



VoIP Speaker Configuration Guide

NQ-S1810CT-G2, NQ-S1810WT-G2

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Configuring the Nyquist VoIP Speakers

The Nyquist VoIP Ceiling Speaker Gen 2 (NQ-S1810CT-G2) and Nyquist VoIP Wall Baffle Speaker Gen 2 (NQ-S1811WT-G2) are VoIP talkback speakers designed to work with the Nyquist Series IP network-based intercom and paging solution.

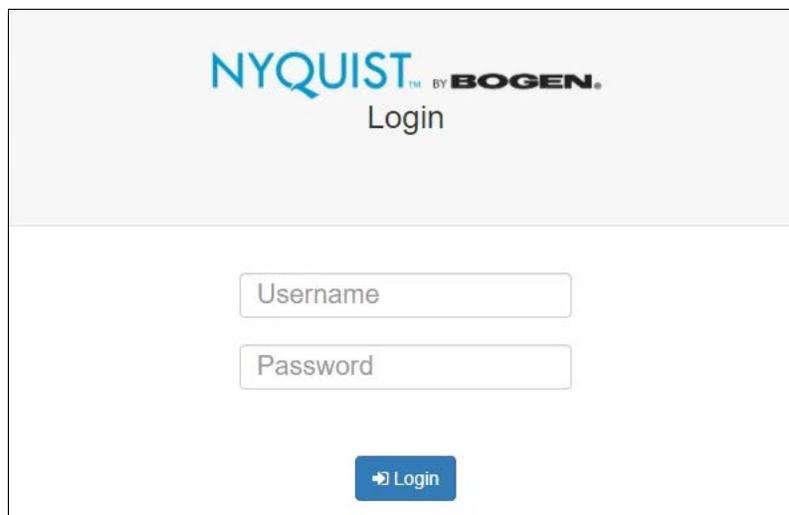
The ceiling talkback speaker assembly consists of an 8" cone speaker and VoIP module preassembled onto a 13" steel ceiling grille painted with bright white enamel.

The VoIP wall baffle talkback speaker assembly consists of an 8" cone speaker and VoIP module preassembled onto a bright white injection-molded wall baffle speaker enclosure.

Both types of speakers are 802.3af-compliant and are designed to facilitate rapid and efficient deployment using existing network Power over Ethernet (PoE) ports. They also have a Form-C relay for controlling third-party devices. These VoIP speakers enable ease of placement wherever needed within a facility.

A short press of the appliance's **Reset** button reboots the device. If you press the **Reset** button for 10 seconds, the appliance returns to the factory default configuration settings. (Returning to the default configuration settings does not change the appliance's firmware.)

The Nyquist server can automatically discover and configure the Nyquist VoIP speakers, but you can also manage the device and manually configure some settings through the web-based user interface (web UI). The following sections describe the process for manual configuration. For information about using Nyquist's automatic configuration process, refer to the *Nyquist System Administrator Guide*.



The image shows a web-based login interface for a Nyquist appliance. At the top, the logo reads "NYQUIST™ BY BOGEN®" in blue and black text, with "Login" centered below it. The main area contains two white input boxes with rounded corners: the top one is labeled "Username" and the bottom one is labeled "Password". Below these boxes is a blue button with a white right-pointing arrow and the text "Login".

Figure 1. Nyquist Appliance Login

To access the appliance's UI:

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

- 1 Access the appliance's web UI by doing one of the following:
 - a) On your web browser, enter the IP address for the appliance as the URL.
 - b) From the Nyquist web UI navigation bar, select **Stations**, select **Stations Status**, navigate to the device that you want to configure, and then select the **Link** icon.
- 2 At the Nyquist Appliance Login page, enter username and password, and then select **Login**.

The default username is **admin**; the default password is **bogen**.

The dashboard for the selected appliance appears.

