Organization of this manual

This manual describes functions and other operation principles of the Octave · 1/3 Octave Real-time Analysis Program NX-42RT.

The manual consists of the chapters listed below. You should also consult the documentation for the Sound Level Meter NL-42/NL-52.

Outline
Gives basic information on the functions of the NX-42RT.

Change the function to the NX-42RT
Explains how to change to the function of the NX-42RT.

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-42RT.

Communication commands
Explains commands about functions of the NX-42RT.

Octave, 1/3 octave band filter
Lists the characteristics of the octave and 1/3 octave band filter in the NX-42RT.

Noise floor
Lists the residual noise (representative value) of the NL-42/NL-52.

Specifications
Lists the technical specifications of the NX-42RT.

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2. If the software does not operate according to specifications, and the cause is the responsibility of Rion, and if this is detected and Rion is informed of this fact within 90 days from the purchase date of the Software, Rion will undertake to remedy the problem free of charge.

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1. You can terminate this Agreement at any time by stopping to use the Software and destroying the Software and all associated documentation.
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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.

**Important**

Disregarding instructions printed here incurs the risk of program damage or data loss.

**Note**

Denotes special information that is helpful in utilizing the capabilities of the program but that is not directly related to safety.
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The NX-42RT software is designed for installation in the Sound Level Meter NL-42/NL-52, 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 \(L_N (1 \text{ to } 99)\) 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 function, one of the following items can be measured together with the additional processing value of the NL-42/NL-52.

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

For details on the NL-42/NL-52 including information on how to use the operation keys, please refer to the Instruction Manual of the NL-42/NL-52.
Change the function to the NX-42RT

NX-42RT installation

Follow the procedure described in the separate “Optional program installation / uninstallation” to install the NX-42RT program in the NL-42/NL-52 unit.

<table>
<thead>
<tr>
<th>Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

| 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.rian.co.jp/english/). |

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>The NX-42RT program can only be installed if the Extended Function Program NX-42EX has been installed in the NL-42/NL-52 first.</td>
</tr>
</tbody>
</table>

Switching to the NX-42RT function

On the menu list screen of the NL-42/NL-52, select [Option] and press the MENU/ENTER key.

The option screen appears. Use the △/▽ keys to move to the [NX-42RT 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-42RT measurement screen.
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

Channel name and center frequency

Measurement in progress symbol

Measurement value

NC curve

Sub channel level bar

Main channel level bar

Partial over all level bar

Setting of output, etc

Overlay graph

Frequency band level bars

Frequency indication

Level indication

Cursor

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 11).

Frequency band level bars
Show the level value in each frequency band as a bar graph. When octave band analysis is selected, 11 bands from 16 Hz to 16 kHz are shown. When 1/3 octave band analysis is selected, 33 bands from 12.5 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 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, Freq. response for AC OUT (or Output frequency), POA upper and lower 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.

• 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.

• POA upper and lower frequency
  Shows the frequency band range selected on the [Partial Over All] of the Measure menu screen.
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 $\langle \rangle$ keys can be used to shift the frequency band. The frequency bands selected for partial overall 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).

---

**Note**

“--.-” is shown when the indicated value is $\pm 10$ dB or lower.
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 $\triangle$/\(\triangledown$/\langle$/\rangle$ 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-42RT function. For information on other items, please refer to the Instruction Manual of the NL-42/NL-52.

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 $\triangle/\triangledown$ keys to select the ON/OFF setting and press the MENU/ENTER key.

<table>
<thead>
<tr>
<th>Note</th>
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<tbody>
<tr>
<td>For some settings, overlapping data may not be available.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Note</th>
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<tbody>
<tr>
<td>The NC curve is displayed only when the store mode is Manual and octave band analysis is carried out.</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>The frequency weighting characteristic C or Z of the measurement frequency band is recommended for evaluation with NC curve.</td>
<td></td>
</tr>
<tr>
<td>NC-value and NC curve are not saved in store data.</td>
<td></td>
</tr>
</tbody>
</table>

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 dB to 80 dB, 10 dB step: differs from NL-42/NL-52). 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-42RT program does not support comparator signal output.

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**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 Δ/▽ keys to select the frequency weighting characteristic (OFF, Inter lock, A, C, Z, 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.

