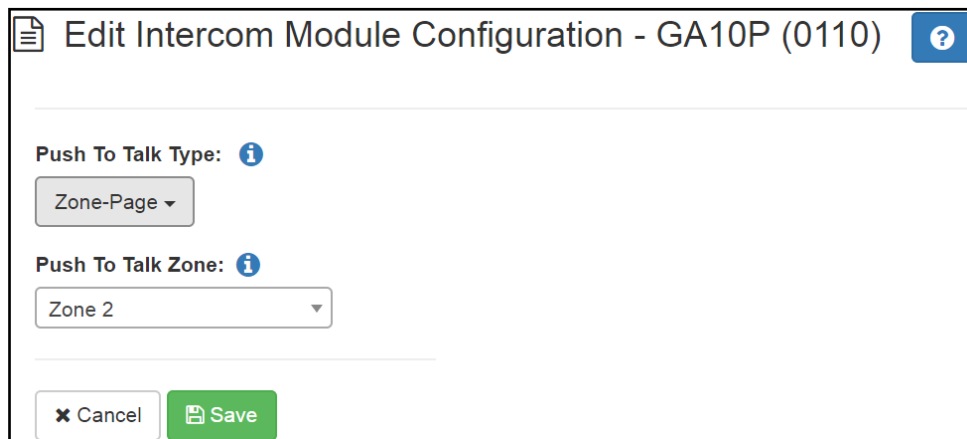
Push To Talk Channel	Channel 4 is the only available PTT channel.
Push To Talk Type	<p>Select the type of activity that is performed when the button is pressed on the microphone. Options are:</p> <ul style="list-style-type: none">• Disabled• Analog-Output• All-Call-Page• Emergency-All-Call-Page• Zone-Page• Record-Zone-Page• Multi-Site-All-Call-Page• Multi-Site-Emergency-All-Call-Page <p><i>Note:</i> For all selections other than Disabled, the DSP Router settings of the device are overridden to route the PTT microphone input signal (Analog 4) to the output channel (Analog 1).</p> <hr/> <p><i>Tip:</i> To prevent the PTT microphone signal from being sent to the network, select Analog-Output. All other settings (other than Disabled) will send the PTT microphone signal over the network.</p> <hr/>
PTT Audio Source for Mixer Output	<p><i>Note:</i> This field does not appear if Push To Talk Type is set to Disabled or Analog-Output.</p> <p>Specifies whether the PTT microphone signal is sent to the network output or both the analog and network outputs.</p> <p>If Analog is selected, the PTT microphone input is routed as specified in the PTT Output setting as well as being sent over the network.</p> <p>If Network is selected, the PTT microphone input is routed only through the network. Note that this could create a small but noticeable delay.</p>
PTT Output	<p>Selects the output used for locally playing PTT-initiated paging if either Push To Talk Type is Analog-Output or PTT Audio Source for Mixer Output is Analog. Options are:</p> <ul style="list-style-type: none">• Disabled• Line-Out

Table 44. MMPA Push-To-Talk Configuration Parameters (Continued)

Push To Talk Zone	<i>Note:</i> This field appears only if Push To Talk Type is set to Zone-Page . Select the zone to receive the page.
IP Address	Displays the IP address of the device, if known, and a Link button that allows you to start the device's UI. If the Nyquist server has not discovered the device's IP address, the Link button does not appear.

Push-To-Talk Configuration for GA10P or GA10PV Intercom Module

If you have added an NQ-GA10P or NQ-GA10PV Intercom Module with a station type of Push-To-Talk Microphone, you can select the type of page that can be made when the PTT microphone is active.



The screenshot shows a web form titled "Edit Intercom Module Configuration - GA10P (0110)". It contains two configuration fields, each with an information icon (i):
1. "Push To Talk Type:" with a dropdown menu currently showing "Zone-Page".
2. "Push To Talk Zone:" with a dropdown menu currently showing "Zone 2".
At the bottom of the form, there are two buttons: a "Cancel" button with a close icon (x) and a "Save" button with a save icon (floppy disk).

Figure 46. 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 Specify parameters from the Edit Intercom Module Configuration page (see *Figure 45, "Edit Intercom Module Configuration Parameters,"* on page 186).
- 5 After making your edits on the Edit Intercom Module Configuration page, select **Save**.

Table 45. Edit Intercom Module Configuration Parameters

Push To Talk Type Select the type of pages that can be made from the microphone. The available 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.

Note: This option is only available when Push To Talk Type is Zone-Page or Record-Zone-Page.

Configuring Ambient Noise Sensor

The Ambient Noise Sensor (ANS) 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.

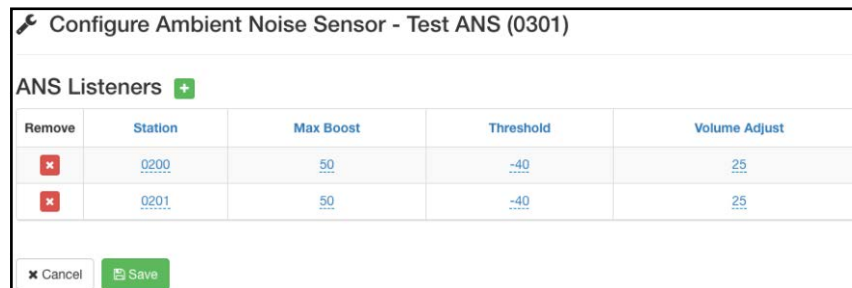


Figure 47. Configure Ambient Noise Sensor

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 70).

Then, create a station with **Type** as **Ambient Noise Sensor** and **Device Type** as **NQ-GA10P-Intercom Module** or NQ-GA10PV-Intercom HDMI Module (see “Adding a Station” on page 198).

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 46. 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 –42 disables any volume adjustments from the ambient noise sensor. The default value is 0 dB.
Threshold (dBFS)	Displays the <i>decibels relative to full scale</i> (dBFS) value at which the device will adjust the volume to compensate for the increased ambient noise volume. This value should be between –42 and 0 dBFS. A fairly noisy environment is approximately –20 dBFS. Quiet environments are approximately –42 dBFS. The default value is –24 dBFS.

Table 46. Configure Ambient Noise Sensor Parameters (Continued)

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 561).

You can also configure it to automatically display the check-in status map during an active check-in process (e.g., a lockdown), allowing staff and emergency personnel to quickly and easily view check-in status information. To enable the check-in status map, set **Check-In Enabled** to **Yes** on the GA10PV's *Display Configuration* page. You can also select what will be displayed during the check-in process; the available configuration settings are similar to those available on the Manage Check-In page (see *"Manage Check-In"* on page 587).

Display Configuration - 0112-GA10PV (0112) ?

Type: i
Analog Clock ▾

Date Format: i
MMM DD, YYYY ▾

Show Date: i
 Yes

Show Event: i
 Yes

Show Seconds: i
 Yes

Background Color: i
rgb(255,255,255)

Text Color: i
rgb(0,0,0)

Text Font: i
Gelasio ▾

Text Size: i
70

Check-In Enabled: i
 No

Check-In Font Size Minimum: i
50

Check-In Show Name: i
 Yes

Check-In Show Not Checked In Only: i
 No

Check-In Show Vacant: i
 Yes

Check-In Show Excluded: i
 No

Figure 48. 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**.
- 4 After making your edits on the Display Configuration page, select **Save**.

Table 47. Display Configuration

Type	<p>Select one of the five layouts available:</p> <ul style="list-style-type: none">• 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	<p>Select the format for displaying the date. Available formats are:</p> <ul style="list-style-type: none">• 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	<p>Use the slider to select if the date will be displayed.</p>
Show Event	<p>Use the slider to select if the scheduled events will be displayed. (See <i>"Understanding Event Settings"</i> on page 294.)</p>
Show Seconds	<p>Use the slider to select if seconds will be displayed on the clock.</p>
Background Color	<p>Select a background color for the display. You can select a color by:</p> <ul style="list-style-type: none">• 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.) <p>For more information, see <i>"Using Color in Display Messages"</i> on page 567.</p>

Table 47. Display Configuration

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 567.

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.

This value 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 567.

Table 47. Display Configuration

Time Font	<p>Select a font for the time from the drop-down list. Available fonts are:</p> <ul style="list-style-type: none">Comic-ReliefCourier-PrimeGelasioLiberation SansLinux Libertine
Time Size	<p>Select the font size for the time.</p> <p>This value is based on font points, with 72 points being an inch.</p>
Check-In Enabled	<p>If set to Yes, the GA10PV will automatically display check-in status during an active check-in procedure while disabling the display of clock and messages.</p>
Check-In Font Size Minimum	<p>The Minimum Font Size specifies the minimum font size to use during scaling (do not scale below the minimum specified value).</p> <p>Stations displayed on the check-in status screen will automatically be scaled in an attempt to fit as many stations on the available screen space as possible. The minimum font size can help ensure that the font is large enough to read the station list from the anticipated viewing distance while attempting to fit as many stations on the display as possible.</p> <p>This value is based on font points, with 72 points being an inch.</p>
Check-In Show Name	<p>If set to Yes, station names will be displayed under the station extension.</p> <p>Hiding station names may allow you to fit more stations on the screen.</p>
Check-In Show Not Checked In Only	<p>If set to Yes, stations that have not checked in will be displayed, while stations that have checked in will not be displayed.</p> <p>This option can help fit more stations on the screen.</p>

Table 47. Display Configuration

Check-In Show Vacant	<p>If set to Yes, stations that are marked as vacant will also be displayed.</p> <p>If a vacant station checks in, it will be displayed as checked-in (green) instead of vacant.</p>
Check-In Show Excluded	<p>If set to Yes, stations that are excluded from the check-in process will also be displayed.</p>

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.

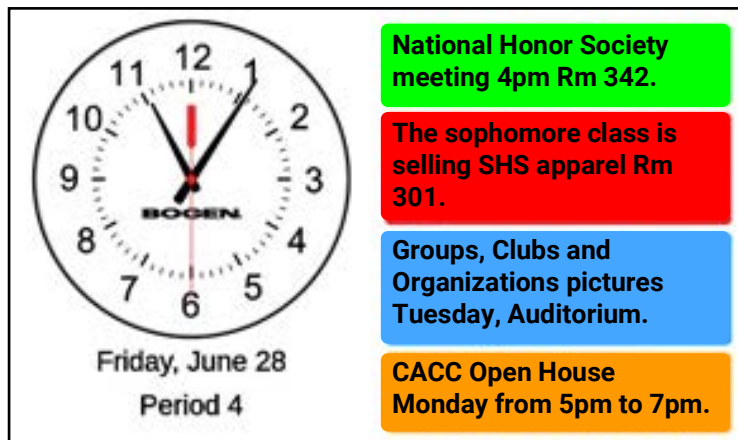


Figure 49. Example of Display with Analog Clock

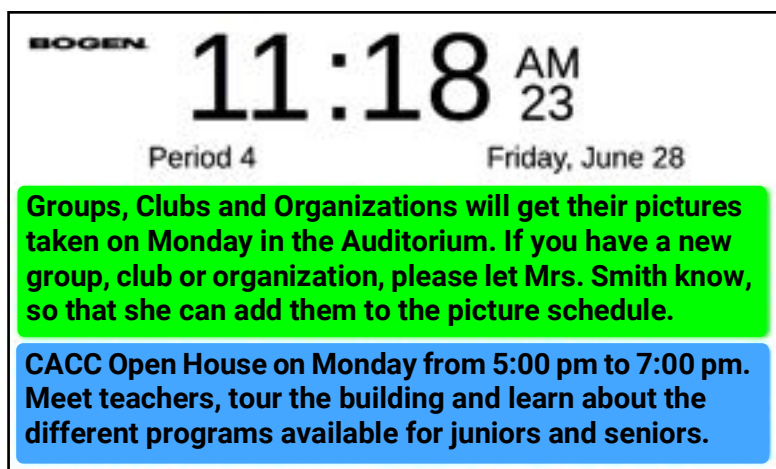


Figure 50. Example of Display with Digital Clock

Groups, Clubs and Organizations will get their pictures taken on Monday in the Auditorium. If you have a new group, club or organization, please let Mrs. Smith know, so that she can add them to the picture schedule.

CACC Open House on Monday from 5:00 pm to 7:00 pm. Meet teachers, tour the building and learn about the different programs available for juniors and seniors.

Figure 51. Example of Single Column Display

Groups, Clubs and Organizations will get their pictures taken on Monday in the Auditorium. If you have a new group, club or organization, please let Mrs. Smith know, so that she can add them to the picture schedule.

Groups, Clubs and Organizations will get their pictures taken on Monday in the Auditorium. If you have a new group, club or organization, please let Mrs. Smith know, so that she can add them to the picture schedule.

Figure 52. Example of Two Column Display

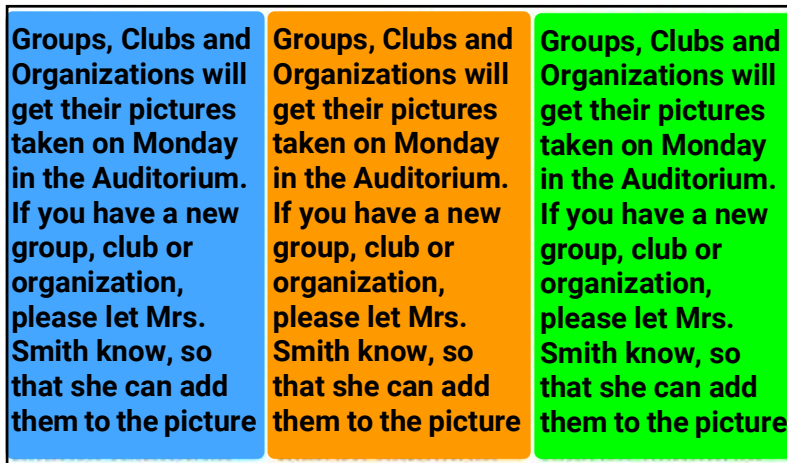


Figure 53. Example of Three Column Display

Configuring WBC Display Options

The NQ-S1810WBC includes an LED display and flasher, which have several configurable settings. These settings can be configured via the WBC Display Configuration page or via a Routine, which might be executed in response to a System Event (e.g., Emergency All-Call, etc.) or as part of a calendar schedule (see *"Adding a Schedule" on page 287*) or as a scheduled routine (see *"Add a Scheduled Routine" on page 310*).

Important: Be aware that the NQ-S1810WBC's LED display can only display uppercase characters. Lowercase characters are allowed as input, but will display as uppercase.

WBC Display Configuration - WBC (220)

Enable Clock Display: **i**
Yes

Clock Time Format: **i**
12 Hour

Show Clock Seconds: **i**
Yes

Enable Flasher Use: **i**
Yes

Message LED Brightness: **i**
Medium

Flasher LED Brightness: **i**
High

Cancel Save

Figure 54. WBC Display Configuration

To configure the LED display and flasher:

- 1 On the navigation bar, select **Stations**.
- 2 Select the **Edit** icon for the NQ-S1810WBC device that you want to configure.
- 3 Select **WBC Display Configuration**.
- 4 Complete the configuration parameters for the station. Parameters are described in *Table 48, "WBC Display Configuration," on page 197.*

Table 48. WBC Display Configuration

Enable Clock Display	<p>Specify Yes if the clock will be enabled (i.e., displayed) or No if it will be disabled (i.e., hidden).</p> <p>When the clock is disabled, the WBC can still be used to display messages and LED flashers.</p>
Clock Time Format	<p>Specify 12 Hour to display the clock in AM/PM format or 24 Hour to display the clock in 24-hour (i.e., military time) format.</p>
Show Clock Seconds	<p>Specify Yes to display seconds or No to hide them.</p>
Enable Flasher Use	<p>Select Yes to enable the LED flasher or No to disable it.</p> <p>If disabled, the LED flasher will never be illuminated, even if requested.</p>
Message LED Brightness	<p>Specify the brightness level of the red message LEDs on the display.</p> <p>Valid values are:</p> <ul style="list-style-type: none">• Off• Low• Medium• High
Flasher LED Brightness	<p>Specify the brightness level of the message LEDs.</p> <p>Valid values are:</p> <ul style="list-style-type: none">• Low• Medium• High

Deleting a Station

Note: You cannot delete a station that is used in a routine **Action** (see “*Understanding Action Parameters*” on page 495).

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 is 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 or ATA191/192-3PW-K9 Analog Telephone Adapter (ATA), the Nyquist system server reboots the ATA device. If the Nyquist system server does not know the ATA device's IP address, you must reboot the device for the changes to take effect on that device.

When a station is deleted from an ATA device, it can take several minutes for the changes to show up on the device's web interface. When the second station is deleted from the device, 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**.

Adding a Station

Using the Nyquist system server's TFTP-based automatic discovery and configuration 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.

Important: If TFTP-based discovery is not possible, we recommend that stations be added using the "*Appliance Discovery Wizard*", as described on page 143.

Station SIP Registration Password

Stations that will initiate or receive SIP calls must register with the Nyquist C4000 server each time they become available (e.g., after connecting to the network). To prevent unauthorized SIP clients from registering, a **Registration Password** is assigned to each station, and the Nyquist server, which remembers each station's password, authenticates the password during each station registration.

Although each station can have a distinct registration password, it is very common to assign the same password to all SIP stations. To simplify manual configuration of stations, the C4000's **Default Registration Password** can be configured in the *System Parameters* page (see Table 20, "Edit System Parameters Page," on page 72). When a station is added, if its **Registration Password** is specified, it will be used (Table 37, "Station Configuration Page Parameters," on page 149); but if not, the **Default Registration Password** will be used.

Caution If you are using a password manager to auto-fill your C4000 password (e.g., your browser asks if you want it to remember your login credentials), it may auto-fill your registration password with your login password when adding or editing a station.

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 newly detected station that you want to configure.

Important: Non-Nyquist devices, such as phones, do not appear under **New Stations**. Stations must be manually added and configured for these devices by specifying the MAC address of each. Once added, the phone should be connected to the network, where it can use the TFTP auto-configuration feature to download the configured Station settings.

- 4 Complete the configuration parameters that are not automatically configured. Parameters are described in Table 37, "Station Configuration Page Parameters," on page 149.

Note: If this new appliance is replacing an existing one, see "Swapping a Nyquist Device" on page 200.

- 5 When prompted, enter the Web Interface password.
- 6 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 37, "Station Configuration Page Parameters," on page 149.

Important: Make sure to select the correct **Type** and **Device Type**, as these cannot be modified once the station has been created.

Tip: Some Device Type-specific options are not available while adding the device (see Table 38, "Station Type-specific Configuration Options," on page 163). To access these options, add the new device, then edit its settings (see "Editing Station Configuration Settings" on page 162).

- 4 Select **Save**.

Swapping a Nyquist Device

Through the **New Stations** option, you can replace an existing device with an identical replacement 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, but you cannot 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. You can also replace an earlier generation 2- or 4-channel amplifier with a later generation amplifier, assuming the number of channels is the same. For example, you can replace an NQ-A2060 with an NQ-A2300 G2.

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.

Tip: If possible, upgrade both the original and replacement devices' firmware to the latest version before swapping in the new device. This will improve compatibility and help ensure the conversion will be successful. This is particularly important for pre-1.2.1647 firmware releases, for which the configuration will not be preserved.

Using a Cisco SPA112 or ATA191/192 Analog Telephone Adapter

The Cisco SPA112 and ATA191/192-3PW-K9 Analog Telephone Adapters (ATAs) allow an analog phone to access IP phone services through two standard telephone RJ-11 phone ports.

The following limitations exist when a Cisco ATA 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 ATA 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 ATA device, the Nyquist system server reboots the device. If the Nyquist system server does not know the device's IP address, you must manually reboot the device for the changes to take effect on that device.
- When a station is added to the ATA device, 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 ATA device, 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 ATA device.

- When you delete the second station from the ATA device, 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.
- When you configure two stations on the same ATA device, the second station (Phone 2) uses port # 5061.
- It can take several minutes for changes to show up on the ATA device's web interface when adding, modifying, or deleting stations to or from the device.
- When you add a station to an ATA device for the first time, you must reboot the device after adding the station with the Nyquist web UI before the device will retrieve its configuration information.
- If station VLAN settings are provided and two stations are defined on the ATA device, 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.

Tip: Refer to the *Cisco Small Business SPA100 Series Phone Adapters Administration Guide* or the *Cisco ATA 191 and ATA 192 Analog Telephone Adapter Administration Guide for Multiplatform Firmware* for instructions on connecting the ATA.

To add a Cisco SPA112 or Cisco ATA191/192-3PW-K9 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 ATA device'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** or **Cisco ATA191/192-3PW-K9**.
 - c) For **MAC Address**, enter the MAC address of the Cisco SPA112 or Cisco ATA191/192-3PW-K9.

Note: The MAC address can be found on the Voice → Information tab of the device's Phone Adapter Configuration Utility (see subsequent steps).

- d) For **Dial Plan Type**, select **Custom**, and for **Dial Plan**, specify the following value:

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)

For all other parameters, see *Table 37, "Station Configuration Page Parameters,"* on page 149.

- 4 If you would like to create a second station for this ATA device (it supports up to two lines), repeat the previous steps, providing the same MAC address but a different extension.
- 5 Select **Save**.
- 6 From your web browser, enter the IP address of the Cisco SPA112 or Cisco ATA191/192-3PW-K9 device.



Figure 55. Cisco SPA112 or Cisco ATA191/192-3PW-K9 Login Window

- 7 Log into the device.

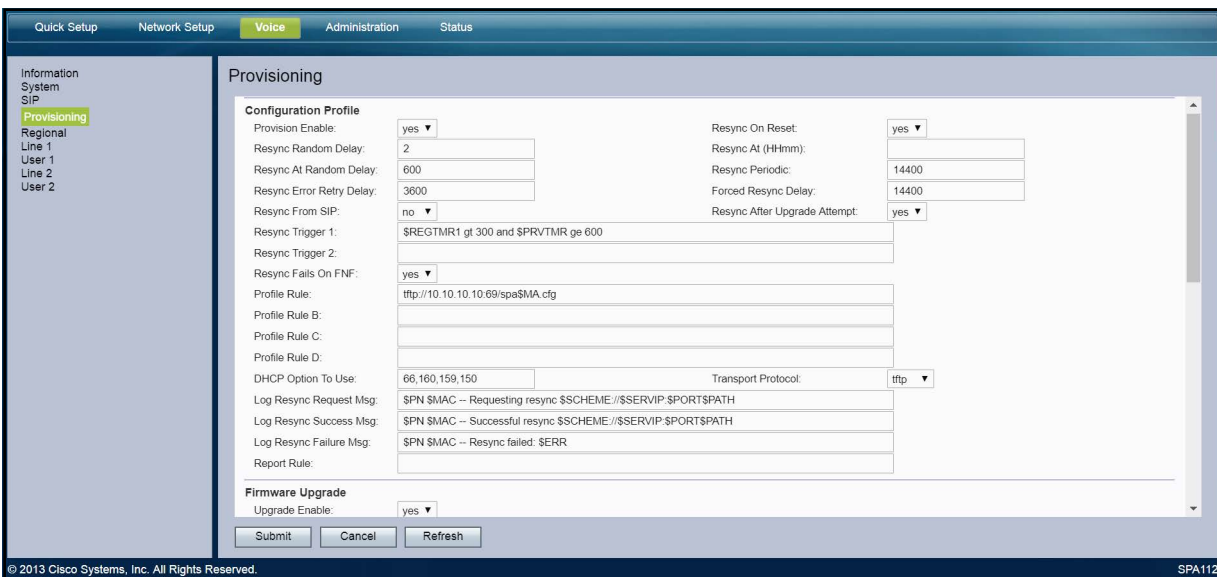


Figure 56. Provisioning Settings

- 8 Select the **Voice** tab, and then select **Provisioning**.
- 9 Set the **Profile Rule** value to `tftp://<nyquist-sysctr1-ip>:69/spa$MA.cfg`, replacing `<nyquist-sysctr1-ip>` with the IP address of the C4000 System Controller.
- 10 Set **Transport Protocol** to **tftp**, and then select **Submit** to reboot the device.
- 11 Verify that the device has been provisioned.
 - On the device, select the **Voice** tab and then select **Information**. Scroll to the bottom of the page and verify that **Provisioning Status** is set to *Successful*. Verify that **Registration State** under **Line 1 Status** (and **Line 2 Status**, if two stations are being added) indicates *Registered*.
 - On the System Controller, navigate to the **Stations** tab and press the **Stations Status** button. On the *Stations Status* page, find the device. Ensure its Status says "Not in use" in green.
- 12 Log back into the device. The C4000 system server will have set the following parameters:
 - Quick Setup → Line 1 (and optionally Line 2) → Proxy
 - Quick Setup → Line 1 (and optionally Line 2) → Display Name
 - Quick Setup → Line 1 (and optionally Line 2) → User ID
 - Quick Setup → Line 1 (and optionally Line 2) → Password
 - Quick Setup → Line 1 (and optionally Line 2) → Dial Plan
 - Network Setup → Basic Settings → Connection 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://<nyquist-sysctr1-ip>:69/spa\$MA.cfg"
 - Voice → Provisioning → Resync From SIP → "no"
 - Voice → Line 1 (and optionally Line 2) → Mailbox ID → `<nyquist-station-extension-number>`
 - Voice → Line 1 (and optionally Line 2) → Mailbox Subscribe URL → `<nyquist-server-ip-address>`
 - Voice → Line 1 (and optionally Line 2) → Proxy → `<nyquist-server-ip-address>`
 - Voice → Line 1 (and optionally Line 2) → Subscriber Information → Display Name, User ID, Password
 - Voice → Line 1 (and optionally Line 2) → Dial Plan
 - Administration → Management → User List → password for username = `admin`

13 Log out of the device.

Note: Each time the ATA device is rebooted, it will retrieve the configuration settings from the Nyquist System Controller.

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/hubfs/Product_Documentation/HT813_User_Guide.pdf
- https://www.grandstream.com/hubfs/Product_Documentation/HT813_Administration_Guide.pdf
- <https://www.grandstream.com/products/gateways-and-atas/analog-telephone-adaptors/product/ht813>
- <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 205*)
- 2 Configure a Nyquist Station to use the HT813 FXS port (see *"Configure station to use HT813 FXS port" on page 206*)
- 3 Configure a Nyquist SIP Trunk to use the HT813 FXO port (see *"Configure SIP Trunk to use HT813 FXO port" on page 209*)

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.

- 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.

- 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.
- On the HT813 "Basic Settings" page, configure the HT813's static IP address.
- 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 206).
- 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 206 and "Configure SIP Trunk to use HT813 FXO port" on page 209 for details.

Grandstream Device Configuration

[STATUS](#)
[BASIC SETTINGS](#)
[ADVANCED SETTINGS](#)
[FXS PORT](#)
[FXO PORT](#)

New Admin Password: (purposely not displayed for security protection)

Confirm Admin Password:

802.1Q/VLAN Tag: (0-4094)

Layer 2 QoS: SIP 802.1p: (0-7)
 RTP 802.1p: (0-7)

Black List for WAN Side Port:

STUN server is: (URI or IP:port)

Keep-alive Interval: (in seconds, default 20 seconds)

Use STUN to detect network connectivity: No
 Yes, total STUN response misses to restart DHCP (minimum=3)

Use DNS to detect network connectivity: No Yes

Verify host when using HTTPS: No Yes

Firmware Upgrade and Provisioning: Upgrade Via TFTP HTTP HTTPS FTP FTPS

Firmware Server Path:

Config Server Path:

Figure 57. Grandstream Device Configuration Advanced Settings

Configure station to use HT813 FXS port

- From the navigation bar, select **Stations**.
- From the Station page, select the **Add** icon.

- 3 Add a new Station for the FXS port using the station settings specified in *Table 49, "Add Station Properties to use HT813 FXS port,"* on page 207 (which only details HT813-specific fields).
- 4 Press the **Save** button.
- 5 Reboot the HT813 device (see *"HT813 Device Reboot Required after making changes"* on page 211).

Table 49. 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".
MAC Address	<p>Enter the HT813's LAN MAC Address.</p> <p>This address can be obtained by viewing the HT813's Status page (see <i>"Grandstream Device Configuration Status Page"</i> on page 209).</p> <p>Please make sure you enter the LAN MAC Address, not the WAN MAC Address.</p> <p><i>Note:</i> The HT813 uses the LAN MAC Address for configuration file names, even when the WAN Port is used to connect it to the network.</p>
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 as a SIP client. The Nyquist server will remember the registration password for each station.

Table 49. Add Station Properties to use HT813 FXS port

Web Password	Enter a new password to be used by the HT813's web interface.
Web Password Confirmation	<p>Since the default password for the HT813 web interface is "admin", we strongly recommend that you change it for security reasons.</p> <p><i>Note:</i> Changing the "Web Username" is not supported. Any value you enter in the "Web Username" field that differs from "admin" will be ignored.</p>
Dial Plan Type	<p>You may change the dial plan type to meet your requirements.</p> <p>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.</p> <p>If you select "Custom" to create a custom dial plan, refer to the Grandstream HT813 Administration Guide (https://www.grandstream.com/hubfs/Product_Documentation/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 "Nyquist DTMF Feature Dialing Codes" on page 632).</p>

Grandstream Device Configuration

[STATUS](#) [BASIC SETTINGS](#) [ADVANCED SETTINGS](#) [FXS PORT](#) [FXO PORT](#)

MAC Address: WAN -- 00:0B:82:E9:E6:D2 LAN -- 00:0B:82:E9:E6:D1 (**Device MAC**)
WAN IPv4 Address: 10.10.5.59
WAN IPv6 Address:
Product Model: HT813
Serial Number:
Hardware Version: V1.1A Part Number -- 9610006311A
Software Version: Program -- 1.0.5.2 Bootloader -- 1.0.5.1 Core -- 1.0.5.2 Base -- 1.0.5.2
 CPE -- 1.0.1.139
Software Status: Running Mem: 19896
System Up Time: 13:59:47 up 5:19
PPPoE Link Up: Disabled
 NAT: Unknown NAT

Port Status:

Port	Hook	User ID	Registration
FXS	On Hook	551	Registered
FXO	Not Connected	ht813-82e9e6d1	Registered

Port Options:

Port	DND	Forward	Busy Forward	Delayed Forward
FXS	No			

Provision: Not running, Last status : Downloading file from url.
Core Dump: Clean

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Figure 58. 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 *Table 50, "Add SIP Trunk Properties to use HT813 FXO port," on page 210.*
- 4** Press the **Save** button.
- 5** Reboot the HT813 device (see *"HT813 Device Reboot Required after making changes" on page 211*).

Note: The HT813 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 206*).

Table 50. Add SIP Trunk Properties to use HT813 FXO port

Name	<p>The name must match the following format:</p> <p style="text-align: center;"><code>ht813-<last-8-digits-of-HT813-LAN-MAC-Address></code></p> <p>For example, if the HT813's LAN MAC address is <code>000b82e9e6d1</code>, the name must be:</p> <p style="text-align: center;"><code>ht813-82e9e6d1</code></p> <p><i>Note:</i> 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.</p>
Extension	Select a previously created DISA Station extension.
Username	<p>Set this equal to the SIP Trunk's Name field.</p> <p>Example:</p> <p style="text-align: center;"><code>ht813-82e9e6d1</code></p>
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 <i>"Grandstream Device Configuration Status Page" on page 209</i>).
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	<p>While displaying the HT813's Status page, copy the MAC address information from the HT813's Status page into the "Custom Settings" field.</p> <p>Sample MAC address information copied from HT813 Status page:</p> <p style="text-align: center;">WAN - 00:0B:82:E9:E6:D2 LAN - 00:0B:82:E9:E6:D1</p> <p>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.</p>

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 (*"Grandstream Device Configuration Advanced Settings" on page 206*). 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

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 system supports the use of the Yeastar TA2400 FXS VoIP Gateway to integrate 24 standard analog phones into your IP communications system.

Note: Quantum/Multicom MCESS and MCWESS phones are not supported by this device.

To install the gateway, refer to the Yeastar TA2400 installation guide at:

https://www.yeastar.com/download/TAXX00/Yeastar_TA1600&2400&3200_V3_Installation_Guide_en.pdf

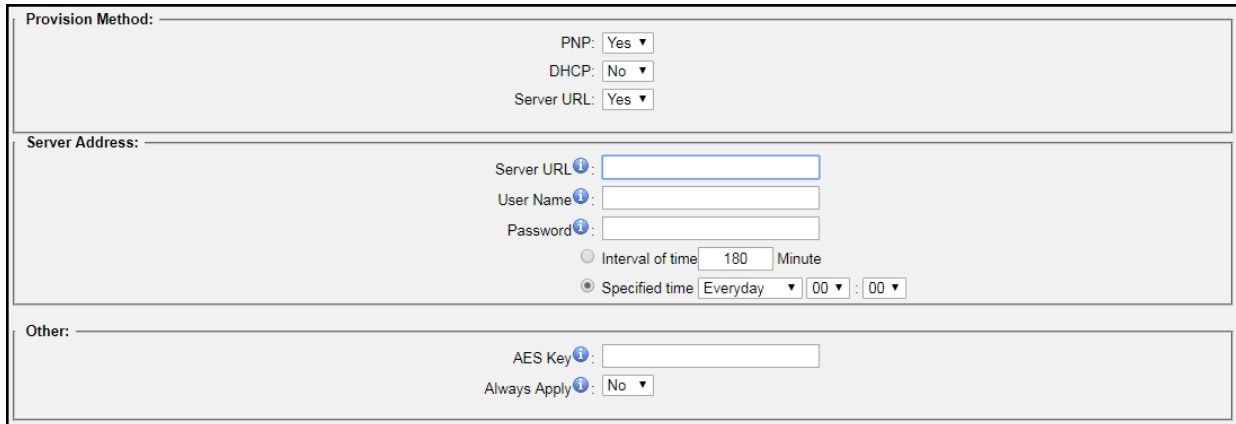
To configure the Yeastar TA2400 for use with the Nyquist system, you first set up the Yeastar TA2400 to retrieve configuration from the Nyquist server. (See *"Connect the Yeastar TA2400 to the Nyquist Server" on page 212*.) Then, you add a station that uses a port on the TA2400 via the Nyquist Admin UI. (See *"Adding a Station that Uses a Yeastar TA2400 Port" on page 213*.)

You also can use the Yeastar TA2400 web interface to view port status. (See *"Viewing Yeastar TA2400 Status" on page 214*.)

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.



Provision Method:	PNP: Yes
	DHCP: No
	Server URL: Yes
Server Address:	Server URL: <input type="text"/>
	User Name: <input type="text"/>
	Password: <input type="text"/>
	<input type="radio"/> Interval of time: 180 Minute
	<input checked="" type="radio"/> Specified time: Everyday 00:00
Other:	AES Key: <input type="text"/>
	Always Apply: No

Figure 59. 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 198).

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 212.)
- 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 226.)

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 60. 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 51 on page 215*.

Table 51. 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: <ul style="list-style-type: none"> • 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 51. 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.

Customizing an NQ-T1100 IP Phone – Color Touch Display

Once a NQ-T1100 IP Phone - Color Touch Display has been added as a Station (see *“Adding a Station” on page 198*), the placement and labels of keys on the NQ-T1100 admin phone can be customized.

To edit the line keys of the NQ-T1100 IP phone:

- 1 Select **Stations** from the navigation bar.
- 2 Select the **Edit** button next to the NQ-T1100 station, which will have a **Device Type** of “NQ-T1100 IP Phone - Color Touch Display”.
- 3 Press the **Edit Line Keys** button.
- 4 The **Edit Line Keys** view will be displayed (see *“NQ-T1100 - IP Phone - Color Display Edit Line Keys” on page 219*).
- 5 Click on each key to be customized to display and edit the **Edit Line Key** properties for that key, as described in *Table 52, “Edit Line Key # Properties,” on page 217*.

Note: The existing settings for a key will not always be displayed in the **Edit Line Key** properties window.

- 6 When all keys have been defined, click **Update Phone Settings** to update the settings on the NQ-T1100 device. After pressing **Update Phone Settings**, it will take a couple of minutes for the NQ-T1100 Admin phone to reboot and update the touch-screen keypad to match the edits performed via the web interface.
- 7 Press the **Done** key.

Table 52. Edit Line Key # Properties

Type	<p>The type of action to be initiated by this key. The listed types are fairly self-explanatory, but there are several special values:</p> <ul style="list-style-type: none">• Custom Speed Dial: The key's label and value (DTMF dialing digits) can be configured by the user.• Empty: The key will be inoperable with no label.• Reserved: The Nyquist system will not configure the key, allowing the user to manually configure it via the Admin Phone's touch screen interface. The Nyquist web interface will label the key "Reserved" as a reminder that Nyquist will reserve the key for user customization via the Admin Phone.
Label	<p>A string of characters that will be displayed on the line key.</p> <p>Maximum length is 30 characters.</p> <hr/> <p><i>Tip:</i> You may want to use extra spaces to align text that spans multiple lines.</p> <hr/>

Table 52. Edit Line Key # Properties

Value	<p>Only available when Type is Custom Speed Dial.</p> <p>A string of characters that will be used to place a call when the specified line key is pressed on the Admin phone. Any valid Nyquist DTMF sequence can be used. See <i>"Nyquist DTMF Feature Dialing Codes"</i> on page 632 for further details.</p> <p>Maximum length is 99 characters.</p>
Format String	<p>Only available when Type is Zone.</p> <p>A string of characters that are used to format the label for a line key that represents a Paging Zone speed dial. It may contain the following variables, which will be replaced with the appropriate value when the line key label is created for a Paging Zone:</p> <ul style="list-style-type: none">• \$name: Paging Zone name• \$number: Paging Zone number <p>For example, the following format string:</p> <p style="padding-left: 40px;">Z\$number: \$name</p> <p>when used for a zone with zone number 5 and a zone name of "Outdoor" would show up on the line key as "Z5: Outdoor". This is the default format for Zone line keys, which is used if a value is not specified for the Format String field.</p> <p>Maximum length is 30 characters.</p> <p><i>Note:</i> The buttons will not display the label defined by the Format String during the customization process, but instead simply display "Zone" (as shown in <i>"NQ-T1100 - IP Phone - Color Display Edit Line Keys"</i> on page 219).</p>

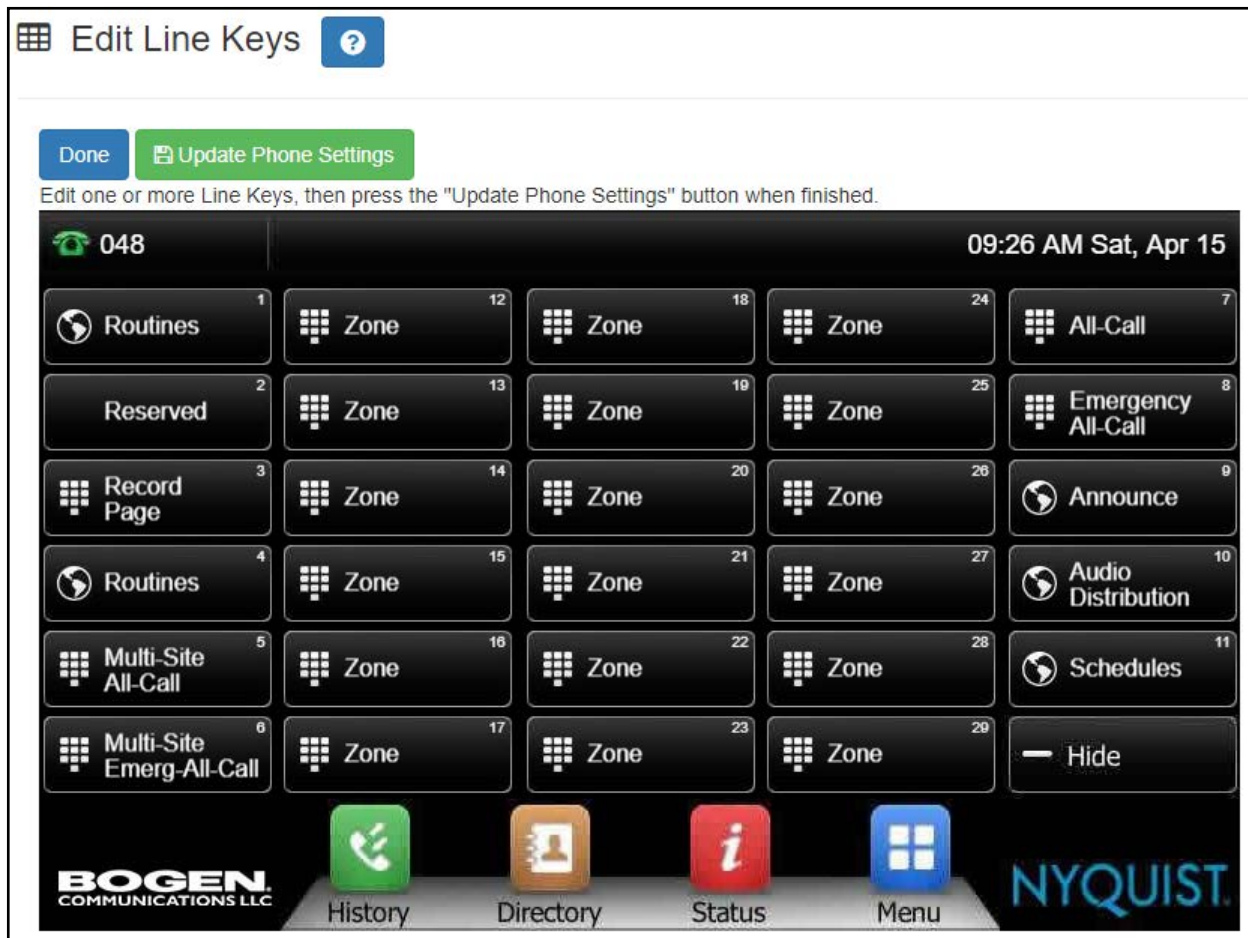


Figure 61. NQ-T1100 - IP Phone - Color Display Edit Line Keys

Customizing an NQ-ZPMS Zone Paging Microphone Station

Once an NQ-ZPMS Zone Paging Microphone Station has been added as a station (see *"Adding a Station"* on page 198), the placement and labels of keys on the NQ-ZPMS phone can be customized.

To edit the line keys of the NQ-ZPMS IP phone:

- 1 Select **Stations** from the navigation bar.
- 2 Select the **Edit** button next to the NQ-ZPMS station, which will have a **Device Type** of "NQ-ZPMS Zone Paging Microphone Station".
- 3 Press the **Edit Line Keys** button.
- 4 The *Edit Line Keys* view will be displayed (see Figure 62, "NQ-ZPMS Zone Paging Microphone Station – Edit Line Keys," on page 222).

- 5 Click on each key to be customized to display and edit the *Edit Line Key* properties for that key, as described in “*Edit Line Keys Properties*” on page 220. All keys are customizable except the top-left key, which displays the station name, and the rightmost column of keys.

Tip: This view provides access to four pages of keys that can be viewed and edited. Click on one of the black dots shown above the first row of keys to view a different page.

Note: The existing settings for a key will not always be displayed in the *Edit Line Key* properties window.

- 6 When all keys have been defined, click **Update Phone Settings** to update the settings on the NQ-ZPMS device. After pressing **Update Phone Settings**, it will take a couple of minutes for the NQ-ZPMS phone to reboot and update the touchscreen keypad to match the edits performed via the web interface.
- 7 Press the **Done** key.

Table 53. Edit Line Keys Properties

Type	<p>The type of action to be initiated by this key. The listed types are fairly self-explanatory, but there are several special values:</p> <ul style="list-style-type: none">• Custom Speed Dial: The key’s label and value (DTMF dialing digits) can be configured by the user.• Empty: The key will be inoperable with no label.• Reserved: The Nyquist system will not configure the key, allowing the user to manually configure it via the phone’s touch screen interface. The Nyquist web interface will label the key “Reserved” as a reminder that Nyquist will reserve the key for user customization via the phone.• SIP Line: If you have configured additional SIP Lines on the phone, this line key Type can be used to associate the line key with a specified SIP Line. If the SIP Line is registered, a green indicator will show on the line key. Pressing this line key will initiate dialing using the defined SIP line.
Label	<p>A string of characters that will be displayed on the line key. If the text does not fit in the space provided, it will scroll.</p> <p>Maximum length is 30 characters.</p>

Table 53. Edit Line Keys Properties (Continued)

Value	<p>Only available when Type is Custom Speed Dial. A string of characters that will be used to place a call when the specified line key is pressed on the phone. Any valid Nyquist DTMF sequence can be used. See <i>"Nyquist DTMF Feature Dialing Codes"</i> on page 632 for further details.</p> <p>Maximum length is 99 characters.</p>
Format String	<p>Only available when Type is Zone.</p> <p>A string of characters that are used to format the label for a line key that represents a Paging Zone speed dial. It may contain the following variables, which will be replaced with the appropriate value when the line key label is created for a Paging Zone:</p> <ul style="list-style-type: none">• \$name: Paging Zone name• \$number: Paging Zone number <p>For example, the following format string:</p> <p style="padding-left: 40px;">Z\$number: \$name</p> <p>when used for a zone with zone number 5 and a zone name of "Outdoor" would show up on the line key as "Z5: Outdoor". This is the default format for Zone line keys, which is used if a value is not specified for the Format String field.</p> <p>Maximum label length is 30 characters.</p> <p><i>Note:</i> The buttons will not display the label defined by the Format String during the customization process, but instead simply display "Zone".</p>

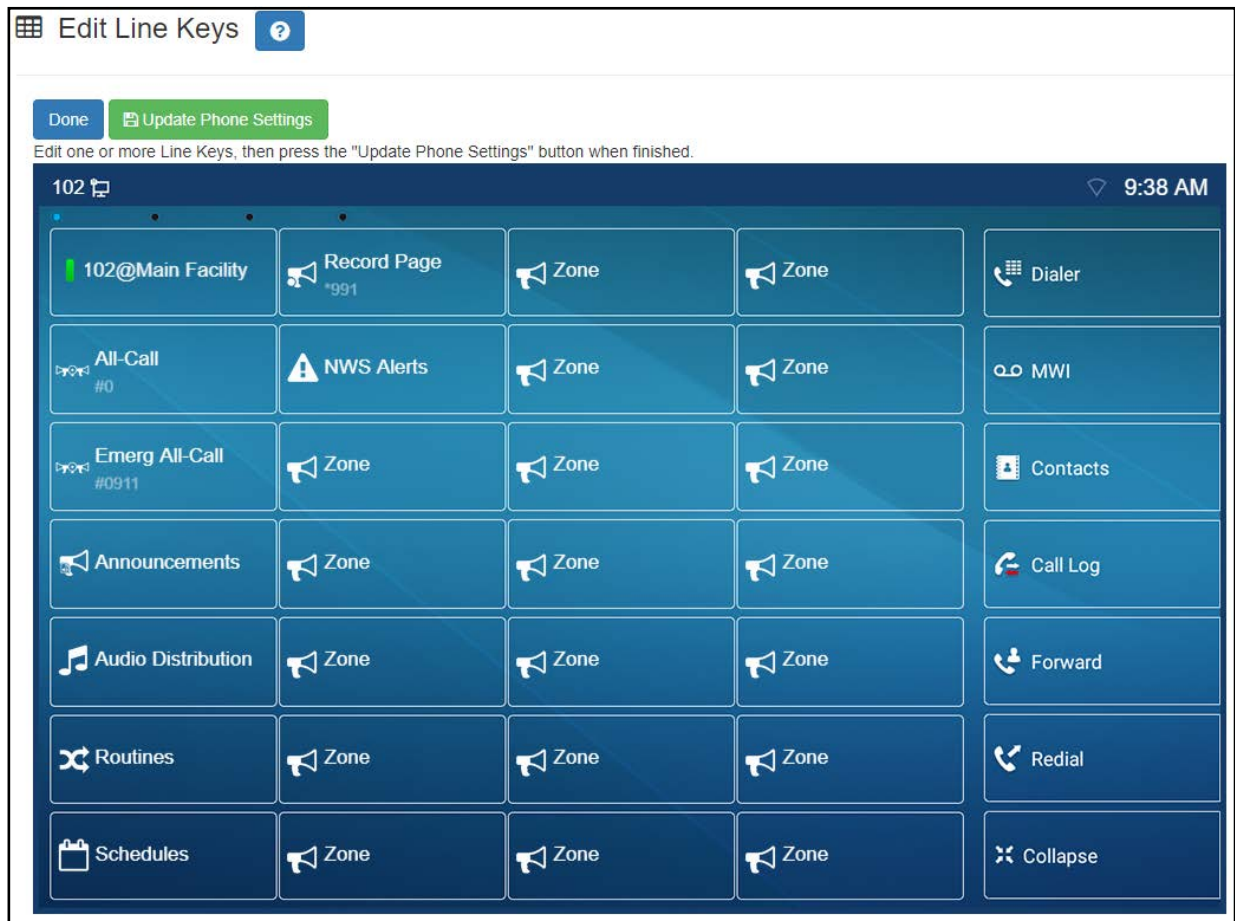


Figure 62. NQ-ZPMS Zone Paging Microphone Station – Edit Line Keys

Routing Intercom Calls to PBX Extensions via SIP Trunk

The Nyquist system can be configured to route call-switch-initiated intercom calls to Admin extensions on PBX systems by using a SIP Trunk and one or more *Admin PBX Extension* stations.

Nyquist stations that include Day/Night Admin configuration but do not have a call-switch can also place Admin intercom calls to Admin PBX extensions by dialing 0, *0, or *00

0 = Normal intercom call to Day/Night Admin

*0 = Emergency intercom call to Day/Night Admin

*00 = Urgent intercom call to Day/Night Admin

Regarding this feature, the term *intercom call* does not include calls placed by dialing a station's extension. This feature requires call-switch-based initiated calls to an Admin station or the use of 0, *0, *00 to place a call to an Admin station. The Admin station called is defined by the caller's Day/Night Admin setting.

The following steps outline configuration for using this feature.

1 Configure a SIP Trunk with **Allow Outbound Intercom Calls** enabled.

Set **Allow Outbound Intercom Calls** to *Yes* to allow call-switch-based stations to place calls to PBX-based Admin extensions via the SIP Trunk, using Day/Night Admin-PBX-Extension.

2 Add one or more stations with **Station Type** equal to *Admin PBX Extension*.

The Admin PBX Extension stations are used as Day/Night Admin stations to route intercom calls to PBX-based Extensions via a SIP Trunk.

Note: When adding an Admin PBX Extension station, the length of the Extension field is not restricted to the Dialing Length set on the Nyquist system. For example if the Nyquist Dialing Length is set to three, you can still use any dialing length in the Extension field of the Admin PBX Extension station. For example, suppose your Nyquist system's Dialing Length is set to three, but your PBX extensions all use four digits. In this case, if your PBX extension is 1001, you can enter 1001 into the Extension field of the Admin PBX Extension, even though it exceeds the three-digit Dialing Length currently set on the Nyquist system.

3 Configure **Day/Night Admin** extensions for call-switch-based station.

To send call-switch-based intercom calls to Admin PBX Extension stations, specify Day/Night Admin extensions that have the following format:

<Admin-PBX-Extension>@<SIP-Trunk-Name>

where <Admin-PBX-Extension> represents the station extension of an existing station of type *Admin PBX Extension* and <SIP-Trunk-Name> represents the name of the SIP Trunk to use for placing the intercom call to the Admin PBX Extension station.

Day Admin:<Admin-PBX-Extension>@<SIP-Trunk-Name>

Night Admin:<Admin-PBX-Extension>@<SIP-Trunk-Name>

For example, if the Day/Night Admin is using PBX extension 100 and SIP Trunk with name equal to "UHS":

100@UHS

This would cause call-switch-based intercom calls to ring PBX extension 100 over SIP Trunk with name "UHS."

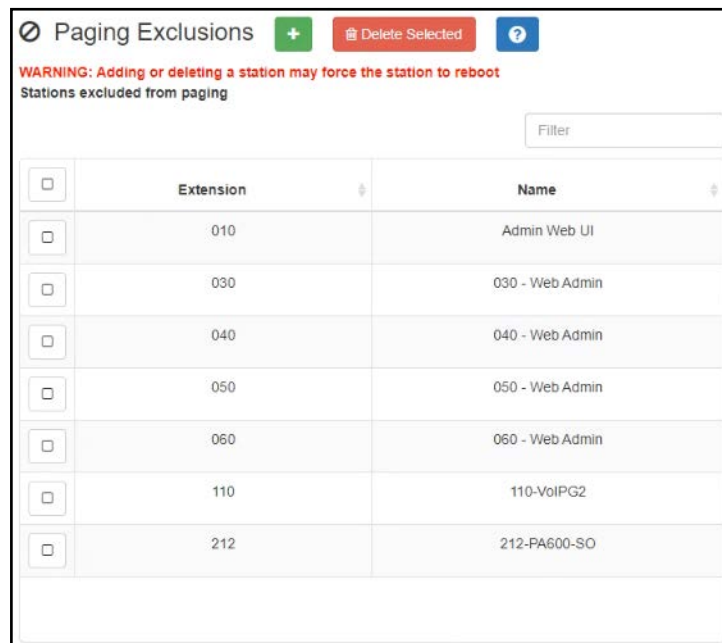
Excluding Stations from Paging

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.

Tip: There is no need to exclude the Speaker Extension associated with a station to avoid feedback, as the associated speaker of a station is automatically muted while paging from that station. For details, see "Speaker Extension Muting" on page 147.



<input type="checkbox"/>	Extension	Name
<input type="checkbox"/>	010	Admin Web UI
<input type="checkbox"/>	030	030 - Web Admin
<input type="checkbox"/>	040	040 - Web Admin
<input type="checkbox"/>	050	050 - Web Admin
<input type="checkbox"/>	060	060 - Web Admin
<input type="checkbox"/>	110	110-VolPG2
<input type="checkbox"/>	212	212-PA600-SO

Figure 63. Paging Exclusions Page

To add a station to the Page Exclusions list (i.e., exclude it from paging):

- 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.

Note: You can also use the Page-Exclusion Routine Action (see *Table 124, "Action Types and Parameters,"* on page 496) to add or remove stations from Paging Exclusions.

Viewing Station Status

The Station Status feature allows you to quickly assess the status of all stations.

The screenshot shows the 'Stations Status' page with a navigation bar and a table of station information. The table has columns for Extension, Name, Device Type, Status, IP Address, Link, and Action. The status of stations varies from 'Unavailable' to 'Not in use'.

	Extension	Name	Device Type	Status	IP Address	Link	Action
	0010	Admin Web UI	n/a	Unavailable	Unknown	Unknown	
	0020	0020 - TechDoc	n/a	Unavailable	Unknown	Unknown	
	0030	0030 - Web Admin	n/a	Unavailable	Unknown	Unknown	
	0040	0040 - Web Admin	n/a	Unavailable	Unknown	Unknown	
	0050	0050 - Web Admin	n/a	Unavailable	Unknown	Unknown	
	0060	0060 - Web Admin	n/a	Unavailable	Unknown	Unknown	
	0100	Admin - IP Phone	NQ-T1100 IP Phone - Color Touch Display	Not in use	172.31.19.205	Link	
	0101	IO CTRL	NQ-E7010-Input Output Controller	Not in use	172.31.8.31	Link	Reboot
	0102	EDP01	NQ-EDP01-Entry Door Phone	Not in use	172.31.9.22	Link	Reboot
	0109	VoIP G3	NQ-S1810WT-G3 VoIP Wall Baffle Speaker Gen3	Not in use	172.31.9.29	Link	Reboot
	0110	VoIP G2	NQ-S1810WT-G2 VoIP Wall Baffle Speaker Gen2	Not in use	172.31.9.34	Link	Reboot
	0111	GA10P	NQ-GA10P-Intercom Module	Not in use	172.31.8.166	Link	Reboot

Figure 64. 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 54. 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.
	<i>Note:</i> For Sound Masking stations, None will be displayed.
Name	Specifies the name for the station. Names can be up to 16 characters in length.

Table 54. Station Status Page Parameters

Device Type	Specifies the Device Type, such as NQ-P0100 Matrix Mixer Pre Amp.
Status	Shows the current state of the station. Possible statuses are: <ul style="list-style-type: none">• 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.

Appliance Status							
Page Exclusion Device Discovery Simplified Configuration Stations Refresh							
Filter							
	Extension	Name	Device Type	Status	IP Address	Link	Action
	0101	IO CTRL	NQ-E7010-Input Output Controller	Not in use	172.31.8.31		
	0113	MMPA	NQ-P0100-Matrix Mixer Pre Amp	Not in use	172.31.9.35		
	n/a	ASB-01	NQ-E7030-Analog Station Bridge	Up:24 of 24 stations	172.31.8.168		
	n/a	A2120-G2	NQ-A2120-G2-Amplifier	Up	172.31.9.40		
	n/a	A4060-G2	NQ-A4060-G2-Amplifier	Up:4 of 4 stations	172.31.9.39		
	n/a	GA400P	NQ-GA400P-AoIP Gateway	Up:2 of 2 stations	172.31.9.36		
	n/a	PA-240	NQ-PA240 Public Address Mixer Amplifier	Up:2 of 2 stations	172.31.9.38		

Figure 65. 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 55. 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. <i>Note:</i> For appliances that can have more than one station associated with them, n/a will be displayed. If the appliance is being used for Sound Masking, n/a will be displayed.
Name	Specifies the name for the station. Names can be up to 16-characters in length.

Table 55. Appliance Status Page Parameters (Continued)

Device Type	Identifies the type of appliance such as NQ-E7010-Input Output Controller.
Status	<p>Shows the current state of the appliance. Possible statuses are:</p> <ul style="list-style-type: none">• 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.• Unreachable. Indicates that the appliance is currently unreachable (which usually means that a ping test failed).• Up. Indicates that the device is reachable and operational. This status may also include the number of stations that are currently registered with the Nyquist server.
IP Address	<p>Provides the IP address of the appliance.</p> <p>If Status is currently Unreachable, this indicates the last known IP address of the appliance.</p>
Link	<p>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.</p>
Action	<p>Provides a Reboot button for Nyquist devices that have an IP address. Selecting this button reboots the device.</p>

You can return to the Stations page by selecting **Stations**.

Viewing Zone Information

From the Zones page you can select to add, edit, or delete zones and view parameters for all existing zones.

The screenshot shows the 'Zones' page with a 'Simplified Configuration' toggle and a table of zone parameters. The table includes columns for Icon, Number, Name, Type, Preannounce Tone, Cut Level (dB), Audio Distribution Cut Level (dB), Stations, Description, Multicast IP Address, and Multicast Port Number.

Icon	Number	Name	Type	Preannounce Tone	Cut Level (dB)	Audio Distribution Cut Level (dB)	Stations	Description	Multicast IP Address	Multicast Port Number
[Icon]	1	Zone1	Paging+Time+Audio	1-Second	-25	-27	Show	Show	239.1.1.10	6100
[Icon]	2	Zone2	Paging+Time+Audio	1-Second	-6	-30	Show	Show	239.1.1.11	6104
[Icon]	3	Zone3	Paging+Time+Audio	1-Second	-6	-19	Show	Show	239.1.1.12	6108
[Icon]	4	Zone4	Paging+Time+Audio	1-Second	-6	-24	Show	Show	239.1.1.13	6112
[Icon]	5	Zone5	Paging+Time+Audio	1-Second	-6	-24	Show	Show	239.1.1.14	6116
[Icon]	6	Zone6	Paging+Time+Audio	1-Second	-6	-24	Show	Show	239.1.1.15	6120
[Icon]	7	Zone7	Paging+Time+Audio	1-Second	-6	-24	Show	Show	239.1.1.16	6124
[Icon]	8	Zone8	Paging+Time+Audio	1-Second	-6	-24	Show	Show	239.1.1.17	6128
[Icon]	9	Zone9	Paging+Time+Audio	1-Second	-6	-24	Show	Show	239.1.1.18	6132
[Icon]	44	Music room	Paging+Time+Audio	2-Second	-6	-17	Show	Show	239.1.1.19	6136

Figure 66. Zones Page

To view existing zones:

- 1 On the navigation bar, expand **Zones and Queues**.
- 2 Select **Zones**.
Zone information is described in *Table 56*.
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 56. Zone Page Parameters

Simplified Configuration

Displays the *Simplified Configuration* page, which presents an alternate method for configuring zones (see “*Simplified Configuration*” on page 236).

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.

Table 56. Zone Page Parameters

Name	Identifies the zone by the user-created name. The name can be alphanumeric (such as Bldg 1) and contain up to 30 characters.
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 <i>"Using Audio Distribution" on page 438</i>). 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 647*.)

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 57. Audio Activities by Zone Type

Zone Type	Type of Audio	Audio Activities
Paging	Caller speaking (optionally after a preannouncement audio clip) Announcements (prerecorded)	One-way calls that allow the caller to speak an announcement to all stations (i.e., speakers) of Paging-type zones. Announcements are also played to Paging-type zones.
Time	Tones	Scheduled events, routines, I/O contact closures, and manually initiated tones play to stations of Time-type zones. <i>Note:</i> 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.

