JBL PROFESSIONAL by HARMAN

# INTONATO|24

## Monitor Management Tuning System


# Operation Manual

# Table of Contents

# Introduction

Thank you for purchasing the JBL® Intonato 24 Monitor Management Tuning System. The Intonato 24 is a powerful, sophisticated speaker management processor and monitor controller for audio recording, post production, and broadcast facilities. With support for mono to immersive surround formats, the Intonato 24 provides the centerpiece for a scalable audio production monitoring system.

### Supported Formats

The Intonato 24 can be configured for mono, stereo, 5.1, 7.1, and greater surround systems, including burgeoning immersive audio production formats such as Dolby® Atmos®, Barco® Auro, DTS:X™, and others that use overhead or height surround speakers. Up to 4 subwoofers are supported, with LFE capabilities, assignable bass management for each satellite speaker, and global bass management on/off control. Fully customizable downmixing with adjustable downmixing levels is also supported, allowing various downmix formats to be recalled using scenes.

### Inputs

The Intonato 24 can accept up to 24 simultaneous source inputs from various combinations of the 24 line-level analog, 24 digital AES, and 24 BLU link input channels. AES Input C has selectable sample rate conversion (SRC), which can be enabled when connecting digital devices synchronized from different clocks (such as their own).

### Outputs

Up to 24 line-level analog outputs are available for connecting to the amplifiers. Or, up to 24 BLU link output channels can be routed to BLU link-equipped amplifiers, such as the Crown Audio® DCi N models. Two independently adjustable delays are also provided to synchronize the monitor system and talent headphone mix to video displays and restore “lip synchronization”.

### Mic Input and Stereo Aux Output

The Intonato 24’s XLR mic input can be used for both calibrating the system and for talkback communication during recording sessions. The stereo aux output (channels 23 and 24 when configured) carries the talkback signal and supports channel downmixing, making it perfect for recording voiceover or automatic dialog replacement (ADR) for surround-formatted projects.

### Configuration and Control

The Intonato 24 can be configured and controlled from a compatible Windows®, Mac®, iOS®, or Android™ device using the free JBL Intonato control app. Network control can be established by connecting to a DHCP-enabled network via a wired computer connection or a Wi-Fi router and Wi-Fi-equipped device. User control is also available using the dedicated Intonato DC desktop controller (sold separately).

The Intonato 24 offers six different speaker layout configuration types and works on the principle of creating a profile for a given type of session, then creating and storing scenes to the profile for later recall by the studio engineer.

A profile contains all the configuration settings for a given type of session. Up to 30 profiles can be stored. Scenes contain the various states the studio engineer will need to recall during a session (source/speaker monitor selection, fold-down mixes, etc.). Up to 30 scenes can be stored to each profile.

Within scenes, audio inputs can be routed or mixed to outputs with their levels adjusted as necessary. This provides a great deal of audio routing flexibility to suit the application.

For the studio engineer, the Intonato 24 provides master mute, dim, and monitor volume control, as well as individual speaker mute/solo control, and monitor SPL indication.

### Integrated Auto-Calibration System

The Intonato 24 includes a sophisticated auto-calibration system that leverages JBL's decades of experience integrating speaker systems into real-world production environments. Based on JBL's proprietary software used to measure acoustics during product development, the Intonato 24 incorporates a powerful hardware-based DSP solution designed to produce a "tuned" monitoring environment that delivers greater accuracy in a broad range of environments.

Using the supplied calibration microphone, the Intonato 24 analyzes the system performance in the monitoring environment and automatically matches the level, "time-of-arrival" delay, and frequency response of all speakers. Furthermore, an infinite number of mic position measurements can be taken to provide an averaged room frequency response, for very complex yet fast and accurate room EQ calibration.

Differing distances in speaker placement can prevent correlated signals from summing properly at the mix position. The Intonato 24's auto-calibration system ensures the output and "time of arrival" of all speakers is carefully matched. The auto-calibration system measures the level and time of arrival of each speaker, and applies the precise amount of attenuation and delay to all speakers to match that of the most distant speaker.

In the low frequencies, the room is in control. Place a speaker in different places in the room and you will hear differences in low-frequency response. Although a speaker may deliver neutral frequency response on-axis in an anechoic environment, when measured at the mix position the response is altered by the interaction of the loudspeaker and the production environment.

"Room modes" or "standing waves" (low-frequency resonance caused by the geometry and construction of the room) can augment and attenuate low-frequency response, creating a false impression of bass at the listening position. This issue can result in mixes that are bass-light or bass-heavy when auditioned on systems outside the control room.

During the auto-calibration process, the Intonato 24 measures the low-frequency response delivered by each speaker and applies settings to tackle effects of low-frequency resonance. Additionally the system identifies and neutralizes response anomalies caused by the speaker's proximity to the room's walls or work surface. The system is designed to identify low-frequency resonance and boundary issues below 500Hz and adjust the "Room EQ" to provide flat low-frequency response from all speakers. In our experience, the desired low-frequency curve varies according to room size and material.

Once system calibration is complete, the Intonato 24's "User EQ" allows the system's frequency response to be tailored according to preference—for example, to compensate for perforated-screen transmission loss, or to create the X Curve or another custom frequency-response contour.

# Features

- Support for 44.1, 48, 88.2, and 96 kHz sample rates
- Up to 24 simultaneous inputs from the available 24 analog, 24 AES, and 24 BLU link input channels
- Up to 24 analog and BLU link output channels
- Sample rate conversion for asynchronous connection of up to 8 AES input signals
- Support for mono, stereo, 5.1, 7.1, and greater surround formats, including burgeoning immersive audio production formats such as Dolby Atmos, Barco Auro, DTS:X, and more
- Mixing matrix with channel-independent level control for flexible routing, mixing, and downmixing of any combination of AES, Analog, and BLU link inputs to outputs
- Bi-amped speaker support
- LFE support with adjustable LFE low-pass filter frequency
- Bass Management for up to 4 subwoofers, with global bass management on/off control
- Adjustable bass management crossover frequency
- Included measurement microphone and auto-calibration feature for automated system calibration of output trims, delays, and 12-band room EQ, with support for an infinite number of mic positions to provide an averaged room EQ response
- Built-in signal generator with pink noise, white noise, and sine wave tone options
- Manually adjustable 8-band parametric EQ and polarity on every output channel
- Independently adjustable delays for synchronizing speaker and headphone monitoring systems to video displays
- Stereo aux output with downmixing support, talkback, 3-band EQ, and level control—perfect for providing a headphone mix to talent for voiceover/ADR recording sessions or feeding remote stereo speakers
- Store up to 30 profiles
- Store up to 30 scenes in each profile for recall of source/monitor selection and fold-down monitoring
- End-user control of solo and mute for each speaker output
- End-user control of master level, mute, and dim, with dim level adjustment
- Monitor level calibration with SPL readout for reliable level referencing
- Password protection to prevent unauthorized tampering
- Built-in speaker tunings for the JBL M2 speakers, 7 Series speakers, and various JBL subwoofers
- Unit configuration and control using the free JBL Intonato control app, available for compatible Windows, Mac, Android, and iOS devices
- Optional dedicated Intonato DC desktop controller available

# Front Panel Overview


1. **Input Source LEDs**
   These LEDs indicate input signal status of the 24 configured inputs post the A/D converters (if analog) and before the DSP. Signal status is indicated as follows:
   - **LED Off** – The input channel is not configured for use in the current scene.
   - **LED Dim Green** – The input channel is configured for use in the current scene, but no signal is detected.
   - **LED Bright Green** – The input channel detects signal level.
   - **LED Red** – The input channel is clipping.

2. **Status LEDs**
   These LEDs indicate status as follows:
   - **Power** – Lights to indicate the unit is powered on.
   - **Master** – Lights when the Intonato 24 is providing the master clock for the BLU link bus.
   - **SRC** – Lights to indicate sample rate conversion is enabled on AES Input C.
   - **Network** – Lights to indicate a connection has been established with the network.

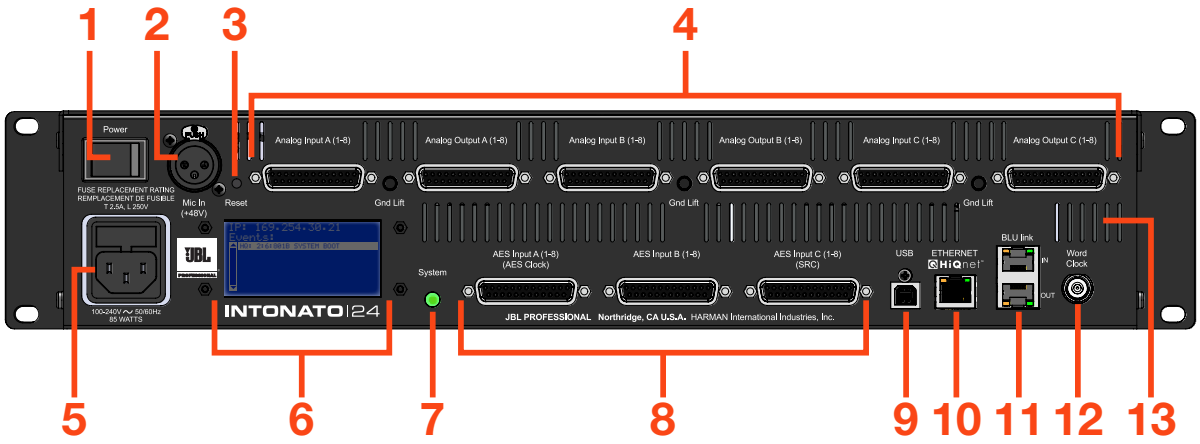
3. **Clock Source LEDs**
   These LEDs indicate the source providing master clock to the Intonato 24:
   - **Internal** – Lights to indicate the Intonato 24 is clocked from the internal oscillator.
   - **BLU link** – Lights to indicate the Intonato 24 is clocked from another device on the BLU link bus.
   - **AES** – Lights to indicate the Intonato 24 is clocked from the AES signal connected to AES Input A1.
   - **Word Clock** – Lights to indicate the Intonato 24 is clocked from the Word Clock (BNC) input.

4. **Output LEDs**
   These 24 output LEDs indicate output signal status post the DSP. Signal status is indicated as follows:

   - **LED Off** – The output channel is not configured for use in the current scene.
   - **LED Dim Green** – The output channel is configured for use in the current scene, but no signal is detected.
   - **LED Bright Green** – The output channel detects signal level.
   - **LED Red** – The output channel is clipping.

5. **Cooling Vents**
   These vents provide air circulation through the processor. A low-noise fan is used to circulate air through the Intonato 24 and keep it running at an optimal temperature. The fan is baffled to appropriately direct airflow and minimize fan noise. When installing the Intonato 24, ensure that all airflow vents remain unblocked.

# Rear Panel Overview




1. **Power Switch**
   This rocker-type power switch is used to turn the Intonato 24's power on or off.

2. **Microphone Input Connector**
   This balanced female XLR input serves two purposes: connect the included measurement microphone to initially calibrate the speaker system to the monitoring environment; connect a talkback mic to communicate with talent via the stereo aux output during recording sessions.

   **WARNING:** This input supplies a constant 48V phantom power supply. To prevent microphone damage when connecting a dynamic microphone, ensure that a balanced cable connection is used.

3. **Reset Button**
   This button is used to perform a factory reset on the unit. The factory reset restores all parameters to the factory default settings. To perform a factory reset, press and hold the **Reset** button while powering on the Intonato 24. The button must be held until the LCD indicates "Factory Reset". Follow the on-screen instructions to complete the factory reset procedure.

   **WARNING:** Performing the factory reset will erase all user-defined settings and presets and is irreversible.

4. **Analog Input and Output Connectors**
   25-pin female D-Sub connectors are used for the analog inputs and outputs. These connectors adhere to the industry-standard TASCAM® balanced audio pinouts. See **"D-Sub Connector Pinouts" on page 98** for more information on the pinouts of these connectors.

   - **Analog Inputs** – Connect the input D-Sub connectors to the analog outputs of the source devices (e.g., mixer, DAW audio interface, D/A converters, reference playback devices, etc.). Each input connector accepts eight channels of analog audio. These are electronically balanced inputs with a maximum input level of up to +28 dBu.

     **NOTE:** Analog input sensitivity is selectable per D-Sub connector. See **"Analog Input Sensitivity (A, B, and C)" on page 21** for more information.

Each analog D-Sub input connector has an accompanying Ground Lift button. If hum occurs at an input, and is due to a ground loop between the Intonato 24 and the connected source device, engaging the associated Ground Lift button will break the ground loop.

- **Analog Outputs** – Connect the output D-Sub connectors to the analog inputs of the amplifiers or powered speakers, as well as to the headphone amplifier for talent talkback, if applicable. Each output D-Sub connector carries eight channels of analog audio. These are electronically balanced outputs with a maximum output level of +24 dBu.

**5. Power Input Connector**

Connect the power cable to this standard IEC connector to supply power to the unit. This connector has a built-in fuse to limit exposure to any possible over-current conditions. See **"Replacing the Fuse" on page 97** for information on replacing the fuse.

**6. LCD**

This liquid crystal display (LCD) indicates the Intonato 24's current IP address and displays processor status (e.g., network activity, sample rate, fault conditions, error messages, etc.). It also displays prompts when performing the factory reset function.

**7. System Button/LED**

This button is used during the factory reset procedure.

**8. AES Inputs**

Connect these 25-pin female D-Sub connectors to the AES digital outputs of source devices (e.g., DAW audio interface, reference playback devices, etc.). Each input connector accepts eight channels of digital audio. The pinout of these connectors are based on the industry-standard TASCAM balanced audio pinouts. See **"D-Sub Connector Pinouts" on page 98** for more information on the pinouts of these connectors.

**NOTE:** When connecting digital signals to these connectors, the clock is derived from AES Input A1. Optional sample rate conversion can be enabled on the AES Input C connector, allowing connection of up to eight asynchronous digital sources (digital sources which are slaved to a different clock than that connected to AES Input A1).

**9. USB Port**

This port provides potential update capabilities.

**10. Ethernet (HiQnet®) Port**

Connect this Ethernet port to a DHCP-enabled network to configure, control, and update the Intonato 24 via the JBL Intonato control app. End-user control is available via the app or using the dedicated Intonato DC desktop controller (sold separately).

**11. BLU link Input/Output Ports**

Connect these RJ45 ports to other BLU link-equipped devices to transmit and receive up to 24 channels of high-resolution digital audio via Ethernet cabling. See **"Using BLU link" on page 80** for more information on using BLU link.

**12. Word Clock Input**

In cases where an external master (or “house”) clock is used for reference, connect the word clock output of the master clock device to this BNC connector. See **“Configuring the Clock Source” on page 76** for information on using word clock.

**13. Cooling Vents**

These vents provide air circulation through the processor. A low-noise fan is used to circulate air through the Intonato 24 and keep it running at an optimal temperature. The fan is baffled to appropriately direct airflow and minimize fan noise. When installing the Intonato 24, ensure that all airflow vents remain unblocked.

# Installing the Intonato 24

**IMPORTANT:** Read the important safety instructions included in the box before installing and operating this product.

## Rack Installation

THE INTONATO 24 IS FOR RACK MOUNT USE ONLY. Install the Intonato 24 in a 19” rack with the provided rack screws and washers. When installed in a rack, ensure that all airflow vents remain unblocked. The Intonato 24 should not be mounted directly above or below anything that generates excessive heat. Ambient temperatures should not exceed 104° F (40° C) when equipment is in use. Although the unit is shielded against radio frequency and electromagnetic interference, extremely high fields of RF and EMI should be avoided where possible. The Intonato 24 is cooled via an internal low-noise fan optimized for quiet operation.

## Making Audio Connections

1. Ensure the power is turned off on all interconnecting equipment and the Intonato 24 before making audio connections.
2. Connect the outputs of the source devices to the inputs of the Intonato 24. If connecting via AES digital connections, use 110 ohm cable optimized for AES transmission. For all analog connections, use the highest quality cables available with the shortest possible cable runs. If connecting via BLU link, Cat5e or higher cables should be used.

   **TIP:** The Intonato 24 offers selectable analog input sensitivity options, which allow the analog input gain stages to be optimized for the connected source devices. These analog input sensitivity settings can be configured from the Utility screen in the control app. See **“Analog Input Sensitivity (A, B, and C)” on page 21** for more information.
3. Connect the Intonato 24’s outputs to the designated amplifier, powered speaker, or headphone amplifier inputs. Analog and/or BLU link outputs can be used, depending on the application.
4. If the system will be calibrated using the built-in auto-calibration feature, connect the included measurement microphone to the XLR mic input using a balanced microphone cable of suitable length and place it in a microphone stand.

## Applying Power

1. Ensure your sources are powered on and turned down.
2. Connect a power cable to the AC power inlet on the Intonato 24’s back panel, then connect the other end to an available AC power outlet.
3. Switch the back-panel power switch to the on position.
4. Apply power to the power amplifiers or powered speakers.

# Installing the JBL Intonato Control App

The free JBL Intonato control app is used to program and control the Intonato 24. It is available for compatible Android, iOS, Mac, and Windows devices.

## Device Requirements

Visit http://www.jblpro.com/intonato24 for the latest information on device requirements for the JBL Intonato control app.

## Downloading and Installing the App

Download and install the JBL Intonato control app from the iTunes Store®, Google Play™, or from http://www.jblpro.com/intonato24.

# Connecting to the Network

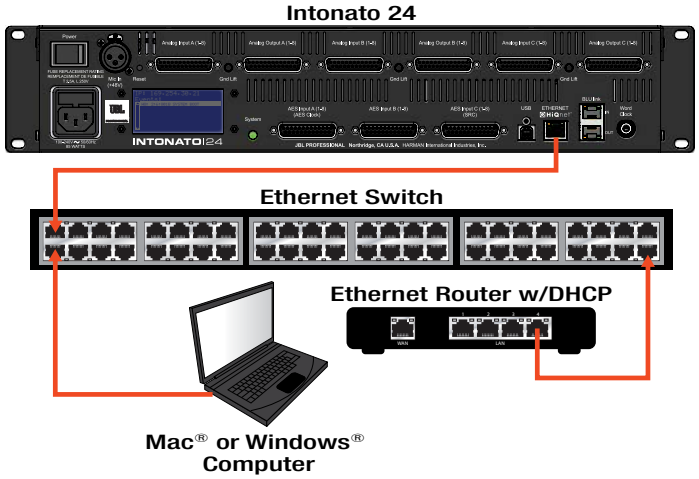
## Connecting to a Wired Network Switch or Router

**NOTE:** The Intonato 24 must be connected to a DHCP-enabled network for initial configuration and control.

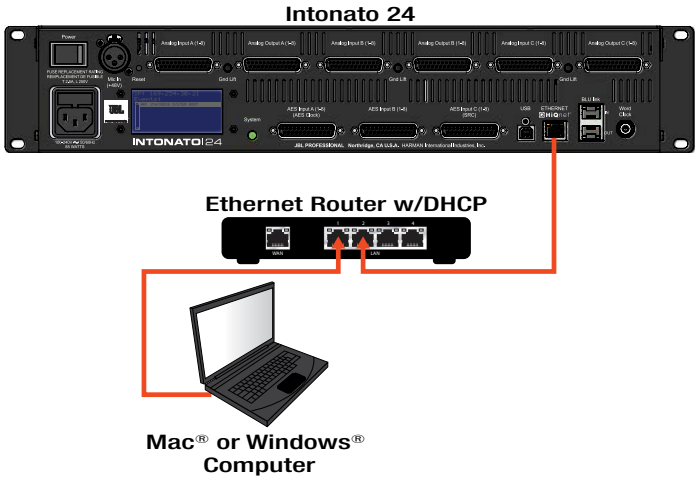
1. If using a switch, connect one of the LAN ports from a DHCP-enabled router to one of the ports on the switch, or connect it to another switch on the network.
2. Connect a Cat5, Cat5e, or Cat6 Ethernet cable to the Ethernet port on the Intonato 24.
3. Connect the other end of the Ethernet cable to one of the LAN ports on the switch or router.
4. Connect your computer's Ethernet port to one of the other LAN ports on the switch or router using a Cat5, Cat5e, or Cat6 cable.
5. Apply power to the Intonato 24 and wait for the processor to initialize. Give the unit time to negotiate with the network so it can be assigned an IP address. This can take a few minutes. Look at the LCD screen on the back of the unit to ensure the Intonato 24 has been assigned an IP address.

**NOTE:** For more information on networking, including troubleshooting tips, see **"Networking" on page 89**.

**Wired Network Switch Connection**




**Wired Network Router Connection**




**TIP:** Once connection to the network has been established using a DHCP server, the HiQnet® NetSetter™ application can be used to assign the Intonato 24 a static IP address if required for the application. See **"Using HiQnet® NetSetter™" on page 92** for more information.

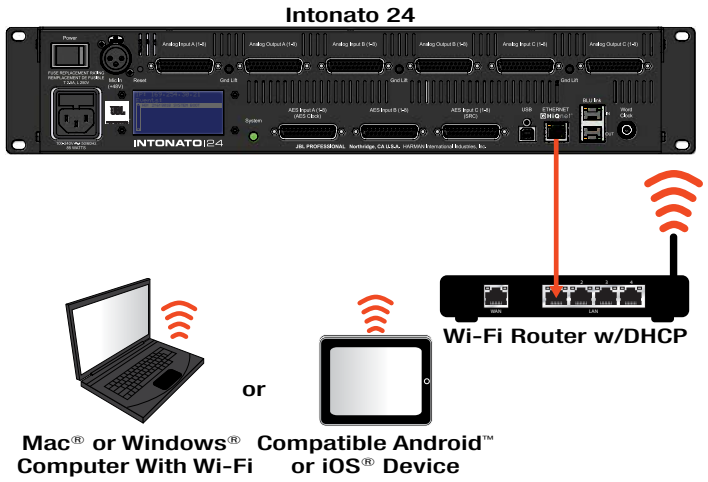
**NOTE:** The Intonato 24 can establish a network connection with the Intonato DC desktop controller and control app simultaneously.

**WARNING:** Only connect to networks that remain inside the building.

## Connecting to a Wi-Fi Network Router

**NOTE:** The Intonato 24 must be connected to a DHCP-enabled network for initial configuration and control.

**Wi-Fi Network Router Connection**




1. Connect a Cat5, Cat5e, or Cat6 Ethernet cable to the Ethernet port on the Intonato 24.
2. Connect the other end of the Ethernet cable to one of the LAN ports on the Wi-Fi router.
3. Connect to the Wi-Fi network using your Wi-Fi-equipped computer or device.
4. Apply power to the Intonato 24 and wait for the processor to initialize. Give the unit time to negotiate with the network so it can be assigned an IP address. This can take a few minutes. Look at the LCD screen on the back of the unit to ensure the Intonato 24 has been assigned an IP address.

**NOTE:** For more information on networking, including troubleshooting tips, see **"Networking" on page 89**.

**TIP:** Once connection to the network has been established using a DHCP server, the HiQnet NetSetter application can be used to assign the Intonato 24 a static IP address if required for the application. See **"Using HiQnet® NetSetter™" on page 92** for more information.

**NOTE:** The Intonato 24 can establish a network connection with the Intonato DC desktop controller and control app simultaneously.

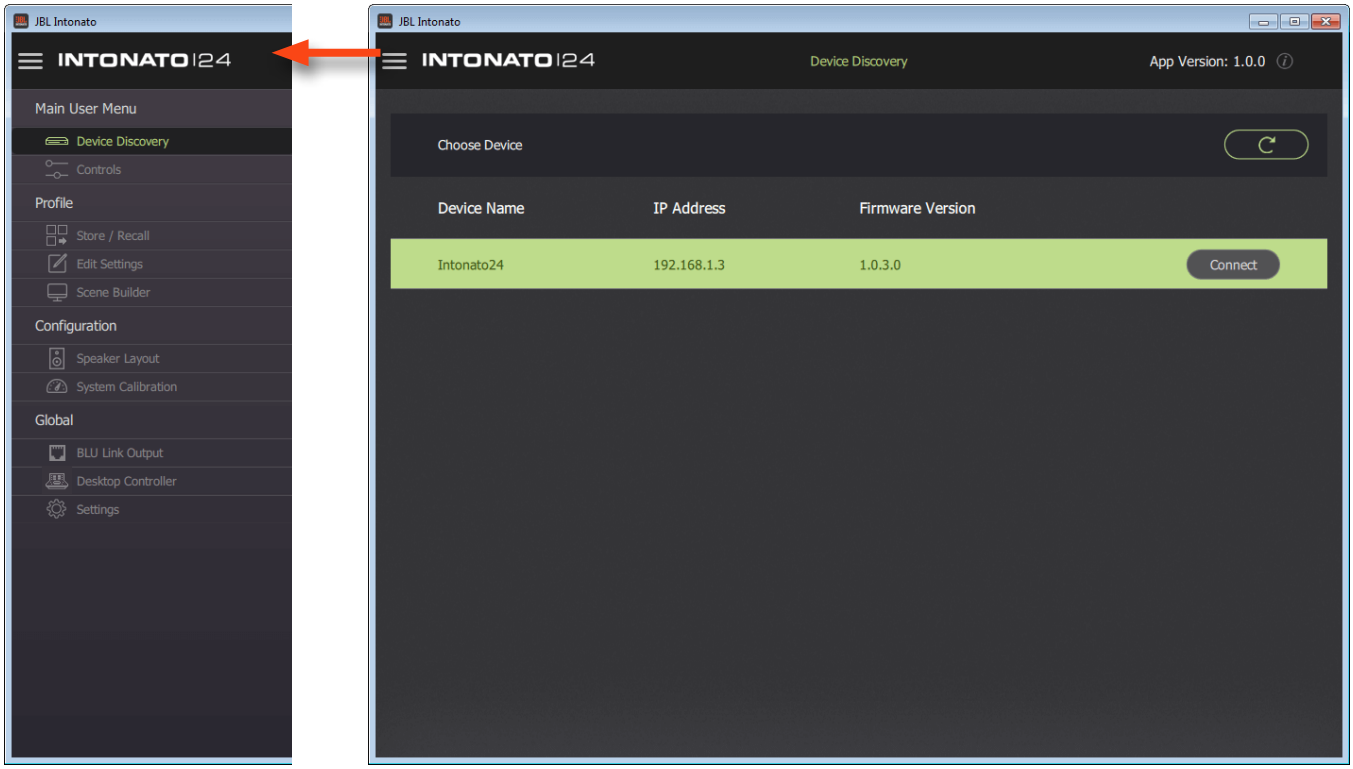
**WARNING:** Only connect to networks that remain inside the building.

# Using the Intonato 24 Control App

The Intonato 24 is configured using the JBL Intonato control app. For information on downloading and installing the JBL Intonato control app, see **“Installing the JBL Intonato Control App” on page 10**. The following sections describe, in order, how to configure and use the Intonato 24 processor.

## Discovering Devices on the Network

The Device Discovery screen is the first screen that appears once the JBL Intonato control app has initialized. The app will search the network for connected Intonato 24 devices and list them on this screen. You can always come back to this screen by selecting **Device Discovery** in the Main User Menu.




### Refresh Button

Press this button to refresh the list of devices detected on the network.

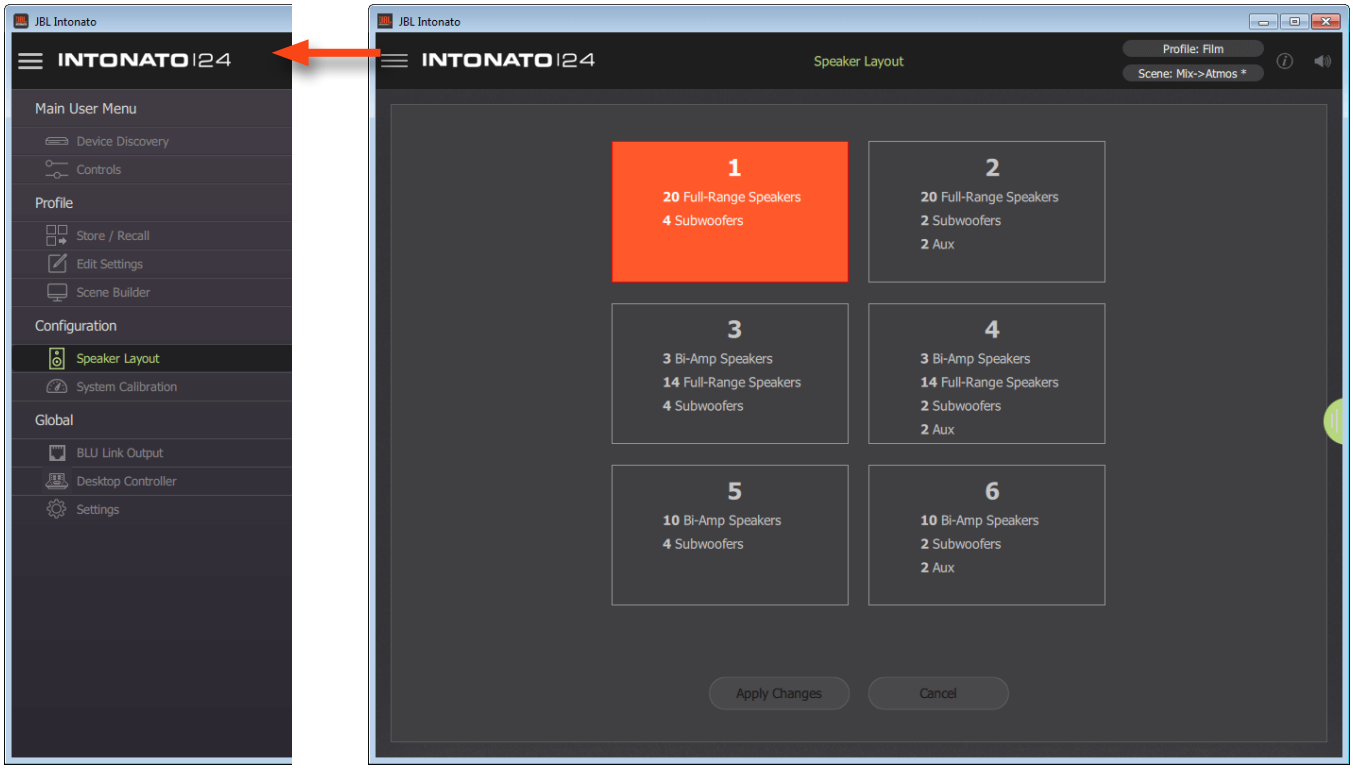
### Device List

This list displays all Intonato 24 devices detected on the network, as well as their currently configured IP address and firmware version. Press the **Connect** button to connect to a device.

## Selecting the Speaker Layout Type

The first step in configuring the Intonato 24 is to select the speaker layout that suits the application:

1. When connecting to the Intonato 24 for the first time, the control app will automatically navigate to the Speaker Layout screen. If a speaker layout was previously selected and needs to be changed, select **Speaker Layout** from the Main User Menu.
2. Select the speaker layout that suits the application.
3. Press the **Apply Changes** button.




There are six speaker layout types to choose from:

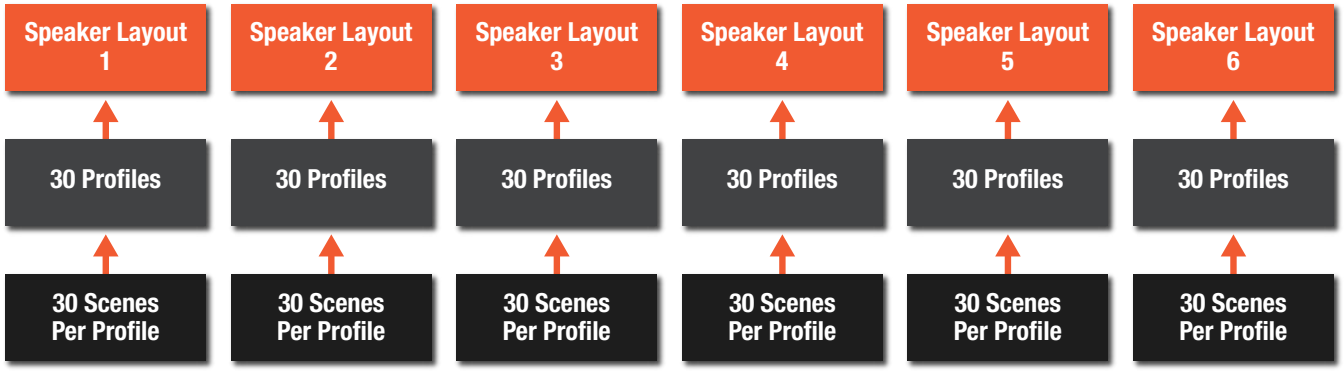
1. 20 full-range speakers, 4 subwoofers
2. 20 full-range speakers, 2 subwoofers, and 2-channel aux output with talkback
3. 3 bi-amplified speakers, 14 full-range speakers, 4 subwoofers
4. 3 bi-amplified speakers, 14 full-range speakers, 2 subwoofers, and 2-channel aux output with talkback
5. 10 bi-amplified speakers, 4 subwoofers
6. 10 bi-amplified speakers, 2 subwoofers, and 2-channel aux output with talkback

**TIP:** See **“Application Examples” on page 44** to see example applications using some of the speaker layouts listed above.

## About Speaker Layouts, Profiles, and Scenes

Profiles and scenes are stored to the speaker layout type selected during configuration. Up to 30 profiles can be stored to each of the six speaker layout types, and up to 30 scenes can be stored to each of the 30 profiles (see illustration below). Although it is not typical to change the speaker layout type once configured, unless the speaker system is being upgraded, this does provide a means to retain profile and scene settings if the speaker layout type is changed.

**NOTE:** Profiles and scenes cannot be transferred between speaker layout types.




The table below shows the settings stored to the speaker layout, profiles, and scenes, and which settings are persistent (their state/value doesn't change as profiles and scenes are recalled, but will be defaulted if another speaker layout type is loaded or the unit is power cycled).

| Speaker Layout | Profiles | Scenes | Persistent |
|---|---|---|---|
| • System calibration settings (room EQ, time-alignment delay, output level, polarity)<br>• Reference level user calibration offset setting (used to calibrate the measured SPL readout)<br>• BLU link output channel assignments<br>• All stored profile and scene settings | • Input channel names, routing, and group assignments<br>• Input LFE assignments<br>• Input trim levels<br>• Output channel names, group assignments, bass management assignments, and speaker tuning selections<br>• Outputs assigned for master volume control<br>• User EQ settings for each output<br>• Analog input sensitivity, clock source, sample rate, and SRC enable<br>• AV and Aux AV delay<br>• Bass management crossover frequency and LFE low-pass frequency<br>• Global bass management on/off, dim level, and master reset level<br>• Aux output level and tone (EQ) settings<br>• Settings for all scenes (30 per profile) | • All input and LFE mix level settings in the Scene Builder screen | • Master volume, dim, and mute<br>• Speaker mute/solo selections |

### About the Aux Outputs

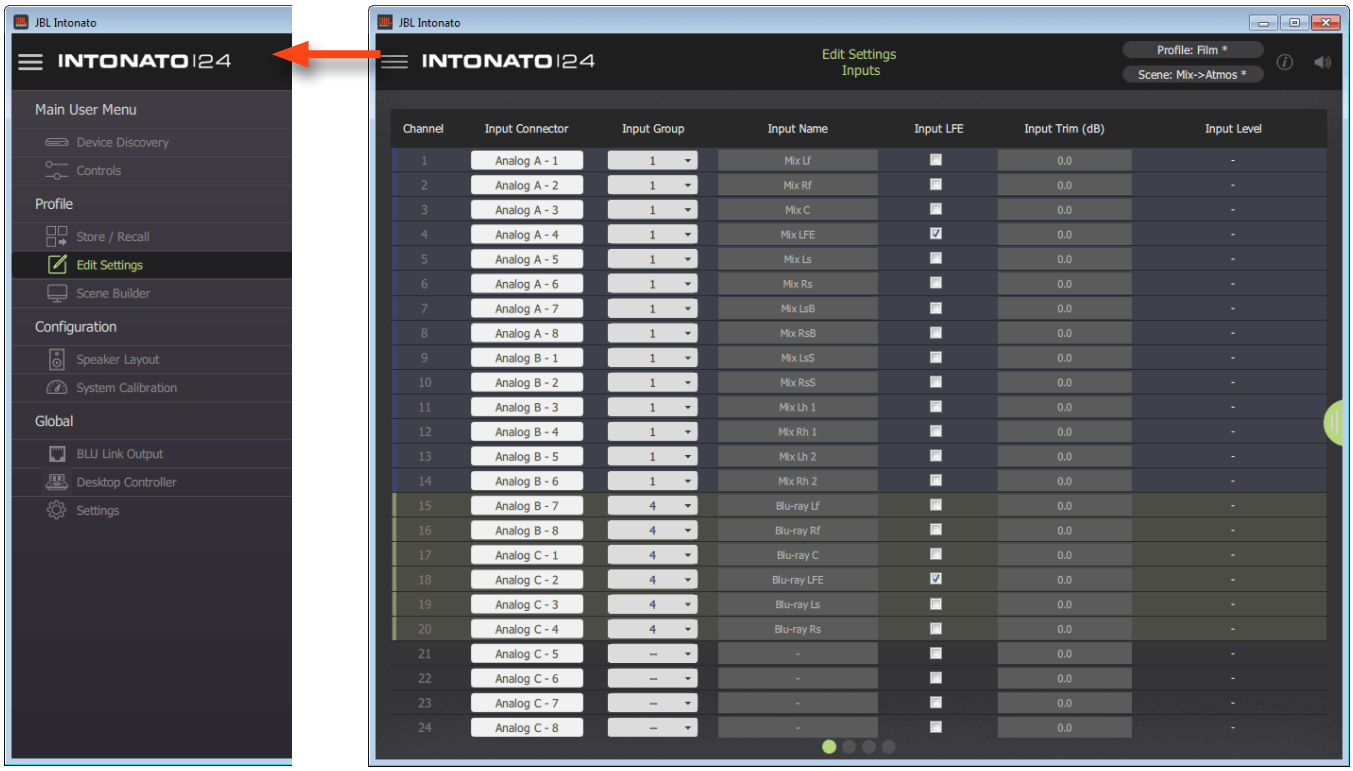
When speaker layout 2, 4, or 6 is selected, Intonato 24 output channels 23 and 24 are configured to provide a stereo auxiliary feed, which can be connected to an external headphone amplifier for recording sessions (for example, during voiceover or ADR recording sessions in an editing facility where a mixing console is not available). The feed can also be used to send a mix to a pair of speakers in a remote location.

A 24 x 2 mixer allows any combination of inputs to be mixed to the stereo aux output, including downmixed surround mixes. The stereo aux output has its own level control, 3-band EQ, and AV delay to restore “lip synchronization” with video displays.

Additionally, the XLR mic input is routed to the aux outputs and becomes active when the Talkback button is pressed. Input 24 will automatically be switched to carry the signal from the XLR mic input. The talkback input assignment is fixed and cannot be changed. The XLR mic input gain is fixed at 30 dB.

## Configuring Inputs

Once the speaker layout type has been selected, it's time to configure the inputs for the application. The inputs can be configured by selecting **Edit Settings** from the Main User Menu. The Input Configuration screen is the first screen displayed from this menu.




### Information and Navigation Bar

The bar across the top of the screen provides important feedback and access to navigation and is available on most screens. Press the icon in the upper left-hand corner to access the Main User Menu and navigate the various screens. The title of the current screen is displayed in the middle of the bar. In the upper right-hand corner, the currently loaded profile and scene preset are displayed. If an asterisk appears next to the profile or scene preset, this indicates it has been edited from the stored values. The information icon accesses the application's contextual help. The speaker icon can be used to mute all outputs (with the exception of the stereo aux output).

### Input Connector

From these dropdown menus, select the desired physical input to route to each corresponding Intonato 24 input channel. There is no limitation on the mix of Analog, AES, and BLU link inputs; they can be assigned in any order.

### Input Group

Select from the 12 options available in this dropdown menu to visually group input channels by color.

### Input Name

These fields allow inputs to be named to suit the application, which will simplify configuration and operation.

