



32ch Multi-Channel Power Amplifier

PA-1853

Remote Control for PA-1853

RB-1853

Instruction Manual

Ver. 200

ASTRODESIGN, Inc.


Safety Precautions (Please keep in mind)


Remember to always follow the safety precautions. Failure to do so can result in fires, electric shock, serious injury or death, and damage to property.

Warning Indications and Meaning of Symbols

This manual uses the following warning indications and symbols. Before reading this manual, make sure that you understand the meaning of these indications.

Warning Indications

 **Warning** Failure to heed this warning can result in fire, electric shock, serious injury, or death.

 **Caution** Failure to heed this caution can lead to injury due to electric shock or other accidents, and damage to the unit and other property in the vicinity.

Symbols

• Caution symbols



Fire



Electric shock



High temperatures



Finger injury hazard

• Symbols for forbidden actions



Forbidden



Do not disassemble


• Symbols for required actions





Required actions




About Handling the Unit

 **Forbidden** Do not throw or subject to strong impacts. Doing so can result in cracks, overheating, and fire.
Do not use where there is a risk of fire or explosion. Doing so may cause a fire.
Do not allow liquid or foreign objects inside the unit. Doing so may cause a fire, electric shock, or accident.
If liquid or foreign objects should get inside, immediately turn the power off and contact your dealer or an ASTRODESIGN, Inc. sales representative.

 **Do not disassemble** Do not disassemble, repair, or modify. It can cause fires or electric shock.

 **Required actions** If thunder is heard during outdoor use, immediately turn the power off, unplug the power cord from the power outlet, and move the unit to a safe place. Failure to do so may cause a fire and electric shock due to lightning.

About Handling the Power Cord

 **Forbidden** Do not damage the power cord. Damage to the power cord may result in fire, electric shock, and malfunction.
• Do not modify the power cord.
• Do not forcibly bend the power cord, bundle or tie it, or place heavy objects on it.
• Keep the power cord away from heaters and do not allow it to become hot.

Caution

About Handling the Unit



Forbidden

Do not install in an unsteady location. The unit may fall, resulting in an injury or malfunction.

Do not place an object on the unit. Doing so may cause a malfunction.

Do not place any objects near the unit. Do not block the fan section. Doing so may result in a malfunction.

Do not use in the following environments.

Doing so may cause a malfunction.

- Location where the ambient temperature is outside the range of 0 to 40°C *1
- Location where the ambient humidity is outside the range of 30 to 80% RH *2
- Location near an air conditioning unit where there may be sudden temperature changes or condensation
- Location subject to direct sunlight
- Location with corrosive gases or very dusty location
- Location where strong magnetic fields are generated
- Location where the unit may be splashed with water, oil, chemicals, etc.
- Location where vibration is transferred through the floor
- Unstable location

*1: If the surface temperature of the LCD panel exceeds 60°C, there is a risk of damaging the backlight and other components.

*2: "Prolonged exposure to direct ultraviolet rays may lead to browning of the deflection plate and a decrease in contrast, potentially compromising display quality.

Do not power on again immediately after disconnecting the power

it can be the cause of malfunction.

About Power Supply



Required actions

Use the power cable provided with this device.

Please use the power cable provided with this device for the AC power supply.

To facilitate power interruption, please install this equipment near an electrical outlet.

About Power Supply



Required actions

Be sure to connect to an outlet with a protective grounding terminal.

- Lack of grounding can lead to electric shock and malfunctions.
- If an outlet with a protective grounding terminal is not available, be sure to ground using the FG terminal.

Use a dedicated power supply.

Please use a dedicated power supply for this device. Do not use the same power source as devices such as photocopiers that consume a lot of power and may generate noise. This can be a cause of malfunction.

About LCD Panel

※ Due to the nature of LCDs, pixel defects (bright or dark dots) may occur, but this is not considered a malfunction.



Forbidden

Do not touch any liquid (liquid crystals) that may leak from the LCD panel.

- If the LCD panel is inadvertently damaged, liquid (liquid crystals) may leak from the panel. Keep the liquid away from your mouth and skin and do not inhale the vapors.
- If any liquid should contact your mouth or eyes, wash away immediately with water. Furthermore, if any liquid should adhere to your skin or clothing, wipe it off with alcohol or the like and then wash away with soap. Your skin or clothing may be damaged if liquid crystals are left adhered.



Finger injury hazard

Be careful of glass shards from a broken LCD panel.

If the LCD panel is inadvertently damaged, take care not to cut your hands on glass shards.



Required actions

Care in handling of the LCD panel.

- Do not wipe with benzene or thinner.
- Do not apply water (or salt water).
- Do not leave exposed to ultraviolet rays for long periods.
- Do not use in an environment subject to condensation.
- Do not strike, bump, or otherwise subject to impacts.
- Do not disassemble.

If the Unit Malfunctions or Trouble Occurs

Stop using the unit immediately, unplug the power cord, and contact your dealer or an ASTRODESIGN, Inc. sales representative.

Before Operation

Instruction

We sincerely thank you for your purchase of the 32-channel multi-channel power amplifier PA-1853 and the remote box RB-1853.

This user manual (hereinafter referred to as 'this manual') provides instructions on how to use the 32-channel multi-channel power amplifier PA-1853 and remote box RB-1853, as well as important precautions for use. To ensure proper use, please be sure to read this manual before using the equipment. Also, please keep this manual in a safe place.

Notational Conventions

In this manual, to simplify descriptions, certain terms are represented as follows:

Item	Term used in this manual
PA-1853	This device
RB-1853	Remote Box

Supplied Items

Your package should include the following items. If any item is missing or damaged, contact your dealer or an ASTRODESIGN, Inc. sales representative.

Accessories	Quantity
PA-1853 main unit	1
RB-1853 main unit	1
PA-1853/ RB-1853 Instruction Manual	1
LAN Cable	1
AC Cable	1

! Important

- Always use the included accessories. Using items other than the included accessories may cause malfunctions.
- Please use the designated screws provided with the device to attach the bottom feet of this equipment. Using non-designated screws for attachment can lead to malfunctions.

About Bright and Dark Dots

The LCD panel of this device is manufactured with great precision, but occasionally, there may be bright dots (permanently lit pixels) or dark dots on the screen. This is not a malfunction, so please use the device with this understanding.

Installation

If you are installing this device in a rack or similar enclosure, please ensure that the ventilation holes (intake and exhaust) on the sides are not obstructed to maintain adequate airflow. Additionally, do not use the device in locations where the ambient temperature exceeds 40 degrees Celsius. Be especially cautious when stacking multiple units to ensure that the ambient temperature does not exceed the specified limit.

Trademarks and Registered Trademarks

Dante and Dante Controller are registered trademarks of Audinate.

Contents

Safety Precautions (Please keep in mind)	2
Warning Indications and Meaning of Symbols	2
If the Unit Malfunctions or Trouble Occurs	3
Before Operation	4
Instruction	4
Notational Conventions	4
Supplied Items	4
About Bright and Dark Dots	4
Installation	4
Trademarks and Registered Trademarks	4
Chapter 1 About this device	6
1.1 Features	6
1.2 Names and functions of each part	7
1.2.1 Front panel of this device	7
1.2.2 Rear panel of the device	8
1.2.3 Front panel of Remote Box	9
1.2.4 Rear panel of Remote Box	9
Chapter 2 Preparation and Basic Operations of the Device	10
2.1 Device Preparation	10
2.1.1 Starting the Device and Connecting the Remote Box	10
2.1.2 Shutting Down the Device	10
2.2 Basic Operations of the Device	11
2.2.1 Home screen	11
2.2.2 User Memory Selection screen	12
2.2.3 Status screen	13
2.2.4 Settings screen	14
Chapter 3 Device Configuration	15
3.1 Settings screen	15
3.1.1 Menu Button	15
3.1.2 Mixing	16
3.1.3 In/Out	22
3.1.4 SP Config	25
3.1.5 Auto Calibration	29
3.1.6 Manual Setup	29
3.1.7 System	37
Chapter 4 Setup	38
4.1 Connection Settings for this Device and Input Devices	38
4.2 Speaker Configuration Settings	39
4.3 Routing Input/Output Signals	40
4.4 Mixing	41
Chapter 5 Feature Introduction	43
5.1 Standby Mode	43
5.2 User Memory Function	44
5.3 Converting Multi-Channel Audio Sources to Binaural and Transaural Audio Sources	46
5.3.1 Binaural Conversion	46
5.3.2 Transaural Conversion	47
5.4 Upmixing 2ch Stereo Audio Sources to 22.2ch Multi-Channel Audio Sources	48
5.5 Calibration Function	49
5.5.1 Manual Calibration	49
5.6 Firmware Update	52
Chapter 6 Troubleshooting	53
6.1 When the Device Doesn't Function Properly	53
6.2 If Abnormalities or Malfunctions Occur	53
Chapter 7 Specifications of the Device	54
7.1 Input Signal Formats	54
7.1.1 Audio Signals	54
7.2 Output Signal Specifications	55
7.2.1 Audio Signal	55
7.3 External Control	56
7.4 Audio Specifications	56
7.5 General Specifications	56
7.6 LCD Panel Specifications	56
7.7 Accessories	57
7.8 Block Diagram	57
7.8.1 INPUT BLOCK	57
7.8.2 OUTPUT BLOCK	58
7.9 External View	65
7.9.1 PA-1853 External View	65
7.9.2 RB-1853 External View	67
Chapter 8 Revision History	68

Chapter 1 About this device

In this chapter, we will provide an overview of the features of this device and explain the names and functions of each component.

1.1 Features

This device is a multi-channel power amplifier capable of driving 32 passive speakers. It also features various input interfaces, including HDMI, MADI, Dante, AES, and more. The key features of this device include the following:

•32-Channel Digital Power Amplifier

Equipped with 32 channels of Class D power amplifiers, each providing 140W (at 4Ω, 20Hz to 20kHz, THD+N < 1%). This ensures high-power performance.

•Rich Input and Output Interfaces

This product features the following input and output connectors:

HDMI (HDMI2.1 x 2 input, HDMI 2.1 x 1 output (eARC/ARC supported))

MADI (64 channels/48kHz x 1 input, 64 channels/48kHz x 1 output)

Dante (Primary/Secondary connectors, 64 channels/48kHz input, 64 channels/48kHz output)

AES (2 channels/48kHz input, 2 channels/48kHz output, 75Ω)

•Binaural Mixing Function

Capable of converting multi-channel input signals to binaural (2-channel). In addition to standard binaural playback, it allows virtual reproduction of surround sound fields using only front speakers. It also supports HRTF (wav/) file loading for individual optimization.

Binaural operations employ our high-speed signal processing technology, performing convolution operations of up to 96kHz 4096 taps × 32 channels × L/R at approximately 25GHz.

Processing everything in the time domain minimizes delay and changes in tonality.

•Speaker Adjustment Function

Allows for EQ, delay, and level adjustments for each channel. This enables correction of acoustic issues due to different installation environments and customization of sound according to personal preferences.

•Audio Mixing Function

Supports the creation of up to 32 independent mixes, suitable for various scenarios, including customized upmixing.

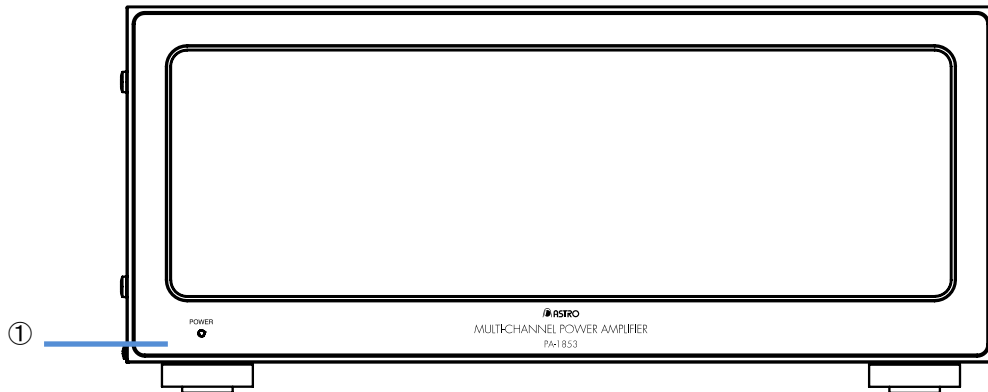
•Control via Remote Box

The remote box can be easily connected using only one LAN cable. All operations can be performed from the remote box.

1.2 Names and functions of each part

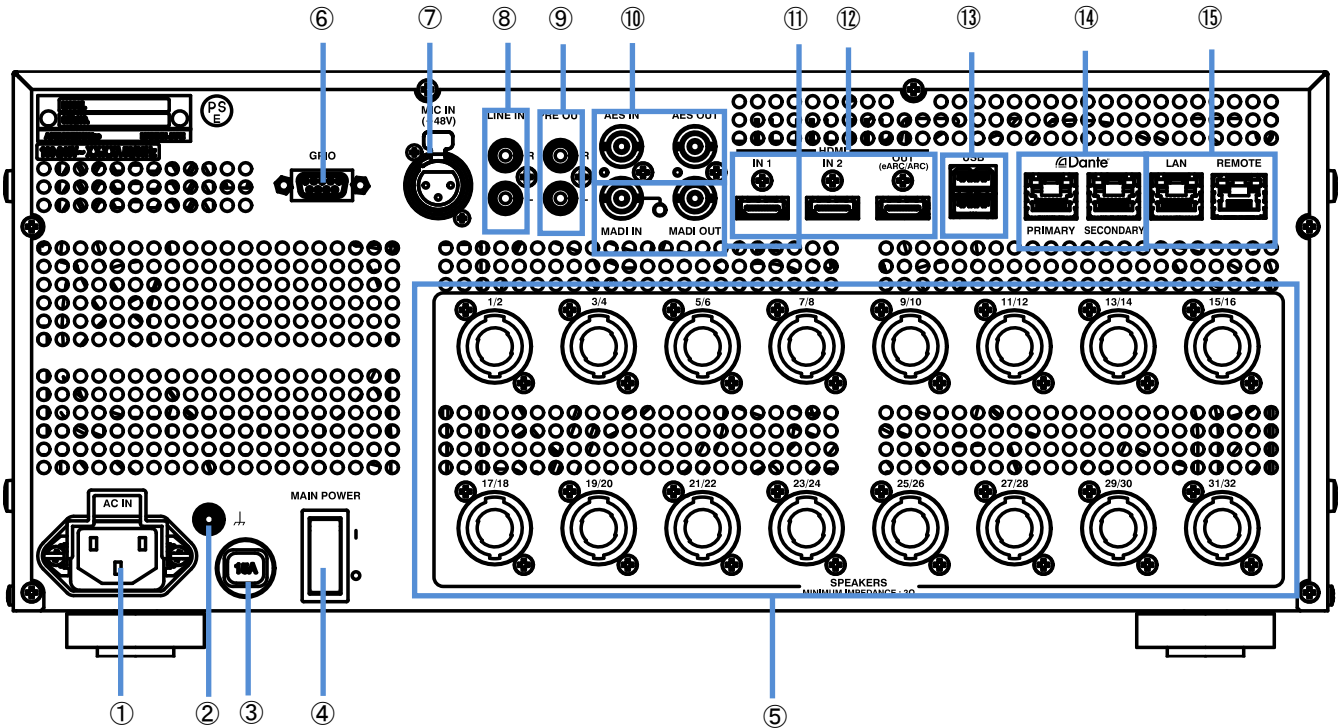
The names and brief descriptions of the functions of each part of the main unit and the remote box are as follows:

1.2.1 Front panel of this device



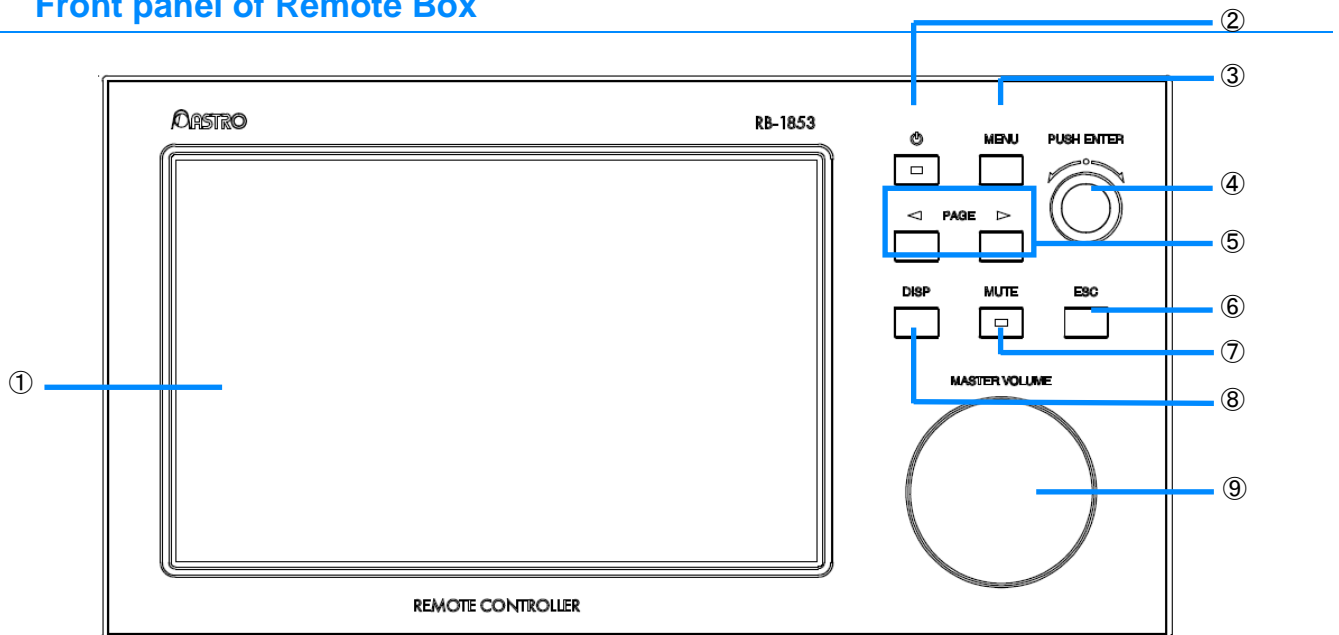
No.	Name	Description
①	Power Indicator Lamp	indicates the power status of the main unit using LEDs. When the unit is powered on, it lights up in green, and in standby mode, it lights up in red.

1.2.2 Rear panel of the device



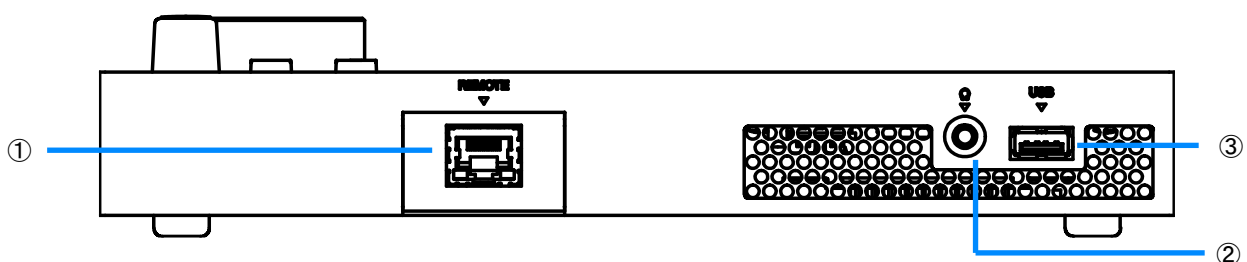
No.	Name	Description
①	AC IN Connector (AC Power Connector)	When using AC power, connect the included AC power cord. Specifications: AC100-240V
②	FG Terminal	Connects the frame ground of the connected equipment.
③	Circuit Protector	Trips (thermal trip method) when a current of over 15A flows, serving as overload protection. If it trips, it may indicate a fault inside the product. In such cases, please contact our sales department.
④	POWER Switch	Controls the power of this device.
⑤	SPEAKER OUT Terminal	1-32ch Output Terminals. Equipped with Neutrik NL4MD-H-3 connectors (2 speaker outputs per connector). Maximum Output: 140W (4Ω, THD+N < 1%)
⑥	GPIO Connector	GPIO: 3 GPI inputs, 3 GPO outputs, +12VOUT output. GPI can be used for controlling the unit, GPO for outputting unit status. +12VOUT can be used to control LED lighting or switch external speaker selectors. Specifications: D-sub 9-pin (female)
⑦	MIC IN	Phantom power (+48V) microphone input. Used for speaker measurement.
⑧	LINE IN	Line Input Terminal.
⑨	PRE OUT	Used for main or subwoofer output.
⑩	AES IN/OUT	AES Input/Output Terminal. 2ch IN/2ch OUT (48 kHz) 24-bit PCM.
⑪	MADI IN/OUT	MADI Input/Output Terminal. 64ch IN/64ch OUT (48 kHz) 24-bit PCM. The LED indicator lights up in green when a signal is input (LED indicator next to the input terminal).
⑫	HDMI IN/OUT	HDMI 2.1 Input (PCM 8ch, MPEG4-AAC input supported) HDMI 2.1 Output (ARC/eARC supported, MPEG4-AAC input supported)
⑬	USB Connector	Connect USB devices for firmware updates and more.
⑭	Dante PRIMARY/SECONDARY LAN Connector	Dante Audio Input/Output Terminal. 64ch IN/64ch OUT (48 kHz) 24-bit PCM. Dante audio channel routing is configured using Audinate's Dante Controller software. For more details, refer to the Dante Controller User Guide by Audinate.
⑮	LAN Connector	Connect the included remote box for device settings. Specifications: RJ-45 connector (with PoE power on one side, for use with the included remote box). Connectors are inch-threaded.

1.2.3 Front panel of Remote Box



No.	Name	Description
①	Touch Panel Display	7-inch Touch Panel LCD displays the device settings screen.
②	POWER Switch	Used to transition the device to standby mode. It lights up in green when the power is on and turns off when the power is off or in standby mode.
③	MENU Button	Used for displaying the popup menu (Not available).
④	Jog Dial	Used for operations within the settings screen
⑤	PAGE Button	Pressing the left and right PAGE buttons allows you to navigate through the LCD menu pages.
⑥	ESC Button	Used during settings in the settings screen.
⑦	DISP Button	Used to switch the LCD backlight on/off.
⑧	MUTE Button	Used to mute/unmute the speaker. It lights up in red when muted.
⑨	Volume Adjustment Dial	Used for Master Volume Adjustment. You can adjust the volume of the speaker's output audio with this control.

1.2.4 Rear panel of Remote Box



No.	Name	Description
①	REMOTE Terminal	Used for connecting the main unit and the remote box. PoE compatible.
②	Headphone Jack	Allows you to listen to the audio being input-selected (Not available).
③	USB Port	Used for firmware updates and data transfer.

Chapter 2 Preparation and Basic Operations of the Device

In this chapter, we will explain the connection, startup/shutdown, and basic operation methods of the device.

2.1 Device Preparation

The device connection and startup/shutdown methods are as follows:

2.1.1 Starting the Device and Connecting the Remote Box

Ensure that the power switch on the device is in the "Off" position.

Connect the included AC power cord to the AC IN connector.

Connect the remote box to the device.

Use the included LAN cable to connect the REMOTE terminal on the back of the device to the LAN terminal on the remote box. If using a LAN cable other than the included one, please use a CAT 5E or higher-grade LAN cable.

Turn on the power switch.

Simultaneously, the power of the remote box should turn on, and the LCD should start blinking.

During the blinking of the LCD, the startup process is in progress, so avoid operating the remote box.

If the LCD doesn't blink, please verify that the LAN cable is correctly connected.

Confirm that the remote box is operational.

After startup, wait for about 1 minute, and the LCD will light up, indicating that the remote box is operational.