Warning Although a station can be assigned to more than one zone, be aware that this can cause problems if a scheduled event is assigned to two or more zones that include the same station.

Figure 67. 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 58*.
- 5 Select **Save**.

Table 58. 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 <i>"Using Audio Distribution" on page 438</i>). 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 (see <i>Figure 57, "Audio Activities by Zone Type"</i>). Options are: <ul style="list-style-type: none">• Paging• Time• Audio• Paging+Time• Paging+Audio• Paging+Time+Audio• Audio+Time <p><i>Note:</i> 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.</p>
Stations (optional)	Add extensions for the stations to be included in the zone. <i>Note:</i> An analog phone station cannot be added to a zone.

Table 58. Add Zone Page Parameters

Preannounce Tone	Use the drop-down menu to select what, if any, tone should play before a paging announcement.
Multicast IP Address (optional)	Specify the IP address for multicast calls to the zone.
Multicast Port Number (optional)	Specify the first of four port numbers used for multicast calls to this zone. <i>Note:</i> This field is required if a Multicast IP Address is specified. The port number must be an even number and are assigned in increments of four. For example, if a zone was created with the Multicast Port Number of 6004, the next available Multicast Port Number would be 6008.
<hr/> <hr/> Caution Not using multicast when a zone has many stations can cause performance issues. <hr/> <hr/>	
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 58, "Add Zone Page Parameters," on page 234.*
- 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**.

Simplified Configuration

The *Simplified Configuration* page provides an alternative interface for viewing and configuring Zones.

To display the Simplified Configuration view:

- 1 Ensure the *Simplified Configuration* role permission is enabled.
- 2 On the navigation bar, expand **Zones and Queues**, then select **Zones**.
 - a) Alternatively, expand **Stations** or **Amplifier and Gateway Devices**.
- 3 Select the **Simplified Configuration** button.

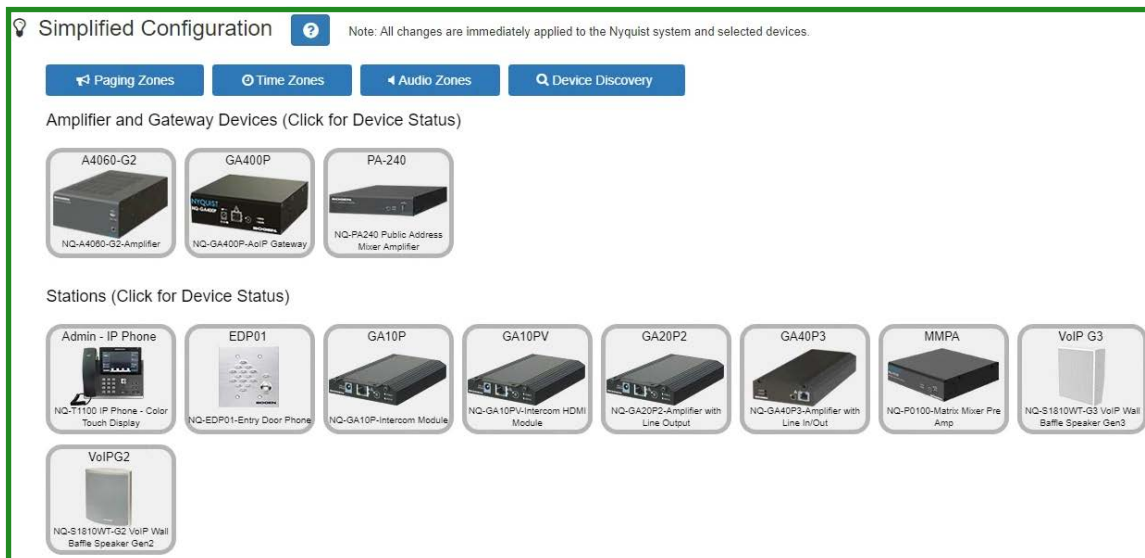


Figure 68. Simplified Configuration: Main Screen

The **Simplified Configuration** view displays an image of each appliance in the Nyquist system. The appliances are divided into lists of *Amplifier and Gateway Devices* and *Stations*.

Hovering the mouse over an appliance image displays a tooltip indicating the appliance's configured extensions.

Displaying Device Status

Clicking an appliance image displays information about the device and its configuration.



Figure 69. Simplified Configuration Device Status

The information displayed is determined by the device's type and configuration. The properties displayed correspond to the device and stations configuration settings described in the following:

- *Table 37, "Station Configuration Page Parameters," on page 149*
- *Table 38, "Station Type-specific Configuration Options," on page 163*
- *Table 62, "Add Amplifier and Gateway Devices Parameters," on page 258*

Paging Zones, Time Zones, and Audio Zones

The Simplified Configuration page includes three buttons—**Paging Zones**, **Time Zones**, and **Audio Zones**—that allow you to assign appliances to zones and configure zone cut levels. Select any one of these buttons to view and edit the zones of the selected type.

To configure Paging, Time, or Audio Zones:

- 1 On the navigation bar, expand **Zones and Queues**, then select **Zones**.
 - a) Alternatively, expand **Stations** or **Amplifier and Gateway Devices**.
- 2 Select the **Simplified Configuration** button.
- 3 Select the **Paging Zones**, **Time Zones**, or **Audio Zones** button, depending on which zone type you want to configure.

- 4 Select the zone to be edited using one of the following mechanisms:
 - a) select the left or right arrow buttons to iterate through the currently defined zones until the target zone is displayed, or
 - b) select the down-arrow button to display a list of all defined zones of the current type, then select the target zone.
- 5 The zone being edited is displayed at the top of the page as “<zone type> Zones - Zone-#: <zone name>.” Appliances that are assigned to the current zone will be displayed with a green border.

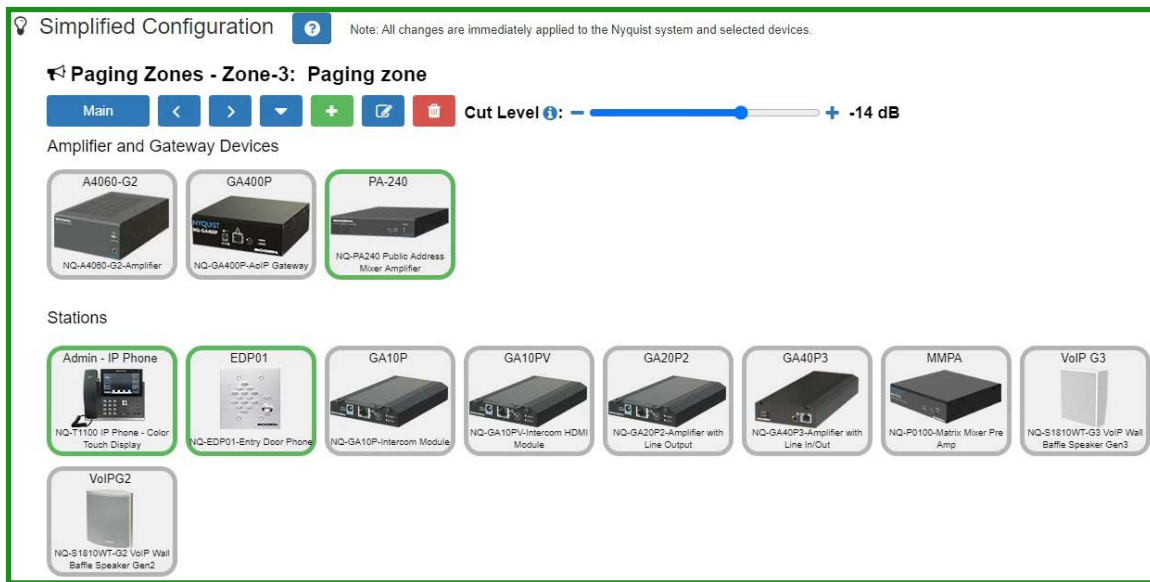


Figure 70. Simplified Configuration: Paging Zones

From the **Paging Zones**, **Time Zones**, or **Audio Zones** page, stations can be added or removed from a zone and zones can be created, edited, and deleted.

To return to the Simplified Configuration Main Page, select the **Main** button.

Add or Remove a Station to or from a Zone

To add or remove a station to or from a zone:

- 1 Select the target zone.
- 2 Click on the corresponding appliance image.
 - a) If prompted whether or not to enable **Paging** for this appliance, select **Yes** or **No**.
- 3 An image of the appliance will be displayed with a button for each extension associated with this station (see Figure 71, “Simplified Configuration Add or Remove Station,”

on page 240). Toggle the extension button(s) to include or exclude the extension(s) from the current zone.

Important: Keep in mind that if the zone has multiple Zone Types (i.e., Paging+Time, Paging+Audio, Audio+Time, or Paging+Time+Audio), adding or removing a station while viewing one Zone Type will add or remove the station to or from the corresponding Zone Type pages.

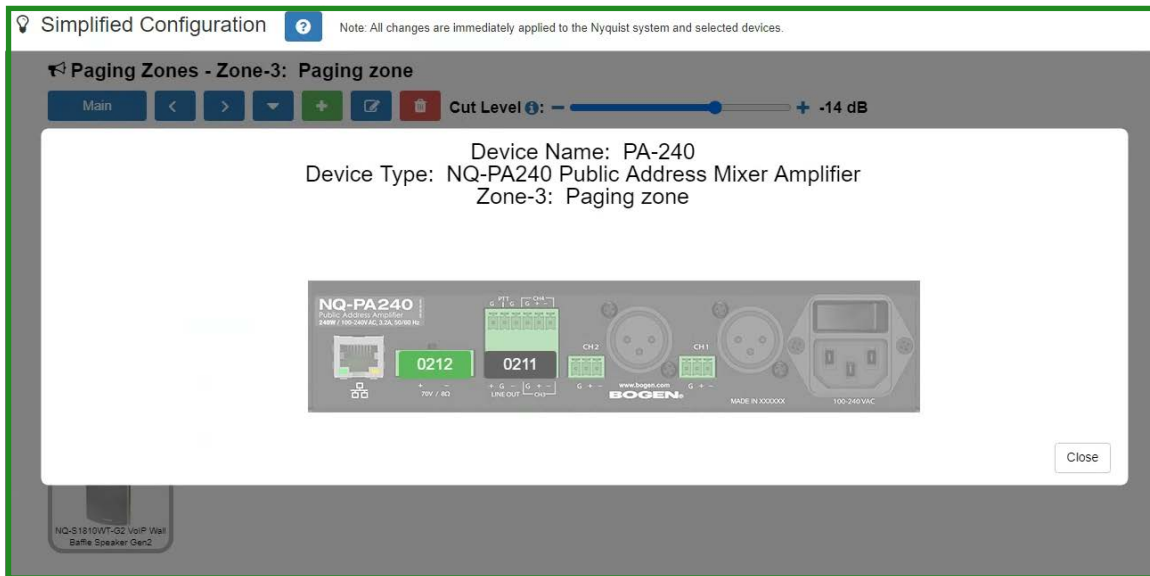


Figure 71. Simplified Configuration Add or Remove Station

Create a Zone

To create a new zone:

- 1 Select the add button.
- 2 Follow the screens of the **Create Zone** wizard. For details, see "Adding a Zone" on page 231.

Edit a Zone

To edit a zone:

- 1 Select the zone to be edited.
- 2 Select the edit button.
- 3 Follow the screens of the **Edit Zone** wizard. For details, see "Editing Zone Configuration" on page 235.

Delete a Zone

To delete a zone:

- 1 Select the zone to be deleted.
- 2 Select the delete button.
- 3 Select **Delete** to confirm.

Changing the Cut Level

To change the cut level for a zone:

- 1 Select the zone to be configured using one of the following mechanisms:
 - a) select the left or right arrow buttons to iterate through the currently defined zones until the target zone is displayed, or
 - b) select the down-arrow button to display a list of all defined zones of the current type, then select the target zone.

- 2 Adjust the **Cut Level** slider to adjust the level.

For the *Audio Zones* view, the slider adjusts the zone's **Audio Distribution Cut Level**; for the *Time Zones* and *Paging Zones* views, it adjusts the zone's **Cut Level**.

Device Discovery

The **Device Discovery** button launches the *Appliance Discovery Wizard*. For details, see "*Appliance Discovery Wizard*" on page 143.

Page Queuing

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 five 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*" on page 24).

The Page Queuing feature allows you to record an unlimited number of pages or messages for queuing (aka, stacking) to one or more specified zones.

Note: 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 the user recording the page has indicated that the recording is completed. It also prevents page overlapping because pages sent to a queue play one at a time.

Though similar, the Page Queuing feature differs from the Schedule Announcement (see *"Using the Schedule Announcements Feature"* on page 303) and Record Announcement (see *"Recording Announcements"* on page 353) features. The Schedule Announcement feature allows you to specify a date and time when the announcement is to be played, and the Record Announcement (DTMF code *990) feature allows you to use the admin phone to record an announcement, which is played immediately after it is recorded.

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.

If **Enable Queue All-Call Page** is set to **Yes** in the *System Parameters*, All-Call pages will also be queued. Queued All-Call pages have a higher priority than queued zone pages and will interrupt any that are playing, which will later be replayed upon completion of the All-Call page. To start a real-time All-Call page, without queuing, dial #0* (#0*# when using DISA, or 0000001 if the PBX is not able to pass hashtags).

Important: Multi-Site All-Call pages are not queued. Similarly, All-Call pages initiated by remote facilities are not queued. These will be played in real time.

Note: Unlike queued zone pages, queued All-Call pages do not support the Message Plays parameter. They are always played once.

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 414*.

Viewing Queues

	Number	Name	Delay Between Messages	Message Plays	Zones
	1	Q 1	2	3	Show
	2	Q 2	2	1	Show
	5	chipotle	3	2	Show

Figure 72. Queues

Using DTMF codes *991 or *991*{zone} or selecting **Record Page** from the Admin Phone or the Admin web UI allows you to initiate a queued page.

When DTMF code #{zone} 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 instead, dial #{zone}*.

To view existing queues:

- 1 On the navigation bar, expand **Zones and Queues**.
- 2 Select **Queues**.

Table 59 describes the Queue information:

Table 59. Queues Page Parameters

Number	Number that the user assigns to the queue.
Name	Name that the user assigns to the queue.

Table 59. Queues Page Parameters

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.

The screenshot shows a form titled "Add Queue" with a help icon. The form contains the following elements:

- Number:** A text input field with an information icon.
- Name:** A text input field with an information icon.
- Delay Between Messages:** A slider control set to 2, with an information icon.
- Message Plays:** A slider control set to 1, with an information icon.
- Zones:** A section containing an "Add Zones ..." input field, a "Clear" button, and an "Add All" button.
- Buttons:** "Cancel" and "Save" buttons at the bottom.

Figure 73. 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 Table 59, "Queues Page Parameters," on page 243.)
- 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 59, "Queues Page Parameters,"* on page 243.)
- 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**.

Sound Masking Zones

A sound masking zone consists of one or more sound masking stations, each one corresponding to an amplifier channel attached to one or more speakers. Each sound masking

station, however, can be associated with only one sound masking zone and cannot be used for any other purpose (e.g., announcements, paging, etc.).

The speakers associated with the stations within a sound masking zone will play generated noise designed to mask unwanted sound. This can reduce or eliminate the perception of sound, usually to minimize distracting noise and/or increase privacy.

Upon initial exposure, people may require time to acclimate to the masking sound. *Ramping* facilitates this process by playing the masking sound at a lower level (–10 dB relative to the final level) and gradually increasing the level to the final level over a masking zone-specific number of days (20 or 30 days), giving people time to slowly get used to the masking sound.

For similar reasons, it may be helpful, even after the initial ramping period, to gradually increase and decrease the masking sound levels, such as at the beginning and ending of each exposure period. For example, you may want to gradually increase the level by +10 dB at the beginning of each day and gradually decrease it by –10 dB at the end of each day. This can be accomplished by using scheduled routines (see *"Using Routines"* on page 466) that include the SM-Scheduled-Ramp action, which can gradually increase or decrease the masking sound volume over a period of one to two hours.

Tip: There are several Routine actions that are available for controlling sound masking operations: SM-Enable-Zone, SM-Disable-Zone, SM-Scheduled-Ramp, and SM-Set-Output-Gain. For more details, see *"Using Routines"* on page 466.

When a masking zone amplifier detects an Emergency-All-Call announcement, an Alarm tone or Emergency announcement that plays to all speakers, or the Disable-Audio routine action or dashboard control, the masking sound is immediately muted to allow important notifications to be heard. Once the announcement has completed, the masking sound will be automatically ramped up to its configured level over a period of five minutes. This also occurs whenever the masking zone signal has been disabled and re-enabled or when the appliance is restarted, such as a reboot, power cycle, or firmware update.

Note: Sound masking is *not* muted for an Emergency Announcement or Alarm that is being played to a specific zone.

Privacy needs often vary throughout the day and week. Several routine actions—SM-Disable-Zone, SM-Enable-Zone, and SM-Set-Output-Gain—allow you to enable, disable, and adjust the masking sound levels of your sound masking zones via scheduled and/or triggered routines (see *"Using Routines"* on page 466).

Viewing Sound Masking Zones

To view existing Sound Masking Zones:

- 1 On the navigation bar, expand **Zones and Queues**.
- 2 Select **Sound Masking Zones**. See Table 60, "Sound Masking Zones Parameters," on page 248 for details.

The screenshot shows a web interface for 'Sound Masking Zones'. At the top, there is a header with a minus sign, the text 'Sound Masking Zones', a green plus button, and a blue question mark button. Below the header is a table with a search filter box on the right. The table has the following columns: Icon, Number, Name, Status, Enabled, Stations, Description, Speaker Orientation, Output Gain, Spectrum Preset, Slow Ramp Days, and Ramp Days Left. The first row contains the following data: an icon of a speaker, the number '1', the name 'Meeting Zone', the status 'Off', a red 'No' button, a 'Show' button, the description 'Meeting Zone', the speaker orientation 'Down', the output gain '-25', the spectrum preset 'Non-ideal open-plan space', '20' slow ramp days, and '20' ramp days left.

Icon	Number	Name	Status	Enabled	Stations	Description	Speaker Orientation	Output Gain	Spectrum Preset	Slow Ramp Days	Ramp Days Left
	1	Meeting Zone	Off	No	Show	Meeting Zone	Down	-25	Non-ideal open-plan space	20	20

Figure 74. Sound Masking Zones

Table 60. Sound Masking Zones Parameters

Edit button	Edit this sound masking zone.
Delete button	Delete this sound masking zone. <i>Note:</i> An active sound masking zone must be disabled before it can be deleted.
Start Ramping button	Start ramping up the sound masking noise for this zone. <i>Note:</i> Only available when the sound masking zone is enabled.
Stop Ramping button	Stop ramping up the sound masking noise for this zone. <i>Note:</i> Only available when the sound masking zone is enabled. <i>Note:</i> Stopping the ramping up process does not stop the sound masking; it sets the level to the defined, non-ramping gain level.
Icon	Displays the icon configured for this zone.
Number	Displays the unique number configured for this zone.
Name	Displays the name configured for this zone.

Table 60. Sound Masking Zones Parameters (Continued)

Status	<p>Indicates the current sound masking status.</p> <p>Valid values are:</p> <ul style="list-style-type: none">• On: Sound masking is currently active.• Off: Sound masking is currently inactive.• Pause: Sound masking has been temporarily paused, such as when audio is disabled.• Ramping: Sound masking is currently active and slowly ramping to full volume.
Enabled	<p>Indicates whether or not this sound masking zone is enabled (i.e., Yes indicates signal is being played).</p> <hr/> <p><i>Tip:</i> On the Sound Masking Zones page, this is a button that can be used to enable or disable the sound masking noise.</p> <hr/>
Stations	<p>Displays which Sound Masking stations are included in this sound masking zone.</p>
Description	<p>Displays the configured description of this sound masking zone.</p>
Speaker Orientation	<p>Indicates the configured orientation of the speakers.</p> <p>Valid values are Up and Down.</p>
Output Gain	<p>Indicates the configured output gain (in dB) of the sound masking noise.</p> <p>The default value is –35 dB.</p>
Spectrum Preset	<p><i>Note:</i> Indicates the preset frequency spectrum to be played for sound masking. The available options are described below.</p> <hr/> <p><i>Important:</i> To change the Spectrum Preset for an active masking zone, disable the zone, change the preset, then re-enable the zone.</p> <hr/>
Closed-plan space	<p>Recommended for private office or small conference room with some reflective surfaces, absorptive ceiling, and furnishings.</p>

Table 60. Sound Masking Zones Parameters (Continued)

Good open-plan space	Suitable for open office with 4- to 5-foot high cubical panels, some reflective surfaces, and moderate furniture absorption.
Ideal open-plan space	Suitable for open offices with 5-foot or higher cubical panels, absorptive ceilings and furnishings, and proper layout.
NCB Contour	Noise Criterion Balanced (NCB) Contour may be used to evaluate the acceptability of masking sound in various non-industrial environments.
Non-ideal open-plan space	Recommended for open office with no cubical panels or with cubical panels under 4-foot high, reflective surfaces, and moderate furniture absorption.
NRC Canada Contour	A cost-effective open-plan environment masking spectrum published by the National Research Council, Canada.
NC40 Contour	Noise Criterion (NC) 40 Contour may be used to evaluate the acceptability of masking sound in an open office environment.
Slow Ramp Days	<p>Indicates the number of days over which the masking noise will gradually increase from –10 dB below the specified Output Gain level to the specified level.</p> <p>Valid values are 20 and 30 days.</p> <p>Gradually ramping up the sound levels this way helps listeners to slowly acclimate to the masking noise over time to avoid or minimize discomfort.</p>
Ramp Days Left	The number of days remaining before the masking noise will reach the specified Output Gain level when ramping up the sound level.

Adding and Editing a Sound Masking Zone

Before you can create a Sound Masking Zone, you must first create one or more Sound Masking stations. Unlike a standard station, however, a Sound Masking station is created via the *Station Management* view of the amplifier to be used as a Sound Masking station (see “Using Station Management for Amplifiers and Gateway Devices” on page 262). Edit each amplifier channel to be included in the Sound Masking Zone (see “Editing Station Configuration Settings” on page 162 for details) and set its **Type** to **Sound Masking**.

Warning If downward-facing speakers are installed and two amplifier stations are used within the same masking zone, it is critical that either the stations come from different amplifiers (preferable) or the In-Phase setting for the two stations are configured differently (i.e., one Yes, one No). Otherwise, there will be phasing issues or uncontrollable variations in masking levels.

Once one or more Sound Masking stations have been defined, a Sound Masking Zone can be created.

Important: When adding a new Sound Masking station, always use the **Station Management** button of an amplifier listed in the **Amplifiers and Gateway Devices** view and select a channel of an existing amplifier. Adding a station from the **Stations** view and assigning a **Type** of **Sound Masking** will not associate the station with an actual device.

Warning Sound masking amplifiers and stations are not monitored by Station Supervision.

➔ Add Sound Masking Zone
?

✕ Cancel
Save

Icon: ⓘ

⊖ minus-circle

Enabled: ⓘ

No

Number: ⓘ

Name: ⓘ

New Zone

Stations: ⓘ

Add Stations ...

Clear

Add All

Speaker Orientation: ⓘ

Down
▼

Spectrum Preset: ⓘ

Ideal open-plan space
▼

Output Gain: -30 ⓘ

-

●

+

Slow Ramp Days: 30 ⓘ

-

●

+

20

30

Description: ⓘ

✕ Cancel
Save

Figure 75. Add Sound Masking Zone page

To create or edit a sound masking zone:

- 1 On the navigation bar, expand **Zones and Queues**.

- 2 Select **Sound Masking Zones**.
- 3 Select the Add icon.
- 4 Complete the parameters to the Add Sound Masking Zone page (see *Table 60, "Sound Masking Zones Parameters,"* on page 248).
- 5 Select **Save**.

Managing Amplifiers and Gateway Devices

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 Amplifier and Gateway Devices

Through the *Amplifier and Gateway 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.

	Name	Device Type	Manage	Action	Mac Address	Serial Number	IP Address
	A2120-G2	NQ-A2120-G2-Amplifier			7804733a9731	172500100012	172.31.9.40
	A4060-G2	NQ-A4060-G2-Amplifier			7804733b9208	172500100012	172.31.9.39
	GA400P	NQ-GA400P-AoIP Gateway			b0b113b62871	172500100012	172.31.9.36
	PA-240	NQ-PA240 Public Address Mixer Amplifier			40bd321ee4dc	172500100012	172.31.9.38

Figure 76. Amplifier and Gateway Devices

To view amplifiers and gateway devices attached to your network:

On the navigation bar, select **Amplifier and Gateway Devices**.

Table 61 describes the parameters for each amplifier or gateway device:

Table 61. Amplifier and Gateway Devices Page

	Edit	Edit the amplifier or gateway device.
	Delete	Delete the amplifier or gateway device.
	Device Status	Display the device status for this amplifier or gateway device.
	Name	Provides a name for the amplifier or gateway device.

Table 61. Amplifier and Gateway Devices Page

Device Type	Provides the type of device, such as <i>NQ-A2120-Amplifier</i> .
Manage	Provides a link to the Station Management and, if applicable, Configure PTT tools for the amplifier or gateway device.
Action	Provides a Reboot button to select the if amplifier or gateway device needs to be rebooted.
MAC Address	Provides the MAC address for the amplifier or gateway device.
Serial Number	Provides the serial number of the amplifier or gateway device.
IP Address	Provides the IP address of the amplifier or gateway device.
Link	Provides link to the amplifier or gateway device's UI.
Status	<p>Provides the status of the amplifier or gateway device. Possible statuses include:</p> <ul style="list-style-type: none">• Unknown. The server is unable to determine the state of the amplifier or gateway device.• Unreachable. The server is unable to ping the amplifier or gateway 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 or gateway device. If the numbers do not match, then one or more stations attached to the amplifier or gateway device are 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. <p><i>Note:</i> When an amplifier is used for Sound Masking, the Up status indicator will not include a station count.</p> <p><i>Note:</i> After an amplifier or gateway device is rebooted, it can take a few minutes for all associated stations to register with the Nyquist server (usually less than three minutes).</p>
Description	Select Show to view the user-provided description of the amplifier or gateway device.
VLAN Configuration	<p>Provides how the VLAN configuration is set. Options are:</p> <ul style="list-style-type: none">• Server• Network/Device• Disabled

Table 61. Amplifier and Gateway Devices Page

VLAN ID	<p>Provides the VLAN for the amplifier or gateway device. The LAN ID parameters range from 2 through 4094 and pertain to the amplifier or gateway device's network interface (not to the ports or stations).</p> <p><i>Note:</i> This field can only be changed when the Server option is used for VLAN Configuration.</p>
VLAN Priority	<p>Provides the priority for the port. Values range from 0 through 7.</p> <p><i>Note:</i> This field can only be changed when the Server option is used for VLAN Configuration.</p>
Web Username	<p>Provides the username for logging into the amplifier or gateway device's web UI.</p>
Firmware	<p>Provides information about firmware that is loaded onto the amplifier or gateway device.</p>
Number of Stations	<p>Provides the number of stations associated to the amplifier. 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 (i.e., not using device discovery) or have been instructed to change it.</p>
Channels	<p>Displays the channels configured on the amplifier via bridge switch positions.</p>

Adding Amplifier and Gateway Devices

From the Add Amplifier and Gateway Devices page, you can add a new audio power amplifier to your Nyquist system.

Tip: Amplifiers and gateway devices can also be added using the "Appliance Discovery Wizard", as described on page 143.

Add Amplifier and Gateway Devices ?

✕ Cancel Save

Name: ⓘ

Device Type: ⓘ
NQ-A2060-Amplifier ▾

MAC Address: ⓘ

Serial Number: ⓘ

VLAN Configuration: ⓘ
Network/Device ▾

VLAN ID: ⓘ
2

VLAN Priority: ⓘ
0 - Best Effort ▾

Web Username: ⓘ
admin

Password: ⓘ
Show

Firmware: ⓘ
NyqUpdate-2.0.497.tar.gz ▾

Number of Stations: ⓘ
1 ▾

Figure 77. Add Amplifier and Gateway Devices

To add an amplifier:

- 1 On the navigation bar, select **Amplifier and Gateway Devices**.
- 2 On the Amplifier and Gateway Devices page, select the **Add** icon.
- 3 Complete the parameters on the Add Amplifier and Gateway Devices page. (See *Table 62*.)
- 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 them (see *"Using Station Management for Amplifiers and Gateway Devices"* on page 262).

Table 62. Add Amplifier and Gateway Devices Parameters

Name	Enter a name for the amplifier or gateway device.
Device Type	Select the type of device. Options are: <ul style="list-style-type: none">• NQ-A2060-Amplifier• NQ-A2060-G2-Amplifier• NQ-A2120-Amplifier• NQ-A2120-G2-Amplifier• NQ-A2300-Amplifier• NQ-A2300-G2-Amplifier• NQ-A4060-Amplifier• NQ-A4060-G2-Amplifier• NQ-A4120-Amplifier• NQ-A4120-G2-Amplifier• NQ-A4300-Amplifier• NQ-A4300-G2-Amplifier• NQ-GA400P-AoIP Gateway• NQ-PA120 Public Address Mixer Amplifier• NQ-PA240 Public Address Mixer Amplifier• NQ-PA600 Public Address Mixer Amplifier
MAC Address	Enter the MAC address for the amplifier or gateway device.
Serial Number	Enter the serial number of the amplifier or gateway device.
VLAN Configuration	Select how the VLAN configuration is set. Options are: <ul style="list-style-type: none">• Server• Network/Device• Disabled
VLAN ID	Select the VLAN for the amplifier or gateway device. The LAN ID parameters range from 2 through 4094 and pertain to the amplifier's network interface (not to the ports or stations). <i>Note:</i> This field can only be changed when the Server option is used for VLAN Configuration .

Table 62. Add Amplifier and Gateway Devices Parameters

VLAN Priority	Select the priority for the port. Values range from 0 through 7. <i>Note:</i> 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.
Web Password	Provide a password for logging into the device's web UI. Select Show to reveal a previously set password.
Web Password Confirmation	
Firmware	Provides information about firmware that is loaded onto the amplifier or gateway device. 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, leave this Firmware parameter empty.
Number of Stations	Select how many stations are associated with the device based on the number of ports.
Channels	Select the channels configured on the amplifier via the switch position.
Description	Provide a description of the device.

Editing Amplifier and Gateway Devices

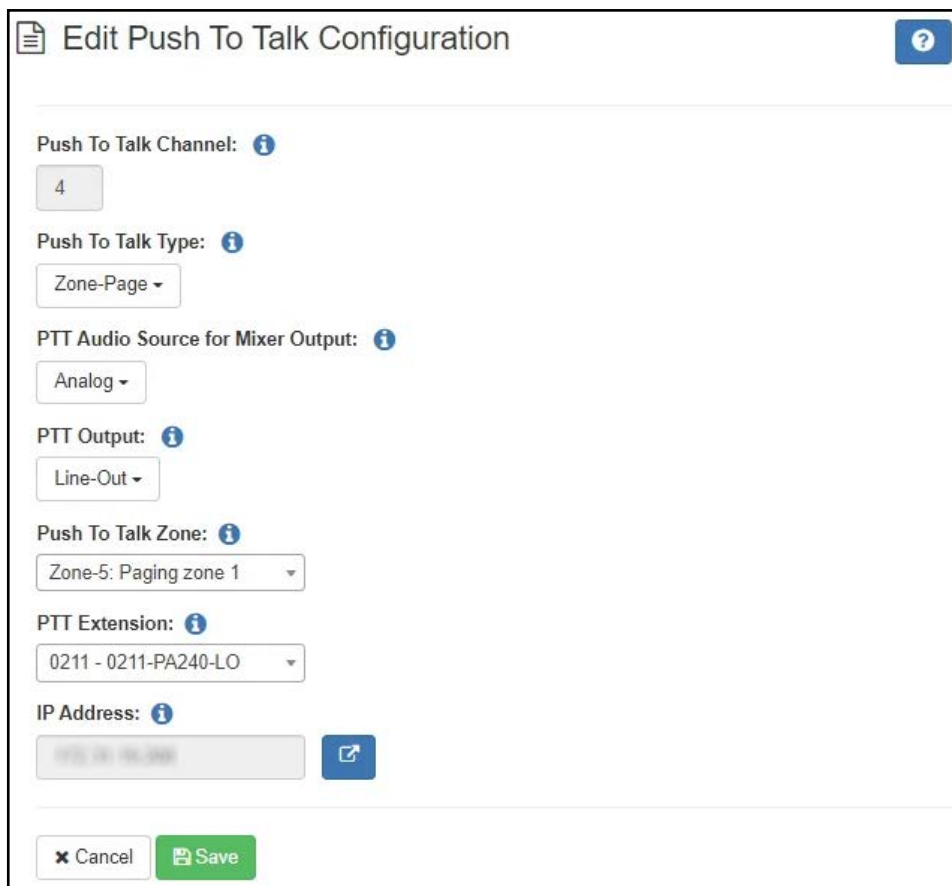
The Edit Amplifier and Gateway Devices page allows you to change parameters for an amplifier or gateway device. You can also select the **Station Management** button to associate stations to the amplifier or gateway device.

To edit an amplifier or gateway device:

- 1 On the navigation bar, select **Amplifier and Gateway Devices**.
- 2 On the Amplifier and Gateway Devices page, select the **Edit** icon.

- 3 Complete the parameters on the Edit Amplifier and Gateway Devices page. (They are the same parameters found on the Add Amplifier and Gateway Devices page. See *Table 62, "Add Amplifier and Gateway Devices Parameters,"* on page 258.)
- 4 Select **Save**.

Configuring Push-To-Talk for a Public Address Mixer Amplifier



The screenshot shows the 'Edit Push To Talk Configuration' page. The title bar includes a document icon, the text 'Edit Push To Talk Configuration', and a help icon. The form contains the following fields:

- Push To Talk Channel:** A text input field containing the number '4'.
- Push To Talk Type:** A dropdown menu with 'Zone-Page' selected.
- PTT Audio Source for Mixer Output:** A dropdown menu with 'Analog' selected.
- PTT Output:** A dropdown menu with 'Line-Out' selected.
- Push To Talk Zone:** A dropdown menu with 'Zone-5: Paging zone 1' selected.
- PTT Extension:** A dropdown menu with '0211 - 0211-PA240-LO' selected.
- IP Address:** A text input field containing '192.168.1.100' and a copy icon.

At the bottom of the form are two buttons: 'Cancel' (with a close icon) and 'Save' (with a save icon).

Figure 78. Push-To-Talk Configuration Page (PAMA)

To edit Push-To-Talk configuration for a Public Address Mixer/Amplifier:

- 1 On the navigation bar, select **Amplifier and Gateway Devices**.
- 2 For the public address mixer amplifier that you want to configure, in the **Manage** column, select **Configure PTT**.

- 3 Specify parameters from the Edit Push To Talk Configuration page. For details, see *Table 63, "PAMA Push-To-Talk Configuration Parameters," on page 261.*
- 4 Select **Save**.

Table 63. PAMA Push-To-Talk Configuration Parameters

Push To Talk Channel	Channel 4 is the only available PTT channel.
Push To Talk Type	<p>Select the type of activity that is performed when the button is pressed on the microphone. Options are:</p> <ul style="list-style-type: none"> • Disabled • Analog-Output • All-Call-Page • Emergency-All-Call-Page • Zone-Page • Record-Zone-Page • Multi-Site-All-Call-Page • Multi-Site-Emergency-All-Call-Page <p><i>Note:</i> For all selections other than Disabled, the DSP Router settings of the device are overridden to route the PTT microphone input signal (Analog 4) to the line output and speaker output channels (Line Out and Speaker Out).</p> <hr/> <p><i>Tip:</i> To prevent the PTT microphone signal from being sent to the network, select Analog-Output. All other settings (other than Disabled) will send the PTT microphone signal over the network.</p> <hr/>
PTT Audio Source for Mixer Output	<p><i>Note:</i> This field does not appear if Push To Talk Type is set to Disabled or Analog-Output.</p> <p>Specifies whether the PTT microphone signal is sent to the network output or both the analog and network outputs.</p> <p>If Analog is selected, the PTT microphone input is routed as specified in the PTT Output setting as well as being sent over the network.</p> <p>If Network is selected, the PTT microphone input is routed only through the network. Note that this could create a small but noticeable delay.</p>

Table 63. PAMA Push-To-Talk Configuration Parameters (Continued)

PTT Output	<p>Specifies the amplifier output used for the PTT microphone signal if Push To Talk Type is Analog-Output or PTT Audio Source for Mixer Output is Analog.</p> <p>Options are:</p> <ul style="list-style-type: none">• Disabled• Line-Out• Speaker-Out• Both
Push To Talk Zone	<p><i>Note:</i> This field appears only if Push To Talk Type is set to Zone-Page or Record-Zone-Page.</p> <p>Select the zone to receive the page.</p>
PTT Extension	<p>The station extension to be displayed to call recipients for PTT calls from this station.</p>
IP Address	<p>Displays the IP address of the device, if known, and a Link button that allows you to start the device's UI. If the Nyquist server has not discovered the device's IP address, the Link button does not appear.</p>

Using Station Management for Amplifiers and Gateway Devices

Depending on the **Device Type**, the Station Management screen for Amplifier and Gateway Devices can show Ports listed as **Channel A** to **Channel D** (NQ-A2XXX/A4XXX Amplifiers), **Speaker Out** and **Line Out** (NQ-PAXXX Amplifiers), or **Output 1** and **Output 2** (NQ-GA400P AoIP Gateway).

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.

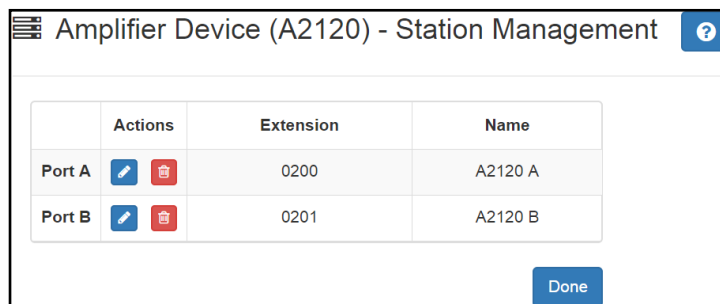


Figure 79. Station Management for Two-Channel Amplifier

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 and Gateway 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 Amplifier and Gateway Devices"* on page 256.

- 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 the station associated with a port, select the **Edit** icon next to the port and follow the steps for editing a station (see *"Editing Station Configuration Settings"* on page 162).

Warning If an amplifier has one station defined as type **Sound Masking**, then all stations for that amplifier should be defined as **Sound Masking**. For more information, see *"Sound Masking Zones"* on page 246.

- 5 Select **Done**.

Deleting Amplifier and Gateway Devices

You can delete an amplifier device through the Amplifier and Gateway Devices page.

To delete an amplifier:

- 1 On the navigation bar, select **Amplifier and Gateway Devices**.
- 2 On the Amplifier and Gateway Devices page, select the **Delete** icon next to the amplifier or gateway device that you want to delete.
- 3 When prompted, select **Delete**.

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 64. 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.

To view roles:

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

The Roles page appears. *Table 65 on page 266* describes the parameters that appear on this page.

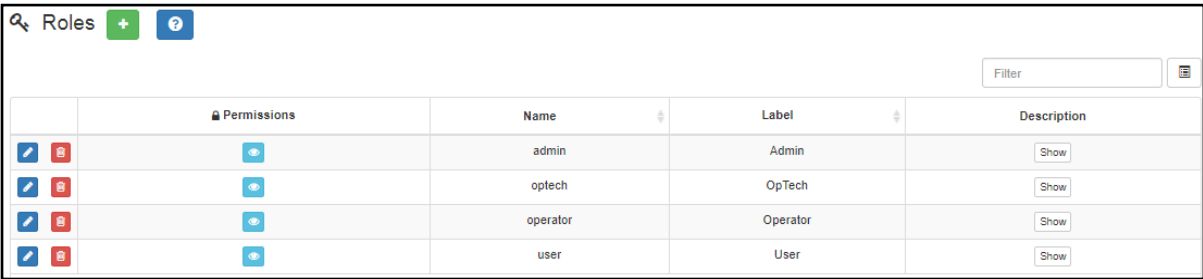


Figure 80. Roles Page

Table 65. 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. <i>Note:</i> 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. <i>Note:</i> 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. <i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .

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 198.*)

The screenshot shows a web form titled "Add Role". At the top left, there is a magnifying glass icon followed by the text "Add Role" and a blue square icon with a white question mark. Below the title, there are three input fields: "Name:" with a single-line text box, "Label:" with a single-line text box, and "Description:" with a larger multi-line text area. At the bottom of the form, there are two buttons: a "Cancel" button with a red 'x' icon and a "Save" button with a green document icon.

Figure 81. 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 65, "Roles Page Parameters," on page 266.*)
- 4 Select **Save**.
- 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 268.*)
- 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 65, "Roles Page Parameters," on page 266.)
- 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 Dash-

board and for most Dashboard features are limited to View, while available permissions for Schedule Announcements include Create, Delete, Edit, and View.

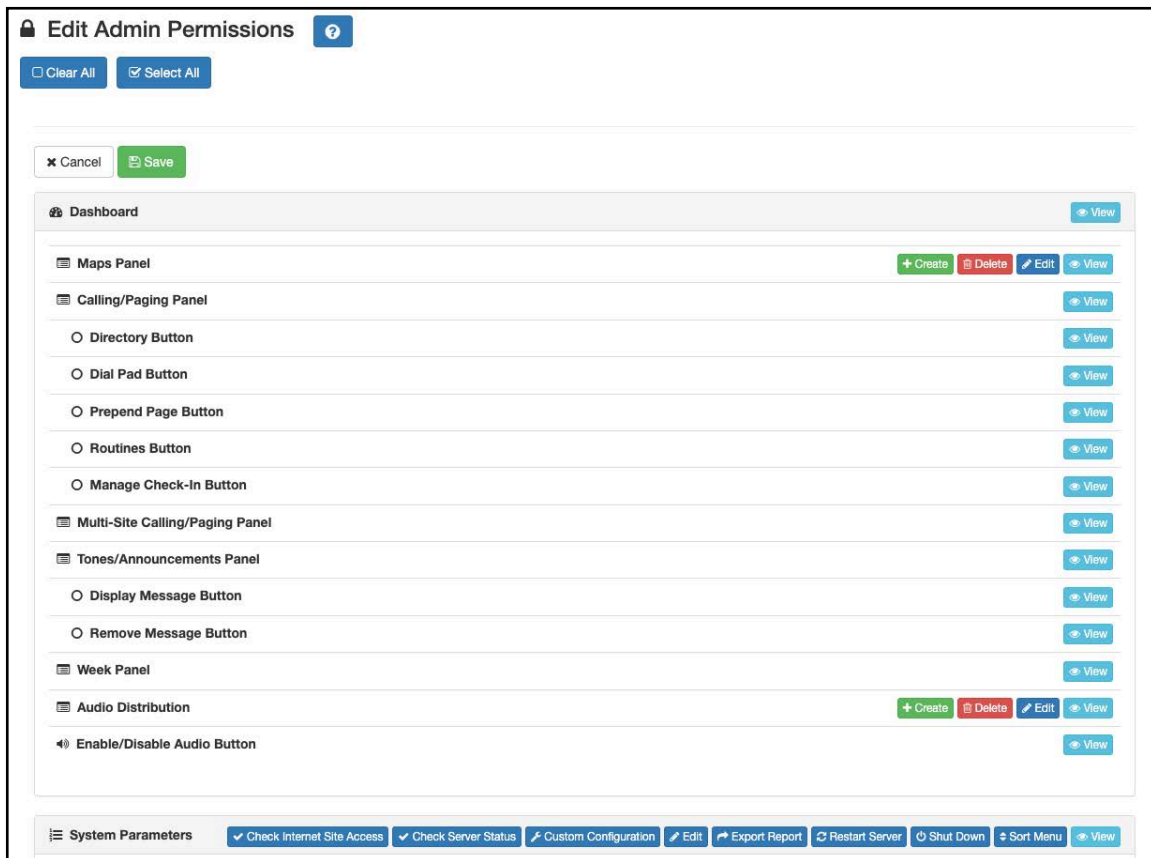




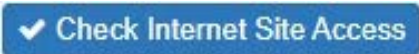
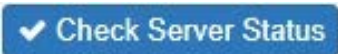






Figure 82. Edit Permissions Page

Table 66. Descriptions of Permission Buttons

	Allows user to create a new item, such as a new user.
	Allows user to delete an item.
	Allows user to edit an item.
	Allows user to view an item.
	Allows user to manage items. This option pertains only to playlists.
	Allows user to import or export a system backup file.

Table 66. Descriptions of Permission Buttons

 Settings	Allows user to set parameters for system backup jobs.
 Restore	Allows user to restore a system backup.
 Sort Menu	Allows user to change the order of the navigation bar menu.
 System Update	Allows user to import a system update.
 Check Internet Site Access	Allows user to verify Nyquist server can access URLs required to run properly. For details, see <i>"Check Internet Site Access"</i> on page 46.
 Check Server Status	Allows user to check and display the status of the Nyquist server. For details, see <i>"Check Server Status"</i> on page 47.
 Custom Configuration	Allows user to update Actions and Custom Variables, SNMP Configuration, and Syslog Configuration.
 Export Report	Allows user to export an Excel spreadsheet with configuration information. For details, see <i>"Exporting a Report"</i> on page 23.
 Restart Server	Allows user to restart the Nyquist server. For details, see <i>"Restarting the Server"</i> on page 30.
 Shut Down	Allows user to shut down the Nyquist server. For details, see <i>"Shutting Down the Server"</i> on page 45.

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.

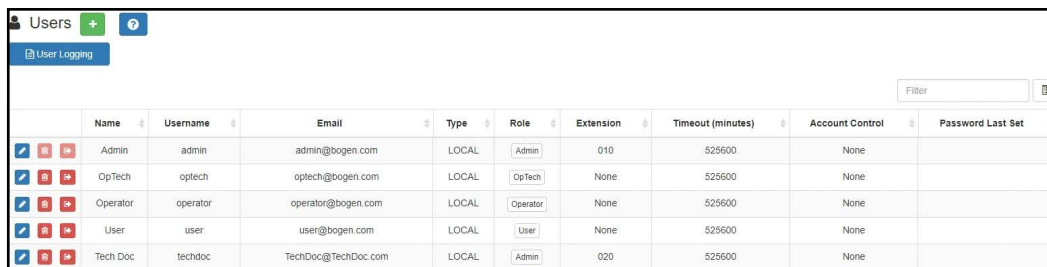
Note: A warning appears if you attempt to delete a role that is associated with a user.

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 custom role that provides permissions to create a user.



The screenshot shows the 'Users' page interface. At the top, there is a 'Users' header with a green plus icon and a blue help icon. Below the header is a 'User Logging' button. A search filter field is located on the right side of the table. The table itself has columns for Name, Username, Email, Type, Role, Extension, Timeout (minutes), Account Control, and Password Last Set. There are five rows of user data, each with a blue checkmark icon and a red delete icon in the first column.

	Name	Username	Email	Type	Role	Extension	Timeout (minutes)	Account Control	Password Last Set
<input checked="" type="checkbox"/>	Admin	admin	admin@bogen.com	LOCAL	Admin	010	525600	None	
<input checked="" type="checkbox"/>	OpTech	optech	optech@bogen.com	LOCAL	OpTech	None	525600	None	
<input checked="" type="checkbox"/>	Operator	operator	operator@bogen.com	LOCAL	Operator	None	525600	None	
<input checked="" type="checkbox"/>	User	user	user@bogen.com	LOCAL	User	None	525600	None	
<input checked="" type="checkbox"/>	Tech Doc	techdoc	TechDoc@TechDoc.com	LOCAL	Admin	020	525600	None	




Figure 83. Users Page

To view users:

- 1 On the navigation bar, select **Users**.
- 2 To filter the list of users, enter the desired text into the Filter field. All fields will be searched for the specified text value. For example, enter "Bogen" to find each user that contains the (case-insensitive) text "Bogen" within the displayed listing.
- 3 To view each user as a list of properties within a list of users, press the Toggle button adjacent to the Filter field. Press it again to return to the table view.

The following table describes the information displayed for each user.

Table 67. User Page Parameters

 Edit button	Opens the Edit User view for the user.
 Delete button	Deletes the user.
 Logout button	Logs this user out of any active web sessions on this C4000.
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.
Type	Indicates whether the user account was created on the C4000 (LOCAL) or imported from an LDAP service (LDAP).
Role	Displays the role assigned to the user.
Extension	Displays the extension used by the user.
Timeout (minutes)	Displays the number of minutes of inactivity after which a session will be automatically logged out.
Account Control	Displays the LDAP account's UserAccountControl status. <i>Note:</i> This indicates the enabled status of the account as well as password expiration information.
Password Last Set	The date and time when the password was last modified.
User Logging	Opens the User Logging view (see "User Logging" on page 276).

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 265.)

Add User ?

Username:

First Name:

Last Name:

Email:

Role:
User ▾

Extension:
None ▾

Password:
 Show

Timeout (minutes):
525600

✕ Cancel Save

Figure 84. Add User Page

Note: You must have permissions to create a user before performing this procedure. (See "Assigning and Editing Permissions" on page 268.)

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 68. Add or Edit User Page Parameters

Username	Provide the username used by this user to log onto the system. <i>Note:</i> This value is read-only when editing an LDAP user account. <i>Note:</i> The username field is case sensitive.
First Name	Provide the first name of the user. <i>Note:</i> This value is read-only when editing an LDAP user account.
Last Name	Provide the last name of the user. This value is read-only when editing an LDAP user account.
Email	Provide the email address of the user. This value is read-only when editing an LDAP user account.
Type (Edit User only)	Displays whether the user account was created on the C4000 (LOCAL) or imported from an LDAP service (LDAP). <i>Note:</i> This value is read-only.
Access Control (LDAP users only)	Displays the current access control settings for this user. Possible values are: <ul style="list-style-type: none">• Enabled• Enabled, password never expires• Disabled• Disabled, password never expires <i>Note:</i> This value is read-only.
Password Last Set (Edit User only)	Displays the date and time when the password was last modified. <i>Note:</i> This value is read-only.
Role	Select the user's role from the drop-down menu.
Extension	Select the station extension for the user from the drop-down menu.

Table 68. Add or Edit User Page Parameters (Continued)

Password or Change Password (LOCAL users only)	Enter the new password. <i>Note:</i> The password is case-sensitive and must contain uppercase letters, lowercase letters, digits, symbols, and a minimum of five characters.
Timeout (minutes)	Specify the number of minutes of inactivity after which the user will be automatically logged off a web session (known as a <i>forced logout</i>). Valid values are 4 to 525600 (i.e., 365 days) or zero (0), which means never perform a forced logout. <hr/> <i>Tip:</i> Moving the mouse while the two-minute warning modal is displayed will reset the timeout. <hr/>

The default value is 60 minutes.

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 68, "Add or Edit User Page Parameters," on page 274.)
- 4 Select **Save**.

User Logging

Each time a user logs into or out of the C4000, an event is logged, including failed login attempts and automatic logouts.

The screenshot shows the 'User Logging' interface. At the top, there are buttons for 'Done', 'Delete All', 'Export All', and 'Refresh'. Below these is a table with columns: Log Type, Name, Username, Email, User Type, Role, Extension, and Created. The table contains 11 rows of data for an Admin user. At the bottom, there is a pagination control showing 'Showing 1 to 10 of 21 rows' and a dropdown for '10 rows per page'. A page navigation bar at the bottom right shows page 1 of 3.

Log Type	Name	Username	Email	User Type	Role	Extension	Created
Login	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:53:32 pm
Failed Login	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:53:27 pm
Login	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:53:20 pm
Auto Logout	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:52:08 pm
Login	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:49:56 pm
Logout	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:49:51 pm
Login	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:49:00 pm
Failed Login	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:48:54 pm
Logout	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 02:48:49 pm
Login	Admin	admin	admin@bogen.com	LOCAL	Admin	123	Nov 11, 2022 11:37:54 am

Figure 85. User Logging Page

To view the user log:

- 1 On the navigation bar, select **Users**.
- 2 Select the **User Logging** button.

The following table describes the information displayed for each logging event.

Table 69. User Logging Page Properties

Log Type	Displays the type of event. Valid values are: <ul style="list-style-type: none">• Login• Failed Login• Logout• Auto Logout (i.e., session timeout)• Forced Logout (i.e., Logout button on Users page)
Name	Displays the name of the user.
Username	Displays the username of the user.
Email	Displays the email address of the user.
User Type	Indicates whether the user account was created on the C4000 (LOCAL) or imported from an LDAP service (LDAP).
Role	Displays the user's assigned Role.
Extension	Displays the user's assigned extension.
Created	Displays the date and time of the event.
Delete All	Deletes all User Logging events.
Export All	Generates and downloads a CSV file containing all User Logging events. The column names, as provided in the first row of the file, are: <ul style="list-style-type: none">• log_type• user_type• user_id• role• username• email• first_name• last_name• extension• created
Refresh	Updates the page to show the latest logging events.

Note: The information logged reflects the state of the user at the time of the event, such as the user's role, extension, email address, etc. Changes to these attributes will not be reflected in events prior to those changes.

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.

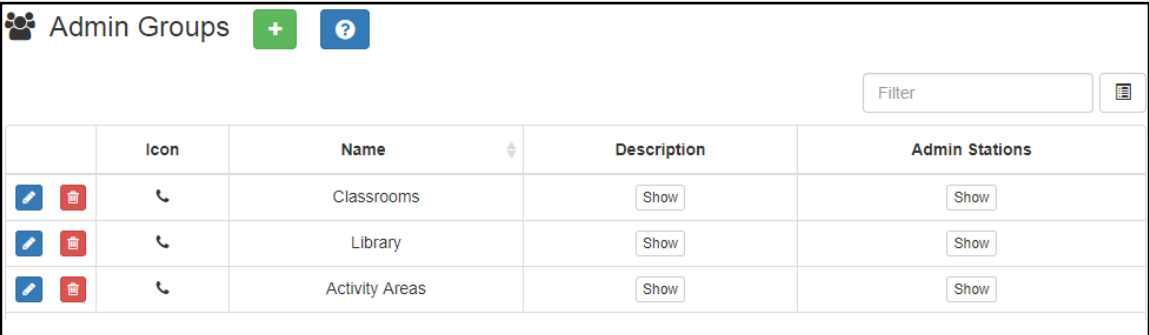
If Call Forwarding is enabled at the Admin Station, Nyquist tries the forwarded extension. If that station does not answer or is busy, the call timeout is reduced to 15 seconds. After 15 seconds, the call rolls over to the Admin Group.

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.












		Icon	Name	Description	Admin Stations
			Classrooms	<input type="button" value="Show"/>	<input type="button" value="Show"/>
			Library	<input type="button" value="Show"/>	<input type="button" value="Show"/>
			Activity Areas	<input type="button" value="Show"/>	<input type="button" value="Show"/>

Figure 86. Admin Groups Page

To view Admin Groups:

On the navigation bar, select **Admin Groups**.

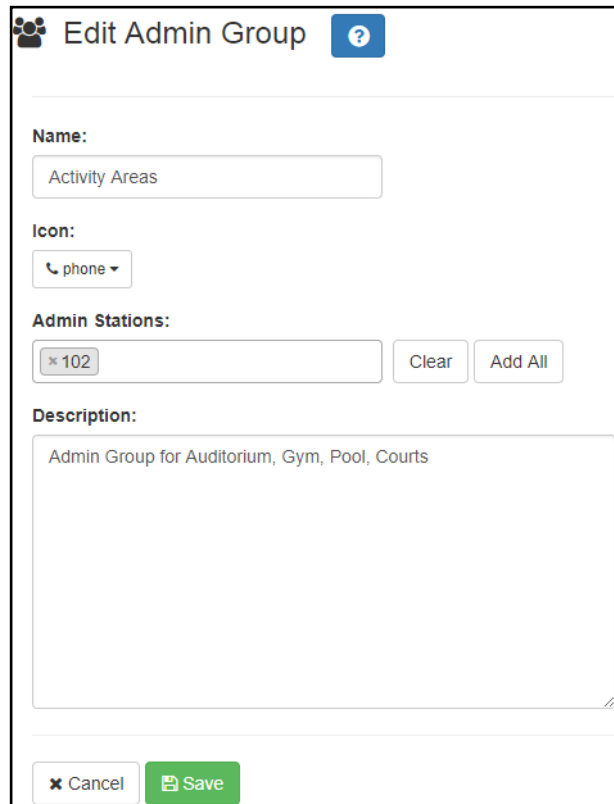
The following table describes the information that appears on the Admin Groups page:

Table 70. Admin Groups Page Parameters

Icon	Displays the icon that is associated with the Admin Group.
Name	Identifies the name of the Admin Group. <i>Note:</i> 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. <i>Note:</i> 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.

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.



The screenshot shows the 'Edit Admin Group' interface. At the top, there is a title bar with a group icon and a question mark icon. Below the title bar, the form is organized into sections: 'Name:' with a text input field containing 'Activity Areas'; 'Icon:' with a dropdown menu showing 'phone'; 'Admin Stations:' with a text input field containing 'x 102', a 'Clear' button, and an 'Add All' button; and 'Description:' with a large text area containing 'Admin Group for Auditorium, Gym, Pool, Courts'. At the bottom of the form, there are 'Cancel' and 'Save' buttons.

Figure 87. 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 198 and "Editing Station Configuration Settings" on page 162.)

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 71. Edit Admin Group Page Parameters

Name	Type the name of the Admin Group. <i>Note:</i> 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. <i>Note:</i> 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 station before attempting to delete the Admin Group. (See *“Editing Outside Lines”* on page 128, *“Setting System Parameters”* on page 70, or *“Editing Station Configuration Settings”* on page 162.)

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 162.)

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 72. Add Admin Groups Page Parameters

Name	Enter the name of the Admin Group. <i>Note:</i> 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. <i>Note:</i> 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, announcements, and audio distribution to be played at specific times and in specific zones, set up holiday schedules, maintain calendar features, and schedule announcements, including recurring announcements. The Schedules feature also allows you to schedule the execution of Routines at specific dates and times and on recurring schedules.

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, which include:

- Event name
- Signal time
- Zone
- Tone
- Scheduled Audio
- Routines

Understanding the Site Page

Through the Site 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.

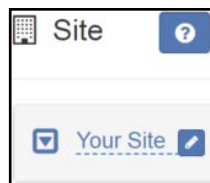


Figure 88. Site Page

You can then create one or more schedules and select the appropriate schedule for specific days of the week.

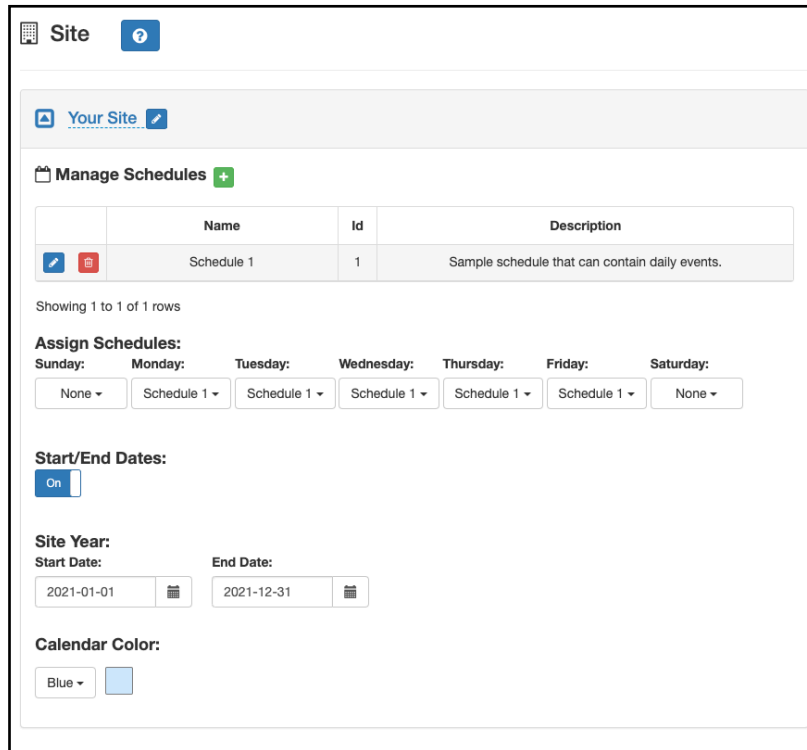


Figure 89. Creating a Schedule

Using Site Settings

The Site page provides parameters that can be added, viewed, and changed for a schedule. The following table describes these parameters:

Table 73. Site Settings Page Parameters

Manage Schedules	<p>Create or edit one or more daily schedules, which can then be assigned to specific days of the week.</p> <p><i>Note:</i> Each schedule is automatically assigned an identifier (Id), which can be referenced via the <code>\$scheduleid</code> variable from various actions and conditional statements.</p>
Day of the Week	<p>Under Assign Schedules, select the schedule that is to be used for that day from the drop-down menu.</p>
Start/End Dates	<p>Use the slider to set to On if you want to enter start and end dates. If set to Off, the schedule continues indefinitely.</p>

Table 73. Site Settings Page Parameters

Start Date	<p><i>Note:</i> This option appears only if Start/End Dates is set to On.</p> <p>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.</p>
End Date	<p><i>Note:</i> This option appears only if Start/End Dates is set to On.</p> <p>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.</p>
Calendar Color	<p>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.</p>

From the Site 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 90. Edit Site Name

To rename a site:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Site**.
- 3 Select the **Edit** icon next to the name of the site that you want to rename.
- 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.

