INSTRUCTION MANUAL

SOUND LEVEL METER UNIT

UN-04

RION CO., LTD.

3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan

PRECAUTIONS

- Operate the unit only as described in this manual.
- Do not disassemble the unit or attempt internal alterations.
- In case of malfunction, do not attempt any repairs. Note the condition of the unit clearly and contact the supplier.
- Observe the following precautions before using the unit:
  1) Make sure that all connections are properly established.
  2) Check the setting of all switches and controls, and make sure that the unit is operating normally.
- The permissible ambient temperature range for operation of the unit is –10 to +50°C. Relative humidity must be below 90%.
- Do not store the unit in locations which
  1) may be subject to strong magnetic fields or strong radiation, or
  2) may be subject to high levels of dust or splashes of water, or
  3) may be subject to gases or air with high salt or sulphur content, or are in the vicinity of stored chemicals, or
  4) may be subject to high temperature, humidity, or to direct sunlight, or
  5) may be subject vibrations or shock.
- Always switch off the power after using the unit.
- When disconnecting cables, always hold the plug and do not pull the cable.

CONTENTS

OUTLINE

The UN-04 is a sound level meter unit suitable for use with all major measurement microphones and preamplifiers from Rion. It has switchable front-panel and rear-panel inputs. By selecting the appropriate microphone, the UN-04 can be used for general as well as for precision sound level measurements, in compliance with applicable standards. The AC and DC outputs allow the use of equipment such as a data recorder or analyzer, and a separate I/O connector serves for connection to the printer CP-10/CP-11 or to a computer for data transfer and external measurement control (RS-232-C interface). The optional add-on units listed below allow the creation of a measurement system tailor-made for specific needs.

- AC adapter NC-11 series/NC-79, battery unit BP-07
  The UN-04 can be powered from the AC adapter NC-11 series/NC-79 or the battery unit BP-07. It is also possible to use an AC adapter and the battery unit together, so that power is normally provided by the adapter while the battery unit acts as a backup power supply.

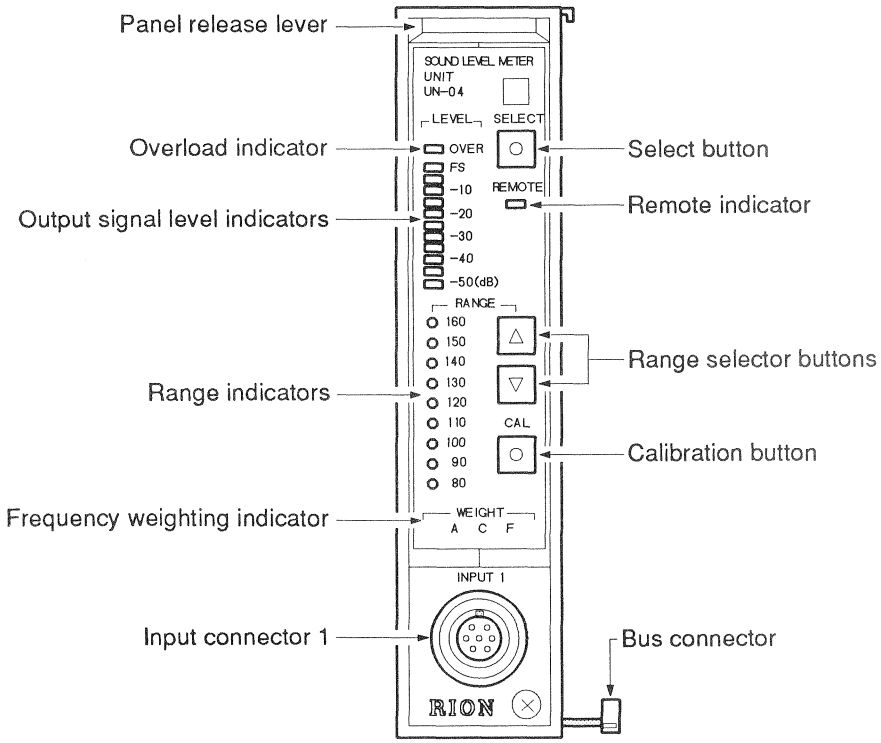
- Printer CP-10/CP-11
  Can be used to generate a record of measurement results every five seconds.

- Display unit UV-12
  Up to ten UN-04 units can be connected to a UV-12, and the display can be switched to show the measurement results of any desired sound level meter unit. The UV-12 incorporates a GP-IB and an RS-232-C interface, allowing the use of a computer to control measurement operation of connected UN-04 units and to gather measurement data.

- Rack-mount base UV-05-091
  Several UN-04 units can be linked, and standard rack mounting is possible using the rack-mount base UV-05-091. A single base supports up to twelve UN-04 units.

CONTROLS AND FEATURES

Front Panel



Front panel

Panel release lever
Push this lever down and pull it out to gain access to the inner panel for changing various measurement settings (⇒ p. 6).

Overload indicator [LEVEL OVER]
Lights up when the input signal exceeds the currently selected range, causing amplifier saturation.

Output signal level indicators [LEVEL FS to –50(dB)]
Show the output signal level.

Range selector buttons [RANGE △ / ▽]
Range indicators [RANGE 80 to 160]
The range selector buttons serve to set the full-scale point, and the range indicators show which range is selected. Pushing the [△] button increases the range, and pushing the [▽] button decreases it.

Frequency weighting indicator [WEIGHT]
Shows which weighting curve is selected: A, C or F (flat). The weighting circuit setting can be changed on the inner panel (⇒ p. 6).

Input connector 1 [INPUT 1]
Serves for connection of the microphone preamplifier. The sensitivity selector on the inner panel must be set to a position that matches the connected microphone.

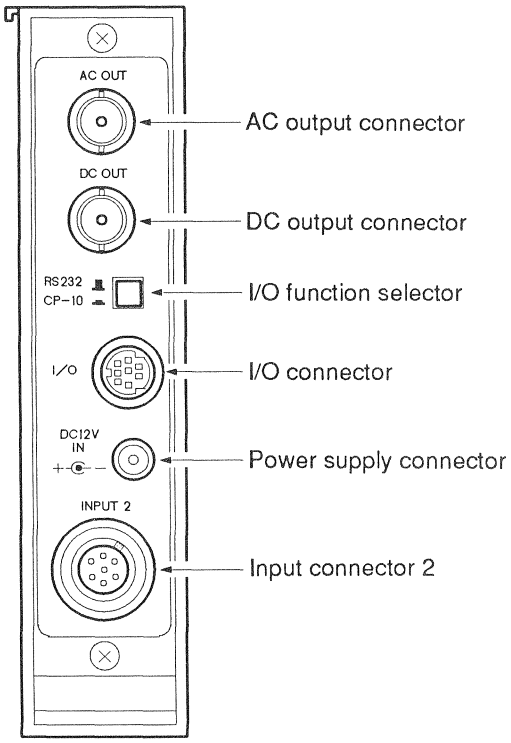
Select button [SELECT]
When the UN-04 is connected to the display unit UV-12, pressing this button will cause the measurement data from this UN-04 to be shown on the display unit. In this case, the indicator of the button lights up. If the UN-04 is not connected to a display unit, this button has no effect.

Remote indicator [REMOTE]
Lights up when the UN-04 is set to the remote mode via the RS-232-C interface. In remote mode, the controls on the panel of the UN-04 are inactive.

Calibration button [CAL]
Activates the internal signal generator for calibration of equipment connected to the AC or DC output. The indicator lights up when the button is pressed.

Bus connector
Serves for connection to the display unit UV-12. The connector also serves to supply power when several UN-04 units are linked.

Rear Panel



Rear panel

AC output connector [AC OUT]
DC output connector [DC OUT]
AC and DC signals corresponding to the measurement result are supplied here.

I/O function selector [RS232/CP-10]
This selector must be set to the appropriate position, depending on which type of equipment is connected to the I/O connector.

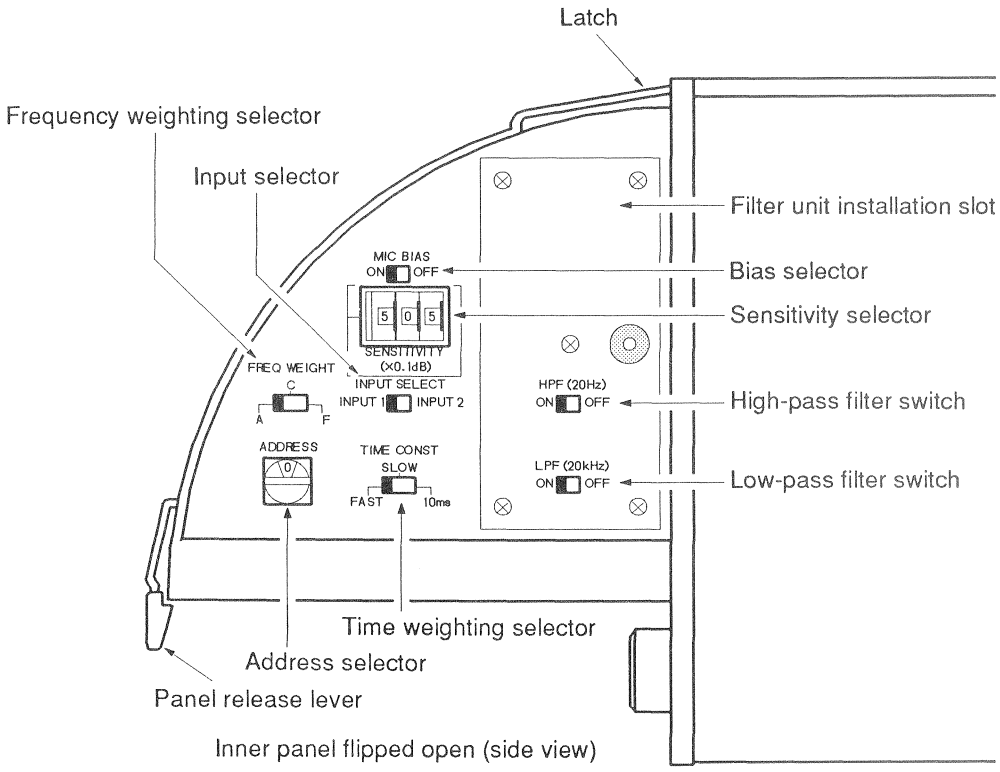
RS232: RS-232-C interface for connection of a computer
CP-10: Data output to the Printer CP-10/CP-11

I/O connector [I/O]
Serves either as output for connection of the printer CP-10/CP-11, or as RS-232-C interface for data transfer to and input of control signals from a computer. The I/O function selector must be set to the appropriate position.
Note: When the UN-04 is connected to the display unit UV-12, this connector is inactive.