<table>
<thead>
<tr>
<th>Note</th>
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</thead>
<tbody>
<tr>
<td>If [BAND] is selected for the [AC OUT] or [DC OUT], [BAND] will also be selected for the other output.</td>
</tr>
<tr>
<td>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].</td>
</tr>
</tbody>
</table>

**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: [16Hz], [31.5Hz], [63Hz], ..., [16kHz].

For 1/3 octave band analysis, the available settings are as follows: [12.5Hz], [16Hz], [20Hz], ..., [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) 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 $\uparrow/\downarrow$ keys to select the time weighting characteristics (F[Fast], S[Slow]) 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 $\uparrow/\downarrow$ 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 $\uparrow/\downarrow$ keys to select the ON/OFF setting and press the MENU/ENTER key.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>When POA is displayed, each value of the $L_N$ and $L_{\text{min}}$ is disabled.</td>
</tr>
</tbody>
</table>
**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 $\Delta/\nabla$ 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: [16Hz], [31.5Hz], [63Hz], ..., [16kHz].

For 1/3 octave band analysis, the available settings are as follows: [12.5Hz], [16Hz], [20Hz], ..., [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 $\Delta/\nabla$ 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 \(L_{AEq}\)
- S-time-weighted maximum sound pressure level (Slow) \(L_{ASmax}\)

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>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].</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>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_{AEq}) and (L_{AEq}) in the main channel.</td>
</tr>
</tbody>
</table>

| Measurement value of additional processing 2 is displayed as \(Ly2\) within store data. |

Measurement value of additional processing 2 is displayed as \(Ly2\) within store data.
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 (‖) 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.

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

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 16 Hz, 31.5 Hz, 63 Hz, ..., 16 kHz

For 1/3 octave band analysis:
- From left 12.5 Hz, 16 Hz, 20 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-42/NL-52 and 18000 for the NX-42RT.

For example, if the \( L_p \) store interval is set to [100ms], the NL-42/NL-52 will create one file per hour and the NX-42RT will create one file per 30 minutes.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>After installation is complete, the SD memory card from which the NX-42RT program was installed can be used as a memory card for storing data.</td>
</tr>
<tr>
<td>Prior to measurement, it is recommended first to format the memory card for storing data with this unit.</td>
</tr>
</tbody>
</table>
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 subdirectory name.
When a file with the same name exists in the same directory, it will always be overwritten. A sample configuration is shown below.

```
NX-42RT
  Manual_0000
    NL_001_OCT_MAN_0000_0000.rnd
    SOUND
  Auto_0000
    AUTO_LP
      NL_001_OCT_Lp_0000_0001.rnd
    AUTO_LEQ
      NL_001_OCT_Leq_0000_0001.rnd
    SOUND
    Auto_0000.rnh
```

**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.

```
NL_001_OCT_MAN_0123_0000.rnd
```

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. The SD memory card capacity may be less than the capacity indicated depending on the type of the SD memory card.

Using Auto store

Octave band analysis

Only $L_p$ store interval set

<table>
<thead>
<tr>
<th>$L_p$ store interval</th>
<th>SD memory card capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ms</td>
<td>66 h.</td>
</tr>
<tr>
<td>200 ms</td>
<td>136 h.</td>
</tr>
<tr>
<td>$L_{eq, 1s}$</td>
<td>682 h.</td>
</tr>
<tr>
<td>1 s</td>
<td>682 h.</td>
</tr>
<tr>
<td>512 MB</td>
<td>2 GB</td>
</tr>
<tr>
<td>260 h.</td>
<td>532 h.</td>
</tr>
<tr>
<td>2663 h.</td>
<td></td>
</tr>
</tbody>
</table>

Only $L_{eq}$ processing interval set

All processed data except sound level are considered as a single data set, and up to 100,000 data sets can be stored continuously and automatically per a store.

In the case of $L_{eq}$ processing interval set is 10 min, it will be 100,000 sets in about 690 days.

Data set number of total that can be saved on the SD memory card are as follows.