If you are unable to operate it even after waiting, please restart the power of the device.

! Important

- During the startup process, never turn off the power of the device, as it can cause malfunctions.

2.1.2 Shutting Down the Device

1 Turn off the power switch.

The power of the device and the remote box will turn off, and the switch LED and the remote box's LCD will go dark.

If you don't plan to use the device for an extended period, unplug the power cord from the outlet.

2.2 Basic Operations of the Device

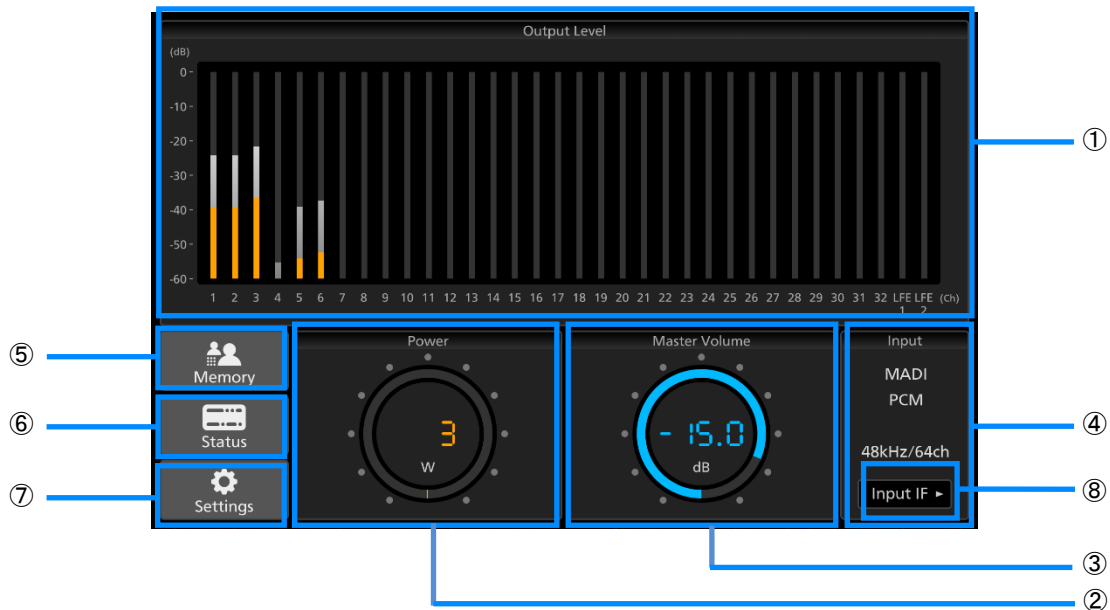
The basic operations of the device are as follows:

The device can be categorized into the Home screen, User Memory Selection screen, Status screen, and Settings screen. Each displaying specific configuration items.

2.2.1 Home screen

When the power is turned on, the touch panel display will show the Home screen.

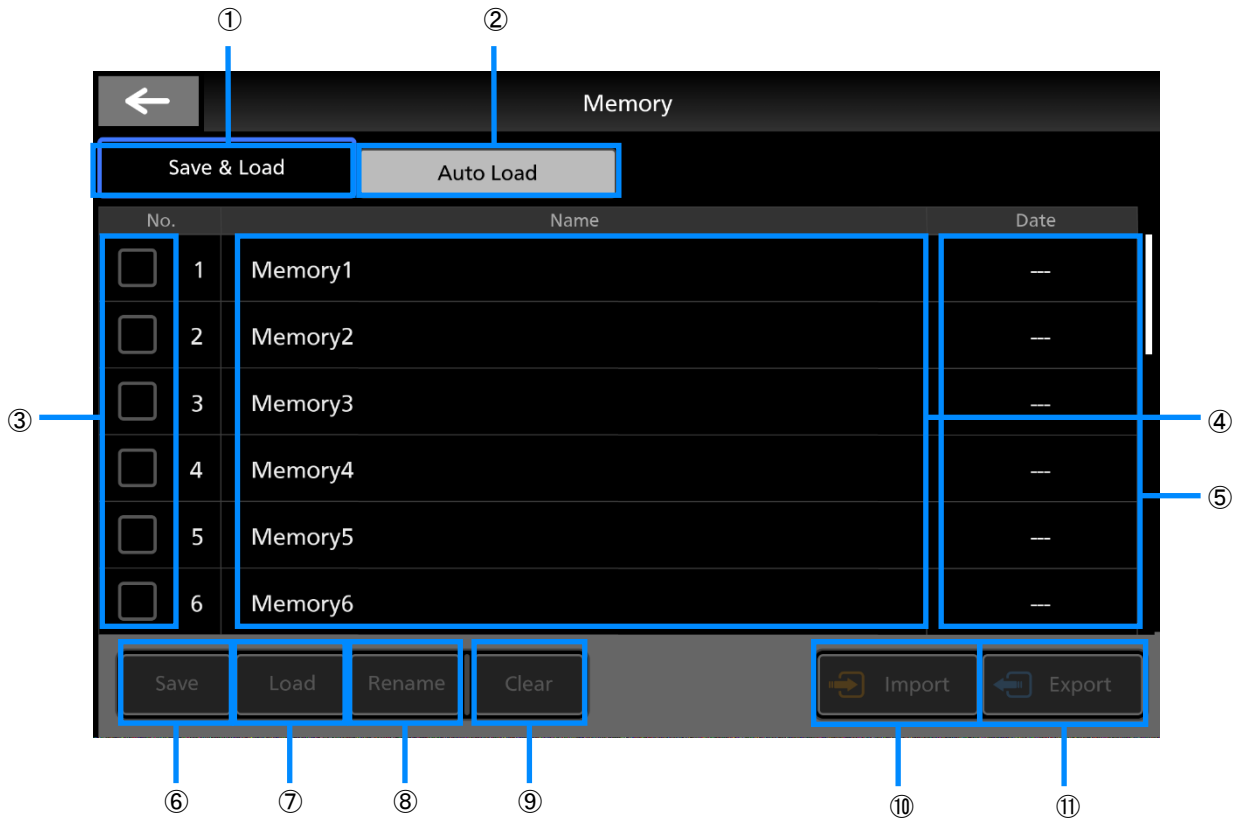
The Home screen displays the following information:



No.	Name	Description
①	VU Meters	Indicates the VU values for each channel.
②	Watt Checker	Displays the current speaker drive wattage.
③	Master Volume	Shows the current master volume. You can adjust the master volume using the volume adjustment dial on the remote box. Mute ON/OFF is also displayed here.
④	Input Source Display	Displays the current input source.
⑤	Memory Button	Transitions to the User Memory Selection screen.
⑥	Status Button	Transitions to the Status Display screen.
⑦	Setting Button	Transitions to the Settings screen.
⑧	Input Switching Button	Switches the input interface.

2.2.2 User Memory Selection screen

In the User Memory Selection screen, you can save and recall user memories.



No.	Name	Description
①	Save & Load Tab	Displays the user memory settings screen.
②	Auto Load Tab	Displays the user memory load settings screen (Not available)
③	Memory No.	Indicates the number of the user memory.
④	Memory Name	Displays the name of the user memory.
⑤	Saved Date & Time	Shows the date and time when the user memory was saved.
⑥	Save Button	Saves the current settings as a user memory.
⑦	Load Button	Loads the selected user memory.
⑧	Rename Button	Changes the name of the selected user memory.
⑨	Clear Button	Deletes the selected memory.
⑩	Import Button	Imports data from a USB memory to the selected memory number.
⑪	Export Button	Exports the selected user memory to a USB memory.

2.2.3 Status screen

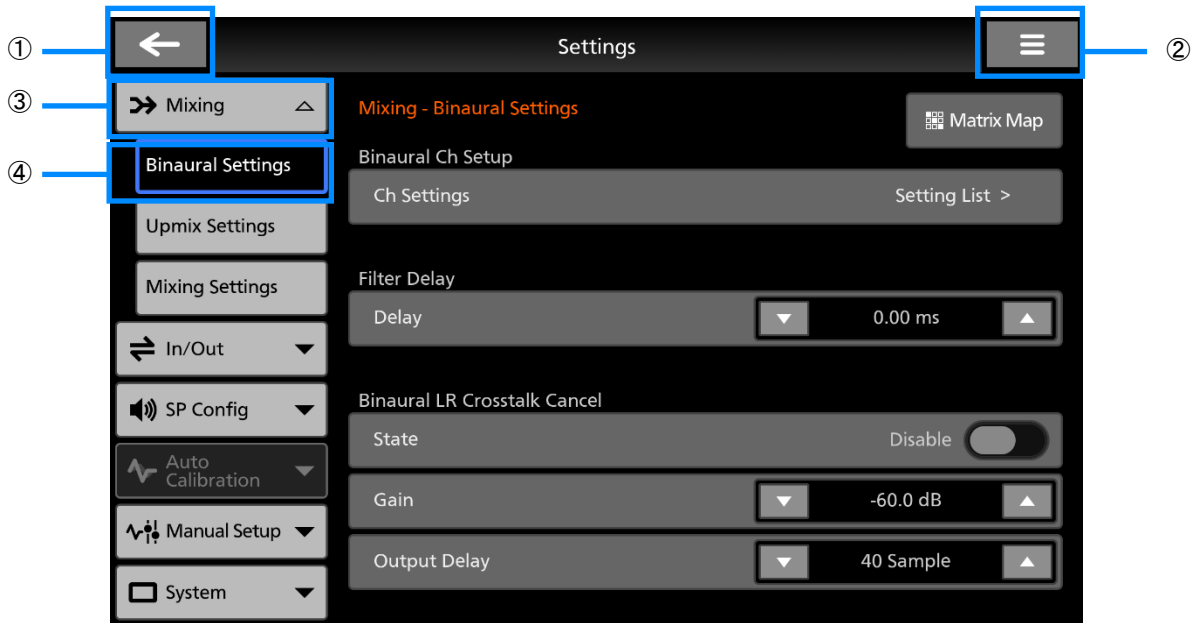
The Status screen shows the following information:

No.	Name	Type	Imp.	Crossover	LFE1	LFE2	Mute	Volume	Delay
1	Speaker 1	L	8	-				0.0dB	0.000 m
2	Speaker 2	L	8	-				0.0dB	0.000 m
3	Speaker 3	L	8	-				0.0dB	0.000 m
4	Speaker 4	L	8	-				0.0dB	0.000 m
5	Speaker 5	L	8	-				0.0dB	0.000 m
6	Speaker 6	L	8	-				0.0dB	0.000 m
7	Speaker 7	L	8	-				0.0dB	0.000 m
8	Speaker 8	L	8	-				0.0dB	0.000 m
9	Speaker 9	L	8	-				0.0dB	0.000 m
10	Speaker 10	L	8	-				0.0dB	0.000 m

No.	Name	Description
①	Speaker Tab	Displays speaker information.
②	Other Tab	Displays version information.
③	Speaker No.	Indicates the speaker number.
④	Speaker Name	Displays the speaker's name.
⑤	Type	Displays the type. S : Small, L : Large, Sw : Subwoofer, T : Tweeter
⑥	Impedance	Displays the impedance value.
⑦	Crossover	Displays the crossover value.
⑧	LFE1	Indicates 'O' when LFE1 is enabled.
⑨	LFE2	Indicates 'O' when LFE2 is enabled.
⑩	Mute	Displays an icon when muted.
⑪	Volume	Displays the volume value.
⑫	Delay	Displays the delay value.

2.2.4 Settings screen

In the Settings screen, you can configure various settings. For more details, please refer to section 3.1, 'Settings Screen.'



No.	Name	Description
①	Back Button	Returns to the previous screen.
②	Menu Button	Opens the menu list.
③	First-Level Button	Toggles the display of the second-level settings.
④	Second-Level Button	Displays the setting screen.

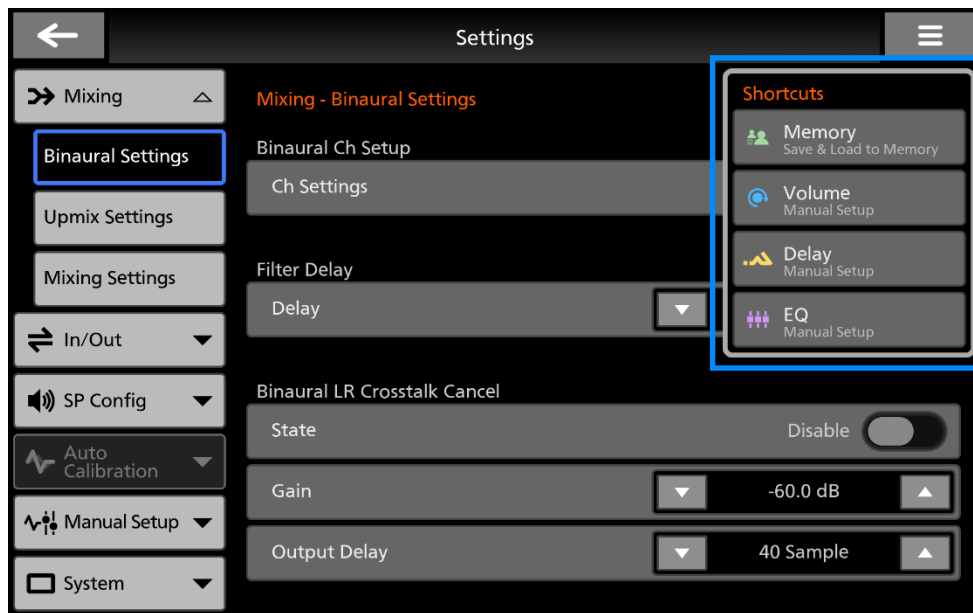
Chapter 3 Device Configuration

In this device, various settings can be configured through the Settings screen. In this chapter, we will explain the settings in the Settings screen.

3.1 Settings screen

3.1.1 Menu Button

You can navigate to each item from the Menu button in the top right corner.

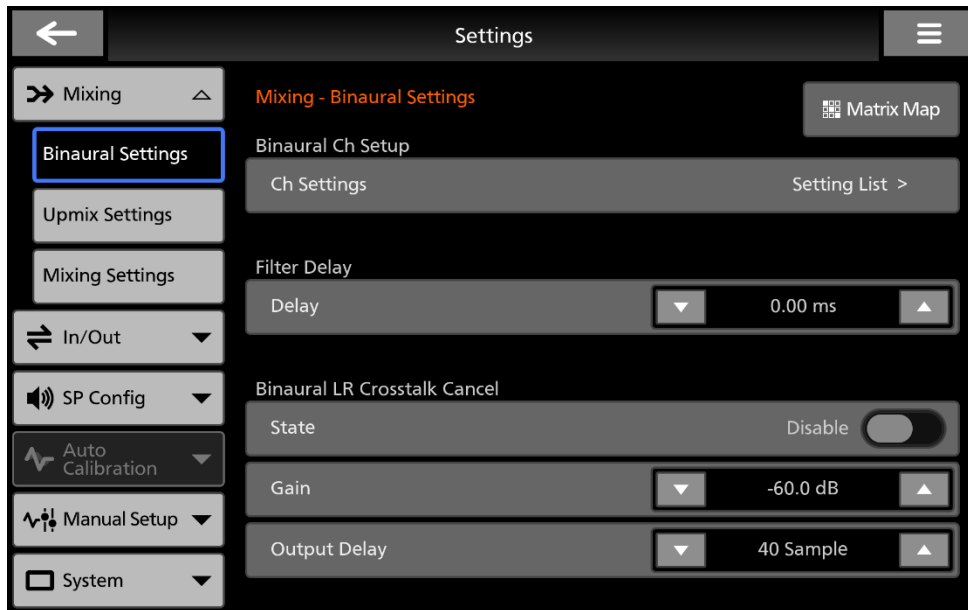


Setting Item 1	Setting Value
Memory	Navigate to the Save & Load tab in the Memory screen.
Volume	Navigate to the Volume Single Setup screen in Manual Setup.
Delay	Navigate to the Delay Setup screen in Manual Setup.
EQ	Navigate to the EQ Setup screen in Manual Setup.

3.1.2 Mixing

You can configure settings related to mixing.

Binaural Settings



Setting Item 1	Setting Value
Ch Settings Navigate to the Binaural Setting List screen.	
Filter Delay Adjust the delay caused by binaural processing.	-20.00 ~ 0.00ms You can set it in increments of 0.01 ms.
State This function cancels out the crosstalk between the right and left ears by outputting the audio from the Binaural L(R) speaker in reverse phase from the Binaural R(L) speaker, effectively canceling it out in space.	Enable / Disable
Gain You will adjust the gain for canceling out from the opposite-side speaker in reverse phase. Typically, this is not a problem at low volume.	-70.0 ~ 0.0dB You can set it in increments of 0.1 dB.
Output Delay Introduce a delay to the output. You will adjust it based on the width between both ears. Since each sample corresponds to approximately 0.3541 cm, if the distance between both ears is 15 cm, you will introduce a delay of around 42 samples.	0 ~ 127Sample You can set it in increments of 1 unit.

Binaural Setting List

Binaural Ch	Input Ch	HRIR File
1		---
2		---
3		---
4		---
5		---
6		---
7		---
8		---

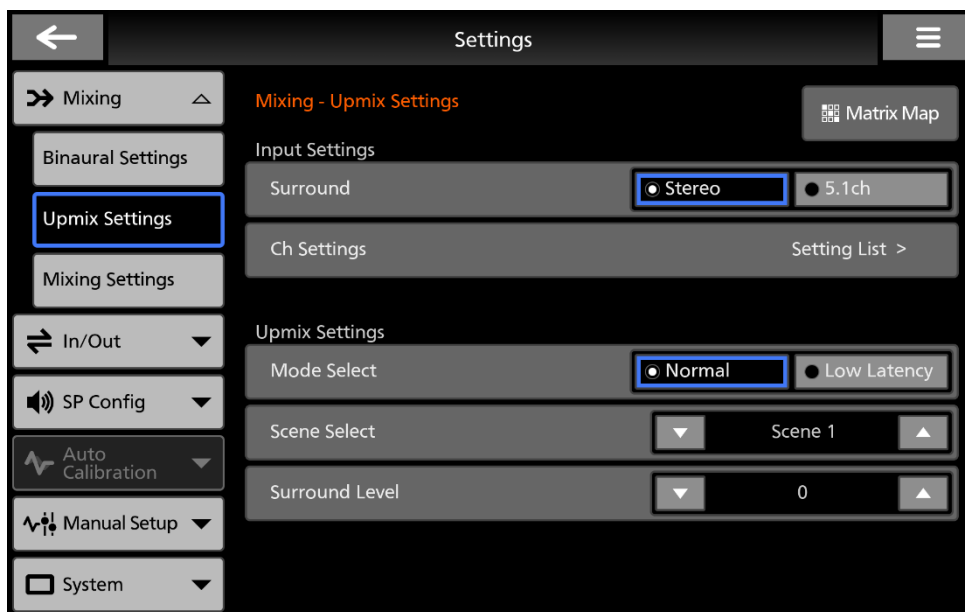
	Setting Item 1	Setting Value
Input Ch		1~64
Select the input channels for Binaural settings.		
HRIR File		
Navigate to the screen for setting HRIR files		

HRIR File



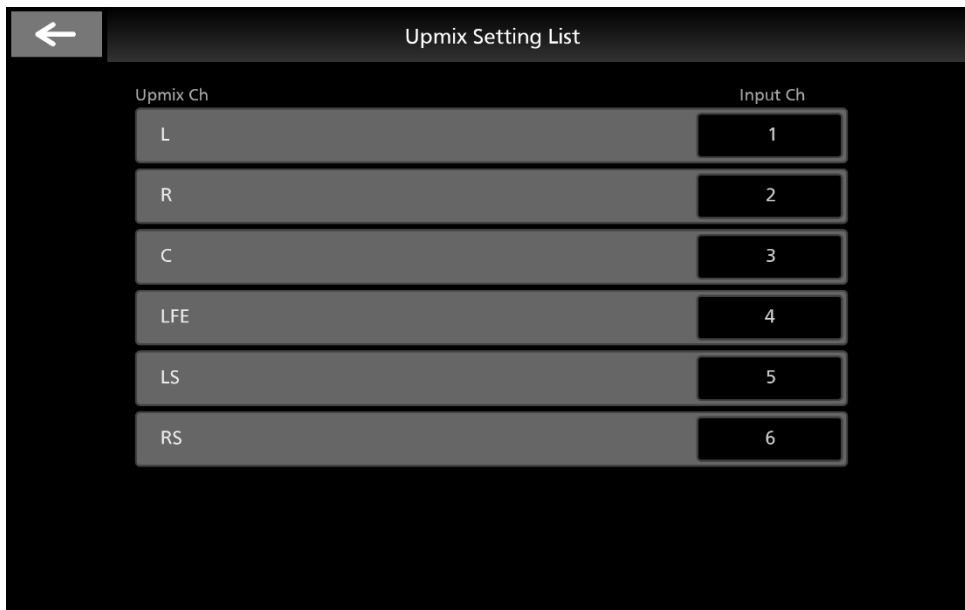
Setting Item 1	Setting Value
HRIR File Type Select the HRIR File type.	96kHz WAVE / 96kHz SOFA
96kHz WAVE File Choose the 96kHz WAVE File option.	
96kHz SOFA File Choose the 96kHz WAVE File option.	
Azimuth Set the Azimuth for the selected SOFA File.	0 ~ 360deg
Elevation Set the Azimuth for the selected SOFA File.	0 ~ 360deg

Upmix Settings



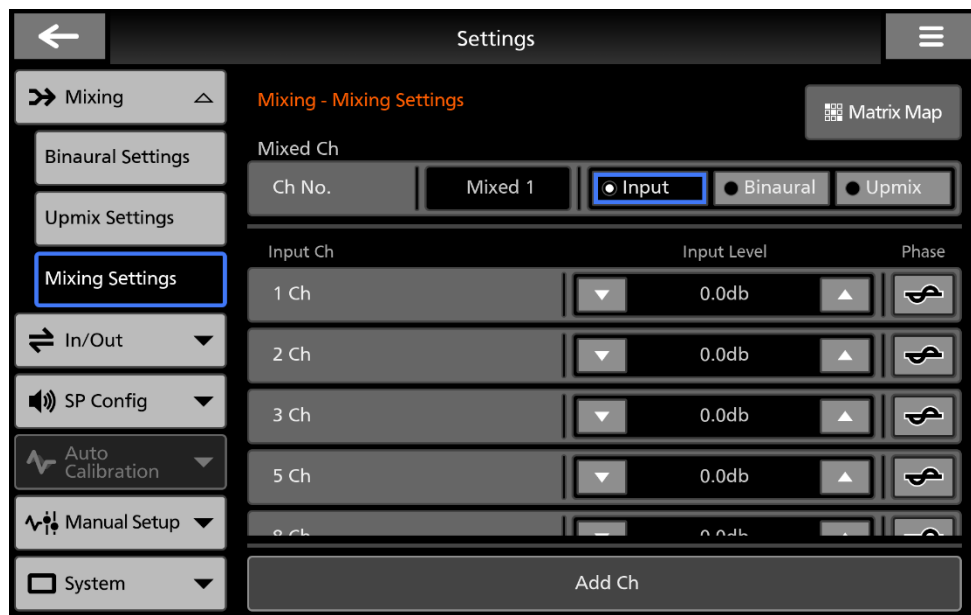
Setting Item 1	Setting Value
Surround Choose the type of surround input.	Stereo / 5.1ch
Ch Settings Navigate to the Binaural Ch Settings List screen.	
Mode Select Select the upmix mode. Choose Low Latency when playing audio with video.	Normal / Low Latency
Scene Select Select a scene.	Scene 1 ~ Scene 9
Surround Level Adjust the spread of the sound.	-4 ~ <u>0</u> ~ +4 You can set it in increments of 1 unit.



