Operating Manual

Genelec Smart IP Manager
Genelec Smart IP Controller



GENELEC®

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1 Introduction

Genelec Smart IP system for installed audio applications can be configured by Smart IP Manager software. This software is specifically designed to be used by installers during system set-up and allows the configuration of almost unlimited numbers of rooms, zones, loudspeakers and audio channels. For daily system management a public API command set allows Smart IP loudspeakers to be integrated into house automation systems – enabling end user control of simple parameters including volume, power on/off, loudspeaker activity and a selection of pre-programmed audio settings.

To help cope with challenging acoustic environments, Smart IP Manager integrates with the loudspeaker's internal DSP to allow analysis and corrective equalisation of any detrimental room acoustics, along with control of delay and level alignment. Internal memory within the speaker then allows instant recall of settings, allowing fast and accurate deployment in any environment.

Take a moment to familiarize yourself with the contents of this manual. In this manual we give suggestions for various types of installations and application scenarios.

We are also ready to help you at any time. For support, first contact your local dealer. Genelec sales network is well trained to help and support you. You can also contact Genelec directly at support@genelec.com

2 Glossary

Abbreviation or term	Explanation
44xx (xx is two numbers)	Family of Smart IP Loudspeakers.
AES67	AES67 is a technical standard for audio over IP and audio over Ethernet interoperability.
Dante	Dante audio is a proprietary audio over IP networking method, providing digital audio distribution over IP networks (www.audinate.com).
DHCP	Dynamic Host Configuration Protocol; used to automatically assigning IP addresses and other communication parameters to devices connected to the network.
IGMP	Internet Group Management Protocol; a communications protocol used by hosts and adjacent routers on networks to establish multicast group memberships. IGMP is an integral part of IP multicast and allows the network to direct multicast transmissions only to hosts that have requested them.
IP	Internet Protocol
PoE	Power-over-Ethernet
QoS	Quality of service (QoS) is the use of technologies that work on a network to control traffic and ensure the performance of critical applications with limited network capacity.
VLAN	Virtual LAN: any broadcast domain that is partitioned and isolated in a computer network at the data link layer.
Zone	Zone is a collection of loudspeakers working together. Zones can have specific independent controls.

3 System Components

The Genelec Smart IP loudspeakers for installed audio applications use power-over-Ethernet (PoE) power and support low-latency high resolution uncompressed multichannel audio-over-IP streams with 32…96 kHz sample rate and 16…24-bit digital word resolution. Smart IP loudspeakers can receive standard multichannel Dante audio streams and AES67 audio streams with maximum eight channels.

Smart IP loudspeaker systems are configured using two software applications: audio streams are configured using Dante Controller software, and loudspeaker settings are configured using Genelec Smart IP Manager software. Both software are needed to completely configure Smart IP loudspeaker installations.

Genelec Smart IP system for installed audio applications consists of the following key components from Genelec:

- PoE-powered Genelec Smart IP loudspeakers
- Genelec Smart IP Manager software for configuring loudspeakers for network settings, acoustic calibrations, and selecting Audio over IP stream input or analogue balanced line input. Available for Windows (www.genelec.com/smart-ip-manager)

Other components you need are

- Standard Ethernet IP switch devices with a PoE or PoE+ (802.3at) output for the Smart IP loudspeakers, or an IP switch with no PoE support and a PoE+ power injector; we recommend **managed IP switch devices** that support IGMP and QoS (these IP protocols are usually advertised in the IP switch documentation when the switch supports them)
- Dante Controller software by Audinate, for configuring audio streams in Dante format or AES67 format
- A device or software transmitting AES67 or Dante audio-over-IP streams
- Standard CAT cabling (CAT5e minimum; recommended CAT 6 or higher and STP cable)

Optional components:

- Genelec Smart IP Controller app – for basic controls after Smart IP system setup (available for iOS and Android through the official application stores)
- API interface in Smart IP loudspeakers – manage Genelec Smart IP loudspeakers using a house automation system. Documentation of Smart IP API interface is available from Genelec.
- Automation system drivers – home automation system drivers for Smart IP loudspeakers are available for several home automations systems at the Genelec web site.
- Wireless router (optional) – enable IGMP snooping in WiFi router to prevent AoIP streams from flooding Wireless communication and preventing control message traffic over WiFi

3.1 Selecting IP switch devices

Genelec Smart IP loudspeakers support Audinate Dante technology. The loudspeaker has two IP addresses, one for receiving the audio-over-IP stream and one for management and monitoring of the loudspeaker.

3.1.1 IP network capacity

Bandwidth requirements for the IP switch device depend on your network size and usage.

Gigabit switches are highly recommended. The use of 100 Mbps or lower IP switches is discouraged as the small capacity will adversely affect the system performance.

We also recommend building a dedicated network (physical or VLAN) intended only for media (audio and video) instead of using the same network for all traffic.

If there is substantial traffic on the network (more than 50% traffic load), we recommend that the switch supports QoS (Quality of Service) and that it is properly configured.

When multicast audio or video streams are present on the network, we recommend that switches are configured to use the IGMP for managing load of the multicast traffic.

All IP switches do not support the PoE functionality needed by Smart IP loudspeakers and therefore can only be used with Smart IP System when separate PoE power injectors are used.

3.1.2 PoE support

Smart IP loudspeakers receive power on the same cable with IP traffic. This technology is called Power over Ethernet. Genelec Smart IP supports standard PoE (13 W power into the device) and PoE+ (24 W into the device) power levels. An IP switch must support the IEEE 802.3at standard to have the capability for PoE+.

A 15W or 30W of power budget for each Genelec loudspeaker is needed. This may have to be manually configured into a PoE-capable IP switch. Genelec Smart IP loudspeakers support automatic arbitration of the power budget with the capable IP switches.

Each IP switch manufacturer gives instructions on

- how to turn on/off PoE in certain powers
- how to manage PoE capacity in the IP switch
- how to monitor the power consumption for each port

Consult the IP switch operating manual for these details. These help you ensure and understand that the PoE supply has been configured correctly.

The loudspeaker communicates with the PoE capable IP switch automatically to set the PoE power on and to the correct capacity. This is the basic PoE activation mechanism. This may result in only 15 W being available for the loudspeaker. Certain IP switches require also the use of LLDP (Link Layer Discovery Protocol) protocol to obtain the full 30W power out from the IP switch.

When IP switch uses LLDP negotiation between the switch and the loudspeaker it should work entirely automatically. If you experience problems in enabling the PoE power, it may be necessary to edit the LLDP settings or even entirely turn off the LLDP negotiation.

3.1.3 PoE budget calculation

The Smart IP Loudspeaker supports automatic negotiation with the IP switch or IP power injector to set the PoE power level. However, in some cases it may be necessary to set the PoE power level in the switch manually.

There are several Power-over-Ethernet standards. The Smart IP Loudspeaker supports the PoE+ standard but also works with the lower power PoE standard. When the Smart IP Loudspeaker also works with lower PoE power, the duration of high SPL output is shortened, and long continuous output signals play at lower sound level than when the PoE+ power level is used. Genelec recommends using PoE+ power level with Smart IP Loudspeaker.

Table 1. PoE and PoE+ power levels for one network connection.

Name	Standard	IP switch out	Speaker in
PoE	IEEE 802.3af-2003	15.4 W	12.95 W
PoE+	IEEE 802.3at-2009	30 W	25.5 W

Each PoE supply device (IP switch or power injector) has a certain total output power capacity. This can limit the number of PoE outputs that can be set on. For a Smart IP Loudspeaker, calculate the power for each IP switch output as 15.4 W for PoE and 30 W for PoE+. Ensure that the total PoE power output does not exceed the switch or power injector PoE output capacity.

Example: IP switch maximum PoE power output capacity is 150 W. You use PoE+ and four outputs are connected. The total output power of the IP switch is 4 x 30 W = 120 W. This is smaller than the maximum PoE power output capacity of the IP switch, 150 W. This scenario is acceptable.

3.1.4 Network Structure

Genelec recommends always designing a network structure with star topology. Only one IP device (for example, one 4430A) is connected at one port in an IP switch. This follows the standard Ethernet network structure. Please note that

- several Smart IP loudspeakers cannot be connected in parallel on the same Ethernet cable
- several Smart IP loudspeakers cannot be daisy-chained using the Ethernet connections

Audio-over-IP requires the use of cable-based LAN network. Low-latency uncompressed audio-over-IP streaming does not work over WLAN.

In bigger networks with data, audio and video traffic it might be useful to configure separate VLANs (Virtual LAN) for each usage or separate networks physically to ensure the best performance for each network. VLANs (Virtual LANs) let you divide one physical Ethernet network into multiple isolated logical networks. VLANs can reduce broadcast traffic load and isolate media-related IP traffic.

As a practical example, look at the network in Figure 1. There are separate audio networks created with one PoE capable IP switch in the Meeting Room 2. It will handle all Audio over IP traffic and

loudspeaker management while it has no connection to the office IP network (Data Switch). This is an example of the easiest Smart IP network implementation.

PoE capable IP switches in Meeting Room 1 and Lobby are connected to the office network. These two PoE enabled IP switches use VLANs to separate the office data network and audio networks. Using VLANs requires some network understanding and configuration of the IP switches switches.

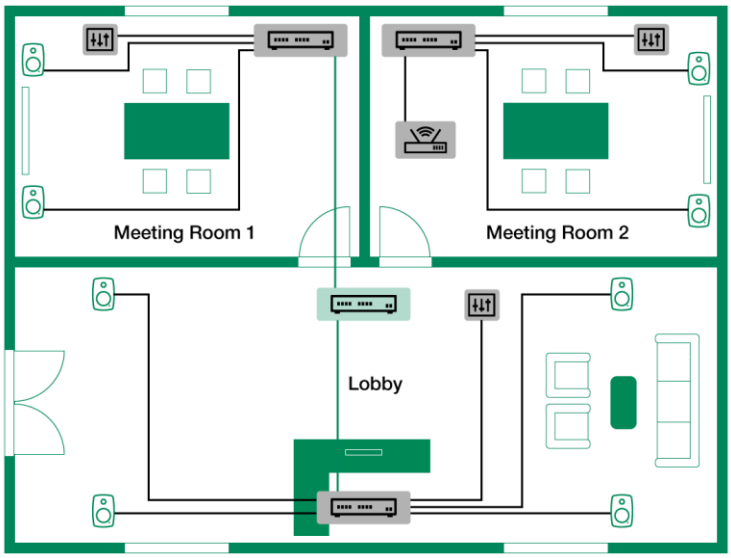


Figure 1. Smart IP network examples.

4 Setting up Smart IP Network

To take full advantage of your Smart IP system it is important to become familiar with all the system components.

To set up a system you will need Smart IP monitors, audio signal cables, ethernet network cables, Smart IP Manager software and other components listed in the previous chapter.

To set up a Genelec Smart IP system,

- Plan system control and zones
- Place Smart IP loudspeakers in the room
- Run ethernet network cables from the Ethernet switch to all Smart IP loudspeakers
- Run audio cables to the Smart IP loudspeakers (optional)
- Download and install the Smart IP Manager software, https://www.genelec.com/smart-ip-manager
- Download and install the Dante Controller software, https://www.audinate.com/products/software/dante-controller
- Setup IP Audio stream Dante Controller software
- Configure the system using the Smart IP manager.

4.1 System Control and Zone Plan

The system configuration depends how access to the devices is indented to be limited. The simplest way is to use a single zone where all devices belong to the one control zone. By default, all Smart IP loudspeaker belong to “Default” zone. This means that if controlling e.g. Default zone volume then all loudspeakers will follow that volume. This plan is also suitable if the system volume can be individually controlled from the audio source and Smart IP controlling method not needed.

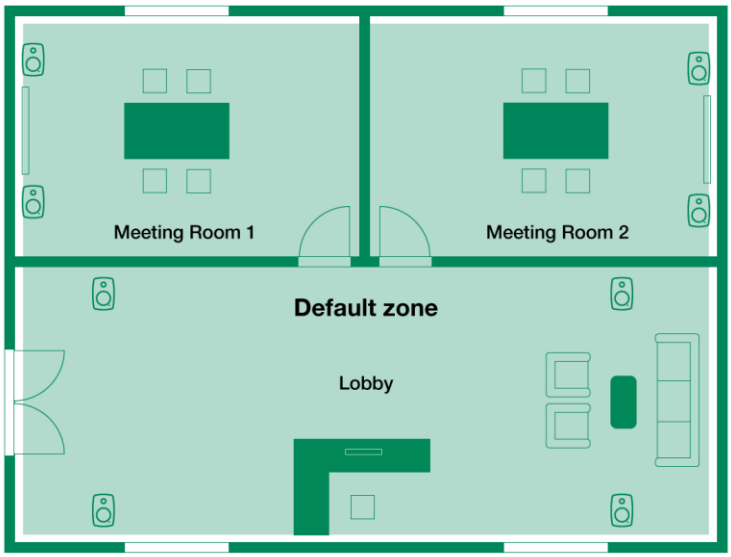


Figure 2. The default zone.

In the example the one-zone option is not suitable if there is need to control each room separately with the Smart IP Controller or API. Separate control can be easily done by dividing each room to own controlling zone.

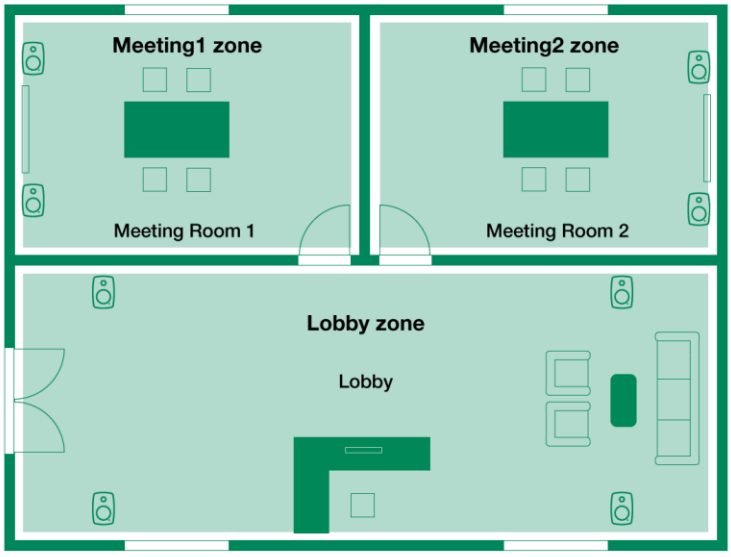


Figure 3. Own zone for each room.

It’s good practice to document where each Smart IP Loudspeaker is installed.

Table 1. System identifier documentation example.

Loudspeaker barcode	MAC address on loudspeaker	Receiver MAC	Management IP Address in loudspeaker	Receiver name	Location
4430Awa1000238	AC:47:23:20:25:01	00:1D:C1:86:10:c3	DHCP	Genelec-822231	Meeting Room1
:	:	:	:	:	:
4430AM192	AC:47:23:20:00:10	00:1D:C1:82:22:41	192.168.1.23	Genelec-822241	Lobby

With this information it’s possible to track where each loudspeaker is located. In addition to this, Smart IP Manager also offers LED blinking on selected loudspeaker, which is useful when identifying speakers in the room where you are. The receiver name makes loudspeakers easy to identify later. If needed, the receiver name can be changed using Dante Controller software.