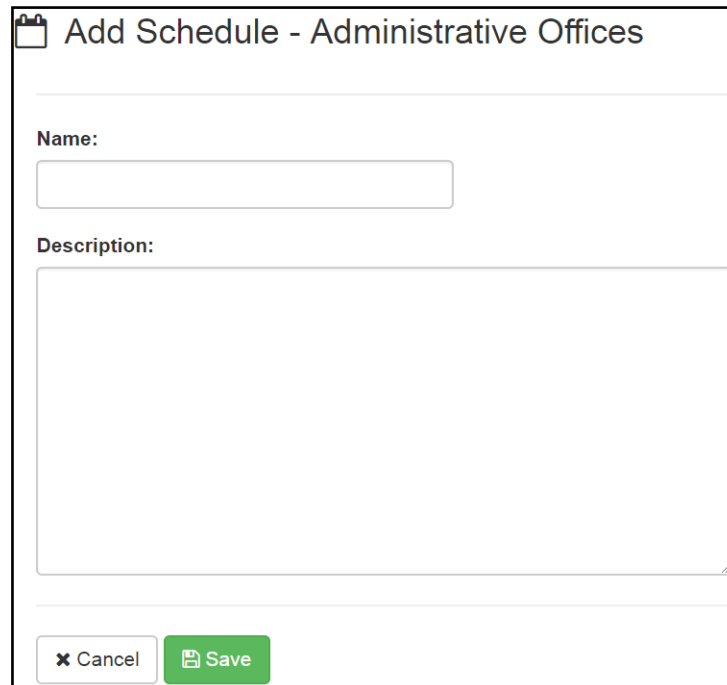


Figure 91. Add Schedule Page

To add a schedule:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Site**.
- 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: ! @ \$ * ? - . , .

- 6 Select **Save**.

Cloning a Schedule

If you need to create a schedule that is similar to an existing schedule, it may be easier to clone an existing schedule than to create one from scratch.

To clone a schedule:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Site**.
- 3 Select the down arrow next to the site name.
- 4 Select the **Clone** icon for the schedule to be copied.
- 5 Select the **Edit** icon for the newly created schedule and modify as desired.

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 296.)

To replace a schedule:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Site**.
- 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 Site 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 Site 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 296.)

To review and edit a schedule:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Site**.
- 3 Select the down arrow next to the site name.
- 4 Make desired changes to the Site settings. (See “Using Site Settings” on page 285.)

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 a.m. as an event, such as the start of a shift. You can add a second event that has the tone sound at 10 a.m. for a scheduled break.

Tip: This view allows you to view scheduled events, not past events that have already occurred. To view past events, look for entries with the Scheduler source and/or Scheduled Event type in the *Call Details* view (see “Using the Call Details Feature” on page 396). Each scheduled event’s Source will be Scheduler, Type will be Scheduled Event, Status will be Start or Played, and Destination will indicate the scheduled event ID, event name, and target zone(s).

	Name	Signal Time	Zones	Tone	Scheduled Audio	Display Event Name	Id	Routines
	Shift Start	8:00:00 am	<input type="button" value="Show"/>	5-Second	None		1	1234 Routine
	Lunch	12:48:00 pm	<input type="button" value="Show"/>	Quad Beep	None		2	None
	Shift End	4:00:00 pm	<input type="button" value="Show"/>	5-Second	None		3	New Routine

Figure 92. Events Page

To review events for a schedule:

- 1 On the navigation bar, expand **Schedules**.

- 2 Select **Site**.
- 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 74* describes the parameters for this page:

Table 74. Events Page Parameters

Name	Displays the name for the event. <i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .
Signal Time	Displays the time for this event to start using the HH:MM:SS format.
Zones	Upon hovering the mouse over the Show button, the zones to be included in this event are shown.
Tone	Displays the desired tone for this event.
Scheduled Audio	Displays if the event includes Scheduled Audio, and if so, what playlist, Matrix Mixer Pre-Amp channel, or amplifier is used for this event.
Display Event Name	Displays if the event name will appear on the GA10PV displays associated to the event zone or zones.
Id	The identifier for this event. <i>Note:</i> This value is accessible as \$eventid in Routines and GA10PV Display Messages.
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.

Edit Schedule - Manufacturing Plant ?

Name:
Regular Day

Description:
Schedule for normal release day on Monday, Tuesday, Thursday, and Friday.

✕ Cancel Save

Figure 93. Edit Schedule Page

To edit a schedule's name and description:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Site**.
- 3 Select the down arrow next to the site 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 94. Edit Event Page

To edit an event:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Site**.
- 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 75, "Event Settings Page Parameters," on page 294.)
- 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 **Site**.
- 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 **Site**.
- 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 75 on page 294*.)
- 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.

Understanding Event Settings

Event settings appear when adding or editing an event.

Table 75. Event Settings Page Parameters

Name	<p>Specifies the name for the event.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Signal Time	<p>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.</p>
Zones	<p>Specifies the zones to be included in this event.</p> <p><i>Note:</i> 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.</p> <hr/> <p>Caution It is possible for multiple zones to have one or more stations in common. If you schedule an event for zones that share one or more stations, there may be issues.</p> <hr/>
Tone	<p>Select the desired tone for this event. If an audio distribution entry from the Scheduled Audio menu is selected, this field is not required.</p> <p><i>Note:</i> If a tone is specified for this setting and the devices in the specified zones are unable to communicate with the Nyquist server at the scheduled time, the devices will still trigger this event for up to 72 hours after the last successful synchronization with the Nyquist server (which occurs at midnight). Instead of the specified Tone, however, it will play the Appliance Backup Scheduled Tone (see “<i>Edit System Parameters Page</i>” on page 72).</p>

Table 75. Event Settings Page Parameters (Continued)

Scheduled Audio	<p>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.</p> <p>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.</p>
Display Event Name	<p>Specifies if the event name will appear on the GA10PV displays associated to the event zone or zones.</p> <p><i>Note:</i> 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.</p>
Amplifiers/Matrix Mixers	<p>Specifies the amplifiers or Matrix Mixer Pre-Amp and its associated station number.</p> <p><i>Note:</i> This parameter appears only if Scheduled Audio is set to Start Line-Input.</p>
Input Channel	<p>Specifies the matrix channel being used for input.</p> <p><i>Note:</i> This parameter appears only if Scheduled Audio is set to Start Line-Input.</p>
Routines	<p>Specifies one or more Routines to be executed when this event starts.</p> <p><i>Note:</i> If a specified routine is disabled, it will not execute, but will not be removed from the trigger.</p>

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.

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 **Site**.
- 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.

The Calendar view also provides access to the calendars of Facilities that are defined in the Facilities view (see *"Configuring Facilities" on page 137*). You can view and modify calendars of any Facilities that are configured to allow access via the Remote Calendar Control settings (see *Table 20, "Edit System Parameters Page," on page 72*).

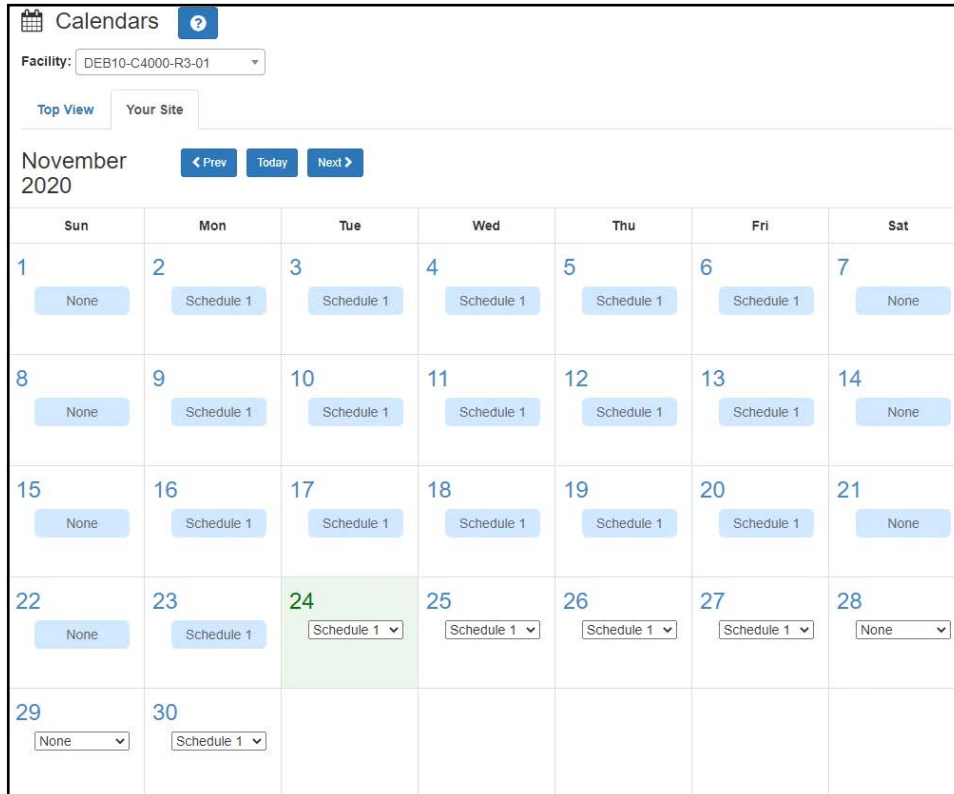


Figure 95. Calendars Page

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.

- 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 popup window that appears.
- 7 When done viewing events, select **Close**.

Schedule Popup Window Parameters

The Schedule popup window appears when viewing events for a date from either the monthly view (see *“Using the Calendars Feature”* on page 296) or from the dashboard’s Weekly Schedule panel (see *“Viewing the Schedule for the Week”* on page 437).

Time	Name	Zones	Tone	Scheduled Audio
7:41:00 am	Start - CCM	Zone-1: Time Zone	1-Second	
7:42:00 am	Stop - CCM	Zone-1: Time Zone	1-Second	
9:59:00 am	Daily Meeting	Zone-1: Time Zone	Quad Beep	None
10:56:00 am	test1	Zone-1: Time Zone	Hyenaah	▶ Disney World
10:57:00 am		Zone-1: Time Zone	No Tone	⊘ Stop Playlist
12:27:00 pm	caramel	Zone-1: Time Zone	Hyenaah	None
3:21:00 pm		Zone-1: Time Zone	7-Second	None
3:22:00 pm		Zone-1: Time Zone	7-Second	None

Figure 96. Schedule Popup Window

The Schedule popup window displays the name, the day, and the date of the schedule. It also contains the following parameters:

Table 76. Schedule Popup Window 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:

! @ \$ * ? - . , .

Table 76. Schedule Popup Window Parameters (Continued)

Zones	Identifies the zones and types of zones that are specified for this event.
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 .

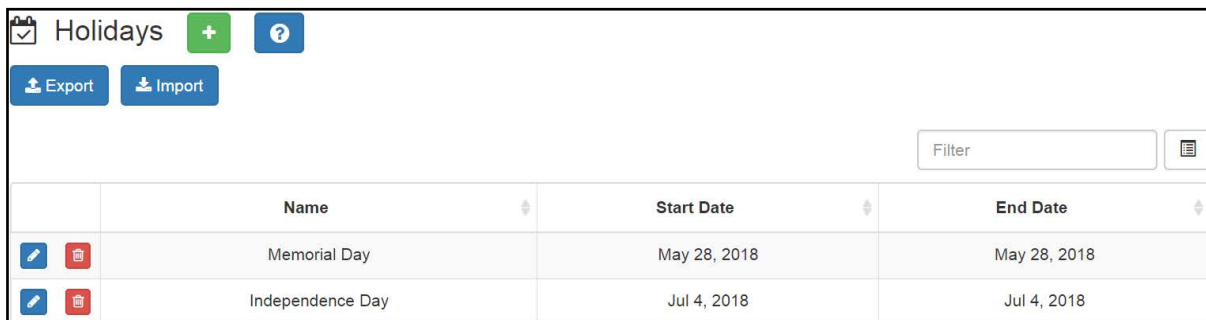
Using the Holidays Management Tool

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 "overrides" the Regular schedule and tones do not sound during that day.







	Name	Start Date	End Date
 	Memorial Day	May 28, 2018	May 28, 2018
 	Independence Day	Jul 4, 2018	Jul 4, 2018

Figure 97. Holidays Page

To view holidays:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Holidays**.
A listing of holidays and the parameters associated with these holidays appears.

The following table describes these parameters:

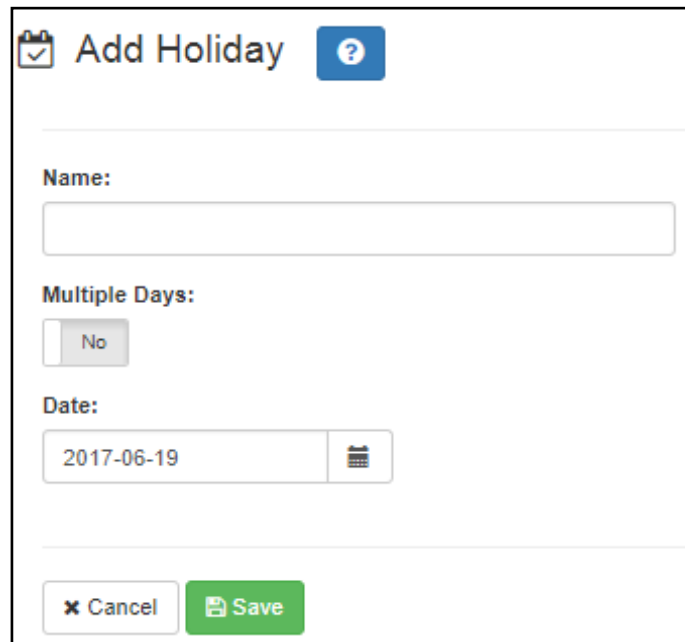
Table 77. Holiday Parameters

Name	Provides the name of the holiday.
Multiple Days	<i>Note:</i> 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. <i>Note:</i> For holidays that do not involve multiple days, this field appears as Date .
End Date	Provides the end date of the holiday. <i>Note:</i> 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 Nyquist servers.

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.



The screenshot shows a form titled "Add Holiday" with a calendar icon and a help icon. The form includes a "Name:" text input field, a "Multiple Days:" toggle switch set to "No", and a "Date:" field with the value "2017-06-19" and a calendar icon. At the bottom are "Cancel" and "Save" buttons.

Figure 98. 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 77, "Holiday Parameters," on page 300.)
- 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**.

- 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 77, "Holiday Parameters," on page 300*.
- 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 or 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.
- 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 Announcements 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 315.

	Name	Type	Description	Signal Date	Signal Time	Zone	Max Wait Seconds	Recurring	Recurrence Data	Playback
	Lockdown Alert	Emergency		Recurring	Recurring	All Speakers	120	Yes		▶ 0:00 / 0:04
	Lockdown Alert	Emergency		Oct 20, 2021	5:30:30pm	All Speakers	120	No		▶ 0:04 / 0:04

Figure 99. 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 78. Schedule Announcements Page Parameters

Name	<p>Displays the name of the announcement.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Type	The type of announcement; either Normal or Emergency .
Description	<p>Displays the description of the announcement.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
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.
Maximum Wait Seconds	<p>Specifies the maximum number of seconds to wait for an active page or announcement to complete so the scheduled announcement can be played.</p> <p>The default is 120 seconds.</p> <p>If an Emergency All-Call is in progress at the time that a scheduled announcement should be played, the scheduled announcement will not be played due to the active Emergency All-Call. In this case, the scheduled announcement will not wait for the Emergency All-Call to end and will be canceled.</p> <p><i>Note:</i> Scheduled Announcements will not play during an active check-in process.</p>
Recurring	<p><i>Note:</i> If an announcement is already playing, a recurring announcement will not play until its next scheduled occurrence.</p> <p>Indicates if the announcement is scheduled to reoccur.</p>
Recurrence Data	Displays data for the recurring announcement, such as the start and end dates, when you roll over or select the Show button.

Table 78. Schedule Announcements Page Parameters

Playback	Allows you to manually play the announcement. Selecting the down arrow in this field also allows you to download and save the announcement.
Refresh	Press the Refresh button to refresh the list of Scheduled Announcements.

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, 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 354.)

To add a schedule announcement:

Edit Schedule Announcement

✕ Cancel Save

Announcement: Lockdown Alert (Emergency)

▶ 0:00 / 0:04 🔊 ⋮

Signal Date: 2023-03-22 📅

Signal Time:

Hour: 11 **Minute:** 13 **Second:** 56

Zone: All Speakers

Maximum Wait Seconds: 120

Recurring: No

✕ Cancel Save

Figure 100. Add Schedule Announcement Page

- 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 79. Add Schedule Announcement Parameters

Announcement	Use the drop-down menu to select the announcement that you want to schedule.
Signal Date	<p><i>Note:</i> This field only appears if Recurring has been set to No.</p> <p>Use the calendar or type to select the date that the announcement is to play.</p>

Table 79. Add Schedule Announcement Parameters (Continued)

Signal Time	<p><i>Note:</i> This field only appears if Recurring has been set to No.</p> <p>Select the Hour, Minute, and Second from the corresponding dropdown menus.</p>
Zone	<p>Select either All Speakers or a specific zone that is to receive this announcement.</p>
Maximum Wait Seconds	<p>The maximum number of seconds to wait if there is already an active page preventing the scheduled announcement from playing. Valid values range from 0 to 86400.</p> <p>The default value is 120 seconds.</p>
Recurring	<p>Use the slider to indicate if the announcement will be scheduled to recur.</p>

*If **Recurring** is set to Yes, the following parameters will be displayed:*

Table 80. Recurring Parameters

Recurrence Start Date	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>Use the calendar or type to select the start date for this recurring announcement.</p>
Recurrence End Date	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>Use the calendar or type to select the end date for this recurring announcement.</p>
No End Date	<p>Use the slider to select Yes if you want this announcement to recur indefinitely.</p>
Recurrence Second	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>Select the Second from the corresponding drop-down menu.</p>
Recurrence Minute	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>Select the Minute from the corresponding drop-down menu. If you do not select a minute, the default will be every minute.</p>
Recurrence Hour	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>Select the Hour from the corresponding drop-down menu. If you do not select an hour, the default will be every hour.</p>

Table 80. Recurring Parameters

Recurrence Day	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>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.</p>
Recurrence Month	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>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.</p>
Recurrence Day of the Week	<p><i>Note:</i> This field appears only if Recurring has been set to Yes.</p> <p>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.</p>

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 announcement, 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 427).

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 79, "Add Schedule Announcement Parameters," on page 306.)
- 5 After making the desired changes, select **Save**.

Using the Schedule Routines Feature

Routines can be scheduled to execute at a future date/time, and can be scheduled to repeatedly execute using a recurring schedule.

Routines that you want to schedule for execution must have an **Extension** defined and must have **Use Caller's Extension** set to No.

To view Schedule Routines, and to schedule a Routine:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Schedule Routines**.
- 3 To schedule a Routine for execution, select the Add  icon.

The Schedule Routines page appears. This page displays the following information each of the scheduled routines:

Table 81. Schedule Routines Properties

Name	Name of the Routine to be executed.
Description	Displays the description of the routine. <i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .
Execute Date	Date on which Routine will execute.
Execute Time	Time at which Routine will execute.
Parameter 1	Value to be passed to the Routine as \$schedParam1.
Parameter 2	Value to be passed to the Routine as \$schedParam2.

Table 81. Schedule Routines Properties

Zone	Either All Speakers or the specific zone associated with the Routine.
Recurring	If the Routine is scheduled to recur, Yes, otherwise No.
Recurrence Data	Displays data for the recurring routine, such as the start and end dates, when you roll over or select the Show button.

Add a Scheduled Routine

To schedule a Routine execution, select the Plus icon.

Figure 101. Add Schedule Routine

Table 82. Add Schedule Routine Parameters

Routine	<p>Use the drop-down menu to select the Routine that you want to schedule.</p> <p><i>Note:</i> Only Routines that have Extension set and have Use Caller's Extension set to No will be displayed.</p>
Start Date	<p><i>Note:</i> This field only appears if Recurring has been set to No.</p> <p>Use the calendar to select the date on which the Routine is to execute.</p>

Table 82. Add Schedule Routine Parameters (Continued)

Start Time	<p><i>Note:</i> This field only appears if Recurring has been set to No.</p> <p>Select the Hour and Minute from the corresponding drop-down menus to select the Hour and Minute that the Routine is to execute.</p> <p><i>Note:</i> Scheduled Routines will start at the beginning of the selected minute. If you want the actions in a Routine to start a few seconds after the beginning of the selected minute, you can insert a Pause action in the Routine to delay the execution of actions until the second that you want them to execute. For example, if you want the actions in a Routine to start at 12h:05m:15s, add a Pause action with Seconds equal to 15.</p>
Parameter 1 and Parameter 2	<p>The Parameter 1 and Parameter 2 values are made available to Routine Conditions and the following Routine actions via the \$schedParam1 and \$schedParam2 variables (see Table 124, "Action Types and Parameters," on page 496 for details):</p> <ul style="list-style-type: none">• Add-Announcement-Audio• Dash-Text• Dash-Text-Delete• Display-Msg• Display-Msg-Delete• Email
Zone	<p>Select either All Speakers or a specific zone to associate with the Routine.</p> <p>The zone number is used by the following:</p> <ul style="list-style-type: none">• Dash-Text and Dash-Delete actions for Text field and Identifier field via \$zone variable.• Display-Msg and Display-Msg-Delete actions for Text field and Identifier field via \$zone variable.• Email action subject field and text field via the \$zone variable.• The zone number is also passed to Routines that are executed by the scheduled Routine, which is useful if the subsequently executed Routine includes a Feature-Wait action or other actions that use the \$zone variable.
Recurring	<p>Use the slider to indicate if the Routine will be scheduled to recur.</p>

If **Recurring** is set to Yes, further parameters will be displayed to configure the recurring Routines. For details on the parameters, see *Table 80, "Recurring Parameters,"* on page 307.

Edit a Schedule Routine

To edit a Scheduled Routine:

- 1 On the navigation bar, expand **Schedules**.
- 2 Select **Schedule Routines**.
- 3 Select the **Edit** icon for the Schedule Routine.
- 4 On the Edit Schedule Routine page, make the desired changes. (See *Table 81, "Schedule Routines Properties,"* on page 309 and *Table 80, "Recurring Parameters,"* on page 307).
- 5 Select **Save**.

Schedule Routine Call Detail Records

When a scheduled routine is executed, a call detail record is created in the following format:

Source: Routine Extension

Destination: Routine (routine's DTMF code)

Type: Scheduled Routine

Status: Executed

Call Detail Records are created for Routines executed on a specific scheduled date/time and for each execution of a recurring schedule.

Retrieving First and Last Scheduled Events

You can retrieve XML 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 In your browser, type the following:

```
http://<server>:8088/static/schedules-boundary.xml
```

- 2 Press **Enter**.

Alternatively, you can retrieve the XML programmatically or from a command prompt. Here are a couple simple examples:

Curl example:

```
curl http://<server>:8088/static/schedules-boundary.xml
```

PowerShell example:

```
(Invoke-WebRequest -Uri http://<server>:8088/static/schedules-boundary.xml).Content
```

The XML returned will contain the schedule name, as well as the start and end event times, for the site. (See *Figure 102, "Schedule Information for a Site," on page 314.*) If the day has been scheduled as a holiday, the word "Holiday" appears in the .xml file. (See *Figure 103, "XML Output for a Holiday," on page 314.*)

```
<?xml version="1.0" encoding="UTF-8"?>
<Schedules>
  <Site>
    <Name>Manufacturing Plant</Name>
    <Schedule>
      <Name>Regular Day</Name>
      <First-Event>8:40:00</First-Event>
      <Last-Event>14:50:00</Last-Event>
    </Schedule>
  </Site>
</Schedules>
```

Figure 102. Schedule Information for a Site

```
<Schedules>
  <Holiday>
    <Name>New Year's Day</Name>
    <Start-Date>2022-01-01</Start-Date>
    <End-Date>2022-01-01</End-Date>
  </Holiday>
</Schedules>
```

Figure 103. 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 284.)

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 147) 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 104).

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 293).

The following steps will guide you through setting up Audio Distribution:

- 1** Define audio sources by:
 - Adding songs and creating playlists (see *"Managing Songs" on page 320* and *"Managing Playlists" on page 326*)
 - Adding airable Radio Station sources (see *"Using Internet Radio Services" on page 332*)
 - Adding SoundMachine sources (see *"Adding a Source" on page 334*)
 - Setting up appliances that will provide audio sources (see *"Managing Line-Input Sources" on page 318*)
- 2** On the Dashboard, add Audio Distributions that can be used by the system. Each Audio Distribution defines the audio source to use and the destinations (i.e., zones and/or stations) for the audio when played (see *"Creating an Audio Distribution" on page 341*).
- 3** Setup your Audio Distributions to play by:
 - Scheduling Audio Distribution via Schedules (see *"Using the Schedule Announcements Feature" on page 303*)
 - Starting Audio Distribution via Routines (see *"Using Routines to Start Audio Distribution" on page 347*)
 - Starting Audio Distribution via I/O Controller contact closure (see *"Configuring I/O Controller Input Rules" on page 170*)
 - Starting Audio Distribution manually using one of the following:
 - Web Interface Dashboard (see *"Using Audio Distribution" on page 438*)
 - NQ-T1100 or NQ-ZPMS Admin Phone (see *"Customizing an NQ-T1100 IP Phone – Color Touch Display" on page 216*, *"Customizing an NQ-ZPMS Zone Paging Microphone Station" on page 219*, and *"Using the Admin Phone" on page 349*)

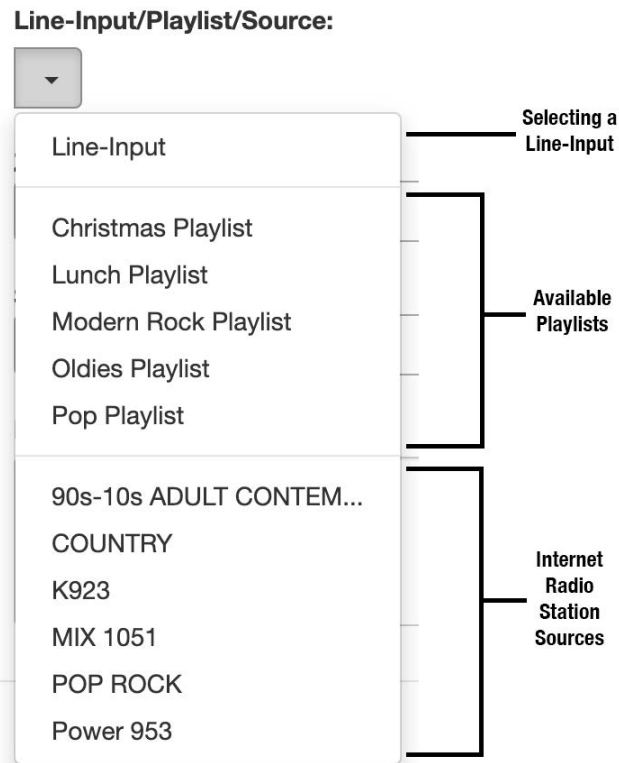


Figure 104. Audio Distribution Sources

Audio Distribution sources can include:

- Audio from two- or four-channel audio power amplifier's or MMPA's Line Inputs
- User-supplied music (songs and playlists)
- Internet Radio Services
 - airable stations
 - SoundMachine stations

Managing Line-Input Sources

The screenshot shows a web form titled "Create an Audio Distribution". It has a dropdown menu labeled "Line-Input/Playlist/Source" with "Line-Input" selected. A dropdown menu is open, listing the following options: "A2120-G2-2CH (201)", "A4060 - G2 - 4CH (206)", "GA400P (198)", "PA600-TechDoc (212)", "191-MMPA (191)", and "197 - GA40P3 (197)". To the right of the dropdown menu are two empty input fields. Below the dropdown menu is a small square button with an upward-pointing arrow. To the right of this button is the label "Input Channel:" followed by another small square button with an upward-pointing arrow. Below these elements is a large text area labeled "Description:". At the bottom right of the form are two buttons: "Close" and "Save".

Figure 105. 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 Distribution.

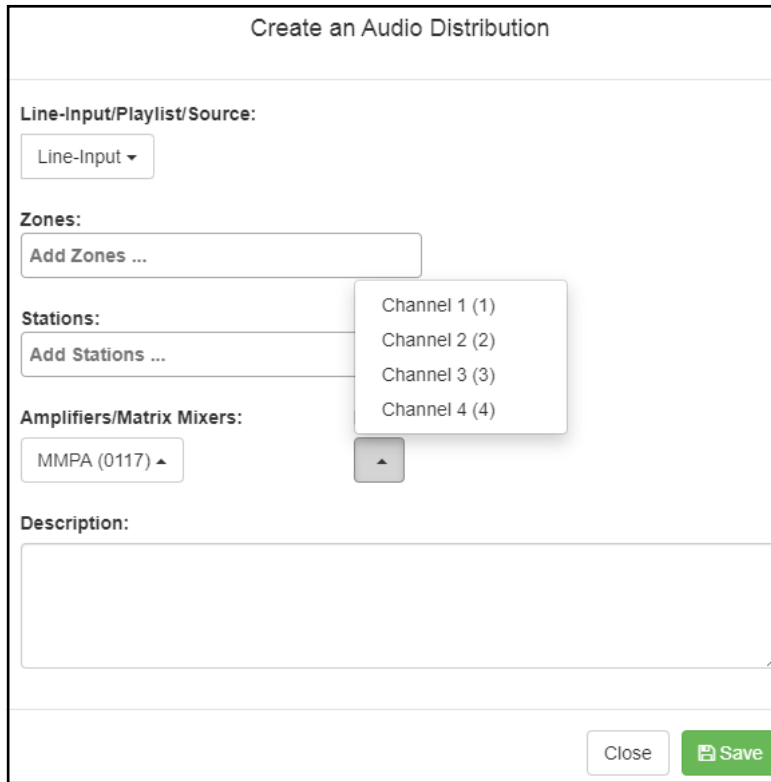


Figure 106. Available Channels for an MMPA

The available Input Channel selections can range from 1 or 2 for an amplifier or 1 to 4 for an MMPA.

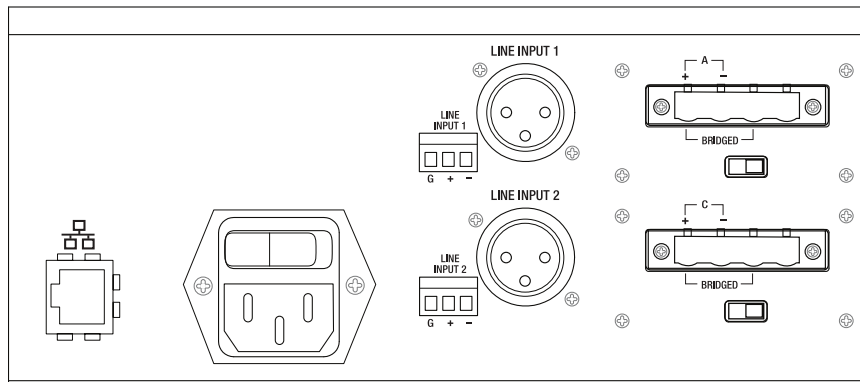


Figure 107. Line Input for NQ-A4300-G1 Audio Power Amplifier

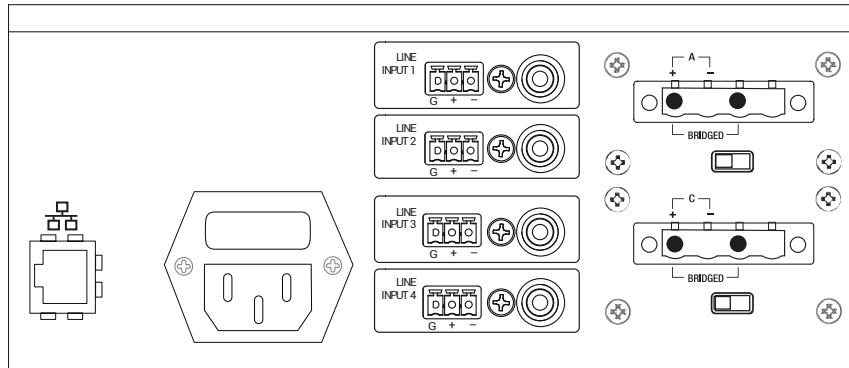


Figure 108. Line Input for NQ-A4300-G2 Audio Power Amplifier

The G1 amplifiers and MMPAs must be configured at the device, using either XLR or Phoenix (but not both) as the input. The G2 amplifiers must be configured at the device, using either RCA or Phoenix (but not both) as the input.

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 upload a song similarly to how you upload an announcement file or tone. You can store songs on a USB flash drive; these songs can then be played via the playlists feature (see *"Playing Songs Directly from a USB Flash Drive" on page 322*).

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 398*.)

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.

Songs								Filter
	Title	Artist	Album	Track Number	Length	Genre	Year	Playback
	Come Together	Aerosmith	Aerosmith's Greatest Hits	9	03:46	Rock	1993	▶ 0:00 / 3:46
	Dream On	Aerosmith	Aerosmith's Greatest Hits	1	04:27	Rock	1993	▶ 0:00 / 4:27
	Fins	Jimmy Buffett	Songs You Know By Heart	3/13	03:25	Rock	1985	▶ 0:00 / 3:25
	Pink Noise	Bogen Communications LLC	Test Tools	1	01:00	Tones	2018	▶ 0:00 / 1:00
	Shake Me Like A Monkey	Dave Matthews Band	Big Whiskey and the GrooGrux King	2/13	04:01	Rock	2009	▶ 0:00 / Download
	White Noise	Bogen Communications LLC	Test Tools	2	01:00	Tones	2018	▶ 0:00 / Playback speed

Figure 109. 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 83. 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.
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.

Table 83. Songs Page Parameters (Continued)

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, as well as specify the song's playback speed.

Playing Songs Directly from a USB Flash Drive

You can use a USB flash drive as storage for songs that can be played via the playlists feature.

To add songs and create a playlist for a USB flash drive, you must create a root file on the USB flash drive 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.

The music files must be in the root directory of the USB flash drive. Valid formats for these files are mp3, wav, and aac.

The Nyquist server automatically mounts the USB flash drive, 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**.

If you want to see if a USB flash drive is plugged into the System Controller and mounted for use, you can use the **Check Server Status** feature from System Parameters to view a list of mounted USB drives (search for "USB Drives" in the "Disk Space" section of the Check Server Status report).

Note: If you use a USB flash drive as storage for songs on a playlist and the USB flash drive 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 flash drive from the computer.

Warning After you have inserted a USB flash drive into the System Controller, removing it may damage the contents stored on the USB flash drive. If you need to remove the USB flash drive from the System Controller, use **Shut Down**, found in System Parameters, to shutdown the Nyquist System Controller before removing the USB flash drive.

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.

The screenshot shows a web form titled "Add Song" with a play icon and a help icon. The form is organized into several sections:

- Multiple Songs:** A button labeled "No".
- Title:** A text input field.
- Artist:** A text input field.
- Album:** A text input field.
- Track Number:** A text input field with an information icon.
- Year:** A text input field.
- Genre:** A text input field.
- Playlists:** A text input field with the placeholder "Add song to playlists ...", a "Clear" button, and an "Add All" button.
- File Upload:** A "Choose a file ..." button and a "Choose File" button.

At the bottom of the form are two buttons: "Cancel" and "Save".

Figure 110. 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 metadata, 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 metadata. 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.
- 5 After completing all changes, select **Save**. The song or songs will be copied onto the Nyquist system.

Table 84. 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 (see *Table 85 on page 325*).
- 5 After completing all changes, select **Save**.

Table 85. 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:

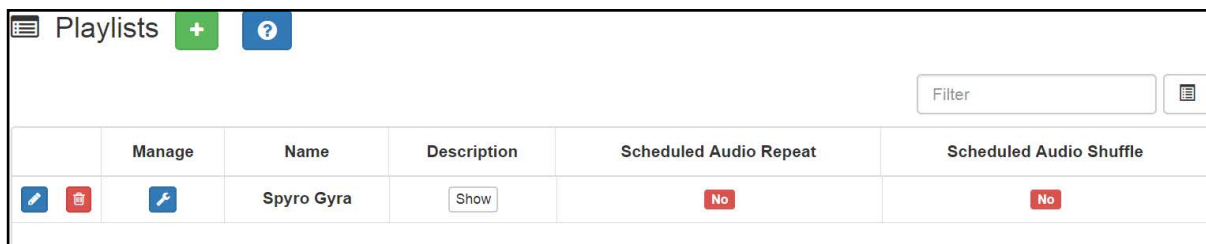
- 1 On the navigation bar, expand **Audio**.
- 2 Select **Songs**.
- 3 On the Songs page, select the **Delete** icon next to the song that you want to delete.
- 4 When prompted, select **Delete**.

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 293.) Specifying the audio program for stations or zones is known as audio distribution.

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.






	Manage	Name	Description	Scheduled Audio Repeat	Scheduled Audio Shuffle
 		Spyro Gyra	<input type="button" value="Show"/>	<input type="button" value="No"/>	<input type="button" value="No"/>

Figure 111. 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 86. 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. This field can contain a maximum of 40 characters. <i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .

Table 86. Playlists Page Parameters (Continued)

Description	<p>When Show is selected, the user-provided description of the play list appears. This field can contain a maximum of 256 characters.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Scheduled Audio Repeat	<p>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.</p> <p><i>Note:</i> When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.</p>
Scheduled Audio Shuffle	<p>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.</p> <p><i>Note:</i> When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.</p>

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 uploaded to your Nyquist server or are available on a USB flash drive inserted into the Nyquist server.

☰ Add Playlist ?

Name:

Scheduled Audio Repeat:
 Yes

Scheduled Audio Shuffle:
 Yes

Description:

Figure 112. 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 87, "Add Playlist Parameters,"* on page 329.)
- 5 Select **Save**.

Table 87. Add Playlist Parameters

Name	<p>Displays the user provided name for the playlist. This field can contain a maximum of 40 characters.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Scheduled Audio Repeat	<p>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.</p> <p><i>Note:</i> When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.</p>
Scheduled Audio Shuffle	<p>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.</p> <p><i>Note:</i> When playlists are being used by the Audio Distribution feature, the Scheduled Audio options are ignored.</p>
Description	<p>When Show is selected, the user-provided description of the playlist appears. This field can contain a maximum of 256 characters.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>

Adding Songs to a Playlist

After you create a playlist, use the Manage tool to add songs to the playlist.

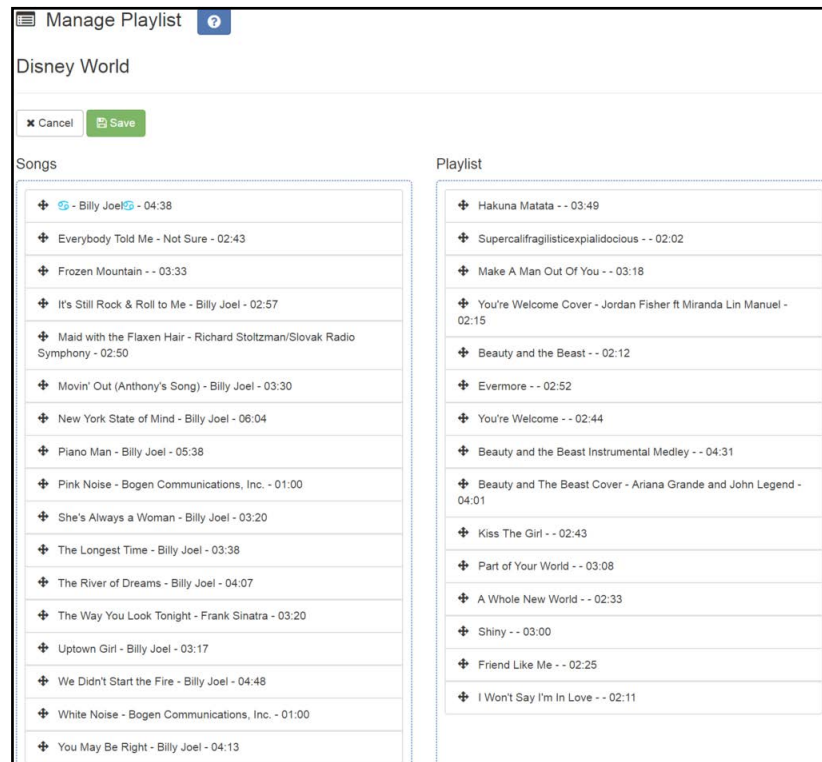


Figure 113. Manage Playlist Page

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 Playlist 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**.

- 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 Playlist 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 330*. To delete a song from a song list, see *"Deleting a Song from a Playlist" on page 331*.

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 87, "Add Playlist Parameters," on page 329*.)
- 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 access online content, such as music services and Internet radio, using *airable* and *SoundMachine*. 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.

Use of the Internet Radio Services feature requires the Nyquist server to have Internet access. It also depends on the permissions assigned to the role with which you are associated.



Figure 114. Internet Radio Services Permissions

For information about assigning permissions to roles, see *“Assigning and Editing Permissions” on page 268.*

Viewing Internet Radio Services

If you have **View** permission for the Internet Radio Services, you can view a list of Internet 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 337.*)

Station	Codec	Sample Rate	Mono/Stereo	Bit Rate
Eagles	MP3			192kb/s
LiveATC KBED Laurence G Hanscom Field Airport Tower	MP3	16000 Hz	Mono	24 kb/s
Money Matters Boston	MP3	44100 Hz	Stereo	128 kb/s
WBUR 90.9 FM	MP3	22050 Hz	Mono	48 kb/s

Figure 115. 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 88. 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.

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 Source** also allows you to manage credentials or sign up for SoundMachine.

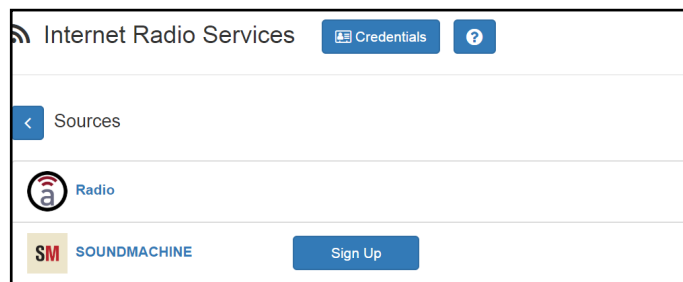


Figure 116. Add Source Page

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 Source**.
- 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 89. 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 appears, 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:

Table 90. SoundMachine Parameters

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 SoundMachine 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	<p>Displays the Schedules that have been created through SoundMachine. (See <i>"Using SoundMachine Music Selection Schedules"</i> on page 340.)</p> <p>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.</p> <p>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.</p> <p>The Music Selection Schedules that you create appear as Line-Input/Playlist/Source selections for Audio Distribution. (See <i>"Using Audio Distribution"</i> on page 438.)</p>
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.

- 4 When prompted, select **Delete**.

Managing Credentials

If you have been assigned permissions, you can view, add, edit, and delete login credentials needed to access the SoundMachine service.

For information about roles and permissions, see *"Assigning and Editing Permissions"* on page 268.

Viewing Credentials

The Credentials list allows a quick view of the users who have login 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 91. 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.

Adding 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 SoundMachine.

The screenshot shows a web form titled "Add Credential" with a help icon. The form contains the following elements:

- Name:** A dropdown menu with "SOUNDMACHINE" selected.
- Username:** An empty text input field.
- Password:** An empty text input field.
- Enabled:** A radio button set with "No" selected.
- Sign Up:** A blue button on the right side of the form.
- Cancel:** A button with an 'x' icon at the bottom left.
- Save:** A green button with a floppy disk icon at the bottom right.

Figure 117. 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 92. 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 118. 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 93*.)
- 6 Select **Save**.

Table 93. Edit Credentials 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. 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 334*) or Add Credential (see *"Adding Credentials" on page 337*) 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 438*.)

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 294*.

Creating an Audio Distribution

Audio Distribution +					
Line-Input/Playlist/Source	DTMF Code	Zones	Stations	Description	
Playlist 1	5	<input type="button" value="Show"/>	<input type="button" value="Show"/>	This is my description. This is my description. ...	
Playlist 2	6	<input type="button" value="Show"/>	<input type="button" value="Show"/>	This is my description. This is my description. ...	

Figure 119. 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 108 if you need to change your station's CoS.

CoS Configuration + ?						
Name	Call in Level	Zone Paging	All-Call Paging	Emergency All-Call	Inter-Facility Call/Page	Audio Distribution
Admin	Urgent+Emergency	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>
Station	Normal+Emergency	<input type="button" value="No"/>	<input type="button" value="No"/>	<input type="button" value="No"/>	<input type="button" value="No"/>	<input type="button" value="No"/>
No Privs	Normal+Emergency	<input type="button" value="No"/>	<input type="button" value="No"/>	<input type="button" value="No"/>	<input type="button" value="No"/>	<input type="button" value="No"/>
Chrome	Normal+Emergency	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="No"/>	<input type="button" value="No"/>	<input type="button" value="No"/>
tomtest	Normal+Emergency	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>

Figure 120. Audio Distribution Set in CoS

You must also be assigned a Role that has permissions to create Audio Distribution.

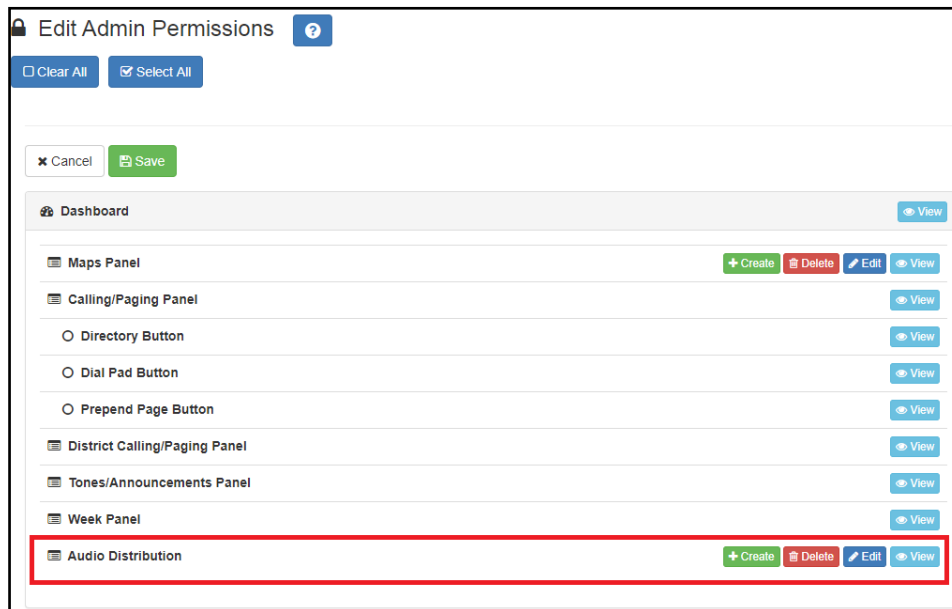


Figure 121. Role Permissions for Audio Distribution

Figure 122. Create an Audio Distribution

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 94*).

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 94. 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.

Starting and Stopping Audio Distribution

Starting and stopping Audio Distribution can be done manually (via the Nyquist web interface dashboard, the NQ-T1100 or NQ-ZPMS Admin Phone's Audio Distribution menu, or the 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.

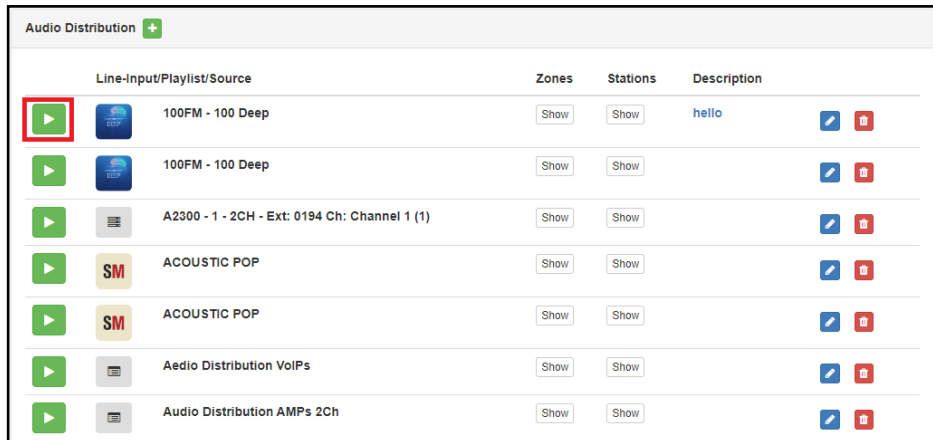


Figure 123. Audio Distribution Play Icon

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 If a non-blank **Audio Distribution Password** has been configured (see *Table 20, "Edit System Parameters Page," on page 72*), a keypad will be displayed and an audio prompt will request either the audio distribution password value or a confirmation (i.e., the digit 1).
- 4 The selected audio distribution will start.
- 5 To end the playing of audio, select the **Stop** icon next to the playlist.
- 6 If a non-blank **Audio Distribution Password** has been configured (see *Table 20, "Edit System Parameters Page," on page 72*), a keypad will be displayed and an audio prompt will request either the audio distribution password value or a confirmation (i.e., the digit 1).
- 7 The selected audio distribution will stop.

Add Event

Name:
Lunch Time Music

Signal Time:
Hour: 11 **Minute:** 30 **Second:** 0

Zones:
 × Zone-120: Zone 20 - VoIPs
 × Zone-132: Zone 32 - Amplifiers 2Ch
 Clear Add All

Tone:
1-Second

Scheduled Audio:
None

- None
- Start Line-Input
- Stop Line-Input
- Stop Playlist
- Stop 100FM - 100 Deep (Z: Zone 32 - Amplifiers 2Ch)
- Stop Chill (Z: Zone 20 - VoIPs)
- Aedio Distribution VoIPs
- Audio Distribution AMPs 2Ch
- Audio Distribution AMPs 4Ch
- Audio Distribution ASBs
- Disney World
- Fiddle Faddle

Figure 124. 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 293.

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 distribution does not appear in this **Scheduled Audio** list.

Automatically Starting a Routine When Audio Distribution is Started

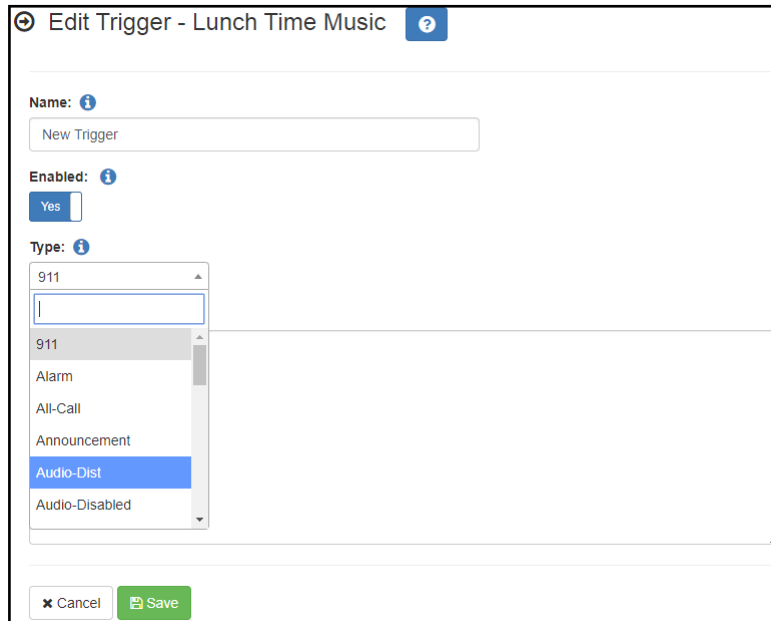


Figure 125. Adding Audio-Dist Trigger

The Routines feature lets you automatically start one or more actions using Audio Distribution (Audio-Dist) as a trigger. For example, maybe you want a bell or tone to sound in the kitchen when the lunchtime music begins, alerting 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 474 for more information about creating a routine.

Using Routines to Start Audio Distribution

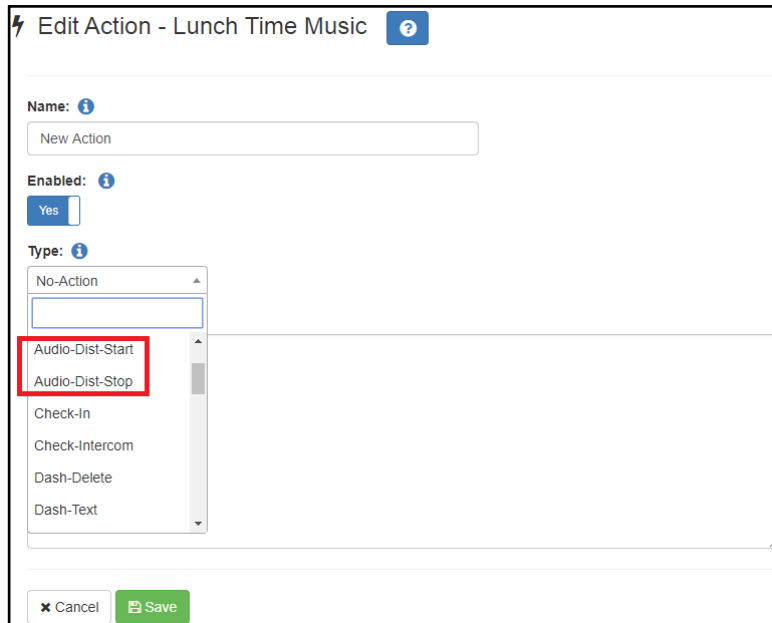


Figure 126. Audio Distribution Actions

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 466.

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 235.

All Nyquist stations are preprogrammed 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 162).

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.

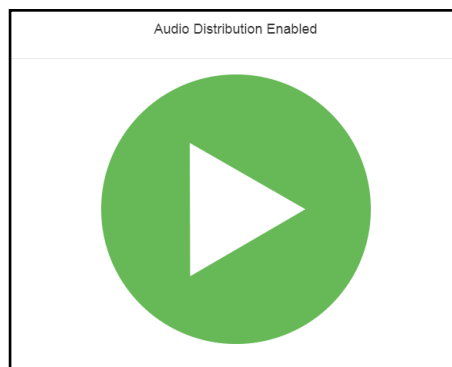


Figure 127. Audio Distribution Enabled

A popup window also appears when you stop Audio Distribution.

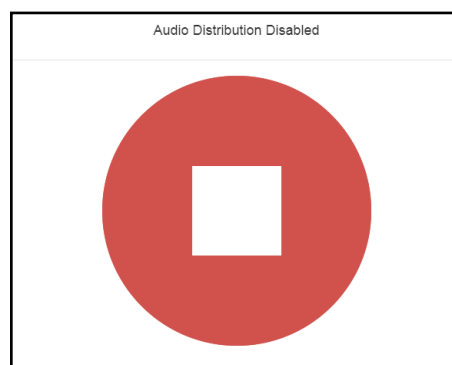


Figure 128. Audio Distribution Disabled

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.



Figure 129. Audio Distribution Status

In the **Audio Distribution** section of the dashboard, the **Stop** icon will be displayed next to an audio distribution that is playing. Selecting the **Stop** icon will stop the audio distribution.

In the **Audio Distribution** menu of NQ-T1100 and NQ-ZPMS Admin phones, audio distributions that are currently playing are prefixed with "(P)" to indicate that the audio distribution is playing.

Using the Admin Phone

If you are using a Nyquist NQ-T1100 or NQ-ZPMS VoIP Phone as an Admin Phone, you can start and stop a specified Audio Distribution or stop all Audio Distributions by selecting the phone's Audio Distribution menu.



Figure 130. NQ-T1100 Admin Phone Audio Distribution Display



Figure 131. NQ-ZPMS Admin Phone Audio Distribution Display

For more information, refer to the Nyquist NQ-T1100 or NQ-ZPMS's Admin Phone User Guide.

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 DTMF codes, or played via routine actions. Announcements can be either normal announcements, such as prerecorded announcements about upcoming site events, or emergency announcements, such as prerecorded 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:

- 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**).

Scheduled Announcement Rules

Scheduled announcements follow slightly different rules. When you schedule an announcement, you can set the Maximum Wait Seconds parameter to indicate how many seconds to wait for an active page or announcement to finish before giving up.

For example, if the Maximum Wait Seconds is set to 120 seconds, when the system attempts to play the announcement at the scheduled time, if a page or announcement is already actively using the Zone, the scheduled announcement will wait up to 120 seconds for the Zone to become idle. If the Zone becomes idle in less than 120 seconds, the system will play the announcement. If the Zone is still busy after 120 seconds, the scheduled announcement will not play.

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.

Recording Announcements

To record an announcement:

- 1 If not already on your dashboard, select **Dashboard** from the navigation bar.
- 2 Select the **Dial Pad** icon.
- 3 Dial *990 and press **Send**.
- 4 Follow the voice prompts to record your announcement.

Alternatively, the NQ-T1100 Admin Phone can be used by selecting **Record Announcement** in the phone’s **Announce** menu, or the NQ-ZPMS Admin Phone can be used by selecting **Record Announcement** in the phone’s **Announcements** menu.

After you finish recording an announcement, you can use the Announcements page to update the new announcement’s name, DTMF code, and other parameters.

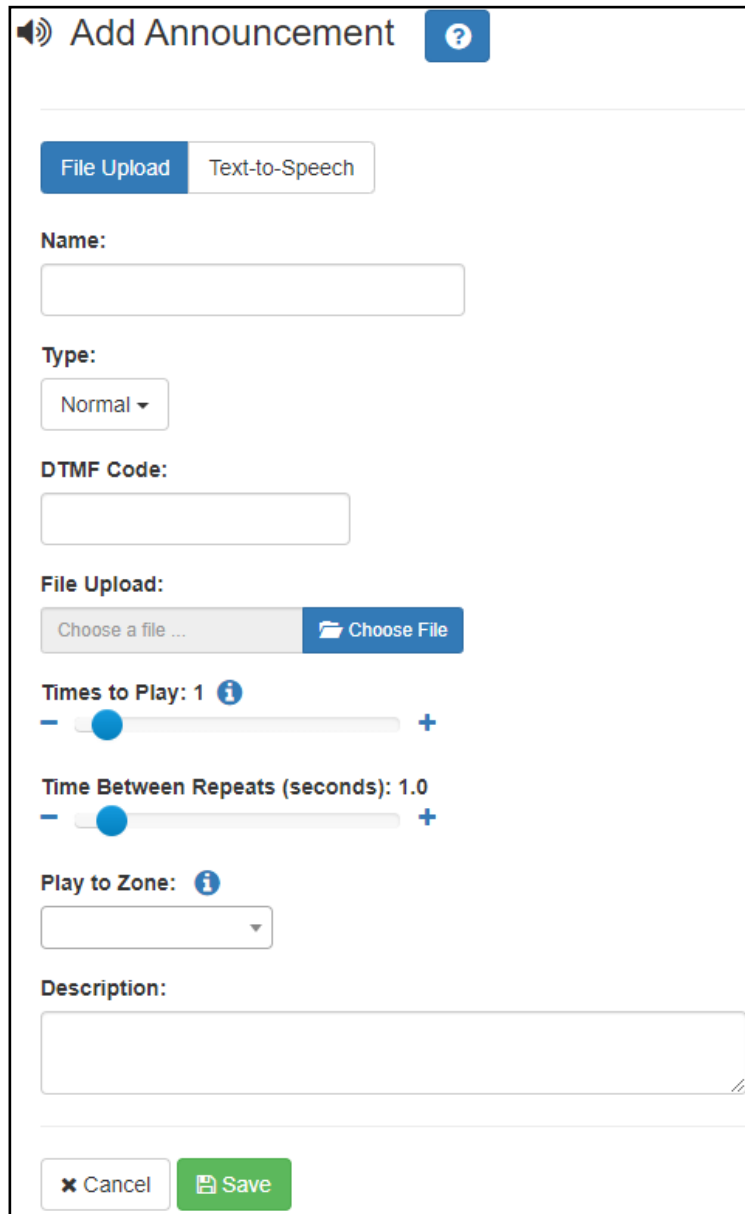
Note: When you record an announcement by dialing *990 or by selecting **Record Announcement** on the Admin phone’s **Announce** menu, the initial DTMF code for the recorded and saved announcement will be set to the announcement’s row ID. You can change the DTMF code after the announcement is saved by 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.

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.