Upmix Ch Settings



Setting Item 1	Setting Value
Input CH	1 ~ 64
Choose the input channels corresponding to Upmix Ch. When the input is set to Stereo, you can only configure Upmix Channels for LCh (Left Channel) and RCh (Right Channel).	

Mixing Settings

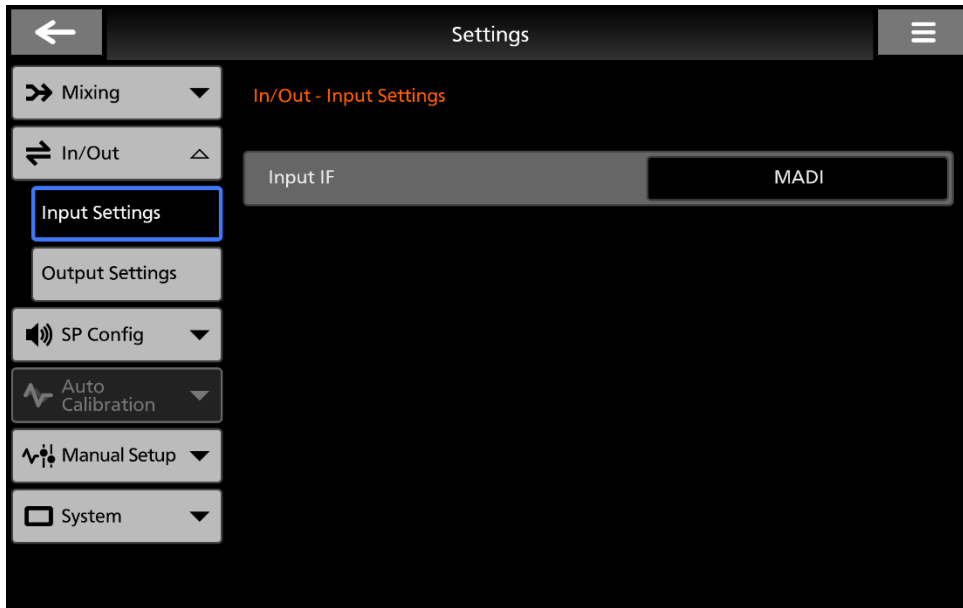


Setting Item 1	Setting Value
Mixed Ch No. Select the channel for mixing settings.	1 ~ 32 / LFE1 / LFE2
Mixed Ch type Configure the type of channel for mixing settings.	Input / Binaural / Upmix
Input Level Set the level of the input channel.	-60.0 ~ 0.0 ~ +12.0 dB You can set it in increments of 0.1 dB.
Phase Choose the phase.	  Normal / Reverse
Add Ch Select the input channels to add/remove to/from the configured mixing channel.	1 ~ 64 Multiple selections are possible.

3.1.3 In/Out

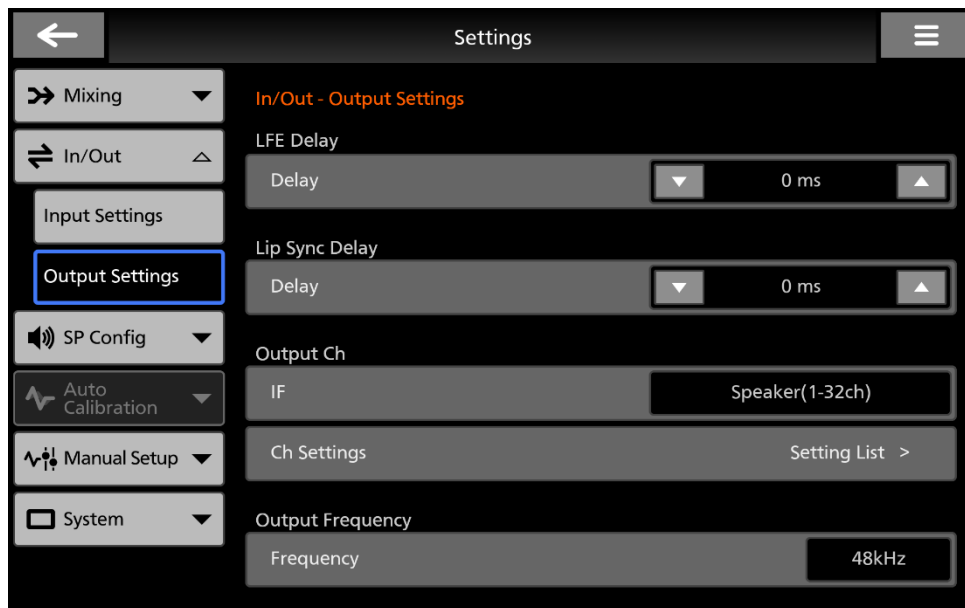
You can perform input and output-related settings.

Input Settings



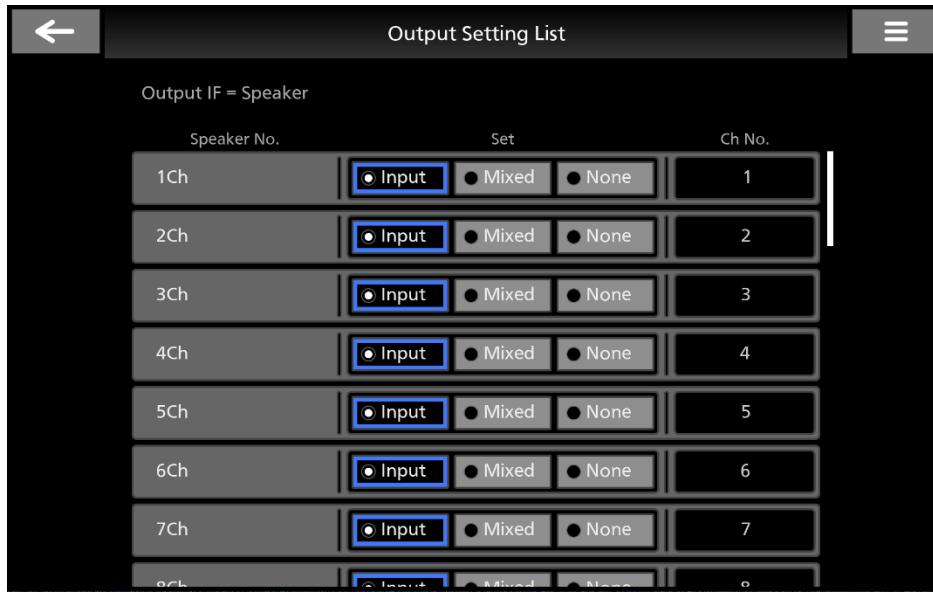
Setting Item 1	Setting Value
Input IF Switch between input interfaces.	MADI / Dante / AES / LINE IN

Output Settings



Setting Item 1	Setting Value
LFE Delay Adjusts the timing of LFE1 and LFE2 signals mixed from the input signal without changing the LFE components extracted from each speaker.	-20 ~ 0ms You can set it in 1ms increments.
Lip Sync Delay Apply delay to all channels.	0 ~ 150ms
Output IF Switch between output interfaces.	Speaker(1-32ch) / MADI(1-64ch) / Dante(1-64ch) / AES(L/Rch) / PRE OUT(L/Rch)
Ch Settings Navigate to the Ch Settings screen.	
Output Frequency Switch the output sampling rate frequency between 48kHz and 96kHz.	48kHz / 96kHz ※Dante output will remain at 48kHz regardless of the selection at this time.

Ch Setting List

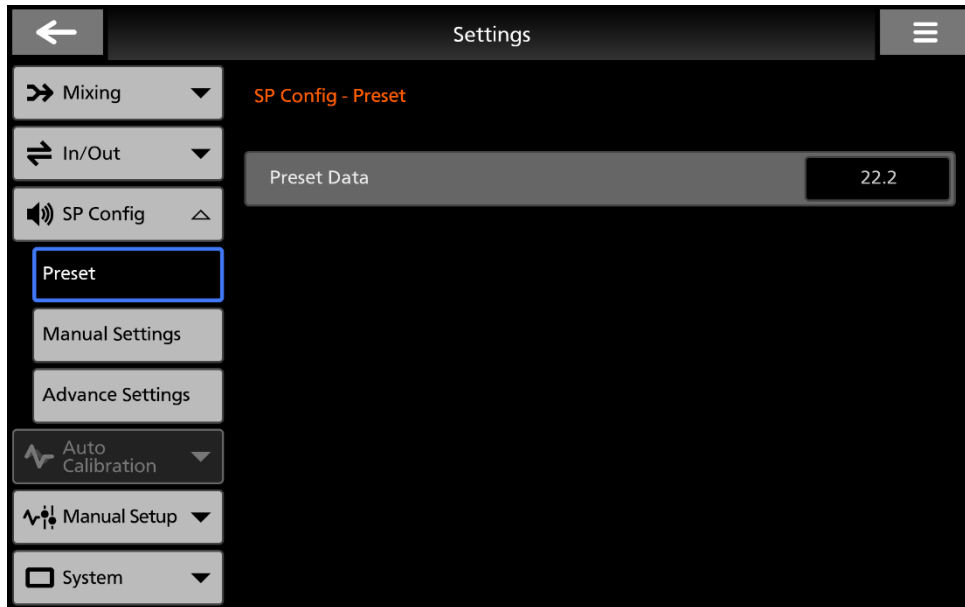


Setting Item 1	Setting Value
Set Select the output type for each speaker.	Input / Mixed / None
Ch No. Selection Button Use the Ch No. selection button to choose the input channel for each speaker.	1 ~ 32 The default is the same as the speaker's number.

3.1.4 SP Config

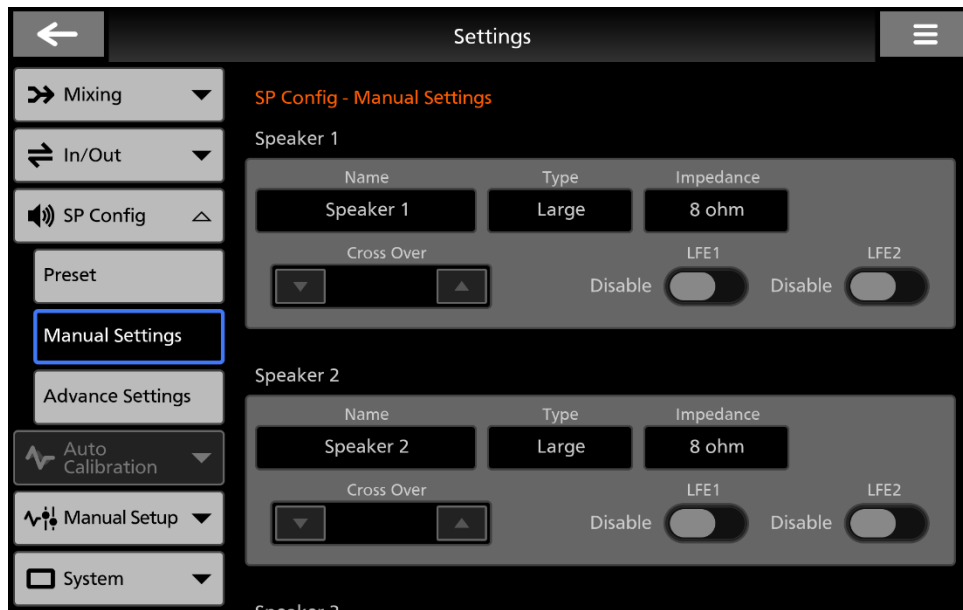
You can perform various settings related to each speaker.

Preset



Setting Item 1	Setting Value
Preset Data	22.2(SA-1852) / 22.2 / 7.1.4 / 7.1.2 / 7.1 / 5.1.4 / 5.1.2 / 5.1 / None
Selecting presets that match the speaker arrangement.	

Manual Settings



Setting Item 1	Setting Value
Name Changing the speaker's name.	
Type Choosing the speaker type.	Small / Large / Subwoofer / Tweeter
Impedance Used to calculate power meters that can be displayed on the home screen.	2 ohm / 4 ohm / 6 ohm / 8 ohm
Cross Over When selecting Subwoofer, frequencies below the crossover are passed through, when selecting Small/Tweeter, frequencies above the crossover are passed through, and when selecting Large, it's disabled.	20 ~ 15000Hz Type : Small initial time value 100Hz Type : Subwoofer initial time value 100Hz Type : Tweeter initial time value 4000Hz Setting the crossover frequency in 1Hz increments
LFE1 Mixing the low-frequency components (Low) of the crossover to LFE1/2.	Enable / Disable
LFE2 Mixing the low-frequency components (Low) of the crossover to LFE1/2.	Enable / Disable

Advance Settings

Please note that some features may be planned for support in future firmware updates.

Explanation of Preset Content

Setting Item 1	Ch	Name	type	Cross Over	Impedance	LFE1	LFE2
22.2(SA-1852)	1	FL	Large	-	8Ω	Disable	Disable
	2	FR	Large	-	8Ω	Disable	Disable
	3	BtFC(L)	Large	-	8Ω	Disable	Disable
	4	LFE1	Large	120Hz	4Ω	Enable	Disable
	5	BL	Large	-	8Ω	Disable	Disable
	6	BR	Large	-	8Ω	Disable	Disable
	7	FLc	Large	-	8Ω	Disable	Disable
	8	FRc	Large	-	8Ω	Disable	Disable
	9	BC	Large	-	8Ω	Disable	Disable
	10	LFE2	Large	120Hz	4Ω	Disable	Enable
	11	SiL	Large	-	8Ω	Disable	Disable
	12	SiR	Large	-	8Ω	Disable	Disable
	13	TpFL	Large	-	8Ω	Disable	Disable
	14	TpFR	Large	-	8Ω	Disable	Disable
	15	TpFC	Large	-	8Ω	Disable	Disable
	16	TpC	Large	-	8Ω	Disable	Disable
	17	TpBL	Large	-	8Ω	Disable	Disable
	18	TpBR	Large	-	8Ω	Disable	Disable
	19	TpSiL	Large	-	8Ω	Disable	Disable
	20	TpSiR	Large	-	8Ω	Disable	Disable
	21	TpBC	Large	-	8Ω	Disable	Disable
	22	BtFC(R)	Large	-	8Ω	Disable	Disable
	23	BtFL	Large	-	8Ω	Disable	Disable
	24	BtFR	Large	-	8Ω	Disable	Disable
22.2	1	FL	Large	-	8Ω	Disable	Disable
	2	FR	Large	-	8Ω	Disable	Disable
	3	FC	Large	-	8Ω	Disable	Disable
	4	LFE1	Large	120Hz	4Ω	Enable	Disable
	5	BL	Large	-	8Ω	Disable	Disable
	6	BR	Large	-	8Ω	Disable	Disable
	7	FLc	Large	-	8Ω	Disable	Disable
	8	FRc	Large	-	8Ω	Disable	Disable
	9	BC	Large	-	8Ω	Disable	Disable
	10	LFE2	Large	120Hz	4Ω	Disable	Enable
	11	SiL	Large	-	8Ω	Disable	Disable
	12	SiR	Large	-	8Ω	Disable	Disable
	13	TpFL	Large	-	8Ω	Disable	Disable
	14	TpFR	Large	-	8Ω	Disable	Disable
	15	TpFC	Large	-	8Ω	Disable	Disable
	16	TpC	Large	-	8Ω	Disable	Disable
	17	TpBL	Large	-	8Ω	Disable	Disable
	18	TpBR	Large	-	8Ω	Disable	Disable
	19	TpSiL	Large	-	8Ω	Disable	Disable
	20	TpSiR	Large	-	8Ω	Disable	Disable
	21	TpBC	Large	-	8Ω	Disable	Disable
	22	BtFC	Large	-	8Ω	Disable	Disable
	23	BtFL	Large	-	8Ω	Disable	Disable
	24	BtFR	Large	-	8Ω	Disable	Disable

Setting Item 1	Ch	Name	type	Cross Over	Impedance	LFE1	LFE2
7.1.4	1	L	Large	-	8Ω	Disable	Disable
	2	R	Large	-	8Ω	Disable	Disable
	3	C	Large	-	8Ω	Disable	Disable
	4	LFE	Subwoofer	120Hz	4Ω	Enable	Enable
	5	Ls	Large	-	8Ω	Disable	Disable
	6	Rs	Large	-	8Ω	Disable	Disable
	7	Lrs	Large	-	8Ω	Disable	Disable
	8	Rrs	Large	-	8Ω	Disable	Disable
	9	Ltf	Large	-	8Ω	Disable	Disable
	10	Ltr	Large	-	8Ω	Disable	Disable
	11	Rtf	Large	-	8Ω	Disable	Disable
	12	Rtr	Large	-	8Ω	Disable	Disable
7.1.2	1	L	Large	-	8Ω	Disable	Disable
	2	R	Large	-	8Ω	Disable	Disable
	3	C	Large	-	8Ω	Disable	Disable
	4	LFE	Subwoofer	120Hz	4Ω	Enable	Enable
	5	Ls	Large	-	8Ω	Disable	Disable
	6	Rs	Large	-	8Ω	Disable	Disable
	7	Lrs	Large	-	8Ω	Disable	Disable
	8	Rrs	Large	-	8Ω	Disable	Disable
	9	Lts	Large	-	8Ω	Disable	Disable
	10	Rts	Large	-	8Ω	Disable	Disable
7.1	1	L	Large	-	8Ω	Disable	Disable
	2	R	Large	-	8Ω	Disable	Disable
	3	C	Large	-	8Ω	Disable	Disable
	4	LFE	Subwoofer	120Hz	4Ω	Enable	Enable
	5	Ls	Large	-	8Ω	Disable	Disable
	6	Rs	Large	-	8Ω	Disable	Disable
	7	Lrs	Large	-	8Ω	Disable	Disable
	8	Rrs	Large	-	8Ω	Disable	Disable
5.1.4	1	L	Large	-	8Ω	Disable	Disable
	2	R	Large	-	8Ω	Disable	Disable
	3	C	Large	-	8Ω	Disable	Disable
	4	LFE	Subwoofer	120Hz	4Ω	Enable	Enable
	5	Ls	Large	-	8Ω	Disable	Disable
	6	Rs	Large	-	8Ω	Disable	Disable
	7	Ltf	Large	-	8Ω	Disable	Disable
	8	Ltr	Large	-	8Ω	Disable	Disable
	9	Rtf	Large	-	8Ω	Disable	Disable
	10	Rtr	Large	-	8Ω	Disable	Disable
5.1.2	1	L	Large	-	8Ω	Disable	Disable
	2	R	Large	-	8Ω	Disable	Disable
	3	C	Large	-	8Ω	Disable	Disable
	4	LFE	Subwoofer	120Hz	4Ω	Enable	Enable
	5	Ls	Large	-	8Ω	Disable	Disable
	6	Rs	Large	-	8Ω	Disable	Disable
	7	Lts	Large	-	8Ω	Disable	Disable
	8	Rts	Large	-	8Ω	Disable	Disable
5.1	1	L	Large	-	8Ω	Disable	Disable
	2	R	Large	-	8Ω	Disable	Disable
	3	C	Large	-	8Ω	Disable	Disable
	4	LFE	Subwoofer	120Hz	4Ω	Enable	Enable
	5	Ls	Large	-	8Ω	Disable	Disable
	6	Rs	Large	-	8Ω	Disable	Disable

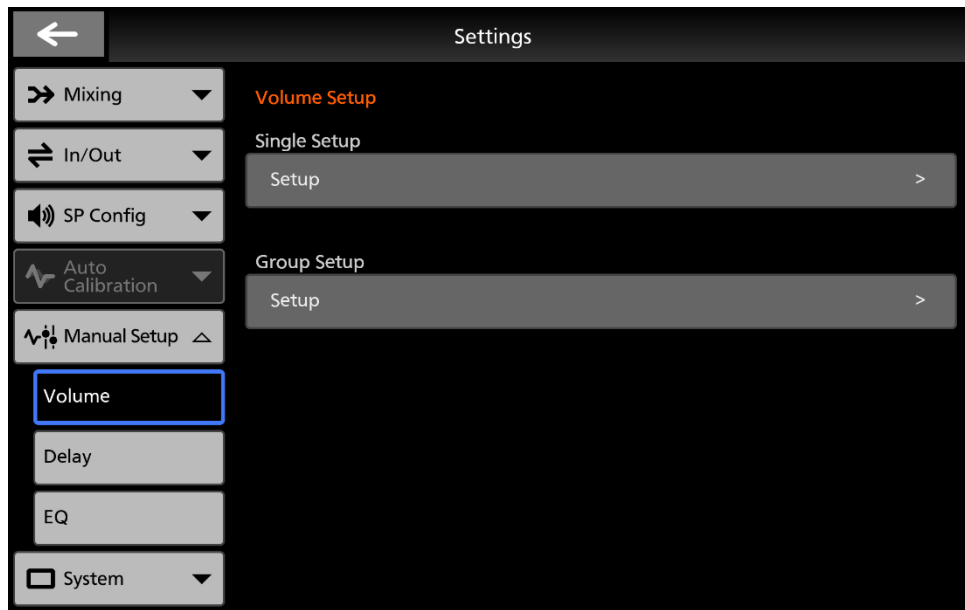
3.1.5 Auto Calibration

This feature is planned for support in future firmware updates.

3.1.6 Manual Setup

You can manually set the volume, delay, and frequency characteristics for each speaker.

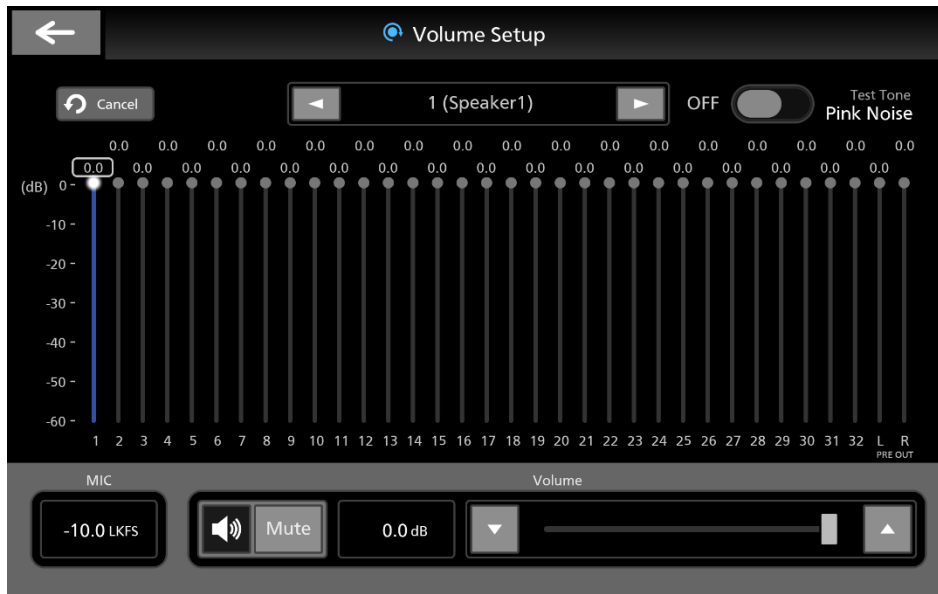
Volume Setup



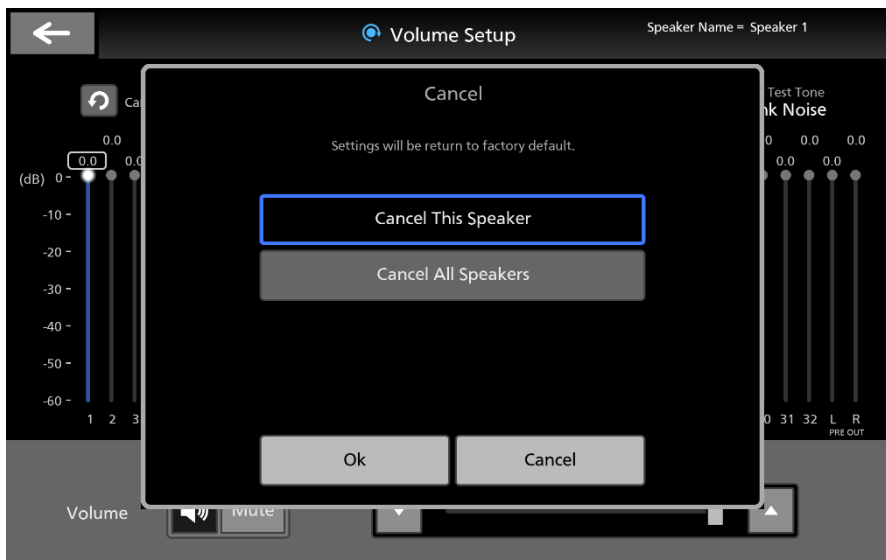
Setting Item 1	Setting Value
Single Setup	Navigate to the Single Setup screen.
Group Setup	Navigate to the Group Setup screen.