Power supply connector [DC 12 V IN]
The output from the AC adapter is connected here.

Input connector 2 [INPUT 2]
Serves for connection of the microphone preamplifier. The sensitivity selector on the inner panel must be set to a position that matches the connected microphone.

Inner Panel



Input selector [INPUT SELECT]
Serves to select the input that is to be used.
INPUT 1: Signal from input connector 1 on the front panel
INPUT 2: Signal from input connector 2 on the rear panel

Bias selector [MIC BIAS]
When using a condenser microphone requiring bias, this switch must be set to ON. For prepolarized condenser microphones and ceramic microphones, the switch must be set to OFF.

Sensitivity selector [SENSITIVITY (x 0.1 dB)]
Serves to set the sensitivity of the unit, to match the sensitivity of the microphone. The value is set with a three-digit digital switch.

Frequency weighting selector [FREQ WEIGHT]
Serves to select the frequency weighting curve: A, C or F (flat).

Time weighting selector [TIME CONST]
Serves to set the time weighting characteristics (time constant).

Address selector [ADDRESS]
Serves to set the unit address when the UN-04 is connected to the display unit UV-12. Up to ten UN-04 units can be connected to a UV-12, and the address serves to distinguish between the connected units. When the UN-04 is not connected to a UV-12, there is no need to set the address, and the address selector may be left at any position.

Filter unit installation slot
The optional filter unit NX-06 can be installed here.

High-pass filter switch [HPF (20 Hz)]
Activates the high-pass filter which cuts off signal components below 20 Hz.

Low-pass filter switch [LPF (20 kHz)]
Activates the low-pass filter which cuts off signal components above 20 kHz.

Panel release lever
To open the inner panel, press down this lever and pull it out.

Latch
This latch secures the inner panel when it is open. To close the inner panel, press the top section of the latch to release it, and push the panel in.

CONNECTIONS AND SETUP

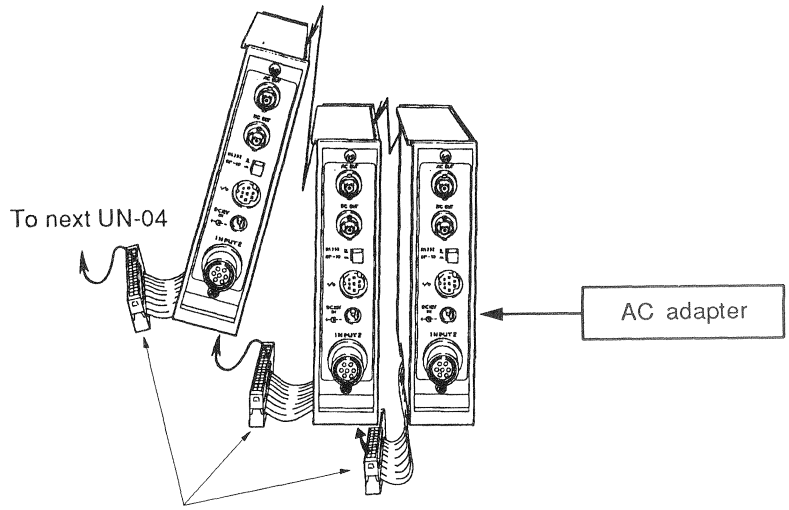
Power Supply Connections

The UN-04 can be powered from the AC adapter NC-11A (120 V AC), NC-11B (220 V AC), NC-79 (100 - 250 V AC), or from the battery unit BP-07.

Note: The UN-04 does not have a power switch. Consequently, you should plug the AC adapter into an AC outlet only after the microphone and all other equipment connections are completed. When using the battery unit, set the power switch on the battery unit to "Off" before making connections.

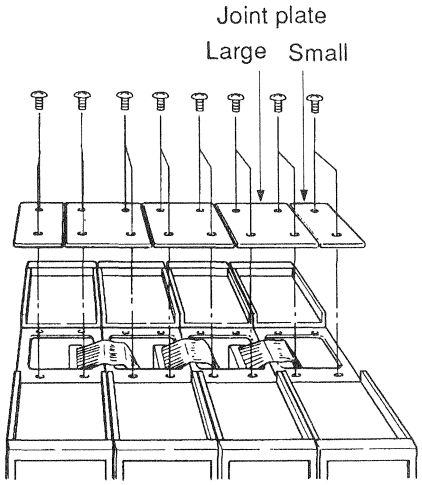
AC Adapter

Connect the AC adapter to the power supply connector.
When using several UN-04 units in a linked configuration, connect the AC adapter to the first unit, and use the bus connector located in the bottom panel for subsequent units. Up to two units can be powered by the AC adapter NC-11 series, and up to twelve units by the AC adapter NC-79 which has a higher current capacity rating.



Bus connector
Remove the four screws of the connector cover, pull the connector out and plug it into the next UN-04.

Linking several UN-04 units



Use the joint plates to link the bottom panels of the units. The small joint plate may be omitted.
Large joint plate: Connector cover
Small joint plate: Optional accessory

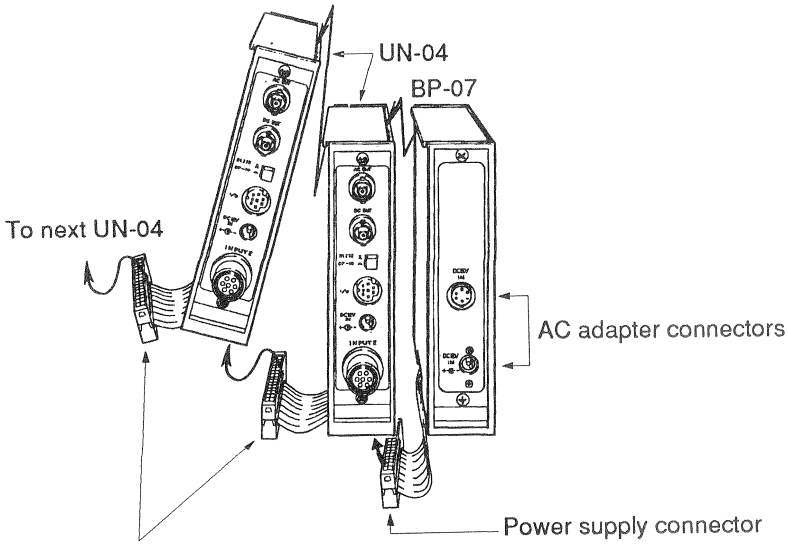
Linking several UN-04 units

Battery Unit

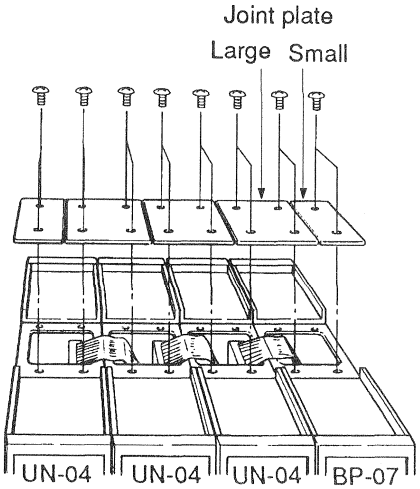
When using the battery unit BP-07, establish connections as shown below. If several UN-04 units are used in a linked configuration, connect the battery unit to the first unit and use the bus connector for subsequent units.

The battery unit BP-07 holds eight size "C" batteries (IEC R14). When using alkaline batteries, the BP-07 can power three UN-04 units for about eight hours. When the voltage meter on the battery unit enters the red zone, replace all batteries as soon as possible.

It is also possible to connect the AC adapter NC-11 series/NC-79 to the battery unit. In this case, power is normally provided by the adapter, but in case of a power failure the battery unit serves as a backup power supply.



Linking several UN-04 units with the battery unit



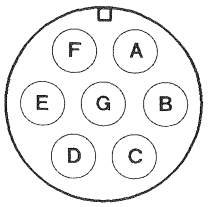
Use the joint plates to link the bottom panels of the units. The small joint plate may be omitted.
Large joint plate: Connector cover
Small joint plate: Optional accessory

Linking several UN-04 units with the battery unit

Input Connector

The input connector serves for connection of the microphone (available separately). The possible combinations of microphones, preamplifiers, and accessories that can be used with the UN-04 are listed on page 14.

The pin assignment of the input connector is shown below.



Tajimi Electronics connector TC1108-23A10-7F
Suitable plug: TC1108-12A10-7M

Input connector 1 and 2

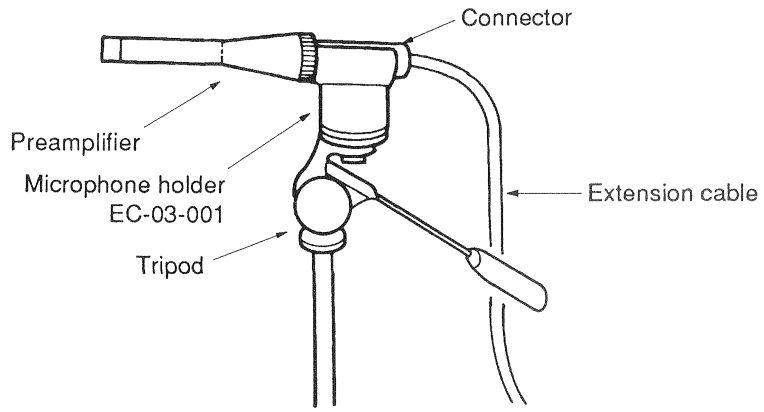
A: Preamplifier power supply output (+12 V)
B: Ground
C: Signal input
D: Preamplifier power supply output (–12 V)
E: Bias voltage output (30 V)
F: Bias voltage output (60 V)
G: Bias voltage output (200 V)

Pins E, F, and G carry the polarization bias voltage for condenser microphones. When the bias selector is set to OFF, no output appears at these pins.

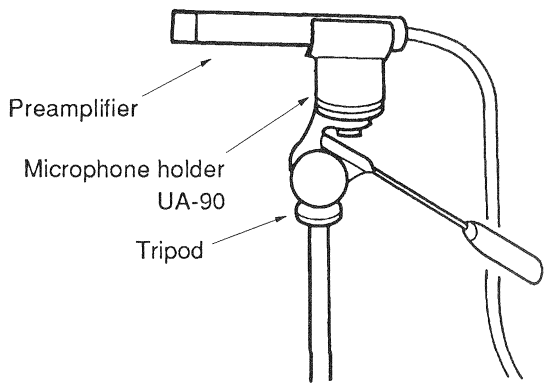
Microphone Selection and Mounting Method

Connect the microphone to the preamplifier, the preamplifier to the extension cable, and the extension cable to the input connector 1 or 2 on the UN-04.

