Honeywell

X-618 Public Address System

Product Description

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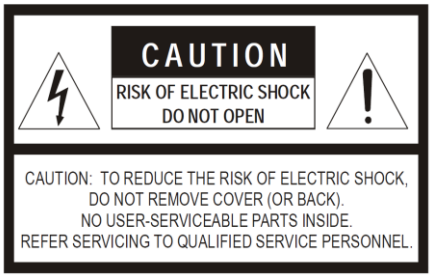
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Precautions





Danger

This sign reminds users of “dangerous voltage” on the product.



Caution

This sign reminds users of important instructions attached to the product.

Safety guideline	In order to prevent electric shock, this equipment plug shall not be used as conductor to extend power supply line.
	Do not block the equipment’s ventilation opening or put other equipment on it.
Safety guideline	Protect this equipment against rainwater or moisture so as to avoid fire or electric shock.

Unpacking

After removing the amplifier from the carton, inspect for any exterior damage to the unit. If damage is noted, notify the carrier at once so that a claim can be justified. Save all packing material. This is important when the claim is processed.

Ventilation

To offset heat generated by the unit, it is necessary to provide ample ventilation around the unit. Avoid blocking or impeding the ventilation holes on the unit. To prevent unnecessary problems, install the unit in a place free from any vibrations, direct sunlight, humidity or dust circulation.

Prevent liquids or other materials to enter cabinet

If the unit gets wet or any foreign material enters the amplifier cabinet, immediately disconnect the AC power cord and consult your dealer or qualified technician.

Important Safety Instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with a dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- Do not install on or near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

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- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use the attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
- WARNING – To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
- The mains plug is used as disconnecting device and shall remain readily operable.
- The apparatus is unsuitable for use in air-handling spaces.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- Class I apparatus shall be connected to a mains socket outlet with a protective earthing connection.

Network Security

Placement

- Please put the device in a safe place, lock the cabinet and keep the keys well.
- The access control system of the central control room should be under strict management.
- Any person except authorized maintainer is forbidden to disassemble or change parts of device.
- It is forbidden to communicate X-618 system with third party system unless updating the configuration.

Password Precaution

- Please change the password during the system deployment.
- Users need to change the password regularly.
- The password with six numbers is preferred.

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Preface

Thank you for buying the X-618 Public Address System. Please carefully read this manual prior to system use to ensure the correct use of the system.

Brief Introduction

This manual describes functions, characteristics, applications, product specifications, and the appearance of the X-618 Public Address System. The manual includes the following chapters:

Chapter 1: System Description

This chapter describes characteristics, functions, components, and applications of the X-618 Public Address System.

Chapter 2: Digital Integrated System Manager (X-DCS3000)

This chapter describes the X-DCS3000 characteristics, functions, appearance, and specifications.

Chapter 3: High Efficiency Power Amplifier (X-DA/EN)

This chapter describes the X-DA/EN power amplifier characteristics, functions, appearance and specifications.

Chapter 4: Configurable Network Paging Console (X-NPMS)

This chapter describes the X-NPMS characteristics, functions, appearance and specifications.

Chapter 5: Key-extend Module (X-K8)

This chapter describes the X-K8 characteristics, functions, appearance and specifications.

Chapter 6: Network Resource Interface (X-NRI/EN)

This chapter describes the X-NRI/EN characteristics, functions, appearance and specifications.

Chapter 7: Digital Noise Detector (X-ND100)

This chapter describes the X-ND100 characteristics, functions, appearance and specifications.

Intended Reader

This manual is mainly for personnel who are to use the X-618 Public Address System.

Relevant Documents

The following documents can be used as a reference when reading this manual:

- X-618 Public Address System Installation Manual
- X-618 Public Address System Configuration Manual
- X-618 Public Address System Operation Manual

Use Instructions

- All content in this manual, including figures, are to be used only for reference.
- This product may be subject to change without notice.
- Users of this product are recommended to carefully read all warnings and precautions in this manual.
- Carefully read this manual before using the product and keep it as a reference for future use.
- This manual has been reviewed for accuracy. In case of any doubt or dispute of the product description, the final interpretation given by the Life Safety A/V (Guangzhou) Co., Ltd. shall prevail.
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1 System Description

This section describes the background, characteristics, functions, product components, and applications of the X-618 Public Address System. The X-618 Public Address System is referred to as the “X-618” throughout the remainder of this manual.

The X-618 provides a series of complete multiple audio source, and public audio management solutions. Centralized network management is achieved through system software and the whole system state is monitored.

System Characteristics

The X-618 has the following main features:

- Supports up to 2000 loudspeaker circuits.
- Plays multiple sound sources simultaneously, including network sound sources, paging sources, external sound input sources.
- Built-in voice recordings for emergency purpose.
- Includes AVC (Automatic Volume Control) capable of automatically adjusting the broadcasting sound volume, according to the ambient noise to improve sound clarity.
- Page and control broadcasts through the X-NPMS (Configurable Network Paging Console).
- Expand external audio interfaces overpass the X-NRI/EN (Network Resource Interface).
- Dry contact trigger input and output.
- Play prerecorded voice or music files through manual control, preset timer control, or preset event control.
- Supports automatic and manual voice alarms.
- Each DCS built-in nonvolatile memory can store audio files.
- In case of paging in emergency mode, the system is capable of automatically recording sounds through the PTT microphone.
- Automatically diagnoses system faults such as power supply faults, power amplifier faults, loudspeaker circuit faults, and communication faults.
- Built-in network switching function, including 4 Ethernet ports.
- The system can be easily configured and upgraded through Ethernet.
- Supports remote telephone paging through NRI and telephone interface device connected to PSTN or VoIP telephone network.

System Management Software Functions

The X-618 system management software has the following functions:

- System Configuration Function
- User Management Function
- Broadcast Control Function
- System State Management
- System Warning Function
- Log Management Function
- Voice Synthesis Function
- Audio Management Function

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System Configuration Function

The following system configuration functions can be set through the X-618 Config software:

- Equipment configuration to be managed by the X-618 Config software.
- Configure the X-618 system map and operation interface according to actual needs.
- Audio source configuration, broadcast list and broadcast task.
- Configure automatic timing broadcast schedule.
- Management scope and authority configuration of different client software.
- Configure relevant parameter of server-side software.

User Management Function

The user management functions allow adding, modifying, and deleting users, as well as controlling the user privileges of corresponding users.

The X-618 system management software has two levels of privileges and user types, including super user and normal user.

- A super user and has full operation authority, which is allowed to add and delete the System Administrator and System Operator, as well as set their privileges.
- According to the authority allocated by super user, normal user can conduct equipment configuration, zone configuration, map configuration, audio source configuration, task configuration, timing configuration, user configuration, figure broadcast, log review and alarm review.

Broadcast Control Function

The broadcast control function allows for uniform management of all broadcasting services and management of all broadcasting operations on the client-side of the broadcast controls. Users can conduct task broadcast to all zones in group, device or map view based on references.

System State Management

The system state management function allows for monitoring the zone broadcasting states of all equipment. The system automatically displays the states on the system interface. The system states are easy to query.

System Warning Function

The system warning function allows for the centralized management of equipment fault states, and automatically records fault logs through the log management module.

When the system detects a fault, an audible and visual alarm is emitted. Fault equipment unit indicator lights are yellow.

Users can identify the fault through the system management software.

Log Management Function

The log management function allows for recording of all system operations and fault events, as well as the automatic storage and analysis of such faults to identify their causes. The operation and fault logs are stored in a separate memory module and cannot be deleted manually. The logs of the most recent year are maintained, and logs exceeding this time limit are deleted by the system automatically.

Operation logs mainly contain records of equipment startup/shutdown events, manual/automatic operations, and emergency broadcasting records. The logs contain the fault date, time, and operation code or command.

Fault logs contain records of the fault time, code, recovery time and type.

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All logs can be queried through the system management software according to conditions such as the time, work group, or equipment so as to enable the ability to export the corresponding log files.

Log printing, such as the printing type, printing time, and fault level, can be set.

The log management module acquires system configuration information from the system management server and does not require separate configuration.

Voice Synthesis Function

System management software supports two ways of voice synthesis: voice segments synthesis and TTS text-to-speech. Through the method of voice segments synthesis, users can combine voice segments into complete speech to broadcast according to a preset combination method. It also supports text-to-speech broadcast via the third-party software like TTS or Windows built-in voice library.

The voice synthesis function is used together with the broadcast control function.

Audio Management Function

The audio management function allows for uniform management and the ability to play sound files (in the WAV format) stored on the server, respond to the X-618 system equipment or control server requests, and send single or multiple sound files to the network.

The audio management function can convert different sound file formats to the format designated by the X-618 system. Audio file playlists can be accessed through the system control server, and corresponding broadcasting tasks are set.

Product Components

The X-618 includes the following product components:

- X-DCS3000 Digital Integrated System Manager

  The X-DCS3000 Digital Integrated System Manager is hereinafter referred to as the “DCS”, and a complete model is used when describing unique features.

  The DCS in the X-618 expands the number of loudspeaker lines, and supports multiple audio source files for broadcasting. The system easily integrates with the audio source file storage system, the audio broadcasting system, the loudspeaker line control system, and the system for monitoring and diagnosing faults.

