INSTRUCTION MANUAL

Octave · 1/3 Octave
Real-time Analysis Program

NX-62RT

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Organization of this manual

This manual describes functions and other operation principles of the Octave · 1/3 Octave Real-time Analysis Program NX-62RT.
The manual consists of the chapters listed below. You should also consult the documentation for the Sound Level Meter NL-62.

Outline

Gives basic information on the functions of the NX-62RT.

Change the function to the NX-62RT

Explains how to change to the function of the NX-62RT.

Reading the display

Explains various items that appear on the display and menu screen.

Measurement

Explains the basic procedures for measurement.

Store data format and file structure

Explains the format of stored data and how the files are organized.

Card capacity and store time

Lists the data store time corresponding to the SD memory card capacity, etc.

Recall data

Explains screen and display settings of the recall data.

Default settings

Lists the factory default settings of the NX-62RT.

Communication commands

Explains commands about functions of the NX-62RT.

Specifications

Lists the technical specifications of the NX-62RT.

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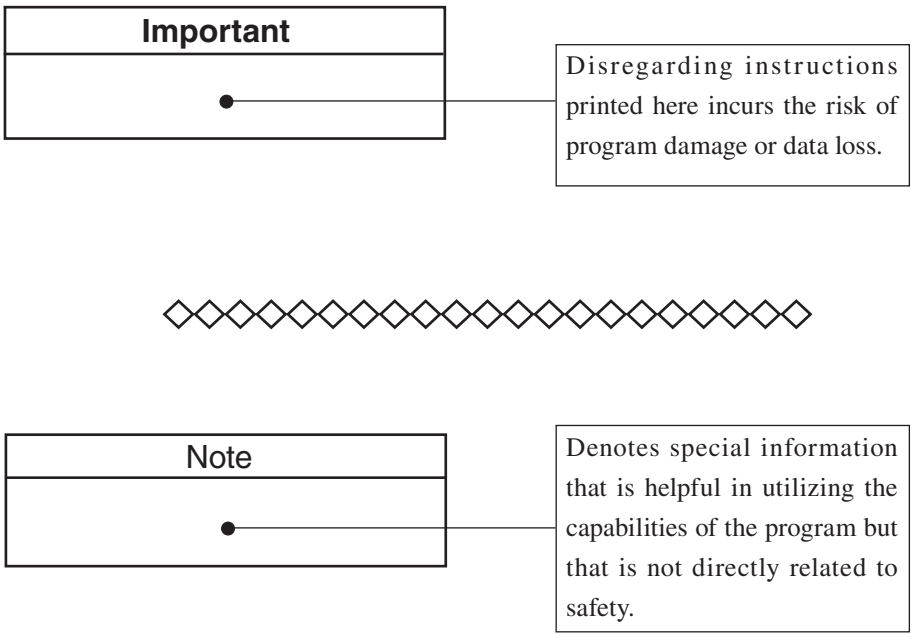
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8. Jurisdiction

   Any disputes or litigation arising from this agreement will be under the jurisdiction of the Tokyo District Court.

FOR SAFETY

In this manual, important safety instructions are specially marked as shown below. To prevent the risk of severe damage to the program or peripheral equipment, make sure that all instructions are fully understood and observed.



Contents

Usage License Agreement iii

FOR SAFETY vii

Outline 1

Change the function to the NX-62RT 3

- NX-62RT installation 3
- Switching to the NX-62RT function 3

Reading the display 4

- Measurement screen 4
- Menu list screen 8
- Explanation of menu screen items 10

Measurement 19

- Measurement procedure 19

Store data format and file structure 22

Card capacity and store time 24

- Using Auto store 24
- When performing waveform recording 25

Recall data 26

Default settings 29

Communication commands 31

- List of commands 31
- Command Description 33

Specifications 49

Outline

The NX-62RT software is designed for installation in the Sound Level Meter NL-62, allowing the unit to function as an octave band and 1/3 octave band real-time analyzer.

Measurement data can be displayed as a graph or in numerical format.
The graph display allows overlaying with previous measurement data.
The indoor noise rating (NC-value) can also be displayed.
Data are stored in CSV format, which allows processing on a computer, using general application software.

Octave and 1/3 octave band analysis can be carried out for the following items.

- Instantaneous sound pressure level L_p
- Equivalent continuous sound pressure level L_{eq}
- Sound exposure level L_E
- Maximum sound pressure level L_{max}
- Minimum sound pressure level L_{min}
- Percentile sound level L_N (1 to 99) 1-increment steps, max. 5 values

Using the partial over all for selected frequency bands, the following items can be measured.

- Instantaneous sound pressure level L_p
- Equivalent continuous sound pressure level L_{eq}
- Sound exposure level L_E
- Maximum sound pressure level L_{max}

As an additional processing 2 function, one of the following items can be measured together with the additional processing value of the NL-62.

- C-weighted equivalent continuous sound level L_{Ceq}
- I-time-weighted equivalent continuous sound level L_{AIeq}
- S-time-weighted maximum sound pressure level (Slow) L_{ASmax}

For details on the NL-62 including information on how to use the operation keys, please refer to the Instruction Manual of the NL-62.

Change the function to the NX-62RT

NX-62RT installation

Follow the procedure described in the separate “Optional program installation / uninstallation” to install the NX-62RT program in the NL-62 unit.

Important
Never format the optional program card with SD memory card formatting software (such as SD Formatter, etc.). Otherwise the program data on the card will be erased and the respective functions can no longer be used. Restoration of the erased program is not warranted.
Upgrade the firmware of the sound level meter to the latest version before installing the optional program. The latest version firmware can be downloaded from “Software downloads” of Support Room on our web site (http://www.rion.co.jp/english/).

Switching to the NX-62RT function

On the menu list screen of the NL-62, select [Option] and press the MENU/ENTER key.

The option screen appears. Use the △/▽ keys to move to the [NX-62RT Octave · 1/3 Octave Real-time Analysis Program] and press the MENU/ENTER key.

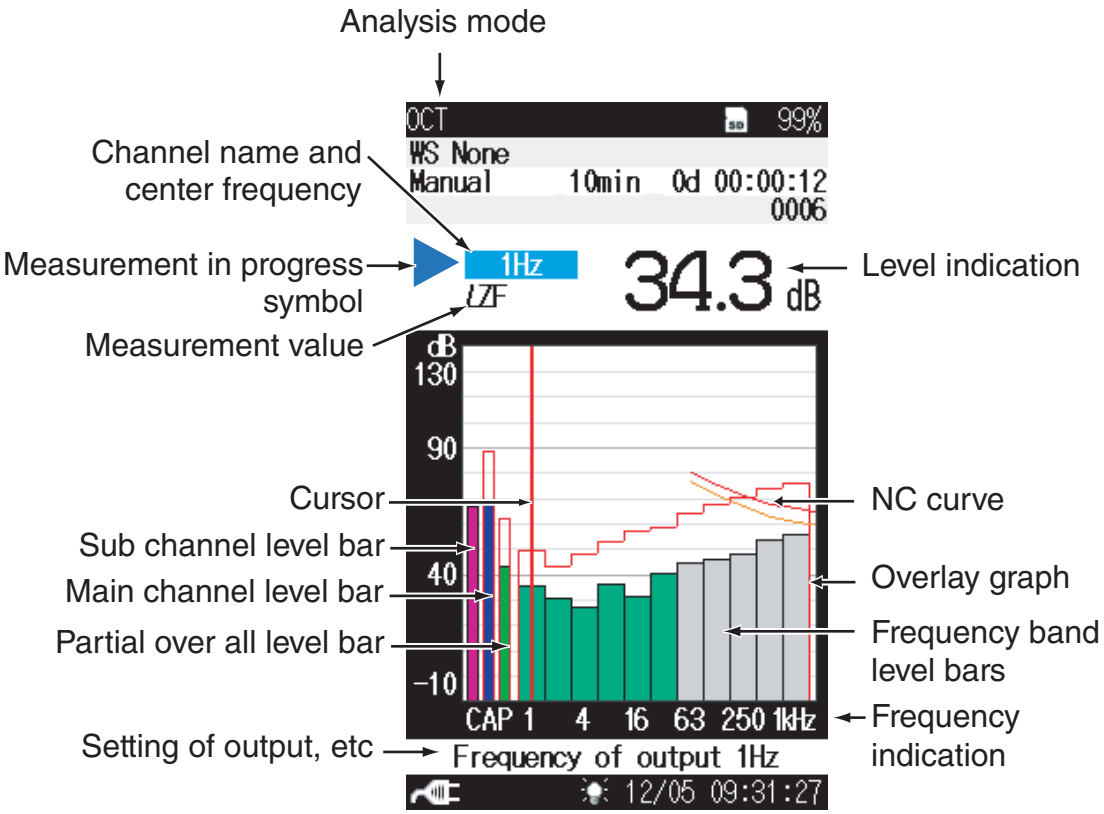
When the message “Please wait” disappears, the function switching procedure is completed, and the unit shows the NX-62RT measurement screen.

