Honeywell

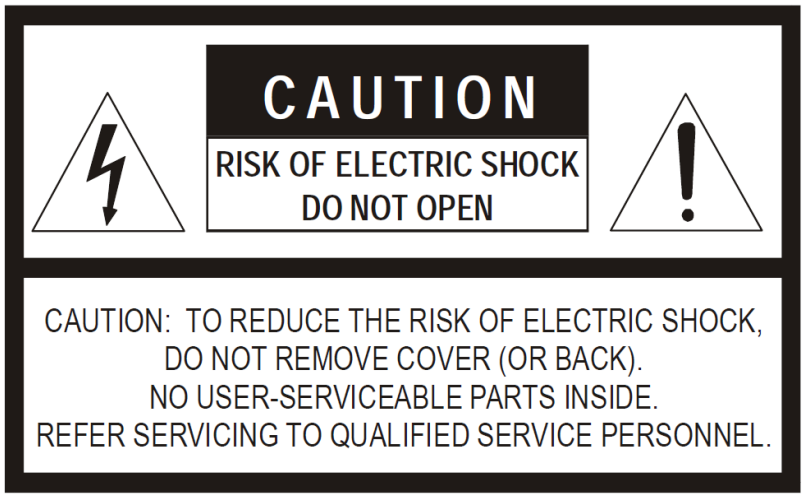
THE POWER OF CONNECTED

X-618 Public Address and Voice Alarm System

Product Description

M_2000061034_EN_3.2

Safety Guidelines



Danger

This sign reminds users that the product contains equipment that has dangerous levels of high voltage.

Caution

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

Safety guideline	To prevent an electric shock, do not use an extension cord when connecting the appliance to a plug outlet. Do not block the appliance air vents by placing other equipment on top of it.
Safety guideline	Do not expose the appliance to rain or moisture to avoid causing a fire or an electric shock.

Safety Precautions

For the installation, operation, and use of this product, please carefully read the following precautions.

Electrical Safety

- The product installation and use must comply with local electrical safety regulations.
- Honeywell assumes no liability for user errors or misuse that result in a fire or an electrical shock.

Transportation Safety

- During transportation, do not violently shake the appliance or expose it to corrosive liquids.

Environmental Requirements

- Do not install the appliance in an environment with extreme temperatures or excessive amounts of dust.
- The appliance should be placed away from direct sunlight in a well-ventilated, clean, and stable environment without vibrations or shocks. The optimum working environment temperature is 5 - 28 ºC with a relative humidity < 95%. If the equipment is in operation for a long time and the ambient temperature is too high, it is recommended that effective measures be taken to reduce the temperature.
- The required appliance power supply voltage is AC100V~ 220V (-15% ~ +10%) 50 ~ 60 Hz or DC 12V/24V. If the voltage is too high, too low, or fluctuates too drastically, it is recommended to install a stable AC power source.
- The appliance is not waterproof. Do not expose the appliance to rain or moisture to avoid damage.
- Place the appliance on a level, stabilized surface or rack.
- Do not place other items on top of the appliance.

Safe Use Precautions

- Install the equipment under the guidance of qualified technicians.
- Before using the appliance, make sure that the power cables are not damaged. The power cables must clearly show quality and safety inspection labels.
- The power plug and outlet prong configuration must match. If the plug outlet does not match the prong configuration of the plug, the outlet must be replaced with one that matches the plug.
- The appliance must have a sufficient power source and an independent grounding wire.
- Note that the equipment must be properly grounded. Otherwise, the equipment could fail to work properly or be damaged.
- When the power is turned on, high voltage runs through the power lines and the appliance. Do not open the appliance to prevent an electric shock.
- When installing the appliance, make sure the wires and cables are configured correctly to avoid damage to the equipment.
- When the power is turned on, do not touch power terminals with lightning safety logos to prevent an electric shock.
- When the power is turned on, do not physically alter the appliance to avoid damaging the equipment.
- Honeywell assumes no liability for appliance malfunctions. Please consult qualified technicians for repairs.

Manual Labels and Information

- Please note the product labels, product categories, power requirements, and other information.
- Read this manual thoroughly and use the equipment in accordance with the provided instructions. This manual can be used as a reference for other components related to this product. For more specific information, contact Honeywell.
- Keep this manual for future reference.

Table of Contents

Preface

Thanks for buying the X-618 Public Address and Voice Alarm system. Please carefully read this manual prior to system use so as to ensure correct use of the system.

Brief Introduction

This manual mainly describes functions, characteristics, applications, product specifications, and the appearance of the X-618 Public Address and Voice Alarm 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 and Voice Alarm system.

Chapter 2: Digital Integrated System Manager (X-DCS2000/EN)

This chapter describes the X-DCS2000/EN characteristics, functions, appearance, and specifications.

Chapter 3: Digital Integrated System Manager (X-DCS3000)

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

Chapter 4: High Efficiency Power Amplifier (X-DA)

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

Chapter 5: Configurable Network Paging Console (X-NPMI)

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

Chapter 6: Configurable Network Paging Console (X-NPMS)

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

Chapter 7: Key-extend Module (X-K8/K4)

This chapter describes the X-K8/K4 characteristics, functions, appearance and specifications.

Chapter 8: Network Resource Interface (X-NRI/EN)

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

Chapter 9: 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 Broadcasting and Voice Alarm System.

Relevant Documents

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

- X-618 Public Address and Voice Alarm system Installation Manual
- X-618 Public Address and Voice Alarm system Configuration Manual
- X-618 Public Address and Voice Alarm system Operation Manual

Use Instructions

- All content including figures in this manual are to be used only for reference.
- The product may be subject to change from time to time 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 with its accuracy is ensured. 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.
- The Life Safety A/V (Guangzhou) Co., Ltd is not liable for any consequences caused by user mistakes when using the product or user misunderstandings of the manual content.

1 System Description

This section mainly describes the background, characteristics, functions, product components, and applications of the X-618 Public Address and Voice Alarm system. The X-618 Public Address and Voice Alarm 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 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 so as to improve sound clarity.
- The users can page and control broadcasts through the X-NPMS (Network Paging Console).
- The users can expand external audio interfaces overpass the X-NRI/EN (Network Resource Interface).
- Featured with dry contact trigger input and output.
- Able to 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 to 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, etc.
- Built-in network switching function, including 4 Ethernet ports.
- The system can be easily configured and upgraded through Ethernet.
- Link to fire alarm system through DCS or NRI.
- 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

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, etc.

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

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 method of voice segments synthesis, users can combine voice segments into complete speech to broadcast according to preset combination method. Besides, it also support 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-DCS2000/EN/X-DCS3000 Digital Integrated System Manager

  The X-DCS2000/EN/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 is control equipment in X-618 designed for expanding the number of loudspeaker lines, and can support multiple audio source files for broadcasting. The system integrates with functions such as the audio source file storage system, the audio broadcasting system, the loudspeaker line control system, and the system for monitoring and diagnosing faults. The system integrates well and is easily configured.

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

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

  In the X-618 system, the DA is used to amplify audio signal power and drive 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 prerecord audio, etc functions.