### Input LFE

Check any of these boxes to identify the corresponding input as an LFE channel. When checked, the

input channel will be routed through the LFE low-pass filter and on to the subwoofer outputs. Any number of inputs can be designated as LFE input channels.

**NOTE:** Ensure subwoofers are set to LFE mode, if applicable.

**NOTE:** The LFE signal level must also be set in the Scene Builder screen to feed the LFE input signal to the subwoofer(s). See **"Creating Scenes" on page 36** for information on using the Scene Builder.

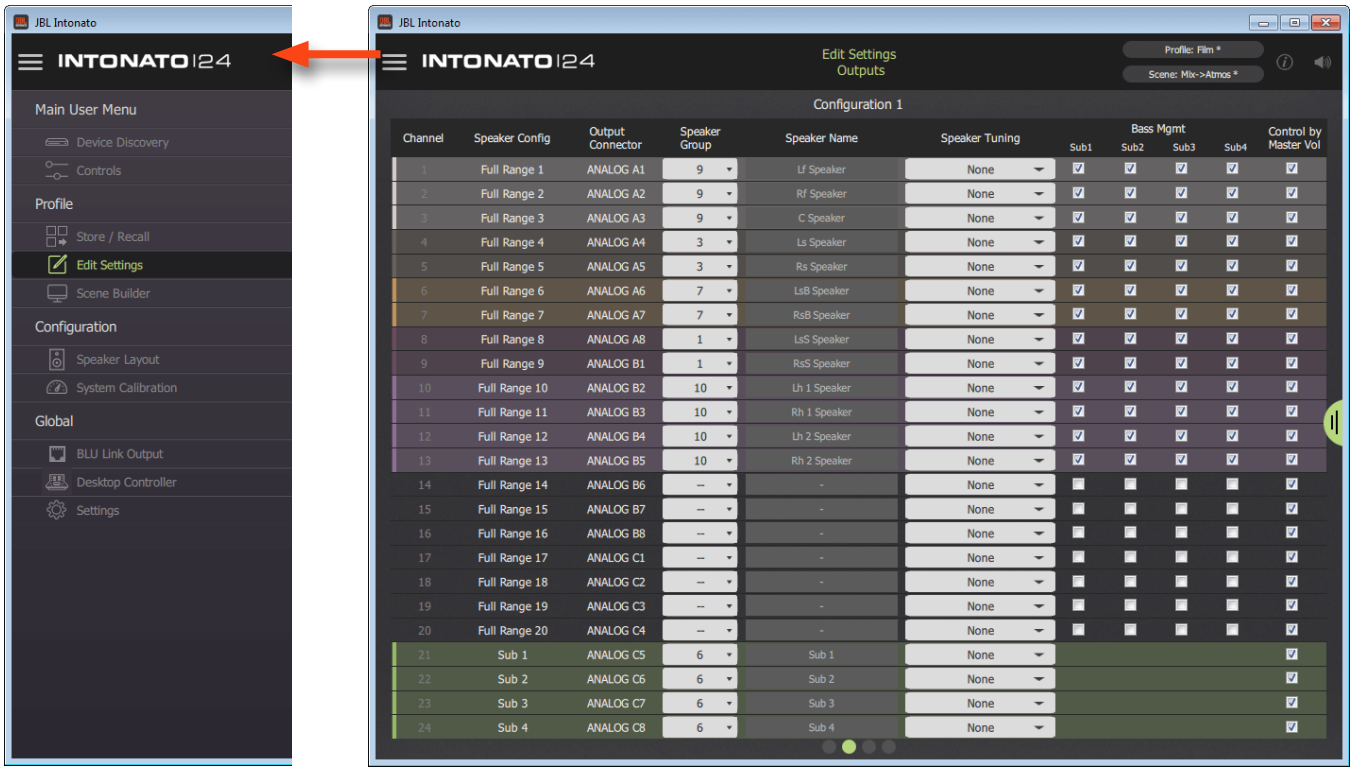
### Input Trim
Adjust these fields to trim the incoming signal level for each channel. The range is -100 to +10 dB.

### Input Level
These readouts display real-time input signal level for each channel.

### Master Section Tab
The tab on the right shows or hides the master section controls.

## Configuring Outputs

The next step is to configure the Intonato 24 outputs. The Output Configuration screen can be accessed by selecting **Edit Settings** from the Main User Menu, then going to the second screen by swiping or selecting the second bubble at the bottom.




### Speaker Configuration

These fields display the type of output configured for each output channel per the selected speaker layout.

### Output Connector

These fields display the physical output channels as they relate to the analog D-Sub output connectors.

### Speaker Group

Select from the 12 options available in this dropdown menu to visually group speaker output channels by color.

### Speaker Name

These fields allow outputs to be named to suit the application, which will simplify configuration and operation.

### Speaker Tuning

From this dropdown menu, the speaker tuning for the connected speaker model can be selected if available.

**NOTE:** The Intonato 24 comes preloaded with speaker tunings for the JBL M2 Series, 7 Series, and various JBL subwoofers. See **"Speaker Tunings" on page 87** for more information.

### Bass Management (Sub1, Sub2, etc.)

Checking a checkbox in this column will configure the channel to be bass managed to the assigned subwoofer whenever the master Bass Management button is enabled. When bass management is enabled, a crossover will be applied to split the signal between the satellite and subwoofer speakers. The crossover frequency can be adjusted using the Bass Management Crossover Frequency parameter on the Utility screen.

### Control by Master Volume

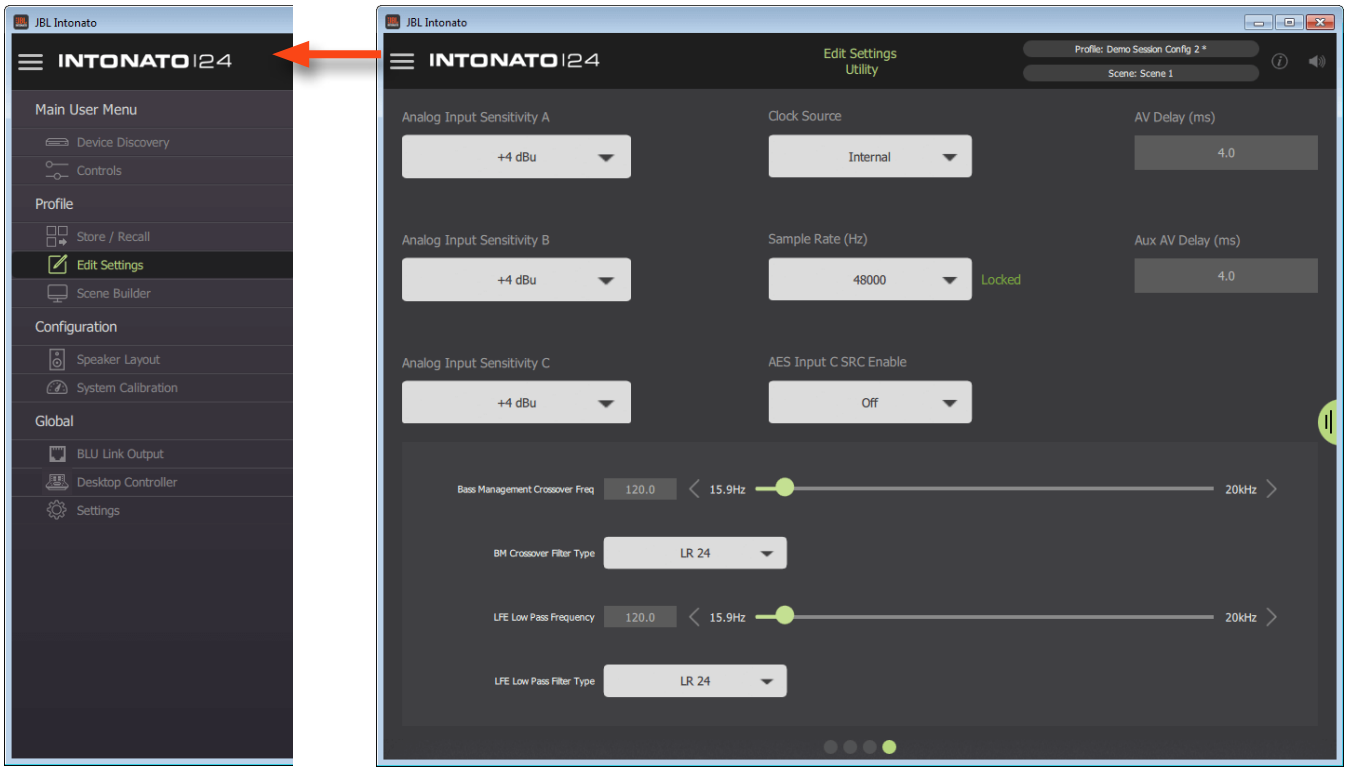
Each channel checked in this column will be controllable by the studio engineer when adjusting the master volume controls (Master Volume, Dim button, and Mute button).

### Master Section Tab

The tab on the right shows or hides the master section controls.

## Configuring Utility Settings

The next step is to configure the Intonato 24 utility settings. The Utility screen can be accessed by selecting **Edit Settings** from the Main User Menu, then going to the fourth screen by swiping or selecting the fourth bubble at the bottom.




### Analog Input Sensitivity (A, B, and C)

These dropdown menus adjust the input sensitivity for each of the analog D-Sub input connectors. Adjust these settings to match the source output levels for optimal signal-to-noise ratio and headroom. There are three options to choose from:

- -10 dBV (with 18 dB of headroom)
- +4 dBu (with 20 dB of headroom)
- +8 dBu (with 24 dB of headroom)

### Clock Source

This dropdown menu selects the source that will provide master clock to the Intonato 24. The options are Internal, AES (Input 1), and Word Clock (BNC). See **“Configuring the Clock Source” on page 76** for information on setting this parameter to suit the application requirements.

**WARNING:** When clocking to an AES or word clock signal, always mute the Intonato 24 outputs before changing the external clock’s sample rate to prevent unwanted noise through the speaker system.

### Sample Rate

This dropdown menu selects the internal processing sample rate.

**NOTE:** When slaving to an AES or word clock signal, the external clock’s sample rate will be detected and will override this setting.

**NOTE:** When using BLU link, all devices on the BLU link bus must be configured with the same sample rate setting.

### AES Input C SRC Enable

This dropdown menu turns sample rate conversion on AES Input C on or off. When enabled, the SRC LED on the front panel will light. See **"Configuring the Clock Source" on page 76** for more information on using the SRC feature.

### AV Delay

This parameter applies a delay to the audio signal to compensate for latency in video displays and restore "lip synchronization". The AV Delay parameter affects all output channels, with the exception of the stereo aux output, and has a range of 0–170 ms.

### Aux AV Delay

This parameter applies a delay to the audio signal to compensate for latency in video displays and restore "lip synchronization". The Aux AV Delay parameter affects only the stereo aux output and has a range of 0–170 ms.

### Bass Management Crossover Frequency Slider

This parameter sets the crossover frequency between the satellite speakers configured for bass management and subwoofer(s).

### Bass Management Crossover Filter Type

This dropdown selects the low-pass and high-pass filter types for the bass management crossover. The selectable options are Bessel 6, 12, 18, 24, 30, 36, 42, 48, Butterworth 6, 12, 18, 24, 30, 36, 42, 48, Linkwitz-Riley 12, 24, 36, and 48. The numerical values indicate the slope rate in dB/octave.

### LFE Low Pass Frequency Slider

This parameter sets the low-pass filter frequency for LFE signals assigned to the subwoofer(s).

**NOTE:** Ensure subwoofers are set to LFE mode, if applicable.

### LFE Low Pass Filter Type

This dropdown selects the filter type for the LFE low-pass filter. The selectable options are Bessel 6, 12, 18, 24, 30, 36, 42, 48, Butterworth 6, 12, 18, 24, 30, 36, 42, 48, Linkwitz-Riley 12, 24, 36, and 48. The numerical values indicate the slope rate in dB/octave.

**TIP:** When using bass management and LFE channels, it's important to balance the bass managed and LFE signal levels properly. See **"Balancing Subwoofers – Bass Management and LFE Levels" on page 26** for more information.

### Master Section Tab

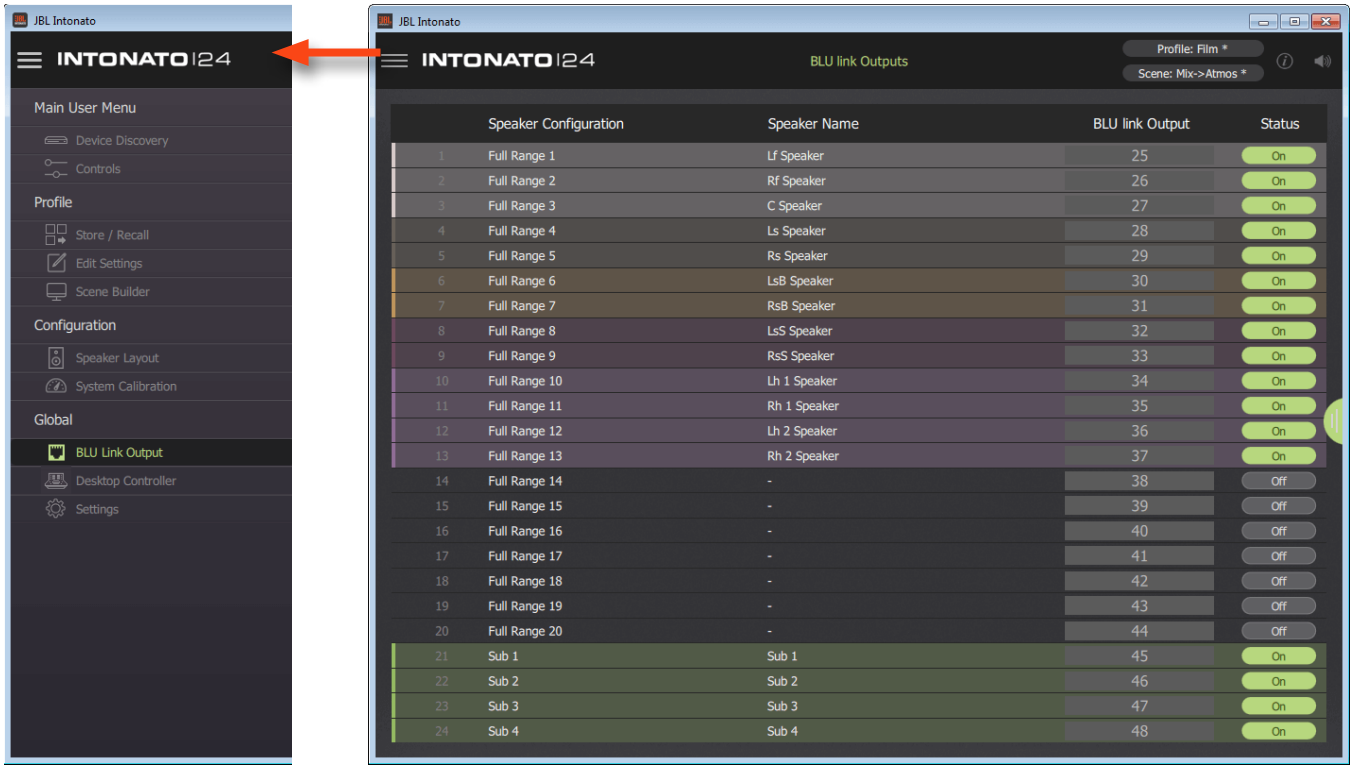
The tab on the right shows or hides the master section controls.

## Configuring BLU link Outputs

If the application requires BLU link output from the Intonato 24, BLU link output settings should be configured next by selecting **BLU Link Output** from the Main User Menu.

From the BLU Link Output screen, up to 24 BLU link channels can be assigned to the BLU link bus. To assign BLU link output channels, select the BLU link output channel to assign then enable the **Status** button for each.

**NOTE:** Output signals are always present on the analog D-Sub output connectors and are simply mirrored to any assigned BLU link channels.




### Speaker Configuration

These fields display the type of output configured for each output channel per the selected speaker layout.

### Speaker Name

These fields display the name given to each speaker output.

### BLU link Output

These fields select the BLU link channel to be assigned to each output.

### Status

These buttons turn each BLU link output on or off. When turned off, no signal will be passed to the BLU link bus.

**NOTE:** The above settings are global and will not be affected when loading profiles or scenes.

### Master Section Tab

The tab on the right shows or hides the master section controls.

## Calibrating the System

Once configuration is complete, the next step is to run the auto-calibration process. When used in conjunction with the included measurement microphone, a monitoring system can be automatically calibrated to the production environment.

The auto-calibration process starts by detecting level differences between speakers in the system and adjusting levels to match. Then, time-of-arrival differences between each speaker placement and the listening position are detected and compensated for using delays. The final stage is to analyze each speaker and adjust the room equalization to fine-tune each speaker's frequency response to the environment. Note that all parameters are also available for manual adjustment.

**Follow these steps to automatically calibrate the system:**

**CAUTION:** The use of hearing protection is recommended during the auto-calibration process. System calibration test tones may generate sound pressure level in excess or 85 dB, which can be painful to the ears when experienced for extended periods of time.

**NOTE:** The auto-calibration process cannot correct for speaker polarity issues. Ensure all balanced audio cables and speaker wires are properly wired and connected before calibrating the system.

1. Connect the included measurement microphone to the XLR mic input using a balanced microphone cable of suitable length and place it in a microphone stand.
2. Place the microphone at the main listening position.
3. Select **System Calibration** from the Main User Menu.
4. Press the **Run Auto Calibration** button and follow the on-screen instructions to calibrate the system.

   **NOTE:** The Room EQ will analyze frequencies up to 800 Hz and adjust center frequencies up to approximately 750 Hz when running the auto-calibration process.

   **TIP:** When running the auto-calibration process, an infinite number of mic positions can be measured to achieve an averaged frequency response. For more accurate results, it is recommended to measure at least three different mic positions.

5. Once system calibration is complete, make manual setting adjustments from the System Calibration screen if required.

   **TIP:** Any further refinements to the system's frequency response should be made using the User EQ so as to not disturb the calibrated Room EQ settings. See **"User EQ Refinement Recommendations" on page 25** for more information.

**TIP:** The monitor system reference level readout can be calibrated using the User Calibration Offset slider found on the Signal Generator screen. See **"The Signal Generator Screen" on page 30** for information on calibrating this reference level readout.

**TIP:** If the Intonato 24 limiters need to be used for speaker protection, the limiter threshold will need to be calibrated. See **"Limiter Threshold" on page 29** for information on calibrating the limiter threshold.

## User EQ Refinement Recommendations

### Low Frequencies

After performing auto calibration, we recommend evaluating the low-frequency performance of the system by listening to material with which you are familiar. While the system is designed to deliver flat low-frequency response in the room, different room sizes require differing compensation. After removing the energy contributed by the interactions of speakers and resonant properties of the room, you may notice the program content lacks the expected low-frequency response.

The User EQ can be used to produce your ideal in-room response. If you notice the material lacks an expected low-frequency contour, we recommend applying the following settings to all speakers in the system:

- Type: Low Shelf
- Frequency: 95 Hz
- Slope: 9 dB/octave
- Gain: +2 dB to +6 dB (Apply the amount of gain required to restore the expected low-frequency energy.)

Adjustments may vary as follows:

- Frequency: 90 Hz to 110 Hz
- Slope: From 6 dB/octave to 12dB/octave

Applying the aforementioned User EQ settings in addition to the calibrated Room EQ settings should provide a neutral mix environment.

### High Frequencies

In the midrange and high frequencies, the speaker is in control. In the low frequencies, the room is in control. While the reflectivity or absorptive qualities of the room may affect the overall high-frequency energy of the speaker system, the User EQ (found in the Edit Settings menu) allows project-specific and client-specific equalization to be applied, without disturbing the Room EQ settings applied during the auto-calibration process.

Depending on the size and acoustic characteristics of the room, reflectivity vs absorptive qualities, and perforated-screen transmission loss, attenuation or boost of the high-frequency response may be desirable. Additionally, the X Curve or another custom frequency-response contour may be required for the application. This should be applied using the User EQ.

For more information on using the User EQ, see **“Adjusting User EQ” on page 32**.

## Balancing Subwoofers – Bass Management and LFE Levels

When using bass management and LFE channels, it's important to balance the levels between the two properly. Up to four subwoofers may be used for bass management—extending the low-frequency response of the speaker system. Additionally, the same subwoofers can be assigned to reproduce the LFE (Low Frequency Effects) channels of one or more playback sources. When using a sub for both purposes, levels should be calibrated as described below.

**To calibrate bass management and LFE signal levels for the subs, follow these steps:**

**NOTE:** Auto calibration should be performed before calibrating the bass management and LFE levels. See **"Calibrating the System" on page 24**.

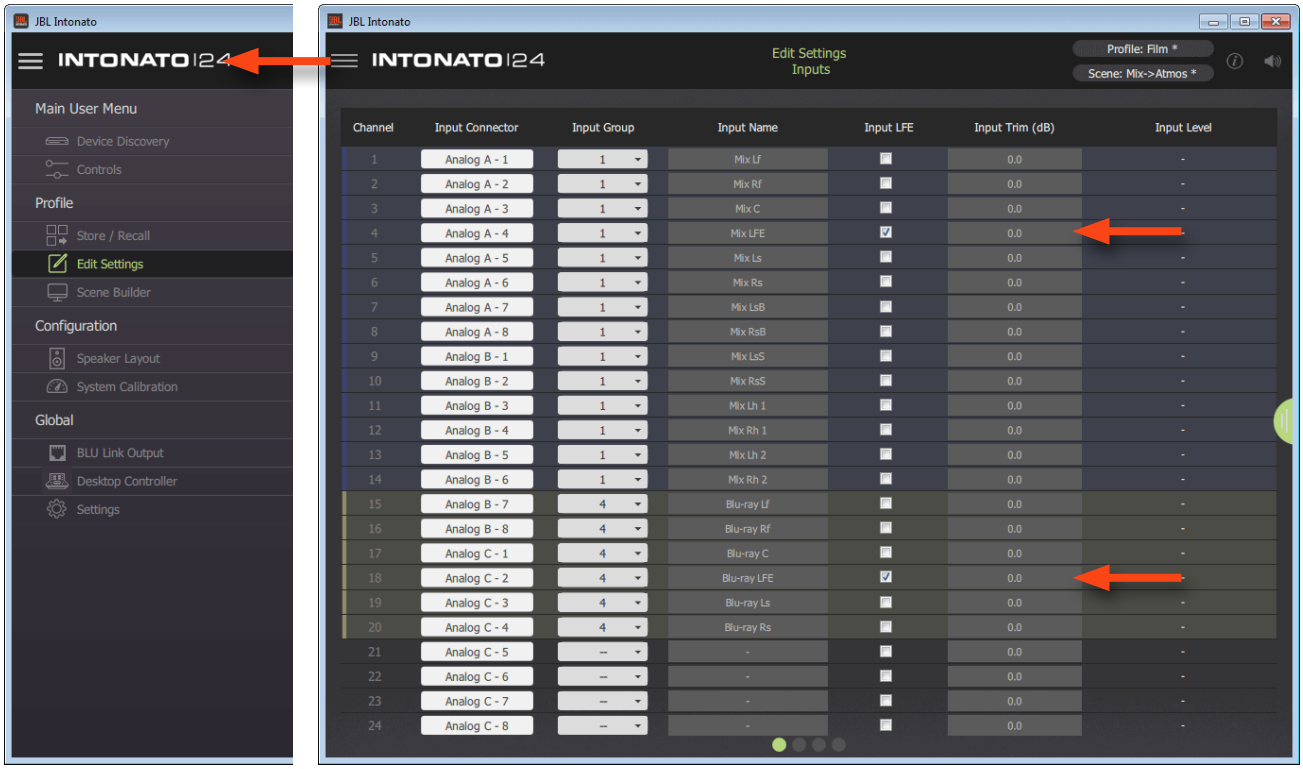
1. Ensure Bass Management is enabled and play broadband source material—with which you are familiar—through the system. Ensure that no signal is being sent to the LFE channel. Select **System Calibration** from the Main User Menu, then solo the first sub and one of the main satellite speakers in the left-hand column.

   **NOTE:** If using only one subwoofer, solo both the left and right front satellite speakers along with the sub to account for the ~3 dB increase in signal level due to summation of the two satellite speakers vs the single subwoofer.

   Select the first sub from the left-hand column and adjust the sub's **Level** setting to balance the subwoofer response with the bass-managed satellite speaker(s) to produce the desired bass-managed response. When properly balanced, the subwoofer and the speaker(s) should behave as a single speaker with extended low-frequency response. Repeat for any additional subwoofers.


2. Once all bass management sub levels have been calibrated, un-solo the channels so that all channels are again audible.

**3.** Next, play some source material that includes LFE signal, and ensure the LFE signal is passing through the system. Select **Edit Settings** from the Main User Menu, then adjust the **Input Trim** control of the LFE channel to produce the desired SPL in the room. Repeat for any additional source LFE channels.



## The System Calibration Screen

From the System Calibration screen, individual speaker levels, time-of arrival delay offsets, and room EQ can be automatically calibrated and/or manually adjusted for the monitoring environment. To access the System Calibration screen, select **System Calibration** from the Main User Menu.


### Channel Selection (Leftmost Column)

This column allows an output channel to be selected for editing.

### Mute and Solo Buttons

The Mute (M) and Solo (S) buttons can be used to mute or solo output channels. Multiple channels can be muted or soloed simultaneously.

### Graph

This graph displays a graphical representation of the Room EQ curve, with touchpoints that can be selected and dragged to adjust settings graphically.

### Frequency Slider

This parameter adjusts the frequency of the selected band. Values can be adjusted by dragging the slider, pressing the arrows, or entering a value directly in the numeric field.

### Gain Slider

This parameter adjusts the gain of the selected band.

### Q Slider

This parameter adjusts the width of the selected band.

### Show/Hide TouchPoint Button

This button toggles visibility of the band-numbered touchpoints in the graph.

### Band 1–12 Buttons
These buttons select one of twelve bands for editing.

### Type Dropdown Menu
This dropdown menu selects the type of filter for the selected band, with bell, low shelf, high shelf, lowpass, and highpass filters available for each band.

### Copy Band and Paste Band Buttons
These buttons can be used to copy the settings of a single band and paste them to a band of another speaker output channel. With a band selected, press the **Copy Band** button to copy the band's settings. Then, select the speaker output channel and band to which the settings will be pasted and press the **Paste Band** button.

### Copy EQ and Paste EQ Buttons
These buttons can be used to copy all EQ settings of one speaker output channel and paste them to another. With a speaker output channel selected, press the **Copy EQ** button to copy the EQ's settings. Then, select the speaker output channel to which the settings will be pasted and press the **Paste EQ** button.

### Level (Trim)
This parameter adjusts the selected output channel's level. This parameter is automatically set when running the auto-calibration process, but can also be adjusted manually. The range of this control is from -∞ to 0 dB.

### Polarity
Allows the polarity for the selected output to be toggled between "Normal" or "Inverted".

### Delay
This parameter adjusts the selected output's time-of-arrival (delay) offset. This parameter is automatically set when running the auto-calibration process, but can also be adjusted manually. The delay range is 0–170 ms.

**NOTE:** During auto calibration, subwoofer delays require a physical distance to be entered when prompted by the app. The distance is in feet, from the listening position to the subwoofer.

### Run Auto Calibration Button
Pressing this button will launch the auto-calibration process, which will automatically calibrate the speaker level trims, delays, and room EQ to the listening environment.

**NOTE:** The Room EQ will analyze frequencies up to 800 Hz and adjust center frequencies up to approximately 750 Hz when running the auto-calibration process.

### Limiter Threshold
This parameter adjusts the level at which output limiting will occur. The range is from -60 to 0 dBFS. This is a dbx® OverEasy™ (soft-knee) limiter. The easiest way to set this parameter is to raise the system to the loudest monitoring volume that will ever be used, lower this parameter until limiting begins to become audible, then raise it back up so the signal level is just below the point of limiting.

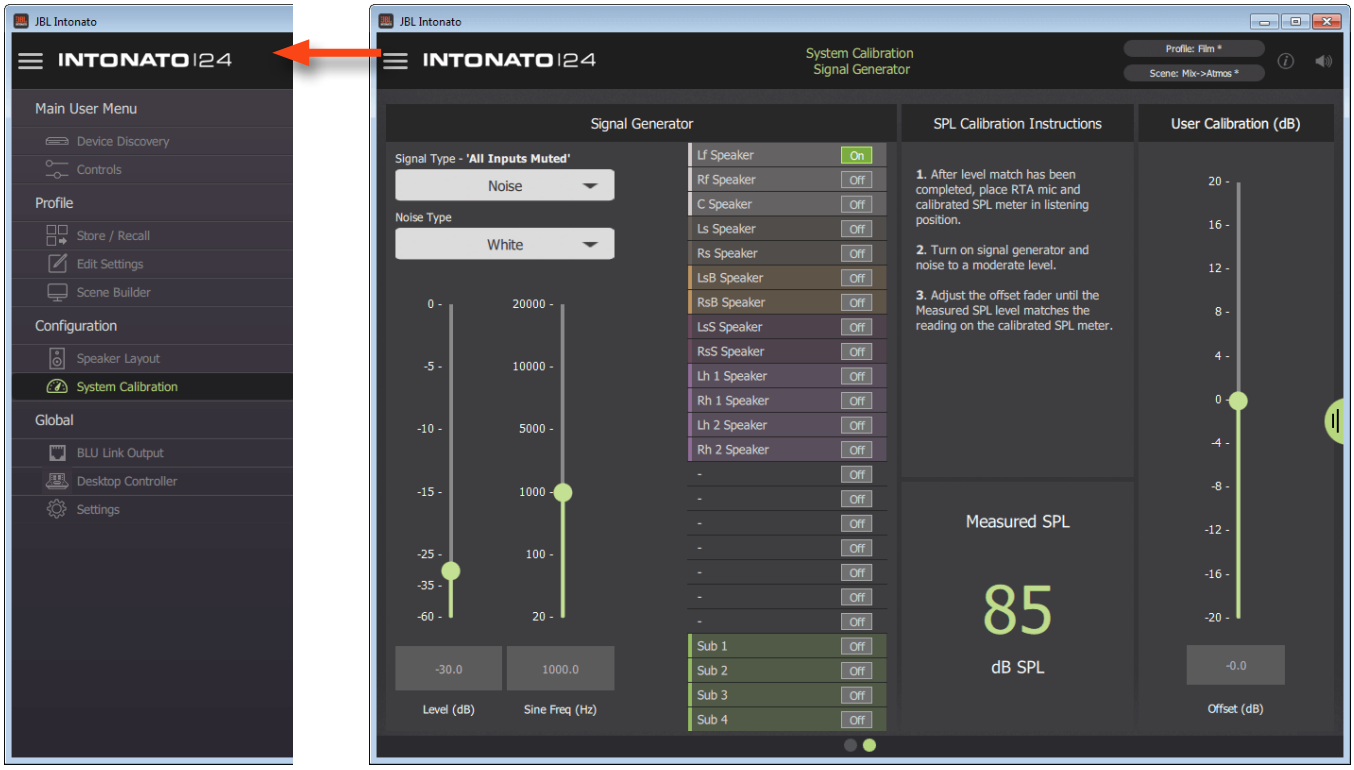
### Master Section Tab
The tab on the right shows or hides the master section controls.

## The Signal Generator Screen

The Intonato 24's built-in signal generator can produce sine wave tones, pink noise, or white noise that can be fed to any or all output channels (with the exception of the aux outputs).

The Intonato 24 also provides a SPL readout to visually indicate monitoring level, which must be calibrated once setup is complete.

The signal generator and SPL readout calibration details can be found on the Signal Generator screen, which can be accessed by selecting **System Calibration** from the Main User Menu, then going to the second screen by swiping or selecting the second bubble at the bottom.




### Signal Type

This dropdown menu is used to turn the signal generator on or off and selects the type of signal to generate. The options are "Off", "Sine", and "Noise". When the signal generator is on ("Sine" or "Noise" is selected), all other input sources are automatically muted.

### Noise Type

When the "Noise" signal type is selected, this dropdown menu will become visible and allow the type of noise to be selected. The options are "White" or "Pink".

### Level Slider

This parameter adjusts the level of the signal generator.

### Sine Frequency Slider

When the "Sine" signal type is selected, this slider becomes active and adjusts the frequency of the generated sine wave tone.

### On/Off Buttons

This button enables or disables the signal generator for each output channel.

### SPL Calibration Instructions
Follow these instructions to calibrate the SPL readout.

### Measured SPL Readout
This readout displays the measured sound pressure level. Follow the on-screen SPL calibration instructions to calibrate this value.

### User Calibration Offset Slider
Adjust this slider to calibrate the SPL readout. Follow the on-screen SPL calibration instructions to calibrate this slider.

### Master Section Tab
The tab on the right shows or hides the master section controls.

**NOTE:** Signal generator settings are persistent—meaning the settings will not change when a different profile or scene is loaded. However, the settings will be reset back to their default values if a different speaker layout is selected or the unit is power cycled. The exception is the User Calibration Offset slider setting, which, once calibrated, will persist with the selected speaker layout, when loading profiles or scenes, and after a power cycle.

## Adjusting User EQ

After the system has been calibrated, the User EQ can be used to make refinements to the system's frequency response, without affecting the calibrated Room EQ settings. This includes calibrating the monitor system to the X Curve or another custom frequency-response contour.

**NOTE:** User EQ settings are stored in a profile. This allows alternate "system tunings" to be stored and recalled if required for the application.

The User EQ screen can be accessed by selecting **Edit Settings** from the Main User Menu, then going to the third screen by swiping or selecting the third bubble at the bottom.


### Channel Selection (Leftmost Column)

This column allows an output channel to be selected for editing.

### Mute and Solo Buttons

The Mute (M) and Solo (S) buttons can be used to mute or solo output channels. Multiple channels can be muted or soloed simultaneously.

### Graph

This graph displays a graphical representation of the User EQ curve, with touchpoints that can be selected and dragged to adjust settings graphically.

### Frequency Slider

This parameter adjusts the frequency of the selected band. Values can be adjusted by dragging the slider, pressing the arrows, or entering a value directly in the numeric field.

### Gain Slider
This parameter adjusts the gain of the selected band.

### Q Slider
This parameter adjusts the width of the selected band.

### Show/Hide TouchPoint Button
This button toggles visibility of the band-numbered touchpoints in the graph.

### Band 1–8 Buttons
These buttons select one of eight bands for editing.

### Restore Button
This button restores a flattened EQ curve.

### Flat Button
This button flattens the EQ curve.

**TIP:** Use the Flat and Restore buttons to compare a speaker's frequency response before and after applying EQ.

### Type Dropdown Menu
This dropdown menu selects the type of filter for the selected band, with bell, low shelf, high shelf, lowpass, and highpass filters available for each band.

### Copy Band and Paste Band Buttons
These buttons can be used to copy the settings of a single band and paste them to a band of another speaker output channel. With a band selected, press the **Copy Band** button to copy the band's settings. Then, select the speaker output channel and band to which the settings will be pasted and press the **Paste Band** button.

### Copy EQ and Paste EQ Buttons
These buttons can be used to copy all EQ settings of one speaker output channel and paste them to another. With a speaker output channel selected, press the **Copy EQ** button to copy the EQ's settings. Then, select the speaker output channel to which the settings will be pasted and press the **Paste EQ** button.

### Master Section Tab
The tab on the right shows or hides the master section controls.

## Using Profiles

Profiles contain settings configured for a given type of session and can be managed from the Store/Recall screen. Up to 30 profiles can be stored in the Intonato 24 (per speaker layout), and profiles can be backed up to the control device's file system. Some preconfigured profiles, along with scenes, come packaged in the app's file system directory to get you started.

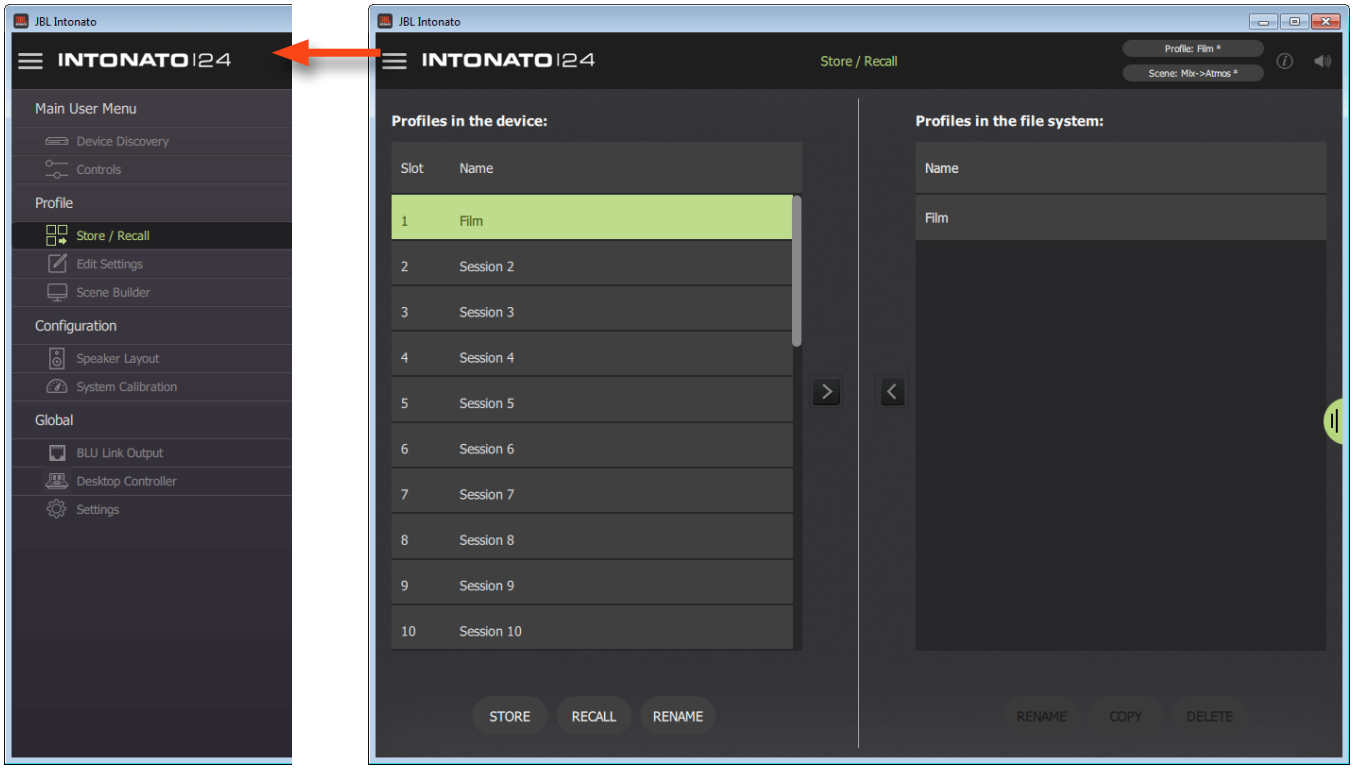
The following settings are stored in a profile:

- All input, output, user EQ, and utility configuration settings
- Settings for all scenes (30 per profile)
- Master bass management on/off setting
- Master volume reset level and dim level
- Aux output level and tone (EQ) settings

**TIP:** After storing the first profile, the profile can be stored to another slot, any necessary changes can be made, then the profile can be re-stored (overwritten). This allows multiple profiles with minor changes to be created more efficiently than creating each from scratch.

**NOTE:** Profiles are stored to the following computer directories:
**Windows** – C:\Users\'YourUsername'\AppData\Roaming\JBL Intonato\LocalPresets
**OS X** – Users/'YourUsername'/Library/Application Support/JBL Intonato/LocalPresets

The Store/Recall screen can be accessed by selecting **Store/Recall** from the Main User Menu.




### Store Button

This button stores the current profile settings to the Intonato 24 device. To store a profile, select the desired destination from the device profile list, then press the **Store** button.

### Recall Button
This button recalls a profile from within the Intonato 24 device. To recall a profile, select the desired profile from the device profile list, then press the **Recall** button.

### Rename Button
This button opens a naming screen, where the selected profile can be renamed in the Intonato 24 device.

### Right Arrow Button
This button copies the selected profile from the Intonato 24 device to the file system of the control device.

