Digital Audio Matrix System
NPX System

inter M

8×8 Audio Matrix System

Overview

The NPX system is an 8x8 audio matrix system that allows you to select and broadcast a variety of source sources in any location. You can select the source and adjust the volume directly through the local controller and audio input device in each output area. In addition, the NPX-8000 provides high-performance S / N and THD, and various DSP functions for tuning the input and output audio to set up BGM broadcasting in places where natural ambience and image are required.

The NPX system can be used in various places such as exhibition centers, hospitals, hotels, shopping malls, restaurants and cafes where high quality BGM are required. And also it can be used educational facilities such as conference centers, seminar rooms, audiovisual rooms and auditoriums that require rich and clear sound.

NPX-8000 | 8×8 Audio Matrix System

NRM-8000A | Analog Remote Microphone
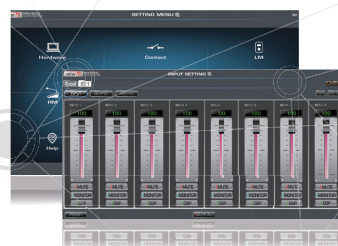
MP-8000 | Management Program

NLM-8000A | Wall Type Local Machine

NLM-8000C | Wall Type Local Machine

**Mobile Application** | Remote Monitoring and Control

FEATURES

Optimized Audio Matrix System

The NPX system supports DSP (Digital Signal Processor) for optimized sound, PC program for remote monitoring and controlling, and mobile application. The NPX system can transmit various BGM broadcasts and announcements to a number of output areas, and control the broadcast output of each area through a zone controller.

8x8 Analog Audio & Contact Closure Input / Output Configuration

NPX-8000 consists of 8 channels of analog audio and contact closure input / output terminals. Various audio sources such as CD, Tuner, and MIC are input through the analog audio input terminal, and the input audio signal is output according to the NPX-8000's matrix setting. In addition, it can be linked with external device via 8 channels contact input / output terminal.
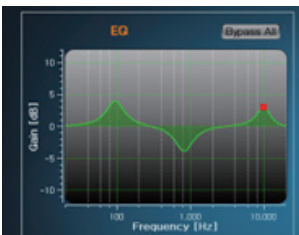
Audio Control Through DSP, High-Quality BGM Playback

The SD card (up to 32GB) allows you to play BGM without additional sound source device. The input/output audio features HPF, LPF, EQ, Programmable Delay, Limiter, Mute, Gain, etc. It plays high quality sound source suitable for installation environment. You can adjust the DSP value of all areas with the PC program MP-8000 and the mobile application, and adjust the sound of each area through the zone controller, NLM-8000C.
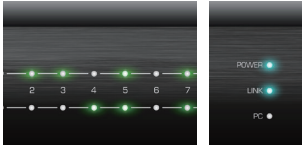
Setting Scheduling

PC program for system integration control MP-8000 allows you to set up a schedule broadcast that can be used to reserve a specific sound source for the required time, day of week, and feature date.

Sound Source Playback Through SD Card

The SD card (up to 32GB) allows you to play BGM without additional sound source device.

Front LED Indicator For Various Conditions

You can intuitively check the status of audio input/output, power, LM/RM link, connection status of PC program MP-8000 through LED.

PC Program For System Integration Control

It is possible to control all the devices configured in the system with the PC program connected to the device intuitively and systematically through the Ethernet network.

Mobile Application For Remote Monitoring And Controlling

On mobile phones and tablet PCs, user can select sources, control volume, play SD card back, output contact closer, recall preset, and monitor and control your NPX system freely and conveniently with mobile apps.
※ Support iOS 6.0 or later, Android 4.0 or later

Zone Controller And Audio Input Device For Distributed Control

The zone controller (NLM-8000C) installed in each output area allows user to select the sound source to be output to the area, adjust the volume, and input the sound source directly through the wall-mounted audio input device (NLM-8000A)

Remote Microphone For Informative Broadcasting

With the remote microphone (NRM-8000A), user can select desired area or entire area to broadcast messages, notices, calls, etc. You can select broadcasting area with LCD and 10 key buttons installed on the front, and announce starts and ends with chime button.

PRODUCT LINE UP

NPX-8000 Audio Matrix Controller

- Audio matrix controlling device of the NPX system
- High quality Digital Signal Processor (HPF, LPF, EQ, Programmable Delay, Limiter, Mute, Gain)
- Interlocked with external device through 8 contact closer input/output terminals
  (contact closer operation setting possible)
- Provide PC program (MP-8000) and mobile application for system integration control and remote monitoring.
- Wall-mounted zone controller and audio input device for distributed controlling
- Remote microphone for paging broadcasting (NRM-8000A)
- Sound source playback with SD card
- LED indicator of audio input/output and status of device

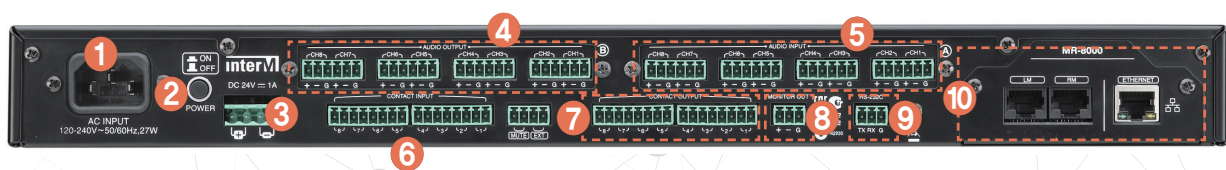|	NPX-8000
Communication Type	Contact Closure, RS-232C RM, LM Port : CAN Ethernet Network : LAN(TCP/IP)
Contact Closure Input/Output	Input 8 channels, Output 8 channels, Mute, ext
Communication Speed	CAN : 20kbps, LAN (TCP/IP) : 100Mbps, Serial 115200bps
Communication Length	CAN : MAX 300M, LAN (TCP/IP) : MAX 100M
Input Sensitivity	-60 ~ +23dBu
Output Level	0dBu (AIM GAIN=0)
Signal To Noise (20kHz LPF)	MIC : More than 55dB, LINE : More than 75 dB
Thd (20kHz LPF)	MIC : Less than 0.5%, LINE : Less than 0.2%
Frequency Response 40Hz~18kHz (DSP Bypass)	0dBu ± 3dBu
Operation Temperature	-10°C ~ +40°C
Power Source	AC 100-240V, 50/60Hz, DC 24V
Weight (SET)	3.6kg (7.94lb)
Dimensions (SET)	482(W) x 44(H) x 320(D)mm/19 x 1.7 x 12.6 in