<table>
<thead>
<tr>
<th>SD memory card capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>512 MB</td>
</tr>
<tr>
<td>1,380,000 sets</td>
</tr>
<tr>
<td>2 GB</td>
</tr>
<tr>
<td>354,000 sets</td>
</tr>
</tbody>
</table>
### 1/3 Octave band analysis

**Only \( L_p \) store interval set**

<table>
<thead>
<tr>
<th>SD memory card capacity</th>
<th>512 MB</th>
<th>2 GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ms</td>
<td>36 h.</td>
<td>142 h.</td>
</tr>
<tr>
<td>200 ms</td>
<td>70 h.</td>
<td>275 h.</td>
</tr>
<tr>
<td>( L_{eq, 1s} )</td>
<td>353 h.</td>
<td>1378 h.</td>
</tr>
<tr>
<td>1 s</td>
<td>353 h.</td>
<td>1378 h.</td>
</tr>
</tbody>
</table>

**Only \( L_{eq} \) processing interval set**

All processed data except sound level are considered as a single data set, and up to 100,000 data sets can be stored continuously and automatically per a store.

In the case of \( L_{eq} \) processing interval set is 10 min, it will be 100,000 sets in about 690 days.

Data set number of total that can be saved on the SD memory card are as follows.

<table>
<thead>
<tr>
<th>SD memory card capacity</th>
<th>512 MB</th>
<th>2 GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data sets</td>
<td>160,000 sets</td>
<td>625,000 sets</td>
</tr>
</tbody>
</table>

### 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**

<table>
<thead>
<tr>
<th>SD memory card capacity</th>
<th>512 MB</th>
<th>2 GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling frequency (Hz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 k</td>
<td>1 h.</td>
<td>4 h 40 min.</td>
</tr>
<tr>
<td>24 k</td>
<td>2 h 10 min.</td>
<td>9 h 20 min.</td>
</tr>
<tr>
<td>12 k</td>
<td>4 h 20 min.</td>
<td>18 h 50 min.</td>
</tr>
</tbody>
</table>

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-42/NL-52 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.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data saved for overlay use have a yellow background on the graph display.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>The frequency weighting characteristic C or Z of the measurement frequency band is recommended for evaluation with NC curve.</td>
</tr>
</tbody>
</table>

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)
$L_{\text{max}}/L_{\text{min}}$ Type ................................................. Band
Windscreen correction ..................................................... WS None
Diffuse sound field correction (DF) ................................... 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
$L_{\text{max}}$ ......................................................................... ON
$L_{\text{min}}$ .......................................................................... OFF
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-42/NL-52 instruction manual). The time, language and store data are not initialized.
This section lists commands about the function of the NX-42RT. For information on other commands, please refer to the documentation (Serial Interface Manual) of the NL-42/NL-52.

### List of commands

**S:** Setting command (for making NX-42RT settings)

**R:** Request command (for obtaining information on NX-42RT status and the measurement value)

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wave level trigger band</td>
<td></td>
</tr>
<tr>
<td></td>
<td>position offset (S/R)</td>
<td>41</td>
</tr>
<tr>
<td>DOD</td>
<td>Output displayed value (R)</td>
<td>42</td>
</tr>
<tr>
<td>DRD</td>
<td>Continuous output (R)</td>
<td>45</td>
</tr>
</tbody>
</table>
**Command description**

**Display Calculate Type**

Display calculate type

Setting the calculate type displayed on a screen

<table>
<thead>
<tr>
<th>Setting command</th>
<th>Display Calculate Type, p1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>p1 = “Lp”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Leq”</td>
</tr>
<tr>
<td></td>
<td>p1 = “LE”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Lmax”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Lmin”</td>
</tr>
<tr>
<td></td>
<td>p1 = “LN1”</td>
</tr>
<tr>
<td></td>
<td>p1 = “LN2”</td>
</tr>
<tr>
<td></td>
<td>p1 = “LN3”</td>
</tr>
<tr>
<td></td>
<td>p1 = “LN4”</td>
</tr>
<tr>
<td></td>
<td>p1 = “LN5”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Ly” (Additional processing)</td>
</tr>
</tbody>
</table>

Request command Display Calculate Type?