### Left Arrow Button
This button copies the selected profile from the file system of the control device to the selected profile location in the Intonato 24 device.

**WARNING:** Performing this action will overwrite the selected profile in the Intonato 24 device.

### Rename Button (File System)
This button opens a naming screen, where the selected profile can be renamed in the control device's file system.

### Copy Button
This button copies the profile currently selected in the control device's file system. A naming screen will appear, where the new profile can be renamed before it is pasted to the file system.

### Delete Button
This button deletes the selected profile from the control device's file system. A screen will appear requesting confirmation.

**WARNING:** Deletion of a preset from the file system is irreversible. Only perform this action to permanently delete a profile from the file system.

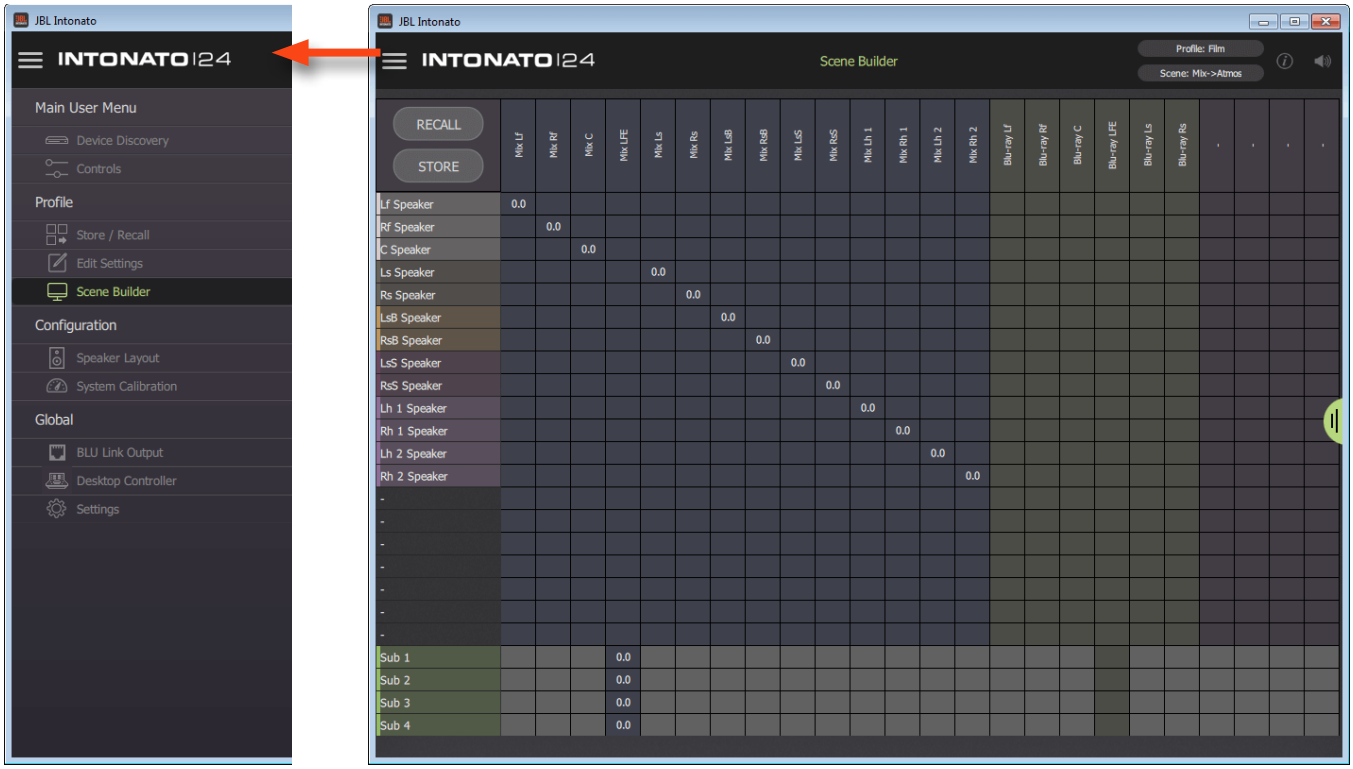
### Master Section Tab
The tab on the right shows or hides the master section controls.

## Creating Scenes

The Scene Builder is used to create scenes during configuration. Scenes allow the studio engineer to switch between different sources to monitor, select alternate speaker systems for reference monitoring, and monitor downmixed versions of surround mixing formats. Some preconfigured scenes come packaged in the app to get you started. They can be found by loading one of the included preconfigured profiles from the Store/Recall screen.

Any input signal can be routed to any output or multiple outputs. All mixer values shown in the grid are stored to a scene. Up to 30 scenes can be stored to each of the 30 available profiles.

To access the Scene Builder screen, select **Scene Builder** from the Main User Menu.




### Scene Grid

This grid displays physical input (source) channels along the top row and physical output (destination) channels along the leftmost column. Selecting a square in the grid will bring up a level slider (shown to the right), allowing the signal level of the selected input to be routed/mixed to the selected output at the desired level. Level buttons for the most commonly used values are also provided to allow levels to be set quickly with the touch of a button.


### Recall Button

Press this button to select a scene for recall.

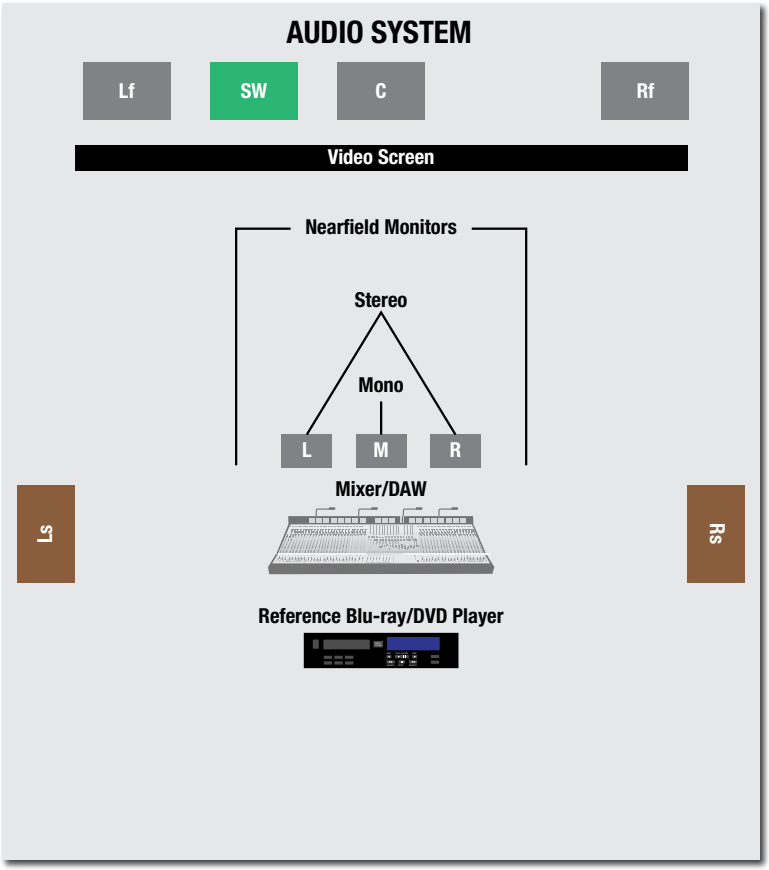
### Store Button

Press this button to store the current Scene Builder settings to a scene.

### Master Section Tab

The tab on the right shows or hides the master section controls.

The images below show a typical 5.1 system and an example of how the Scene Builder settings might be set for the first scene. You can see that the “mix” source (the main mix from the mixer or DAW) is routed to the speakers, the LFE channel is routed to the sub, and the 5.1 mix has been downmixed to the aux outputs for the talent headphone system.

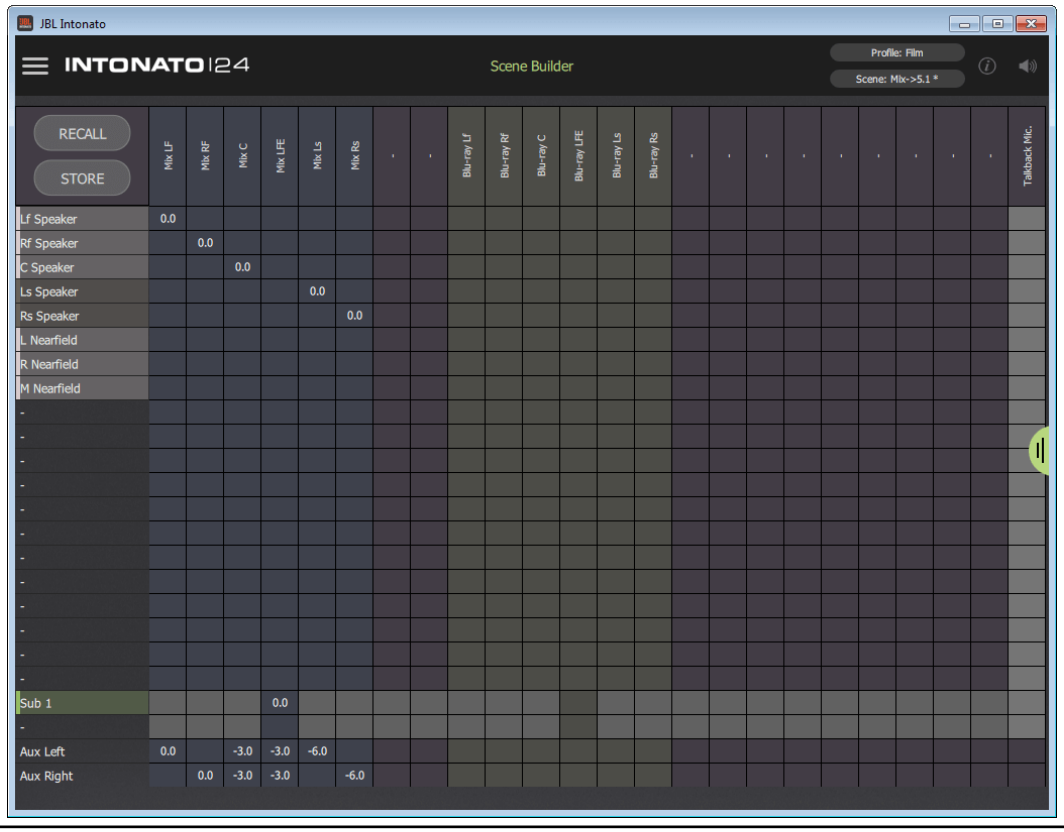




Downmixed Aux L/R + TB Mic

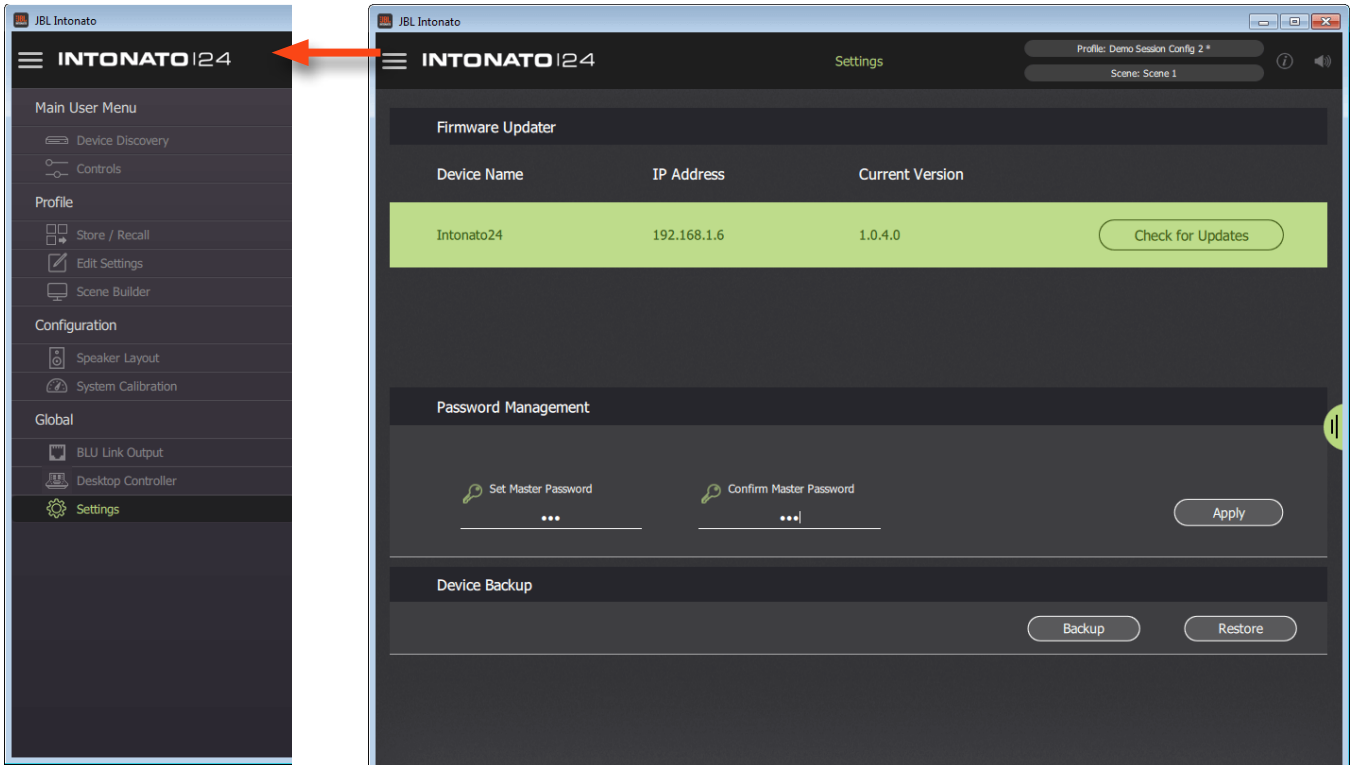
**SPEAKER LEGEND**

L = Left
R = Right
M = Mono
Lf = Left Front
Rf = Right Front
C = Center
SW = Subwoofer
Ls = Left Surround
Rs = Right Surround



## Setting the Security Password and Updating Firmware

After the Intonato 24 has been configured for the application, a master password can be set to prevent unauthorized configuration changes. This password can be set from the Settings screen, which can be accessed by selecting **Settings** from the Main User Menu. From this screen, the Intonato 24's firmware can also be updated.




### Device Information

These fields display the name, IP address, and current firmware version of the connected Intonato 24 device.

### Check for Updates Button

Press this button to search online for any available Intonato 24 firmware updates. If an update is available, the update can be downloaded and installed.

### Set Master Password and Confirm Master Password Fields

Use these fields to set and confirm the master password. Once set, the password can be changed at any time after logging in.

### Apply Button

Once the password has been set, press this button to apply the changes.

### Device Backup and Restore Buttons

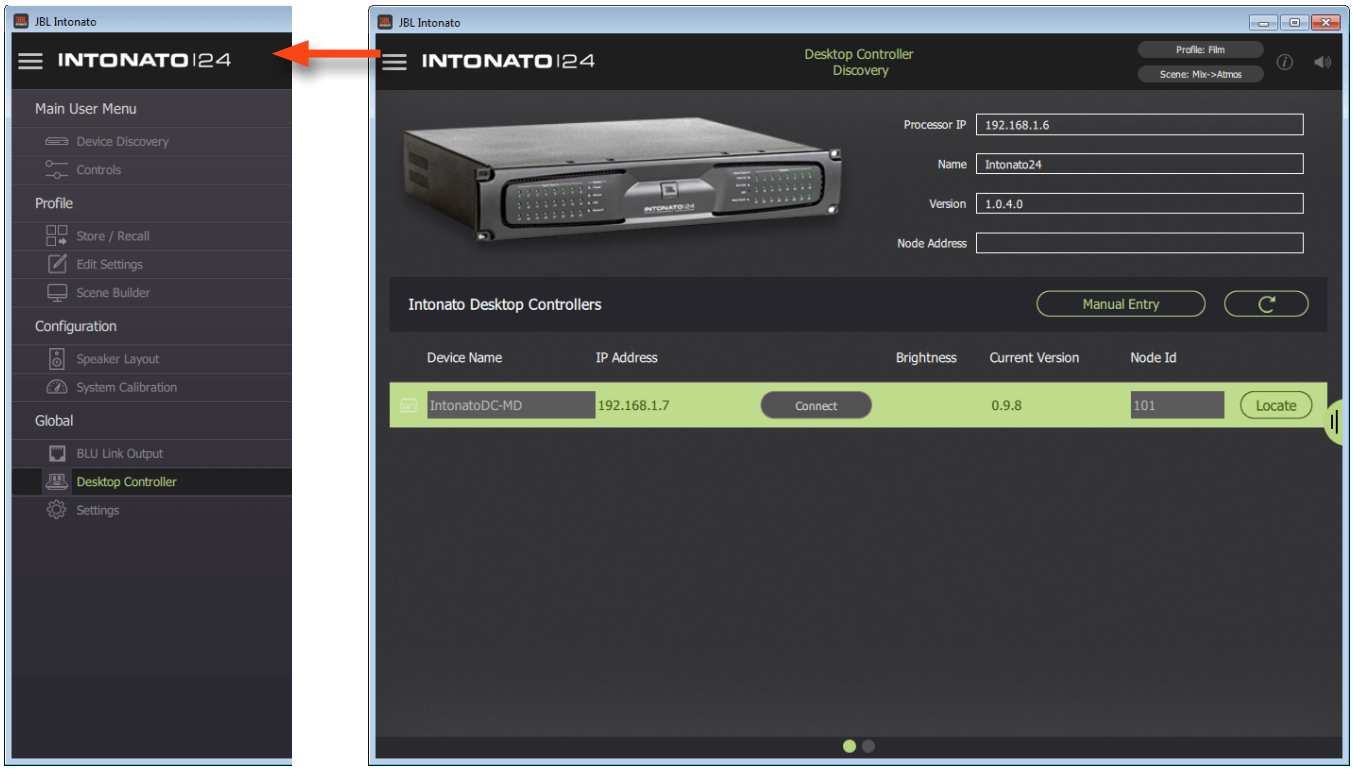
Press the Backup button to backup all Intonato 24 settings to the control device's file system. Press the Restore button to restore all Intonato 24 settings from the control device's file system.

### Master Section Tab

The tab on the right shows or hides the master section controls.

## The Desktop Controller Screens

The Desktop Controller screens can be accessed by selecting **Desktop Controller** from the Main User Menu. From this screen, any Intonato DC desktop controllers connected to the network are listed and can be paired to an Intonato 24 for control. See the Intonato DC manual for more information on the Desktop Controller screens and pairing an Intonato DC for intonato 24 control.

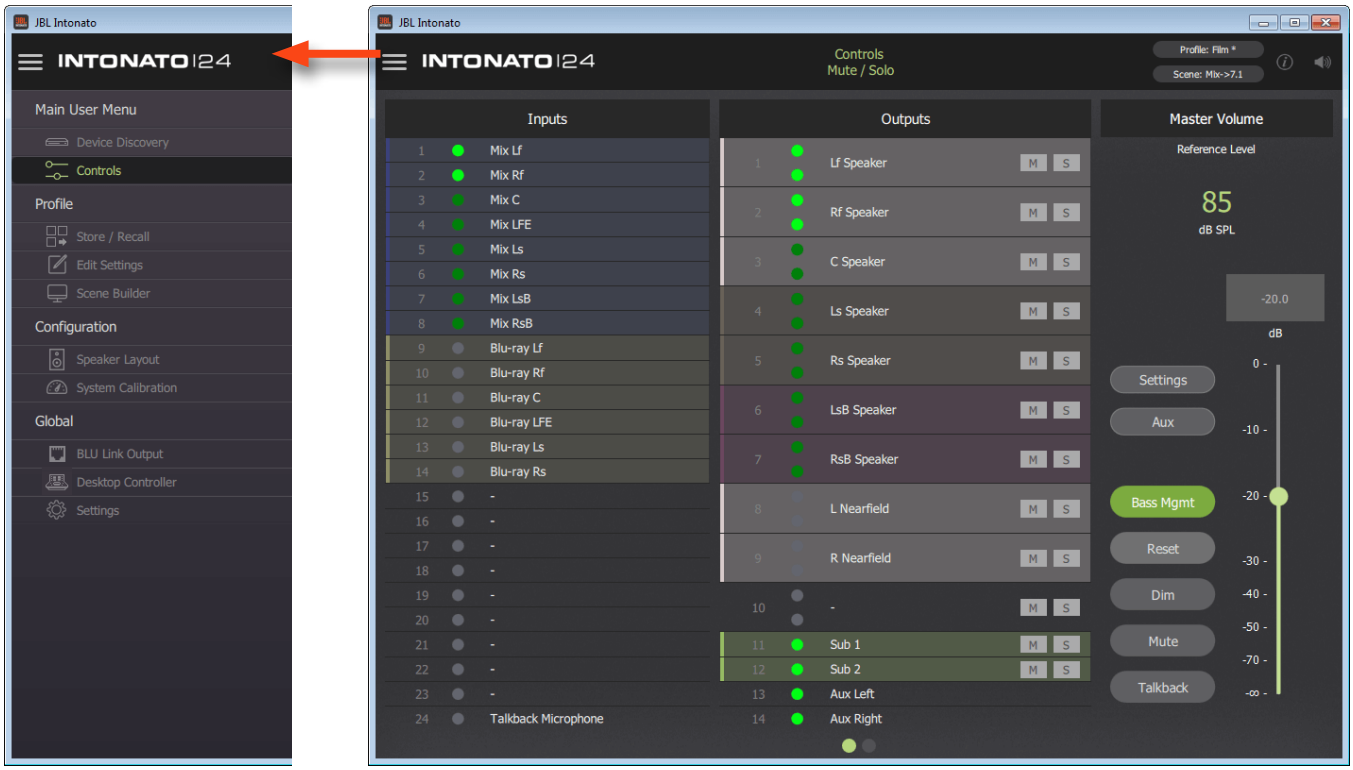



**NOTE:** All devices must have a unique node ID (also known as a HiQnet "node address" or "device ID"). If a node ID conflict occurs, one of the node ID addresses will need to be changed, using the NetSetter application, to resolve the conflict. See **"Using HiQnet® NetSetter™" on page 92** for more information about using NetSetter.

## User Control – Master Controls

The first user control screen (or Mute/Solo screen) can be accessed by selecting **Controls** from the Main User Menu. From this screen, the studio engineer can see input/output status, solo and mute individual speakers, turn bass management on or off, activate the talkback mic, and control master volume, mute, and dim. The 3-band parametric EQ and level control for the aux outputs can also be found on this screen if using a speaker layout with the aux outputs configured.

The two screens available in this menu are the only screens accessible by the studio engineer once the security master password has been set, and they provide similar functionality to that of the dedicated Intonato DC desktop controller.




### Input and Output Signal Indicators

These round indicators display input/output signal status as follows:

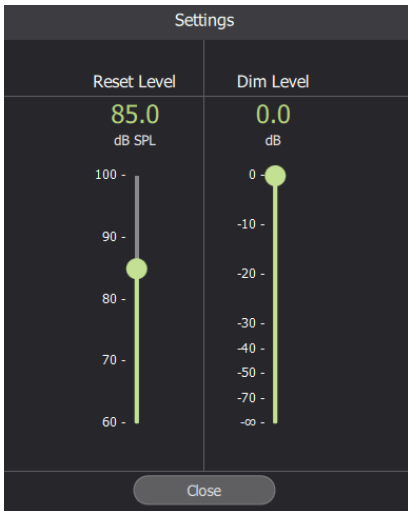
- **Indicator Off** ● – The channel is not configured for use in the current scene.
- **Indicator Dark Green** ● – The channel is configured for use in the current scene, but no signal is detected.
- **Indicator Light Green** ● – The channel detects signal level.
- **Indicator Red** ● – The channel is clipping.

### Mute and Solo Buttons

Press any of the Mute (M) buttons to mute an output channel. Press any of the Solo (S) buttons to solo an output channel. Multiple channels can be muted or soloed simultaneously.

### Settings Button

Opens the Settings screen, where the reset level and dim level can be calibrated by the studio engineer.




The Reset Level parameter sets the level that the Master Volume control will be reset to when pressing the Reset button.

The Dim Level parameter sets how much the signal level will be attenuated when the studio engineer presses the Dim button.

### Aux Button

Opens a window containing a 3-band semi-parametric EQ and level control, which can be used to adjust the tone and level of the aux outputs.


The Aux button is only available when using a speaker layout that enables the aux outputs.

### Bass Management Button

This is a global bass management on/off control. When enabled, the incoming signal will be split at the selected bass management crossover frequency: the upper frequencies will be sent to the satellite speakers configured for bass management, and the lower frequencies will be sent to the subwoofer(s).

When disabled, the satellite speakers configured for bass management will receive a full-range signal, and the subwoofer(s) will not receive any bass managed signal. Note that assigned LFE channels will still be routed to the subwoofer(s).

**NOTE:** The state of the Bass Management button is stored to the profile. After a power cycle, the profile will be loaded and this button will return to its stored state.

### Reset Button

Resets the Master Volume control to the Reset Level value set in the Settings screen.

### Dim Button

Pressing this master button will attenuate the monitored signal level by the amount set by the Dim Level parameter in the Settings screen. This setting affects all output channels configured for master volume control.

**NOTE:** The state of the Dim button is not affected when a new profile or scene is recalled.

### Mute Button

Pressing this master button will mute the monitored signal in all output channels configured for master volume control.

**NOTE:** The state of the Mute button is not affected when a new profile or scene is recalled.

### Talkback Button

This button is only available if the aux outputs are active—meaning speaker layout 2, 4, or 6 has been selected. Pressing and holding this button will activate the talkback mic for as long as the button is held. When talkback is enabled, the signal from the XLR mic input will be fed to the stereo aux output.

### Master Volume Slider and Reference Level

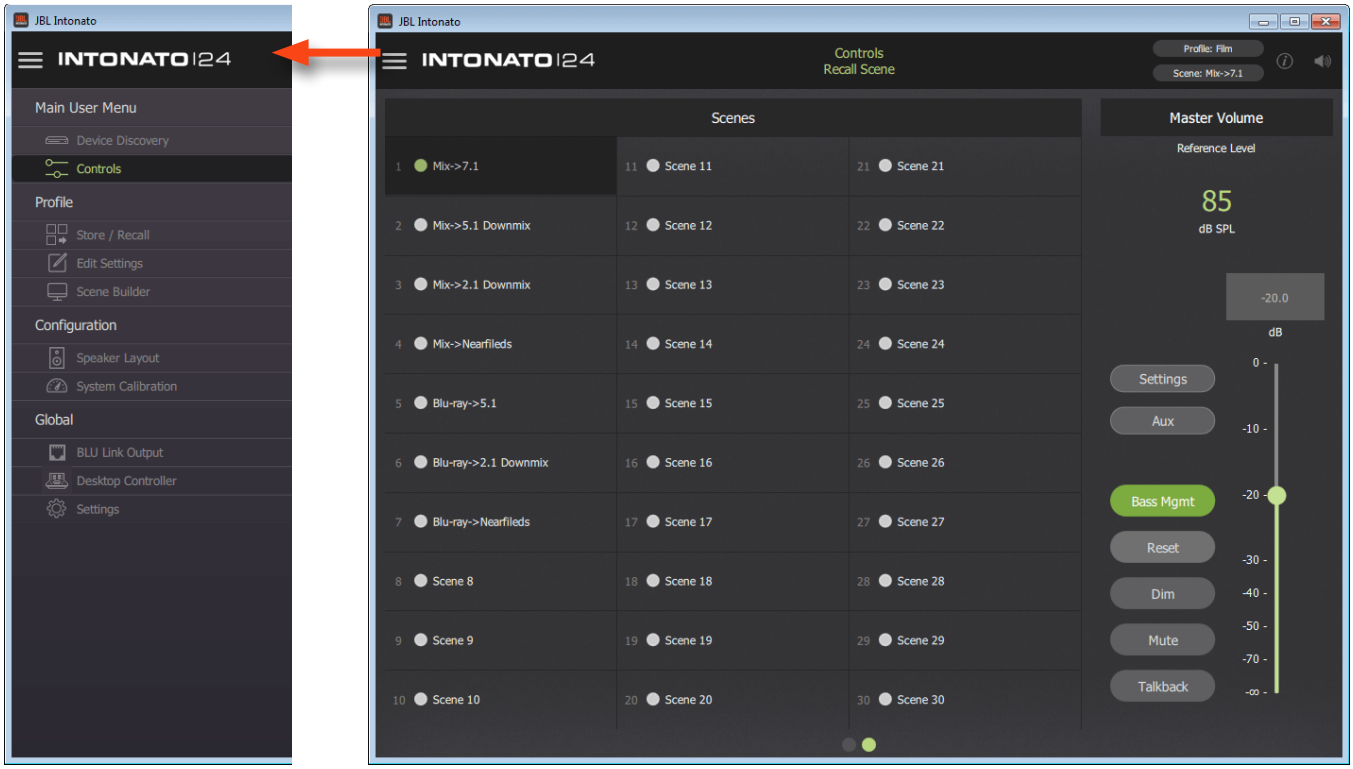
Adjusting the Master Volume slider will attenuate the volume of all output channels configured for master volume control. Note that the stereo aux output will not be affected by this control. See **"Configuring Outputs" on page 19** for information on configuring outputs for master volume control.

**NOTE:** The state of the Master Volume slider is not affected when a new profile or scene is recalled.

Above the Master Volume slider is a Reference Level readout, which displays the output sound pressure level (SPL). The SPL value is calibrated by the installer during product setup. See **"The Signal Generator Screen" on page 30** for more information on calibrating this readout.

## User Control – Recalling Scenes

The second user control screen (or Recall Scene screen) can be accessed by selecting **Controls** from the Main User Menu, then swiping or selecting the second bubble at the bottom. From here, the studio engineer can recall different pre-programmed scenes. The same parameters from the Recall Scene screen are also provided on the right. See the previous pages for information on these controls.

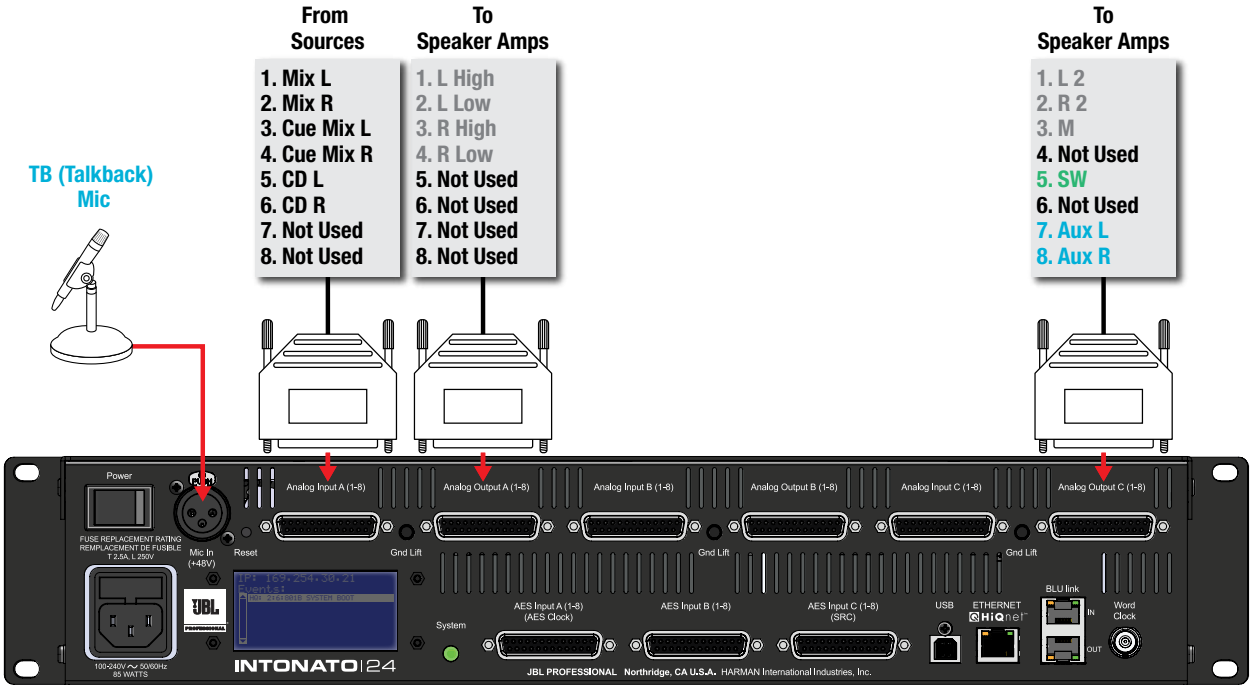


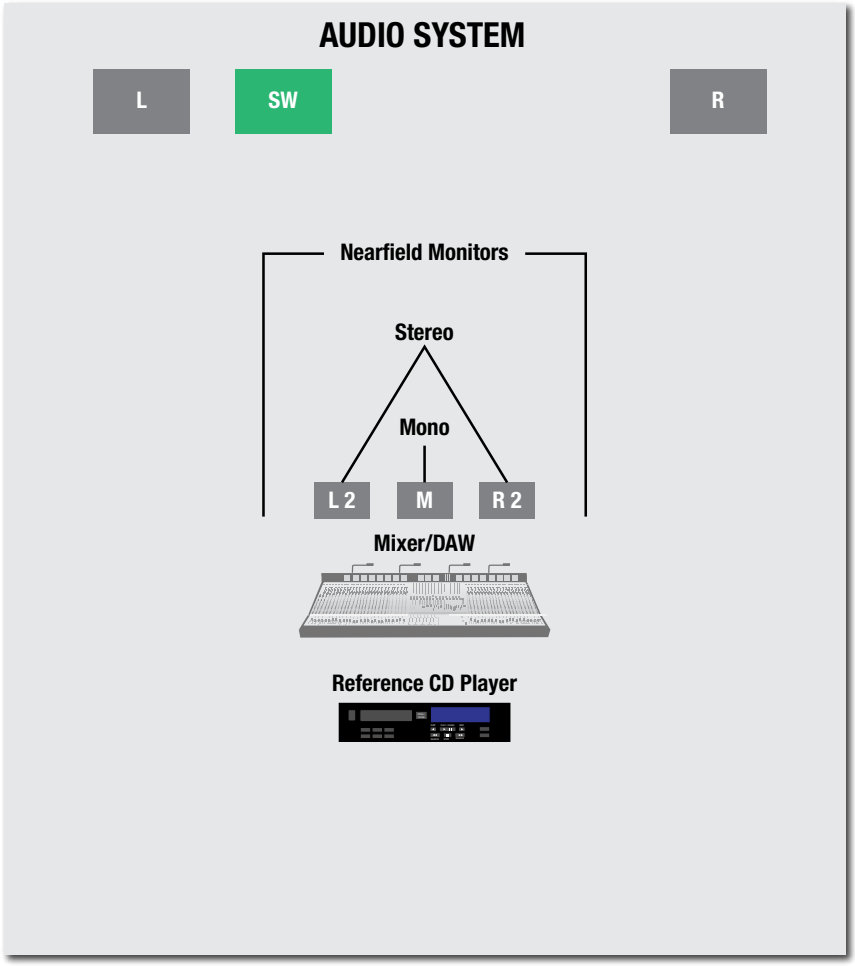

### Scene List

Selecting a scene from this list will immediately recall the scene. See **“Creating Scenes” on page 36** for more information on scenes.

# Application Examples

## 2.1 Bi-Amplified Application



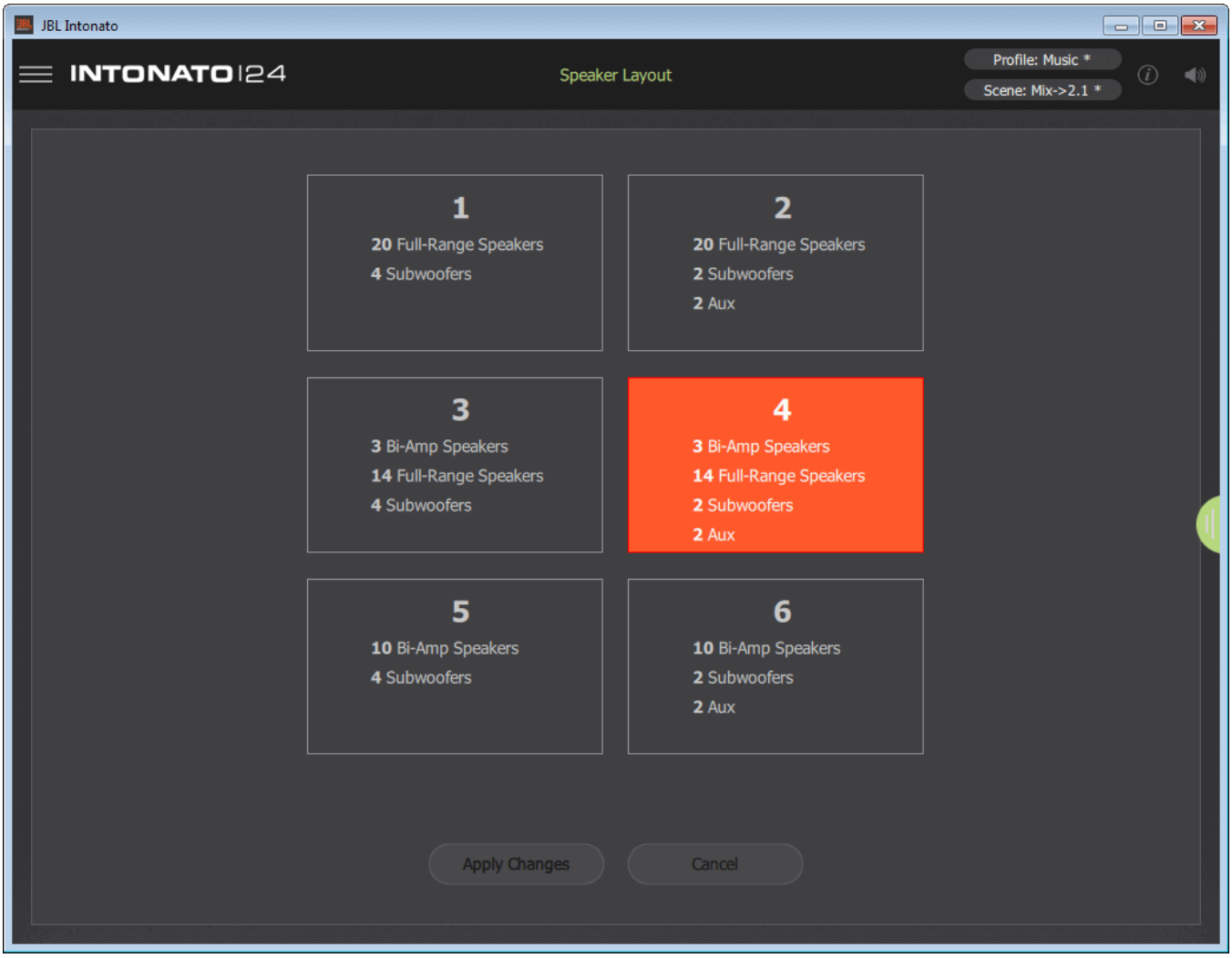


**SPEAKER LEGEND**

L = Left
R = Right
M = Mono
SW = Subwoofer

## 2.1 Bi-Amplified Application Notes – Speaker Layout Configuration:

- Speaker layout 4 has been selected for this application. This provides up to 3 bi-amplified outputs, 14 full-range outputs, and 2 subwoofer outputs. The 2-channel aux output carries the mix and talkback mic signal and is fed to the talent's headphone amplifier.
- Three monitor systems are used: the main bi-amplified L/R speakers with a sub, the nearfield full-range stereo speakers, and the nearfield mono speaker.



