TOA

USER'S MANUAL

PLEASE READ THIS MANUAL FIRST!

NETWORK AUDIO ADAPTERS NX-100 NX-100S

Thank you for purchasing TOA's Network Audio Adapter.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

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1. SAFETY PRECAUTIONS

- Be sure to read the instructions in this section carefully before use.
- Make sure to observe the instructions in this manual as the conventions of safety symbols and messages regarded as very important precautions are included.
- We also recommend you keep this instruction manual handy for future reference.

Safety Symbol and Message Conventions
Safety symbols and messages described below are used in this manual to prevent bodily injury and property damage which could result from mishandling. Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of the potential safety hazards.

⚠ WARNING	Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.

When Installing the Unit

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.

- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects -- including the unit itself -- on the power cord, as doing so may result in fire or electric shock.
- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down and causing personal injury and/or property damage.

When the Unit is in Use

- Should the following irregularity be found during use, immediately stop the power supply to the unit by disconnecting the AC adapter from the AC outlet or the DC power cords from the unit terminals, then contact your nearest TOA dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.
  - · If you detect smoke or a strange smell coming from the unit.
  - · If water or any metallic object gets into the unit
  - · If the unit falls, or the unit case breaks
  - · If the power supply cord is damaged (exposure of the core, disconnection, etc.)
  - · If it is malfunctioning (no tone sounds.)
- To prevent a fire or electric shock, never open nor remove the unit case as there are live electrical parts inside the unit. Refer all servicing to your nearest TOA dealer.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.
- Do not insert nor drop metallic objects or flammable materials in the gaps around the rear-mounted connectors, as this may result in fire or electric shock.
- Do not touch the unit and the AC adapter plug during thunder and lightning, as this may result in electric shock.

⚠ CAUTION Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

When Installing the Unit

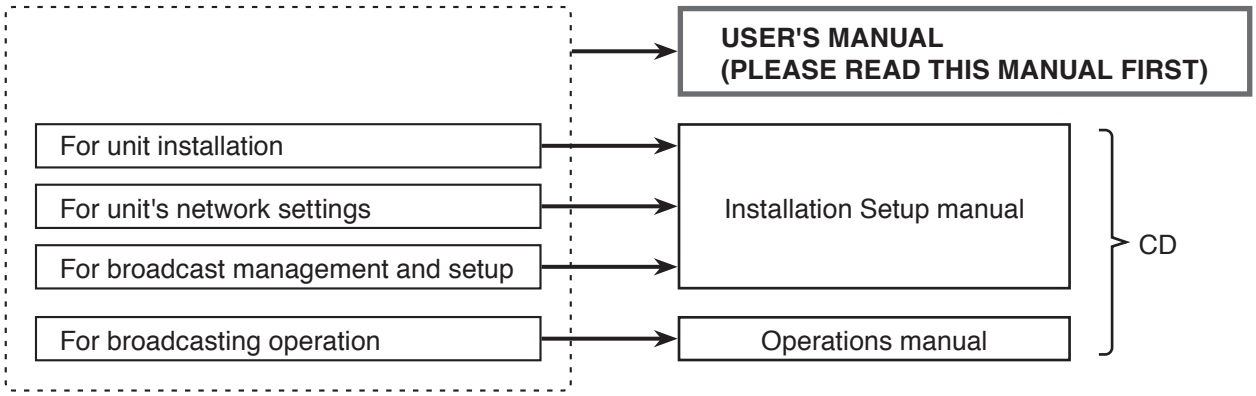
- Never plug the AC power supply plug into nor remove it from an AC outlet with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.

When the Unit is in Use

- Use the dedicated AC adapter or its equivalent for the unit. Note that the use of other adapter may cause a fire.
- If dust accumulates on the power supply plug or in the wall AC outlet, a fire may result. Clean it periodically. In addition, insert the plug in the wall outlet securely.
- Disconnect the power supply cable and connector for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.

2. COMPOSITION OF THE NX-100/100S INSTRUCTION MANUAL

The NX-100/100S Instruction Manual is divided into three parts: User's Manual (entitled as "PLEASE READ THIS MANUAL FIRST"), Installation Setup, and Operations. Before installation or use, be sure to refer to the pertinent information included in these manuals in order to familiarize yourself with its correct operation.



3. PARTS INCLUDED WITH THE PACKAGE

Check to be sure that all the following components are included with the unit.

[NX-100]

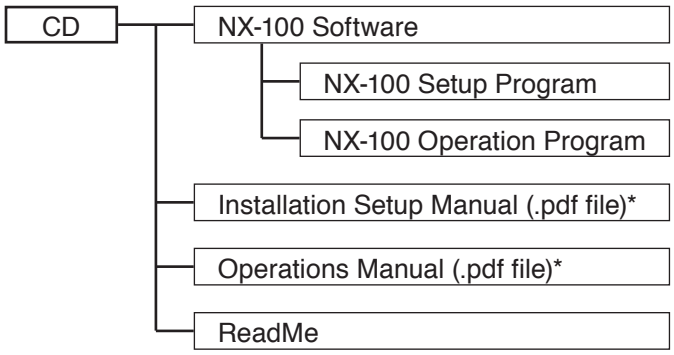
Program CD	1
Machine screw M3 x 10	8
9-pin removable terminal plug (for control I/O)	2
3-pin removable terminal plug (for audio I/O)	2
3-pin removable terminal plug (for power supply)	1
RS-232C connector cover*	1
USER'S MANUAL (PLEASE READ THIS MANUAL FIRST)	1

[NX-100S]

Program CD	1
Machine screw M3 x 10	8
9-pin removable terminal plug (for control I/O)	2
3-pin removable terminal plug (for audio I/O)	2
Ferrite clamp (for AC adapter)	1
USER'S MANUAL (PLEASE READ THIS MANUAL FIRST)	1

* Not supplied with the version US.

