



# **INSTRUCTION MANUAL**

**COUPLING CLAMP**

**MODEL ISS-7630-CUP**

**Noise Laboratory Co., Ltd.**

Edition 1.01  
AEJ00362-001-0B

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## **1. IMPORTANT SAFETY PRECAUTIONS**

The following instructions are very important for safe handling of ISS-7630-CUP (the "Unit"). Read them carefully before use.

- 1. Do not use the Unit near flammable materials or fire sources. When used, there is a risk of fire due to pulses, etc**
- 2. Any person with medical electronics such as a heart pacemaker is not to operate the Unit. And, do not enter the test area while the Unit is operating.**
- 3. To avoid electric shock, be sure that the power of the Unit, the power source, and the device under test ("DUT") are all turned OFF, and make sure there is no residual voltage before making any connections.**
- 4. A number of safety recommendations are listed in the later chapter "BASIC SAFETY PRECAUTIONS". Be sure to read them before test environment settings, connecting and testing.**
- 5. A powerful magnetic field is generated by the Unit at the time of pulse output. Give careful consideration to your testing environment to use the Unit.**

Memorandum

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## 2. APPLICATION FORM INSTRUCTION MANUAL

We place an order for an instruction manual.

**Model: ISS-7630-CUP**

**Serial No.:** \_\_\_\_\_

**Applicant:**

Company name: \_\_\_\_\_

Address: \_\_\_\_\_

Department: \_\_\_\_\_

Person in charge: \_\_\_\_\_

Tel No.: \_\_\_\_\_

Fax No. \_\_\_\_\_

**Cut off this page “APPLICATION FORM FOR  
INSTRUCTION MANUAL” from this volume and keep it  
for future use with care.**

When an INSTRUCTION MANUAL is required, fill in the above Application Form and mail or fax it to the following sales department of our company.

**To: Noise Laboratory Co., Ltd.**

**1-4-4 Chiyoda Sagamihara City,**

**Kanagawa Pref., 229-0037 Japan**

**Tel: +81-(0)42-712-2051**

**Fax: +81-(0)42-712-2050**

Cut  
line

Memorandum

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## 4. PREFACE

Thank you very much for purchasing ISS-7630-CUP (the "Unit"). Please read this instruction manual (the "Manual") thoroughly prior to use of the Unit in order to attain the maximum and safe use of the Unit.

- The Manual will let you operate ISS-7630-CUP safely and make the most use of it if you strictly follow the operational procedures and the safety instructions.
- Keep the Manual handy whenever you operate ISS-7630-CUP.



## 5. BASIC SAFETY PRECAUTIONS

### 5-1. Symbols of Hazard

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This sign indicates the presence of "dangerous voltage/current" that may endanger persons.



This sign indicates "handle with care".  
Refer to the Manual to protect human bodies and devices.

### 5-2. Basic Safety Precautions

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1. **There is a risk of electric shock.**  
**【Precautions regarding use and safety】**
2. **Do not supply the Unit with voltage or do not make any connections other than the designated load (Accessory Terminator). The Unit may be damaged if this is not obeyed**  
**【Precautions regarding connection and use】**
3. **Before connecting the Unit, turn OFF the DC power source and the Unit, and make sure that there is no residual voltage. Connect each cable securely. Nonobservance may cause electric shock or damage to the internal parts of the Unit and connected devices.**  
**【Precautions regarding bodily injury and connection】**
4. **Use accessories and optional items supplied by the Company to ensure safe operation.**  
**【Precautions regarding connection and use】**
5. **Do not utilize or store the Unit under extremely high or low temperature environment. (Operating environment: 23°C±5°C / Operating Humidity Range: 25-75 %)**  
**【Precautions regarding environment】**
6. **Do not use the Unit under high humidity or dusty conditions.**  
**【Precautions regarding environment】**
7. **Should condensation form, fully dry the Unit before usage.**  
**【Precautions regarding environment】**
8. **Do not wipe the body of the Unit with solvents such as lacquer thinner or alcohol. When the Unit gets dirty, wipe it with a detergent moistened fabric etc.**  
**【Precautions regarding use】**
9. **Do not use the Unit near flammable materials or fire sources. When used, there is a risk of fire due to electric discharge, etc.**  
**【Precautions regarding bodily injury and environment】**

**10. The Company and its sales agent assume no responsibility for any bodily injury, loss, damage or resultant damage arising from derelict misuse of the Unit on the part of the user.**

**【Precautions regarding bodily injury, use, environment, and connection】**

**11. Should the necessity of services such as repair, maintenance, or internal calibration arise, leave them to qualified service personnel only.**

**【Precautions regarding use and safety】**

### **5-3. Loss of Warning Label**

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1. If the warning label is peeled off and missing or it gets dirty, replace it with a new one for safety.
2. If the warning label is lost, order a new one from our sales agent or the technical service center of the Company.