Reading the display

Measurement screen

There are two types of measurement screens: graph screen and numeric list screen. You can switch between the two screen types using the controls at the bottom of the menu list screen or in the [Display] screen.

Graph display (GRP)



Analysis mode

Shows the selected analysis mode for the currently displayed screen. “OCT” indicates octave band analysis, and “OCT1/3” indicates 1/3 octave band analysis (see pages 9, 15).

Level indication

Shows the level of the bar selected by the cursor.

Cursor

Selects a channel and frequency band in the currently displayed graph. Use the ◁/▷ keys to move the cursor.

Overlay graph

When the [Overlapping] setting is ON, the measured data are shown together with a graph for saved data (see page 12).

Frequency band level bars

Show the level value in each frequency band as a bar graph. When octave band analysis is selected, 15 bands from 1 Hz to 16 kHz are shown. When 1/3 octave band analysis is selected, 44 bands from 1 Hz to 20 kHz are shown. The frequency bands selected for partial over all are shown in light green in the graph.

Frequency indication

Indicators for 1 Hz, 4 Hz, 16 Hz, 63 Hz, 250 Hz, 1 kHz, 4 kHz, and 16 kHz are shown here on a horizontal axis, as a guide to the frequencies of the level bar graph display.

Setting of output, etc

Pressing and holding the DISPLAY key cycles the display through the following indications: The number of waveform recording, LPF setting, Freq. response for AC OUT (or Output frequency), The number of waveform recording...

- The number of waveform recording (during measurement only)

  When the [Wave Rec Mode] on the Wave recording screen was selected, the number of recorded WAV files is shown here.
- LPF setting

  When the [LPF setting] was selected on the measurement screen, the cutoff frequency is shown here.
- Freq. response for AC OUT

  When the frequency weighting characteristic was selected on the [AC OUT] of the [I/O] menu screen, the selected characteristic is shown here.
- Output frequency

  When “BAND” was selected on the [AC OUT] of the I/O menu screen, the set output frequency band is shown here.

Partial over all level bar

If [Partial Over All] is selected on the Measure menu screen, the partial over all (POA) for the selected frequency band range is shown by this green level bar. The indication “P” is shown below the bar (see page 16).

Main channel level bar

The level of the main channel (MAIN) is shown by this blue bar. The frequency weighting characteristic is indicated below the bar.

Sub channel level bar

The level of the sub channel (SUB) is shown by this pink bar. The frequency weighting characteristic is indicated below the bar.

NC curve

Shows the NC curve selected on the Display menu screen (see page 12).

Measurement value

Shows the measurement value of the bar selected with the cursor.

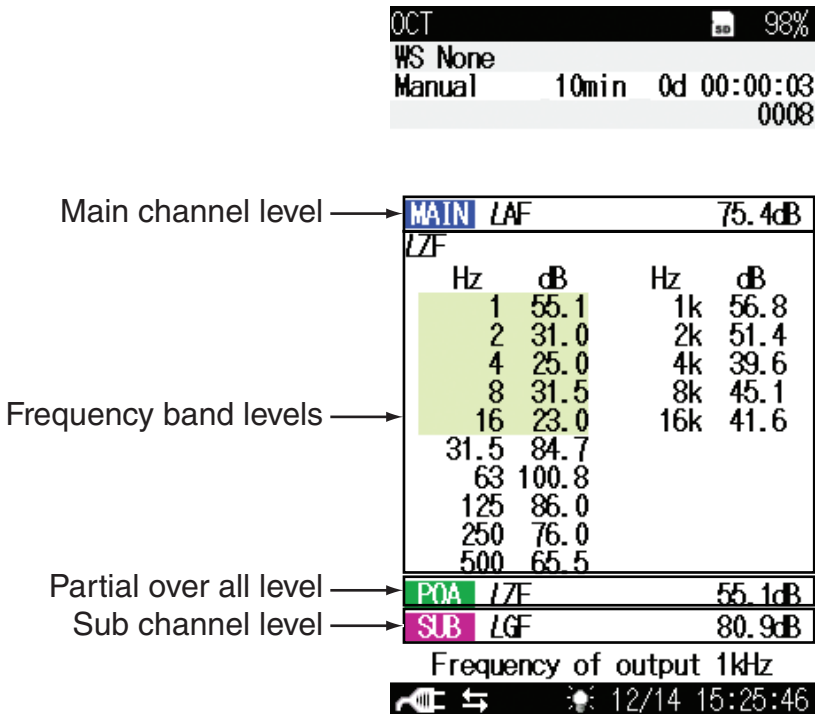
Measurement in progress symbol

Flashes during measurement.

Channel name and center frequency

Shows the name and center frequency of the frequency band selected with the cursor.

Numeric list display (NUM)



Main channel level

Shows the level value and the measurement calculation of the main channel (MAIN).

Frequency band levels

Show the level value in each frequency band and the measurement calculation. During 1/3 octave band analysis, the ◁/▷ keys can be used to shift the frequency band. The frequency bands selected for partial over all are highlighted in light green.

Partial over all level

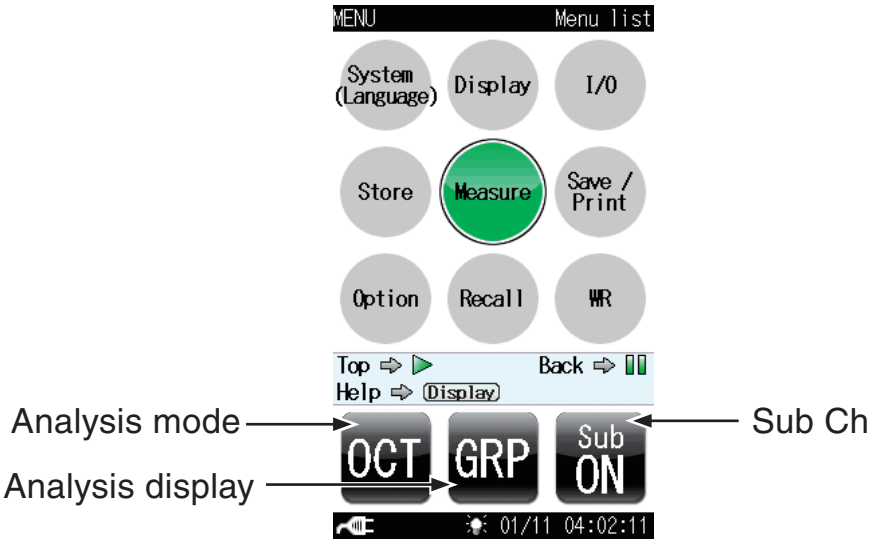
Shows the partial over all (POA) level value and the measurement calculation.

Sub channel level

Shows the level value and the measurement calculation of the sub channel (SUB).