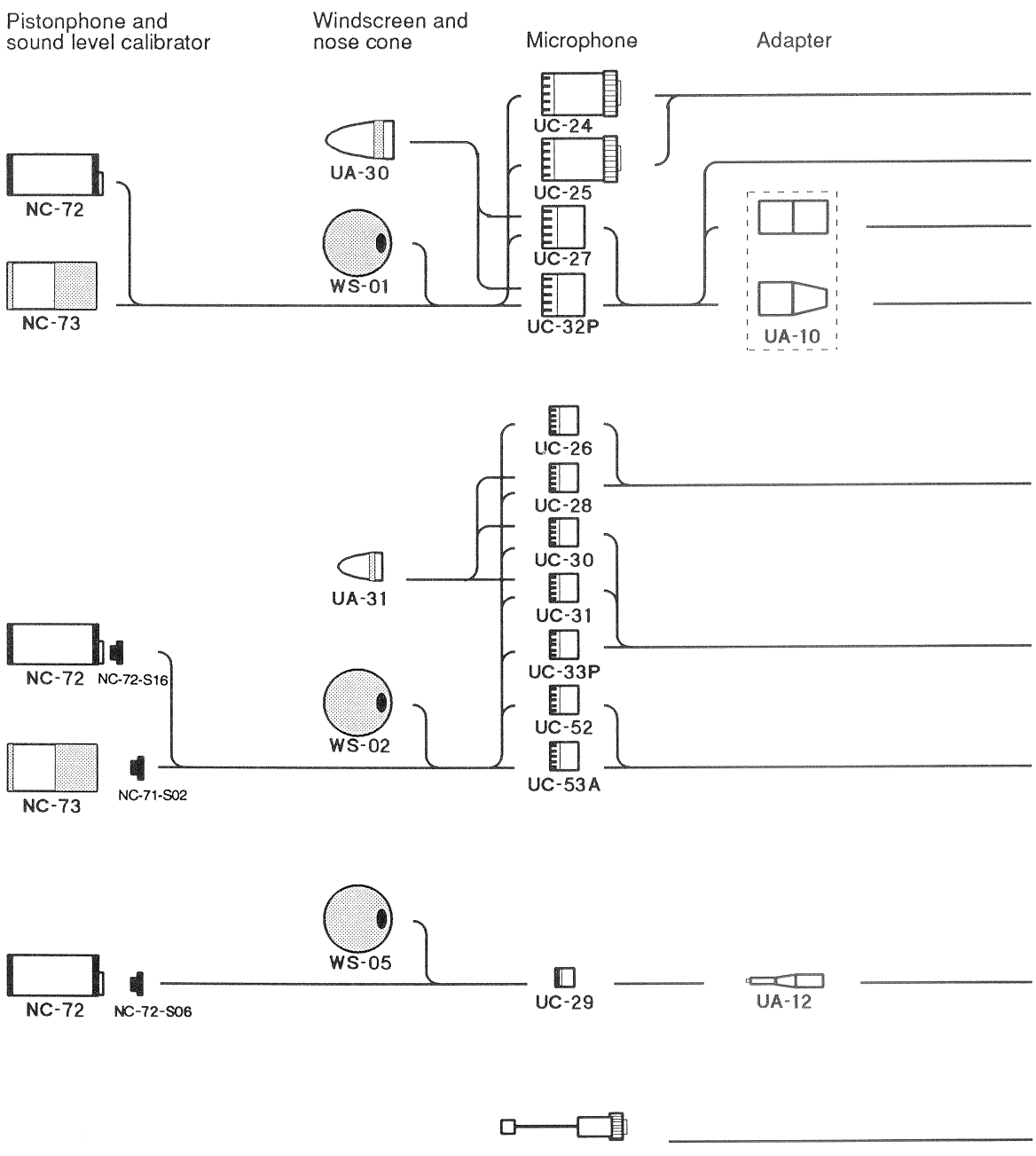
When mounting the microphone on a tripod, fasten the microphone holder EC-03-001(supplied with the extension cable) to the tripod, then insert the extension cable connector into the microphone holder.

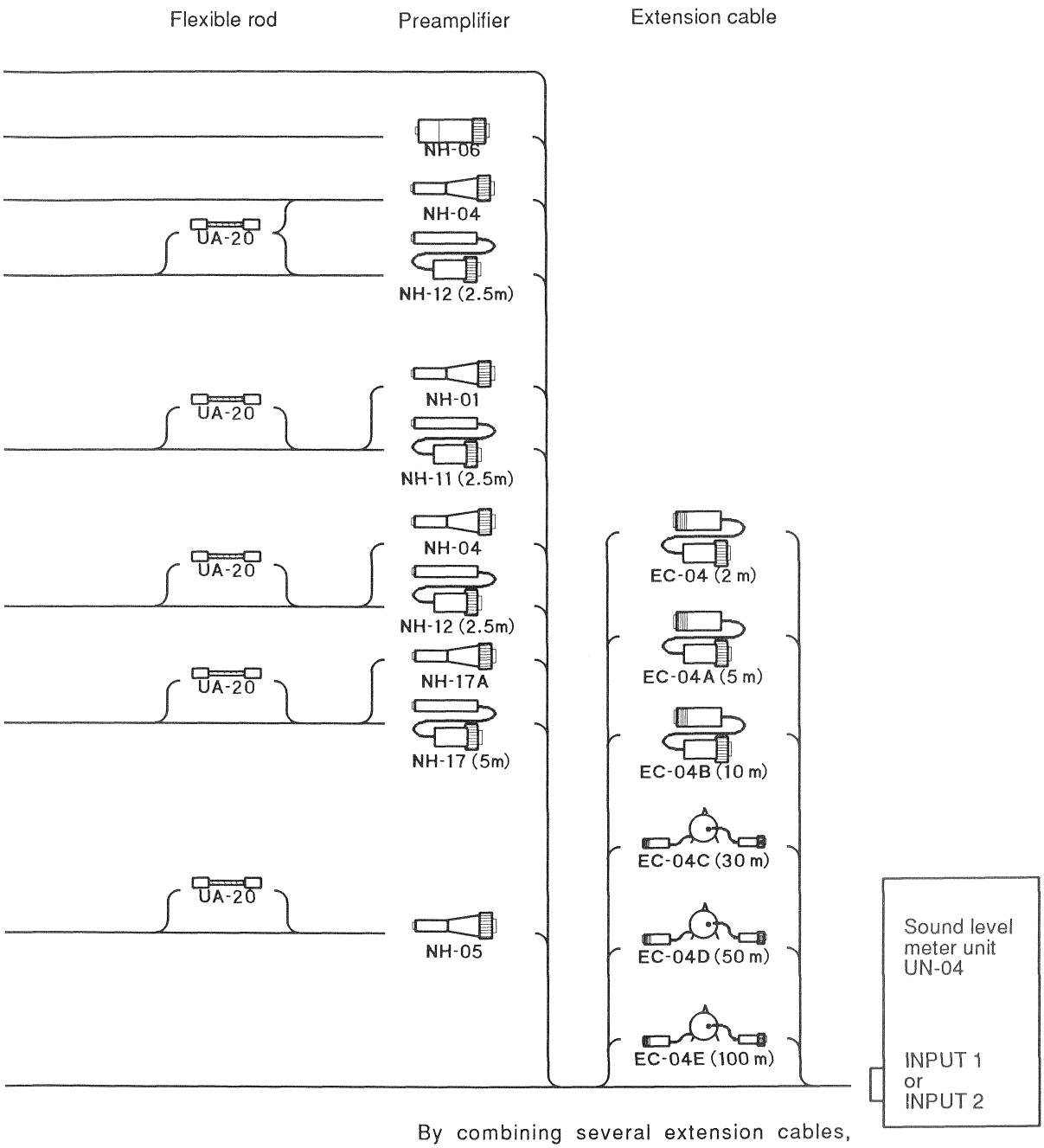


When using the preamplifier models NH-11, NH-12, or NH-17, the microphone holder UA-90 is required to insert the preamplifier.



Usable Microphone and Preamplifier Combinations





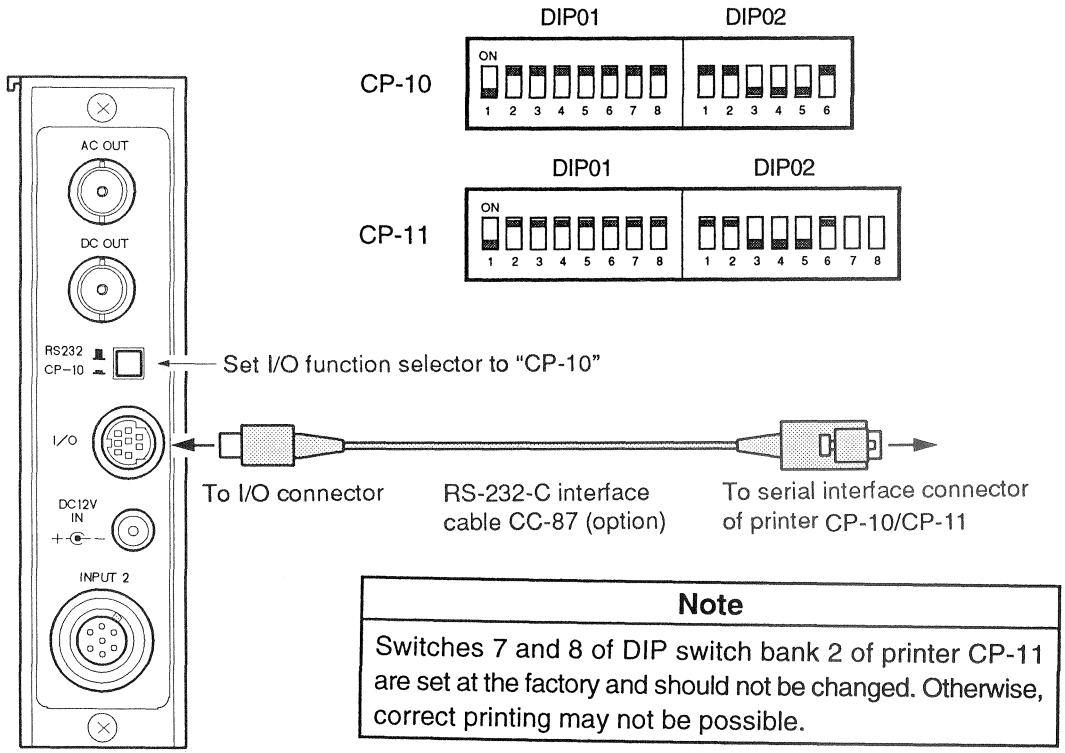
By combining several extension cables, cable runs over 100 m are also possible.