- X-DA1500/EN/DA2250/DA4125 High Efficiency Power Amplifier

  X-DA1500/EN/DA2250/DA4125 is hereinafter referred to as DA.

  In the X-618 system, the DA amplifies audio signal power and drives many broadcasting loudspeakers.

- X-NPMS Configurable Network Paging Console

  The X-NPMS Configurable Network Paging Console is hereinafter referred to as the “NPM” or “X-NPMS”.

  The NPM connects to other devices of X-618 system to transmit audio and control information through the Ethernet network. The NPM is used for manual paging, audio (line input or audio files) broadcast, and voice synthesis and prerecorded audio functions.

- X-NRI/EN Network Resource Integration Module

  The X-NRI/EN Network Resource Integration Module is hereinafter referred to as the “NRI” or “X-NRI/EN”.

  The X-NRI/EN connects to other devices of X-618 system to transmit audio and control information through the Ethernet network. It offers external audio and control interface for the system to connect with a third device. X-NRI/EN can connect with fire controller via dry contact interface to realize fire linkage broadcast.

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- Config Software

  This is used for hardware configuration. As the default factory setting, it only provides the most basic functions. The X-618 Config software can set the advanced functions based on the user's needs, including device base parameter setting, fault diagnosis, tasks for playing operations, and button functions.

  The X-618 Config software can be configured online or offline. If the software is configured offline, the configuration data is saved as a project file. The configuration file is uploaded to the device system, once the configuration software has been installed on a computer and that computer is connected to the system. After the system receives the configuration data, the system reboots automatically to allow the configuration settings to take effect.

System Structure

The X-618 is a highly integrated public address system based on standard Ethernet and TCP/IP protocol. The system is composed of DCS, NPM, NRI and speakers. The X-DCS3000 and amplifier form a basic broadcast system unit. Multi broadcast system units can extend system's scale.

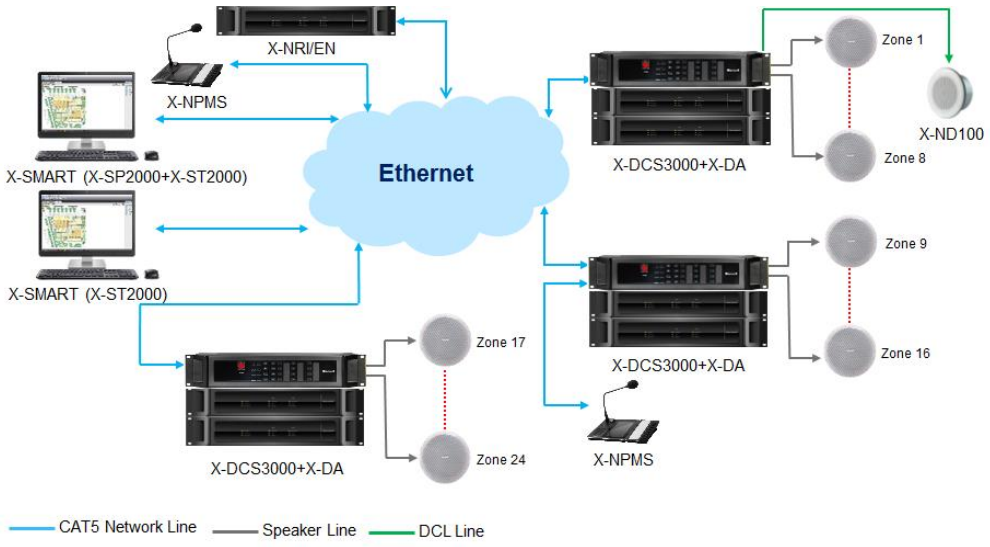


Figure 1 Schematic Diagram of the X-618 Broadcast System

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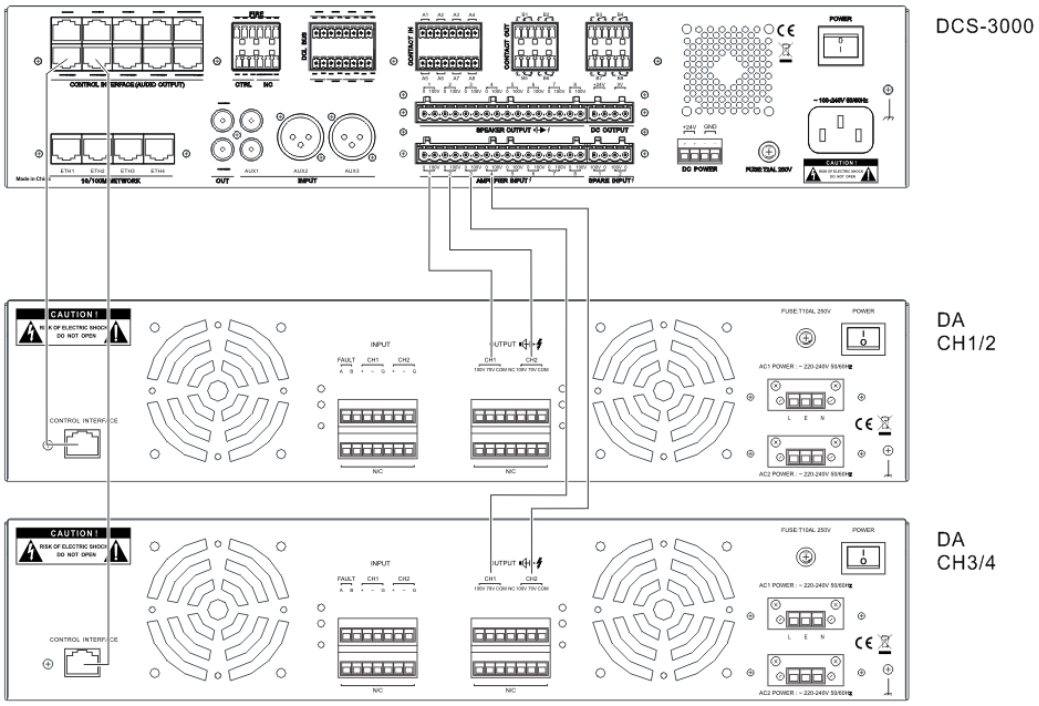


Figure 2 Broadcast System Unit of X-DCS3000 and Amplifier

Applications

The X-618 is applicable in the following situations:

- Office buildings
- Hotels
- Exhibition halls
- Shopping mall
- Factories
- Urban rail network

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2 Digital Integrated System Manager (X-DCS3000)

This chapter describes the characteristics, functions, appearance, and specifications of the X-DCS3000.

The X-DCS3000 in the X-618 is designed for expanding the number of loudspeaker lines, and can support multiple audio sources for broadcasting. The system integrates all functions related to broadcasting, such as the audio file storage, network audio broadcasting, the loudspeaker line management, monitoring and faults diagnosing. The system integrates well and is easily configured.

Product Characteristics

The DCS offers the following features:

- Supports the manual selection of audio source files, zone buttons, and the device can be operated directly.
- Supports public address.
- LED lights show the device status.
- Remote paging and broadcasting from NPM.
- 8 configurable speaker lines.
- 3 auxiliary inputs that can connect external audio source equipment, such as CD player or tuner.
- 8 DCL (Digital Control Link) interfaces that can be connected with X-ND100 (Digital Noise Detector).
- Built-in loudspeaker to monitor the audio of speaker lines, network monitor is available via NPM.
- Built-in 1GB nonvolatile memory which is used to store firmware, audio files, log and configuration data.
- Maximum of 4 audio channels from the network or internal audio files can be broadcasted in 8 speaker lines at the same time.
- Supports amplifier changeover. Supports 4 main and 1 spare amplifiers or 8 main and 1 spare amplifiers.
- Self-test of acousto-optic components.
- Supports automatic fault diagnosis.
- If short circuit fault is found in the speaker lines, the lines will be disabled automatically.
- Supervising the fault on DCL buses and digital noise detectors, such as off-line, repeated address, and short circuit.
- Labels on the front panel mark the name of speaker lines and audio sources. Internal audio matrix enables broadcasting in any audio source in any zone.
- Supports emergency broadcast to evacuate people under emergency situation.
- Timing broadcast function.
- Fuses are used to protect the power supply. If the main power supply circuit is short in DCS, the system will disconnect the main power supply.
- Up to 250 DCS can be extended through Ethernet.

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Functions Introduction

The DCS has the following main features:

- Main and Backup Power Supply
- Power Supply Protection
- Fault Diagnosis
- Line Fault Detection
- Monitoring Function
- Self-test Function
- AVC Function
- Volume Control
- Power Amplifier Management
- Amplifier changeover Function
- Zone Control
- Voice Information Management
- Emergency Override Function
- Public Address Function
- Paging Function
- Log Management Function
- Software Configuration Function

Main and Backup Power Supply

The main and standby power supplies are provided with the DCS. The methods by which the power supply detects faults can be configured through the software. In case of a main power supply fault, the main power supply indicator light on the front panel of the DCS turns yellow, and the output fault automatically causes the backup power supply to provide power instead. After the main power supply is returned to normal, it automatically supplies power and the backup power supplies resume their standby presence.

Power Supply Protection

The DCS power supply is protected. In case of a short circuit or other fault within the DCS, the main power supply is disconnected automatically.