[CD File Configuration]



These dedicated programs permit the NX-100/100S to be operated from a connected PC.

* Adobe Acrobat Reader is required to view these files.

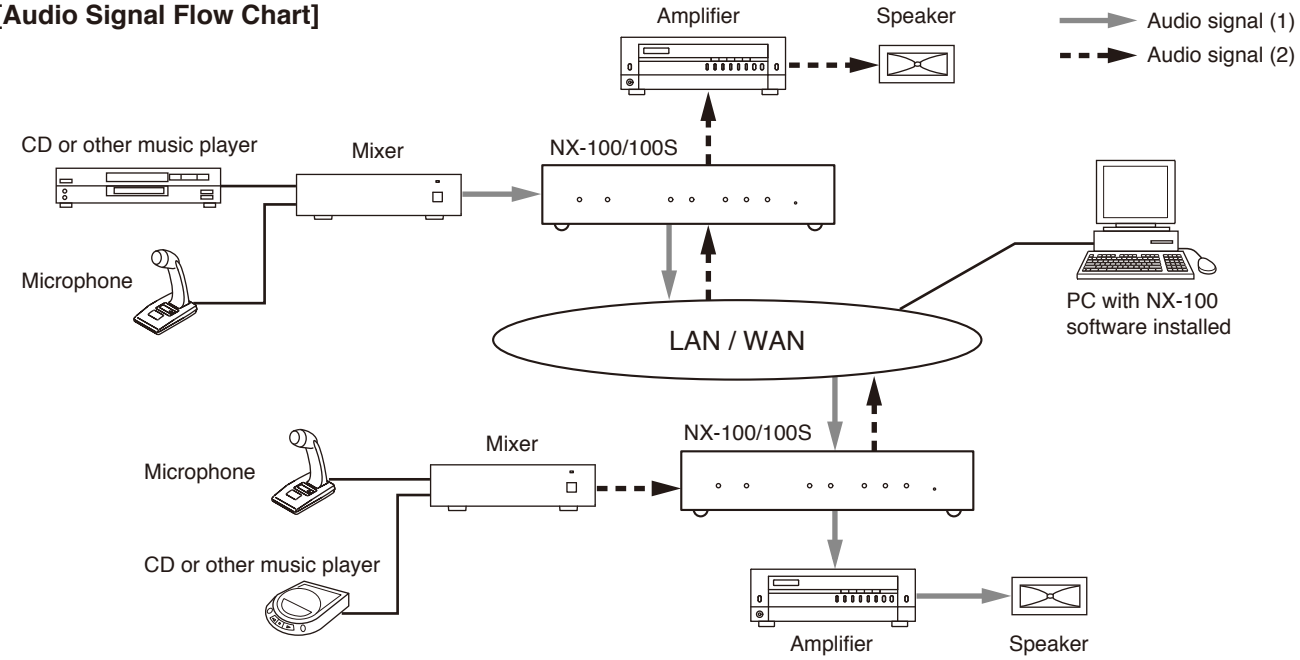
[Update information]

- The latest versions of the following software and manuals are open to the public on the Toa's download site http://www.toa-products.com/international/: NX-100 firmware, NX-100 software (Setup program and Operation program), and Instruction manuals (Installation setup manual and Operations manual). Please download them from the above web site.
- To confirm the NX-100 firmware version or to update the firmware, use the system setting tool of the setup program. For details, refer to the installation setup manual.
- To confirm the NX-100 software version, use the Help menu of the software.
- The version of each instruction manual is in the lower right corner on the last page expressed in a year-month format. Example: "201303" represents 2013, March.

4. GENERAL DESCRIPTION

TOA's NX-100/100S Network Audio Adapter is specially developed to transmit high-quality audio signals and such control data as serial data over IP networks such as LAN or Internet in real time.

[Audio Signal Flow Chart]



5. FEATURES

- Permits use of not only dedicated lines, but also the Internet, which greatly reduces operating costs when transmitting audio signals to remote locations.
- Under peak conditions with no network delay, audio signals can be transmitted with a minimal delay of about 20 ms.
- Transmission of contact control data possible.
- Transmission of serial data control information also possible. NX-100 only
- Simultaneous bi-directional transmission of audio signals possible.
- Simultaneous transmission of audio signals to multiple locations (up to 4 locations for unicast*1 streaming, 64 locations for multicast*2 streaming) possible.
- Enables loss-free audio signal transmission even over congested networks such as the Internet.
- The entire system can be remotely operated or managed from a single PC (personal computer) using the supplied software program.
- Because audio transmissions can be started and finished via the unit's contact inputs, systems can be configured even without the use of a personal computer.
- Designed to operate on either AC or DC power source. NX-100 only

*1 UNICAST: A communications method used to transmit audio data to designated addresses in a matched ratio of 1:1. Up to 4 channels can be simultaneously transmitted.

*2 MULTICAST: A communications method used to simultaneously transmit a single audio data source to multiple destinations.