Output Connections

Output connections of the UN-04 include data output to the printer CP-10/CP-11, communication with a computer, AC and DC output to other equipment, and data output to the display unit UV-12. This section describes the printer connection and the AC and DC output connection. Regarding connection to a computer, please refer to the chapter starting on page 30, and regarding connection of the display unit UV-12, please refer to the instruction manual of the UV-12.

Printer CP-10/CP-11

1. Connect the printer to the I/O connector on the UN-04, using the RS-232-C interface cable CC-87.
2. Set the I/O function selector on the UN-04 to "CP-10".
   The setting of the I/O function selector is checked only once when the UN-04 is turned on. If you are already using the UN-04 and want to change the setting, choose the new position, turn the power supply off and then on again.
3. Set the dipswitches DIP01 and DIP02 of the CP-10/CP-11 as folows.

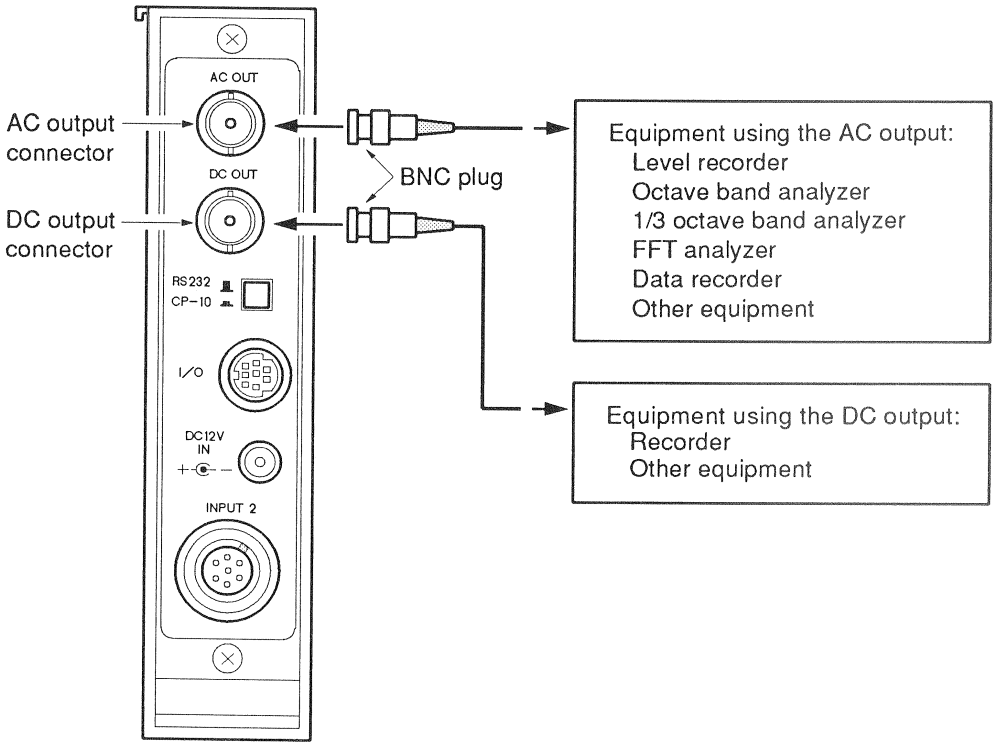


Note

Switches 7 and 8 of DIP switch bank 2 of printer CP-11 are set at the factory and should not be changed. Otherwise, correct printing may not be possible.

AC Output and DC Output

The AC output and DC output connectors provide a signal corresponding to the measured sound pressure level. This signal can be supplied for example to a level recorder for level recording, or to a data recorder or frequency analyzer.



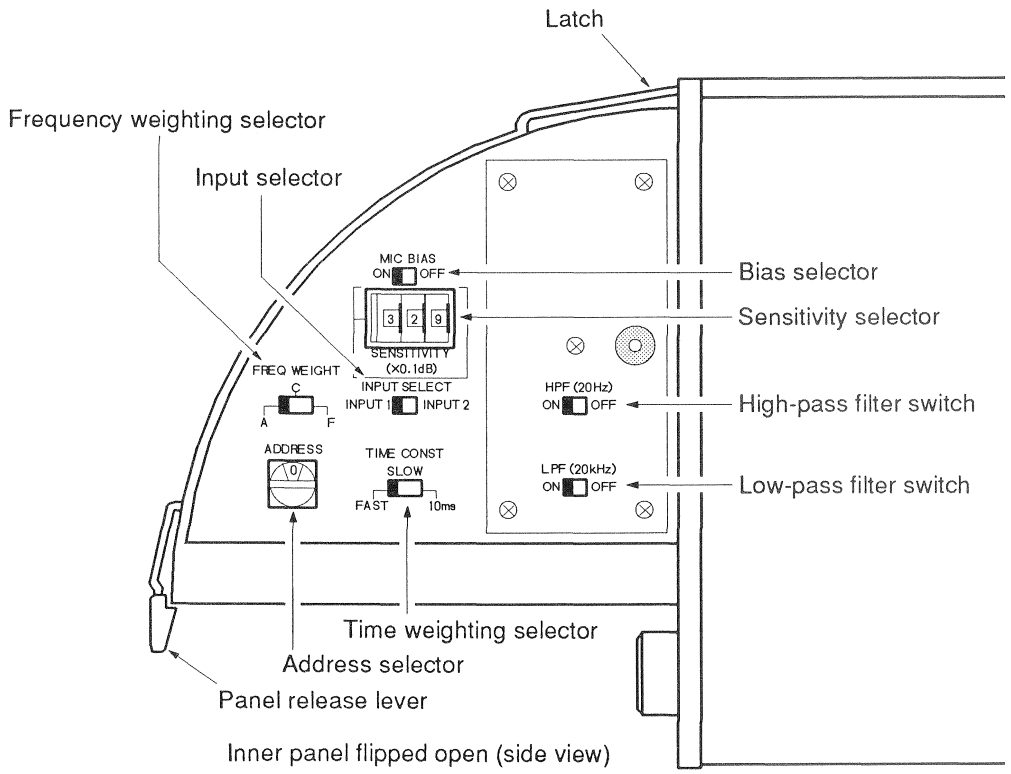
AC output and DC output specifications

Output	AC output	DC output
Connector type	BNC	BNC
Output impedance	Approx. 600 Ω	Approx. 50 Ω
Output voltage(Note)	1 V rms ±2 %	+3.5 V ±1 %, 0.5 V/10 dB
Maximum output voltage	±10 V peak (no overload)	+5 V (no overload)
Load impedance	10 kΩ or more	10 kΩ or more

(Note): full-scale output voltage

Setup

The controls for measurement settings are located on the inner panel. To access this panel, push down the panel release lever and pull the panel out. Set the controls as shown below, and then push the panel back into the unit.



- **Input setting**

  Set the input selector to the appropriate position, depending on which input is to be used.

  INPUT 1: Input connector 1 on front panel
  INPUT 2: Input connector 2 on rear panel

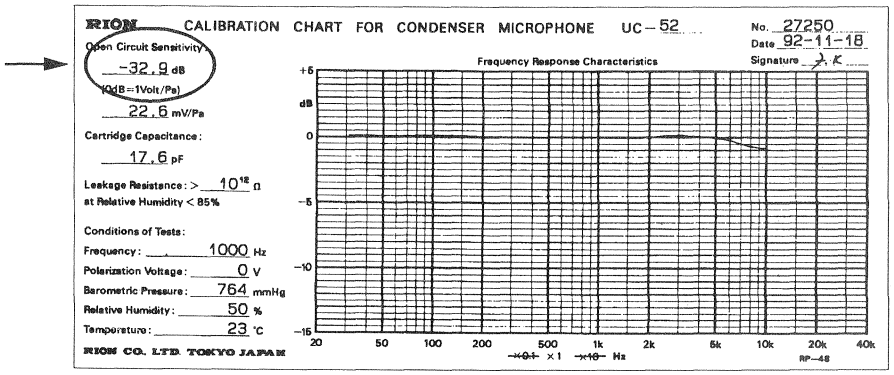
- **Bias setting**

  When using a condenser microphone that requires a bias voltage, the bias switch must be set to ON. When using the ceramic microphone UC-24, or the prepolarized condenser microphones UC-52, UC-53A, or the UC-90 series, the switch must be set to OFF.

• Sensitivity setting

The sensitivity selector serves to set the sensitivity of the unit to match the sensitivity of the microphone. The required value is calculated by adding up the microphone open circuit sensitivity and the preamplifier loss.

The microphone sensitivity is shown on the calibration chart accompanying each microphone. An example is reproduced below.



Calibration chart

The preamplifier loss (due to the capacitance of microphone and preamplifier) can be determined using the table below.

Microphone / Preamplifier	1-inch	1/2-inch			1/4-inch
	UC-27	UC-30 UC-31	UC-26	UC-52	UC-29
	UC-32P	UC-33P	UC-28	UC-53A	
NH-04 NH-12	–0.1	–0.4			
NH-06	–0.3				
NH-01 NH-11			–0.4		
NH-17 NH-17A				–0.3	
NH-05					–0.9

Example

When using the 1/2-inch condenser microphone UC-52 (sensitivity –32.9 dB) and the preamplifier NH-17A (loss –0.3), the required sensitivity setting is
(–32.9) + (–0.3) = –33.2
The digital switch therefore must be set to "332".

- **Frequency weighting**
  For normal measurements, the "A" setting should be used. When wishing to measure the physical sound pressure level, set the frequency weighting selector to "F". Depending on the microphone, measurements up to a frequency of 100 kHz are possible in this setting. The "C" setting also yields nearly flat response, but the influence of components below 31.5 Hz and above 8 kHz is reduced.