Fault Diagnosis

The DCS automatically detects equipment states, records fault logs, and prompts operation managers through the fault detection function.

In case of a system fault, the DCS can immediately detect corresponding faults. The DCS fault indicator light turns yellow, the fault buzzer emits a prompt tone, and the fault information are recorded in the operation log.

The DCS can detect faults including main and backup power supply faults, emergency microphone faults, communication faults, loudspeaker circuit faults, earth fault and power amplifier faults (such as power faults, protection faults, and single output circuit faults).

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Line Fault Detection

The DCS can detect loudspeaker circuit faults. When the DCS detects a short circuit, the DCS can automatically disable the output channel and stop broadcasting to protect the power amplifier.

During installation and commissioning, users can set upper and lower redundancy range circuit impedance limits through the software. If the circuit impedance is higher than the upper limit, the DCS reports an open circuit. If the circuit impedance is lower than the lower limit, the DCS reports a short-circuit fault.

Monitoring Function

The DCS built-in speaker is able to monitor the audio from all zones by manual operation.

Self-test Function

To initiate the DCS self-test function, manually press the “Self-test” button. When the test is being performed, all indicator lights on the front panel of the DCS turn on, and the fault indication buzzer continuously buzzes.

The DCS performs uniform management of equipment such as the DA. During the self-test, all equipment directly connected to the DCS perform the self-test function.

AVC Function

Every DCS has 8 monitor module input interfaces, and each channel can connect up to 5 noise detector modules. Ambient noise can automatically be collected to adjust output volume to offer better audio definition.

The relevant parameter of noise detection and AVC can be configured by config software. A group detector module can control one or more zone’s volume.

Volume Control

The user can directly adjust the speaker volume and monitor volume by pressing the buttons on the panel of the DCS.

The volume can only be set by the Automatic Volume Control (AVC) function. The DCS automatically detects and adjusts the zone broadcasting volume according to the configuration parameters.

When the system is under fire emergency broadcast (override) mode, output volume is automatically adjusted to preset value and manual adjustment is invalid. After entering normal public broadcast, volume can be adjusted.

Manual control of every output channel can be realized by config software.

Power Amplifier Management

The DCS automatically detects the operating states of the power amplifier. Switching between the main and backup power amplifiers is achieved based on the number of power amplifiers connected to the system and recognized by the system software. For example:

- Configuring the number of power amplifiers

  The software can be used specify the number of connected power amplifiers according to their type. There is no amplifier in the default setting.

- Switching between the main and standby power amplifiers
  - Standby CH1 can backup CH1, CH3, CH5 and CH7 main amplifiers, and the standby CH2 can backup CH2, CH4, CH6 and CH8 main amplifiers.
  - The relationship between main and standby amplifiers can be configured by software, which can be configured to double N+1 backup (N≤4) or single N+1 backup (N≤8).
  - When the DCS detects a main power amplifier signal fault, it can automatically switch to the standby power amplifier according to the detection sequence.

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Zone Control

There are 8 speaker line interfaces and each interface corresponds to one zone. Enable or disenable the interfaces via config software.

Every power amplifier can correspond to a fixed speaker line to avoid influence on other zones.

Voice Information Management

Built-in 1GB nonvolatile memory: 500MB (The maximum storage time is 96 minutes) can be used to store audio files and 350MB (The maximum storage time is 67 minutes) is used for recording

Sound files can be broadcasted separately, and can be prioritized in a file playlist.

One of the audio files can be configured as a pre-signal and be played before any regular broadcasting operations.

Voice information broadcasting modes include the broadcast times priority levels. Time delay can be set in the definition of broadcast operations tasks.

Public Address Function

The DCS has the following common public address functions:

- Supports broadcasting multiple sound sources (external input sources, background music, recorded voice sound files, and microphone sources) in multiple zones.
- Automatically broadcasts locally stored recorded voice sound files, network audio, and background music.
- Automatic timed broadcasting and timer data are uploaded to the equipment after being set through the software.
- Dry contacts trigger specified broadcasting, and events triggered by the dry contacts can be configured through the software as well as automatically perform preconfigured tasks when receiving dry contact signals.
- Broadcast audio based on signals sent from the dry contacts and serial data.

Paging Function

Selected DCS zones can receive paged broadcasts. A configured pre-signal can be played first to alert users of an incoming paging session. Users can then communicate with each using the NPMs.

Log Management Function

When the device is in use or when faults occur, it will record the event logs automatically. The users can view or query the logs from the configuration software.

Software Configuration Function

The following DCS features can be configured through the software:

- Number of zones (1-8)
- Loudspeaker circuit impedance detection
- Sound file playlist
- Broadcast operations (including sound sources, play modes, audition, priority levels, and related operations)
- AVC function
- Network monitoring function
- Device ID and IP address
- Power amplifier

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- Main and spare power amplifier monitoring and switching
- Uploading recorded voice sound files
- Dry contact input trigger broadcasting
- Emergency broadcasting
- Various fault detection functions
- Timer broadcasting
- Dry contact output function
- Configuration data is downloaded to the DCS through the network, and the DCS automatically reboots to allow the configured data to take effect.

DCS Interface

This section describes the front and rear panels of the X-DCS3000.

Front Panel

Figure 3 shows the schematic diagram of the X-DCS3000 front panel. Refer to Table 1 for the description of relevant ports and indicator lights.

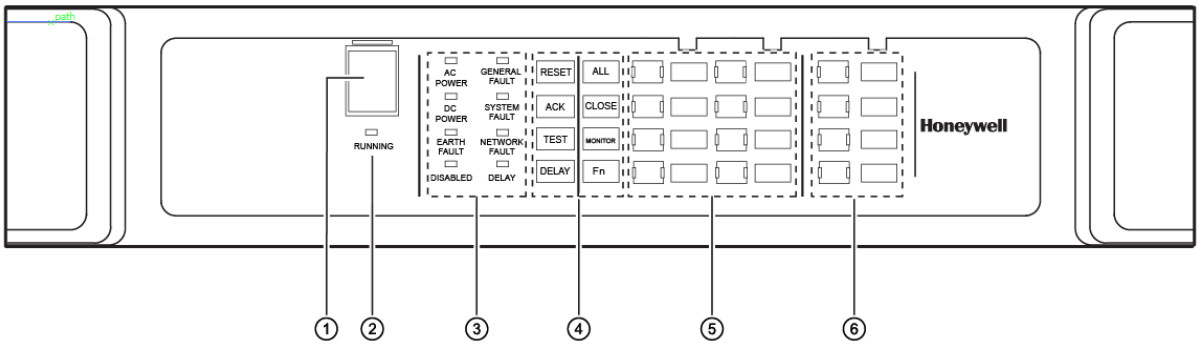


Figure 3 Schematic Diagram of the X-DCS3000 Front Panel

Table 1 X-DCS3000 Front Panel Button and Indicator Light Descriptions

No.	Button/Indicator light	Description
1	Manual emergency button	A protective cover covering the manual emergency mode button prevents pushing the button by mistake. When switching to the emergency mode is necessary, raise the protective cover and then press the button. The button indicator light turns red.
2	Running indicator	A flickering green light means equipment is working.
4	Device state indicator lights	Figure 3 shows the schematic diagram of the DCS device state indicator lights. Refer to Table 2 for relevant descriptions.
5	Function buttons	Figure 4 is the schematic diagram of the DCS function buttons. Refer to Table 3 for relevant descriptions.
6	Zone selection buttons and state indicator lights	Figure 5 is the schematic diagram of the DCS zone selection buttons and state indicator lights. Refer to Table 4 for relevant descriptions.

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No.	Button/Indicator light	Description
7	Audio source selection buttons and state indicator lights	Figure 6 is the schematic diagram of the DCS audio source selection buttons and state indicator lights. Refer to Table 5 for relevant descriptions.

Rear Panel

Figure 4 displays the schematic diagram of the X-DCS3000 rear panel. Refer to Table 2 for the relevant descriptions.