Menu list screen

When the measurement screen is displayed, pressing the MENU/ENTER key brings up the menu list screen as shown below.
Use the △/▽/◁/▷ keys to select the desired menu and press the MENU/ENTER key.
Pressing the DISPLAY key displays explanation screen of the item that has been selected.
Pressing the PAUSE/CONT key or the START/STOP key switches back to the measurement screen.



Note
Because the explanation shown when the DISPLAY key is pressed applies in part also to the sound level meter function, there will be functions that cannot be used.

The following settings of Analysis mode, Analysis display and Sub Ch can be done with the touch panel. (The current setting is shown when the menu list screen is displayed.) Touch the screen directly with your finger.

Analysis mode

Selects the analysis mode.

Each press of the “Analysis mode” on the screen with the finger cycles through the following settings.

“OCT”, “1/3 OCT”

Analysis display

Selects the analysis display.

Each press of the “Analysis display” on the screen with the finger cycles through the following settings.

“GRP”, “NUM”

Sub Ch

Selects whether or not to display the measurement calculation of the sub channel measurement.

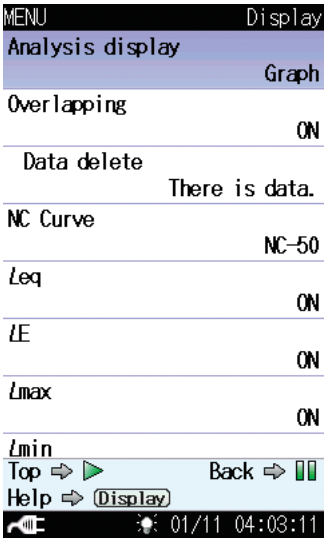
Each press of the “Sub Ch” on the screen with the finger cycles through the ON and OFF.

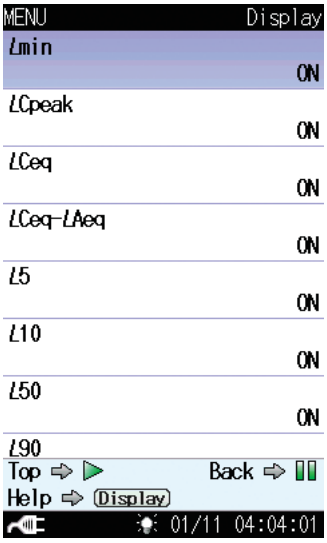
Explanation of menu screen items

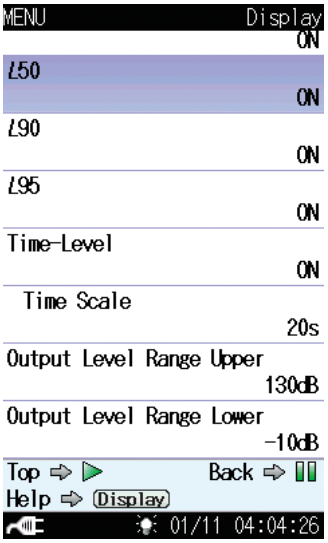
This section explains items on the various menu screens that are related to the NX-62RT function. For information on other items, please refer to the Instruction Manual of the NL-62.

Display

This screen sets the measurement calculation and other items displayed on the measurement screen.







Analysis display

Switches the format in which data are shown.

Selecting [Analysis display] and pressing the MENU/ENTER key brings up the screen to select the display format. Use the △/▽ keys to select [Graph] or [Numeric list] and press the MENU/ENTER key. The setting made here has the same effect as using the touch panel on the menu list screen.

Overlapping

Selects whether the measurement data preceding the currently displayed data are shown as an overlay.

Select [Overlapping] and press the MENU/ENTER key. The ON/OFF setting screen appears.

Use the △/▽ keys to select the ON/OFF setting and press the MENU/ENTER key.

Note
For some settings, overlapping data may not be available.

Data delete

This item is shown when [Overlapping] was set to ON.

When the display shows [There is data], loaded data are used for overlay when a new measurement is started in graph display mode.

When the display shows [There is no data], overlay display is activated only after data have been loaded. For information on how to load data, refer to page 27.

When the display shows [There is data], pressing the MENU/ENTER key brings up a confirmation screen for deleting data. Select [Yes] and press the MENU/ENTER key if the data can be deleted. Selecting [No] and pressing the MENU/ENTER key causes the unit to return to the Display menu screen.

NC Curve

Shows a noise criteria curve based on permissible noise values for each frequency. This is used to evaluate room noise levels etc.

Select [NC Curve] and press the MENU/ENTER key. The NC curve selection screen appears. Use the △/▽ keys to select [OFF], [NC-15], [NC-20], [NC-25], [NC-30], [NC-35], [NC-40], [NC-45], [NC-50], [NC-55], [NC-60], or [NC-65], and press the MENU/ENTER key.

Note
The NC curve is displayed only when the store mode is Manual and octave band analysis is carried out.
The NC curve is shown for two values: the selected value and the one below. (If [NC-50] is selected, the curve for “NC-50” and “NC-45” is shown.) If [NC-15] is selected, only that curve is shown.
The frequency weighting characteristic C or Z of the measurement frequency band and the Low Pass Filter OFF setting are recommended for evaluation with NC curve.

Output Level Range Lower

Displays the screen to set the lower bound value of the bar graph on the measurement screen.

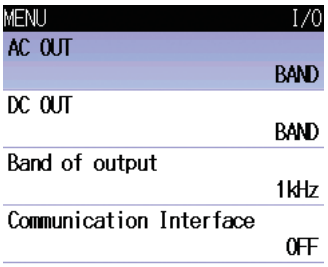
Select [Output Level Range Lower] and press the MENU/ENTER key. The lower limit of bar graph screen appears.

Use the △/▽ keys to set the value (-10 to 80, 10 dB step: differs from NL-62). Then press the MENU/ENTER key.

The value of lower limit cannot be set the value set by the [Output Level Range Upper] or more.

I/O

This screen sets the type of output signal etc.





Note
The NX-62RT program does not support comparator signal output.

AC OUT

Displays the screen to select the type of frequency weighting characteristic of the signal output from the AC OUT connector of the unit.

Select [AC OUT] and press the MENU/ENTER key. The AC OUT setting screen appears.

Use the △/▽ keys to select the frequency weighting characteristic (OFF, Inter lock, A, C, Z, G, BAND) and press the MENU/ENTER key.

When [BAND] is selected, the AC signal for the frequency band selected under [Band of output] is output.

DC OUT

Displays the screen to select the type of DC signal output from the DC OUT connector of the unit.

Select [DC OUT] and press the MENU/ENTER key. The DC OUT setting screen appears.

Use the △/▽ keys to select the type of DC signal output (OFF, MAIN, BAND) and press the MENU/ENTER key.

When [MAIN] is selected, a DC signal corresponding to the level in the main channel is output. When [BAND] is selected, a DC signal corresponding to the level in the frequency band selected under [Band of output] is output.

Note
If [BAND] is selected for the [AC OUT] or [DC OUT], [BAND] will also be selected for the other output.
When [BAND] is selected for [AC OUT] and [DC OUT], and the setting for [AC OUT] is changed to another setting, the setting for [DC OUT] will be changed to [MAIN]. When the setting for [DC OUT] is changed from [BAND] to another setting, the setting for [AC OUT] will be changed to [Inter lock].

Band of output

This setting is shown when [BAND] is selected for the [AC OUT] or [DC OUT]. The setting selects the frequency band for which a corresponding signal is output at the AC OUT connector and DC OUT connector of the unit.

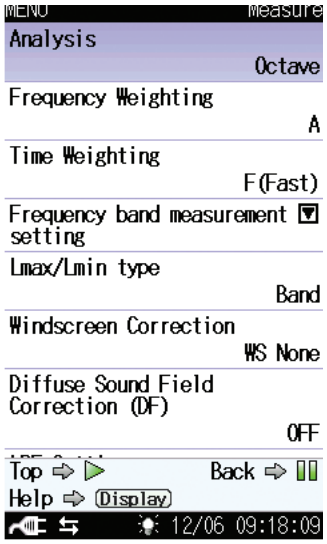
Select [Band of output] and press the MENU/ENTER key. The frequency band selection screen appears. Use the △/▽ keys to select the frequency band and press the MENU/ENTER key.