6. HANDLING PRECAUTIONS

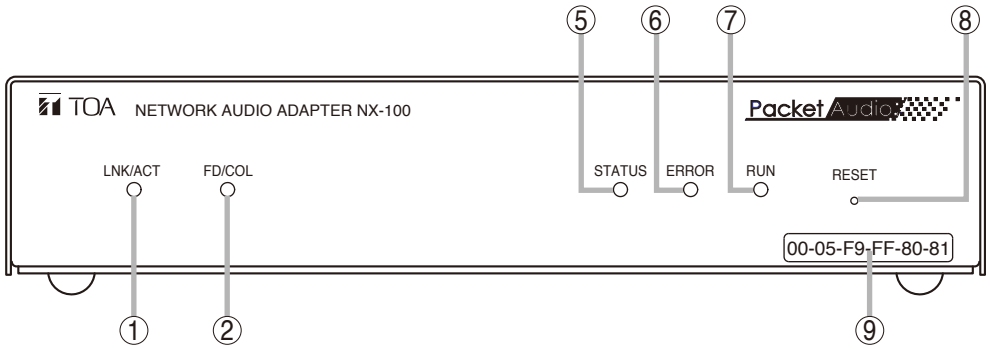
- **Warning:** This is a class A products. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
- **Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- The user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

- Avoid soldering stranded or shielded cable, as contact resistance may increase when the cable is tightened and the solder is crushed, possibly resulting in an excessive rise in joint temperatures.
- Avoid exposing the unit to strong shocks or vibration, which could damage the unit.
- Do not use the unit in close proximity to TV sets or radios in order to avoid reception interference.
- Take care to only use the unit in locations having an ambient temperature within the range of 0 – 50°C (0 – 40°C when using the AC adapter), and humidity of less than 90% (no condensation). NX-100 only
- Take care to only use the unit in locations having an ambient temperature within the range of 0 – 40°C, and humidity of less than 90% (no condensation). NX-100S only
- When mounting in an equipment rack, take care not to install the unit in close proximity to power amplifiers, as the higher resulting temperatures could exceed the unit's maximum permissible operating temperature limit.
- Regarding optional AC adapter inspection and replacement:
  To ensure the safe use of the AC adapter, inspect and replace it on a regular basis. As a guideline, the AC adapter should be replaced with a new one after 5 years of use when it is continuously used for 24 hours per day under ordinary usage conditions. Please note, however, that replacement guidelines may differ depending on the installation environment or usage conditions.
- To clean, be sure to first cut off power to the unit, then wipe with a dry cloth. When the unit gets very dirty, use a cloth damped in a neutral cleanser. Never use benzene, thinner or chemically-treated cleaning cloth because such volatile liquids could deform or discolor the unit.

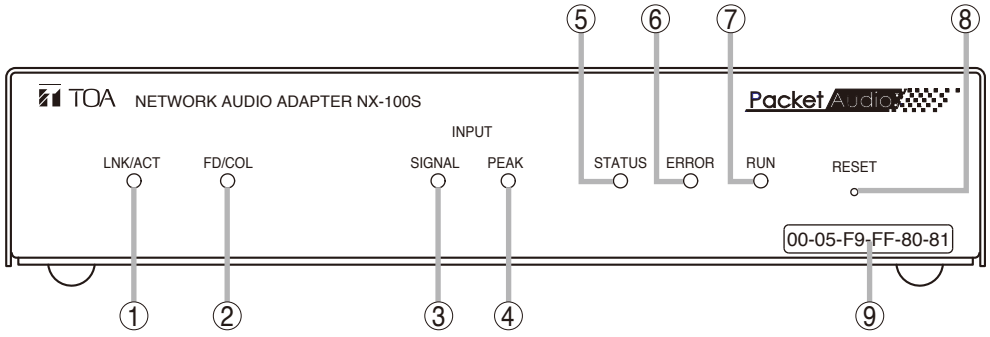
7. NOMENCLATURE AND FUNCTIONS

[Front]

• NX-100



• NX-100S



1. **LNK/ACT Indicator (Green)**
   Lights when the unit is connected to a network.
   Flashes while the unit is transmitting or receiving data.

2. **FD/COL Indicator (Yellow)**
   Remains lit while the network is in full-duplex communications mode.
   Flashes whenever data collision is detected.

3. **Input Signal Indicator (Green)** **NX-100S only**
   Lights when the audio signal applied to the Audio input terminal (19) is adjusted to a level enough high for transmission to a network with the Input volume control (20).

4. **Input Peak Indicator (Red)** **NX-100S only**
   Remains lit while the input audio signal is being distorted. Set the Input volume control (20) and the Input level selection switch (21) to a proper position according to the input signal level.

5. **Status Indicator (Yellow)**
   Remains lit during broadcasts.
   Flashes while the unit is writing data into the internal storage medium (flash memory).

6. **Error Indicator (Red)**
   Lights if an error is detected during transmission, etc.

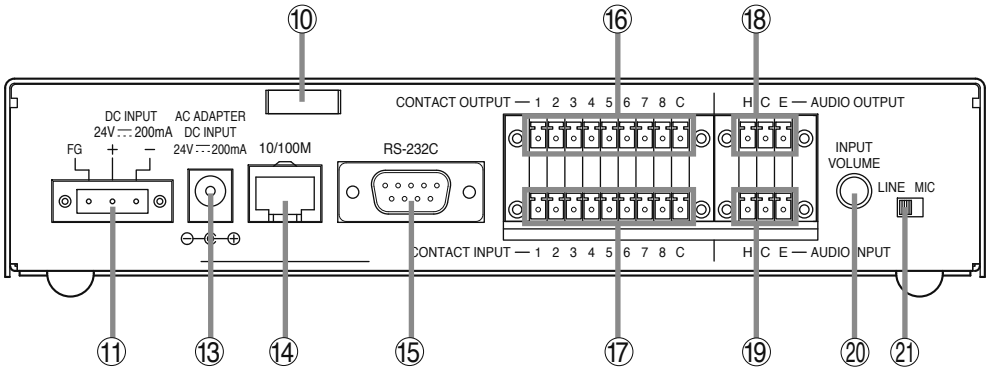
7. **Run Indicator (Green)**
   Remains lit during normal operation.
   Flashes at 2-second intervals when a failure is detected.

