

INSTRUCTION MANUAL

Waveform Recording Program

NX-42WR



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

<http://www.rion.co.jp/english/>

Organization of This Manual

This manual describes recording functions, playback functions, and other operation principles of the Waveform Recording Program NX-42WR.

The manual consists of the chapters listed below. You should also consult the documentation for the Sound Level Meter NL-42/NL-52/NL-62.

Outline

Gives basic information on the functions of the NX-42WR.

Installation

Explains about installation of the NX-42WR.

Reading the Display

Explains various items that appear on the display during recording.

Menu Screens

Explains how to use the menus.

Waveform Recording

Explains the steps to take for waveform recording.

Store Data Format and File Structure

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

Card Capacity and Recording Time

Explains the relationship between rated memory card capacity and recording time.

Communication Commands

Explains additional commands that become available when the sound recording function is loaded.

Specifications

Lists the technical specifications of the NX-42WR.

* Company names and product names mentioned in this manual are usually trademarks or registered trademarks of their respective owners.

Usage License Agreement

Important

Carefully read and observe the following agreement.
--

This is a legally binding software license agreement between you as the user and RION CO., LTD. By installing, copying, or using the software, the user agrees to all conditions of the agreement. If the user does not agree to any of the conditions of the agreement, the software must be returned immediately without using it or any other product associated with it.

The software is protected by national and international copyright laws and regulations and intellectual property laws. RION CO., LTD. only grants the right to use the software. The software itself is not sold to the user.

1. License Conditions

(1) Definition and Scope

The item covered by this agreement is software for the Sound Level Meter NL-42/NL-52/NL-62 including the media on which the software is supplied, and documentation that is supplied with the software either in printed form or as an electronic file. This license agreement defines the right of the user to use the software.

(2) Usage

The user may install and use the software on the Sound Level Meter NL-42/NL-52/NL-62.

2. Intellectual Property Rights

RION CO., LTD. only grants the right to use the software. The software itself is not sold to the user.

RION CO., LTD. holds the copyright to the software, and the rights to all copies revert to RION CO., LTD. The user may not remove any copyright or trademark information attached to the software.

3. Limitations

- (1) Based on this agreement, the user only acquires the right to use the software. Any other rights not covered in this agreement are not accorded to the user. The user may not copy or otherwise duplicate the software and the associated documentation by any means, in whole or in part, except for the case stated in "1. (2) Usage". The software and the associated documentation are protected by copyright laws.
- (2) The user does not have the right to give, sell, loan or otherwise make available the software and associated documentation to third parties, or to grant any usage rights to third parties.
- (3) The user does not have the right to alter, decompile, or reverse-engineer the software.
- (4) The user may not use the software to produce any products that imitate the software. Any imitation or simulation of the software is an infringement of copyright laws.

4. Duty of Agreement Propagation

The user must ensure that all persons using the software are fully aware of all conditions of this agreement. Any violation will be the responsibility of the user.

5. Warranty

- (1) RION CO., LTD. guarantees that the software is supplied on media that have no substantial defect, and that the software contains the functions that are explicitly listed in the specifications. If the software does not operate according to specifications or if any problems described above that are the responsibility of RION CO., LTD. are detected and RION CO., LTD. is informed of this fact within 90 days from the purchase date of the software, RION CO., LTD. will undertake to remedy the problems free of charge.
- (2) If the software does not operate according to specifications due to causes that are not the responsibility of RION CO., LTD. will undertake to remedy the problems against charge.

6. Limitation of Warranty

- (1) RION CO., LTD. does not guarantee that the software is fit for any particular purpose of the user, whether stated explicitly or implicitly, or that the software is free of errors. RION CO., LTD. does not provide any other kind of warranty except as stated in this agreement. RION CO., LTD. does not accept responsibility for any kind of damage, whether direct or indirect, tangible or intellectual, that may arise from the use of the software or the failure of the software to perform any function.
- (2) Under no circumstances will the responsibility of RION CO., LTD. as stated in "5. Warranty" exceed the equivalent of the price that the user paid for the software.

7. Duration

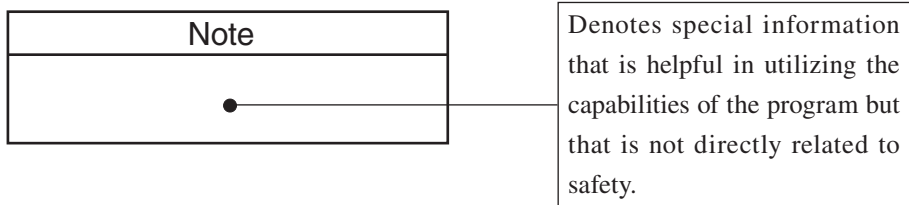
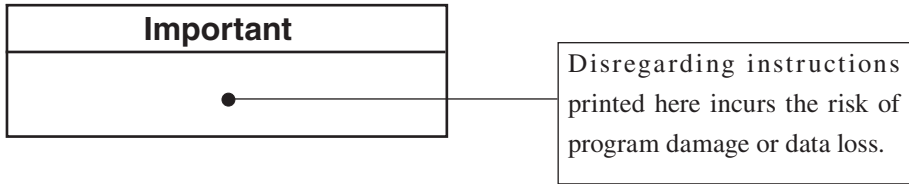
This agreement is valid until terminated. The user can terminate the agreement at any time by unloading the software from the Sound Level Meter NL-42/NL-52/NL-62 and destroying the software and associated documentation. The agreement also terminates when the user violates any of the conditions herein. In this case, the user also must destroy the software and unload the software from the Sound Level Meter NL-42/NL-52/NL-62.

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
Installation	2
Reading the Display	3
Recording screen	3
Menu screen	4
Menu Screens.....	5
Waveform Recording.....	12
Event recording.....	13
Total recording	22
Playback of recorded files	24
Analysis of recorded files.....	24
Store Data Format and File Structure.....	25
Card Capacity and Recording Time	27
About card capacity and recording time	27
Communication Commands	29
List of commands	29
Command Description	31
Specifications	40

Outline

This program card contains software that adds sound pressure waveform recording capability to the Sound Level Meter NL-42/NL-52/NL-62. Recorded sound pressure waveform information is saved as PCM format WAVE files on the memory card, along with other stored data. This makes it easy to play and analyze the sound pressure waveform information later on a computer.

Outline of recording functions

Sound pressure waveform information is stored on the memory card, along with other store data. It is not possible to record only sound pressure waveform information.

There are two recording modes, called event mode and total mode.

Event mode

Sound pressure waveform recording is possible only during auto store mode (Auto store or Timer Auto store) operation. Event mode allows choosing between three types of recording: manual recording, level recording, and interval recording.

- Manual recording

Allows recording the sound pressure waveform for any duration during auto store operation. This type of recording is suitable when the operator needs to control the recording function as necessary.

- Level recording

The sound pressure waveform is recorded automatically when a selected level is exceeded. This type of recording is suitable when higher level sound information should be recorded.

- Interval recording

Recording is carried out at selected intervals (10 minutes, 1 hour), for 15 seconds, 1 minute or 2 minutes. This type of recording is suitable for capturing environmental sound at specific intervals.

Total mode

- Total recording

In auto store mode, all sound pressure waveform information is recorded as long as the mode is active.

In manual store mode, measurement followed by a store operation records the sound pressure waveform for the entire period while measurement is carried out.

Playback or analysis of recorded information on the NL-42/NL-52/NL-62 is not possible.

Installation

Follow the procedure described in the separate “Optional program installation / uninstallation” to install the NX-42WR program in the NL-42/NL-52/NL-62 unit.

Important

Never format the optional program card with SD 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/>).