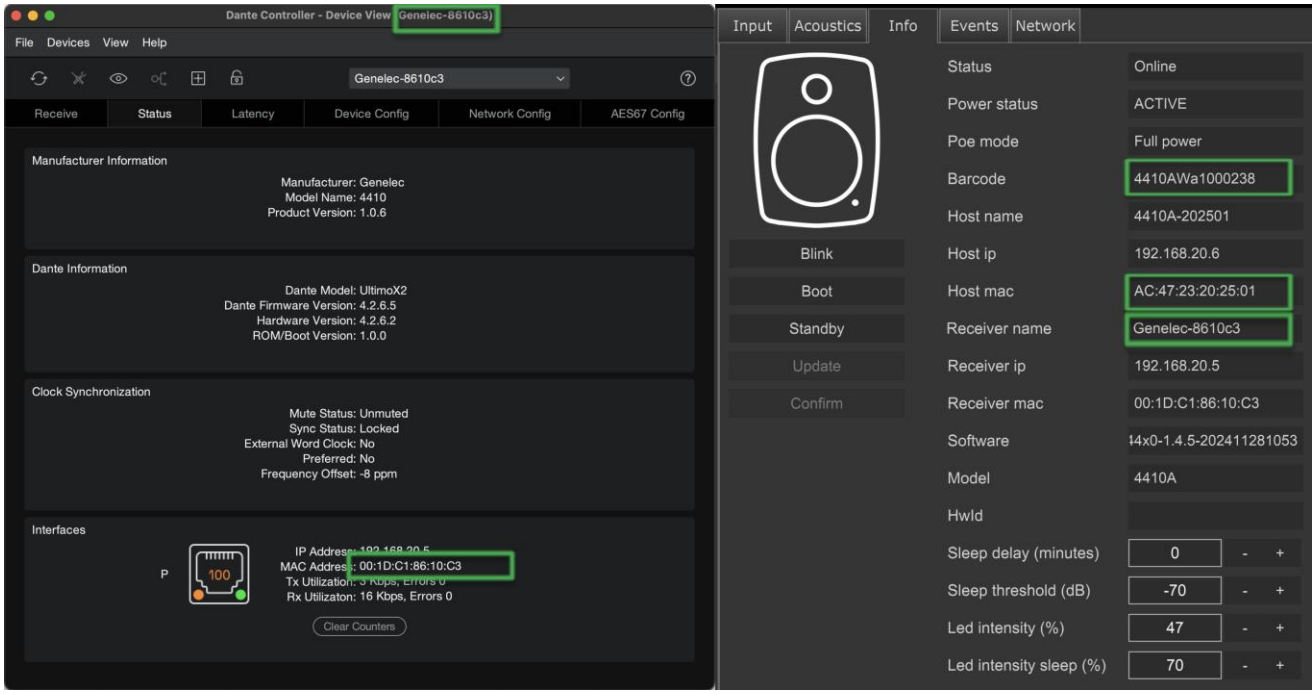


Figure 4. Indentifiers.

4.2 Positioning and mounting the loudspeakers

Aim loudspeakers so that the acoustic axis points towards the main listening area. In some cases, AV install designers may indicate different aiming.

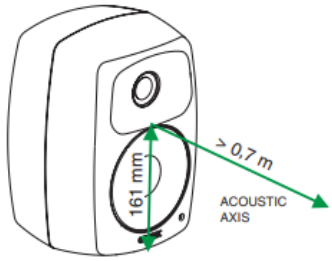


Figure 5. Example definition of the acoustic axis.

Several mounting options are available for each loudspeaker model. See Genelec Accessories Catalogue on https://www.genelec.com/accessories for a complete list of mounting hardware options. The accessories can come with instructions on the proper methods of installation.

4.3 Connection Analog Input

Analogue cabling is an alternative way of feeding audio signal into the Smart IP loudspeakers. Before cabling the analogue input, turn down the output level or turn off the power in all loudspeakers as this prevents loud pops when connecting.

The analogue audio input uses an Euroblock-type connector. The screw mount terminals on the connector can be used in daisy-chaining the same audio signal across several loudspeakers. For this, follow the example shown in Figure 6.

The analogue input impedance is 10 kOhm. The loudspeakers on daisy chain appear electrically in parallel, reducing the load impedance presented to the source device. Typically, 10…20 loudspeakers can be daisy chained.

If there is a need to connect the analogue inputs of the speakers to the same system with passive loudspeakers, connect Smart IP analogue inputs in parallel with the amplifier analogue input. Avoid connecting Smart IP loudspeakers to power amplifier outputs. If this must be done, use a balanced attenuator. Typically, an attenuation of about 20 dB is needed. Note, that an amplifier output can exceed the maximum voltage capacity of the analogue input, and this can result in failure of the analogue input.

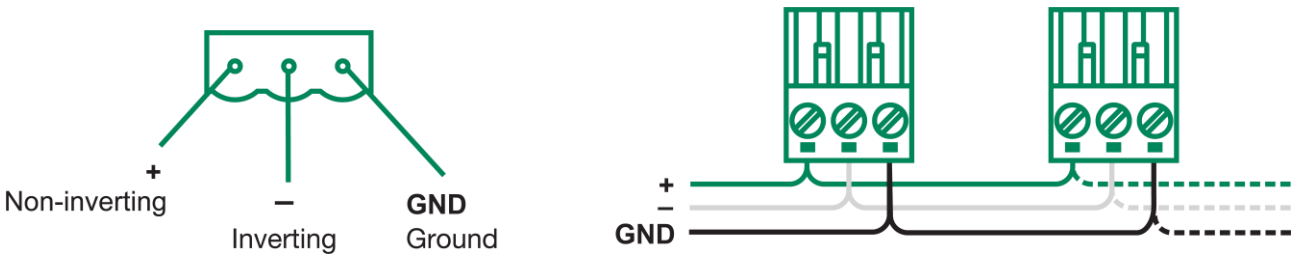


Figure 6. Analogue input pin-out (left). Principle of daisy-chaining using analogue input Euroblock connectors (right).

4.4 Connecting Ethernet and PoE to loudspeakers

Example of powering the Smart IP loudspeaker with a PoE+ enabled IP switch is shown in Figure 7. For best performance, the power budget available for all PoE outputs of the IP switch should enable Smart IP loudspeakers to run at PoE+ power. In the case of four loudspeakers, the IP switch must support at least 4 x PoE+ power level (>120W).

Connect an Ethernet cable from the PoE+ output in an IP switch to the Smart IP loudspeaker Ethernet port. Use at least CAT5 cable or better. Press the power switch to power up the loudspeaker.

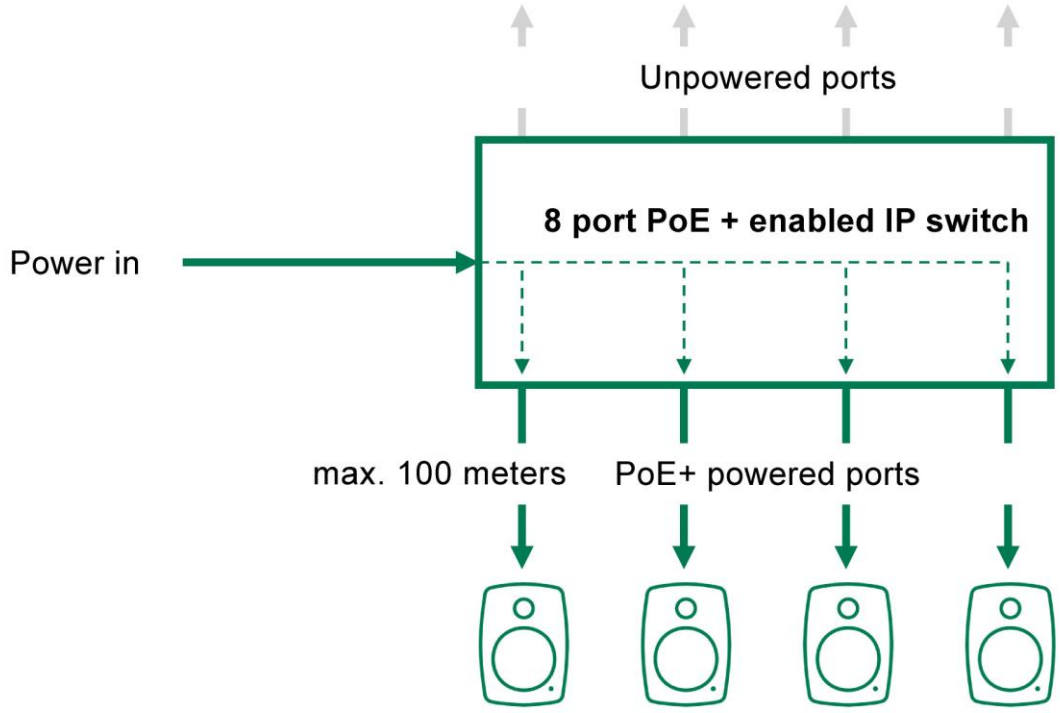


Figure 7. Smart IP loudspeakers powered with PoE+ IP switch.

Example of powering the Smart IP loudspeaker with a PoE+ power injector. This method enables the use of standard non-PoE IP switches. Each power injector must support full PoE+ power level into the device.

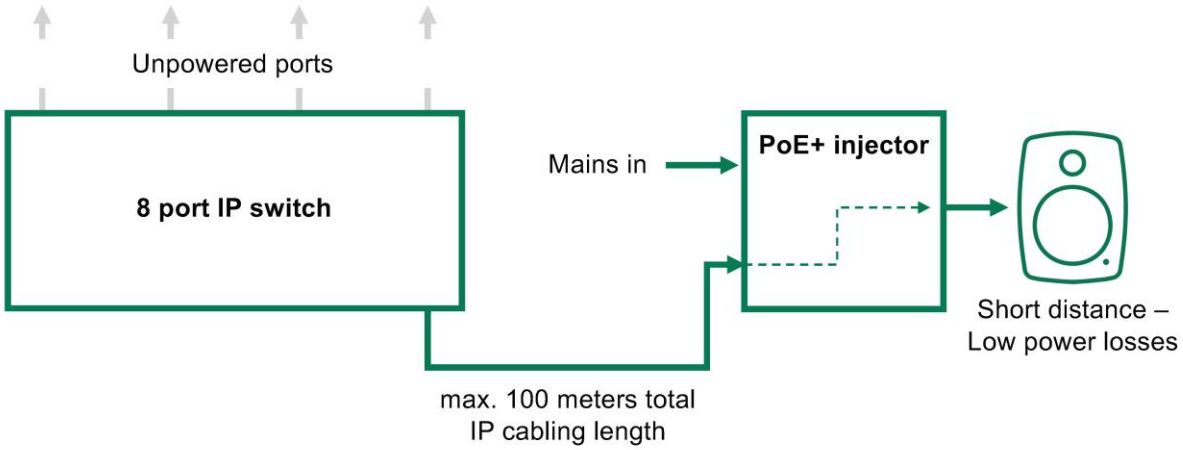


Figure 8. Smart IP loudspeaker powered by an IP PoE+ power injector.

4.5 Downloading and Installing Smart IP Manager

Genelec Smart IP Manager software is a computer application that is used in defining Smart IP loudspeaker systems and in configuring the settings for individual Smart IP loudspeakers. Acoustic calibrations, zone setup, input selection and loudspeaker management are done using Genelec Smart IP Manager software. This is a software intended for AV installers.

All Smart IP loudspeakers have an Application Programming Interface (API). Genelec recommends using the API inside the loudspeaker with house and home automation systems to implement end-user control.

Download Smart IP Manager at https://www.genelec.com/smart-ip-manager and follow the screen instructions to install. Consult the ‘Using Smart IP Manager’ section for more details on using the software.

4.6 Downloading and Installing Smart IP Controller

Smart IP Controller is a mobile device app that enables volume control of zones of Smart IP loudspeakers.

Smart IP Controller App can be downloaded for Smart IP system control. Applications are available in Google Play store and Apple Store. To be able to use the controller the network should be extended with a Wifi router.

4.7 Setting Up IP Audio Stream

Audio stream setup is done by using Dante Controller software. Download the software from https://www.audinate.com/products/software/dante-controller

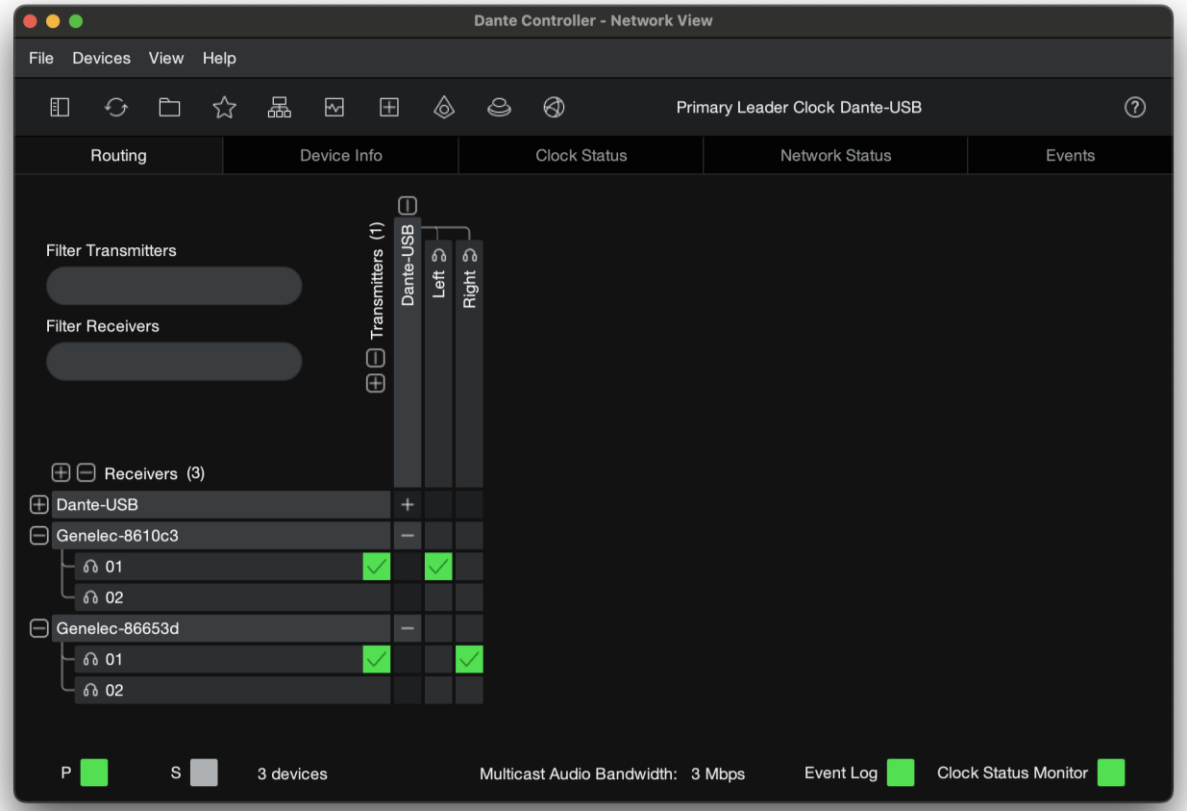


Figure 9. Configuring streams in the Dante controller.

The Smart IP loudspeaker can receive two independent input streams. The loudspeaker output audio is a 1:1 mix of the two streams. This could support use cases where different streams are set up for different applications, for example one for background music and one for live audio or announcements. Then, the user can control streams at the audio source side. **The sample rate and audio format for the two streams must be the same.**

It is also possible to mix Dante format and AES67 format audio streams with this method.