INPUT DSP	

3-BAND PEQ	Frequency>> Default : 1band = 100Hz, 2band = 1000Hz,
	3band = 10000Hz // Range : 20 ~ 20000Hz (1 ~ 3 band)
	Q>> Default : 0.7 // Range : 0.1 ~ 16,
	Gain>> Default : 0dB // Range : -10dB ~ 10dB

HIGH PASS FILTER	Default : 20Hz // Range : 20Hz ~ 400Hz
COMPRESSOR	Threshold>> Default : 0dB // Range : 0dB ~ -40dB, Ratio>> Default : 1:1 // Range : 1:1 ~ 20:1 Attack time>> Default : 5ms // Range : 1ms ~ 40ms, Decay time>> Default : 100ms // Range : 50ms ~ 1000ms
OUTPUT DSP	

7-BAND PEQ	Frequency>> Default : 1band = 125Hz, 2band = 250Hz, 3band = 500Hz, 4band = 1000Hz,
	5band = 2000Hz, 6band = 4000Hz, 7band = 8000Hz // Range : 20Hz ~ 20000Hz (1 ~ 7 band)
	Q>> Default : 0.1 // Range : 0.1 ~ 16,
	Gain>> Default : 0dB // Range : -10dB ~ 10dB

HIGH PASS FILTER	Default : 20Hz // Range : 20Hz ~ 400Hz
LIMITER	Threshold>> Default : 0dB // Range : 0dB ~ -20dB, Attack time>> Default : 1ms // Range : 1ms ~ 40ms Decay time>> Default : 870ms // Range : 100ms ~ 2000ms
DUCKER	Preset>> Default : None // Range : None, FAST, NORMAL, SLOW Threshold>> Default : -30dB // Range : -20dB ~ -50dB Decay Time>> Default : 850ms // Range : 1ms ~ 10000ms Hold Time>> Default : 500ms // Range : 0ms ~ 2000ms Range>> Default : -30dB // Range : 0dB ~ -100dB
DELAY	Default : 0ms // Range : 0ms ~ 50ms

» Front Panel

① DISPLAY (128X32/2.23INCH/OLED)

② SELECT/ENTER SWITCH
(ROTARY-PUSH & ENCODER SWITCH)

③ MENU BUTTON (MOMENTARY SWITCH)

④ ESC BUTTON (MOMENTARY SWITCH)

⑤ AUDIO INPUT/OUTPUT STATUS LED

⑥ SD MEMORY CARD SLOT

⑦ STATUS INDICATOR LED

» Rear Panel

① AC INPUT

② POWER SWITCH

③ DC 24V INPUT CONNECTOR

④ 8 CHANNEL AUDIO OUTPUT TERMINAL

⑤ 8 CHANNEL AUDIO INPUT TERMINAL

⑥ CONTACT CLOSURE INPUT

⑦ 8 CHANNEL CONTACT CLOSURE OUTPUT

⑧ MONITOR OUTPUT

⑨ RS-232C PORT

⑩ NETWORK PORT

- RM: Remote microphone NRM-8000A (up to 4 units) daisy chain connection
- LM: Wall-mounted zone controller NLM-8000C (up to 8 units) + wall-mounted audio input unit NLM-8000A (up to 1 unit)
- ETHERNET: Connecting to PC program for setting/controlling

PRODUCT LINE UP

NRM-8000A Remote Microphone

- Remote microphone for paging broadcast
- Audio input with goose-neck condenser microphone
- 2.4inch OLED display
- Selecting broadcasting zone and controlling with 10 buttons
- Connect to NPX-8000 with RM LINK terminal
- Powered by RM LINK terminal or power adapter
- CIA-15 and adapter are required when connecting two or more devices

	NRM-8000A
Input Sensitivity	-50dBu
Output Level	0dBu
Signal to Noise Ratio (20kHz LPF)	More than 60dB
THD (20kHz LPF)	Less than 0.5%
Frequency Response (50Hz ~ 18kHz)	0dBu ± 3dBu
Communication Protocol	CAN (Controller Area Network)
Communication Speed	20kpbs
Communication Distance	MAX : 300M
Use Cable	CAT5E
Operation Temperature	-10°C ~ +40°C
Power Source	DC 40V (over 300M, DC 24V Adapter)
Power Consumption	MAX 10W
Weight (SET)	1.37kg (3.02lb)
Dimensions (SET)	200(W) × 73(H) × 206(D) mm/7.8 x 2.8 x 8.1 in

NLM-8000A Local Machine

- Wall-mounted Audio input device
- 1xXLR audio input (MONO, Gain, Phantom Power)
- 1xRCA audio input (STEREO)
- Connect to NPX-8000 with LM LINK IN terminal
- Connect to NLM-8000C LM LINK OUT terminal with daisy chain

	NLM-8000A
Input Sensitivity	MIC : -50dBu/2kΩ, LINE : -10dBu/10kΩ
Output level	Normal : 0dBu
S/N @ Rated output (20kHz LPF)	MIC : More than 60dB LINE : Less than 75dB
THD (20kHz LPF)	MIC : Less than 0.5 % LINE : Less than 0.2 %
Frequency Response (50Hz ~ 18kHz)	0dBu ±3dB
Communication Distance	MAX : 300M
Use Cable	CAT5E
Power Source	DC 40V
Power Consumption	2W
Weight (SET)	136g (0.3lb)
Dimensions (SET)	70(W) x 115(H) x 53(D) mm/2.7 x 4.5 x 2(D) in

# NLM-8000C Local Machine

- Wall-mounted Zone Controller
- 1.3inch OLED Display
- Control with Rotary-Push Encoder
- Select desired source or control volume
- Connect to NPX-8000 with LM LINK IN terminal
- Connect to NLM-8000C LM LINK OUT terminal with daisy chain