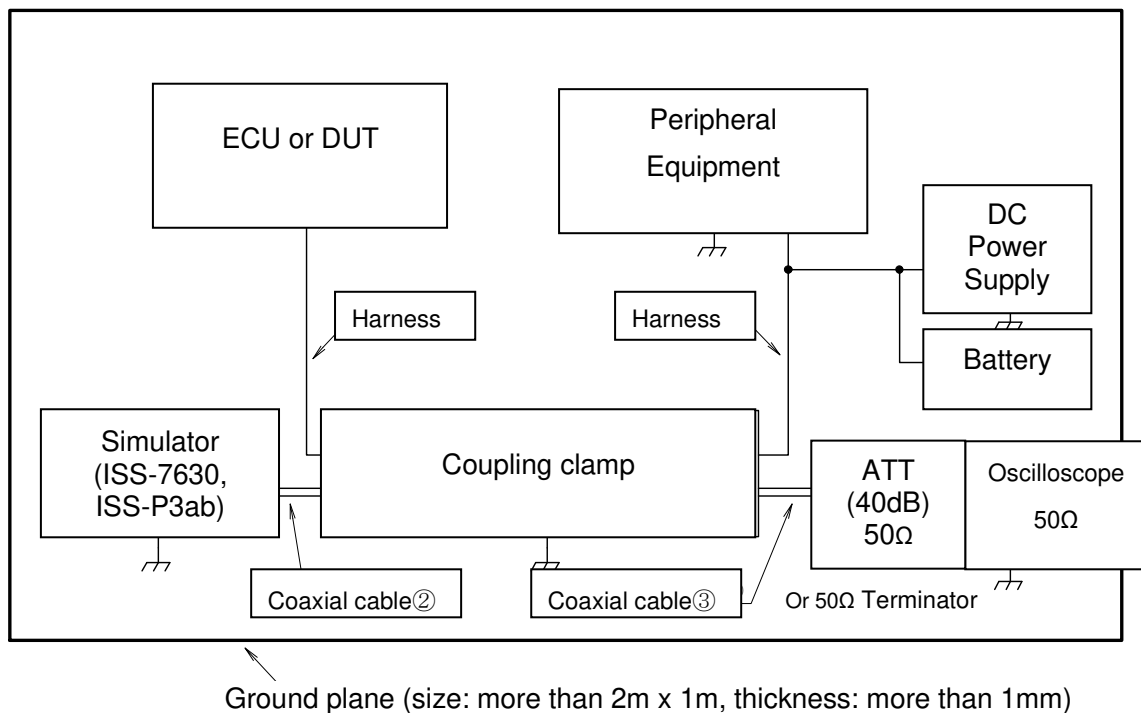
## 6. MAIN FEATURES

### 6-1. Features

- This coupling clamp, ISS-7630-CUP (the “Unit”) complies with the ISO7637-3 (1995-07-15) Standard.
- The Unit allows easy testing when connected to pulse simulator (ISS-7630 or ISS-P3ab).
- The Unit has a micro-strip line structure, and the characteristic impedance is 50Ω.
- The waveform is not distorted because of well matched impedance..
- The Unit is capable of handling fast rising waveforms of  $t_r < 3.5\text{ns}$  input from the pulse simulator ISS-7630.