The AES67 audio stream supported by the loudspeaker may have maximum of 8 audio channels. Dante audio automatically divides multichannel streams into low channel count flows suitable for the loudspeaker and this process is automatic.

The AES67 mode must be turned ON to enable of AES67 streams. Follow these instructions on Dante Controller:

- Double click on the loudspeaker to be configured. The **Device View** window opens.
- Click **AES67 Config** tab.
- In the **AES67 Mode** panel, go to **New**: and select **Enabled**.
- In the **Reset Device** panel, click **Reboot** to reboot loudspeaker with AES67 enabled.

The audio reproduction can also be controlled using loudspeaker settings. It is possible to switch between the analogue and audio-over-IP inputs or to mix these inputs. ‘Input tab’ section in ‘Using Smart IP Manager’ has more details on these settings.

5 Using Smart IP Manager

This section discusses the features in the Smart IP Manager.

When starting Smart IP Manager for the first time the network interface which is used for controlling the Smart IP loudspeakers needs to be defined. For example, most computers offer a cable-based IP network and WLAN interfaces.

IP addresses can be set in following ways:

- DHCP (recommended)
- Manual IP address
- AutoIP (not recommended – used automatically if nothing else not available 169.254.x.x)
- IP address mask

Select the network in the menu item ‘Settings’ | ‘Audio network’. The IP network is selected by giving the IP network address of the computer IP network interface you want to use. Please use the ‘ipconfig’ command to a list of all IP networks in their IP addresses in the computer. Enter the IP address of the interface you want to use.

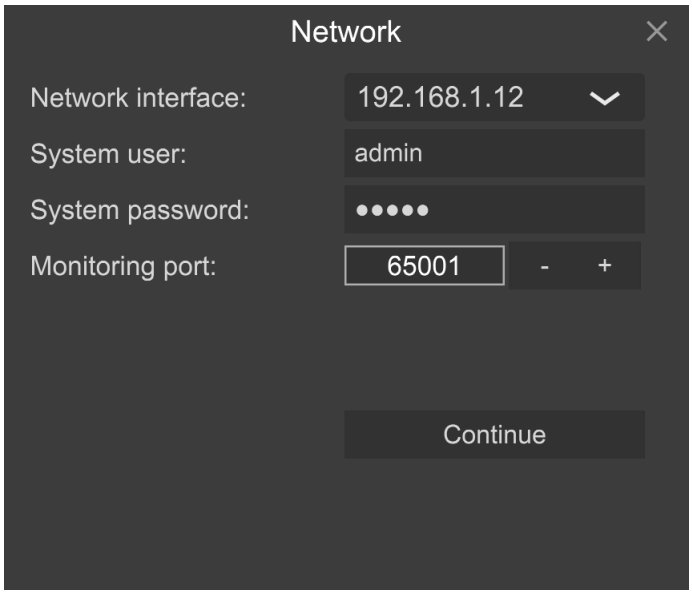


Figure 10. Audio network settings window.

To start using the Smart IP manager with a certain loudspeaker you need the System username and System password. When the loudspeaker leaves the factory, the loudspeaker has been assigned default credentials that are System username ‘admin’ and System password ‘admin’. Always change these when you access the loudspeaker the first time (see Zone Credentials chapter).

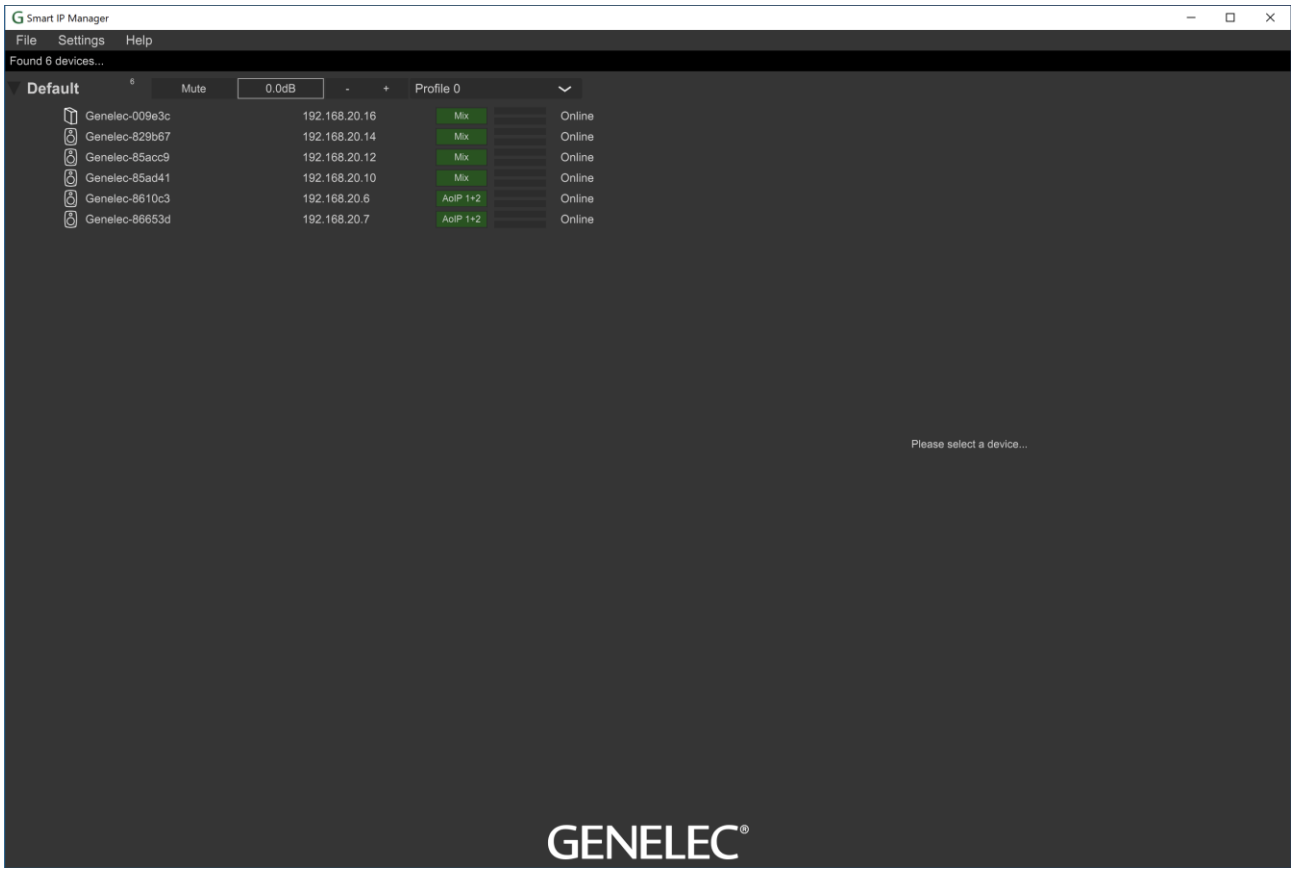


Figure 11. Smart IP Manager with the default zone.

5.1 Menus

The main menu contains a set of menu command enabling system management.

File menu

‘**Add zone**’ creates a new zone.

‘**Clear all messages’** clears all status message logged by Smart IP Manager.

‘**Query/refresh devices**’ forces the Smart IP device query message to be send.

‘**Check for updates**’ forces the software update check.

‘**Export**’ Creates json file from device network. File is created to <user documents>/Genelec/SmartIP/SmartIPConfig.txt

‘**Exit**’ closes the Smart IP Manager software.

Settings menu

‘**Audio network**’ opens network settings page for the computer.

Help menu

‘**About**’ shows information about Smart IP Manager, including the software version information.

‘**Online manual**’ opens online manual for Smart IP Manager.

5.2 Audio network settings

The audio network settings define settings used to communicate with the Smart IP loudspeakers.

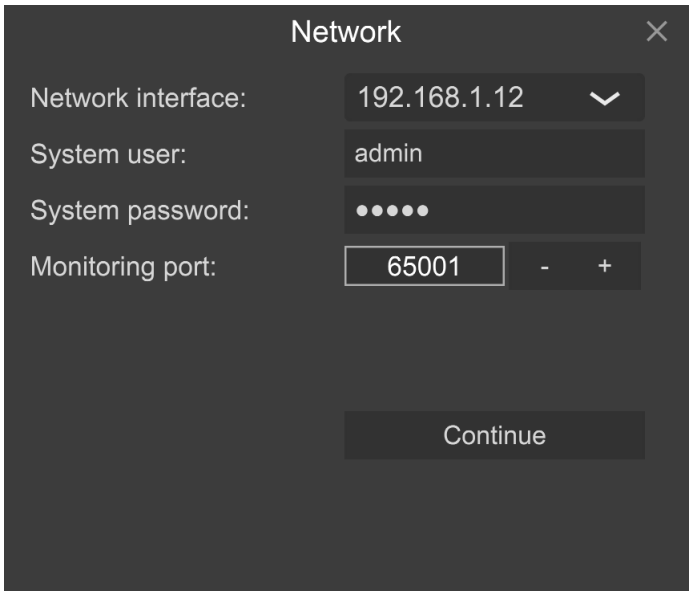


Figure 12. Audio network settings page.

- **Network interface**: Select an IP address that is used for the audio network.
- **System user**: Set a username that is used for Smart IP communication (default: admin).
- **System password**: Set a password that is used for Smart IP communication (default: admin).
- **Monitoring port**: The default port is set in this field. Normally there is no need to edit this port number. If you know that this port number is not available, you can use another vacant port. In that case, enter a vacant port number and restart the Smart IP Manager to update the port number.

5.3 Zones

Zones are collections of loudspeakers working together, for example within an audio reproduction area. By default, all loudspeakers belong to the Default zone. Using the Default zone can be very handy as this enables quick and easy setup of a system that reproduces only a limited number of audio channels and can be easily controlled as one system. Examples of these kind of systems

could be background music of an office or a restaurant. Very little configuration is needed when the default zone is used.

5.3.1 Default Zone

The example in

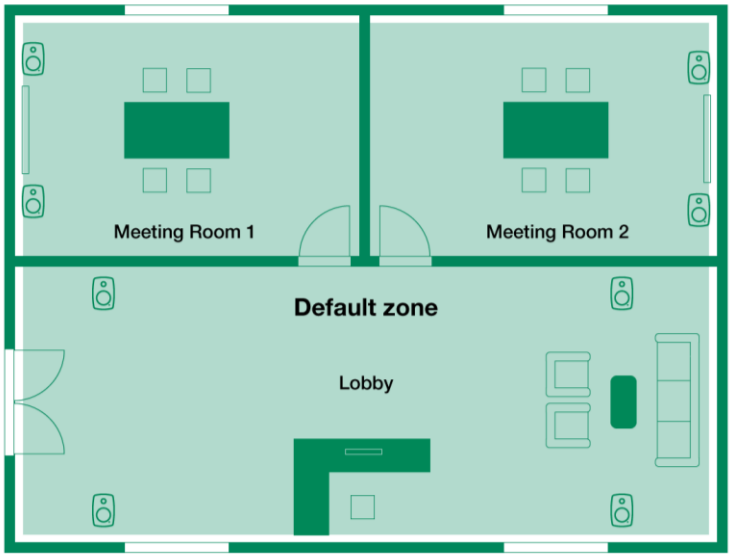


Figure 13 shows eight Smart IP loudspeakers with the default settings. All eight Smart IP loudspeakers are listed under the Default zone in Smart IP Manager. Muting or adjusting the volume of the Default zone will affect all the Smart IP loudspeakers.

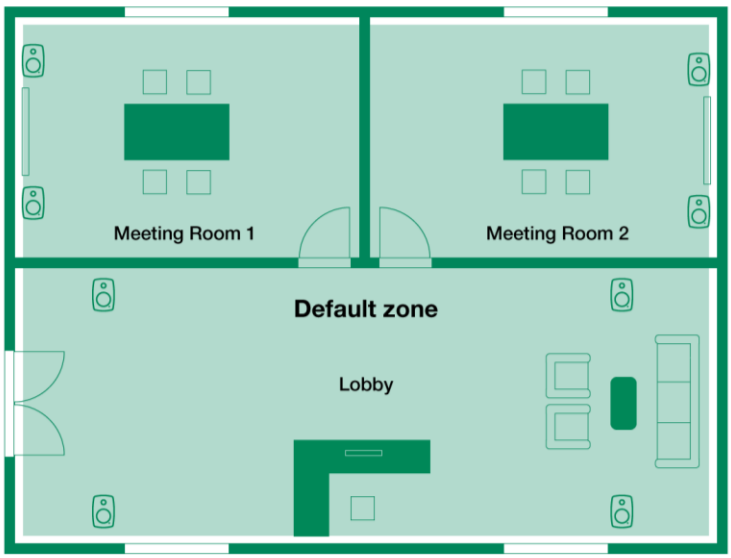


Figure 13. The default zone.

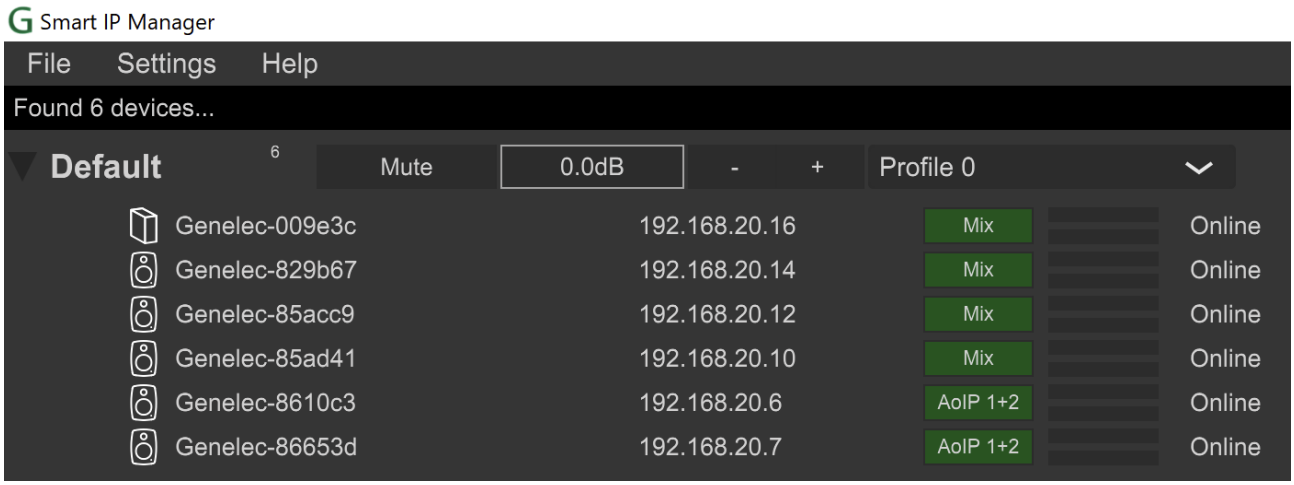


Figure 14. Default zone listing.

5.3.2 Creating Zones

To control rooms/zones separately and individually, the Smart IP playback system can be divided into several zones. In the zone plan below we have three example zones, called ‘Meeting1’, ‘Meeting2’ and ‘Lobby’.