8. **Reset Button**
   Restarts the unit when pressed.

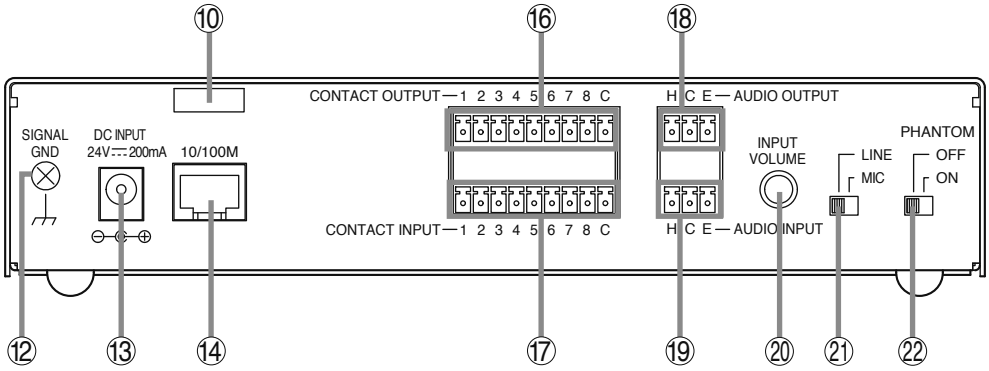
9. **MAC Address**
   The unit's MAC address consists of 12 hyphenated alphanumeric characters.

[Rear]

• **NX-100**



• **NX-100S**



10. Cord Clamp
Pinches and securely holds the AC adapter cord to prevent its plug from detaching.

11. DC Power Input Terminal [DC INPUT]
NX-100 only
A 24 V DC input.

12. Functional Earth Terminal [SIGNAL GND]
NX-100S only
Hum noise may be generated when external equipment is connected to the unit.
Connecting this terminal to the functional earth terminal of the external equipment may reduce the hum noise.
Note: This terminal is not for protective earth.

13. AC Adapter Terminal
[NX-100: AC ADAPTER, NX-100S: DC INPUT]
Connect the AC adapter* to this terminal.
* Use the AD-246 (optional) or its equivalent.

14. Network Connection Terminal [10/100M]
Connects to 10/100 Base-T networks. (RJ-45 Ethernet jack)

15.RS-232C Terminal **NX-100 only**
A 9-pin D-sub connector (male).

16. Control Output Terminal [CONTACT OUTPUT]
An open collector output (Withstand voltage: 30 V DC, Control current: 50 mA maximum).

17. Control Input Terminal [CONTACT INPUT]
A no-voltage "make" contact input (Short circuit current: 10 mA, Open voltage: 12 V).

18. Audio Output Terminal [AUDIO OUTPUT]
A 0 dB*/10 kΩ balanced output. Line level audio signal output.
H: Hot
C: Cold
E: Ground (shield)

19. Audio Input Terminal [AUDIO INPUT]
A –58 to 0 dB*/2 kΩ balanced input. Microphone or line level audio signals can be connected to this terminal.
H: Hot
C: Cold
E: Ground (shield)

20.Input Volume Control [INPUT VOLUME]
Adjusts the audio input level.
Turn the control clockwise to increase the level and counterclockwise to decrease it.

NX-100S only
Adjust the control so that the Input signal indicator (3) lights and the Input peak indicator (4) does not light.

21. Input Level Selection Switch [LINE/MIC]
Set this switch to the MIC (right side) position when using a microphone, and to the LINE (left side) for other inputs. (Factory-preset to the LINE position.)

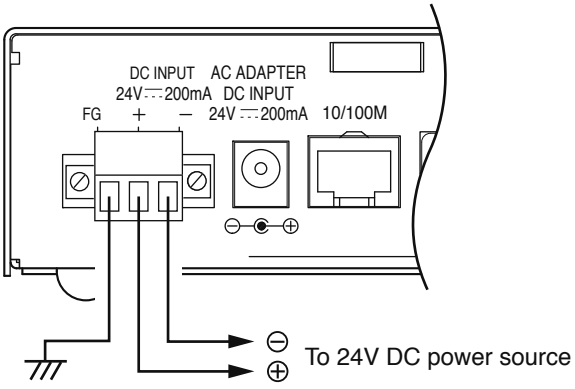
22. Phantom Power ON/OFF switch [PHANTOM]
NX-100S only
The supply voltage is 24 V DC.
To supply the phantom power to the microphone connected to the Audio input terminal (19), set the Input level selection switch (21) to the MIC position and the PHANTOM switch to the ON position.

* 0 dB = 0.775 V

8. POWER SOURCE CONNECTIONS

8.1. When Using a 24V DC Power Source **NX-100 only**

Connect a 24V DC power source to the unit's DC INPUT terminal.