- X-NRI/EN Network Resource Integration Module

  The X-NRI/EN Configurable Network Paging Console 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 mainly offer external audio and control interface for system so as to connect with the third device. X-NRI/EN can connect with fire controller via RS-485 interface to realize fire linkage broadcast.

- Config Software

  It is usually used for hardware function setting. As the default factory setting only provided the most basic functions. Only through the X-618 Config software can set the advanced functions base on the user's needs, include device base parameter setting, fault diagnosis, tasks playing operations button functions, etc.

  The X-618 Config software ware 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

X-618 is a high-integrated system of public address and voice alarm, which is based on standard Ethernet and TCP/IP protocol. The system is composed of DCS, NPM and NRI, etc. X-DCS2000/EN/X-DCS3000 and amplifier form a basic broadcast system unit. Through multi broadcast system units can extend system's scale.

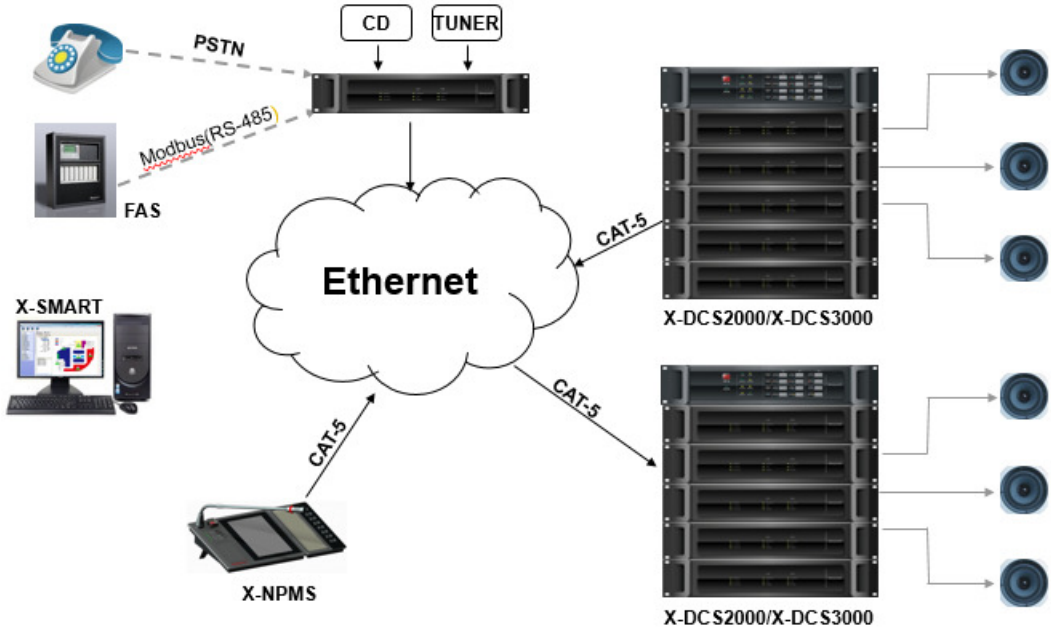


Figure 1 Schematic Diagram of X-618 Broadcast System

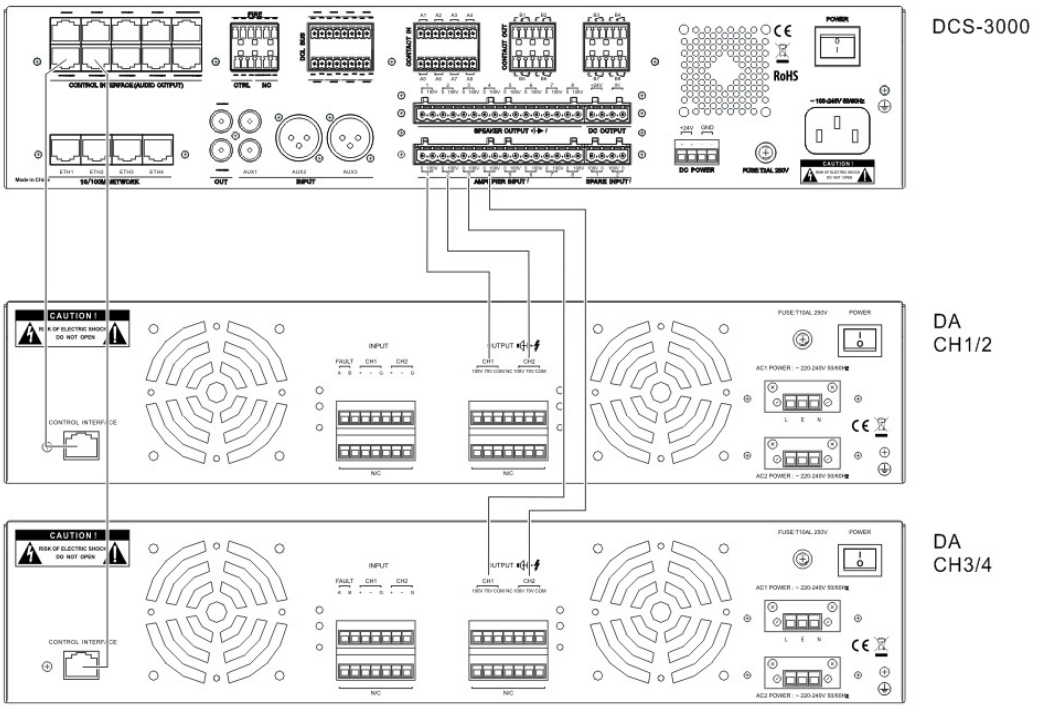


Figure 2 Broadcast System Unit of X-DCS2000/X-DCS3000 and Amplifier

Applications

The X-618 is applicable in the following situations:

- Office buildings
- International hotel
- Exhibition halls
- Shopping mall
- Factories
- Urban rail network

2 Digital Integrated System Manager (X-DCS2000/X-DCS3000)

This chapter mainly describes the characteristics, functions, appearance, and specifications of the X-DCS2000/X-DCS3000.

The X-DCS2000/X-DCS3000 is control equipment in X-618 designed for expanding the number of loudspeaker lines, and can support multiple audio sources for broadcasting. The system integrates all functions related 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 various features, which are listed below:

- Supports the manual selection of audio source files, zone buttons, and the device can be operated directly.
- Supports public address and voice alarm.
- Led lights show the device status.
- Remote paging and broadcasting from NPM.
- 8 configurable speaker lines.
- 3 auxiliary inputs that can external audio source equipment, such as CD player or tuner etc.
- 8 DCL (Digital Control Link) interfaces which can be used to connect 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.
- Max. 4 channels audio sources from the network or internal audio files can be broadcasted in 8 speaker lines at the same time.
- Max. 8 channel main amplifier and 2 channel spare amplifier can be connected.
- Supports amplifier changeover. Supports 4 main and 1 spare amplifiers or 8 main and 1 spare amplifiers.
- Supports (only X-DCS2000) one amplifier channel drive one or more zones.
- Self-test of acousto-optic components.
- Supports automatic fault diagnosis.
- If short circuit fault is found in speaker lines, the lines will be disabled automatically.
- Supervising the fault on DCL buses and digital noise detectors, such as off-line, repeated address, short circuit etc.
- Labels are available on the front panel to mark the name of speaker lines and audio sources. Internal audio matrix enables broadcasting any audio source in any zone.
- Supports emergency broadcast.
- 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.