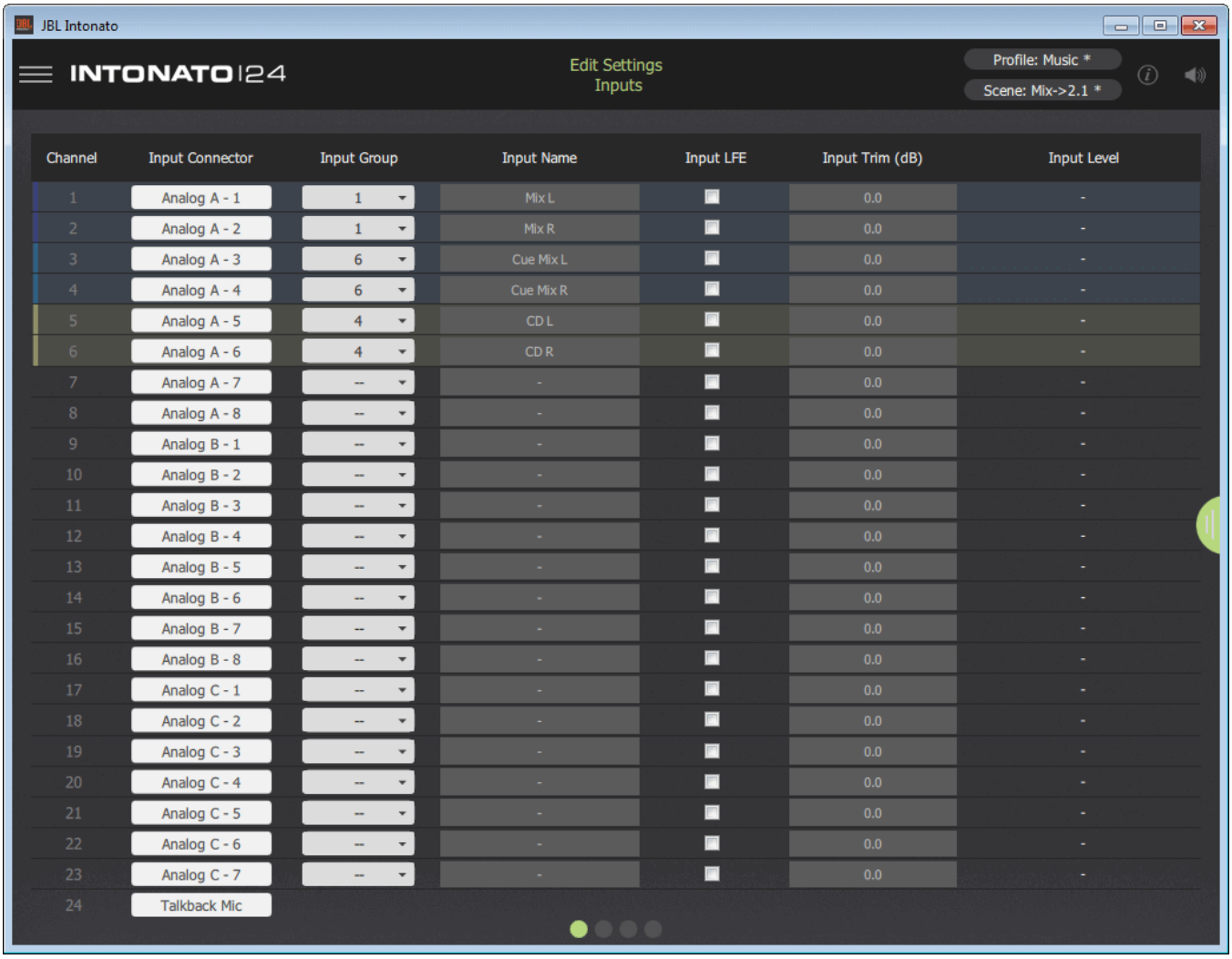

**Speaker Layout Selection Screen**

## 2.1 Bi-Amplified Application Notes – Input Configuration:

- The screenshot below shows the Input Configuration screen for this application. From this screen, physical inputs are assigned, input group assignments are made (to color-code input channels), inputs are named, and input trims are calibrated if required.

  **NOTE:** When the talkback mic is configured, it will be routed to input channel 24.

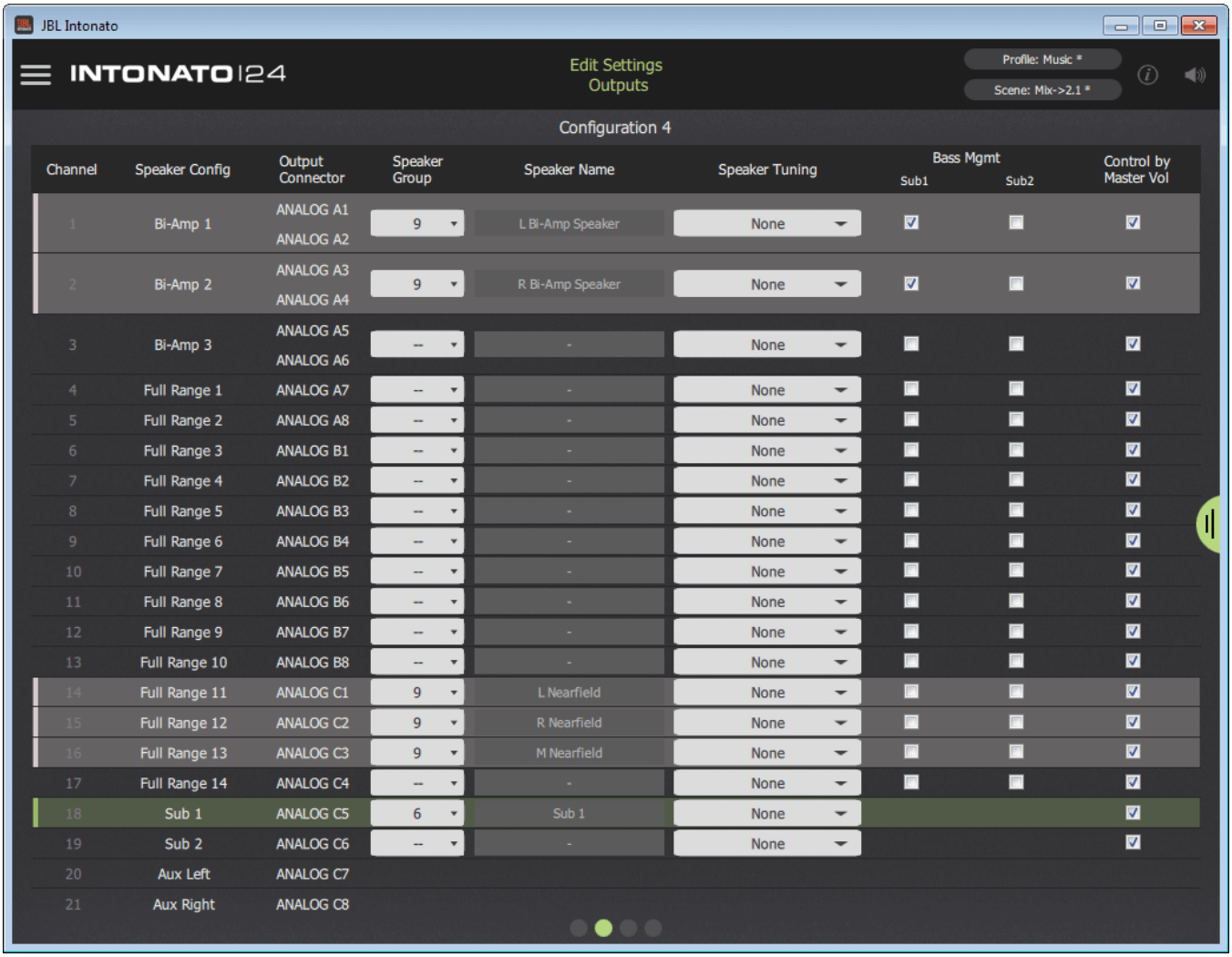
- For more information on the fields shown in this screen, see **"Configuring Inputs" on page 17**.




**Input Configuration Screen**

## 2.1 Bi-Amplified Application Notes – Output Configuration:

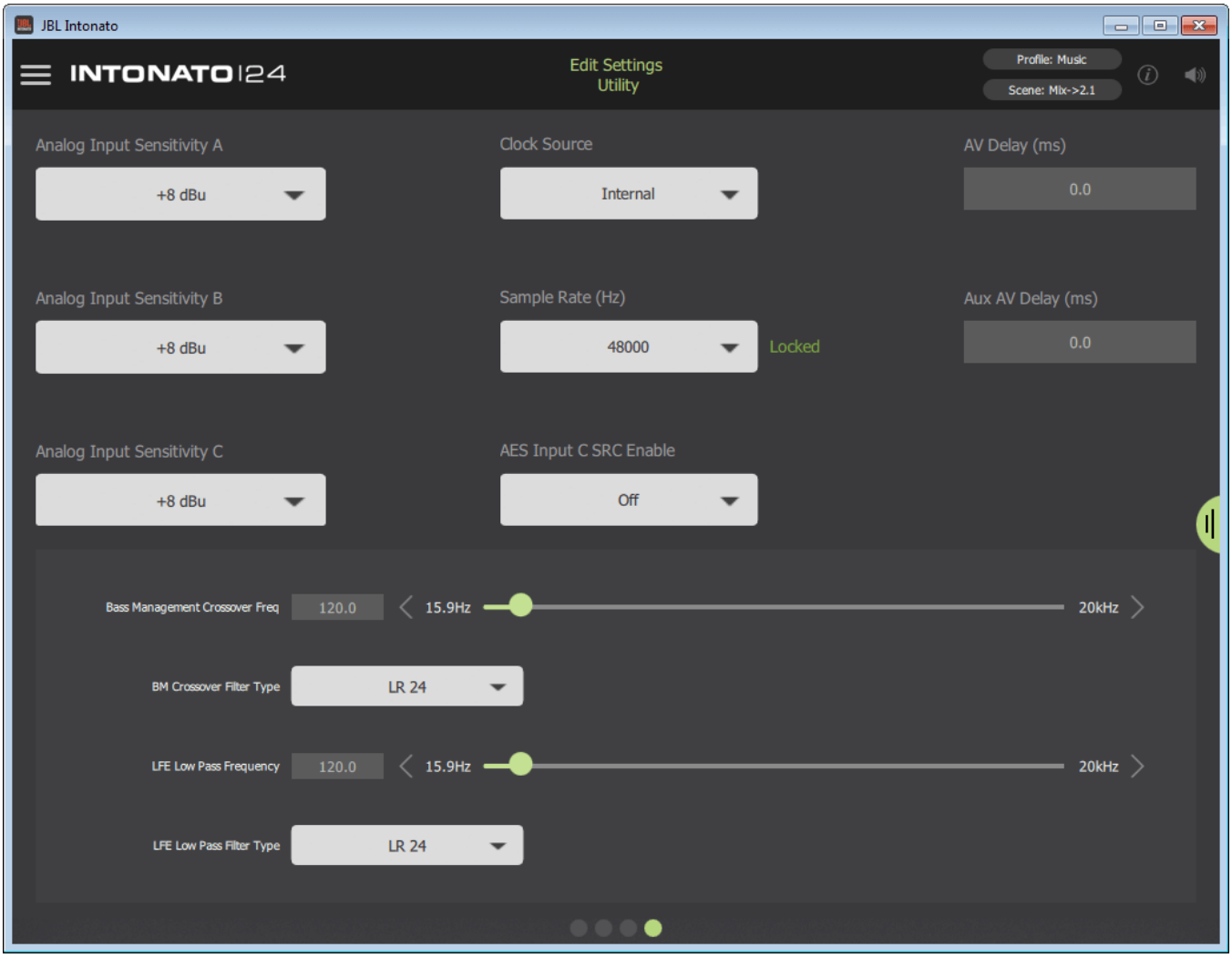
- The screenshot below shows the Output Configuration screen for this application. From this screen, speaker group assignments are made (to color-code the output channels), outputs are named, speaker tunings are selected (if available), outputs are assigned for bass management, and outputs are assigned to be controlled by the master volume, mute, and dim controls.
- The cue mix and talkback mic inputs are routed to the aux outputs on Analog Output C7 and C8 (channels 23 and 24) and are sent to a headphone amplifier for monitoring by the talent during recording sessions.
- For more information on the fields shown in this screen, see **"Configuring Outputs" on page 19**.




**Output Configuration Screen**

## 2.1 Bi-Amplified Application Notes – Utility Configuration:

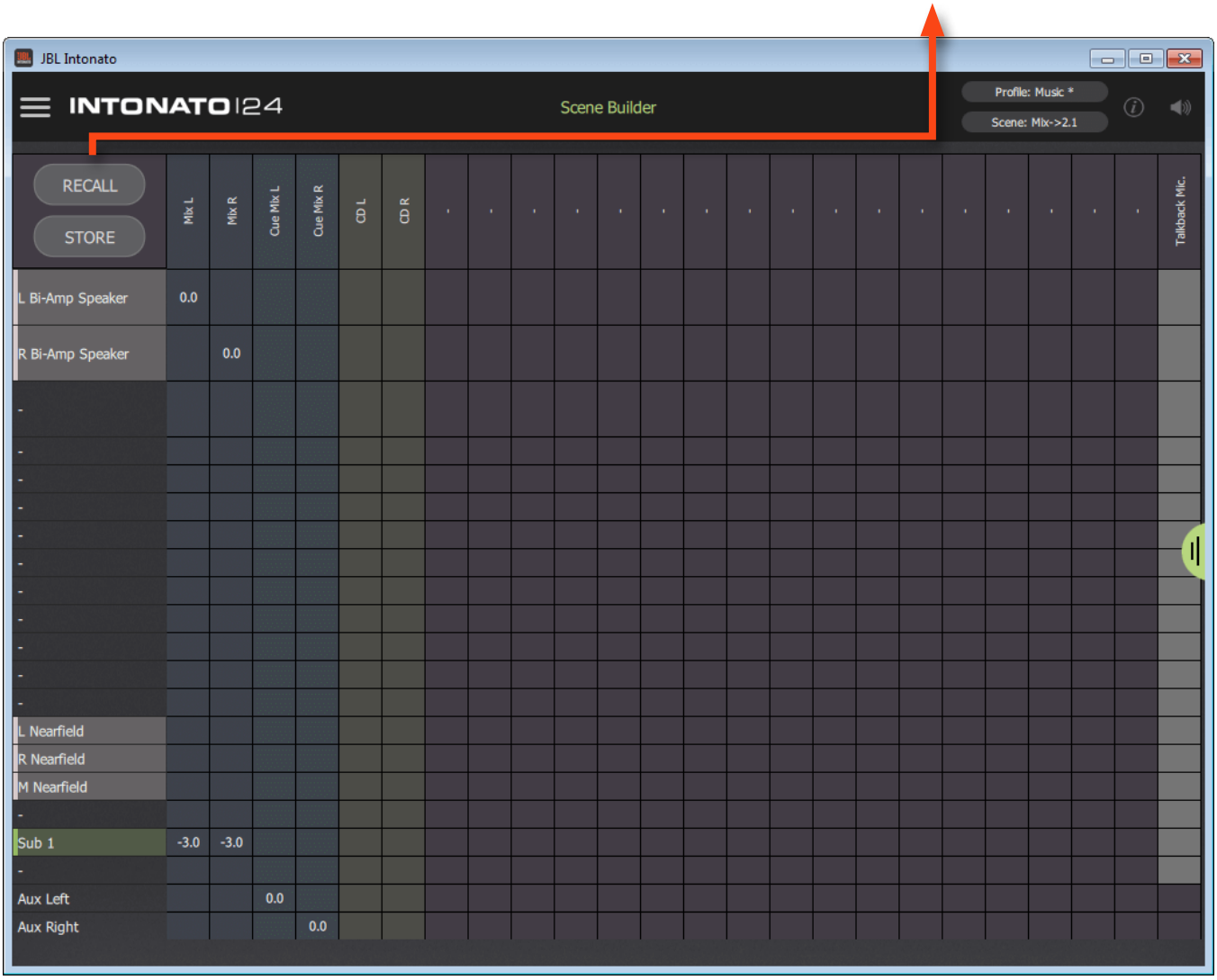
- The screenshot below shows the Utility screen for this application. From this screen, the bass management crossover frequency can be fine-tuned and additional settings configured for the application.
- For more information on the fields shown in this screen, see **"Configuring Utility Settings" on page 21**.




**Utility Screen**

## 2.1 Bi-Amplified Application Notes – Scene Configuration:

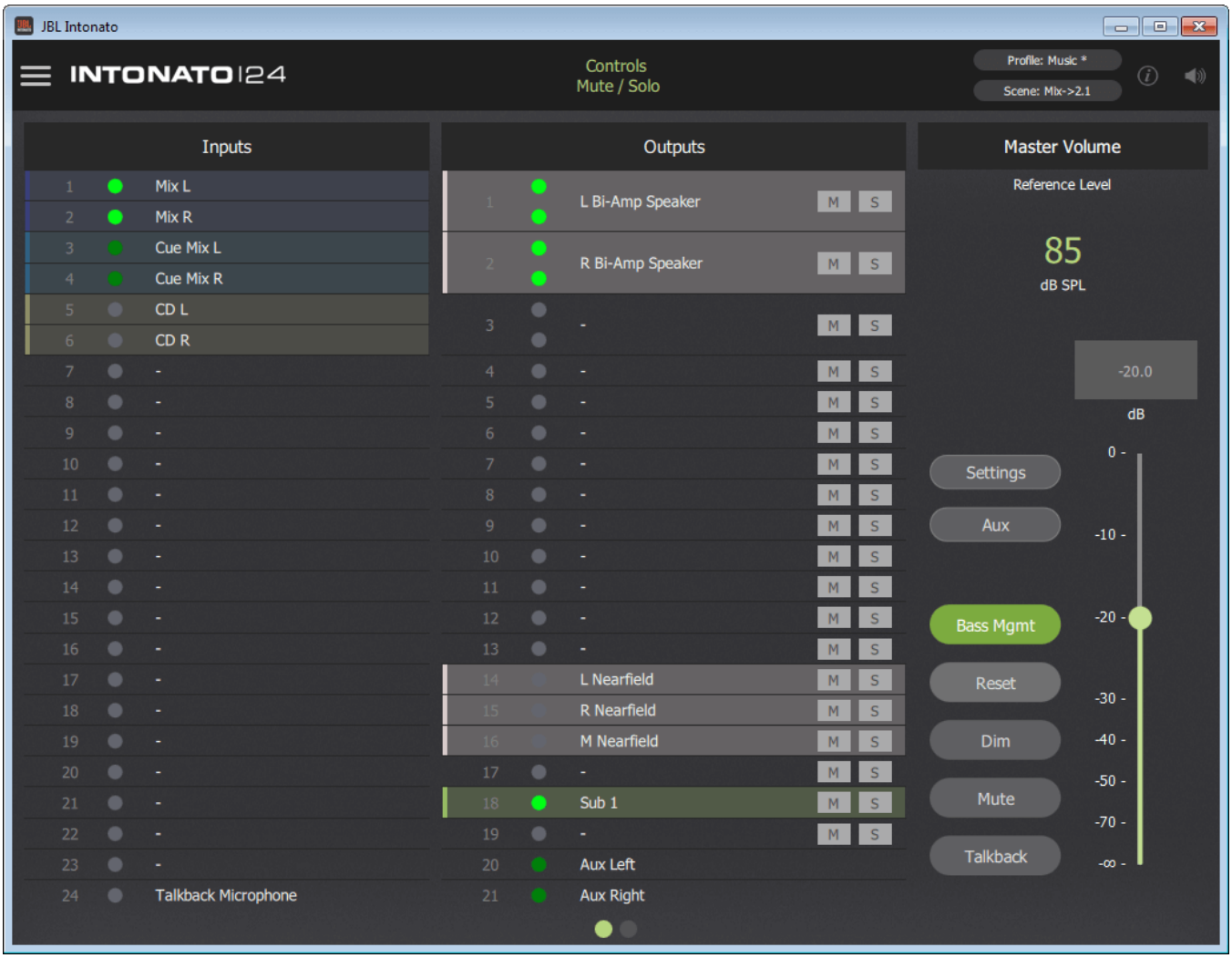
- The screenshot below shows the Scene Builder screen for this application, where scenes are created. In this application, scenes are used to select the CD player source for reference and select the stereo or mono nearfield speakers for monitoring.
- Downmixing options are customizable to suit the application, allowing the stereo signal to be downmixed to the mono reference speaker.
- For more information on the Scene Builder screen, see **"Creating Scenes" on page 36**.


**Scene Builder Screen**

## 2.1 Bi-Amplified Application Notes – User Master Control:

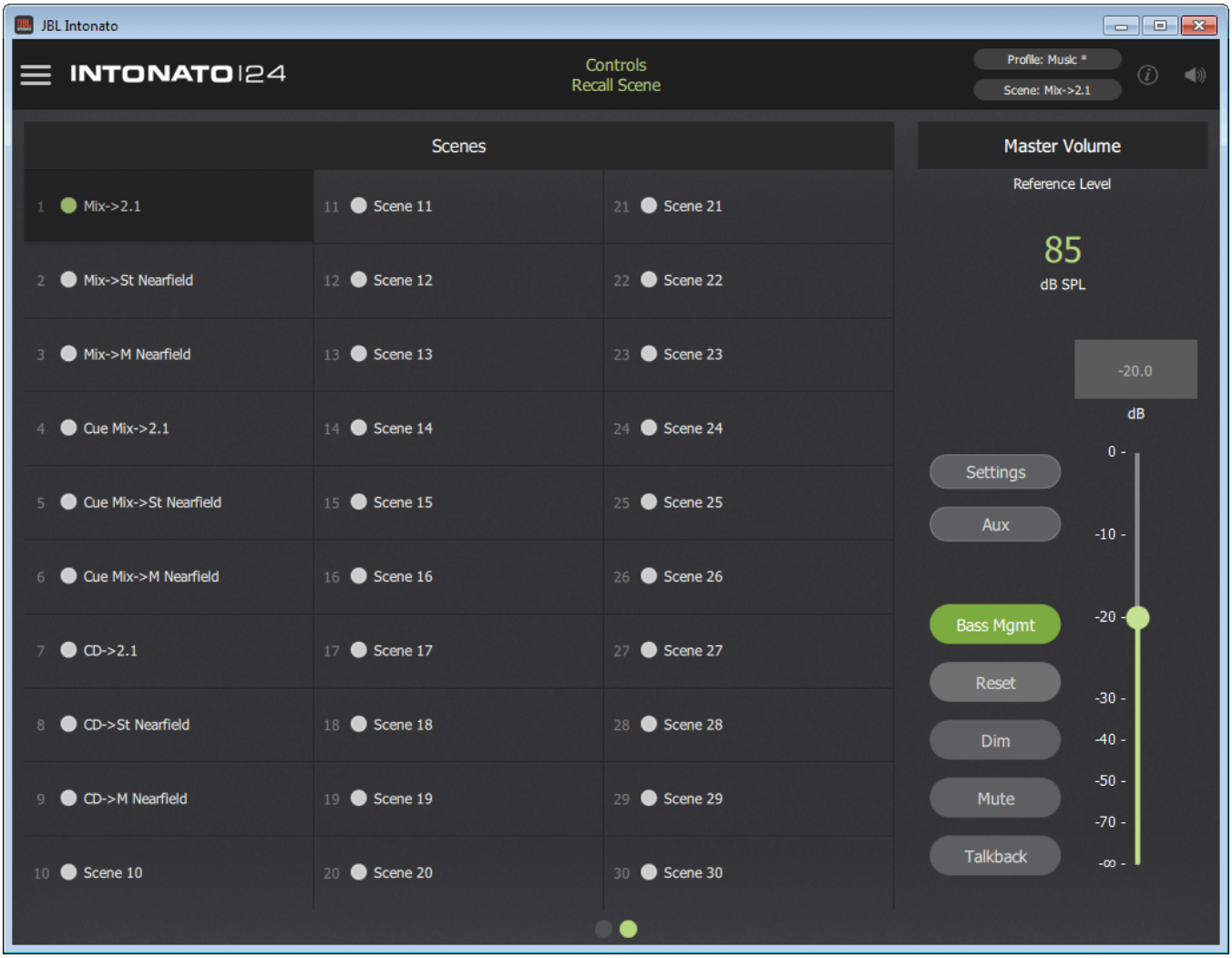
- The screenshot below shows the first user control screen for this application. From this screen, the engineer can mute and solo individual speakers, turn bass management on or off, and control master volume, mute, and dim. Enabling the Talkback button allows the engineer to communicate with the talent during recording sessions.
- The Reference Level readout can be pre-calibrated to display the SPL of the monitor system.
- The inputs and outputs are color-coded as programmed from the Input and Output Configuration screens.
- For more information on this control screen, see **“User Control – Master Controls” on page 40**.




**Control Screen 1**

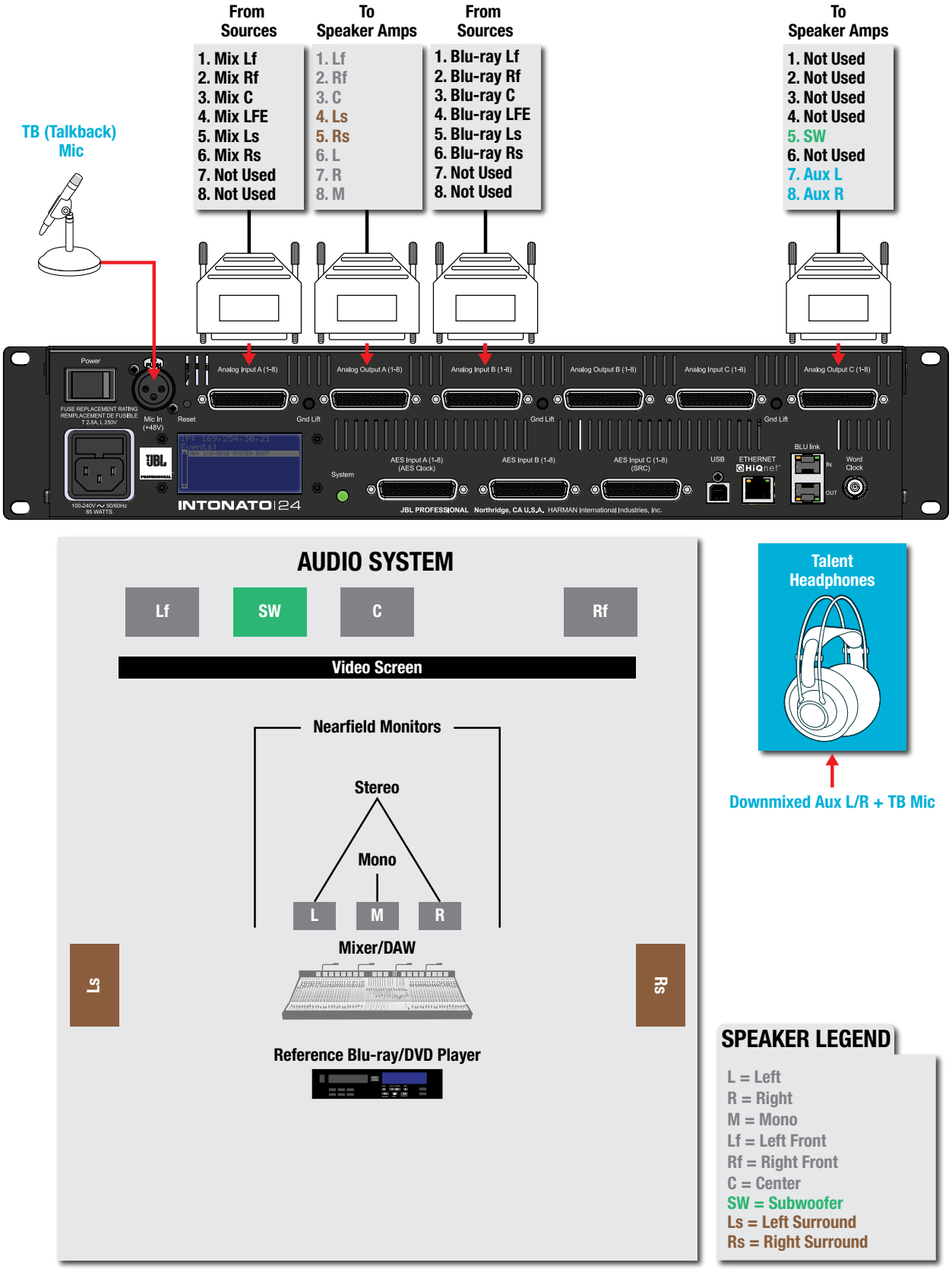
## 2.1 Bi-Amplified Application Notes – User Scene Selection:

- The screenshot below shows the second user control screen for this application. From here, the engineer can recall scenes that select sources or speaker systems for monitoring, or select alternate downmixing options.



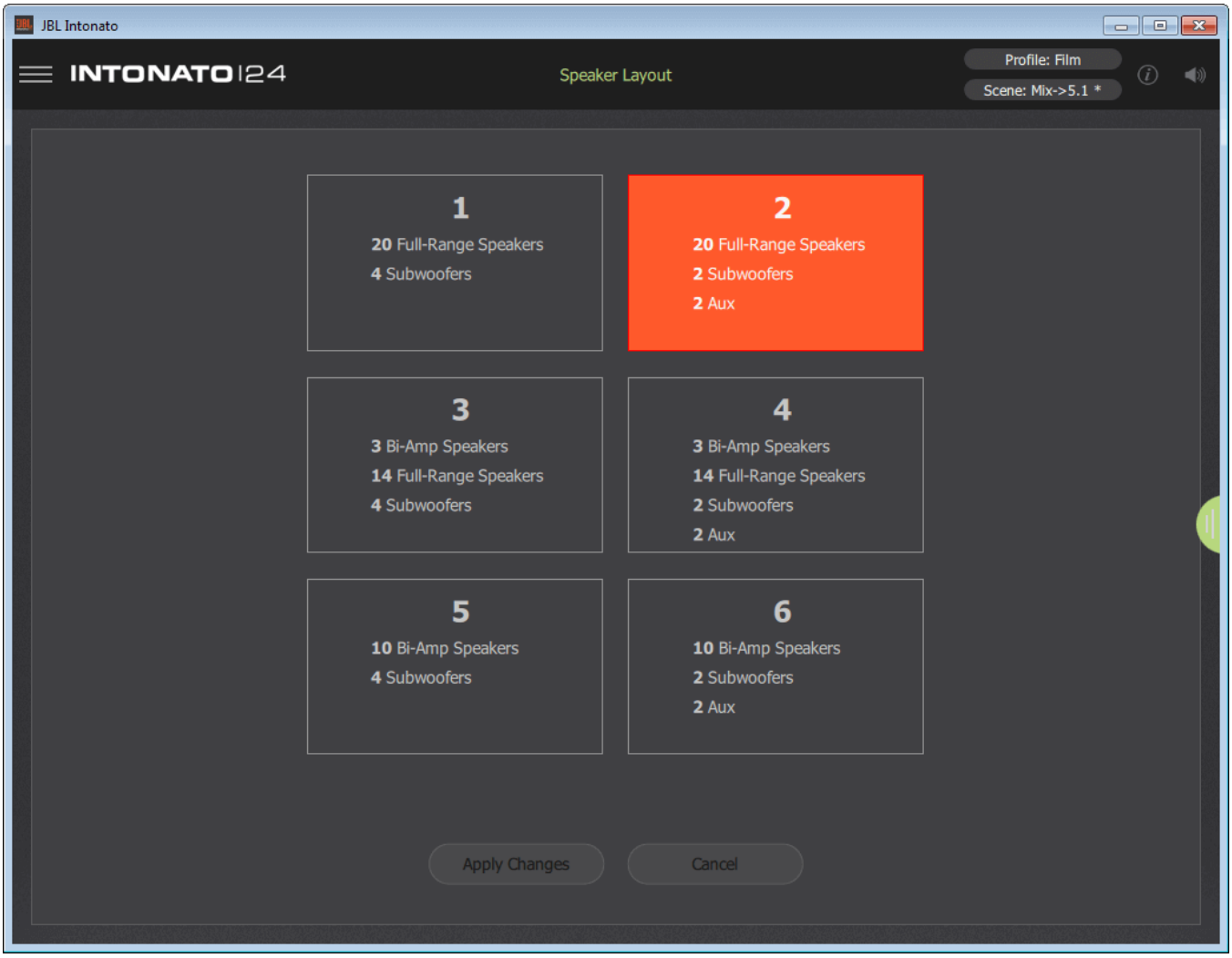

**Control Screen 2**

## 5.1 Full-Range Application



### 5.1 Full-Range Application Notes – Speaker Layout Configuration:

- Speaker layout 2 has been selected for this application. This provides up to 20 full-range outputs and 2 subwoofer outputs. The 2-channel aux output carries the fold-down mix and talkback mic signal and is fed to the talent's headphone amplifier.
- Three monitor systems are used: the main 5.1 speakers, the nearfield stereo speakers, and the nearfield mono speaker.



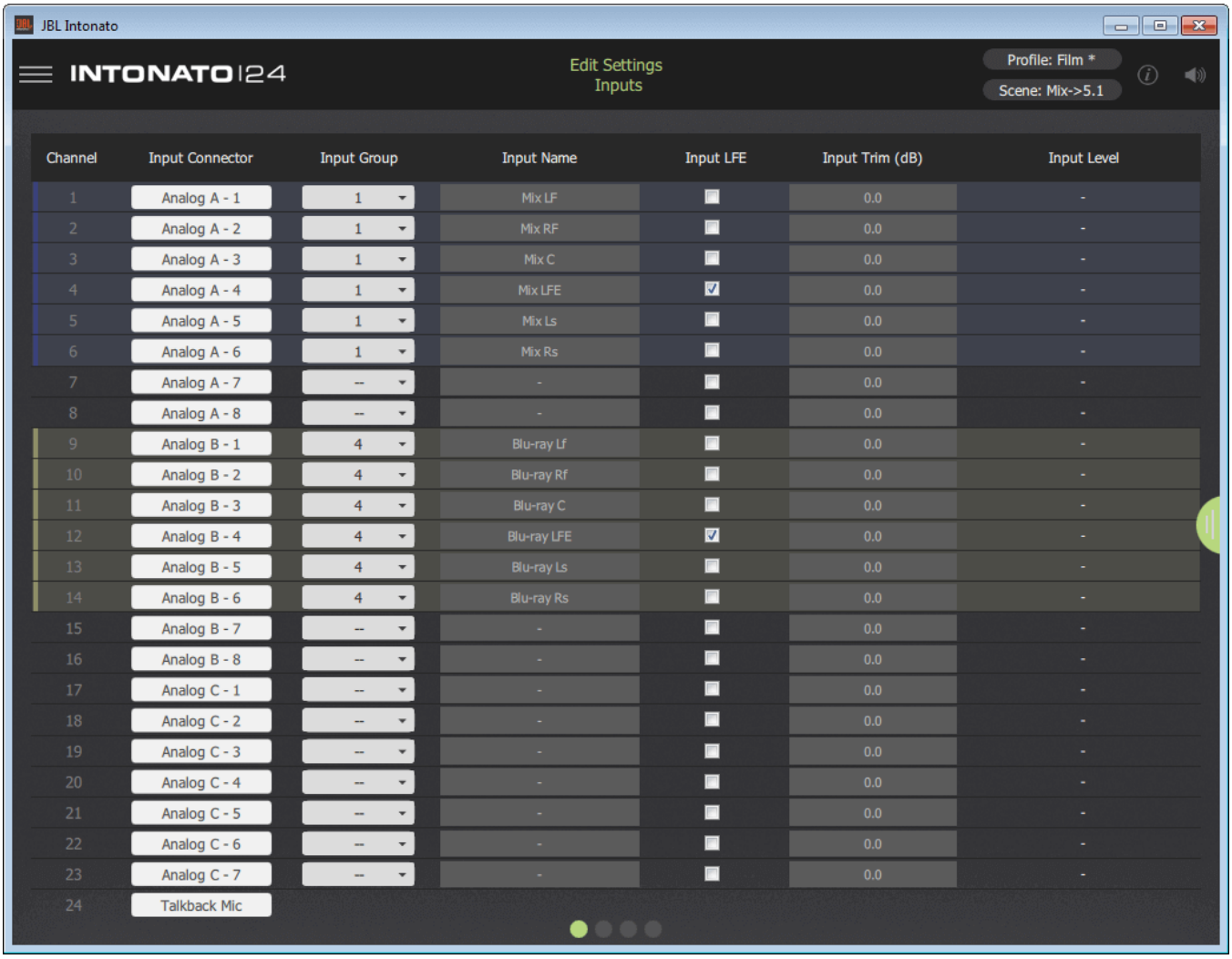

**Speaker Layout Selection Screen**

## 5.1 Full-Range Application Notes – Input Configuration:

- The screenshot below shows the Input Configuration screen for this application. From this screen, physical inputs are assigned, input group assignments are made (to color-code input channels), inputs are named, input LFE channels are designated, and input trims are calibrated if required.

  **NOTE:** When the talkback mic is configured, it will be routed to input channel 24.

- For more information on the fields shown in this screen, see **"Configuring Inputs" on page 17**.