The screenshot shows the 'Add Announcement' page with the following elements:

- Header:** A speaker icon, the text 'Add Announcement', and a blue help button with a question mark.
- Mode Selection:** Two buttons: 'File Upload' (highlighted in blue) and 'Text-to-Speech'.
- Name:** A text input field.
- Type:** A dropdown menu currently set to 'Normal'.
- DTMF Code:** A text input field.
- File Upload:** A section containing a 'Choose a file ...' button and a blue 'Choose File' button.
- Times to Play:** A slider set to 1, with a minus sign on the left and a plus sign on the right.
- Time Between Repeats (seconds):** A slider set to 1.0, with a minus sign on the left and a plus sign on the right.
- Play to Zone:** A dropdown menu with an information icon.
- Description:** A large text area for entering details.
- Footer:** 'Cancel' and 'Save' buttons.

Figure 132. 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 95, "Add Announcement Page Parameters," on page 355.)
- 5 Select **Save**.

Table 95. Add Announcement Page Parameters

File Upload / Text-to-Speech	Select whether this announcement will play an audio clip or use Text-to-Speech to convert the specified text into speech.
Name	Provide a name for the announcement. <i>Note:</i> 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. <i>Note:</i> 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. <i>Note:</i> 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. <i>Note:</i> This option appears only if you have selected the File Upload tab.

Table 95. Add Announcement Page Parameters (Continued)

Times to Play	<p>Select the number of times the announcement will play. Parameters are between 0 and 10.</p> <p><i>Note:</i> A setting of 0 results in the playing continuously until it is manually stopped via the dashboard or a Stop-Announcement routine action.</p> <p><i>Note:</i> Announcements configured for continuous playback should not be used with the Facility Announcement feature.</p>
Time Between Repeats (seconds)	<p>Select the time in seconds between replaying of the announcement. You can select between 0.5 and 5.0 in 0.5 increments.</p>
Text-To-Speech	<p>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.</p> <p><i>Note:</i> This option only appears if Text-to-Speech is selected and you have the Text-To-Speech feature license.</p>
Play to Zone	<p>Select either All Speakers or a specific zone for this announcement to play.</p> <p><i>Note:</i> 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.</p>
Description	<p>Provide a description of the announcement.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>

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 96. 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 96. 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 96. SSML Formats for Text-to-Speech Entries (Continued)

Adjust Output Volume	<ul style="list-style-type: none">• <code><prosody volume='silent'>This is silent.</prosody></code>• <code><prosody volume='x-soft'>This is 25% as loud.</prosody></code>• <code><prosody volume='soft'>This is 50% as loud.</prosody></code>• <code><prosody volume='medium'>This is the default volume.</prosody></code>• <code><prosody volume='loud'>This is 50% louder.</prosody></code>• <code><prosody volume='x-loud'>This is 100% louder.</prosody></code>• <code><prosody volume='default'>This is the default volume.</prosody></code>• <code><prosody volume='-33%'>This is 33% softer.</prosody></code>• <code><prosody volume='+33%'>This is 33% louder.</prosody></code>• <code><prosody volume='33%'>This is 33% louder.</prosody></code>• <code><prosody volume='33'>This is 33% of normal volume.</prosody></code>
Add Emphasis to Speech	<ul style="list-style-type: none">• This is <code><emphasis level='strong'>stronger</emphasis></code> than the rest.• This is <code><emphasis level='moderate'>stronger</emphasis></code> than the rest.• This is <code><emphasis level='none'>the same as</emphasis></code> than the rest.
Spell Words Phonetically	You say <code><phoneme ph='t ah0 m ey1 t ow0'>tomato</phoneme></code> , I say <code><phoneme ph='t ah0 m aa1 t ow0'>tomato</phoneme></code>

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.

Announcements										
Name	Type	DTMF Code	Creation Date/Time	Created By	Times to Play	Time Between Repeats (seconds)	Play to Zone	Description	Playback	
Lockdown Alert	Emergency	1	Aug 29, 2018 - 7:26am	0	Continuously	1.0	20	Show	▶ 0:00 / 0:04	⏮ ⏪ ⏩ ⏭
Weather Alert	Emergency	2	Aug 29, 2018 - 7:26am	0	Continuously	1.0	All Speakers	Show	▶ 0:00 / 0:06	⏮ ⏪ ⏩ ⏭
Noise	Normal	3	Sep 11, 2018 - 11:37am	038	Continuously	1.0	90	Show	▶ 0:00 / 0:08	⏮ ⏪ ⏩ ⏭
Nef Anyo	Normal	4	Sep 11, 2018 - 11:41am	038	Continuously	1.0	20	Show	▶ 0:00 / 0:07	⏮ ⏪ ⏩ ⏭

Figure 133. 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 97. Announcements Page Parameters

Name	Displays the user-provided name of the announcement file. <i>Note:</i> 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.

Table 97. Announcements Page Parameters

Times to Play	<p>Displays the number of times the announcement will play. This number can range from 0 through 10.</p> <p><i>Note:</i> A setting of 0 results in the announcement playing continuously until it is manually stopped via the dashboard.</p> <p><i>Note:</i> Announcements configured for continuous playback should not be used with the Facility Announcement feature.</p>
Times Between Repeats (seconds)	<p>Displays the time in seconds before replaying the announcement.</p>
Play to Zone	<p>Displays either All Speakers or a specific zone for this announcement to play.</p> <p><i>Note:</i> 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.</p>
Description	<p>Provides a description of the announcement.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Playback	<p>Allows you to preview the announcement. Selecting the Menu icon also allows you to download and save the announcement or adjust the preview playback speed.</p>

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 (see *Table 98 on page 362*).
- 5 Select **Save**.

Table 98. Edit Announcement Page Parameters

Name	<p>Displays the user provided name of the announcement file.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Type	<p>Indicates if the announcement is a Normal or an Emergency announcement.</p>
DTMF Code	<p>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.</p> <p><i>Note:</i> 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.</p> <p>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.</p>
Created By	<p>Displays the number for the station used to create or download the announcement.</p> <p><i>Note:</i> This field cannot be edited and only indicates which station created the announcement.</p>
Times to Play	<p>Select the number of times the announcement will play. Parameters are between 0 and 10.</p> <p><i>Note:</i> A setting of 0 results in the playing continuously until it is manually stopped via the dashboard.</p> <p><i>Note:</i> Announcements configured for continuous playback should not be used with the Facility Announcement feature.</p>
Times Between Repeats (seconds)	<p>Select the time in seconds between replaying of the announcement. You can select between 0.5 and 5.0 in 0.5 increments.</p>

Table 98. Edit Announcement Page Parameters (Continued)

Play to Zone	<p>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.</p> <p><i>Note:</i> 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.</p>
Description	<p>Provides a description of the announcement.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>

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 495).

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 Announcements Feature*” on page 303.

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 99. Add-Announcement-Audio audio sources

Announcement	Specifies a predefined Announcement (see <i>"Viewing Announcements" on page 360</i>).
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 <i>"Using SSML for Text-to-Speech Entries" on page 356</i>).

- 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.

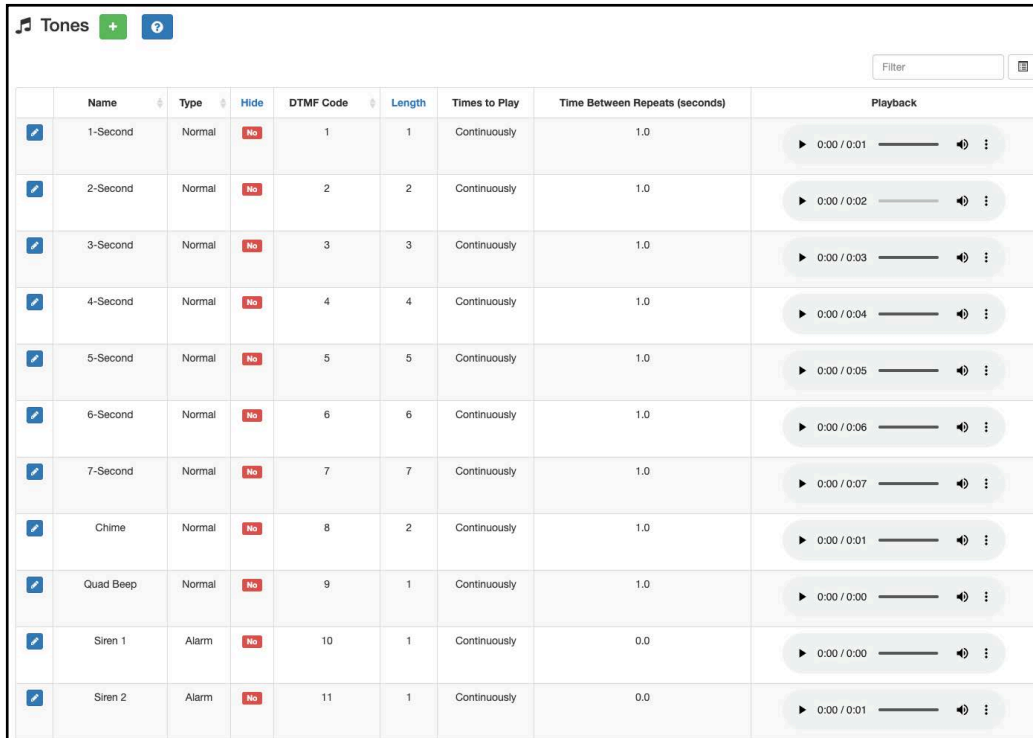
For further details on these Announcement action types, see *Table 124, "Action Types and Parameters," on page 496*.

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 398*.)

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.



	Name	Type	Hide	DTMF Code	Length	Times to Play	Time Between Repeats (seconds)	Playback
<input checked="" type="checkbox"/>	1-Second	Normal	No	1	1	Continuously	1.0	▶ 0:00 / 0:01 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	2-Second	Normal	No	2	2	Continuously	1.0	▶ 0:00 / 0:02 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	3-Second	Normal	No	3	3	Continuously	1.0	▶ 0:00 / 0:03 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	4-Second	Normal	No	4	4	Continuously	1.0	▶ 0:00 / 0:04 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	5-Second	Normal	No	5	5	Continuously	1.0	▶ 0:00 / 0:05 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	6-Second	Normal	No	6	6	Continuously	1.0	▶ 0:00 / 0:06 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	7-Second	Normal	No	7	7	Continuously	1.0	▶ 0:00 / 0:07 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	Chime	Normal	No	8	2	Continuously	1.0	▶ 0:00 / 0:01 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	Quad Beep	Normal	No	9	1	Continuously	1.0	▶ 0:00 / 0:00 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	Siren 1	Alarm	No	10	1	Continuously	0.0	▶ 0:00 / 0:00 ——— 🔊 ⋮
<input checked="" type="checkbox"/>	Siren 2	Alarm	No	11	1	Continuously	0.0	▶ 0:00 / 0:01 ——— 🔊 ⋮

Figure 134. 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 100. Tones Page Parameters

Name	Provides a name for the announcement file. <i>Note:</i> 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.

Table 100. Tones Page Parameters (Continued)

Hide	Specifies if the tone should be hidden from the dashboard view or Admin Phone menu.
DTMF Code	Provides the DTMF code used when manually activating the tone via dashboard dial pad or IP phone keypad.
Length	Time in seconds that the tone plays.
Times to Play	Displays the number of times the tone plays. Parameters are 0 to 10. <i>Note:</i> 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.

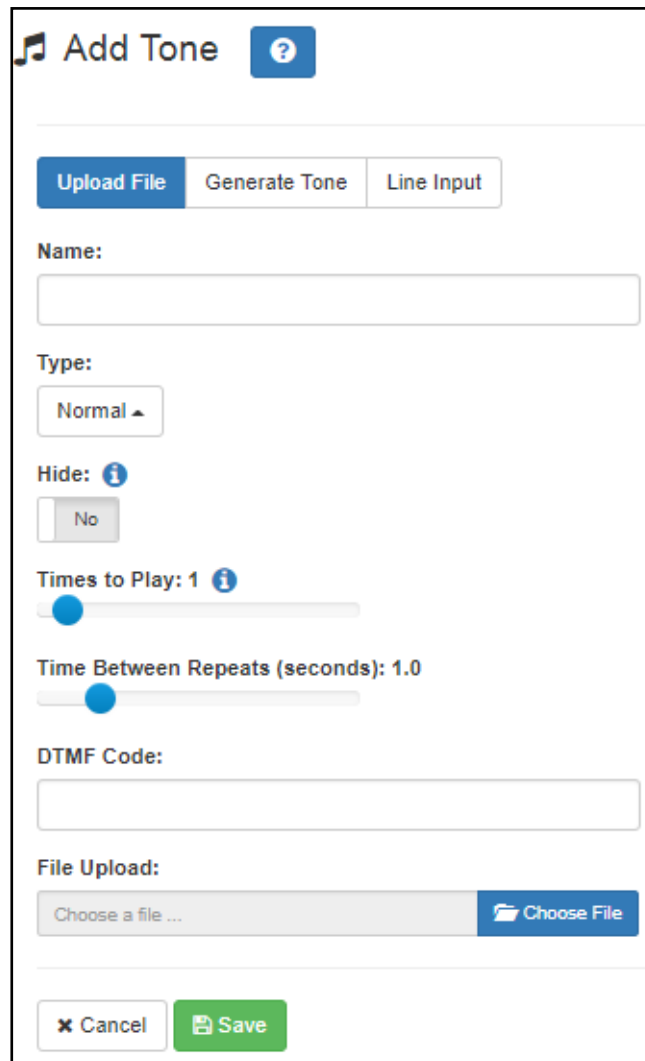
Adding Tones

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 367*).
- Generating a one-frequency tone that can be saved (see *"Generating Tones" on page 368*).
- Using a line input channel from a two- or four-channel audio power amplifier or Matrix Mixer Pre-Amp which will provide a real-time tone (see *"Using Line Input for Tones" on page 371*).

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 294*) or manual tone activation (see *"Managing Tones via the Dashboard" on page 426*).

Uploading Tones



The screenshot shows a web interface for adding a tone. At the top, there is a title 'Add Tone' with a music note icon and a help icon. Below the title are three tabs: 'Upload File' (selected), 'Generate Tone', and 'Line Input'. The form contains several fields and controls: a 'Name:' text input field; a 'Type:' dropdown menu set to 'Normal'; a 'Hide:' checkbox set to 'No'; a 'Times to Play: 1' slider; a 'Time Between Repeats (seconds): 1.0' slider; a 'DTMF Code:' text input field; a 'File Upload:' section with a 'Choose a file ...' button and a 'Choose File' button; and finally, 'Cancel' and 'Save' buttons at the bottom.

Figure 135. 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 (see *Table 101*).
- 6 Select **Save**.

Table 101. Add Tone Page Parameters (Upload)

Name	Provide a name for this tone. <i>Note:</i> 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. <i>Note:</i> 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 to 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.

The screenshot shows a web interface for adding a tone. At the top, there is a title "Add Tone" with a music note icon and a help icon. Below the title are three tabs: "Upload File", "Generate Tone" (which is selected and highlighted in blue), and "Line Input". The "Generate Tone" tab contains several configuration options: a "Name:" text input field; a "Type:" dropdown menu set to "Normal"; a "Hide:" checkbox with an information icon, currently set to "No"; a "Frequency (Hz):" text input field with the value "550"; a "Duration (seconds): 1.0" slider; a "Times to Play: 1" slider with an information icon; a "Time Between Repeats (seconds): 1.0" slider; and a "DTMF Code:" text input field. At the bottom of the dialog are two buttons: "Cancel" and "Save".

Figure 136. Add Tone – Generate Tone

To generate a tone:

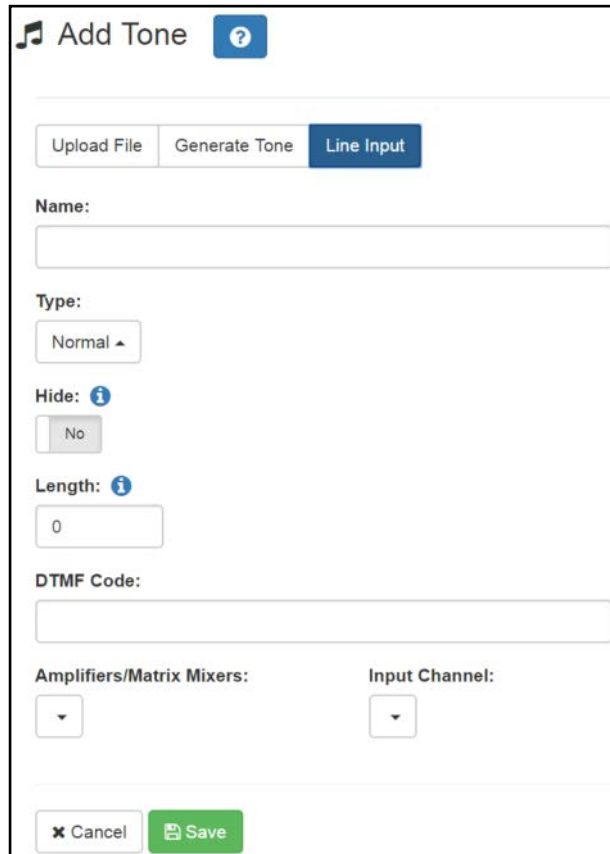
- 1 On the navigation bar, expand **Audio**.
- 2 Select **Tones**.
- 3 On the Tones page, select the **Add** icon.
- 4 On the Add Tone page, select **Generate Tone**.
- 5 Complete the parameters (see *Table 102*).
- 6 Select **Save**.

Table 102. Add Tone Page Parameters (Generate)

Name	Provide a name for this tone. <i>Note:</i> 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. <i>Note:</i> 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- or four-channel audio power amplifier channel or Matrix Mixer Pre-Amp channel to use as a real-time source for a tone.



The screenshot shows the 'Add Tone' interface with the 'Line Input' tab selected. The form includes the following fields and controls:

- Buttons: Upload File, Generate Tone, Line Input (selected)
- Name:
- Type: Normal (dropdown)
- Hide: No (checkbox)
- Length: 0 (input field)
- DTMF Code:
- Amplifiers/Matrix Mixers: (dropdown)
- Input Channel: (dropdown)
- Buttons: Cancel, Save

Figure 137. 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 (see *Table 103 on page 372*).
- 6 Select **Save**.

Table 103. Add Tone Page Parameters (Line Input)

Name	Provide a name for this tone. <i>Note:</i> 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. <i>Note:</i> 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- or four-channel audio power amplifier or Matrix Mixer Pre-Amp 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. You also cannot change the **Type** of a tone if it is used in a routine (see “*Understanding Trigger Parameters*” on page 482 and “*Understanding Action Parameters*” on page 495).

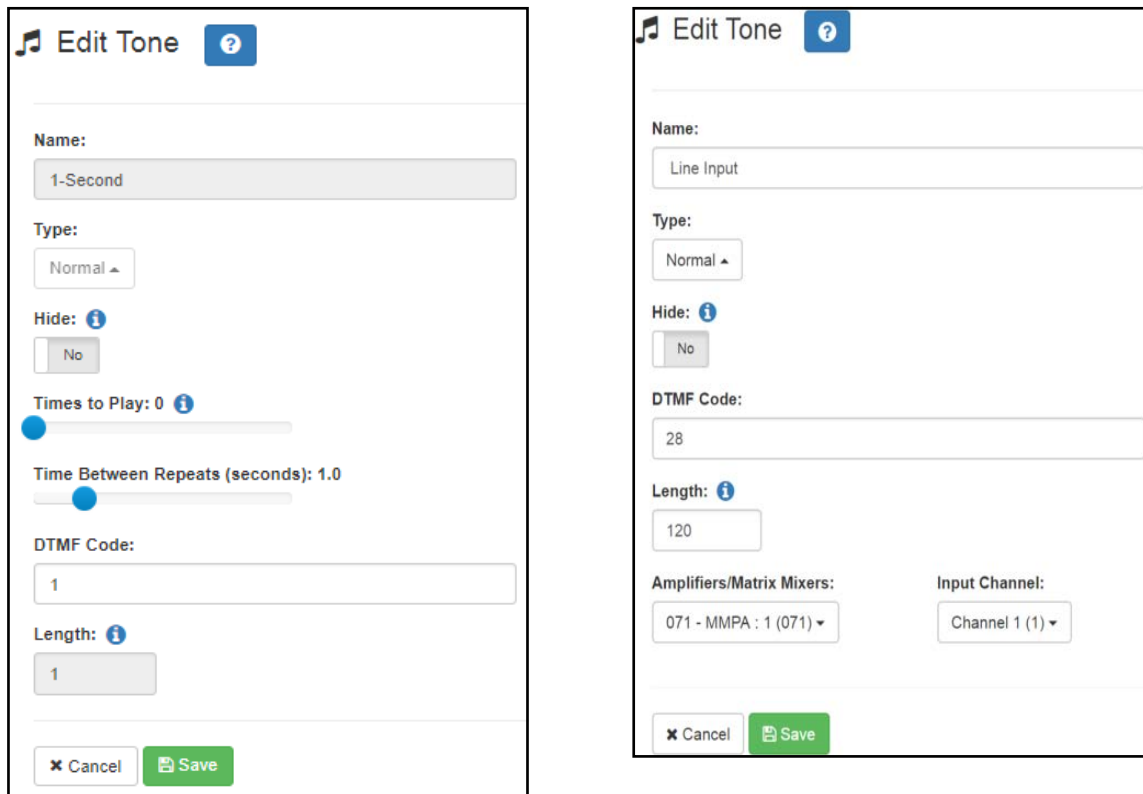


Figure 138. Edit Tone Pages

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 (see *Table 104 on page 374*).
- 5 After completing all changes, select **Save**.

Table 104. Edit Tone Page Parameters

Name	<p>Displays the name for this tone.</p> <p><i>Note:</i> This parameter cannot be changed for default system Tones.</p> <p><i>Note:</i> Valid characters include uppercase letters (A–Z), lowercase letters (a–z), numerals (0–9), space, and the following special characters: ! @ \$ * ? - . , .</p>
Type	<p>Use the drop-down menu to select if the tone is Normal or Alarm.</p>
Hide	<p>Specifies if the tone is to be hidden from the dashboard view.</p>
Times to Play	<p>Displays the number of times the tone will play. Parameters are 0 through 10.</p> <p><i>Note:</i> 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.</p>
Time Between Repeats (second)	<p>Displays the time in seconds between replaying of the tone. You can select between 0.5 and 5.0 in 0.5 increments.</p> <p><i>Note:</i> This parameter does not appear for Line Input tones.</p>
DTMF Code	<p>Provides the DTMF code used when manually activating the tone via dashboard dial pad or IP phone keypad.</p>
Length	<p>Provides the length of the tone.</p> <p><i>Note:</i> This parameter cannot be changed except for Line Input tones.</p>
File Upload	<p>Select Choose File, navigate to the audio file, and then select the file if you want to choose a new file.</p> <p><i>Note:</i> This parameter appears only for user-provided tones but not for Line Input tones.</p>
Amplifiers/Matrix Mixers	<p>Specifies the two-channel or four-channel audio power amplifier or Matrix Mixer Pre-Amp and its associated station number.</p> <p><i>Note:</i> This parameter appears only for Line Input tones.</p>
Input Channel	<p>Specifies the matrix channel being used for input.</p> <p><i>Note:</i> This parameter appears only for Line Input tones.</p>

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 495).

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 playing multiple simultaneous tones, assuming the tones are playing to different zones. If a manual request to play a tone is made while a tone is playing to All Time-type zones, the requester will receive a busy signal and the tone will not be played.
- 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

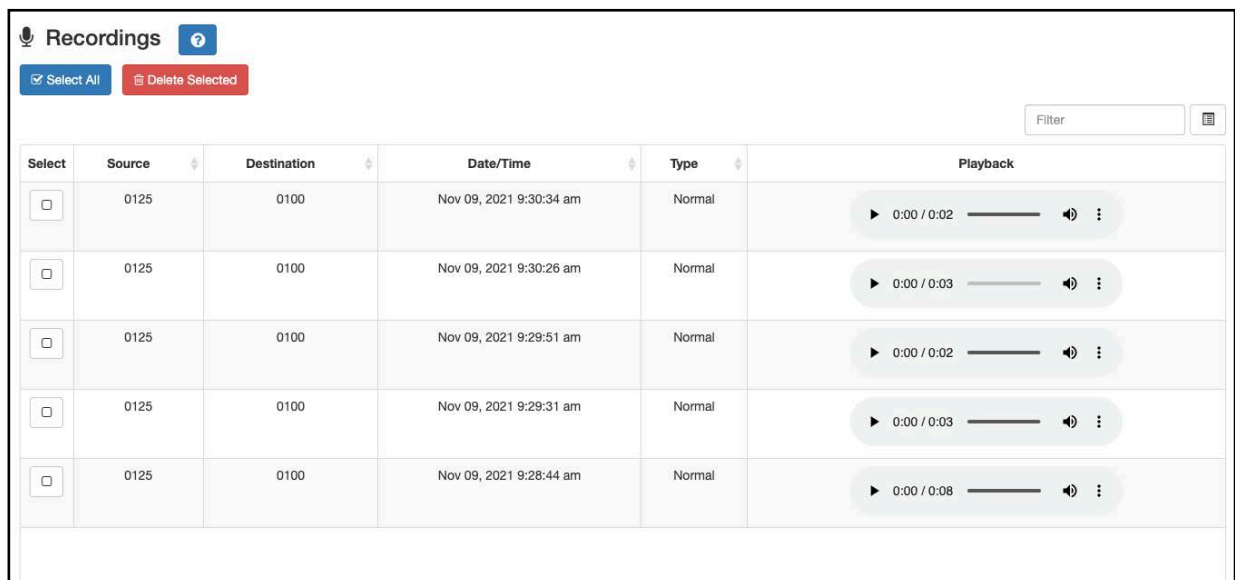
- Routine triggers that use the Tone or Scheduled-Tone trigger types do not include a zone filter, thus tone-based routine triggers are activated whenever a tone is played to any zone. The routine trigger does include a filter for the tone being played, so you can filter routine execution by the tone being played.

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 70. For information about configuring a station for call recording, see Table 37, *"Station Configuration Page Parameters,"* on page 149.

Through the audio file management feature, you can play back an individual call, delete selected recordings, or delete all recordings.



Select	Source	Destination	Date/Time	Type	Playback
<input type="checkbox"/>	0125	0100	Nov 09, 2021 9:30:34 am	Normal	▶ 0:00 / 0:02 ——— 🔊 ⋮
<input type="checkbox"/>	0125	0100	Nov 09, 2021 9:30:26 am	Normal	▶ 0:00 / 0:03 ——— 🔊 ⋮
<input type="checkbox"/>	0125	0100	Nov 09, 2021 9:29:51 am	Normal	▶ 0:00 / 0:02 ——— 🔊 ⋮
<input type="checkbox"/>	0125	0100	Nov 09, 2021 9:29:31 am	Normal	▶ 0:00 / 0:03 ——— 🔊 ⋮
<input type="checkbox"/>	0125	0100	Nov 09, 2021 9:28:44 am	Normal	▶ 0:00 / 0:08 ——— 🔊 ⋮

Figure 139. Recordings Page

To manage recordings:

- 1 On the navigation bar, expand **Audio**.
- 2 Select **Recordings**.
- 3 To play back 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 105. 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.
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.

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, Microsoft Edge, or Apple Safari browser. Small devices such as touch-screen tablets can be used to operate Zone Control via the 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 140, "Zone Control Settings and Zone Filter View,"* on page 379)
- Zone View, including an Audio Distribution view (see *Figure 141, "Zone Control Zone View,"* on page 382).

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 26, "Edit Systems Parameters Page,"* on page 71). 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, Edge, or Safari web browser, enter:

`https://<server>/zone-control/login`

where <server> 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 26, "Edit Systems Parameters Page,"* on page 71).

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 140, "Zone Control Settings and Zone Filter View,"* on page 379).
- 5 Select the desired settings, as described in *Figure 106, "Zone Control Settings,"* on page 380.
- 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 141, "Zone Control Zone View,"* on page 382).

BOGEN C4000 NYQUIST Zone Control
Juliet

⚙️ Settings

Station:	<input type="text" value="030"/>
Display Audio Distributions:	<input checked="" type="checkbox"/> Yes
Display Paging Zones:	<input checked="" type="checkbox"/> Yes
Display Volume Cut Level:	<input checked="" type="checkbox"/> Yes
Display Zones Header:	<input checked="" type="checkbox"/> Yes
Display Audio Distributions Header:	<input checked="" type="checkbox"/> Yes

▼ Zone Filter

🔊 Audio

All Speakers:	<input checked="" type="checkbox"/> Yes
Audio zone:	<input checked="" type="checkbox"/> Yes
Zone 2:	<input checked="" type="checkbox"/> Yes

🔊 Paging

All Call:	<input type="checkbox"/> No
Emergency All Call:	<input type="checkbox"/> No
Zone 1:	<input type="checkbox"/> No
Zone 2:	<input type="checkbox"/> No

Save

Figure 140. Zone Control Settings and Zone Filter View

Table 106. Zone Control Settings

Station	<p>The Admin Web Interface Station to be associated with this Zone Control login.</p> <p>The Station selected will be used to determine the CoS settings to be used to grant audio distribution permissions (see Table 24, "CoS Configuration Page Parameters," on page 105). The station extension will also appear in the Call Detail Records when an Audio Distribution is started or stopped.</p> <hr/> <p><i>Tip:</i> 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).</p> <hr/> <p><i>Tip:</i> 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.</p> <hr/>
Display Audio Distributions	<p>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.</p> <p>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.</p>
Display Paging Zones	<p>When enabled, the Zone Filter list will include Paging Zones, to allow selected Paging Zones to be displayed on the Zone View.</p> <p><i>Note:</i> 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.</p>
Display Volume Cut Level (dB)	<p>When enabled, the Zone View will display the numeric value for Cut Level to the right of each volume slider.</p>

Table 106. 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). <i>Note:</i> 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, Edge, or Safari browser:

`https://<server>/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 141, "Zone Control Zone View," on page 382*).

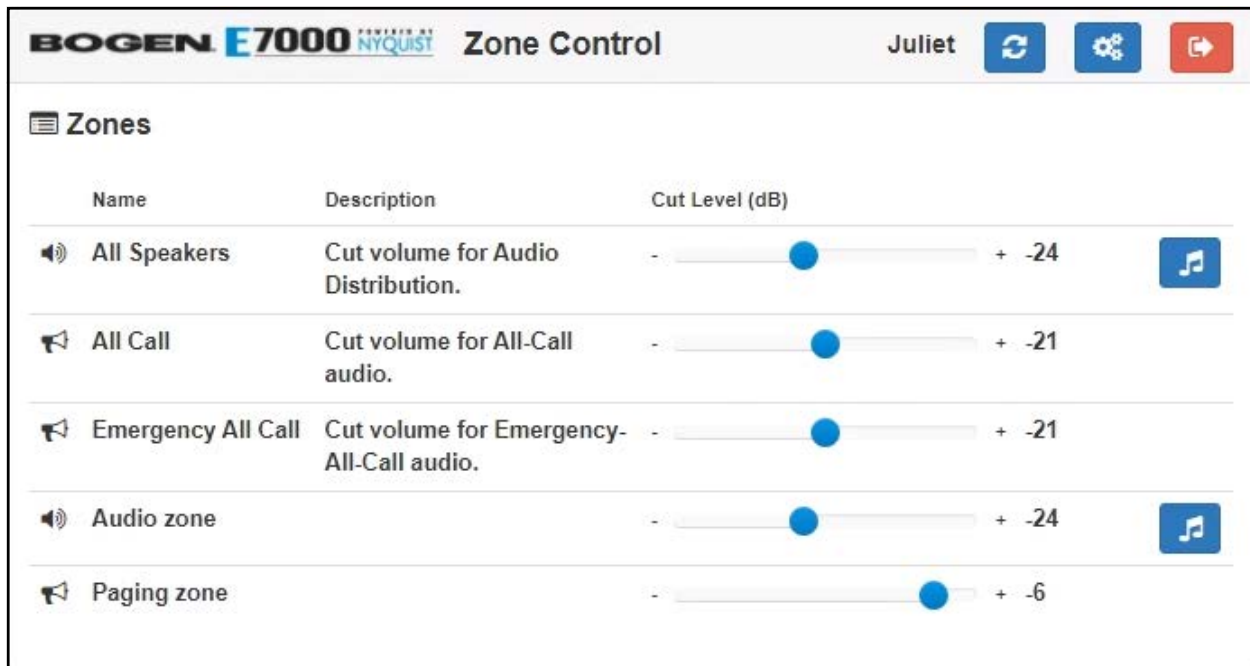







Figure 141. Zone Control Zone View

Table 107. Zone Control buttons

	<p>Refresh: Press the Refresh button to have the Zone Controller refresh the volumes and audio distribution settings.</p> <p><i>Note:</i> The status of zone volumes and audio distribution is <i>not</i> 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.</p>
	<p>Settings: Press the Settings button to access the Settings page for the logged in user.</p>
	<p>Zones: Press the Zones button to display the Zone View.</p>
	<p>Logout: Press the Logout button to log out of the Zone Controller.</p>
	<p>Audio: Press the Audio button to display the audio distributions that play to the selected Zone.</p>

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**).

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 383). 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.

Note: The Audio Distribution Window is only available when **Display Audio Distributions** is set to **No**. When **Display Audio Distributions** is set to **Yes**, the Audio Distribution selections are displayed on the Zones page.

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.

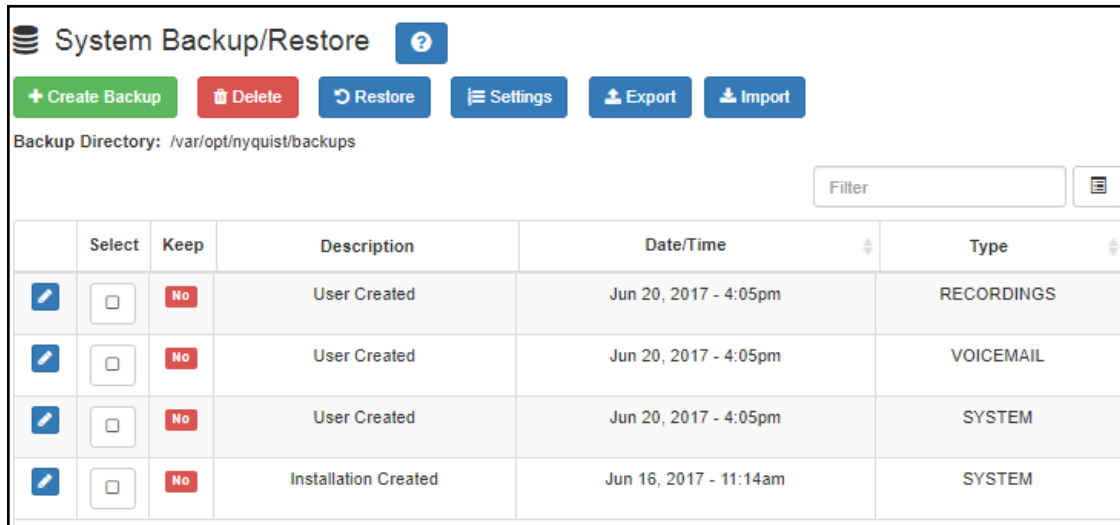
You should do a system backup after a change is made to system configuration, including station and zone configuration. You should also do a system backup before updating your system to a new Nyquist release and export the backup.

You can set retention periods for each type of backup. (See *"Setting System Parameters"* on page 70.)

Check Server Status can be used to view how much disk space is currently being used by backups. On the System Parameters page, press **Check Server Status**, then scroll down to the "Disk space used by" section where you will find "backups," which indicates how much disk space is currently being used by backups.

Viewing System Backup Files

The System Backup/Restore page allows you to see all backup files available for restore.



The screenshot shows the 'System Backup/Restore' interface. At the top, there are navigation buttons: '+ Create Backup' (green), 'Delete' (red), 'Restore' (blue), 'Settings' (blue), 'Export' (blue), and 'Import' (blue). Below these is the 'Backup Directory: /var/opt/nyquist/backups' and a 'Filter' input field. The main content is a table with the following data:

	Select	Keep	Description	Date/Time	Type
	<input type="checkbox"/>	No	User Created	Jun 20, 2017 - 4:05pm	RECORDINGS
	<input type="checkbox"/>	No	User Created	Jun 20, 2017 - 4:05pm	VOICEMAIL
	<input type="checkbox"/>	No	User Created	Jun 20, 2017 - 4:05pm	SYSTEM
	<input type="checkbox"/>	No	Installation Created	Jun 16, 2017 - 11:14am	SYSTEM

Figure 142. 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 108. 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 <i>"Using the Edit System Parameters Page"</i> on page 70 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.

Creating a Backup File

You can manually create a backup of all system files, voicemail files, or recordings.

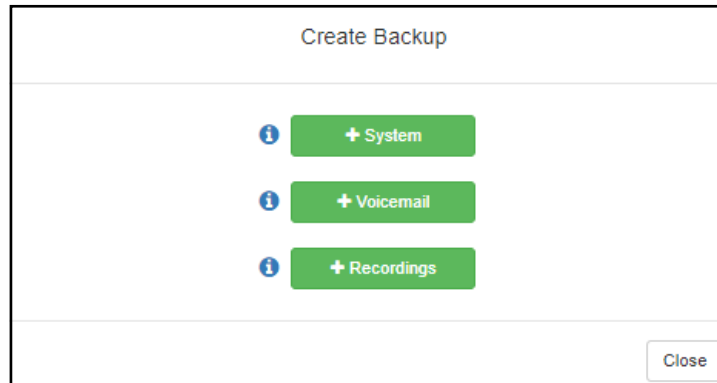


Figure 143. Create Backup Page

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 70). However, you can select to delete any files; the system will warn you if you select to delete a file marked to keep.

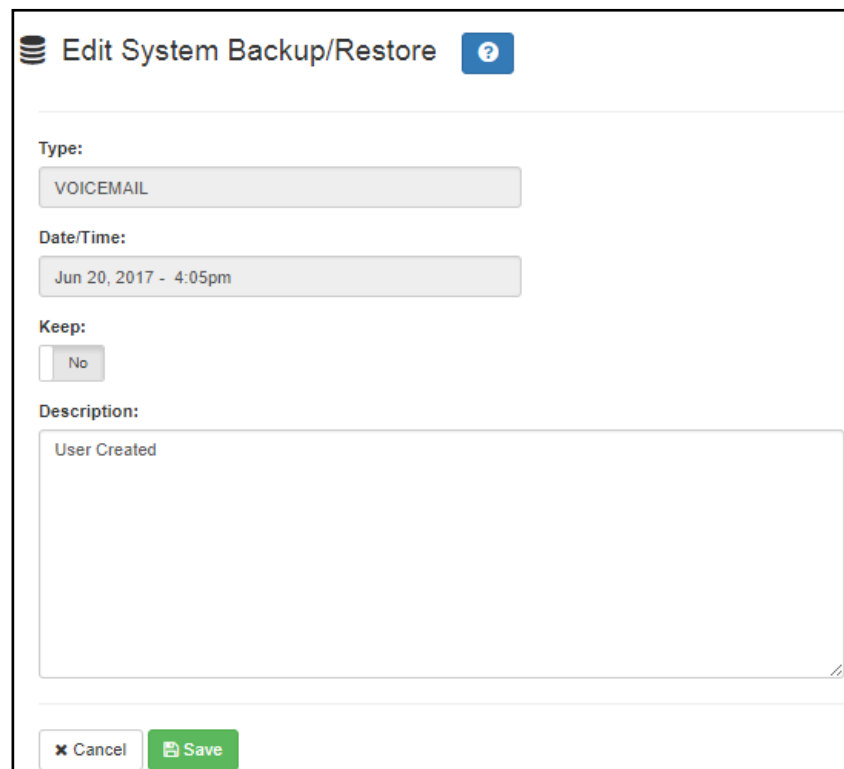
To delete a backup file:

- 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**.

- 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.



The screenshot shows a web interface for editing system backup/restore information. The title bar reads "Edit System Backup/Restore" with a blue question mark icon. Below the title, there are four sections: "Type:" with a dropdown menu showing "VOICEMAIL"; "Date/Time:" with a dropdown menu showing "Jun 20, 2017 - 4:05pm"; "Keep:" with a dropdown menu showing "No"; and "Description:" with a text area containing "User Created". At the bottom of the form are two buttons: "Cancel" and "Save".

Figure 144. 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 109. 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 keeps 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.

Edit Backup Settings ?

Backup Directory:
/var/opt/nyquist/backups

New Backup Directory:
[Empty text input field]

Auto Backup:
Yes

Minute:
x 0
Not selecting a minute will default to 0.

Hour:
x 1am
Not selecting an hour will default to 1am.

Day:
x 1st
Not selecting a day will default to every day.

Month:
Select month ...
Not selecting a month will default to every month.

Day of Week:
Select day of week ...
Not selecting a day of week will default to every day of the week.

x Cancel Save

Figure 145. 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 (see *Table 110*).
- 4 Select **Save**.

Table 110. Backup Settings Page Parameters

Backup Directory	Displays current path for backup file.
New Backup Directory	Enter new path for backup directory, 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 zero (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 "1am".
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 icon with the downloaded report name appears in the lower left section of the 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.

Important: We *strongly* recommend that you export your backups to external media to use in the event that a Nyquist drive fails. If the Nyquist drive fails, the backups stored on the Nyquist server will no longer be available, and externally stored backups will be the only backups available to use in recovering your system configurations and files.

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 or equal to 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**.

Software Components List

The version numbers for several key software components that are installed and used by the Nyquist system are listed in the *Software Components* section of the **Check Server Status** report (see *"Check Server Status" on page 47*). The version numbers are dynamic and may change after the **Upgrade Debian Operating System Components** feature has been used (see *"Upgrade Debian Operating System Components" on page 40*).

The following is an example of the *Software Components* section of the report:

```
Software Components:
Asterisk 18.20.2
apache2 Version: 2.4.56-1~deb11u2
bash Version: 5.1-2+deb11u1
bind9 Version: 1:9.16.44-1~deb11u1
binutils Version: 2.35.2-2
curl Version: 7.74.0-1.3+deb11u11
dnsutils Version: 1:9.16.44-1~deb11u1
exim4 Version: 4.94.2-7+deb11u2
glibc Version: 2.31-13+deb11u7
isc-dhcp-server Version: 4.4.1-2.3+deb11u2
Laravel Framework 8.83.16
libssh Version: 0.9.8-0+deb11u1
libssl Version: 1.1.1w-0+deb11u1
linux kernel 5.10.0-27-amd64 #1 SMP Debian 5.10.205-2 (2023-12-31) x86_64 GNU/Linux
lsyncd Version: 2.2.3-1+b1
mosquitto Version: 2.0.11-1+deb11u1
msmtp Version: 1.8.11-2.1
mysql Ver 15.1 Distrib 10.5.21-MariaDB
nmap Version: 7.91+dfsg1+really7.80+dfsg1-2
ntp Version: 1:4.2.8p15+dfsg-1
openssh Version: 1:8.4p1-5+deb11u3
openssl Version: 1.1.1w-0+deb11u1
php Version: 7.4.33-1+deb11u4
php-ldap Version: 2:7.4+76
pjsip 2.13.1
rsync Version: 3.2.3-4+deb11u1
rsyslog Version: 8.2102.0-2+deb11u1
snmpd Version: 5.9+dfsg-4+deb11u1
sox Version: 14.4.2+git20190427-2+deb11u2
sudo Version: 1.9.5p2-3+deb11u1
systemd Version: 247.3-7+deb11u4
tar Version: 1.34+dfsg-1
tcpdump Version: 4.99.0-2+deb11u1
tftpd-hpa Version: 5.2+20150808-1.2
wget Version: 1.21-1+deb11u1
```

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*: Provides access to the Debian Linux OS server log files.
- *Nyquist C4000*: Provides access to the Nyquist application log files.
- *Web Server*: 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 111. System Logs

File	Description
Server	
aptitude	Records information about packages installed or upgraded on the server.
auth.log	Contains system authorization information, including user logins and authentication methods that were used.
btmpt	Contains information about failed login attempts.
daemon.log	Contains information logged by the various background daemons that run on the system.
debug	Contains errors and debug information.
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.
dpkg.log	Contains information that is logged when a package is installed or removed using dpkg command.
faillog	Contains user failed login attempts.
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.
lastlog	Contains information on the last login of each user.

Table 111. System Logs (Continued)

File	Description
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.
mysql.err	Contains a record of mysql errors that occur when the server is running.
mysql.log	Contains a general record of what mysql is doing (connect, disconnect, queries).
nyquist_af_alerts.log	Contains Automatic Failover alerts, used by Technical Support to help diagnose any issues.
nyquist_af_setup.log	Contains Automatic Failover setup information, 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_mysql_table_check	Contains status of Nyquist database tables after a Nyquist server reboot. All tables should display a status of OK. If a table shows anything other than OK, contact Bogen Technical Support for assistance.
syslog	Contains list of errors that occur when the server is running and server start and stop records.
user.log	Contains information about all user-level logs.
Nyquist C4000	
api_log	Contains a record of all commands received from 3rd-party systems to the Routines API.
checkin	Contains historical record of actions that occurred during a check-in. (See <i>"Check-In Log and Call Detail Records"</i> on page 598.) Contains events recorded for the Station Check-In process. These include times and data for Check-In Start, Stop, Reset, Done, Vacancy Add, Vacancy Delete, and individual stations' Check-in.
device_status	Record of station unavailability events recorded by Station Monitoring.
messages	Contains messages generated by Nyquist.
nyquist_routines.log	Contains records of Nyquist routine events (e.g., started and stopped) as well as messages logged via the Log-Text action or the logText (<text>) function from within a routine action condition's CODE segment (see <i>"Routines Log"</i> on page 552 for details).
Web Server	
access.log	Contains access records for the web server.

Table 111. System Logs (Continued)

File	Description
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.

Viewing System Log Files

You can view a specific log for the Linux server, Nyquist server, or web server.

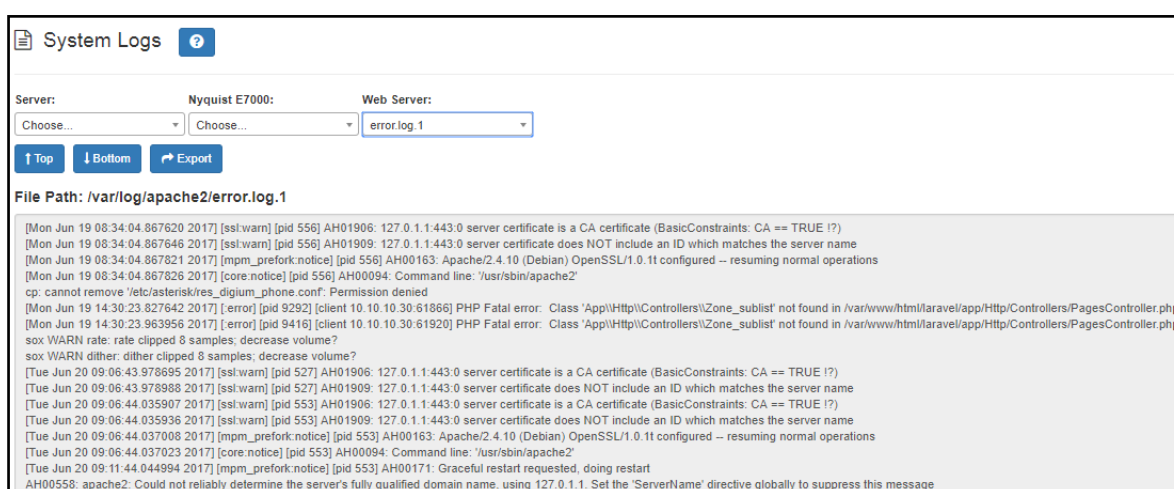


Figure 146. System Logs

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.

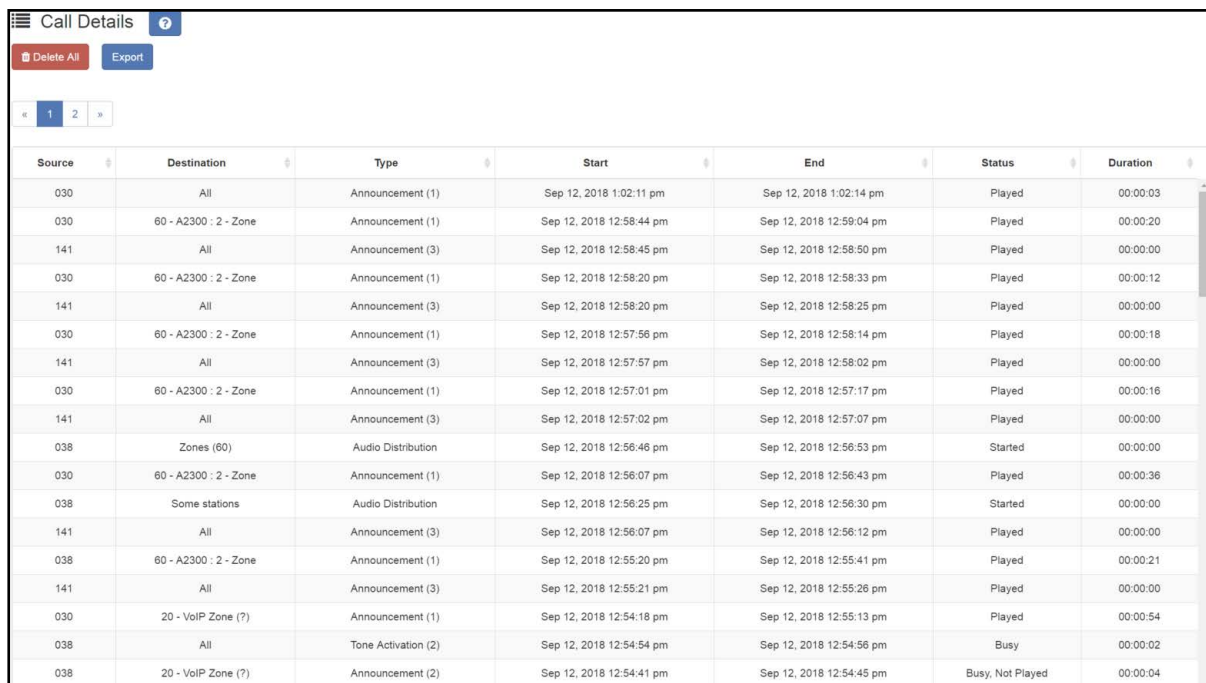
3 Select **Export**.

If the Save As dialog box appears, you can select where to download and save the log file; if not, it will be downloaded to the browser's configured download location.

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 placed or received telephone calls.



Source	Destination	Type	Start	End	Status	Duration
030	All	Announcement (1)	Sep 12, 2018 1:02:11 pm	Sep 12, 2018 1:02:14 pm	Played	00:00:03
030	60 - A2300 : 2 - Zone	Announcement (1)	Sep 12, 2018 12:58:44 pm	Sep 12, 2018 12:59:04 pm	Played	00:00:20
141	All	Announcement (3)	Sep 12, 2018 12:58:45 pm	Sep 12, 2018 12:58:50 pm	Played	00:00:00
030	60 - A2300 : 2 - Zone	Announcement (1)	Sep 12, 2018 12:58:20 pm	Sep 12, 2018 12:58:33 pm	Played	00:00:12
141	All	Announcement (3)	Sep 12, 2018 12:58:20 pm	Sep 12, 2018 12:58:25 pm	Played	00:00:00
030	60 - A2300 : 2 - Zone	Announcement (1)	Sep 12, 2018 12:57:56 pm	Sep 12, 2018 12:58:14 pm	Played	00:00:18
141	All	Announcement (3)	Sep 12, 2018 12:57:57 pm	Sep 12, 2018 12:58:02 pm	Played	00:00:00
030	60 - A2300 : 2 - Zone	Announcement (1)	Sep 12, 2018 12:57:01 pm	Sep 12, 2018 12:57:17 pm	Played	00:00:16
141	All	Announcement (3)	Sep 12, 2018 12:57:02 pm	Sep 12, 2018 12:57:07 pm	Played	00:00:00
038	Zones (60)	Audio Distribution	Sep 12, 2018 12:56:46 pm	Sep 12, 2018 12:56:53 pm	Started	00:00:00
030	60 - A2300 : 2 - Zone	Announcement (1)	Sep 12, 2018 12:56:07 pm	Sep 12, 2018 12:56:43 pm	Played	00:00:36
038	Some stations	Audio Distribution	Sep 12, 2018 12:56:25 pm	Sep 12, 2018 12:56:30 pm	Started	00:00:00
141	All	Announcement (3)	Sep 12, 2018 12:56:07 pm	Sep 12, 2018 12:56:12 pm	Played	00:00:00
038	60 - A2300 : 2 - Zone	Announcement (1)	Sep 12, 2018 12:55:20 pm	Sep 12, 2018 12:55:41 pm	Played	00:00:21
141	All	Announcement (3)	Sep 12, 2018 12:55:21 pm	Sep 12, 2018 12:55:26 pm	Played	00:00:00
030	20 - VoIP Zone (?)	Announcement (1)	Sep 12, 2018 12:54:18 pm	Sep 12, 2018 12:55:13 pm	Played	00:00:54
038	All	Tone Activation (2)	Sep 12, 2018 12:54:54 pm	Sep 12, 2018 12:54:56 pm	Busy	00:00:02
038	20 - VoIP Zone (?)	Announcement (2)	Sep 12, 2018 12:54:41 pm	Sep 12, 2018 12:54:45 pm	Busy, Not Played	00:00:04

Figure 147. Call Details Page

Viewing Call Details Records

To view the call details records for the facility:

On the navigation bar, select **Call Details**.

The following table describes the Call Details parameters:

Table 112. 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: <ul style="list-style-type: none">• 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_<yyyymmddhhmmss>.csv`.

- 3 In the lower left corner of the browser, select the downloaded CSV file, open it (presumably using a spreadsheet application, such as Excel, or a text editor), and optionally print it.

For example, if using Excel:

- a) Open the Excel spreadsheet, select **Page Layout**, and set the desired parameters.
- b) Select **File**, and then select **Print**.

Alternatively, you can use the following PowerShell commands to format and display the information from one or more downloaded files.

To display to a spreadsheet-like window, with filtering and sorting capabilities:

```
Import-Csv -Path "<filename1>.csv", "<filename2>.csv" | Out-GridView
```

To display to the console in a table-like format:

```
Import-Csv -Path "<filename1>.csv", "<filename2>.csv" | Format-Table *
```

For more information on Excel or PowerShell, 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 230.)

To start a white noise or pink noise file as a tone, follow the steps listed in *"Managing Tones via the Dashboard"* on page 426, 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 327) and then follow the steps listed in *"Using Audio Distribution"* on page 438 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 113. Common Issues

Issue	Possible Cause	Possible Solution
This web interface 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 “ <i>Client Requirements</i> ” on page 10). 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. <hr/> <i>Tip:</i> Accessing the application from an incognito browser session may provide more accurate validation of certificate issues. <hr/>
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.
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.

Table 113. Common Issues

Issue	Possible Cause	Possible Solution
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.
A station 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 113. Common Issues

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 <i>"Excluding Stations from Paging"</i> on page 224.)
	The station is not a member of audio distribution zone.	Add the station to an audio distribution zone. (See <i>"Editing Zone Configuration"</i> on page 235.)
	The station's Multicast Audio Distribution parameter is disabled.	Enable the station's Multicast Audio Distribution parameter. (See <i>"Editing Station Configuration Settings"</i> on page 162.)
	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 Digital Call Switch (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 <i>"Viewing Station Configuration Settings"</i> on page 148.)

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 114. Dashboard Informational Messages

Message	Meaning
Alarm (<extension>): <alarm-name>	The listed extension is starting an alarm.
Tone (<extension>): <tone-name>	The listed extension is starting a tone.
Page (<extension>): Zone: <zone-number> - <zone-name>	The listed extension is starting a page for the listed zone.
Announcement (<extension>): <announcement-name>	The listed extension is starting the listed announcement.
Emergency Announcement (<extension>): <e-announcement-name>	The listed extension is starting the listed emergency announcement.
All-Call (<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	A scheduled announcement is playing.
Multi-Site Emergency All-Call (<extension>)	The listed extension is starting a multiple site Emergency All-Call page.
Multi-Site All-Call (<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).
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 (<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."

Table 114. Dashboard Informational Messages (Continued)

Message	Meaning
Audio Enabled	Audio (paging, Scheduled Audio, audio distribution) is enabled. See <i>"Enabling and Disabling Audio"</i> on page 441 for more information.
Audio Disabled	Audio (paging, Scheduled Audio, audio distribution) is disabled. See <i>"Enabling and Disabling Audio"</i> on page 441 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 170 and *"Configuring I/O Controller Output Rules"* on page 174 for additional information.

User-created messages set up by Routines also appear on the dashboard. See the Dash-Text command in Table 124, *"Action Types and Parameters,"* on page 496 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 21.) You also want to ensure that outside line access is enabled. (See *"Editing Outside Lines"* on page 128.)

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 162.)

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 setup 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 115. Equipment-Related Errors

Error Message	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.
Line-Input busy (Matrix Mixer: <mixer extension>. Channel: <mixer channel number>.	You are attempting to use an input channel that is already in use.

Table 115. Equipment-Related Errors (Continued)

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 140.)

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 116. 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.	Warning	Secondary Master
Please contact technical support and avoid making configuration changes.		
Warning: Secondary node is now providing service.	Warning	Secondary Master
Please contact technical support and avoid making configuration changes.		

Table 116. Automatic Failover Dashboard Messages

Message	Type	Server(s)
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

Zone Overlap Messages

Zone overlap occurs when two or more target zones of a scheduled event include the same station (or stations).

- **WARNING:** Zone overlap exists in scheduled events. Use 'Check Server Status' to view overlap list.

Perform a **Check Server Status** operation (see "Check Server Status" on page 47) to determine which scheduled event references two or more target zones that include the same station. To fix this, either remove the shared station from all but one target zone, or remove the overlapping target zone(s) from the scheduled event.

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.

- 1 Type `https://<address>/setup/network` in the web browser's address bar. If you are configuring the System Controller for the first time, replace `<address>` with **192.168.1.10**, otherwise use the previously configured IP address of the server.

Network Wizard

The System Controller has two different network ports, Port A and Port B. Port A is always used by the Nyquist server to communicate with Nyquist devices and the Nyquist web interface. Port B is an optional port that when configured is always used by the Nyquist server to communicate with Internet based services. Port B is not used to communicate with Nyquist devices. If Port B is not configured, then Port A is also used by the Nyquist Server to communicate with Internet based services.

1. Is Port A a Static IP Address or provided via a DHCP Server?

Static IP Address ▾

What is the IP Address for Port A?

192 168 1 10

What is the Subnet Mask for Port A?

255 255 255 0

What is the Gateway for Port A?

▢ ▢ ▢ ▢

2. Is Port B a Static IP Address, provided via a DHCP Server, or Not Used?

DHCP Server ▾

3. DNS Servers: ⓘ

▢

Save and Reset Network Interfaces

Figure 148. 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 and/or DNS names to include in the Server Certificate** field (on the System Parameters page) and you still need the server certificate to include those IP addresses, you will need to edit the System Parameters (see *"Setting System Parameters"* on page 70) and press the **Generate Server Certificate** button to re-create the certificate with the new server IP address and the additional IP addresses (see Table 21, *"System Tools,"* on page 83).

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 466. For information about managing check-in, refer to *"Manage Check-In"* on page 587.

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
- Control I/O Controller output contacts

Note: For information about managing display messages, see *"Managing Display Messages"* on page 558.

Which items appear on your dashboard depends on your assigned permissions and the station's CoS. (See *"Managing Roles and Users"* on page 265 and *"Using CoS Configuration"* on page 104.)