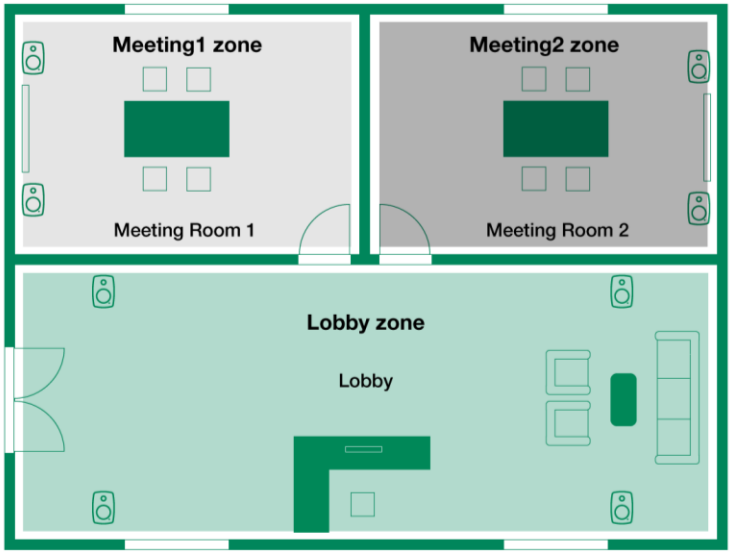


Figure 15. Three Zone example.

1. To create a zone, click ’File : Add zone’ menu item in the Smart IP Manager. The Create zone window opens.

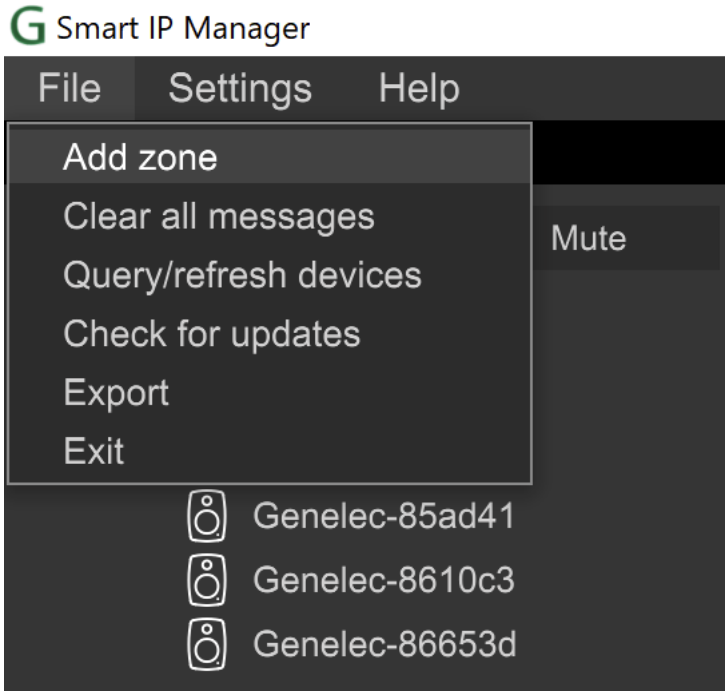


Figure 16. Add a new zone.

2. Assign the name ”Meeting1” for the zone. A zone ID is automatically generated by the Smart IP Manager. If ID is reserved or blocked for any reason, the ID can be manually changed. Click ‘Create’ button to create a zone. Note that if no loudspeakers are assigned to a zone and Smart IP Manager software is closed, the zone will be removed from the Smart IP Manager window.

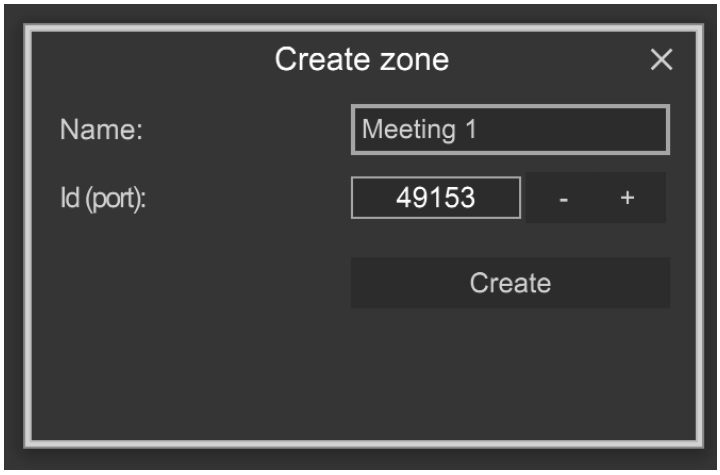


Figure 17. Create ‘Meeting1’ zone.

3. Repeat steps 1-2 until all required zones are created.

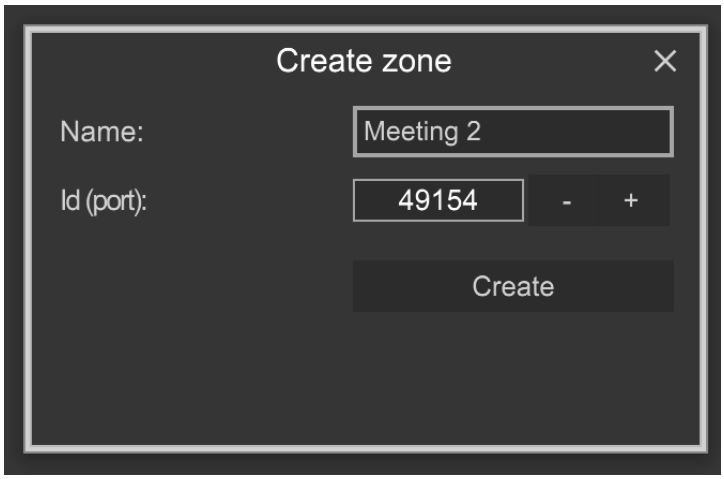


Figure 18. Create ‘Meeting2’ zone.

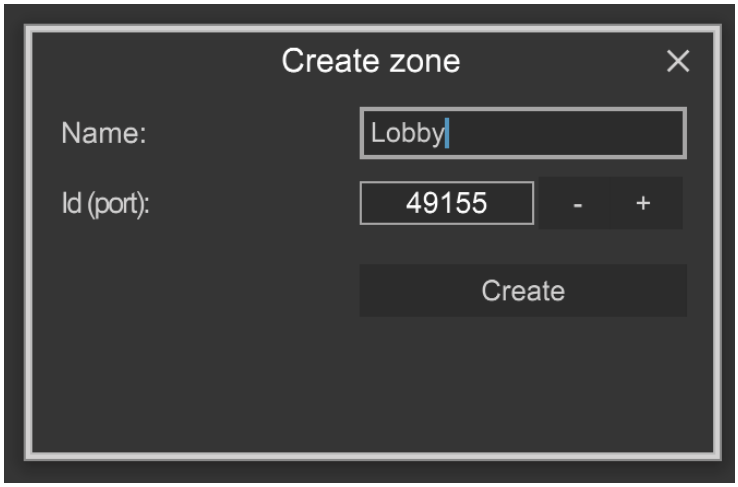


Figure 19. Create ‘Lobby’ zone.

5.3.3 Assigning Loudspeakers to the Zone

After the required zones have been created, loudspeakers are assigned to the zones. The instructions below show how to identify loudspeakers in Meeting Room 1 and assign them to the zone.

1. Finding a loudspeaker and adding it to a zone. A loudspeaker can be identified by selecting it from the list and clicking the ‘Blink’ button in the Info tab → the selected loudspeaker will flash its front LED.

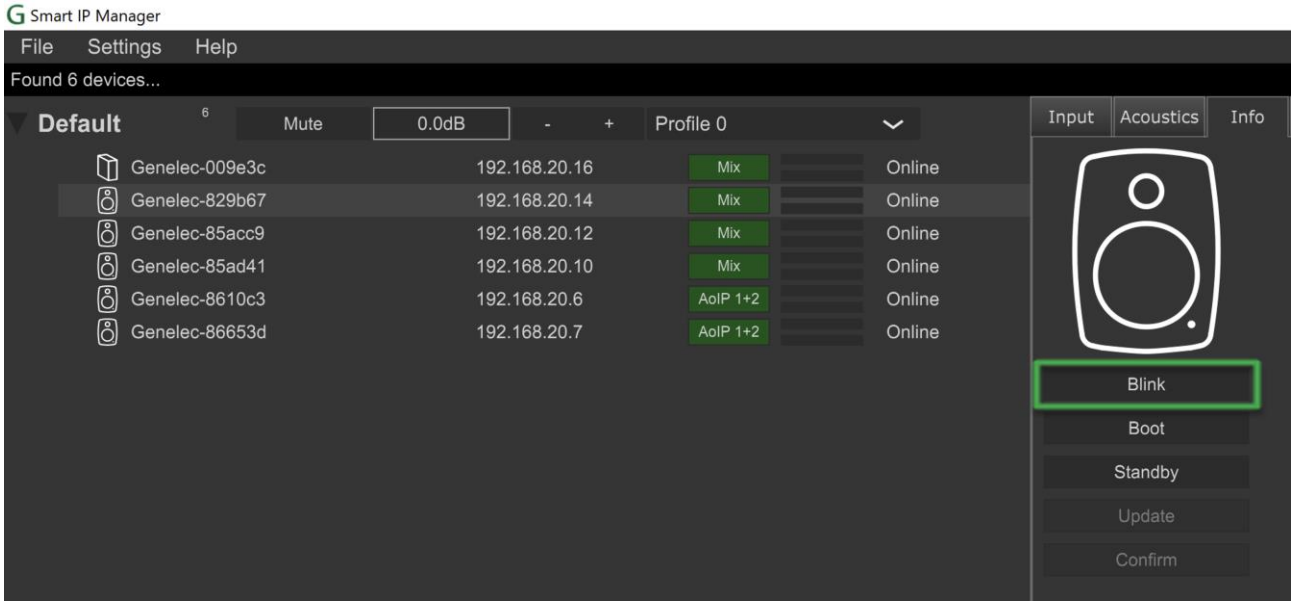


Figure 20. Identify a loudspeaker from Smart IP Manager.

2. To assign the loudspeaker to the zone, open the ‘Network’ tab and select the correct zone name (in our example, ‘Meeting1’) in the Zone dropdown menu. Click ‘Apply and boot’ button to finish the assignment. Repeat for all the loudspeakers.

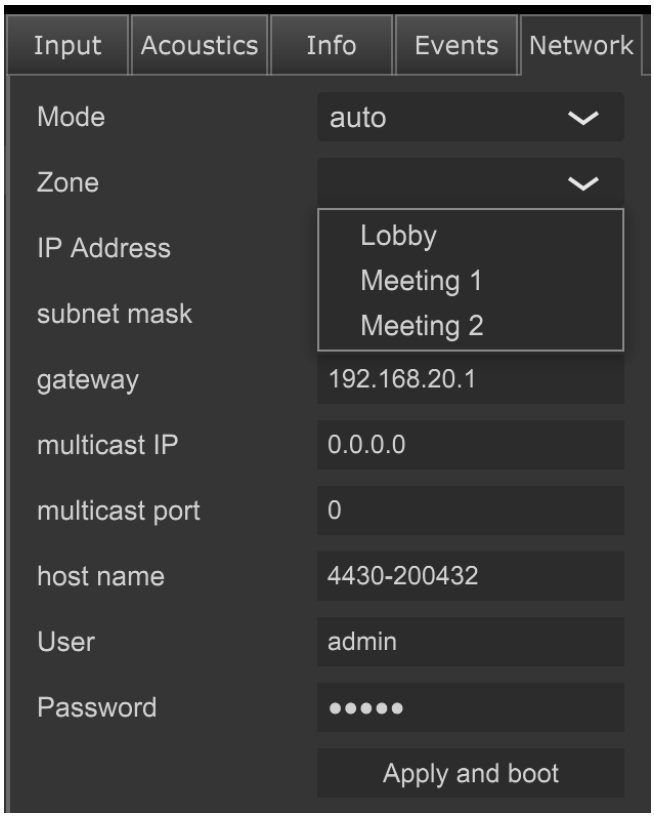


Figure 21. Assign the loudspeaker to the zone.

3. Repeat for the other zones.

After this Smart IP Manager will show the three zones created.

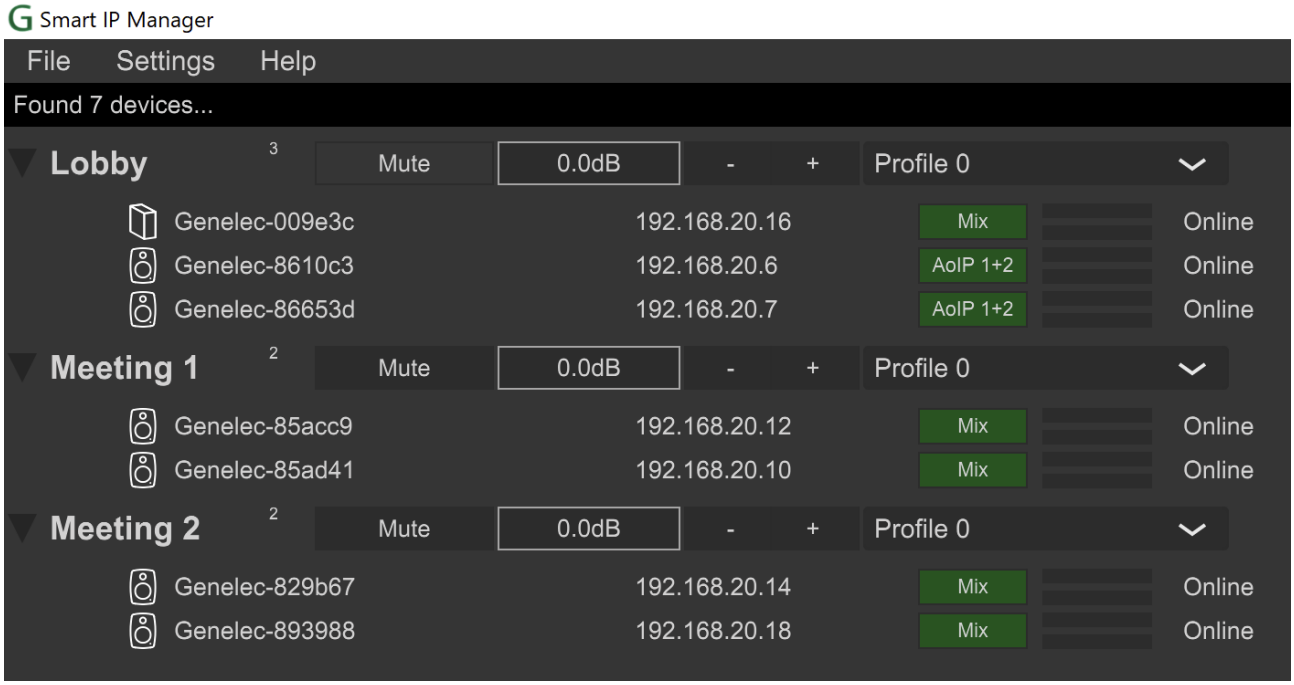


Figure 22. Three Smart IP zones created.

Zones are indicated by a bold title showing the name of the zone. The loudspeakers belonging into a zone are shown under this title. The list of loudspeakers can be collapsed.