Volume Single Setup

You can set the volume and mute status individually for each speaker.



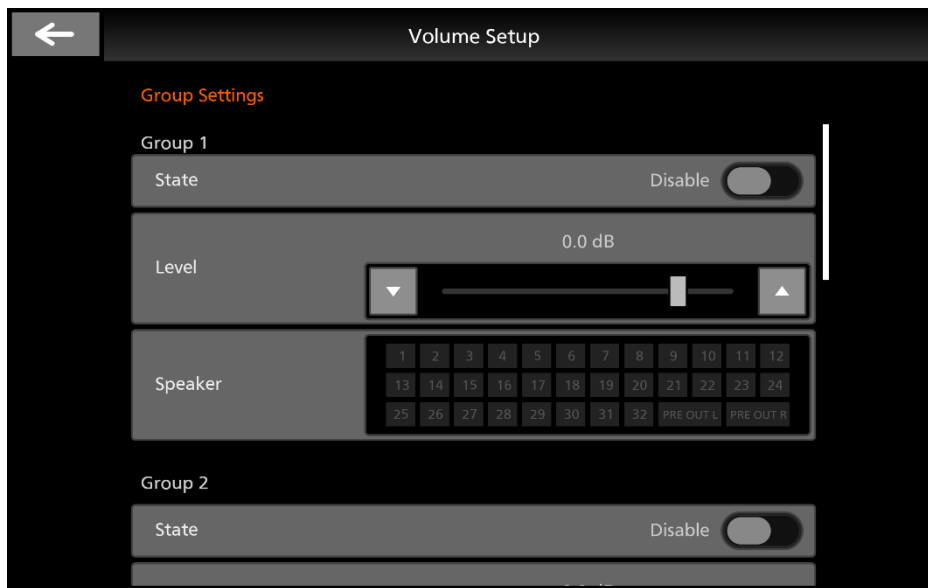
Setting Item 1	Setting Value
Speaker Ch Select the channel of the speaker you want to configure.	1 ~ 32 / PRE OUTL / PRE OUTR
Test Tone Output pink noise. While pink noise is being output, all other audio is muted.	Pink Noise / <u>OFF</u>
Mute Set mute for each channel of the speaker.	ON / <u>OFF</u>
Volume Set the volume value for each channel of the speaker.	-60 ~ <u>0</u> dB You can adjust in 0.1dB increments.
Cancel Transition to the Cancel screen.	
MIC Displays the microphone's loudness value.	



Setting Item 1	Setting Value
Cancel This Speaker Reset the current speaker's volume settings to the default values.	
Cancel All Speaker Reset the volume settings of all speakers to their default values.	

Volume Group Setup

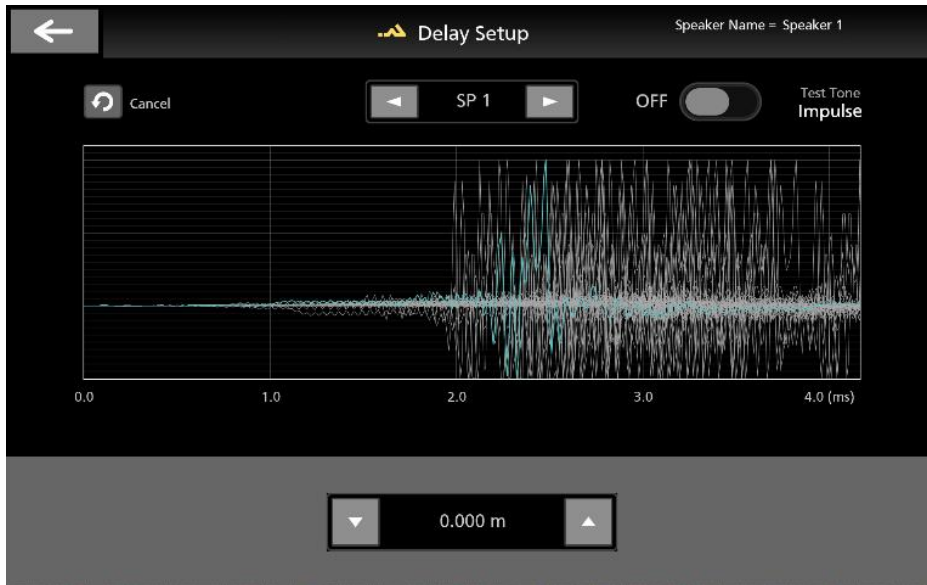
You can group multiple speakers together and set their volume simultaneously.



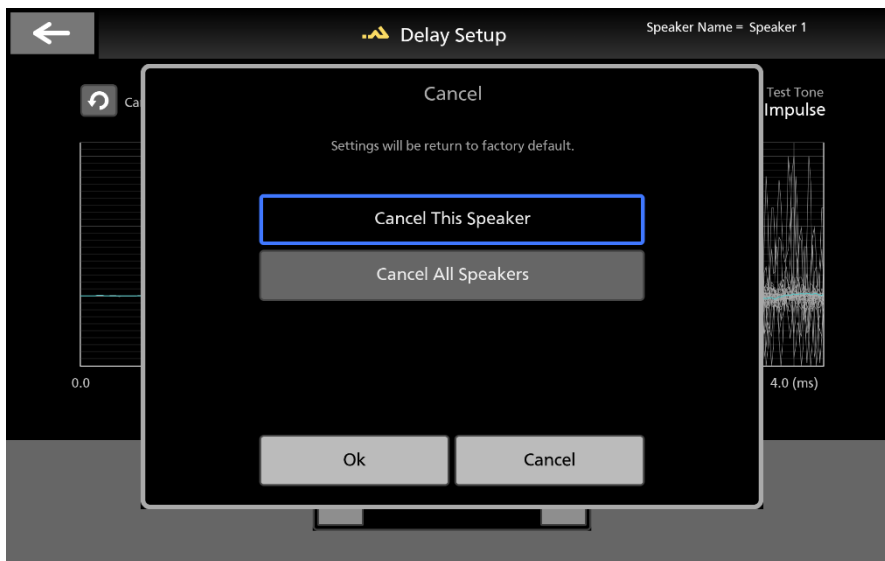
Setting Item 1	Setting Value
State Select the channels of the speakers you want to configure.	Enable / Disable
Output Level Set the volume for each group.	-60 ~ 0 ~ +12dB You can set it in 1dB increments.
Speaker Group Ch Select the speaker channels to be included in each group.	1 ~ 32 / PRE OUT L / PRE OUT R Multiple selections are possible.

Delay Setup

You can set the delay amount for each speaker.

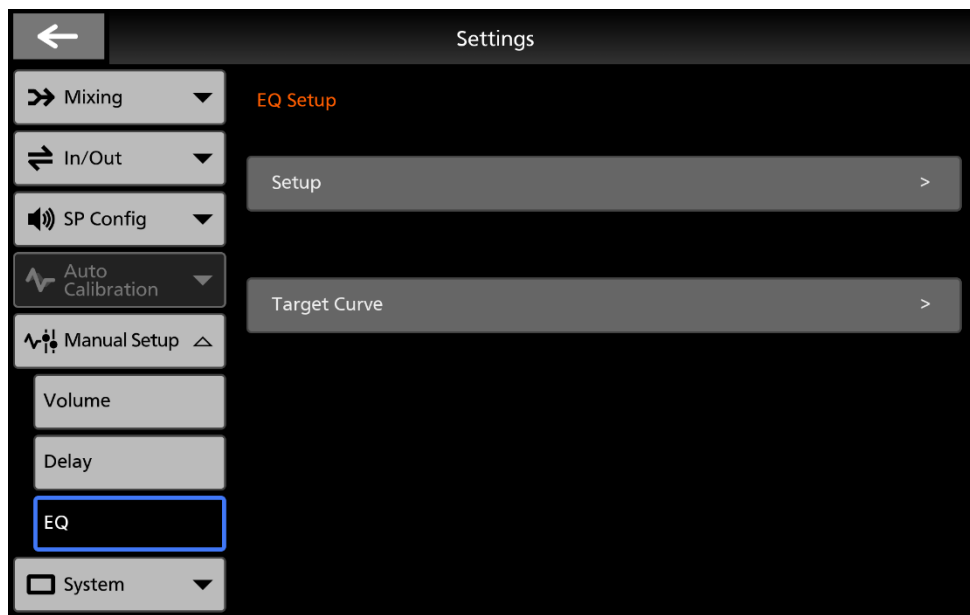


Setting Item 1	Setting Value
Speaker Ch Select the channels of the speakers you want to configure.	1 ~ 32 / PRE OUT L / PRE OUT R
Test Tone Output a sine wave with one cycle at regular intervals. Used for measuring delay amounts.	Impulse / <u>OFF</u>
Delay Set the delay value for each channel of the speaker. Set the delay amount by inputting the distance from the speaker to the listening position.	0.000 ~ <u>3.000</u> ~ 20.000m (0.004m Step)



Setting Item 1	Setting Value
Cancel This Speaker Reset the current speaker's delay settings to the default values.	
Cancel All Speaker Reset the delay settings of all speakers to their default values.	

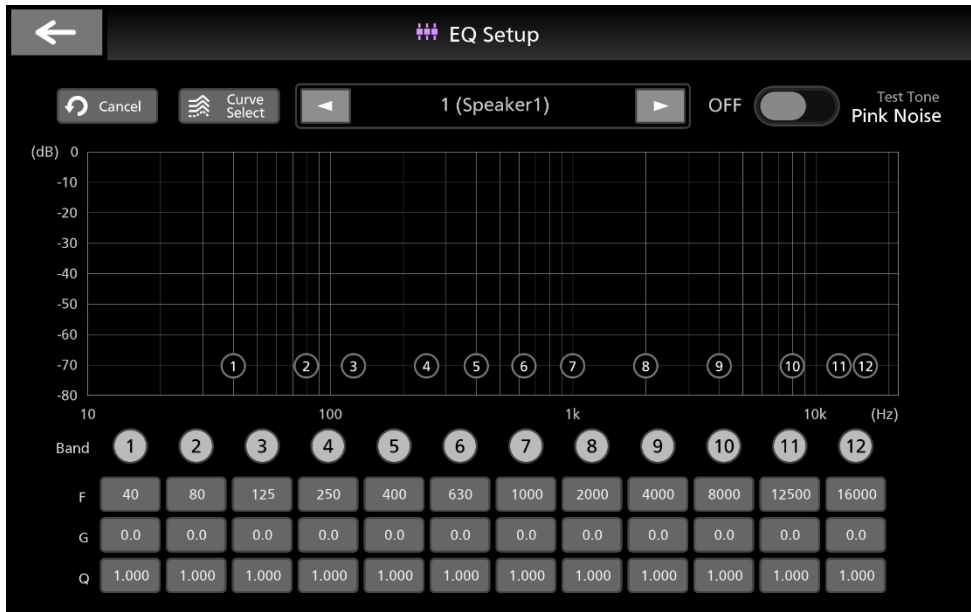
EQ



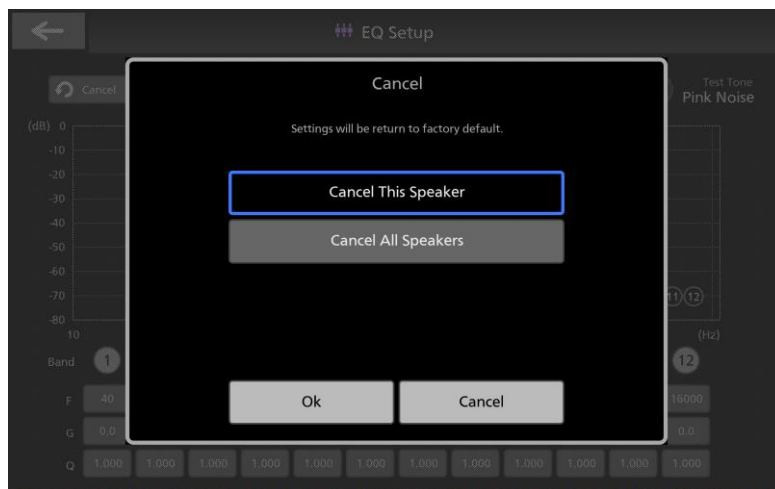
Setting Item 1	Setting Value
Setup	Transitions to the EQ Setup screen.
Target Curve	Transitions to the Target Curve screen.

EQ Setup

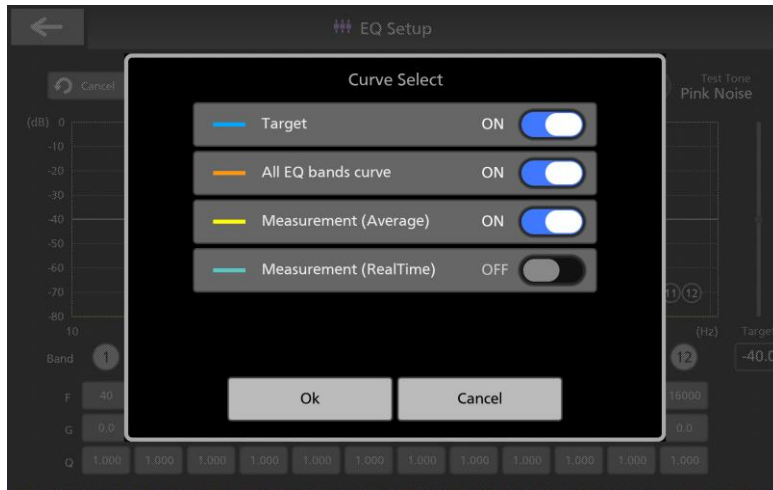
You can apply EQ to each speaker individually.



Setting Item 1	Setting Value
Speaker Ch Select the channel of the speaker you want to configure.	1 ~ 32
Test Tone Output pink noise. This is used when measuring frequency response characteristics.	Pink Noise / OFF
F Set the frequency.	20~22000Hz You can set it in 1Hz increments.
G Set the gain value.	-20.0 ~ 0.0 ~ +15.0dB You can set it in 0.1dB increments.
Q Set the bandwidth.	0.100 ~ 1.000 ~ 10.000 You can set it in 0.001 increments.
Cancel Transitions to the Cancel screen.	

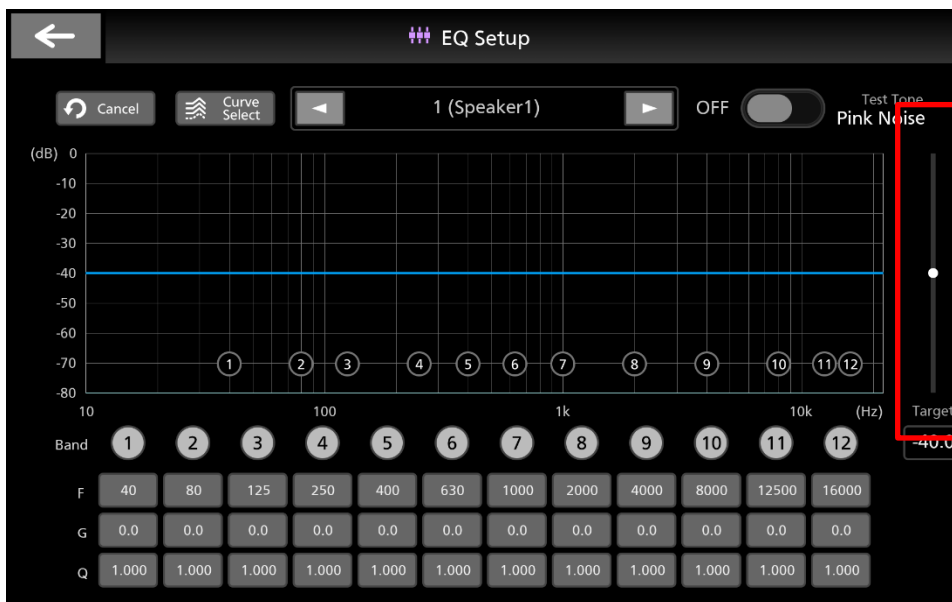


Setting Item 1	Setting Value
Cancel This Speaker Reset the current speaker's frequency, gain value, and bandwidth to their default values.	
Cancel All Speaker Reset all speakers' frequency, gain value, and bandwidth to their default values.	



Setting Item 1	Setting Value
Target Display the graph of the target frequency range.	ON / OFF
All EQ bands curve Display all filters.	ON / OFF
Measurement (Average) Display the measurement results of the average value.	ON / OFF
Measurement (Real Time) Display real-time measurement results.	ON / OFF

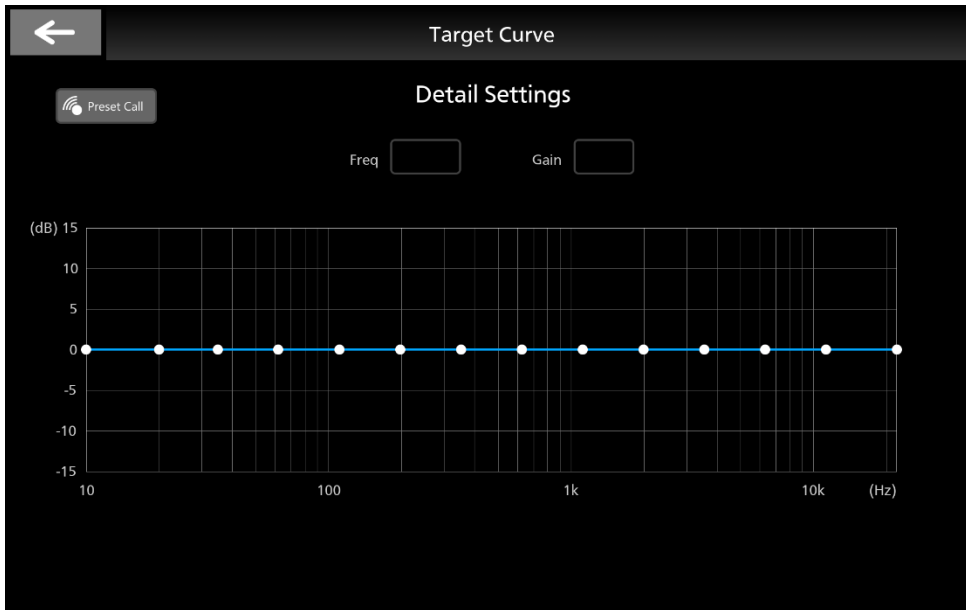
When you turn on Target in the Curve Select screen, the Target adjustment slider will appear on the right side of the screen.



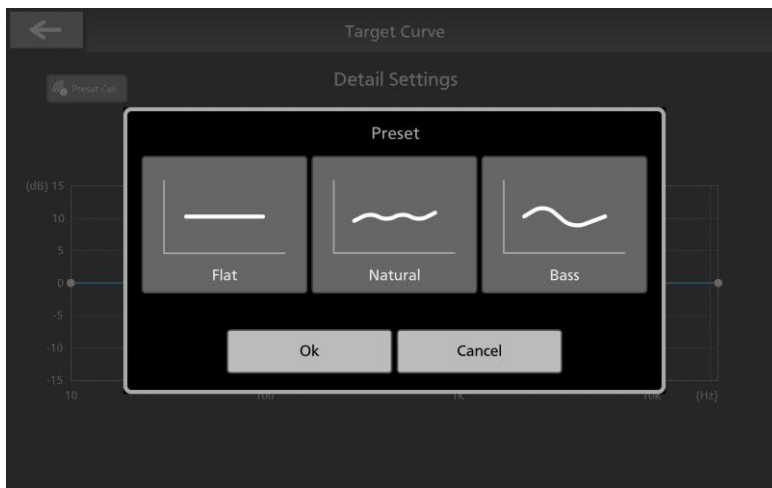
Setting Item 1	Setting Value
Target Set the offset value for the Target Curve to be adjusted.	-80.0 ~ -40.0 ~ 0.0

Target Curve

You can adjust the frequency range of the target.
Tap on any of the 14 points to adjust them freely.



Setting Item 1	Setting Value
Preset Call Call up the graph preset.	
Freq Display the frequency of the last-tapped point.	
Gain Display the gain value of the last-tapped point.	

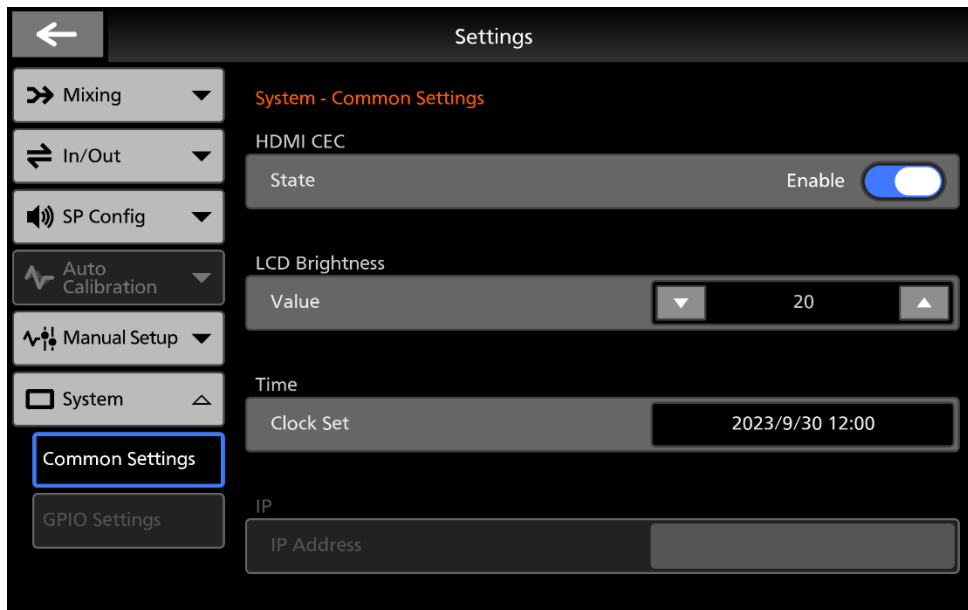


Setting Item 1	Setting Value
Preset Select the graph to call up.	Flat / Natural / Bass

3.1.7 System

You can configure the system settings of this device.

Common Settings



設定項目 1	設定値
HDMI CEC Set up the link with HDMI Control-compatible devices connected via HDMI.	Enable / Disable
LCD Brightness Value Adjust the brightness of the LCD monitor.	10 ~ <u>20</u> ~ 100
Time Clock Set Set the time on this device.	
IP Address Configure the IP Address of this device. Support is planned for version upgrades.	
Factory Default Reset settings to their default values.	
Version Upgrade Perform a version upgrade for PA-1853/RB-1853.	
All Memory Export Support is planned for version upgrades.	
All Memory Import Support is planned for version upgrades.	
Log File Export Export log files to a USB memory device.	

GPIO Settings

It is planned to be supported in a future version upgrade.

Chapter 4 Setup

In this chapter, we will explain the method for setting up input and output on the settings screen using the 22.2 channel speaker system as an example. When setting up, please make changes to the channel numbers and other settings to match your own system.

