TOA

SX-2000 Series
Audio Management System

EN 54 Standard-compliant and Network enabled for extended multi-location installations with centralized control.

Description

The SX-2000 is a scalable system for configuring versatile and highly effective PA systems. The system features new matrix capabilities, so that a single system can have its components distributed in different locations under centralized control. Ideal for large scale installations ranging from multiple buildings to local systems, the versatile SX-2000 Series is particularly suitable for using in airports and railway stations, factories, shopping malls and large offices. The system's versatility such as dual power source and redundancy for fail-safe operation makes it a reliable solution for any specific installation without long lead times and the expense of custom systems.

System Configuration

The basic system comprises one SX-2100AI Audio Input Unit, one SX-2000AO or SX-2100AO Audio Output Unit and the SX-2000SM System Manager. It enables from 2 inputs / 8 outputs right up to 64 inputs and 256 outputs, with further expansion to 1,416 control inputs/outputs if needed. The SX-2000 Series makes it simple to control an expanded system by use of networking with commercial switching hub and cables, IP Intercom Network audio adaptor(s) can also be used. It features functions such as feedback suppressor, compressor / auto-leveler, equalizer / filters, and auto mixing (with feedback ducker) to ensure high sound quality. The SX-2100AI modular construction simplifies system configuration as only plug-in modules have to be used. Therefore it allows flexibility of use with a wide range of input devices such as CD player, FM etc. to suit a particular application.

Fail-Safe Operation

The system is featuring a self-diagnosis to continuously monitor the status as well as speaker lines and connections. It generates alerts and email notifications to the system administrator along with a failure log. Power failure protection is given by two power supply channels plus a battery back-up that keeps the system in operation without requiring an UPS. An additional analog backup line from the microphone to the amplifier allows simultaneous broadcasting even during a breakdown of the system's digital functions. The SX-2000 system can be password-protected and key locked at external devices.

Features

- Network-base sound system
- Max. 64 audio inputs and 256 outputs with 16 bus lines
- Max. 1,416 control inputs and outputs for system integration
- Built-in DSP function, event logger and surveillance of amplifiers and speaker lines
- Max 1,536 zones in combination with VM-3000
- Max 2,048 zones in combination with TOA's N-8000 series IP Intercom System

Maximum System Capacity	
Output Power	128,000 W
Speaker Zones	256
Remote Mic connection	64

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Certificate No: 1134-CPR-102

SX-2000SM

SX-2000SM

- Matrix system in combination with an audio input unit, audio output unit and remote microphone
- Audio signal routing and priority control
- 8 control inputs, 8 control outputs
- Failure status outputs, failure data inputs/switches
- Access indicators, mode indicators and failure indicators enabling a wide range of controls and status monitoring
- Control can be performed by way of a CF card inserted into the SX-2000SM unit
- Operations can be recorded and their contents stored on a CF card as an operation log

- Two power inputs for creation of a dual-redundant power system
- Automatic voice announcement for emergency purpose available
- System settings via Dual LAN connection

Options

- SX-2000AO: Audio Output Unit
- SX-2100AI: Audio Input Unit
- SX-2100AO: Audio Output Unit