Using the Dashboard

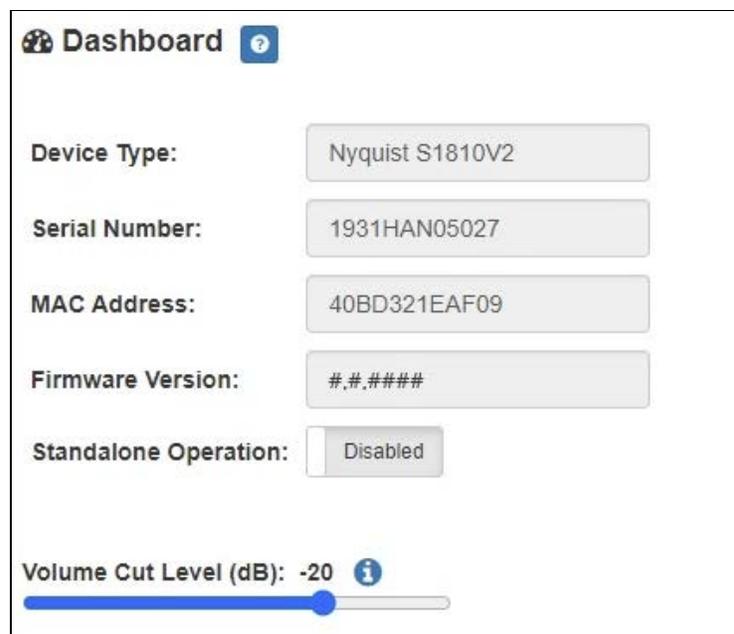


Figure 2. Nyquist Speaker Dashboard

The dashboard displays the following fields:

Table 1. Appliance Dashboard Fields

Device Type	Identifies the model of this device.
Serial Number	Identifies the serial number for the device.
MAC Address	Identifies the Media Access Control (MAC) address, which is a unique identifier assigned to network interfaces for communications on the physical network segment.
Firmware Version	Identifies the firmware version installed on the station.
Standalone Operation	Enables or disables Standalone mode.
Volume Cut Level (dB)	Specifies a temporary volume setting for the speaker during the current intercom call or page. <i>Note:</i> This is a temporary adjustment that allows the user to experiment with the loudness of the speaker and will be reset to the normal setting on subsequent calls. To make permanent adjustments, change the station-specific cut level settings on the Nyquist System Controller. The value can be adjusted between -42 and 0 dB.

The following buttons are available at the top of all pages in the application.

Table 2. Appliance Dashboard Buttons

Dashboard	Displays the dashboard.
Configuration Settings	Accesses the Configuration Settings page where you can view various options or select to receive configuration settings from the server.
Network Settings	Accesses the Network Settings page where you can view and set network settings, such as the static IP address.
Firmware Update	Accesses the Firmware Update page where you can view the current Nyquist version, update firmware to a new version, the configuration to factory defaults, and reboot the appliance.
Logs	Accesses log files, which record either events or messages that occur when software runs and are used when troubleshooting the appliance.
DSP	Accesses the DSP page where you can view and set parameters for Digital Signal Processing (DSP).

Table 2. Appliance Dashboard Buttons (Continued)

Help	Accesses the appliance's online help.
Manual	Displays the <i>appliance's configuration manual</i> .
Logout	Logs out of the appliance's dashboard.

Updating Firmware

When you select **Firmware Update** from the appliance's web UI, the Firmware Update page appears. From this page you can determine which Nyquist firmware version the appliance is using and if an update is available. You can also load a firmware release, install the loaded firmware, restore the configuration to factory defaults, and reboot the appliance.

Note: 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 different from the one installed on the appliance, an automatic firmware update occurs unless the **Firmware** parameter for the station is left blank. Refer to the *Nyquist System Administrator Guide* for more information.