	NLM-8000C
Communication Protocol	CAN (Controller Area Network)
Communication Speed	20 kbps
Communication Distance	MAX 300M (LINK Connection included)
Use Cable	CAT5E
Power Source	DC 40V
Power Consumption	2.4W
Weight (SET)	133g (0.40lb)
Dimensions (SET)	70(W) x 115(H) x 39.7(D) mm/2.7 x 4.5 x 1.5 in

MP-8000 Management Program
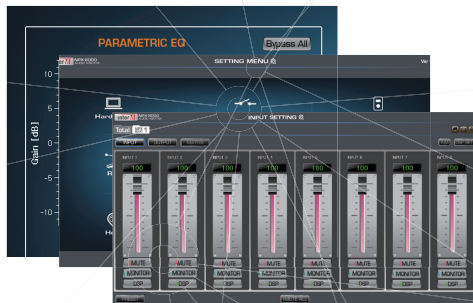
- PC program(Windows) for controlling, managing, and setting system
- Control input/output audio matrix
- DSP control(volume, EQ, FILTER, COMPRESSOR, LIMITOR)
- Set event scheduler
- Control music player
- Set input/output contact closure
- Set Wall Mount Controller(LM) (Preset)
- Set Remote microphone(RM) (Zone Macro)
- Save LOG
- Windows system only

MOBILE&TABLET Application

- Support Android / iOS system
- 2 or more mobile devices cannot login simultaneously
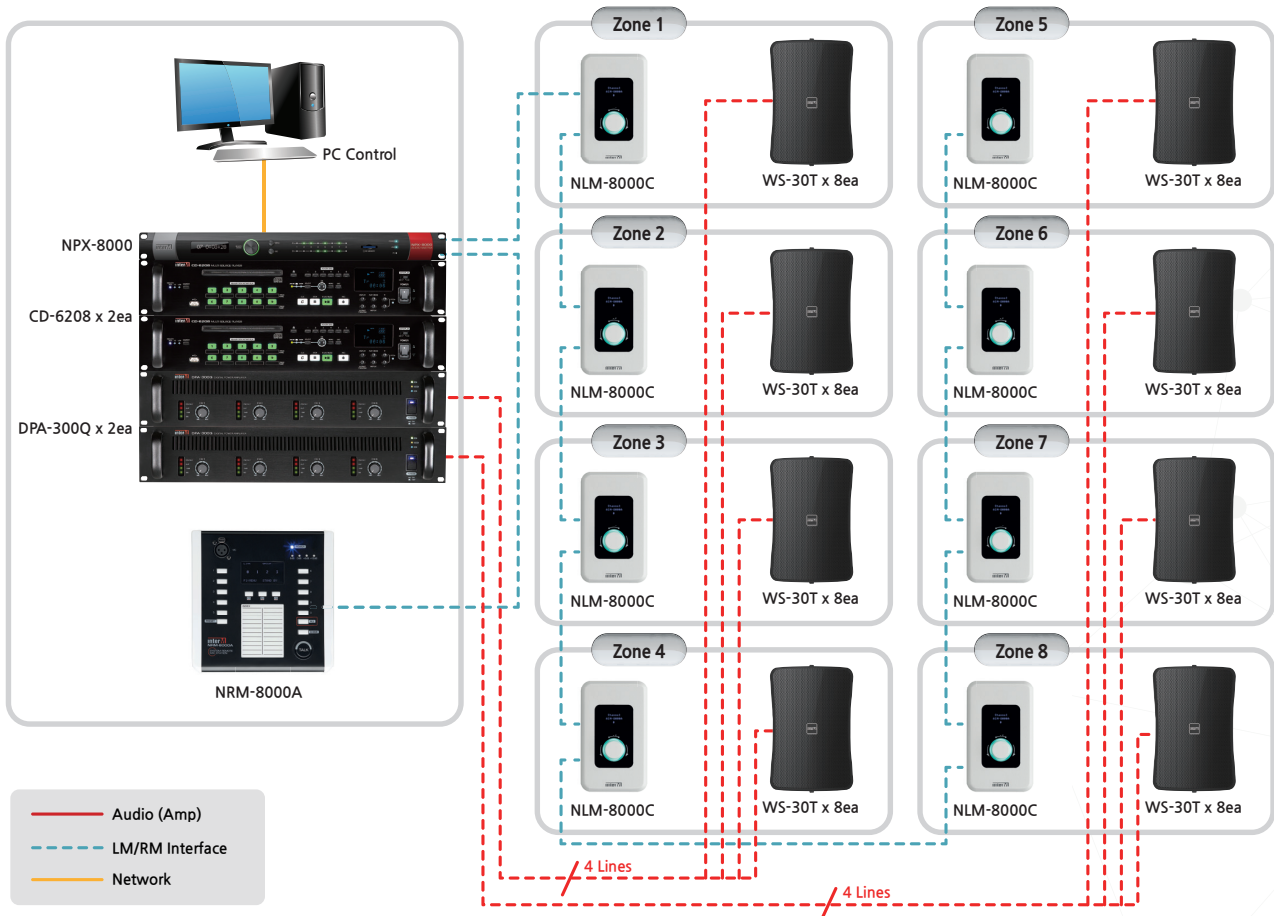- Display Connection Status
- Convenient for users