Specifications

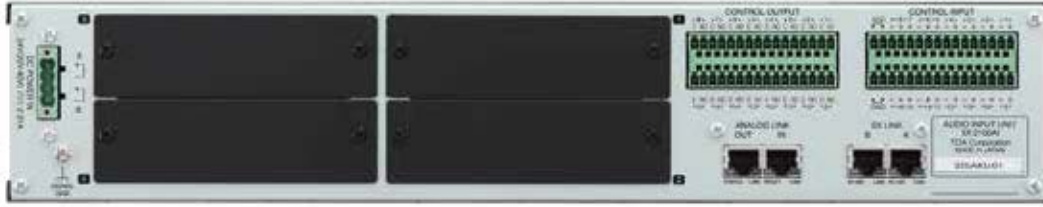| Specifications	SX-2000SM
Applicable Model	VX-2000DS, VX-3000DS
Power Source	24 VDC; 2 power inputs
Current Consumption	Under 0.8 A
SX Link Network I/F	2 x 100 BASE-TX circuits
LAN	Network I/F 1 10 BASE-T/100 BASE-TX circuit. Network Protocol TCP/IP. Connection Cable Shielded Category 5 twisted pair cable for LAN (CAT5-STP)
Analog Link	Input/output connector output: 2. Connection cable shielded category 5 twisted pair cable for LAN (CAT5-STP)
Failure Data	3 inputs (ACK/RESET/LAMP TEST) and 4 outputs (CPU FAULT/GENERAL FAULT/CPU OFF/BUZZER)
Memory Card	Insertion slot: 1 (supplied CF card (128MB))
Control	8 control outputs, 8 control inputs
Finish	Panel: Aluminum, black, alumite, case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 44 x 333 mm (19", 1U)
Weight	3.8 kg

SX-2100AI

SX-2100AI

> Modular audio input
> 2 to 8 audio inputs per unit
> Multiple units can be decentralized in a whole system
> Audio signals are transmitted digitally to the audio output unit
> Analog audio output function (1 channel) enables simultaneous all-zone calls for use in emergency situations
> Audio input levels (post-fader levels) are indicated on the level meters provided for each input channel
> Volumes can be adjusted for each channel using the volume controls on the front panel or the SX-2000 software
> Volume controls can be locked using the SX-2000 software

> Input channels can be monitored using the internal speaker
> 2 power inputs for redundant power system to support a dual-redundant power supply system

Options

> SX-200RM: Remote Microphone Interface Module
> RM-200SF: Remote Microphone
> RM-200SA: Remote Microphone
> RM-210: Extension Unit
> D-921E: Mic/Line Input Module
> D-921F: Mic/Line Input Module
> D-922E: Mic/Line Input Module
> D-922F: Mic/Line Input Module
> D-936R: Stereo Select Input Module

Specifications

	SX-2100AI
Applicable Model	VX-2000DS, VX-3000DS
Power Source	24 VDC (2 independent power inputs)
Current Consumption	Under 1.5 A (when operated on 24 VDC)
Audio Inputs	8 inputs, for up to 4 modules
Audio Input Characteristics	Sampling frequency: 48 kHz
Analog Link Input / Output Connector Connection Cable / Device	1 input, 1 output, CAT5-STP, max. cable length 800m, 2 x RJ45 connector
SX Link Network I/F Connection Cable / Device	2 x 100 Base-TX CAT5-STP, maximum cable length 100m to hub
Operating Temperature	0℃ to +40℃
Finish	Panel: Aluminum, black, alumite, case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 88.4 x 349 mm (19", 2U)
Weight	7 kg

SX-2100AI (Rear)

SX-200RM

Remote Microphone
Interface Module

> Can be used to connect two remote microphones
> Input sensitivity can be adjusted

Specifications	SX-200RM
Power Source	Supplied from SX-2100AI
Input	2 x RJ45 connector for remote microphones
A/D Converter	24 bits
Frequency Response	20 Hz – 20 kHz, ± 1 dB
Sampling Frequency	48 kHz
Dynamic Range	> 100 dB (IHF-A weighted)
Total Harmonic Distortion	< 0.05 %
Finish	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm
Weight	190 g

SX-200IP

IP Interface Module

> Module for mounting in the SX-2100AI, RJ45 connectors
> Enable paging announcement from the N-8000 Series stations (N-8600MS & N-8610RM) to the SX-2000 System

Specifications	SX-200IP
Network Section	Network I/F: 10BASE-T/100BASE-TX (Automatic-Negotiation) Network Protocol: TCP/IP, UDP, HTTP, RTP, ARP, ICMP, IGMP Voice sampling frequency: 16kHz, 8kHz (controllable on the software) Voice packet loss recovery: Silence insertion Audio delay time: 80ms, 320ms (controllable on the software)
Indicator	Operation indicator (RUN)
Finish	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm
Weight	150 g