Response data d1

Returned value Same as for setting command

**AC OUT**

**AC out**

Setting AC output

<table>
<thead>
<tr>
<th>Setting command</th>
<th>AC OUT, p1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>p1 = “Off”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Main” (Inter lock)</td>
</tr>
<tr>
<td></td>
<td>p1 = “A”</td>
</tr>
<tr>
<td></td>
<td>p1 = “C”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Z”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Band”</td>
</tr>
</tbody>
</table>

Request command AC OUT?

Response data d1

Returned value Same as for setting command
**DC OUT**

**DC out**

Setting DC output

<table>
<thead>
<tr>
<th>Setting command</th>
<th>DC OUT, p1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>p1= “Off”</td>
</tr>
<tr>
<td></td>
<td>p1= “Main”</td>
</tr>
<tr>
<td></td>
<td>p1= “Band”</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Setting command</th>
<th>Output Band Frequency, p1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>p1= “16Hz”</td>
</tr>
<tr>
<td></td>
<td>p1= “31Hz”</td>
</tr>
<tr>
<td></td>
<td>p1= “63Hz”</td>
</tr>
<tr>
<td></td>
<td>p1= “125Hz”</td>
</tr>
<tr>
<td></td>
<td>p1= “250Hz”</td>
</tr>
<tr>
<td></td>
<td>p1= “500Hz”</td>
</tr>
<tr>
<td></td>
<td>p1= “1kHz”</td>
</tr>
<tr>
<td></td>
<td>p1= “2kHz”</td>
</tr>
<tr>
<td></td>
<td>p1= “4kHz”</td>
</tr>
<tr>
<td></td>
<td>p1= “8kHz”</td>
</tr>
<tr>
<td></td>
<td>p1= “16kHz”</td>
</tr>
</tbody>
</table>

Request command      | Output Band Frequency? |
Response data        | d1                      |
Returned value       | Same as for setting command |
Communication commands

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

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:
- pl= “Low”
- pl= “Center”
- pl= “High”

Request command: Output Band Offset?
Response data: d1
Returned value: Same as for setting command

Lmax Type

$L_{\text{max}}/L_{\text{min}}$ type
Setting Lmax/Lmin type on measure screen

Setting command: Lmax Type, p1
Parameter:
- pl= “Band”
- pl= “AP”

Request command: Lmax Type?
Response data: d1
Returned value: Same as for setting command
**Communication commands**

**Lp Store Interval**

$L_p$ store interval

Setting $L_p$ store interval

<table>
<thead>
<tr>
<th>Setting command</th>
<th>Parameter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lp Store Interval, p1</td>
<td>p1= “Off”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “100ms”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “200ms”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “Leq1s”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “1s”</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Setting command</th>
<th>Parameter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meas Parallel, p1</td>
<td>p1= “Off”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “LAIeq”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “LCeq”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “LASmax”</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Setting command</th>
<th>Parameter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Weighting (Band), p1</td>
<td>p1= “A”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “C”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p1= “Z”</td>
<td></td>
</tr>
</tbody>
</table>

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”

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”

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”

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**: `UpperLimitFrequency, p1`
- **Parameter**: `p1= “16Hz”`
  - `p1= “31Hz”`
  - `p1= “63Hz”`
  - `p1= “125Hz”`
  - `p1= “250Hz”`
  - `p1= “500Hz”`
  - `p1= “1kHz”`
  - `p1= “2kHz”`
  - `p1= “4kHz”`
  - `p1= “8kHz”`
  - `p1= “16kHz”`

- **Request command**: `UpperLimitFrequency?`
- **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

**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**: `UpperLimitFrequencyOffset, p1`
- **Parameter**: `p1= “Low”`
  - `p1= “Center”`
  - `p1= “High”`

- **Request command**: `UpperLimitFrequencyOffset?`
- **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 = “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

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, pl
Parameter:
- pl= “Main”
- pl= “Sub”
- pl= “16Hz”
- pl= “31Hz”
- pl= “63Hz”
- pl= “125Hz”
- pl= “250Hz”
- pl= “500Hz”
- pl= “1kHz”
- pl= “2kHz”
- pl= “4kHz”
- pl= “8kHz”
- pl= “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

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

<table>
<thead>
<tr>
<th>Setting command</th>
<th>Wave Level Trigger Band Offset, pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>p1 = “Low”</td>
</tr>
<tr>
<td></td>
<td>p1 = “Center”</td>
</tr>
<tr>
<td></td>
<td>p1 = “High”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Request command</th>
<th>Wave Level Trigger Band Offset?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response data</td>
<td>d1</td>
</tr>
<tr>
<td>Returned value</td>
<td>Same as for setting command</td>
</tr>
</tbody>
</table>
Communication commands

**DOD**

**Output displayed value**

Getting displayed value

Send the request command at one second interval or longer.