APPLICATION

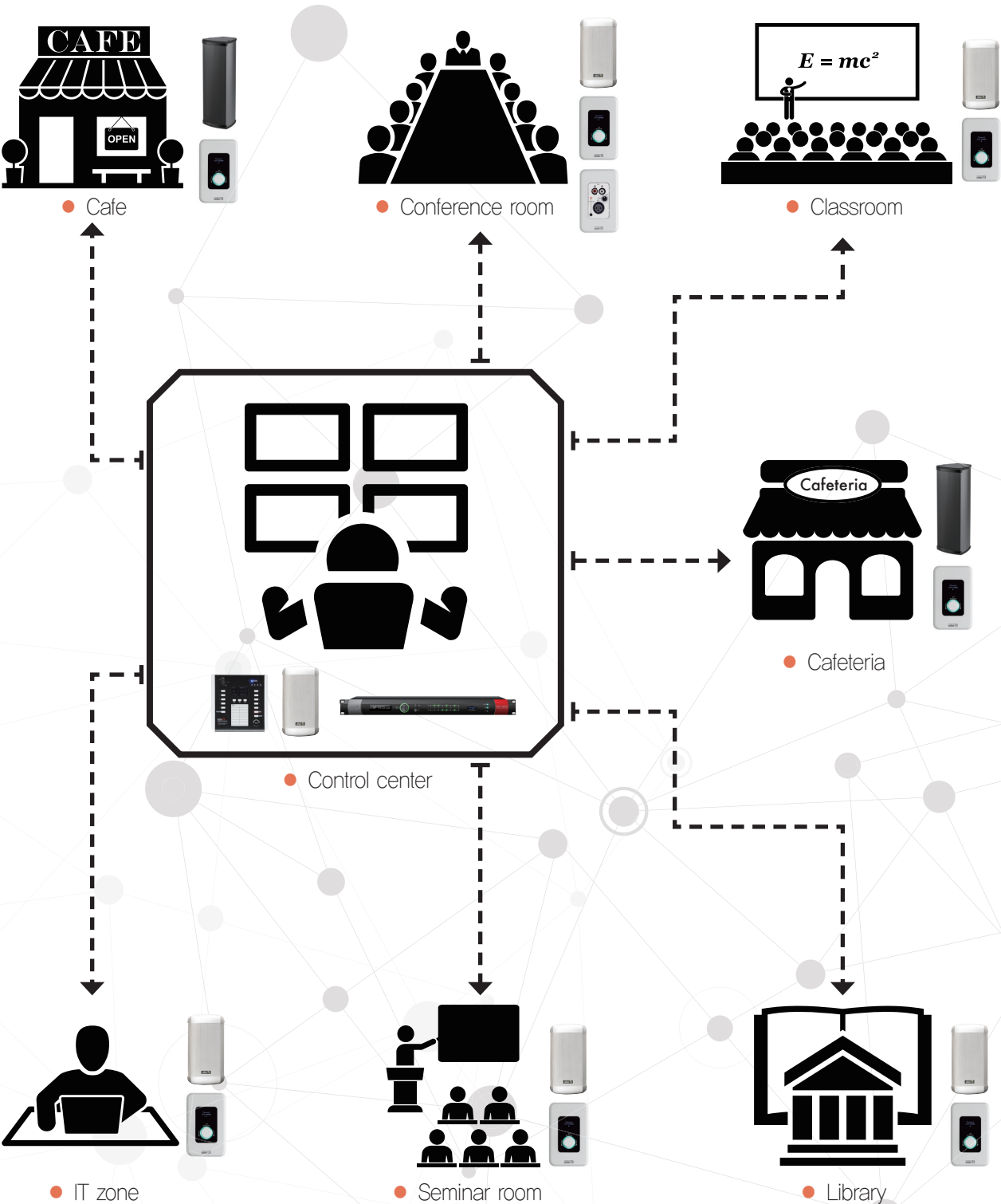### » NPX SYSTEM Basic System Connection Diagram

NLM-8000A: up to 1 unit, NLM-8000C: up to 8 units

NRM-8000A: up to 4 units
* When connecting two or more, it is necessary to connect CIA-15, Communication Interface Accessory.
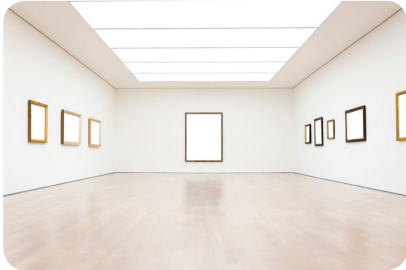
» Examples Of Distributed Controlling By Space

PC Control

NPX-8000

CD-6208 x 2ea

DPA-300Q x 2ea

NRM-8000A

——	Audio (Amp)
- - -	LM/RM Interface
——	Network

Zone 1 — NLM-8000C — WS-30T x 8ea
Zone 2 — NLM-8000C — WS-30T x 8ea
Zone 3 — NLM-8000C — WS-30T x 8ea
Zone 4 — NLM-8000C — WS-30T x 8ea
Zone 5 — NLM-8000C — WS-30T x 8ea
Zone 6 — NLM-8000C — WS-30T x 8ea
Zone 7 — NLM-8000C — WS-30T x 8ea
Zone 8 — NLM-8000C — WS-30T x 8ea

4 Lines

4 Lines

The NPX system is a distributed control audio matrix device that outputs audio sources to a desired area through various source devices, SD cards, etc. With NRM-8000A (4 units can be linked), announcement can be broadcast by selecting the desired area, and the matrix, volume, and DSP can be easily set up with MP-8000(integration control program) and mobile application.

» University

- Cafe
- Conference room
- Classroom

$$E = mc^2$$

- Cafeteria

- Control center

- IT zone
- Seminar room
- Library

⬤ APPLICATION

» Places High Quality BGM Is Needed

⬤ Gallery

⬤ Hospital

⬤ Hotel

⬤ Restaurant


⬤ Wedding hall

⬤ Retail store

⬤ Shopping center

⬤ Park

LPF, EQ, Programmable Delay, Limiter, Mute, Gain, etc. are set for the audio input/output by setting the DSP value In the places such as exhibition hall, hospital, hotel, shopping mall, restaurant, cafe etc. where high quality BGM broadcasting is required, the NPX system achieves sound suitable for each environment by setting DSP value to adjust the functions of HPF, LPF, EQ, Programmable Delay, Limiter, Mute and Gain for the input/output audio.