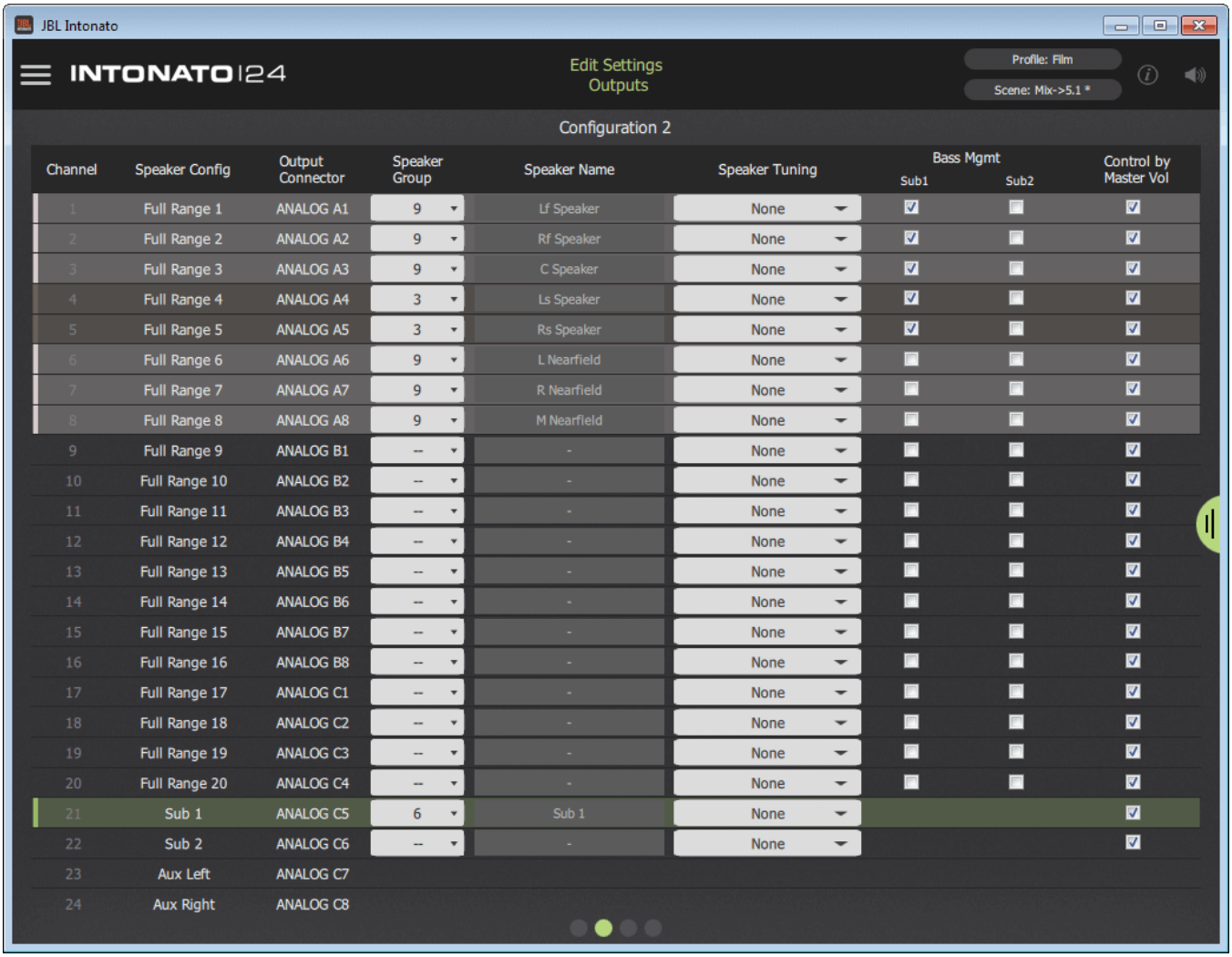



| Channel | Input Connector | Input Group | Input Name | Input LFE | Input Trim (dB) | Input Level |
|---|---|---|---|---|---|---|
| 1 | Analog A - 1 | 1 | Mix LF | ☐ | 0.0 | - |
| 2 | Analog A - 2 | 1 | Mix RF | ☐ | 0.0 | - |
| 3 | Analog A - 3 | 1 | Mix C | ☐ | 0.0 | - |
| 4 | Analog A - 4 | 1 | Mix LFE | ☑ | 0.0 | - |
| 5 | Analog A - 5 | 1 | Mix Ls | ☐ | 0.0 | - |
| 6 | Analog A - 6 | 1 | Mix Rs | ☐ | 0.0 | - |
| 7 | Analog A - 7 | -- | - | ☐ | 0.0 | - |
| 8 | Analog A - 8 | -- | - | ☐ | 0.0 | - |
| 9 | Analog B - 1 | 4 | Blu-ray Lf | ☐ | 0.0 | - |
| 10 | Analog B - 2 | 4 | Blu-ray Rf | ☐ | 0.0 | - |
| 11 | Analog B - 3 | 4 | Blu-ray C | ☐ | 0.0 | - |
| 12 | Analog B - 4 | 4 | Blu-ray LFE | ☑ | 0.0 | - |
| 13 | Analog B - 5 | 4 | Blu-ray Ls | ☐ | 0.0 | - |
| 14 | Analog B - 6 | 4 | Blu-ray Rs | ☐ | 0.0 | - |
| 15 | Analog B - 7 | -- | - | ☐ | 0.0 | - |
| 16 | Analog B - 8 | -- | - | ☐ | 0.0 | - |
| 17 | Analog C - 1 | -- | - | ☐ | 0.0 | - |
| 18 | Analog C - 2 | -- | - | ☐ | 0.0 | - |
| 19 | Analog C - 3 | -- | - | ☐ | 0.0 | - |
| 20 | Analog C - 4 | -- | - | ☐ | 0.0 | - |
| 21 | Analog C - 5 | -- | - | ☐ | 0.0 | - |
| 22 | Analog C - 6 | -- | - | ☐ | 0.0 | - |
| 23 | Analog C - 7 | -- | - | ☐ | 0.0 | - |
| 24 | Talkback Mic | | | | | |

**Input Configuration Screen**

## 5.1 Full-Range Application Notes – Output Configuration:

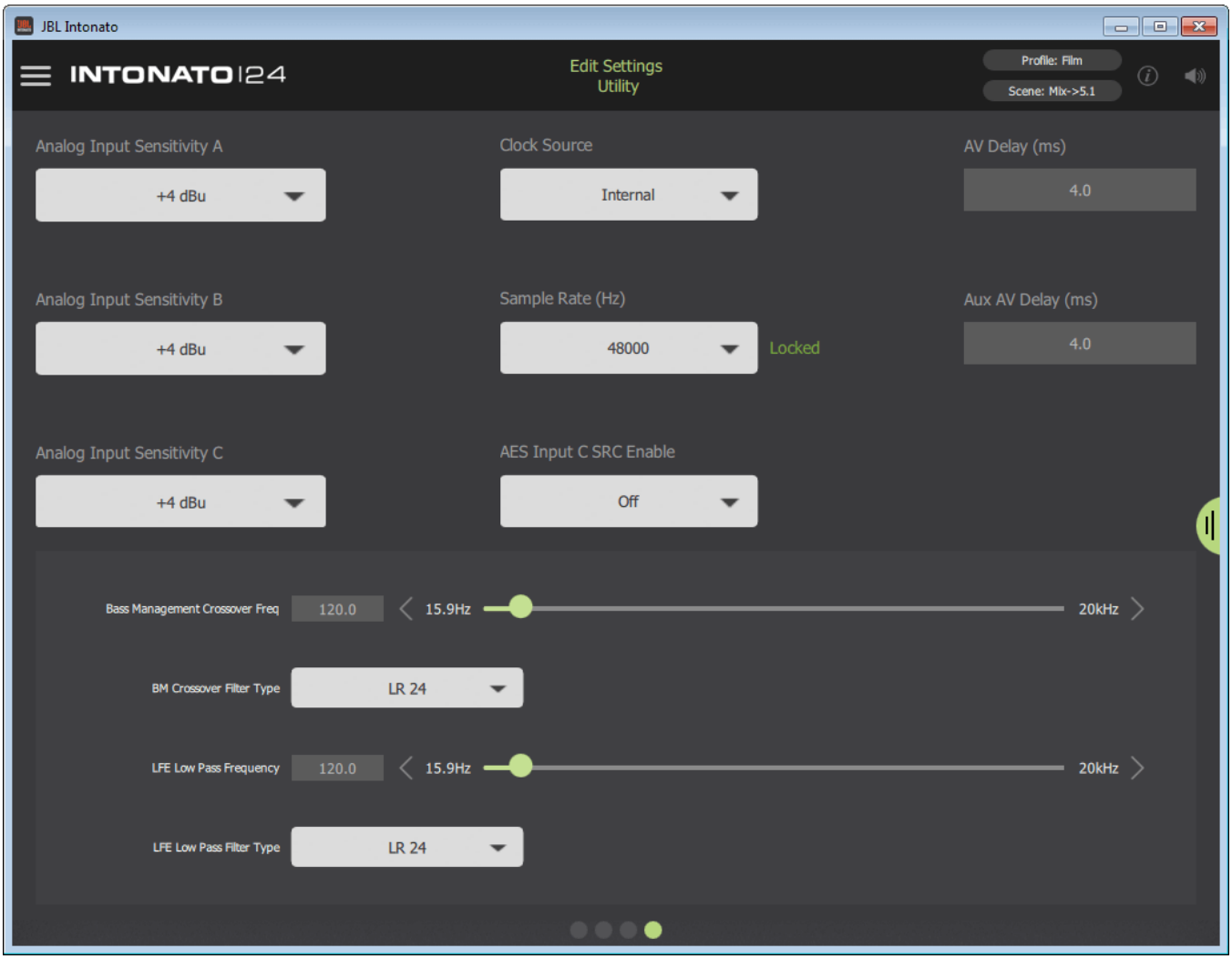
- The screenshot below shows the Output Configuration screen for this application. From this screen, speaker group assignments are made (to color-code the output channels), outputs are named, speaker tunings are selected (if available), outputs are assigned for bass management, and outputs are assigned to be controlled by the master volume, mute, and dim controls.
- The downmixed surround mix and talkback mic input are routed to the aux outputs on Analog Output C7 and C8 (channels 23 and 24) and are sent to a headphone amplifier for monitoring by the talent during voiceover/ADR recording sessions.
- For more information on the fields shown in this screen, see **"Configuring Outputs" on page 19**.




**Output Configuration Screen**

## 5.1 Full-Range Application Notes – Utility Configuration:

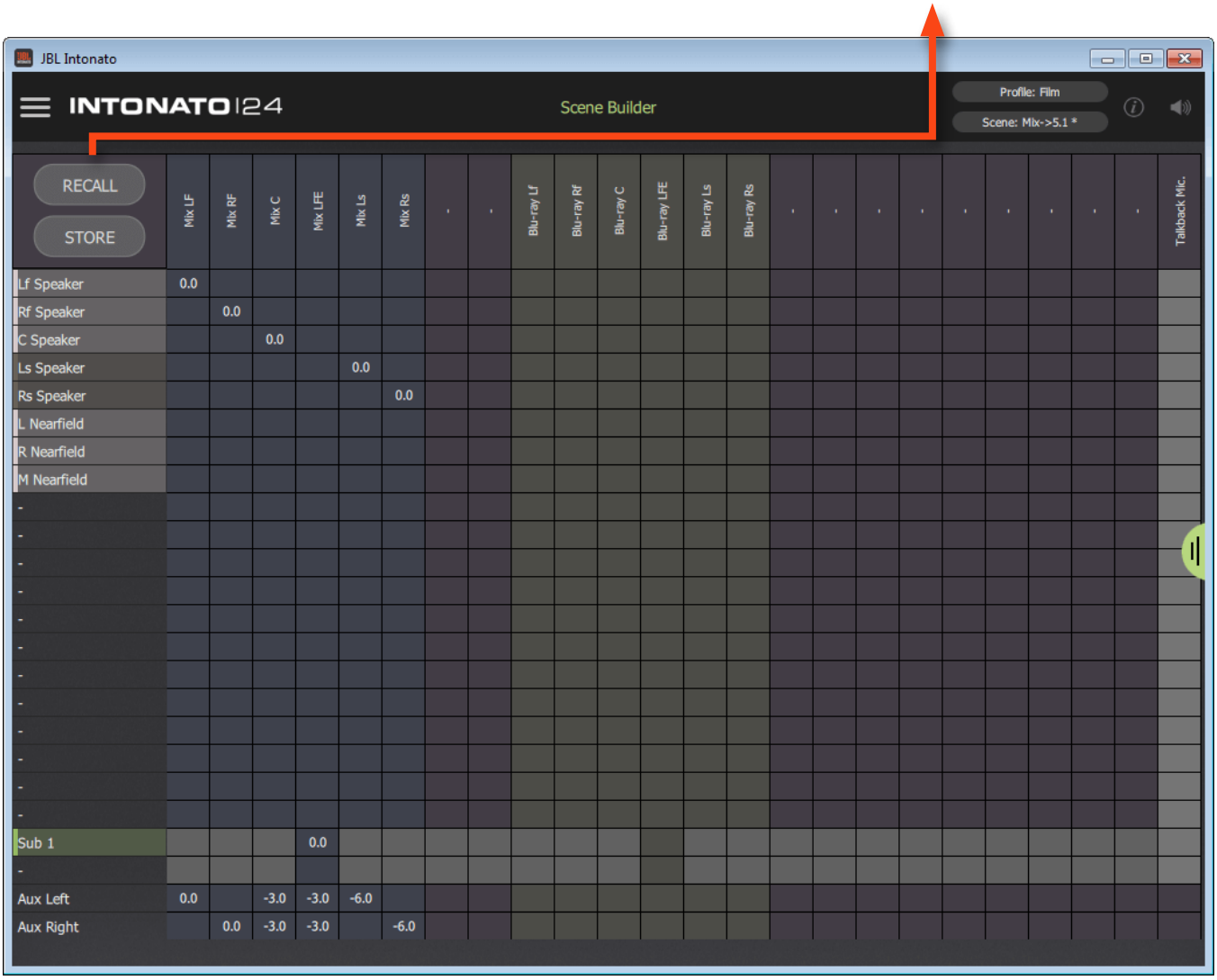
- The screenshot below shows the Utility screen for this application. The bass management crossover frequency and LFE low-pass filter frequency can be fine-tuned from this screen. Delays for the speaker system and talent headphones (to compensate for video display latency and restore “lip synchronization”) and additional settings can also be configured from here.
- For more information on the fields shown in this screen, see **“Configuring Utility Settings” on page 21**.




**Utility Screen**

## 5.1 Full-Range Application Notes – Scene Configuration:

- The screenshot below shows the Scene Builder screen for this application, where scenes are created. In this application, scenes are used to select the Blu-ray™/DVD player source for reference and select the stereo or mono nearfield speakers for monitoring.
- Downmixing options are customizable to suit the application, allowing the 5.1 signal to be downmixed to the stereo or mono reference speakers, or the 5.1 speaker system to play back other downmixed formats.
- For more information on the Scene Builder screen, see **"Creating Scenes" on page 36**.


**Scene Builder Screen**

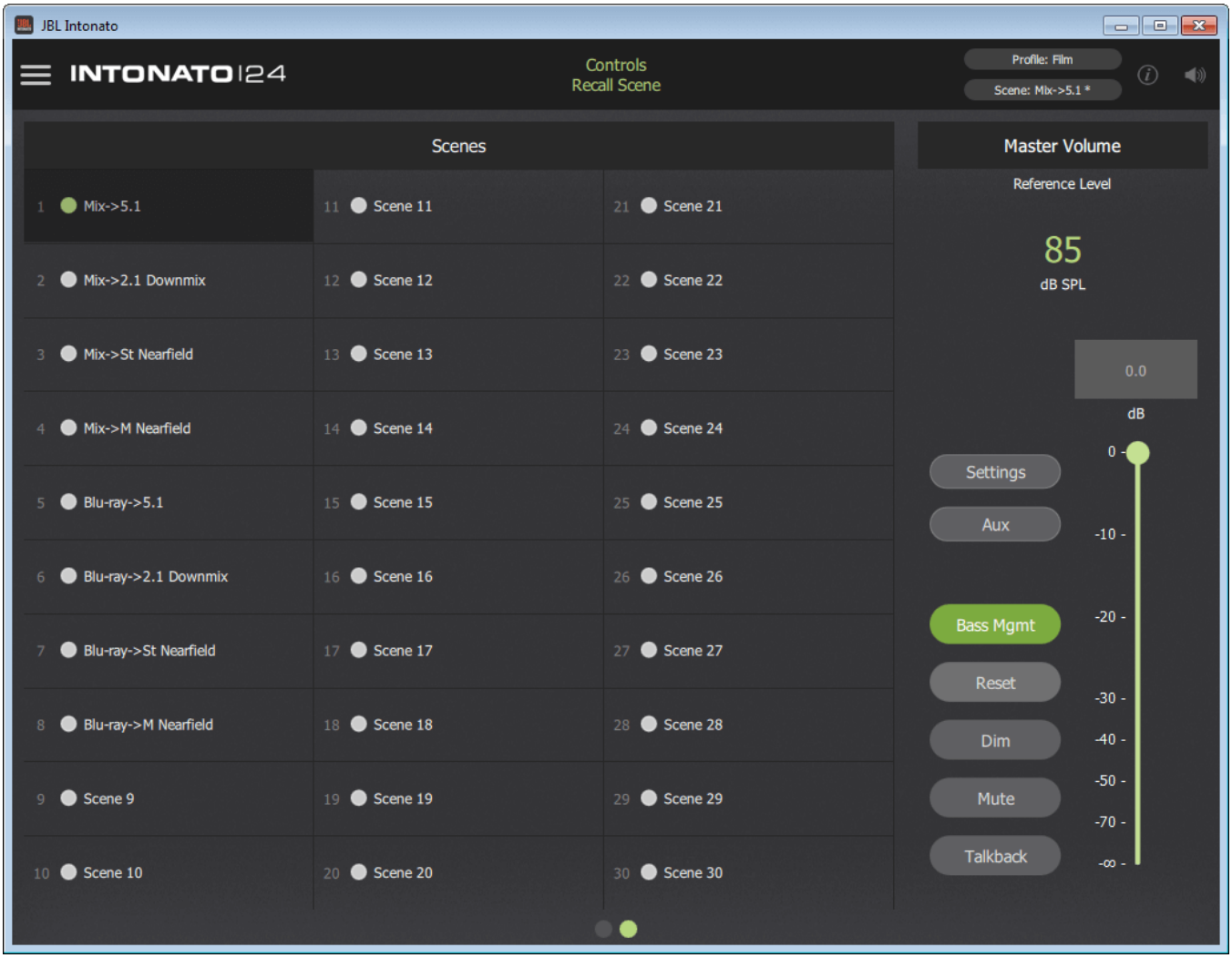
### 5.1 Full-Range Application Notes – User Master Control:

- The screenshot below shows the first user control screen for this application. From this screen, the engineer can mute and solo individual speakers, turn bass management on or off, and control master volume, mute, and dim. Enabling the Talkback button allows the engineer to communicate with the talent during recording sessions.
- The Reference Level readout can be pre-calibrated to display the SPL of the monitor system.
- The inputs and outputs are color-coded as programmed from the Input and Output Configuration screens.
- For more information on this control screen, see **“User Control – Master Controls” on page 40**.


**Control Screen 1**

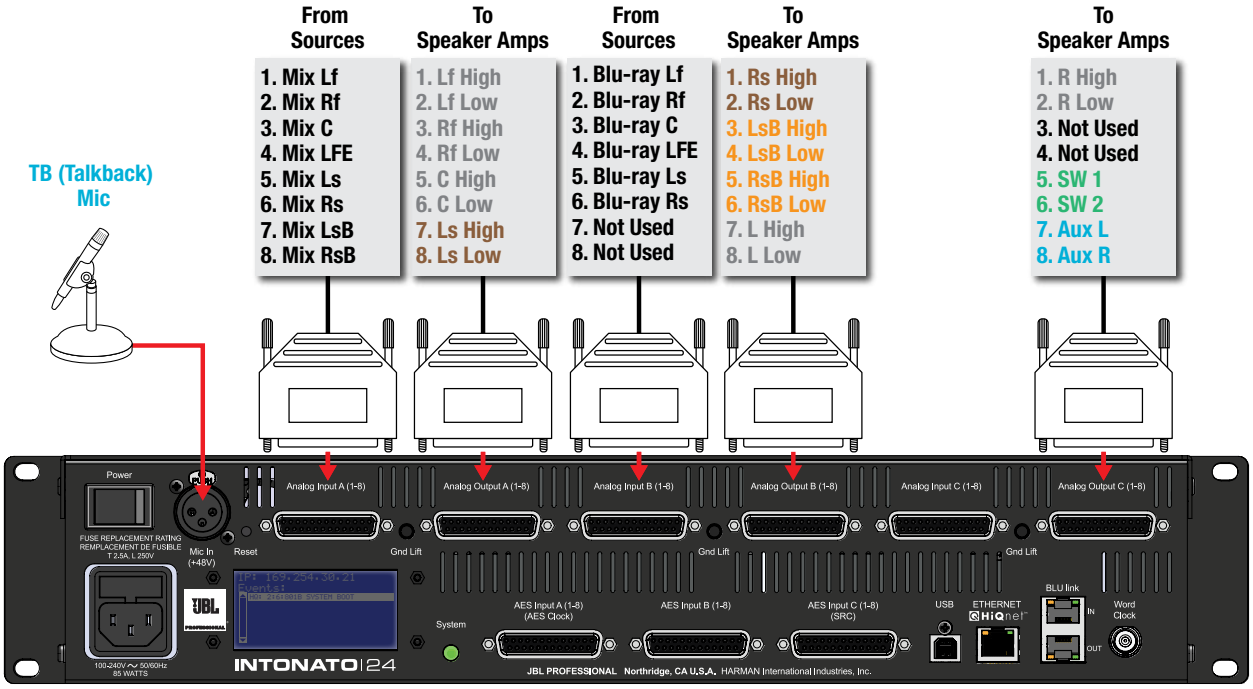
## 5.1 Full-Range Application Notes – User Scene Selection:

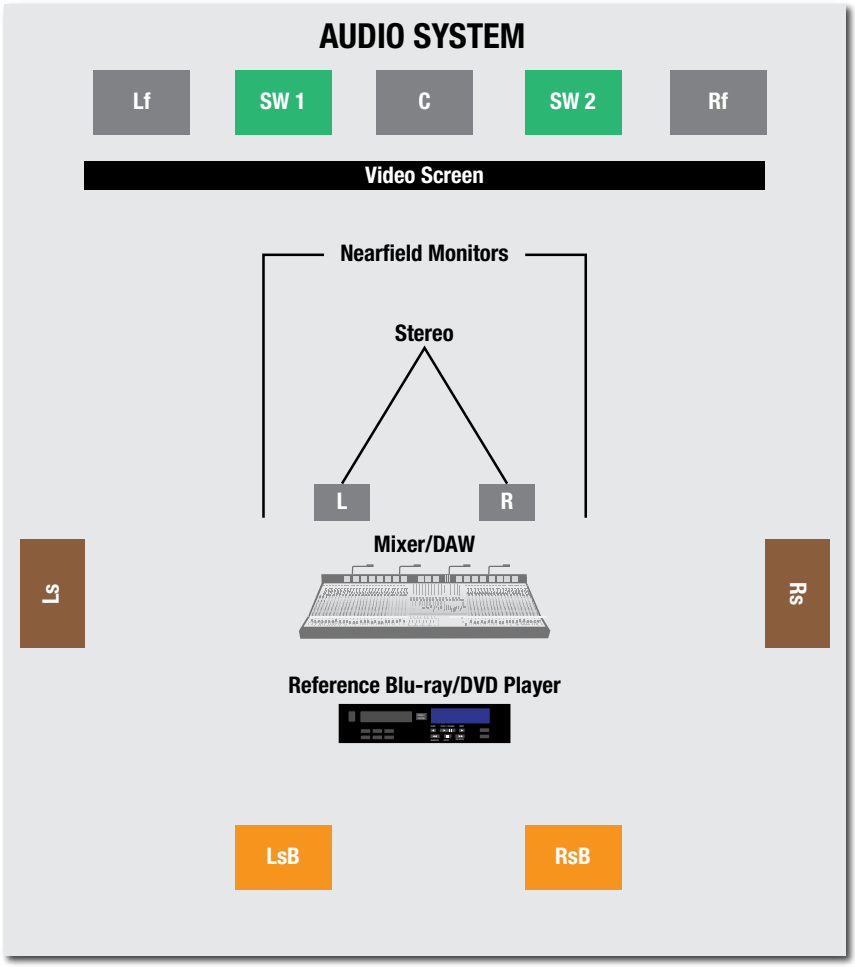
- The screenshot below shows the second user control screen for this application. From here, the engineer can recall scenes that select sources or speaker systems for monitoring, or select alternate downmixing options.




**Control Screen 2**

## 7.2 Bi-Amplified Application





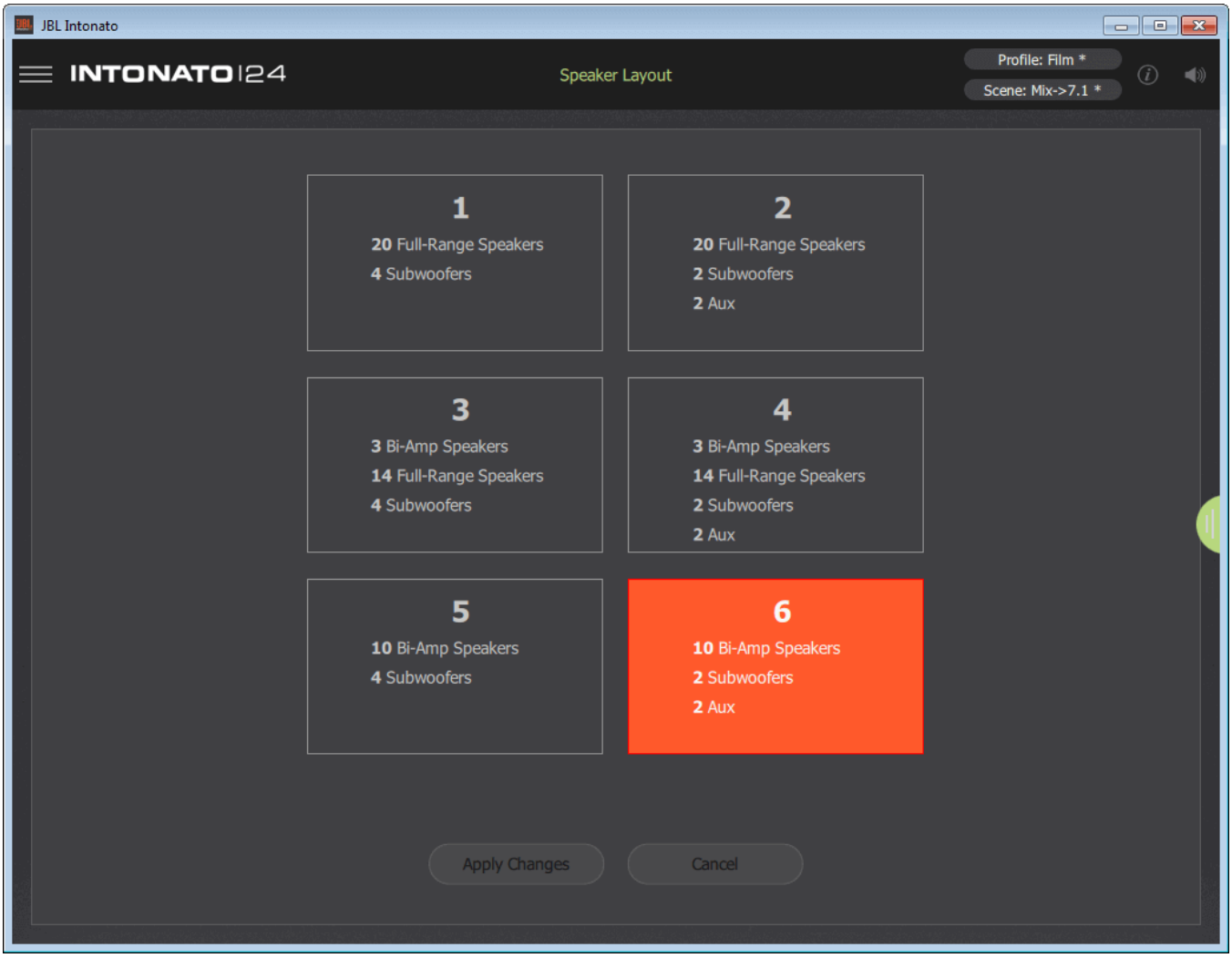
Downmixed Aux L/R + TB Mic

**SPEAKER LEGEND**

L = Left
R = Right
Lf = Left Front
Rf = Right Front
C = Center
SW = Subwoofer
Ls = Left Surround
Rs = Right Surround
LsB = Left Surround Back
RsB = Right Surround Back

### 7.2 Bi-Amplified Application Notes – Speaker Layout Configuration:

- Speaker layout 6 has been selected for this application. This provides up to 10 bi-amplified outputs and 2 subwoofer outputs. The 2-channel aux output carries the fold-down mix and talkback mic signal and is fed to the talent's headphone amplifier.
- Two monitor systems are used: the main 7.2 speakers and the nearfield stereo speakers. All satellite speakers are bi-amped.



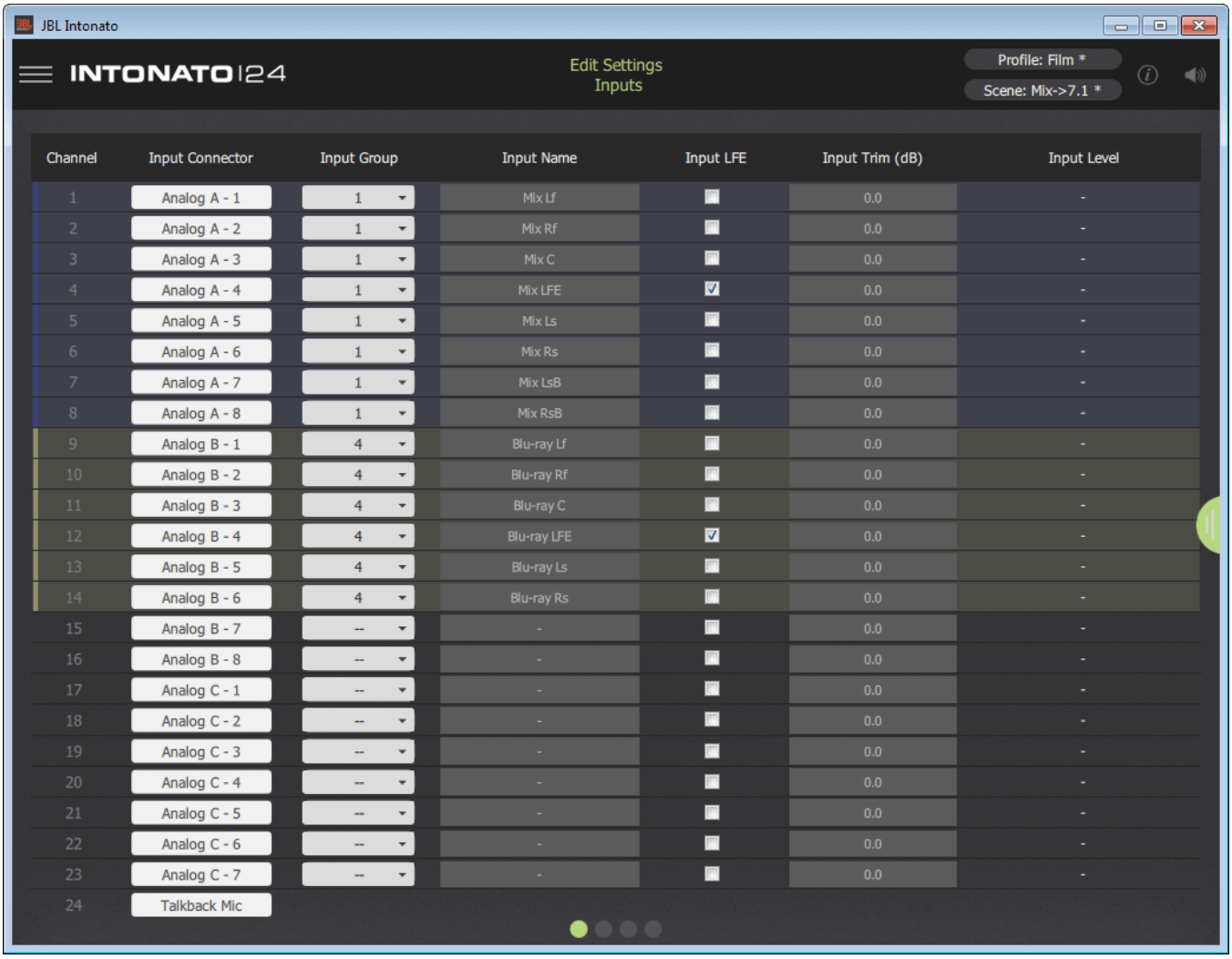

**Speaker Layout Selection Screen**

### 7.2 Bi-Amplified Application Notes – Input Configuration:

- The screenshot below shows the Input Configuration screen for this application. From this screen, physical inputs are assigned, input group assignments are made (to color-code input channels), inputs are named, input LFE channels are designated, and input trims are calibrated if required.

  **NOTE:** When the talkback mic is configured, it will be routed to input channel 24.

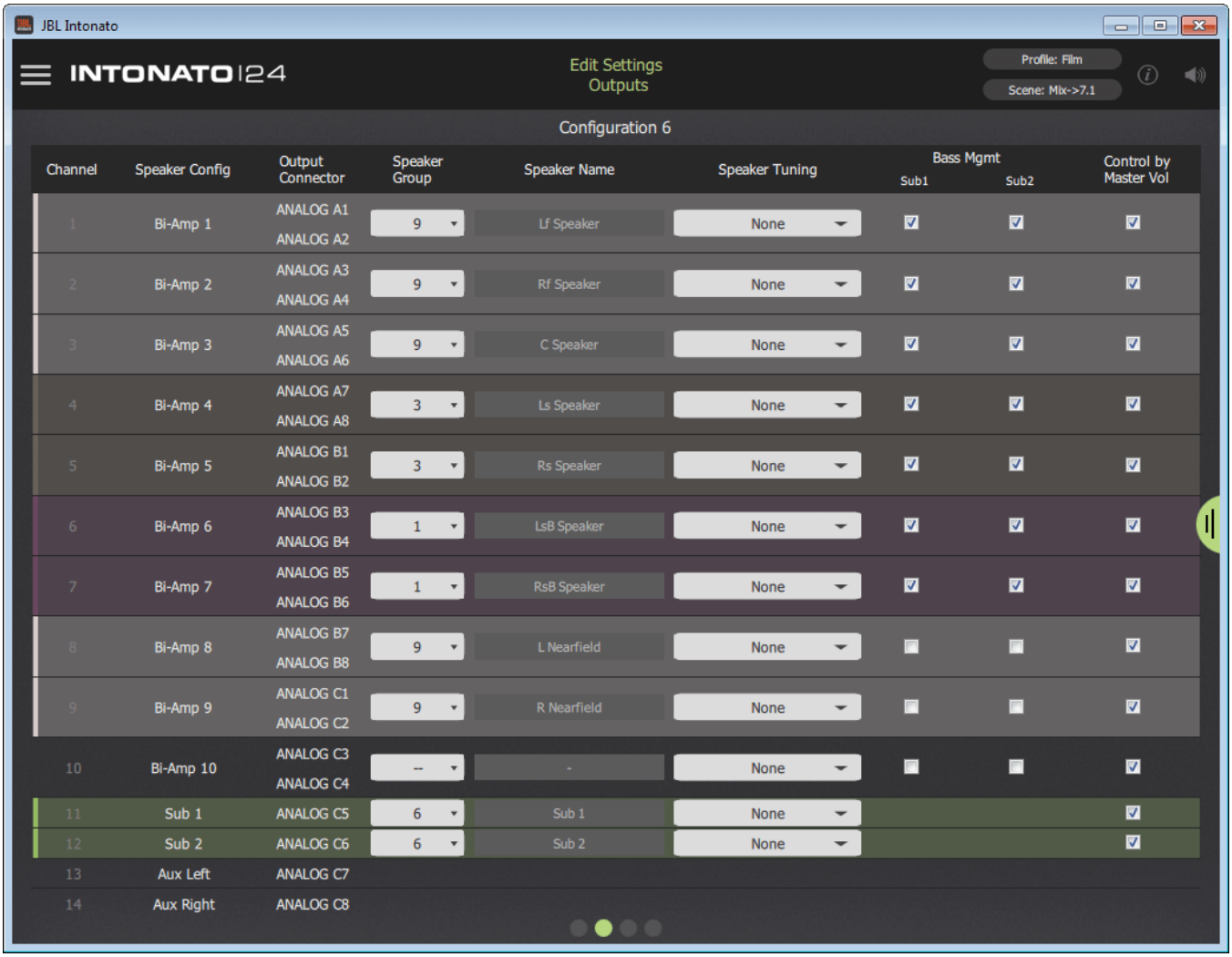
- For more information on the fields shown in this screen, see **"Configuring Inputs" on page 17**.




**Input Configuration Screen**

## 7.2 Bi-Amplified Application Notes – Output Configuration:

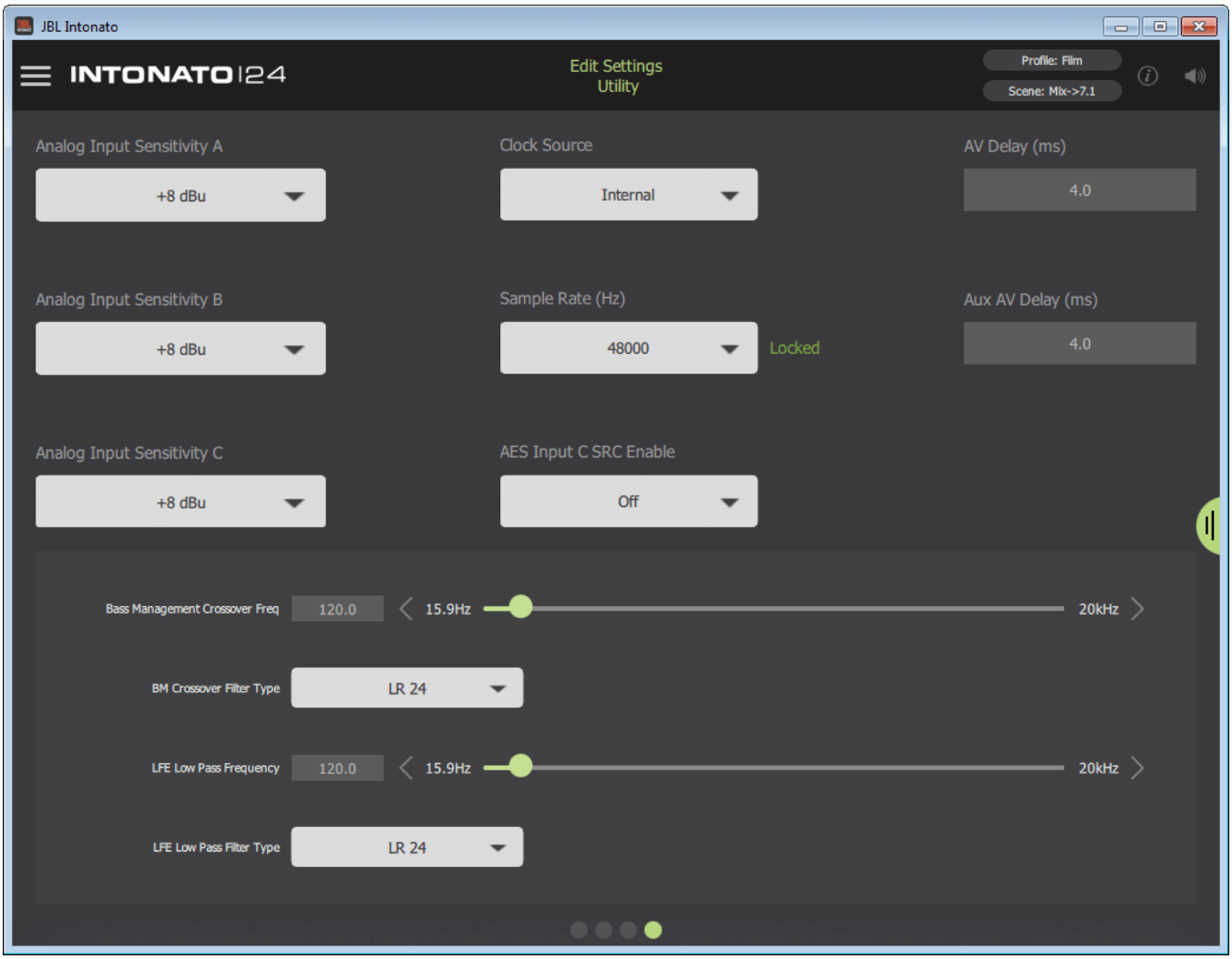
- The screenshot below shows the Output Configuration screen for this application. From this screen, speaker group assignments are made (to color-code the output channels), outputs are named, speaker tunings are selected (if available), outputs are assigned for bass management, and outputs are assigned to be controlled by the master volume, mute, and dim controls.
- The downmixed surround mix and talkback mic input are routed to the aux outputs on Analog Output C7 and C8 (channels 23 and 24) and are sent to a headphone amplifier for monitoring by the talent during voiceover/ADR recording sessions.
- For more information on the fields shown in this screen, see **"Configuring Outputs" on page 19**.