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 Voice Alarm 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 again 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).

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 so as to prevent the power amplifier from being protected.

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.

In order to ensure facticity of detection, detection module X-EOL can be connected to the end of speaker lines to detect line fault.

Except to detect open circuit and short circuit of speaker line, it can also detect grounding fault, so as to prevent damage and make it easy to maintain.

Monitoring Function

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

Self-test Function

The DCS initiates the self-test function by manually pressing the “Self-test” button. In addition, when the test is being performed, all indicator lights on the front panel of the DCS turn on, the fault indication buzzer continuously buzzes.

The DCS performs uniform management of equipment such as the DA. During the self-test, all equipments 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 to at most 5 noise detector modules. Ambient noise can be collected so as to adjust output volume automatically to offer a better definition of audio.

Relevant parameter of noise detector and AVC can be configured by config software. Therefore a group detector module can control one or more zones’ 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 using the Automatic Volume Control (AVC) function. The DCS can automatically detect and adjust the zone broadcasting volume according to the configuration parameters.

When the system is under fire emergency broadcast 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 can automatically detect 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, described below in detail by the following:

- 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 for default setting.

- Switching between the main and standby power amplifiers
  - Spare amplifier 1 can backup the main amplifier 1, 3, 5, 7. Spare amplifier 2 can backup the main amplifier 2, 4, 6, 8.
  - The switching relationship between main and spare amplifier can be set via config software. Regularly set double N+1 mode (N≤4) or single N+1 mode (N≤8).
  - When the DCS detects a main power amplifier signal fault, the DCS can automatically switch to the standby power amplifier. The switching sequence is controlled according to fault occurrence sequence.

Zone Control

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

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

Voice Information Management

Build-in 1GB nonvolatile memory: 500MB (The maximum storage time is 96 minutes.) can 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 and time delay can be set in the definition of broadcast operations tasks.

Emergency Voice Alarm Function

The DCS can be linked with the fire alarm system through dry contacts, RS-485 cables, or through the Ethernet network. When the system is configured to be linked with a fire alarm through the configuration software, the fire alarm controller can send fire control signals to DCS through the Ethernet network.

When the DCS receives fire broadcasting initiation signals, the DCS immediately interrupts all non-emergency broadcasting functions and enters the emergency voice alarm state. The DCS can automatically trigger alarms for areas with emergencies according to the initial fire alarm controller signals. The system can also configure emergency broadcasting evacuation schemes through the software and facilitate personnel evacuation through voice prompts.

The DCS supports manually or automatically starting fire emergency voice alarm. The priority level of manual operation is higher than that of automatic broadcasting.

Manual operation includes selecting broadcasting zones and starting or stopping emergency broadcasts.

Operators can perform emergency voice broadcasting through the PTT microphone (Optional). The DCS can automatically record up to 30 minutes of paging content.

When the PTT microphone is used to perform emergency paging, fault prompt tones and monitoring pauses and the system returns to its original working state within 3 seconds after the completion of broadcasting.

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 task when receiving dry contact signals.
- Can broadcast audio based on the 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 operated or any faults happen, 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
- 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 so as to allow the configured data to take effect.

DCS Interface

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

Front Panel

Below figure shows the schematic diagram of the DCS front panel. Refer to below table for the description of relevant ports and indicator lights.

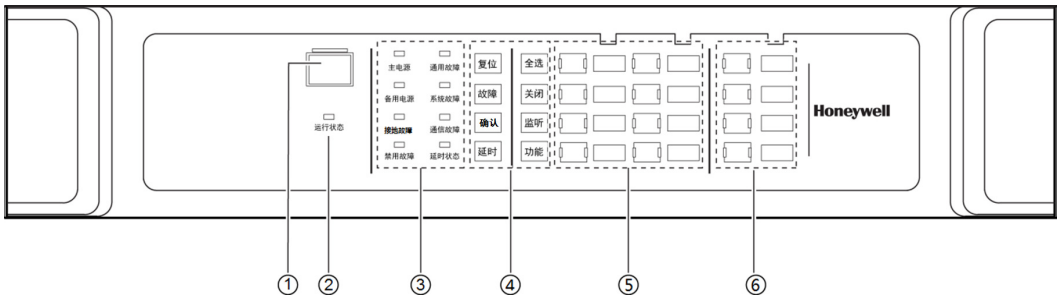


Figure 3 Schematic Diagram of the DCS Front Panel

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

No.	Button/Indicator light	Description
1	Manually 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.
3	Device state indicator lights	Shows the schematic diagram of the DCS device state indicator lights.
4	Function buttons	The schematic diagram of the DCS function buttons.
5	Zone selection buttons and state indicator lights	The schematic diagram of the DCS zone selection buttons and state indicator lights.
6	Audio source selection buttons and state indicator lights	The schematic diagram of the DCS audio source selection buttons and state indicator lights.

Rear Panel

Below figure displays the schematic diagram of the X-DCS3000 rear panel. Refer to below table for the relevant descriptions.

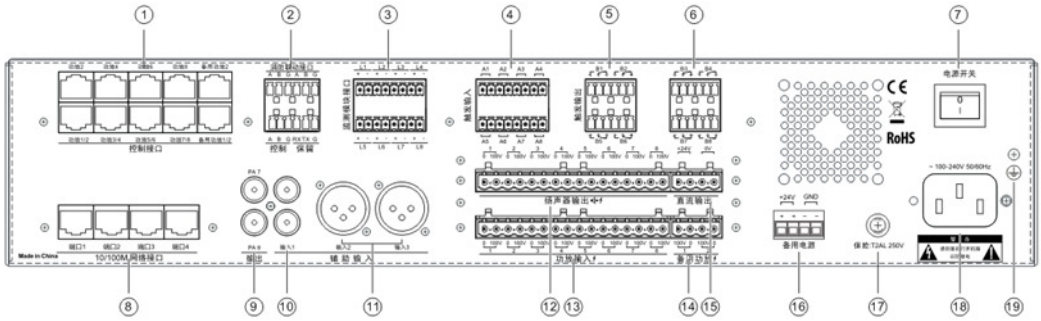


Figure 4 Schematic Diagram of the DCS Rear Panel

Table of DCS 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 is used to connect LPI-ModBus module. CTRL is a reserved RS-485 interface.
3	DCL BUS	Connects to external monitor module, such as noise detector or other module, etc.
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	100V output terminal	Connects to 8 loudspeaker circuits.
12	100V input terminal (Main amplifier)	Connects to 8 main amplifiers, 100V audio output.
13	100V input terminal (Spare amplifier)	Connects to 2 spare amplifiers, 100V 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-DCS2000/X-DCS3000 product specifications are detailed in below table.