### 6-2. Regarding ISO7637-3 (1995-07-15)

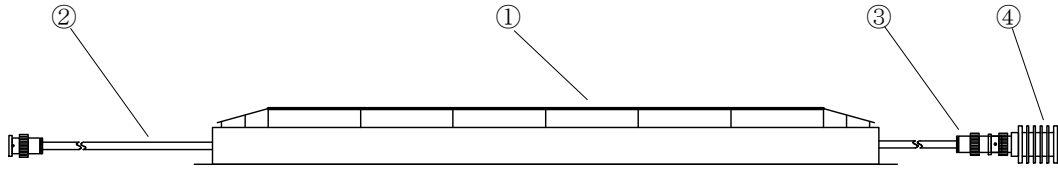
ISO 7637-3 (1995-07-15) provides the standard for coupling tests. It specifies configuration of the tests, pulse voltage waveform, test voltage level, and testing environment. The Unit is designed in compliance with the ISO standard. Summary of the schematic circuit diagram excerpted from the standard is shown below. Be sure to refer to the ISO standard for details.



**Figure 1 Testing Configuration (for Coupling Clamp Tests)**

Figure 1 is a schematic diagram. Run tests in accordance with the ISO standard or a test plan.

## 7. PART NAMES AND FUNCTIONS



**Figure 2**

- ① Coupling Clamp
- ② Coaxial Connection Cable *for* a simulator.
- ③ Coaxial Connection Cable *for* a terminator.
- ④ Terminator

① Coupling Clamp



The coupling clamp main unit for coupling pulses to harnesses etc.

The unit is utilized by inserting a harness into the plates of the clamp located on the ceiling.

Stray capacity arisen between the harness and the plate transmits the high frequency components onto the secondary side (harnesses) mainly by electrostatic inductions. Therefore, the transmission gets harder as the noise components reach a lower frequency range.

Since the transmission efficiency depends on the stray capacity between the harness and the plate, the harness should be pinched by the plates as tight as possible to increase the stray capacity.

The coupling would not take effect unless the coupling pulses have sufficient energy of high frequency range.

**Do not touch any portion of the clamp during pulse output. Otherwise you may get an electric shock.**

② Coaxial Cable (For Simulator Connection)

This is a 50Ω coaxial cable with BNC connectors to connect the coupling clamp to the simulator.

A BNC tangent line is attached.

One end is to be connected to the pulse simulator (ISS-7630 or ISS-P3ab), and the other end is to be connected to the terminator.

③ Coaxial Cable (For Terminator Connection)

A 50Ω coaxial cable with BNC connectors to connect the coupling clamp to the attached terminator

One end is to be connected to the coupling clamp, and the other end is to be connected to the terminator.

④ Terminator



A 50Ω terminal resistor for matching the transmission line (coupling clamp) with 50Ω.

The rated power of the terminator is 5W. Take every caution not to input the voltage that gives higher effective power than the rating. In case of coupling pulses of the ISS 7630 simulator or ISS-P3ab without DC voltage, It will be no problem.

⑤ Metal Fasteners

Metal pieces to fasten the simulator (ISS-7630) to the ground plane.

Attach them to 2 locations, at the FG terminals on the front and rear panes.

Refer to "8.1 Preparation of Testing".

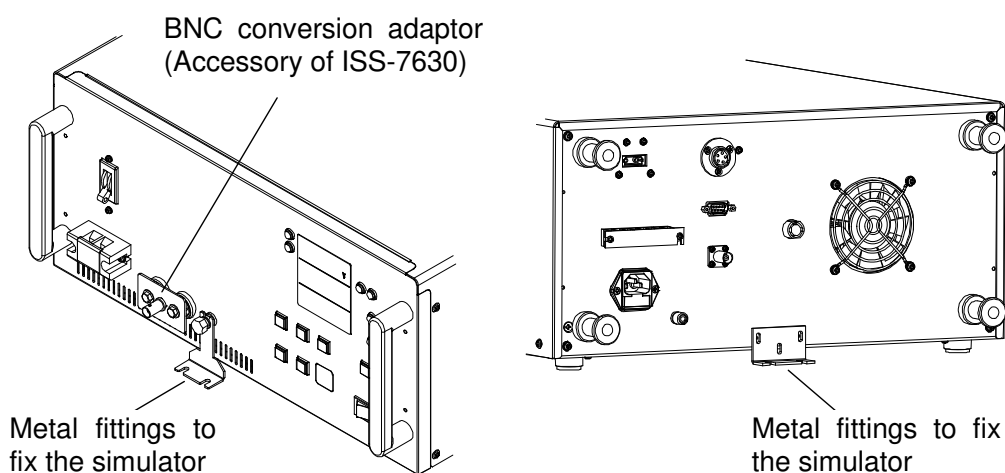
## 8. TEST PROCEDURE

### 8-1. Test Preparation

Before proceeding with the test, always carry out “10 Pre-Start Checkup (Waveform Verification).” Prepare the installation environment and connect the cables. Set up according to the Standard and/or other user requirements. An example is shown below.