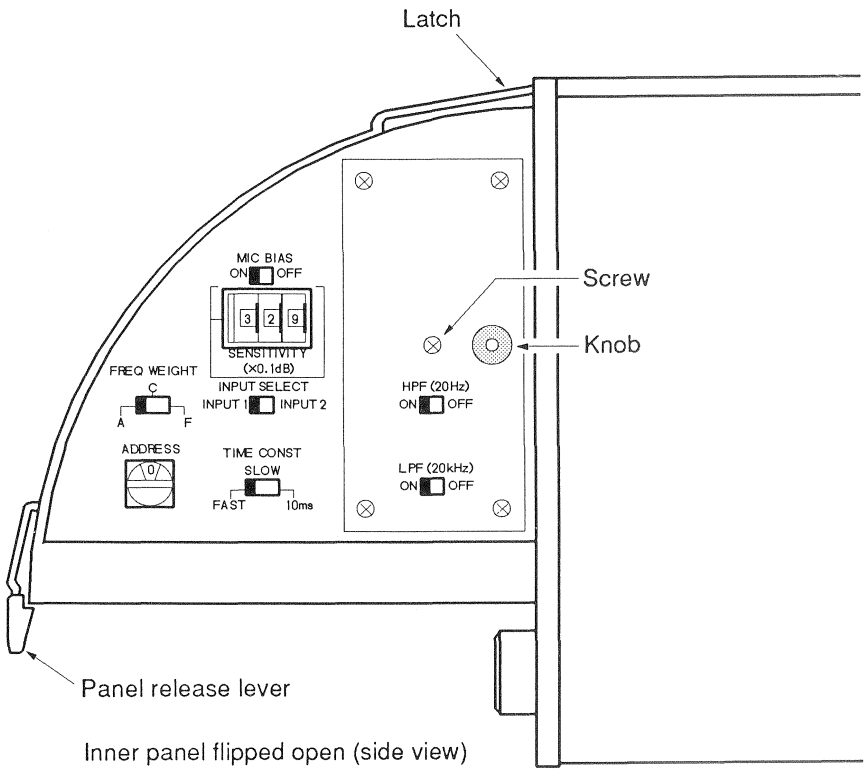
- **Time weighting**
  For normal measurements, the "FAST" setting should be used. If the noise level fluctuations are mild, the "SLOW" setting may also be selected.

- **High-pass and low-pass filter setting**
  The high-pass filter cuts off components below 20 Hz, and the low-pass filter components above 20 kHz.

- **Address setting**
  The address setting is required when the UN-04 is connected to the display unit UV-12. Up to ten UN-04 units can be connected to a UV-12, and the address serves to distinguish between the connected units. When the UN-04 is not connected to a UV-12, there is no need to set the address, and the address selector may be left at any position.

Filter Unit NX-06

The UN-04 is supplied with internal high-pass filter (20 Hz) and low-pass filter (20 kHz), but it is also possible to install the optional filter unit NX-06.



Inner panel flipped open (side view)

To install the filter unit, remove the screw and pull the panel (with HPF and LPF switches) out by grasping the knob (see illustration). Then insert the filter unit.
When the NX-06 is installed, internal high-pass and low-pass filters are set to off. RS-232-C interface command, however, can be used to activate these filters (see page 39).

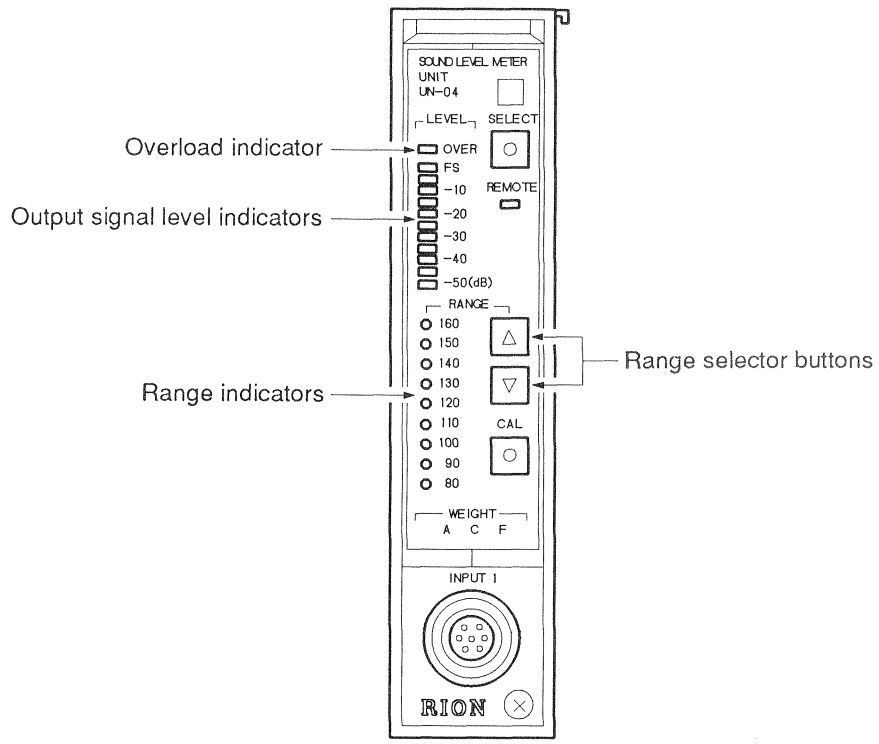
OPERATION STEPS FOR MEASUREMENT

Power-on

If an AC adapter is used to power the unit, plug the adapter into an AC outlet. If the battery unit BP-07 is used to power the unit, set the power switch on the battery unit to "On". Next, turn on connected equipment such as the printer CP-10/CP-11 and equipment connected to the AC or DC output.

Range Selection

Select the measurement range (full-scale value) with the range selector buttons. The corresponding indicator lights up.
Pushing the [△] button increases the range, and pushing the [▽] button decreases it. Normally, you should select the range so that the overload indicator does not light. If the input signal is too high, causing amplifier saturation, the overload indicator lights up. In such a case, the measurement results will not be reliable.



Front panel

The selectable range settings depend on the sensitivity setting (microphone sensitivity), as shown in the table below.

Microphone sensitivity (dB)	Available range setting
–00.0 to –29.9	80, 90, 100, 110, 120, 130
–30.0 to –39.9	90, 100, 110, 120, 130, 140
–40.0 to –49.9	100, 110, 120, 130, 140, 150
–50.0 to –99.9	110, 120, 130, 140, 150, 160

Recording Measurement Results on the Printer CP-10/CP-11

Press the On-line/Off-line switch of the CP-10/CP-11 to set the printer to the on-line condition. The printer then will print out the measurement results every five seconds. The printout format is as follows.

```
nnn.ndB,xx,y,zzzz
```

The items are defined as follows. An underline symbol (_) represents a space.

nnn.n Measurement value

xx Overload indication
__: No overload
OV: Overload has occurred

y Frequency weighting
A: A weighting
C: C weighting
F: Flat response

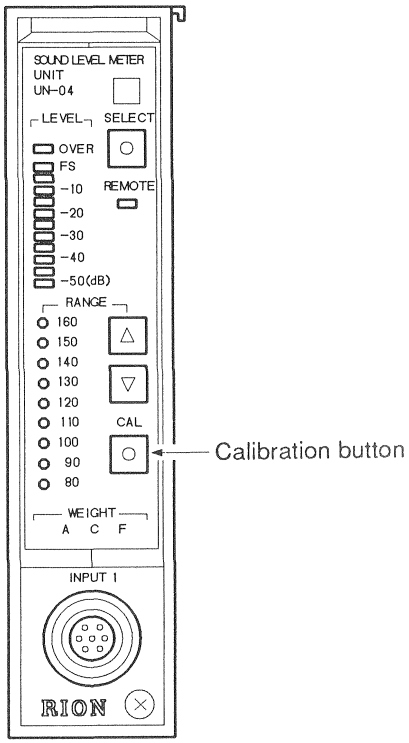
zzzz Time weighting
Fast: Fast characteristics
Slow: Slow characteristics
10ms: Time constant 10 ms

Using Equipment Connected to the AC and DC Outputs

Calibration of Connected Equipment

After connecting the equipment to the AC output or DC output, carry out calibration as follows.

1. Press the calibration button.
   The indicator of the button lights up. In this condition, a 3.2-V signal is supplied at the DC output and a 1000 Hz, 0.5 Vrms signal at the AC output.
2. Use the calibration signal to calibrate the connected equipment. The signal corresponds to a measurement value 6 dB below the full-scale point.
3. Press the calibration button once more to turn off the calibration signal. The indicator of the button goes out.

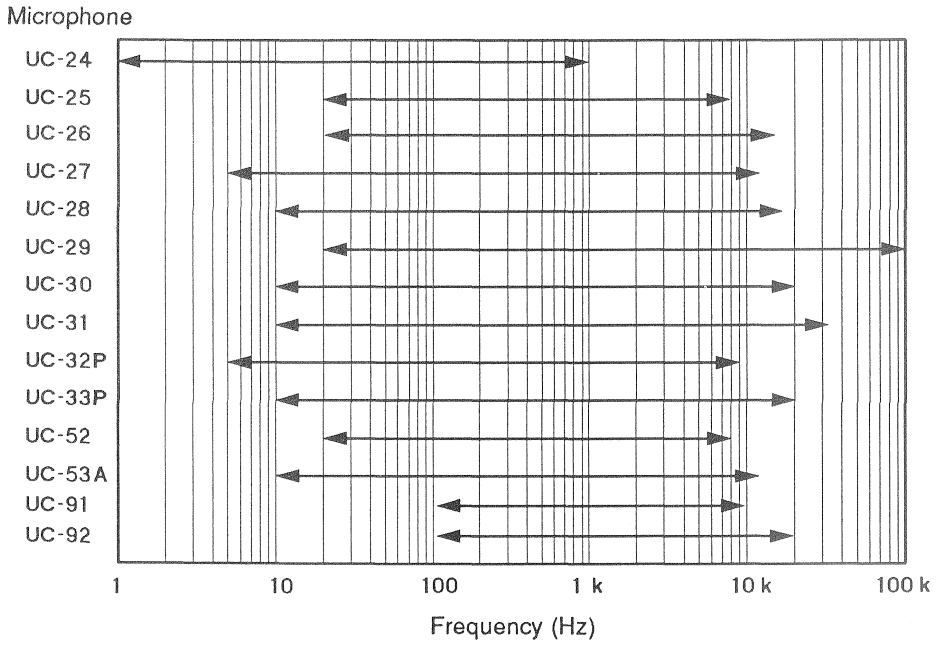


Measurement Range

The frequency range and the level range that can be measured depend on the microphone and preamplifier combination.