**Output Configuration Screen**

### 7.2 Bi-Amplified Application Notes – Utility Configuration:

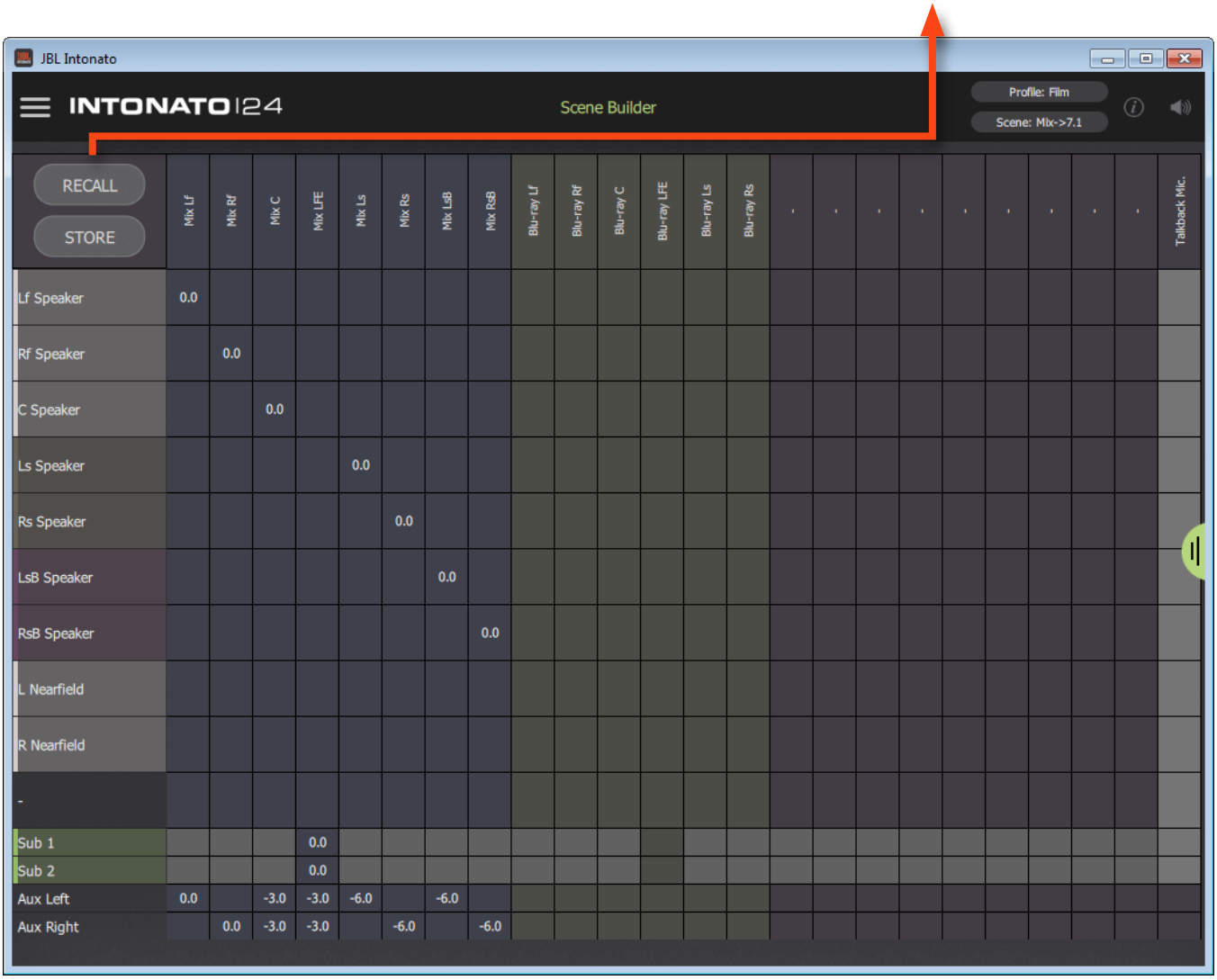
- The screenshot below shows the Utility screen for this application. The bass management crossover frequency and LFE low-pass filter frequency can be fine-tuned from this screen. Delays for the speaker system and talent headphones (to compensate for video display latency and restore “lip synchronization”) and additional settings can also be configured from here.
- For more information on the fields shown in this screen, see **“Configuring Utility Settings” on page 21**.




**Utility Screen**

## 7.2 Bi-Amplified Application Notes – Scene Configuration:

- The screenshot below shows the Scene Builder screen for this application, where scenes are created. In this application, scenes are used to select the Blu-ray/DVD player source for reference and select the stereo nearfield speakers for monitoring.
- Downmixing options are customizable to suit the application, allowing the 7.1 signal to be downmixed to the stereo reference speakers, or the 7.2 speaker system to play back other downmixed formats (e.g., 5.1, stereo, or mono).
- For more information on the Scene Builder screen, see **"Creating Scenes" on page 36**.


**Scene Builder Screen**

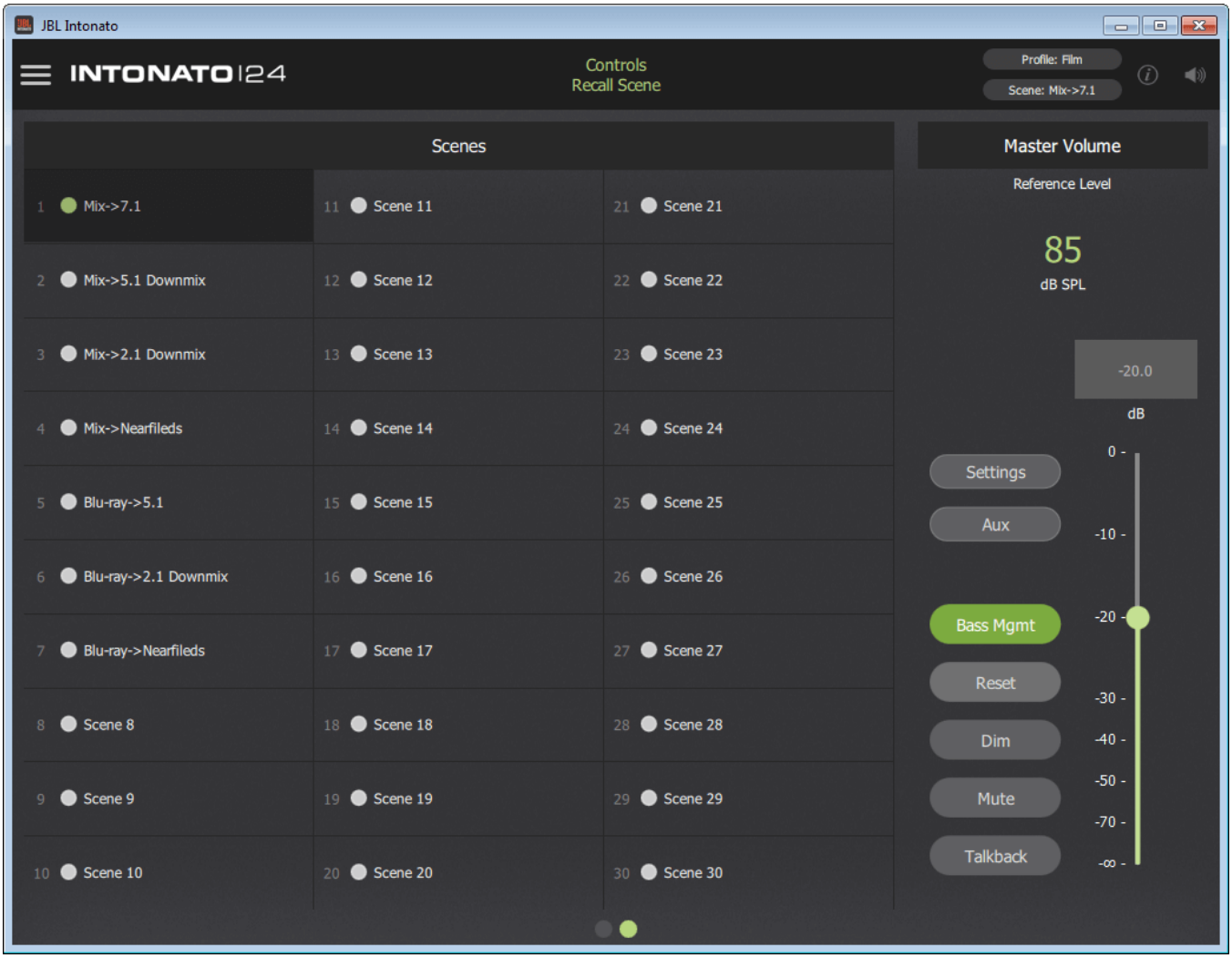
### 7.2 Bi-Amplified Application Notes – User Master Control:

- The screenshot below shows the first user control screen for this application. From this screen, the engineer can mute and solo individual speakers, turn bass management on or off, and control master volume, mute, and dim. Enabling the Talkback button allows the engineer to communicate with the talent during recording sessions.
- The Reference Level readout can be pre-calibrated to display the SPL of the monitor system.
- The inputs and outputs are color-coded as programmed from the Input and Output Configuration screens.
- For more information on this control screen, see **“User Control – Master Controls” on page 40**.


**Control Screen 1**

## 7.2 Bi-Amplified Application Notes – User Scene Selection:

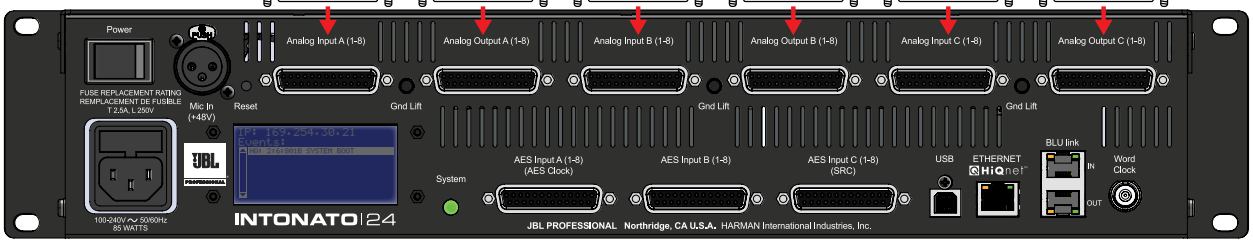
- The screenshot below shows the second user control screen for this application. From here, the engineer can recall scenes that select sources or speaker systems for monitoring, or select alternate downmixing options.

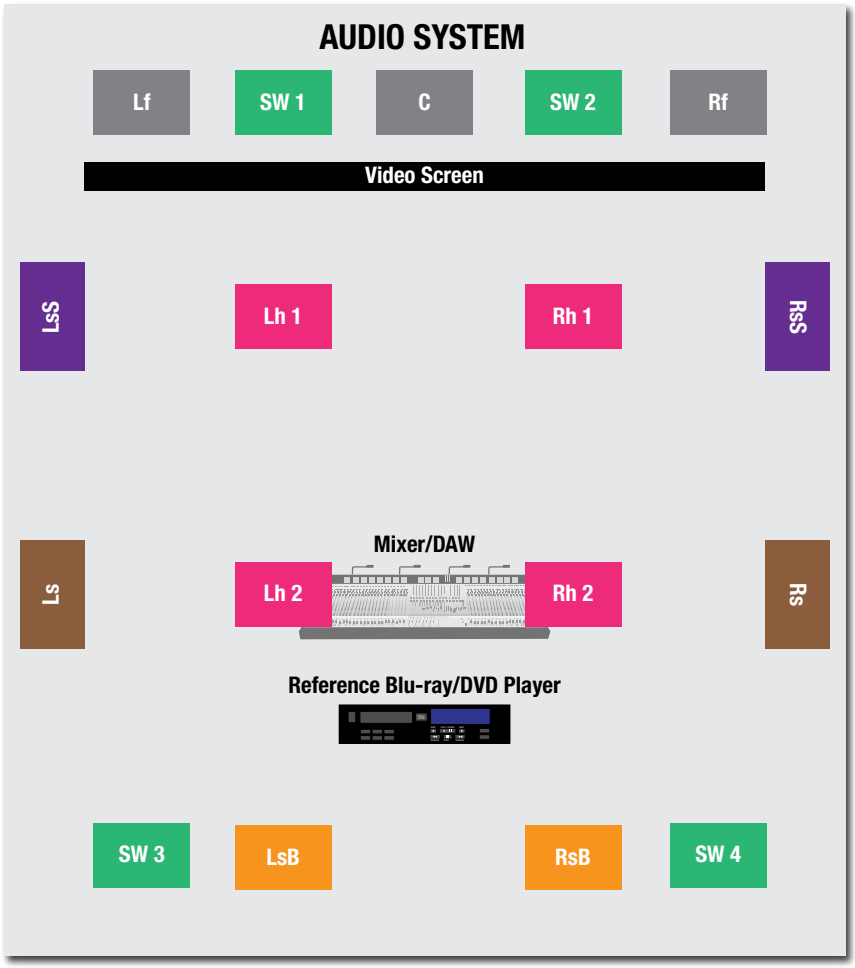



**Control Screen 2**

## Dolby Atmos Application

| From Sources | To Speaker Amps | From Sources | To Speaker Amps | From Sources | To Speaker Amps |
|---|---|---|---|---|---|
| 1. Mix Lf | 1. Lf | 1. Mix LsS | 1. RsS | 1. Blu-ray C | 1. Not Used |
| 2. Mix Rf | 2. Rf | 2. Mix RsS | 2. Lh 1 | 2. Blu-ray LFE | 2. Not Used |
| 3. Mix C | 3. C | 3. Mix Lh 1 | 3. Rh 1 | 3. Blu-ray Ls | 3. Not Used |
| 4. Mix LFE | 4. Ls | 4. Mix Rh 1 | 4. Lh 2 | 4. Blu-ray Rs | 4. Not Used |
| 5. Mix Ls | 5. Rs | 5. Mix Lh 2 | 5. Rh 2 | 5. Not Used | 5. SW 1 |
| 6. Mix Rs | 6. LsB | 6. Mix Rh 2 | 6. Not Used | 6. Not Used | 6. SW 2 |
| 7. Mix LsB | 7. RsB | 7. Blu-ray Lf | 7. Not Used | 7. Not Used | 7. SW 3 |
| 8. Mix RsB | 8. LsS | 8. Blu-ray Rf | 8. Not Used | 8. Not Used | 8. SW 4 |



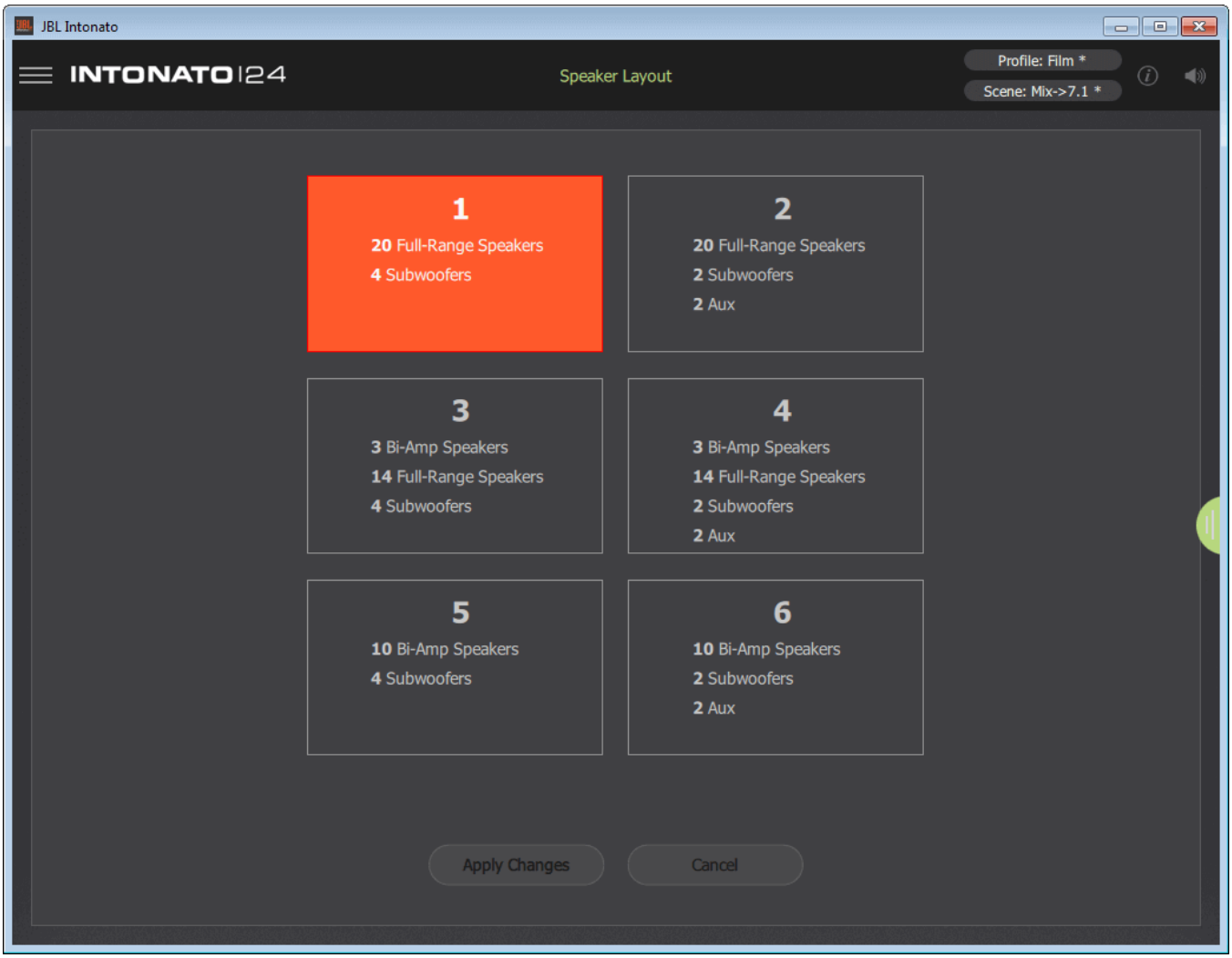




### SPEAKER LEGEND

Lf = Left Front
Rf = Right Front
C = Center
SW = Subwoofer
Ls = Left Surround
Rs = Right Surround
LsB = Left Surround Back
RsB = Right Surround Back
LsS = Left Surround Side
RsS = Right Surround Side
Lh = Left Height
Rh = Right Height

**Dolby Atmos Application Notes – Speaker Layout Configuration:**

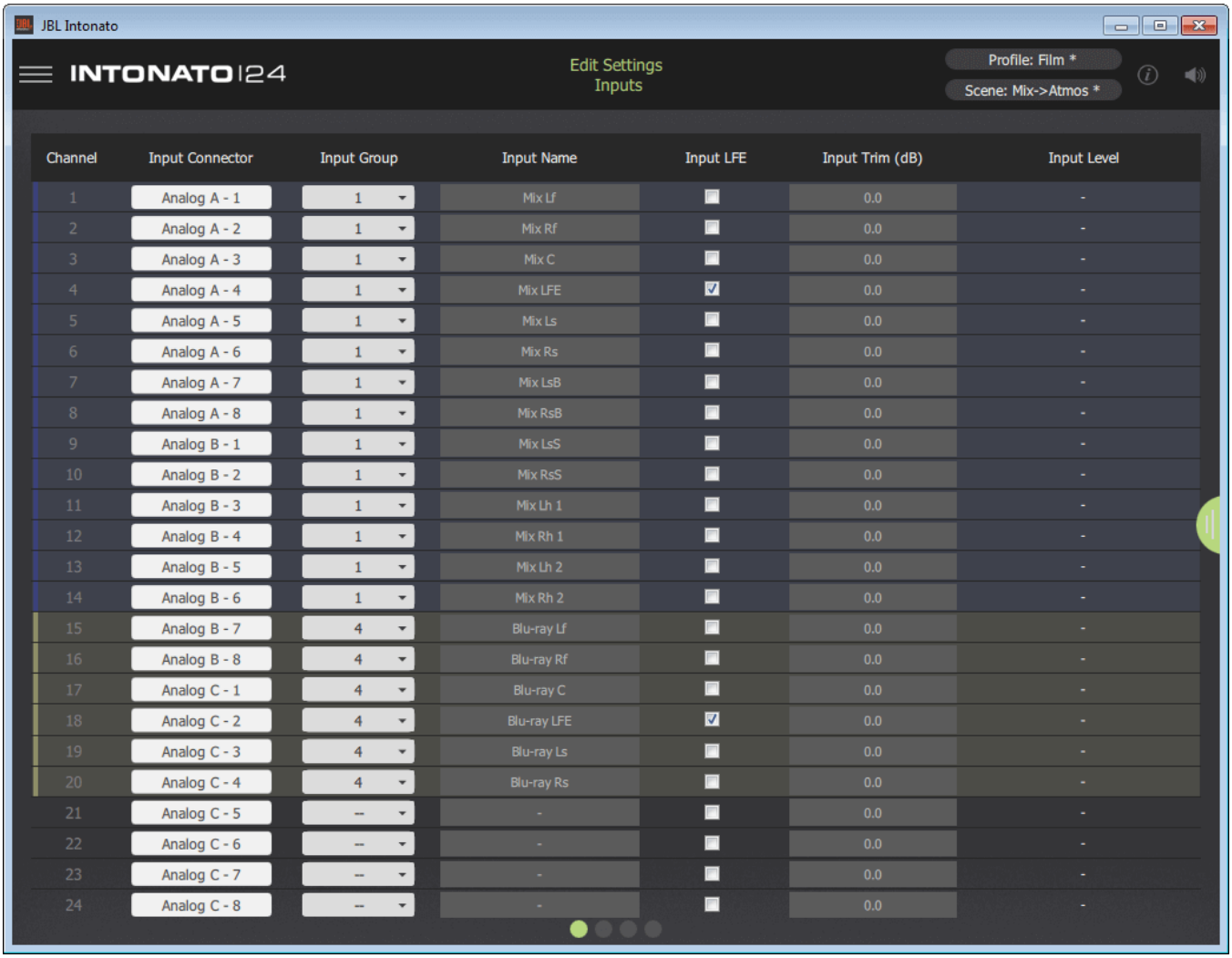
- Speaker layout 1 has been selected for this application. This provides up to 20 full-range outputs and 4 subwoofer outputs.




**Speaker Layout Selection Screen**

## Dolby Atmos Application Notes – Input Configuration:

- The screenshot below shows the Input Configuration screen for this application. From this screen, physical inputs are assigned, input group assignments are made (to color-code input channels), inputs are named, input LFE channels are designated, and input trims are calibrated if required.
- For more information on the fields shown in this screen, see **“Configuring Inputs” on page 17**.

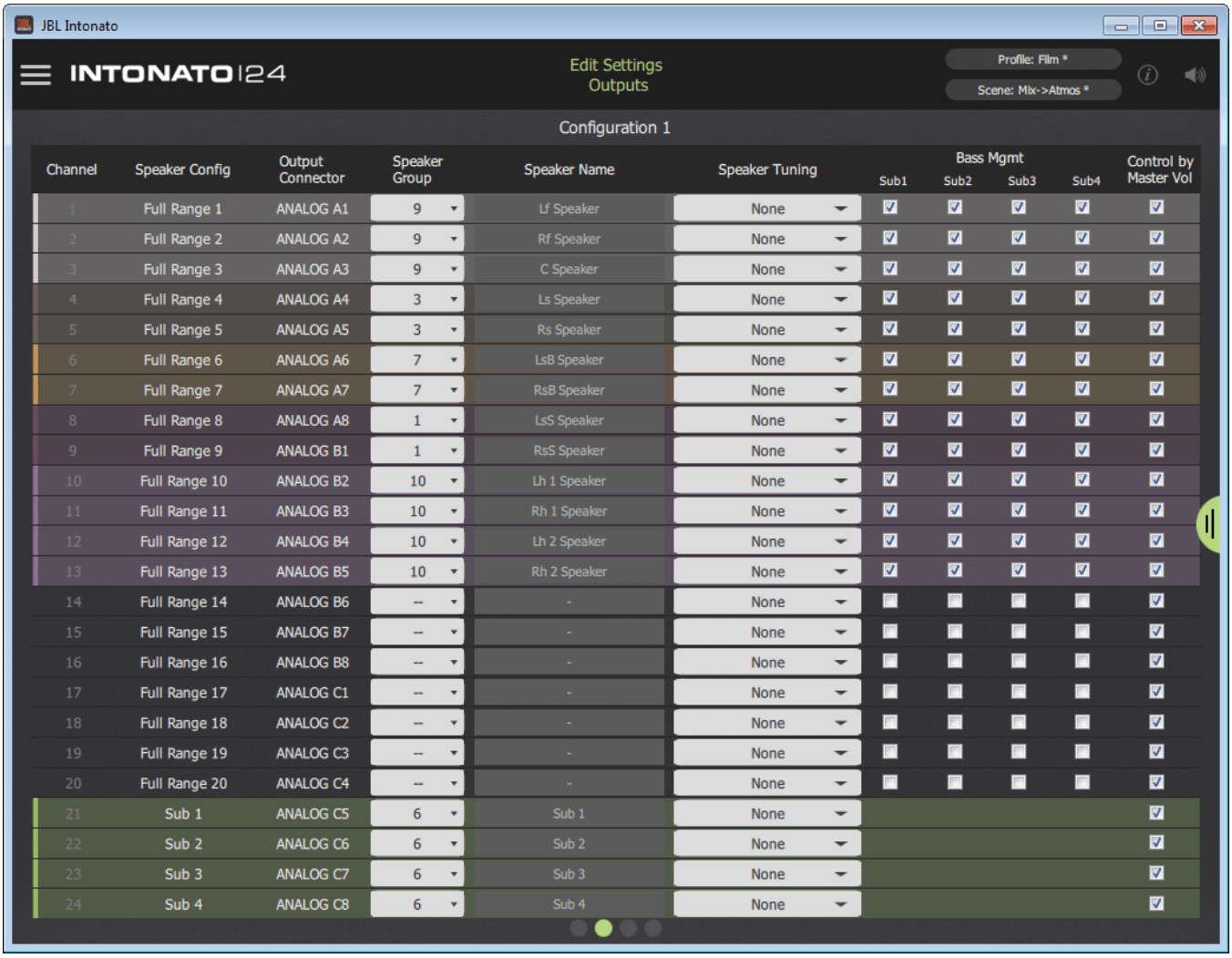



| Channel | Input Connector | Input Group | Input Name | Input LFE | Input Trim (dB) | Input Level |
|---|---|---|---|---|---|---|
| 1 | Analog A - 1 | 1 | Mix Lf | ☐ | 0.0 | - |
| 2 | Analog A - 2 | 1 | Mix Rf | ☐ | 0.0 | - |
| 3 | Analog A - 3 | 1 | Mix C | ☐ | 0.0 | - |
| 4 | Analog A - 4 | 1 | Mix LFE | ☑ | 0.0 | - |
| 5 | Analog A - 5 | 1 | Mix Ls | ☐ | 0.0 | - |
| 6 | Analog A - 6 | 1 | Mix Rs | ☐ | 0.0 | - |
| 7 | Analog A - 7 | 1 | Mix LsB | ☐ | 0.0 | - |
| 8 | Analog A - 8 | 1 | Mix RsB | ☐ | 0.0 | - |
| 9 | Analog B - 1 | 1 | Mix LsS | ☐ | 0.0 | - |
| 10 | Analog B - 2 | 1 | Mix RsS | ☐ | 0.0 | - |
| 11 | Analog B - 3 | 1 | Mix Lh 1 | ☐ | 0.0 | - |
| 12 | Analog B - 4 | 1 | Mix Rh 1 | ☐ | 0.0 | - |
| 13 | Analog B - 5 | 1 | Mix Lh 2 | ☐ | 0.0 | - |
| 14 | Analog B - 6 | 1 | Mix Rh 2 | ☐ | 0.0 | - |
| 15 | Analog B - 7 | 4 | Blu-ray Lf | ☐ | 0.0 | - |
| 16 | Analog B - 8 | 4 | Blu-ray Rf | ☐ | 0.0 | - |
| 17 | Analog C - 1 | 4 | Blu-ray C | ☐ | 0.0 | - |
| 18 | Analog C - 2 | 4 | Blu-ray LFE | ☑ | 0.0 | - |
| 19 | Analog C - 3 | 4 | Blu-ray Ls | ☐ | 0.0 | - |
| 20 | Analog C - 4 | 4 | Blu-ray Rs | ☐ | 0.0 | - |
| 21 | Analog C - 5 | -- | - | ☐ | 0.0 | - |
| 22 | Analog C - 6 | -- | - | ☐ | 0.0 | - |
| 23 | Analog C - 7 | -- | - | ☐ | 0.0 | - |
| 24 | Analog C - 8 | -- | - | ☐ | 0.0 | - |

**Input Configuration Screen**

**Dolby Atmos Application Notes – Output Configuration:**

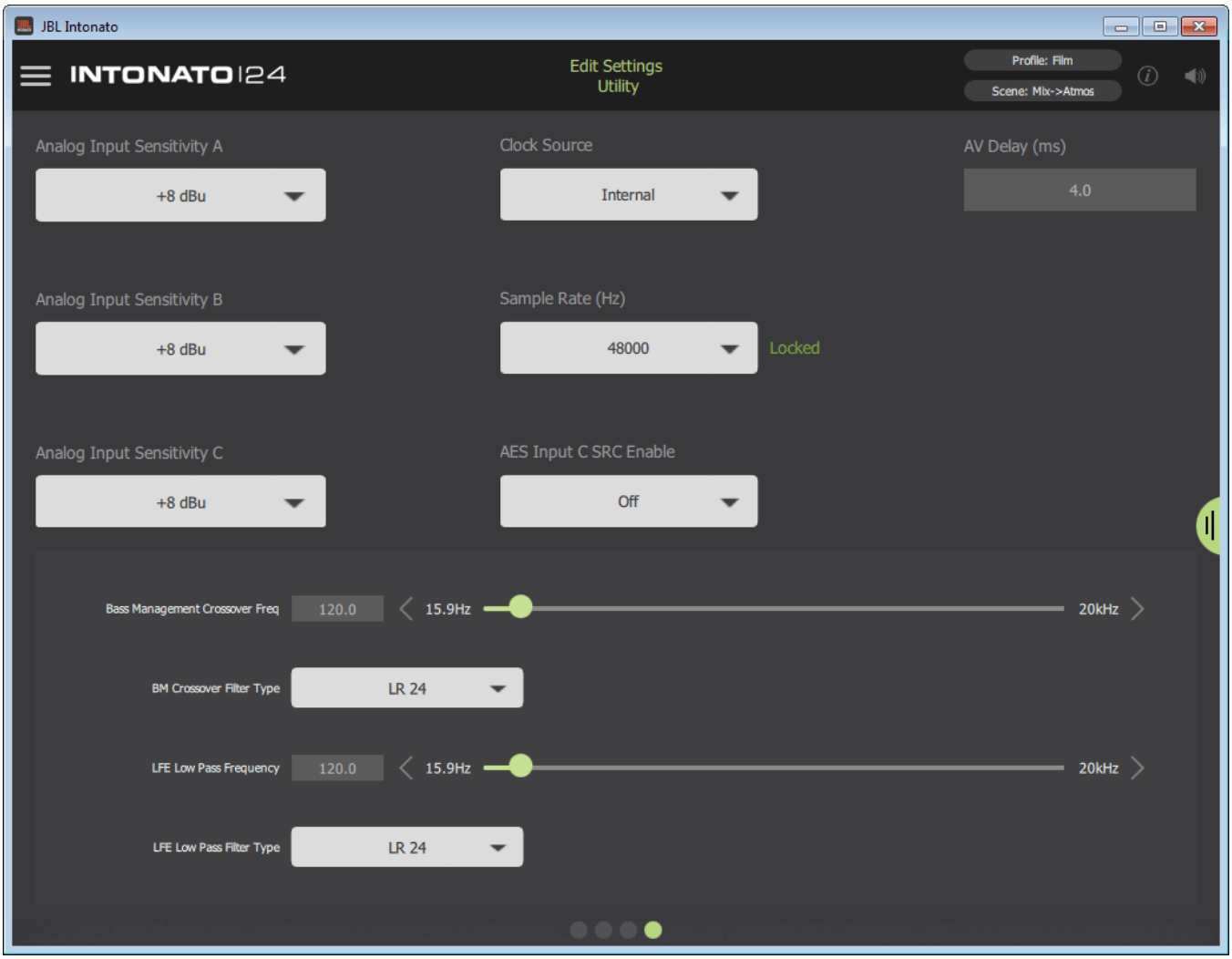
- The screenshot below shows the Output Configuration screen for this application. From this screen, speaker group assignments are made (to color-code the output channels), outputs are named, speaker tunings are selected (if available), outputs are assigned for bass management, and outputs are assigned to be controlled by the master volume, mute, and dim controls.
- For more information on the fields shown in this screen, see **"Configuring Outputs" on page 19**.




**Output Configuration Screen**

**Dolby Atmos Application Notes – Utility Configuration:**

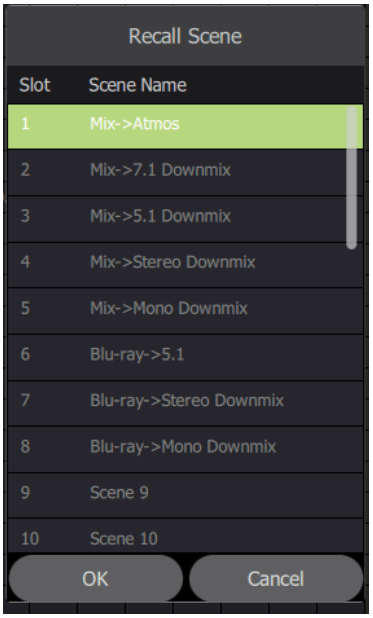
- The screenshot below shows the Utility screen for this application. The bass management crossover frequency and LFE low-pass filter frequency can be fine-tuned from this screen. Delays for the speaker system and talent headphones (to compensate for video display latency and restore “lip synchronization”) and additional settings can also be configured from here.
- For more information on the fields shown in this screen, see **“Configuring Utility Settings” on page 21**.

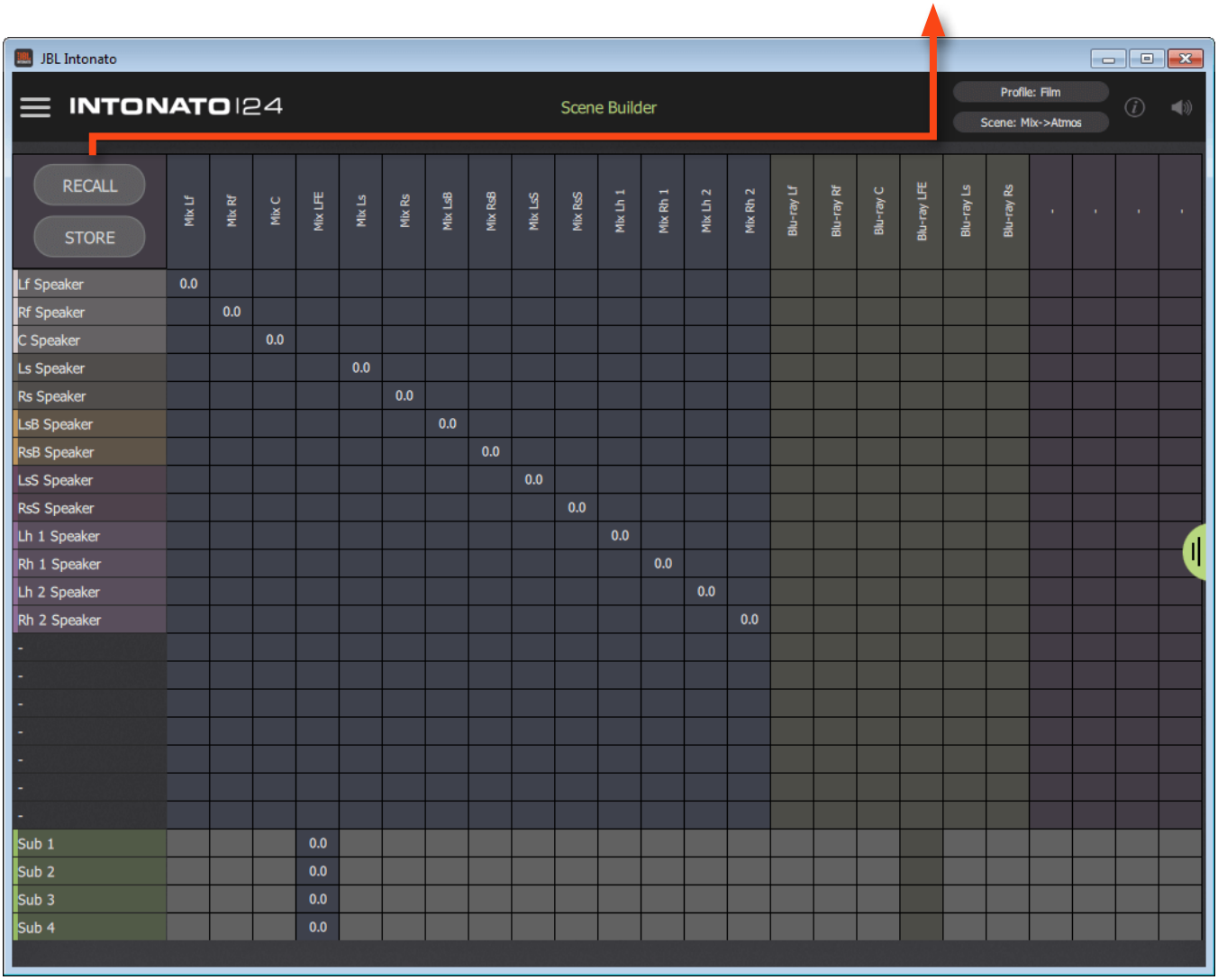



**Utility Screen**

## Dolby Atmos Application Notes – Scene Configuration:

- The screenshot below shows the Scene Builder screen for this application, where scenes are created. In this application, scenes are used to select the Blu-ray/DVD player source for reference.
- Downmixing options are customizable to suit the application. For example, 5.1, 7.1, stereo, and mono fold-down mixes can all be pre-programmed and recalled via scenes.
- For more information on the Scene Builder screen, see **"Creating Scenes" on page 36**.




**Scene Builder Screen**

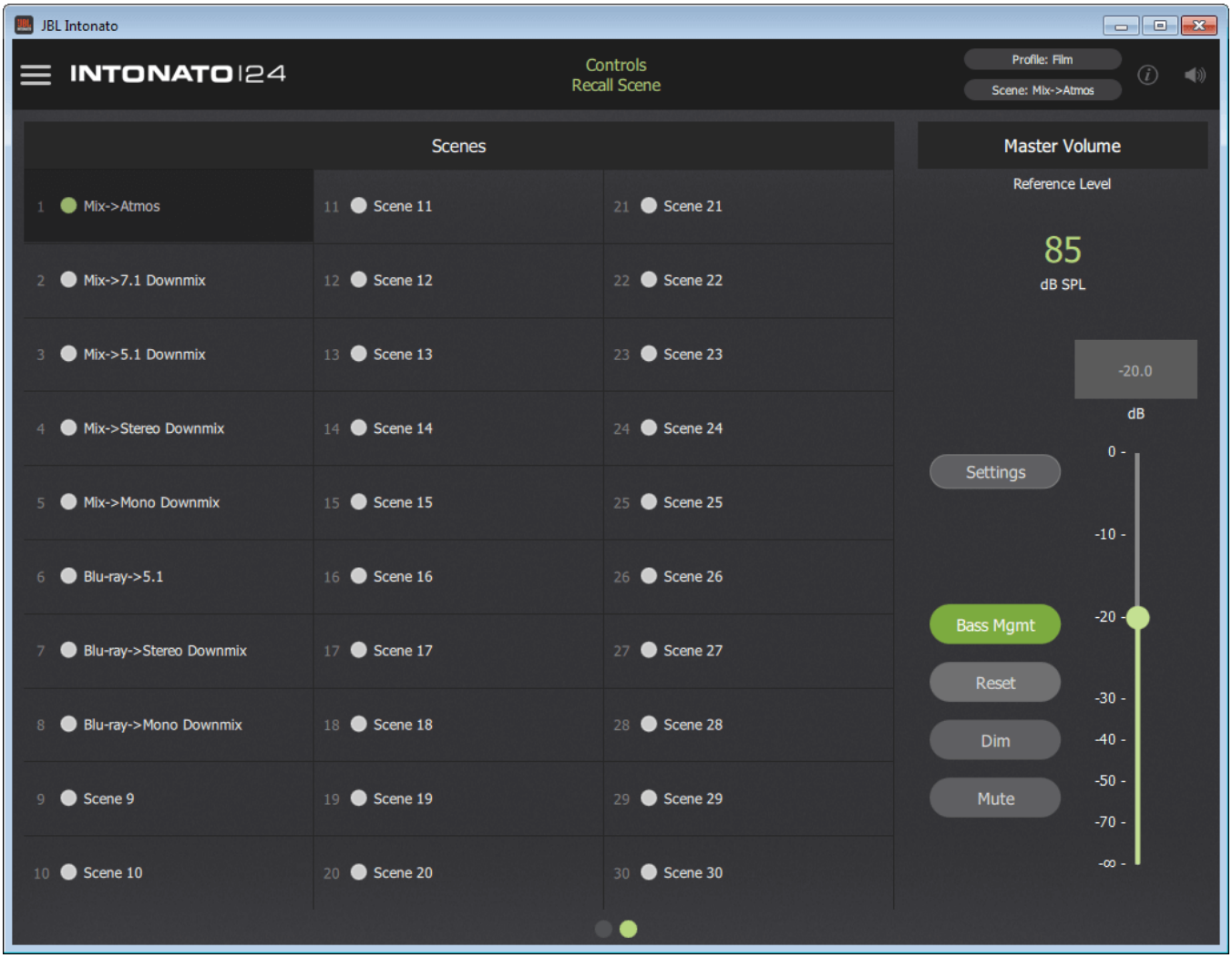
## Dolby Atmos Application Notes – User Master Control:

- The screenshot below shows the first user control screen for this application. From this screen, the engineer can mute and solo individual speakers, turn bass management on or off, and control master volume, mute, and dim.
- The Reference Level readout can be pre-calibrated to display the SPL of the monitor system.
- The inputs and outputs are color-coded as programmed from the Input and Output Configuration screens.
- For more information on this control screen, see **"User Control – Master Controls" on page 40**.