Zone contains shared controls. These are shown after the zone name. These items contain

- MUTE button to mute or play the zone
- controls for volume (+ and – signs)
- setup profile selector – the setup is collectively set for all loudspeakers in the zone



Figure 1. The zone name line, also showing the zone control functions

5.3.4 Deleting zones

A zone can be deleted by removing all Smart IP loudspeakers assigned to it. Move each loudspeaker to another existing zone or create new zones as needed. Once the zone is empty, go to File → Query/Refresh Devices. The empty zone will no longer appear in the list and is automatically removed.

5.4 Loudspeaker management

Each loudspeaker is presented under the zone title, and the data shown for each loudspeaker is

- name of the receiver device (user settable using the Dante Controller)
- IP address assigned to the loudspeaker (typically provided by an automatic selection system, run by DHCP protocol) – this IP number is used for the loudspeaker control
- audio input (values are Mix, AoIP, Analog, No input)
- a status text showing any errors and warnings (this can be cleared from the File menu, option ‘Clear all messages’)

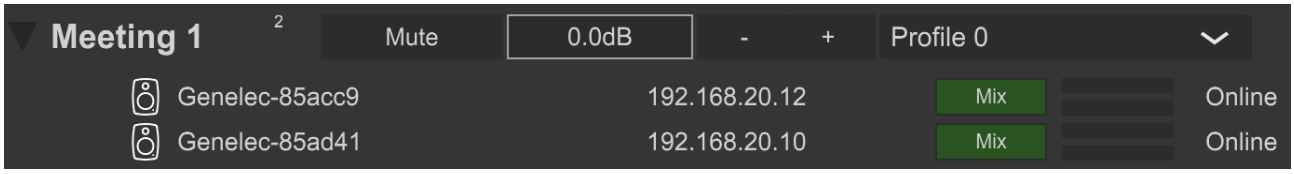


Figure 2. The loudspeaker information shown under the zone title; this example shows two loudspeakers named ‘Genelec-85acc9’ and ‘Genelec-85ad41’

The exclamation mark (**!**) in front of a loudspeaker icon indicates that the loudspeaker has something to report. The detailed message can be accessed in the ‘events’ tab. A loudspeakers power status can be STANDBY or ACTIVE, the connection status can be ‘Online’ or ‘Offline’ (not reachable on the network). If the loudspeaker has some problems, its internal status is ‘warning’ or in severe cases, ‘error’. Firmware update status is also shown in the same manner.

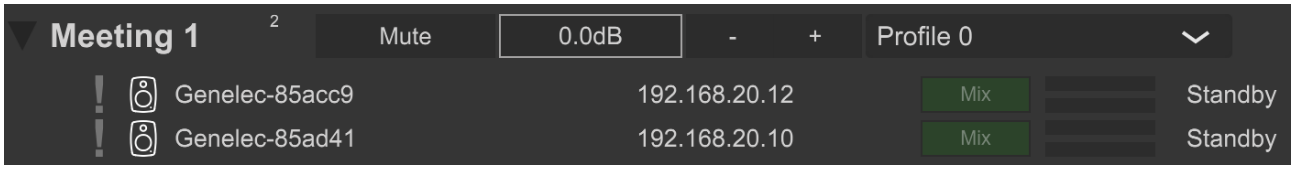


Figure 23. Loudspeaker status indicators ('!' and 'standby’ text).

Table 2. Loudspeaker status icon indicators explained.

Status icon	Meaning
!	Offline (Dark Grey)
!	Standby (Grey)
!	Warning (Yellow)
!	Error (Red)
!	Firmware update available (Green)
!	Updating firmware (Blue)
!	Firmware confirmation waiting (Orange)
!	No access to this loudspeaker due to missing credentials (Black)
	Normal status (No icon)

5.5 Loudspeaker Information and Settings

Detailed information and settings related to the selected loudspeaker are shown at the right side of the Smart IP Manager window. Various information can be selected by clicking on the tabs at the top of the window:

- Input tab: the settings for the audio inputs of this loudspeaker – use these controls to see what audio stream has been set and what input channel has been selected as well as what are the settings for the analogue input; also select which audio input is used
- Acoustics tab: the acoustical controls inside this loudspeaker – use these controls to equalize the loudspeaker, set the level alignment and output delay alignment for this loudspeaker
- Info tab: general information about the selected loudspeaker and receiver
- Events tab: recent network events related to this loudspeaker
- Network tab: network-oriented settings for this loudspeaker

Some of these tabs allow user to control multiple loudspeakers at once, for example acoustic settings can be modified for all selected loudspeakers. Select multiple loudspeakers using Ctrl -key and mouse click.

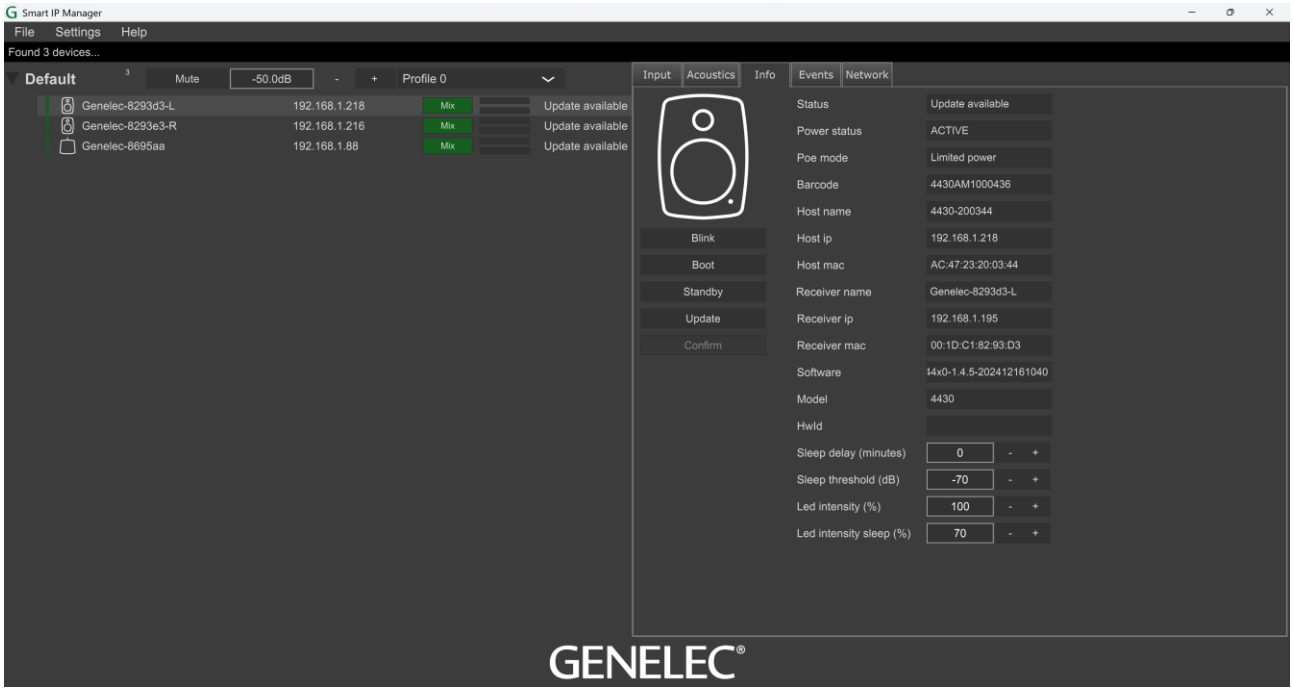


Figure 4. Loudspeaker information window, showing several tab-selectable information panels.

5.5.1 Input tab

Besides Audio-over-IP streams, the loudspeaker may also support an analog input. A loudspeaker has the following input modes

- **AoIP1+2**: Both Audio-over-IP streams are summed and played. This reduces the level of a single stream by 6dB so that no clipping can occur

- **AoIP1**: First Audio-over-IP streams is played
- **AoIP2**: Second Audio-over-IP stream is played
- **Analog**: Only the analog input audio is played
- **Mix**: Both the analog and selected AoIP audio signals are summed and played
- **No input**: loudspeaker does not output any signal and is silent

The input can be controlled from input tab and from the device tree with input button which toggles the input.

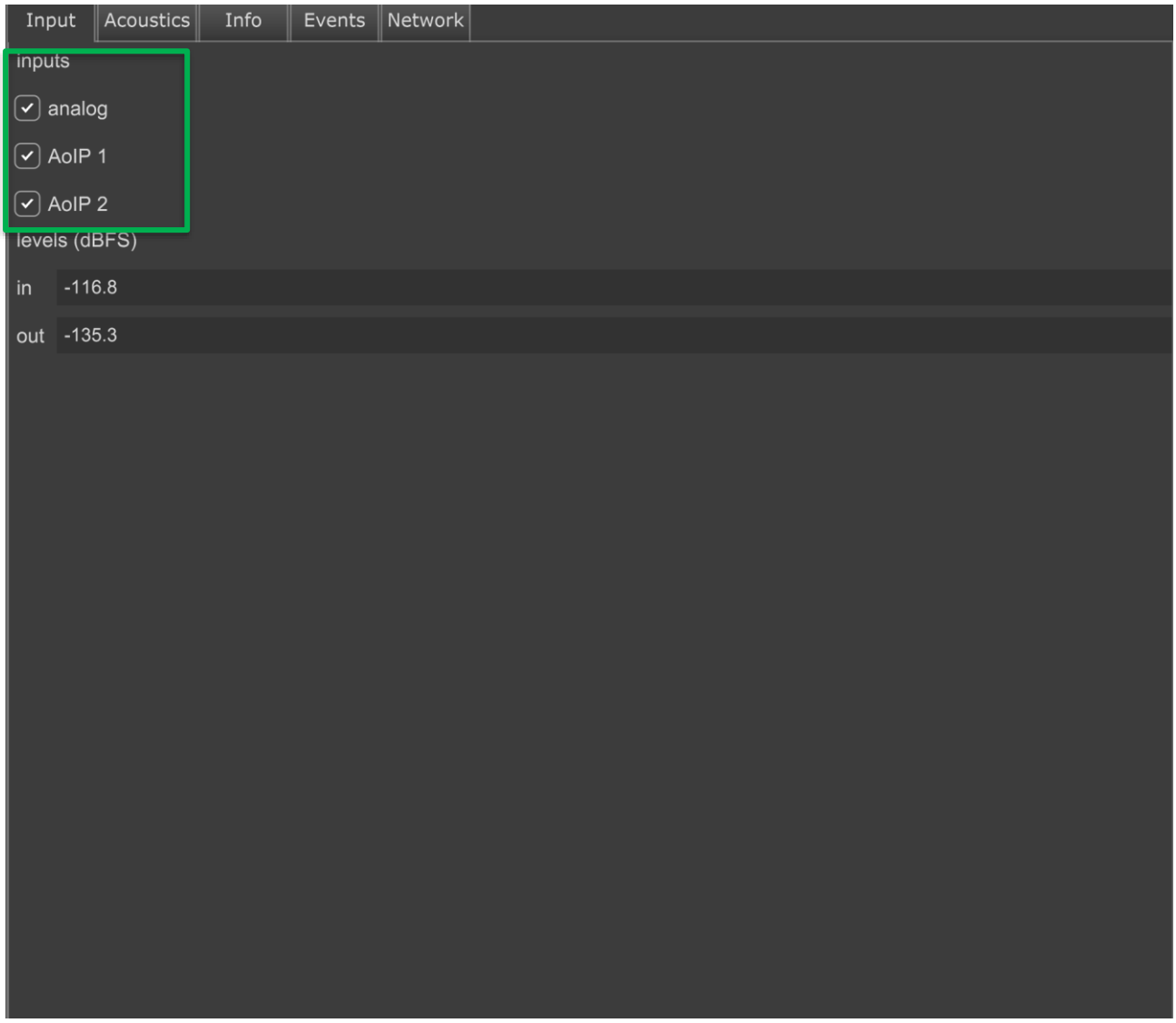


Figure 24. Input selection from the input tab.

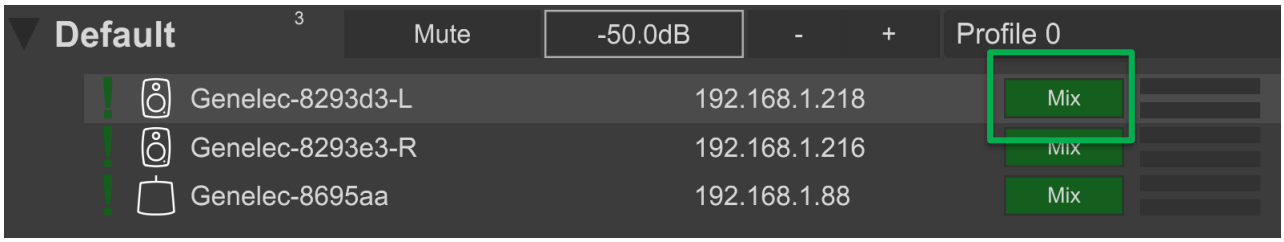


Figure 25. Input selection from the device tree with the input button.

5.5.2 Acoustic tab

Acoustic calibration settings can be controlled in the ‘Acoustics’ tab. Values of all the currently selected loudspeakers are adjusted together to the values of the controls. This can be useful in speeding up the system calibration as several loudspeakers can be quickly set to the same setting.

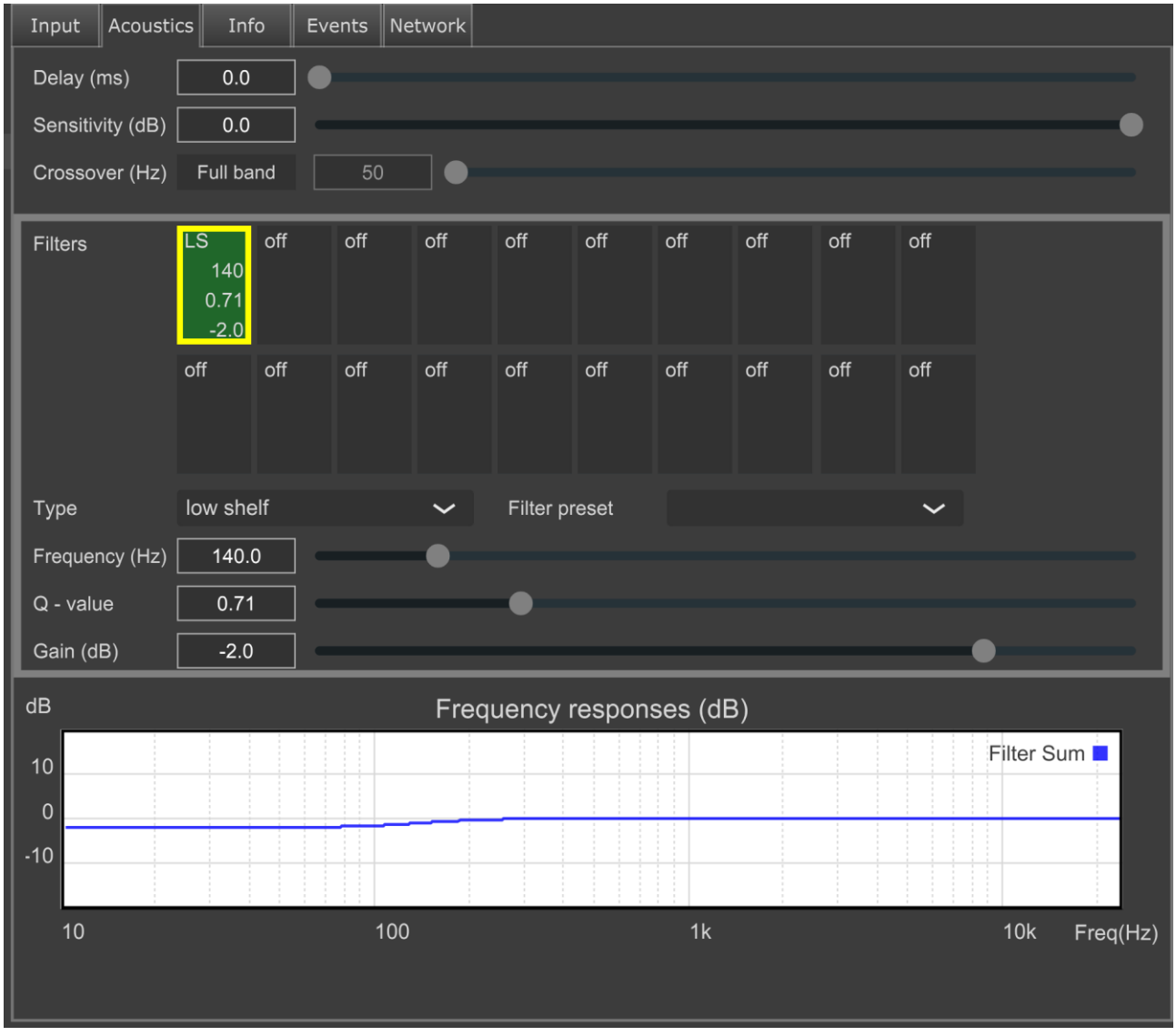


Figure 26. Acoustic settings tab.