» Application of NPX System Digital Audio Matrix System



<Ordinary CU-20 Series column speaker frequency characteristic>

<Frequency characteristics complementing the influence of sound of the installation site>
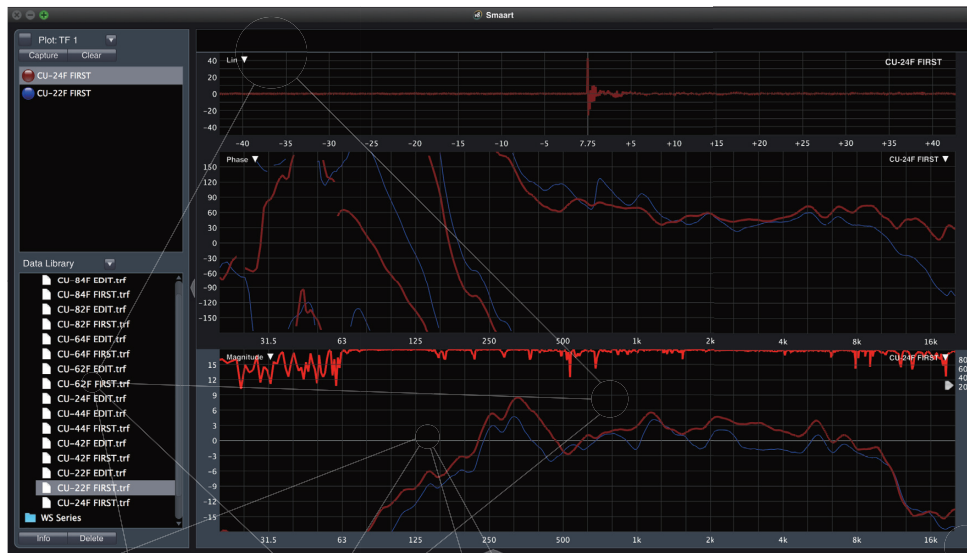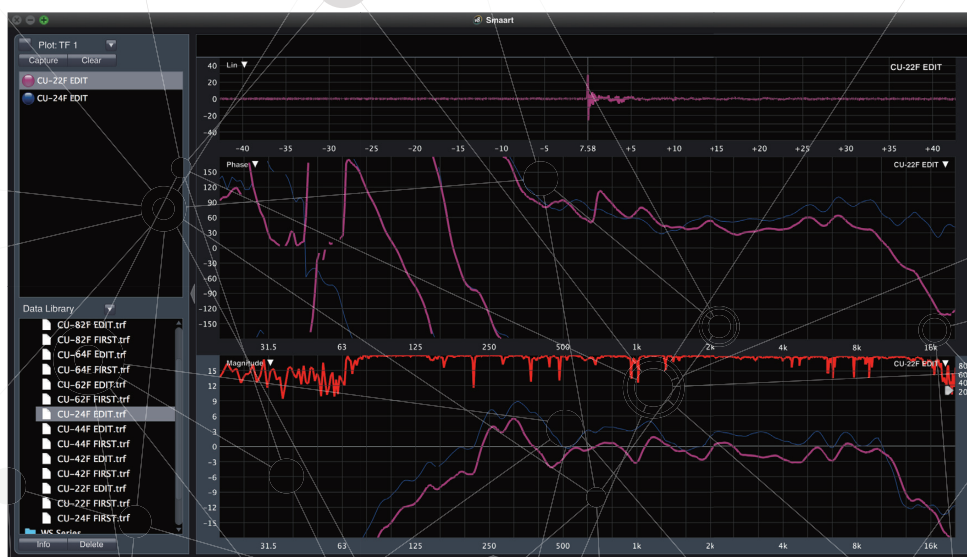
Inter-M's CU Series is all-round column speaker that can be used both indoor and outdoor such as educational, cultural, office, and gym facilities. Our new CU Series is composed of 4 series 14 models, and provides clear voice delivery and high quality BGM playback.

In addition, through a combination of CU Series column speaker and NPX system, users can adjust the sound parameter delicately with built-in DSP, which can improve CU Series column speaker's sound quality. For example, users can control the reflection sound from the ceiling or wall which allow the listener to have more clarity, and are able to set adequate sound at right time to avoid noise from crowd especially in shipping complex, train station, and airport, by scheduling function. Ordinary frequency characteristics of CU-20 Series provide high clarity and sound quality, and the user can achieve even better sound by using NPX system's built-in DSP.

MP-8000 GUI Manual

» Initial Screen
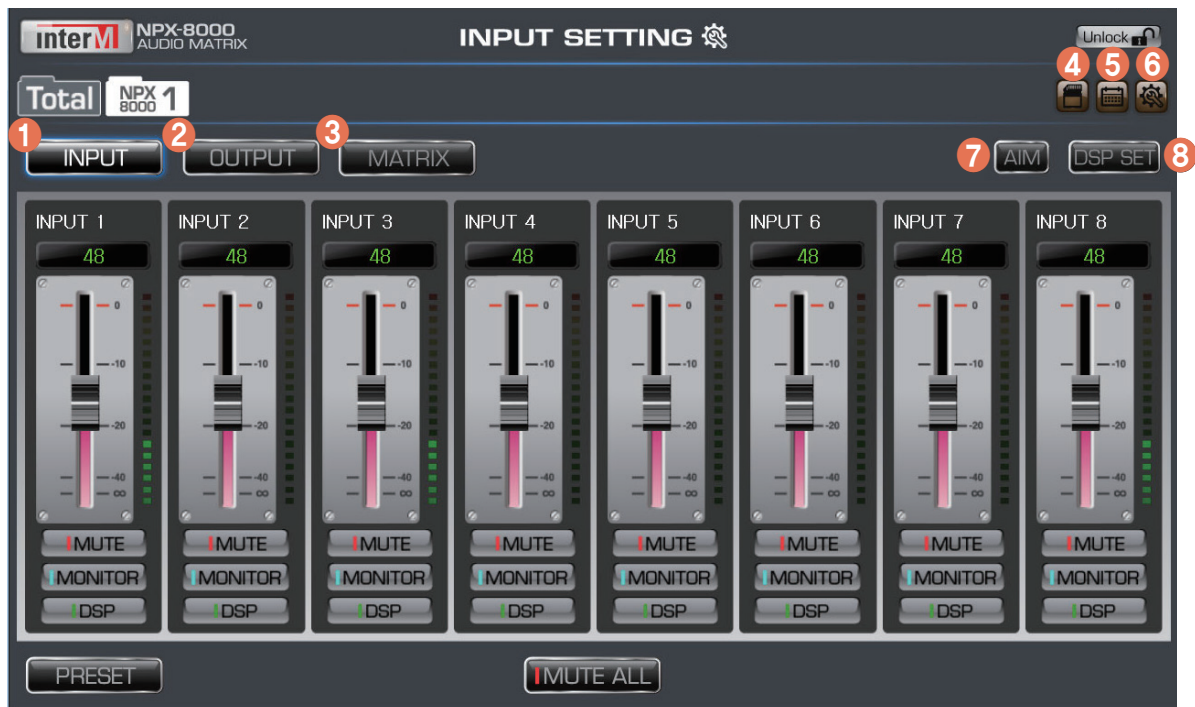
❶ Input DSP Setting
 Switches to the screen to adjust DSP value such as the volume of the input audio, EQ, etc.