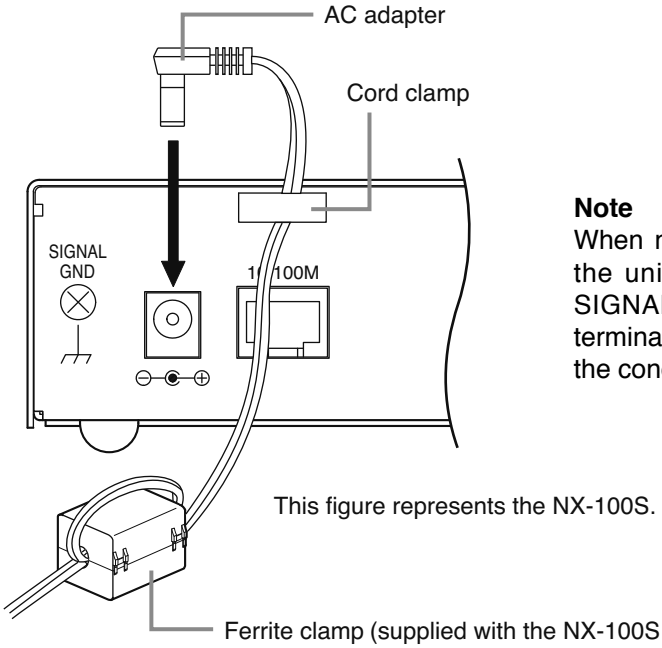
Notes

- Be sure to connect the unit's FG terminal to the ground terminal of the amplifier or mixer.
- The DC power supply must have a capacity of over 200 mA.
- The range of input voltage to be fed to the DC INPUT terminal should be between 21.6 V and 26.4 V DC. If the input voltage exceeds this range, the unit may malfunction or fail.
- Refer to p. 10, CONNECTIONS TO TERMINAL PLUGS, for connector connection procedures.

8.2. When Using the AC Adapter

Connect the AC adapter* to the unit's AC adapter terminal. Pinch the cord with a clamp and securely fix it.

* Use the AC adapter AD-246 (optional) or the equivalent. As for the usable adapter, consult your TOA dealer.



Note

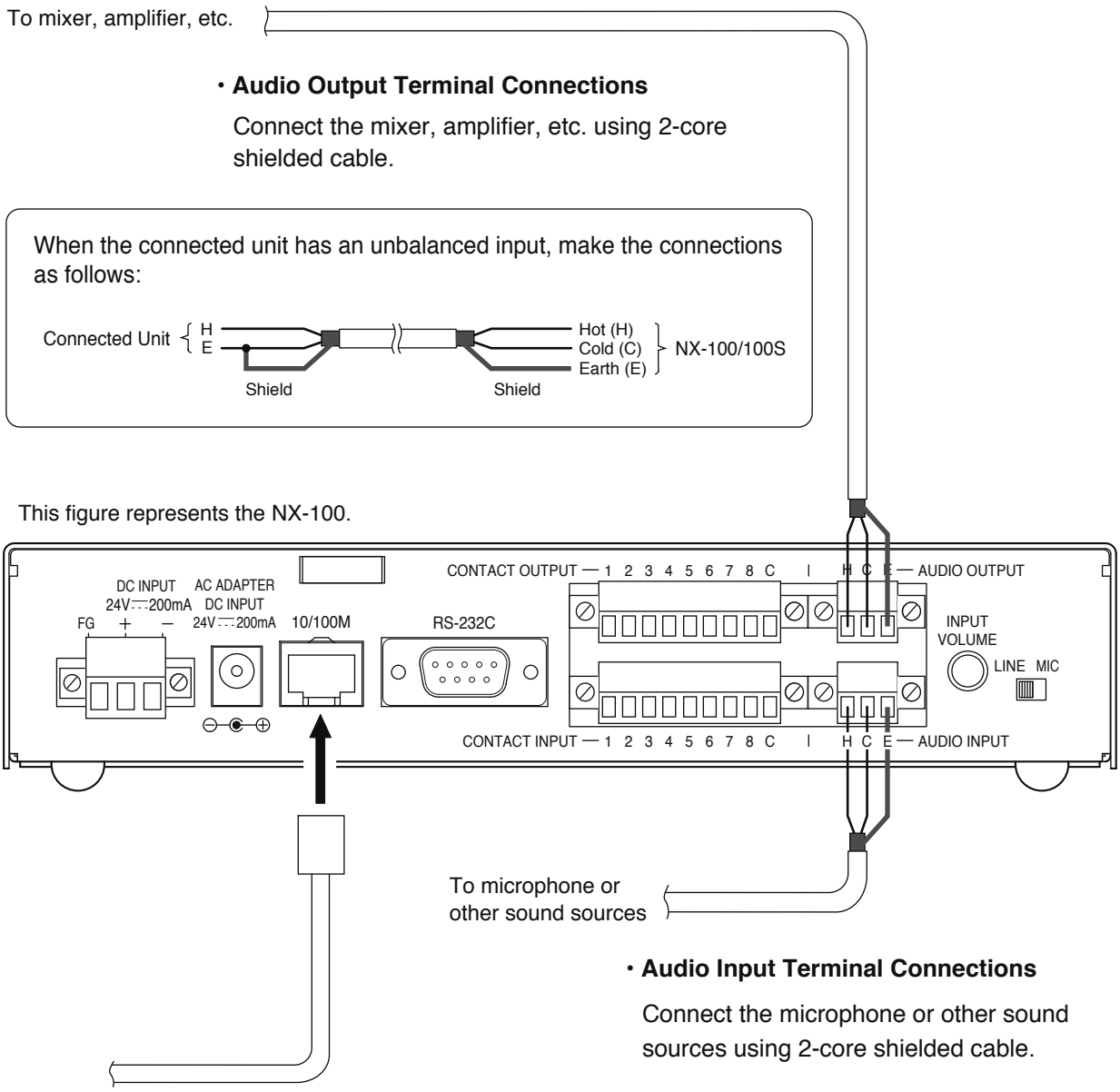
When noise interference affects voice output, connecting the unit's Earth terminal (FG terminal for the NX-100, SIGNAL GND terminal for the NX-100S) to the ground terminal of the connected amplifier or mixer may improve the condition.