5.5.2.1 Delay

The delay control can be used to increase the delay of the speaker. The delay adjustment is useful in calibrating stereo or immersive playback systems. For these systems, the delay from all loudspeakers to the listening position should be the same. This will significantly improve the accuracy of stereo imaging of the system,

5.5.2.2 Sensitivity

This control can be used to adjust the output level of a loudspeaker. The sensitivity adjustment is useful when calibrating a stereo pair or immersive playback system. For these systems, the level from all loudspeakers to the listening position should be the same. This will significantly improve the accuracy of stereo imaging of the system

5.5.2.3 Crossover and bass management

This control can be used to set up the crossover filter of subwoofer and main monitors. Use control click to select multiple devices from the device tree and activate crossover filter by enabling it from button. After this it is easy to set the filter frequency for all devices at the same time.

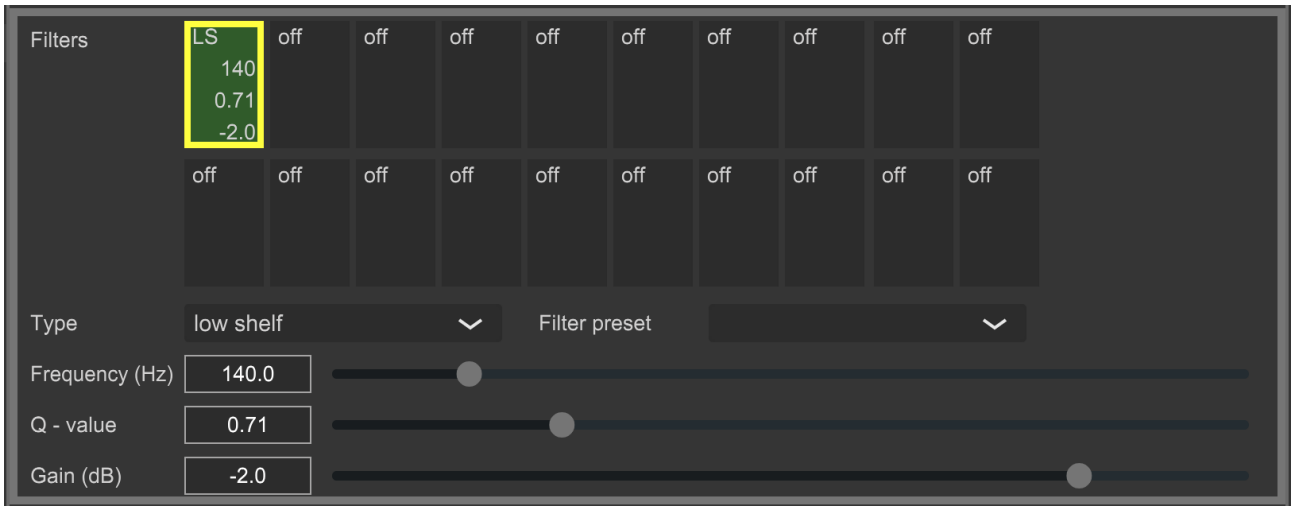
Tip: Delay parameter can be used to adjust signal phase. Additional measurements may be needed to get the best result.

5.5.2.4 Filters

Filter buttons are used to select the filter for adjusting and to display the filter info. There are 20 filters for the user to adjust in each loudspeaker. The filter type can be selected in the dropdown menu. The values of the centre frequency, Q value and gain of each filter can be adjusted using the slider controls.

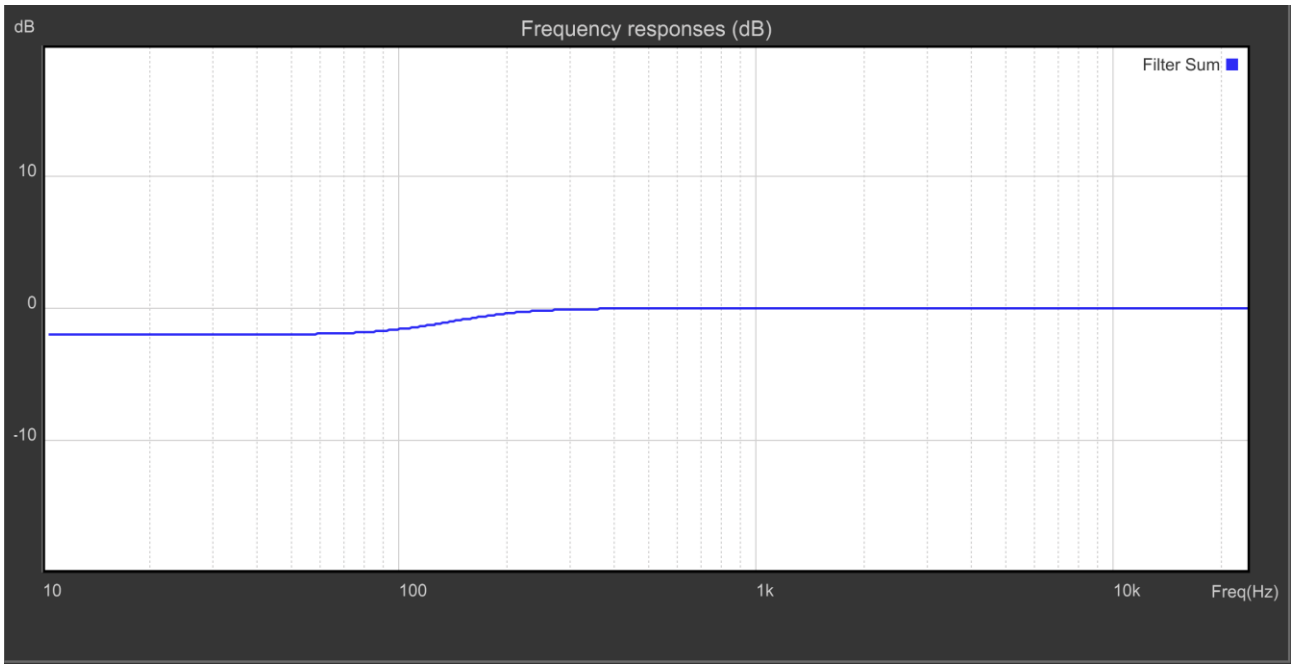
Filter presets for bass cut, bass roll off and treble tilt exist. These can be used to quickly create suitable acoustic settings, but the result can still be modified using the sliders. Bass cut can be used to reduce the low frequency boost or boominess and is best used when placing the loudspeaker near a wall. When placing the loudspeaker near a corner or a double corner there will be even more low frequency boost due to the walls. Adjust the gain to -4dB or even to -6dB for best results.

For best results you should measure the room response using a calibrated microphone and an acoustical measurement tool like REW software. Based on the measurements it is possible to compensate the room response for example using filters placed on the peaking frequencies. The filter function can be selected for each filter in the tool set. Some measurement software also offers equalizer design and optimization that can be copied manually into the room equalization tool set.



5.5.2.5 Filter Frequency Response Graph

The sum of the configured filters is displayed in a graphical format in the lower part of the window.



5.5.2.6 Storing Acoustic Settings to Profile Preset

Acoustic settings can be stored into the loudspeaker. There are five profile preset memory slots in a loudspeaker for this purpose. To store settings the profile preset:

1. Use the right mouse click on the zone caption text line and select the “Store preset” option in the dropdown menu.
2. Select the target profile preset you want to use for your settings in the popup shown. The preset name can be edited to change the name to what you want.

3. Click the ‘Store’ button to save the current acoustic and input settings into every loudspeaker in the selected zone.
4. Close the window.



Figure 27. Store preset window.

Profiles can be used to configure various setups for example for different listening positions or different numbers of loudspeakers to be active. The input setting “no input” can be used to stop the loudspeaker from participating in sound reproduction, making it silent. The profile presets can be later recalled to quickly load the stored settings, using zone control.

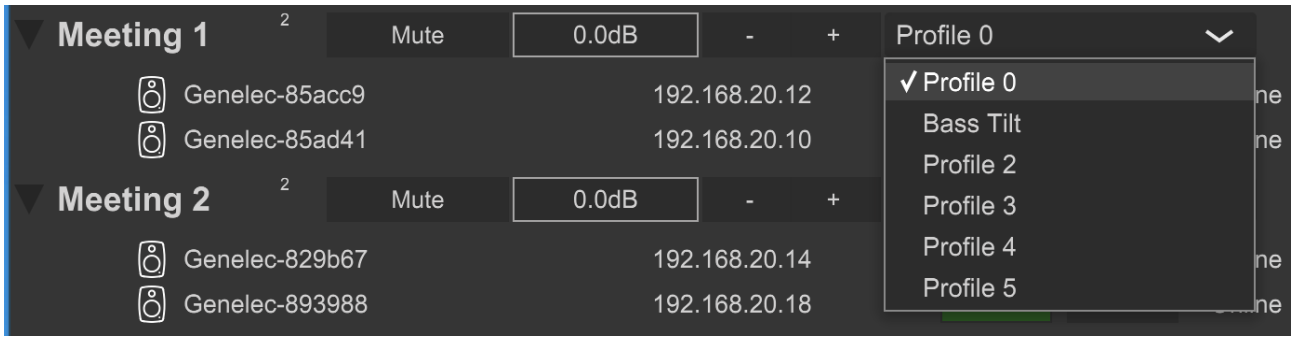


Figure 28. Loading a profile preset.

5.5.3 Info tab

The Info tab is used to view the status of the Smart IP loudspeaker. It can be also used to update the Smart IP loudspeaker firmware and set ISS settings. Next chapters will show more details.

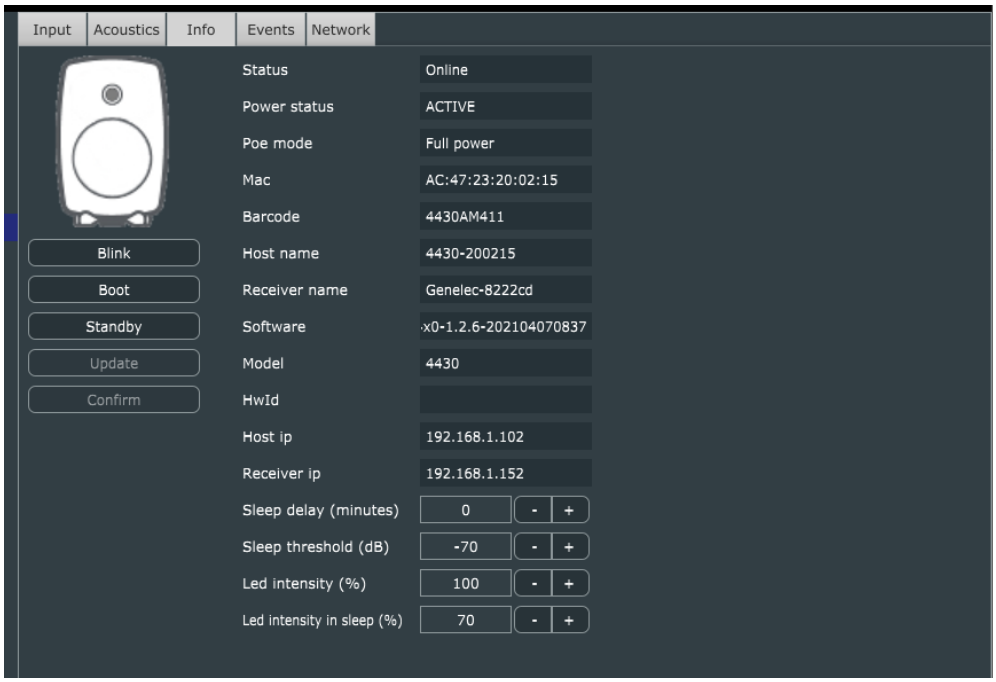
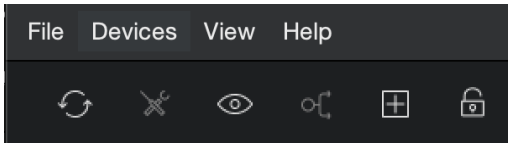


Figure 29. Info tab.

5.5.3.1 Identify the loudspeaker

The physical location loudspeaker in the room can be identified by clicking the ‘Blink’ button. This causes the loudspeaker to blink its front panel LED for a while. The blinking will automatically stop after some time.

Identifying the loudspeaker is also possible using the Dante Controller. The loudspeaker LED can blink when the “eye” button in the detail window is clicked. The LED will blink for a while and will automatically stop after some time.



5.5.3.2 Booting the loudspeaker

The loudspeaker can be booted by clicking the ‘Boot’ button. The Smart IP loudspeaker turns OFF and will drop from the network until it has booted.

5.5.3.3 Put the loudspeaker to standby

The loudspeaker can be put to standby mode by clicking the ‘Standby’ button. When the loudspeaker is in the standby mode, it can be woken up by clicking the ‘Wake up’ button – this is the same button but with a different text to indicate the action.

5.5.3.4 Update the Firmware of the Loudspeaker

The loudspeaker shows a green notification icon when a new firmware is available in the Genelec Cloud. To update the firmware

1. Select the loudspeaker to be updated in the device tree.
2. Open the ‘info’ tab and click the ‘Update’ button. After this, the firmware is uploaded into the loudspeaker and the icon turns blue. An alternate way to update is to right-click the loudspeaker line and then select the ‘Update firmware’.
3. When the upload of firmware has finished, the loudspeaker boots. In this situation the loudspeaker goes offline for a moment. When the loudspeaker wakes up and reappears on the network an orange icon is indicating that the update has been successful.
4. Confirm the update by opening the ‘Info’ tab and click the ‘Confirm’ button. This is necessary to keep the new firmware. An alternate way to check is to right-click the loudspeaker and then select the ‘Confirm update’. If the confirmation is not done, the loudspeaker reverts back to the previous firmware version after the next reboot.