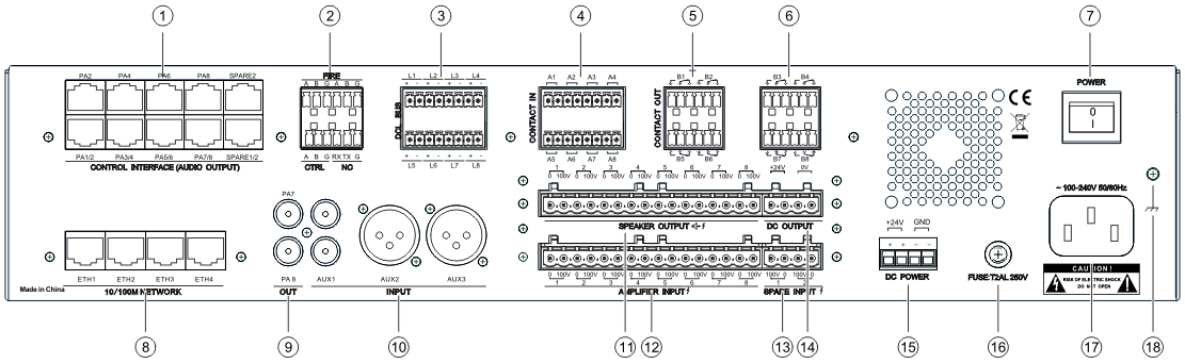


Figure 4 Schematic Diagram of the X-DCS3000 Rear Panel

Table 2 X-DCS3000 Rear Panel Ports

No.	Port	Description
1	Control Interface	Connects to the power amplifier. It can connect to 8 main amplifiers and 2 spare amplifiers. The DCS outputs audio signals and self-test signals to the DAs, and receives the DA fault signals through the interface.
2	Communication Interface	Fire is a RS-485 Interface which can be connected with LPI-ModBus module (Not supported for North America). CTRL is a reserved RS-485 interface.
3	DCL BUS	Connects to external monitor module, such as noise detector or other module.
4	Contact input	8 contact input ports with supervision
5	Contact output	8 contact output ports
6	Cooling fan	
7	Power supply switch	Turns on and off the main power supply
8	10M/100M network interface	4 ports 10M/100MB Ethernet switch
9	Auxiliary output	Corresponding to amplifier channel 7 and 8
10	Auxiliary input 1	Audio input interface used to connect external sound source equipment such as a CD. The input gain is fixed.
	Auxiliary input 2, 3	Connects to external audio source devices such as microphone, CD player etc. The input gain is configurable.
11	70V/100V output terminal	Connects to 8 loudspeaker circuits.

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No.	Port	Description
12	70V/100V input terminal (Main amplifier)	Connects to 8 main amplifiers, 70V audio output.
13	70V/100V input terminal (Spare amplifier)	Connects to 2 spare amplifiers, 70V audio output.
14	DC output	Output DC24V power, the maximum output current is 1A.
15	DC power	Connects to backup power supply(24V DC)
16	Main fuse	Provides over-current protection for the main power supply.
17	Main Power Supply socket	Connects to main power supply
18	Grounding terminal screw	Connects to the grounding wires

DCS Specifications

The X-DCS3000 product specifications are detailed in Table 3.

Table 3 X-DCS3000 Digital Integrated System Manager Specifications

Parameters	Values
Main power supply voltage	AC 100-240V, 50/60Hz
Backup power supply	21.5V-28.5V DC
Main power supply fuse	T2AL 250V
Rated power	50 W
Auxiliary input	
Input channels	3
Input signal	AUX1：0dBV （1V） AUX2、3：-40dBV~0dBV
Input impedance	10 KΩ
Frequency response	60Hz-16KHz
SNR	>85dB
Audio output	
Output channels	8 main amplifiers, 2 standby amplifiers and 2 auxiliary outputs.
Output signal	<1.6dBV（1.2V）
Auxiliary output	1V（0dBV）
THD	< 0.06%
Monitor module interface	
Channel No.	8
Module No. for each channel	5
Type of supported module	Noise detector module
Loudspeaker circuit	
Output voltage	70V/100V

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Parameters	Values
Channel No.	8 (with line supervision)
Max. Output load power	500W
Contact Input/output	
Contact input	8 (with line supervision)
Contact output	8 (NO, NC and COM)
Maximum voltage of the outputs	250V AC/30V DC
Maximum current of the outputs	2.5A
Other	
Monitoring loudspeaker	10W/8Ω
Ethernet interface	10M/100M
Ethernet interface No.	4
Memory capacity	1GB（Flash）
Working conditions	
Humidity	< 95%, without condensing
Working temperature	-10°C ~ 55°C / 14°F ~ 131°F
Storage temperature	-40°C ~ 70°C / -40°F ~ 158°F
Specification	
Dimension (WxHxD)	482 mm x88 mm x 420mm / 18.97" x 3.46" x 16.53"
Packing dimension (WxHxD)	580mm x235mm x552mm / 22.83" x 9.25" x 21.73"
Net weight	9.3Kg / 20.5 lbs
Gross weight	12.5Kg / 27.5 lbs
Safety & Regulatory Approvals	FCC PART 15, Subpart B (Class A) ; UL 60065

3 High Efficiency Power Amplifier (X-DA/EN)

This chapter describes the X-DA (or hereinafter called the “DA”) characteristics, functions, appearance and specifications.

In the X-618 system, the DA is used to amplify audio signal power and drive many broadcasting loudspeakers.

There are three models:

- X-DA1500/EN (1 amplifier channel, 500W maximum power output)
- X-DA2250/EN (2 amplifier channels, 250W for each power output)
- X-DA4125/EN (4 amplifier channels, 125W for each power output)

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Product Characteristics

The DA has the following main characteristics:

- A CLASS-D power amplifier with high efficiency and energy conservation
- 3 power levels: 500W, 2X250W and 4X125W
- Contains 1/2/4 independent channels
- Each channel has 100V or 70V output
- Supports balanced or unbalanced audio input
- Forced air-cooling
- Automatically limits output voltage

DA Functions and Features

This section describes the main functions of the DA.

- Main and Backup Power Supplies
- Power Supply Protection
- Overheating Protection
- Overload and Short-circuit Protection
- Fault Monitoring and Output
- Self-test Function

Main and Backup Power Supplies

The DA contains main and backup power supplies. The main power supply is generally utilized, and the backup power supplies standby in case of a main power supply fault. In case of a main power supply fault, the POWER indicator light on the DA front panel and AC FAULT indicator light turn on. The DA outputs fault signals simultaneously and automatically switches to the backup power supply for power. After the main power supply is returned to normal, it again supplies the power.

Power Supply Protection

In the case of a short circuit or other DA fault, the main power supply input is disconnected automatically.

Overheating Protection

When the temperature within the DA reaches 45°C/113°F, the fans automatically start and operate at the fastest speed. When the temperature is lower than 40°C/104°F, the fans stop.

When the temperature within the DA exceeds 75°C/167°F, the DA automatically stops producing signals and sends overheating protection signals to help identify the faulty circuit. When the temperature has returned to normal (lower than 70°C/158°F), the DA again performs normally.

Overload and Short-circuit Protection

When the DA output experiences a short circuit is overloaded, the DA automatically disconnects the output, and outputs overload or short-circuit protection signals until the faults are eliminated.

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Fault Monitoring and Output

The DA can monitor the main and backup power supply for instances of under voltage, overheating protection states, and overload or short circuit protection states. When the DA detects any fault, the DA outputs a general fault signal until all faults are eliminated.

Self-test Function

Press the Self-test button on the front Panel of DCS to start the self-test function. The DCS then sends self-test signals to the DA, causing all indicator lights to turn on and all DAs to temporarily stop operating. Upon the completion of the self-test, all functions return to normal.

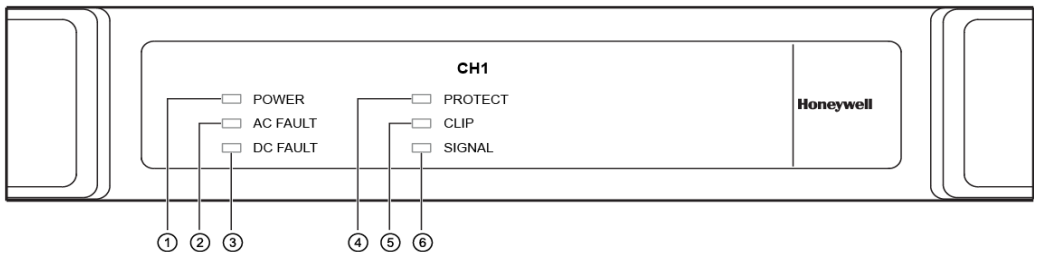
The DA Interface

This section describes the indicator lights and ports on the DA front and rear panels.

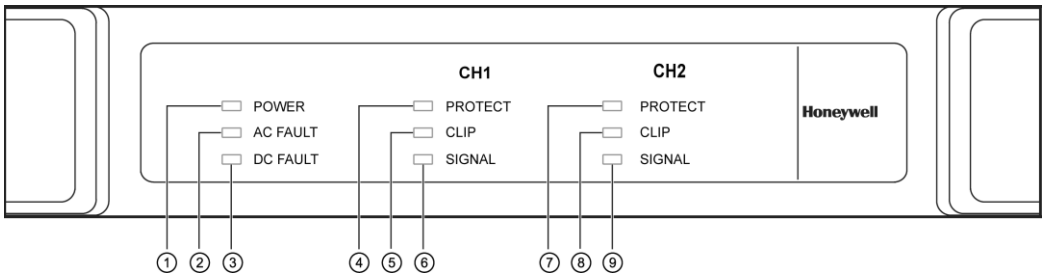
Front Panel

The front panel of the DA is shown in Figure 5. Table 4 lists the LED indicator lights found on the front panel and their descriptions.