Table of DCS 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	

Parameters	Values
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 or EOL module
Loudspeaker circuit	
Output voltage	100V
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
Storage temperature	-40°C~+70°C
Specification	
Dimension (WxHxD)	482 mm x88 mm x 420mm
Packing dimension (WxHxD)	580mm x235mm x552mm

Parameters	Values
Net weight	9.3Kg
Gross weight	12.5Kg

3 High Efficiency Power Amplifier (X-DA)

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 four models:

- X-DA1500 (1 amplifier channel, 500W maximum power output)
- X-DA2250 (2 amplifier channels, 250W for each power output)
- X-DA4125 (4 amplifier channels, 125W for each power output)
- X-DA4060 (4 amplifier channels, 60W for each power output)

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, 4X125W and 4X60W
- Contains 1/2/4 independent channels
- Each channel has 100V or 70V output
- Supports balanced or unbalanced audio input
- The DA is cooled through forced air-cooling
- Able to automatically limit 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, the fans automatically start and operate at the fastest speed. When the temperature is lower than 40 °C, the fans stop.

When the temperature within the DA exceeds 75°C, 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), the DA again performs normally.

Overload and Short-circuit Protection

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

Fault Monitoring and Output

The DA can monitor the main and backup power supply for instances of undervoltage, overheating protection states, and overload or short circuit protection states. When the DA monitors any fault, the DA outputs an 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.

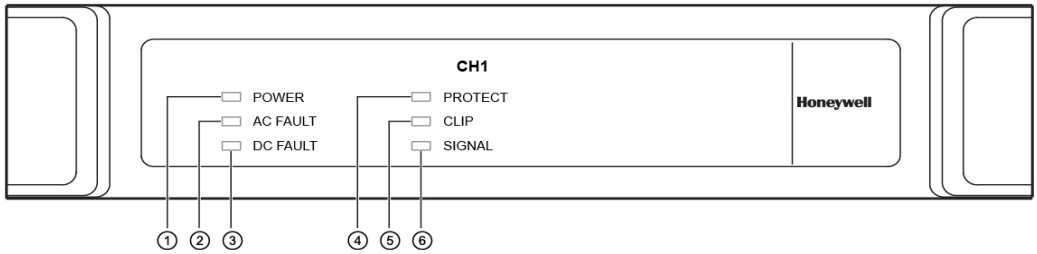
The DA Interface

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

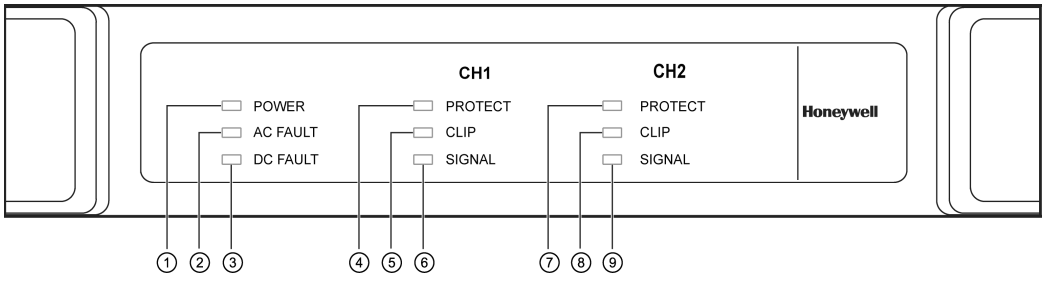
Front Panel

The front panel of the DA is shown in below figure. The table lists the LED indicator lights found on the front panel and their descriptions.

X-DA1500



X-DA2250



X-DA4125/X-DA4060

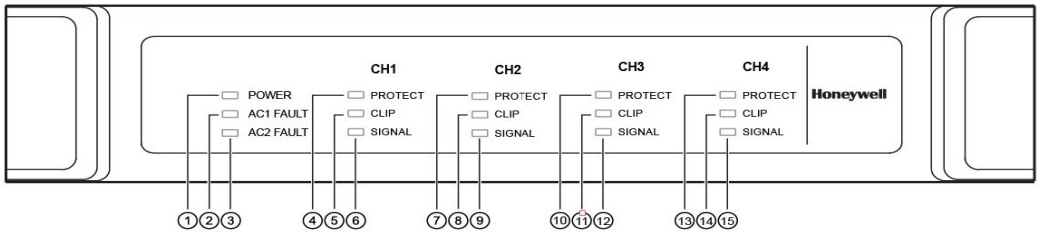


Figure 5 Schematic diagram of the DA front panel

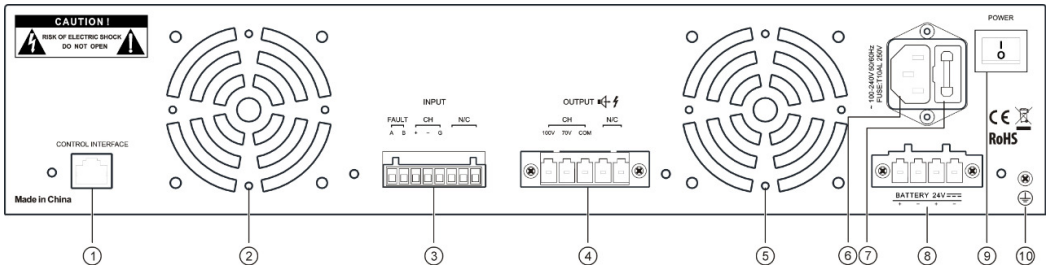
Table of DA front panel LED light indicators

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.
4/710/13	CH1/2/3/4	PROTECT	DA protection indicator light. When the DA overheats, experiences over-current, over-voltage, or undervoltage, 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.

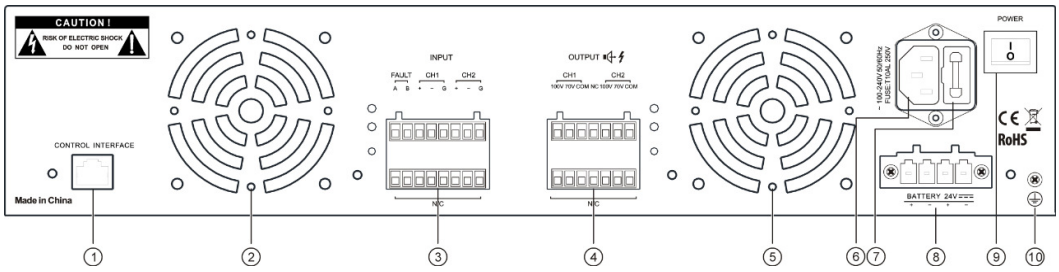
Rear Panel

The rear panel of the DA is shown in below figure, below table shows description of ports on rear panel.