4.1 Connection Settings for this Device and Input Devices

1 Confirm that the power of this device is off.

If the power is on, please turn off the power switch on the back of the unit.

Confirm that this device is connected to the remote box.

※The remote box is required for input device settings.

Connect this device to your input device.

Connect the output terminal of your device (MADI/Dante/AES/Analog) to the corresponding input terminal of this device.

Turn on the power of this device.

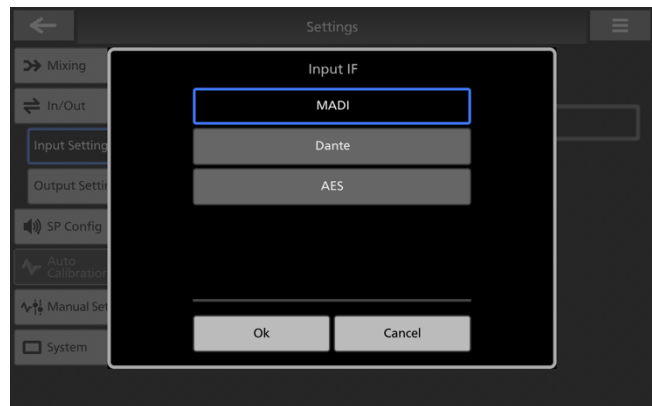
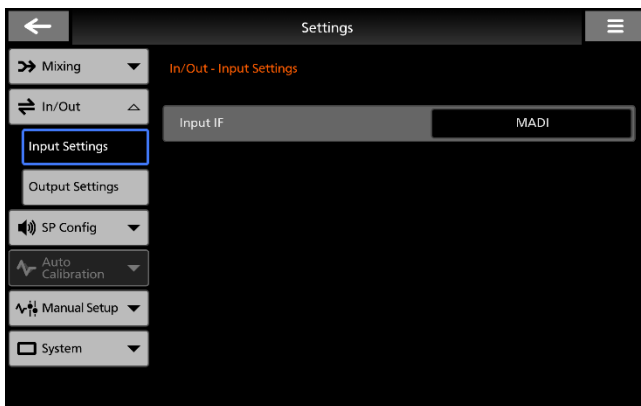
Switch the input interface of this device.

Press the "Settings" button displayed on the lower left of the touch panel on the remote box.

Then, select "In/Out" → "INPUT Settings" from the tabs on the left side of the screen.

Choose the terminal that matches the one you will be using from the INPUT IF section and switch the input interface.

Touch the 「OK」button and then tap the 「←」button on the top left of the screen to return to the home screen.



4.2 Speaker Configuration Settings

1 Navigate to "SP Config" → "Manual Settings" from the settings screen.

Configure the speaker type:

Small : Applies a high-pass filter at the crossover frequency.

Large : Does not set a crossover frequency.

Subwoofer : Applies a low-pass filter at the crossover frequency.

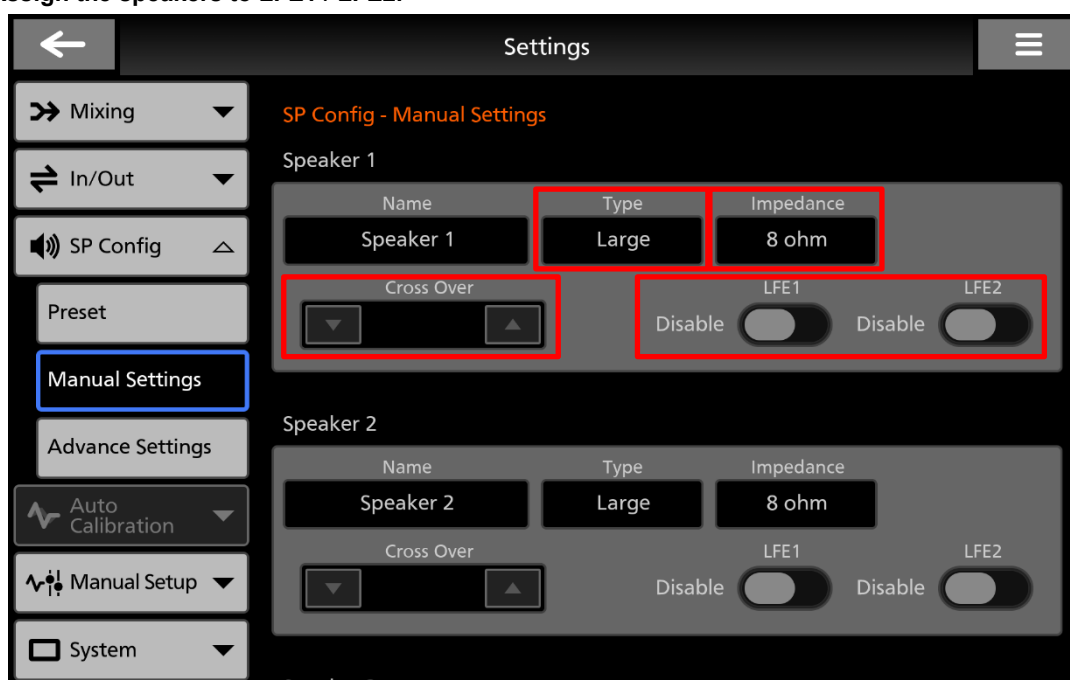
Tweeter : Applies a high-pass filter at a frequency higher than Small.

Set the speaker impedance.

Set the crossover frequency.

Note that when "Large" is selected as the speaker type, you cannot set a crossover frequency.

Assign the speakers to LFE1 / LFE2.



Furthermore, we have prepared presets for the following specifications.

To select a preset, go to the 「Settings」 menu, then navigate to SP Config → Preset → Preset Data.

When you apply the preset 22.2(SA-1852), it will also configure the mixing settings as described later.

Preset Name	Purpose
22.2(SA-1852)	Preset for our product, chair-type 22.2ch speaker 「TamaToon」
22.2	Preset for 22.2ch (compliant with ARIB STD-B59)
7.1.4	Preset for 7.1.4ch (7 mid channels, 4 high channels, 1 subwoofer channel)
7.1.2	Preset for 7.1.2ch (7 mid channels, 2 high channels, 1 subwoofer channel)
7.1	Preset for 7.1ch (7 mid channels, no high channels, 1 subwoofer channel)
5.1.4	Preset for 5.1.4ch (5 mid channels, 4 high channels, 1 subwoofer channel)
5.1.2	Preset for 5.1.2ch (5 mid channels, 2 high channels, 1 subwoofer channel)
5.1	Preset for 5.1ch (5 mid channels, no high channels, 1 subwoofer channel)
none	No preset configuration

4.3 Routing Input/Output Signals

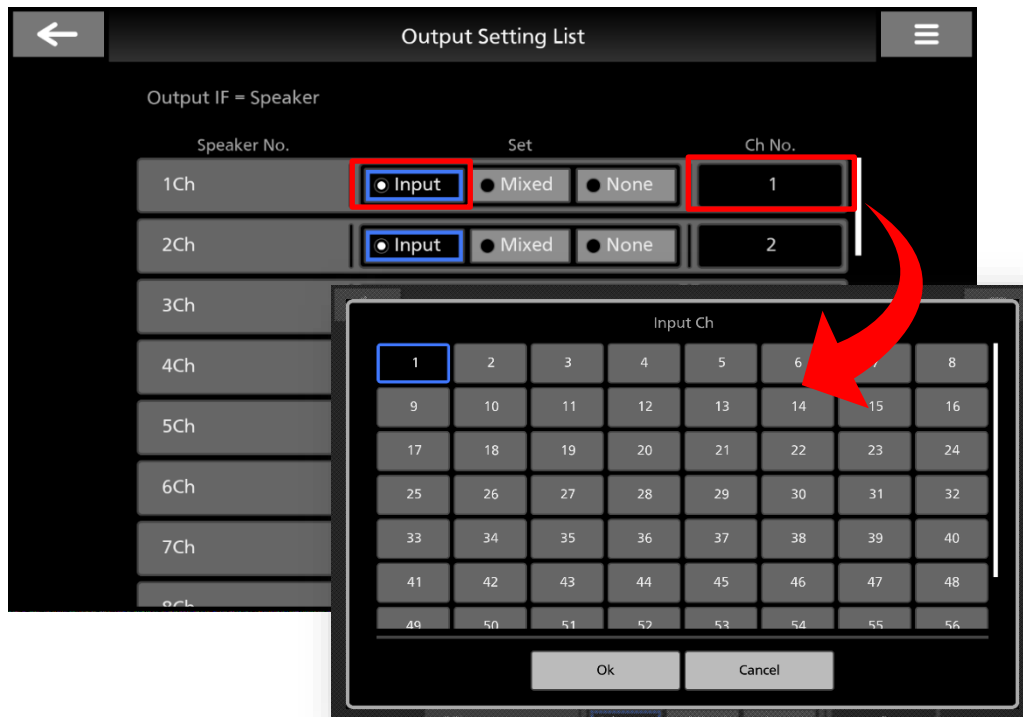
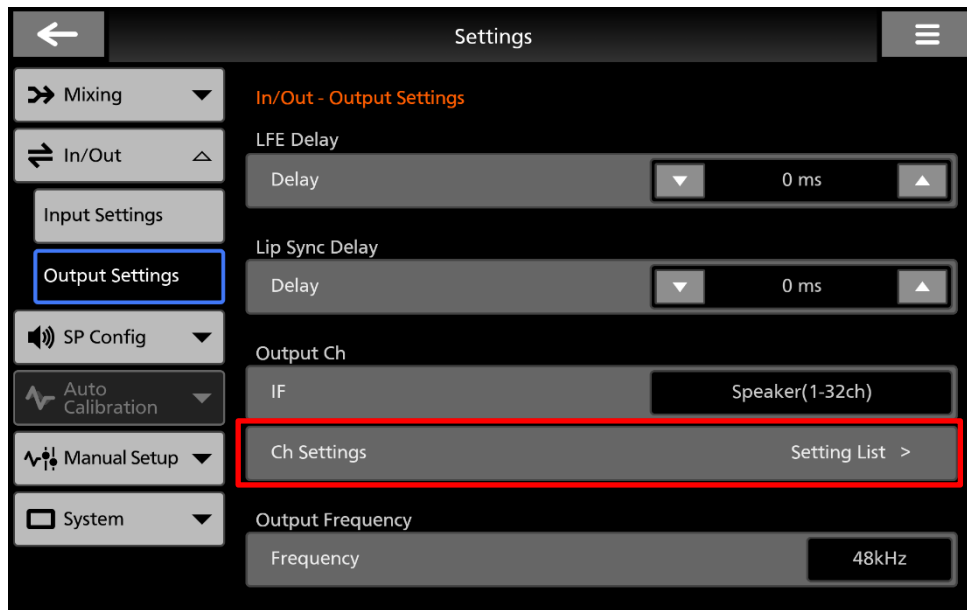
You can assign the signals input into this device to any speaker (hereafter referred to as output channels).

- 1 From the settings screen, navigate to In/Out → Output Settings.

Move to the Ch Settings List screen.

Set the assignment mode for the desired output channel to Input (1 to 1).

Set the input channel from the Ch No. selection button.



4.4 Mixing

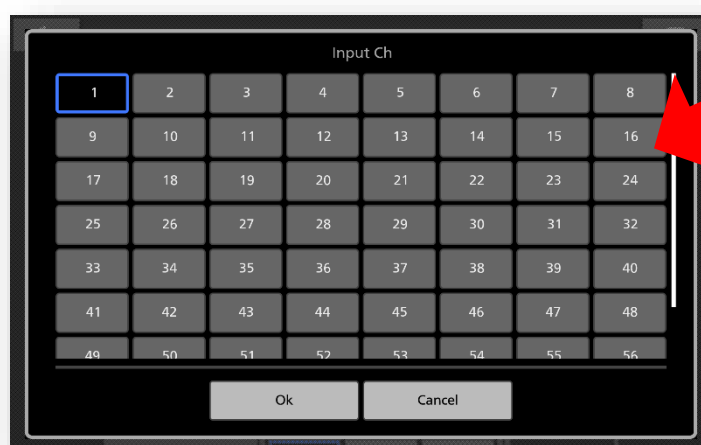
If you want to output audio from multiple input channels to a single speaker, such as our product, the 22.2ch chair-type speaker 「TamaToon」, you can use the mixing function.

1 Navigate to Mixing → Mixing Settings from the settings screen.

Select the Mixed Ch you want to use.

From Add Ch, choose the input channels you want to include in the Mixed Ch.

Adjust the level and phase for each channel as needed, depending on your application.

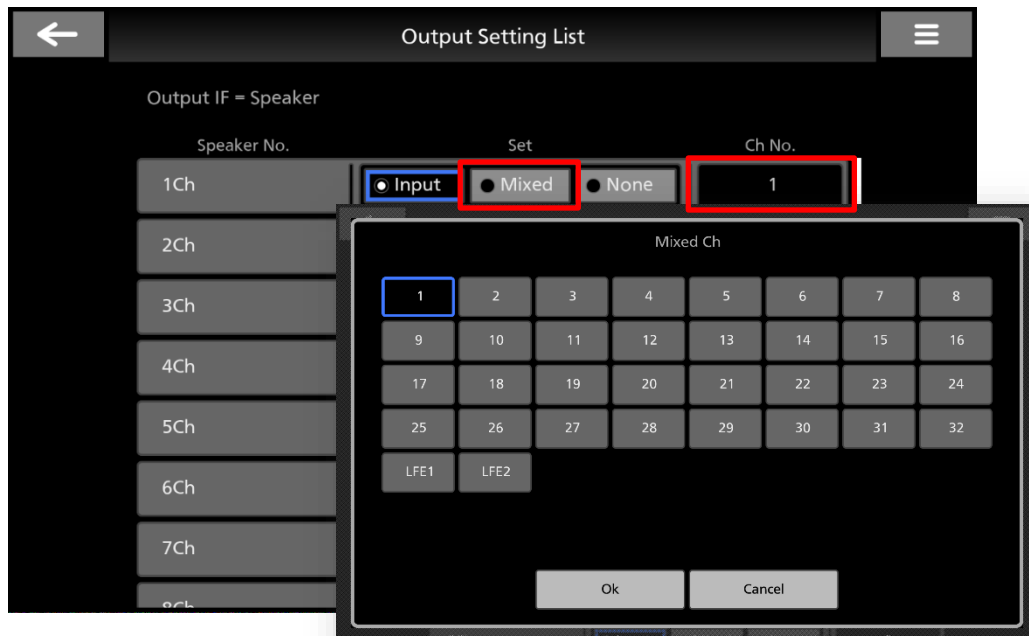
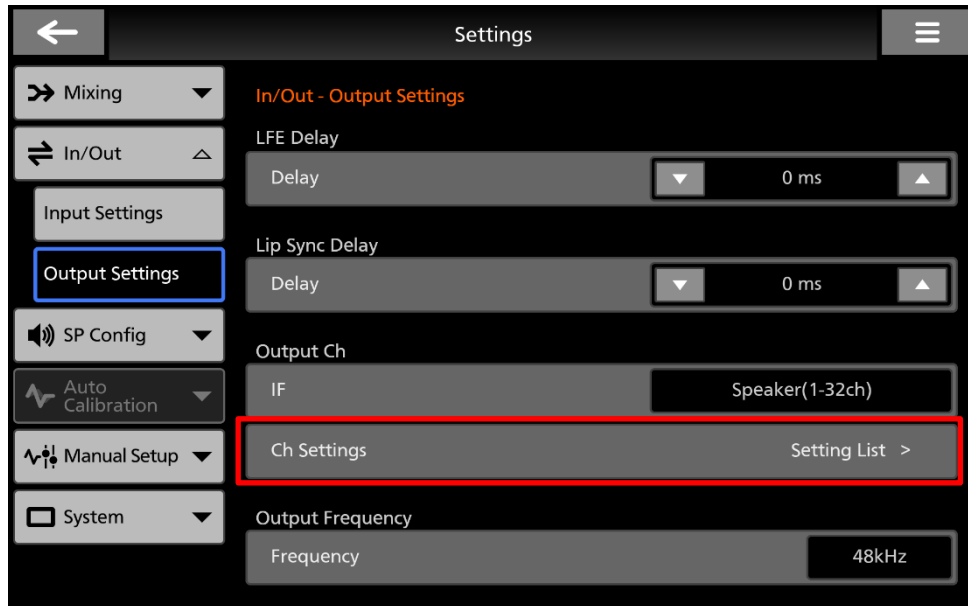


2 Next, assign the created Mixed Ch to a speaker. Go to In/Out → Output Settings from the settings screen.

Move to the Ch Settings List screen.

Set the assignment mode for the desired output channel to Mixed (1 to Many).

Set the Mixed Ch from the Ch No. selection button.

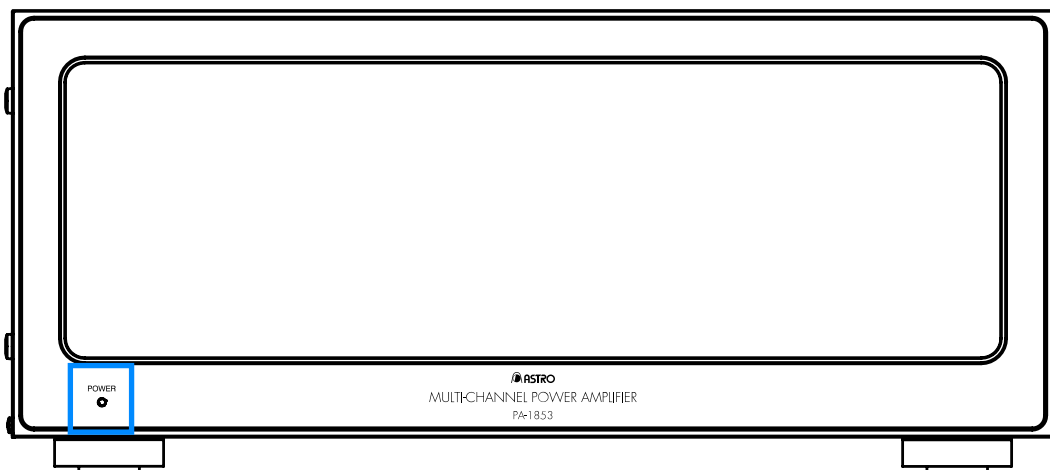
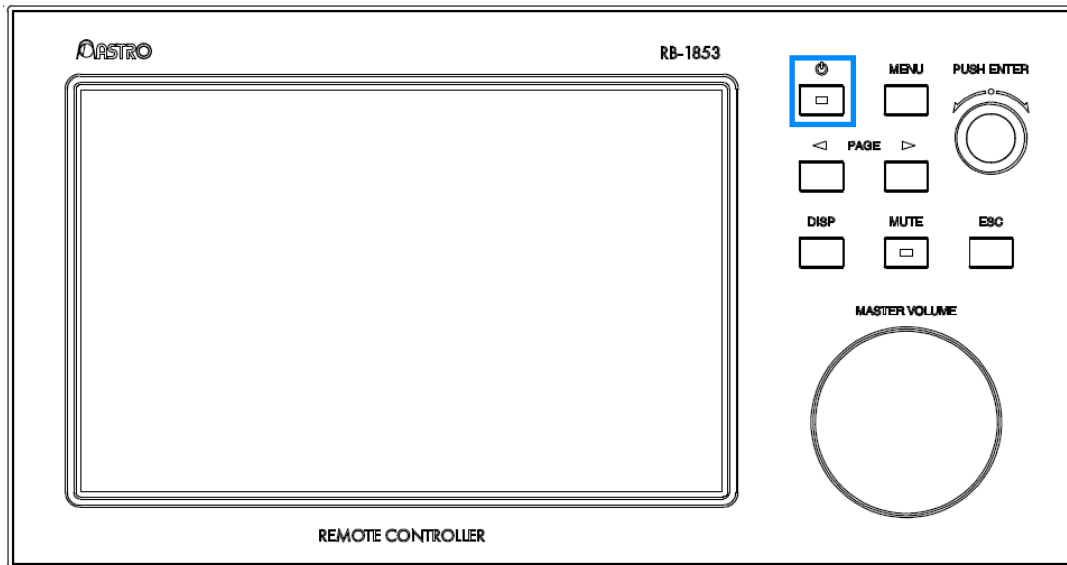


Chapter 5 Feature Introduction

In this chapter, we will introduce the functions of this device, explain how to operate it, important notes, and settings.

5.1 Standby Mode

By pressing and holding the power button on the remote box for 3 seconds, the device enters standby mode. You can return from standby mode by pressing the power button while in standby. In standby mode, the display on the remote box turns off, and audio output is muted. When in standby mode, the LED on the power button of the remote box turns off, and the device's power indicator blinks red.

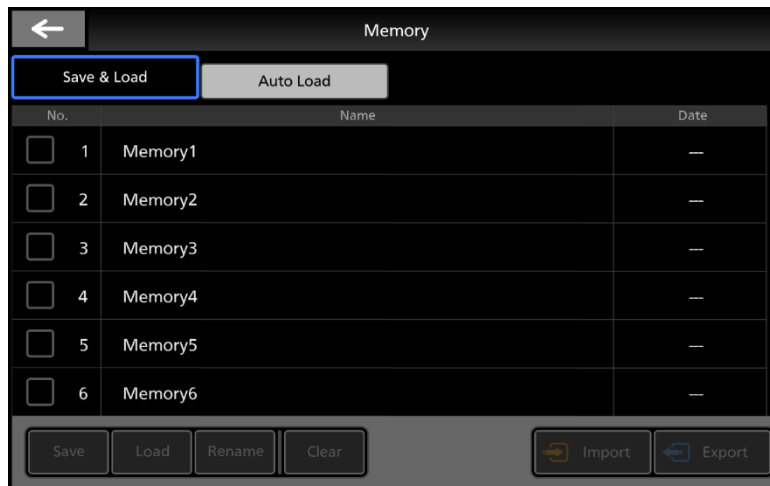


5.2 User Memory Function

This device is equipped with a user memory function that allows you to save and recall your settings. The user memory function allows you to save and recall the following settings:

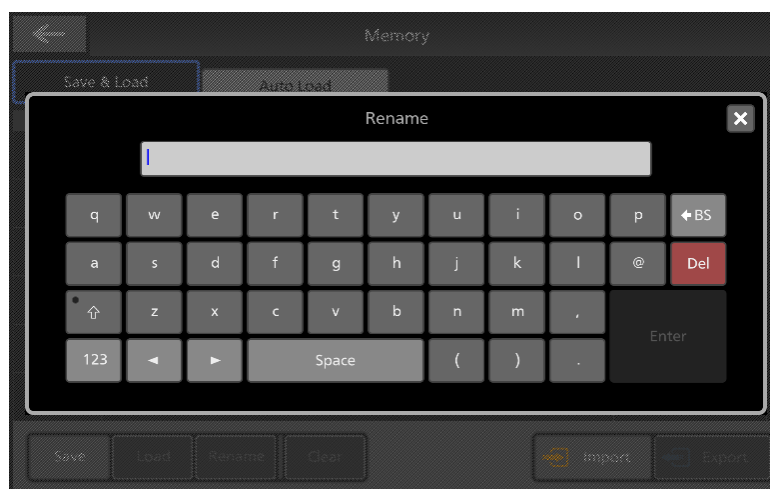
- Mixing Settings
- In/Out
- SP Config
- Manual Setup

Here are the procedures for saving or recalling user memories, as well as instructions for renaming and deleting saved user memories:



● Saving Procedure

- 3 Navigate to the **Save & Load** tab from the User Memory Selection screen.
- 4 Tap the checkbox for the desired Memory No. (Multiple selections are not allowed).
- 5 Tap the **Save** button.
- 6 A confirmation popup for saving the user memory will appear. Tap **OK** to confirm. If it has not been saved to the selected Memory No., save it after setting a name.