Request command: DOD?

Response data: d1,d2,...,dn (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” 16 Hz
- d5 = “xxx.x” 31.5 Hz
- d6 = “xxx.x” 63 Hz
- ...
- ...
- d14 = “xxx.x” 16 kHz
- d15 = 0 or 1 Overload information
  (1: Yes, 0: No)
- d16 = 0 or 1 Under-range information
  (1: Yes, 0: No)
1/3 octave band analysis

Returned value

- $d_1 = \text{"xxx.x"}$ Sub channel $L_p$
  (When [Sub Channel Settings] is set to OFF, $d_1$ is returned as “--.--”)
- $d_2 = \text{"xxx.x"}$ Main channel $L_p$, $L_{eq}$, $L_E$, $L_{max}$, $L_{min}$, $L_N$
- $d_3 = \text{"xxx.x"}$ Partial over all $L_p$, $L_{eq}$, $L_E$, $L_{max}$
  (When [Partial Over All] is set to OFF, $d_3$ is deleted)
- $d_4 = \text{"xxx.x"}$ 12.5 Hz
- $d_5 = \text{"xxx.x"}$ 16 Hz
- $d_6 = \text{"xxx.x"}$ 20 Hz
- $d_{36} = \text{"xxx.x"}$ 20 kHz
- $d_{37} = 0$ or 1 Overload information
  (1: Yes, 0: No)
- $d_{38} = 0$ or 1 Under-range information
  (1: Yes, 0: No)
**Additional processings display**

<table>
<thead>
<tr>
<th>Returned value</th>
<th>d1 = “xxx.x”</th>
<th>Additional processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(When [Setting the additional processings.] is set to OFF, d1 is returned as “--.--”)</td>
<td>d2 = “xxx.x”</td>
<td>Additional processing 2</td>
</tr>
<tr>
<td>(When [Setting the additional processings 2.] is set to OFF, d2 is returned as “--.--”)</td>
<td>d3 = “xxx.x”</td>
<td>$L_{Ceq} - L_{Aeq}$</td>
</tr>
<tr>
<td>(When the calculation is not realized, d3 is returned as “--.--”)</td>
<td>d4 = “xxx.x”</td>
<td>$L_{Aeq} - L_{Aeq}$</td>
</tr>
<tr>
<td>(When the calculation is not realized, d4 is returned as “--.--”)</td>
<td>d5 = 0 or 1</td>
<td>Overload information</td>
</tr>
<tr>
<td>(1: Yes, 0: No)</td>
<td>d6 = 0 or 1</td>
<td>Under-range information</td>
</tr>
<tr>
<td>(1: Yes, 0: No)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* d1 to dn 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: 1AH)

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,...,dn (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” 16 Hz
- d5 = “xxx.x” 31.5 Hz
- d6 = “xxx.x” 63 Hz
  
  -
  
  -

- d14 = “xxx.x” 16 kHz
- d15 = 0 or 1 Overload information
  (1: Yes, 0: No)
- d16 = 0 or 1 Under-range information
  (1: Yes, 0: No)
1/3 octave band analysis

Returned value

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>d0</td>
<td>“xxx” Counter (1 to 600)</td>
</tr>
<tr>
<td>d1</td>
<td>“xxx.x” Sub channel</td>
</tr>
<tr>
<td></td>
<td>(When [Sub Channel Settings] is set to OFF, d1 is returned as “--.--”)</td>
</tr>
<tr>
<td>d2</td>
<td>“xxx.x” Main channel</td>
</tr>
<tr>
<td>d3</td>
<td>“xxx.x” Partial over all</td>
</tr>
<tr>
<td></td>
<td>(When [Partial Over All] is set to OFF, d3 is deleted)</td>
</tr>
<tr>
<td>d4</td>
<td>“xxx.x” 12.5 Hz</td>
</tr>
<tr>
<td>d5</td>
<td>“xxx.x” 16 Hz</td>
</tr>
<tr>
<td>d6</td>
<td>“xxx.x” 20 Hz</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>d36</td>
<td>“xxx.x” 20 kHz</td>
</tr>
<tr>
<td>d37</td>
<td>0 or 1 Overload information</td>
</tr>
<tr>
<td></td>
<td>(1: Yes, 0: No)</td>
</tr>
<tr>
<td>d38</td>
<td>0 or 1 Under-range information</td>
</tr>
<tr>
<td></td>
<td>(1: Yes, 0: No)</td>
</tr>
</tbody>
</table>