X-DA1500



X-DA2250



X-DA4125/X-DA4060

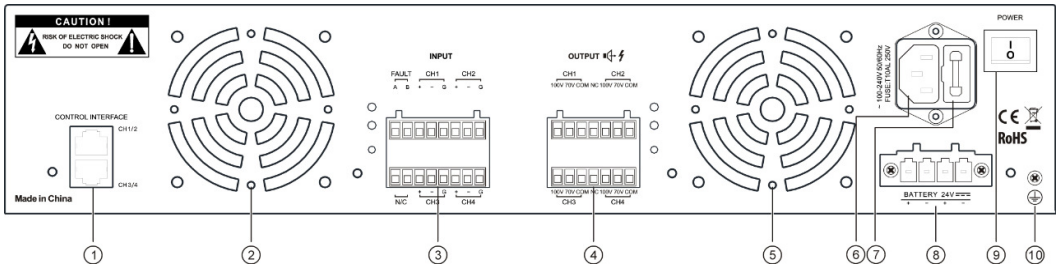
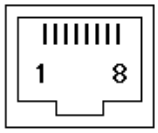


Figure 6 Schematic Diagram of the DA Rear Panel

Table of DA Rear Panel Ports

No.	Port			Description
1	CONTROL INTERFACE			Connects to an external audio input device to receive signal.
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 port	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 of 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	
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 below table.

Table of X-DA High Efficiency Power Amplifier Specifications

Parameters		Values			
		X-DA1500	X-DA2250	X-DA4125	X-DA4060
Rated output power		1 X 500W	2 X 250W	4 X 125W	4 X 60W
Main power supply voltage		~ 220V-240V 50/60Hz			
Backup power supply voltage		~ 220V-240V 50/60Hz			
Power dissipation		<720W			<320W
Main power supply fuse		T10AL 250V			T3.15AL 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%）			>90dB（±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	4
Environment humidity		< 95%, without condensing			

Parameters	Values			
Operation temperature	0°C~+40°C			
Storage temperature	-10°C～+55°C			
Product dimensions (width × height × depth)	482 mm×88 mm ×420 mm			
Package dimensions (width × height × depth)	580 mm×235 mm ×552mm			
Net weight	11.3Kg	12.2 Kg	12.9Kg	10.6Kg
Gross weight	14.4Kg	15.3 Kg	16Kg	13.7Kg

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 bidirectional intercom function.

Product Characteristics

The X-NPMS has the following characteristics:

- 7' LCD touch screen for operational controls
- Max. 8 key modules can be extended, each module has 8 keys.
- The key function can be defined as select zone, select group, select all, select audio, one click, volume control, etc.
- Gooseneck microphone and Push-To-Talk microphone are optional.
- Supports to detect microphone fault and record log automatically.
- Sound-light fault indicator.
- Supports line in and line out.
- Supports paging, business broadcasting, emergency broadcasting.
- Supports temporary broadcasting, DVA, Record, USB files.
- Supports automatically record microphone broadcasting.
- Supports authorization management.
- Microphone tone can be set.
- Supports multi-language display.
- Supports desktop, rack-mounted and wall-mounted.
- Built-in loudspeaker for monitoring and intercom functions.
- Supports POE or external power supply.

X-NPMS Functions

This section describes the following main X-NPMS functions:

- Indicator light
- Sound instructions
- Fault detect function
- Broadcast operation
- Internal communication
- Monitor function
- Log management

Indicator

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

Fault indicator is used to indicate fault. Light is flickering when a fault occurs, and be constant lighted after confirmation.

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

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

- Microphone is in good status and not working, the indicator doesn't light.
- Microphone is in good status and waiting to finish broadcasting presignal, indicator flickers in green.
- Microphone is in good status and working, the indicator is in solid green.
- Microphone has a fault, the indicator lights in orange.

Sound Instruction

Except lamp indicator, device can also offer different voice instructions according to current states.

- Fault prompt tone. Buzzer is muted under normal situation and when a fault occurs, it rings with 0.5s on and 0.5s off. After press any fault confirmation button, buzzer is muted till another fault occurs.
- When microphone starts to work, buzzer automatically mute to avoid any interference until it finish work. Except during intercom communication, monitor speaker is automatically muted when any microphone is working

Fault Detector Function

X-NPMS can supervise self working status and send the fault status to relevant devices and record fault log. 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

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

X-NPMS has following operation interfaces:

- Manual Broadcast

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

- Broadcast Audio Files from USB Disk

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

- Voice Synthesis Broadcast

The voice synthesis here means combine many voice pieces to broadcast. Voice pieces are stored in SD card of X-NPMS, and can be displayed in interface according to types.

- Recording Broadcast

The interface of recording broadcast will display the list of prerecord files, users can choose prerecord files to broadcast in target zones or delete the prerecord files.

- Timing Broadcast

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

Internal Communication

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, X-NPMS will display requesting screen. The target device will play ring signal and show intercom window. User can click “Accept” to start internal communication, or click “Hang up” to stop intercom.

Monitor Function

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

Log Management

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

X-NPMS Interface

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

Front Panel

Below figure shows the schematic diagram of the NPMS front panel. Refer to below table for the descriptions of relevant controls.

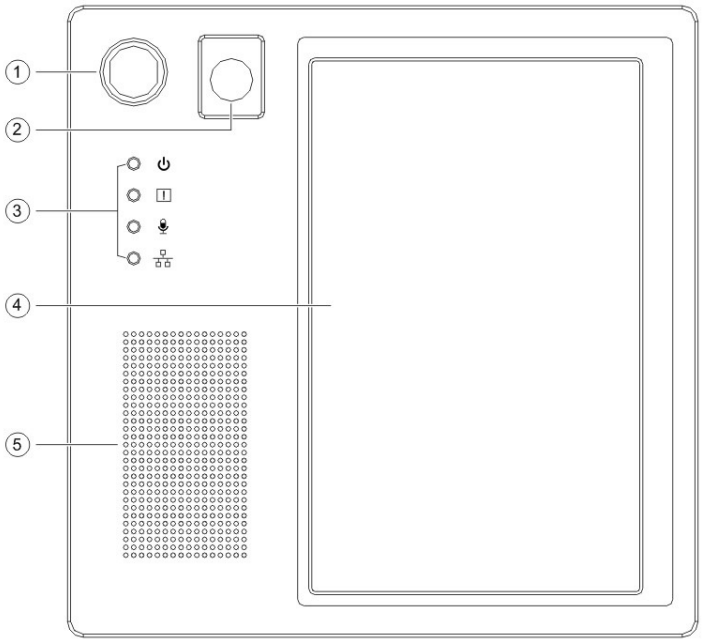


Figure 7 Schematic Diagram of X-NPMS Front Panel

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

No.	Control/Indicator light/Button	Description
1	Microphone socket	To install goose-neck microphone

No.	Control/Indicator light/Button	Description
2	Manual emergency button & indicator	To control system enter manual emergency mode. When system is in automatic emergency mode, the indicator flickers in red. When the device is in manual emergency mode, the indicator is in solid red.
3	indicators	Power Indicator To indicate power status, normally in green.
		Fault Indicator To indicate system faults, when there is a fault, it is in 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 occurs. Flickering yellow light shows the equipment connects to network but cannot communicate to other devices. Normally in green light.
4	display screen	7' LCD screen, operate through touching.
5	Loudspeaker	To monitor or internal communication.

Rear Panel

Below figure shows the schematic diagram of the NPMS rear panel. Refer to below table for the descriptions of relevant ports.