❷ Output DSP Setting
 Switches to the screen to adjust DSP value such as the volume of the output audio, EQ, etc.

❸ Audio Matrix Setting
 Switches the screen to control the matrix settings of the input/output audio.

❹ SD card playback control
 Switches to the screen to control the sound source files of the SD card mounted on the front.

❺ Schedule Setting
 Switches to the schedule setting screen.

❻ Device Setting
 Switches to the screen for setting the network, LM/RM, and contact points.

❼ Input Sensitivity Setting
 Sets the type of input audio to MIC, LINE, and USER. When set to USER, the input sensitivity can be adjusted from 62dB to -4dB.

❽ Save/Load DSP Settings
 User can save or recall the DSP value set in the input and output.

» Input DSP setting   *Output DSP setting screen is also the same.

InterM NPX-8000 AUDIO MATRIX   **INPUT SETTING** ⚙   Unlock 🔓

Total NPX 8000 1

INPUT   **OUTPUT**   **MATRIX**   AIM   DSP SET

① INPUT 1 | INPUT 2 | INPUT 3 | INPUT 4 | INPUT 5 | INPUT 6 | INPUT 7 | INPUT 8
48 | 48 | 48 | 48 | 48 | 48 | 48 | 48

②
③ MUTE
④ MONITOR
⑤ DSP

PRESET   ⑥ MUTE ALL

---
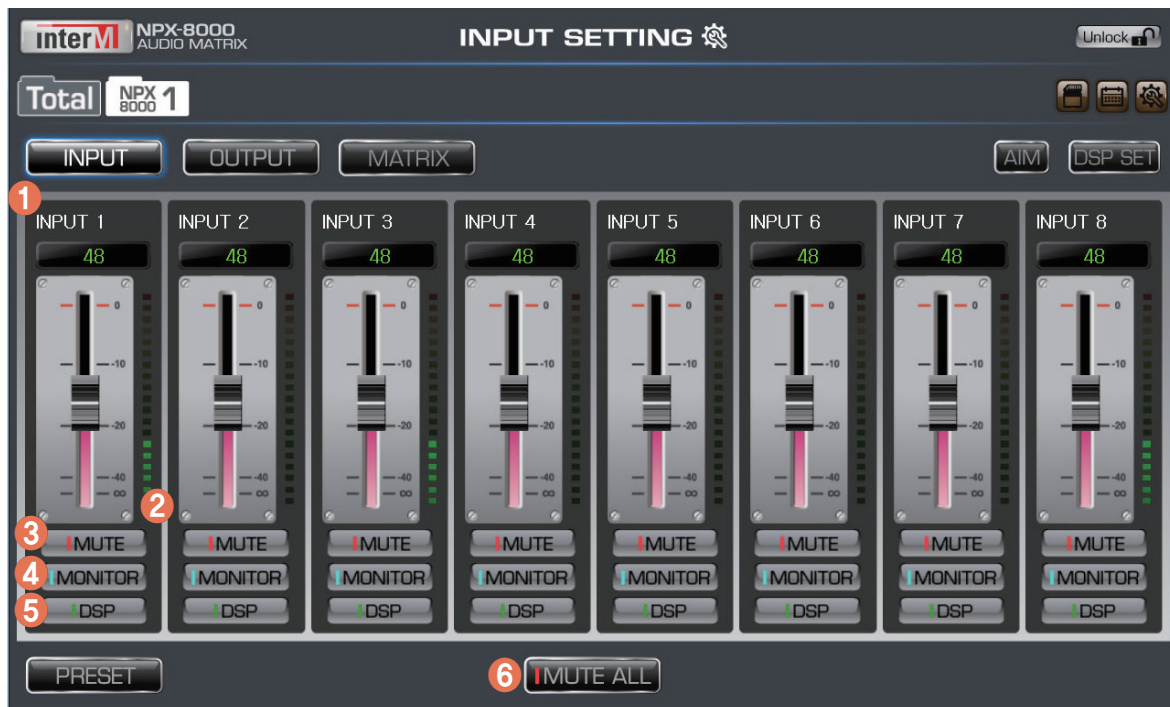
❶ VOLUME

You can adjust the volume of channel 1 through 8 from 0 to 100.
The fader position allows user to see the actual size (in dB) of the input and output audio.

❷ LEVEL METER

The input signal of the channel is indicated by the level meter.

❸ MUTE

Switches to the screen to adjust the volume, EQ, etc. of the input audio.

❹ MONITOR

Monitors the audio of the selected channel with the MONITOR jack of the NPX-8000.

❺ DSP

Switches to the screen for setting the audio DSP of each channel.