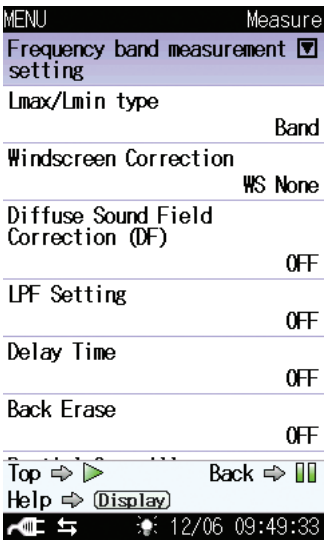
For octave band analysis, the available settings are as follows:
[1Hz], [2Hz], [4Hz], ..., [16kHz].

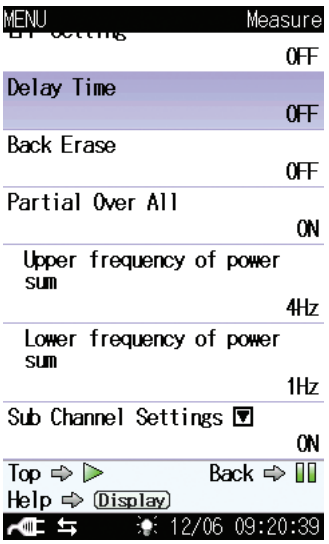
For 1/3 octave band analysis, the available settings are as follows:
[1Hz], [1.25Hz], [1.6Hz], ..., [20kHz].

Measure

This screen sets the analysis mode, measurement correction, etc.







Analysis

Displays the screen to select the analysis mode.

Select [Analysis] and press the MENU/ENTER key. The analysis screen appears.

Use the △/▽ keys to select the analysis mode (Octave, 1/3 octave) and press the MENU/ENTER key. The same can be performed using the touch panel on the menu list screen.

Frequency band measurement setting▣

Sets the frequency weighting and time weighting for the frequency band. (It is necessary to set up aside from a setup of a main channel and a sub channel.)

Select [Frequency band measurement setting] and press the MENU/ENTER key. The frequency band screen appears.

Frequency Weighting

Displays the screen to select the frequency weighting characteristics for the frequency band.

Select [Frequency Weighting] and press the MENU/ENTER key. The frequency weighting screen appears.

Use the △/▽ keys to select the frequency weighting characteristics (A, C, Z, G) and press the MENU/ENTER key.

Time Weighting

Displays the screen to select the time weighting characteristics for the frequency band.

Select [Time Weighting] and press the MENU/ENTER key. The time weighting screen appears.

Use the △/▽ keys to select the time weighting characteristics (F[Fast], S[Slow], 10s) and press the MENU/ENTER key.

Lmax/Lmin type

Sets the format in which the maximum value and minimum value analysis result is displayed.

Select [Lmax/Lmin Type] and press the MENU/ENTER key. The display type selection screen appears. Use the △/▽ keys to select “Band” or “AP” and press the MENU/ENTER key.

When “Band” is selected, the maximum and minimum analysis result values occurring within the processing time are shown for each frequency band.

When “AP” is selected, the maximum and minimum analysis result values occurring within the processing time are shown for the all-pass level of the main channel.

Partial Over All

Selects whether the partial over all (POA) for a range of user-selected frequency bands is displayed.

Select [Partial Over All] and press the MENU/ENTER key. The ON/OFF selection screen appears. Use the △/▽ keys to select the ON/OFF setting and press the MENU/ENTER key.

Upper frequency of power sum

This item is shown when [Partial Over All] was set to ON. Specify the highest frequency band to use for partial over all calculation.
Select [Upper frequency of power sum] and press the MENU/ENTER key. The upper limit frequency band selection screen appears. Use the △/▽ keys to select the frequency band to use as upper limit and press the MENU/ENTER key.

For octave band analysis, the available settings are as follows:
[1Hz], [2Hz], [4Hz], ..., [16kHz].

For 1/3 octave band analysis, the available settings are as follows:
[1Hz], [1.25Hz], [1.6Hz], ..., [20kHz].

If the frequency band selected for [Upper frequency of power sum] is lower than the frequency band selected for [Lower frequency of power sum], the frequency band for [Lower frequency of power sum] will be set to the same frequency band as the [Upper frequency of power sum] setting.

Lower frequency of power sum

This item is shown when [Partial Over All] was set to ON. Specify the lowest frequency band to use for partial over all calculation.
Select [Lower frequency of power sum] and press the MENU/ENTER key. The lower limit frequency band selection screen appears. Use the △/▽ keys to select the frequency band to use as lower limit and press the MENU/ENTER key.
The available settings are same as [Upper frequency of power sum].

If the frequency band selected for [Lower frequency of power sum] is higher than the frequency band selected for [Upper frequency of power sum], the frequency band for [Upper frequency of power sum] will be set to the same frequency band as the [Lower frequency of power sum] setting.

Setting the Additional Processings 2

When [Sub Channel Settings] is set to ON, one of the following values can also be measured, along with the regular additional processing function that is carried out simultaneously with the main channel measurement. (The measurement calculation is fixed.)

- C-weighted equivalent continuous sound level L_{Ceq}
- I-time-weighted equivalent continuous sound level L_{AIeq}
- S-time-weighted maximum sound pressure level (Slow) L_{ASmax}

Note
The additional processing data will only be displayed if the Additional Processing 2 item under [Display] in the menu list screen is set to [ON].
When the frequency weighting for the main channel is set to [A], the Additional Processing 2 setting can be used to show the difference between L_{Ceq} and L_{Aeq} in the main channel or the difference between L_{AIeq} and L_{Aeq} in the main channel.

Measurement

Measurement procedure

1. Press the POWER key to turn the unit on.
   After the power-on screen has been shown, the measurement screen appears.
   The measurement parameter settings that were active before the unit was turned off will show on the screen. Therefore the actual display may not always be the same.
2. Set the analysis mode. Press the MENU/ENTER key and use the touch panel on the menu list screen to select “Octave analysis” or “1/3 octave analysis”. The analysis mode can also be selected via the [Measure] item in the menu list screen.
3. Set the display screen for measurement. Use the touch panel on the menu list screen to select “GRP” (Graph) or “NUM” (Numeric list). The setting can also be made via the [Display] item in the menu list screen.
4. Select [Display] on the menu list screen and set the upper and lower limit of the bar graph. Choose a setting in which the bar graph indication registers to about the middle of the range.
5. Set the required items under “Measure” in the menu list screen.
6. Using the [Display] item in the menu list screen, select [ON] for the measurement calculation that should be shown in addition to the sound level. Also make settings for graph overlay and NC curve display, as required.
7. Using the [Store] item in the menu list screen, select the store mode and the measurement parameters.

8. Return to the measurement screen and press the START/STOP key to start the measurement.
   At this point, previous measurement values are cleared.
   While the measurement is in progress, the ▶ symbol flashes and the elapsed time is displayed. In addition, the indicator LED flashes red.
   When the measurement time has elapsed, the measurement is terminated automatically.
   To terminate the measurement before the allocated time, press the START/STOP key.

   During measurement, the PAUSE/CONT key can be used to pause and resume the measurement (only manual store mode). During pause, the pause symbol (II) is shown and the indicator LED flashes blue.

- Pressing the DISPLAY key during or after measurement switches the measurement value shown on the display screen in the following order.

  $L_p \rightarrow L_{eq} \rightarrow L_E \rightarrow L_{max} \rightarrow L_{min} \rightarrow L_{N1} \rightarrow L_{N2} \rightarrow L_{N3} \rightarrow L_{N4} \rightarrow L_{N5} \rightarrow$ Additional processings $\rightarrow$ Time-Level $\rightarrow L_p$

  The measurement value which is set [OFF] is skipped except L_p.