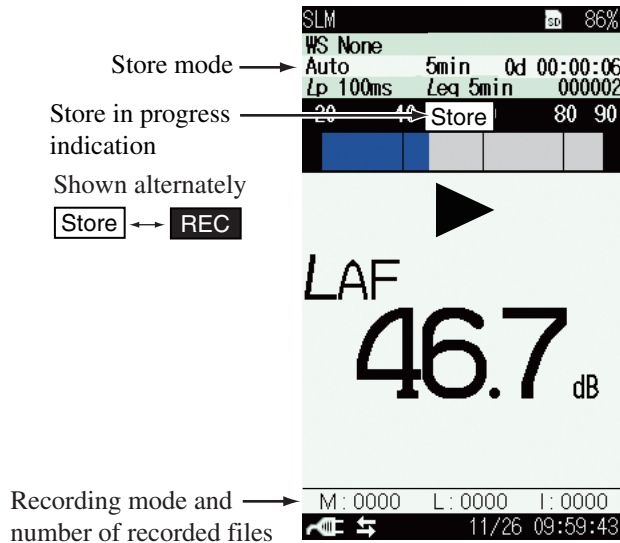
Note

The NX-42WR program can only be installed if the Extended Function Program NX-42EX has been installed in the NL-42/NL-52 first. The NX-42WR program can be installed in the NL-62 without installing NX-42EX.

Reading the Display

Recording screen

An illustration of recording screen is shown below.
(The size and font of the actual display may differ.)



Store mode

Shows the selected mode for storing data in memory.

Store in progress indication

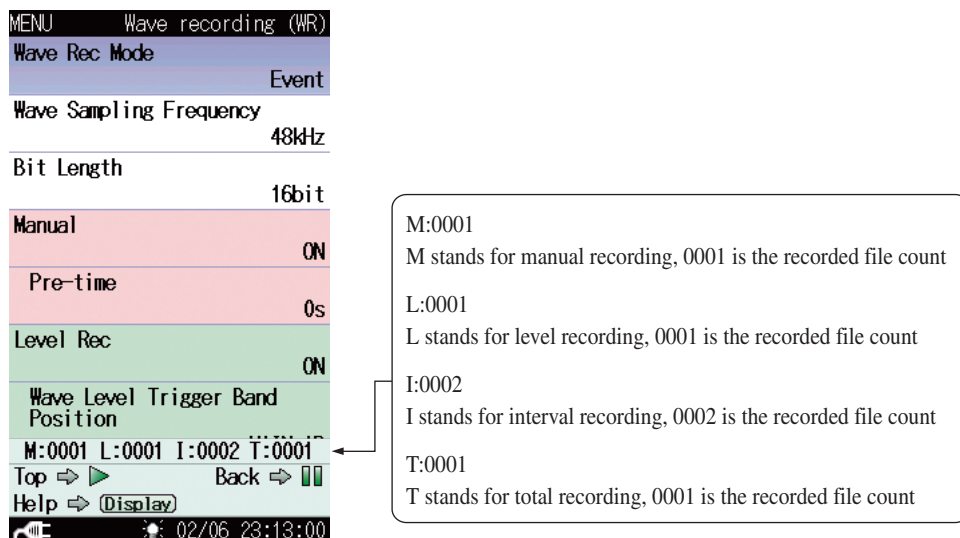
Shows the store condition.

Recording mode and number of recorded files

Shows the recording mode and the recorded file count.

Menu screen

The menu screen looks as follows.



Wave recording screen (WR)
 (Store Mode : Auto,
 Wave Rec Mode : Event)

The recorded file count starts at 0001 and will stop at the maximum of 9999.

Manual recording: SM0001.WAV to SM9999.WAV

Level recording: SL0001.WAV to SL9999.WAV

Interval recording: SI0001.WAV to SI9999.WAV

Total recording: ST0001.WAV to ST9999.WAV

The figure such as “SM0001” shows the sequential number for the file. A "0000" file is not created.

Note

The performance about the file after the 10,000th will not be guaranteed.

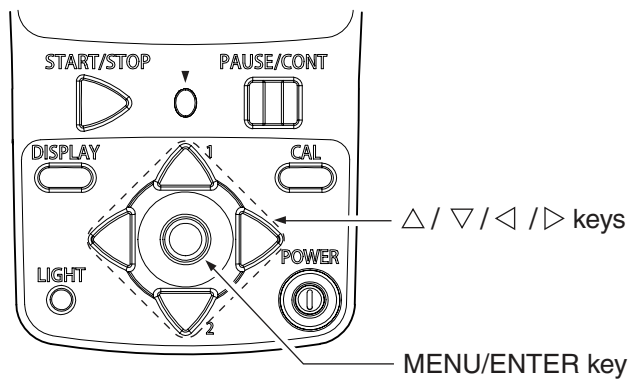
Menu Screens

Pressing the MENU/ENTER key brings up the menu list screen. Use the $\Delta/\nabla/\triangleleft/\triangleright$ keys to select [WR] and press the MENU/ENTER key. The wave recording (WR) screen appears. The recording condition is set on this screen. Each item of the wave recording screen is selected using the Δ/∇ key. Pressing the DISPLAY key displays explanation screen of the item that has been selected.

Pressing the PAUSE/CONT key switches back to the menu list screen.

Pressing the START/STOP key switches back to the measurement screen.

As for the wave recording screen, the displayed set item is different depending on the set recording mode.



Pressing the $\Delta/\nabla/\triangleleft/\triangleright$ keys to select [WR] and pressing MENU/ENTER button brings up the [Wave recording (WR)] screen.

Menu list screen

MENU Wave recording (WR)	
Wave Rec Mode	Total
Wave Sampling Frequency	48kHz
Bit Length	16bit
Wave Splitting Interval	1min

M:0000 L:0000 I:0000 T:0001
Top ⇒ ▶ Back ⇒
Help ⇒ (Display)
⏪ 11/28 14:56:40

**Wave recording screen
(Wave Rec Mode : Total)**

MENU Wave recording (WR)	
Wave Rec Mode	Event
Wave Sampling Frequency	48kHz
Bit Length	16bit
Manual	ON
Pre-time	0s
Level Rec	ON
Trigger Level	70dB
M:0000 L:0000 I:0000 T:0000	
Top ⇒ ▶ Back ⇒	
Help ⇒ (Display)	
⏪ 11/28 10:59:33	

**Wave recording screen 1
(Wave Rec Mode : Event)**

MENU Wave recording (WR)	
0s	
Level Rec	ON
Trigger Level	70dB
Wave Level Trigger Band Position	MAIN AP
Pre-time	0s
Maximum Recording Time	10min
Reference Time Interval <input checked="" type="checkbox"/>	OFF
M:0000 L:0000 I:0000 T:0000	
Measure ⇒ ▶ Back ⇒	
Help ⇒ (Display)	
⏪ 06/07 13:04:45	

**Wave recording screen 2
(Wave Rec Mode : Event)**

MENU Wave recording (WR)	
Position	MAIN AP
Pre-time	0s
Maximum Recording Time	10min
Reference Time Interval <input checked="" type="checkbox"/>	OFF
Interval Rec	ON
Interval	10min
Rec Time	15s
M:0000 L:0000 I:0000 T:0000	
Measure ⇒ ▶ Back ⇒	
Help ⇒ (Display)	
⏪ 06/07 13:04:52	

**Wave recording screen 3
(Wave Rec Mode : Event)**

Wave Rec Mode

Set the waveform recording mode.

Select [Wave Rec Mode] and press the MENU/ENTER key. The Wave Rec Mode screen appears. Select the recording mode (OFF, Total, Event) and press the MENU/ENTER key.

If [Total] is selected, all sounds are recorded from start to finish.

If [Event] is selected, manual recording, level recording and interval recording are selectable (refer to the description of each mode).