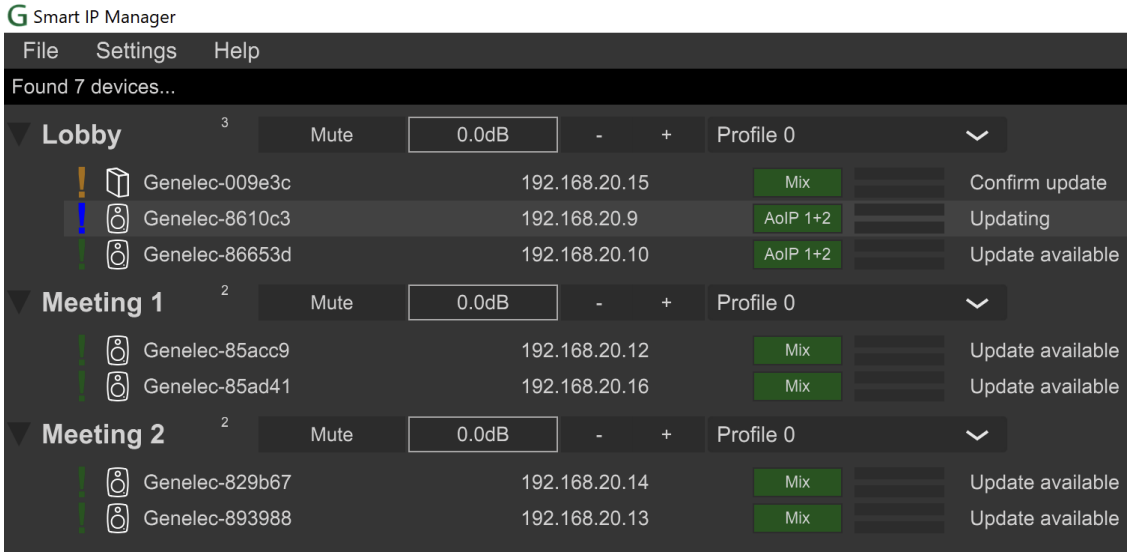


Figure 30. Firmware update status indicators.

NOTE: Dante audio receiver firmware can be updated using the Dante Controller software. Consult the Dante Controller documentation on how to do this.

5.5.3.5 Loudspeaker information

- Status: Offline, Online, Standby, Warning, Error (for detailed information about warnings and errors can be found from the log in the events tab).
- Power Status: Active, Standby
- PoE Mode: Full power (PoE+: 30W), Limited Power (PoE: 15W)
- Mac: MAC address of controller CPU
- Barcode: Serial number

- Host name: Genelec loudspeaker name
- Receiver name: Dante device name
- Software: Software revision string
- Model: Loudspeaker model
- HwId: Hardware id
- Host IP: Genelec/host IP address (used to control)
- Receiver IP: Dante device IP address (used to Dante control)

5.5.3.6 ISS Settings

A Smart IP loudspeaker comes with an ISS (Intelligent Signal Sensing) power saving feature, and ISS can be configured to enter the loudspeaker in a standby mode automatically when there is no active audio signal at the loudspeaker input. The settings of this feature can be set in the ‘Info’ tab.

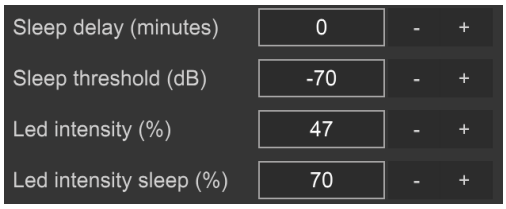


Figure 31. ISS settings.

To set ISS active for a loudspeaker:

1. Set Sleep Delay to a value greater than 0. The zero value (0) is the default and means the ISS is OFF and the loudspeaker never goes to power save. The Sleep delay specifies the time after which the loudspeaker enters into the low power sleep mode if there is no audio input signal.
2. The Sleep Threshold specifies the minimum input signal level for detecting active input. Exceeding this level is needed to keep the loudspeaker awake.
3. LED intensity in Sleep specifies the led brightness in the low power consumption sleep mode. No light is selected with value 0 and maximum brightness is selected with value 100.

The loudspeaker wakes up from the sleep state automatically when the audio signal level exceeds the Sleep threshold level at the configured input.

5.5.3.7 LED Intensity

Smart IP loudspeaker’s front panel LED intensity in the normal operating mode can be set in the ‘Info’ tab. The value can be set from 0 to 100. Value 0 means that the LED is OFF and 100 means that LED has the maximum brightness.

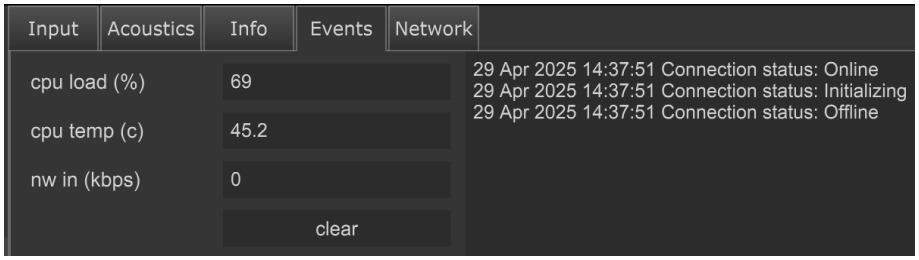


Figure 32. Front panel LED Intensity setting.

5.5.4 Events tab

The loudspeaker events can be checked in the Events tab. The ‘Events’ tab can be used to view what happens with loudspeaker during the use.

- CPU load: tells how busy the loudspeaker CPU is. Value ranges from 0% at idle to 100% at full load; typically the value is between 50-70.
- CPU temp: tells a temperature of the CPU inside the loudspeaker; typically the temperature varies in the range 40 – 80 C.
- Nw in (kbps): tells how much network traffic the loudspeaker CPU is receiving. If the incoming traffic is very high this may indicate unwanted multicast traffic flooding all the ports in an IP switch.



5.5.5 Network tab

This tab shows all the network related settings.

- Mode: selects how the IP address for loudspeakers is set. By default, a loudspeaker is configured to use an “automatic” IP address. When there is a DHCP server in the network, a loudspeaker uses the IP address assigned by the DHCP server. If a DHCP is not found, the loudspeaker uses an auto-IP (in the IP address range 169.254.xxx.xxx). A loudspeaker can also be configured to use a static IP address.
- Zone: sets the zone where the loudspeaker belongs.
- IP Address: shows the current IP address of the loudspeaker.
- Subnet mask: shows the current subnet mask of the loudspeaker.
- Multicast IP: shows the current multicast IP address of the loudspeaker (See Smart IP public API documentation on how to use this).
- Multicast port: shows the current multicast port of the loudspeaker (See Smart IP public API documentation on how to use this).

- Host name: name of the loudspeaker – the default name is set as *[loudspeaker model – 3 last bytes of MAC address]*.
- User: shows the user name set to enable access to the loudspeaker settings (default user name is ‘admin’)
- Password: shows the password enabling access to the loudspeaker settings (the default password id ‘admin’)

NOTE: to confirm any changes, click ‘Apply’ and click the ‘boot’ button.

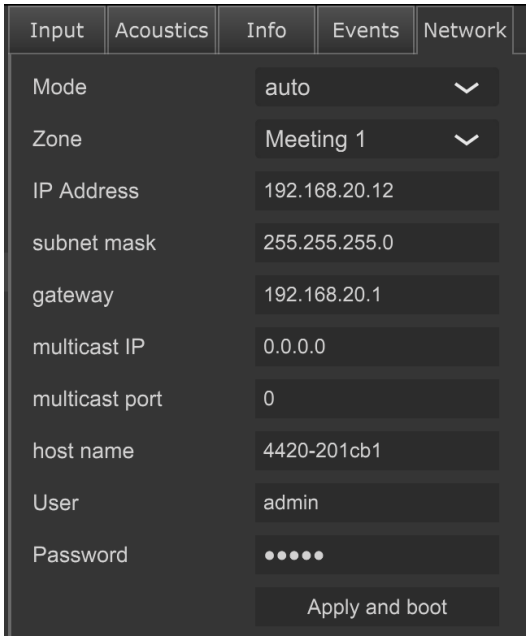


Figure 33. Network tab.

5.5.5.1 Zone Credentials

The zone credentials can be same for all zones. However, access to individual zones can be restricted to Smart IP controller App by assigning here unique credentials in Ip manager where required. The default credentials can be changed.

By default, the same credentials apply to all zones. However, access to individual zones can be restricted by assigning unique credentials where required. Default credentials can be changed at any time.

To change the credentials for a zone, follow the steps below:

1. Select all the loudspeakers in the zone. The credentials of all loudspeakers in the zone must be the same.
2. Open the Network tab.
3. Enter the Username and Password you want to have for this zone.

4. Apply the changes to zone credentials by clicking ‘Apply and boot’ button.



Figure 34. Setting the zone credentials.

Once the settings have been applied, the loudspeakers will reboot. All speakers in the zone will display a warning status, indicated by a yellow exclamation mark (!). To restore access, refresh the zone by navigating to File >> Query/refresh device. The zone will then return to its normal operational status. All loudspeakers within the same zone must share identical credentials. Do not assign different credentials to speakers within the same zone.

6 How to configure and use Smart IP Controller App

Smart IP Controller is a mobile device application designed for the daily management of the zones in a Smart IP system. This app is easy to install and configure to any Apple iOS or Android phone or tablet. The main functions allow adjusting the volume levels and turning zones on and off.

To use the Smart IP Controller App, Zones must first be created in the smart IP manager software on a PC. Once you create a new zone and add it to your mobile device, you can control it through the Controller App. If no zones are created, all speakers will be placed in the “Default” zone. When launched, the app will discover available zones including Default.

After configuring other zones using the Smart IP Manager, if the speakers have the default username and password the app will automatically connect to the zone. If not, a tab will prompt you to enter the correct username and password.



Figure 35. Smart IP Controller App.

6.1 Wi-Fi Setup for the Smart IP Controller App

The Controller app requires a Wi-Fi router on the same network with the Smart IP loudspeakers (for an example, see

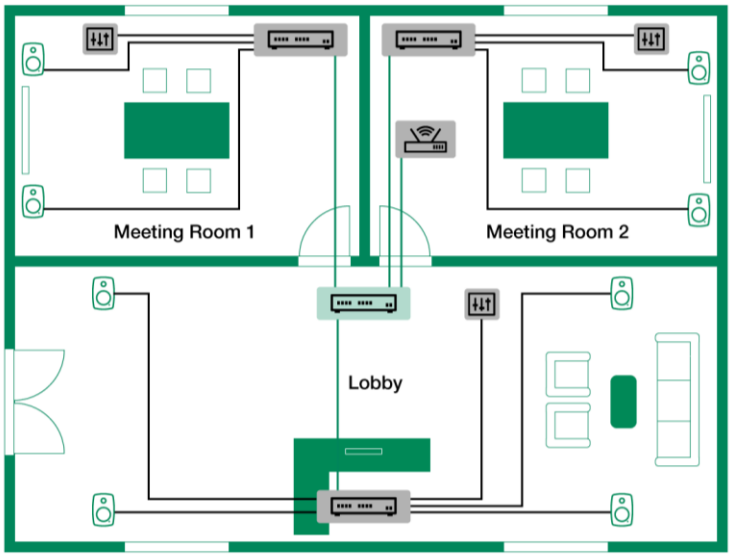


Figure 36). Being on the same network typically means that the first three octets of the IP address for all the IP devices on the network are the same.

For example, your network address range may contain IP addresses between

192.168.0.1 to **192.168.0.127**

and in this example, only the last octet changes and is unique to each device.

If your network is using automatic assignment of the IP addresses, then all devices are automatically on the same network. Typically, a method called DHCP is used for automatic IP address assignment, and this method is usually the default method for small networks.

In some cases, it may be necessary to manually set the IP address for each device. When you do this, two devices can never have exactly the same IP address even if the start part of the IP address must be the same for all devices. Then, you assign a unique number to each device using the last octet.

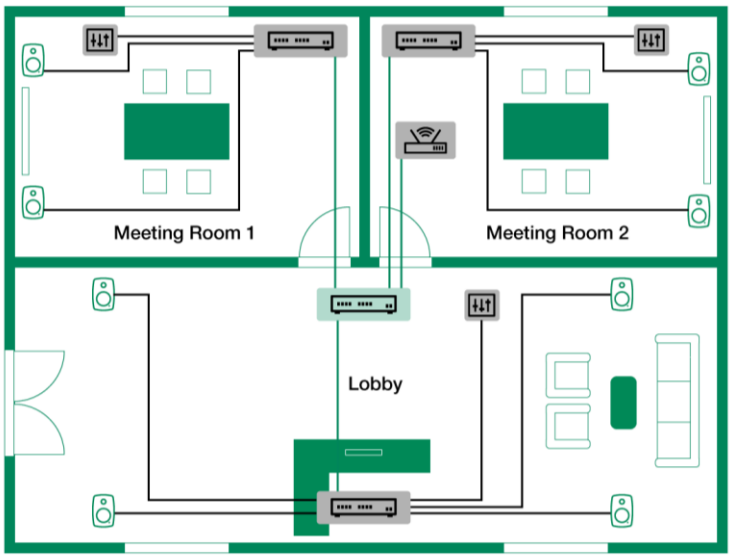


Figure 36. Network cabling example.

6.2 Enabling Smart IP Controller App on your WLAN

Ensure that the mobile device running the Smart IP Controller App is connected to the same network as the Smart IP loudspeakers. Mobile devices typically connect using Wi-Fi network (WLAN). This is done on your mobile device's network or IP address settings. If Wi-Fi setting is DHCP enabled this network connection is usually established automatically.

If you use mobile phone network for Internet connectivity, then remember to enable the Wi-Fi service in your mobile device.

To connect to the Smart IP Controller App, you connect your mobile device to the same Wi-Fi network as the smart IP loudspeakers, as illustrated below.

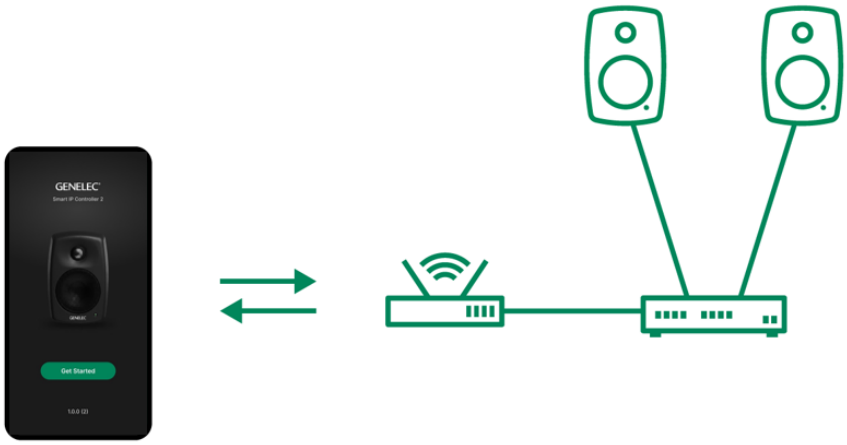


Figure 37. Genelec Smart IP control network is a simple system configuration containing a Wi-Fi network access point, IP switch with PoE output to Smart IP loudspeakers.