- While the graph display screen is shown during or after measurement, the ◁/▷ keys can be used to move the cursor that selects the center frequency to display. The frequency band under the cursor and its numeric value reading are shown at the top of the screen.
  The center frequencies for the band level bar graphs are as follows.

  For octave band analysis:
  From left 1 Hz, 2 Hz, 4 Hz, ..., 16 kHz

  For 1/3 octave band analysis:
  From left 1 Hz, 1.25 Hz, 1.6 Hz, ..., 20 kHz

- After measurement is completed, you can use the menu list screen or the [Display] item on the menu list screen to switch between graph display and numeric list display.

- While no measurement is in progress, pressing the PAUSE/CONT key will freeze the sound level displayed at that point. Press the PAUSE/CONT key again to cancel the display freeze.

- The number of L_p store data per file is 36000 for the NL-62 and 18000 for the NX-62RT.
  For example, if the L_p store interval is set to [100ms], the NL-62 will create one file per hour and the NX-62RT will create one file per 30 minutes.

Note
After installation is complete, the SD memory card from which the NX-62RT program was installed can be used as a memory card for storing data.
Prior to measurement, it is recommended to format the memory card for storing data once with this unit.

Store data format and file structure

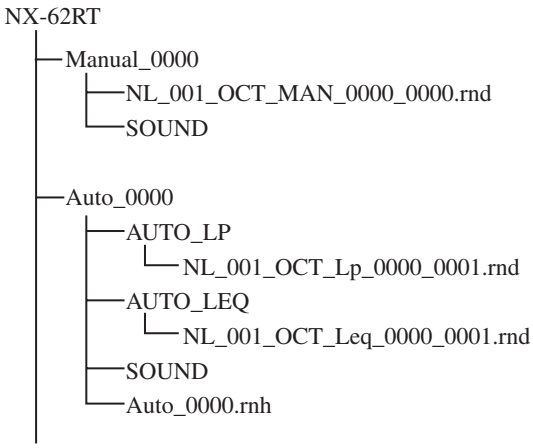
Data stored on the SD memory card are in CSV format (.rnd). Various files and subdirectories are created on the card.

Folder and file names that are used for saving data differ, depending on the selected store mode.

Store destination folder

Files are saved in the store folder specified by store name. The store name specified on the menu screen is created as a 4-digit number under the sub-directory name.

When a file with the same name exists in the same directory, it will always be overwritten. A sample configuration is shown below.



Important
Use SD memory cards provided by Rion. The performance of other cards is not guaranteed.
Note that we assume no responsibility for any damage or loss of stored measurement data.

File name of data

Files of data are named as shown below.



Store mode: The file name varies depending on the store mode.

- Manual store: MAN
- Auto store (L_p store): Lp
- Auto store (L_{eq} calculation): Leq

Store name: 0000 to 9999

Address: Manual store is fixed to 0000

Card capacity and store time

The measurement duration for which data can be stored on an SD memory card depends on the capacity of the inserted card. Approximate times are listed below.

Using Auto store

Octave band analysis

Only L_p store interval set

		SD memory card capacity	
		512 MByte	2 GByte
L_p store interval	100 ms	56 h.	227 h.
	1 s	649 h.	2611 h.

Only L_{eq} processing interval set

	SD memory card capacity	
	512 MByte	2 GByte
Data sets	291,000 sets	1,171,000 sets

1/3 Octave band analysis

Only L_p store interval set

		SD memory card capacity	
		512 MByte	2 GByte
L_p store interval	100 ms	29 h.	117 h.
	1 s	313 h.	1259 h.

Only L_{eq} processing interval set

	SD memory card capacity	
	512 MByte	2 GByte
Data sets	124,000 sets	499,000 sets

Octave band and 1/3 octave band analysis

Number of bytes per header file

About 1500 bytes per file

When performing waveform recording

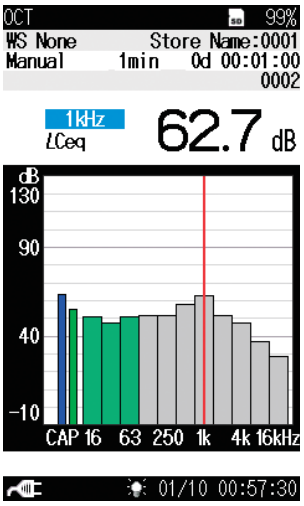
Using Auto store, 16 bit

		SD memory card capacity	
		512 MByte	2 GByte
Sampling frequency (Hz)	48 k	1 h.	4 h 40 min.
	24 k	2 h 10 min.	9 h 20 min.
	12 k	4 h 20 min.	18 h 50 min.

The duration of recording with 24 bit becomes shorter than that with 16 bit because the data volume of 24 bit is about 1.5 times more.

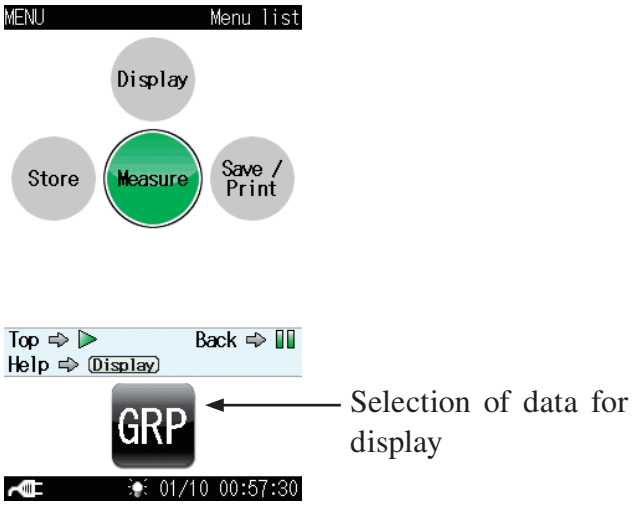
Recall data

Use the [Recall] item in the menu list screen to call up saved measurement data onto the display (see the NL-62 Instruction Manual).



Recall data display screen (graph display)

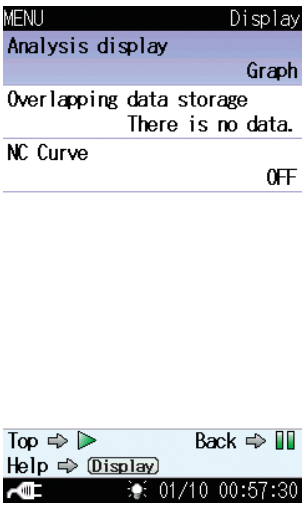
Pressing the MENU/ENTER key while the recall data display screen is shown brings up the recall data menu list screen. Pressing the PAUSE/CONT key returns the unit to the recall data display screen.



Recall data menu list screen

The touch panel function allows direct selection of data for display, and switching between graph display and numeric list display.

Selecting [Display] on the recall data menu list screen and then pressing the MENU/ENTER key brings up the following screen. Pressing the PAUSE/CONT key returns the unit to the recall data menu list screen.



Analysis display

Switches the format in which data are shown.

Selecting [Analysis display] and pressing the MENU/ENTER key brings up the screen to select the display format. Use the △/▽ keys to select [Graph] or [Numeric list], and press the MENU/ENTER key. The setting made here has the same effect as using the touch panel on the recall data menu list screen.