- Installation

Place the Coupling Clamp, the simulator (ISS-7630 or ISS-P3ab), an oscilloscope, and the power source (batteries) on the ground plane, and secure each with screws. Use the Metal Fasteners attached to ISS-7360-Cup to secure ISS-7630.



Set DUT, peripheral DUT connecting devices, the harness.

- Wiring the Simulator (for ISS-7630)

Insert the BNC Conversion Adapter (accessory to ISS-7630) into the output connector (DC LINE OUT/PULSE). Connect the BNC Conversion Adapter and the Coupling Clamp ① with Coaxial Cable ②. Connect the Coupling Clamp ① and the Terminator ④ with Coaxial Cable ③. In case of evaluating the waveform after passing the Coupling Clamp, connect 20dB ATT in two series instead of the Terminator ④ and examine the waveform using an oscilloscope (50Ω termination) after the 40dB attenuation.

- Wiring the Simulator (for ISS-P3ab)

Connect the ISS-P3ab simulator's Surge OUT BNC connector (Coupling Clamp) and the Coupling Clamp ① with Coaxial Cable ②. Connect the Coupling Clamp ① and the Terminator ④ with Coaxial Cable ③. When evaluating the waveform after passing the Coupling Clamp, connect 20dB ATT in two series instead of the Terminator ④ and examine the waveform using an oscilloscope (50Ω termination) after the 40dB attenuation.

- Connecting DUT

Connect DUT and peripheral connecting devices.

Insert the harness of DUT and the peripheral devices into the clammer portion of the Coupling Clamp ①.



Since the waveform contains high frequency components over the range of 200MHz, the malfunction level cannot be measured quantitatively if the free capacity and the electromagnetic field radiation deviate due to placement of the simulator and DUT, types of cables used, and the height from ground plane. This highly depends on the physical positioning of devices under the testing environment. Thus, devices must be always positioned in the same locations in order to realize quantitative tests.

## **8-2. Running DUT**

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Run DUT as it is used. Input signals preliminarily if necessary.

## **8-3. Starting Test**

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When the simulator (ISS-7630, ISS-P3ab) begins to output pulses, the pulse is coupled to the harness.

Proceed according to the Standard or test plan.

For operation procedures of the simulator, refer to its manual.



Do not touch the clamper portion on the ceiling when outputting pulse. There is a risk of electric shock.



The Terminator may burn out when tests are carried out coupling pulses to DC.

Always couple pulses without DC voltage.

To avoid coupling pulses to DC, be sure to turn OFF the DC LINE of ISS-7630. As for ISS-P3ab, always connect from the Surge OUT BNC connector (Coupling Clamp).

Since the waveform contains high frequency components over the range of 200MHz, the malfunction level cannot be measured quantitatively if the free capacity and the electromagnetic field radiation deviate due to placement of the simulator and DUT, types of cables used, and the height from ground plane. This highly depends on the physical positioning of devices under the testing environment. Thus, devices must be always positioned in the same locations in order to realize quantitative tests.]

## **8-4. Finishing Test**

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To finish the test using ISS-7630, put it in STOP mode. As for ISS-P3ab, lower the simulator output voltage to 0V and then put it into STOP mode.

Next, turn the power OFF.

Stop the operation (working status) of DUT, and shut the power supply off.

Remove the harness from the coupling clamp.

## 9. PRODUCT SPECIFICATIONS

- Coupling Harness Measurements ..... 4mm~40mm Diameter
- Pulse Voltage Insulator Strength ..... over 600V
- VSWR (without Harness) ..... less than 1.3 (~200MHz)
- Input/Output Connector ..... BNC-R
- Dimensions ..... (approximately)  
1200mm×H70mm×D300mm
- Weight ..... (approximately) 3.5kg
  
- Terminator ..... 50Ω±5Ω  
5W
  
- Run Time Temperature ..... 23°C±5°C
- Run Time Humidity ..... 25%~75%



## 10. WAVEFORM VERIFICATION

Before proceeding to the coupling clamp tests, confirm that the simulator is transmitting pulses normally. Refer to Figure 1. However, when verifying the waveform, harness must not be inserted into the clamper portion. Insertion of the harness will alter the characteristic impedance and cause reflections onto the waveform. The ISO complied procedure for waveform verification is given below. Refer to ISO Standards for details.