When [Wave Rec Mode] is set to "OFF", waveform recording will not be carried out.

Note
Event mode is selectable if the store mode is Auto or Timer Auto.

Wave Sampling Frequency

Select the sampling frequency. High frequency sounds can be analyzed and reproduced as the value increases.

Select [Wave Sampling Frequency] and press the MENU/ENTER key. The Wave Sampling Frequency screen appears. Select the sampling frequency (48kHz, 24kHz, 12kHz) and press the MENU/ENTER key.

Bit Length

Select the recording data bit length. Increased accuracy of analysis and better sound quality can be obtained as the value increases.

Select [Bit Length] and press the MENU/ENTER key. The Bit Length screen appears. Select the bit length (16bit, 24bit) and press the MENU/ENTER key.

Wave Splitting Interval (only Total mode)

Select the size of one file for the entire recording.

Select [Wave Splitting Interval] and press the MENU/ENTER key. The Wave Splitting Interval screen appears. Select the splitting interval (1min, 10min, 1h) and press the MENU/ENTER key.

Manual (only Event mode)

Select whether to set the Manual recording.

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

Select the ON/OFF setting and press the MENU/ENTER key.

When [Manual] is set to “ON”, the timing for recording can be selected arbitrarily.

Pre-time

When [Manual] or [Level] is set to “ON”, this item is displayed.

The recording starts including the data from the pre-time before the start.

Select [Pre-time] and press the MENU/ENTER key. The Pre-time screen appears. Select the interval (0s, 1s, 5s, 10s, 30s, 1min) and press the MENU/ENTER key.

Level Rec (only Event mode)

Select whether to set the Level recording.

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

Select the ON/OFF setting and press the MENU/ENTER key.

When [Level Rec] is set to “ON”, recording starts when the value exceeds the trigger level.

Trigger Level

When [Level Rec] is set to “ON”, this item is displayed.

Set the trigger level for recording start.

Select [Trigger Level] and press the MENU/ENTER key. The Trigger Level screen appears.

Use the $\triangleleft/\triangleright$ keys to select the first digit and use the \triangle/∇ keys to set the value. Use the $\triangleleft/\triangleright$ keys to select the two lower digits and use the \triangle/∇ keys to set the value. Then press the MENU/ENTER key. (Setting range 25 to 130 dB, 1-dB steps)

When [Reference Time Interval] on next page is set to “ON”, [Trigger Level] is not displayed (the setting is invalid).

Wave Level Trigger Band Position

When [Level Rec] is set to “ON”, this item is displayed.

Set the target band position for trigger.

Select [Wave Level Trigger Band Position] and press the MENU/ENTER key. The Wave Level Trigger Band Position screen appears. Select the band position (SUB AP, MAIN AP) and press the MENU/ENTER key.

Note
When using optional program NX-42RT or NX-62RT, each frequency band can also be selected.

Maximum Recording Time

When [Level Rec] is set to “ON”, this item is displayed.

Set the maximum time for level recording.

If the trigger level is not set appropriate, the recording time will increase.

This setting helps to reduce the consumption of memory.

Select [Maximum Recording Time] and press the MENU/ENTER key.

The Maximum Recording Time screen appears. Select the recording time (OFF, 10min) and press the MENU/ENTER key.

Reference Time Interval

When [Level Rec] is set to “ON”, this item is displayed.

Set the start time and trigger level for each time zone that divided a maximum of four categories.

Select [Reference Time Interval] and press the MENU/ENTER key. The Time Zone Setting screen appears.

Select [Reference Time Interval] on the Time Zone Setting screen and press the MENU/ENTER key. The ON/OFF setting screen appears.

Select the ON/OFF setting and press the MENU/ENTER key.

When [Reference Time Interval] is set to “ON”, [Time1] to [Time4] setting is valid.

Select any from [Time1] to [Time4] and press the MENU/ENTER key. The selected time zone screen for setting start time and trigger level appears.

Use the $\triangleleft/\triangleright$ keys to select the start time and use the \triangle/∇ keys to set the value (0 to 23 hour, and OFF). Use the $\triangleleft/\triangleright$ keys to select the trigger level and use the \triangle/∇ keys to set the value (25 to 130 dB, 1-dB steps).

Press the MENU/ENTER key.

Interval Rec (only Event mode)

Select whether to set the Interval recording.

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

Select the ON/OFF setting and press the MENU/ENTER key.

When [Interval Rec] is set to “ON”, recording is carried out at preset intervals.

Interval

When [Interval Rec] is set to “ON”, this item is displayed.

Set the interval for recording waveforms.

Select [Interval] and press the MENU/ENTER key. The Interval screen appears. Select the interval (10min, 1h) and press the MENU/ENTER key.

Rec Time

When [Interval Rec] is set to “ON”, this item is displayed.

Set the recording time for each recording interval.

Select [Rec Time] and press the MENU/ENTER key. The Rec Time screen appears. Select the recording time (15s, 1min, 2min) and press the MENU/ENTER key.

Menu tree

Wave Rec Mode	
OFF	
Total	
Wave Sampling Frequency-----	48kHz, 24kHz, 12kHz
Bit Length-----	16bit, 24bit
Wave Splitting Interval-----	1min, 10min, 1h
Event	
Wave Sampling Frequency-----	48kHz, 24kHz, 12kHz
Bit Length-----	16bit, 24bit
Manual-----	OFF, ON
Pre-time-----	0s, 1s, 5s, 10s, 30s, 1min
Level Rec-----	OFF, ON
Trigger level-----	25dB to 130dB
Wave Level Trigger Band Position-----	SUB AP, MAIN AP
Pre-time-----	0s, 1s, 5s, 10s, 30s, 1min
Maximum Recording Time-----	OFF, 10min
Reference Time Interval ▼-----	OFF, ON
	Time1 to Time4 (Hour: 0 to 23 and OFF, Level 25 to 130dB)
Interval Rec-----	OFF, ON
Interval-----	10min, 1h
Rec Time-----	15s, 1min, 2min

▼ -----: Items displayed when proceeding to next menu level

Waveform Recording

The NX-42WR provides the following recording modes: Event mode (Manual recording, Level recording, Interval recording) and Total mode (Total recording). The Event mode can only be used when Auto store (Auto and Timer Auto) is selected.

The Total mode can be used when Auto store (Auto and Timer Auto) or Manual store (Manual) is selected.

When the store mode was set to “Manual” using the NL-42/NL-52/NL-62 menus, the Event mode can no longer be selected.

Select the appropriate recording function before starting to record.

Verify that an SD memory card with sufficient free space is inserted in the card slot of the NL-42/NL-52/NL-62. If no card is inserted, recording cannot be carried out.

For information on how to access and use the setup screen and menus, see the section “Menu Screens”.

Note
Recorded data will always use Z frequency weighting (flat response), regardless of the frequency weighting setting of the NL-42/NL-52/NL-62. When the low pass filter (LPF) setting of the NL-62 is selected, the setting will be valid in the recording.
If the measurement time is shorter than the recording time set with this program, the actual recording time will be equivalent to the measurement time.
When recording is performed, pay attention to the setting of output level range over of this unit. If a set value of the output level range over is too high for the sound level of measurement target, the volume of recorded sound will be small and it may be difficult to hear when played on a computer. Also, note that the volume of 24-bit sound is relatively small when compared with 16-bit sound since 24-bit sound has wider dynamic range.
When sound is recorded with 24 bit, it may not be played on a computer depending on its specifications (such as Windows version and sound board type). Before recording, make sure that the data recorded with the specified bit length and sampling frequency can be played on your computer. For 16-bit data, it can be played on computers running Windows XP SP3 or later versions in most cases.
After installation is complete, the SD card from which the NX-42WR program was installed can be used as a memory card for storing data.
Prior to measurement, it is recommended first to format the memory card for storing data with this unit.