6.3 Configuring Smart IP Controller App

Follow these steps to add and configure each zone. To add zone definitions (as shown in this figure below) to the Smart IP Controller do the following:

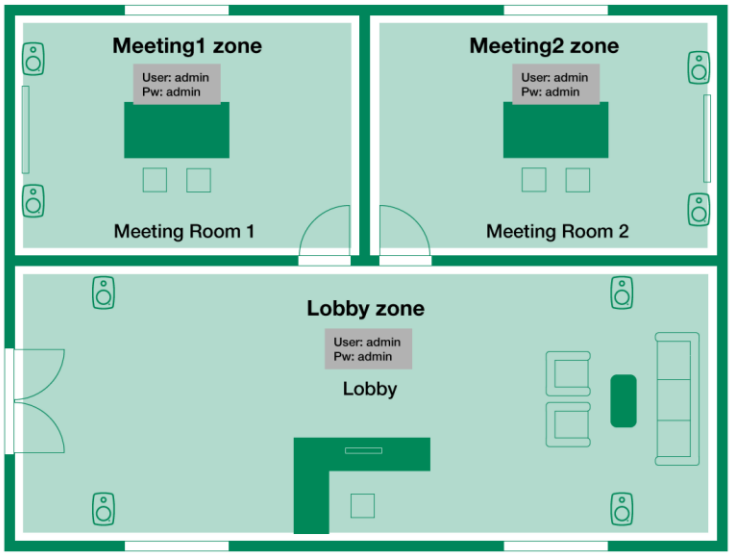


Figure 38. Each room has its own zone.

Launching the application:

Launch the Smart IP Controller App and wait until all the loudspeakers in the network have been discovered. Ensure that the number of speakers found matches the actual number of loudspeakers and zones before proceeding.



Figure 39. The number of Smart IP zones and speakers found by Smart IP Controller App.

After all loudspeakers have been discovered, they will appear in the **Default Zone** if no other zone has been created. To control these loudspeakers using the Controller App, add the Default Zone to your saved zones.

If the Default zone is the only zone you want to have, the zone addition process is now complete, you can move to using the Controller app controls for the Default zone.

Adding a Zone to control:

Add the first zone by clicking the zone name or the '+' button located next to it.

You can also view other zones created in the Smart IP Manager. These zones can be added and saved for control within the Controller App. Once added, they will appear under Saved Zones and be available for control.

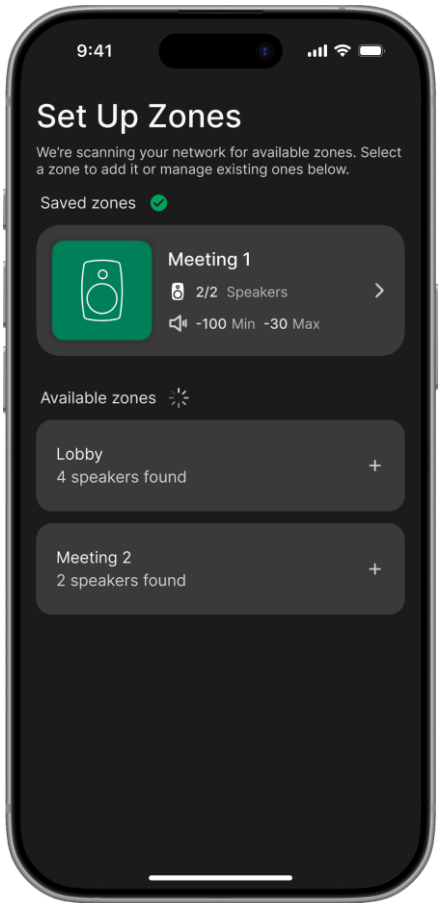


Figure 40. The setup zone page with the one saved zone (Meeting 1), showing other two zones Meeting 2 and Lobby are also available to add for control.

Note: If you change zone credentials in the speaker later via IP Manager, you must first delete the old zone from the Controller App, then re-add it with the new credentials.

Zone Management:

Navigate to Manage Zones to configure each zone. From this page, you can define the minimum and maximum volume range, assign a zone image, and delete any zones that you do not want to include in control.

The volume range setting can be used to limit the playback level for each zone. The adjustable range spans from -130 dB to 0 dB, where 0 dB represents full output level.

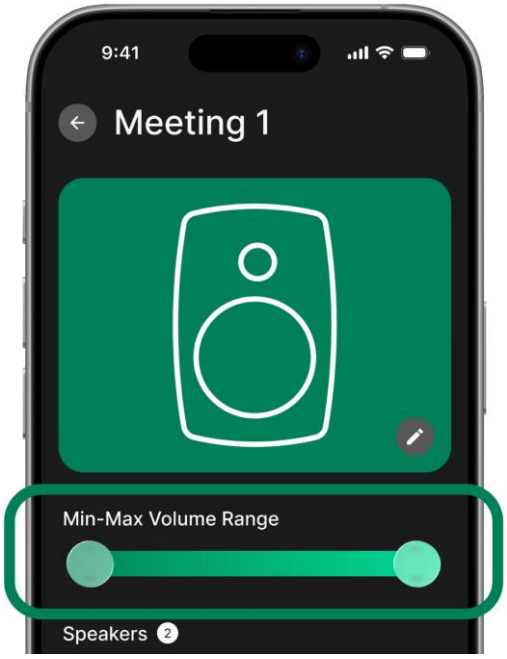


Figure 41. Volume limit for the volume control.

Click to add an optional image of the zone. Assigning an image makes it easier to identify the zone by just seeing the image. You can upload a live photo taken from your device camera or an image loaded from your device gallery.

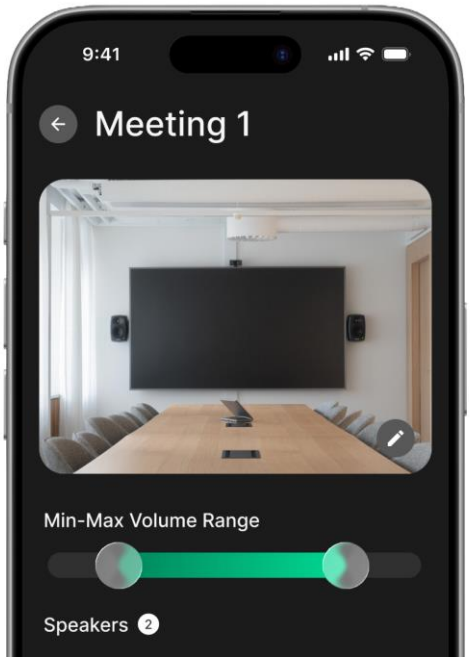


Figure 42. Image uploaded for the Meeting1 zone.

Detailed information for each zone is available, including the speaker model, MAC address, and Zone ID. All speakers associated with the zone are also displayed, together with their corresponding IP address information.

To remove a zone from the IP Controller app, delete the zone from the Manage Zones page. This does not affect the zone configuration in Smart IP Manager.

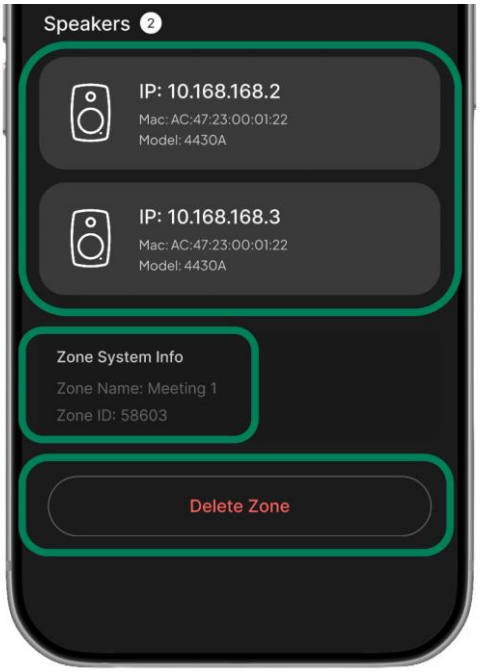


Figure 43. Click to delete zone to remove it from control.

You can return to Manage zone setting from the main control page by clicking the setting button in the top right corner.

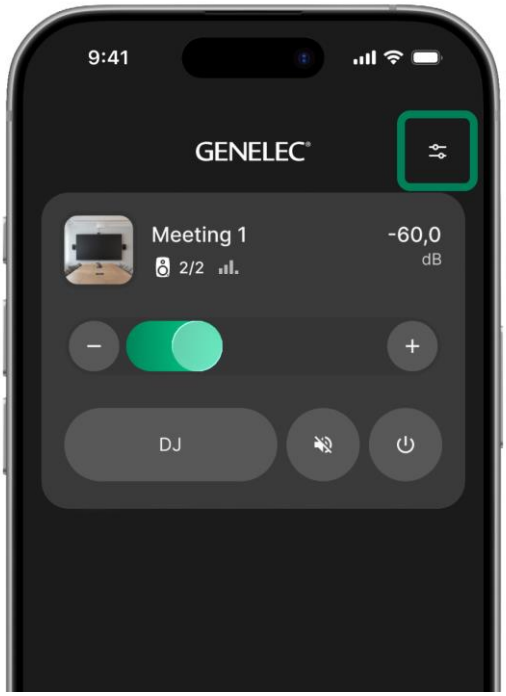


Figure 44. Click the setting icon in the upper-right corner to open the manage zone page.

6.4 Zone Control from controller

To control zones and speakers, navigate back to the **Controller Settings**.

Control Individual Zones:

Each individual zone can now be controlled independently including volume, mute, power and profile selection.

Manage zone output level:

Volume level of a zone can be adjusted using “+ / –“from the control or by moving the slider bar to the right or left.

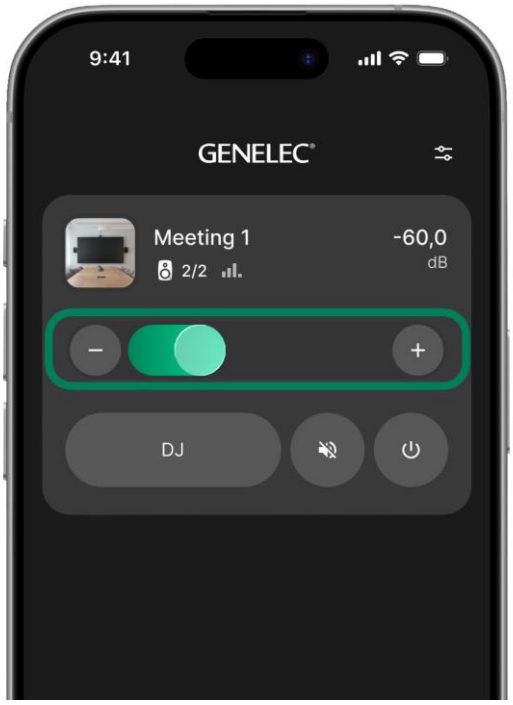


Figure 45. Volume control bar of Meeting1 zone

Acoustic profile load for zone:

Select and load any previously created acoustic profile by pressing the Profile tab. Profiles are created in the Smart IP Manager. This feature enables optimized acoustic settings to be applied to each zone based on room characteristics and acoustic conditions, allowing users to recall of profiles created in Smart IP Manager.

A profile can include input and acoustic settings for example one profile maybe used for bass tilt and another for DJ use that has different input and different EQ.

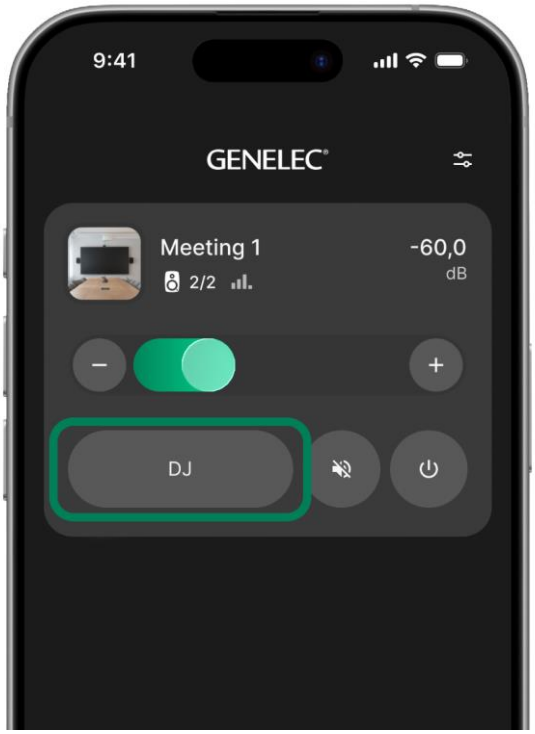


Figure 46. An acoustic profile preset loaded for this zone.

Mute Zone:

If muted, the zone will mute the output for all the speakers in the zone.

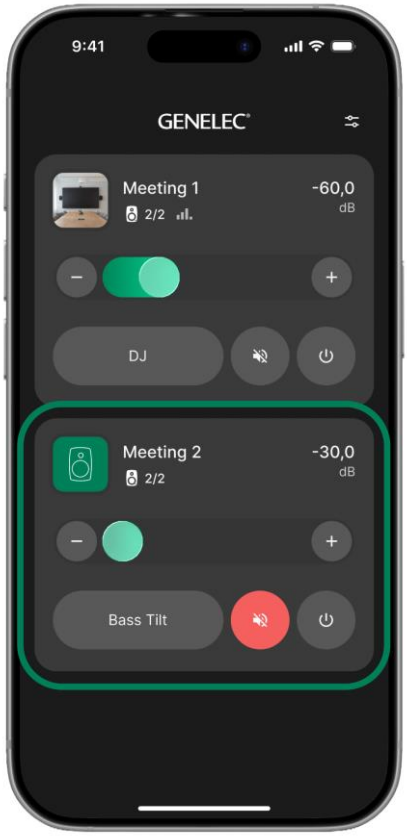


Figure 47. One zone (Meeting 2) is muted.

Turn off/on a Zone:

Use the power button to turn a selected zone on or off. When turned off, all speakers in the zone enter standby mode.

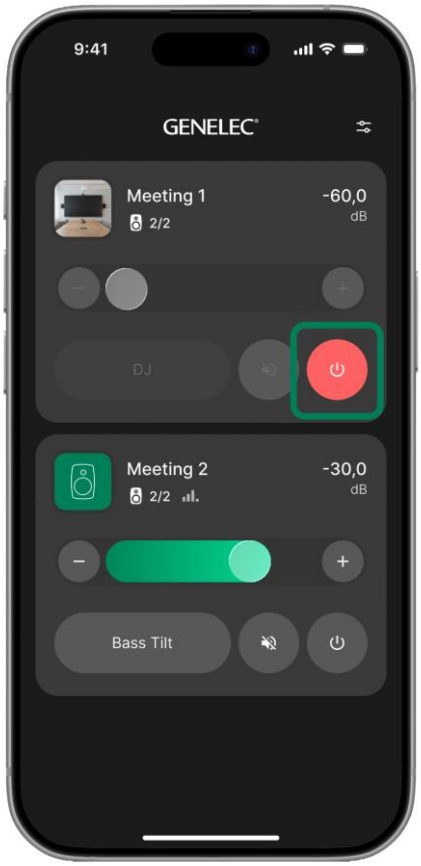


Figure 48. All the speakers in Meeting1 zone are on standby mode now.

6.5 Daily Use of Smart IP Controller App

Each zone is presented by the zone view. In this view you can see the zone name, and the number of Smart IP loudspeakers in every zone.

The controls affect all the loudspeakers inside the zone. The controls for the zone include

- volume control by pressing + or – buttons
- power on/off
- mute the loudspeakers
- The animated bars show if audio is playing in the zone.



Figure 49. Zone view for daily use.

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