- Place Coupling Clamp, the simulator (ISS-7630 or ISS-P3ab), and an oscilloscope on the ground plane and screw fasten. Use Metal Fasteners ⑤ for ISS-7630.
- Wiring the Simulator (for ISS-7630)
  - Insert the BNC Conversion Adapter (ISS-7630 accessory) into Output Connector (DC LINE OUT/PULSE).
  - Connect the BNC Conversion Adaptor and Coupling Clamp ① with Coaxial Cable ②.
  - Connect the Coupling Clamp ① and 20dB ATT×2 (2 connected in series to attenuate 40dB) with Coaxial Cable ③.
  - Connect 20dB ATT to oscilloscope (50Ω termination) and verify the waveform.
- Wiring the Simulator (for ISS-P3ab)
  - Connect the simulator ISS-P3ab Surge Out BNC connector (Coupling Clamp) and Coupling Clamp ① with Coaxial Cable ②.
  - Connect the Coupling Clamp ① and 20dB ATT×2 (2 connected in series to attenuate 40dB) with Coaxial Cable ③.
  - Connect 20dB ATT to oscilloscope (50Ω termination) and verify the waveform.
- Output pulses from the simulator and verify that the oscilloscope waveform matches the 50Ω load waveform shown in the specifications of the simulator.

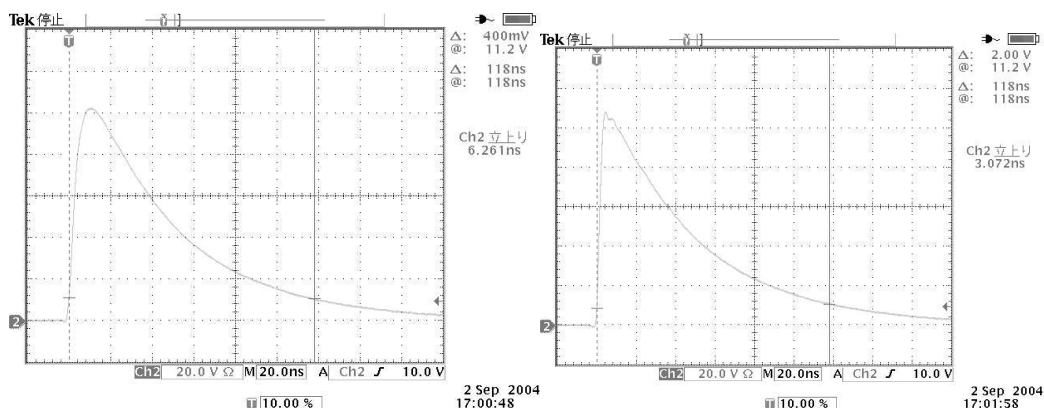


Do not touch the clamper portion of the ceiling when outputting pulse.  
There is a risk of electric shock.



The Terminator may burn out when tests are carried out coupling pulses to DC.  
Always verify the waveform without DC injection.

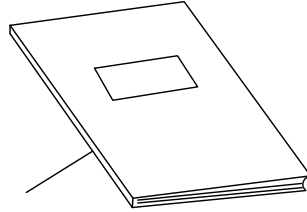
Measured Waveforms (After Passing Coupling Clamp)  $t_r < 3.5\text{ns}$  Setting



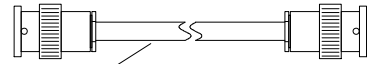
# 11. ACCESSORIES



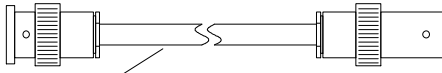
Bag of  
Accessories



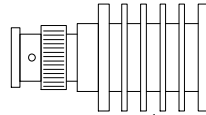
Instruction  
Manual



Coaxial Cable ①  
(To Connect with Simulator)