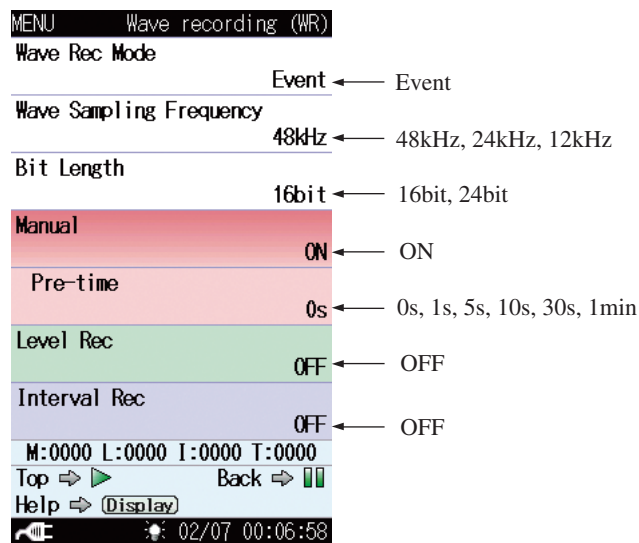
Event recording

Refer to the documentation (Instruction Manual) of the Sound Level Meter NL-42/NL-52/NL-62 and select Auto store (Auto or Timer Auto) and the respective measurement parameters, as described in the section “Store Operation”.

The sampling frequency setting depends on the upper end of the frequency that is to be analyzed. For better sound quality recording, choose a high setting. To permit long-term recording, choosing a lower setting may be preferable. During Auto store, the PAUSE/CONT key (PAUSE function) cannot be used.

Manual recording

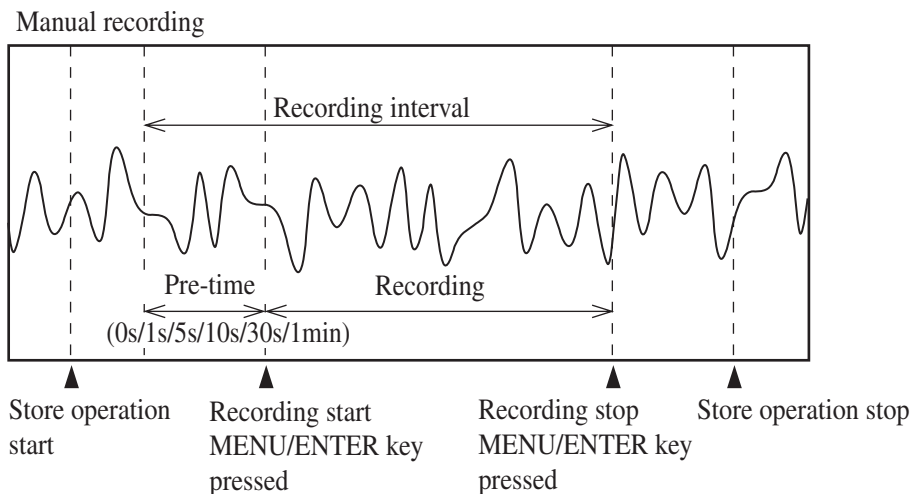
1. Make settings as shown below.



Wave recording screen
(Wave Rec Mode: Event, Manual: ON)

2. Press the START/STOP key to return to the measurement screen.
3. Press the START/STOP key to start the auto store operation.
4. When you press the MENU/ENTER key, recording starts, including the data from setting pre-time before this point.
When you press the MENU/ENTER key again, recording stops.

The graph below shows the operation principle of manual recording.

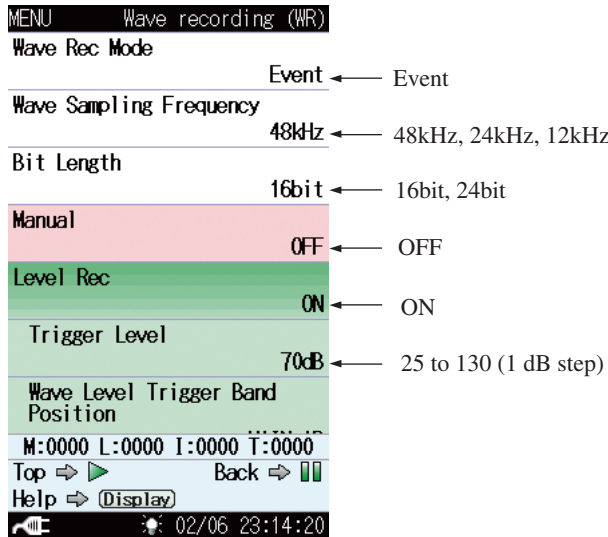


The maximum recording duration for one manual recording session is pre-time plus one hour.

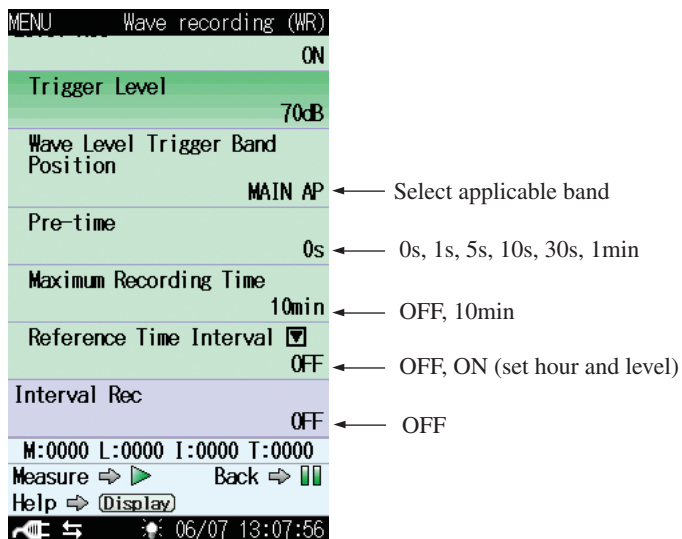
Recording stops automatically when a recording duration excluding pre-time reaches one hour.

Level recording

1. Make settings as shown below.



Wave recording screen 1
(Wave Rec Mode: Event, Level Rec: ON)



Wave recording screen 2
(Wave Rec Mode: Event, Level Rec: ON)

When the Reference Time Interval is set to ON, the Trigger Level is not displayed

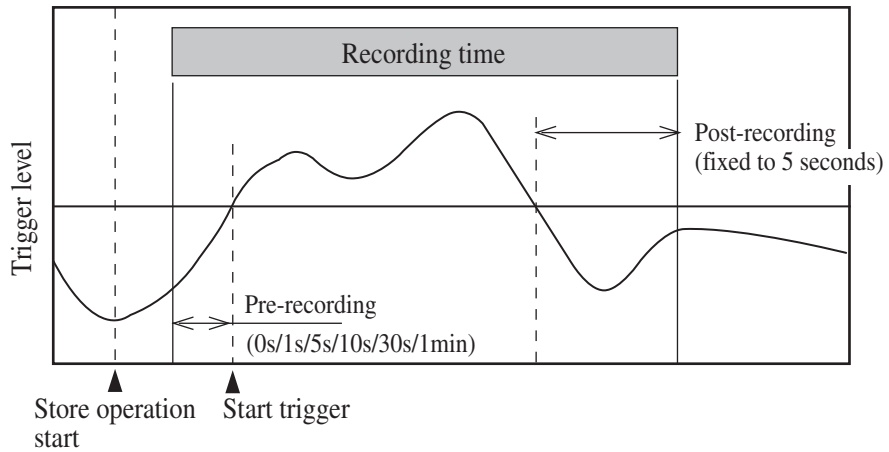
2. Press the START/STOP key to return to the measurement screen.
3. Press the START/STOP key to start the auto store operation.
When a signal higher than the preset trigger level is input, recording starts, including the data from the selected pre-time before this point. Recording stops when the signal falls below the trigger level, after a post-recording period of 5 seconds. If the level rises again above the trigger level during these 5 seconds, recording continues without interruption.
Recording also stops when the preset recording time has elapsed.
4. To terminate recording early, press the START/STOP key.