Figure 3. Firmware Update Page

To use the Firmware Update page:

- 1 On the appliance web UI's main page, select **Firmware Update** to view or update the firmware version.
- 2 If the device is in Standalone mode, selecting the **Check for Updates** button checks the Bogen website for the latest firmware version available. If a version newer than the one currently installed is found, it is downloaded to the appliance.
- 3 If you already have a firmware file you would like to install to the appliance, select **Upload Firmware** to upload the firmware file from your computer to the appliance. A popup screen appears that allows you to select the file that you want to upload. You can navigate to the file's location. After you select the file, select **Upload**.
- 4 The page displays the uploaded firmware version ("New Nyquist Version") and an **Update Firmware** button appears. Select this button if you want to update the appliance's firmware to the uploaded version.
- 5 If you want to return your appliance to its original factory configuration, select **Restore Factory Settings**.
- 6 Select **Reboot Appliance** to restart your appliance.

Table 3. Firmware Update settings

Current Nyquist Version	Shows the version of the appliance's currently installed firmware.
New Nyquist Version	Shows the version of the firmware that has been loaded, though not installed, onto the appliance.
Update Firmware	Available only when a new firmware version has been loaded onto the appliance (as specified in New Nyquist Version). Installs the loaded firmware. A reboot may be required after installation.
Upload Firmware	Prompts the user to specify a firmware file, which will then be loaded (though not installed) onto the appliance. <i>Note:</i> To obtain the firmware file for a specific version, please contact Bogen Customer Service.
Check for Updates	Available only when the appliance is configured for Standalone mode. Checks the Bogen website for the latest firmware version available and, if it finds a version newer than what is currently installed, downloads it to the appliance.

Table 3. Firmware Update settings

Restore Factory Settings	Returns the appliance to its original factory configuration. <i>Note:</i> This does not install the original appliance firmware. The firmware will not be changed.
Reboot Appliance	Restarts the appliance.

Network Settings Tab Parameters

Network settings can be configured dynamically by the Nyquist server or manually by using the appliance's web UI.

To manually configure network settings:

- 1 On the appliance web UI's main page, select **Network Settings**.
- 2 Select your desired network settings.
- 3 Select **Save**.

Network Settings ?

IP Address: 172.31.19.220

Netmask: 255.255.255.0

Gateway: 172.31.19.254

VLAN ID: 9

VLAN Priority: 0 - Best Effort ▾

NTP Server: 172.31.19.203

TFTP Server: 172.31.19.203

TFTP Server from DHCP: No ▾

DHCP Enabled: Yes ▾

Reboot Appliance: No ▾

Save

Figure 4. Network Settings

Network settings are described in the following table:

Table 4. Network Settings

IP Address	Identifies the IP address assigned to the appliance.
Netmask	Identifies the subnetwork subdivision of an IP network.
Gateway	Identifies the address, or route, for the default gateway.
VLAN ID	Identifies the Virtual Local Area Network (VLAN) for this appliance. Values range from 0 to 4094.
VLAN Priority	Identifies the priority of the network traffic on the VLAN. Priority can range from 0 through 7.

Table 4. Network Settings (Continued)

NTP Server	<p>Identifies the IP address or the domain name of the Network Time Protocol (NTP) Server.</p> <p><i>Note:</i> This field is only editable when Standalone Operation is enabled.</p>
TFTP Server	<p>Identifies the host name or IP address of the Trivial File Transfer Protocol (TFTP) server.</p> <p>The specified TFTP server can be used to automatically set this device's Configuration settings via the Get Configuration from Server button.</p> <p>If TFTP Server from DHCP (see below) is set to "Yes", this value will be auto-configured via DHCP option 66, assuming the DHCP server has been configured to provide option 66. For details, see the documentation for your DHCP server.</p> <p><i>Note:</i> A TFTP server runs on the Nyquist server on port 69 (the standard TFTP port) and the optional Nyquist DHCP service automatically provides this TFTP address via option 66.</p> <p><i>Note:</i> If this value is unspecified, the TFTP Server from DHCP will automatically be set to "Yes", this field will become read-only, and DHCP will be used to configure this setting. To change this value, the TFTP Server from DHCP setting must be set to No, which makes the field editable.</p> <p><i>Note:</i> This setting is not available when Standalone Operation is enabled.</p>
TFTP Server from DHCP	<p>"Yes" means the device will use the DHCP option 66 value to retrieve an address for the TFTP Server from DHCP.</p> <p>"No" means the device will ignore the DHCP option 66 value and use the manually configured value of the TFTP Server (see above).</p> <p><i>Note:</i> This setting is not available when Standalone Operation is enabled.</p>