● **Recalling Procedure**

- 1** Go to the Save & Load tab from the User Memory Selection screen.
- 2** Tap the checkbox for the desired Memory No. (Multiple selections are not allowed).
- 3** Tap the Load button.
- 4** A confirmation popup for recalling the user memory will appear. Tap OK to confirm.

● **Renaming Procedure**

- 1** Access the Save & Load tab from the User Memory Selection screen.
- 2** Tap the checkbox for the desired Memory No. (Multiple selections are not allowed).
- 3** Tap the Rename button.
- 4** A software keyboard will appear. Enter the desired name and tap Enter.

● **Deletion Procedure**

- 1** Navigate to the Save & Load tab from the User Memory Selection screen.
- 2** Tap the checkbox for the desired Memory No. (Multiple selections are allowed).
- 3** Tap the Clear button.
- 4** A confirmation popup for deleting the user memory will appear. Tap OK to confirm.

● **USB Memory Output Procedure**

- 1** Go to the Save & Load tab from the User Memory Selection screen.
- 2** Tap the checkbox for the desired Memory No. (Multiple selections are not allowed).
- 3** Tap the Export button.
- 4** A confirmation popup for exporting the user memory will appear. Tap OK to confirm.

● **Importing from USB Memory**

- 1** Access the Save & Load tab from the User Memory Selection screen.
- 2** Tap the checkbox for the desired Memory No. (Multiple selections are not allowed).
- 3** Tap the Import button.
- 4** A confirmation popup for importing the user memory will appear. Tap OK to confirm.

5.3 Converting Multi-Channel Audio Sources to Binaural and Transaural Audio Sources

5.3.1 Binaural Conversion

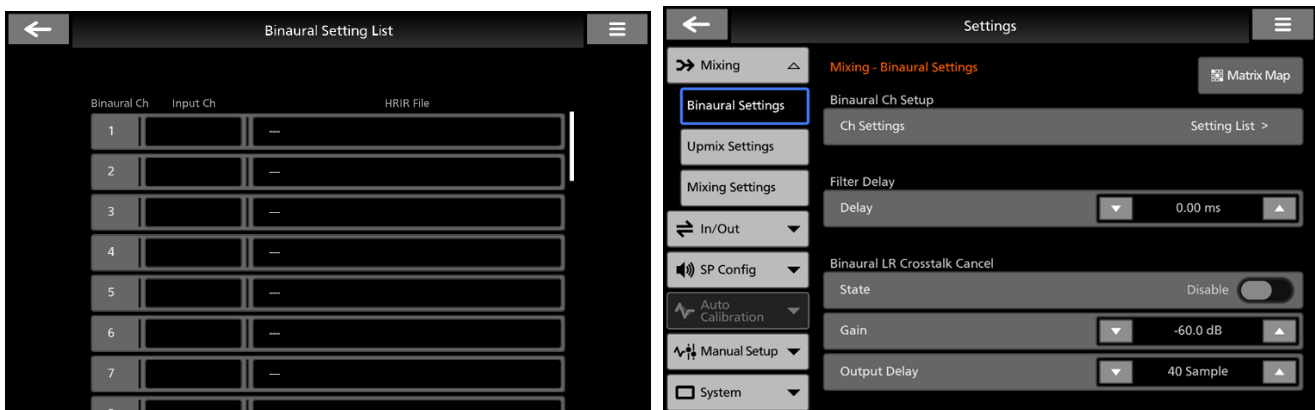
Binaural audio refers to the mechanism of perceiving three-dimensional sound using a two-channel audio source, such as headphones or earphones. When we naturally distinguish the position of sound, we unconsciously recognize the information related to reflections and changes in frequency characteristics caused by the shape of our heads and ears. We utilize this information to determine the direction of sound. The changes in sound caused by the shape of the head and ears are referred to as Head Response Transfer Function (HRTF) or Head Response Impulse Response (HRIR). Since the shape of the head varies from person to person, HRTF also varies among individuals.

This device can convert multi-channel audio sources like 22.2ch or 7.1.4ch into binaural audio sources. To create binaural audio optimized for an individual, you will need a sofa file or wav file that contains the measured HRTF data for that individual.

Here is how to apply a sofa file or wav file to create a binaural audio source:

- 1 Insert a USB memory containing the sofa file or wav file into the USB port of this device.
- 2 From the settings screen, go to **Mixing** → **Binaural Settings** → **HRIR File**. Select the input channel for which you want to apply HRTF and choose the HRTF file you want to use.
- 3 From the settings screen, go to **Mixing** → **Mixing Settings**. Change any desired **Mixed Ch** to **Binaural** and assign the L and R channels of the binaural input channel you want to use to separate **Mixed** channels.
- 4 Refer to section 4.4 **Mixing** to assign the **Mixed** channels you created in step 3 to the output channels. Assign the binaural input channel L to the left side of the output and R to the right side.
- 5 From the settings screen, go to **Mixing** → **Binaural Settings** → **Filter Delay**. Adjust the **Filter Delay** value to compensate for the delay according to the incurred delay amount.

※You need to create the sofa file yourself.



5.3.2 Transaural Conversion

Transaural technology applies binaural techniques to speakers. For example, techniques that reproduce three-dimensional sound using a soundbar fall under transaural technology. When playing audio through two speakers, typically labeled as L (left) and R (right), the sound emitted from the L speaker reaches not only the left ear but also wraps around the head and reaches the right ear. The same occurs with the R speaker. This phenomenon is known as crosstalk.

Crosstalk that occurs in this manner becomes a hindrance to proper listening when playing binaural audio through speakers. To mitigate this, an out-of-phase sound, canceling out the crosstalk that leaks from one ear to the other, is reproduced from the opposite speaker. This is referred to as crosstalk cancellation. Leveraging crosstalk cancellation allows for correct listening of binaural audio through speakers.

This device is equipped with a function to perform crosstalk cancellation and convert multi-channel audio sources into transaural audio sources. Below are the steps to create transaural audio sources:

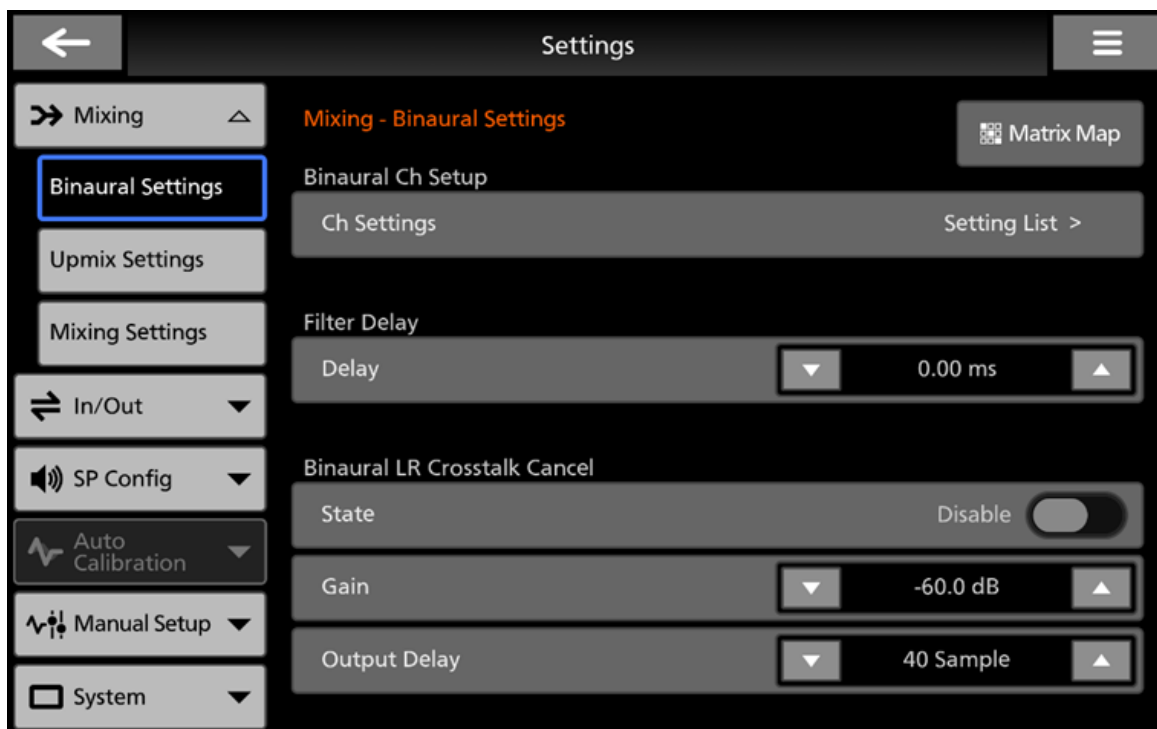
1 Follow the steps from 5.3.1 to create a binaural audio source and assign output channels to the speakers.

From the settings screen, go to **Mixing** → **Binaural Settings** → **LR Crosstalk Cancel** and set **State** to **Enable**.

Set the 「Output Delay」. To determine the value, measure the distance between both ears. You can calculate the number of samples to delay using the following formula:

$$\text{Distance between both ears [cm]} / 0.3541 = \text{Number of Samples}$$

Adjust the gain in 「Gain」 for the out-of-phase signal. Typically, a low volume is sufficient. Adjust this at the listening position.

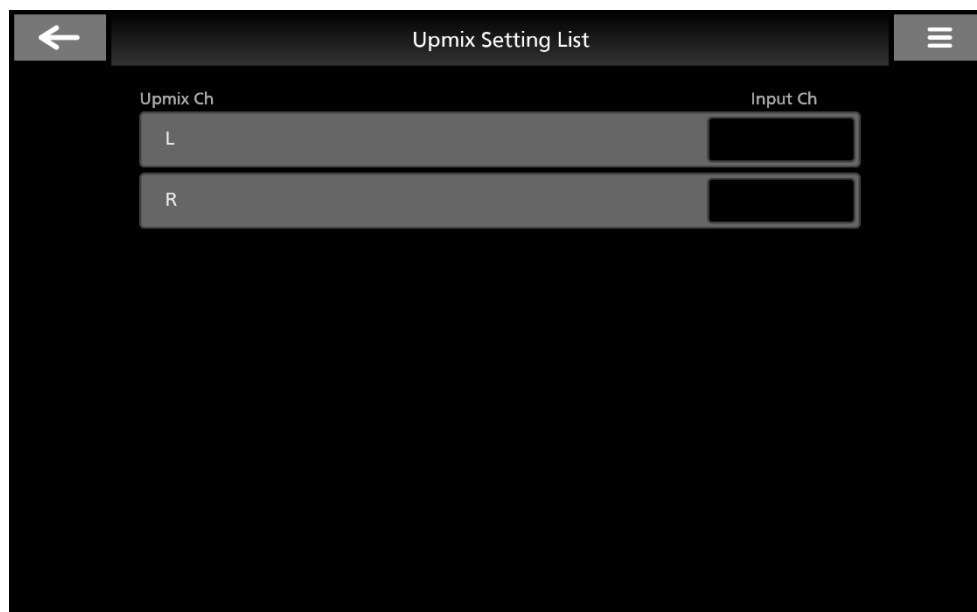
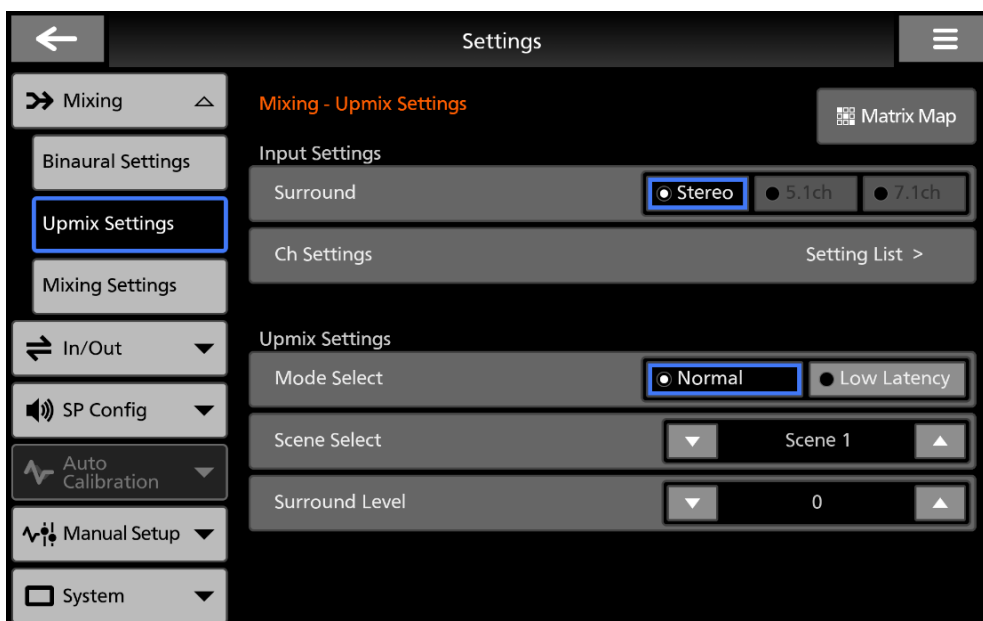


5.4 Upmixing 2ch Stereo Audio Sources to 22.2ch Multi-Channel Audio Sources

This device can upmix 2ch stereo audio sources to 22.2ch multi-channel audio sources.

Here's how to perform the upmix:

- 1 From the settings screen, go to **Mixing** → **Upmix Settings** → **Ch Settings**.
- 2 Select the input channel of the audio source you want to upmix and assign it to L (left) and R (right).
- 3 Optionally, set **Scene Select** and **Surround Level** according to your preferences.
- 4 From the settings screen, go to **Mixing** → **Mixing Settings**. Change any desired **Mixed Ch** to **Upmix** and apply the upmix input channels you want to use to separate **Mixed** channels.
- 5 Refer to section 4.4 **Mixing** to assign the **Mixed** channels you created in step 4 to the output channels.



5.5 Calibration Function

To ensure that the audio is heard correctly, calibration is necessary based on the speakers, playback environment, and listening position. This device allows for calibration of volume, delay, and EQ.

※Automatic calibration will be available after a software update.

Here, we explain how to perform calibration manually:

5.5.1 Manual Calibration

In manual calibration, you can perform detailed settings for Volume, Delay, and EQ in that order. Make sure to follow the sequence of EQ → Volume → Delay to ensure proper volume settings.

Volume

You can set the volume and mute on/off for each speaker.

You can also output pink noise to check speaker connections and volume.

● Adjustment Procedure

1 Connect a microphone to the MIC IN port on the device.

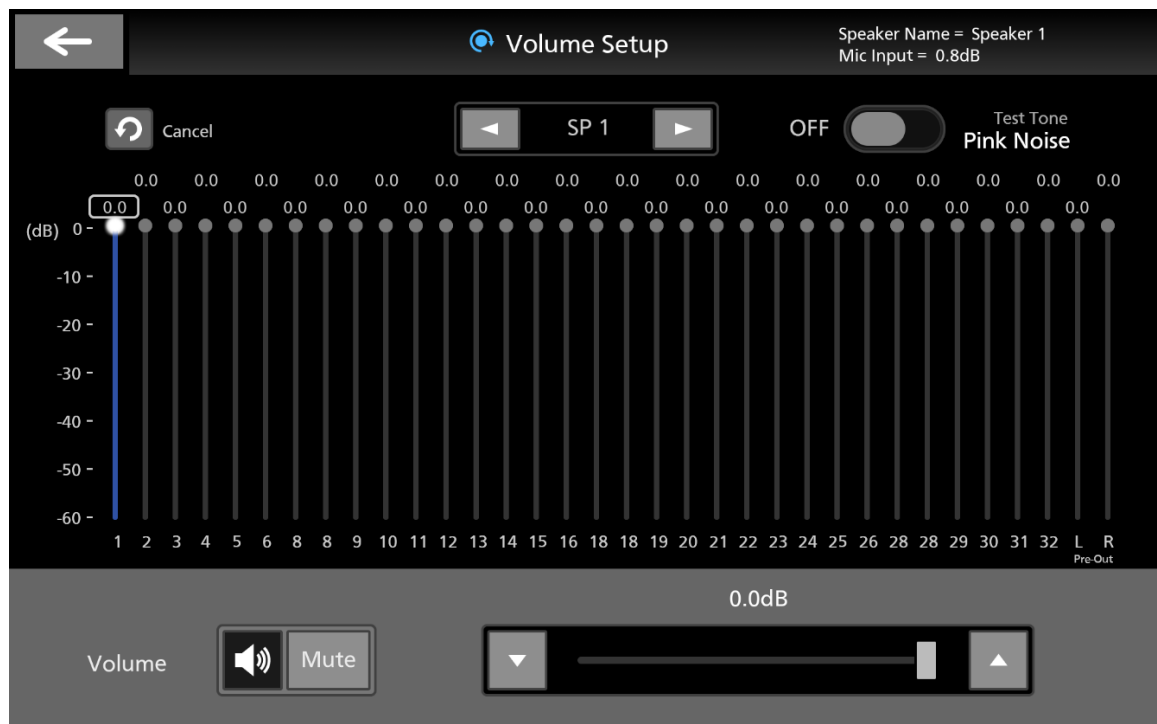
From the settings screen, go to **Manual Settings** → **Volume**.

Select the speaker for which you want to change the volume.

You can switch speakers using the ◀/▶ buttons on the screen or the ◀/▶ buttons on the remote box.

Use the ▲/▼ buttons on the screen to adjust the speaker's volume.

Repeat steps 3~4 for all the speakers you want to adjust.



Delay

You can set the delay for each speaker and measure the speaker's delay due to distance using a one-cycle sine wave.

● Adjustment Procedure

1 Connect a microphone to the MIC IN port on the device.

From the settings screen, go to **Manual Settings** → **Delay**.

Select the speaker for which you want to set the delay.

You can switch speakers using the ◀/▶ buttons on the screen or the ◀/▶ buttons on the remote box.

Measure the distance from the listening position to the selected speaker.

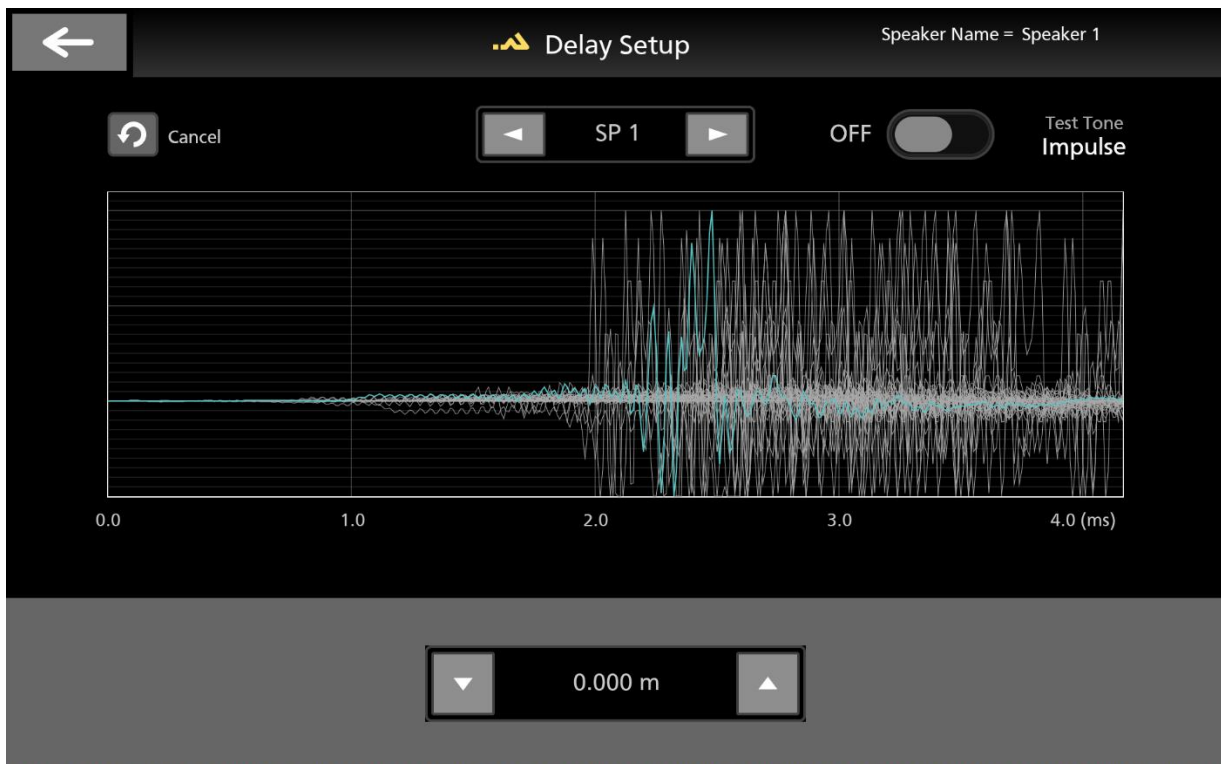
Input the distance between the speaker and the listening position using the ▲/▼ buttons on the screen.

Place the microphone at the listening position, turn on Impulse on the top right of the screen, and start the measurement.

Ensure that the starting positions of the white graph (reference) and the colored graph (measurement) on the screen match.

If they don't match, check if the microphone position matches the listening position.

Repeat steps 3~7 for all the speakers you want to adjust.



EQ

You can set the equalizer (EQ) values for each speaker to customize the speaker's frequency response or compensate for changes in characteristics due to the playback environment.

● Adjustment Procedure

1 Connect a microphone to the MIC IN port on the device.

From the settings screen, go to **Manual Settings** → **EQ**.

Ensure that the frequency response of the recorded audio is displayed on the central graph.

Select or deselect graphs to display as needed.

You can turn on/off graphs for

- Measured Value (Average)
- Measured Value (Real-Time)

using **Curve Select** in the top left of the screen.

Select the speaker for which you want to change the EQ settings.

You can switch speakers using the ◀/▶ buttons on the screen or the ◀/▶ buttons on the remote box.

Perform EQ settings at the bottom of the screen.

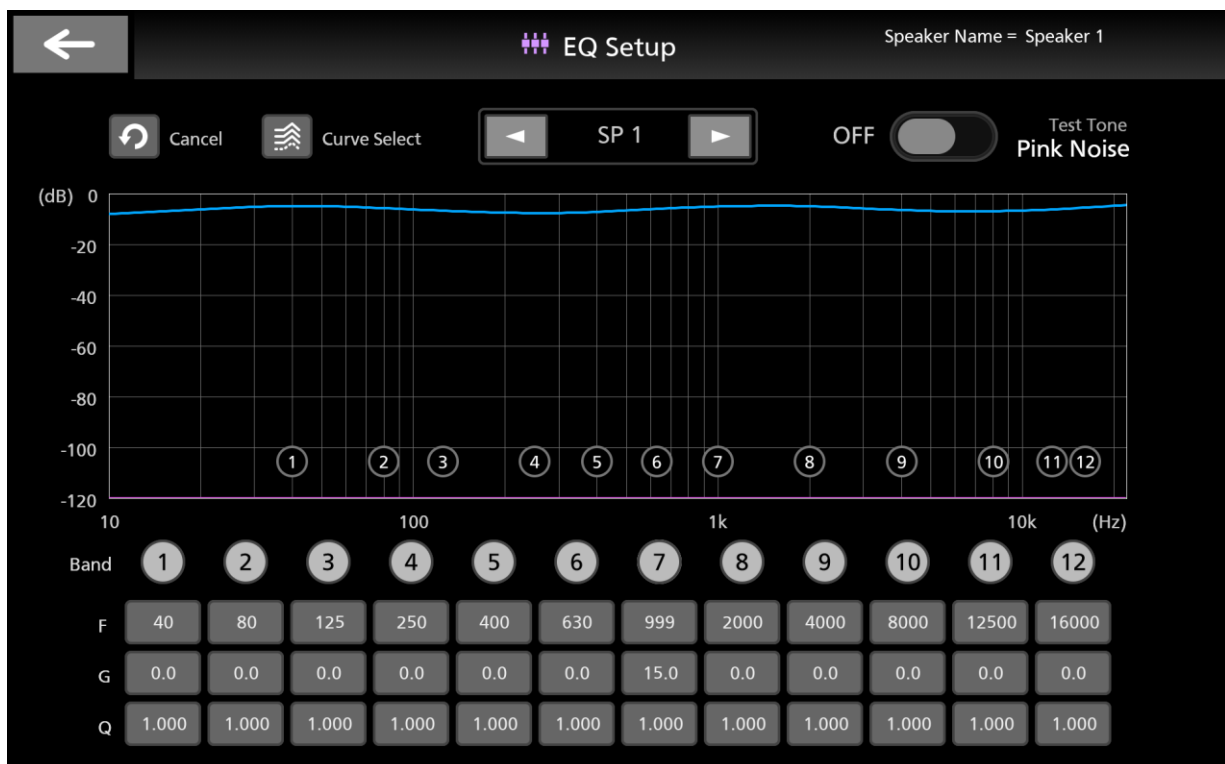
F, G, and Q correspond to frequency, gain, and Q value, respectively.