The graphs on the next page show the operation principle of level recording.

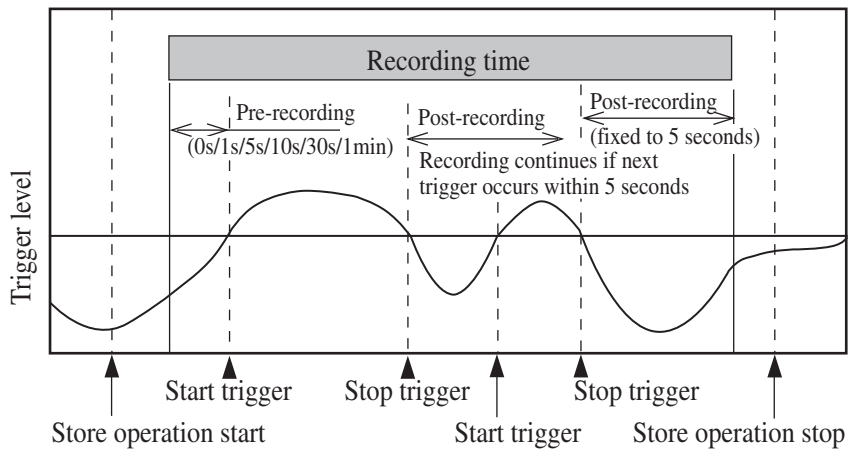
Note

When the [Maximum Recording Time] is set to "OFF", splitting interval for file is 1 hour.

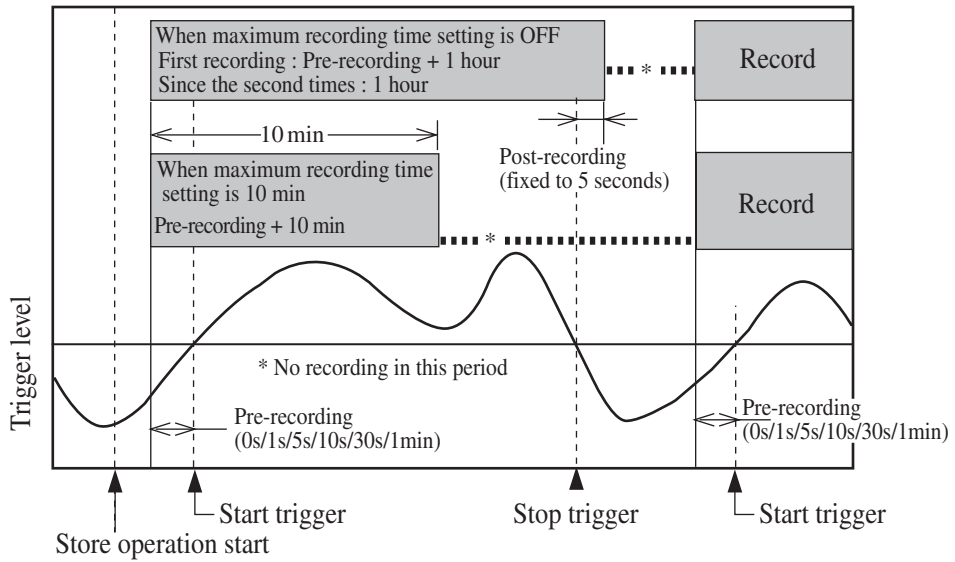
Level recording



Level recording When stop trigger occurred within maximum recording time, but start trigger occurred again within 5-second post-recording period



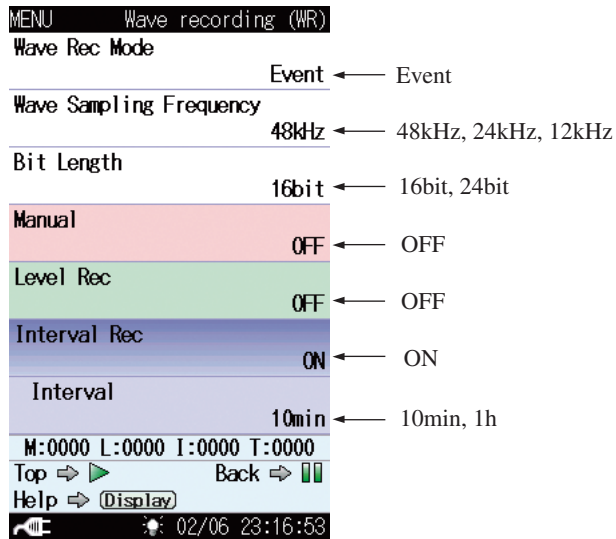
Level recording When recording time is set to OFF and to 10 minutes



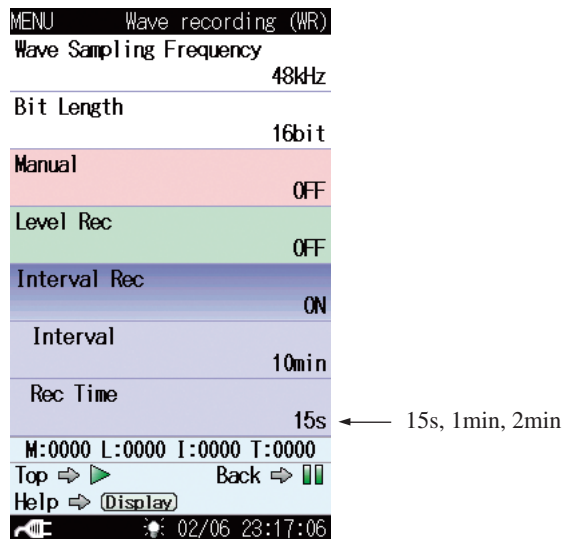
Note
<p>When the maximum recording time is set to 10 minutes, recording will stop after 10 minutes also when sound that exceeds the trigger level continues for a long time (such as the sound of an idling car). This is helpful to prevent unnecessary use of SD memory card capacity.</p>

Interval recording

1. Make settings as shown below.



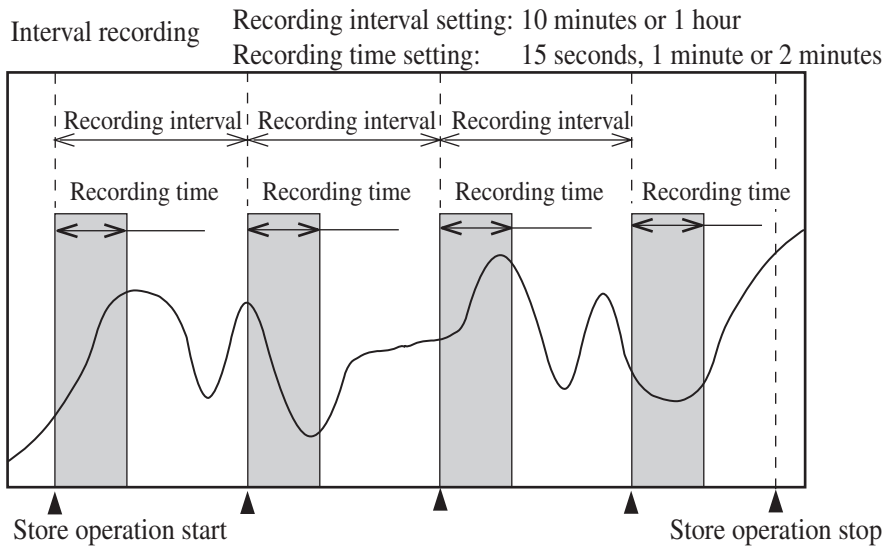
Wave recording screen 1
(Wave Rec Mode: Event, Interval Rec: ON)



Wave recording screen 2
(Wave Rec Mode: Event, Interval Rec: ON)

2. Press the START/STOP key to return to the measurement screen.
3. Press the START/STOP key to start the auto store operation and start recording at the preselected intervals and recording times.
4. To stop measurement, press the START/STOP key.