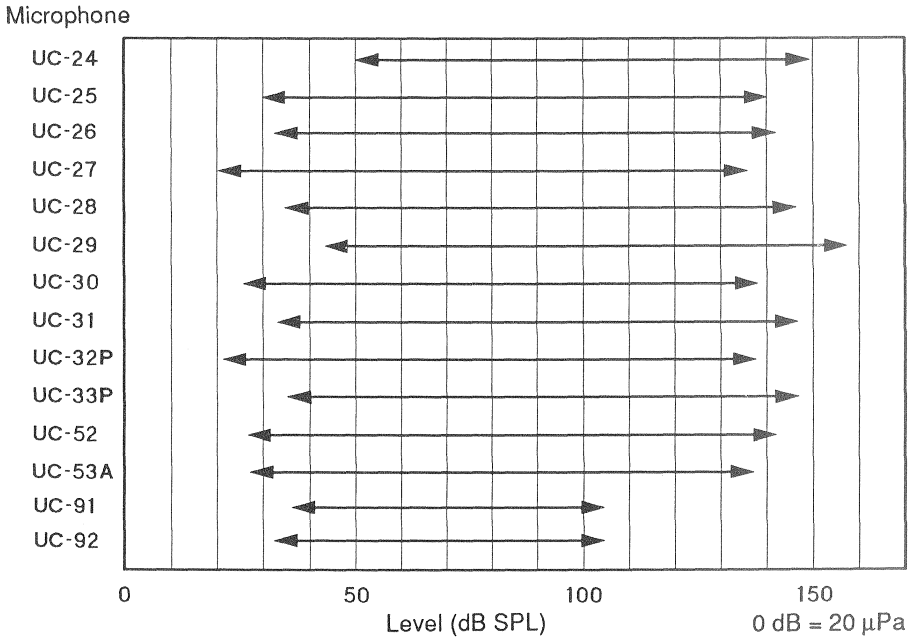
Frequency Range

The measurable frequency range depends on the microphone model, as shown below.



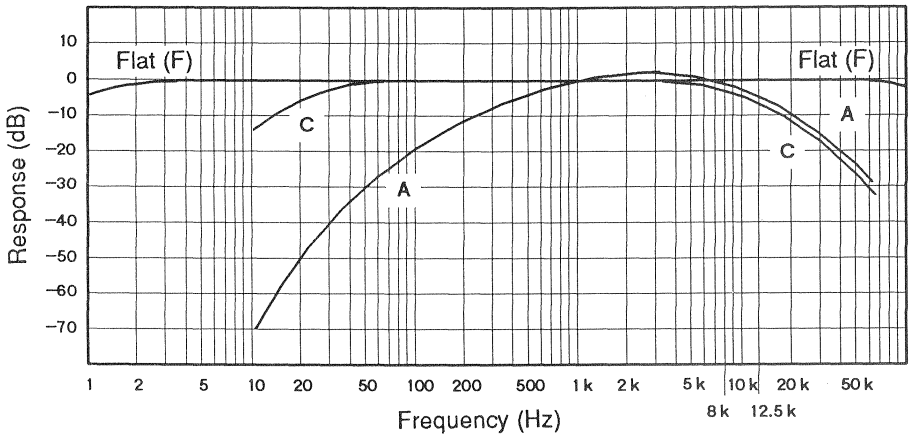
Measurement Level Range

The measurable level range depends on the microphone model, as shown below.

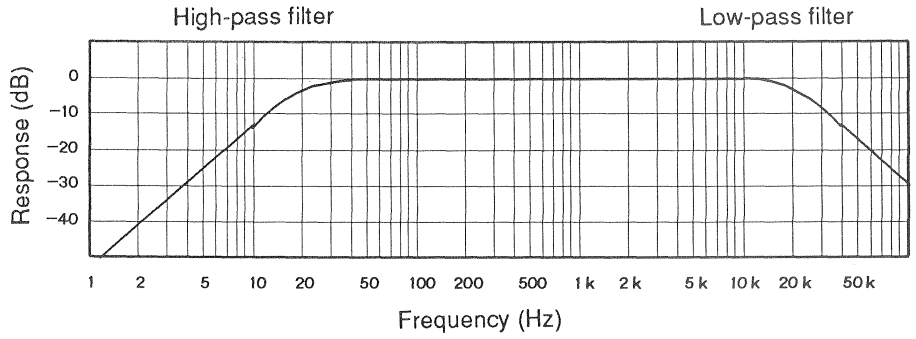


Frequency Response

The frequency response characteristics are shown below, with A weighting, C weighting, and at the flat setting.

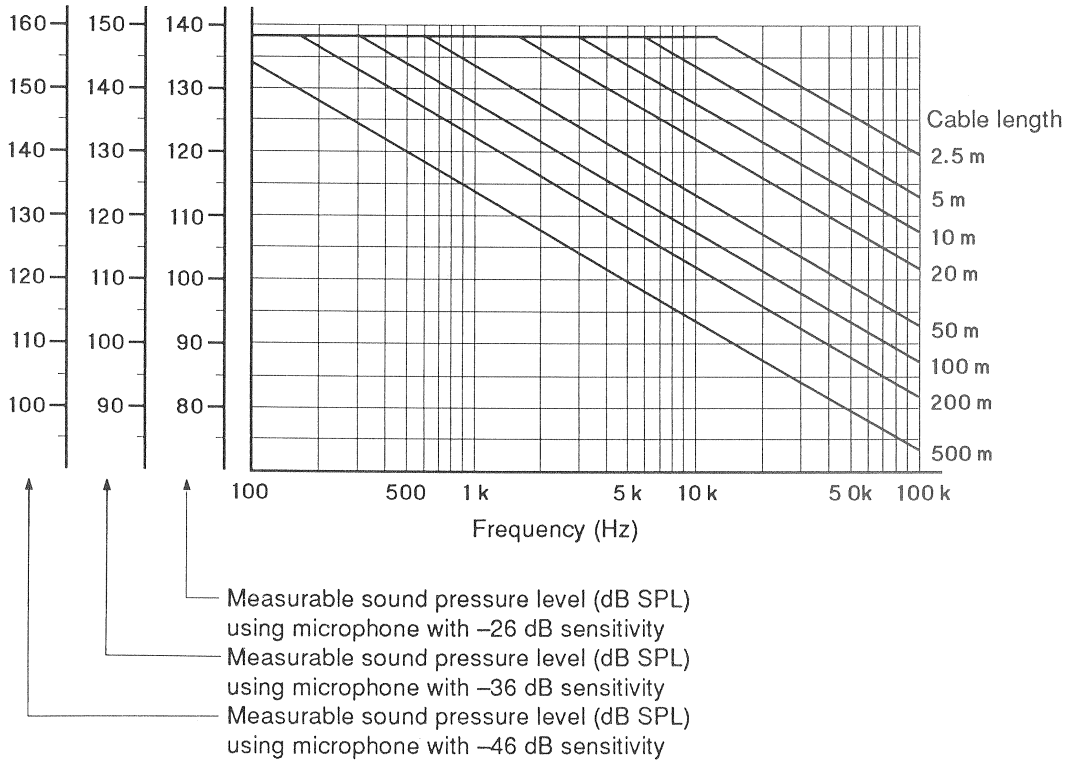


The frequency response characteristics of the low-pass filter and high-pass filter are shown below.



Extension Cable Influence

Due to the capacitance between signal lead and shield of the extension cable, there is a limit on maximum sound pressure level and frequency, depending on the length of the extension cable. The chart below shows the relationship between cable length, frequency, and sound pressure level.



For example, when using a microphone with a sensitivity of –26 dB, and an extension cable of 50 m, measurements at 10 kHz are possible up to 110 dB.

RS-232-C INTERFACE

The built-in RS-232-C interface allows the use of a computer to control the measurement conditions of the UN-04 and to store measurement results and measurement settings. This section explains the following points.

- **Connection to a computer** (⇒ p. 31)
  To connect the UN-04 to a computer, the RS-232-C interface cable CC-87 or CC-87E (sold separately) is required. This section explains how to use the cable and gives information about the internal cable wiring.

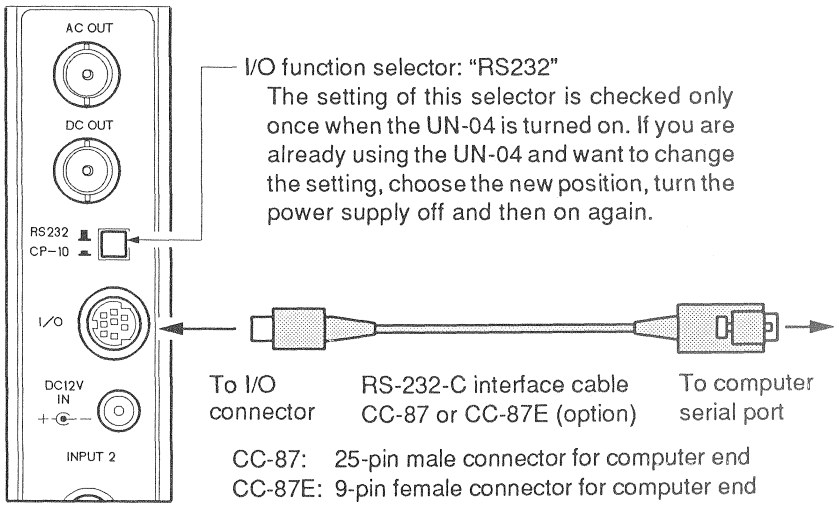
- **Transfer protocol and transfer procedure** (⇒ p. 33)
  This section describes the transfer protocol for the RS-232-C interface and explains the steps for sending data and commands.

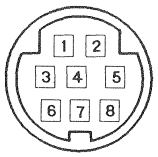
- **Commands** (⇒ p. 37)
  This section describes the commands that serve to control the UN-04. The section is divided into an explanation of the command format and a listing of commands.

- **Output data format** (⇒. 40)
  This section describes the format in which measurement data and setting data are output by the UN-04.

Connection to a Computer

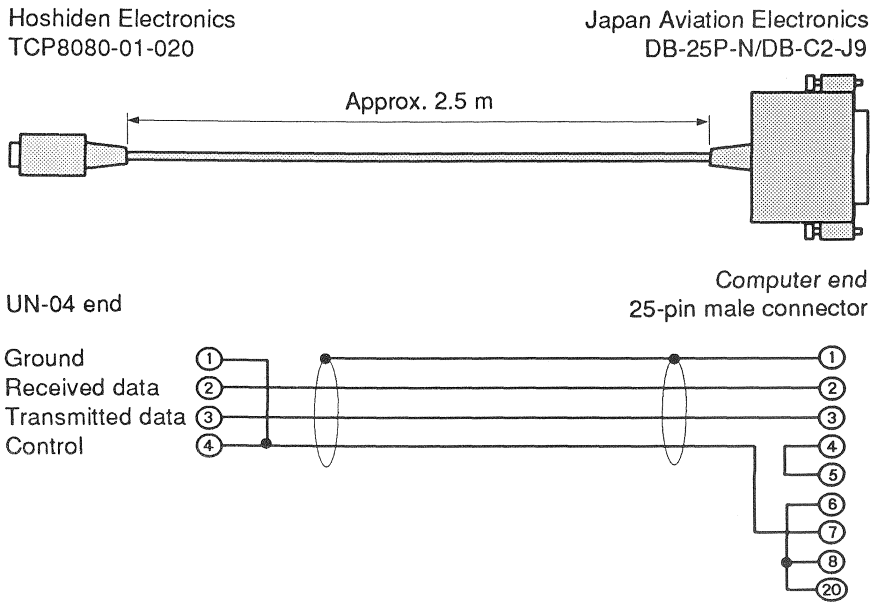
Connect the UN-04 to a computer as shown below, and set the I/O function selector of the UN-04 to "RS232".