D-921E

Mic/Line Input Module (24 bits monaural type)

> 2-channel microphone/line input module designed for use with the SX-2100AI
> Equipped with removable terminal block type connectors

D-921F

Mic/Line Input Module (24 bits monaural type)

> 2-channel microphone/line input module designed for use with the SX-2100AI
> Equipped with XLR connectors

D-922E

Mic/Line Input Module (20 bits monaural type)

> 2-channel microphone/line input module designed for use with the SX-2100AI
> Equipped with removable terminal block type connectors

D-922F

Mic/Line Input Module (20 bits monaural type)

> 2-channel microphone/line input module designed for use with the SX-2100AI
> Equipped with XLR connectors

D-936R

Stereo Select Input Module

> 4 stereo input module designed for use with the SX-2000AI
> Equipped with standard RCA pin jacks

SX-2000AO

SX-2000AO

> Audio output unit
> Units can be operated in a decentralized system
> 8 audio outputs and 2 inputs, can be mixed
> 8 control inputs and 8 control outputs
> Receives audio signals from the audio input unit via digital transmission
> Analog audio input function (1 channel) enables simultaneous all-zone calls for use in emergency situations
> Audio output levels (post-fader levels) indicated on the level meters separate for each output channel
> Volumes adjustable for each channel by front volume controls or the SX-2000 software
> The volume controls can be locked by SX-2000 software
> Any output channel can be monitored using the internal speaker

> Emergency audio input and 24 V emergency cut-off input
> 2 power inputs for dual-redundant power supply system
> For public address applications

Options

> SX-2000CI: Control Input Unit
> SX-2000CO: Control Output Unit
> DA-250DH: Digital 2 Channel Amplifier 100 V
> DA-250FH: Digital 4 Channel Amplifier 100 V
> DA-550FH: Digital 4 Channel Amplifier 100 V
> DA-250D: Digital 2 Channel Amplifier 4/8 Ω
> DA-250F: Digital 4 Channel Amplifier 4/8 Ω
> DA-550F: Digital 4 Channel Amplifier 4/8 Ω

Specifications	SX-2000AO
Applicable Model	VX-2000DS, VX-3000DS
Power Source	24 VDC (operating range: 20 – 40 VDC from VX-200PS)
Current Consumption	Under 0.79 A
Audio Output	8 outputs, 0 dBV, load: 600 Ω or more
Audio Output Characteristics	Frequency Response: 20 Hz – 20 kHz , sampling frequency 48 kHz, D/A converter 24 bit
Control Input / Control Output	8 inputs / 8 outputs, removable terminal blocks (6 pins)
Emergency Line Input	Emergency signals switched and sent to input 1 (H,C,E) by relay, removable terminal blocks (3 pins)
Emergency-Cutoff 24 V Input	1 input, input current < 5 mA, removable terminal block (2 pins)
Analog Link	1 input, 1 output, connection cable CAT5-STP, max. cable length 800 m, 2 x RJ45 connector
SX Link	2 x 100 Base - TX circuits with RJ 45 connector. Connection cable CAT5-STP, maximum cable length of 100 m to hub
Finish	Panel: Aluminum, black, alumite, case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 88.4 x 349 mm (19", 2U)
Weight	6.2 kg

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SX-2100AO

> Multiple units can be decentralized in a system
> 8 audio outputs
> 8 control inputs and 8 control outputs
> 1 SX-2000CI Control Input Unit and 1 SX-2000CO Control Output Unit each can be cascaded
> 2 local audio inputs with control inputs are provided for the audio inputs
> Emergency switch over to a standby amplifier
> Analog transmission path (1 channel) enables all-zone calls for use in emergency situations
> 2 channels of link connection terminals for connecting to two VX-2000DS or VX-3000DS
> 2 inputs can be mixed and output
> 2 power inputs for redundant power supply
> Level meters for each output channel allow monitoring of audio output levels
> Output volumes adjustable on the front panel

> Any output channel can be monitored using the internal speaker
> Key lock function
> Automatic control of stand-by amplifier