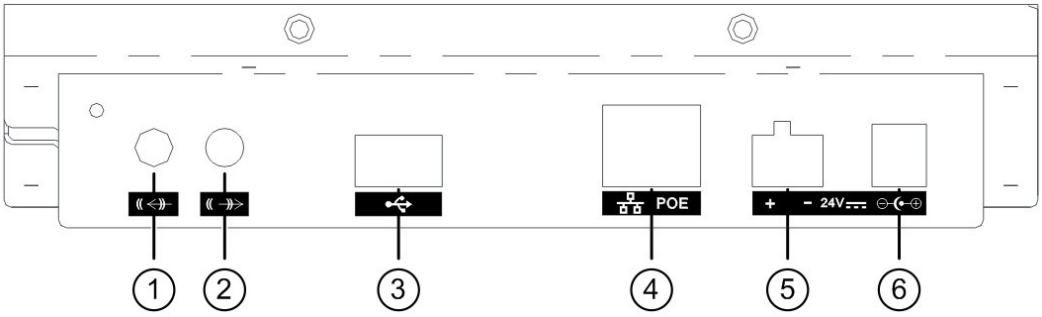


Figure 8 Schematic Diagram of the X-NPMS Rear Panel

Table of 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.

No.	Port	Description
3		USB interface To insert USB disk.
4		To connect to Ethernet switcher or POE switcher.
5、6		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 below table.

Table of 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）
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
Storage temperature	-40°C~+70°C
Humidity	<95%, without condensation
Dimension (W×H×D)	200 x 46.5 x 200 mm
Packing dimension (W×H×D)	403 x 133 x 268 mm
Net weight	1.7Kg
Gross weight	2.5Kg

5 Configurable Network Paging Console (X-NPMK)

The X-NPMK (Network Paging Console) uses key operation mode to fulfill zone paging and broadcast control over X-618 broadcast system under the same network.

Product Characteristics

- Key operation.
- Removable gooseneck microphone.
- Built-in loudspeaker for zone monitoring and internal communication.
- Audio signal digital processing ensures the audio quality unaffected by transmission path.
- Key modules(X-K8 or X-K4) can be extended as required.

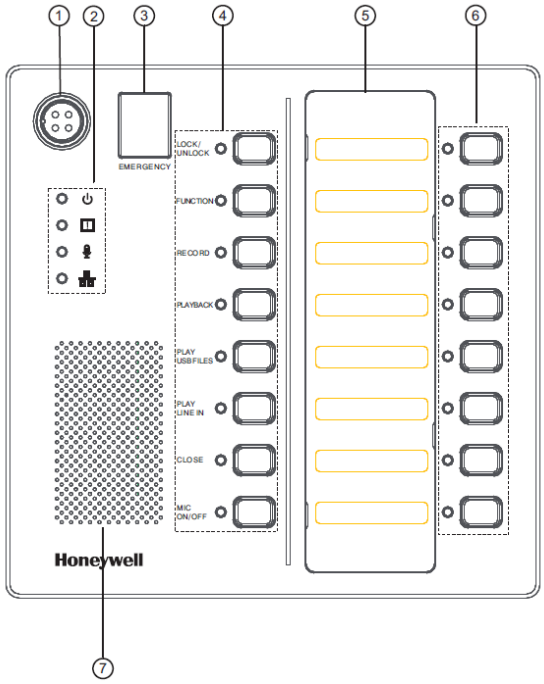
X-NPMK Functions

- Manual Emergency Broadcast
- One-click Broadcast
- Zone/group Broadcast
- Audio Prerecord & Broadcast
- Play Audio Files from USB Disk
- Internal Communication
- Automatic Record
- Microphone and Network Supervision
- Log Function

X-NPMK Interface

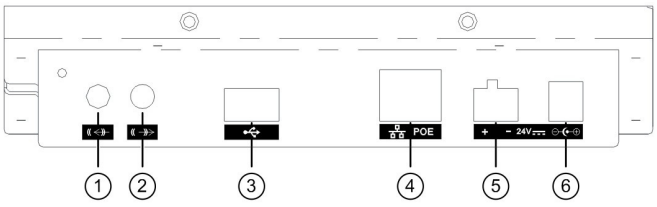
This section describes the front and rear panels of the NPMK.

Front Panel



No.	Buttons/Indicators		Description
1	Microphone socket		To install the gooseneck or PTT microphone.
2	Indicator lights	⏻	Power Indicator To indicate power supply status, green light means device is in working status.
		⚠	Fault Indicator To indicate device's fault status. When a fault is detected, the light is in orange and flickers. After the fault is confirmed, the light is in orange still. When the light is off, showing there is no fault.
		🎤	Microphone Status Indicator To indicate microphone's working status. The orange light indicates a fault is detected. The flash green light indicates device is broadcasting. The green light indicates device is working. When the light is off, meaning it isn't in working status.
		🖧	Internet Status Indicator To indicate the Internet working status. When a fault is detected, the light is in orange. When the Internet is connected but there is communication fault, the light is in orange and flickers. The green light shows device is in good-working status.
3	Manually emergency button		To enter the manually emergency mode. When the system enter auto. emergency mode, the light is in red and flickers. When it enter manually emergency mode, the light is in red.
4	Function buttons & Indicators	Lock & Unlock	To lock and unlock the keypad.
		Function	To execute functions with other keys.
		Record	To record the audio source manually.
		Playback	To playback the record.
		Play USB Files	To play the audio source from USB.
		Play Line In	To play the audio source from line in.
		Close	To close the zones.
		Mic On & Off	To turn on or off the microphone.
5	Label		The name or function of the programmable keys can be written on the label.
6	Programmable buttons & indicators		8 programmable buttons and corresponding indicators.
7	Loudspeaker		To monitor or listen system's audio.

Rear Panel



No.	Port	Description
1		External Audio Input Interface Used to connect external audio device.
2		Audio Output Interface Used to output microphone signal or monitoring signal.
3		USB Interface Used to connect USB disk.
4		Network Interface Used to connect to Ethernet switch or POE switch.
5/6		24V DC Power Supply Interface Used to connect to power adaptor or external power supply. It has higher priority than POE.

X-NPMK Specifications

X-NPMK product specification information is detailed in below table.

Parameters	Values
Power Supply Voltage	DC 24V
Rated Power	11W
Microphone Frequency Response	50Hz-15KHz
SNR	> 85dB
THD	< 0.05%
Microphone Input	-44dB±2dB
Line Input	0dBV (1V)
Line Output	0dBV(1V)
Monitoring Loudspeaker	2W/8 Ω
Sample Rate	44.1 KHz, 16Bit
Microphone Pole Length	385 mm
Operation Temperature	-10°C～+55°C
Storage Temperature	-40°C～+70°C
Humidity	<95%, Non-condensation
Dimension (W×H×D)	200 × 46.5 × 200 mm
Packing Dimension (W×H×D)	403 × 133 × 268mm
Net weight	1.7Kg
Gross weight	2.6Kg

6 Key-extend Module (X-K8/K4)

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

Key-extend module is accessory of X-NPMS, which is used to extend number of physical keys. Each X-NPMS can extend at most 8 units X-K8/K4.