Mount the ferrite clamp (supplied with the NX-100S) on the cable in a way that the cable is looped one turn as illustrated. (This countermeasure is for complying with the CE marking requirements.)

8.3. When Simultaneously Using the 24V DC Power Supply and the AC Adapter **NX-100 only**

When both the 24 V DC power supply and the AC adapter are simultaneously used, the AC adapter takes precedence. However, should power from the AC adapter be interrupted due to a power failure, etc., the power supply will automatically switch over to the unit's 24 V DC power source. Connecting a battery directly to the DC INPUT terminal also permits it to be used as backup power supply during a power failure.

9. TERMINAL CONNECTIONS



• Audio Output Terminal Connections

Connect the mixer, amplifier, etc. using 2-core shielded cable.

• Audio Input Terminal Connections

Connect the microphone or other sound sources using 2-core shielded cable.

• Network Connections

The NX-100/100S automatically distinguishes between 10BASE-T and 100BASE-TX networks, and establishes a connection. For this connection, use a "straight" UTP Category 5 LAN (Ethernet) cable fitted with an RJ-45 connector.

Tip
It is recommended that the unit be connected to network equipment capable of performing full-duplex communications.

Note
Refer to p. 10, CONNECTIONS TO TERMINAL PLUGS, for audio terminal connection procedures.

• **Control Output Terminal Connections**

Connect the control input terminals of all other connected units using 2 control lines.

[Control Output Specifications]

Open collector output
Withstand voltage: 30 V DC
Control current: 50 mA maximum
Pulse width: 1 s (when in Latch mode)

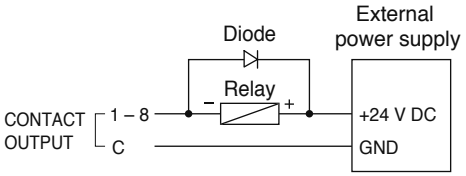
To other unit's control input

Caution

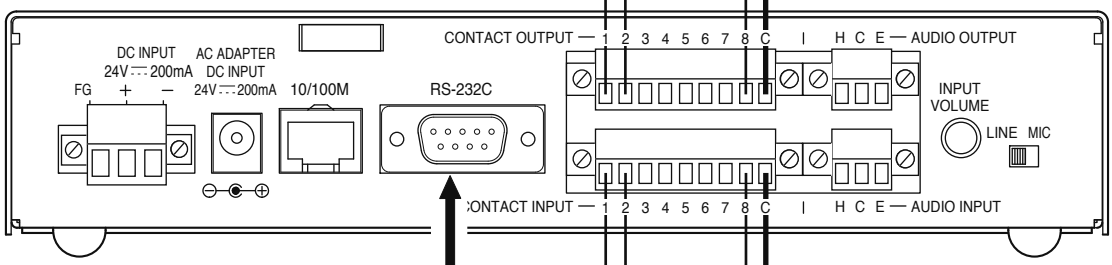
Be sure to connect only these control lines to other unit's control input terminals.
Connecting in parallel with control lines from other equipment may cause the unit to malfunction.

Note

To control a power distributor or PA amplifier mounted in the same rack as the unit using the unit's control output terminals, provide an external relay and power supply as shown below to perform control with the relay contacts.



This figure represents the NX-100.



To other unit's control output

[Control Input Specifications]

No-voltage "make" contact input
Short circuit current: 10 mA
Open voltage: 12 V
Pulse width: Over 50 ms

• **RS-232C Interface Connections** NX-100 only

The NX-100 can be used to control such RS-232C components as DTE and DCE components over a network.
Use a "straight" cable fitted with a 9-pin D-sub connector when connecting to DTE components such as PCs.
Use a "cross" cable fitted with a 9-pin D-sub connector for connecting to DCE components such as modems.

• **Connections to the Control Input Terminal**

Connect the control output terminals of all other connected units using 2 control lines.

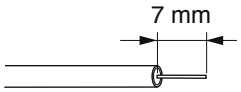
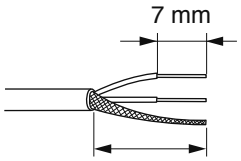
Tips

- Refer to p. 10, CONNECTIONS TO TERMINAL PLUGS, for control terminal connection procedures.
- When not using the RS-232C interface, place the supplied RS-232C cover over the terminal to protect it against dust. NX-100 only

10. CONNECTIONS TO TERMINAL PLUGS

Wire the removable terminal plugs for power input (NX-100 only), audio input and output, and control input and output as follows:

[Cable size and width to strip]

Application	Size	Width to Strip
For power supply terminal NX-100 only	AWG24 – 12	Solid cable and stranded cable 
For audio terminal For control terminal	AWG28 – 16	Shielded cable 

Caution
Avoid soldering stranded or shielded cable, as contact resistance may increase when the cable is tightened and the solder is crushed, possibly resulting in an excessive rise in joint temperatures.