**Control Screen 1**

**Dolby Atmos Application Notes – User Scene Selection:**

- The screenshot below shows the second user control screen for this application. From here, the engineer can recall scenes that select sources or speaker systems for monitoring, or select alternate downmixing options.




**Control Screen 2**

# Configuring the Clock Source

The Intonato 24 can be clocked via the internal crystal oscillator, AES input, Word Clock input, or BLU link bus.

To use BLU link, a 48 or 96 kHz sample rate must be used. In order for BLU link to be used simultaneously with AES Input A and B, the Intonato 24 and AES source device must be synchronized —via word clock or AES—at a 48 or 96 kHz sample rate and within a maximum tolerance of ±50 ppm.

Built-in sample rate conversion (SRC) can be applied to AES Input C. This allows other digital devices, which are not slaved via a house clock, to be connected digitally to the Intonato 24. SRC can also be used when combining BLU link and AES input signals operating at different sample rates. For information on enabling/disabling SRC, see **"AES Input C SRC Enable" on page 22**.

The following table shows the Intonato 24's clock configurations and the available inputs and outputs for each.

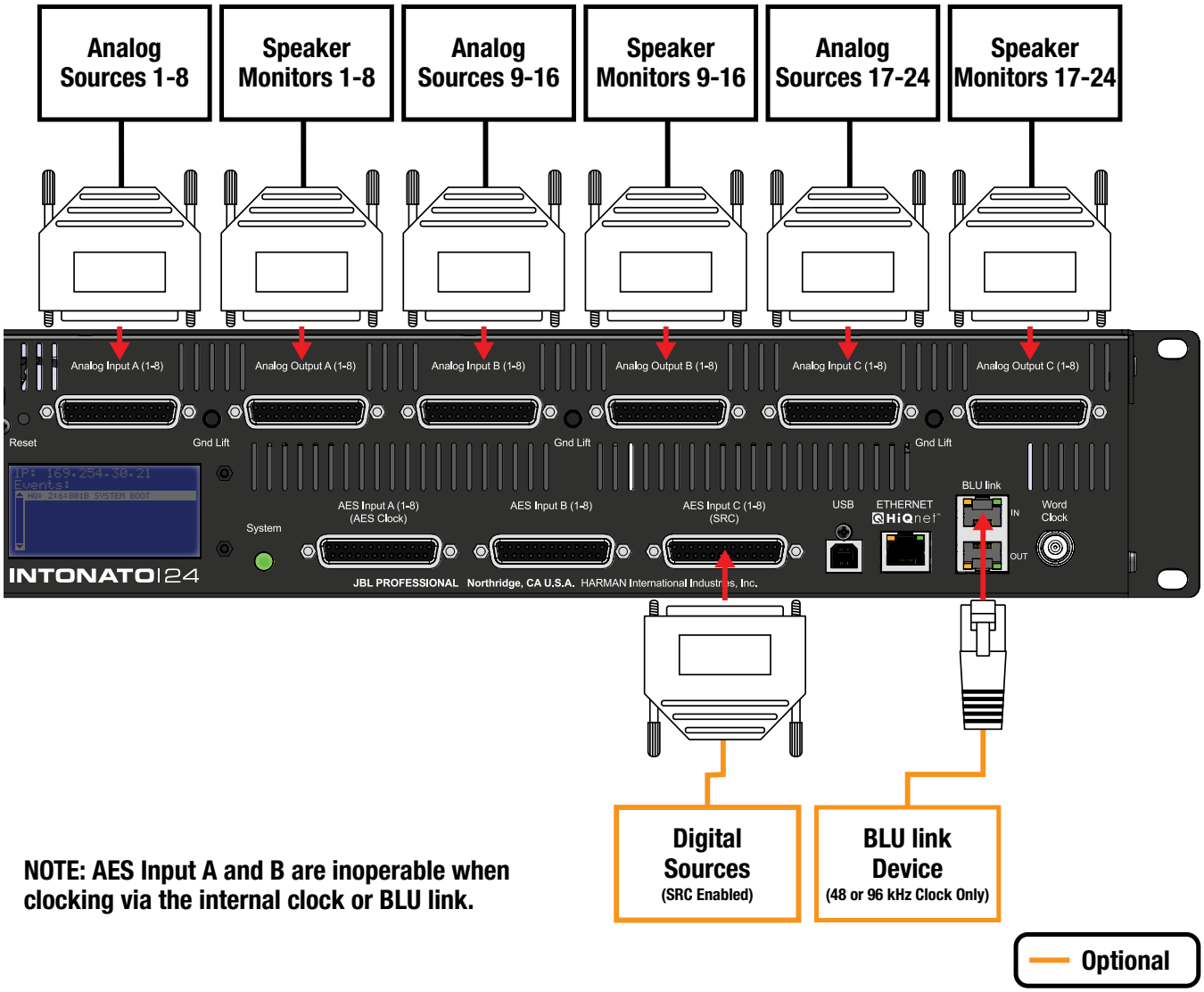
| Intonato 24 Clock Source | Sample Rate | Can BLU link I/O Be Used? | Intonato 24 is BLU link Master | Available Inputs |
|---|---|---|---|---|
| Internal | 44.1 kHz / 88.2 kHz | No | N/A | Analog<br>AES C (SRC On) |
| Internal | 48 kHz / 96 kHz | Yes | Optional<br>(Intonato 24 or another device on the BLU link bus can be master) | Analog<br>AES C (SRC On)<br>BLU link |
| AES<br>(Input A Ch. 1) | 44.1 kHz / 88.2 kHz | No | N/A | Analog<br>AES A, B<br>AES C (SRC Optional) |
| AES<br>(Input A Ch. 1) | 48 kHz / 96 kHz | Yes | Yes<br>(Intonato 24 must be master for the BLU link bus | Analog<br>AES A, B<br>AES C (SRC Optional)<br>BLU link |
| Word Clock | 44.1 kHz / 88.2 kHz<br>(±50 PPM Max) | No | N/A | Analog<br>AES A, B,<br>AES C (SRC Optional) |
| Word Clock | 48 kHz / 96 kHz<br>(±50 PPM Max) | Yes | Yes<br>(Intonato 24 must be master for the BLU link bus) | Analog<br>AES A, B<br>AES C (SRC Optional)<br>BLU link |

**NOTE:** When using BLU link, the Intonato 24 will need to be the BLU link master in most cases. For information on BLU link mastership, see **"BLU link Mastership" on page 81**.

The following sections illustrate the clocking configurations listed above and provide more information on how the Intonato 24 would be configured for each.

## Clocking via the Internal Clock

When using only the analog input connections, the *Internal* clock source setting should be selected. Note that AES Input A and B are not available in this configuration, however, AES Input C can still be used as long as SRC is enabled. BLU link I/O is only available in this configuration if using a 48 or 96 kHz internal sample rate. Up to 24 input channels can be assigned.

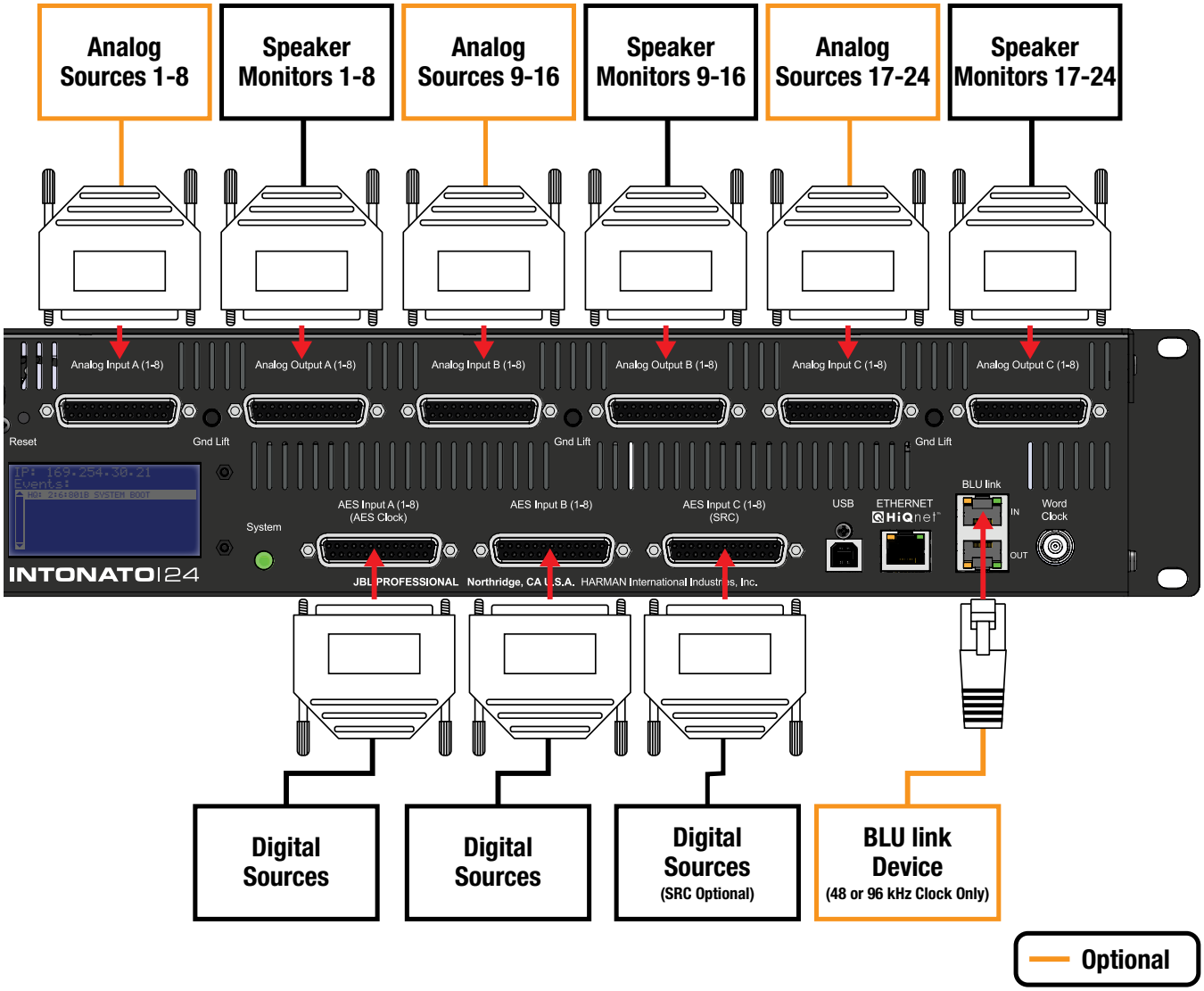



**NOTE: AES Input A and B are inoperable when clocking via the internal clock or BLU link.**

| Intonato 24 Settings | |
|---|---|
| Clock Source: | Internal |
| Sample Rate: | 44.1 kHz / 48 kHz / 88.2 kHz / 96 kHz |
| SRC: | Enable if using AES Input C |

## Clocking via AES

When using the AES Input A and B connections without a house clock, the *AES* clock source setting should be selected—the clock will be derived from the signal connected to AES Input A, channel 1. Note that the analog inputs can still be used in this configuration if required. If using digital devices which operate using a clock that differs from that connected to AES Input A and B, such devices can be connected to AES Input C as long as the SRC feature is enabled. BLU link I/O is only available in this configuration when using an AES clock operating at a 48 or 96 kHz sample rate. Up to 24 input channels can be assigned.



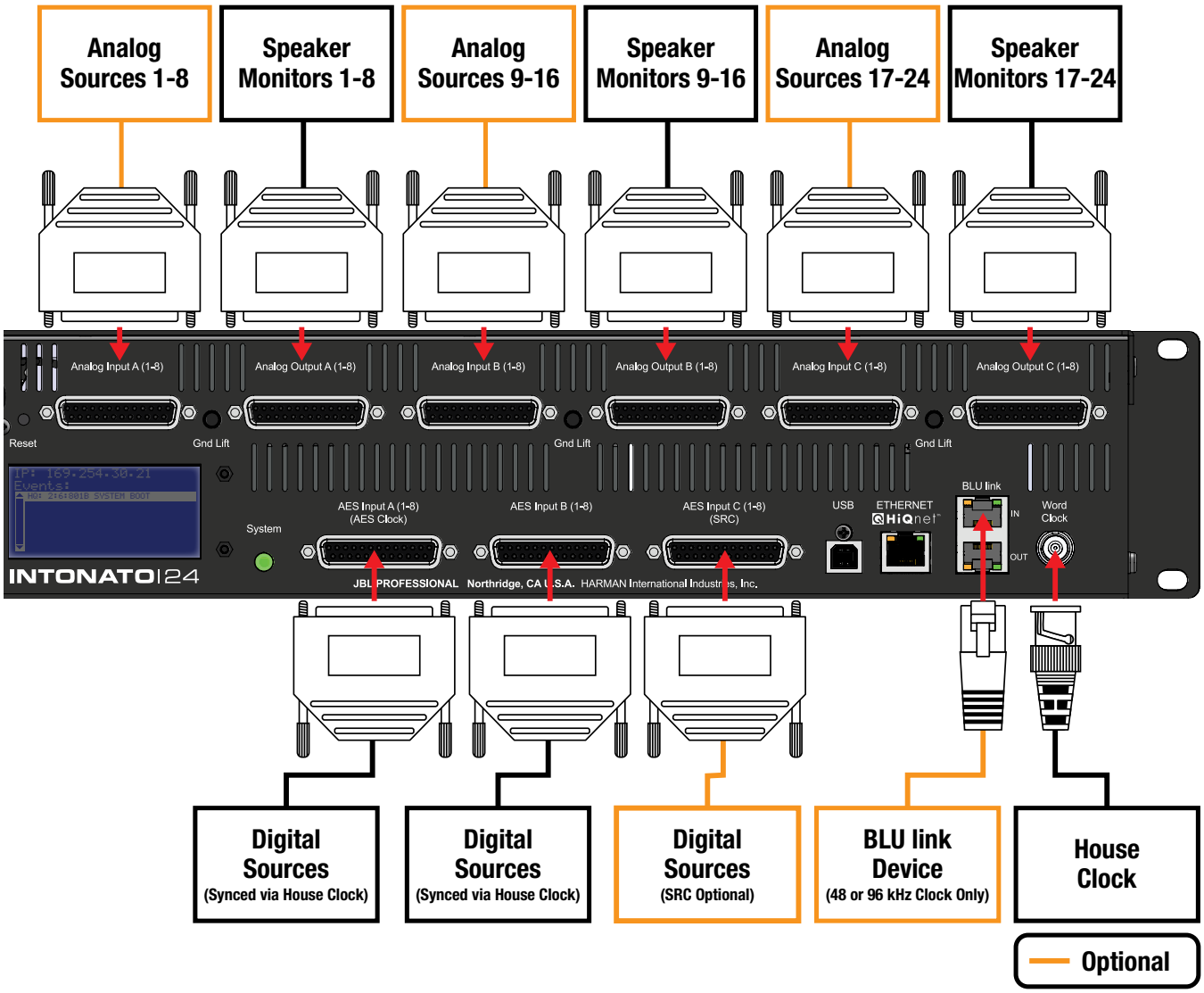

**NOTE:** When using BLU link, the digital sources connected to AES Input A and B must be clocked at a 48 or 96 kHz sample rate.

| Intonato 24 Settings | |
|---|---|
| Clock Source: | AES (Input A, Channel 1) |
| Sample Rate: | N/A, derived from AES signal |
| SRC (Optional): | Enable if using AES Input C with different digital clocks |

**WARNING:** To prevent unwanted noise through the speaker system, always mute the Intonato 24 outputs before changing the sample rate on the AES device that is providing the clock.

## Clocking via Word Clock

When using the AES inputs along with a house clock, *Word Clock* should be selected for the clock source setting. Note that the analog inputs can still be used in this configuration if required. If using digital devices which operate using a clock that differs from that connected to AES Input A and B, such devices can be connected to AES Input C as long as the SRC feature is enabled. BLU link I/O is only available in this configuration when using a house clock operating at a 48 or 96 kHz sample rate. Up to 24 input channels can be assigned.




**NOTE:** When using BLU link, the digital sources connected to AES Input A and B must be clocked at a 48 or 96 kHz sample rate from the house clock.

| Intonato 24 Settings | |
|---|---|
| Clock Source: | Word Clock |
| Sample Rate: | N/A, derived from Word Clock input |
| SRC (Optional): | Enable if using AES Input C with different digital clocks |

**WARNING:** To prevent unwanted noise through the speaker system, always mute the Intonato 24 outputs before changing the sample rate on the master word clock device.

# Using BLU link

BLU link is a proprietary, point-to-point digital audio bus found on many HARMAN products. It carries 256 channels of audio at 48 kHz or 128 channels at 96 kHz, both at 24 bits. The physical connections are made with Cat5e or higher Ethernet cables.

## BLU link Specifications

- Based on Gigabit Ethernet technology
- Up to 100m over Cat5e cable between each point (>100m using fiber converters)
- 256 channels at 48 kHz, 128 channels at 96 kHz
- 24-bit audio resolution
- Bus-like architecture—audio transmitted on a channel is available at all other devices on the bus
- Wired in a loop for redundancy—recovers from a single cable break
- Up to 60 BLU link nodes (devices) can exist in a single BLU link system

## Making BLU link Connections

On the rear panel of BLU link devices there are two BLU link ports: a BLU link input port and a BLU link output port. Devices are connected together by wiring the output port of the first device to the input port of the next, then repeating for each BLU link device on the bus.

**NOTE:** Only connect BLU link ports to other BLU link ports. Connecting BLU link ports to network peripherals, such as an Ethernet switch or router, will not work.

See **"Configuring Inputs" on page 17** for information on assigning BLU link input channels.

See **"Configuring BLU link Outputs" on page 23** for information on assigning BLU link output channels.

## BLU link Mastership

BLU link requires one device to provide the master clock for all other devices on the bus. This is accomplished using priorities. Each connected BLU link device is given a "priority" value between 0 and 255, with 255 being the highest. The BLU link protocol auto-negotiates with all connected devices to determine which device has the highest priority, and the device that wins becomes the master clock for the BLU link bus.

In the Intonato 24, the BLU link priority setting is fixed at 128 when the unit is slaved via the internal crystal oscillator or AES. When slaved via word clock, the priority setting is increased to 254 to ensure the Intonato 24 is the BLU link master and that AES and BLU link can be used simultaneously. This will force the Intonato 24 to provide master clock for the BLU link bus in most cases. If an application requires that another BLU link device on the bus be the BLU link master, simply set its priority setting to 255.

**NOTE:** The BLU link sample rate for all devices on a BLU link bus must be configured to match. See **"Configuring Utility Settings" on page 21** for information on changing the Intonato 24's sample rate setting.

## BLU link Fault Tolerance

When the last BLU link device in a system is connected back to the first, the BLU link bus is capable of a degree of fault tolerance since each device receives the same audio from two other devices. If a single cable connection is broken, the devices that are no longer connected will detect the cable break: one device will detect that its BLU link IN port is disconnected and the other will detect that its OUT port is disconnected. The devices will then re-route the audio so that it can again pass through the bus.

**NOTE:** When a cable connection is broken, the audio will take longer to reach its destination. This added latency is not compensated for in any way, but is a side effect of the way the fault tolerance system functions.

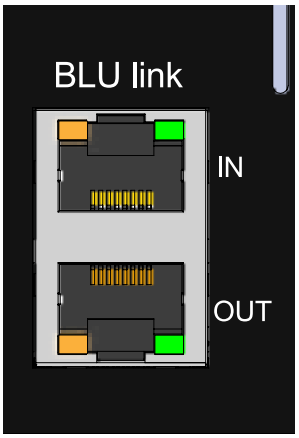
## BLU link Port LED Indicators

Each BLU link port has LEDs that indicate the following:

### Both Yellow LEDs On

This indicates the device is the BLU link master, and it is providing the clock for all other devices on the BLU link bus.

The green LEDs light to indicate the port has established a link with the BLU link bus.




### One Yellow LED On

This indicates the device is slaved to the BLU link clock received from the connected device.

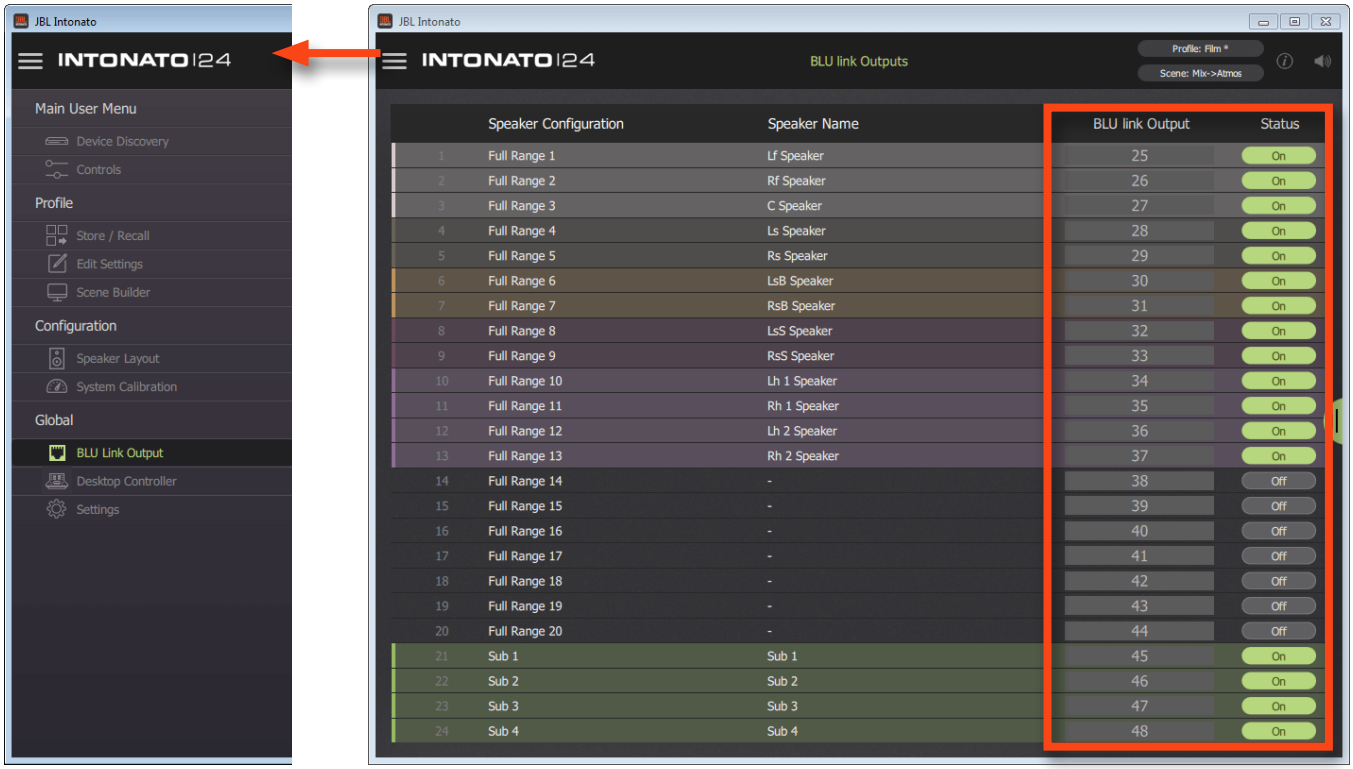
The green LEDs light to indicate the port has established a link with the BLU link bus.

## Configuring Crown DCi Network Series Amplifiers

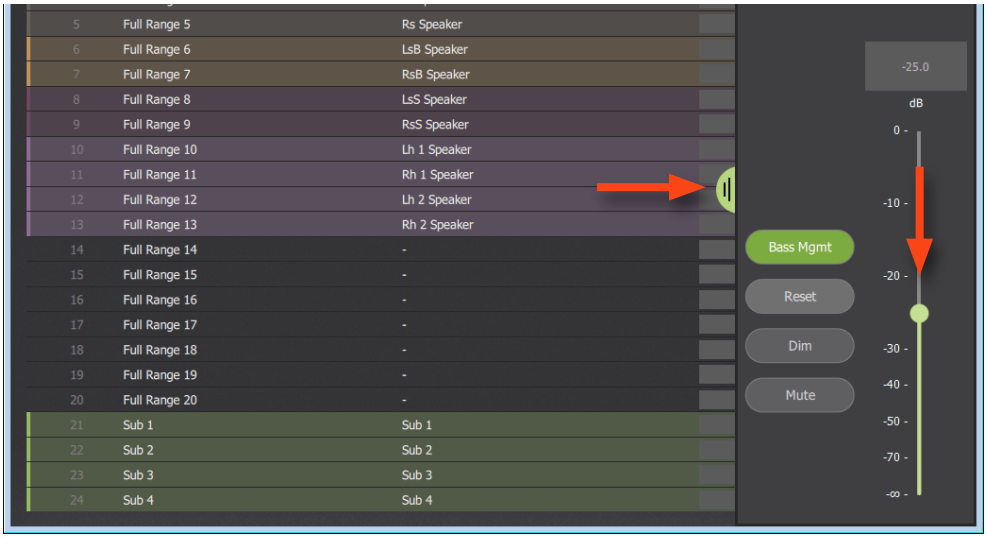
This section of the manual describes how to configure the Intonato 24 and DCi Network Series amplifiers for BLU link operation.

**Follow these steps to use BLU link with the Intonato 24 and DCi Series amplifiers:**

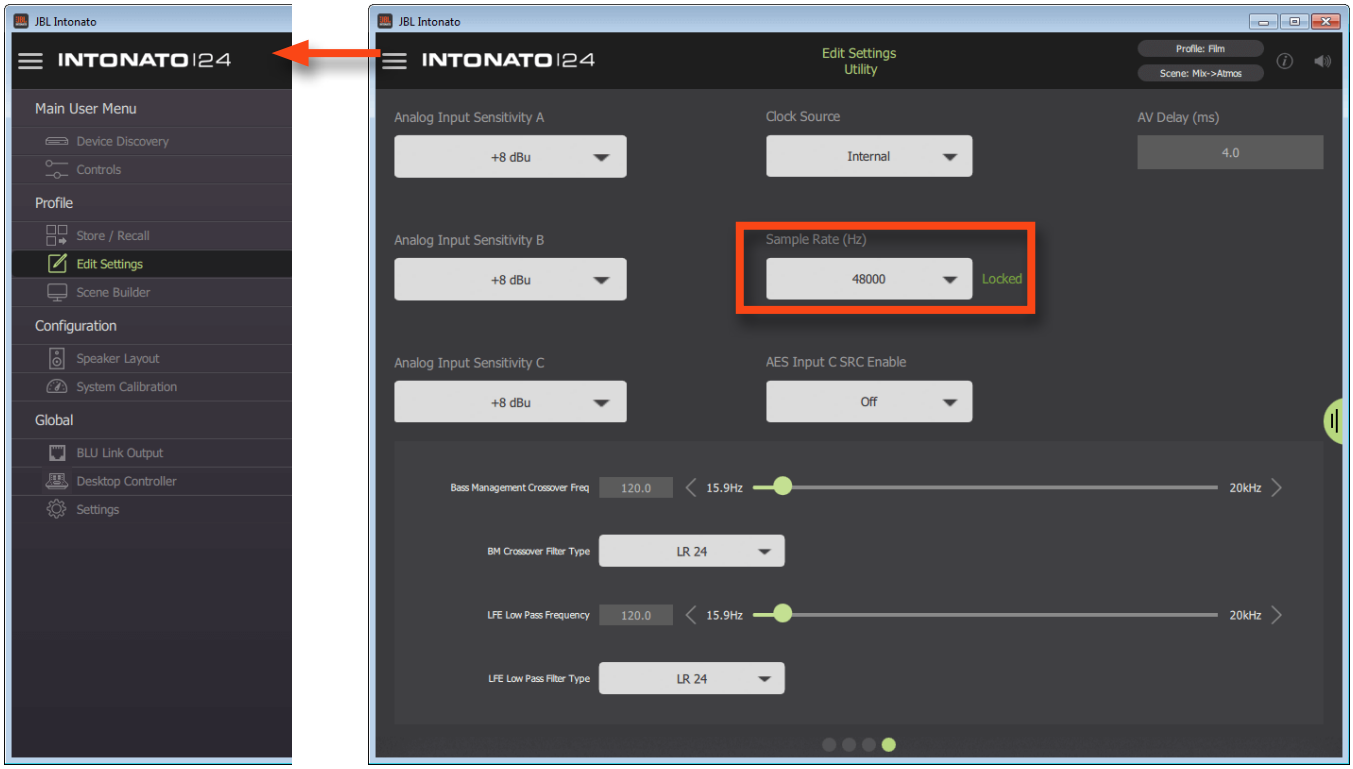
1. Using the Intonato control app, select BLU link Output from the Main User Menu. Now configure and enable the Intonato 24 BLU link outputs. Refer back to this screen for reference when assigning BLU link channels to the DCi amplifier inputs.




2. Select the tab on the right of the screen to view the master controls. Set the Master Volume control to around -20 dB. This will prevent sudden loud signals from playing through the system once BLU link audio is established.



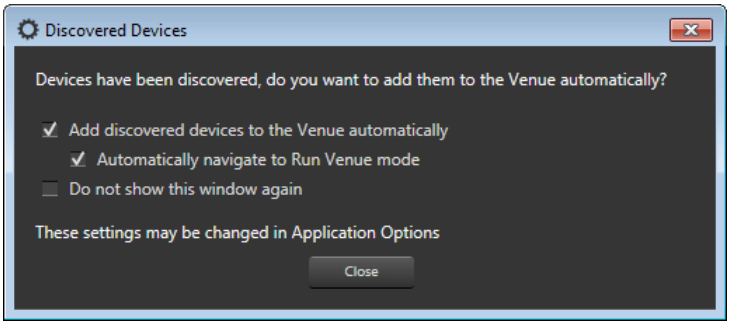
3. Select **Edit Settings** from the Main User Menu and navigate to the fourth screen by swiping or selecting the fourth bubble at the bottom. Verify the sample rate is correctly set for the application. Note that either 48 or 96 kHz must be selected to use BLU link. Take note of this setting so the DCi amplifiers can be set to match in a later step.




4. Download and install HiQnet Audio Architect™.

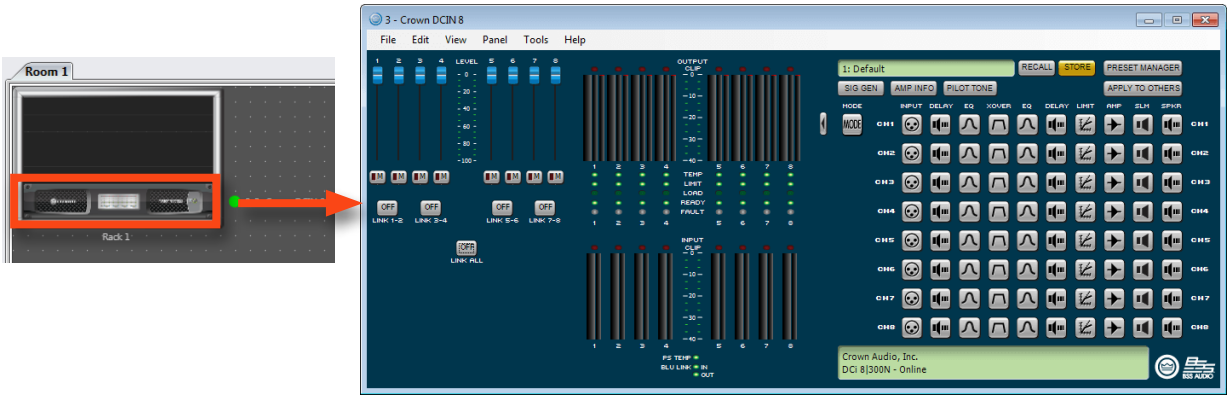
5. Launch Audio Architect.

6. To edit DCi settings in real time, the DCi amplifiers must be discovered on the network and Audio Architect must enter “Run Venue” mode (sometimes referred to as “going online”). The prompt below should appear once Audio Architect initializes. To automatically go online with discovered HiQnet devices, check the **Add discovered devices to the Venue automatically** checkbox and the **Automatically navigate to Run Venue mode** checkbox. Now click the **Close** button.

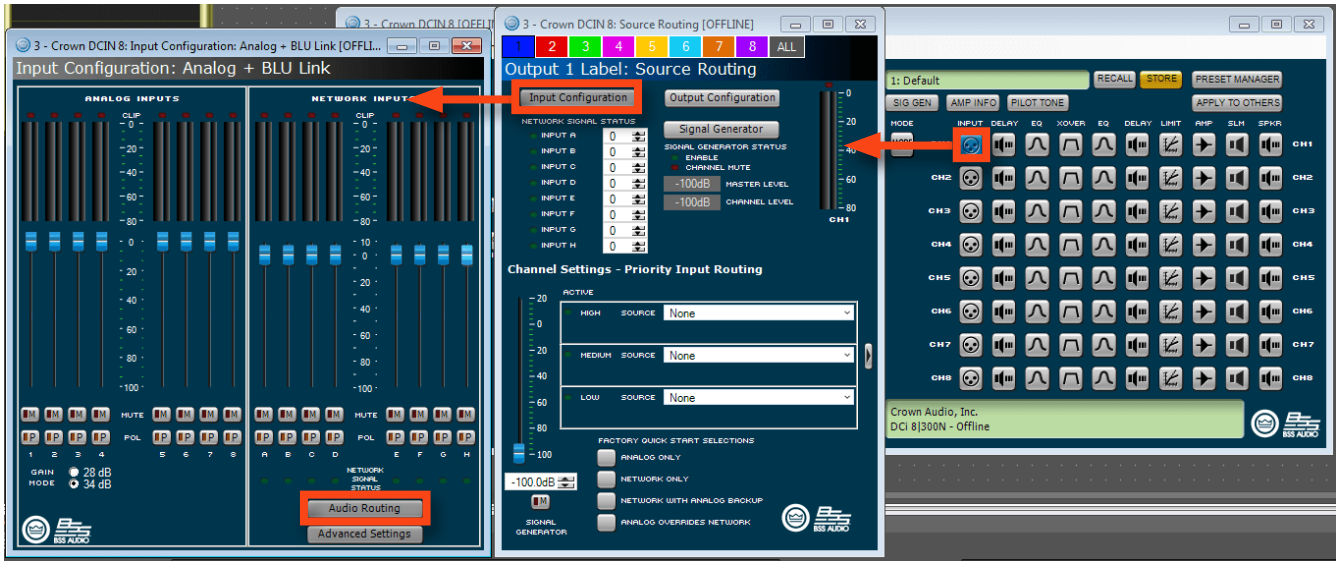



**NOTE:** If the above prompt does not appear, the DCi amplifiers or the Audio Architect application may be incorrectly configured for the network. Ensure Audio Architect’s Application Options are correctly configured for your network interface card (NIC). See the DCi amplifier manual for further information about adding HiQnet devices to the Venue and using Run Venue mode. Further information is also available in Audio Architect’s help file. If you’re having problems connecting to the DCi amp over the network, see **“Networking” on page 89** or refer to the DCi amplifier manual.

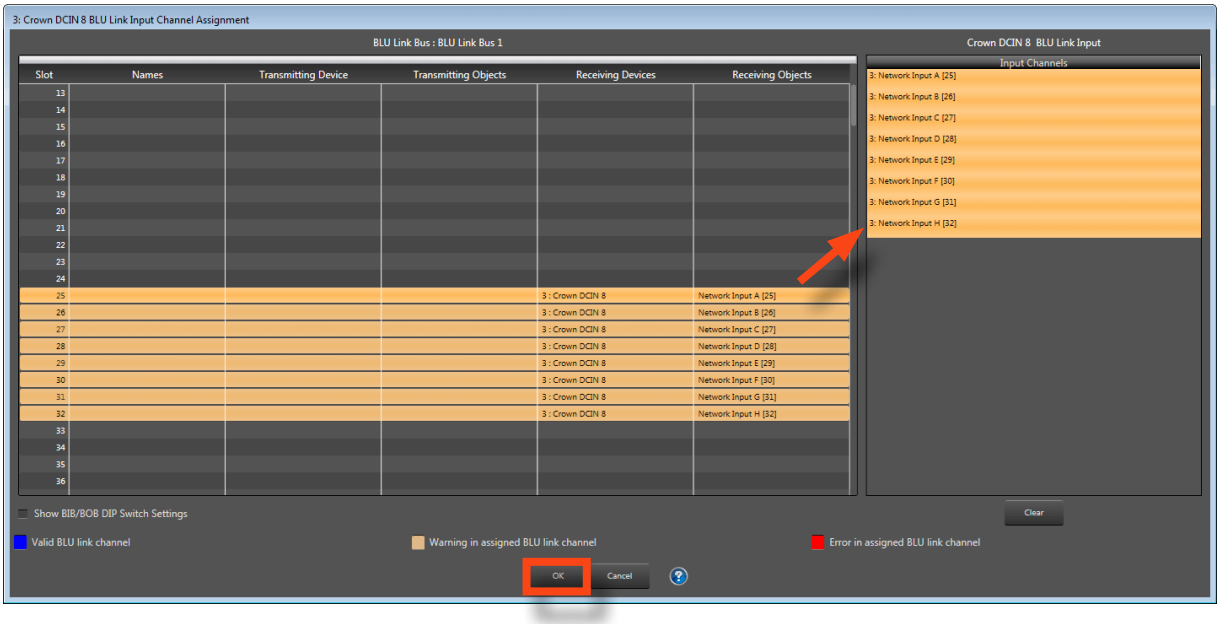
**7.** Double-click the DCi icon in the Room window to open the DCi Control panel.



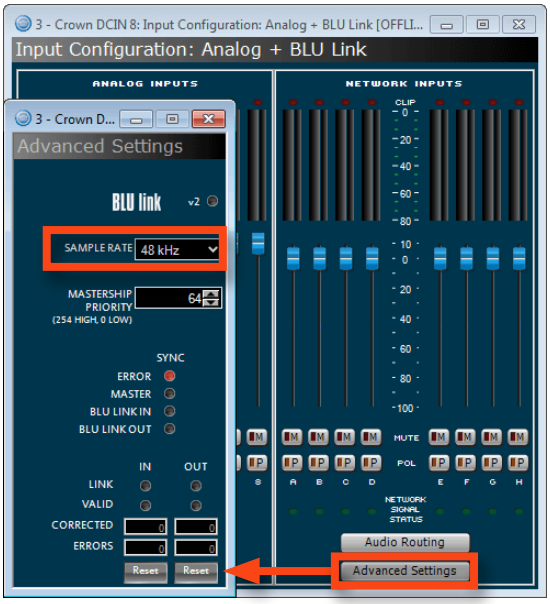

**8.** Open the DCi Input Configuration panel by double-clicking the first **Input** icon, then click the **Input Configuration** button. Now click the **Audio Routing** button.



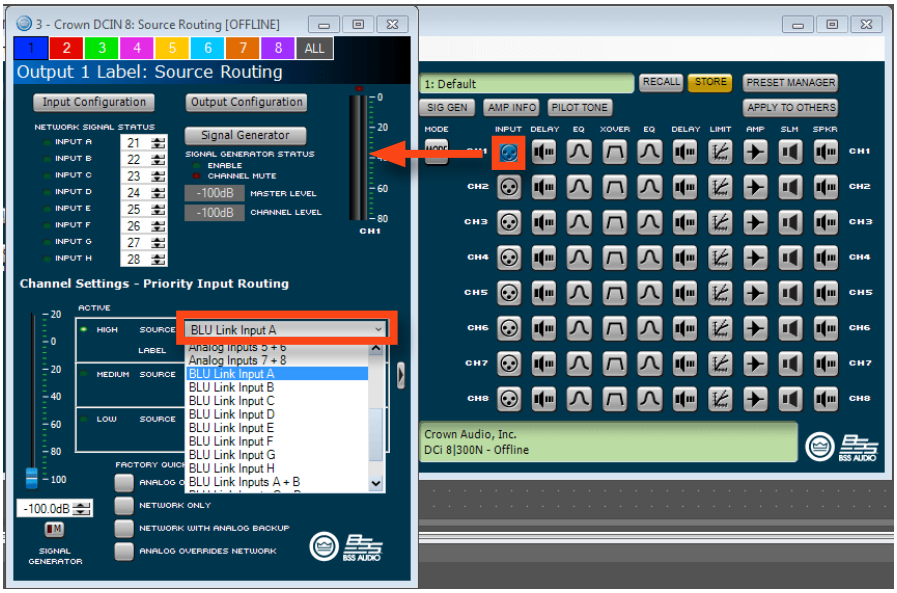

**9.** From the BLU Link Input Channel Assignment window, click and drag the BLU link output channels to be assigned to the DCi BLU link input slots (e.g., Network Input A, Network Input B, etc.). Refer to the assignments made in step 1 for reference. When done, click the **OK** button.