Overlapping data storage

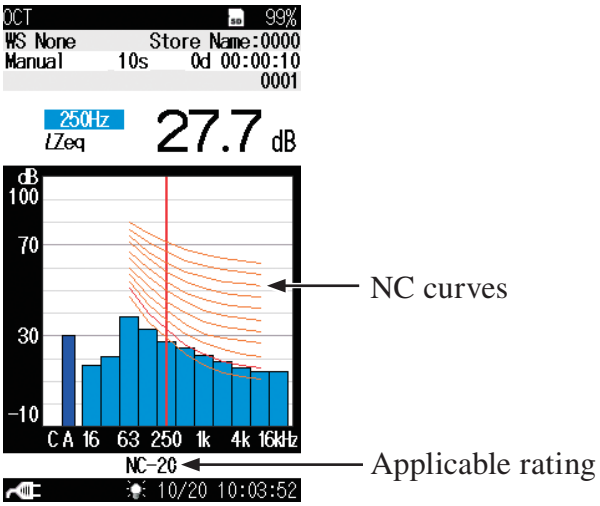
Saves recalled data for use on the overlay display. If there are already saved data, the indication “There is data.” is shown, otherwise the indication “There is no data.” is shown. Selecting [Overlapping data storage] and pressing the MENU/ENTER key saves the recalled data for overlay use.

Note
Data saved for overlay use have a yellow background on the graph display.

NC curve

Selects whether NC curves are shown for recalled data. Select [NC Curve] and press the MENU/ENTER key, select [ON], and press the MENU/ENTER key again. This will cause all NC curves from NC-15 to NC-65 to be shown on the recall data display screen. The applicable rating is shown below the measurement results.

Note
Ratings for measurement results are shown only when the store mode is Manual, and the L_{eq} graph screen for saved octave analysis data is shown.
The frequency weighting characteristic C or Z of the measurement frequency band and the Low Pass Filter OFF setting are recommended for evaluation with NC curve.



Recall data display screen with NC curves

Default settings

The factory default settings of the unit are listed below.

Analysis	Octave
Main channel frequency weighting	A
Main channel time weighting	F(Fast)
Frequency band measurement frequency weighting	A
Frequency band measurement time weighting	F(Fast)
L_{max}/L_{min} Type	Band
Windscreen correction	WS None
Diffuse sound field correction (DF)	OFF
LPF Setting	OFF
Delay time	OFF
Back erase	OFF
Partial over all	OFF
Upper frequency of power sum	16 kHz
Lower frequency of power sum	16 Hz
Sub channel settings	OFF
Sub channel frequency weighting	A
Sub channel time weighting	F(Fast)
Setting the additional processings	OFF
Setting the additional processings 2	OFF
Backlight auto off	30 s
Backlight brightness	2
LCD auto off at auto store	OFF
Battery type	Alkaline
Index	1
Touch panel lock	OFF
Analysis display	Graph
Overlapping	OFF
NC curve	OFF
L_{eq}	ON
L_E	OFF
L_{max}	ON

L_{min} ..... OFF
L_{N1} ($L05$) ..... OFF
L_{N2} ($L10$) ..... OFF
L_{N3} ($L50$) ..... ON
L_{N4} ($L90$) ..... OFF
L_{N5} ($L95$) ..... OFF
Time-Level ..... ON
Time scale ..... 20 s
Output level range upper ..... 130 dB
Output level range lower ..... 30 dB
AC OUT ..... Inter lock
DC OUT ..... MAIN
Band of output (only AC OUT and DC OUT are set to BAND) .... 16 Hz
Communication interface ..... OFF
Baud rate ..... 9600 bps
Store mode ..... Manual
Store name 0000
Measurement time ..... 10 min
Calibration mode ..... Internal

When you turn power to the unit on while holding down the START/STOP key, the unit will be initialized to the above settings. When wishing to set the unit to the factory default values, select [menu] → [system – Read/Save Setting] → [Load Default Settings] and then press the MENU/ENTER key (please refer to the chapter “Setup Files” of the NL-62 instruction manual). The time, language and store data are not initialized.

Communication commands

This section lists commands about the function of the NX-62RT. For information on other commands, please refer to the documentation (Serial Interface Manual) of the NL-62.

List of commands

S: Setting command (for making NX-62RT settings)

R: Request command (for obtaining information on NX-62RT status and the measurement value)

Command	Function	See page
Display Calculate Type	Display calculate type (S/R)	33
AC OUT	AC out (S/R)	33
DC OUT	DC out (S/R)	34
Output Band Frequency	Output band frequency (S/R)	34
Output Band Offset	Output band frequency offset (S/R)	35
Lmax Type	L_{max}/L_{min} type (S/R)	35
Lp Store Interval	L_p store interval (S/R)	36
Meas Parallel	Additional processing 2 (S/R)	36
Frequency Weighting (Band)	Frequency weighting of frequency band (S/R)	36
Time Weighting (Band)	Time weighting of frequency band (S/R)	37
Octave Mode	Analysis mode (S/R)	37
Display Partial Over All	Display partial over all (S/R)	37
Upper Limit Frequency	Upper limit frequency (S/R)	38
Upper Limit Frequency Offset	Upper limit frequency offset (S/R)	39
Lower Limit Frequency	Lower limit frequency (S/R)	40
Lower Limit Frequency Offset	Lower limit frequency offset (S/R)	41
Wave Level Trigger Band	Wave level trigger band position (S/R)	42

Wave Level Trigger Band Offset

	Wave level trigger band position offset (S/R) 43
DOD	Output displayed value (R) 44
DRD	Continuous output (R) 47

Command Description

Display Calculate Type

Display calculate type

Setting the calculate type displayed on a screen

Setting command	Display␣Calculate␣Type, p1
Parameter	p1= “Lp”
	p1= “Leq”
	p1= “LE”
	p1= “Lmax”
	p1= “Lmin”
	p1= “LN1”
	p1= “LN2”
	p1= “LN3”
	p1= “LN4”
	p1= “LN5”
	p1= “Ly” (Additional processing)
Request command	Display␣Calculate␣Type?
Response data	d1
Returned value	Same as for setting command

AC OUT

AC out

Setting AC output

Setting command	AC␣OUT, p1
Parameter	p1= “Off”
	p1= “Main” (Inter lock)
	p1= “A”
	p1= “C”
	p1= “Z”
	p1= “G”
	p1= “Band”
Request command	AC␣OUT?
Response data	d1
Returned value	Same as for setting command

DC OUT

DC out

Setting DC output

Setting command	DC␣OUT, p1
Parameter	p1= “Off”
	p1= “Main”
	p1= “Band”
Request command	DC␣OUT?
Response data	d1
Returned value	Same as for setting command

Output Band Frequency

Output band frequency

Setting frequency band for BAND output of AC signal and DC signal

Setting command	Output␣Band␣Frequency, p1
Parameter	p1= “1Hz”
	p1= “2Hz”
	p1= “4Hz”
	p1= “8Hz”
	p1= “16Hz”
	p1= “31Hz”
	p1= “63Hz”
	p1= “125Hz”
	p1= “250Hz”
	p1= “500Hz”
	p1= “1kHz”
	p1= “2kHz”
	p1= “4kHz”
	p1= “8kHz”
	p1= “16kHz”
Request command	Output␣Band␣Frequency?
Response data	d1
Returned value	Same as for setting command

Output Band Offset

Output band frequency offset

Setting output band offset

Divides the frequency of the output band for 1/3 octave band analysis into three values

“Low” setting is not available when the output band is set to “1 Hz”

Example: When the output band is set to “1kHz”, “Low” will be 800 Hz, “Center” 1 kHz, and “High” 1.25 kHz.