There are 2 models:

- X-K8 8 key-extend module (with 8 keys and 8 indicators)
- X-K4 4 key-extend module (with 4 keys and 4 indicators, only used for fire alarm purpose)

Product Characteristics

Key-extend module has the following characteristics:

- Modular design, easy to extend.
- Button function can be configured by software.
- Supports desktop and rack installation.
- Every button of X-K4 has a cover to avoid misoperation.
- Additional bracket can be installed to change angle of inclination for different use habits.

Key-extend module Functions

This section describes the following main X-K8/K4 functions:

- Extendibility
- Communication and power supply

Key-extend module X-K8/K4 is used to connect X-NPMS. Physical keys can be extended. Every X-K8 module can extend 8 keys, and each X-K4 module can extend 4 keys with a protector cover. X-NPMS can extend at most 8 key-extend module. Users can set extended button function as zones/groups selecting, broadcast task and volume control, etc via config software.

Extendibility

Key-extend module X-K8/K4 is used to provide more physical keys for X-NPMS. Every X-K8 module can extend 8 keys, and each X-K4 module can extend 4 keys with cover. X-NPMS can extend up to 8 key-extend module. Users can set extended button function as zones/groups, tasks or volume control via configuration software.

Communication and Power Supply

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

Key-extend module Interface

This section describes the appearance of key-extend module.

Product Appearance

Following is schematic diagram of key-extend module appearance:

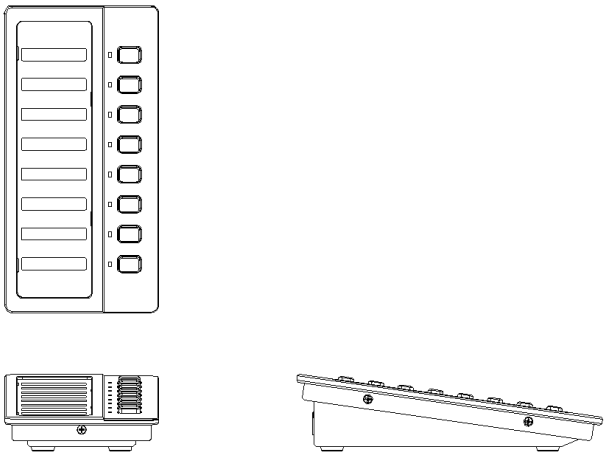


Figure 9 Schematic Diagram of X-K8 Appearance

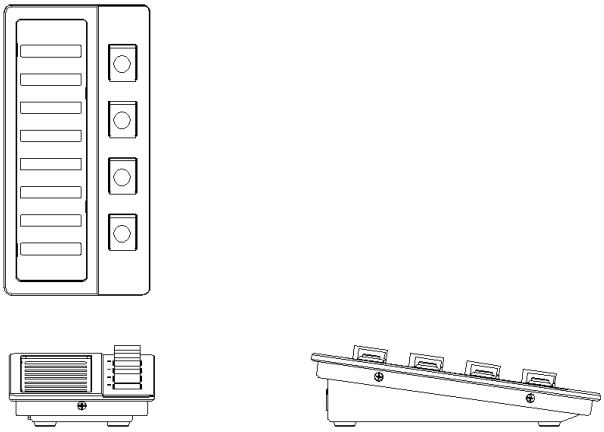


Figure 10 Schematic Diagram of X-K4 Appearance

Module Assembly

Below figure is the assembly schematic diagram of key-extend module and X-NPMS.

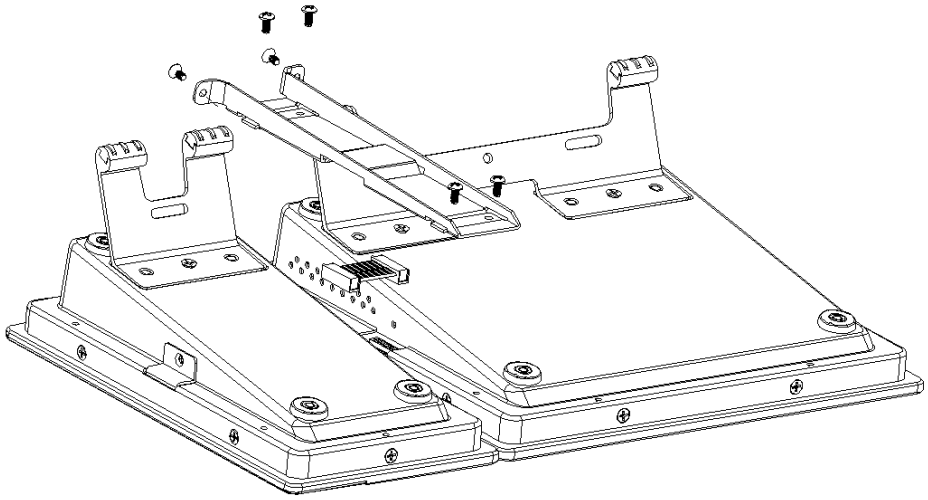


Figure 11 Assembly Schematic Diagram of Key-extend Module and X-NPMS

Key-extend Module Specifications

The key-extend module product specification information is detailed in below table.

Table of Key-extend Module Product Specification Information

Parameters	Values
Key No.	8 or 4
Operating temperature	-10°C～+55°C
Storage temperature	-25°C～+70°C
Humidity	<95%, without condensation
Dimension (W×H×D)	100 x46.5 x 200 mm
Packing dimension (W×H×D)	403 x 133 x 268 mm
Net weight	0.57 Kg
Gross weight	1.2 Kg

7 Network Resource Interface (X-NRI/EN)

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

The X-NRI/EN is external interface expansion control equipment in X-618 to meet the common interface requirements of the broadcasting system. It includes at most 5 channels of network audio source, and the type of audio can be chosen from 4 channels of external input audio or built-in audio. All the audio sources broadcasted 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 equipments such as a CD player or tuner.
- Balance 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.
- Max. 5 channels audio source playing in the network that can be 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.
- 32 dry contact inputs with supervision automatically.
- Link to fire alarm system by dry contacts or LPI-ModBus, which supports at most 32 DCS (256 zones).
- Users can page through selecting predefine broadcast zones/groups, which supports at most 32 DCS (128 zones).
- Automatically monitor the dry contact inputs 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
- Fire alarm interface
- 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 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

Network audio source management

Max 5 channels audio source playing in the network that can be external audio source or internal players. AUDIO1~4 can be set for external audio source or internal players, AUDIO 5 only be set for internal player through the Config software.

External Audio Inputs and Internal Player

External audio source playing

NRI provides 4 auxiliary input ports that can connect to external audio source. The users can set the interfaces enable or not, the audio source name, multi-case IP address, inputs type through the Config software. The audio source which be connected to the NRI through the interfaces, can be broadcasted in the zones, and these zones were selected through the X-SMART software, NPM panel or DCS panel. Unlike the normal device such as CD/DVD player which can be connected to the auxiliary input port directly, the special device such as 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

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

Fire Alarm Interface

According to NRI can link to fire alarm system by dry contact or RS-485, X-618 system supports up to 32 DCS in the same group to enable fire alarm linkage and emergency broadcast. DCS internal audio source or the audio source of NRI can be selected as the fire alarm voice. The groups which are related by each trigger signal can be set freely through the Config software; the evacuation broadcast and alert broadcast are selectable. NRI can link to Notifier fire alarm controller through RS-485 connecting with LPI-ModBus module.