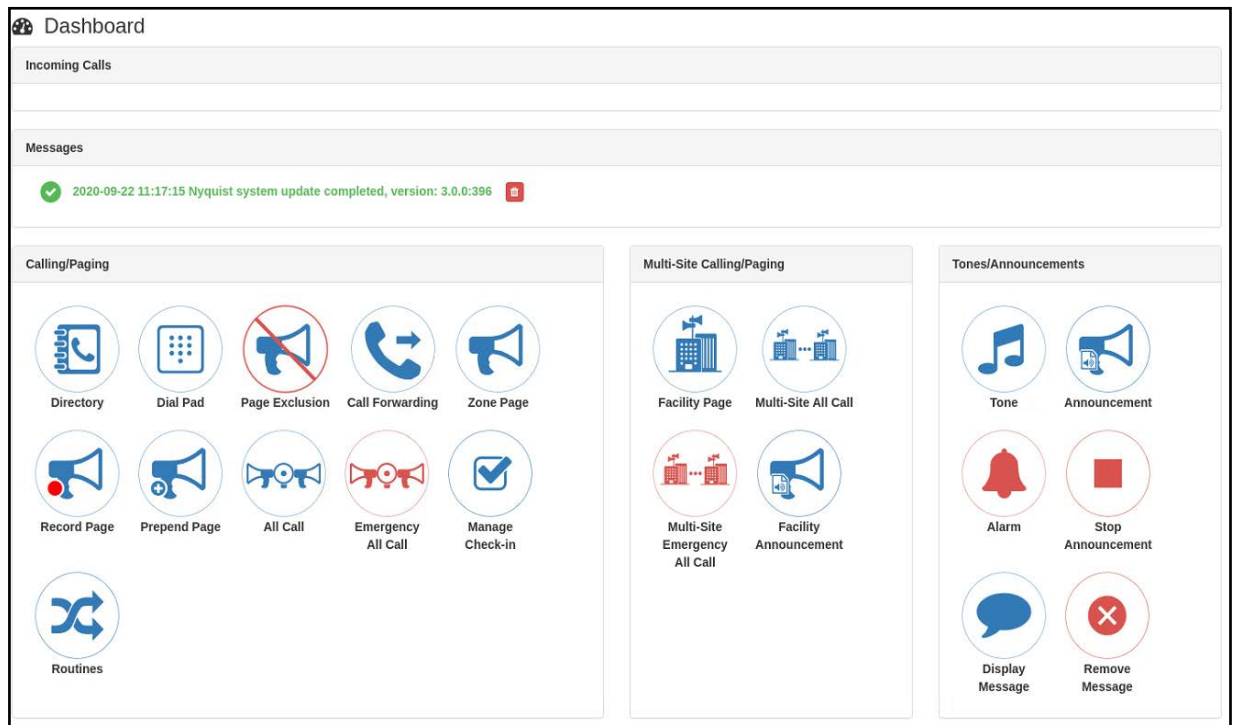


Figure 149. Nyquist Dashboard

Viewing Messages

The Dashboard displays a list of active messages about the system. These can include messages about system updates, device communications, weather alerts, or any of a number of other messages.

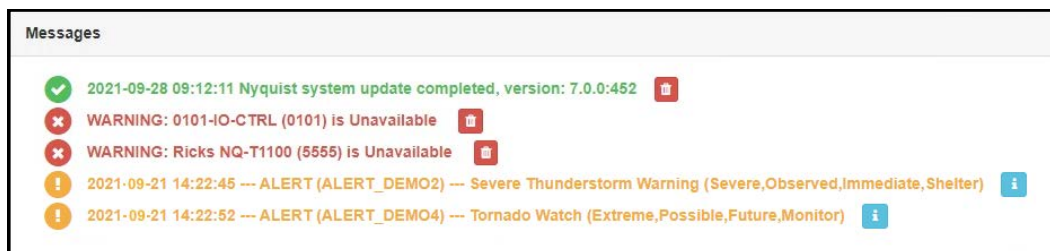


Figure 150. Dashboard Messages

Weather Alert messages

When National Weather Service (NWS) alert notices are displayed, clicking the Information button displayed to the right of any displayed alert notice will open a window enti-

tled "National Weather Service Alerts," which displays the text of all active NWS alerts (see *Figure 151, "National Weather Service Alerts," on page 412*).

Note: The NWS Alerts text display feature depends on an executing Routine that generates NWS alerts using a Display-Msg action with the \$alerts() variable in the Display-Msg Text field and with the POST_DASH_PHONE_TEXT parameter included in the \$alerts() parameter list (see *"Setting Variables for the Display Message" on page 606*).

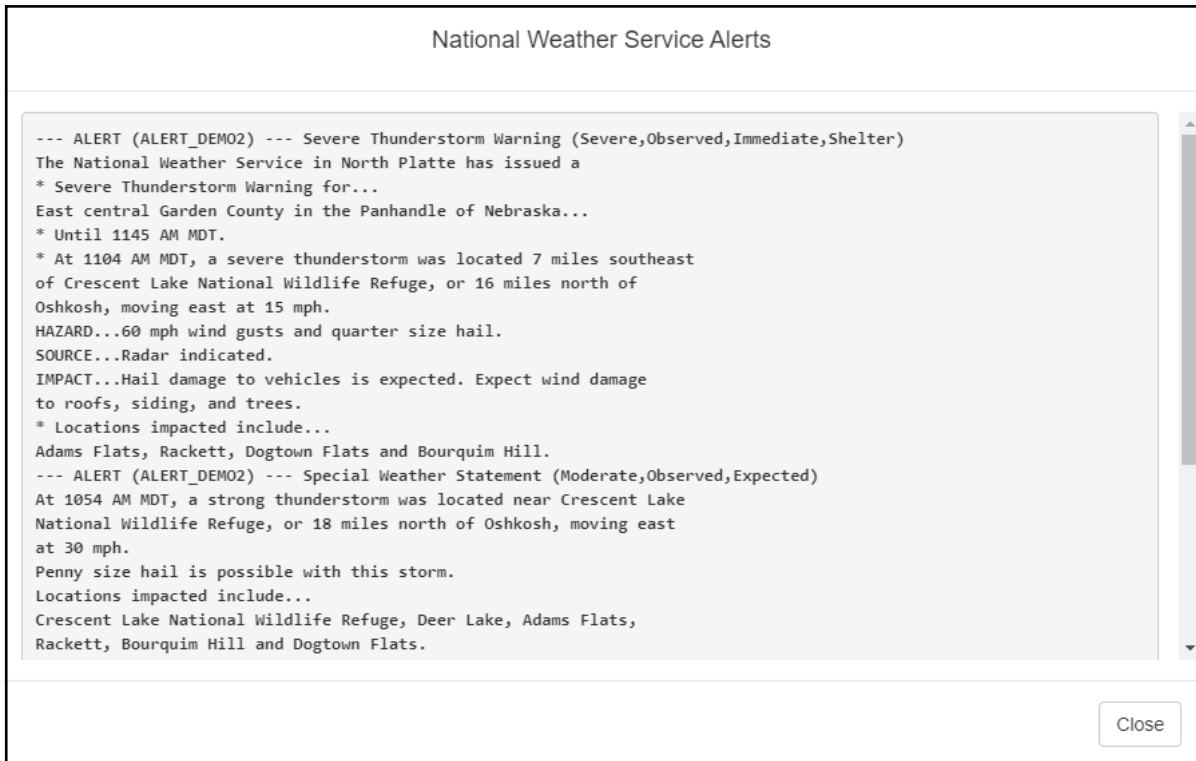


Figure 151. National Weather Service Alerts

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

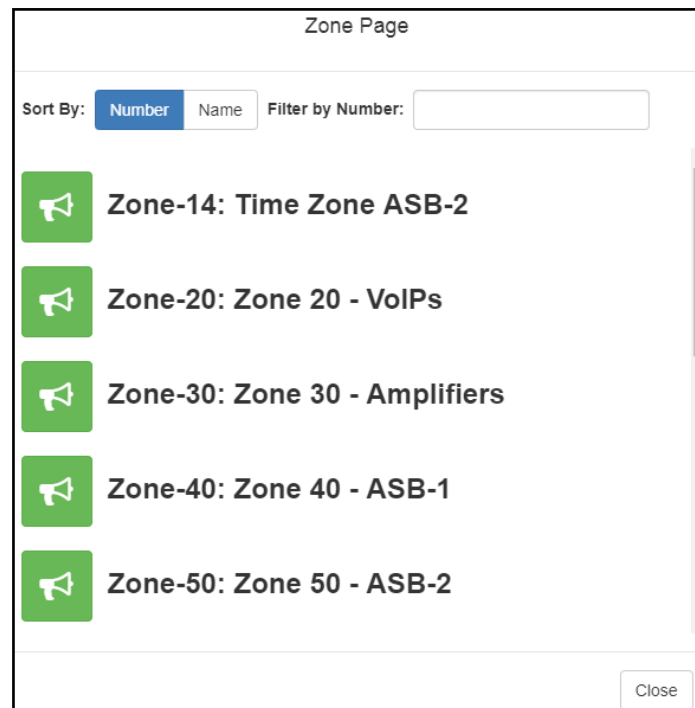


Figure 152. Paging Single Zone

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 Zone 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.

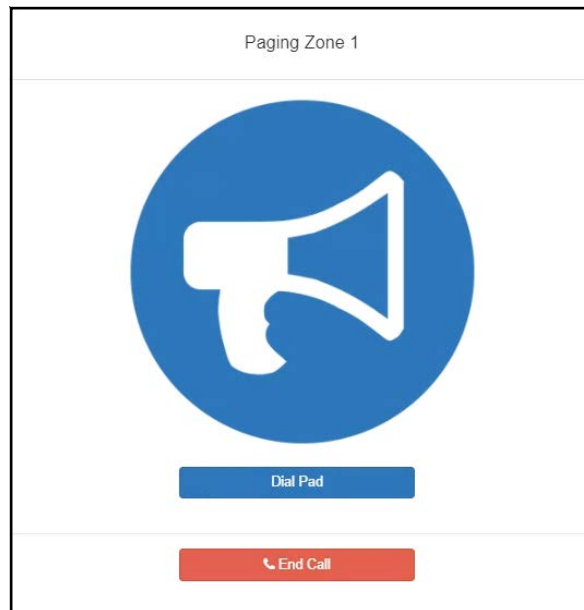


Figure 153. End Call

Record Page

You can record a page to be added to a zone queue. (For information about queues, see *"Viewing Queues"* on page 243.) 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.

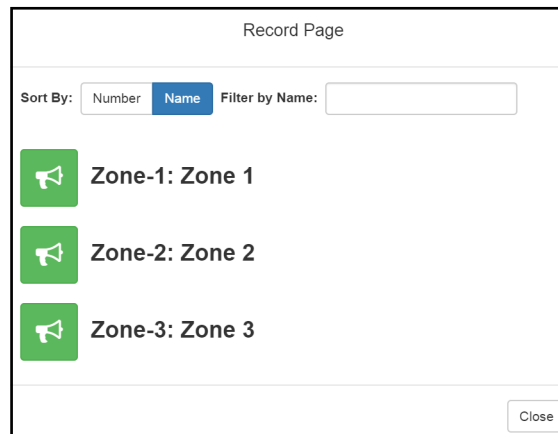


Figure 154. Record Page

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 prompt (if system parameter **Enable Queued Paging Instruction Message** is set to Yes) or tone (if set to No) 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 prerecorded weather alert announcement, you can prepend that announcement file so that it plays first as you prepare to make a page.

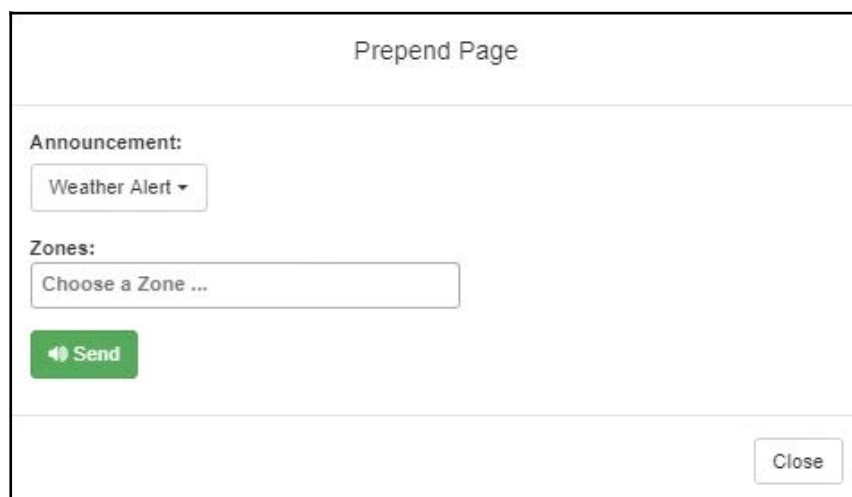
The image shows a dialog box titled "Prepend Page". It contains two sections: "Announcement:" with a dropdown menu currently showing "Weather Alert", and "Zones:" with a text input field containing "Choose a Zone ...". Below these fields is a green "Send" button with a speaker icon. In the bottom right corner of the dialog box is a "Close" button.

Figure 155. 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 Select the Announcement for which you want to prepend a page.
- 4 On the Prepend Page popup, select the zone that you want to page.
- 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.
- 8 After the prepend announcement ends, speak into the microphone.
- 9 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, queued zone paging, non-emergency announcements, and audio distribution. If a queued zone

page is interrupted by an All Call page, the queued zone page will repeat after the All Call page is finished.

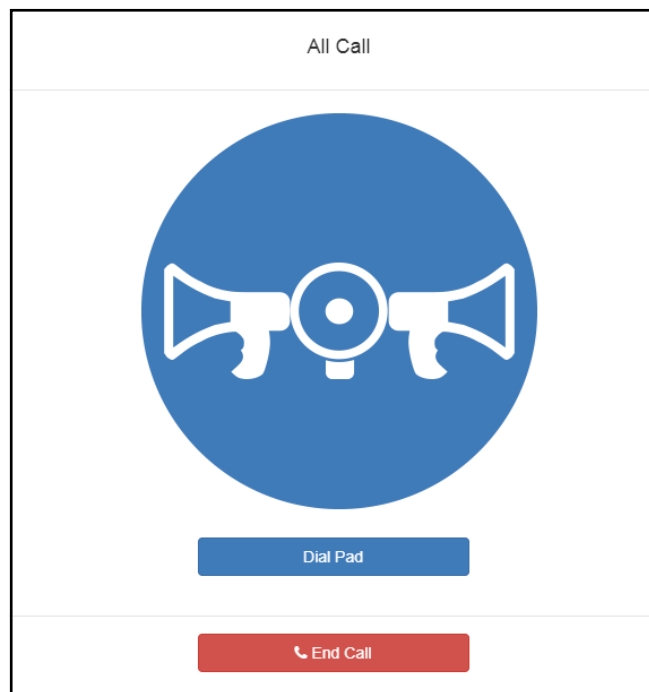


Figure 156. All Call

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. Starting an Emergency All Call page will terminate all audio currently being played on the system (e.g. All-Call page, Zone paging, Announcements, Tones, Alarms, and Audio Distribution).

Note: Audio Distributions that are terminated by Emergency All Call pages are not resumed after the page is finished.

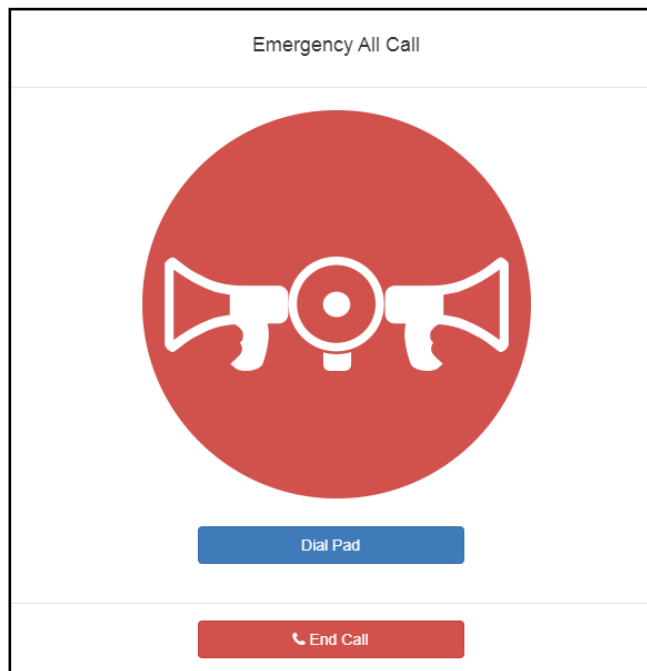


Figure 157. Emergency All Call

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.

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.

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 137*.

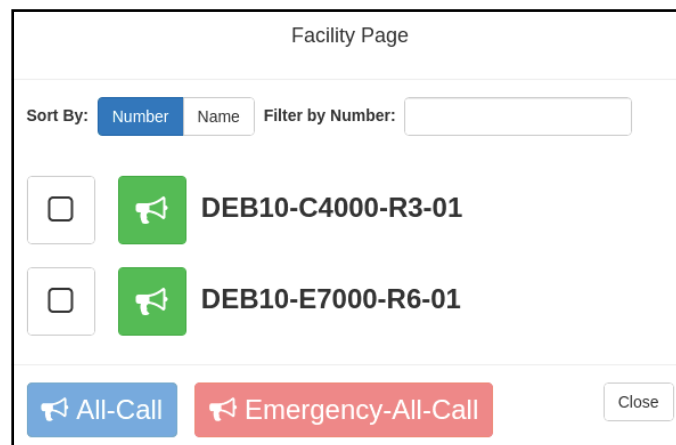


Figure 158. Facility Page

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.

- 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 104 for information about setting up CoS for multi-site paging.)

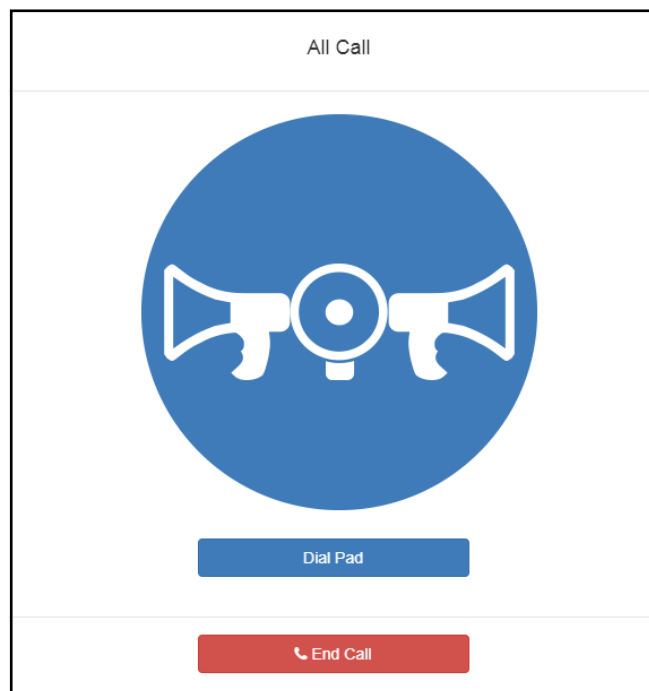


Figure 159. Multi-Site All Call

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.

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 104 for information about setting up CoS for multi-site paging.)

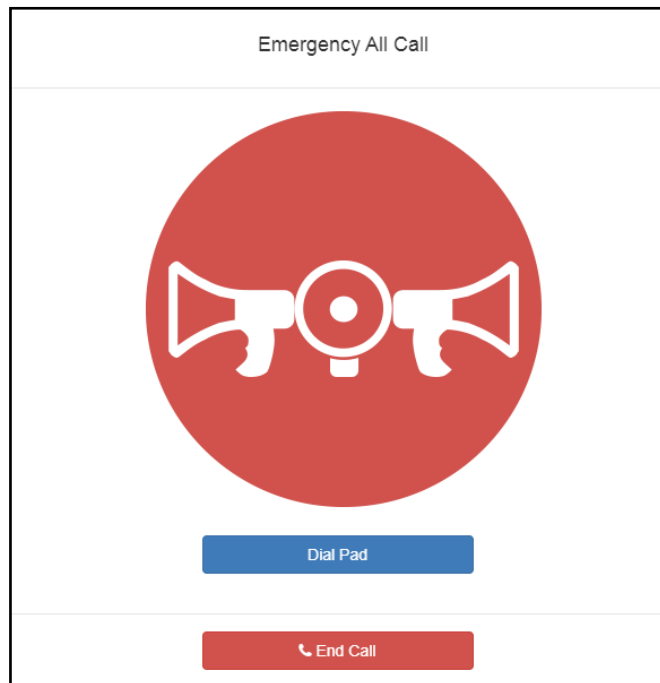


Figure 160. Multi-Site Emergency All Call

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.

Backup Paging from an NQ-T1100 Admin Phone

NQ-T1100 Admin Phones include the ability to perform Paging even if the Nyquist Server is down (by using backup paging). This is a great feature if you are concerned about the Nyquist server being a single point of failure. When combined with the Backup Bell Schedule feature, in the unlikely event that the Nyquist server becomes unavailable, users will still be able to perform paging and receive bell tones.

When the user attempts to perform a Page but does not get a response from the Nyquist server, the user can perform a backup Page by using the following step on the NQ-T1100 Admin Phone.

- 1 Press the **Menu** button on the NQ-T1100 Admin Phone.
- 2 Press the **Features** button.
- 3 Scroll down the menu on the left side of the screen, then press the **Paging List** button.
- 4 Select the entry for Emergency-All-Call, All-Call, or a Paging Zone.
- 5 Press the **Paging** button, located on the bottom right of the display.

The NQ-T1100 will immediately start a Page to the selected Zone. A preannounce tone will not be played because backup paging does not support preannounce tones, but the caller will hear a tone to indicate that the Page has started.

The backup paging feature should *never* be your first choice for paging; it should *only* be used as a backup in the event that the Nyquist server is down.

The NQ-T1100 station needs to have the following CoS configured to initiate paging:

- Emergency All-Call
- All-Call Paging
- Zone Paging

Entries will only be available in the Paging List if the required CoS is enabled for the station.

How to disable the Nyquist Backup Paging feature

If you do not want the Nyquist Backup Paging feature enabled, you can add the following custom variable to the Actions and Custom Variables section of the Custom Configuration page to disable it:

```
backup_paging=disabled
```

When the feature is disabled, it is disabled for all NQ-T1100 IP phones connected to the Nyquist system.

To re-enable the Backup Paging feature, use the following:

```
backup_paging=enabled
```

If you are using the NQ-T1100 web interface to manually configure the phone's paging list, you can use the following to instruct the Nyquist system to not make changes to your configuration:

```
backup_paging=custom
```

Inter-Facility Calling and Paging Passwords

Using the **Edit System Parameters** page (see Table 20, "Edit System Parameters Page," on page 72), 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 Table 20, "Edit System Parameters Page," on page 72).

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.

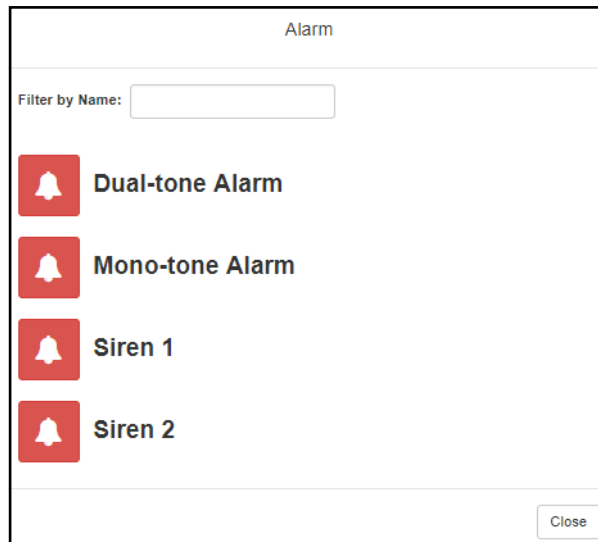


Figure 161. Alarm Page

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 To end the alarm, select **Stop**.

Tip: To end an alarm started by a different station, select the Dashboard's (red square) **Alarm** icon.

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.

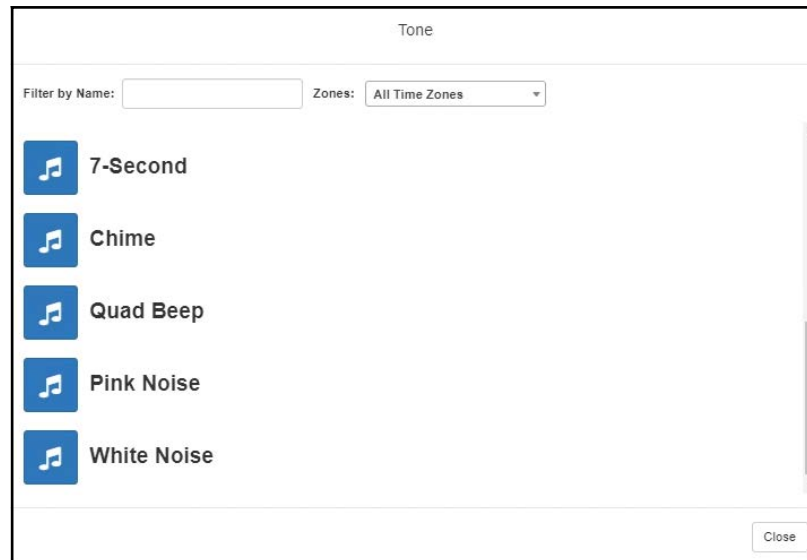


Figure 162. Tone Page

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 been hidden appear. (See "Managing Tones" on page 364 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: A tone will play continuously if one of three conditions exist: its **Type** is **Alarm**, its **Times to Play** is set to zero (0) while using Line-Input as tone source, or its **Length** is set to zero (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 **Stop** 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 364.)

Tip: To end a tone started by a different station, select the Dashboard’s (red square) **Tone** icon.

Managing Announcements via the Dashboard

You can start previously recorded announcements from the dashboard and select the zone where the announcement will play.

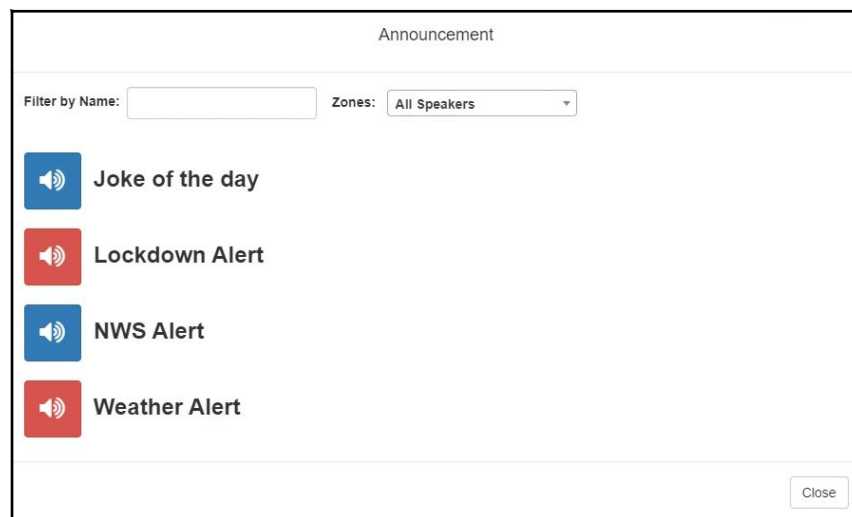


Figure 163. Announcement Page

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, Normal announcements display a blue icon and Emergency announcements display a red icon. Use the **Zones** drop-down menu to select the zone where the announcement will play and enter text in **Filter by Name** to search the list of announcements.
- 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).
- 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 350.)

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 that 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 164. 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. The announcement type (Normal or Emergency) is displayed in parentheses.

Note: Announcements that are defined to play continuously are not available for a Facility Announcement.

- 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.

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 352 for details on how to determine if the announcement was successfully played.

- 9 To end the announcement at the current facility, select Stop (or Close, if the Dial Pad is displayed).

Managing Calls via the Dashboard

Receiving Calls

Receiving calls via the dashboard is simple. When a call to the Admin's extension is received, a pop-up will appear, displaying the calling station's name and extension and prompting the user to accept (**Answer**) or reject (**Busy**) the call. To accept the call, select **Answer** and begin talking.



Figure 165. Incoming Call to Admin Extension

When a call placed using a station’s call-switch is received, the incoming call will be displayed on the Dashboard in the Incoming Call section, displaying the calling station’s name and the call priority. To accept the call, press **Answer**; to reject it, press **Busy**.

Incoming Calls			
Action	Priority	Caller	
<input type="button" value="Answer"/> <input type="button" value="Busy"/>	Normal	108 - Classroom	

Figure 166. Incoming Call from Call-Switch

Placing Calls

Nyquist provides two ways to place a call via the dashboard:

- Through the use of a directory
- Through the use of a dial pad

If you are calling a second-generation “Digital Call Switch & Speaker” station and no one answers the call (or the station is busy), you can request a callback (see *“Requesting a Callback” on page 434* for details). The call recipient will see a flashing LED as a Callback Request Indicator (CRI) to indicate that a callback has been requested.

Note: The callback request feature is only available on a Nyquist system if the Enable Callback Request Indicator system parameter is enabled. A related parameter, Callback Request Indicator Expiration, specifies for how many hours an indicator will be displayed before it is automatically turned off (see *“Edit System Parameters Page” on page 72*).

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.

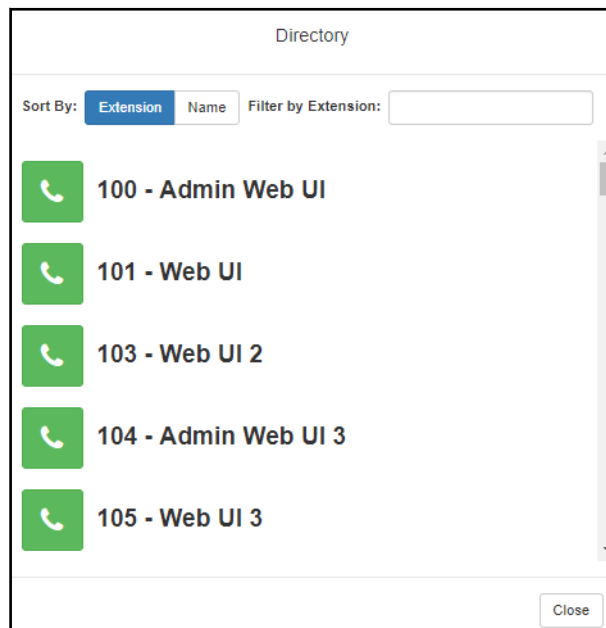


Figure 167. Directory Page

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**.
- 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.

Call Forwarding

Incoming call can be forwarded to a different station. Call forwarding can be enabled or disabled via the Dashboard or via the Admin Phone touch screen.

*To enable or disable call forwarding via the Admin Phone, do **one** of the following:*

- Touch **Menu**, touch **Features**, and touch **Call Forward**.
- Touch **Directory**, touch **Features**, and touch **Call Forwarding**.
- Touch **Features** and touch **Call Forwarding**.
- Pick up the handset and touch **Forward**.

See the *NQ-T1100 Admin Phone User Guide* for further details.

To enable or disable call forwarding from the Dashboard:

- 1 Ensure you are logged into the station whose incoming calls will be forwarded.
- 2 If not already on the dashboard, select **Dashboard** from the navigation bar.
- 3 Under Calling/Paging, select **Call Forwarding**.
- 4 Next to **Forward To**, select the station to which calls will be forwarded.
- 5 Select the desired forwarding operation:

Always Forward: Forward all incoming calls.

Busy Forward: Forward incoming calls received while the station is busy.

No Answer Forward: Forward incoming calls that are not answered within 15 seconds.

Busy or No Answer Forward: Forward incoming calls received while the station is busy or that are not answered within 15 seconds.

Cancel Forwarding: Stop forwarding incoming calls.

Current Forwarding Status: Play a voice announcement that identifies the current call forwarding status for the station.

An entry of type *Call Forward Setup* will be recorded to the Call Detail Records upon modifying the call forwarding settings (see “Using the Call Details Feature” on page 396).

Tip: If Call Forwarding is not working for a station, verify that the **Call Forwarding** CoS is enabled for that station.

Requesting a Callback

To request a callback, simply dial *7 after the call is auto-answered. If you place a call to a busy station that has a second-generation Digital Call Switch (DCS-G2), the system will ask you if you would like to initiate a callback request.

To cancel a callback request, call the station again and dial *8.

Tip: To request a callback without placing a call, dial *7<station-extension>. To cancel a request, dial *8<station-extension>.

Note: A callback request using *7<station-extension> can only be placed if the calling station’s CoS has “Call Any Station” enabled and the called station has a Call-in Level of Normal+Emergency or Urgent+Emergency and is equipped with a DCS-G2.

Note: Stations placing intercom calls to remote facility stations are not able to activate the CRI feature for the remote station.

Note: Callback requests initiated by remote PBX-based callers are not supported.

Receiving and Returning a Callback

The station that receives a callback request will indicate that a callback request is pending by displaying a Callback Request Indicator (CRI)—flashing its LED once per second (the color will be the same as the station’s current status).

When the station with an active callback request places a call using the call-switch, it will call the station that requested the callback.

If the station's CRI is active and the next call initiated from the station is an Emergency call, the CRI shall remain active after the Emergency Call is completed. It will also remain active if the station is restarted.

When returning a callback, if the requesting station does not answer within 60 seconds, the call will either be terminated (for a non-Admin Station) or the call will be forwarded to the caller's admin group (for an Admin Station), and the CRI deactivated.

Using Page Exclusion

You can exclude stations from paging except for alarms, emergency announcements, and emergency pages. Alarms, Emergency All-Call pages, Multi-Site Emergency All-Call pages, and Emergency Announcements to all speakers will be sent to and heard at the station even if that station is set to exclude paging. The following are not sent to the station: All-Call Page, Multi-site All-Call Page, Zone Page, Facility Page, Facility Zone Page, Recorded Page, Prepended Page, Tones, Announcements (normal, emergency to zones), and Facility Announcements (normal, emergency to zones).

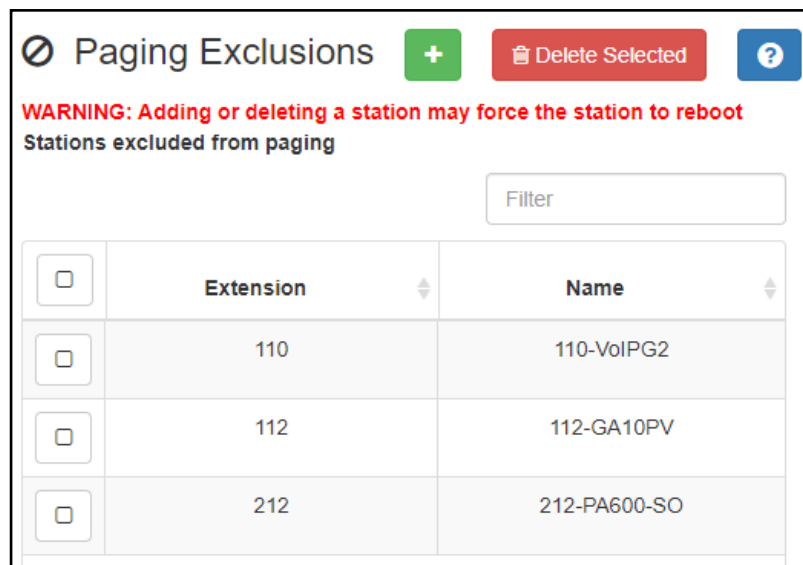


Figure 168. Paging Exclusions Page

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.

- 5 Select the **Add Exclusions** button to add the selected stations to the Page Exclusions list.

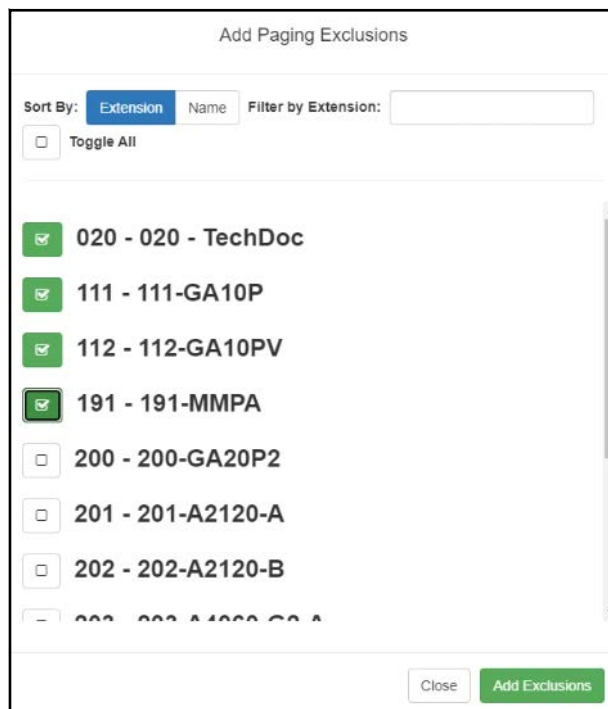


Figure 169. Add Paging Exclusion Page

Tip: You can also add or remove stations to or from the Paging Exclusion list using the Page-Exclusion Routine Action (see *Table 124, "Action Types and Parameters,"* on page 496).

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.

Schedule				
Magic Kingdom - EDITING Schedule Testing Autom				
Thursday August 23, 2018				
Time	Name	Zones	Tone	Scheduled Audio
2:17:30 pm	Happily Ever After	Amp Time Zone	Triumphal Fanfare	▶ Disney World
2:18:00 pm	Magic Parade	Amp Time Zone	Caramel	⊘ Stop Playlist
2:39:00 pm	Let the Magic Begin	A2120 - MONO, A2300 - 504, A2300 - 505, All Time Zone, Amp Time Zone, Time zone - 1, Zone 10	Triumphal Fanfare	▶ Disney World
2:39:49 pm	Closing Hours	A2120 - MONO, A2300 - 504, A2300 - 505, All Time Zone, Amp Time Zone, Time zone - 1, Zone 10	Caramel	⊘ Stop Playlist

Figure 170. Schedule Popup Window

To view this week's schedule:

- 1 If not already on your dashboard, select **Dashboard** from the navigation bar.
- 2 Scroll to the Weekly Schedule panel.
- 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.

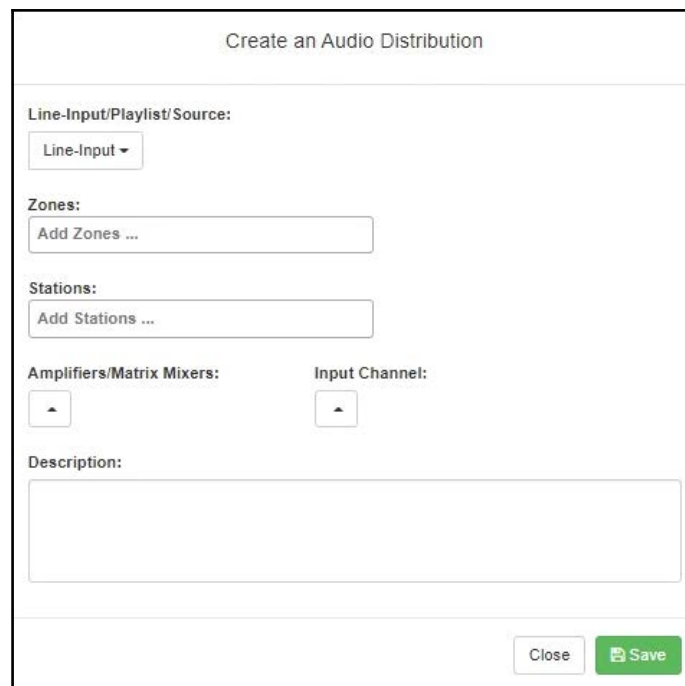
The Schedule popup window appears. (See "Schedule Popup Window Parameters" on page 298.)

- 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 distribution can be tied to a specific event in a schedule. For information about the Scheduled Audio feature, see *“Understanding Event Settings”* on page 294.

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.



The screenshot shows a web form titled "Create an Audio Distribution". The form contains the following fields and controls:

- Line-Input/Playlist/Source:** A dropdown menu with "Line-Input" selected.
- Zones:** A text input field with the placeholder "Add Zones ...".
- Stations:** A text input field with the placeholder "Add Stations ...".
- Amplifiers/Matrix Mixers:** A small square button with an upward-pointing arrow.
- Input Channel:** A small square button with an upward-pointing arrow.
- Description:** A large text area for entering a description.
- Buttons:** "Close" and "Save" buttons at the bottom right.

Figure 171. 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.

Note: If you are using at least one Nyquist Matrix Mixer Pre-Amp, Line-Input appears as a Input Source/Playlist option.

- 2 Select the **Add** icon in the Audio Distribution section.
- 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.

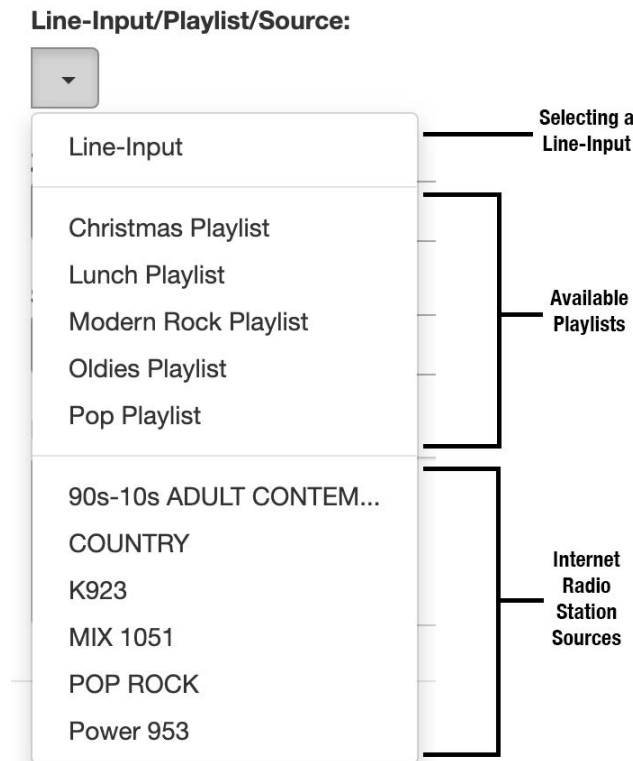


Figure 172. Audio Distribution Sources

- 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.
- 3 If a non-blank **Audio Distribution Password** has been configured (see *Table 20, "Edit System Parameters Page," on page 72*), a keypad will be displayed and an audio prompt will request either the audio distribution password value or a confirmation (i.e., the digit 1).
- 4 The selected audio distribution will play.
- 5 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 active, an informational message appears in the Messages window of the Admin Web UI dashboard indicating the audio that is currently playing, to which speakers (all or selected), and to which zones.

Audio distribution will be paused automatically by higher priority feature activation (for example, All-Call Page, Zone Paging, Announcements, 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 is available on the NQ-T1100 and NQ-ZPMS Admin Phones by selecting the Audio Distribution key and then selecting the desired Audio Distribution from the displayed menu.)

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 235*. Audio Distribution volume can also be changed using the Zone Control feature (see *"Zone Control: Volume and Audio Distribution Panel" on page 377*).

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 Interface or Admin Phone user may start or stop an Audio Distribution if their 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 flash drive as storage for songs on a playlist and the USB flash drive 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 flash drive 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 466.

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 Table 20, "Edit System Parameters Page," on page 72) 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 (1) adding an I/O Controller as a station and (2) 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 174.)

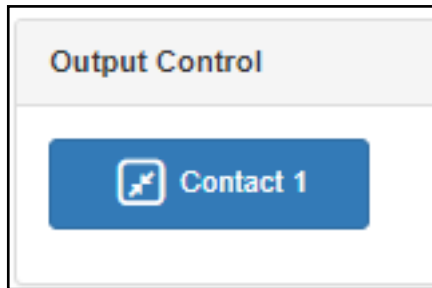


Figure 173. Output Control Section

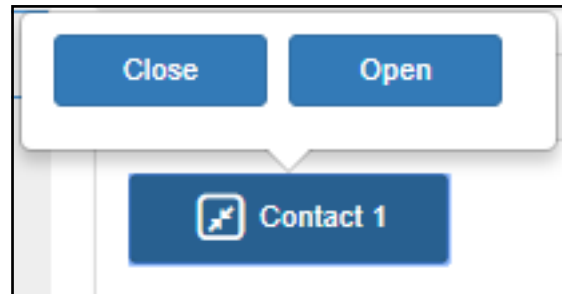


Figure 174. Manual Control Buttons

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 zero (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 zero (0), you can only close the circuit.

- 3 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 647 and *"Assigning Maps Panel Permissions"* on page 446).

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.

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 contain 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

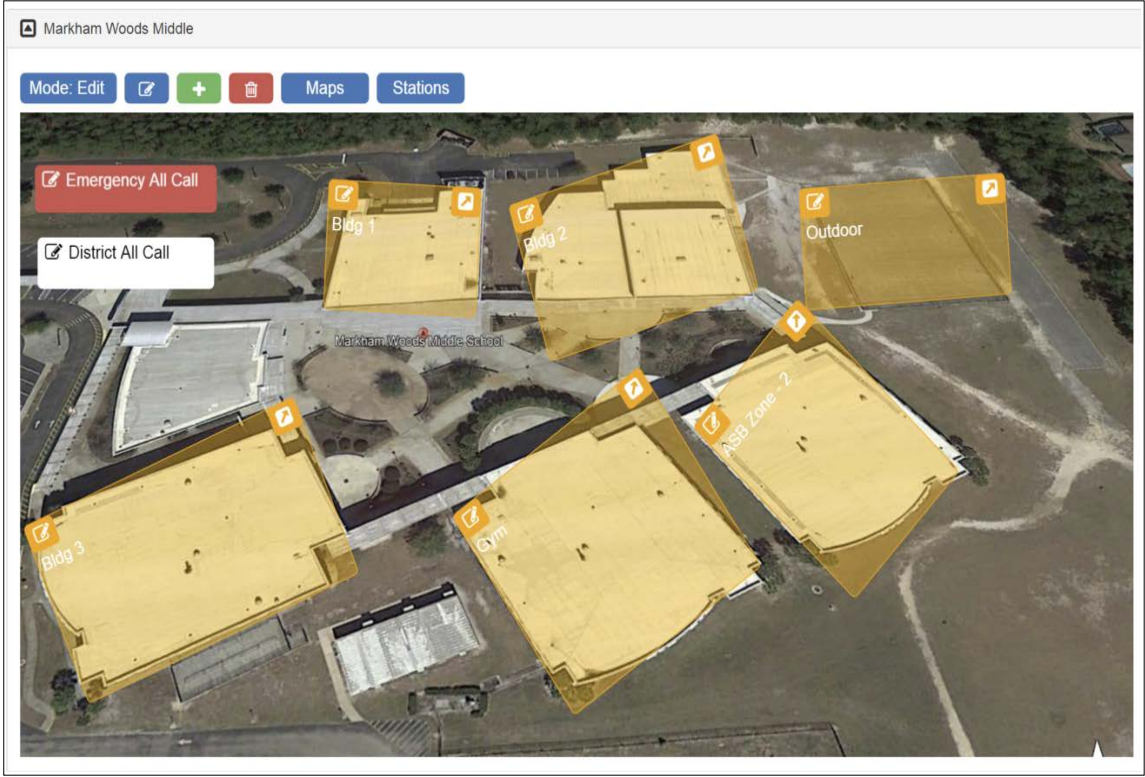


Figure 175. Maps Panel

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 the **Mode** button to toggle between Edit and Live modes.



Select the **Edit** icon if you want to edit the currently displayed map. This icon does not appear if you are in **Live** mode.



Select the **Add** icon if you want to add a new map. This icon does not appear if you are in **Live** mode.



Select the **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 an **Admin 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 24, "CoS Configuration Page Parameters," on page 105.*

- 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**. 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

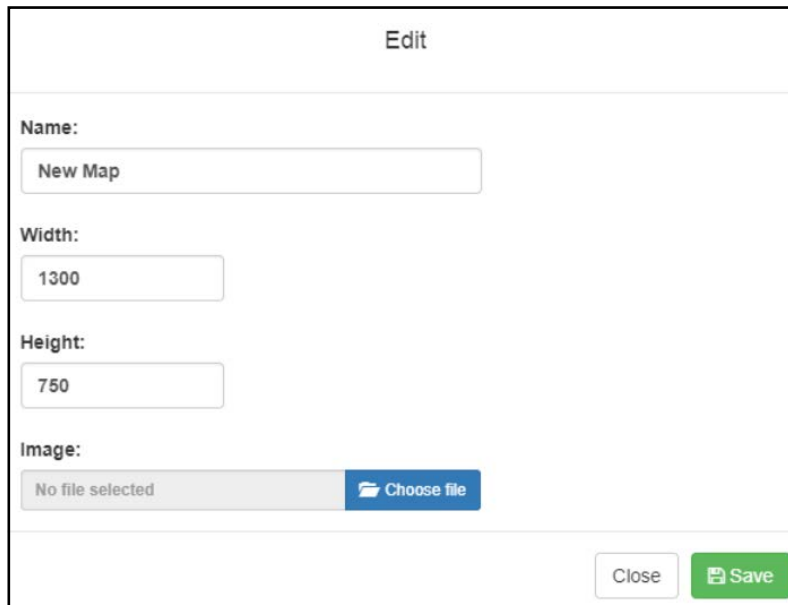
You can add a site graphic to your Nyquist system UI by uploading a PNG or JPEG file.

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 117, "Edit Image Parameters,"* on page 449).
- 6 Select **Choose file** and navigate to the desired file.
- 7 Select **Save**.



The image shows a dialog box titled "Edit". It contains the following fields and buttons:

- Name:** A text input field containing "New Map".
- Width:** A text input field containing "1300".
- Height:** A text input field containing "750".
- Image:** A section with a grey button labeled "No file selected" and a blue button labeled "Choose file" with a file icon.
- At the bottom right, there are two buttons: a white "Close" button and a green "Save" button with a save icon.

Figure 176. Edit Dialog Box

Table 117. 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.

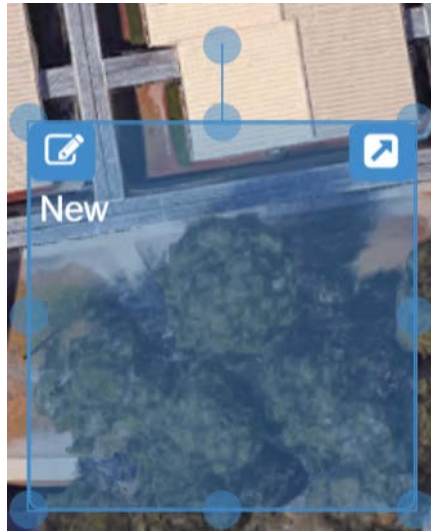


Figure 177. Defined Action Object

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.

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 arrow on the top right of the selectable object to “go into” the 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.

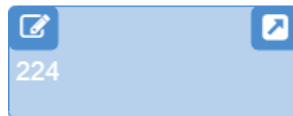


Figure 178. Defined Action Object With Edit Icon (Left Corner)

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 (see *Table 118 on page 452*).
- 4 Select **Save**.

Figure 179 shows the 'Edit Map Object' dialog box. The dialog is titled 'Edit Map Object' and contains the following fields and controls:

- Name:** Text input field containing 'New'.
- Width:** Text input field containing '165'.
- Show Name:** Checkable button labeled 'Yes'.
- Height:** Text input field containing '56'.
- Type:** Dropdown menu showing 'Rectangle'.
- Rotation:** Text input field containing '0'.
- Action:** Dropdown menu showing 'Call'.
- Camera URL:** Text input field.
- Extension:** Dropdown menu.
- Color:** Dropdown menu showing 'Blue'.

At the bottom of the dialog, there are three buttons: 'Delete' (red), 'Close' (grey), and 'Save' (green).

Figure 179. Edit Map Object Dialog Box

Table 118. 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. <i>Note:</i> 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 <i>"Creating a Defined Action Object Button"</i> on page 455.

Table 118. Edit Map Object Parameters

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.

Table 118. Edit Map Object Parameters

- **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 118. Edit Map Object Parameters

Announcement	<p>Use the drop-down menu to select the announcement to play.</p> <p>This option appears only if Action is set to Announce-Facilities or Announce-Selected-Facilities.</p>
Paging Zone	<p>Select the zone in which to play the page.</p> <p>This option appears only if Action is set to Page.</p>
Zone Number	<p>Enter the zone number of the remote facility at which to play the page.</p> <p>This option appears only if Action is set to Facility Zone Page.</p>
URL	<p>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.</p>
Video URL	<p>Enter the full name of the URL for a room camera.</p>
Routine	<p>Select the routine that you want to execute when this button is selected. This option appears only if Action is set to Execute Routine.</p>
Color	<p>Use the drop-down menu to select a color for this object. The default color is Green. Other options are:</p> <ul style="list-style-type: none">• 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 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 118, "Edit Map Object Parameters," on page 452*). 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 118, "Edit Map Object Parameters," on page 452*). For information about enabling routines and the **Allow DTMF** option, see *Table 120, "Routines Parameters," on page 473*.

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 147.

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.

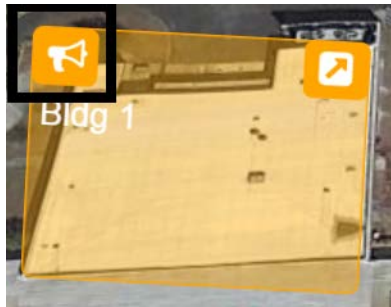


Figure 180. Page Icon

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.

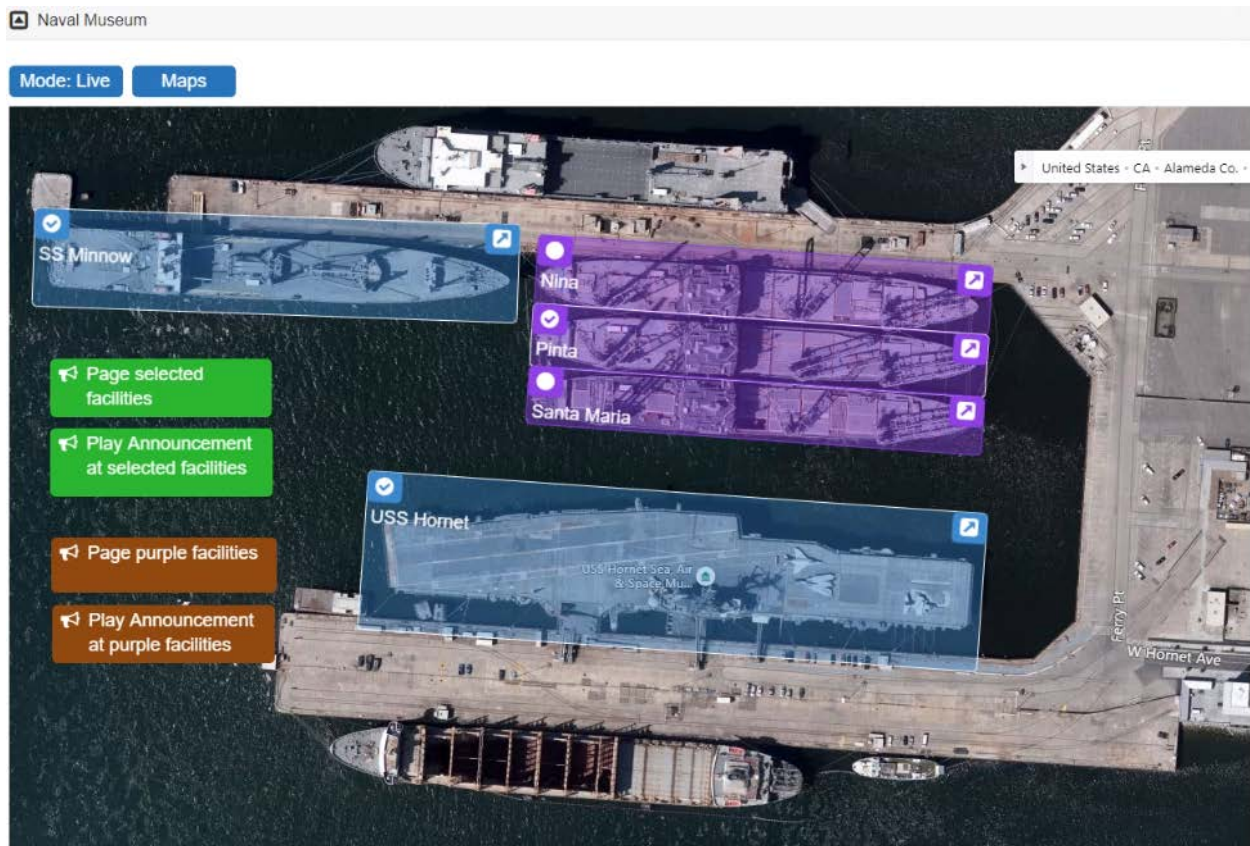


Figure 181. Paging or playing an announcement to multiple selected facilities

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 181*, 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:

- 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 181*, 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 181*, 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 447.)

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.

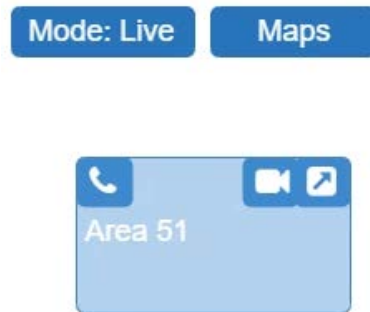


Figure 182. Call Icon

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

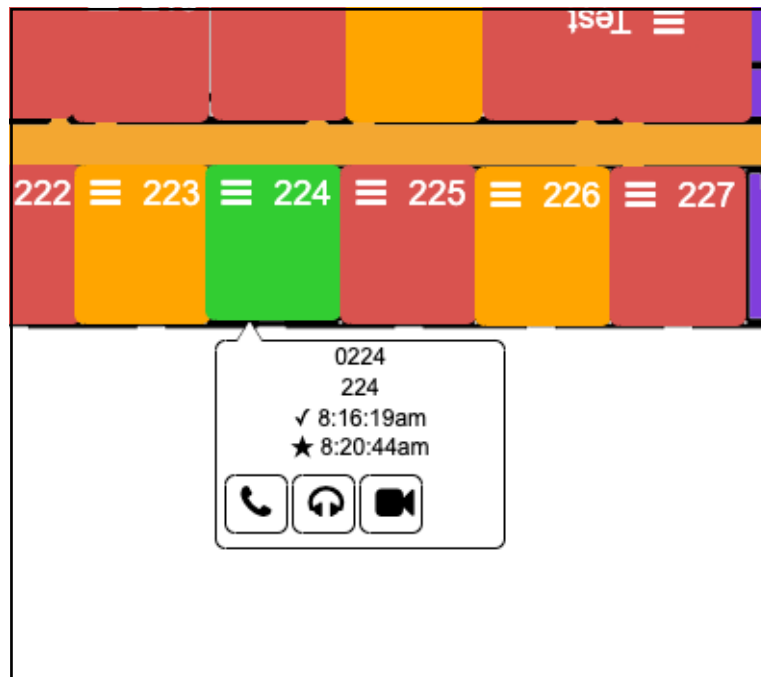


Figure 183. Maps Check-In View

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 268).
- Your station Type is **Admin Web Interface** (see *"Editing Station Configuration Settings"* on page 162).
- Check-in has been configured for your system (see *"Configuring Check-In"* on page 593).
- You have an available map that shows the rooms or areas that you want to monitor (see *"Adding a Site Graphic"* on page 448).
- You have created a map object for each station that you want to monitor (see *"Creating a Map Object for Check-In"* on page 462).

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 474).

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.

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 449).

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 118, "Edit Map Object Parameters,"* on page 452 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 184. Map Object in Live Mode

When a 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 118, "Edit Map Object Parameters,"* on page 452). 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.

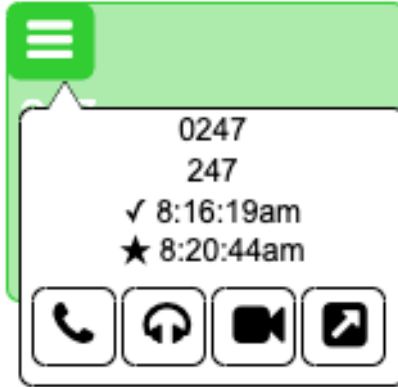


Figure 185. Map Object With Hamburger Menu

From the hamburger menu, you can select the desired action.

During a 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 on either 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 186 shows the 'Edit Trigger - Emergency' configuration window. The window contains the following fields and options:

- Name:** A text input field containing 'New Trigger'.
- Enabled:** A toggle switch set to 'Yes'.
- Type:** A dropdown menu with 'Check-In' selected.
- Check In:** A dropdown menu with 'Start' selected. The dropdown is open, showing the following options: 'Start', 'Stop', 'Done', 'Reset', and 'Finished'.

At the bottom of the window, there are 'Cancel' and 'Save' buttons.

Figure 186. 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 456).

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 the result of an input trigger (see *Table 23, "Failover Event Routine Triggers,"* on page 101 and *Table 122, "Trigger Types and Parameters,"* on page 483). Routines can support your crisis plans for situations such as site lockdown, weather events, or emergency evacuation.

Important: 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;
- as a Scheduled Routine (see *"Using the Schedule Routines Feature"* on page 309);
- or via the optional (requires a license) 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 268) and the station being used to start the routine must have the CoS parameter **Execute Routines** enabled (see *"Using CoS Configuration"* on page 104).

Important: To initiate a routine from a web interface station, the station places a SIP call to the server. A microphone is required to initiate a SIP call, so a microphone must be connected to the station and enabled in the station's web browser to initiate a routine from the web interface, even if it will not be used.

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 553 or “Importing a Routine” on page 554 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.

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.
- 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 To end the routine, select **Stop**.

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 (icons for running routines are red).

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:

Note: Parameters (and their preceding asterisks) are only required if the Routine uses them.

- Dial: *94<routine-DTMF-code>*<parameter1>*<parameter2>
- Dial: 000094<routine-DTMF-code>*<parameter1>*<parameter2>
- 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.