X-DA1500/EN



X-DA2250/EN



X-DA4125/EN

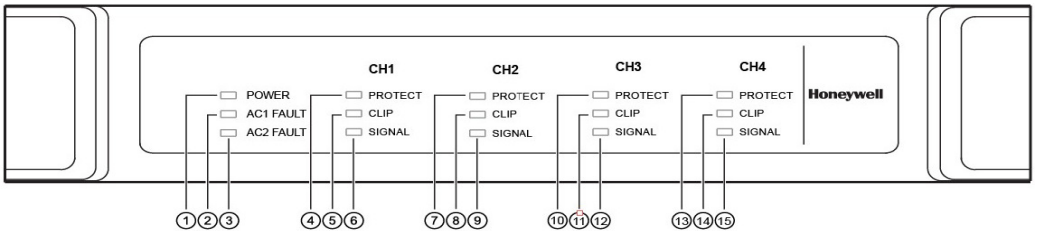


Figure 5 Schematic diagram of the DA front panel

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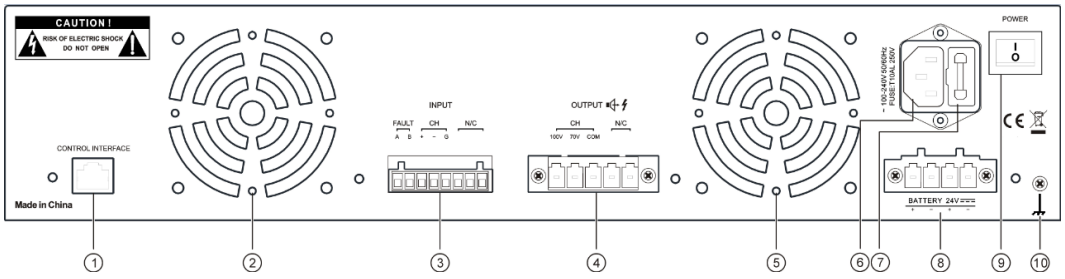
Table 4 DA front panel LED light indicators

No.	Indicator Light		Description
1	POWER		DA power indicator. This light is green when the DA is working normally.
2	AC FAULT		Indicates the main power supply status. If this light is turned off, the main power supply is operating normally. If the light turns yellow, the main power supply has experienced a fault.
3	DC FAULT		Indicates the backup power supply status. If this light is turned off, the backup power supply is working normally. If the light turns yellow, backup power supply has experienced a fault.
4/7/10/13	CH1/2/3/4	PROTECT	DA protection indicator light. When the DA overheats, experiences over-current, over-voltage, or under voltage, the DA automatically protects the equipment. In this case, the light turns yellow.
5/8/11/14		CLIP	Peak clipping indicator light. When the input signal exceeds the rated peak value, the indicator light turns red.
6/9/12/15		SIGNAL	Signal indicator light. This light turns green and fluctuates depending upon the signal intensity. If the light is off, there is no input signal.

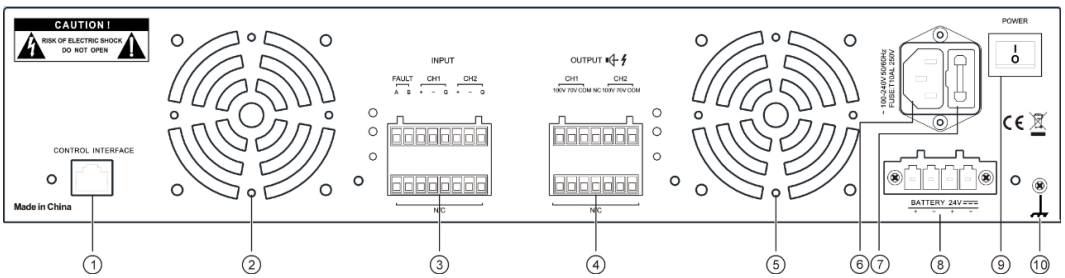
Rear Panel

The rear panel of the DA is shown in Figure 6, Table 5 shows description of ports on rear panel.

X-DA1500/EN



X-DA2250/EN



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X-DA4125/EN

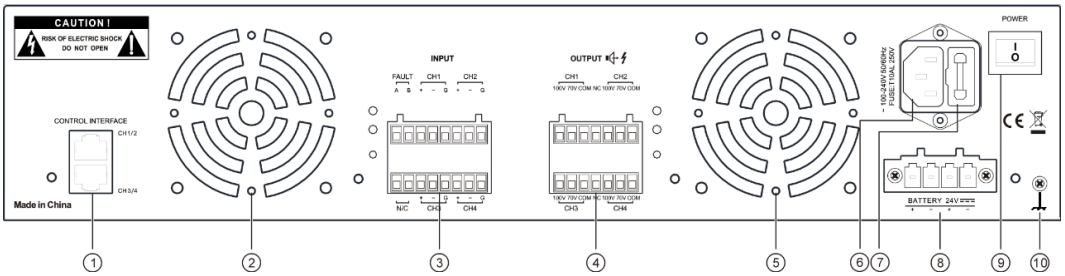
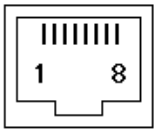


Figure 6 Schematic Diagram of the X-DA/EN Rear Panel

Table 5 DA Rear Panel Ports

No.	Port			Description
1	CONTROL INTERFACE			Connects to an external audio input device to receive signal. For the specification of pin of this port, please refer to Table 6.
2	Cooling fan			
3	Audio input and control ports	FAULT	A	If a DA fault occurs, it is protected, or it is self-tested, ports A and B experience a short circuit.
			B	
		Channel	+	Balanced positive input
			-	Balanced negative input
			G	Grounding (Connect to the "-"port if the input is an unbalanced input connection.)
4	Audio output ports	Channel	100V	100V high impedance audio output
			70V	70V high impedance audio output
			COM	Common port
5	Cooling fan			
6	Main power supply power port			Supplies electricity to the main power supply
7	Backup power supply power port			Supplies electricity to the backup power supply
8	Grounding terminal			Connects to the grounding wires
9	Power switch			Turns the power on and off
10	Main Fuse			T10AL250V

Table 6 Definition of the RJ-45 Port

Pin	Description	Diagram
1	CH2 balanced input positive port	
2	CH2 balanced input negative port	
3	Amplifier fault output port • Output power is VCC (12V-24V) for amplifier working normally. • Output power is GND (0V) for a fault occurs or protection and self-test initiated.	
4	CH1 balanced input positive port	
5	CH1 balanced input negative port	

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Pin	Description	Diagram
6	GND (0V)	
7	VCC (12V-24V power supplied by external equipment)	
8	Amplifier self-test port • When input voltage is VCC (12V-24V), self-test initiated. • When there is no input voltage, amplifier works normally.	

DA Specifications

The DA product specification information is detailed in Table 7.

Table 7 X-DA/EN High Efficiency Power Amplifier Specifications

Parameters		Values		
		X-DA1500/EN	X-DA2250/EN	X-DA4125/EN
Rated output power		1 X 500W	2 X 250W	4 X 125W
Main power supply voltage		~ 100V-240V 50/60Hz		
Backup power supply voltage		21.5V DC~28.5V DC		
Power consumption		<700W		
Backup Power Input		1/3 Rated Power Working Current ≤10A/24VDC		
		Full Power Working Current ≤30A/24VDC		
Main power supply fuse		T10AL 250V		
Output voltage		100V / 70V		
Frequency response		70Hz ~ 18KHz （+1dB ~ -3dB）		
Input sensitivity		1.414V_{RMS}		
Impedance		20k ohm		
SNR (with A-Weight)		>100dB（±5%）		
Nonlinear distortion		<0.05% （at 1/3 rated power, 1kHz）		
Indicator		1 power indicator, 1 main power fault indicator and 1 backup power fault indicator		
	Channel 1	1 indicator, 1 clip indicator and 1 protector indicator		
	Channel 2	2 indicators, 2 clip indicators and 2 protector indicators		
	Channel 4	4 indicators, 4 clip indicators and 4 protector indicators		
Channel		1	2	4
Environment humidity		< 95%, without condensing		
Operation temperature		0°C ~ 40°C / 32°F ~ 104°F		
Storage temperature		-10°C ~ 55°C / 14°F ~ 131°F		
Product dimensions (width × height × depth)		482 mm×88 mm ×420 mm / 18.98" x 3.46" x 16.54"		
Package dimensions (width × height × depth)		580 mm×235 mm ×552mm / 22.83" x 9.25" x 21.73"		
Net weight		11.3Kg /24.9lbs	12.2Kg / 26.9lbs	12.9Kg / 28.4lbs

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Parameters	Values		
Gross weight	14.4Kg / 31.8lbs	15.3 Kg / 33.7lbs	16Kg / 35.3lbs
Safety & Regulatory Approvals	FCC PART 15, Subpart B (Class A); UL 60065		

4 Configurable Network Paging Console (X-NPMS)

This section describes the X-NPMS characteristics, functions, appearance, and specifications.

The X-NPMS connects to the X-618 system and related devices, to transmit audio and control information through the Ethernet network. The X-NPMS is used for paging, controlling broadcasts, monitoring zones, and for using the bi-directional intercom function.

Product Characteristics

The X-NPMS has the following characteristics:

- 7” LCD touch screen for operational controls
- Removable gooseneck microphone
- Built-in loudspeaker for monitoring and intercom functions.
- Digitizes audio signals to ensure that the quality of broadcasted audio is not affected by external interference
- Supports extend physical key modules according to requirement.

X-NPMS Functions

This section describes the following main X-NPMS functions:

- Indicator light
- Sound instructions

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- Fault detect function
- Broadcast operation
- Internal communication
- Monitor function
- Log management

Indicator

The power indicator is used to indicate power supply status, normally in green.

The fault indicator is used to indicate fault. The light flickers when a fault occurs, and is constantly on after confirmation.