DSP setting screen

Input DSP function
1) 3-BAND PEQ
2) HIGH PASS FILTER
3) COMPRESSOR

Output DSP function
1) 7-BAND PEQ
2) HIGH PASS FILTER
3) LIMITER
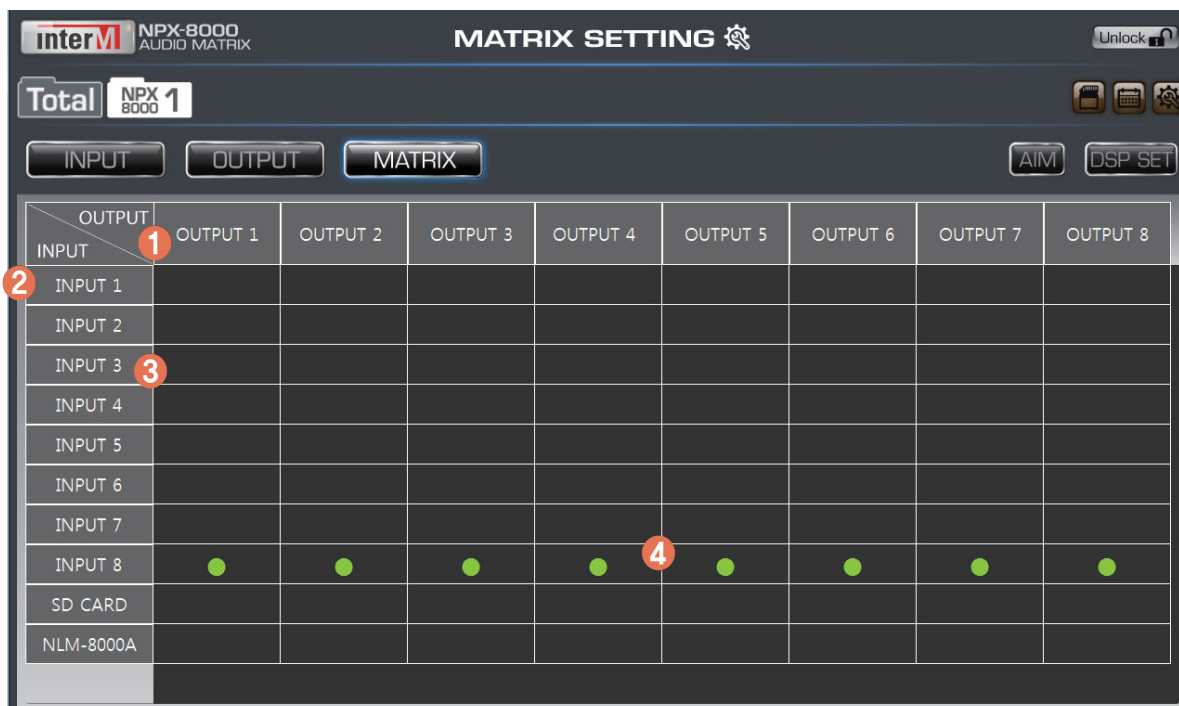4) DUCKER
5) DELAY

❻ MUTE ALL

MUTE audio on all channels.

Mobile & Tablet PC_ Source Select GUI

※ Priority broadcast setting and DSP setting are not provided by mobile application / tablet PC, please set it through MP-8000.

※ Only audio output volume control is available.

<Mobile&tablet PC monitor/control display>

MP-8000 GUI Manual

» Matrix Setting

❶ Output Channel

Displays 8 output channels from 1 to 8. You can click on each name to change it to the name you want.

❷ Input Channel

Displays 10 input channels from 1 to 8 inputs, SD card and NLM-8000A. You can click on each name to change it to the name you want.

❸ Setting Name of Channel

You can click on each name to change it to the name you want. For example, input channels can be set to genres such as JAZZ or POP, and output channels can be set as café on the first floor and common room on the second floor.

❹ Matrix Setting

Selects the audio signal to be output to each output channel. If you select the input source (INPUT) and output channel (OUTPUT) through the matrix, it lights up in green as shown above, and the input audio selected for that channel is output. When multiple input channels (INPUT) are selected for the output channel (OUTPUT), the selected input is mixed and output.

<Mobile&tablet PC output volume control display>

Mobile & Tablet PC Contact Control GUI

※ The contact setting is only possible with the MP-8000, and the signal output can be controlled with the mobile application and tablet PC

» Setting Schedule
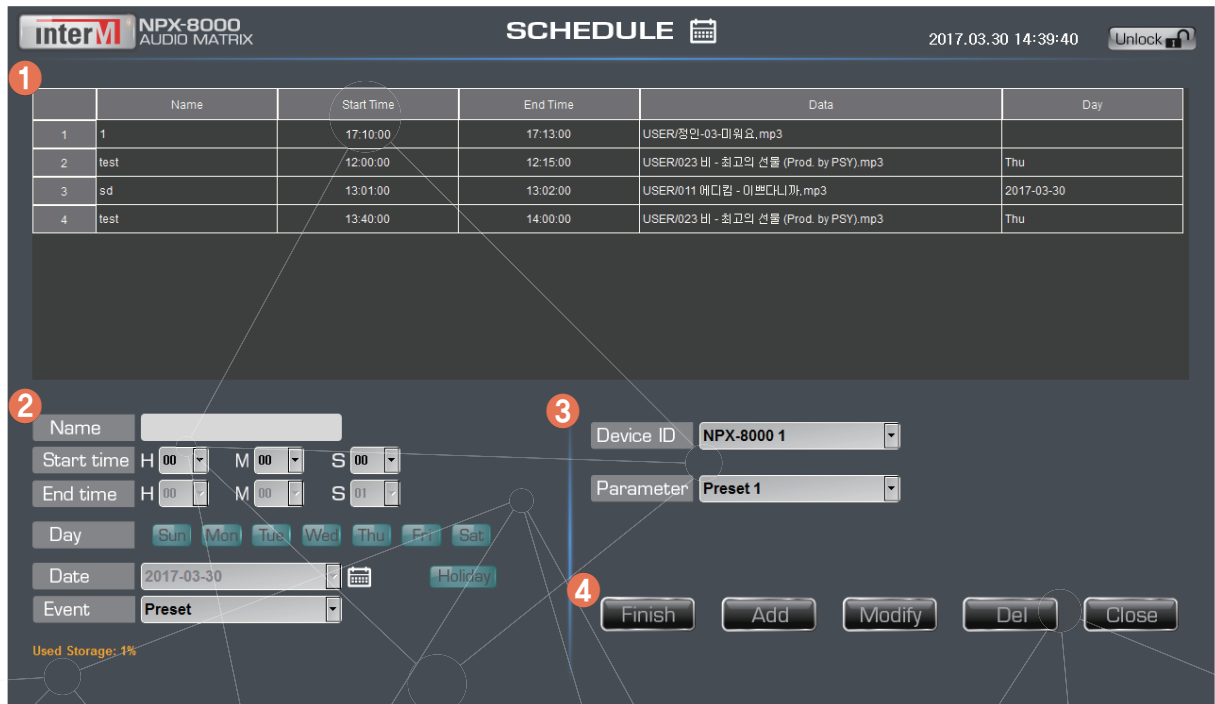
❶ List of Schedule

Displays the list of saved schedule. Indicates schedule name, start / end time, action event, date.