Telephone Interface

NRI can be connected with the telephone interface module through the RS-485 and audio input, to enable to use telephone remotely select play zones and paging through PSTN switch or VoIP gateway. Max 128 predefined groups of NRI can be set through 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 so as to allow the configured data to take effect.

X-NRI/EN Interface

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

Front Panel

Below figure is the drawing of X-NRI/EN front panel, relevant ports and description of indicators can refer to below table.

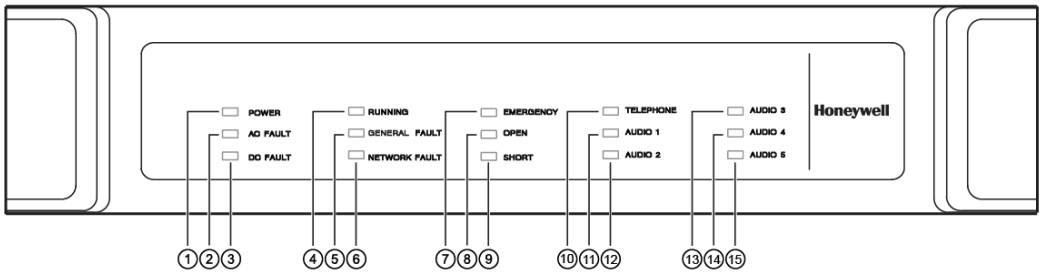


Figure 12 Drawing of the X-NRI/EN Front Panel

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

No.	indicator	Description
1	POWER	Power indicator When the power supplies normally, 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 in good working, and 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 works when any fault of 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, turns yellow and the buzzer works when it gets connection failure，such as disconnection from the network.
7	EMERGENCY	Indicator for system fault The light flashes yellow and the buzzer work when any fault of the whole 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, turns yellow and the buzzer works when it gets connection failure，such as disconnection from the network.
9	SHORT	Indicator for system fault The light flashes yellow and the buzzer work when any fault of the whole system appears, such as power fault.

No.	indicator	Description
10	TELEPHONE	Indicator for peripherals connection fault The light is off when the NRI is connected to the peripherals correctly, turns yellow and the buzzer works when it gets 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. AUDIO1~4 is for 4 channels line inputs, as the lights flash green, and AUDIO5 is for internal player, as the light keeps green.

Rear Panel

Below figure is the drawing of X-NRI/EN rear panel, relevant ports and description of indicators can refer to below table.

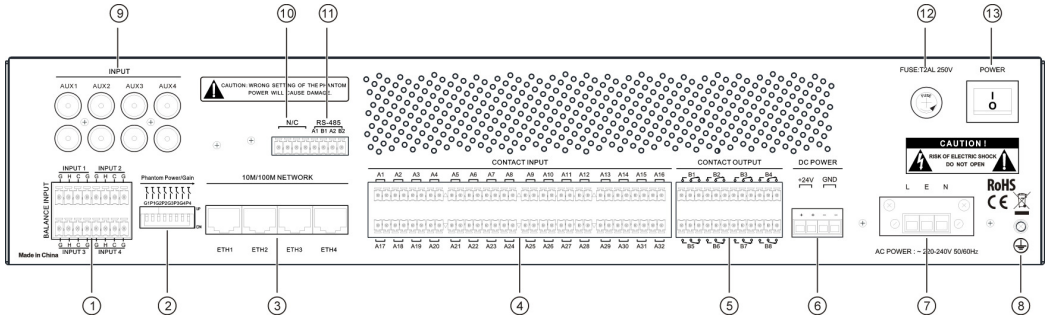


Figure 13 Drawing of the X-NRI/EN Rear Panel

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

No.	Port	Description
1	Balance input	Used for the differential inputs and the phantom power and the gain can be set by the switch on right side.
2	Dial switch	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.
10	Communication interface	Reserved

No.	Port	Description
11	RS-485	Communication control port. Used to connect the third party device. A1、B1 can be connected with fire alarm system (LPI-MODBUS module) A2、B2 can be connected with 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 below table.

Table of 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
Working conditions	

Parameters	Values
Environment humidity	< 95%, without condensing
Working temperature	-10°C~+55°C
Storage temperature	-40°C~+70°C
Specification	
Dimension (W×H×D)	482 mm×88 mm ×420 mm
Packing dimension (W×H×D)	580mm×235mm ×552mm
Net weight	7.3Kg
Gross weight	10Kg

8 Digital Noise Detector (X-ND100)

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

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

Product Characteristics

X-ND100 has the following main characteristics:

- Connect to DCS by a pair of cables which transmit data and power supply.
- Max. 5 noise detectors for each channel.
- Real time to measure broadcast signal and noise signal.
- The maximum distance is up to1000m.
- Flush-mounting in ceiling.
- Fire-proof ABS shell.
- Ideal for indoor installation.

X-ND100 Functions

This section describes the following X-ND100functions:

- Ambient noise detection
- Communication and power supply

Ambient Noise Detection

X-ND100 is the key components 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

X-ND100 connects to X-DCS3000 via pair twisted wires, which are for sending sound data and supplying power. Digital transmission method can avoid signal attenuation due to far transmission distance. Maximum 5 noise detectors or end-of -line modules can be connected in one cable.

X-ND100 Appearance

This section describes X-ND100 appearance.

Product Appearance

Below figure shows the schematic diagram of X-ND100 appearance.

Figure 14 X-ND100 Appearance

Interface

Below figure is the schematic diagram of X-ND100 interface. Refer to below table for the descriptions of relevant controls.

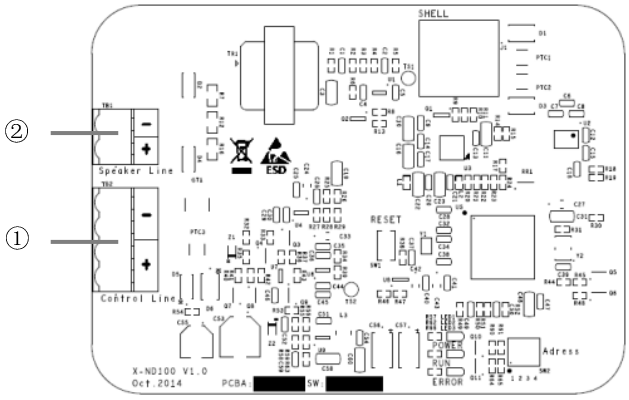


Figure 15 Connector of X-ND100

Table of 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 below table.

Table of 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

Parameters	Values
Color	White (RAL9003)
Mounting Hole Size	Φ160 mm
Depth of Hole	100mm
Ceiling Thickness	5~25 mm
Operating Temperature	-10°C~+55°C
Storage Temperature	-25°C~+70°C
Relative Humidity	<95%, no condensation
Dimensions	Φ180 x 105 mm
Packing Dimension (W×H×D)	185 x 185 x115 mm
Net Weight	0.315Kg
Gross Weight	0.446Kg

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