Example:

```
*94123*60*120
```

This example will execute Routine 123, passing 60 as \$cmdParam1 and 120 as \$cmdParam2. The variables \$cmdParam1 and \$cmdParam2 are available to CODE: segments of the Routine Action's Condition field. For example:

```
CODE:  
$user_var[1] = $cmdParam1;  
$user_var[2] = $cmdParam2;
```

Then you can use the \$user_var[] variables in Routine Action fields that support the use of the \$user_var[] variables (see *Table 127, "Variables, Definitions, and Availability,"* on page 526).

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 Certification Authority certificate must be installed on the client computer (i.e., the computer making the request). For details, see *"Client Requirements" on page 10*.
- The global **Enable Routines API** setting must be enabled on the Routines page (see *"Viewing Routines" on page 472*).
- The routine to be executed must have the **Allow API** parameter enabled (see *"Editing a Routine" on page 475*).
- The routine's station, set via its **Extension** setting, must meet the following conditions:
 - The **Type** setting must be "Admin Web Interface" (see *"Editing Station Configuration Settings" on page 162*).
 - 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 104*).
- The routine cannot end with a paging action or any call type action that requires a user to speak.

Invoking a Routine via the Routines API

A routine is invoked 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. The "Authorization" HTTP header of each web request must be a string, formatted as "Bearer <routine-api-key>".

Important: The same API Key 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>/<wait-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).
- <wait-flag>: Can be 1 (ON) or 0 (OFF). A value of 1 returns to the caller after the routine finishes (i.e., a synchronous call), while a value of 0 returns immediately after the routine starts (i.e., an asynchronous call).
- <p1>: A value that will replace the \$apiParam1 variable in an action field.
- <p2>: A value that will 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 (as well as within Routine Action Condition fields). See *Table 119, "Routine Actions and Routine API parameters," on page 472* and *Table 124, "Action Types and Parameters," on page 496* for details about which fields of which Routine Actions can use the \$apiParam1 and \$apiParam2 variables.

Note: Values must be provided for both <p1> and <p2>. If either or both parameters 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 "Invoking a Routine via the Routines API" on page 470. For example, to execute a routine associated with DTMF code 3333 on server 192.168.0.1 with a Routine API Key of '1ed163a71c6695f42035ebade76f1968' and passing 'abc' and 'xyz' as parameters p1 and p2, either of the following examples would work.

- **Example 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"}
```

- **Example 2 (PowerShell):** At a PowerShell prompt, execute the following command:

```
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
```

Tip: These examples 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.

Important: Be aware that the variables available to the Routine when invoked through the Routines API may be different than when invoked through a trigger.

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: The `api_log` System Log file (see *Table 111, “System Logs,” on page 393*) may be helpful when troubleshooting Routine API calls.

Table 119. Routine Actions and Routine API parameters

Routine Action	Routine Action field(s) able to use \$apiParam1 and \$apiParam2
Add-Announcement-Audio	Number Text-To-Speech
Change-Volume	Cut Level
Dash-Delete	Identifier
Dash-Text	Identifier Text
Display-Msg	Identifier Text
Display-Msg-Delete	Identifier
Email	Subject Text
Log-Text	Text to log
Webhook-Post	POST command

Viewing Routines

Selecting **Routines** from the navigation bar allows you to view and edit existing routines and to create new routines.

	Name	Extension	Enabled	Use Caller's Extension	Allow DTMF	DTMF Code	Allow API	Allow Multiple	Description
<input type="checkbox"/>	1234 Routine	040	Yes	No	Yes	1234	Yes	Yes	Show
<input type="checkbox"/>	Test Routine	010	Yes	No	Yes	1	Yes	Yes	Show

Figure 187. Routines

To view existing routines:

- 1 On the navigation bar, select **Routines**.

The Routines page displays the following parameters for each routine:

Table 120. 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 <i>"Invoking a Routine via the Routines API"</i> on page 470). <i>Note:</i> 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. <i>Note:</i> 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.

Table 120. Routines Parameters

Use Caller's Extension	<p>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.</p> <p>If Extension is used, this field must not be set. This field is enabled by default.</p> <p><i>Note:</i> Either this field or Extension must be set or the routine is invalid.</p>
Allow DTMF	<p>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.</p>
DTMF Code	<p>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.</p>
Allow API	<p>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.</p>
Allow Multiple	<p>Specifies if multiple instances of the routine can run at the same time. This field is disabled by default. If disabled, the system allows only one instance of the routine to execute regardless of how many times the routine might be triggered while already executing.</p>
Description	<p>Select Show to view a description of the routine.</p>

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 475).

Note: When a Routine is added, edited, or deleted, all Admin phones will automatically be rebooted to update their **Routines** menu.

Editing a Routine

The Edit Routine page allows you to set other parameters for the routine (see *Table 120, "Routines Parameters,"* on page 473).

The screenshot shows the 'Edit Routine' form with the following fields and values:

- Name:** New Routine
- Extension:** 0100
- Enabled:** Yes
- Use Caller's Extension:** No
- Allow DTMF:** Yes
- DTMF Code:** 555
- Allow API:** Yes
- Allow Multiple:** Yes
- Description:** (empty text area)

Figure 188. 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 120, "Routines Parameters,"* on page 473).
- 4 Select **Save**.

Cloning a Routine

To clone a routine:

- 1 On the navigation bar, select Routines.
- 2 On the Routines page, select the Clone icon next to the routine that you want to clone.
- 3 A copy of the selected routine will be created with the following modifications:
 - The name will have " (clone)" appended to it.
 - The DTMF code will be blank.
 - The Enabled flag will be set to No (i.e., disabled).
- 4 Modify the cloned routine as desired.

Deleting a 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 490 and "Understanding Action Parameters" on page 495). 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 Details Records"* on page 396.

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



The screenshot shows a mobile application interface for viewing triggers. At the top, there is a title bar with a back arrow, the text 'Triggers - Drill - Fire', and two icons: a green plus sign and a blue question mark. Below the title bar are two buttons: 'Done' and 'Actions'. A search filter box is located on the right side of the screen. The main content is a table with the following columns: Name, Enabled, Type, Parameter 1, Parameter 2, and Description. The table contains one row with the following data: Name: Fire Alarm, Enabled: Yes, Type: Announcement, Parameter 1: Number, Parameter 2: Fire Drill, and Description: (empty). There is a 'Show' button at the end of the description column.

Name	Enabled	Type	Parameter 1	Parameter 2	Description
Fire Alarm	Yes	Announcement	Number	Fire Drill	

Figure 189. 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 121, "Triggers," on page 479*).

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 121. 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. For the list of trigger types and their descriptions, see <i>Figure 23, "Failover Event Routine Triggers," on page 101</i> and <i>Figure 122, "Trigger Types and Parameters," on page 483</i> .
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 <i>"Understanding Trigger Parameters" on page 482</i> .

Table 121. 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 <i>"Understanding Trigger Parameters"</i> on page 482.
Description	Displays the description entered by the user for the selected trigger.

Adding a Trigger

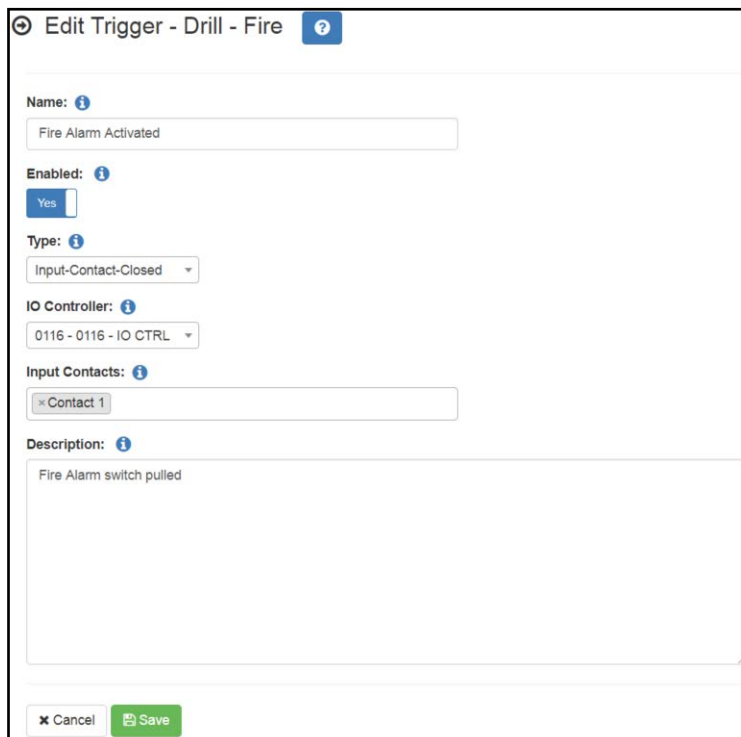
One or more triggers (i.e., events that start a routine) can be added to a routine. When adding a trigger, you can set up to two parameters for the trigger (see *“Understanding Trigger Parameters”* on page 482).

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 481).
- 5 Select **Save**.

Editing a Trigger

The Edit Trigger page allows you to set the parameters for the trigger.



The screenshot shows the 'Edit Trigger - Drill - Fire' configuration page. The page has a title bar with a back arrow, the title 'Edit Trigger - Drill - Fire', and a help icon. Below the title bar, there are several sections with labels and icons:

- Name:** A text input field containing 'Fire Alarm Activated'.
- Enabled:** A toggle switch set to 'Yes'.
- Type:** A dropdown menu with 'Input-Contact-Closed' selected.
- IO Controller:** A dropdown menu with '0116 - 0116 - IO CTRL' selected.
- Input Contacts:** A text input field containing 'Contact 1'.
- Description:** A large text area containing 'Fire Alarm switch pulled'.

At the bottom of the page, there are two buttons: 'Cancel' (with a close icon) and 'Save' (with a save icon).

Figure 190. 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 121, "Triggers,"* on page 479.)
- 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, however, 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 365).

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 122. Trigger Types and Parameters

Trigger Type	Parameter 1	Parameter 2
911	None	None
AF-Primary-* For details, see <i>Figure 23, "Failover Event Routine Triggers,"</i> on page 101.	None	None
AF-Secondary-* For details, see <i>Figure 23, "Failover Event Routine Triggers,"</i> on page 101.	None	None
Alarm	Alarm <ul style="list-style-type: none"> • Selected alarm • Any 	None
All-Call	None	None
Amp-Protection-Mode Routines with this trigger will execute whenever a selected amplifier device goes into protection mode.	Selected device(s) <ul style="list-style-type: none"> • Any • Selected device(s) <i>Note:</i> Up to 19 devices may be selected. If more are needed, create additional triggers for the addition devices.	None

Table 122. Trigger Types and Parameters (Continued)

Trigger Type	Parameter 1	Parameter 2
Announcement	Announcement type	
	• Any	None
	• Number	Announcement
	• Normal-Any	None
	• Normal-Zone	Zone <ul style="list-style-type: none"> • All Speakers • Any Zone • Selected Zone
	• Emergency-Any	None
• Emergency-Zone	Zone <ul style="list-style-type: none"> • All Speakers • Any Zone • Selected Zone 	
Audio-Dist <i>Note:</i> The routine must have an extension defined and Use Caller's Extension must be set to No . <hr/> <i>Tip:</i> 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 playlist.	Audio Distribution Command <ul style="list-style-type: none"> • Start • Stop 	Audio Distribution Selection <ul style="list-style-type: none"> • Any • Selected Audio Distribution
Audio-Disabled	None	None
Audio-Enabled	None	None

Table 122. Trigger Types and Parameters (Continued)

Trigger Type	Parameter 1	Parameter 2
<p>Check-In</p> <p><i>Note:</i> 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.</p>	<p>Check In</p> <ul style="list-style-type: none"> • Start • Stop • Done • Finished • Reset 	<p>Stations</p> <ul style="list-style-type: none"> • Any • Selected station or stations
<p>Emergency-Call</p> <p><i>Note:</i> When both Callers and Called are specified, the trigger occurs when an intercom call involves a specified caller OR a specified called party.</p>	<p>Callers</p> <ul style="list-style-type: none"> • Any • Selected station or stations 	<p>Called</p> <ul style="list-style-type: none"> • Any • Selected station or stations
<p>Emerg-All-Call</p>	<p>None</p>	<p>None</p>
<p>Facility-Page</p>	<p>Facility</p> <ul style="list-style-type: none"> • Any • Selected facility number(s) <p><i>Note:</i> A maximum of 25 facilities may be selected.</p>	<p>None</p>
<p>Facility Status Down</p> <p><i>Note:</i> The routine must have an extension defined and Use Caller's Extension must be set to No.</p> <p><i>Note:</i> If displaying messages, delete messages first using IDENT, then create messages with IDENT set.</p> <hr/> <p>Warning Routines will be triggered every 60 seconds. Make sure that repeating actions make sense.</p> <hr/>	<p>Facility</p> <ul style="list-style-type: none"> • Any • Selected facility number 	<p>None</p>

Table 122. Trigger Types and Parameters (Continued)

Trigger Type	Parameter 1	Parameter 2
<p>Facility Status Up</p> <p><i>Note:</i> This trigger fires when a facility that was previously down comes back up. After a Nyquist server reboot, it will fire for each Facility that has registered with the Nyquist server.</p> <p><i>Note:</i> The routine must have an extension defined and Use Caller's Extension must be set to No.</p> <p><i>Note:</i> If displaying messages, delete messages first using IDENT, then create messages with IDENT set.</p> <hr/> <p>Warning Routines will be triggered every 60 seconds. Make sure that repeating actions make sense.</p> <hr/>	<p>Facility</p> <ul style="list-style-type: none"> • Any • Selected facility number 	<p>None</p>
<p>Incoming-Call</p> <p><i>Note:</i> 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.</p>	<p>None</p>	<p>None</p>
<p>Input-Contact-Closed</p> <p><i>Note:</i> 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.</p>	<p>IO Controller</p> <ul style="list-style-type: none"> • Selected IO Controller 	<p>Input Contacts</p> <ul style="list-style-type: none"> • Selected input contact or contacts

Table 122. Trigger Types and Parameters (Continued)

Trigger Type	Parameter 1	Parameter 2
<p>Input-Contact-Opened</p> <p><i>Note:</i> 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.</p> <p><i>Note:</i> This trigger is not generated for input contacts that have Stop On set to Manual Control.</p>	<p>IO Controller</p> <ul style="list-style-type: none"> • Selected IO Controller 	<p>Input Contacts</p> <ul style="list-style-type: none"> • Selected input contact or contacts
<p>Intercom-Call</p>	<p>Callers</p> <ul style="list-style-type: none"> • Any • Selected station or stations 	<p>Called</p> <ul style="list-style-type: none"> • Any • Selected station or stations
<p>Multi-Site-All-Call</p>	<p>None</p>	<p>None</p>
<p>Multi-Site-E-All-Call</p>	<p>None</p>	<p>None</p>
<p>NWS-Alert</p> <p><i>Note:</i> The Event and Severity parameters can be used to filter the execution of Routines via the trigger.</p> <p><i>Note:</i> This trigger requires at least one Routine running with a Display-Msg action that includes the \$alerts variable.</p>	<p>Event</p> <ul style="list-style-type: none"> • Any • Selected event type 	<p>Severity</p> <ul style="list-style-type: none"> • Any • Extreme • Severe • Moderate • Minor • Unknown
<p>Night-Ring</p> <p><i>Note:</i> Use the Action Ring-Wait to detect when a call has been answered or disconnected. See "Understanding Action Parameters" on page 495 for more information.</p> <p><i>Note:</i> The routine must have Use Caller's Extension disabled and an assigned Extension with the proper CoS.</p>	<p>None</p>	<p>None</p>

Table 122. Trigger Types and Parameters (Continued)

Trigger Type	Parameter 1	Parameter 2
<p>PBX-Incoming-Call</p> <p>This trigger is evaluated on all incoming calls from <i>PBX Connection</i> types.</p> <p><i>Note:</i> This trigger does not apply to incoming calls from PSTN (use the Incoming-Call trigger for these).</p>	<p>Caller ID</p> <p>Allowed values (one of the following):</p> <ul style="list-style-type: none"> • Comma-separated list of caller ID extensions to match (e.g., <i>100,101</i>) • Partial caller ID number followed by a percent sign (%) indicating a wildcard that matches one or more subsequent digits • Leave blank to match any caller ID number 	<p>Called Extension</p> <p>Allowed values (one of the following):</p> <ul style="list-style-type: none"> • Comma-separated list of station or feature extensions (e.g., <i>100,#0911,*94111,*94222</i>) • Partial caller ID number followed by a percent sign (%) indicating a wildcard that matches one or more subsequent digits • Leave blank to match any caller ID number
<p>Reboot</p> <p>Routines with this trigger will execute whenever the Nyquist server reboots or is restarted via Restart Server. Routines with this trigger will also be executed after a System Update is performed on the Nyquist server. To use this trigger, the routine must have an extension defined and disable Use Caller's Extension.</p>	<p>None</p>	<p>None</p>

Table 122. Trigger Types and Parameters (Continued)

Trigger Type	Parameter 1	Parameter 2
<p>Schedule-Activated</p> <p>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.</p> <p><i>Note:</i> When schedules are edited via the Nyquist web interface, this trigger is generated for all active schedules after changes have been saved.</p>	<p>Holiday or Schedule Name</p>	<p>None</p>
<p>Sched-Event</p>	<p>Scheduled Event</p> <ul style="list-style-type: none"> • Any • Selected event 	<p>None</p>
<p>Scheduled-Tone</p> <p><i>Note:</i> The routine must have an extension defined and "Use Callers Extension" must be set to "No".</p>	<p>Tone</p> <ul style="list-style-type: none"> • Any • Selected tone 	<p>None</p>
<p>Station-Status-Up</p> <p><i>Note:</i> The routine must have an extension defined and Use Caller's Extension must be set to No.</p> <p><i>Note:</i> Station Supervision must be enabled in System Parameters.</p>	<p>Stations</p> <ul style="list-style-type: none"> • Any • Selected station or stations 	<p>None</p>
<p>Station-Status-Down</p> <p><i>Note:</i> The routine must have an extension defined and Use Caller's Extension must be set to No.</p> <p><i>Note:</i> Station Supervision must be enabled in System Parameters.</p>	<p>Stations</p> <ul style="list-style-type: none"> • Any • Selected station or stations 	<p>None</p>

Table 122. Trigger Types and Parameters (Continued)

Trigger Type	Parameter 1	Parameter 2
Tone	Tone <ul style="list-style-type: none"> Any Selected tone 	None
Urgent-Call <i>Note: When Callers and Called are both specified, the trigger occurs when intercom call involves a specified caller OR a specified called party</i>	Callers <ul style="list-style-type: none"> Any Selected station or stations 	Called <ul style="list-style-type: none"> Any Selected station or stations
Zone-Page	Zone <ul style="list-style-type: none"> 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

The screenshot shows a web interface titled "Actions - New Routine". It has a "Done" button and a "Triggers" button. Below these is a table with columns: Name, Enabled, Type, Parameter 1, Parameter 2, Parameter 3, Parameter 4, Execute Order, Finish Delay, and Description. There is also a "Filter" input field above the table.

	Name	Enabled	Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4	Execute Order	Finish Delay	Description
+ [edit] [delete]	Show Dash Text	Yes	Routine	DTMF: 6	Facility3	None	None	1	No-Delay	Show
+ [edit] [delete]	New Action	Yes	No-Action	None	None	None	None	2	None	Show

Figure 191. 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 123, "Actions," on page 491*).

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 123. Actions

Name	Displays Name of the action.
Enabled	Move the slider to Yes to enable this action.

Table 123. Actions

Type

Displays the type of action. Type can be one of the following:

Note: Depending on the Type, additional parameters may be set (see "Understanding Action Parameters" on page 495).

- Add-Announcement-Audio
- Alarm
- All-Call
- Announcement
- Audio-Dist-Start (Audio Distribution Start)
- Audio-Dist-Stop (Audio Distribution Stop)
- Call-And-Announce
- Change-Setting
- Change-Volume
- Change-WBC-Setting
- Check-In
- Check-intercom
- Dash-Delete (Dashboard Text Delete)
- Dash-Text (Dashboard Text)
- Disable-Audio
- Display-Msg (Display NQ-GA10PV or NQ-S1810WBC Message)
- Display-Msg-Delete (Delete NQ-GA10PV or NQ-S1810WBC Message)
- Enable-Audio
- Email
- Emergency-Call
- Emerg-All-Call (Emergency All-Call)
- Facility-Announcement
- Facility-Page
- Feature-Wait
- Goto
- Intercom-Call
- Intercom-Wait
- Log-Text
- 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
- SM-Disable-Zone
- SM-Enable-Zone
- SM-Scheduled-Ramp
- SM-Set-Output-Gain
- Stop-Announcement
- Tone
- Urgent-Call
- Webhook-Post
- Zone-Page

Table 123. Actions

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.
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 495*).

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 123, "Actions," on page 491*).
- 5 Select **Save**.

Editing an Action

The Edit Action page allows you to set the parameters for the action.

Edit Action - New Routine ?

Name: ⓘ
Show Dash Text

Enabled: ⓘ
 Yes

Type: ⓘ
Routine

Facility: ⓘ
Facility3

Routine DTMF: ⓘ
6

Finish Delay: ⓘ
No-Delay

Description: ⓘ
dash text

Figure 192. 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 123, "Actions," on page 491*).
- 5 Select **Save**.

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.

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 (with the exception of Display-Msg, which has significantly more).

In the list of Actions for a Routine, the parameters appear as **Parameter 1**, **Parameter 2**, **Parameter 3**, and **Parameter 4**. If the Action uses more than four parameters, **Parameter 4** will display a **Show** button that allows you to view the remaining parameters.

On the Edit Action page, however, 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 365*). 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.

Important: Each action can be made conditional, which means that it will only execute if its defined condition evaluates to true. To make an action conditional, enter a PHP expression in the **Condition** field for that action.

For more details about conditional actions, see *“Condition Statements” on page 537*.

The following table describes the action **Type** and any applicable parameters.

Table 124. Action Types and Parameters

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Add-Announcement-Audio</p> <p>Adds audio to a temporary announcement.</p> <p>This must be preceded by a New-Announcement action followed by zero or more Add-Announcement-Audio actions and finally a Play-Announcement action.</p>	<p>Audio Source Type</p> <ul style="list-style-type: none"> • Announcement • Number • Text-to-Speech (TTS) 	<p>Announcement to play (depends on Audio Source Type)</p> <p>Announcement</p> <ul style="list-style-type: none"> • Selected announcement (announcement type in parentheses) <p>Number</p> <ul style="list-style-type: none"> • Numeric value • Variable <p>Text-to-Speech</p> <ul style="list-style-type: none"> • Text, with optional TTS formatting (see <i>"Using SSML for Text-to-Speech Entries"</i> on page 356) <p>The following variables can be used for Number or Text-to-Speech announcements:</p> <p>\$apiParam1 \$apiParam2 \$caller \$called \$contact \$schedParam1 \$schedParam2 \$station</p>	<p>Pronounce fractions (used only when Audio Source Type is Number)</p> <ul style="list-style-type: none"> • 0 = No • 1 = Yes 	<p>Announce number as (used only when Audio Source Type is Number):</p> <ul style="list-style-type: none"> • Number • Digits

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Alarm</p> <p><i>Note:</i> In addition to the parameters, you also can set a Finish Delay, of either No-Delay or Wait-Until-Done.</p>	<p>Alarm</p> <ul style="list-style-type: none"> Selected alarm 	<p>None</p>	<p>Duration</p> <ul style="list-style-type: none"> Number of seconds for action to continue; default is 86400 seconds (24 hours) 	<p>None</p>
<p>All-Call</p> <p><i>Note:</i> All-Call must be the last action in a routine.</p> <p>In addition to the parameters, you also can set a Finish Delay, of either No-Delay or Wait-Until-Done.</p>	<p>None</p>	<p>None</p>	<p>None</p>	<p>None</p>
<p>Announcement</p> <p><i>Note:</i> In addition to the parameters, you also can set a Finish Delay, of either No-Delay or Wait-Until-Done.</p>	<p>Announcement</p> <ul style="list-style-type: none"> Selected announcement (announcement type in parentheses) 	<p>Zone</p> <ul style="list-style-type: none"> All speakers Selected zone 	<p>Duration</p> <ul style="list-style-type: none"> Number of seconds for action to continue; default is 86400 seconds (24 hours) <p><i>Note:</i> The announcement will stop when the duration length is reached, regardless of the length of the announcement.</p>	<p>None</p>
<p>Audio-Dist-Start</p> <p><i>Note:</i> In addition to the parameters, you can also set a Finish Delay, of either No-Delay or Wait-Until-Done.</p>	<p>Audio Distribution</p> <ul style="list-style-type: none"> Selected Audio Distribution 	<p>None</p>	<p>None</p>	<p>None</p>

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Audio-Dist-Stop</p> <p><i>Note:</i> In addition to the parameters, you can also set a Finish Delay, of either No-Delay or Wait-Until-Done</p>	<p>Audio Distribution</p> <ul style="list-style-type: none"> • Selected Audio Distribution • All 	<p>None</p>	<p>None</p>	<p>None</p>
<p>Call-And-Announce</p>	<p>Number to Call</p> <ul style="list-style-type: none"> • 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 <p><i>Note:</i> 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.</p>	<p>Announcement to Play</p> <ul style="list-style-type: none"> • Selected announcement 	<p>Play Count</p> <ul style="list-style-type: none"> • Continuous Play • Number of times to play <p><i>Note:</i> 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.</p>	<p>None</p>
<p>Change-Setting</p>	<p>Selected Setting</p>	<p>New Value</p>		

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Change-Volume</p> <hr/> <p><i>Tip:</i> To change the cut level for multiple Audio Types and/or Zones in a Routine, add a Change-Volume action for each.</p> <hr/> <p><i>Tip:</i> To change the cut level at a specific time (or on a recurring schedule), create a Scheduled Routine that calls the Change-Volume action.</p> <hr/>	<p>Audio Type</p> <ul style="list-style-type: none"> • All-Call • Audio Distribution • Emergency-All-Call • Zone Paging 	<p>Zone</p> <p>(available options determined by specified Audio Type)</p> <ul style="list-style-type: none"> • All Speakers • All Speakers • One of a list of Audio zones • All Speakers • One of a list of Paging and Time-type zones 	<p>Cut Level (dB)</p> <p>A value between –42 and 0 dB.</p> <p>If a Cut Level Type of “Cut Level” is specified, the cut level value is specified (in dB) via a slide control.</p> <p>If a Cut Level Type of “API Value” is specified, select either:</p> <ul style="list-style-type: none"> • \$apiParam1 or • \$apiParam2. <p>The actual cut level (in dB) will be determined by the value of the selected variable when this action is executed via a Routines API call.</p>	<p>None</p>

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Change-WBC-Setting</p>	<p>Stations</p> <ul style="list-style-type: none"> • All Displays • List of WBC station extension numbers 	<p>Field to change</p> <ul style="list-style-type: none"> • Enable Clock Display • Clock Time Format • Show Clock Seconds • Enable Flasher Use • Message LED Brightness • Flasher LED Brightness 	<p>New value for specified field</p> <p>Select a new value for the specified <i>Field to change</i>. Available values are determined by the selected field.</p>	<p>None</p>
<hr/> <p><i>Tip:</i> WBC settings can be changed during the day to satisfy different daytime requirements by executing a routine as part of a "bell" schedule and/or via the Schedule Routines page. For example, a scheduled Routine could turn off all WBC LED displays after hours (Message LED Brightness = Off) and turn them back on when the next day starts (Message LED Brightness = Low, Medium, or High).</p> <hr/>				
<p>Check-In</p>	<p>Check In</p> <ul style="list-style-type: none"> • Start • Stop • Done • Finish • Wait (see "Check-In Action Type with Check-In Set to Wait" on page 520) • Station • Vacancy-Add • Vacancy-Delete • Reset • Exclude-Add • Exclude-Delete 	<p>Stations</p> <ul style="list-style-type: none"> • Selected Stations <p><i>Note:</i> Used when Parameter 1 (Check In) is Station, Vacancy-Add, Vacancy-Delete, Exclude-Add, or Exclude-Delete.</p>	<p>Finish Delay</p> <ul style="list-style-type: none"> • No-Delay • Wait-Until-Done <p>No-Delay means the next action will execute immediately. Wait-Until-Done means the next action will not execute until this action has completed.</p>	<p>None</p>
<p>Check-Intercom</p>	<p>None</p>	<p>None</p>	<p>None</p>	<p>None</p>

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Dash-Delete</p> <p>This action type is for deleting messages from the web interface dashboard.</p> <p>The number used for Number is based on the order the message was created; the third message created would be identified as number 3.</p>	Dash Delete			
	<ul style="list-style-type: none"> LIFO (Last In, First Out) 	None	None	None
	<ul style="list-style-type: none"> FIFO (First In, First Out) 	None	None	None
	<ul style="list-style-type: none"> IDENT 	<p>Identifier</p> <p>The following variables can be used:</p> <p>\$apiParam1 \$apiParam2 \$caller \$called \$contact \$deviceMacAddr \$facility \$eventid \$eventname \$schedParam1 \$schedParam2 \$scheduleid \$station \$toneid \$tonename \$user_var[1...10] \$zone</p>	None	None
<ul style="list-style-type: none"> Number 	Number	None	None	

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Dash-Text</p> <p>This action type is for adding messages to web interface dashboards.</p>	<p>Style</p> <ul style="list-style-type: none"> • Basic • Danger • Info • Success • Warning 	<p>Identifier</p> <p>The following variables can be used:</p> <p>\$apiParam1 \$apiParam2 \$caller \$called \$contact \$deviceMacAddr \$facility \$eventid \$eventname \$namecalled \$namecaller \$schedParam1 \$schedParam2 \$scheduleid \$station \$toneid \$tonename \$user_var[1...10] \$zone</p> <p><i>Note:</i> This parameter is optional and is used to identify a message for deletion.</p>	<p>Scope</p> <ul style="list-style-type: none"> • All • Admin 	<p>Text</p> <p>The following variables can be used:</p> <p>\$apiParam1 \$apiParam2 \$schedParam1 \$schedParam2 \$caller \$called \$contact \$cputemp \$date1 \$date2 \$date3 \$deviceMacAddr \$deviceName \$df-avail \$facility \$eventid \$eventname \$namecaller \$namecalled \$scheduleid \$schedulename \$toneid \$tonename \$station \$time1,\$time2 \$uptime \$user_var[1...10] \$zone</p>
<p><i>Note:</i> When specifying 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, it displays the phone number of the caller.</p>				
<p>Disable Audio</p> <p><i>Note:</i> In addition to the parameters, you can also set a Finish Delay, of either No-Delay or Wait-Until-Done</p>	None	None	None	None

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Display-Msg</p> <p>Display a message on the NQ-GA10PV and/or NQ-S1810WBC display.</p>	<p>Zones</p> <ul style="list-style-type: none"> • All Displays • Selected zone or zones 	<p>Identifier</p> <p><i>Note:</i> This parameter is optional and is used to identify a message for deletion.</p> <p>The following variables can be used as part of the identifier value:</p> <p>\$apiParam1 \$apiParam2 \$caller \$called \$contact \$deviceMacAddr \$toneid \$tonename \$facility \$eventid \$eventname \$schedParam1 \$schedParam2 \$scheduleid \$station \$user_var[1...10] \$zone</p>	<p>Stations</p> <ul style="list-style-type: none"> • Selected NQ-GA10PV or NQ-S1810WBC station • \$called • \$caller <p><i>Note:</i> Using the \$called variable allows a single Intercom-call triggered routine to handle all NQ-GA10PV and NQ-S1810WBC displays.</p>	<p>(continued below)</p>

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4										
<p>Display-Msg (cont'd)</p>	<p>The Display-Msg Action Type allows you to set the message text or image, display time (in seconds), priority, style settings (e.g., background color, font, font size, font color, font styles), and more. For further information about message settings, see <i>"Using Color in Display Messages"</i> on page 567.</p> <p>You also have the option to select a Message Template, which will initialize many of the Display-Msg parameters with preset values to use as a starting point for your message. The template selected can be of type Text or Image. For further information about defining and using Message Templates, see <i>"Managing Display Messages"</i> on page 558.</p> <hr/> <p>Caution Be aware that specifying a Message Template does not associate the current action with that template (and will not be persisted as part of the action), but is only used to <i>initialize</i> the settings for this action. This also means that selecting a template can override settings that you may have already specified, such as the Text or Identifier properties (among others). Use caution when selecting a Message Template for a previously defined action.</p> <hr/> <p><i>Tip:</i> You can use this Action Type to create a routine for displaying emergency alerts from the National Weather Service (NWS). See <i>"Setting Variables for the Display Message"</i> on page 606 for descriptions about the variables used in an Alerts routine.</p> <hr/> <p><i>Note:</i> Be aware that the Display Time (seconds) setting causes the message to display for that length of time, but the action completes immediately and the routine proceeds to the next action. You can use the Pause action if you want the routine to pause for a specified duration. If you plan to use Display-Msg-Delete to explicitly delete a displayed message, set Display Time (seconds) to 0 (i.e., do not automatically delete message).</p> <p>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 or NQ-S1810WBC display messages, the variable is replaced by the ID of the caller that triggered the routine. When calls are placed from outside the system, it displays the phone number of the caller.</p> <p>On the NQ-GA10PV, you can also use basic HTML tags, such as:</p> <ul style="list-style-type: none"> • for bold • <i> for italic • <u> for underline <p>Includes the following fields, which were entered when the Action was created:</p> <table border="0" style="width: 100%;"> <tr> <td>• Display Time</td> <td>• Display time</td> </tr> <tr> <td>• +Priority</td> <td>• Message type</td> </tr> <tr> <td>• Text to display</td> <td>• Image type</td> </tr> <tr> <td>• Text style settings</td> <td>• Image priority</td> </tr> <tr> <td></td> <td>• Message image</td> </tr> </table> <p>* Priority of 5 (Exclusive) is disabled when Message Type is Image.</p>				• Display Time	• Display time	• +Priority	• Message type	• Text to display	• Image type	• Text style settings	• Image priority		• Message image
• Display Time	• Display time													
• +Priority	• Message type													
• Text to display	• Image type													
• Text style settings	• Image priority													
	• Message image													

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Display-Msg (cont'd)	The Text field may use any of the following variables (availability based on trigger):			
	\$alerts	*\$calltypeshort	\$eventid	\$station
	\$apiParam1	*\$calltypelong	\$eventname	\$time1
	\$apiParam2	\$contact	\$facility	\$time2
	*\$autobgcolor	\$cputemp	\$namecalled	\$toneid
	*\$autofontcolor	\$date1	\$namecaller	\$tonename
	\$autopriority	\$date2	\$schedParam1	\$uptime
	\$auto_resize	\$date3	\$schedParam2	\$user_var[1...10]
	\$caller	\$deviceMacAddr	\$scheduleid	\$weather
	\$called	\$deviceName	\$schedulesname	\$zone
	*\$calltypechar	\$df-avail		
	* Available only for emergency-call and urgent-call triggers			
	<hr/> <p><i>Tip:</i> To completely blank out an NQ-GA10PV screen, display a message using the Solid-Black (1920×1080) image, which is available by default. This can be used to “turn off” an NQ-GA10PV display such that it will not display a message or the clock (i.e., completely black). The Image Type must be set to Full Screen. To ensure no other messages will display during this message duration, specify a Priority of 6 (Fullscreen on GA10PV).</p> <hr/>			

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Display-Msg-Delete</p> <p><i>Note:</i> NQ-GA10PV and NQ-S1810WBC Display Messages created by a Routine that expires during the Routine's execution remain in the undeleted messages list until deleted with a Display-Msg-Delete action. When using LIFO, FIFO, or NUMBER to delete display messages, you will still need to execute a Display-Msg-Delete command for any display messages that have expired during the Routine's execution.</p>	Display Message Delete			
	• LIFO	None	None	None
	• FIFO	None	None	None
	• IDENT	Identifier The following variables can be used: \$apiParam1 \$apiParam2 \$caller \$called \$contact \$deviceMacAddr \$facility \$eventid \$eventname \$schedParam1 \$schedParam2 \$scheduleid \$station \$toneid \$tonename \$user_var[1...10] \$zone	None	None
	• PARAM	Zones <i>Note:</i> This field is optional.	Stations <i>Note:</i> This field is optional.	None
• NUMBER	Number	None	None	

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Email</p> <p><i>Note:</i> In addition to the parameters, you can also set a Finish Delay, of either No-Delay or Wait-Until-Done.</p>	<p>Send Email To</p> <p>Specifies a comma-delimited list of email addresses.</p> <p>Maximum length of string is 2048 characters.</p> <p><i>Note:</i> To use this parameter to send a text message to a cellphone, see "Using Email Action to Send Text Message" on page 518.</p>	<p>Subject</p> <p>The following variables can be used:</p> <p>\$apiParam1 \$apiParam2 \$caller \$called \$contact \$cputemp \$date1 \$date2 \$date3 \$deviceMacAddr \$deviceName \$df-avail \$facility \$eventid \$eventname \$namecaller \$namecalled \$schedParam1 \$schedParam2 \$schedulename \$station \$time1 \$time2 \$toneid \$tonename \$uptime \$user_var[1...10] \$zone</p> <p><i>Note:</i> The availability of variables is based on the trigger type.</p>	<p>Text</p> <p>The following variables can be used:</p> <p>\$apiParam1 \$apiParam2 \$caller \$called \$contact \$cputemp \$date1 \$date2 \$date3 \$deviceMacAddr \$deviceName \$df-avail \$facility \$eventid \$eventname \$namecaller \$namecalled \$schedParam1 \$schedParam2 \$schedulename \$station \$time1 \$time2 \$toneid \$tonename \$uptime \$user_var[1...10] \$zone</p> <p><i>Note:</i> The availability of variables is based on the trigger type.</p>	<p>None</p>
<p>Emergency-Call</p>	<p>Placed by</p> <ul style="list-style-type: none"> • Calling Station • Selected Station <p><i>Note:</i> If Calling Station is used, this action must be the last action in the routine and must be executed via DTMF code.</p>	<p>None</p>	<p>None</p>	<p>None</p>

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Emerg-All-Call</p> <p><i>Note:</i> This action must be the last action in a routine.</p>	None	None	None	None
<p>Enable-Audio</p> <p><i>Note:</i> You can set a Finish Delay, of either No-Delay or Wait-Until-Done.</p>	None	None	None	None
<p>Facility-Announcement</p>	<p>Announcement</p> <ul style="list-style-type: none"> • Non-continuous announcement to be played (announcement type in parentheses) 	<p>Facilities</p> <ul style="list-style-type: none"> • One or more facilities at which the announcement will be played 	None	None
<p>Facility-Page</p> <p><i>Note:</i> This action must be the last action in a routine.</p>	<p>Facilities</p> <ul style="list-style-type: none"> • Facilities to be paged (maximum of 25) 	None	None	None

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Feature-Wait	Feature Wait <ul style="list-style-type: none"> • 911 <i>Note:</i> 911 waits for the specific caller to disconnect. <ul style="list-style-type: none"> • Alarm • Announcement • All-Call • Disable-Audio • Emerg-All-Call • Facility-Page <i>Note:</i> Facility-Page should only be used when the trigger is also Facility-Page. <ul style="list-style-type: none"> • Multi-Site-All-Call • Multi-Site-E-All-Call • Tone • Zone-Page 	Maximum Wait Time <ul style="list-style-type: none"> • Number of seconds to wait for feature to complete; default is 86400 seconds (24 hours) <i>Note:</i> A value of 0 means to wait until the feature has completed regardless of the time it takes to complete. <i>Note:</i> If the feature is not active, the routine continues to the next action.	None	None
Goto	Routine Action <p>The Goto action can be used to change the flow of Action execution in a Routine.</p> <p>The Goto action can also be used to cause the Routine to repeat (loop) by adding a Goto Action at the end of the Routine and selecting the first Action in the Routine as the Routine Action to go to.</p> <p>The Condition field of the Goto action can be used to conditionally execute the Goto.</p> <p>Caution If you create a loop that causes the Routine to repeat all Actions until the Routine is stopped, please ensure that the loop does not put too much burden on the Nyquist server by aggressively repeating actions that are time consuming. If several aggressive Routines are started on the server, they could negatively impact system and audio performance. If Routines aggressively send Display messages to GA10PV devices, audio performance on the GA10PV could be negatively impacted.</p>			

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Intercom-Call</p>	<p>Placed by</p> <ul style="list-style-type: none"> • Calling Station • Selected station <p><i>Note:</i> If Calling Station is used, this action must be the last action in the routine and must be executed via DTMF code.</p>	<p>Received by</p> <ul style="list-style-type: none"> • Station that received the call 	<p>None</p>	<p>None</p>
<p>Intercom-Wait</p> <p><i>Note:</i> 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.</p>	<p>None</p>	<p>None</p>	<p>None</p>	<p>None</p>

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Log-Text</p> <p>This action can be used to log user-supplied text to the Routines log file: <code>nyquist_routines.log</code>. This file can be viewed via System Logs under the <i>Nyquist C4000</i> category.</p> <p><i>Note:</i> Similar functionality is also available via the <code>logText()</code> function, for use within CODE: segments (see “Logging Functions” on page 543).</p>	<p>Text to log</p> <p>The text supplied in the Text field will be logged.</p> <p>The text can include the same variables that are available to the Dash-Text action’s Text field (excluding the <code>\$date#</code> and <code>\$time#</code> variables, as log entries already contain a timestamp).</p> <p>A maximum of 4095 characters can be entered as text to log.</p> <p><i>Note:</i> Single-quote and double-quote characters are automatically removed and not included in the log output.</p>	None	None	None
<p>Multi-Site-All-Call</p> <p><i>Note:</i> This must be the last action in a routine.</p>	None	None	None	None
<p>Multi-Site-E-All-Call</p> <p><i>Note:</i> This must be the last action in a routine.</p>	None	None	None	None

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>New-Announcement</p> <p>Creates a temporary announcement to be played by the routine.</p> <p>This must be followed by at least one Add-Announcement-Audio actions and a Play-Announcement action.</p>	<p>Announcement Type</p> <ul style="list-style-type: none"> • Emergency • Normal 	<p>Zone</p> <ul style="list-style-type: none"> • Selected zone number • All speakers (0) 	<p>Number of times to play announcement</p> <ul style="list-style-type: none"> • Number of times to play (1–60) 	<p>Silence time between repeats (seconds)</p> <ul style="list-style-type: none"> • Decimal number between 1.0 and 10.0
No-Action	None	None	None	None
Output-Contact-Close	<p>IO Controller</p> <ul style="list-style-type: none"> • Selected IO Controller 	<p>Output Contacts</p> <ul style="list-style-type: none"> • Selected output contact or contacts 	<p>Duration</p> <ul style="list-style-type: none"> • Number of seconds for action to continue <p><i>Note:</i> Duration of zero (0) will cause the contact or contacts to momentarily close. Leaving Duration blank will cause the contact to stay closed; use Output-Contact-Open to reopen the contact.</p>	None
Output-Contact-Open	<p>IO Controller</p> <ul style="list-style-type: none"> • Selected IO Controller 	<p>Output Contacts</p> <ul style="list-style-type: none"> • Selected output contact or contacts 	None	None
Page-Exclusion	<p>Page Exclusion</p> <ul style="list-style-type: none"> • Add • Delete 	<p>Stations</p> <ul style="list-style-type: none"> • Selected station or stations 	None	None

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Pause</p> <p><i>Note:</i> If pausing is used in a DTMF-based routine that ends with paging, the page will not start until all pauses have been executed. If a DTMF-based routine does not end in a page, the call will not disconnect until all pauses have been executed.</p>	<p>Duration</p> <ul style="list-style-type: none"> Number of seconds to pause 	None	None	None
<p>Play-Announcement</p> <p><i>Note:</i> This must be preceded by a New-Announcement action and at least one Add-Announcement-Audio actions.</p>	None	None	None	None
<p>Play-Ringtone</p> <p><i>Note:</i> Using this action type will not trigger a routine that has a night-ring trigger.</p>	<p>Action</p> <ul style="list-style-type: none"> Start Stop 	<p>Zones</p> <ul style="list-style-type: none"> All speakers Selected zone 	<p>Timeout (seconds)</p> <p><i>Note:</i> Blank or 0 means no timeout.</p>	
<p>Ring-Wait</p> <p><i>Note:</i> Waits for caller's ring to end.</p>	None	None	None	None

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Routine</p> <p><i>Note:</i> In addition to the parameters, you can also set a Finish Delay, of either No-Delay or Wait-Until-Done.</p> <p>All trigger parameters and trigger types from the selected routine pass to the new routine so both routines have the same trigger context.</p>	<p>Routine</p> <ul style="list-style-type: none"> • Selected Routine <p>If Facility or All Facilities is selected as Parameter 2, then Parameter 1 changes to:</p> <p>Routine DTMF</p> <ul style="list-style-type: none"> • DTMF of Routine to execute on remote Facilities 	<p>Facility</p> <ul style="list-style-type: none"> • Local • Selected Facility • All Facilities 	<p>None</p>	<p>None</p>
<p>Routine-Disable</p> <p><i>Note:</i> If the routine that invokes this action does not execute for any reason (e.g., the server is down), the selected routine will <i>not</i> be disabled, even after the server resumes.</p>	<p>Routine</p> <ul style="list-style-type: none"> • Selected routine 	<p>None</p>	<p>None</p>	<p>None</p>
<p>Routine-Enable</p> <p><i>Note:</i> If the routine that invokes this action does not execute for any reason (e.g., the server is down), the selected routine will <i>not</i> be enabled, even after the server resumes.</p>	<p>Routine</p> <ul style="list-style-type: none"> • Selected routine 	<p>None</p>	<p>None</p>	<p>None</p>

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
SM-Disable-Zone	Sound Masking Zone <ul style="list-style-type: none"> All Sound Masking Zones Selected zone 	None	None	None
SM-Enable-Zone	Sound Masking Zone <ul style="list-style-type: none"> All Sound Masking Zones Selected zone 	None	None	None
SM-Scheduled-Ramp	Sound Masking Zone <ul style="list-style-type: none"> All Sound Masking Zones Selected zone 	Volume Adjustment <ul style="list-style-type: none"> Down Up 	Ramp Duration (minutes) <ul style="list-style-type: none"> 60 120 	Range (dB) <ul style="list-style-type: none"> 5 10
SM-Set-Output-Gain	Sound Masking Zone <ul style="list-style-type: none"> All Sound Masking Zones Selected zone 	Output Gain (dB) A value between -30 and 0 dB.	None	None
Stop-Announcement	Zone <ul style="list-style-type: none"> All Speakers (stop an announcement that is playing to All Speakers) Selected zone 	None	None	None
Tone <i>Note:</i> In addition to the parameters, you can also set a Finish Delay , of either No-Delay or Wait-Until-Done .	Tone <ul style="list-style-type: none"> Selected tone 	Zone <ul style="list-style-type: none"> Selected zone All zones of type Time	Duration <ul style="list-style-type: none"> Number of seconds for action to continue; default is 86400 seconds (24 hours) 	None

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Urgent-Call	Placed by <ul style="list-style-type: none">• Calling Station• Selected Station <i>Note:</i> 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 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Webhook-Post</p> <p>Sends an HTTP(S) POST request to a specified URL via a specified curl (or wget) command.</p> <p><i>Note:</i> The specified value can execute <i>only</i> the curl and wget commands.</p>	<p>POST command</p>	<p>None</p>	<p>None</p>	<p>None</p>

The curl (or wget) POST request to be executed by this action.

The Webhook-Post Routine Action can be used to execute actions and procedures on external systems that support incoming HTTPS POST requests. The external system defines the actions that will be taken when a specified HTTP POST is made to a specified URL with specified data. The target URL address and any related data is specified by the external system. The defined information can then be used via the Nyquist Webhook-Post action to cause the Nyquist system to send the HTTPS POST request to the external system for whatever purpose, as defined by the external system. The Nyquist system uses the curl command to generate the HTTP POST request that is sent to the external system.

The following example sends an HTTP POST request to a webhook.site service. (You can browse to <https://webhook.site> to generate your own unique webhook URL that can be used to receive and view requests):

```
curl --request POST -H "Content-Type: application/json" --data
'{"header": "Bogen Nyquist Alert", "title": "Lockdown", "body": "A
lockdown has been initiated."}' -H "x-api-key: <service-api-key>"
https://webhook.site/7afca716-551a-4b37-9e4c-bb08b9c4fa09
```

The following example will execute the Nyquist routine configured for DTMF 15 via the Routine API on server <server>:

```
curl --cacert /etc/apache2/ssl/bogenCA.crt --ssl-no-revoke -H "Accept:
application/json" -H "Content-Type: application/json" -H
"Authorization: Bearer 24f78e9392d4754138555c2470575a5e"
https://<server>/routine/api/15/0/1/0/0
```

Note: If the command will access the Nyquist Routine API, the requisite Bogen Certification Authority (CA) certificate file can be accessed on the Nyquist server at /etc/apache2/ssl/bogenCA.crt.

Important: The specified curl or wget command will execute on the Nyquist system and, therefore, must comply with the Debian syntax and implementation of the command. For details, see:

- <https://manpages.debian.org/buster/curl/curl.1>
- <https://manpages.debian.org/buster/wget/wget.1>

Tip: If testing curl commands using a Windows Command Prompt, be aware that it uses different syntax from Debian Linux Bash, such as different quoting rules. You may want to use the Windows Subsystem for Linux (WSL) to test compatibility. Alternatively, use a PowerShell command prompt which, although not identical, is more similar to Bash (e.g., it supports single-quoted strings, as shown in the previous examples).

Table 124. Action Types and Parameters (Continued)

Type	Parameter 1	Parameter 2	Parameter 3	Parameter 4
<p>Zone-Page</p> <p><i>Note:</i> This must be the last action of the routine.</p> <p>Dashboard messages created during the routine will be deleted when the user disconnects the call.</p>	<p>Zone</p> <ul style="list-style-type: none"> 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 to 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 125. 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>@vzwpx.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 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 depends on the status of the **Callers** – parameter 1 for the trigger (see *"Understanding Trigger Parameters"* on page 482).

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 587*.

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 482*).

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 continue 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 announcement to wait for. The **Announcement** trigger **Type** does allow you to specify an announcement type or number (see *"Understanding Trigger Parameters" on page 482*). 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 **Feature-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 **Feature-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 routine does not wait for an Emergency-All-Call page. Instead, it continues executing subsequent actions.

If you want to ensure that the routine includes an Emergency-All-Call page, use **Emerg-All-Call** as the trigger **Type**.

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 effect.

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.

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 effect.

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 482). 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 126. 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

Table 126. Selecting Messages for Deleting

Zones	Stations	Messages Selected for Deletion
<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, NQ-GA10PV, and NQ-S1810WBC Text Parameters

You can add variables to text messages for the Admin Web UI dashboard, the video display connected to the NQ-GA10PV, the NQ-S1810WBC LED display, 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 127, "Variables, Definitions, and Availability," on page 526*).

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. The NQ-S1810WBC LED display can display up to 64 characters, which will display as uppercase and will horizontally scroll text that exceeds the display width. You should test your message display to ensure it fits into the available space.

Note: These variables are available for text messages and related fields. Within the condition statement of a routine action, there are other variables available, as described in *Table 131, "Conditional Statement Variables," on page 546*.

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$alerts(?,?)	When used in the Text field of a Display-Msg , NWS alerts will display on the video connected to the NQ-GA10PV (see <i>“Setting Variables for the Display Message”</i> on page 606).	Always available <i>Note:</i> The Reboot trigger is recommended to ensure the routine is always running.
\$apiParam1 \$apiParam2	Used only by the Routines API, these parameters can be specified as part of the Routines API URL and referenced by the Routine Action. For details, see <i>“Using the Routines API”</i> on page 469.	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. <i>Note:</i> Use only \$autobgcolor or \$autofontcolor, but not both.	<ul style="list-style-type: none"> • Emergency-Call • Intercom-Call • Urgent-Call
\$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. <i>Note:</i> Use only \$autobgcolor or \$autofontcolor, but not both.	<ul style="list-style-type: none"> • Emergency-Call • Intercom-Call • Urgent-Call

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$autopriority(E,U,N)	<p>When appended to the end of text field, the message's priority is changed where E is replaced by the priority for Emergency calls, U is replaced by the priority for Urgent calls, and N is replaced by the priority for Normal calls.</p> <p>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.</p>	<ul style="list-style-type: none">• Emergency-Call• Intercom-Call• Urgent-Call
\$auto_resize(N)	<p>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 <i>"Setting Variables for the Display Message" on page 606</i>).</p>	Always available

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$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.	<ul style="list-style-type: none"> • 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 • PBX-Incoming-Call • Tone • Urgent-Call • Zone-Page
\$called	Extension number of called station.	<ul style="list-style-type: none"> • Emergency-Call • Intercom-Call • PBX-Incoming-Call • Urgent-Call
\$calltypechar	Replaced by E for Emergency-Call, U for Urgent-Call, or left blank for Intercom-Call.	<ul style="list-style-type: none"> • Emergency-Call • Intercom-Call • Urgent-Call
\$calltypelong	Replaced by Emergency for Emergency-Call, Urgent for Urgent-Call, or left blank for Intercom-Call.	<ul style="list-style-type: none"> • Emergency-Call • Intercom-Call • Urgent-Call

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$calltypeshort	Replaced by Emerg for Emergency-Call, Urg for Urgent-Call, or left blank for Intercom-Call.	<ul style="list-style-type: none">• Emergency-Call• Intercom-Call• Urgent-Call
\$contact	I/O Controller's input contact number that triggered execution of the routine.	<ul style="list-style-type: none">• Input-Contact-Closed• Input-Contact-Opened
\$cputemp	Current temperature (in °C) of the CPU core with the highest temperature.	All triggered routines that include one of the following actions: <ul style="list-style-type: none">• Dash-Text• Display-Msg• Email
\$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
\$deviceMacAddr	MAC address for Nyquist appliance that went into protection mode.	The following actions of the Amp-Protection-Mode trigger: <ul style="list-style-type: none">• Display-Msg• Dash-Text• Email• Log-Text Also available in the CODE: segments of the action's Condition statement.

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$deviceName	Name of Nyquist appliance that went into protection mode.	The following actions of the Amp-Protection-Mode trigger: <ul style="list-style-type: none">• Display-Msg• Dash-Text• Email• Log-Text Also available in the CODE: segments of the action's Condition statement.
\$df-avail	Available disk space of the Nyquist server displayed in either M for megabytes or G for gigabytes.	All triggered routines that include one of the following actions: <ul style="list-style-type: none">• Dash-Text• Display-Msg• Email
\$eventid	Scheduled Event ID (integer)	<ul style="list-style-type: none">• Scheduled-Event
\$eventname	Scheduled Event Name	<ul style="list-style-type: none">• Scheduled-Event
\$facility	Name of facility that is being paged or for which the current status is being provided	<ul style="list-style-type: none">• Facility-Page• Facility Status Down
\$namecalled	Station name for caller that triggered execution of the routine	<ul style="list-style-type: none">• Emergency-Call• Intercom-Call• PBX-Incoming-Call• Urgent-Call

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$namecaller	Called station's name	<ul style="list-style-type: none"> • 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 • PBX-Incoming-Call • Tone • Urgent-Call • Zone-Page
\$nwsAlertEvent \$nwsAlertSeverity \$nwsAlertCertainty \$nwsAlertUrgency \$nwsAlertResponse	The event, severity, certainty, urgency, and response of the NWS alert.	The following actions of the NWS-Alert trigger: <ul style="list-style-type: none"> • Add-Announcement-Audio (with <i>Text-to-Speech</i> Audio Source) • Dash-Text • Dash-Delete • Display-Msg • Display-Msg-Delete • Email • Log-Text • Webhook-Post

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$schedParam1 \$schedParam2	Used only by the Schedule Routines, these parameters can be specified via the Schedule Routine's Parameter 1 and Parameter 2 properties and referenced by the Routine Action (as well as Action Conditional CODE: segments). For details, see <i>"Using the Schedule Routines Feature"</i> on page 309.	Schedule Routines only: <ul style="list-style-type: none"> • Add-Announcement-Audio • Dash-Text • Dash-Text-Delete • Display-Msg • Display-Msg-Delete • Email Also available in the CODE: segments of the Action's Condition statement.
\$schedulename	Activated schedule name	<ul style="list-style-type: none"> • Schedule-Activated
\$station	Station, such as the I/O Controller, that triggered execution of the routine or for which the current status is being provided	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Scheduled-Tone
\$tonename	Tone's name	<ul style="list-style-type: none"> • Scheduled-Tone
\$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: <ul style="list-style-type: none"> • Dash-Text • Display-Msg • Email

Table 127. Variables, Definitions, and Availability

Variable	Definition	Available for Routine Triggers:
\$user_var[1...10]	<p>The values in this general-purpose array can be set and referenced within the Routine Condition CODE: segments and Actions of a single Routine.</p> <p><i>Note:</i> The scope and lifetime of this variable corresponds to the execution of all actions and conditions of the current routine. If you need values to persist and be accessible across multiple executions or between different routines, you can store the values in database variables (see “Managing Routine Database Variables” on page 554).</p>	<p>Routine Action Condition fields can access this general purpose array. In addition, the following routine actions can access them via Text, Identifier, and Subject fields:</p> <ul style="list-style-type: none"> • Dash-Text • Display-Msg • Email • Add-Announcement-Audio (TTS field) • Webhook-Post (POST Command field)
\$weather	<p>Displays current weather conditions as provided by the OpenWeather API service.</p> <p>For details, see “The \$weather variable and the OpenWeather API” on page 533.</p>	<p>All triggered routines that include one of the following actions:</p> <ul style="list-style-type: none"> • Display-Msg <hr/> <p><i>Tip:</i> If you want the weather to always display, use the Reboot trigger.</p> <hr/>
\$zone	<p>Announcement zone or page zone that triggered execution of the routine</p>	<ul style="list-style-type: none"> • Announcement • Zone-Page

The \$weather variable and the OpenWeather API

The \$weather variable, if used in a Display-Msg action message, will be replaced by the current weather conditions and displayed using the following format:

Temperature: # F (feels like #)
 Humidity: #%
 Condition: <text description>
 Wind: <direction> # mph (gusts to #)

To use the `$weather` variable, you must first acquire a free OpenWeather API key. For details on acquiring and using an API key, visit <https://openweathermap.org/appid>.

Important: This feature requires Internet access and the Nyquist system must be able to access <http://api.openweathermap.org>. The *Check Internet Site Access* tests will verify this (see “*Check Internet Site Access*” on page 46).

To enable the `$weather` variable, use the **Custom Configuration** button in *System Parameters* (see “*Custom Configuration*” on page 48) to set the following two variables in the *Actions and Custom Variables* section:

- `weather_api_key`
- `weather_zipcode`

In the *Actions and Custom Variables* text editor, uncomment the `#weather_api_key=` and `#weather_zipcode=` lines (i.e., remove the `#` symbols) and append your API key and the relevant ZIP code (respectively) after the equal signs. The `weather_api_key` specifies an API key from your OpenWeather account. The `weather_zipcode` indicates the 5-digit ZIP code whose weather conditions are to be retrieved. Note that this must be set, even if you intend to override the ZIP code using the `weather_zipcode_#####` parameter.

Tip: Due to the length of many OpenWeather descriptions, you may want to format the message using a smaller font size. For example, the following will display the text at 70% of normal size:

```
<span style="font-size:70%">$weather</span>
```

Override the forecast location

The target ZIP code specified by the `weather_zipcode` can be overridden in a *Display-Msg* action by specifying the `weather_zipcode_#####` parameter after the `$weather` variable, where `#####` is the target ZIP code. For example:

```
$weather weather_zipcode_12345
```

The *Display-Msg* action can also specify the forecast location via coordinates (i.e., latitude and longitude) instead of by ZIP code by specifying the `weather_latlon_<latitude>,<longitude>#` parameter after the `$weather` variable. For example:

```
$weather weather_latlon_42.833261,-74.058015#
```

These overrides allows you to display the weather conditions for multiple and/or alternate locations.

Tip: To display weather conditions for multiple locations at once, you should define a separate Action for each location, as only one location is allowed per Action.

Unit of measurement (Fahrenheit or Celsius)

Temperatures are displayed in degrees Fahrenheit by default. To display temperatures in degrees Celsius, specify `weather_units_metric` after the `$weather` variable. For example:

```
$weather weather_units_metric
```

or

```
$weather weather_latlon_42.833261,-74.058015# weather_units_metric
```

Update frequency

When using the `$weather` variable in a Display-Msg routine action, you will usually want to execute the Display-Msg action in a loop (e.g., by using the Goto action) and pause between executions (e.g., by using the Pause action). The length of the pause should be based on how timely you wish the information to be, while taking into consideration the access limits imposed by your OpenWeatherMap subscription.

As of this Nyquist release, a free OpenWeatherMap account allows 60 calls per minute with a monthly cap of 1,000,000 calls (paid subscriptions allow more). Executing the Display-Msg action once per minute is well within the limit and should not negatively impact Nyquist performance. We do not recommend executing the Display-Msg action more frequently than once every 15 seconds, especially if the GA10PV is being used to play audio distribution.

Tip: OpenWeather recommends calling their API no more than once every 10 minutes per location, as their forecast data is updated no more than once every 10 minutes.

Note: If you initiate a long-running routine like this via the Routines API, you will probably want to set the URL's `<delay_flag>` value to zero ("0") so the call will not block indefinitely, waiting for the routine to complete.

Using Variables in Dashboard and NQ-GA10PV Identifiers

You can use one or more variables in the **Identifier** field (Parameter 2) of **Display-Msg**, **Display-Msg-Delete**, **Dash-Text**, and **Dash-Delete** action types (see *Table 124, "Action Types and Parameters,"* on page 496 for the specific variables available). The value of the Identifier will be determined by the values of the specified variables.

An **Identifier** can have a maximum character length of 255 characters. When using variables, be sure the specified value, including the expanded values of the variables, does not exceed this maximum character length.

Tip: If you would like to verify the actual value of an Identifier that includes variables, you can create a LogText action, specifying the same value as used for **Identifier**, and view the resulting value in the System Logs (nyquist_routines.log). Keep in mind that the LogText message allows more characters, removes single and double quotes, and does not allow the \$date# and \$time# variables.

Using Variables in Display-Msg Text

Note: This section describes variables that are only available for use in the **Display-Msg** action type, and *only* if the routine trigger is **Intercom-Call**, **Urgent-Call**, or **Emergency-Call**.

The following variables can only be used in the **Text** field of 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 and NQ-S1810WBC display messages for emergency, urgent, or intercom calls. For more information about these variables, see *"Using Variables for Dashboard, NQ-GA10PV, and NQ-S1810WBC Text Parameters"* on page 525.

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 495).

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**.

Condition Statements

An action's **Condition** property can be used to specify conditional execution of the Routine Action based on the supplied conditional statement. If the Condition field is not specified (i.e., left blank), the routine action will always be executed. If a condition is specified, the action will only be executed if the condition evaluates to true.

Conditional statement syntax must adhere to the PHP 7.4 programming language while using existing Nyquist variables, functions, and valid conditional logic. The Nyquist system will not attempt to validate the statement syntax or the provided conditional logic, so please ensure that you thoroughly test your conditional statements.

Simple Conditions

A conditional statement can be a simple boolean PHP conditional statement, which evaluates to either true or false. The statement can include PHP and Nyquist variables (see *"Available Condition Variables"* on page 545) and functions (see *"Condition Statement Functions"* on page 541).

Simple Condition Examples

The following condition for an action will cause the action to execute only if the caller is 105:

```
$caller == "105"
```

The following condition for an action will cause the action to execute only if the caller is 105 and the called is 200:

```
($caller == "105") && ($called == "200")
```

The following condition for an action will cause the action to execute only if the caller is 100 or 101 and the called is 200 or 201:

```
((($caller == "100") || ($caller == "101")) && (($called == "200" || ($called == "201")))
```

The following condition for an action will cause the action to execute only if the caller starts with 10 (e.g. 100, 101, 102):

```
strpos($caller, "10") === 0
```

The following condition for an action will cause the action to execute only if the zone number is 123:

```
$zonenumber == "123"
```

The following condition for an action will cause the action to execute only if zone number is 4444 and its name is "Gym":

```
$zone == "Zone 4444 - Gym"
```

The following condition for an action will cause the action to execute only if the current time is between 8 a.m. and 5 p.m.:

```
((($curtime > "08:00:00") && ($curtime < "17:00:00"))
```

The following condition for an action will cause the action to execute only on Monday thru Friday:

```
($weekday != "Sat") && ($weekday != "Sun")
```

The following condition for an action will cause the action to execute only if any Nyquist CPU core has a temperature higher than 85 C:

```
$cputemp > 85
```

Advanced Conditions

Advanced conditions begin with one of the following (including the colon):

- STOP:
- CODE:

Conditions that begin with `STOP:` will cause the Routine to stop executing actions and terminate if the condition is true.

Conditions that begin with `CODE:` will execute the provided code, which may assign values to user variables (which are accessible within the current routine) or database variables (which are accessible within *any* routine). If you also want the current action to execute, the following statement must be included:

```
$DOACTION=true;
```

If `$DOACTION=true` is not included (or is not executed), the default behavior is to not execute the action.

A `return;` statement in the `CODE:` section can be used to exit the code section before all statements have been executed.

The Dash-Text, Display-Msg, Email, and Webhook-Post actions have access to ten user-supplied variables—`$user_var[1]` through `$user_var[10]`—which can be set with Action conditions.

The `CODE:` section can also be used to branch to (“go to”) a specified action, using the `$gotoActionName` variable. For example, the following statement will cause a Routine to go to the Action named “Display Msg 2”:

```
CODE:$gotoActionName = "Display Msg 2";
```

If you also want the current action to execute, use:

```
CODE:$DOACTION=true; $gotoActionName = "Display Msg 2";
```

After branching to—and executing—the specified action, the Routine will continue executing the actions that follow the one specified by `$gotoActionName`.

The `$gotoActionName` variable can be used to go to Actions that either follow *or precede* the current action. This enables loops within the actions of a Routine.

Caution If you create a loop within the routine by setting `$gotoActionName` to a preceding action of the routine, be aware that the routine may execute indefinitely (i.e., an infinite loop).

If you plan to use the `$gotoActionName` feature, make sure that all Action’s have unique names. If more than one action has the same name, the first one found after the current action will be executed.

If you set `$gotoActionName` to a name that does not exist, the Routine will be terminated. This could be an issue if you accidentally specify the wrong name, but it can also be useful if you need to stop the Routine based on conditions determined by your `CODE:` section. If you intend to use `$gotoActionName` to terminate a Routine, you could set `$gotoActionName` to “TERMINATE” or “STOP” and make sure you don’t have an Action with that name.

Routines can be repeated (looped) by setting `$gotoActionName` to the first Action in the Routine. Routines can also be repeated by using a Goto Action to the name of the first Action in the Routine.

Instead of using the `$gotoActionName` variable, you can also use the Goto Action to branch to the name of the Action specified in the Goto Action. Goto Actions can also be conditionally executed based on the associated Condition. The `$gotoActionName` variable is typically used in `CODE:` sections for advanced use-case scenarios where the Goto Action would not be sufficient.

Advanced Condition Examples

The following condition for an action will cause the Routine to stop if the condition is true:

```
STOP:$caller == "105"
```

The `STOP:` keyword tells the system that you want to stop the Routine if the condition is true. When the Routine is stopped, subsequent actions will not be executed, and the Routine will be terminated.

The following condition for an action, if true, will set a user variable and cause the action to be executed:

```
CODE:if ($caller == "105") { $user_var[1] = "Bogen"; $DOACTION=true; }
```

The `$user_var[1]` variable can be used in the current or subsequent actions of type Dash-Text, Display-Msg, or Email (in the action Text fields and the Subject field for Email).

The following condition for an action will evaluate the `$cputemp` variable and set a user variable for use in a Dash-Text, Display-Msg, or Email action:

```
CODE:if ($cputemp > 85) { $user_var[1] = "CPU Temperature getting too hot: $cputemp"; } else { $user_var[1] = "CPU Temperature is normal: $cputemp"; } $DOACTION=true;
```

Whitespace and comments can be used in the `CODE:` section to make it easier to read the code. For example, the above code could be the following instead:

```
CODE:
if ($cputemp > 85) {
    $user_var[1] = "CPU Temperature getting too hot: $cputemp";
} else {
    $user_var[1] = "CPU Temperature is normal: $cputemp";
}
$DOACTION=true;
```


Condition Statement Functions

There are several utility functions provided that are available within the condition statements of the Routine Actions.

Database Variable Functions

The database variable functions enable you to share data between the condition statements of any number of routines by storing key/value pairs in the Routines database.

Table 128. Routine Database Variable Functions

Name	Description
dbPut(<key>,<value>)	<p>Stores the string <value> to a database, which can subsequently be retrieved using the <key> string. <key> is a variable-length string with a maximum of 64 characters. <value> is a variable-length string with a maximum of 4095 characters.</p> <p>For example:</p> <pre>dbPut("Test", "This is a test");</pre> <p>will store "This is a test" in a row referenced by "Test".</p> <p>Subsequent execution of dbPut() can be used to update the row; for example, dbPut("Test", "Update my test string") will update the value referenced by "Test" to the new value "Update my test string".</p>
dbGet(<key>)	<p>Retrieves the string value referenced by the <key> string.</p> <p>For example, after executing:</p> <pre>\$value = dbGet("Test");</pre> <p>the \$value variable will be set to "This is a test", the value referenced by "Test".</p> <hr/> <p><i>Tip:</i> To make the retrieved data available outside of the condition statements—e.g., for display by a Dash-Text or Display-Msg action—copy the retrieved value to the \$user_var array. For example:</p> <pre>\$user_var[1] = dbGet("Test");</pre> <p>This value can then be accessed (within the currently executing routine) via the \$user_var[1] variable.</p> <hr/>

Table 128. Routine Database Variable Functions

Name	Description
dbDelete(<key>)	Deletes the key/value pair referenced by the <key> string. Example: <pre>\$dbDelete("Test");</pre> Will delete the database variable referenced by the "Test" key.
dbTruncate()	Deletes all database variables stored in the Routine database.

Warning This operation cannot be reversed.

The routine database variable functions provide the ability to create named values (i.e., key/value pairs) that can be accessed from the condition statements of routines. This is similar to the functionality provided by the `$user_var` array, but allows values to be shared not only between the actions of one execution of a single routine, as with the `$user_var` array, but between multiple executions of all routines. It also provides named values, which makes for more readable code than indexed values, and a virtually unlimited number of values that can be stored.

Unlike the `$user_var` array, however, database variables cannot be programmatically accessed outside of condition statements (e.g., within the Text property of the Display-Msg action). If you want to access these values, however, simply assign the value of the database variable to an element of the `$user_var` array within a condition statement and then access the value from `$user_var` array outside of the condition statement.

Tip: Database variables can also be viewed, created, modified, and deleted via the *Routines Database Variables* view, accessible via the **Manage Routines Database Variables** button of the *Routines* page (see "Managing Routine Database Variables" on page 554). They can also be imported and exported to and from a CSV (comma-separated value) file, which allows the values to be defined and/or modified in an editor, script, or application (see "Importing and Exporting Database Variables" on page 557). This can be used for troubleshooting, maintenance, or even as a way to define and modify custom configuration settings for your routines.

As described in *Table 128*, `dbPut(<key>)` stores a value for <key>, `dbGet(<key>)` gets the stored value for <key>, `dbDelete(<key>)` deletes the value associated with <key>, and `dbTruncate()` deletes all key/value pairs in the database.

Example:

The following CODE segment can be added to a Routine Action Condition of a Routine that is triggered by All-Call to track the number of All-Call pages placed by the Nyquist system:

```
CODE:
$count = dbGet("All-Call Count");
if ($count == "") $count = 0;
$count++;
dbPut("All-Call Count", $count);
dbPut("Latest All-Call", "$pDate2 - $pTime1");
```

The counter can then be viewed on the Routines Database Variables page. The Routine Action can be any action type, including No-Action, if you want to keep track of All-Call pages without performing any other actions.

Page Exclusion

The `isPageExcluded()` function indicates whether a specified station extension is currently excluded from receiving pages.

Table 129. Page Exclusion Function

Name	Description
<code>isPageExcluded("<station>")</code>	Accepts a station extension string as a parameter and returns one (1) to indicate the station is currently excluded from receiving pages or zero (0) to indicate it is not excluded.

Example:

```
CODE:
if ( !isPageExcluded("104") ) {
$DOACTION=true;
} else {
$DOACTION=false
}
```

Logging Functions

Routine condition statements can log entries to the `nyquist_routines.log` file (see *"Routines Log" on page 552*) by calling the `logText(<text>)` function from within a routine action condition's CODE segment. The `<text>` value can be a string literal (e.g., "Problem detected") or a previously set variable (e.g., `$loggingMessage`).

Table 130. Routine Logging Functions

Name	Description
logText(<text>)	Logs the specified <text> value to the nyquist_routines.log file. <i>Note:</i> This function mirrors the capabilities of the Log-Text action, as described in <i>Table 124 on page 496</i> .

The logText() function logs the user-supplied text to the log file in the following format:

```
<date time> <pid> [<routine-name>] <text>
```

where <date time> is replaced with the date and time at which the log entry was created, <pid> is replaced with the routine's process ID (to facilitate correlation of log entries), <routine-name> is replaced with the routine's name, and <text> is replaced with the user-supplied text.

For example, the following action condition CODE segment will cause a nyquist_routines.log log entry to be created with the text "<date time> <pid> [<routine-name>] This is a test".

```
CODE:  
logText("This is a test");  
$DOACTION=true;
```

Note: The \$DOACTION=true statement has nothing to do with the logging. It is included to make sure the routine action is executed.

Example using a variable:

```
CODE:  
$logText = "This is a test";  
logText($logText);  
$DOACTION=true;
```

Tip: Any variable available in a CODE segment (limited by trigger type) can be used when creating the text to log. For details, see *Table 127, "Variables, Definitions, and Availability," on page 526*.

Tip: It is best practice to avoid using parentheses or quotation characters in the <text> string to be logged, as these can cause syntax errors.

Important: To protect the Nyquist system from running out of disk space, the system will only allow the user to log up to 500 MB of log messages per day before refusing to log additional messages. The Routines feature will continue logging Routine start/finish entries without a limit; only user-generated messages are limited. This user limit provides enough logging capacity for approximately 6200 bytes of log data per second during an entire day. The Routines log files are rotated every day, while making the last 31 days available. If the log files reached their maximum capacity every day for 31 days in a row, the maximum total storage used would be 16 GB; but it is very likely that the actual space used would be far less because rotated log files are compressed.

Available Condition Variables

The following variables are available for use in the conditional statement. Their availability depends on the trigger that started the Routine (and, in some cases, the Action being executed).

Important: Condition statements use PHP syntax (for a PHP tutorial, see <https://www.w3schools.com/php/default.asp>). PHP variable names are case-sensitive, so ensure all variables use the appropriate uppercase and lowercase letters.

Note: Remember that these variables can be used *only* within an action's condition statement. For variables that can be used within other fields (e.g., Text, Text to Log, etc.), see *Table 127, "Variables, Definitions, and Availability,"* on page 526.

Table 131. Conditional Statement Variables

Trigger	Variables
All Triggers	<code>\$caller</code> Station extension or DID Caller ID Number
	<code>\$callerName</code>
	<code>\$called</code> Station extension
	<code>\$calledName</code>
	<code>\$cputemp</code> Current temperature (in °C) of the CPU core with the highest temperature.
	<code>\$curtime</code> Current time in 24-hour format: HH:MM:SS
	<code>\$DOACTION</code> In a CODE: segment, setting this variable to true indicates that the current action should be executed, otherwise the current action will not be executed (default is false, don't execute). When using a CODE: segment, you must include the <code>\$DOACTION</code> variable to indicate if the current Action should be executed or not. If <code>\$gotoActionName</code> is also set, and <code>\$DOACTION</code> is set to true, the current Action will be executed before branching to the eventAction specified by <code>\$gotoActionName</code> .

Table 131. Conditional Statement Variables

Trigger

Variables

`$gotoActionName`

Assigning the name of an Action to this variable will cause the Routine to branch to that Action.

`$origCaller`

Station extension or DID Caller ID Number

`$schedParam1` and `$schedParam2`

Parameters passed via a Schedule Routine.

`$trigger`

Trigger type name in all lowercase characters, e.g. "facility-page"

`$user_var[1...10]`

The values in this general purpose array can be set and/or referenced within the Routine Condition CODE: segments and Actions of the current Routine.

Tip: The database variable functions (see "Database Variable Functions" on page 541) can also be used within conditional statements and provide similar functionality to the `$user_var` array, but allow values to be accessible across routines. Unlike the `$user_var` array, however, the database variable functions cannot be used outside of action condition statements.

To use the database variables from within an Action's Text property, for example, assign the value to an element of the `$user_var` array (e.g., `$user_var[1]=dbGet("key1")`) and reference that `$user_var` element within the Text field.

`$weekday`

Three-letter textual representation of current day: "Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"

Table 131. Conditional Statement Variables

Trigger	Variables
<i>Actions:</i> <ul style="list-style-type: none">• Display-Msg	<p><code>\$ga10pvExt</code></p> <p>This variable can be assigned an integer value to specify the station extension of the NQ-GA10PV or NQ-S1810WBC station on which the message should be displayed.</p>
<i>Actions:</i> <ul style="list-style-type: none">• Display-Msg	<p><code>\$autoDeleteDisplayMsgsUponExit</code></p> <p>Setting this variable to true causes Display Messages created by the Routine to be removed when the Routine exits.</p> <p><code>\$autoDeleteDashMsgsUponExit</code></p> <p>Setting this variable to true causes Dashboard Messages to be removed when the Routine exits.</p> <p><code>\$mergeDelete</code></p> <p>Setting this variable to true merges Display-Msg-Delete and subsequent Display-Msg actions into one operation to improve performance for GA10PV displays. See <i>"Merging Display Message Delete with new Display Message Create"</i> on page 551 for a detailed explanation.</p>
API	<p><code>\$apiParam1</code></p> <p><code>\$apiParam2</code></p> <p>The first and second parameters specified in the API call. See <i>"Invoking a Routine via the Routines API"</i> on page 470 for further details.</p>
Alarm	<p><code>\$alarmDtmfCode</code></p> <p><code>\$alarmName</code></p>
Amp-Protection-Mode	<p><code>\$deviceMacAddr</code></p> <p><code>\$deviceName</code></p>

Table 131. Conditional Statement Variables

Trigger	Variables
Announcement	<p>\$announceType "Emergency", "Normal"</p> <p>\$announceDtmfCode</p> <p>\$zoneNumber</p> <p>\$zoneName</p> <p> Format for regular playlist, sound machine and radio: Zone <zone-number> - <zone-name></p> <p> Format for Line-Input: <amplifier/matrix-mixer name> - Ext: <ext-number> Ch: Channel <# (#)></p> <p> <i>Note:</i> There must be two spaces before "- Ext:"</p>
Audio-Dist	<p>\$audioDistCmd "start" or "stop"</p> <p>\$audioDistName</p>
Facility-Page Facility-Status-Down Facility-Status-Up	<p>\$facilityPageNumber</p> <p>\$facilityName</p> <p><i>Note:</i> The Facility-Page trigger will be fired once for each paged facility. The local facility, however, will fire the All-Call trigger instead of Facility-Page,</p>
Input-Contact-Closed Input-Contact-Opened	<p>\$ioContactStation</p> <p>\$ioContactNumber</p> <p>\$ioContactAction "Closed" or "Opened"</p>
NWS-Alert	<p>\$nwsAlertEvent</p> <p>\$nwsAlertSeverity</p> <p>\$nwsAlertCertainty</p> <p>\$nwsAlertUrgency</p> <p>\$nwsAlertResponse</p> <p><i>Note:</i> See "Alert Filters Configuration" on page 602 for possible values of these variables.</p>
Sched-Event	<p>\$eventId</p> <p>\$eventName</p>

Table 131. Conditional Statement Variables

Trigger	Variables
Schedule-Activated	<code>\$scheduleId</code> <code>\$scheduleName</code> Schedule's name or "Holiday" for any holiday
Scheduled-Routine	<code>\$schedParam1</code> <code>\$schedParam2</code> <code>\$zoneNumber</code> (if Zone provided) <code>\$zoneName</code> (if Zone provided)
Scheduled-Tone	<code>\$toneDtmfCode</code>
Tone	<code>\$toneName</code>
Station-Status-Down	<code>\$station</code>
Station-Status-Up	Station extension <code>\$stationStatus</code> "Down" or "Up"
Zone-Page	<code>\$zoneName</code> Format: "Zone <zone-number> - <zone-name>" <code>\$zoneNumber</code>

When doing comparisons with variables that contain station extension numbers (e.g. `$caller`, `$station`), make sure to surround the numeric constants with quotes. For example, when comparing `$caller` to 105, use the following statement:

```
$caller == "105"
```

This is important because if station extension numbers begin with one or more zeros, numeric comparisons will not work properly. For example, when comparing `$caller` to 0105, use the following statement:

```
$caller == "0105"
```

Automatic Deletion of GA10PV Display Messages and Web Interface Dashboard Messages Upon Exit

The following variables can be set to true in a CODE: section to cause Display Messages or Dashboard Messages created by the Routine to be automatically deleted upon the Routines exit:

```
$autoDeleteDisplayMsgsUponExit  
$autoDeleteDashMsgsUponExit
```

For example, in a CODE: section, including the following statement will cause all Display Messages created by the Routine to be automatically deleted upon routine exit:

```
CODE:$autoDeleteDisplayMsgsUponExit=true;
```

Using a <Parameter#> to change the target GA10PV Display

When a routine is executed via DTMF dialing, one of the supplied parameters can be used to change the target GA10PV Display for a Display-Msg Routine Action.

In the Condition field of a Display-Msg routine action, a CODE: segment can be used to change the GA10PV Display to a GA10PV extension specified in <Parameter1> or <Parameter2> of the dialed DTMF digits.

For example, if the user dials, *94<routine-DTMF-code>*105, the following CODE: segment, placed in the Condition field of a Display-Msg Action, will cause the GA10PV with extension 105 to be used:

```
CODE:  
$ga10pvExt=$cmdParam1;  
$DOACTION=true;
```

Merging Display Message Delete with new Display Message Create

If your routine is executing in a loop and contains actions that create a new display message on a GA10PV, waits for some time or event, deletes the display message, and then immediately creates a new display message, you can use the conditional variable `$mergeDelete` to have the Display-Msg-Delete and subsequent Display-Msg create actions merged to prevent the GA10PV from being notified/updated twice. Using this variable in this way will help improve performance for GA10PV displays, especially if audio is being played to the GA10PV.

To use the `$mergeDelete` conditional variable, add the following to the **Conditional** field for the Display-Msg-Delete action:

```
CODE:$mergeDelete=TRUE;$DOACTION=TRUE;
```

Note: When you use `$mergeDelete`, make sure you have a Display-Msg action that will be immediately executed after the Display-Msg-Delete, otherwise you may notice that the deleted message is not being removed from the GA10PV display. The deleted message will be removed as soon as the new display message is created. Proper testing of your routine can ensure that you get the intended results.

Routines Log

The Routines feature logs the start and finish of routines to the `nyquist_routines.log` log file (see *Table 111, "System Logs," on page 393*) using the following format:

```
<date time> <pid> [<routine-name>] <status> (<routine-initiator>)
```

where `<date time>` is replaced with the date and time for the status event, `<pid>` is replaced with the routine's process ID (to facilitate correlation of log entries), `<routine-name>` is replaced with the routine's name, `<routine-initiator>` is replaced with the routine trigger type that started the routine, and `<status>` is replaced with either Started, Not started, Finished, Stopped, or Exited (see below for more details).

When routines are started, a log entry is added to the `nyquist_routines.log` file using the following format:

```
<date time> <pid> [<routine-name>] Started (<routine-initiator>)
```

In this and other entries, the value of `<routine-initiator>` is based on how the routine was initiated.

- In most cases, `<routine-initiator>` is replaced with the name of the trigger that started the routine.
- If a routine is started via the routines API, `<routine-initiator>` is set to "API".
- If a routine is started via Dashboard or IP Phone via DTMF, `<routine-initiator>` is set to "DTMF/System".
- If a routine is started by the Nyquist system, `<routine-initiator>` is set to "DTMF/System".
- If a routine is started by a reboot trigger, `<routine-initiator>` is set to "reboot".

When routines finish, a log entry is added to the `nyquist_routines.log` file using the following format:

```
<date time> <pid> [<routine-name>] Finished (<routine-initiator>)
```

If a routine finishes but no Actions were enabled, a log entry is added to the `nyquist_routines.log` file using the following format:

```
<date time> <pid> [<routine-name>] Finished - no actions (<routine-initiator>)
```

When a routine is terminated, a log entry is added to the `nyquist_routines.log` file using the following format:

```
<date time> <pid> [<routine-name>] Exited - terminated (<routine-initiator>)
```

Routines may be terminated by the user via the Web Interface dashboard Routines Manager or when the Nyquist system is restarted by the user.

If a routine fails to start, a log entry is added to the `nyquist_routines.log` file using the following format:

```
<date time> <pid> [<routine-name>] Not started - disabled (<trigger-type>)  
<date time> <pid> [<routine-name>] Not started - already running (<trigger-type>)
```

where `<trigger-type>` is replaced with the Routine Trigger type that attempted to start the Routine.

If a routine using `$alerts()` with `REPEAT_#` is disabled by the user or by another routine while it is already running, a log entry is added to the `nyquist_routines.log` file using the following format:

```
<date time> <pid> [<routine-name>] Stopped - disabled (<routine-initiator>)
```

If a routine is terminated due to a CODE segment error, the following entry will be logged:

```
<date time> <pid> [<routine-name>] Exited - terminated due to CODE segment error  
(<routine-initiator>)
```

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 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.

Important: To export multiple routines at once, you may first need to configure your browser to allow pop-ups and redirects for the Nyquist server.

To allow pop-ups for this server:

- 1 Click the lock icon to the left of the server address in the browser URL bar.
- 2 On Chrome, select **Site Settings**.

- 3 Set "Pop-ups and redirects" to **Allow**.

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 Routine Database Variables

The C4000 provides database variables that can be accessed within Routine Action condition statements (see "Condition Statement Functions" on page 541). You can view, insert, delete, or modify these database variables, not only through Nyquist functions, but also via the web interface.

To view the database variables:

- 1 On the navigation bar, select **Routines**.
- 2 Select **Manage Routines Database Variables**
- 3 The key, value, and most recent routine to access each variable are displayed.

Routines Database Variables				
Done + ?				
Export Import Delete Selected				
<input type="checkbox"/>		Routine	Key	Value
<input type="checkbox"/>	✎ ✖		character test	This is a test, in which "curly quotes" and commas are being tested. 'ſſ'âſſ'
<input type="checkbox"/>	✎ ✖	Test Routine	key1	D minor
<input type="checkbox"/>	✎ ✖		skit intro	And now, for something completely different.

Figure 193. Routines Database Variables

To add a database variable:

- 1 On the navigation bar, select **Routines**.
- 2 Select **Manage Routines Database Variables**
- 3 Click **Add**.
- 4 Enter a unique **Key** name (maximum of 64 characters) and a **Value** (maximum of 4095 characters).
- 5 Click **Save**.

The screenshot shows a dialog box titled "Add Routines Database Variable". The dialog has a title bar with a hamburger menu icon on the left, the text "Add Routines Database Variable" in the center, and a blue help icon on the right. Below the title bar, there are two input fields: "Key:" with an information icon and a text input field, and "Value:" with an information icon and a larger text area. At the bottom, there are two buttons: "Cancel" and "Save".

Figure 194. Add Routines Database Variable

- 1 On the navigation bar, select **Routines**.
- 2 Select **Manage Routines Database Variables**
- 3 Click the **Edit** button next to the variable to be edited.
- 4 Update the Key and/or Value for the variable.
- 5 Click **Save**.

To delete one or more database variables:

- 1 On the navigation bar, select **Routines**.
- 2 Select **Manage Routines Database Variables**
- 3 Click the **Delete** button for a specific variable, or
- 4 Select one or more variables (via checkboxes) to delete.
- 5 Click **Delete Selected** and confirm the deletion.

Importing and Exporting Database Variables

Database variables are backed up and restored as part of the normal system backups (see *"Backing Up Your Nyquist System and Files"* on page 384); however, it can sometimes be helpful to export and import database variables to and from a CSV (comma-separated value) text file, such as to transfer variables between systems or to create and/or edit variables in another application (e.g., a spreadsheet).

To export the current database variables:

- 1 On the navigation bar, select **Routines**.
- 2 Select **Manage Routines Database Variables**
- 3 Select (via checkboxes) one or more variables to export.
- 4 Click the **Export** button
- 5 The `routine_db.csv` file will be downloaded to your browser's download directory.

Each row of the exported CSV file contains four comma-separated columns:

- For future use. When importing, this column should always contain a zero (0).
- Routine ID (enclosed in double quotes)

In an exported file, this may contain the routine ID that last accessed the variable. When importing, this column can contain a "0" (zero) or the previously exported value.

- Variable name (enclosed in double quotes)
- Variable value (enclosed in double quotes)

To import database variables from a CSV file:

- 1 On the navigation bar, select **Routines**.
- 2 Select **Manage Routines Database Variables**
- 3 Click the **Import** button
- 4 On the *Import Routines Database Variables* page:
 - a) Click the **Choose file** button and select the CSV file to import.
 - b) If you want to delete all existing database variables before importing, set **Delete all data before importing** to Yes.
 - c) Select whether you want to **Replace** or **Ignore** keys that already exist, whether defined prior to importing or defined multiple times within the CSV file.
 - d) Press the **Import** button.
- 5 The database variables defined in the CSV will be imported into the database and will be displayed on the *Routines Database Variables* page.

Managing Display Messages

It is possible to send messages and images to NQ-GA10PV devices and messages to NQ-S1810WBC 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 NQ-S1810WBC devices and 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.

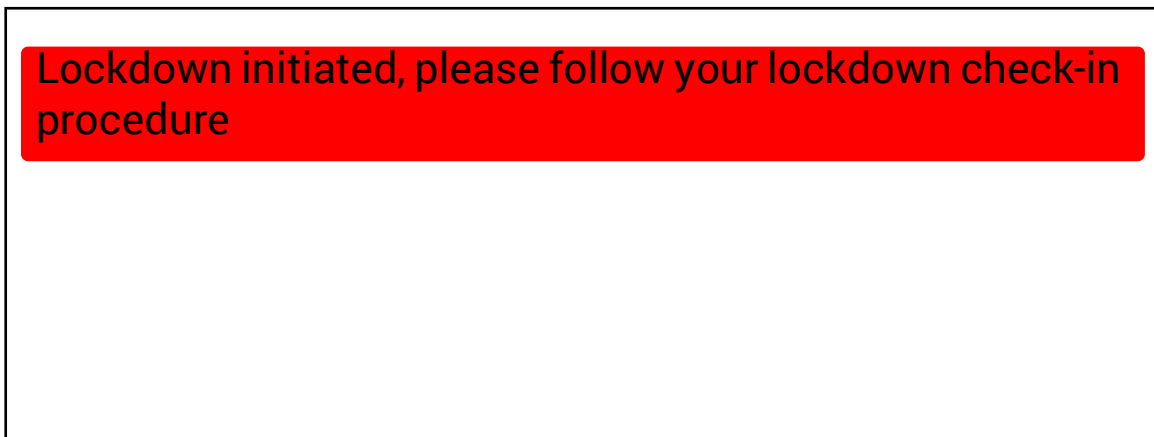


Figure 195. Example of Message with Fullscreen Priority

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 188.

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 466), 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 402.

Message Priorities and Precedence

Multiple messages can be displayed on an NQ-GA10PV or NQ-S1810WBC 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 then 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 **5 (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

The screenshot shows a web form titled "Display Message" with various configuration options. The form is organized into two columns. The left column includes fields for Name, Identifier, Message Type (set to "Text"), Device Type Filter (set to "GA10PV and WBC"), Text (with a right-click hint), Expiration Mode (set to "Display Time"), Display Time (set to 60 seconds), Zones, and Stations. The right column includes Priority (set to "0 (Lowest)"), GA10PV Background Color (set to "rgb(0,255,0)"), GA10PV Font (set to "Liberation Sans"), GA10PV Font Size (set to "70"), GA10PV Font Color (set to "rgb(0,0,0)"), GA10PV Font Styles (set to "Add Styles ..."), WBC Flasher Pattern (set to "No Change"), WBC Number of Flasher Pattern Cycles (set to "0"), and WBC Flasher Color (set to "Blue"). At the bottom right, there are three buttons: "Close", "Send", and "Send and Save".

Figure 196. Display Message

Note: You also can add display messages through routine actions (see “Adding an Action” on page 493.)

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 as a Message Template and send it immediately, select **Send and Save**. The **Name** field must be specified to save a message.

Note: When saved as a Message Templates, an **Expiration Mode** of **Date/Time** will be converted to a **Display Time** of 60 seconds and an **Expiration Mode** of **Manually Removed** will be converted to a **Display Time** of zero (0) seconds.

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, or other display features appear, you must set configuration options for the NQ-GA10PV station (see “*Configuring Intercom HDMI Module Display Options*” on page 188).

Table 132. 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.
Message Type	Select the type of message to be sent: <ul style="list-style-type: none">• Text: A text message will be displayed.• Image: An image will be displayed. <p><i>Note:</i> Selecting Image disables the Priority “5 (Exclusive)” option, sets Priority to “0 (Lowest),” sets Device Type Filter to “GA10PV Only,” and disables NQ-S1810WBC (WBC) options.</p>
Device Type Filter	Select the device type(s) to which the message will be sent. Valid values are: <ul style="list-style-type: none">• GA10PV and WBC• GA10PV Only• WBC Only

Table 132. Display Message Options (Continued)

Text	<p>Type the message that is to appear on the display monitor.</p> <p>You can format text using basic HTML tags, such as:</p> <ul style="list-style-type: none">• <code>bold</code>• <code><i>italic</i></code>• <code><u>underline</u></code>• <code>styled text</code> <p><i>Note:</i> Be aware that entering a new line, even within HTML tags, will create a new line in the final message.</p> <hr/> <p><i>Important:</i> For further details about the Text field, including how to display images within a Text-type Display Message, see <i>Table 136, "Add/Edit Message Template Parameters," on page 580.</i></p> <hr/>
Expiration Mode	<p>Select the mode for setting the message's expiration. Options are:</p> <ul style="list-style-type: none">• 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.
Display Time (seconds)	<p>Appears only if Expiration Mode is set to Display Time. Sets the length of time for the message to be displayed before it expires. The specified value can range from 1 to 99999 seconds.</p>
Expiration Date/Time	<p>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.</p>
Zones	<p>Select the zone or zones. Messages will be sent to the display devices in the selected zones.</p>
Stations	<p>The message is sent to the specified stations and any stations that belong to the specified zones.</p>

Table 132. Display Message Options (Continued)

Priority	<p>Select the message priority, which can range from 0 (Lowest) to 6 (Fullscreen).</p> <p>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.</p> <p>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.</p> <p><i>Note:</i> Priority 5 (Exclusive) is disabled for Image messages and enabled for Text messages.</p>
Image Type	<p>If the Type field was set to Image, select one of the following values to specify how the image will be displayed:</p> <ul style="list-style-type: none">• 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	<p>Select the image priority for this message, which determines precedence when an Image message and Text message have the same message priority:</p> <ul style="list-style-type: none">• Text Over Image: Text message will be given precedence.• Image Over Text: Image message will be given precedence.
Message Image	<p>The name of the saved Message Image to be displayed. For more information, see <i>"Create or Edit a Message Image"</i> on page 577.</p> <hr/> <p><i>Tip:</i> The predefined Solid-Black image can be used to clear the device's screen,</p> <hr/> <p><i>Note:</i> The dimensions of this image (which are displayed in parentheses after the image name) must match the dimensions implied by the Image Type. The list of images can contain <i>any</i> valid Image Type (i.e., 1920×1080 or 925×1040), but the specified image must match the selected Image Type size before saving the message template.</p>

Table 132. Display Message Options (Continued)

GA10PV Background Color	<p>Select the color for the message background. You can select a color by:</p> <ul style="list-style-type: none">• 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.) <p>For more information, see <i>"Using Color in Display Messages"</i> on page 567.</p>
GA10PV Font	<p>Select the down arrow to view a list of available fonts and then select the desired font for the message text. Available fonts are:</p> <ul style="list-style-type: none">Comic-ReliefCourier-PrimeGelasioLiberation SansLinux Libertine
GA10PV Font Size	<p>Enter the desired font size.</p>
GA10PV Font Color	<p>Select the color for the message text.</p> <p>You can select a color by:</p> <ul style="list-style-type: none">• 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.) <p>For more information, see <i>"Using Color in Display Messages"</i> on page 567.</p>
GA10PV Font Styles	<p>Place your cursor in the Add Styles box to select Bold or Italic. Otherwise, the Font Style remains at Regular.</p>

Table 132. Display Message Options (Continued)

WBC Flasher Pattern	<p>Specifies the on/off pattern the flasher will display.</p> <p>Valid values are:</p> <ul style="list-style-type: none">• No Change: The message will not cause the selected flasher to change from its current flasher setting.• Off: The selected flasher will be turned off unless a higher priority message is using the flasher. When the flasher is turned off, it will remain off until another message is sent with a new flasher setting.• Slow: The selected flasher will blink at a rate of once per second for the duration of the message.• Fast: The selected flasher will blink at a rate of twice per second for the duration of the message.• Double: Flash two (2) times within one second with a 1-second pause and repeat.• Triple: Flash three (3) times within 1.5 seconds with a 1-second pause and repeat.• Quad: Flash four (4) times within two seconds with a 1-second pause and repeat.
WBC Number of Flasher Pattern Cycles	<p>Specifies the number of times that the flasher pattern will repeat.</p> <p>Valid values are 1 through 65536 or specify zero (0) to flash continuously for the duration of the message.</p>
WBC Flasher Color	<p>Specifies the color of the LED flasher. Valid values are:</p> <ul style="list-style-type: none">• Amber• Blue• Green• Orange• Red• Violet• White• Yellow

Using Color in Display Messages

You can select colors for display messages three different ways:

- Background, text, and time colors via GA10PV **Display Configuration** (see *"Configuring Intercom HDMI Module Display Options"* on page 188)
- Background and font colors for individual messages by selecting **Display Message** from the dashboard (see *"Creating a Display Message via the Dashboard"* on page 561)
- Background and font colors for individual messages via the **Display-Msg** routine action **Type** (see Table 124, *"Action Types and Parameters,"* on page 496).

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 133. 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
darkolivegreen	556b2f	darkorange	ff8c00

Table 133. Default Color Alias (Continued)

Color Alias	Corresponding Hex Code	Color Alias	Corresponding Hex Code
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	dcddc	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
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

Table 133. Default Color Alias (Continued)

Color Alias	Corresponding Hex Code	Color Alias	Corresponding Hex Code
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
tomato	ff6347	transparent	transparent
turquoise	40e0d0	violet	ee82ee
wheat	f5deb3	white	ffffff
whitesmoke	f5f5f5	yellow	ffff00
yellowgreen	9acd32		

Removing Display Messages via the Dashboard

The **Remove Message** window allows you to remove one or more messages from the display message queue. It can also expire a message that was created using **Manually Removed** as the **Expiration Mode**.

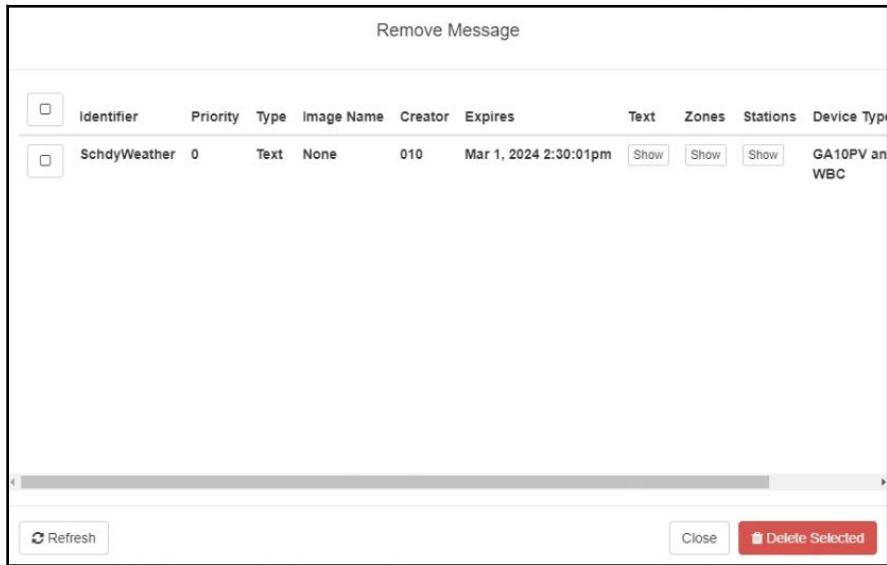


Figure 197. Remove Message

To remove one or more messages 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.
- 3 Select one or more messages to be removed.
- 4 Select the **Delete Selected** button.
- 5 Optionally select **Refresh** to update the list of pending messages.
- 6 Optionally repeat the previous steps to remove more messages.
- 7 Select **Close** to close the window.

Tip: Removing all messages from the NQ-GA10PV does not necessarily clear the display, which may still show other messages and a clock. To completely clear the display and ensure that it will not display a message or the clock (i.e., completely black), show the **Solid-Black** image at the highest priority.

Table 134. Remove Message

Identifier	Indicates the identifier of the message, by which the message can be deleted by a Routine action.
Priority	Indicates the message priority, which can range from 0 (Lowest) to 6 (Fullscreen) .

Table 134. Remove Message

Type	Indicates the type of message: <ul style="list-style-type: none">• Text: A text message will be displayed.• Image: An image will be displayed.
Image Name	Indicates the name of the Message Image being displayed, or None if the Type is Text .
Creator	Displays the extension of the user that displayed this message.
Expires	Displays the date and time when the message will expire.
Text	Displays the message that appears on the display monitor.
Zones	Displays the zones within which the message has been sent.
Stations	Indicates the stations at which the message is displayed.
Device Type Filter	Indicates the device type(s) to which the message has been sent. Valid values are: <ul style="list-style-type: none">• GA10PV and WBC• GA10PV Only• WBC Only

Table 134. Remove Message

Flasher

Indicates the flasher pattern, pattern cycles, and flasher color displayed on NQ-S1810WBC devices.

Flasher Pattern

Specifies the on/off pattern the flasher will display.

Valid values are:

- **No Change:** The message will not cause the selected flasher to change from its current flasher setting.
- **Off:** The selected flasher will be turned off unless a higher priority message is using the flasher. When the flasher is turned off, it will remain off until another message is sent with a new flasher setting.
- **Slow:** The selected flasher will blink at a rate of once per second for the duration of the message.
- **Fast:** The selected flasher will blink at a rate of twice per second for the duration of the message.
- **Double:** Flash two (2) times within one second with a 1-second pause and repeat.
- **Triple:** Flash three (3) times within 1.5 seconds with a 1-second pause and repeat.
- **Quad:** Flash four (4) times within two seconds with a 1-second pause and repeat.

Pattern Cycles

Specifies the number of times that the flasher pattern will repeat.

Valid values are 1 through 65536 or specify zero (0) to flash continuously for the duration of the message.

Table 134. Remove Message

Flasher Color

Specifies the color of the LED flasher. Valid values are:

- **Amber**
- **Blue**
- **Green**
- **Orange**
- **Red**
- **Violet**
- **White**
- **Yellow**

Refresh

Refreshes the list of current messages.

Delete Selected

Removes the selected messages from the devices on which they are displayed.

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 293*.

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 561*).

	Name	Identifier	Type	Text	Priority	Duration	Background Color	Font	Font Size	Font Color
  	Full, lowest, text-image		Image		0	60	 rgb(0,255,0)	Liberation Sans	70	 rgb(0,0,0)
  	Small, p3, left, text-image		Image		3	60	 rgb(0,255,0)	Liberation Sans	70	 rgb(0,0,0)
  	Small, right, p4, toi		Image		4	60	 rgb(0,255,0)	Liberation Sans	70	 rgb(0,0,0)
  	Test template		Text		0	30	 rgb(0,255,0)	Liberation Sans	70	 rgb(0,0,0)

Figure 198. 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 135. 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 562 for further details).
	<i>Note:</i> The Display Message page will be initialized with the settings from the selected message template and can be modified for the message to be sent, but the template will not be altered unless the Send and Save button is selected.
Name	Specifies a name for this message.
Identifier	Used to identify the message so it can be deleted by a Routine action.
Message Type	Displays the type of message: <ul style="list-style-type: none"> • 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.

Table 135. Message Templates

Priority	<p>Displays the message priority, which can range from 0 (Lowest) to 6 (Fullscreen).</p> <p>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.</p> <p>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.</p> <p><i>Note:</i> Priority 5 (Exclusive) is disabled for Image messages and enabled for Text messages.</p>
Duration	<p>Sets the length of time in seconds for the message to be displayed before it expires. Time can range from 1 to 99999.</p>
Background Color	<p>Displays the color for the message background. For more information, see <i>"Using Color in Display Messages"</i> on page 567.</p>
Font	<p>Specifies the font for the message text.</p>
Font Size	<p>Specifies the font size for the message text.</p>
Font Color	<p>Displays the color for the message text.</p> <p>For more information, see <i>"Using Color in Display Messages"</i> on page 567.</p>
Font Styles	<p>Displays the style (bold, italic) for the text. If blank, the message will use the regular style.</p>
Image Type	<p>If the Type field was set to Image, displays one of the following values to specify how the image will be displayed:</p> <ul style="list-style-type: none">• 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.

Table 135. Message Templates

Message Image For text message templates, “**None**” is shown. For image templates, the Name of the saved Message Image to be displayed.

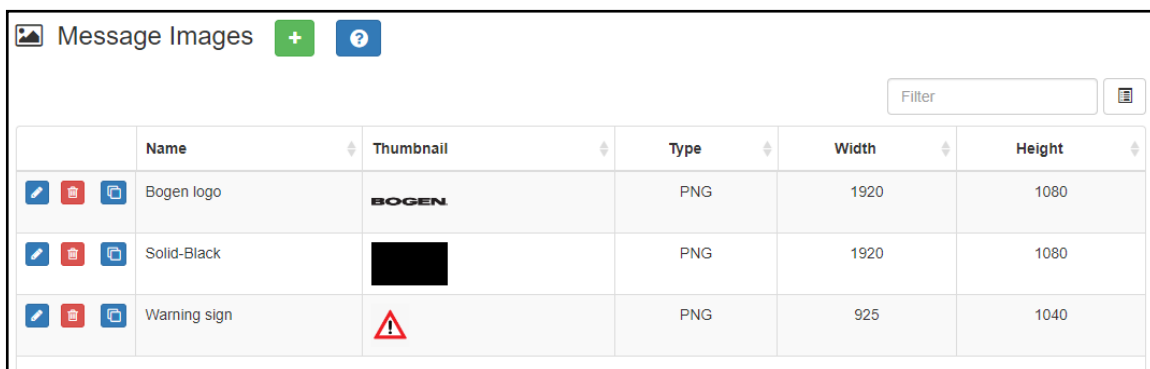
Tip: The predefined **Solid-Black** image can be used to clear the device’s screen,

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; view the full-sized message image (by clicking on the thumbnail); add a message image to the database; edit or delete a message image; or copy the URL of a message image to the clipboard.















	Name	Thumbnail	Type	Width	Height
  	Bogen logo		PNG	1920	1080
  	Solid-Black		PNG	1920	1080
  	Warning sign		PNG	925	1040

Figure 199. Message Images

To view saved message images:

- 1 From the navigation bar, select **Messages** then **Message Images**.

Tip: The **Solid-Black** image is available by default. This is a 1920×1080 black PNG image that can be used to “turn off” an NQ-GA10PV display, such that it will not display a message or the clock (i.e., completely black).

The **Message Images** page displays the following fields for each saved image:

Figure 200. Message Images properties

Edit button	Edits the message image.
Delete button	Deletes the message image.
Copy URL button	Copies the image URL to the clipboard.
Name	Name of the message image.
Thumbnail	Displays a thumbnail of the message image. Placing the mouse over the image will display a URL at which the image can be accessed from the Nyquist server. When clicked, the full image is displayed in a new browser tab.
Type	Format of the image. Allowed image formats include: <ul style="list-style-type: none">• 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 specify 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 469*).

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.

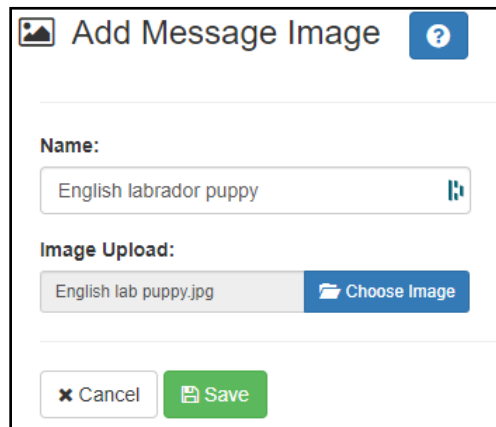


Figure 201. Add Message Image

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 format has the advantage of supporting transparency, which allows the background to display through the image.

Note: If this image will be used as part of an Image-type message (as opposed to being embedded as an `` HTML element in a Text-type message), 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.

📄 Add Message Template
?

Name:

Identifier: ⓘ

Message Type: ⓘ

Device Type Filter: ⓘ

Text: ⓘ

Right click text area for more options

Priority: ⓘ

Display Time (seconds): ⓘ

GA10PV Background Color: ⓘ

GA10PV Font: ⓘ

GA10PV Font Size: ⓘ

GA10PV Font Color: ⓘ

GA10PV Font Styles: ⓘ

WBC Flasher Pattern: ⓘ

WBC Number of Flasher Pattern Cycles: ⓘ

WBC Flasher Color: ⓘ

✕ Cancel
📄 Save

Figure 202. 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 136. 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.
Message Type	Select the type of message to be sent: <ul style="list-style-type: none">• Text: A text message will be displayed.• Image: An image will be displayed. <p><i>Note:</i> Selecting Image disables the Priority "5 (Exclusive)" option, sets Priority to "0 (Lowest)," sets Device Type Filter to "GA10PV Only," and disables NQ-S1810WBC (WBC) options.</p> <p>This value will determine which of several following parameters will be displayed.</p>
Device Type Filter	Select the device type(s) to which the message will be sent: <ul style="list-style-type: none">• GA10PV and WBC• GA10PV Only• WBC Only

Table 136. Add/Edit Message Template Parameters

Text

Type the message that is to appear on the display monitor.

Tip: Click and drag the bottom-right corner to adjust the size of the edit box.

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.

As shown in the `` example, above, HTML elements can also include CSS style definitions to modify their positioning and appearance. (For details on CSS, see <https://www.w3schools.com/css>.)

You can also use the `` HTML tag to display an image. For example:

```

```

An image displayed using this mechanism is not restricted to the standard image sizes to which Image-type messages are restricted, but may require more detailed specification of attributes and style to ensure it appears correctly on the screen.

Note: If the `` HTML tag is used, verify that the GA10PV devices on which this message will be displayed has network/internet access to the specified URL.

Tip: You can easily append an `` HTML tag for a previously uploaded Message Image to the message (see “Create or Edit a Message Image” on page 577) by right-clicking the text box, selecting an image from the list of defined Message Images, and clicking the **Insert Image** button. You can edit the generated HTML tag to adjust the displayed image’s appearance as needed.

Table 136. Add/Edit Message Template Parameters

Priority	<p>Select the message priority, which can range from 0 (Lowest) to 6 (Fullscreen).</p> <p>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.</p> <p>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.</p> <p><i>Note:</i> Priority 5 (Exclusive) is disabled for Image messages and enabled for Text messages.</p>
Display Time (seconds)	<p>Sets the length of time for the message to be displayed before it expires. This value can range from 0 to 99999 seconds. A value of zero (0) indicates that the message will display indefinitely (i.e., until the device has been restarted or the message is removed by a Display-Msg-Delete action or via the Dashboard's Remove Message button).</p>
Image Type	<p>Select the image type to specify the image dimensions and how the image will be displayed:</p> <ul style="list-style-type: none">• 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	<p>Select the image priority for this message, which determines precedence when an Image message and Text message have the same message priority:</p> <ul style="list-style-type: none">• Text Over Image: Text message will be given precedence.• Image Over Text: Image message will be given precedence.

Table 136. Add/Edit Message Template Parameters

Message Image	<p>Select the image to be displayed for this message from the list of Message Images.</p> <hr/> <p><i>Tip:</i> The predefined Solid-Black image can be used to clear the device's screen,</p> <hr/> <p><i>Note:</i> The dimensions of this image (which are displayed in parentheses after the image name) must match the dimensions implied by the Image Type. The list of images is restricted to those with dimensions compatible with <i>any</i> valid Image Type (i.e., 1920×1080 or 925×1040), but must match the selected Image Type size before saving the message template.</p>
GA10PV Background Color	<p>Select the color for the message background. You can select a color by:</p> <ul style="list-style-type: none">• 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.) <p>For more information, see <i>"Using Color in Display Messages"</i> on page 567.</p>
GA10PV Font	<p>Select the down arrow to view a list of available fonts and then select the desired font for the message text. Available fonts are:</p> <ul style="list-style-type: none">Comic-ReliefCourier-PrimeGelasioLiberation SansLinux Libertine
GA10PV Font Size	<p>Enter the desired font size.</p>

Table 136. Add/Edit Message Template Parameters

GA10PV Font Color	<p>Select the color for the message text.</p> <p>You can select a color by:</p> <ul style="list-style-type: none">• 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.) <p>For more information, see <i>"Using Color in Display Messages"</i> on page 567.</p>
GA10PV Font Styles	<p>Place your cursor in the Add Styles box to select Bold or Italic. Otherwise, the Font Style remains at Regular.</p>
WBC Flasher Pattern	<p>Specifies the on/off pattern the flasher will display.</p> <p>Valid values are:</p> <ul style="list-style-type: none">• No Change: The message will not cause the selected flasher to change from its current flasher setting.• Off: The selected flasher will be turned off unless a higher priority message is using the flasher. When the flasher is turned off, it will remain off until another message is sent with a new flasher setting.• Slow: The selected flasher will blink at a rate of once per second for the duration of the message.• Fast: The selected flasher will blink at a rate of twice per second for the duration of the message.• Double: Flash two (2) times within one second with a 1-second pause and repeat.• Triple: Flash three (3) times within 1.5 seconds with a 1-second pause and repeat.• Quad: Flash four (4) times within two seconds with a 1-second pause and repeat.

Table 136. Add/Edit Message Template Parameters

WBC Number of Flasher Pattern Cycles	Specifies the number of times that the flasher pattern will repeat. Valid values are 1 through 65536 or specify zero (0) to flash continuously for the duration of the message.
WBC Flasher Color	Specifies the color of the LED flasher. Valid values are: <ul style="list-style-type: none">• Amber• Blue• Green• Orange• Red• Violet• White• Yellow

Displaying a Message from the Message Templates Page

You can display a message based on a previously created Message Template from the **Message Templates** page.

To display 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 on which you want the new message to be based.
- 3 On the **Display Message** popup, select the zones or stations at which you want the message to be displayed.

Note: The selected zones and station will not be saved.

- 4 Make changes to the message options as needed (see *Table 132, "Display Message Options,"* on page 562).
- 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

A check-in event is a request for a person at each station (other than those explicitly or implicitly excluded) to report in, typically to indicate that they are aware of a current situation and/or are safe.

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)

Manage Check-In allows you to quickly obtain the check-in status of specific areas within a facility—such as conference rooms, offices, or break rooms—during a check-in event. 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 592).

Managing 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 can also use the Maps feature to view check-in status. For more information, see “Using Maps for Check-In” on page 461.

Note: You can also display Check-In status on NQ-GA10PV displays. For information, see “Configuring Intercom HDMI Module Display Options” on page 188.

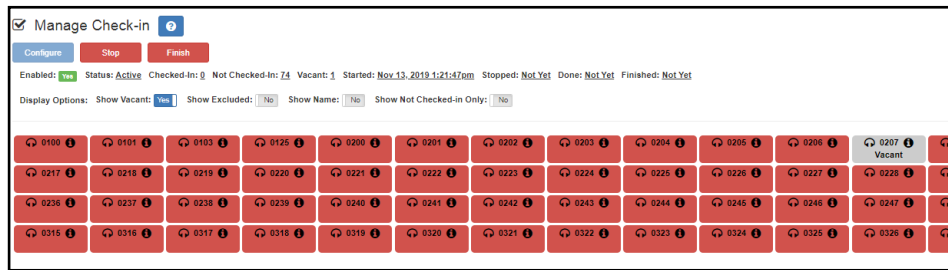


Figure 203. Manage Check-In

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. *Table 137, “Color-coded Check-In Status,” on page 588* explains the use of colors to describe status:

Table 137. Color-coded Check-In Status

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.

You also can select the following **Display Options**:

Table 138. 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	<i>Note: Show Vacant and Show Excluded options are disabled when this option is selected.</i> 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 594.

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 466.)

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 204. 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 checked-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 will still see a ringing status (flashing green) for about two seconds while checking in. Stations checking in with IP phones will notice a call lasting about two 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 482) and the routine Action **Type** is **Check-In** with **Station** set to the VoIP Speaker Only station extension (see “*Understanding Action Parameters*” on page 495).

If a station is configured (via the Call-In Level of its CoS configuration) to only place Emergency calls, the station cannot participate in the check-in process. Station’s configured with a Call-In Level of **Emergency-Only** will, upon initiation of the check-in process, be automatically added to the Check-In Exclusion List (see “*Managing Exclusion and Vacancy Lists*” on page 594). If you wish to include the station in the check-in process, the station’s CoS Call-In Level configuration should be changed to **Normal+Emergency** or **Urgent+Emergency** (see “*Editing CoS Parameters for a Station*” on page 108).

Ending the Check-In Process

There are two different ways to end the check-in process: *stop* or *finish*. *Finish* implies that every station has checked in. *Stop* implies that someone decided to cancel the check-in process before every station had checked in.

After all stations included in the check-in process have checked in, the check-in Status will automatically change to **Done**. Since stations that were not expected to check in may do so, the check-in is not considered complete until you explicitly set the status to **Finish**.

The behavioral difference between *finishing* and *stopping* a check-in is largely determined by how you configure your system. You can define different Actions for your system to perform for the Check-In trigger based on the Stop or Finish values of the Check In property. The primary built-in differences are:

- The elapsed time for the check-in process is calculated after the process is *finished*.
- *Stopping* sets check-in Status to Idle and updates Stopped time, while *finishing* sets check-in Status to Finished and updates Finished time.

Completing the Check-In

You can complete an active check-in process by selecting the **Stop** or **Finish** button on the Station Check-In view. An active check-in process can also be stopped or finished via a Routine action by using the **Check-In Action Type** with the **Check In** option set to **Stop** or **Finish** (see “*Understanding Action Parameters*” on page 495).

Stopping or finishing the check-in will trigger those routines that use **Check-In** as the trigger **Type** and either **Stop** or **Finish** as **Check-In** (see “*Understanding Trigger Parameters*” on page 482 for more information).

After the check-in process has been stopped or finished, all Normal station calls resume as normal calls to the Admin Station, and the check-in process **Status** becomes either **Idle** (if stopped) or **Finished** (if finished).

Resetting the Check-In Process

Once a check-in process has completed, the check-in status should *always* be reset, typically via the **Reset** button on the *Manage Check-In* view. This will clear all check-in statuses, allow non-Admin-to-Admin Station calls to resume, and restore all GA10PV displays back to their normal operational states. Until reset, the GA10PV displays will show their check-in statuses.

You can also reset the check-in process with 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 495).

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.

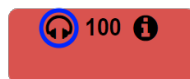


Figure 205. Listen In, or Spy Mode, Button

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.

To activate Spy Mode using a DTMF code (regardless of Check-In process):

- 1 If not already on your dashboard, select **Dashboard** from the navigation bar.
- 2 Under Calling/Paging, select **Dial Pad**.

- 3 When the dial pad appears, dial 978{station-extension}.

Note: Spy Mode monitoring cannot be used on a station that has been set to Privacy Mode.

Configuring Check-In

To use the check-in process, the user must have appropriate permissions assigned (see *"Assigning and Editing Permissions" on page 268*).

Configure Check-in ?

Enabled:

Enable Audio Prompts and Confirmation Messages:

Automatically Stop Audio Distribution:

Vacancy List:

Exclusion List:

Figure 206. 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 (see *Table 139, "Check-In Configuration Options," on page 594*).

- 5 Select **Save**.

Table 139. 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	<p>Specifies if audio files will be used as part of Manage Check-In.</p> <p>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.</p> <p>When feedback is disabled, stations checking in with digital call switches will see a ringing status (flashing green) for about two seconds while checking in. Stations checking in with IP phones will notice a call lasting about two seconds.</p>
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 <i>"Managing Exclusion and Vacancy Lists"</i> on page 594).
Exclusion List	<p>Specifies the stations to be added to the Exclusion List (see <i>"Managing Exclusion and Vacancy Lists"</i> on page 594).</p> <p><i>Note:</i> Stations configured with a Call-In Level of Emergency-Only (via the station's CoS configuration) will automatically be added to the Exclusion List upon initiation of the check-in process.</p>

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 593). 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.

Stations whose CoS is configured as *Emergency-Only* at the time the Check-In process is initiated (based on the Station's currently active CoS configuration) will be automatically added to the Check-in Exclusion List. These stations will appear in the checkin log with a status of **Exclude Add (Auto)** and will remain in the Check-in Exclusion list until the **Reset** button is pressed (stations manually added to the Exclusion list remain in that list until explicitly removed).

You can add or delete a station to or from 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 490).
- 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 from the Exclusion List via a routine:

- 1 Edit a routine that has **Check-In** as an **Action Type** (see "Actions" on page 490).
- 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 490).
- 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 from the Vacancy List via a routine:

- 1 Edit a routine that has **Check-In** as an **Action Type** (see "Actions" on page 490).
- 2 For **Check In**, select **Vacancy-Delete**.
- 3 For **Stations**, select the stations you want to remove from the Vacancy List.
- 4 Select **Save**.

Check-In Routine Actions and Triggers

You will typically define Routines that perform check-in actions (see the Check-In action in *Table 124, "Action Types and Parameters,"* on page 496) and/or that are triggered by check-in events (see the Check-In trigger in *Table 122, "Trigger Types and Parameters,"* on page 483). This allows a great deal of flexibility and customization over the various check-in processes and types of check-in scenarios that you will implement.

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, while a routine used for evacuation during an actual fire would probably include a 911 call.

Tip: In the drill 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**.

Edit Action - Routine 3

Name: Add Vacancy

Enabled: Yes

Type: Check-In

Check In: Vacancy-Add

Stations: x030 - Web User x101 - VoIP SPKR x400 - Admin Phone Clear Add All

Finish Delay: No-Delay

Description:

✕ Cancel Save

Figure 207. 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 393) and creates a Call Detail Record (see *"Viewing Call Details Records"* on page 396). You can export and print the check-in log file using the **Export** button (see *"Exporting and Printing a Call Log"* on page 397). 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:

2022-04-11 15:40:22 - 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:

2022-04-11 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 (including Weather Alerts)

You can use Alert Filters and routines to manage if and how specific Emergency Alert System (EAS) events appear on the video display of the NQ-GA10PV, NQ-T1100, and NQ-ZPMS. Your Nyquist server receives these EAS events—which include non-weather-related alerts—from the National Weather Service (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 1).

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 602).
- 2 Create a routine (see “*Adding a Routine*” on page 474).
- 3 Set the routine’s **Allow Multiple** field to **No** (default).
- 4 *Optional:* If you will be using the Dashboard’s **Routines** button to test this routine, set **Allow DTMF** to **Yes** and assign a value to **DTMF Code**.
- 5 Create at least one action for the routine that uses **Display-Msg** for the action **Type** (see “*Actions*” on page 490).
- 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 606).

For example:

```
$alerts(FLC095,INCLUDE_CODES,AUTO_COMPRESS_15,REPEAT_60)
```

- 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 622) for the \$alerts variable’s <county-code> parameter (see “*Setting Variables for the Display Message*” on page 606) 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, which 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, tsunamis, volcanoes, public health, power outages, and many other emergencies.

CAP elements and values are used when configuring alert filters for your Nyquist system. Further details regarding CAP and the data it provides can be found at:

<https://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.html>

Note: You must have **Edit** permissions to enable and set Alert Filters Configuration. For more information, refer to “Assigning and Editing Permissions” on page 268.

Event Type	Enabled Toggle	Action Type	Announcement	Severity						Certainty						Urgency	
				Extreme Toggle	Severe Toggle	Moderate Toggle	Minor Toggle	Unknown Toggle	Notset Toggle	Observed Toggle	Likely Toggle	Possible Toggle	Unlikely Toggle	Unknown Toggle	Notset Toggle	Immediate Toggle	Exp Toggle
911 Telephone Outage	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Administrative Message	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Air Quality Alert	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Air Stagnation Advisory	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Arroyo And Small Stream Flood Advisory	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Ashfall Advisory	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Ashfall Warning	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Avalanche Advisory	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Avalanche Warning	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Avalanche Watch	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Beach Hazards Statement	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Blizzard Warning	Yes	display-msg	[None]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Figure 208. Alert Filters Configuration

To configure alert filters:

- 1 On the navigation bar, select **Alert Filters**.
- 2 For each **Event Type** (i.e., weather watch, warning, advisory, etc.), indicate that you want to display alerts by toggling the **Enabled** column button to **Yes**. Toggle it to **No** to disable the **Event Type**.
- 3 For each **Event Type**, indicate which, if any, announcement you want to play for this event.

- 4 For each enabled **Event Type**, specify **Yes** for the **Severity**, **Certainty**, **Urgency**, and **Response** values of alerts you want to display. If an alert matches *any* of the specified criteria, it will be displayed.

See “CAP Elements and Values” on page 604 for descriptions of the CAP elements (e.g., Severity, Certainty, Urgency, and Response).

For descriptions of weather-related event types, refer to the following website:

<https://www.weather.gov/lwx/WarningsDefined>

For descriptions of non-weather-related event types, refer to the following website:

<https://www.weather.gov/meg/nonwxrelatedemergmsg>

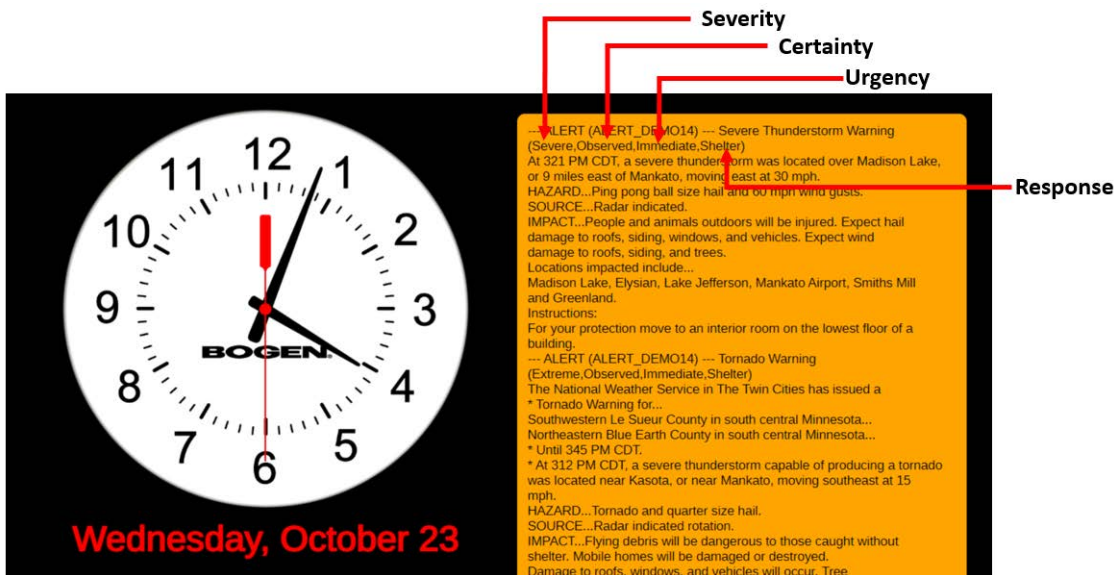


Figure 209. Sample Alert With Elements Defined

Elements and their values are described in the following table:

Table 140. CAP Elements and Values

<i>Element</i>	<i>Available Values</i>
Severity Denotes the severity of the event.	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. Notset: Severity was not provided in the alert received by the NWS.
Certainty Denotes the certainty of the event.	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. Notset: Certainty was not provided in the alert received by the NWS.

Table 140. CAP Elements and Values (Continued)

Element	Available Values
Urgency Denotes the urgency of the event.	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 unknown. Notset: Urgency was not provided in the alert received by the NWS.
Response Denotes the action recommended for the target audience.	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. Assess: Evaluate the information in this message. Allclear: The subject event no longer poses a threat or concern and any follow-on action is described in the instructions. None: No action is recommended. Notset: Response was not provided in the alert received by the NWS.

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 606).

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:

- `$auto_resize`
Indicates that the font will be automatically resized (to a specified minimum) as needed to fit the NWS alert on the screen.
- `$alerts`
Specifies the details of how to respond to an NWS alert, such as: for which county to receive alerts, what information to display, what announcement to play, and more.

`$auto_resize` Parameters

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.

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.

`$alerts` Parameters

The `$alerts` variable is immediately followed by one or more parameters in parentheses, as in the following example:

```
$alerts(FLC095,INCLUDE_CODES,AUTO_COMPRESS_15,REPEAT_60)
```

The available parameters are described in the following sections.

ANNOUNCEMENT_BY_EVENT

Whenever an alert is active, the system will play the announcement associated with the **Event Type**, as defined in the **Alert Filters Configuration** view (see "Alert Filters Configuration" on page 602).

ANNOUNCEMENT_DEFAULT_DTMF_<dtmf-code>

When combined with ANNOUNCEMENT_BY_EVENT, this defines the default announcement to use if the **Announcement** for the current alert **Event Type** is set to **None**. This parameter should usually be included in combination with ANNOUNCEMENT_BY_EVENT; if not, alerts that occur with **Event Type** set to **None** will not play any announcement.

Example:

```
$alerts(FLC127,INCLUDE_CODES,INCLUDE_COUNTY,AUTO_COMPRESS_25,ANNOUNCEMENT_BY_EVENT,ANNOUNCEMENT_DEFAULT_DTMF_411,ANNOUNCEMENT_ZONE_10,PLAY_SKIP_59,POST_DASH_PHONE_TEXT,REPEAT_60) $auto_resize(20)
```

ANNOUNCEMENT_DTMF_<dtmf-code>

Plays the announcement with the DTMF code specified by <dtmf-code>. For example, including ANNOUNCEMENT_DTMF_12 will cause the routine action to play the announcement that has a DTMF code equal to 12. When specifying an ANNOUNCEMENT_DTMF_<dtmf-code>, the <dtmf-code> is replaced by the desired announcement's DTMF code.

The announcement to be played must have **Play To Zone** set to the desired playback zone, or the ANNOUNCEMENT_ZONE_<zone> variable must be included to specify the zone to play to. If **Play To Zone** is not set and ANNOUNCEMENT_ZONE_<zone> is not included, the announcement will not play.

The announcement will only be played if an actual alert exists and the alert text is sent to a GA10PV display. If an alert does not exist when the action executes, the announcement will not be played.

If the \$alerts() variable contains a REPEAT_<integer> parameter, the announcement's **Times to Play** should be considered, because the REPEAT_<integer> parameter will automatically cause the announcement to repeat at the interval specified by the REPEAT_<integer> parameter. If **Times to Play** is set to zero (0), meaning continuous, the user will need to manually stop the Announcement once it has started.

The extension of a routine that includes the \$alerts() variable and ANNOUNCEMENT_DTMF_<dtmf-code> parameter must have permission to start announcements.

Note: A generic National Weather Service alert announcement entitled “NWS Alert” is available for use. Under the Announcements view, look for the “NWS Alert” announcement and use the DTMF code associated with it.

Warning If you change the DTMF code of an announcement that is used in a Routine Action via the `$alerts()` `ANNOUNCEMENT_DTMF_<dtmf-code>` parameter, you will need to manually update the DTMF code for the `ANNOUNCEMENT_DTMF_<dtmf-code>` parameter. Nyquist will not automatically make the change.

ANNOUNCEMENT_ZONE_<zone>

Indicates the zone to which the announcement will be played when the `ANNOUNCEMENT_DTMF_<dtmf-code>` variable has been specified, where `<zone>` specifies a valid zone number. If `ANNOUNCEMENT_ZONE_<zone>` is not specified, the announcement will be played to All Speakers.

Note: This parameter is only applicable when using the `ANNOUNCEMENT_DTMF_<dtmf-code>` parameter.

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 561). 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_<integer>` and `$auto_resize` variable with display message priority of 6.
-

Tip: If you are not going to use NQ-GA10PV displays to view NWS Alerts, then do not include the `AUTO_COMPRESS_#` parameter in the Display-Msg action `$alerts()` parameter list. Inclusion of the `AUTO_COMPRESS_#` parameter is designed to help fit alerts onto the NQ-GA10PV message display when the alerts contain a lot of text, but as a result of compression, they will also display compressed in the National Weather Service Alerts window of the Nyquist dashboard display and on the NQ-T1100 or NQ-ZPMS NWS Alerts display. If your primary method for viewing alert details is via NQ-GA10PV displays, then inclusion of the `AUTO_COMPRESS_#` parameter is recommended.

<county-code>

Displays weather alerts for the specified county. An example county code for Orange County, Florida is FLC095.

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".
- 7 The three-letter + three-digit code displayed before the name is the county code.

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.

An alternative technique to find a county or zone code is:

- 1 Using a web browser, enter the following URL into the address bar:
<https://alerts.weather.gov>
- 2 Scroll to the list of states (and zones) and click the County List (or Zone List) link for the desired state.
- 3 Find the desired county or zone in the provided list. The code is shown to the left of the county or zone name.

INCLUDE_CODES

Displays the Severity, Certainty, Urgency, and Response codes on the Alerts header for each alert (see *Figure 209, "Sample Alert With Elements Defined,"* on page 603).

Note: This parameter is also applicable to the NQ-T1100, NQ-ZPMS, and dashboard when using the POST_DASH_PHONE_TEXT parameter.

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.

Note: This parameter is also applicable to the NQ-T1100, NQ-ZPMS, and dashboard when using the `POST_DASH_PHONE_TEXT` parameter.

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.

PLAY_ONCE

Because the `REPEAT_<integer>` parameter will cause the announcement to repeat until an alert no longer exists, you can include `PLAY_ONCE` in the `$alerts()` parameter list if you want the announcement to play only once, when the alert first appears.

Note: This parameter is only applicable when using the `ANNOUNCEMENT_DTMF_<dtmf-code>` parameter.

Caution If `PLAY_ONCE` is included and an existing alert is immediately replaced by a new alert during a repeat cycle, the announcement will not play for the new alert. At least one repeat cycle must have no alerts present before the play count is reset and subsequent announcements are allowed to play.

PLAY_SKIP_<integer>

Because the `REPEAT_<integer>` parameter will cause the announcement to repeat during each repeat cycle until an alert no longer exists, you can include `PLAY_SKIP_<integer>` in the `$alerts()` parameter list if you only want the announcement to repeat periodically during an alert. When `PLAY_SKIP_<integer>` is included, the announcement playback will be skipped the number of times specified by `<integer>`. For example, if `PLAY_SKIP_4` is included in the parameter list, the announcement will be played every five minutes (by skipping the announcement playback four times).

Note: This parameter is only applicable when using the `ANNOUNCEMENT_DTMF_<dtmf-code>` parameter.

Caution If `PLAY_SKIP_<integer>` is included and an existing alert is immediately replaced by a new alert during a repeat cycle, the announcement will not immediately play for the new alert. The announcement will play after the specified number of skips has transpired.

PLAY_STOP_<integer>

While an alert is pending and an `ANNOUNCEMENT_DTMF_<integer>` is specified, the `PLAY_STOP_<integer>` parameter can be used to control how many times the announcement is played while an alert is still pending. The `<integer>` specifies how many times to play before stopping. Since alerts can last several hours, this parameter can be used to control how many times to play the announcement during the alert before stopping.

Note: This parameter is only applicable when using the `ANNOUNCEMENT_DTMF_<dtmf-code>` parameter.

Caution If an existing alert is immediately replaced by a new alert during a repeat cycle, the announcement will not start playing again until at least one repeat cycle has no alerts present.

POST_DASH_PHONE_TEXT

Single-line NWS weather alert notices can be posted on the Nyquist Dashboard and NQ-T1100 Admin phones, and full-text NWS weather alert notices can be viewed on the NQ-T1100 Admin Phone and NQ-ZPMS Zone Paging Microphone Station screens.

To activate this feature, include the `POST_DASH_PHONE_TEXT` parameter in the `$alerts()` parameter list of a routine's Display-Msg action.

Note: This feature can be used even if you do not have a NQ-GA10PV device in your network. When you configure the Display-Msg action, set the Zones field to "All Displays."

If the `POST_DASH_PHONE_TEXT` parameter is included in the `$alerts()` variable parameter list, a single-line alert notice will be displayed on the Nyquist Dashboard (for admin users) and on NQ-T1100 Admin phone idle screens whenever there is an active alert.

The Nyquist Dashboard notice will include date/time, "--- ALERT ---", alert type, and optionally the county and codes (based on inclusion of `INCLUDE_COUNTY` and `INCLUDE_CODES` parameters in `$alerts()` parameter list).

The Admin Phone notice will omit the date/time and “--- ALERT ---” text to conserve space.

Important: The `POST_DASH_PHONE_TEXT` parameter requires the use of the `REPEAT_##` parameter. Without it, the weather alert will not be displayed on NQ-T1100 or NQ-ZPMS devices and dashboards.

The following is an example of a Dashboard notice using the `POST_DASH_PHONE_TEXT` parameter:

```
2021-04-22 10:15:20 --- ALERT --- Tornado Warning
```

The next example was achieved by adding `INCLUDE_CODES` in the `$alerts()` parameter list:

```
2021-04-22 10:15:20 --- ALERT --- Tornado Warning (Extreme,Possible,Future,Monitor)
```

The next example was achieved by adding `INCLUDE_CODES` and `INCLUDE_COUNTY` in the `$alerts()` parameter list:

```
2021-04-22 10:15:20 --- ALERT (FLC095) --- Tornado Warning (Extreme,Possible,Future,Monitor)
```

The following examples are comparable idle screen notices on the NQ-T1100 Admin Phone:

- >Tornado Warning
- >Tornado Warning (Extreme,Possible,Future,Monitor)
- >(FLC095) Tornado Warning (Extreme,Possible,Future,Monitor)

If multiple routines are executing that contain a Display-Msg action with the `$alerts()` variable using different counties, alerts will be displayed for all counties that have active alerts. If you plan to display alerts for multiple counties, we recommend adding the `INCLUDE_COUNTY` parameter in the `$alerts()` parameter list to help distinguish between the counties that may be simultaneously displayed.

Note: In the phone images below, `ALERT_DEM02` and `ALERT_DEM04` are demonstration county codes.

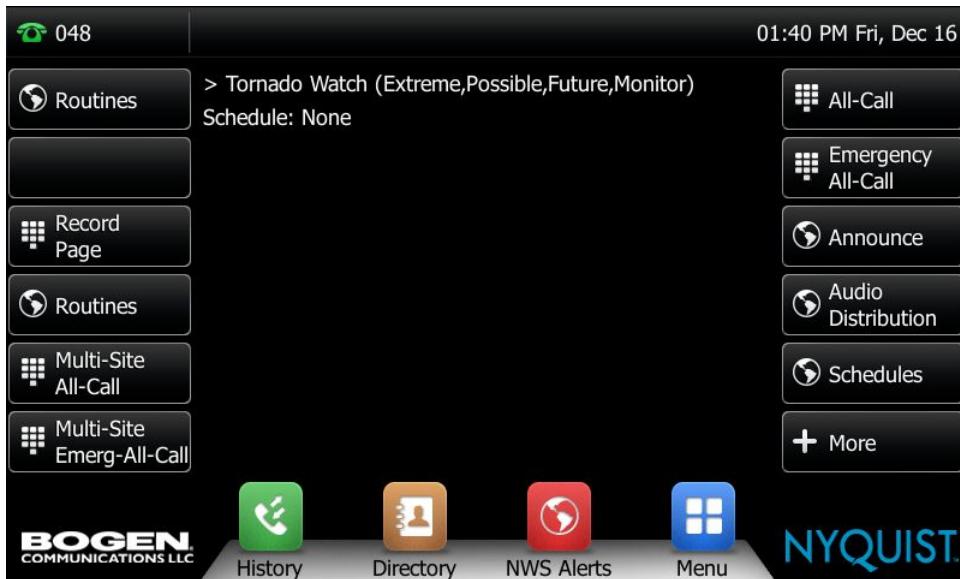


Figure 210. POST_DASH_PHONE_TEXT with ALERT_DEMO4



Figure 211. POST_DASH_PHONE_TEXT with ALERT_DEMO4 and ALERT_DEMO2

Important: For details on how to view the full alerts on the NQ-T1100 and NQ-ZPMS, see "Viewing NWS Alerts on NQ-ZPMS Admin Phone" on page 617 and "Viewing NWS Alerts on NQ-T1100 Admin Phone" on page 619.

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.

Important: This option is required when using the `POST_DASH_PHONE_TEXT` parameter to display NWS alerts on phone devices and/or the C4000 dashboard.

Warning When this option is used in a routine, subsequent actions of that routine will never be executed.

Tip: If you would like to monitor multiple locations for NWS alerts while using this option, create multiple routines, one for each location to be monitored.

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.

ROUTINE_ALERT_DTMF_<dtmf-code>

Executes the routine with the DTMF code specified by <dtmf-code> if an alert is present and alert text is sent to a GA10PV display.

For example, including `ROUTINE_ALERT_DTMF_5` will cause the routine with a DTMF code of 5 to be executed, which might execute a routine that closes an I/O controller output contact which, in turn, might turn on an external light or buzzer.

Tip: If the `REPEAT_<integer>` parameter is present in `$alerts()` and alerts are present, the routine will be executed at each repeat cycle. For example, if `REPEAT_60` is included, the routine will be executed every 60 seconds. You can use `ROUTINE_ALERT_ONCE` to force the routine to only execute once while alerts are present.

ROUTINE_ALERT_ONCE

If this parameter is included with `ROUTINE_ALERT_DTMF_<dtmf-code>`, the specified routine will only be executed once during the alert lifetime.

ROUTINE_NOALERT_DTMF_<dtmf-code>

Executes the routine with the DTMF code specified by <dtmf-code> if no alerts are present.

For example, including `ROUTINE_NOALERT_DTMF_6` will cause the routine with DTMF code of six to be executed if *no alerts* exist, which might execute a routine that opens an I/O controller output contact that, in turn, might turn off an external light or buzzer.

Tip: If the `REPEAT_<integer>` parameter is present in `$alerts()` and *no alerts* exist, the routine will be executed at each repeat cycle. For example, if `REPEAT_60` is included in the parameter list but no alerts exist, the routine will be executed every 60 seconds. You can use `ROUTINE_NOALERT_ONCE` to force the Routine to only be executed once while alerts do not exist.

ROUTINE_NOALERT_ONCE

If this parameter is included with `ROUTINE_NOALERT_DTMF_<dtmf-code>`, the specified routine will only be executed once if *no alerts* are present.

Tip: The `ROUTINE_ALERT_DTMF_<dtmf-code>` and `ROUTINE_NOALERT_DTMF_<dtmf-code>` parameters can be used together to toggle the state of an I/O Controller output contact. They could also be used together to add and/or delete Dashboard messages via Routine Actions.

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.

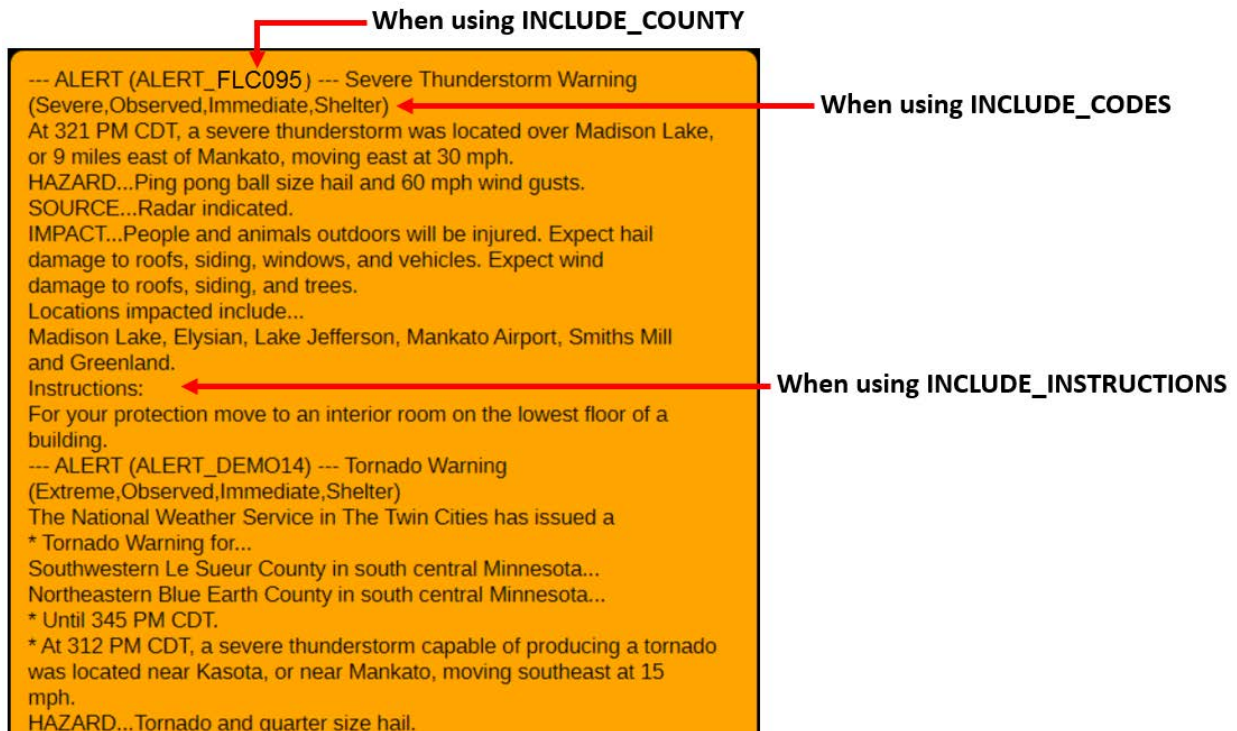


Figure 212. How Parameters Affect Display

A sample alert string is:

```
$alerts(FLC095,INCLUDE_COUNTY,INCLUDE_CODES,INCLUDE_INSTRUCTIONS,REPEAT_60)
```

This string will display alerts for county FLC095 (Orange County, Florida) every 60 seconds including the Severity, Certainty, Urgency, and Response codes (see *Figure 212, "How Parameters Affect Display," on page 617*).

Viewing National Weather Service Alerts

Viewing NWS Alerts on NQ-ZPMS Admin Phone

National Weather Service (NWS) alerts can be viewed on the NQ-ZPMS display. To enable this, use the Nyquist server to customize one of this station's Line Keys with a **Type** of **NWS Alerts**. This will create a Line Key on the NQ-ZPMS (i.e., the **NWS Alerts** button on the Line Keys screen) that can be used to view pending NWS alert messages.

Important: For NWS alerts to be displayed on the NQ-ZPMS, the Nyquist server must execute a routine that includes a `Display-Msg` action. The action's **Text** must use the `$alerts()` variable and include the `POST_DASH_PHONE_TEXT` parameter. For details, see "Setting Variables for the Display Message" in the *Nyquist System Administrator Guide*.

Tip: To notify NQ-ZPMS users about an active NWS alert, we suggest triggering an announcement over the NQ-ZPMS station's associated Speaker Extension, triggering strobe lights via an I/O Controller, or displaying the NWS alerts on a highly visible NQ-GA10PV display. One or more of these actions can be initiated by triggering a routine via the `ROUTINE_ALERT_DTMF_<dtmf-code> $alerts` parameter, specifying the DTMF code of a routine containing one or more actions that notify users of the NWS alert.

To view the text of the active National Weather Service Alerts, press the **NWS Alerts** Line Key.

If no NWS alerts are active, the display will show "No alerts":

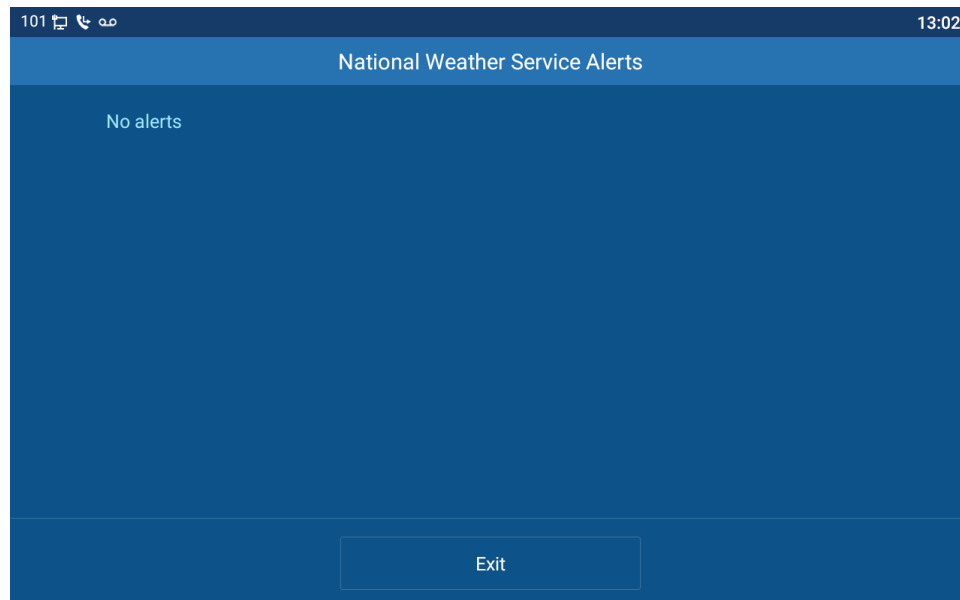


Figure 213. NWS with No Alerts

Important: "No alerts" can also indicate that there are no Routines executing to process NWS alerts via the `Display-Msg $alerts()` variable, or that the `POST_DASH_PHONE_TEXT` parameter was not included with the `$alerts()` variable.

When NWS alerts are active, a scrollable text window will display the text of active alerts:

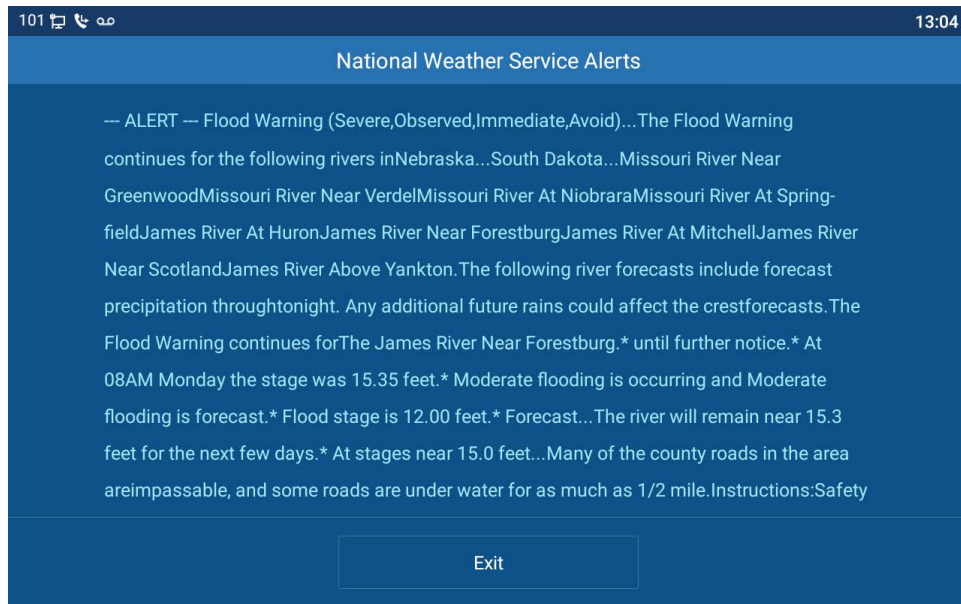


Figure 214. NWS with scrollable window

Touch and drag the screen to advance through the alert text pages. Press the Exit button to go back to the phone's main screen. While displaying the alerts, if there is no scrolling activity for 45 seconds, the phone will automatically return to the idle screen. If a call rings on the phone while the alerts are being displayed, the phone will automatically switch to the incoming call display.

Important: The alerts display is limited to 2000 characters. If the active alerts contain more than 2000 characters of text, "-TRUNCATED" will be appended to the end of the alert text to indicate that the remaining alert text has been truncated. To reduce the number of characters taken up by alerts, consider excluding the `INCLUDE_INSTRUCTIONS $alerts()` parameter.

Viewing NWS Alerts on NQ-T1100 Admin Phone

National Weather Server Alerts text can be viewed on the NQ-T1100 Admin Phone display. To view the text of all active National Weather Service Alerts, press the NWS Alerts softkey found on the bottom of the NQ-T1100 Admin phone display:

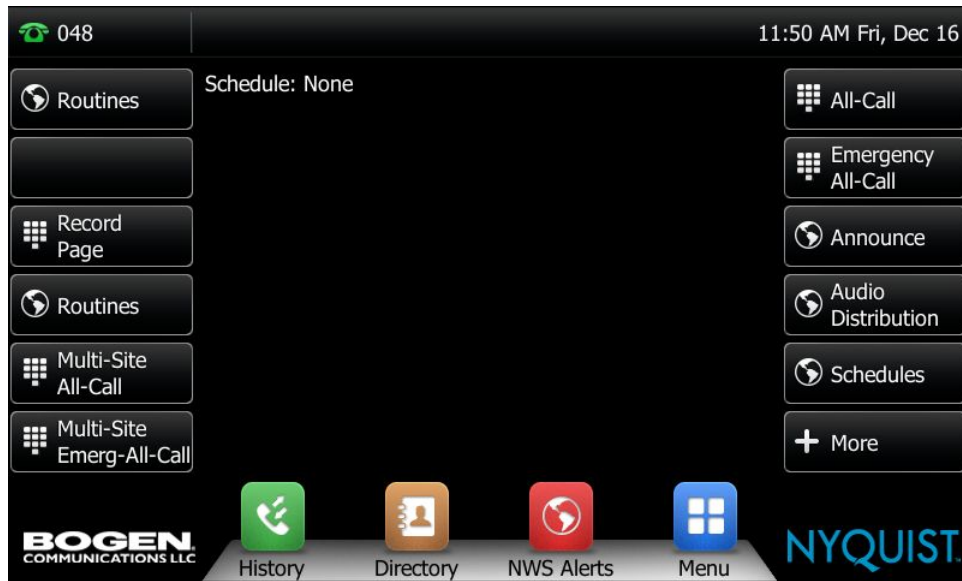


Figure 215. NWS Alerts softkey

If no NWS alerts are active, the display will show “No alerts”:

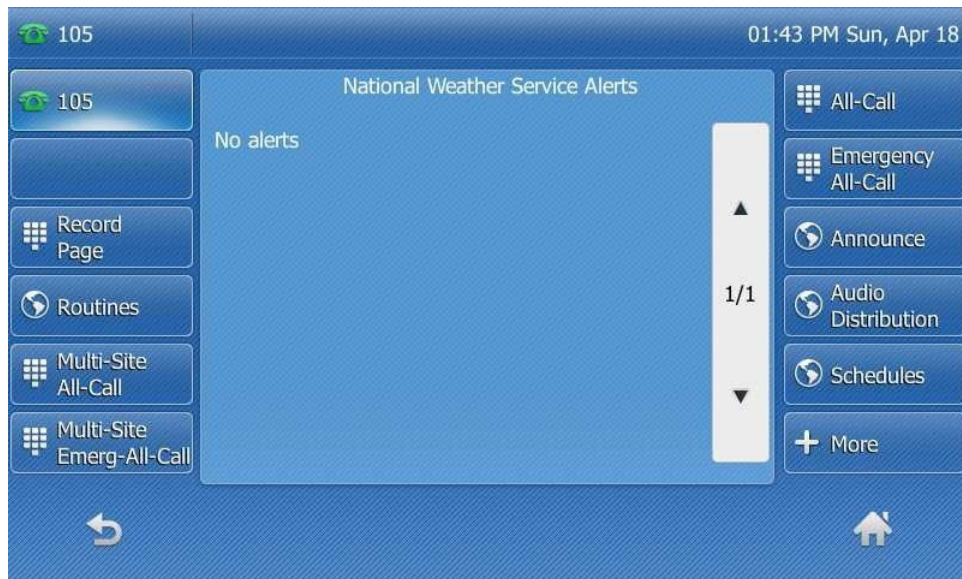


Figure 216. NWS with No Alerts

Note: “No alerts” can also indicate that there are no Routines executing to process NWS alerts via the Display-Msg \$alerts() variable.

When NWS alerts are active, a scrollable text window will open in the center of the phone’s screen to display the text of active alerts:

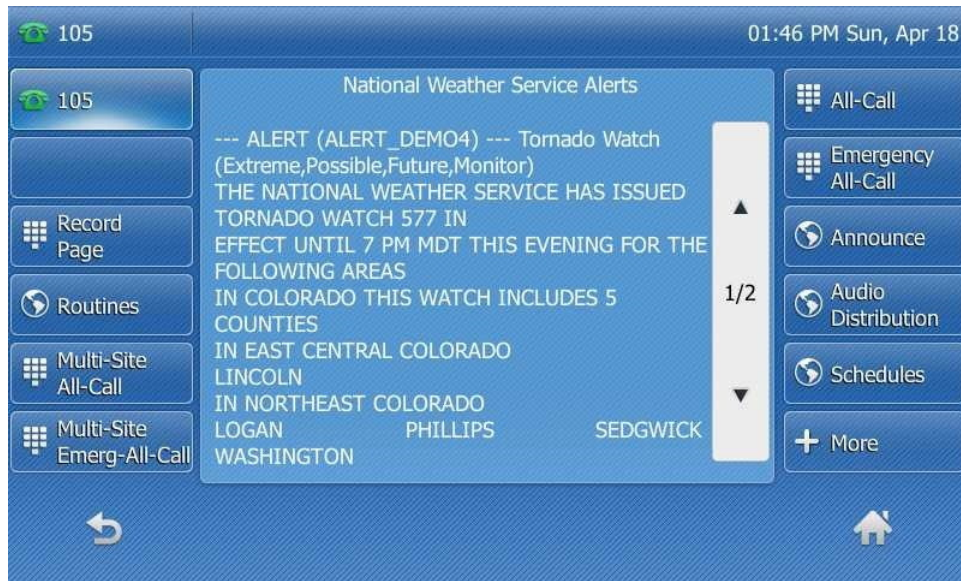


Figure 217. NWS with scrollable window

Use the scrollbar to advance through the alert text pages. Press the back button (on the bottom left) to go back to the phone's Idle screen. While displaying the alerts, if there is no scrolling activity for 45 seconds, the phone will automatically return to the Idle screen. If a call rings on the phone while the alerts are being displayed, the phone will automatically switch to the incoming call display.

Note: The alerts display is limited to 2000 characters. If the active alerts contain more than 2000 characters of text, the end of the display will show "-TRUNCATED" to inform you that the remaining alert text has been truncated. To help reduce the number of characters taken up by alerts, consider not using the INCLUDE_INSTRUCTIONS \$alerts() parameter.

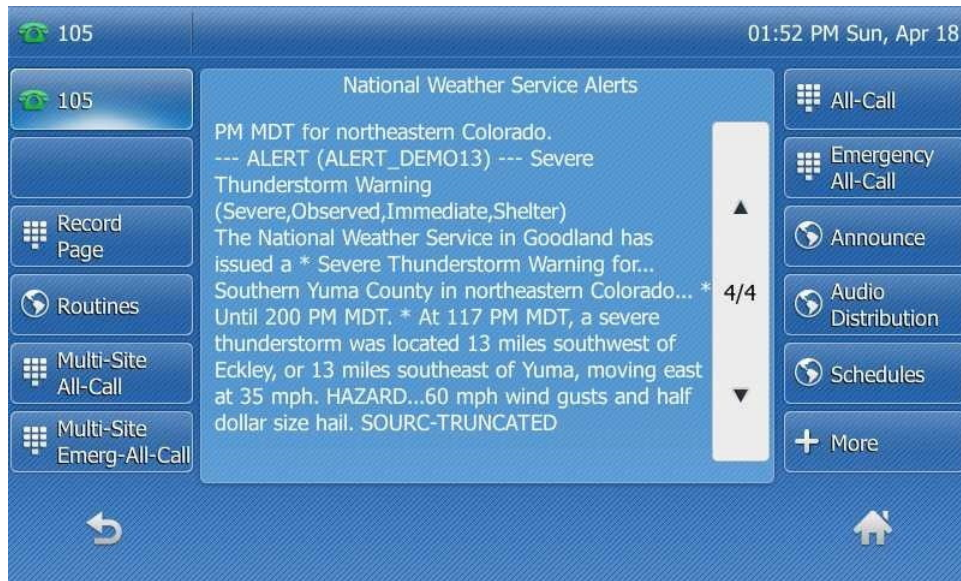


Figure 218. NWS without INCLUDE_INSTRUCTIONS

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<integer>, where <integer> is replaced with a number between 1 and 20 (for example, ALERT_DEMO10). Bogen recommends that you try each demonstration alert to help you get familiar with the alert format, the available \$alerts options, and font sizing.

Appendix A: Bogen Digital Certification Authority

Installing the Bogen Digital Certification Authority

When your client (e.g., a web browser) connects to the Bogen device's web application, the device's digital certificate is sent to the client to authenticate the identity of the device's web application. The client uses the Bogen Certification Authority (CA) certificate to authenticate the device's digital certificate, which verifies that the client is connecting to a valid server. If you do not install the Bogen CA certificate, the browser will display a warning that it was unable to authenticate the server, displaying a red *Not secure* warning immediately to the left of the browser's address bar when you attempt to access the Bogen device.

Installing Certification Authority on Windows System

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

- 1 From your Chrome or Edge browser, type `http://<device>/ssl/bogenCA.crt` in the address bar, where `<device>` is the Nyquist device's IP address or DNS name (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 device, 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**.
- 8 Select **Next**.
- 9 Select **Finish**.
- 10 Restart the browser and log in to the device's web application.

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

To download the certificate to a CRT file, execute the following PowerShell command, replacing *<device>* with the IP address or DNS name of the Nyquist device:

```
Invoke-WebRequest -Uri http://<device>/ssl/bogenCA.crt -OutFile  
$env:TEMP\bogenCA.crt
```

If you wish to validate the certificate before importing it, execute the following command after retrieving the CRT file:

```
(New-Object -TypeName Security.Cryptography.X509Certificates.X509Certificate2  
-ArgumentList "$env:temp\bogenCA.crt").GetCertHashString()
```

The output will be the hash value (i.e., thumbprint) of the downloaded certificate, which should match the following (as of the current release):

```
0A8248F69D970F8DD855D0E0592972DA64B1A845
```

To install the certificate for the current user, execute the following command:

```
Import-Certificate -CertStoreLocation cert:\CurrentUser\Root -FilePath  
$env:TEMP\bogenCA.crt
```

That command installs the CA certificate into the CurrentUser certificate store, which only applies to the current user. To install the certificate for all users on this machine, which requires administrator privileges to execute, execute the following command:

```
Import-Certificate -CertStoreLocation cert:\LocalMachine\Root -FilePath  
$env:TEMP\bogenCA.crt
```

Note: 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 Certification Authority on Mac System

To download and install the Certification Authority on a Mac:

- 1 From your Chrome or Edge browser, type `http://<device>/ssl/bogenCA.crt` in the address bar, where *<device>* is the Nyquist system device's IP address or DNS name (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 browser and log in to the Nyquist web application.

Installing Certification Authority on an Android Device

Note: The Android device WiFi must be connected to the same network as the Nyquist Server.

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

- 1 From your Chrome or Edge browser, type `http://<device>/ssl/bogenCA.crt` in the address bar, where `<device>` is the Nyquist device's IP address or DNS name (for example, `http://192.168.1.0/ssl/bogenCA.crt`).
- 2 If prompted, verify your identity (e.g., enter your PIN or fingerprint).
- 3 Type a certificate name (e.g., "Bogen CA"), specify "VPN and apps" under "Used for", and select **OK** to install the certificate.

Installing Certification Authority on an iOS Device

Note: The iOS device WiFi must be connected to the same network as the Nyquist Server.

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

- 1 From your Safari browser, type `http://<device>/ssl/bogenCA.crt` in the address bar, where `<device>` is the Nyquist device's IP address (for example, `http://192.168.1.0/ssl/bogenCA.crt`).
- 2 Select **Go**.
- 3 Select **Allow** when prompted to allow the download.
- 4 Select **Close** after the notification that a profile was downloaded.
- 5 Select **Settings > General > VPN & Device Management**.
- 6 Select the **Bogen CA** certificate under **DOWNLOADED PROFILE**.
- 7 Select **Install**.
- 8 If prompted, enter your passcode.
- 9 On the **Warning** page, select **Install**.
- 10 Select **Done**.
- 11 Select **Settings > General > About > Certificate Trust Settings**.
- 12 Under **ENABLE FULL TRUST FOR ROOT CERTIFICATES**, enable the switch next to **Bogen CA**.

Viewing the Certificate

The following steps outline how to view and verify the TLS/SSL certificate that was provided by the Nyquist device.

Important: The user interfaces for browsers change not infrequently, so the exact details may vary from what is described in the following instructions. Some security packages can also affect the information available, such as antivirus software that injects its own CA certificate in lieu of the website's actual certificate, which has the effect of hiding the actual certificate from the user.

- 1 Browse to the Bogen device's web application in your browser (using Safari on iOS, Chrome or Edge on all other platforms).
- 2 Select the lock icon on the address bar of the browser (to the left of the URL).
- 3 Display the CA certificate by following one of the following steps:
 - a) On the Chrome or Edge browser, select **Connection is secure**, then select either **Certificate is valid**, the certificate icon, or **Certificate information** to display the Certificate Viewer dialog. Select the Details tab, then Bogen CA in the Certificate Hierarchy section.
 - b) On the Safari browser *[MacOS or iOS only]*, select **Show Certificate** in the window that appears.
 - c) As an alternative on Android devices, select the Android system's **Settings > Biometrics and security > Other security settings > View security certificates**, select the **USER** tab, and select the Bogen certificate.
- 4 Verify that the Bogen CA certificate is selected and not the server certificate (the server certificate's name will be an IP address). To verify that the certificate is valid, verify that the displayed fingerprint values match the following:

SHA-1: 0A 82 48 F6 9D 97 0F 8D D8 55 D0 E0 59 29 72 DA 64 B1 A8 45

SHA-256: 6B D0 D5 8D C8 F7 E8 03 9E A3 F1 52 32 1D 9C 5C 58 8B 4E FA DF 03 43 64 34 C2 6C 63 C5 4A AC 46

Appendix B: Acronyms and Abbreviations

A

AD	Active Directory
ANS	Ambient Noise Sensor
API	Application Programming Interface
ATA	Analog Telephone Adapter
Auth	Authorization

B

BTN	Billing Telephone Number
-----	--------------------------

C

CA	Certification Authority
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 System Access
DN	Distinguished Name
DNS	Domain Name System

DSP Digital Signal Processing
DTMF Dual Tone Multi-Frequency
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
LDAP	Lightweight Directory Access Protocol
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
NWS	National Weather Service

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
REST	Representational State Transfer
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
WBC	Wall Baffle Combo Speaker with Integrated LED Message Display and Flasher (NQ-S1810WBC)

X

XML	Extensible Markup Language
-----	----------------------------

Y

Z

Appendix C: Nyquist DTMF Feature Dialing Codes

Most features of the Nyquist system can be accessed via DTMF dial codes entered from a station's keypad. The availability of a particular feature dial code is determined and restricted by the DTMF code's required CoS and the station's CoS assignments.

For a list of alternatives to some of the DTMF codes listed here (e.g., codes that do not use the pound/hashtag symbol, #), see "Alternate Dialing Codes" on page 643.

Note: DTMF codes marked with ^a support terminating the DTMF code with a # symbol to avoid the 5-second delay while the DISA application waits for additional digits to be entered.

Alarm/Tone Activation

Description	DTMF Code	Required CoS
Start Alarm specified by {DTMF-code}	*91{DTMF-code} ^a	Activate Alarm Signals
	0000091 <i>Note:</i> You will be prompted to enter the Alarm's DTMF code.	Activate Alarm Signals
Start Tone specified by {DTMF-code}, play to {zone} <i>Note:</i> *{zone} is optional.	*96{DTMF-code}*{zone} ^a	Manually Activate Tone Signals
	0000096{DTMF-code}*{zone}	Manually Activate Tone Signals
Start Tone specified by {DTMF-code}	*96{DTMF-code}	Manually Activate Tone Signals
Prompts user to enter a tone number and tone parameters (e.g., times to play) and starts the tone at all Time-type zones	*96	Manually Activate Tone Signals

a. The DTMF code can be terminated with a # symbol to avoid the 5-second delay while the DISA application waits for additional digits to be entered.

Announcements

Description	DTMF Code	Required CoS
Start Announcement specified by {DTMF-code} to station's configured "Announcement Zone" <i>Note: If "Announcement Zone" is not configured, the caller will be prompted to enter a zone number.</i>	*92{DTMF-code}	All-Call Page
	0000092{DTMF-code}	All-Call Page
Start Announcement specified by {DTMF-code}, play to {zone}	*92{DTMF-code}*{zone} ^a	Zone Paging
	0000092{DTMF-code}*{zone}	Zone Paging
Start Announcement specified by {DTMF-code} to all Facilities (including local facility)	*97{DTMF-code}#0	Multi-Site Paging Inter-Facility Call/Page
Start Announcement specified by {DTMF-code} to Facility specified by {facility-page-number}	*97{DTMF-code}#{facility-page-number}	Inter-Facility Call/Page
Start Announcement specified by {DTMF-code} to dialed Facilities <i>Note: Use "0" for {facility-page-number} to include the local facility.</i> <i>Note: The number of dialed digits cannot exceed 70 digits.</i>	*97{DTMF-code}#{facility-page-number}*{facility-page-number}	Multi-Site Paging Inter-Facility Call/Page
Stop Announcement currently playing to {zone-number}	*93{zone-number} ^a	(none)
	0000093{zone-number}	(none)

Calling

Description	DTMF Code	Required CoS
Call {extension} speaker (intercom, auto-answer)	{extension}	Call Any Station
Call {extension} ringer (telephonic, ringing)	*{extension}	Call Any Station
Join conversation at {extension}	*#{extension}	Join Conversation
Call {extension} at {facility-page-number}	###{facility-page-number}*{extension}	Inter-Facility Call/Page
Place long distance call with area code (AAA = Area code, NNNNNNN = number)	981AAANNNNNNN	Outside Access rights
Place local ten-digit call with area code	98AAANNNNNNN	Outside Access rights
Place local seven-digit call	98NNNNNNN	Outside Access rights
Place 911 emergency call	911	(none)
<i>Note:</i> Based on Station's 911 Route setting, call may be directed to Admin Station, PSTN-based 911, or denied.	98911	(none)
Place Emergency call to designated Admin station	****	(none)
Place call to PBX system (via SIP Trunk) by dialing {DTMF-codes}	***{DTMF-codes}	Outside Access rights
<i>Note:</i> {DTMF-codes} can be as simple as an extension number on the attached PBX system.		

Call Forwarding

Description	DTMF Code	Required CoS
Call Forwarding Menu	970 ^a	Call Forwarding
All-Calls (CFALL)	971{extension}	Call Forwarding
When Busy (CFBS)	972{extension}	Call Forwarding
When No Answer (CFNA)	973{extension}	Call Forwarding
When Busy or No Answer (CNBN)	974{extension}	Call Forwarding
Cancel Call Forwarding	975	Call Forwarding
Call Forwarding Status (Caller only)	976	Call Forwarding
Call Forwarding Status (All users)	977	Call Forwarding

Call Parking/Call Pickup

Description	DTMF Code	Required CoS
Park call (during call)	#72	(none)
<i>Note:</i> 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 .		
Call pickup {extension} when ringing	7*{extension} ^a	Remote Pickup

Call Transfer

Description	DTMF Code	Required CoS
Blind transfer (during call)	#1{extension}	Call Transfer
Attended transfer (during call)	*1{extension}	Call Transfer
Complete attended transfer, dropping out of call	*2	Call Transfer
Complete attended transfer, but stay in the call	*3 ^a	Call Transfer
Swap to the other party (during attended transfer)	*4	Call Transfer
Transfer (drop) call from Speaker to associated Phone	*3 ^a	Call Transfer
Transfer (drop) call from Speaker to associated Phone	####	Call Transfer
Transfer call from Phone to associated Speaker	#1{speaker-extension}	Call Transfer

Conferencing

Description	DTMF Code	Required CoS
Create/Enter Dynamic Conference {number}	**{number}	Conference Admin Conference User
<p><i>Note:</i> 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.</p>		
Start system playback of list of created conferences that includes the conference number and the extension that created the conference	**0	(none)

Monitoring/Recording

Description	DTMF Code	Required CoS
Monitor call or location at {extension} <i>Note: Spy Mode monitoring cannot be used on a station that has been set to Privacy Mode.</i>	978{extension} ^a	Monitor Calls/Locations
Enable "spy mode" (MUTE) during call monitoring	4	(none)
Enable "whisper mode" during call monitoring	5	(none)
Enable "barge mode" during call monitoring	6	(none)
Record Message (Announcement)	*990 ^a	All-Call Paging
<p><i>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.</i></p> <p>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.</p>		
Playback recorded calls MENU: 1–Emergency, 2–Monitored, 3–Urgent, 4–Standard	999	Manage Recordings
Start/Stop recording (DTMF used during a call)	*3	Record Calls

Paging

Note: The “##” prefix is used to indicate multi-facility paging operations.

Description	DTMF Code	Required CoS
Multi-Site Emergency All-Call Page	##0911 ^a	Emergency All-Call Multi-Site Paging
Multi-Site All Call Page	##0	All-Call Paging Multi-Site Paging
Emergency All-Call Page	#0911 ^a	Emergency All-Call
Multi-Facility Emergency All-Call Page	##0912{facility-page-number}*{facility-page-number}...	Emergency All-Call Multi-Site Paging
Emergency All-Call Page	951	Emergency All-Call
All-Call Page	#0 ^a	All-Call Paging
	#00	All-Call Paging
	0000000	All-Call Paging
Real-time All-Call Page that belongs to a queue	#0* ^a	All-Call Paging
	0000001 ^a	All-Call Paging
Page to {zone}	#{zone} ^a	Zone Paging
	0000099{zone} ^a	Zone Paging
Real-time Page to {zone} that belongs to a queue	#{zone}* ^a	Zone Paging

Paging (Continued)

Note: The "##" prefix is used to indicate multi-facility paging operations.

Description	DTMF Code	Required CoS
All-Call Page to {facility-page-number}	##{facility-page-number}	Inter-Facility Call/Page
Multi-Facility All-Call Page	##{facility-page-number}*{facility-page-number}...	Inter-Facility Call/Page
Zone Page to {zone-number} at {facility-page-number}	##{facility-page-number}#{zone-number}	Inter-Facility Call/Page
Real-time page to {zone-number} that belongs to a queue at {facility-page-number}	##{facility-page-number}#{zone-number}*	Inter-Facility Call/Page
Record page; system will prompt for Zone Number	*991	Zone Paging
Record page for {zone-number}	*991*{zone-number} ^a	Zone Paging
Cancel Recorded Page <i>Note: Only works if made from the same extension that created the recorded page.</i>	*992	Zone Paging
Cancel Recorded Page for {zone-number} <i>Note: Only works if made from the same extension that created the recorded page.</i>	*992*{zone-number} ^a	Zone Paging

Voicemail

Description	DTMF Code	Required CoS
Voicemail for current caller	900	Voicemail
Voicemail for specified {extension}	904{extension}	Voicemail

Voicemail (Continued)

Description	DTMF Code	Required CoS
Leave voicemail for specified {extension}	904{extension}*	Voicemail

Walking CoS

Description	DTMF Code	Required CoS
Current IP phone's extension becomes {extension} <i>Note: If Auth Code is set to 0000 in the Admin Web UI's System Parameters, this feature is disabled.</i>	3*{auth-code}*{extension}	Walking Class of Service

Dial Codes Used for Simulating Calls to Admin Station from Station Call Switches

Description	DTMF Code	Required CoS
Normal call to admin <i>Note: During the Check-In process, a Normal call starts the check-in process for a station.</i>	0	(none)
Emergency call to admin	*0	(none)
Urgent call to admin	*00	(none)
Outside line calling in (uses night-ring logic)	*000	(none)

Routines

Description	DTMF Code	Required CoS
Execute Routine with {routine-DTMF-code} <i>Note:</i> Only routines with Allow DTMF can be executed from the Admin Phone.	*94{routine-DTMF-code} ^a	Execute Routines
	0000094{routine-DTMF-code}	Execute Routines
Execute Routine with {routine-DTMF-code} specifying values for parameters \$cmdParam1 and \$cmd-Param2. <i>Note:</i> Only routines with Allow DTMF can be executed from the Admin Phone.	*94{routine-DTMF-code}*{parameter1}*{parameter2}	Execute Routine
	0000094{routine-DTMF-code}*{parameter1}*{parameter2}	Execute Routine
Stop Routine with {routine-DTMF-code} <i>Note:</i> If the Allow DTMF parameter for the specified routine is set to No , you will be prompted to enter the system password.	*95{routine-DTMF-code} ^a	Execute Routines
	0000095{routine-DTMF-code}	Execute Routines

Audio Distribution

Description	DTMF Code	Required CoS
Start Audio Distribution where {DTMF-code} is the DTMF code for the desired Audio Distribution	987*{DTMF-code} ^a	Audio Distribution
	00000987{DTMF-code}	Audio Distribution
Stop Audio Distribution where {DTMF-code} is the DTMF code for the desired Audio Distribution	980*{DTMF-code} ^a	Audio Distribution
	00000980{DTMF-code}	Audio Distribution
Stop ALL Scheduled Audio	920	Audio Distribution

Miscellaneous Dial Codes

Description	DTMF Code	Required CoS
Restart Nyquist system server <i>Note: User is prompted for System Password.</i>	#*349	(none)
Toggle Audio Distribution to associated speaker	*9 ^a	(none)
Disable Audio	0000097 ^a	Disable Audio
Enable Audio	0000098 ^a	Enable Audio
Stop Scheduled Audio	920	Audio Distribution
Close {contact-number} on I/O Controller {extension} (For example, dialing 942#120#1 closes contact number 1 on I/O Controller 120.)	942#{extension}#{contact-number}	Manage Output Contacts
Open {contact-number} on I/O Controller {extension} <i>Note: For example, dialing 943#120#1 opens contact number 1 on I/O Controller 120.</i>	943#{extension}#{contact-number}	Manage Output Contacts
Request a callback during a call	*7	Call Any Station
Cancel a callback request during a call	*8	Call Any Station
Request a callback from a specific extension	*7{extension} ^a	Call Any Station
Cancel a callback request from a specific extension	*8{extension} ^a	Call Any Station

Miscellaneous Dial Codes (Continued)

Description	DTMF Code	Required CoS
Start Nyquist Features on Remote Facilities	##*{facility-page-number}*{feature-DTMF-digits}	Inter-Facility Features
Examples:		(none)
Start Announcement 1 on Facility 1	##*1*00000921	(none)
Start Audio Distribution 6 on Facility 5	##*5*000009876	(none)
Execute Routine 5 on Facility 10	##*10*00000945	(none)

Alternate Dialing Codes

If a PBX is not able to pass through the pound sign (or hashtag), #, in the dialing digits, alternative dialing codes may be used to replace Nyquist extensions that start with #.

Nyquist Feature	Dial Code	Alternative Dial Code
All-Call Page	#0	0000000
Emergency All-Call Page	#0911	951
Zone Page	# {zone}	0000099 {zone}
Start Alarm	*91 {DTMF-code} ^a	0000091 {DTMF-code}
Start Tone to zone	*96 {DTMF-code} * {zone} ^a	0000096 {DTMF-code} * {zone}
Start Tone to all Time-type zones	*96 {DTMF-code}	0000096 {DTMF-code}
Start Announcement	*92 {DTMF-code}	0000092 {DTMF-code}
Start Announcement to zone	*92 {DTMF-code} * {zone} ^a	0000092 {DTMF-code} * {zone}

Nyquist Feature	Dial Code	Alternative Dial Code
Stop Announcement	*93{zone} ^a	0000093{zone}
Start Audio Distribution	987*{DTMF-code}	00000987{DTMF-code}
Stop Audio Distribution	980*{DTMF-code}	00000980{DTMF-code}
Start Routine	*94{DTMF-code}	0000094{DTMF-code}
Start Routine with parameters	*94{DTMF-code}*{parameter1}*{parameter2}	0000094{DTMF-code}*{parameter1}*{parameter2}
Stop Routine	*95{DTMF-code}	0000095{DTMF-code}
Restart Nyquist system server <i>Note: User is prompted for System Password.</i>	##*349	00000349

Appendix D: 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 Product LAK will not reset this expiration date. However, 3-year Extended System Software Update licenses can be purchased and 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 646.

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 talkback, or intercom, capability to a system on a concurrent intercom call basis (i.e., one license for each concurrent intercom call).

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 645).

Map-Based Paging License (NQ-C4000MBP)

This LAK uses the format FCMX-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 FCZX-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 645).

Queued Paging/Page Stacking License (NQ-C4000QPL)

This LAK uses the format FCQX-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 645.)

Text-To-Speech License (NQ-C4000TTS)

This LAK uses the format FCTX-XXXX-XXXX-XXXX-XXXX.

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.

Sound Masking License (NQ-C4000SML)

This LAK uses the format FCSM-XXXX-XXXX-XXXX-XXXX.

This license is required to enable the Sound Masking feature.

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 upgraded 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 3/31/2024, installing this upgrade will extend it to 3/31/2025.

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 3/31/2024, installing this upgrade will extend it to 3/31/2025.

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 3/31/2024, installing this upgrade will extend it to 3/31/2025.

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