The graph below shows the operation principle of interval recording.



Note

When the store mode is Timer Auto, the actual recording intervals will be equivalent to the Timer Auto intervals. Interval recording is started whenever the Timer Auto interval elapses.

Recording mode priority

If two or more selections (manual recording, interval recording, level recording) are set to ON, the priority order, starting with the highest priority, is as follows:

Manual recording (highest)

Level recording

Interval recording

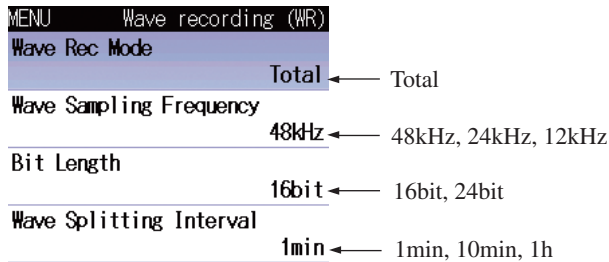
Priority operation

- If manual recording is started during level recording, level recording stops immediately (a file is created at this point), and manual recording takes over. All events (trigger etc.) that occur during manual recording are disregarded.
- If level recording or manual recording is started during interval recording, interval recording stops immediately (a file is created at this point), and the other recording mode takes over. In this case, interval recording is not performed, and only the interval time is updated.

Total recording

For this mode, you select measurement parameters as described in the “Manual”, “Auto”, and “Timer Auto” sections of the “Store Operation” in the documentation (Instruction Manual) of the NL-42/NL-52/NL-62.

1. Make settings as shown below.



Wave recording screen
(Wave Rec Mode: Total)

2. Press the START/STOP key to return to the measurement screen.
3. Store

3-A. Manual store

Press the START/STOP key to start measurement, and press the START/STOP key again to stop.

To save the measured data and recorded data, select “Store data” on the data save confirmation screen when the measurement is stopped.

During a recording session, the PAUSE/CONT key (PAUSE function) can be used but the back erase function becomes unavailable.

3-B. Auto, Timer Auto store

When you press the START/STOP key to start auto store, recording also starts simultaneously.

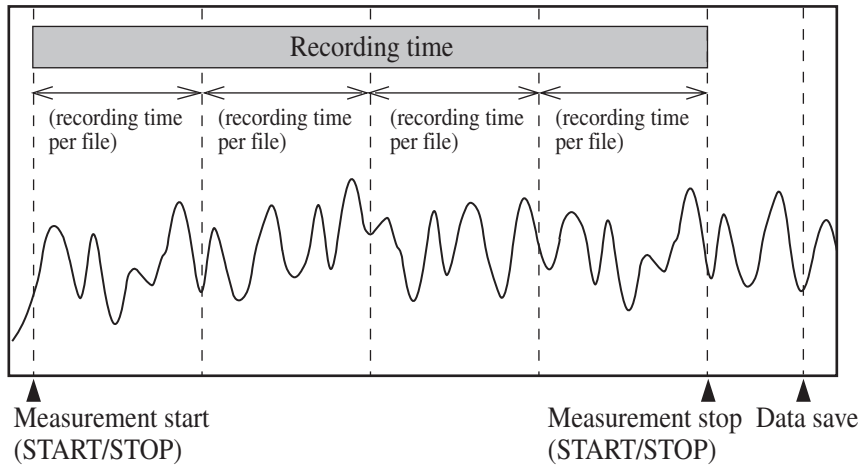
Files are created and saved for each recording period.

To stop recording, press the START/STOP key.

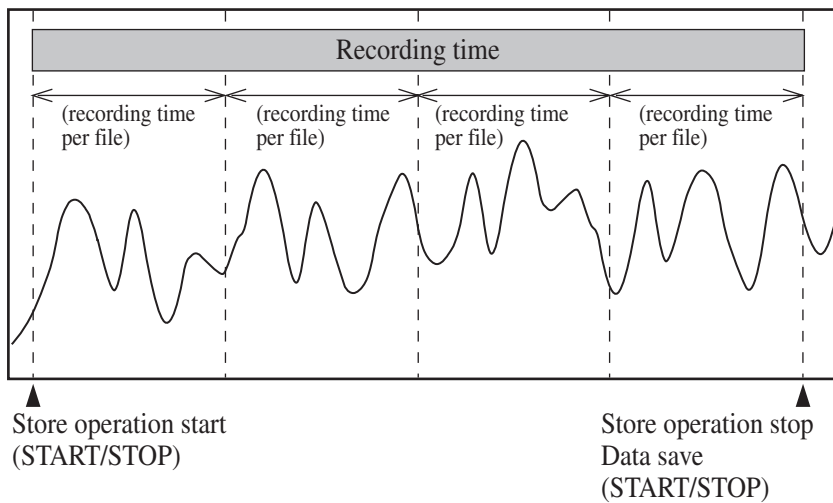
During Auto store, the PAUSE/CONT key (PAUSE function) cannot be used.

The graphs below show the operation principle of total recording.

Total recording (with manual store)



Total recording (with auto store)



Playback of recorded files

Recorded files can be played with WAVE file playback software (on public sale) or with the Waveform Analysis Software CAT-WAVE or AS-60 from Rion.

Playback on the NL-42/NL-52/NL-62 is not possible.

Analysis of recorded files

Recorded files can be analyzed with the Waveform Analysis Software CAT-WAVE from Rion.

Store Data Format and File Structure

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

Store destination folder

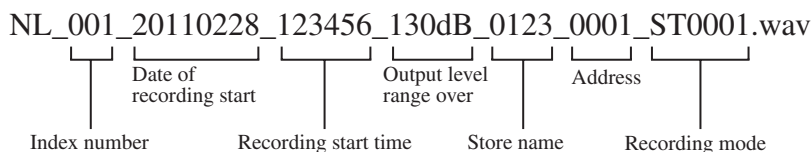
Files are saved in the sub folder SOUND which is created in the store folder specified by store name.

Example: Manual_0123/SOUND (with manual store)

Auto_0123/SOUND (with auto store)

File name of recording data

Recording files are named as shown below.



Store name: 0000 to 9999

Address: 0000 to 9999 (Auto store is fixed to 0000)

Recording mode: The file name varies depending on the recording mode.