Setting command	Output␣Band␣Offset, p1
Parameter	p1= “Low”
	p1= “Center”
	p1= “High”
Request command	Output␣Band␣Offset?
Response data	d1
Returned value	Same as for setting command

Lmax Type

L_{max}/L_{min} type

Setting Lmax/Lmin type on measure screen

Setting command	Lmax␣Type, p1
Parameter	p1= “Band”
	p1= “AP”
Request command	Lmax␣Type?
Response data	d1
Returned value	Same as for setting command

Lp Store Interval

L_p store interval

Setting L_p store interval

Setting command	Lp␣Store␣Interval, p1
Parameter	p1= “Off”
	p1= “100ms”
	p1= “1s”
Request command	Lp␣Store␣Interval?
Response data	d1
Returned value	Same as for setting command

Meas Parallel

Additional processing 2

Setting additional processing 2 type

Setting command	Meas␣Parallel, p1
Parameter	p1= “Off”
	p1= “LAIeq”
	p1= “LCeq”
	p1= “LASmax”
Request command	Meas␣Parallel?
Response data	d1
Returned value	Same as for setting command

Frequency Weighting (Band)

Frequency weighting of frequency band

Setting frequency weighting of frequency band

Setting command	Frequency␣Weighting␣(Band), p1
Parameter	p1= “A”
	p1= “C”
	p1= “Z”
	p1= “G”
Request command	Frequency␣Weighting␣(Band)?
Response data	d1
Returned value	Same as for setting command

Time Weighting (Band)

Time weighting of frequency band

Setting time weighting of frequency band

Setting command	Time␣Weighting␣(Band), p1
Parameter	p1= “F”
	p1= “S”
	p1= “10s”
Request command	Time␣Weighting␣(Band)?
Response data	d1
Returned value	Same as for setting command

Octave Mode

Analysis mode

Setting analysis mode

Setting command	Octave␣Mode, p1
Parameter	p1= “Octave”
	p1= “1/3␣Octave”
Request command	Octave␣Mode?
Response data	d1
Returned value	Same as for setting command

Display Partial Over All

Display partial over all

Setting ON/OFF of partial over all display

Setting command	Display␣Partial␣Over␣All, p1
Parameter	p1= “Off”
	p1= “On”
Request command	Display␣Partial␣Over␣All?
Response data	d1
Returned value	Same as for setting command

Upper Limit Frequency

Upper limit frequency

Setting upper limit frequency band of partial over all

Setting command	Upper␣Limit␣Frequency, p1
Parameter	p1= “1Hz”
	p1= “2Hz”
	p1= “4Hz”
	p1= “8Hz”
	p1= “16Hz”
	p1= “31Hz”
	p1= “63Hz”
	p1= “125Hz”
	p1= “250Hz”
	p1= “500Hz”
	p1= “1kHz”
	p1= “2kHz”
	p1= “4kHz”
	p1= “8kHz”
	p1= “16kHz”
Request command	Upper␣Limit␣Frequency?
Response data	d1
Returned value	Same as for setting command

Upper Limit Frequency Offset

Upper limit frequency offset

Offset for upper limit frequency band for partial over all

Divides the frequency of the upper limit band for 1/3 octave band analysis into three values

“Low” setting is not available when the upper limit frequency is set to “1 Hz”

Example: When the upper limit frequency is set to “1kHz”, “Low” will be 800 Hz, “Center” 1 kHz, and “High” 1.25 kHz.

Setting command	Upper␣Limit␣Frequency␣Offset, p1
Parameter	p1= “Low”
	p1= “Center”
	p1= “High”
Request command	Upper␣Limit␣Frequency␣Offset?
Response data	d1
Returned value	Same as for setting command

Lower Limit Frequency

Lower limit frequency

Setting lower limit frequency band of partial over all

Setting command	Lower␣Limit␣Frequency, p1
Parameter	p1= “1Hz”
	p1= “2Hz”
	p1= “4Hz”
	p1= “8Hz”
	p1= “16Hz”
	p1= “31Hz”
	p1= “63Hz”
	p1= “125Hz”
	p1= “250Hz”
	p1= “500Hz”
	p1= “1kHz”
	p1= “2kHz”
	p1= “4kHz”
	p1= “8kHz”
	p1= “16kHz”
Request command	Lower␣Limit␣Frequency?
Response data	d1
Returned value	Same as for setting command

Lower Limit Frequency Offset

Lower limit frequency offset

Offset for lower limit frequency band for partial over all

Divides the frequency of the lower limit band for 1/3 octave band analysis into three values

“Low” setting is not available when the lower limit frequency is set to “1 Hz”

Example: When the lower limit frequency is set to “1kHz”, “Low” will be 800 Hz, “Center” 1 kHz, and “High” 1.25 kHz.

Setting command	Lower␣Limit␣Frequency␣Offset, p1
Parameter	p1= “Low”
	p1= “Center”
	p1= “High”
Request command	Lower␣Limit␣Frequency␣Offset?
Response data	d1
Returned value	Same as for setting command

Wave Level Trigger Band (only when the NX-42WR is installed)

Wave level trigger band position

Setting the band to use as trigger for waveform level recording

Setting command	Wave␣Level␣Trigger␣Band, p1
Parameter	p1= “Main”
	p1= “Sub”
	p1= “1Hz”
	p1= “2Hz”
	p1= “4Hz”
	p1= “8Hz”
	p1= “16Hz”
	p1= “31Hz”
	p1= “63Hz”
	p1= “125Hz”
	p1= “250Hz”
	p1= “500Hz”
	p1= “1kHz”
	p1= “2kHz”
	p1= “4kHz”
	p1= “8kHz”
	p1= “16kHz”
Request command	Wave␣Level␣Trigger␣Band?
Response data	d1
Returned value	Same as for setting command

Wave Level Trigger Band Offset (only when the NX-42WR is installed)

Wave level trigger band position offset

Setting wave level trigger band position offset

Divides the frequency of the wave level trigger band for 1/3 octave band analysis into three values

"Low" setting is not available when the wave level trigger band is set to "1 Hz"

Example: When the wave level trigger band is set to "1kHz", "Low" will be 800 Hz, "Center" 1 kHz, and "High" 1.25 kHz.

Setting command	Wave␣Level␣Trigger␣Band␣Offset, p1
Parameter	p1= "Low" p1= "Center" p1= "High"
Request command	Wave␣Level␣Trigger␣Band␣Offset?
Response data	d1
Returned value	Same as for setting command

DOD

Output displayed value

Getting displayed value

Send the request command at one second interval or longer.

Request command DOD?

Response data d1,d2,...,d*n* (The number of data changes with the kind of displayed values.)

Octave band analysis

Returned value

d1 = “xxx.x” Sub channel L_p

(When [Sub Channel Settings] is set to OFF, d1 is returned as “␣--.-”)

d2 = “xxx.x” Main channel L_p, L_{eq}, L_E, L_{max}, L_{min}, L_N

d3 = “xxx.x” Partial over all L_p, L_{eq}, L_E, L_{max}

(When [Partial Over All] is set to OFF, d3 is deleted)

d4 = “xxx.x” 1 Hz

d5 = “xxx.x” 2 Hz

d6 = “xxx.x” 4 Hz

•

•

•

d18 = “xxx.x” 16 kHz

d19 = 0 or 1 Overload information (1: Yes, 0: No)

d20 = 0 or 1 Under-range information (1: Yes, 0: No)

1/3 octave band analysis

Returned value

d1 = “xxx.x” Sub channel L_p

(When [Sub Channel Settings] is set to OFF, d1 is returned as “␣--.-”)

d2 = “xxx.x” Main channel L_p, L_{eq}, L_E, L_{max}, L_{min}, L_N

d3 = “xxx.x” Partial over all L_p, L_{eq}, L_E, L_{max}

(When [Partial Over All] is set to OFF, d3 is deleted)

d4 = “xxx.x” 1 Hz

d5 = “xxx.x” 1.25 Hz

d6 = “xxx.x” 1.6 Hz

•
•
•

d47 = “xxx.x” 20 kHz

d48 = 0 or 1 Overload information (1: Yes, 0: No)

d49 = 0 or 1 Under-range information (1: Yes, 0: No)

Additional processings display

Returned value

d1 = “xxx.x” Additional processing
(When [Setting the additional processings.] is set to OFF, d1 is returned as “␣--.-”)

d2 = “xxx.x” Additional processing 2
(When [Setting the additional processings 2.] is set to OFF, d2 is returned as “␣--.-”)

d3 = “xxx.x” L_{Ceq} - L_{Aeq}
(When the calculation is not realized, d3 is returned as “␣--.-”)

d4 = “xxx.x” L_{AIeq} - L_{Aeq}
(When the calculation is not realized, d4 is returned as “␣--.-”)

d5 = 0 or 1 Overload information
(1: Yes, 0: No)

d6 = 0 or 1 Under-range information
(1: Yes, 0: No)

* d1 to d*n* are fixed to 5 digit length as “xxx.x”. Higher digits are padded with spaces as required.
* “␣--.-” shows there is no data. (with a leading space [␣]).