Options

> SX-2000CI: Control Input Unit
> SX-2000CO: Control Output Unit
> VP-3154: 150 W by 4 channels amplifier
> VP-3304: 300 W by 4 channels amplifier
> VP-3504: 500 W by 4 channels amplifier
> VP-2064: 60 W by 4 channels amplifier
> VP-2122: 120 W by 2 channels amplifier
> VP-2241: 240 W by 1 channel amplifier
> VP-2421: 420 W by 1 channel amplifier

Specifications	SX-2100AO
Applicable Model	VX-2000DS, VX-3000DS
Power Source	24 VDC (2 power inputs)
Current Consumption	Under 1.2 A
Audio Output	8 outputs, 0 dBV, load: 600 Ω or more
Audio Output Characteristics	Frequency Response: 20 Hz – 20 kHz , sampling frequency 48 kHz, D/A converter 24 bit
CI/CO Link	SX-2000CI / SX-2000CO: 1 interface, connection cable CAT5-STP, RJ45 connector
Local Audio Input	2 audio inputs, 0 dBV, 10 kΩ, electronically balanced, RJ45 connector Frequency Response: 20 Hz – 20 kHz , sampling frequency 48 kHz, D/A converter 24 bit 2 Control inputs Connection cable CAT5-STP,
DS Link	VX-2000DS, VX-3000DS: 2 interfaces, connection cable CAT5-STP, RJ45 connector, VX-3000DS
Analog Link	1 input, 1 output, connection cable CAT5-STP, RJ45 connector
SX Link	2 x 100 Base-TX with RJ 45 connector, connection cable CAT5-STP
Finish	Panel: Aluminum, black, alumite, Case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 88.4 x 349 mm (19", 2U)
Weight	7.1 kg

SX-2000CI

SX-2000CI

- 32 control inputs
- Control input line failure detection
- Front panel LED for monitoring the line status
- Supply of stabilized 24 VDC
- 2 independent power inputs
- Decentralised installation of multiple units possible
- RJ45 connectors

Options

- SX-2100AO: Audio Output Unit
- SX-2000AO: Audio Output Unit

Specifications	SX-2000CI
Applicable Model	VX-2000DS, VX-3000DS
Power Source	24 VDC, 2 independent Inputs
Current Consumption	Under 0.55 A (when operated on 24 VDC)
Control Outputs	32 inputs
Input/Output Connector	Input: 1, output: 1 RJ45 connector
Connection cable	Shielded category 5 twisted pair cable (CAT5-STP)
Maximum Cable Distance	800 m
Output Voltage	24 VDC ±10 % or less
Maximum Feeding Current	100 mA
Connector	Removable terminal block (2 pins)
Finish	Panel: Aluminum, black, alumite, Case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 44 x 331.5 mm (19", 1U)
Weight	3.6 kg

SX-2000CO

SX-2000CO

- 32 control outputs
- Front panel LED for monitoring the line status
- Supply of stabilized 24 VDC
- 2 independent power inputs
- Decentralised installation of multiple units possible
- RJ45 connectors

Options

- SX-2100AO: Audio Output Unit
- SX-2000AO: Audio Output Unit

Specifications	SX-2000CO
Applicable Model	VX-2000DS, VX-3000DS
Power Source	24 VDC, 2 independent Inputs
Current Consumption	Under 0.29 A (when operated on 24 VDC)
Control Outputs	32 outputs, max. 40 VDC, 2 – 300 mA
Input/Output Connector	Input: 1, output: 1 RJ45 connector
Connection cable	Shielded category 5 twisted pair cable (CAT5-STP)
Maximum Cable Distance	800 m
Finish	Panel: Aluminum, black, alumite, Case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 44 x 331.5 mm (19", 1U)
Weight	3.6 kg

RM-200SA/RM-210   RM-200SF   WB-RM200

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RM-200SA / RM-210

- 13 function switches
- Zone, group, all-call paging, and activate pre-recorded messages
- Emergency sequence can be started with the alarm button which is covered by a hinged lid
- Indication of system failure, line failure, busy zones, etc.
- Extraordinary clarity & freedom from distortion by built-in compression circuit
- Up to 64 remote microphones can be connected
- Covered switch prevents against accidental use
- RM-210: Allows extended zone selection

RM-200SF

- For Emergency broadcast
- For activation of emergency mode, start and stop automatic broadcasts of emergency announcements, reset emergency signals, and live microphone announcements.