* d1 to dn 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.
Octave, 1/3 octave band filter characteristics

The characteristics of the octave and 1/3 octave band filter in the NX-42RT correspond to the JIS C 1513:2002 class 1, ANSI/ASA S1.11-2014/Part 1 class 1, and IEC 61260-1: 2014 class 1 specifications.

Octave band filter characteristics

The graph below shows the allowable attenuation tolerance according to JIS and IEC, and the actual characteristics of the octave band filter in the NX-42RT.

Frequency ratio $f/f_c$ ($f$: Frequency, $f_c$: Center frequency at 1 kHz)
Attenuation tolerance according to IEC 61260-1:2014 class 1
and octave band filter characteristics of NX-42RT
1/3 octave band filter characteristics

The graph below shows the allowable attenuation tolerance according to JIS and IEC, and the actual characteristics of the 1/3 octave band filter in the NX-42RT.

Frequency ratio $f/f_c$ ($f$: Frequency, $f_c$: Center frequency at 1 kHz)
Attenuation tolerance according to IEC 61260-1:2014 class 1 and 1/3 octave band filter characteristics of NX-42RT
The digrams below show the residual noise (representative value) of the NL-42, in the frequency weighting “A”, “C” and “Z” positions. The measurement was made with a 1/3 octave band filter and a frequency analyzer.
The digrams below show the residual noise (representative value) of the NL-52, in the frequency weighting “A”, “C” and “Z” positions. The measurement was made with a 1/3 octave band filter and a frequency analyzer.
## Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compatible model</strong></td>
<td>Sound Level Meter NL-42/NL-52</td>
</tr>
<tr>
<td><strong>Media</strong></td>
<td>SD memory card, 512 MB</td>
</tr>
</tbody>
</table>
| **Applicable standards**           | NL-42/NL-52 IEC 61260-1:2014 class 1  
|                                    | ANSI/ASA S1.11-2014/Part 1 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 $L_{Ceq}$  
| C-weighted peak sound level $L_{Cpeak}$  
| Z-weighted peak sound level $L_{Zpeak}$  
| 1-time-weighted equivalent continuous sound level $L_{A1eq}$  
| Tact-max A-weighted sound level $L_{Atm5}$ |
Specifications

Maximum I-time-weighted equivalent continuous sound level $L_{A\text{Imax}}$

The frequency response of additional processing is associated with that of sub channel. Therefore, $L_{A\text{eq}}$, $L_{A\text{tm5}}$ or $L_{A\text{Imax}}$ can be selected when the sub channel has A-weighting, $L_{C\text{eq}}$ or $L_{C\text{peak}}$ can be selected when the sub channel has C-weighting, $L_{Z\text{peak}}$ can be selected when the sub channel has Z-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 $L_{C\text{eq}}$
- I-time-weighted equivalent continuous sound level $L_{A\text{eq}}$
- S-time-weighted maximum sound pressure level (Slow) $L_{AS\text{max}}$

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 $L_{\text{eq}}$
- Sound exposure level $L_E$
- Maximum sound pressure level $L_{\text{max}}$

Bands

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

Linearity range 113 dB
Specifications

Analysis frequency range
Analysis results are weighted with selected frequency characteristics.

Octave analysis
Octave band pass filter
16 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
12.5 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, 200 ms, $L_{eq, 1s}$, 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 $L_p$
**Specifications**

$L_{eq}$ 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 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)
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 mm (H) × 24 mm (W) × 2.1 mm (D)
Weight Approx. 5 g

Supplied accessories
Inspection certificate 1