Total recording: ST0001

Manual recording: SM0001

Level recording: SL0001

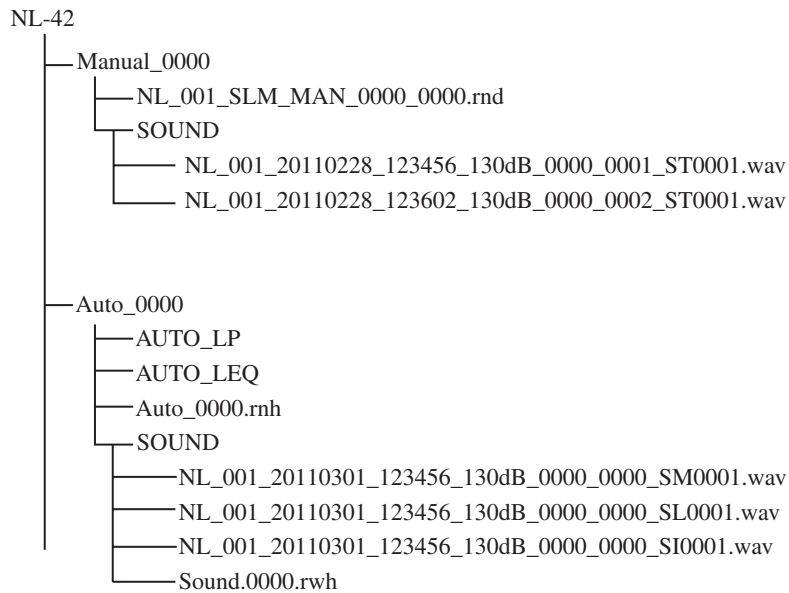
Interval recording: SI0001

The numeric part of file name ranges from 0001 up to 9999 and stops at 9999.

Note
The performance about the file after the 10,000th will not be guaranteed.

When a file with the same name exists in the same directory, it will always be overwritten.

A sample configuration is shown below.



Note

The store name at the time of recording may not correspond to the store name of the recording file name.
--

Card Capacity and Recording Time

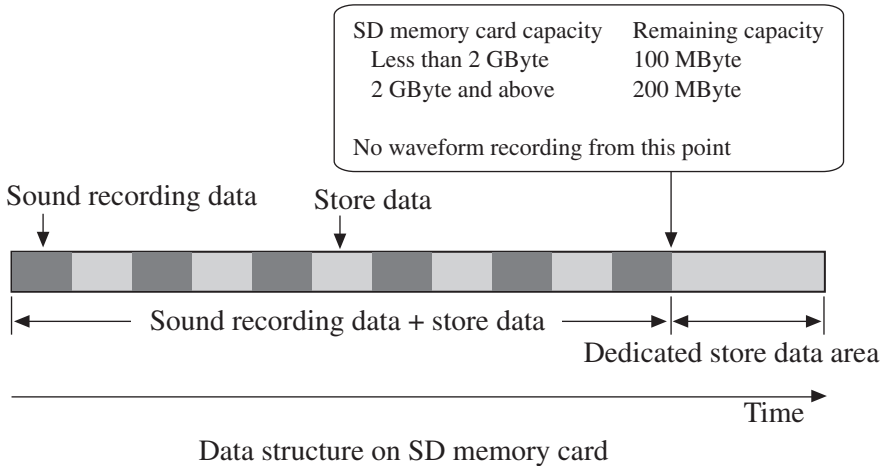
About card capacity and recording time

When saving data on the SD memory card, there are two kinds of storage areas: an area for sound recording data (WAVE files) + store data, and an area dedicated to store data only.

When the area for sound recording data + store data becomes full, sound recording will stop, but only store data will continue to be saved in the area dedicated to store data.

If the capacity of the SD memory card is less than 2 GByte, sound recording will always stop when the remaining capacity reaches 100 MByte. After that, only store data will be saved. On SD memory cards with a capacity of 2 GByte and above, sound recording will stop when the remaining capacity reaches 200 MByte. After that, only store data will be saved.

The actual size of both store data files and sound recording files depends on various factors, such as store mode, sampling frequency, and etc. When there are multiple sound recording data with short recording times, storage space will be wasted and the available time for recording may be up to 20 percent shorter.



Approximate recording times for SD memory cards

		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.

Data apply for Auto store, bit length 16 bit, L_p store interval 100 ms

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.

Important

Use SD memory cards with a capacity of 512 MByte and above.

Communication Commands

This section lists commands that are added to the Sound Level Meter NL-42/NL-52/NL-62 when the waveform recording function is installed. For information on other commands, please refer to the documentation (Serial Interface Manual) of the NL-42/NL-52/NL-62.

List of commands

S: Setting command (for making NL-42/NL-52/NL-62 settings)

R: Request command (for obtaining information on NL-42/NL-52/NL-62 status and measurement results)

Command	Function	See page
Wave Rec Mode	Sound recording mode (S/R)	31
Wave Sampling Frequency	Sampling frequency (S/R)	31
Wave Bit Length	Bit length (S/R)	32
Wave Splitting Interval	File split period (S/R)	32
Wave Manual Rec	Manual recording (S/R)	32
Wave Manual Pre-time	Pre-time (S/R)	33
Wave Level Rec	Level recording (S/R)	33
Wave Level Trigger Level	Trigger level (S/R)	33
Wave Level Trigger Band	Trigger band (S/R)	34
Wave Level Pre-time	Pre-time (S/R)	34
Wave Level Maximum Recording Time	Maximum recording time (S/R)	34
Wave Level Reference Time Interval	Reference time interval (S/R)	35
Wave Level Reference Time 1	Time setting (time zone 1) (S/R)	35
Wave Level Reference Time 2	Time setting (time zone 2) (S/R)	35
Wave Level Reference Time 3	Time setting (time zone 3) (S/R)	36
Wave Level Reference Time 4	Time setting (time zone 4) (S/R)	36
Wave Level Reference Time 1 Level	Level setting (time zone 1) (S/R)	37
Wave Level Reference Time 2 Level	Level setting (time zone 2) (S/R)	37

Wave Level Reference Time 3 Level	
	Level setting (time zone 3) (S/R) 37
Wave Level Reference Time 4 Level	
	Level setting (time zone 4) (S/R) 38
Wave Interval Rec	Interval recording (S/R) 38
Wave Interval Rec Interval	Recording interval (S/R) 38
Wave Interval Rec Time	Recording time (S/R) 39
Wave Rec State	Recording states (R) 39

Command Description

Wave Rec Mode

Sound recording mode

Setting sound recording mode

Setting command	Wave_Rec_Mode, p1
Parameter	p1= "Off" p1= "Total" p1= "Event"
Request command	Wave_Rec_Mode?
Response data	d1
Returned value	Same as for setting command

Wave Sampling Frequency

Sampling frequency

Setting sampling frequency

Setting command	Wave_Sampling_Frequency, p1
Parameter	p1= "12kHz" p1= "24kHz" p1= "48kHz"
Request command	Wave_Sampling_Frequency?
Response data	d1
Returned value	Same as for setting command

Wave Bit Length

Bit Length

Setting bit length

Setting command	Wave_□Bit_□Length, p1
Parameter	p1= "16bit" p1= "24bit"
Request command	Wave_□Bit_□Length?
Response data	d1
Returned value	Same as for setting command

Wave Splitting Interval

File split Period

Setting file split period

Setting command	Wave_□Splitting_□Interval, p1
Parameter	p1= "1m" p1= "10m" p1= "1h"
Request command	Wave_□Splitting_□Interval?
Response data	d1
Returned value	Same as for setting command

Wave Manual Rec

Manual recording

Setting ON/OFF of manual recording mode

Setting command	Wave_□Manual_□Rec, p1
Parameter	p1= "Off" p1= "On"
Request command	Wave_□Manual_□Rec?
Response data	d1
Returned value	Same as for setting command

Wave Manual Pre-time

Pre-time

Setting pre-time on manual recording mode

Setting command	Wave □ Manual □ Pre-time, p1
Parameter	p1= "0s" p1= "1s" p1= "5s" p1= "10s" p1= "30s" p1= "1m"
Request command	Wave □ Manual □ Pre-time?
Response data	d1
Returned value	Same as for setting command

Wave Level Rec

Level recording

Setting ON/OFF of level recording mode

Setting command	Wave □ Level □ Rec, p1
Parameter	p1= "Off" p1= "On"
Request command	Wave □ Level □ Rec?
Response data	d1
Returned value	Same as for setting command