There is no setting command

DRD

Continuous output

L_p data values are sent continuously to the computer every 100 msec
To stop the data transfer, send the stop request code <SUB> (hexadecimal notation: $1A_H$)
This command can be used only when [Communication Interface] is set to [USB]
When the [Wave Rec Mode] on the Wave recording screen is selected, the DRD? is not available. (when optional NX-42WR is installed)

Request command	DRD?
Response data	d0,d1,d2,...,d*n* (The number of data changes with the analysis mode.)

Octave band analysis

Returned value	d0 = “xxx”	Counter (1 to 600)
	d1 = “xxx.x”	Sub channel
	(When [Sub Channel Settings] is set to OFF, d1 is returned as “␣--.-”)	
	d2 = “xxx.x”	Main channel
	d3 = “xxx.x”	Partial over all
	(When [Partial Over All] is set to OFF, d3 is deleted)	
	d4 = “xxx.x”	1 Hz
	d5 = “xxx.x”	2 Hz
	d6 = “xxx.x”	4 Hz
	•	
	•	
	•	
	d18 = “xxx.x”	16 kHz
	d19 = 0 or 1	Overload information (1: Yes, 0: No)
	d20 = 0 or 1	Under-range information (1: Yes, 0: No)

1/3 octave band analysis

Returned value

d0 = “xxx”	Counter (1 to 600)
d1 = “xxx.x”	Sub channel
(When [Sub Channel Settings] is set to OFF, d1 is returned as “␣--.-”)	
d2 = “xxx.x”	Main channel
d3 = “xxx.x”	Partial over all
(When [Partial Over All] is set to OFF, d3 is deleted)	
d4 = “xxx.x”	1 Hz
d5 = “xxx.x”	1.25 Hz
d6 = “xxx.x”	1.6 Hz
•	
•	
•	
d47 = “xxx.x”	20 kHz
d48 = 0 or 1	Overload information (1: Yes, 0: No)
d49 = 0 or 1	Under-range information (1: Yes, 0: No)

* d1 to d*n* are fixed to 5 digit length as “xxx.x”. Higher digits are padded with spaces as required.
* “␣--.-” shows there is no data. (with a leading space [␣]).

There is no setting command

Specifications

Compatible model	Sound Level Meter NL-62
Media	SD memory card, 512 MByte
Applicable standards	IEC 61260:1995 Class 1
	ANSI S1.11-2004 Class 1
	JIS C 1513:2002 Class 1
	JIS C 1514:2002 Class 1
Measurement function	Simultaneous measurement of following items, using selected time weighting and frequency weighting.

Processing (main channel)

Instantaneous sound pressure level	L_p
Equivalent continuous sound pressure level	L_{eq}
Sound exposure level	L_E
Maximum sound pressure level	L_{max}
Minimum sound pressure level	L_{min}
Percentile sound level	L_N (1 to 99, 1-increment steps, max. 5 values)

Processing (sub channel)

Instantaneous sound pressure level	L_p

Additional processing

One of the following measurements can also be selected for simultaneous processing with main processing.

C-weighted equivalent continuous sound level	L_{Ceq}
G-weighted equivalent continuous sound level	L_{Geq}
C-weighted peak sound level	L_{Cpeak}
Z-weighted peak sound level	L_{Zpeak}
I-time-weighted equivalent continuous sound level	L_{AIeq}
Tact-max A-weighted sound level	L_{Atm5}

Maximum I-time-weighted equivalent continuous sound level L_{AImax}

The frequency response of additional processing is associated with that of sub channel. Therefore, L_{AIeq}, L_{Atm5} or L_{AImax} can be selected when the sub channel has A-weighting, L_{Ceq} or L_{Cpeak} can be selected when the sub channel has C-weighting, L_{Zpeak} can be selected when the sub channel has Z-weighting, L_{Geq} can be selected when the sub channel has G-weighting.

Additional processing 2

One of the following measurements can also be selected for simultaneous processing with main processing.

C-weighted equivalent continuous sound level L_{Ceq}

I-time-weighted equivalent continuous sound level L_{AIeq}

S-time-weighted maximum sound pressure level (Slow) L_{ASmax}

Partial over all for frequency bands

Measurement of following items, using partial over all for selected frequency bands.

Instantaneous sound pressure level L_p

Equivalent continuous sound pressure level L_{eq}

Sound exposure level L_E

Maximum sound pressure level L_{max}

Bands

Instantaneous sound pressure level L_p

Equivalent continuous sound pressure level L_{eq}

Sound exposure level L_E

Maximum sound pressure level L_{max}

Minimum sound pressure level L_{min}

Percentile sound level L_N (1 to 99, 1-increment steps, max. 5 values)

Analysis frequency range

Analysis results are weighted with selected frequency characteristics.

Octave analysis

Octave band pass filter

1 Hz to 16 kHz

Configuration 12th-order Butterworth band pass digital filter

Center frequencies

Base-10

1/3 octave analysis

1/3 octave band pass filter

1 Hz to 20 kHz

Configuration 6th-order Butterworth band pass digital filter

Center frequencies

Base-10

Store

Manual store Measurement result and measurement start time are stored manually on an address to address basis.

Measurement time

1 sec to 24 hours

Data store capacity

Up to 1000 data sets in the internal memory.
External memory depends on the card capacity (only the performance of Rion genuine cards is guaranteed).

Auto store The processing result obtained using the specified time interval will be recorded on SD memory card continuously.

L_p store interval

100 ms, 1 s

Main channel L_p, L_{eq}, L_{max}, L_{min} *

∗Only L_p value is stored except 100 ms

Sub channel L_p

Partial over all for frequency bands

L_p

Band pass level L_p

L_{eq} calculation interval

1 sec to 24 hours

Main channel	L_{eq}, L_{max}, L_{min}, L_E, L_N
Additional processing	Selected processing item
Additional processing 2	Selected processing item

Partial over all for frequency bands

L_{eq}, L_{max}, L_E

Band pass level	L_{eq}, L_{max}, L_{min}, L_E, L_N

Data store capacity

The processing result is not stored in the internal memory.

External memory depends on the card capacity (only the performance of Rion genuine cards is guaranteed).

Timer Auto store Start time and repeat interval of trigger occurrence settable

Output

DC output Outputs DC signals corresponding to the level in the frequency weighting selected for processing or frequency band analysis.

DC output:	2.5 V, 25 mV/dB at display full-scale point
Output impedance:	approx. 50 Ω
Load impedance:	10 kΩ minimum

AC output Outputs AC signals with the frequency weighting selected for processing (A, C, Z, G) or frequency band analysis.

Output voltage:	1 Vrms (rms) at display full-scale point
Output impedance:	approx. 600 Ω
Load impedance:	10 kΩ minimum

DC/AC simultaneous output

Enables simultaneous output of DC output and AC output.

Comparator output

None

Overload characteristics

OVER (including OUTPUT OVER) appears in all-pass level AP field when level reaches +8.3 dB of full scale point.

Indoor noise rating (based on the following literature)

NC-value: L.L.Beranek (ed) : Noise and vibration control. McGraw-Hill Book Company, New York, 1971

Overlay graph: Displays the measured data together with the graph based on the recalled data.

Power requirements: Four AA batteries or external power supply.

Battery life (at 23°C):

Alkaline batteries LR6: Approx. 12 hours

Ni-MH secondary batteries: Approx. 12 hours

(Depending on the manufacturer)

Battery life varies depending on the setting of this unit.

Current Consumption

130 mA (normal operation, rated voltage)

Dimensions: 32 (H) × 24 (W) × 2.1 (D) mm

Weight: Approx. 5 g

Supplied accessories

Inspection certificate 1

No. 56771 12-04