Table 4. Network Settings (Continued)

DHCP Enabled	Indicates if the device is enabled to use DHCP to retrieve its IP configuration.
Reboot Appliance	Indicates that this appliance should reboot when the Save button is clicked.

Configuration Settings Tab Parameters

The easiest way to configure Nyquist appliances is to obtain configuration settings from the Nyquist server by selecting **Get Configuration From Server**. However, you can manually configure an appliance through the appliance's Web UI when Standalone Operation is enabled (see "Standalone Operation Configuration Settings" on page 11).

To view the Nyquist appliance configuration:

- 1 On the appliance Web UI's main page, select **Configuration Settings**.
- 2 View the settings as described in Table 5 on page 10 for normal configuration, or modify the settings as described in "Standalone Operation Configuration Settings" on page 11 for Standalone Operation configuration.
- 3 If changes were made (Standalone Operation only), click the **Save Configuration Settings** and/or **Save Multicast Addresses** buttons to save your changes.

	IP Address	Port Number	Cut Level	Station List
Emergency-All-Call:	239.0.1.1	61001	-21	1
All-Call:	239.0.1.2	61002	-21	1
Audio Distribution:	239.0.1.3	61003	-24	1

Port Number	Port Type	Account Id	Local Port	Username
1	Digital-Call-Switch-With-Speaker	sip:0110@172.31.19.202	5060	0110

Figure 5. Appliance Configuration Settings (Standalone disabled)

The following table describes the **Configuration Settings** tab settings:

Table 5. Configuration Settings (Standalone disabled)

Get Configuration from Server	Retrieves configuration settings (i.e., web username, server, and local port) from the TFTP server specified in the Network Settings (see " <i>Network Settings Tab Parameters</i> " on page 6).
Web Username	Identifies the username of the current user.
Emergency-All-Call	Identifies the IP address, port number, cut level (volume), and station list used for emergency all-call pages.
All-Call	Identifies the IP address, port number, cut level (volume), and station list used for all-call pages.
Audio Distribution	Identifies the IP address, port number, cut level (volume), and station list used for audio distribution.
Multicast #	Identifies the IP address, port number, cut level (volume), and station list used for the multicast audio stream of one (or more) zones.

The **Configuration Settings** tab also displays the following information for each **Device Station** attached to the amplifier:

Port Number	Identifies the port number of the appliance.
Port Type	Identifies the device type to which the port connects.
Account ID	Identifies the SIP account (IP address) associated with the device preceded by the extension of the device associated with this port.
Local Port	Identifies the port used for SIP.
Username	Identifies the username or extension for the station associated with the port.

Standalone Operation Configuration Settings

⚙️ Configuration Settings 🔒

Device Type: NQ-S1810-E7020 VoIP Speaker

Device Name: Nyquist S810V2

Web Username: admin

Web Password:

Web Confirm Password:

Time Zone: New York

Output Power (Watts): 1/2

Enable SIP Calls: Yes

External Relay Trigger: Disabled

SIP Server Address: 192.168.5.99

SIP Network Port: 5060

SIP Codecs: G722 ulaw alaw

SIP Extension: 501

SIP Username: 501

SIP Password: bogen

Intercom Cut Level: -6 dB

Save Configuration Settings

👥 Multicast Addresses +

Sorting: Disabled

	Multicast IP Address	Multicast Port Number	Codec	Channels	Cut Level (dB)
+	239.1.1.1	6000	G711 u-law	Speaker	-20

Note: The following codecs are supported for multicast: G711 u-law, G711 a-law, G722, and OPUS.