❷ Schedule Input Window

Sets name, starting/ending time, action event, and date of schedules
- User can select 'Day' or 'Date' in the calendar for 'Date.'
- Day: User can select the day on which the schedule is broadcast.
- Date: User can select the date on which the schedule is broadcast
- Event: Preset/Output Contact/SD card

❸ Setting Details of Event

Sets the detailed behavior for each event. Preset, SD playback file, output channel, repeat can be set.

❹ Setting Schedule

User can add / modify / delete schedules using Add / Modify / Del.
User can use Finish to forcibly terminate a running schedule.

⊘ DSP function

» INPUT DSP Setting Window
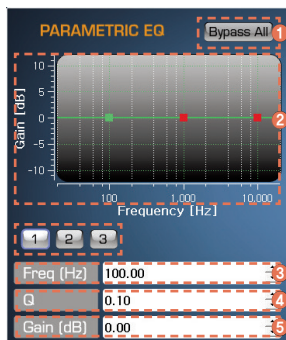
PARAMETRIC EQ (3-BAND PEQ)

❶ Bypass All Button: input channel's EQ value is applied as default value
❷ Graph: displays graph Corresponding to Freq, Q, Gain value
❸ Frequency: changeable from 20Hz to 20000Hz in increments of 1.00
❹ Q: changeable 0.10 to 16.00 in increments of 0.10
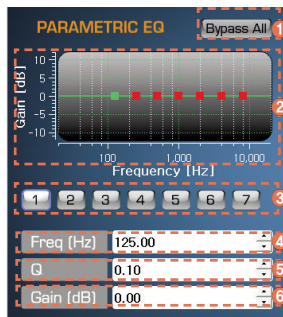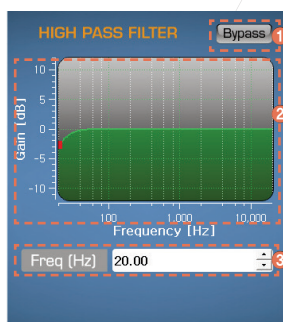❺ Gain: changeable from -10.00dB to 10.00dB in increments of 0.50
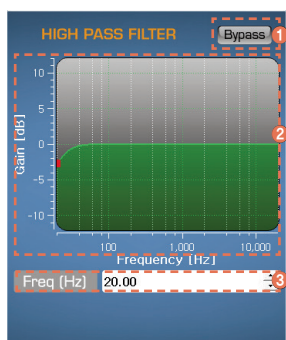
HIGH PASS FILTER

❶ Bypass All Button: FILTER value is applied as default value
❷ Graph: displays graph corresponding to Frequency value
❸ Frequency: changeable from 20.00Hz to 400Hz in increments of 1.00
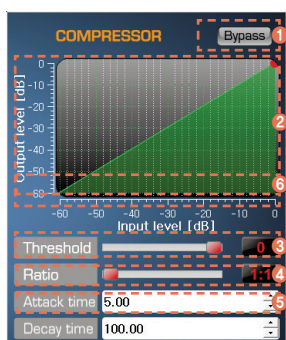
COMPRESSOR

❶ Bypass All Button: COMPRESSOR value applied as default value
❷ Graph: displays graph corresponding to Threshold, Ratio value
❸ Threshold: changeable from -40 to 0 in increments of 1.00
❹ Ratio: changeable from 1:1 to 20:1 in increments of 1.00
❺ Attack time: changeable from 1.00 to 40.00 in increments of 1.00
❻ Decay time: Changeable from 50.00 to 1000.00 in increments 5.00

» OUTPUT DSP Setting Window

PARAMETRIC EQ (7-BAND PEQ)

❶ Bypass All Button: EQ value is applied as default value
❷ Graph: displays graph Corresponding to Frequency, Q, Gain value
❸ 7-BAND PEQ
❹ Frequency: changeable from 20Hz to 20000Hz in increments of 1.00
❺ Q: changeable 0.10 to 16.00 in increments of 0.10
❻ Gain: changeable from -10.00dB to 10.00dB in increments of 0.50

## HIGH PASS FILTER

❶ Bypass All Button: FILTER value is applied as default value
❷ Graph: displays graph corresponding to Frequency value
❸ Frequency: changeable from 20.00Hz to 400Hz in increments of 1.00
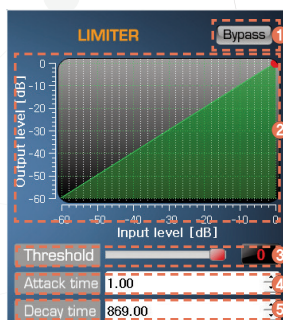
LIMITER

❶ Bypass All Button: LIMITER value applied as default value
❷ Graph: displays graph corresponding to Threshold
❸ Threshold: changeable from -2 to 0 in increments of 1.00
❹ Attack time: changeable from 1.00 to 40.00 in increments of 1.00
❺ Decay time: changeable from 100.00 to 2000.00 in increments of 10.00
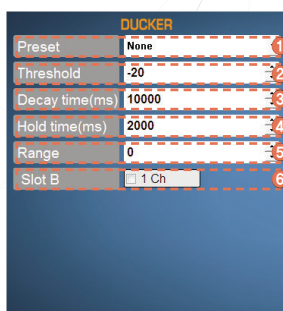
DUCKER

❶ Preset: Preset in 3 steps (Fast / Normal / Slow)
❷ Threshold: changeable from -50 to -20 in increments of -1.00
❸ Decay time: changeable from 1 to10000 in increments of 50
❹ Hold time: changeable from 0 to 2000 in increments of 10
❺ Range: changeable from -30 to 0 in increments of 1
❻ Slot B: can set channel to apply Ducker function
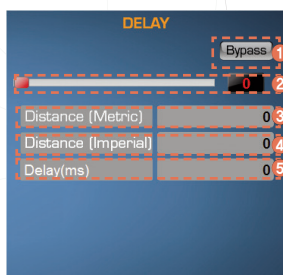
DELAY

❶ Bypass Button: Delay value applied as default value
❷ Control bar: changeable from 0 to 100 in increments of 1
❸ Distance [Metric]: each time the Delay value increases by 1, it is applied in about 0.34 units.
❹ Distance [Imperial]: applies in increments of about 1.11 each time the Delay value increases by 1
❺ Delay(ms): applied in increments of 0.5 as the delay increases