The network status indicator is used to indicate network status, normally in green. When there is a fault in communication, the light flickers orange. If connection fails the light is solid orange.

The microphone running status indicator is used to indicate microphone running status.

- Is in good status and not in use, the indicator doesn't light.
- Is in good status and waiting to finish broadcasting pre-signal, indicator flickers in green.
- Is in good status and in use, the indicator is in solid green.
- Has a fault, the indicator lights in orange.

Sound Instruction

With the exception of the lamp indicator, this device can also offer different voice instructions according to current states.

- Fault prompt tone: Buzzer is muted under normal situations, but when a fault occurs, it rings with 0.5s on and 0.5s off. After pressing any fault confirmation button, the buzzer is muted until another fault occurs.
- When the microphone is used, the buzzer automatically mutes to avoid any interference until it finishes. Except during intercom communication, the monitor speaker is automatically muted when any microphone is in use.

Fault Detector Function

X-NPMS sends fault statuses to relevant devices and records a fault log. The following faults can be detected by X-NPMS:

- Microphone fault mainly indicates voice coil or line fault.
- Network fault indicates whether the connection and the communication with other devices are normal.
- When a fault occurs, equipment can detect it within 100s and send fault states to other devices.

Broadcast Operation Function

The X-NPMS can conduct public address and emergency broadcasts. Under non-emergency broadcasts, only public address can be conducted. Similarly, under manual emergency broadcast, only emergency broadcast can be conducted. The emergency broadcast button is grey during non-emergency broadcasts.

X-NPMS has following operation interfaces:

- Manual Broadcast

To broadcast temporary broadcast tasks (audio source is audio files, line input), the speaker lines need to be selected first. In the operation interface, all broadcast tasks are displayed. Scroll the screen up or down to show more contents.

- Broadcast Audio Files from USB Disk

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To broadcast audio files from USB disk, the speaker lines and audio files need to be selected separately during operation.

- Voice Synthesis Broadcast

Voice synthesis function allows to combine multiple voice pieces/segments to broadcast. Voice pieces/segments are stored in the SD card of the X-NPMS, and can be displayed in an interface according to types.

- Recording Broadcast

The interface for recording broadcasts will display the list of prerecorded files. Users can choose prerecorded files to broadcast in target zones or delete the prerecorded files.

- Timing Broadcast

Via the timing broadcast interface, users can add timing task to timing list. Tasks need to be selected from predefined task lists in the device.

Internal Communication / Intercom

Users can communicate through X-NPMS in the same system. The devices can be configured through the configuration software. At the interface of internal communication, select the target device and X-NPMS will display the requesting screen. The target device will play a ring signal and show an intercom window. The user can click “Accept” to start internal communications, or click “Hang up” to stop the intercom.

Monitor Function

The audio of zones is monitored through the internal loudspeaker. Monitor control is conducted through X-NPMS interface or X-SMART software. Monitor output volume can be adjusted. At the monitor screen, the user can click zone buttons to start monitoring, and then click again to stop monitoring.

Log Management

The X-NPMS can record 10,000 operation and fault logs. When the storage space reaches capacity, the device will delete earlier logs automatically. The logs can be read via configuration software, but they can’t be deleted manually.

X-NPMS Interface

This section describes the front and rear panels of the NPMS.

Front Panel

Figure 7 shows the schematic diagram of the NPMS front panel. Refer to Table 8 for the descriptions of relevant controls.

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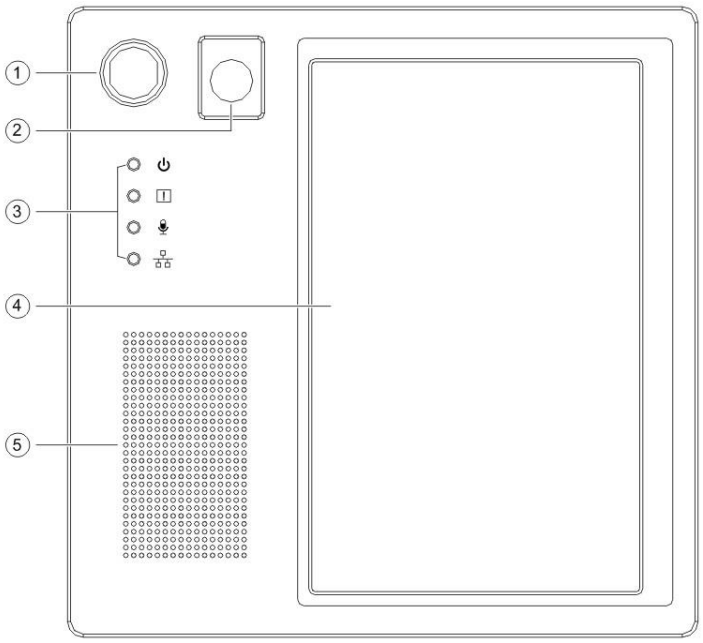


Figure 7 Schematic Diagram of the X-NPMS Front Panel

Table 8 X-NPMS Front Panel Controls, Indicator Lights, and LCD screen

No.	Control/Indicator light/Button	Description
1	Microphone socket	To install goose-neck microphone
2	Manual emergency button & indicator	To control system enter manual emergency mode. When system is in automatic emergency mode, the indicator flickers red. When the device is in manual emergency mode, the indicator is solid red.
3	indicators	Power Indicator To indicate power status, normally green.
		Fault Indicator To indicate system faults, when there is a fault, it is yellow. Flickering yellow light means the fault is not confirmed, and the constant yellow light means the fault is confirmed.
		Microphone Indicator To indicate working and fault status of microphone. Flickering green light means a prompt tone is being played, and constant green light means a paging broadcast is being conducted. Yellow light shows the microphone has a fault.
		Network Status Indicator To indicate network work status. Yellow light shows a fault has occurred. Flickering yellow light shows the equipment is connected to a network, but cannot communicate to other devices. Green light shows it is Normal.
4	display screen	7” LCD screen, operate by touching.
5	Loudspeaker	To monitor or internal communication.

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Rear Panel

Figure 8 shows the schematic diagram of the NPMS rear panel. Refer to Table 9 for the descriptions of relevant ports.

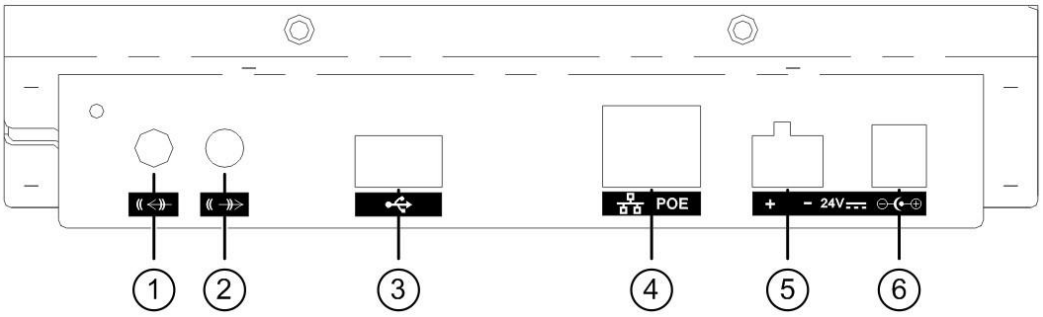


Figure 8 Schematic Diagram of the X-NPMS Rear Panel

Table 9 X-NPMS Rear Panel Ports

No.	Port	Description
1		External audio input interface To connect to external audio equipment.
2		Audio output interface To output microphone or monitor audio signal.
3		USB interface To insert USB disk.
4	POE	To connect to Ethernet switcher or POE switcher.
5 & 6	24V ⎓	DC 24V power supply input interface To connect to power adapter or external power supply. It has a higher priority than POE power supply.

X-NPMS Specifications

X-NPMS product specification information is detailed in Table 10.

Table 10 X-NPMS Configurable Network Paging Console Specifications

Parameters	Values
Power supply voltage	24V DC
Rated power	11W
Frequency response (Microphone)	50Hz-15KHz
SNR	>85dB
THD	< 0.05%
Microphone input	-44dB±2dB
Line input	0dBV（1V）

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Parameters	Values
Line output	0dBV（1V）
Monitoring loudspeaker	2W/8 Ω
LCD size	7 inch
LCD resolution	800× 480
Sampling rate	44.1 KHz, 16Bit
Operating temperature	-10°C ~ 55°C / 14°F ~ 131°F
Storage temperature	-40°C ~ 70°C / -40°F~158°F
Humidity	<95%, without condensation
Dimension (W×H×D)	200 x 46.5 x 200 mm / 7.87" x 1.83" x 7.87"
Packing dimension (W×H×D)	403 x 133 x 268 mm / 15.87" x 5.24" x 10.55"
Net weight	1.7Kg / 3.8lbs
Gross weight	2.5Kg / 5.5lbs

5 Key-extension Module (X-K8)

This section introduces the key-extension module characteristics, functions, appearance, and specifications.

Key-extension module is an accessory of the X-NPMS, which is used to extend the number of physical keys. Each X-NPMS can be extended up to 8 units of X-K8.