Save Multicast Addresses

Figure 6. Appliance Configuration Settings (Standalone enabled)

The following table describes the **Configuration Settings** tab settings when Standalone Operation is enabled for this device:

Table 6. Configuration Settings (Standalone enabled)

Device Type	Displays the type of this device.
Device Name	Provides a name for this device.
Web Username	Specifies a web username for this appliance.
Web Password	Specifies a web password for logging into the appliance.

Table 6. Configuration Settings (Standalone enabled)

Web Confirm Password	Re-enter the password used to log into the appliance.
Time Zone	Specifies the time zone in which the device resides.
Output Power (Watts)	Specifies the output power for the amplifier in Watts. Valid values are: 1/8, 1/4, 1/2, 1, 2, and 4.
Enable SIP Calls	Enables this device to receive one-way SIP calls, wherein only the caller can be heard (such as announcements). If enabled, a number of SIP-related configuration settings are displayed.
SIP Server Address^a	Specifies the IP address of the SIP Registration Server with which the device will register.
SIP Codecs^a	Displays a read-only list of codecs allowed on SIP sessions.
SIP Extension^a	Specifies the SIP extension for this device. The extension, along with the IP address, is used to specify the URI used to place a SIP call to this extension: <code>sip:<extension>@<local_ip_address></code>
SIP Network Port^a	Specifies the IP port on which to communicate with the SIP Registration Server (typically 5060).
SIP User Name^a	Specifies the SIP user name used to register with the SIP server.
SIP Password^a	Specifies the SIP registration password used to register with the SIP server.
Intercom Cut Level^a	Specifies the output level of the speaker. This can be a value from -42 and 0 dB. The default value is -20 dB. <i>Note:</i> To modify, click on the value, adjust the slider on the popup using the cursor keys or mouse, and click the check box button.

a. Available only when Enable SIP Calls has a value of Yes.

The following parameters appear for each Multicast Address configured for this device.

Multicast IP Address	Specifies the multicast IP address on which to receive audio streams.
Multicast Port Number	Specifies the multicast port on which to receive audio streams.
Codec	<p>Specifies the codec to be used when decoding audio. Select one of the following values:</p> <ul style="list-style-type: none">• G711 u-law<ul style="list-style-type: none">• Intercom call quality• A narrowband audio codec that provides toll-quality audio at 64 kbps. The u-law version is primarily used in North America and Japan.• G711 a-law<ul style="list-style-type: none">• Intercom call quality• A narrowband audio codec that provides toll-quality audio at 64 kbps. The a-law version is primarily used in most countries outside of North America and Japan.• G722<ul style="list-style-type: none">• Tone and paging quality• A wideband audio codec operating at 48, 56, and 64 kbps.• OPUS<ul style="list-style-type: none">• Music quality• An audio codec format designed for speech and general audio, supporting low latency, constant and variable bitrate encoding (6 to 510 kbps), and five sampling rates (from 8 to 48 kHz).

Channels

Channel(s) on which the audio streams will be output.

One or more of the following values:

- Speaker

Tip: Fine tuning of levels per output channel can be adjusted using DSP settings.

Cut Level (dB)

Specifies the cut level for the audio stream.

This can be a value from -70 to 0 dB.

The default value is -20 dB.

Note: To modify, click on the value, adjust the slider on the popup using the cursor keys or mouse, and click the check box button.

Note: A maximum of 24 multicast entries is supported.

Multicast Addresses should be ordered by priority, highest priority first. If multiple streams are active on the same channel simultaneously, the one with the highest priority will be played. Set the **Sorting** switch to Enabled and drag entries using the 4-way arrow symbols to drag entries up and down to rearrange the priorities.