Options

- WH-4000A: Headset
- WB-RM200: Wall mounting bracket

Specifications

	RM-200SA	RM-210
Applicable Model	SX-200RM in SX-2100AI, RM-210	RM-200M, RM-200X, RM-200XF, RM-200SA, RM-200SF
Power Requirement	24 V DC (operating range: 15 – 40 V DC)	From remote microphone
Current Consumption	240 mA maximum	80 mA max. (in terms of DC power inputs of RM-200SA)
Distortion	Under 1 %	-
Frequency Response	100 Hz – 20 kHz	-
Signal-to-Noise Ratio	Over 60 dB	-
Audio Output	0 dBV, 600 Ω, balanced	-
Microphone	Uni directional electret condenser microphone	-
Volume Control	Microphone, buzzer, monitor speaker	-
Emergency Broadcast	Activation of emergency broadcast (pre-recorded announcement or live microphone announcement) by emergency broadcast switch	-
Voice Message Control	Activation of up to 32 messages	-
Key Extension	Max. 4 RM-210	10 keys, freely assignable
Connection Cable and Connector	Category 5 STP cable, RJ45 connector	Connection by way of dedicated cable
Finish	ABS resin, bluish gray (PANTONE 538 or its equivalent)	
Dimensions (W x H x D)	190 x 76.5 x 215 mm (Gooseneck microphone excluded)	110 x 76.5 x 215 mm
Weight	880 g	350 g

Specifications

	RM-200SF
Applicable Model	SX-200RM in SX-2100AI, RM-210
Power Requirement	24 V DC (operating range: 15 – 40 V DC)
Current Consumption	240 mA maximum
Distortion	Under 1 %
Frequency Response	200 Hz – 15 kHz
Signal-to-Noise Ratio	Over 55 dB
Audio Output	0 dB*[1], transformer-balanced
Microphone	Uni directional dynamic microphone with talk key, AGC (ON/OFF selectable), microphone element failure detechable by using a built-in small oscillator
Connection Cable	CPEV cable or Category 5 STP cable
No. of Connectable Expansion	Max. 5 units (RM-210)
Monitor Speaker	Built inside
Operation	Emergency key, Function kes, CPU switch, Reset switch
Indicator	Status indicators, Power indicators, Failure indicator, CPU indicator, Selection indicators, Microphone indicator, Broadcast status indicator
Dimensions (W x H x D)	200 x 215 x 95 mm
Weight	1.48 kg (with wall mounting bracket unit)

*[1] 0 dB = 1 V

N-8610RM

N-8610RM

- Connection via LAN or switching hub and SX-200IP
- Can make a paging call to any selected zone(s) of SX-2000 System
- Two way communication capability with other stations in N-8000 Intercom System
- 14 function keys
- Up to 4 RM-210 Extension units can be connected
- Powered by PoE-compatible switching hub or optional AC adapter

Options

- RM-210: Key extension unit
- WB-RM200: Wall mounting bracket
- AD-1210P: AC Adapter
- SX-200IP: IP Interface Module

Specifications

	N-8610RM
Applicable Model	SX-200IP in SX-2100AI
Power Source	Power supply device that complies with IEEE802.3af standard or 12VDC (supplied from the AC adapter (option))
Power Consumption	4W (Use of the AC adapter, 12VDC), 8.5W (when connecting 4 RM-210 Extension units) 5.2W (Use of the PoE, 48VDC), 7.5W (when connecting 4 RM-210 Extension units)
Key Extension	Max. 4 RM-210 (maximum 2 units at PoE power supply)