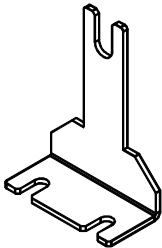


Coaxial Cable②  
(To connect to Terminator)

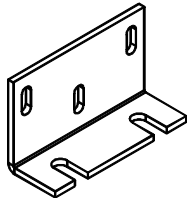


Terminator ③

For front panel



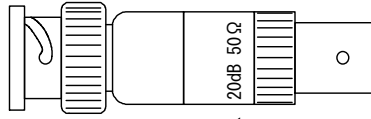
For rear panel



Metal Fittings ⑤ (for ISS-7630)

## 12. OPTIONS

50 $\Omega$  Load Waveform Verification ATT 00-00006A



20dB ATT Set of 2

## 13. WARRANTY

### Services

The following terms are applicable to the services provided by the Company to maintain and repair the Unit.

1. Scope

The Unit and accessories and options provided by the Company are covered under this section.

2. Technical Service Fee

Any repairs provided by the Company during the warranty period will be free of charge in accordance with the Limited Warranty. After expiration of the warranty period, actual cost for the repair will be charged to the user.

3. Ownership of Defective Parts

All the defective parts replaced during the warranty period become the property of the Company. For paid repairs, they also become the property of the Company unless otherwise directed by the user.

4. Maximum Compensation

In the event the user incurs damage due to malfunction of the Unit arising solely from the negligence and/or improper repair on the part of the Company, the Company will compensate for the damage. The maximum compensation amount shall be limited to the amount paid by the user at the time of purchase of the Unit. In no event, shall the company be liable or in any way responsible for incidental or consequential damages such as loss of profit or third party's claims to the user.

5. Wrong Parts, Missing Parts and Damage

The company shall not be liable for loss of profit, business interruption, other incidental damage, special loss, punitive damage or third party's claims to the user directly or indirectly arising from suspension of testing activities due to wrong parts, missing parts, or damage of the Unit.

6. Service Refusal

The company may not accept a repair order in the following cases:

- More than 5 years have passed since the product discontinued
- More than 8 years have passed after delivery
- Required component for servicing already discontinued and no alternative is available.
- Product changed, repaired or remodeled without obtaining a prior permission from the Company.
- Product severely damaged to the extent it has lost its original form

## Limited Warranty

In the event of failure during the warranty period, the Unit will be repaired or replaced free of charge. Decision of the repair method shall be left at the discretion of the Company. This limited warranty is applicable in Japan only.

### 1. Scope

This warranty is applicable only to the Unit and its accessories.

### 2. Warranty Period

One year from the date of delivery.

For a location once repaired, the warranty period for same parts / same problems is 6 months from the time of repair completion.

### 3. Exceptions

Regardless of the above, following will be excluded from the warranty.

- ◇ Consumable parts replacement, including High Voltage Relay (if used)
- ◇ Failure caused by negligence, or damage to the Unit.
- ◇ Failure due to modifications made without the Company's authorization.
- ◇ Failure due to repairs made by personnel not authorized by the Company.
- ◇ Failure directly or indirectly arising from force majeure including but not limited to , acts of god, fire, war, rebellion and others
- ◇ Failure due to shipping, vibration, falling, or impact shock after delivery
- ◇ Failures due to use of the Unit under the improper environment.
- ◇ When the Unit is taken out of the country

## 14. MAINTENANCE

1. Should the necessity of services such as repair, maintenance, or internal calibration arise, leave them to qualified service personnel only.
2. Limit your own maintenance works to exterior surface cleaning and functional tests.
3. When checking or changing replaceable fuses, turn OFF the power switches of the Unit and connected devices (if any).
4. Before cleaning the Unit, turn OFF the power switches of the Unit and connected devices (if any).
5. When face panels get dirty, wipe them lightly with a cloth moistened with water or mild detergent.

## **15. NOISE LABORATORY SUPPORT NETWORK**

- If a symptom which seems a trouble is found, inform the model name and serial number of the product together with the symptom to Noise Laboratory or your nearest sales agent of Noise Laboratory.
- When the product is returned to Noise Laboratory, write the state of the trouble, contents of your request, model name and serial number in a repair order, and pack the product and repair order sheet in the former package of equivalent suitable for transit and send them back.

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**NOISE LABORATORY CO., LTD.**

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