There are 2 models:

- X-K8 8 key-extension module (with 8 keys and 8 indicators)

Product Characteristics

The key-extension module has the following characteristics:

- Modular design, easy to extend.
- Button function can be configured by software.
- Supports desktop and rack installation.
- Additional bracket can be installed to change angle of inclination for different use habits.

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Key-extension module Functions

Extendibility

The key-extension modules X-K8 provide more physical keys for X-NPMS. Every X-K8 module can extend 8 keys. X-NPMS can support up to 8 key-extension modules. Users can set extended button function as zones/groups, tasks or volume control via configuration software.

Communication and Power Supply

Key-extension modules are connected to the X-NPMS or the former key-extension module via a soft wire. The wire transmits power, input and output data.

Key-extension module Interface

This section describes the appearance of key-extension modules.

Product Appearance

Following is schematic diagram of key-extension module appearance:

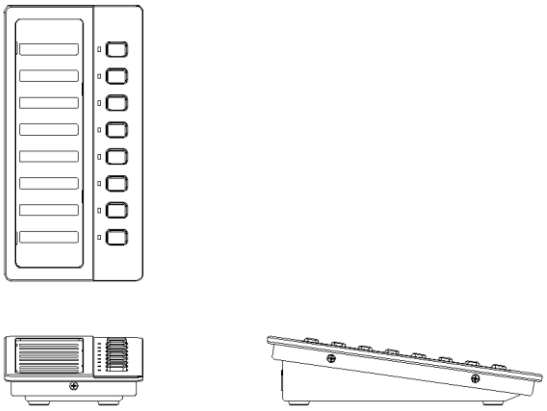


Figure 9 Schematic Diagram of the X-K8 Appearance

Module Assembly

Figure 11 is the assembly schematic diagram of the key-extension module and the X-NPMS.

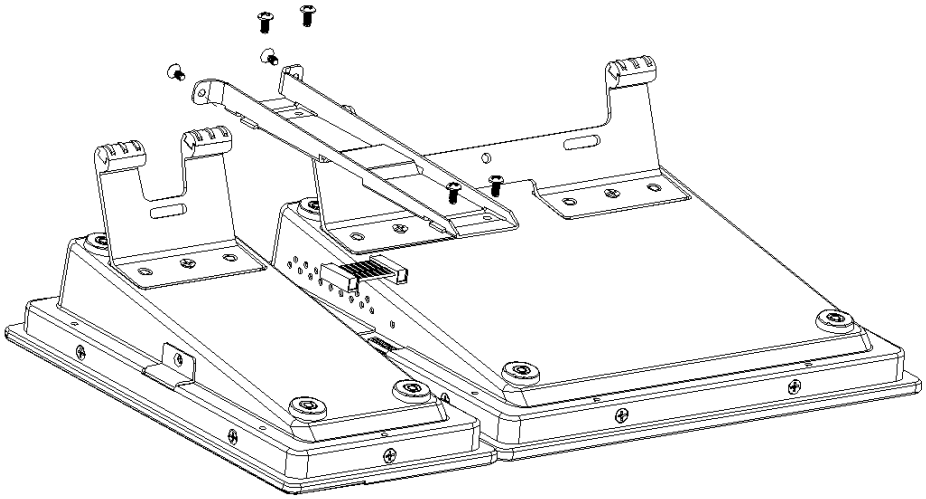


Figure 11 Assembly Schematic Diagram of the Key-extension Module and the X-NPMS

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Key-extend Module Specifications

The key-extend module product specification information is detailed in Table 11.

Table 11 Key-extend Module Product Specification Information

Parameters	Values
Key No.	8 or 4
Operating temperature	-10°C ~ 55°C / 14°F ~ 131°F
Storage temperature	-25°C～70°C / -13°F ~ 158°F
Humidity	<95%, without condensation
Dimension (W×H×D)	100 x46.5 x 200 mm / 3.94" x 1.83" x 7.87"
Packing dimension (W×H×D)	403 x 133 x 268 mm / 15.87" x 5.24" x 10.55"
Net weight	0.57 Kg / 1.26lbs
Gross weight	1.2 Kg / 2.65lbs

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6 Network Resource Interface (X-NRI/EN)

This chapter mainly describes the X-NRI/EN characteristics, functions, appearance and specifications.

The X-NRI/EN is an external interface expansion control equipment in X-618 used to meet the common interface requirements of the broadcasting system. It includes up to 5 channels of network audio sources, the type of audio can be chosen from 4 channels of external input audio or built-in audio. All the audio sources broadcast through an Ethernet network.

Product Characteristics

The NRI has the following characteristics:

- 4 external audio inputs (auxiliary inputs or balance inputs) that can connect to external audio source equipment such as a CD player or tuner.
- Balanced input ports that can set the phantom power supply and gain of each input by the dial switch.
- Built-in network stream players which can be used in emergency or public address.
- Maximum 5 channels of audio source playing in the network that can be an external audio source or internal players.
- Built-in 500MB flash (Max. 96 minutes) and 4GB (Support max. 32GB) SD card for storing audio files, which can be broadcasted through the Ethernet.
- 4 10M/100M Base-T Ethernet switch ports.
- Users can page by selecting predefined broadcast zones/groups, which supports at most 32 DCS (128 zones).
- Automatically monitor the dry contact input fault, communication fault, software running fault and power supply.
- When configured as main NRI, it can monitor all devices' fault states in groups and send out acousto-optic warning.
- Dry contact can be set as general fault output.

X-NRI/EN Functions

This section describes the following main NRI functions:

- Main and Backup Power Supply
- Network audio source management
- External audio inputs and internal player

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- Telephone interface
- Software Configuration Function

Main and Backup Power Supply

The main and standby power supplies are provided for NRI. In case of a main power supply fault, the main power supply indicator light on the front panel of the NRI turns yellow, and the output fault automatically causes the backup power supply to provide power instead. After the main power supply is returned to normal, it automatically again supplies power and the backup power supplies resume their standby presence.

Power Supply Protection

The NRI power supply is protected by the main fuse. In case of a short circuit or other fault within the NRI, the main power supply is disconnected automatically.

Network Audio Source Management

A maximum of 5 channels of audio can play in the network. It can be from an external audio source or internal players. AUDIO1~4 can be set for external audio source or internal players. AUDIO 5 can only be set for an internal player through the Config software.

External Audio Inputs and Internal Player

External audio source playing

The NRI provides 4 auxiliary input ports that can connect to external audio sources. The users can enable the interfaces, set the audio source name, set the multi-case IP address, and input type through the Config software. The audio source which connect to the NRI through the interface, can be broadcast in the zones. These zones were selected through the X-SMART software, the NPM panel or the DCS panel. Unlike a CD/DVD player which can be connected to the auxiliary input port directly, the microphone should be connected to the balance input port. Utilize data chosen switches to set the phantom power (DC24V) or input gain of the balance input in the left.

Internal audio source playing

The NRI provides 500MB of built-in flash memory and 4GB built-in the SD card for storing audio files which can be broadcasted through an Ethernet network. The source can be set through the Config software.

Telephone Interface

The NRI can be connected with the telephone interface module through the RS-485 and audio input. To use the telephone remotely, select play zones and page through to the PSTN switch or the VoIP gateway. A Maximum of 128 predefined groups of NRI can be set through the Config software.

Software Configuration Function

The following NRI features can be configured through the software:

- Set the playlist
- Set the device parameter
- Device supervision
- Upload configuration and audio files

Configuration data is uploaded to the NRI through the network, and the NRI system automatically reboots to allow the configured data to take effect.

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X-NRI/EN Interface

This section describes the front and rear panels of the X-NRI/EN.

Front Panel

Figure 12 is the drawing of the X-NRI/EN front panel, relevant ports and the description of indicators. Refer to Table 12.

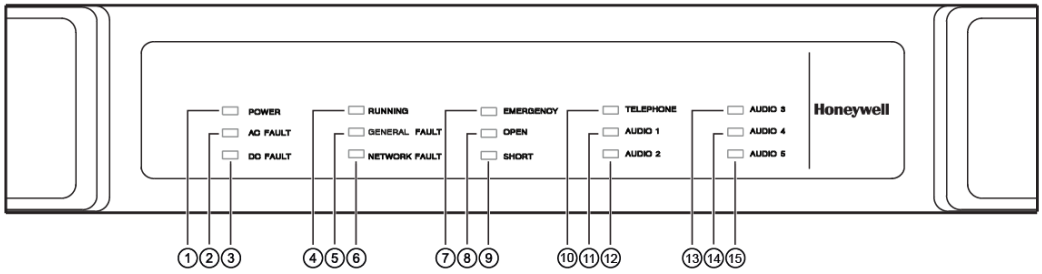


Figure 12 Drawing of the X-NRI/EN Front Panel

Table 12 Description of X-NRI/EN Front Panel Button and Indicators

No.	indicator	Description
1	POWER	Power indicator When the power supplies are normal, the light turns green.
2	AC FAULT	Indicates the main power supply status. If this light is turned off, the main power supply is operating normally. If the light turns yellow, the main power supply has experienced a fault.
3	DC FAULT	Indicates the backup power supply status. If this light is turned off, the backup power supply is working normally. If the light turns yellow, backup power supply has experienced a fault.
4	RUNNING	Indicator for NRI running status The light flashes green while the NRI is working, but the light goes out or keeps green when the NRI is not working.
5	GENERAL FAULT	Indicator for system fault The light flashes yellow and the buzzer sounds when any fault in the whole system appears, such as power fault.
6	NETWORK FAULT	Indicator for peripherals connection fault The light is off when the NRI is connected to the peripherals correctly. It turns yellow and the buzzer sounds when it detects a connection failure， such as disconnection from the network.
7	EMERGENCY	Indicator for system fault The light flashes yellow and the buzzer sounds when any fault in the system appears, such as power fault.
8	OPEN	Indicator for peripherals connection fault The light is off when the NRI is connected to the peripherals correctly. It turns yellow and the buzzer sounds when there is a connection failure， such as disconnection from the network.