Network Section
  Network I/F
  Network Protocol
  Audio Packet
  Transmission System
  Voice Packet Loss Recovery
  Audio Delay Time
	
	10BASE-T/100BASE-TX (Automatic-Negotiation)
	TCP/IP, UDP, ARP, ICMP, HTTP, RTP, IGMP
	
	Unicast, Multicast
	Silence insertion
	80ms, 320ms (controllable on the software)

Finish	ABS resin, bluish gray (PANTONE 538 or its equivalent)
Dimensions (W x H x D)	190 x 76.5 x 215mm (excluding microphone)
Weight	700g

RM-200RJ

RM-200RJ

- Convert the RJ45 connector into a screw terminal block
- Used to connect between a trunk cable (such as CPEV cable) and a feeder cable (such as CAT-5 or CAT-6 cable) in wiring a remote microphone
- Built-in indicator shows the voltage status of DC power cable when the remote microphone cable for the SX-2000 series system is connected

Specifications

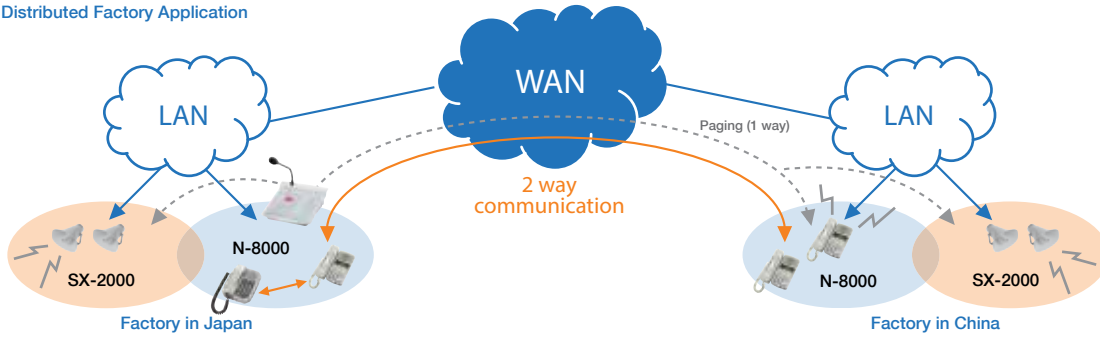|	RM-200RJ
Applicable Model	SX-2100AI, RM-200SA, RM-200SF
Applied Voltage	Under 40V
Withstand Voltage	1A
Voltage Indicator	Monitor terminals: terminal No 7 (+) and terminal No 8 (–), extinguish voltage: 14V or less, lighting voltage: 21V or more, indicator ON/OFF switchable
Connector	RJ45 connector: 1
Terminal	M3 screw terminal (10 pins), distance between barriers: 6.62mm
Finish	Surface-treated steel plate, black, paint
Dimensions (W x H x D)	84 x 116 x 25.7mm
Weight	250g

Integration of SX-2000 with N-8000 IP Intercom strengthens system capabilities.

A large system with up to 2048 zones is realized on the IP Network.
From a remote location, IP Station* can make a paging call to any selected zone(s).

*N-8610RM and N-8600MS

Example: Distributed Factory Application

WAN

LAN

Paging (1 way)

2 way communication

LAN

SX-2000

N-8000

Factory in Japan

N-8000

SX-2000

Factory in China

N-8000 IP Intercom System

2 way communication

N-8610RM

LAN

SX-2000 System #1

Fire alarm

Failure Indication

SX-2000SM

SX-2000CI

SX-2000CO

SW-HUB

SX-2100AI

SX-2100AO

SX-200IP

VP-3304

RM-200SA

SX-2100AI

VP-3304

RM-200SA

Standby amplifier (VP-3304)