Accessing Log Files

A log file records events and messages that occur when software runs, to be used when troubleshooting the appliance. From the appliance's web-based UI, log files can be viewed directly or exported via download to your PC, Mac, or Android device, where they can be copied to removable media or attached to an email for technical support.

To view a log file:

- 1 On the appliance Web UI's main page, select **Logs**.
- 2 From the drop-down menu, select the log that you want to view.
Multiple versions of the same log, and zipped copies of the log, may be available.
- 3 To export the file, select **Export**.
A link to a .txt file appears in the browser's lower left corner.



Figure 7. Logs

Available logs are described in the following table. If a log file is empty, however, it will not appear in the drop-down list of available logs.

Table 7. Logs

Log	Description
ampws.log	Contains information about protection status and logs protection events with temperature information at the time of event.
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.
dpkg.log	Contains information that is logged when a package is installed or removed using dpkg command.
faillog	Contains user failed login attempts.
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.
messages	Contains messages generated by Nyquist.
php5-fpm.log	Contains errors generated by the PHP script.
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.
wtmp	Contains historical record of users logins at which terminals, logouts, system events, and current status of the system, and system boot time.

Setting DSP Parameters

When you select DSP from the appliance's web UI, the DSP page appears.

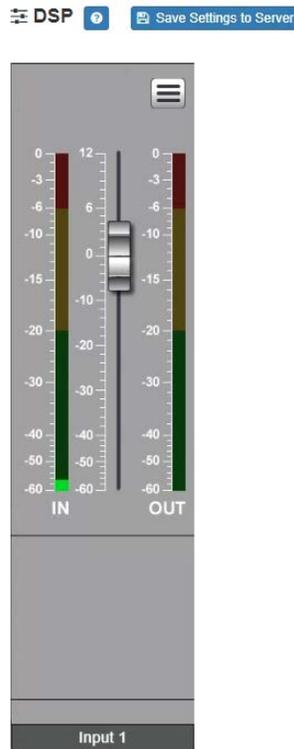


Figure 8. DSP Page

From this page, you can set parameters for DSP, which is a form of processing that uses digital data to simulate characteristics found in analog circuits. With DSP, you can alter analog signals, such as audio signals, that have been converted to a digital format.

You can also select **Save Settings to Server** to back up all configuration settings to the Nyquist server.

The DSP page allows you to adjust the signal level for the Output channel, as well as viewing level indicators for both the input and output signals. Selecting the DSP Features button (hamburger menu above the OUT signal indicator) displays a menu that allows you to access DSP features, as described in the following table.

Table 8. DSP Features

Intercom Tuning	Allows you to specify settings used in intercom calls.
Presets	Allows you to use preset DSP settings for the selected speaker type.

Setting the Channel Level

The Channel Level control is a vertical slider that is adjusted in 1-dB increments and controls the output level for the channel. The Channel Levels can range from -60 to 12 dB. If you place the mouse over the slider, the numerical value of the level appears.

Adjusting Volume Levels

The vertical slider control can be used to adjust the channel's output level in 1-dB increments between -60 and +12 dB. The overall adjusted output level of the channel signal can be viewed on the **OUT** VU meter, marked in 2-dB increments between -60 and 0 dB.

Tip: For best results, use the vertical slider to adjust the input level until you have a strong signal (i.e., within the green and yellow areas on the meter), then adjust the final output levels using the DSP Outputs controls.

To adjust the channel volume level:

- 1 On the appliance Web UI's main page, select **DSP**.
- 2 Use the channel's slider to adjust the volume level.

Knob Adjustments

Many DSP controls use knobs to adjust one or more settings. The value of a knob can be adjusted in one of two ways:

- 1 Click the knob control, hold the mouse button down, and drag the mouse up or down to increase or decrease the value.
- 2 Double-click the knob, type a value into the resulting popup, and click the Save button.