Wave Level Trigger Level

Trigger level

Setting trigger level on level recording mode

Setting command	Wave □ Level □ Trigger □ Level, p1
Parameter	p1= 25 to 130 (1 step)
Request command	Wave □ Level □ Trigger □ Level?
Response data	d1
Returned value	Same as for setting command

Wave Level Trigger Band

Trigger band

Setting trigger band on level recording mode

Setting command	Wave □ Level □ Trigger □ Band, p1
Parameter	p1= “Sub” p1= “Main”
Request command	Wave □ Level □ Trigger □ Band?
Response data	d1
Returned value	Same as for setting command

Wave Level Pre-time

Pre-time

Setting pre-time on level recording mode

Setting command	Wave □ Level □ Pre-time, p1
Parameter	p1= “0s” p1= “1s” p1= “5s” p1= “10s” p1= “30s” p1= “1m”
Request command	Wave □ Level □ Pre-time?
Response data	d1
Returned value	Same as for setting command

Wave Level Maximum Recording Time

Maximum recording time

Setting maximum recording time on level recording mode

Setting command	Wave □ Level □ Maximum □ Recording □ Time, p1
Parameter	p1= “Off” p1= “10m”
Request command	Wave □ Level □ Maximum □ Recording □ Time?
Response data	d1
Returned value	Same as for setting command

Wave Level Reference Time Interval

Reference time interval

Setting ON/OFF of reference time interval on level recording mode

Setting command Wave □ Level □ Reference □ Time □ Interval, p1

Parameter p1= "Off"

p1= "On"

Request command Wave □ Level □ Reference □ Time □ Interval?

Response data d1

Returned value Same as for setting command

Wave Level Reference Time 1

Time setting (time zone 1)

Setting start time of reference time interval (time zone 1) on level recording mode

Setting command Wave □ Level □ Reference □ Time □ 1, p1

Parameter p1= -1 (OFF setting)

p1= 00 to 23

Request command Wave □ Level □ Reference □ Time □ 1?

Response data d1

Returned value Same as for setting command

Wave Level Reference Time 2

Time setting (time zone 2)

Setting start time of reference time interval (time zone 2) on level recording mode

Setting command Wave □ Level □ Reference □ Time □ 2, p1

Parameter p1= -1 (OFF setting)

p1= 00 to 23

Request command Wave □ Level □ Reference □ Time □ 2?

Response data d1

Returned value Same as for setting command

Wave Level Reference Time 3

Time setting (time zone 3)

Setting start time of reference time interval (time zone 3) on level recording mode

Setting command Wave_Level_Reference_Time_3, p1

Parameter p1= -1 (OFF setting)
p1= 00 to 23

Request command Wave_Level_Reference_Time_3?

Response data d1

Returned value Same as for setting command

Wave Level Reference Time 4

Time setting (time zone 4)

Setting start time of reference time interval (time zone 4) on level recording mode

Setting command Wave_Level_Reference_Time_4, p1

Parameter p1= -1 (OFF setting)
p1= 00 to 23

Request command Wave_Level_Reference_Time_4?

Response data d1

Returned value Same as for setting command

Wave Level Reference Time 1 Level

Level setting (time zone 1)

Setting trigger level of reference time interval (time zone 1) on level recording mode

Setting command	Wave_Level_Reference_Time_1_Level, p1
Parameter	p1= 25 to 130 (1 step)
Request command	Wave_Level_Reference_Time_1_Level?
Response data	d1
Returned value	Same as for setting command

Wave Level Reference Time 2 Level

Level setting (time zone 2)

Setting trigger level of reference time interval (time zone 2) on level recording mode

Setting command	Wave_Level_Reference_Time_2_Level, p1
Parameter	p1= 25 to 130 (1 step)
Request command	Wave_Level_Reference_Time_2_Level?
Response data	d1
Returned value	Same as for setting command

Wave Level Reference Time 3 Level

Level setting (time zone 3)

Setting trigger level of reference time interval (time zone 3) on level recording mode

Setting command	Wave_Level_Reference_Time_3_Level, p1
Parameter	p1= 25 to 130 (1 step)
Request command	Wave_Level_Reference_Time_3_Level?
Response data	d1
Returned value	Same as for setting command

Wave Level Reference Time 4 Level

Level setting (time zone 4)

Setting trigger level of reference time interval (time zone 4) on level recording mode

Setting command	Wave □ Level □ Reference □ Time □ 4 □ Level, p1
Parameter	p1= 25 to 130 (1 step)
Request command	Wave □ Level □ Reference □ Time □ 4 □ Level?
Response data	d1
Returned value	Same as for setting command

Wave Interval Rec

Interval recording

Setting ON/OFF of interval recording mode

Setting command	Wave □ Interval □ Rec, p1
Parameter	p1= "Off" p1= "On"
Request command	Wave □ Interval □ Rec?
Response data	d1
Returned value	Same as for setting command

Wave Interval Rec Interval

Recording interval

Setting recording interval on interval recording mode

Setting command	Wave □ Interval □ Rec □ Interval, p1
Parameter	p1= "10m" p1= "1h"
Request command	Wave □ Interval □ Rec □ Interval?
Response data	d1
Returned value	Same as for setting command

Wave Interval Rec Time

Recording time

Setting recording time on interval recording mode

Setting command	Wave □ Interval □ Rec □ Time, p1
Parameter	p1= "15s" p1= "1m" p1= "2m"
Request command	Wave □ Interval □ Rec □ Time?
Response data	d1
Returned value	Same as for setting command

Wave Rec State

Recording states

Request command	Wave □ Rec □ State?
Response data	d1
Returned value	d1=0: Stop d1=1: Interval d1=2: Level d1=3: Manual d1=4: Total

Specifications

Compatible model	Sound Level Meter NL-42/NL-52/NL-62
Media	SD memory card 2 GByte
Sampling frequencies	48 kHz, 24 kHz, 12 kHz
Bit length	24 bit, 16 bit
Data format	WAVE
Frequency weighting	Z weighting (flat response) * When the low pass filter (LPF) setting of the NL-62 is selected, the frequency weighting setting of the NL-62 will be valid
Recording functions	
Event mode	
Manual recording	Recording is carried out during auto store using manual start/stop Pre-recording 0 second, 1 second, 5 seconds, 10 seconds, 30 seconds, 1 minute Max. number of recorded data 9999 using a single store name
Level recording	Recording starts when trigger level is exceeded, including the data from the selected pre-time, and stops 5 seconds after dropping below trigger level Separate trigger level setting is possible for day, evening, and night time interval (up to 4 settings)
Parameter settings	Trigger level 25 to 130 dB (1-dB steps) Pre-recording 0 second, 1 second, 5 seconds, 10 seconds, 30 seconds, 1 minute Maximum recording time Off, 10 minutes Max. number of recorded data 9999 using a single store name

Interval recording	Recording is carried out during auto store at selected intervals for 15 seconds, 1 minute or 2 minutes.
Parameter settings	
Recording interval	10 minutes, 1 hour
Recording time	15 seconds, 1 minute, 2 minutes
Max. number of recorded data	9999 using a single store name
Total mode	
Total recording	Record all sounds during auto store Recording also possible during manual store measurement In manual store mode, measurement followed by store operation records the sound pressure waveform for the entire period of measurement
Parameter settings	
File split interval	1 minute, 10 minutes, 1 hour
Number of recorded data	
Auto store	9999 using a single store name
Manual store	1440 per address
Battery life	Battery life will be approx. 25% shorter when waveform recording function is used
Dimensions	32 (H) × 24 (W) × 2.1 (D) mm
Weight	Approx. 5 g
Supplied accessories	
Inspection certificate	1