[Wiring procedure]

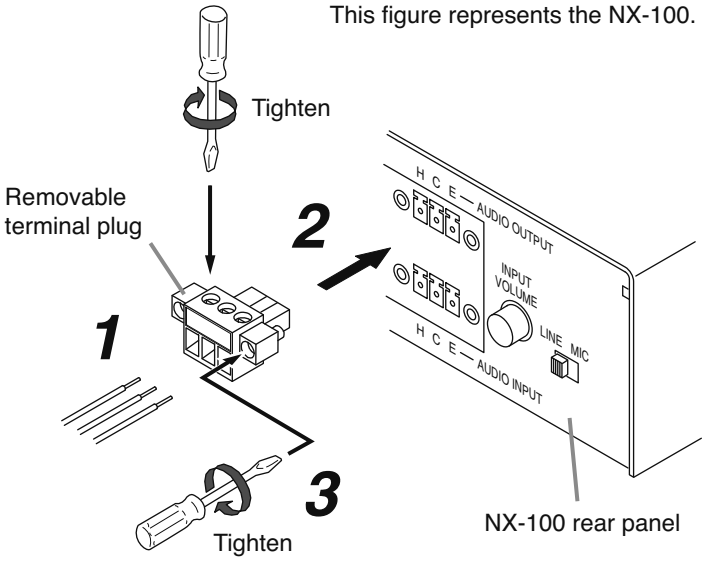
Step 1. Wiring the supplied removable terminal plug.

1-1. Loosen the terminal screws to insert the wire.

1-2. Tighten the terminal screws.
Ensure that the wire does not break free when pulled. If the wire does pull free, repeat the connection procedure from the start.

Step 2. Insert the wired terminal plug into the corresponding terminal block in the unit's rear panel.

Step 3. Tighten the fixing screws. NX-100 only



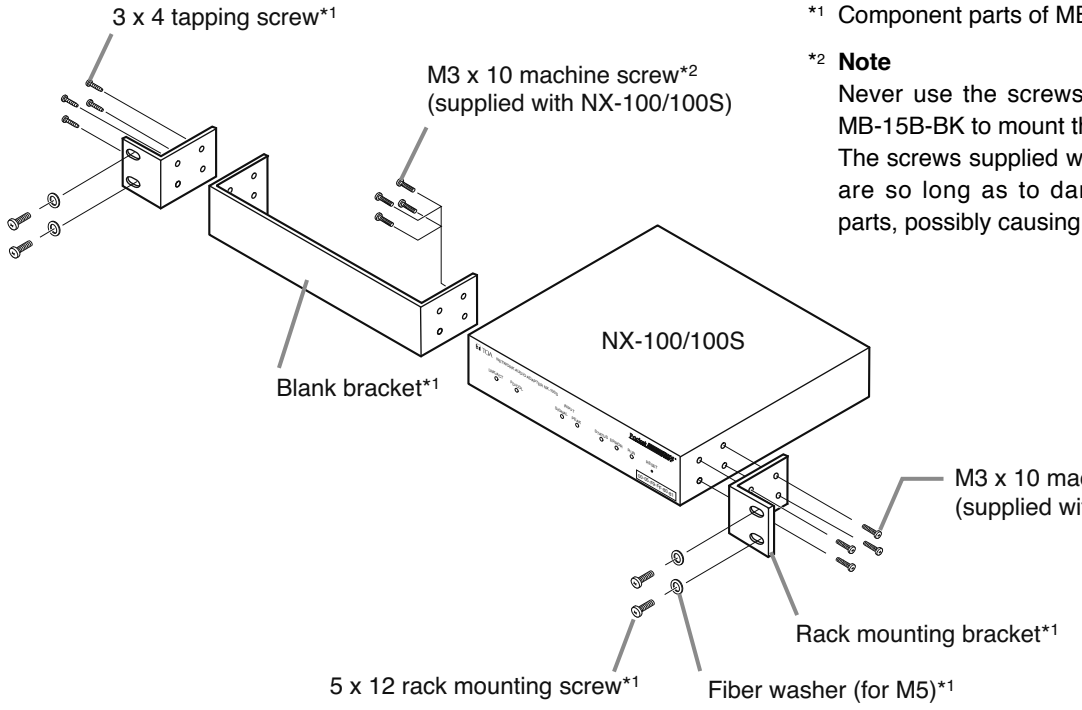
Cautions

- Do not reverse **Steps 1** and **2**. Poor contact may result if force is applied to the unit's internal circuit board pins while the terminal screws are being tightened.
- Use an appropriate type screwdriver for terminal plug wiring.

11. RACK MOUNTING

Use the optional mounting hardware set when installing the unit in an equipment rack. Be sure to remove the rubber feet located on the unit's bottom surface before mounting.