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No.	indicator	Description
9	SHORT	Indicator for system fault The light flashes yellow and the buzzer sounds when any fault in the system appears, such as power fault.
10	TELEPHONE	Indicator for peripherals connection fault The light is off when the NRI is connected to the peripherals correctly. It turns yellow and the buzzer sounds when it detects a connection failure， such as disconnection from the network.
11	AUDIO(1~5)	Indicator for audio source working state The lights turn green when the corresponding audio source is be sent to the network. The AUDIO1~4 is for 4 channel line inputs. The lights flash green. The AUDIO5 is for an internal player. The light remains a solid green.

Rear Panel

Figure 13 is the drawing of the X-NRI/EN rear panel, relevant ports. For a description of indicators. Refer to Table 13.

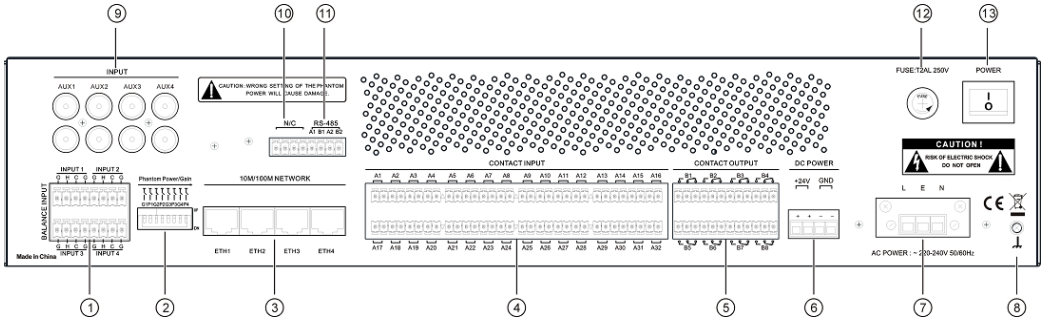


Figure 13 Drawing of the X-NRI/EN Rear Panel

Table 13 Description of the X-NRI/EN Rear Panel Button and Indicators

No.	Port	Description
1	Balance input	Used for the differential inputs. The phantom power and the gain can be set by the switch on right side.
2	Dial switch	Used to set the input gain and phantom power of the left balance input interface.
3	10M/100M network interface	4 ports 10M/100MB Ethernet switch.
4	Contact input	32 contact input ports with supervision.
5	Contact output	8 contact output ports.
6	Backup power supply terminal	Backup power supply connection (DC 24V)
7	Main power supply terminal	AC power supply connection
8	Grounding terminal screw	Connects to the grounding wires.
9	Auxiliary input	Audio input interface used to connect external audio source equipment such as a CD/DVD player, audio cassette, or tuner.

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No.	Port	Description
10	Communication interface	Reserved
11	RS-485	Communication control port. Used to connect the third party device. A1,B1 can be connected with fire alarm system with LPI-MOBBUS module (Not supported in North America) A2,B2 can be connected with the telephone interface
12	Main fuse	Provides over-current protection for the main power supply.
13	Power supply switch	Turns on or off AC power supply.

X-NRI/EN Specifications

The X-NRI/EN product specification information is detailed in Table 14.

Figure 14 X-NRI/EN Specifications

Parameters	Values
Main power supply voltage	~100-240V，50/60Hz
Backup power supply voltage	DC 21.5V-28.5V
Main power supply fuse	T2AL 250V
Rated power	15W
Auxiliary input	
Channels No.	4
Input Signal	1V (0dBV)
Input impedance	20K Ω
Frequency response	60Hz-16KHz
SNR	>85dB
Balance Input	
Channels No.	4
Input Signal	14mV(-37dBV)/ 1V(0dBV), configured by switch
Input impedance	20KΩ
Phantom power	DC 24V, configured by switch
Frequency response	60Hz-16KHz
SNR	>65dB
Contact Input/output	
Contact input ports	32 dry contact inputs with supervision
Contact output ports	8 dry contact outputs (NO, NC and COM)
Maximum working voltage	AC 250V/DC 30V
Maximum working current	2.5A
Other	
Ethernet interface	10M/100M
Ethernet interface No.	4
Memory capacity	4GB SD Card, 1GB Flash

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Parameters	Values
Working conditions	
Environment humidity	< 95%, without condensing
Working temperature	-10°C ~ 55°C / 14°F ~ 131°F
Storage temperature	-40°C～70°C / -40°F ~ 158°F
Specification	
Dimension (W×H×D)	482 mm×88 mm ×420 mm / 18.98" x 3.46" x 16.54"
Packing dimension (W×H×D)	580mm×235mm ×552mm / 22.83" x 9.25" x 21.73"
Net weight	7.3Kg / 16.09lbs
Gross weight	10Kg / 22.05lbs

7 Digital Noise Detector (X-ND100)

This chapter describes the characteristics, functions, appearance, and specifications of the X-ND100.

The X-ND100 is an optional accessory for the X-618 system. It is used to detect ambient noise, calculate noise sound pressure level, and then send data to the X-DCS3000. The X-DCS3000 will conduct automatic volume control in an assigned area, and change the current sound pressure level of the broadcast to improve broadcast clarity.

Product Characteristics

X-ND100 has the following main characteristics:

- Connects to DCS by a pair of cables which transmit data and power.
- Maximum 5 noise detectors for each channel.
- Real time measurement of broadcast and noise signals.
- Maximum distance is up to 1000m.
- Flush-mounting in ceiling.
- Fire-proof ABS shell.
- Ideal for indoor installation.

X-ND100 Functions

Ambient Noise Detection

The X-ND100 is the key component to fulfill the function of automatic volume control. While broadcasting, the broadcast sound is mixed with ambient noise. In order to measure the noise SPL accurately, X-ND100 measures broadcast signal from speaker lines, comparing with the one from microphone to get the actual noise data.

Communication and Power Supply

The X-ND100 connects to the X-DCS3000 via pair of twisted wires, which send sound data and supply power. Digital transmission methods can avoid signal attenuation caused due to far transmission distance. A maximum of 5 noise detectors or end-of -line modules can be connected in one cable.

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X-ND100 Appearance

This section describes X-ND100 appearance.

Product Appearance

Figure 14 shows the schematic diagram of an X-ND100.



Figure 14 X-ND100

Interface

Figure 15 is the schematic diagram of an X-ND100 interface. Refer to Table 15 for the descriptions of the relevant controls.

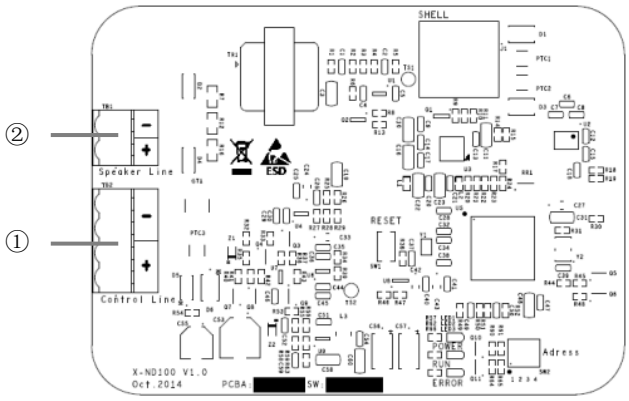


Figure 15 Connector of X-ND100

Table 15 Description of X-ND100 Controls

No.	Controls	Description
1	Control Line Interface	To connect DCS monitoring port
2	Speaker Line Interface	To connect controlled speaker line

Specifications

The X-ND100 product specification information is detailed in Table 16.

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Table 16 X-ND100 Digital Noise Detector Specifications

Parameters	Values
Broadcast Signal Input	100V
Sensitivity	-44±3dB (0dB=1V/Pa,1KHz)
Frequency Response	100Hz~20KHz
S/N Ratio	⩾58dB
Directivity	Omni-directional Directivity
Sound Pressure Level	110dB
Power Supply	By DCL bus
Color	White (RAL9003)
Mounting Hole Size	Φ160 mm
Depth of Hole	100mm
Ceiling Thickness	5~25 mm
Operating Temperature	-10°C ~ 55°C / 14°F ~ 131°F
Storage Temperature	-25°C~+70°C / -13°F ~ 158°F
Relative Humidity	<95%, no condensation
Dimensions	Φ180 x 105 mm / / Φ7.09" x 4.13"
Packing Dimension (W×H×D)	185 x 185 x115 mm / 7.28" x 7.28" x 4.53"
Net Weight	0.315Kg / 0.694lbs
Gross Weight	0.446Kg / 0.983lbs

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