Place the microphone at the listening position, turn on **Pink Noise** on the top right of the screen, and start the measurement.

Check if the measured frequency response (average) matches your expectations.

If it doesn't match, adjust the EQ values.

Repeat steps 5~8 for all the speakers you want to adjust.



5.6 Firmware Update

This device allows for firmware updates for both the main unit and the remote box. Below are the steps for updating the firmware:

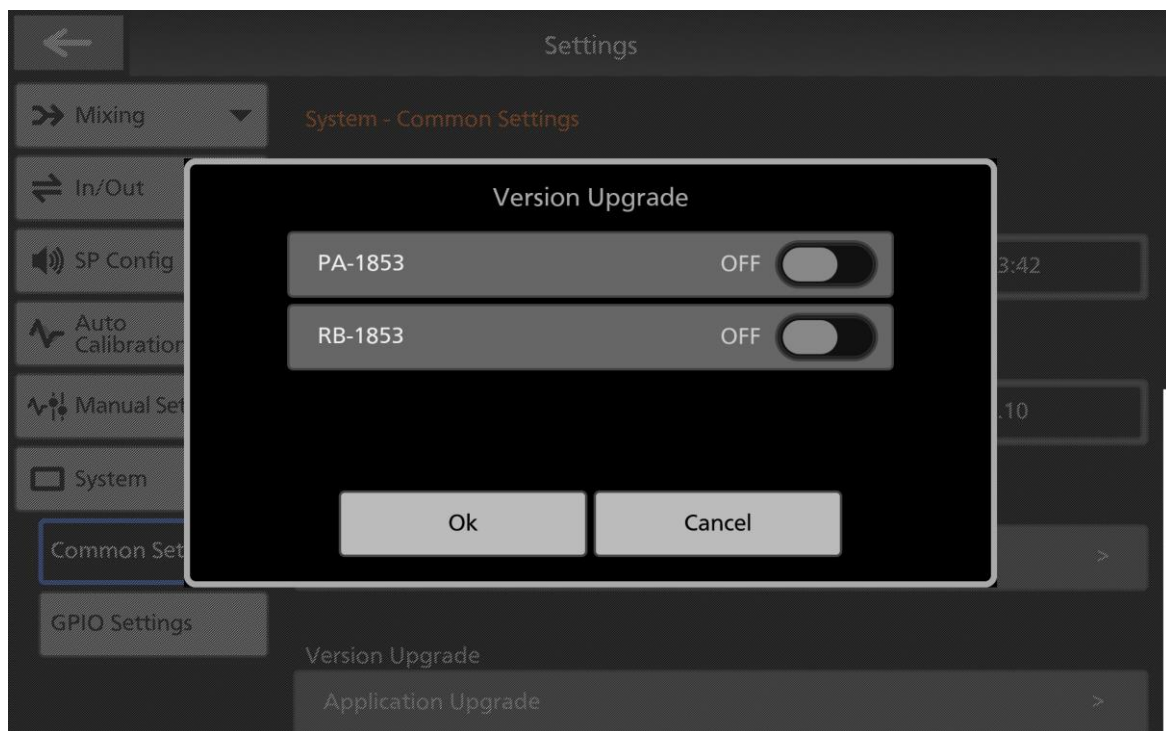
● Update Procedure

- 1 Insert a USB drive containing the update file into the USB port of either the main unit or the remote box, depending on which device you want to update.**

If you are updating the main unit, connect the USB drive to the main unit's USB port. If you are updating the remote box, connect it to the remote box's USB port.

Ensure that the update file is located directly under the USB drive's root directory and is placed in a folder named "PA1853" for the main unit or "RB1853" for the remote box.

- 2 From the settings screen, navigate to Common Settings → Version Upgrade.**
- 3 Toggle the button for the device you want to update to ON and select OK.**
- 4 The update process will begin. Do not turn off the power during the update.**
- 5 Once the update is complete, restart the main unit.**



Chapter 6 Troubleshooting

This chapter describes what to do if the unit does not operate normally.

6.1 When the Device Doesn't Function Properly

If the device is not functioning correctly, please refer to the following table and take appropriate action. If the issue persists, please contact your dealer or ASTRODESIGN, Inc. sales department.

Symptom	Checkpoints	Action
No sound	1. Is the correct input format selected? 2. Are input channel settings correct?	1. Refer to 3.1 List of Setting Items → Settings Screen → In/Out → Input Settings → Input IF and select the appropriate input format following the steps. 2. Check the INPUT menu → Input Select settings.
Sound is too low	Are you continuously outputting at high volume?	Continuous high-volume output may trigger the safe mode, resulting in reduced volume. Lower the volume and power cycle the device.
Power lamp blinking	1. Is the device in the process of starting up? 2. Did the blinking occur during device use?	1. The device's power lamp blinks during startup. Please wait until the startup process is complete. 2. If the power lamp blinks after the startup process and during device use, it may indicate that the fan has stopped, or the amplifier's function has ceased. In such cases, turn off the device, wait for it to cool down, and then power it on again. If the blinking persists, discontinue use, unplug the power cable, and

contact your dealer or ASTRODESIGN, Inc. sales department.

MEMO

- Due to the nature of LCDs, the following phenomena may occur, but they are not indicative of a malfunction:
 - The response time, brightness, and color of the LCD may vary with changes in ambient temperature.
 - You might notice brightness irregularities, flickering, vertical lines, or subtle spots on the screen.
 - The optical characteristics, such as brightness and display irregularities, may change over time, especially in low-temperature environments.
 - The displayed colors may appear differently depending on your line of sight.
 - Some noise or artifacts may appear on the startup screen.
 - If you display fixed patterns for an extended period, you might notice image retention or ghosting.

6.2 If Abnormalities or Malfunctions Occur

Please stop using the device, unplug the power cable, and contact your dealer or ASTRODESIGN, Inc. sales department.

Regarding damage to the LCD panel, it will be subject to paid repair or replacement regardless of the warranty period.

Chapter 7 Specifications of the Device

In this chapter, we will provide details about the specifications of the device.

7.1 Input Signal Formats

7.1.1 Audio Signals

Input Specifications	Specifications
AES Input	Standard: Unbalanced AES Bit Depth: 24-bit PCM Sampling Frequency: 48 kHz Impedance: 75Ω
Analog Input (LINE IN)	2-channel analog unbalanced Maximum Allowable Input: 2.6V
MADI Input	Sampling Frequency: 48 kHz Bit Depth: 24-bit PCM Number of Channels: 64 channels (32 channels at 96 kHz) Impedance: 75Ω
Dante Input	Sampling Frequency: 48 kHz Bit Depth: 24-bit PCM Number of Channels: 64 channels (32 channels at 96 kHz) Redundant connection using Primary/Secondary ports or daisy-chain connection is possible.
XLR Input (MIC IN)	Analog 1 channel Supports +48V phantom power Microphone input terminal for calibration purposes
HDMI Input	Sampling Frequency: 48kHz Bit Depth: 24-bit PCM Number of Channels: 8 channels Supported Compression Formats: MPEG4-AAC (22.2 channels, 5.1 channels, 2 channels) MPEG2-AAC (5.1 channels, 2 channels)

7.2 Output Signal Specifications

7.2.1 Audio Signal

Output Specifications	Specifications
AES Output	Standard: Unbalanced AES Sampling Frequency: 48/96kHz Bit Depth: 24-bit PCM Impedance: 75Ω
MADI Output	Sampling Frequency: 48/96kHz Bit Depth: 24-bit PCM Channel Count: 64 channels Impedance: 75Ω
Analog Output (PRE OUT)	2-channel balanced analog output Maximum Output Level: 2.0V
Dante Output	Sampling Frequency: 48kHz Bit Depth: 24-bit PCM Channel Count: 64 channels Redundant connection using Primary/Secondary ports or daisy-chaining for multiple connections is possible.
HDMI Output	Sampling Frequency: 48kHz Bit Depth: 24-bit PCM Number of Channels: 8 channels Supports eARC/ARC

7.3 External Control

External Control	Specifications
Contact Control	GPIO
LAN	10/100/1000BASE-T

7.4 Audio Specifications

Item	Specifications
Rated Output (20Hz – 20kHz, THD+N less than 1%, 1ch driven):	3Ω 175W 4Ω 140W
Maximum Practical Output (1kHz, THD+N 10%, 1ch driven):	3Ω 220W 4Ω 175W
Compatible Impedance	3Ω~16Ω
Frequency Response	10 Hz~40 kHz
S/N	88 dB
THD+N (-20dBFS 1kHz sine wave input)	0.005%
Audio Input/Output Terminals	Dante Input/Output, MADI Input/Output ×1, Analog Audio UR Input ×1, Pre-out L/R ×1, AES3id Input/Output ×1

7.5 General Specifications

Item	Specifications
Operating Temperature Range	0~40°C
Operating Humidity Range	30~80%RH (non-condensing, at ambient temperature of 0°C to 40°C)
Dimensions	PA-1853: 430(W)×177(H)×380(D) mm (excluding protrusions) EIA 4U RB-1853: 252.4(W)×133(H)×34(D) mm (excluding protrusions)
Weight	Main Unit 14kg, Remote Box 0.8kg
Rated Voltage AC Input	AC100-240V 50/60Hz
Power Consumption	AC100V: 384W AC240V: 380W

7.6 LCD Panel Specifications

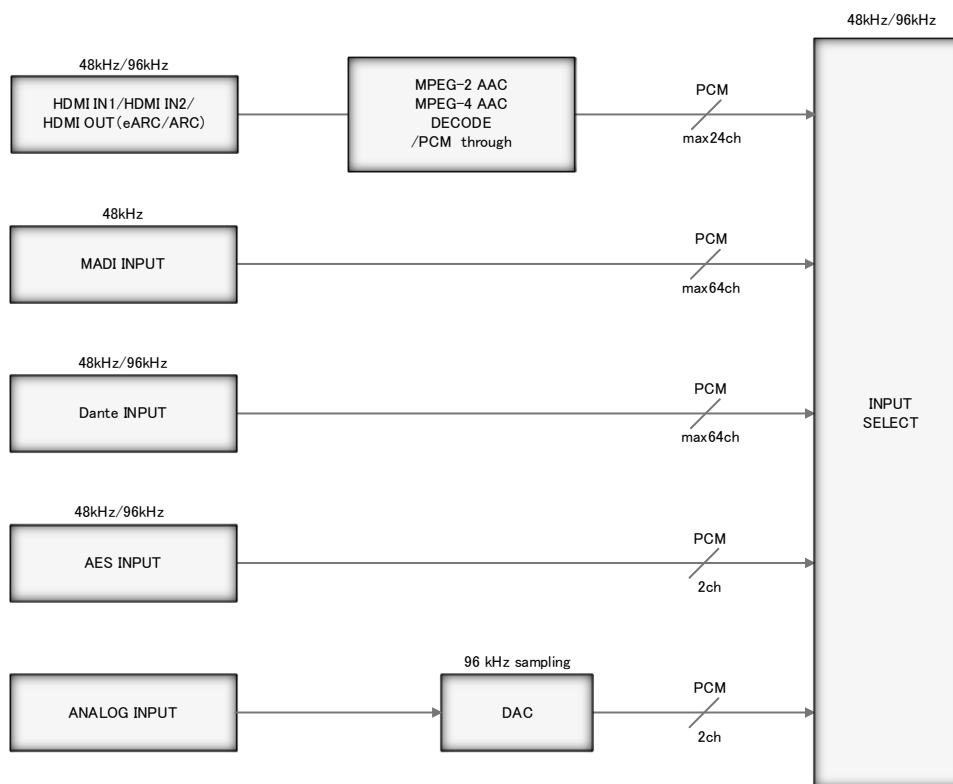
Display Type	Specifications
Color Depth	16.7 million colors
Maximum Brightness	400cd/m ² (typ)
Screen Size	7 inch
Resolution	1920(H)×1200(V) Pixels

7.7 Accessories

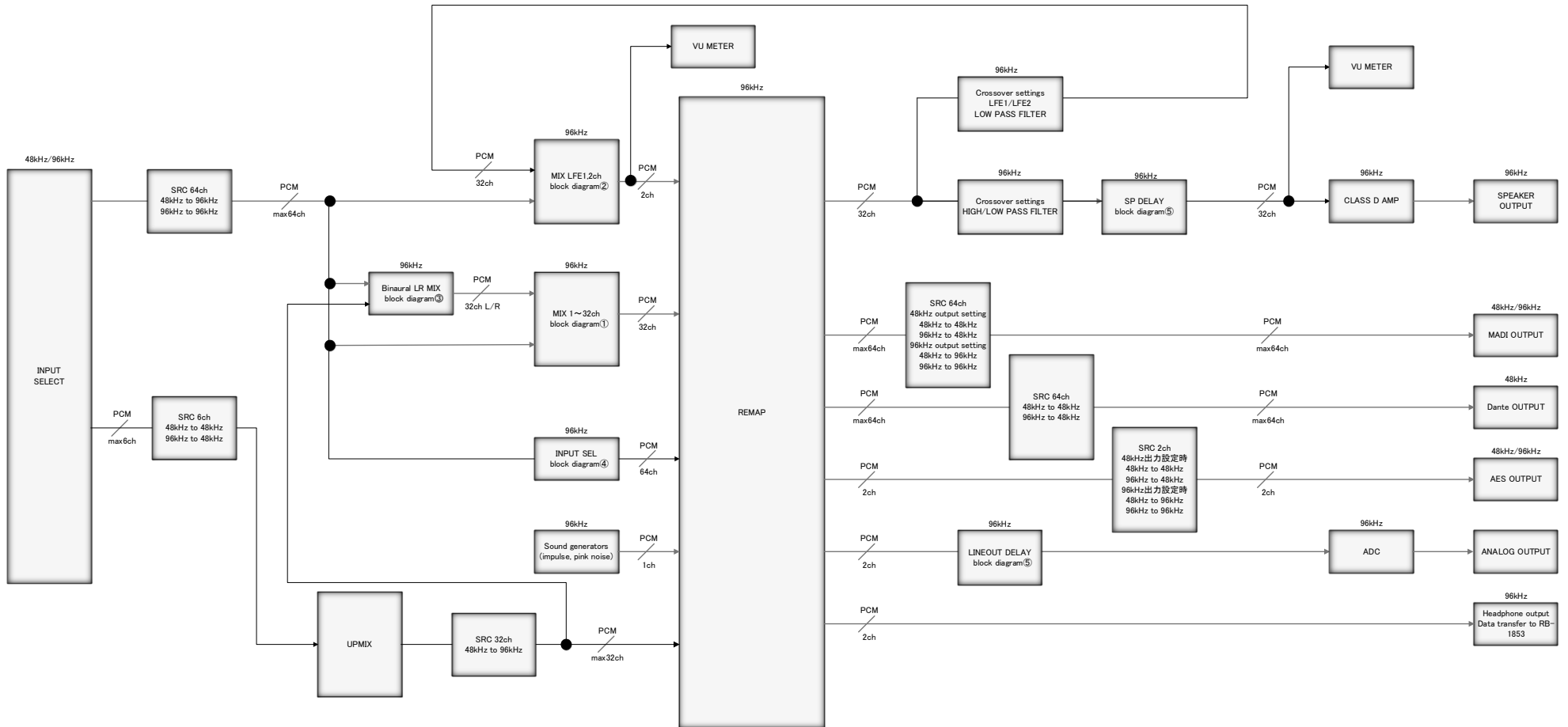
Item	Quantity
PA-1853 main unit	1
RB-1853 main unit	1
PA-1853/ RB-1853 Manual	1
LAN Cable	1
AC Power Cable	1