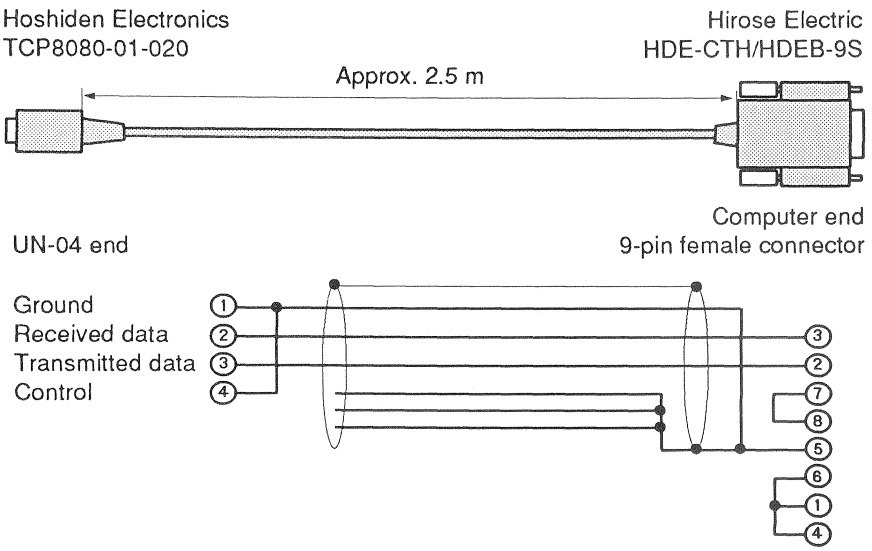


I/O connector of UN-04

- RS-232-C interface cable CC-87 wiring



- RS-232-C interface cable CC-87E wiring



Transfer Protocol and Transfer Procedure

Transfer Protocol

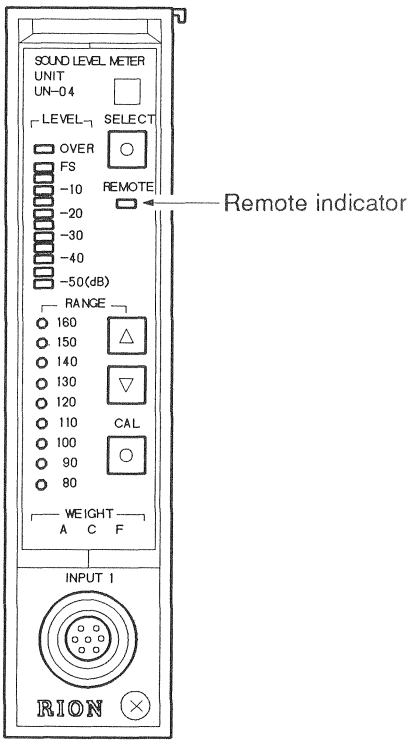
Flow control: Yes
Transmission: Asynchronous, half-duplex
Data word length: 8 bit
Stop bits: 2
Parity: None
Baud rate: 4800 bps

Remote Mode/Local Mode

- **Remote mode**
  In this condition, the UN-04 receives commands from the computer and the panel buttons on the UN-04 are inactive. The remote indicator of the UN-04 is lit.

- **Local mode**
  The UN-04 can be operated with the panel buttons and with commands from the computer. The remote indicator is out.

- **Remote mode/local mode switching**
  The SLK command serves to switch between local mode and remote mode (⇒ p. 39).

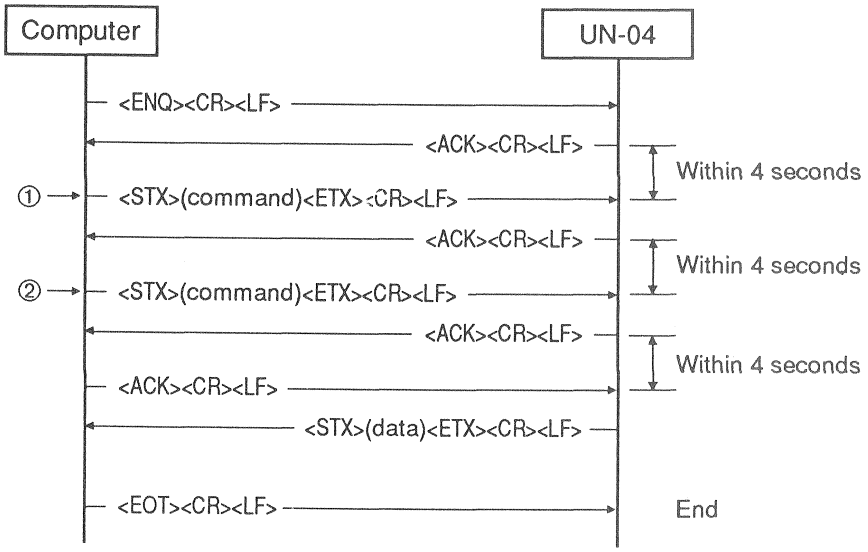


Transfer Procedure

In order to control the UN-04 from a computer or to retrieve measurement data, certain commands must be sent to the UN-04. The data exchange must be performed according to certain rules, to ensure that both the UN-04 and the computer recognize the commands and data properly.
To send commands to the UN-04, the following procedure must be observed.

1. The computer sends <ENQ><CR><LF> to the UN-04.
2. When <ENQ><CR><LF> has been received, the UN-04 returns <ACK><CR><LF> to the computer.
3. The computer verifies receipt of <ACK><CR><LF> and sends a command within 4 seconds.
4. When a valid command is received by the UN-04, it carries out the command.
   If it is a command which controls measurement settings, the appropriate setting is established, and an <ACK><CR><LF> is returned to the computer.
   If it is a command which requests data, the UN-04 returns <ACK><CR><LF> to the computer and waits for <ACK><CR><LF> from the computer. If, within 4 seconds, <ACK><CR><LF> is received by the UN-04, it sends the appropriate data to the computer.
5. Within 4 seconds of sending the <ACK><CR><LF> or the data to the computer, the UN-04 can accept the next command. It is therefore possible to repeat steps 3 and 4, for continuous interaction with the computer. If no further commands are received within 4 seconds, timeout occurs. In this case, the procedure must be restarted from step 1.
6. When the computer sends an <EOT><CR><LF> to the UN-04, data transfer is terminated. To send new commands, the procedure must then be restarted from step 1.

Normal transfer sequence



① : Command which controls measurement setting
② : Command which requests data

<ENQ>: Control code 05H (enquire)
<ACK>: Control code 06H (acknowledge)
<NAK>: Control code 15H (not acknowledge)
<EOT>: Control code 04H (end of transfer)
<STX>: Control code 02H (start text)
<ETX>: Control code 03H (end text)
<CR>: Control code 0DH (carriage return)
<LF>: Control code 0AH (line feed)
(command): ASCII string (command and parameters for UN-04)
(data): ASCII string (output by UN-04)

Error Handling

In order to ensure correct data exchange between the UN-04 and the computer, the rules described above must be observed. If an error occurs, the following steps should be taken.

- The computer has sent <ENQ><CR><LF> but no response is received from the UN-04.
  Send <ENQ><CR><LF> again after about 2 seconds. Repeat this several times. If there is still no response from the UN-04, one of the following conditions may exist:
  Transfer parameters do not match.
  Interface cable is defective or not properly connected.
  UN-04 is not powered.
  I/O function selector on UN-04 is set to "CP-10", or the setting was changed to "RS232" without turning the UN-04 off and on.

- <ACK><CR><LF> from the UN-04 was received, but the computer has not completed the sending of commands within 4 seconds.
  The UN-04 terminates the data transfer condition.

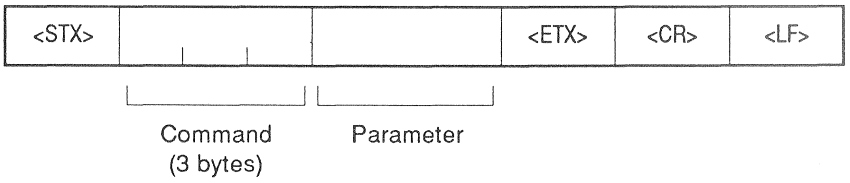
- A wrong command was sent.
  When the computer has sent a wrong command (invalid string or parameter out of range), the UN-04 returns <NAK><CR><LF>. This can be repeated up to three times, but if the command is still invalid at the fourth try, the UN-04 sends <EOT><CR><LF> and terminates the data transfer condition.

- Data from UN-04 were not received properly.
  When the computer returns a <NAK><CR><LF>, the UN-04 sends the immediately preceding data (including <ACK><CR><LF> and <NAK><CR><LF>) again. This can be repeated up to three times, but if the data are still not received at the fourth try, the UN-04 sends <EOT><CR><LF> and terminates the data transfer condition.

Commands

Command Format

Commands that can be used by the UN-04 consist of 3 characters (3 bytes), usually followed by a parameter which specifies the action range of the command. Some commands do not have parameters.



In the following command description, parameters are denoted by "n".

Note: The UN-04 cannot process multiple commands sent together.

Command List

ISLn Selects the input signal.
The action of this command corresponds to the input selector.
n = 3: Input connector 1 (INPUT 1)
n = 4: Input connector 2 (INPUT 2)

SNSn Selects the microphone sensitivity.
The action of this command corresponds to the digital switch of the sensitivity selector.
n = 200 - 599
If parameter n is set to 199 or less (000 - 199), it is treated as 200.
If parameter n is set to 600 or over (600 - 999), it is treated as 599.

WGTn Selects the frequency weighting characteristics.
The action of this command corresponds to the frequency weighting selector.
n = 0: A weighting
n = 1: C weighting
n = 2: Flat response (F)

DETn Selects the time weighting characteristics.
The action of this command corresponds to the time weighting selector.
n = 3: FAST
n = 4: SLOW
n = 5: 10 ms

AMPn Selects the range.
The range specified by the parameter n depends on the microphone sensitivity setting, as shown below.