Intercom Tuning

Selecting **Intercom Tuning** from the **Menu** icon on the DSP page displays the Intercom Tuning page.



Figure 9. Intercom Tuning Settings

The Intercom Tuning page has level indicators for input and output signals and contains the following settings (see *Table 9*).

Table 9. Intercom Tuning Settings

Switching Sensitivity	Specifies the input level at which the Admin Phone takes over for the speaker. The range is -90 to -20 dB.
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Presets

There are a number of DSP effects that are used to enhance the quality of the audio signal being played on the VoIP speaker device (though not all of these effects are visible and available for customization). Due to design differences between the VoIP speaker models (e.g., microphone placement), these DSP settings must be customized for each model.

Bogen has created predefined sets of model-specific DSP configurations to customize the signal for each device. These configurations are available via **Presets**.

Note: It is important that the preset corresponding to the speaker model be specified.

Selecting **Presets** from the **Menu** icon on the DSP page displays the Presets page.

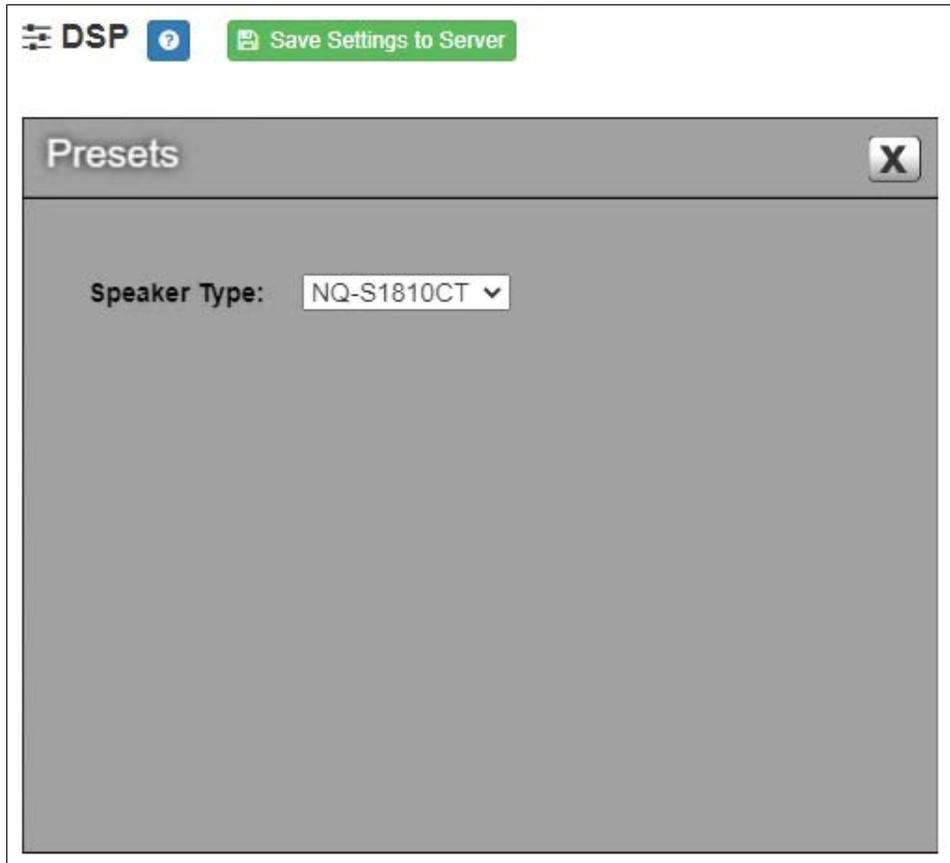


Figure 10. Presets Settings

The Presets page allows you to select the **Speaker Type**.

Table 10. Preset Settings

Speaker Type

Select a predefined Preset configuration from the list of speaker models. Available options are:

- NQ-S1810CT (ceiling-mounted speaker)
- NQ-S1810WT (wall-mounted speaker)