7.8 Block Diagram

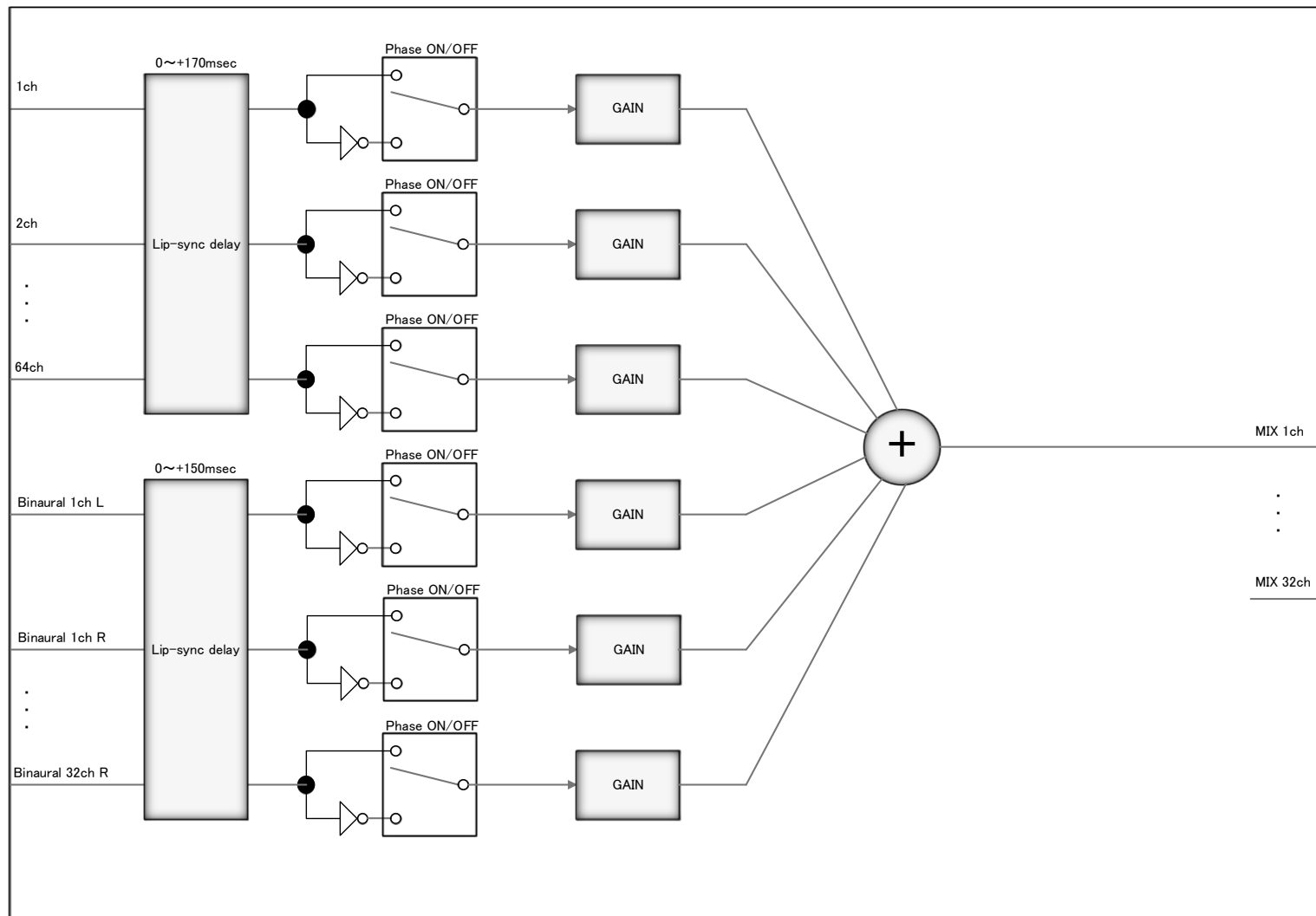
7.8.1 INPUT BLOCK



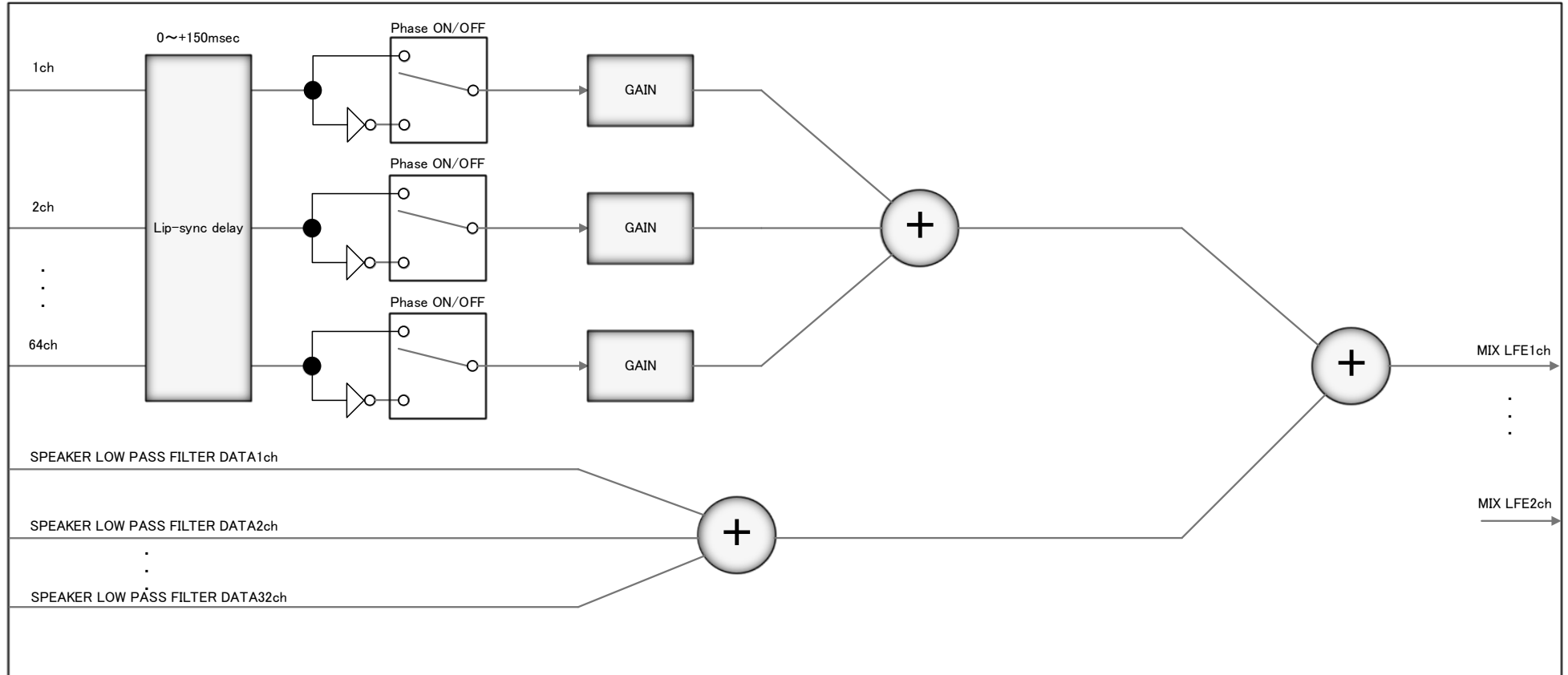
7.8.2 OUTPUT BLOCK



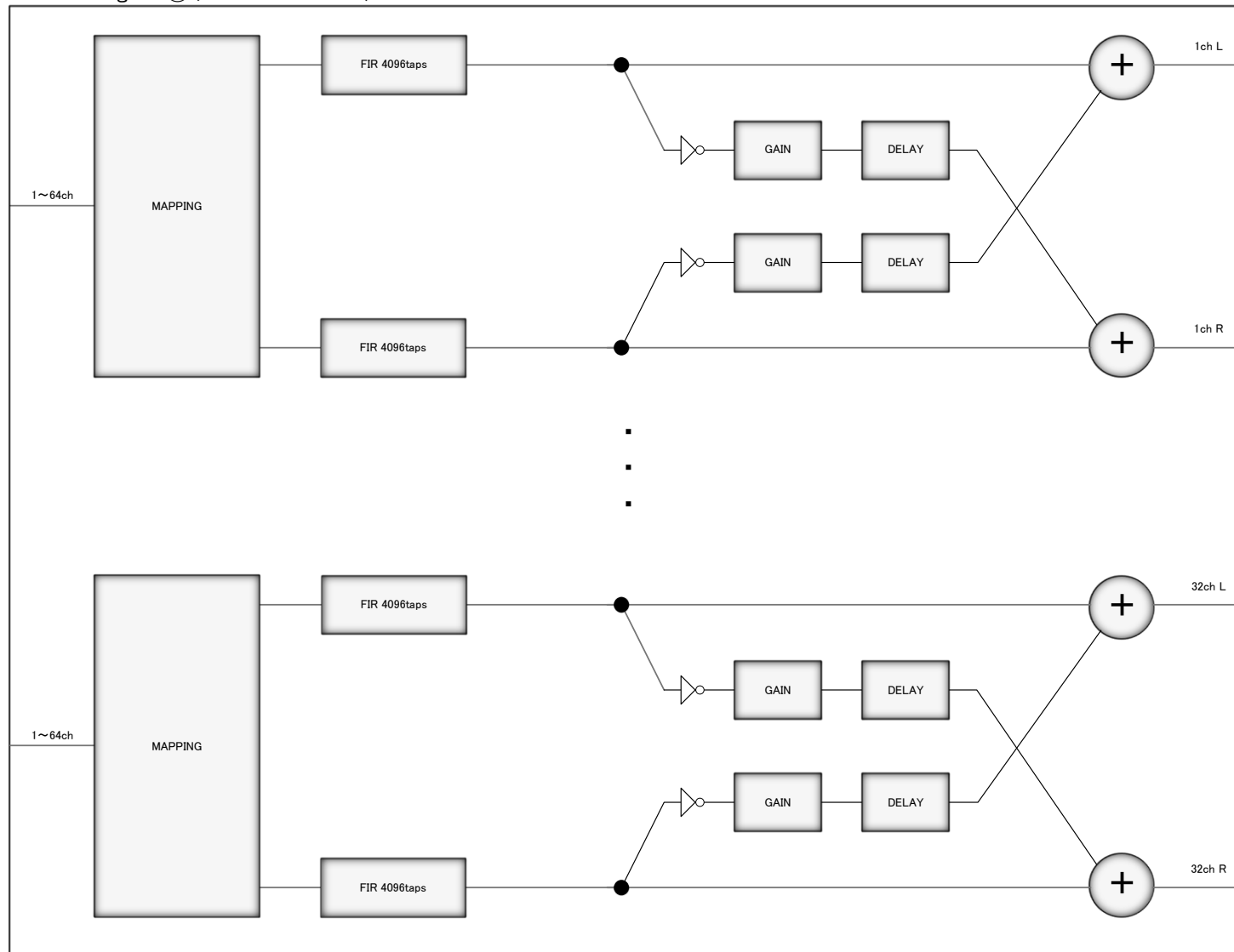
Block Diagram① (MIX 1~32ch)



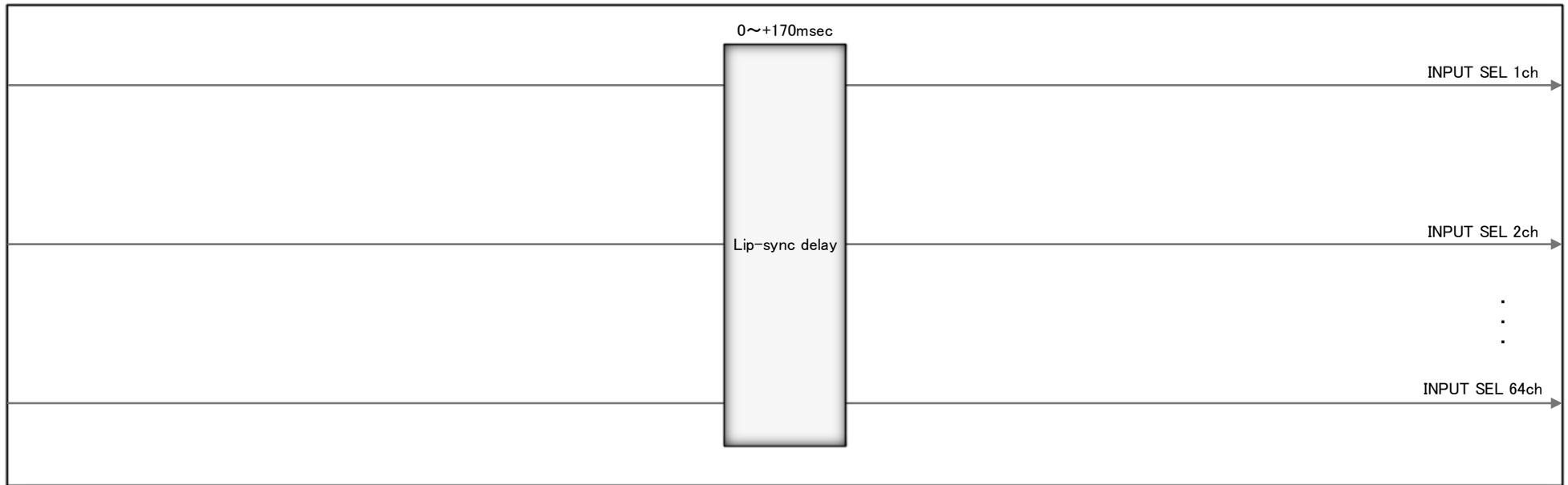
Block Diagram② (MIX LFE1、LFE2ch)



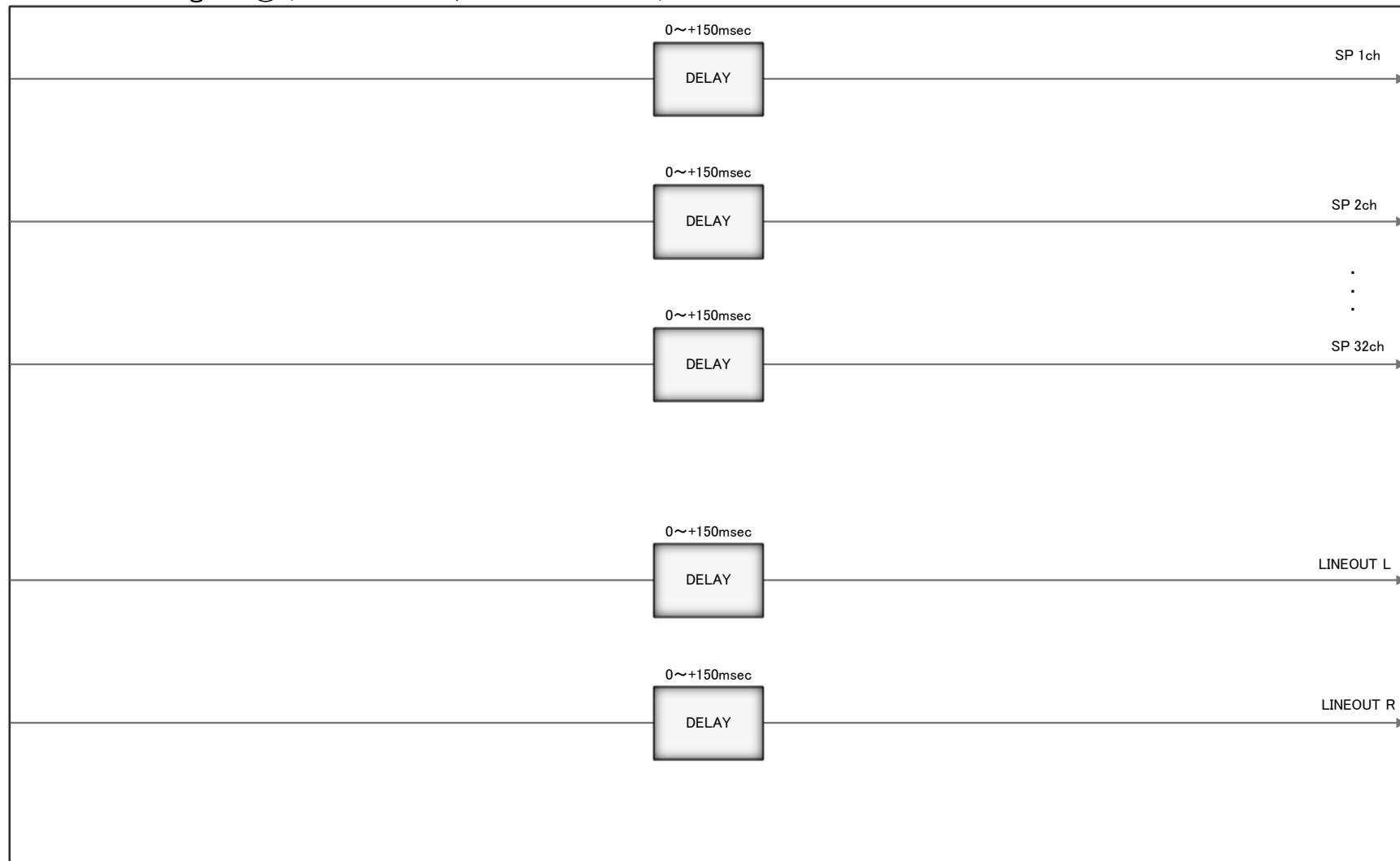
Block Diagram③(MIX Binaural LR)



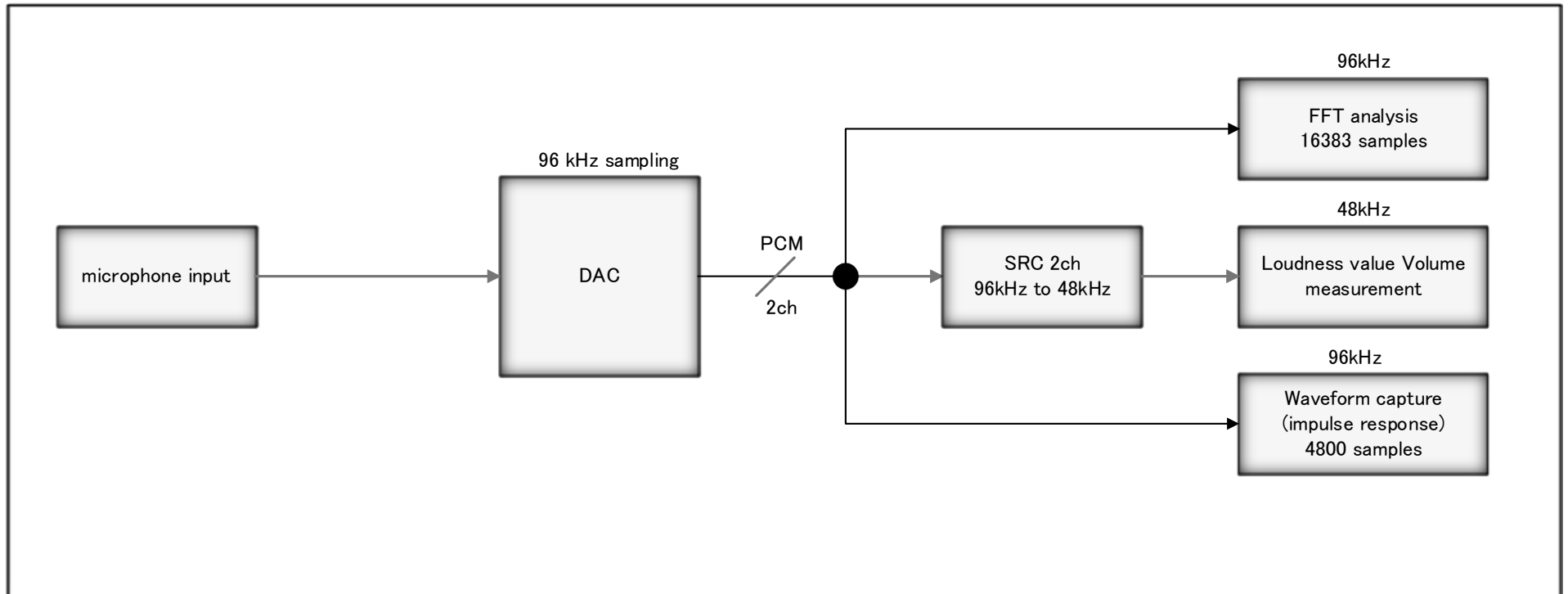
Block Diagram④ (INPUT SEL 1~64ch)

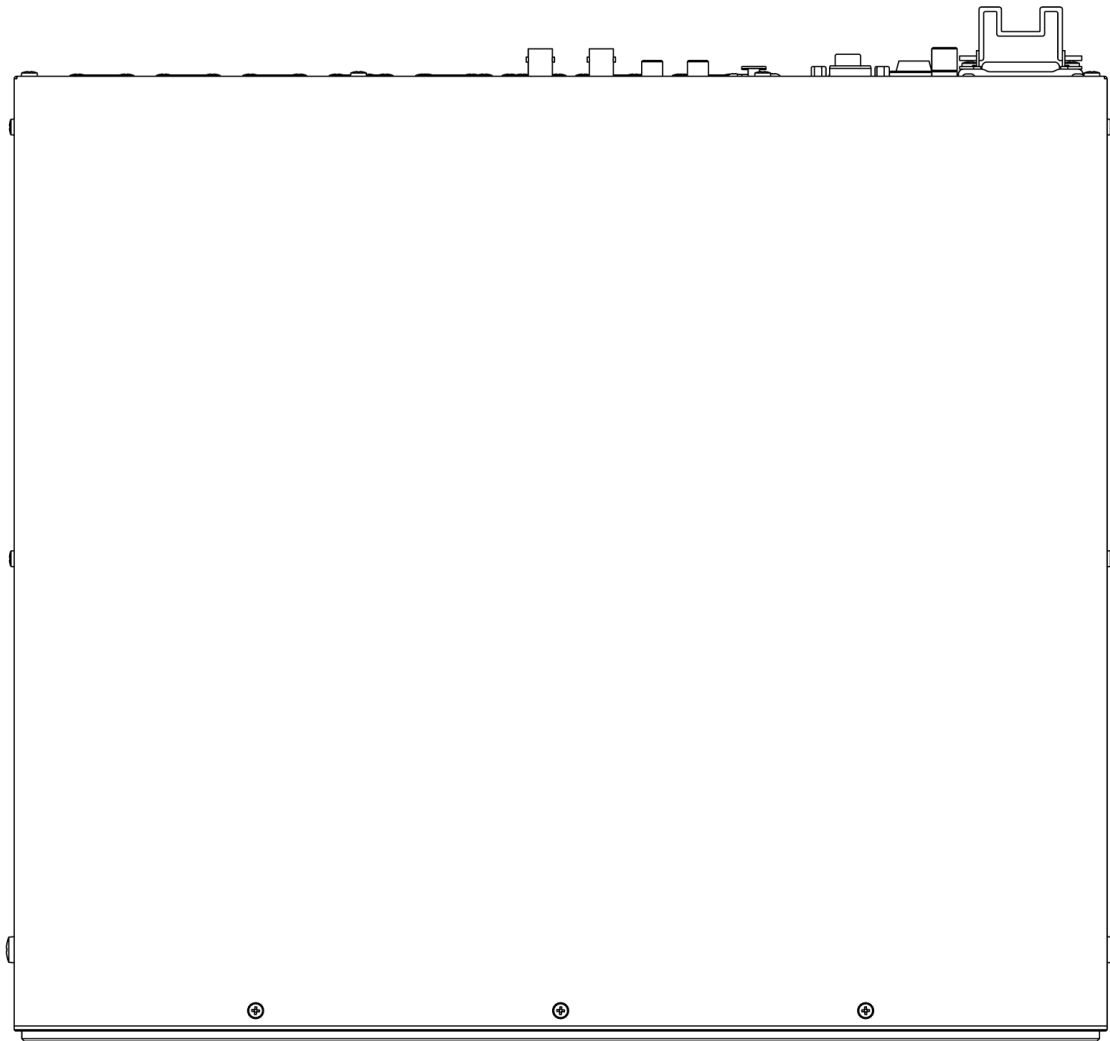


Block Diagram⑤ (SP 1~32ch、LINE OUT L/R)

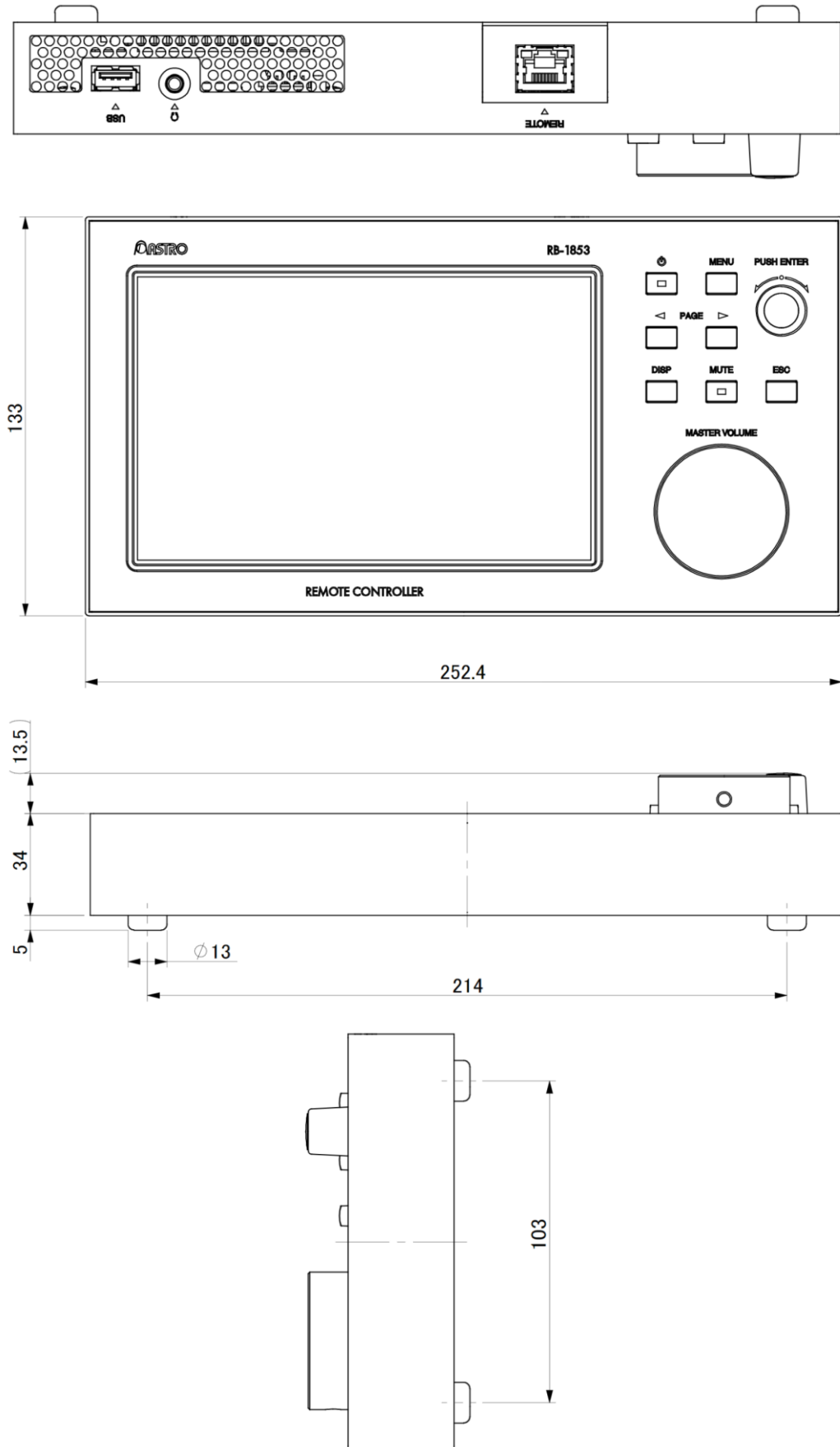


Speaker analysis Microphone input (mono)





7.9.2 RB-1853 External View



Chapter 8 Revision History

Ver.	Date	Page	Item	Details
1.00	2023/02/14			Initial Version
2.00	2023/09/30	6	1.1	Added support for HDMI input.
		8	1.2.2	Added support for HDMI input.
		9	1.2.3	Enabled the use of the jog dial.
		11	2.2.1	Added input switching button.
		12	2.2.2	Modified the User Memory Selection screen.
		13	2.2.3	Added Tweeter to the type function description.
		18	3.1.2	Added SOFA File as a file type choice. Added settings for SOFA File accordingly.
		19~20	3.1.2	Added 5.1-channel support to input surround options. Added a configuration screen for 5.1-channel settings in the Upmix Setting List.
		30	3.1.6	Added display of microphone loudness value in the Volume Single Setup screen.
		33	3.1.6	Added a Target Curve setting option to the EQ Settings screen.
		34	3.1.6	Added explanations for the Cancel button on the EQ Setup screen.
		35	3.1.6	Added explanations for the Curve Select button on the EQ Setup screen.
		35	3.1.6	Added a Target adjustment slider.
		36	3.1.6	Added Target Curve.
		37	3.1.7	Added HDMI CEC functionality. Added IP Address configuration. Added Log File Export.
		38	4.1	Changed the wording from "press the button" to "tap the button."
		44~45	5.2	Added explanations related to the modifications made to the User Memory Selection screen.
54	7.1	Added explanations for HDMI in the input signal format.		
55	7.2.1	Added explanations for HDMI in the output signal format.		
57~64	7.8	Updated the block diagram to include HDMI input in English notation.		

PA-1853/RB-1853

Instruction Manual Ver. 2.00

- An incorrectly collated manual or a manual with missing pages will be replaced.
- All copyrights of this manual are the property of ASTRODESIGN, Inc.
- The content of this manual may not be used or copied in whole or in part without permission.
- The content of this manual is subject to change without notice due to improvements.
- The manufacturer will not be liable for any effects caused by incorrect operation.
- All inquiries concerning this product should be addressed to your dealer or to the manufacturer at the contact numbers given below.
- The products and product names mentioned in this manual are the trademarks or registered trademarks of their respective companies.

M0022-00

2023.09

ASTRODESIGN, Inc.

URL <http://www.astrodesign.co.jp>

● For more information, please contact us :

TOKYO Headquarters

TEL +81-(0)3-5734-6320 FAX +81-(0)3-5734-6102

1-5-2 Minami-yukigaya, Ota-ku, Tokyo, Japan 145-0066

USA OFFICE

TEL +1-408-435-7800 FAX +1-408-435-7900

780 Montague Expressway, Suite 302, San Jose CA 95131 USA