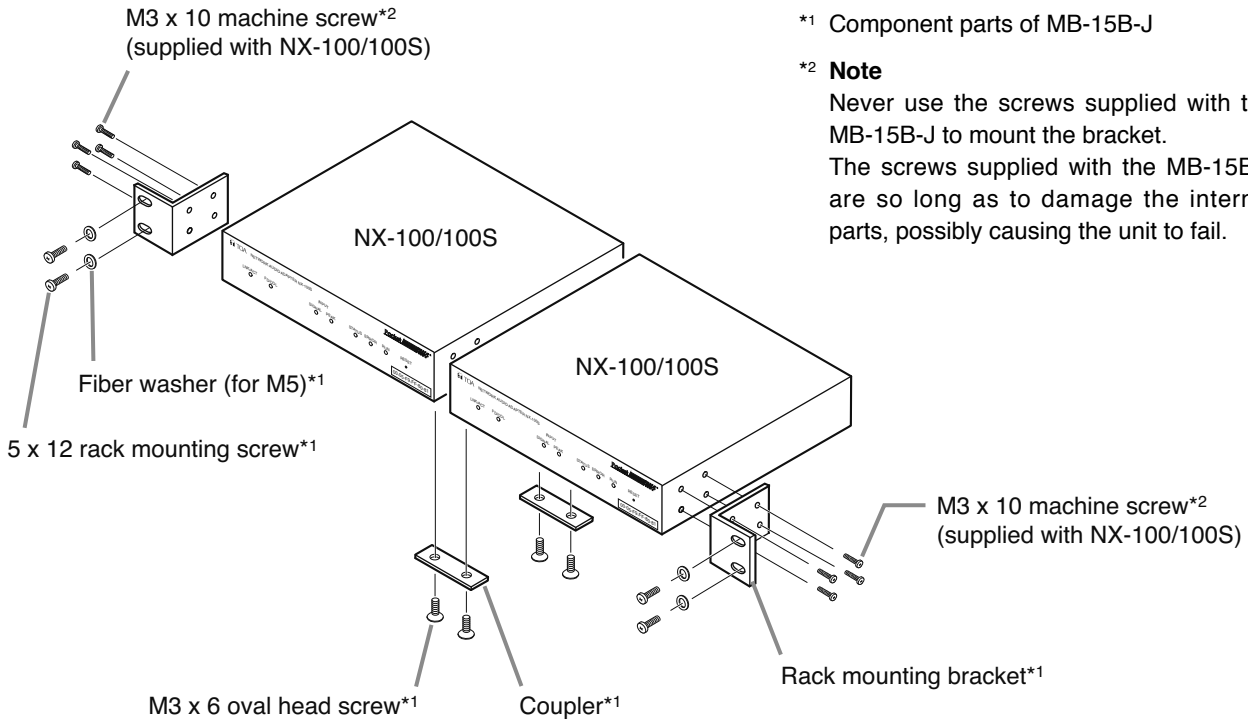
• Use the optional MB-15B-BK hardware set when mounting a single unit.



*1 Component parts of MB-15B-BK

*2 **Note**
Never use the screws supplied with the MB-15B-BK to mount the bracket.
The screws supplied with the MB-15B-BK are so long as to damage the internal parts, possibly causing the unit to fail.

• Use the optional MB-15B-J hardware set when mounting 2 units.



*1 Component parts of MB-15B-J

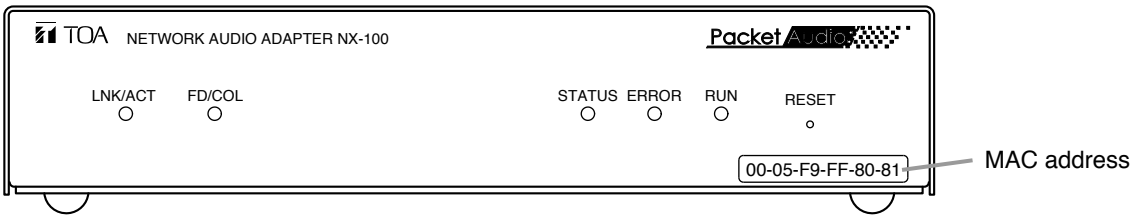
*2 **Note**
Never use the screws supplied with the MB-15B-J to mount the bracket.
The screws supplied with the MB-15B-J are so long as to damage the internal parts, possibly causing the unit to fail.

12. MAC ADDRESSES AND INSTALLATION LOCATIONS

When making the unit's network settings, the unit's MAC address* must have a clear association with its corresponding installation location. Be sure to record the relationship during installation to facilitate later network settings.

* A 12-digit hexadecimal address number peculiar to and assigned to the network-connected unit.

This figure represents the NX-100.



13. SYSTEM CONDITIONS

The following minimum PC (personal computer) specifications are required in order to correctly operate the unit's software program.

- OS: Windows 2000/XP/Vista/7
- CPU: Pentium Ⅲ 1 GHz or greater
- RAM: 1 GB or greater
- Disk Space: 40 MB or greater

14. ACTIVATING THE SETUP LAUNCHER

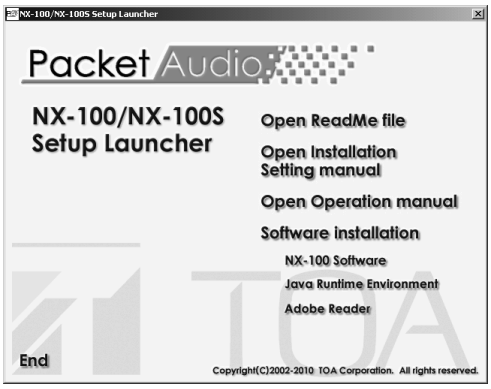
The Setup Launcher is automatically started when the supplied CD-ROM is inserted into the PC's drive.

Note

The Setup Launcher will not be automatically activated when the CD-ROM is inserted if the PC's CD drive is not compatible with an auto-run function. In such cases, execute the "Setup Launcher" file below using "Explorer" or "My Computer" or select Start → Run on the taskbar to enter the command below:

<Drive in which a CD is inserted> \Autorun.exe

[Example] When a CD is inserted into drive e → e:\Autorun.exe



15. SOFTWARE INSTALLATION PRECAUTION

When installing each of the software programs contained in the CD, quit all other currently activated applications.

16. SETTING USING AN INTERNET BROWSER

The NX-100/100S does not exclusively require its dedicated software to change its settings. It can also be set using a standard browser by way of an internet connection. Use one of the following browsers, which have been confirmed to ensure the unit's correct operation:
Internet Explorer 8, Internet Explorer 7 or Internet Explorer 6.

Notes

- Windows, Windows Vista, and Internet Explorer are registered trademarks of Microsoft Corporation in the United States and other countries.
- Pentium is a trademark of Intel Corporation in the U.S. and/or other countries.
- Regarding other company names and products, they are also trademarks of individual companies.

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