Auto Announcement Machines

DC power

VX-3000DS

BGM

Lead-acid Battery

Max. 2048 zones

SX-2000 System #8

SX-2000SM

SX-2100AI

SW-HUB

SX-2100AO
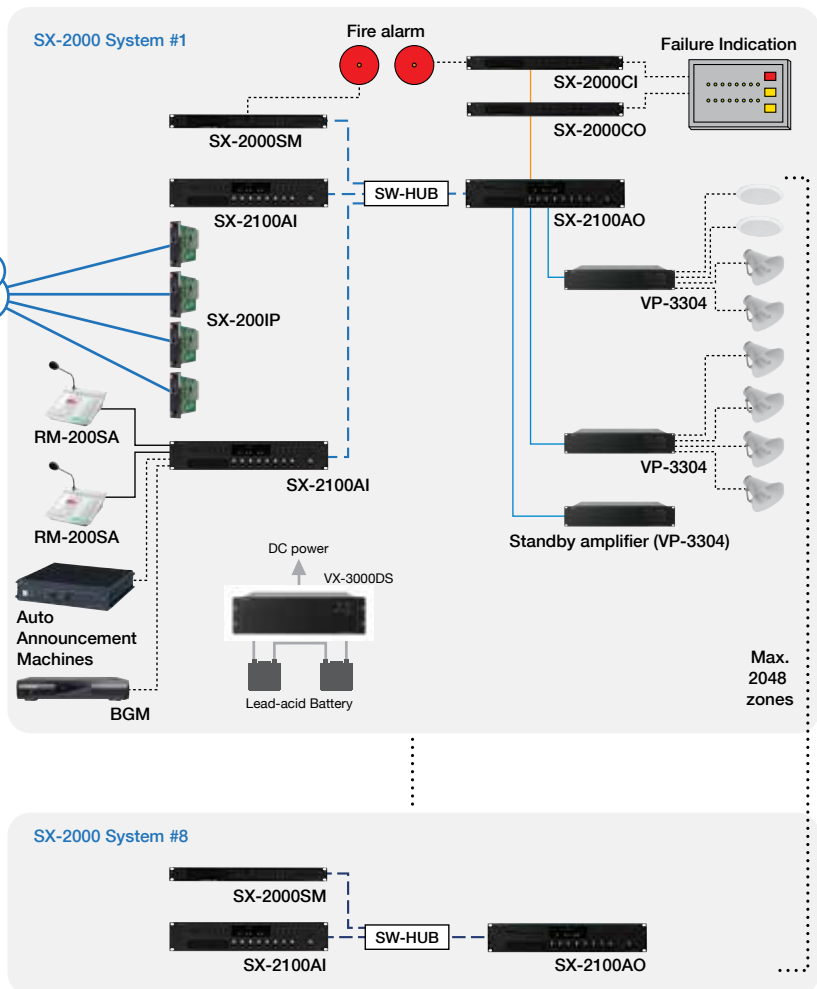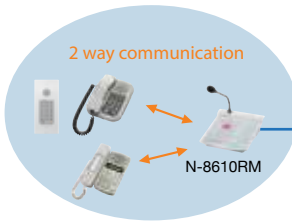
Distributed Control System Example (University)

Campus A

SW-HUB

SW-HUB

Optical fiber network

SW-HUB

SW-HUB

SW-HUB

Campus C

Campus B

Campus A

SX-2100AI

SW-HUB — SX-2000SM

SX-2100AO

VP-3304

VP-3304

Standby amplifier (VP-3304)

Auto Announcement Machines

BGM

SX-2100AI

SX-2100AO

VP-3304

Standby amplifier (VP-3304)

Auto Announcement Machines

BGM

DC power

VX-3000DS

Lead-acid Battery

Campus C

SX-2100AI

SX-2000AO

DA-500FH

DA-500FH

DC power

VX-3000DS

Lead-acid Battery

Auto Announcement Machines

BGM

Optical fiber network

SW-HUB

SW-HUB

SW-HUB

SW-HUB

Campus B

SX-2000CO

SX-2000CI

SX-2100AI

SX-2100AO

VP-3304

VP-3304

Standby amplifier (VP-3304)

Auto Announcement Machines

BGM

SX-2100AO

DC power

VX-3000DS

VP-3304

Standby amplifier (VP-3304)

Smiles for the Public

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