**10.** BLU link audio may now be passing through the DCi amplifier. If it isn't, click the **Advanced Settings** button from the DCi Input Configuration panel. Ensure the BLU link sample rate setting matches the setting noted in step 3. When done, close the Advanced Settings and Input Configuration panels.




**11.** The DCi amplifiers come preconfigured with the respective analog inputs configured as "high-priority" inputs and the BLU link inputs configured as "medium-priority" inputs. Although this may work fine, if the application doesn't actually require prioritized inputs, it's recommended to configure the BLU link inputs as "high-priority" inputs. From the Source Routing panel, select the desired BLU link input slot for the DCi input channel under the **High Source** dropdown menu. Ensure the **Medium Source** and **Low Source** inputs are now defaulted to "None". Repeat for each input channel, accessing each by clicking the respective **Input** icon from the DCi Control panel.




**12.** BLU link audio should be passing through the amplifier as expected. If it isn't, go back through the steps and ensure the device sample rate settings match, BLU link channels are correctly assigned, and that Audio Architect is running in "Run Venue" mode. Adjust system volume using the Intonato 24 Master Volume control.

# Speaker Tunings

When a speaker tuning is selected for a speaker model, the Intonato 24 loads the correct tuning parameters to optimize the speaker for use in the system. The system can then be further optimized for the production environment by using the Intonato 24's easy-to-use auto-calibration feature.

Speaker tunings are comprised of the following parameters:

- **Crossover, Level Trim, and Delay (Bi-amplified Speakers Only)**
  Speaker tunings for bi-amplified speaker models use crossover filters to split the signal between the low-frequency and high-frequency driver components. A level trim is then used to match driver component levels. Lastly, a delay is used on the high-frequency driver to time-align it to the low-frequency driver.

- **EQ**
  Full-range, bi-amp, and sub speaker tunings use a 14-band parametric EQ to flatten the frequency response of the speaker.

- **dbx® OverEasy™ Limiter (with Sidechain)**
  Full-range, bi-amp, and sub speaker tunings use a dbx OverEasy (soft-knee) limiter for speaker protection. A 3-band sidechain EQ is used to tailor the limiter's gain reduction characteristics to fine-tune speaker protection. Note that the limiter threshold must be set manually to engage the limiter for speaker protection. See **"Limiter Threshold" on page 29** for more information.

The Intonato 24 contains factory preset tunings for the following speakers:

- **Other**
  Select this option when a tuning for the speaker model is not listed.

- **LSR705i**
  Full-range tuning for the JBL LSR705i speaker.

- **LSR708i**
  Full-range tuning for the JBL LSR708i speaker.

- **LSR705i Bi Amp**
  Bi-amped tuning for the JBL LSR705i speaker.

- **LSR708i Bi Amp**
  Bi-amped tuning for the JBL LSR708i speaker.

- **M2 Bi Amp**
  Bi-amped tuning for the JBL M2 speaker.

- **M2 VLF Protect**
  Bi-amped tuning for the JBL M2 speaker with high-pass filter for low-frequency driver protection.

- **Other**
  Select this option when a tuning for the subwoofer model is not listed.

- **S2S–EX**
  Tuning for the JBL S2S–EX sub.

- **Sub18**
  Tuning for the JBL Sub18 sub.

- **4645C**
  Tuning for the JBL 4645C sub.

# The Intonato DC Desktop Controller

The optional Intonato DC desktop controller is available for dedicated control of the Intonato 24. Contact your local JBL Professional dealer or visit www.jblpro.com/intonato24 for more information.

# Networking

This section of the manual provides basic information on network settings, network security, and network troubleshooting. It also covers the HiQnet NetSetter application, which is used to assign a static IP address to the Intonato 24 and resolve HiQnet setting conflicts.

## Networking Overview

Below is a brief description of the most common network settings.

- **IP Address**
  An IP address is an identifier for a computer or device on a TCP/IP network. Each device in a network has its own IP address to identify it (e.g., 126.126.17.42). Networks using the TCP/IP protocol route messages based on the IP address of the destination. An IP address is made of four numbers separated by periods. Each number can be 0 (zero) to 255. The last number should not be a 0 (zero) or 255. For example, 126.126.17.1 could be an IP address. 126.126.17.0 would not be a valid IP address.

  A TCP/IP or IP address has two parts: the Network ID and the Host ID. The Network ID identifies the network, and the Host ID identifies either the subnet and device, or just the device if there is no subnet. The subnet mask is a code that indicates which part of the TCP/IP address is the Network ID and which part is the Host ID. In subnet-mask code, 255 identifies the part of the address that is the Network ID. For example, suppose the IP address of a device is 192.168.xx.yy and the subnet mask is 255.255.x.y. That means, “192.168” is the Network ID. The remaining set of numbers (xx.yy) is the Host ID. If the network stands alone (it is not part of a larger network) then the Host ID identifies each device in the network. If the network is part of a venue’s larger network, the network is actually a sub-network or subnet.

- **Subnet**
  A subnet is a small network within a larger network. For example, a TCP/IP network in a single area might be a subnet of a venue’s larger network, which could include computers throughout the building. Or, a network might be divided into multiple subnets. For example, a large installation may have one subnet per rack or room.

- **DHCP (Dynamic Host Configuration Protocol)**
  DHCP is a protocol for automatically assigning IP addresses to devices on a network. With dynamic (DHCP) addressing, a device might have a different IP address every time it connects to the network. DHCP relies on a DHCP server to assign and manage IP addresses. Most network routers come equipped with a built-in DHCP server.

- **Gateway**
  A gateway is used to connect two different networks and allow packets to be passed between them. In a typical home network, the router provides the “gateway” connection between the local area network (LAN) and Internet (WAN) so they can communicate. A gateway can translate between one network system or protocol and another.

## Network Security

Careful planning should be made before placing an Intonato 24 on a network that is accessible by the public—for example, direct access to the device using an unsecured/weakly secured wireless network or a network jack in a public area.

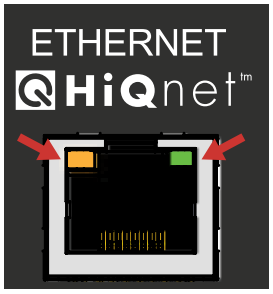
It is highly recommended that the Intonato 24 be placed on a protected, isolated network that does not have any connection to the public. This prevents unauthorized users from reconfiguring or controlling the device. Most routers have built-in functions which help protect the network from unauthorized users, such as MAC address filtering, encryption, and disabling the SSID broadcast. Check the documentation for the network router for information on configuring available security options.

## Network Troubleshooting

The Intonato 24 must be connected to a DHCP-enabled network for initial configuration and control. Connecting the Intonato 24 to the network should be as easy as plugging it into the switch/router and waiting for it to get assigned an IP address. However, some additional configuration will be required if using static IP addressing and/or network security features. If a network connection cannot be established with the Intonato 24, try following these steps to resolve the issue:

1. **Ensure Networked Devices are Powered On**
   Ensure the control device, all network peripherals (switches, routers, bridges, etc.), and the Intonato 24 are powered on and wait a few minutes to allow all devices to boot and get assigned IP addresses. Look at the Intonato 24's back-panel LCD and ensure it has an IP address. If it reads "0.0.0.0", or a network connection still cannot be established, go to the next step.

2. **Check Network Activity LEDs, Cables, and Connections**
   Ensure the yellow and green LEDs are lighting on the Intonato 24's Ethernet port. Also, ensure the port activity/link LEDs are lighting on the router (and switch, if applicable). If using a wired connection from a computer, ensure the Ethernet port LEDs light on the computer's Ethernet port. Note that the yellow LED may only flash occasionally; this is normal.

   If any of these activity/link LEDs are not lighting, try disconnecting then reconnecting the corresponding Ethernet cable. If the LEDs still don't light, try swapping out the connected Ethernet cable for another, known-working cable. Also, make sure the correct type of Ethernet cable is used. If using a crossover cable, it may be causing the problem (depending on the capabilities of the router/switch) and the cable may need to be replaced with a straight-through Ethernet cable.

   If an Ethernet port's LEDs begin lighting after reconnecting or swapping out cables, wait a few minutes, check the Intonato 24's back-panel LCD for an assigned IP address, then try reconnecting with the JBL Intonato control app. If a network connection still cannot be established, go to the next step.

**3. Check IP Addresses and Network Settings**

Ensure the control device's network connection is configured for DHCP, and that it doesn't have a static IP or Auto-IP (169.254.xx.yy) address. Check the IP addresses of the router, control device, and Intonato 24 and ensure they all have the same Network ID. Once all Network IDs are confirmed to match, try reconnecting with the JBL Intonato control app.

If the Intonato 24's IP address reads "0.0.0.0" when an Ethernet cable is connected, and the Intonato 24's Ethernet port LEDs are lighting, this indicates the DHCP server may not be assigning the Intonato 24 an IP address. This could indicate a problem with the DHCP server settings in the router. If the JBL Intonato control app still won't connect, go to the next step.

**4. Check Router/Switch Configuration Settings**

Check the settings in the network router/switch (consult the documentation that came with the network router/switch to see how to enter the utility used to configure it). Ensure the DHCP server is enabled and that the DHCP address range is properly configured. Once the DHCP server has been properly configured and enabled, wait a few minutes to see if the Intonato 24 has been assigned an IP address.

If the DHCP server is properly configured and the Intonato 24 and control device have compatible network settings but still won't communicate, traffic is likely being prohibited by a software or hardware firewall. If connecting using a router/switch that has an enabled hardware firewall, try disabling the firewall and then relaunching the JBL Intonato control app. If this fixes the problem, refer to the router/switch documentation on how to reconfigure the firewall to allow the JBL Intonato control app, or ports 19272 and 3804 (TCP and UDP) and port 21 (FTP), to pass through the firewall. If the control app still won't connect, go to the next step.

**5. Check Software Firewalls**

If connecting using a Mac or Windows computer, check any enabled software firewalls in the computer. Try disabling the firewall and then relaunching the JBL Intonato control app. If this fixes the problem, refer to the firewall manufacturer's documentation on how to reconfigure the firewall to allow the JBL Intonato control app, or ports 19272 and 3804 (TCP and UDP) and port 21 (FTP), to pass through the firewall.

## Using HiQnet® NetSetter™

The Intonato 24 must be connected to a DHCP-enabled network to be assigned an IP address. Once an IP address is assigned, the HiQnet NetSetter application can be used to manually configure Intonato 24 network settings if required for the application.

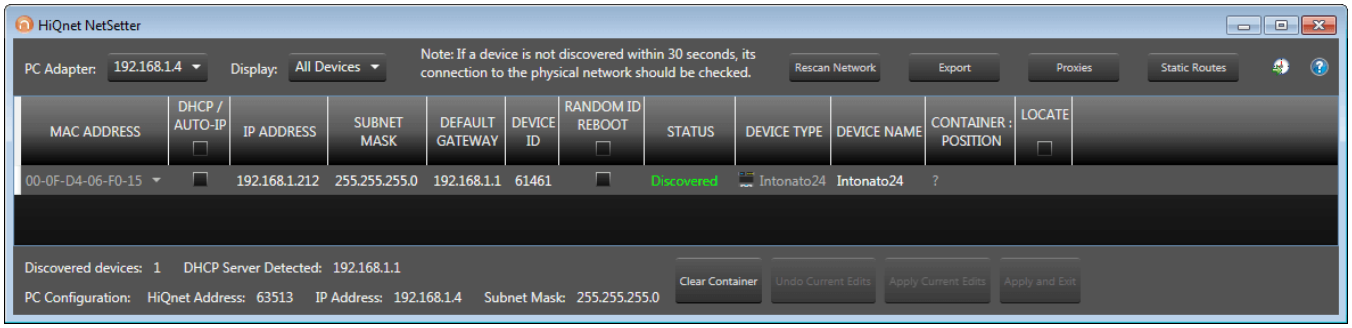
### Configuring the Network Using NetSetter

NetSetter is a Windows-compatible software tool that detects HiQnet devices on a network and allows their network settings to be reconfigured in real time from one central location. Its function is to configure a system of devices to interoperate correctly on the same network and resolve conflicts quickly and easily.

**NOTE:** All HiQnet devices on the network must have a unique device ID (also known as a HiQnet "node address" or "node ID"). If a device ID conflict occurs, edit one of the device ID addresses to resolve the conflict.

The latest version of NetSetter can be downloaded from http://hiqnet.harmanpro.com/software/.

The top of the NetSetter window displays overall operational functions that are available. At the bottom of the NetSetter window is an informational section that lists the number of discovered devices and the IP address of the DHCP server. There is also information regarding the PC HiQnet Address, IP Address, and Subnet Mask.




**Follow these steps to configure the Intonato 24 with a static IP address:**

1. Uncheck the **DHCP/Auto-IP** checkbox.
2. Click in the **IP Address** field and enter the desired IP address.
3. Click in the **Subnet Mask** field and enter the desired subnet mask.
4. Click in the **Default Gateway** field and enter the gateway address.
5. Click the **Apply Current Edits** button to finalize the changes.

**Follow these steps to configure the Intonato 24 back to use DHCP addressing:**

1. Check the **DHCP/Auto-IP** checkbox.
2. Click the **Apply Current Edits** button to finalize the changes.
3. Wait a couple minutes for the DHCP server to assign the Intonato 24 an IP address.

For more information on using NetSetter, click on the help icon in the upper right-hand corner of the NetSetter window.

# Signal Path Block Diagram

## LEGEND

### Top-Level Settings

- **Speaker Layout Selection** (App Menu: Speaker Layout)
- **System Calibration** (App Menu: System Calibration)
- **BLU link Output Router** (App Menu: BLU Link Output)
- **Reference Level User Calibration** (App Menu: Speaker Calibration->Signal Generator)

### Profile Settings

- **Speaker Tuning** (App Menu: Edit Settings->Outputs)
- **AV Delay & Aux AV Delay** (App Menu: Edit Settings->Utility)
- **User EQ** (App Menu: Edit Settings->User EQ)
- ***Aux Tone EQ** (App Menu: Controls->Aux)
- **LFE Low-Pass Filter Frequency** (App Menu: Edit Settings->Utility)
- **Bass Mgmt. Xover Frequency** (App Menu: Edit Settings->Utility)
- **Input LFE Select** (App Menu: Edit Settings->Inputs)
- **Bass Mgmt. Select** (App Menu: Edit Settings->Outputs)
- **Input Router/Names/Groups** (App Menu: Edit Settings->Inputs)
- **Analog Input Sensitivity** (App Menu: Edit Settings->Utility)
- ***Bass Management On/Off** (App Menu: Controls)
- **SRC Enable** (App Menu: Edit Settings->Utility)
- ***Aux Level** (App Menu: Controls->Aux)
- **Input Trim** (App Menu: Edit Settings->Inputs)
- **BLU link Input Router** (App Menu Inputs: Edit Settings->Inputs)
- **Clock Source & Sample Rate** (App Menu Inputs: Edit Settings->Utility)

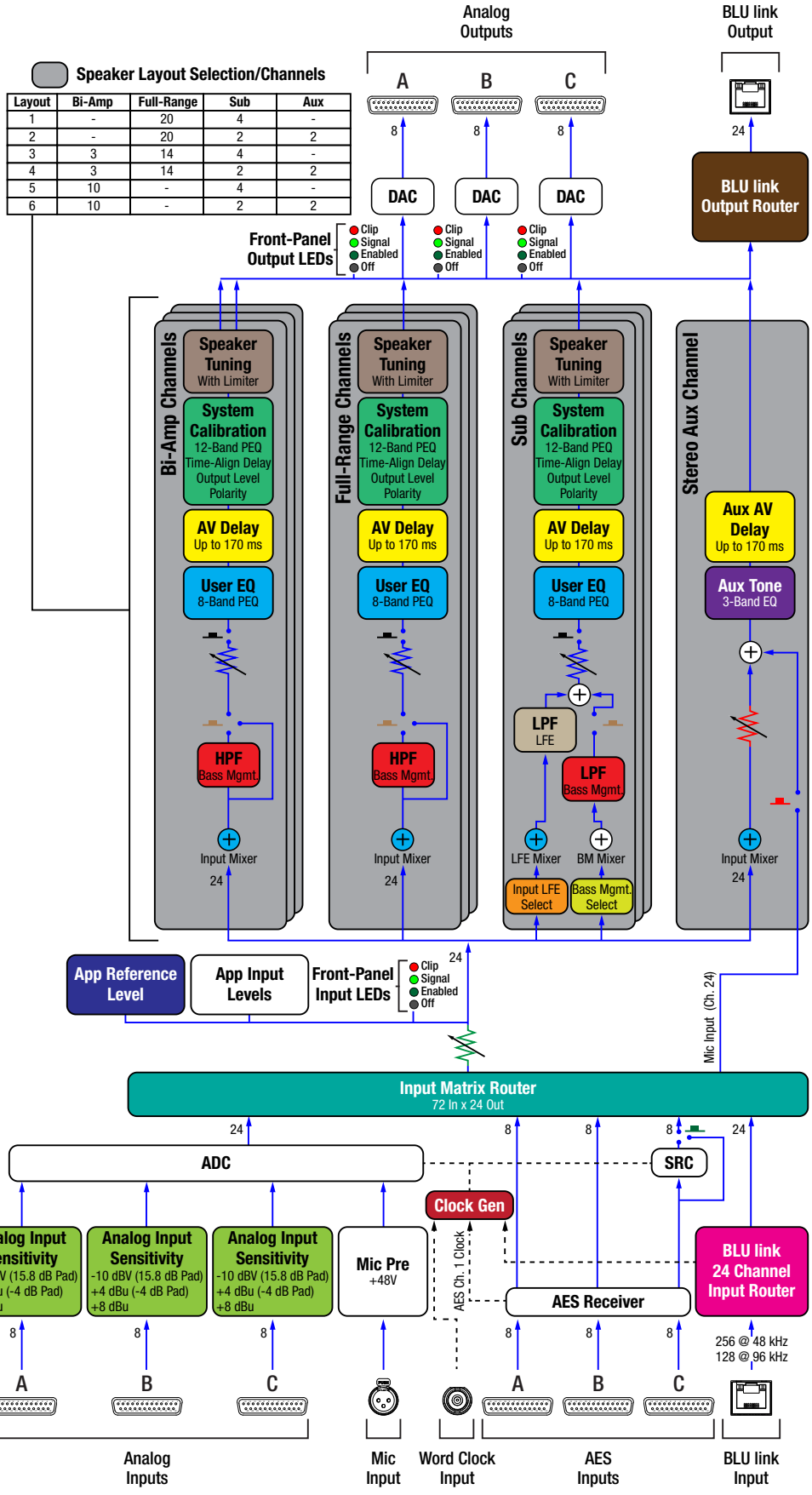
### Scene Settings

- **Input & LFE Mix Levels** (App Menu: Scene Builder)

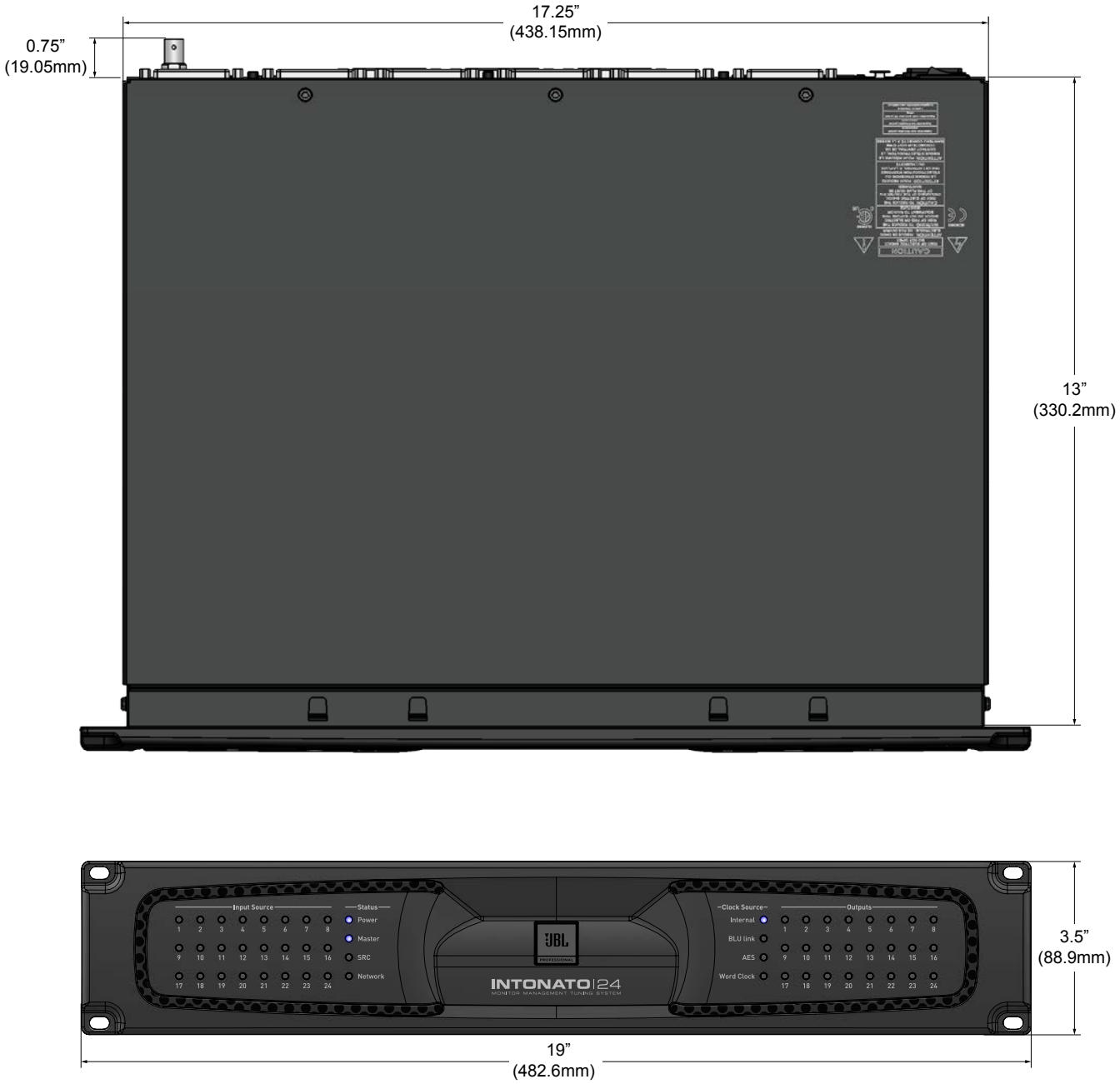
### Persistent Settings

- ***Master Volume/Dim/Mute** (App Menu: Controls)
- ***Speaker Mute/Solo** (App Menu: Controls)
- ***Talkback Enable** (App Menu: Controls)

* = End-user controllable via the app control screens.



# Dimensions


17.25”
(438.15mm)
0.75”
(19.05mm)
13”
(330.2mm)
Input Source
Status
Power
Master
SRC
Network
Clock Source
Internal
BLU link
AES
Word Clock
Outputs
INTONATO|24
MONITOR MANAGEMENT TUNING SYSTEM
3.5”
(88.9mm)
19”
(482.6mm)

# Specifications

### INPUTS

| | |
|---|---|
| Total Simultaneous Inputs: | 24 (selectable among the available 24 analog, 24 AES3, and 24 BLU link input channels) |

### ANALOG INPUTS

| | |
|---|---|
| Connectors: | 3 female 25-pin D-Sub connectors |
| Type: | Electronically balanced, RF filtered |
| Impedance: | > 48 kΩ balanced, > 24 kΩ unbalanced |
| Input Sensitivity: | Selectable in software per D-Sub connector: -10 dBV with 18 dB of headroom, +4 dBu with 20 dB of headroom, +8 dBu with 24 dB of headroom |
| Max Input Level: | +28 dBu, ≤0.008% THD |
| CMRR: | > 47 dB @ 1 kHz |
| Ground Lift: | Switchable per D-Sub connector |

### AES3 DIGITAL INPUTS

| | |
|---|---|
| Connectors: | 3 female 25-pin D-Sub connectors |
| Type: | Electronically balanced, transformer coupled RF filtered |
| Impedance: | 110 Ω |
| Sample Rate Conversion: | Selectable in software for AES Input C only |

### MIC INPUT

| | |
|---|---|
| Connector: | Female XLR |
| Type: | Electronically balanced, RF filtered |
| Impedance: | > 1.5 kΩ, balanced |
| CMRR: | > 70 dB from 20 Hz to 20 kHz |
| Phantom Power: | +48 VDC |
| Gain: | 30 dB fixed |

### WORD CLOCK INPUT

| | |
|---|---|
| Connector: | BNC |
| Supported Sample Rates: | 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz |
| Tolerance: | ±50 ppm max |

### OUTPUTS

| | |
|---|---|
| Total Simultaneous Outputs: | 24 analog outputs (analog outputs can be mirrored to assignable BLU link output channels) |

### ANALOG OUTPUTS

| | |
|---|---|
| Connectors: | 3 female 25-pin D-Sub connectors |
| Type: | Electronically balanced, RF filtered |
| Impedance: | 60 Ω balanced, 30 Ω unbalanced |
| Max Output Level: | +24 dBu, balanced, ≤ .006% THD |

### A/D PERFORMANCE

| | |
|---|---|
| A/D Converter: | 24-bit |
| A/D Dynamic Range: | 114 dB A-weighted |

### D/A PERFORMANCE

| | |
|---|---|
| D/A Converter: | 24-bit |
| D/A Dynamic Range: | 115 dB A-weighted |

**BLU LINK AUDIO**

| | |
|---|---|
| Connectors: | 2 x RJ45 connectors |
| Maximum Nodes: | 60 |
| Maximum Cable Length: | 100m/328ft on Category 5e or higher cable between devices |
| Latency: | 11/Fs [0.23ms@48k, 0.11ms@96k] |
| Pass Through Latency: | 4/Fs [0.08ms@48k, 0.04ms@96k] |

**SIGNAL PROCESSING**

| | |
|---|---|
| User EQ: | 8-band fully parametric EQ w/ selectable filter type for each band |
| Room EQ: | 12-band fully parametric EQ w/ selectable filter type for each band |
| Bi-Amp Crossover: | No speaker tuning selected: No Crossover is applied.<br>With speaker tuning selected: Varies to optimize speaker for tuning selection |
| LFE Low-Pass Filter: | Variable, 16 Hz – 20 kHz |
| Bass Management Crossover: | Variable, 16 Hz – 20 kHz |
| Speaker Output Delay: | Up to 170 ms (applied per output channel for speaker time-of-arrival offset) |
| Lip Synchronization Delay: | Up to 170 ms (globally applied to all output channels except aux outputs) |
| Aux Out Lip Synchronization Delay: | Up to 170 ms (applied to aux output channels only) |
| Master Volume Control: | -120 dB to 0 dB |
| Dim Control: | -120 dB to 0 dB |

**SYSTEM PERFORMANCE**

| | |
|---|---|
| Internal Processing Wordlength: | 32-bit floating point |
| Supported Sample Rates: | 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz (32-192 kHz using sample rate conversion) |
| Dynamic Range: | 114 dB A-weighted<br>112 dB unweighted 20Hz – 22kHz |
| THD+Noise: | 0.007% typical at +4 dBu, 1 kHz, 0 dB input gain |
| Frequency Response: | 20 Hz – 20 kHz, +0 /- 0.5 dB |
| Interchannel Crosstalk: | < -70 dB |
| Latency: | Analog input to analog output: 2.57 ms (48 kHz), 2.28 ms (96 kHz)<br>AES input to analog output: 2.31 ms (48 kHz), 2.15 ms (96 kHz)<br>BLU link input to analog output: 0.08ms (48 kHz), 0.04ms (96 kHz)<br>BLU link input to BLU link output: 0.08ms (48 kHz), 0.04ms (96 kHz) |
| Operating Temperature Range: | 0º to 40º C (32º to 104º F) |

**POWER SUPPLY**

| | |
|---|---|
| Type: | Universal switch-mode |
| Operating Voltage: | 100-240 VAC, 50/60 Hz |
| Power Consumption: | 85 Watts |

**PHYSICAL**

| | |
|---|---|
| Rack Height: | 2U |
| Unit Weight: | 14.30 lbs (6.49 kg) |
| Shipping Weight: | 19.04 lbs. (8.64 kg) |
| Dimensions: | 3.5” (H) x 13.75” (D) x 19.0” (W)<br>88.9mm (H) 349.25mm (D) x 482.6mm (W) |

**RECOMMENDED AUDIO BREAKOUT CABLES**

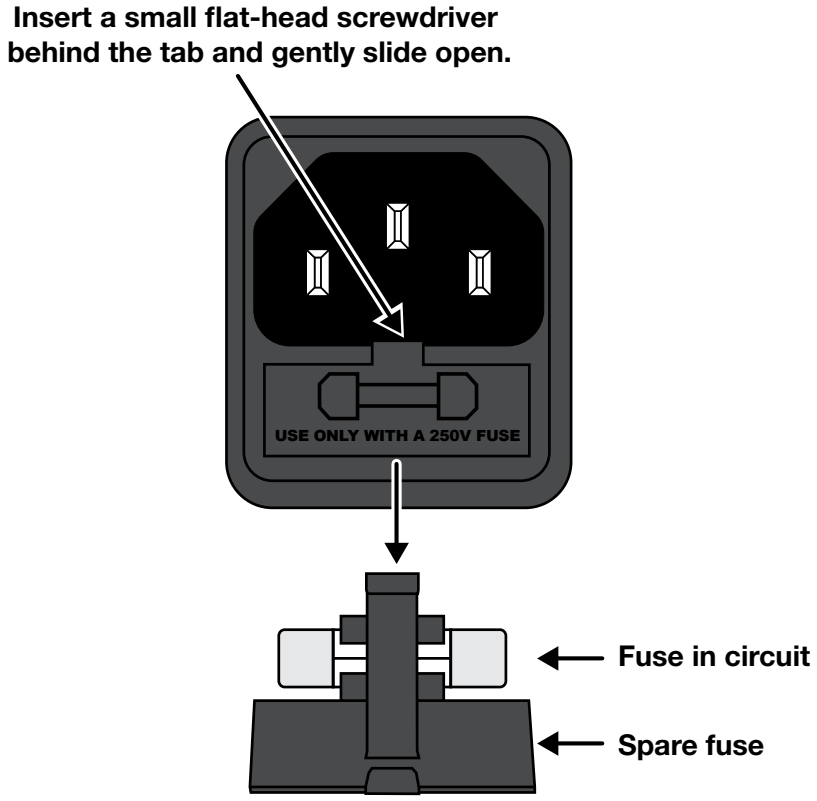
| | |
|---|---|
| DB25 Analog Input | Hosa Technology®: DTF-803 |
| DB25 Analog Output | Hosa Technology®: DTM-803 |
| DB25 AES Input | Digidesign®: DigiSnake Cable (note that only AES input connections are used)<br>(DB25 – XLR MtF AES/EBU snake, DB25 to 4 XLRM (output) and 4 XLRF (input), Model # MH097; P/N DB-XMtF-4-ROHS) |

Specifications subject to change without notice.

# Appendix

## Replacing the Fuse

The power fuse is located in a drawer in the IEC power inlet on the back panel of the Intonato 24. From the factory, there will be two fuses in this drawer. The fuse located in the rear drawer position is the one currently being used in the circuit. The fuse located in the front drawer position is the provided spare fuse.

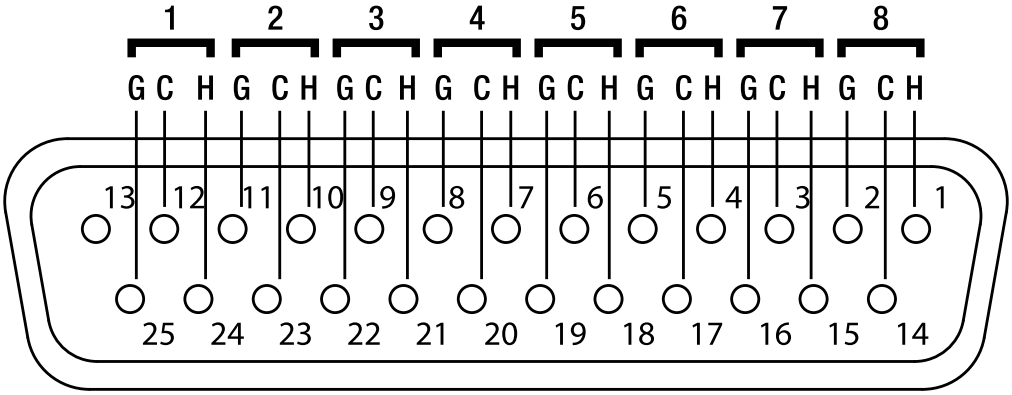



**WARNING:** Replace with same type fuse only (T2.5A, L 250V).

## D-Sub Connector Pinouts

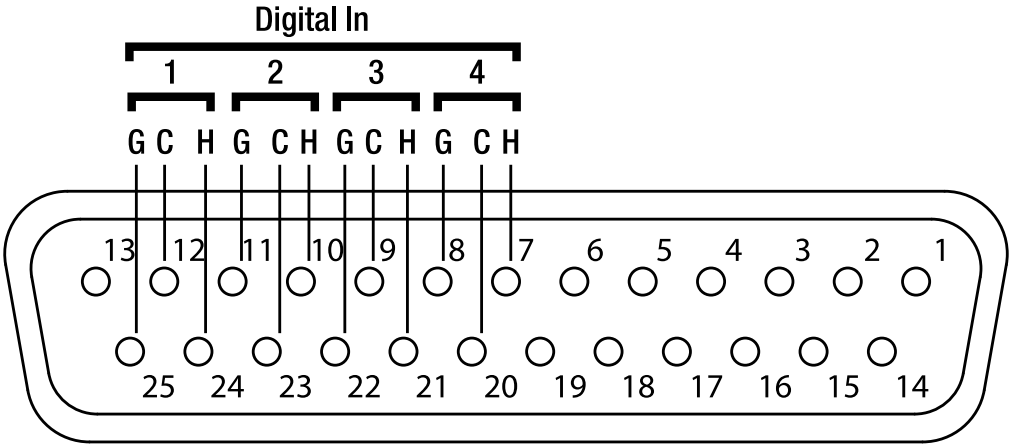
The following diagrams show the pinouts for the D-Sub connectors. The analog and AES connectors use the industry-standard TASCAM DB25 pinout.

### Analog In/Out DB25 Pinout (Female)




1-8 = Balanced Connections (channels)
H = Hot
C = Cold
G = Ground

### AES In DB25 Pinout (Female)




1-4 = Balanced Connections (each connection contains 2 channels of digital audio)
H = Hot
C = Cold
G = Ground

**NOTE:** See **"Specifications" on page 95** for information on recommended DB25 breakout cables.

## Attribution Notices

Dolby and Atmos are registered trademarks of Dolby Laboratories.

DTS:X is a trademark of DTS, Inc.

Blu-ray is a trademark of Blu-ray Disc Association.

Barco is a registered trademark of Barco, Inc.

TASCAM is a trademark of TEAC CORPORATION, registered in the U.S. and other countries.

Windows is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.

Mac and iOS are trademarks of Apple Inc., registered in the U.S. and other countries.

Android is a trademark of Google Inc.

Digidesign is a trademark or registered trademark of Avid Technology, Inc. or its subsidiaries in the United States and/or other countries.

Hosa Technology is a registered trademark of Hosa Technology, Inc.

Crown Audio, HiQnet, and NetSetter are trademarks or registered trademarks of HARMAN.

# Warranty and Service

The JBL Limited Warranty on professional loudspeaker products (except for enclosures) remains in effect for five years from the date of the first consumer purchase. JBL amplifiers are warranted for three years from the date of original purchase. Enclosures and all other JBL products are warranted for two years from the date of original purchase.

## Who is Protected by this Warranty?

Your JBL Warranty protects the original owner and all subsequent owners so long as: A.) Your JBL product has been purchased in the Continental United States, Hawaii or Alaska. (This Warranty does not apply to JBL products purchased elsewhere except for purchases by military outlets. Other purchasers should contact the local JBL distributor for warranty information.); and B.) The original dated bill of sale is presented whenever warranty service is required.

## What Does the JBL Warranty Cover?

Except as specified below, your JBL Warranty covers all defects in material and workmanship. The following are not covered: Damage caused by accident, misuse, abuse, product modification or neglect; damage occurring during shipment; damage resulting from failure to follow instructions contained in your Instruction Manual; damage resulting from the performance of repairs by someone not authorized by JBL; claims based upon any misrepresentations by the seller; any JBL product on which the serial number has been defaced, modified or removed.

## Who Pays for What?

JBL will pay all labor and material expenses for all repairs covered by this warranty. Please be sure to save the original shipping cartons because a charge will be made if replacement cartons are requested. Payment of shipping charges is discussed in the next section of this warranty.

## How to Obtain Warranty Service

If your JBL product ever needs service, write or telephone us at JBL Incorporated (Attn: Customer Service Department), 8500 Balboa Boulevard, PO. Box 2200, Northridge, California 91329 (818-893-8411). We may direct you to an authorized JBL Service Agency or ask you to send your unit to the factory for repair. Either way, you'll need to present the original bill of sale to establish the date of purchase. Please do not ship your JBL product to the factory without prior authorization. If transportation of your JBL product presents any unusual difficulties, please advise us and we may make special arrangements with you. Otherwise, you are responsible for transporting your product for repair or arranging for its transportation and for payment of any initial shipping charges. However, we will pay the return shipping charges if repairs are covered by the warranty.

## Limitation of Implied Warranties

ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE LENGTH OF THIS WARRANTY.

## Exclusion of Certain Damages

JBL'S LIABILITY IS LIMITED TO THE REPAIR OR REPLACEMENT, AT OUR OPTION, OF ANY DEFECTIVE PRODUCT AND SHALL NOT INCLUDE INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS AND/OR DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY, FROM STATE TO STATE.

# Contact Information

## Mailing Address:

JBL Professional
8500 Balboa Blvd.
Northridge, CA 91329

## Customer Service:

Monday through Friday
8:00am – 5:00pm
Pacific Coast Time in the U.S.A.
(800) 397-1881
www.jblproservice.com

## Product Registration:

Register your product online at www.jblpro.com/registration

## On the World Wide Web:

www.jblpro.com

## Professional Contacts, Outside the USA:

Contact the JBL Professional Distributor in your area. A complete list of JBL Professional international distributors is provided at our U.S.A. website: www.jblpro.com

## En Dehors des Etats-Unis:

Contacter votre Distributeur JBL Professional. Une liste complète de nos distributeurs internationaux est disponible sur le site web: www.jblpro.com

## International:

Wenden Sie sich an Ihre örtliche JBL Professional Vertretung. Eine vollständige Liste der internationalen JBL-Vertretungen finden Sie auf unserer Website unter www.jblpro.com

## Fuera de los Estados Unidos:

Comuníquese con el distribuidor de JBL Professional de su zona. En nuestro sitio web, www.jblpro.com, encontrará una lista completa de los distribuidores de JBL International.

# INTONATO|24

## Operation Manual

5081991-A

Issued: 04/2017

8500 Balboa Boulevard Northridge, CA 91329 USA

www.jblpro.com

JBL® PROFESSIONAL by HARMAN