Sensitivity (dB)	Parameter n and specified range (dB)					
	n = 0	n = 1	n = 2	n = 3	n = 4	n = 5
–20.0 to –29.9	80	90	100	110	120	130
–30.0 to –39.9	90	100	110	120	130	140
–40.0 to –49.9	100	110	120	130	140	150
–50.0 to –59.9	110	120	130	140	150	160

FLTn Determines the filter on/off settings.
The action of this command corresponds to the various filter switches.
- n = 0: All filters off
- n = 1: Internal 20-kHz LPF on
- n = 2: Internal 20-Hz HPF on
- n = 3: Internal 20-kHz LPF and 20-Hz HPF on
- n = 4: HPF of filter unit NX-06 on
- n = 5: LPF of filter unit NX-06 on
- n = 6: HPF and LPF of filter unit NX-06 on

Filter frequency of the NX-06 is set with the HPF/LPF switch of the NX-06.
When the switch is set to off, n=4, 5, and 6 are treated as n=0.
When the NX-06 is not installed, n=4, 5, and 6 are treated as n=0.

SLKn Enables remote mode or local mode.
- n = 0: Local mode
- n = 1: Remote mode

CALn Enables or disables the calibration mode.
The action of this command corresponds to the calibration button.
- n = 0: Calibration mode disabled
- n = 1: Calibration mode enabled

STS Requests the current measurement settings. (This command has no parameters.)
The format of the data output in response to this command is described on page 41.

DOD Requests the current measurement data. (This command has no parameters.)
The format of the data output in response to this command is described on page 40.

MOD Requests the maximum value of the current measurement data. (This command has no parameters.)
The maximum value is defined as the maximum value encountered since the unit was turned on or since the last MRS (maximum value reset) command.
The format of the data output in response to this command is described on page 40.

MRS Resets the maximum value. (This command has no parameters.)

UNR Requests the address number.

Output Data Format

This section describes the format of the output data in response to the DOD, MOD, and STS commands.

Output Data in Response to DOD and MOD

The DOD command requests the current measurement value, and the MOD command the maximum measurement value. The output data format is as follows. An underline symbol (_) represents a space.

<STX>nnn.n___,xx<ETX><CR><LF>

nnn.n Measurement value

xx Overload indication
__: No overload
OV: Overload has occurred

Output Data in Response to STS

The current measurement settings are output by the UN-04 in the following format.

<STX>$n_1n_2n_2n_2n_3n_4n_5n_6n_7n_8$<ETX><CR><LF>

n_1 Input signal
- $n_1 = 3$: Input connector 1 (INPUT 1)
- $n_1 = 4$: Input connector 2 (INPUT 2)

$n_2n_2n_2$ Sensitivity (numeric value)
200 to 599 (–20.0 to –59.9 dB)

n_3 Filter
- $n_3 = 0$: All filters off
- $n_3 = 1$: Internal 20-kHz LPF on
- $n_3 = 2$: Internal 20-Hz HPF on
- $n_3 = 3$: Internal 20-kHz LPF and 20-Hz HPF on
- $n_3 = 4$: HPF of filter unit NX-06 on
- $n_3 = 5$: LPF of filter unit NX-06 on
- $n_3 = 6$: HPF and LPF of filter unit NX-06 on

n_4 Frequency weighting
- $n_4 = 0$: A weighting
- $n_4 = 1$: C weighting
- $n_4 = 2$: Flat response (F)

n_5 Time weighting
- $n_5 = 3$: FAST
- $n_5 = 4$: SLOW
- $n_5 = 5$: 10 ms

n_6 Range
The range specified by n_6 depends on the microphone sensitivity, as shown below.

Sensitivity (dB)	n_6 and specified range (dB)					
	$n_6 = 0$	$n_6 = 1$	$n_6 = 2$	$n_6 = 3$	$n_6 = 4$	$n_6 = 5$
–20.0 to –29.9	80	90	100	110	120	130
–30.0 to –39.9	90	100	110	120	130	140
–40.0 to –49.9	100	110	120	130	140	150
–50.0 to –59.9	110	120	130	140	150	160

n_7 Remote mode/local mode setting
$n_7 = 0$: Local mode
$n_7 = 1$: Remote mode

n_8 Calibration mode on/off setting
$n_8 = 0$: Calibration mode disabled
$n_8 = 1$: Calibration mode enabled

SPECIFICATIONS

Applicable standards

JIS C 1505 - 1988 (electrical characteristics only)
IEC 651 : 1979 Type 1 (electrical characteristics only)

Inputs

Input connectors:	Font-panel input and rear-panel input (1 each)
Input impedance:	100 kΩ
Maximum input voltage:	±12 V
Connector type:	7-pin
	Microphone bias output: 30 V, 60 V, 200 V
	Preamplifier power supply output: ±12 V, 5 mA

Measurement level range (with microphone UC-53A)

A weighting:	27 to 128 dB (JIS), 24 to 128 dB (IEC)
C weighting:	33 to 128 dB (JIS), 30 to 128 dB (IEC)
Flat response:	38 to 128 dB (JIS), 35 to 128 dB (IEC)
	(Frequency range 20 Hz to 20 kHz)

Frequency range

2 Hz to 100 kHz (±3 dB)

Frequency weighting

A, C, Flat

Level range selector

Depending on the microphone, the following range settings are available.

Microphone sensitivity range (dB)	Full-scale level (dB)
–20 to –29.9	80 to 130
–30 to –39.9	90 to 140
–40 to –49.9	100 to 150
–50 to –59.9	110 to 160

Calibration

Gain calibration:	Calibration possible for microphone sensitivity from –20 to –59.9 dB. For other ranges, conversion is required.
Calibration signal:	Generated by internal signal generator (sine wave, 1 kHz ±2 %)
	AC output voltage 0.5 Vrms ±2 %
	DC output voltage 3.2 V ±1 %

RMS detection

True rms circuit

Time weighting:	FAST, SLOW, 10 ms
Display:	11-step LED display of instantaneous value (5-dB steps)

Overload indication

Indicator lights when signal waveform saturation occurs (full-scale point +8 dB).

Inherent noise (with inputs shorted)

2 Hz to 100 kHz:	4 μV rms or less
20 Hz to 20 kHz:	2 μV rms or less
A and C weighting:	1.5 μV rms or less

Internal filter

20-Hz high-pass filter (–12 dB/oct)
20-kHz low-pass filter (–12 dB/oct)

Outputs

AC output (rear panel)

Output connector type:	BNC
Output impedance:	Approx. 600 Ω
Output voltage:	1 V rms ±2 % (at full-scale point)
Maximum output voltage:	±5 V peak (no overload)
Dynamic range:	80 dB (2 Hz to 100 kHz), 85 dB (20 Hz to 20 kHz)
Load impedance:	10 kΩ or more

DC output (rear panel)

Output connector type:	BNC
Output impedance:	Approx. 50 Ω
Output voltage:	+3.5 V ±1 % (at full-scale point), 0.5 V/10 dB
Maximum output voltage:	+5 V (no overload)
Dynamic range:	40 dB (2 Hz to 100 kHz), 60 dB (20 Hz to 20 kHz)
Load impedance:	10 kΩ or more

Interface

Function:	Data output and remote control
Standard:	EIA RS-232-C standard
Transmission:	Asynchronous, half-duplex
Baud rate:	4800 bps
Data word length:	8 bit
Stop bits:	2
Parity:	None
Connection cable:	RS-232-C interface cable CC-87 or CC-87E (option)
Compatible printer:	CP-10 or CP-11

Ambient conditions for operation

–10 to +50 °C, 90 % RH or less

Power requirements

Voltage:	9 to 15 V DC (120mA)
Suitable AC adapters:	NC-11 series/NC-79
Suitable battery unit:	BP-07

Dimensions

33 (W) x 149 (H) x 210 (D) mm (without protruding parts)

Weight

Approx. 850 g

Supplied Accessories

Instruction manual	1

Optional Accessories

Filter unit NX-06

AC adapter NC-11 series/NC-79

NC-11A:	120 V AC	12 V DC, 300 mA
NC-11B:	220 V AC	12 V DC, 300 mA
NC-79:	100 - 250 V AC	12 V DC, 2 A

Battery unit BP-07

Display unit UV-12

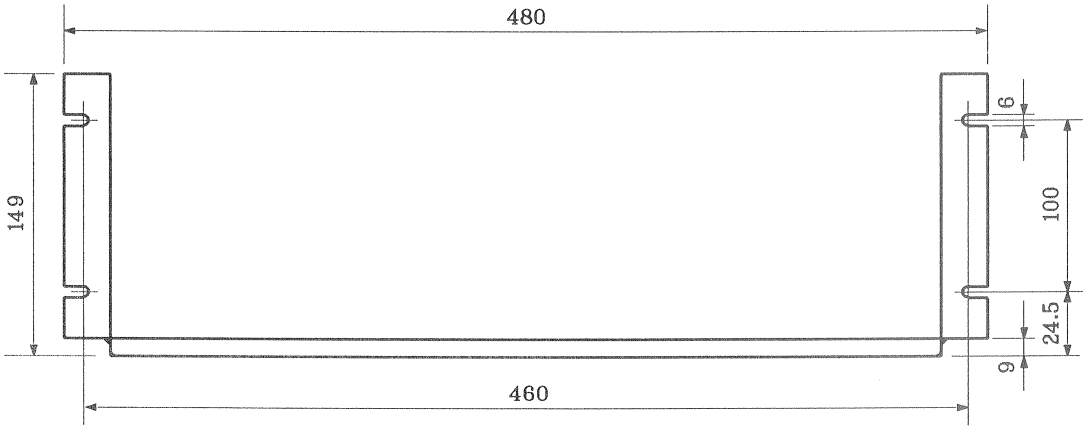
Printer CP-10 or CP-11

RS-232-C interface cable CC-87 series

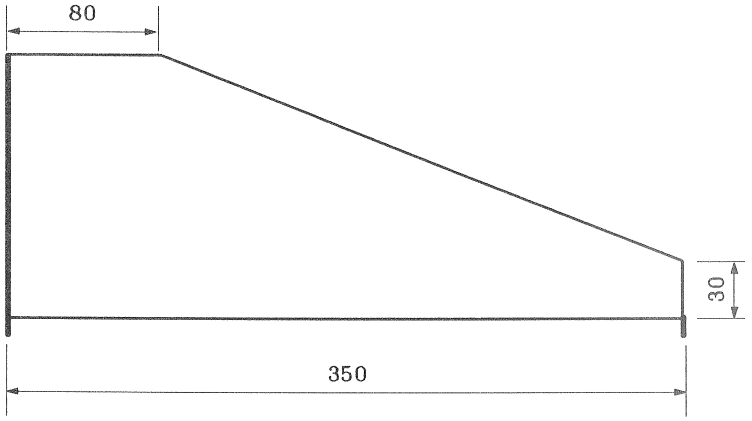
CC-87:	25-pin male connector, for connection to printer CP-10/CP-11 and computer serial port
CC-87E:	9-pin female connector, for connection to computer serial port

Rack-mount base UV-05-091

Rack-mount base UV-05-091



Front view



Side view

Plate thickness: 1.6
Unit: mm

No. 20763 03-04