

Sound Level Meter class1 NL-52

Sound Level Meter class2 NL-42



CE

# Measure Sounds Reliably

Sound Level Meter  
class1  
**NL-52**

Sound Level Meter  
class2  
**NL-42**

**Free trial  
optional programs**  
now available on  
our website



<http://rion-sv.com/>

# Extremely user friendly ! Rion's NL-52 and NL-42 sound level meters provide full support for the measurement process.

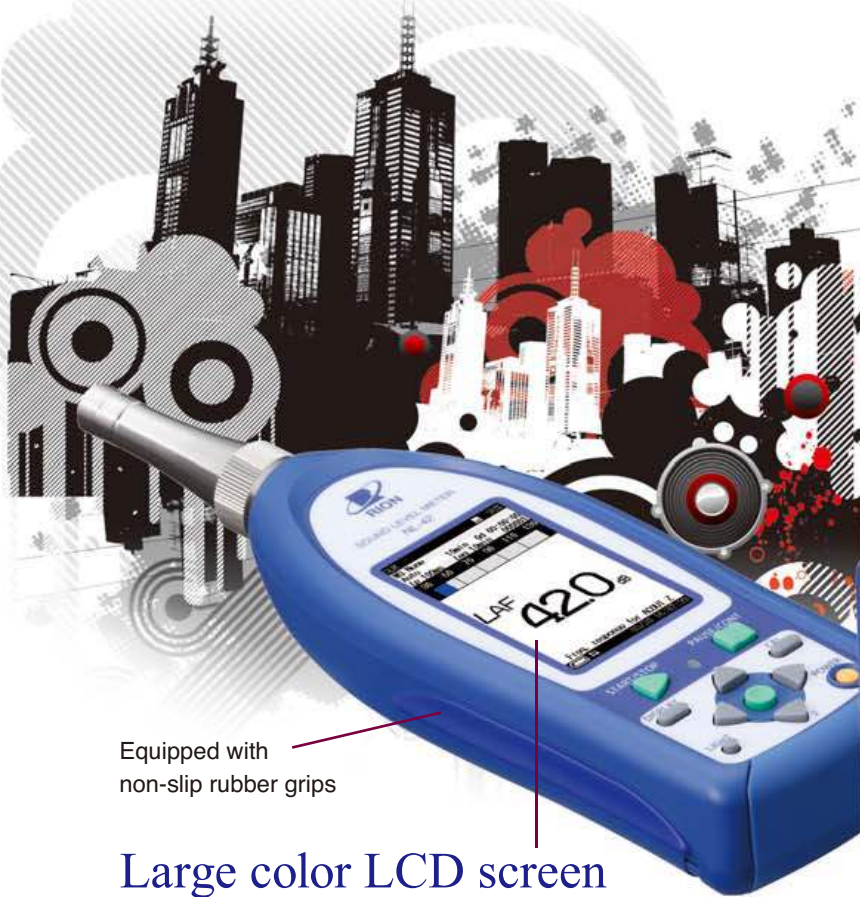
The NL-52 and NL-42 were developed to eliminate the trouble of reading instruction manuals when conducting measurements.

Large and easily viewable three-inch LCD color display.

The unit (except for the microphone) is water-resistant, which means that it is unaffected by sudden rain showers.

You can use rechargeable batteries to help cut down on waste, making this an environmentally friendly product.

250 mm  
9.85 inch



Equipped with non-slip rubber grips

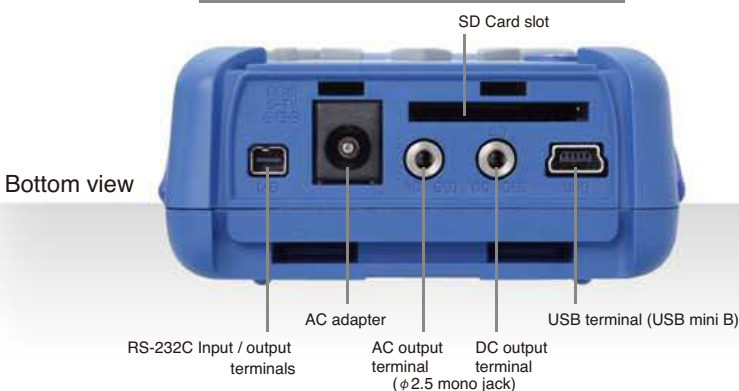
## Large color LCD screen

Three-inch LCD screen with a touch panel  
High resolution screen is easy to see indoors or outdoors and even in the dark.



(Full scale)

### Variety of I/O Connections



Bottom view

RS-232C Input / output terminals

AC adapter  
AC output terminal  
( $\phi$  2.5 mono jack)

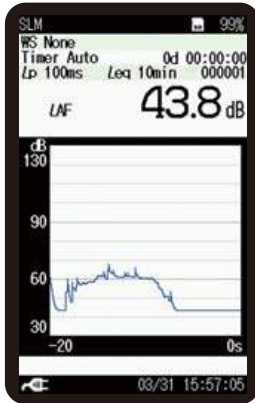
SD Card slot

DC output terminal  
( $\phi$  2.5 mono jack)

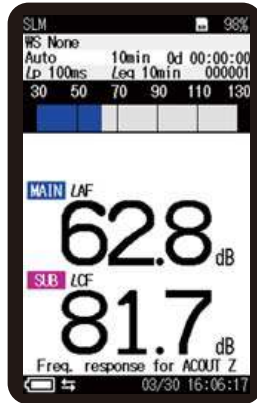
USB terminal (USB mini B)

## No paper manual is needed.

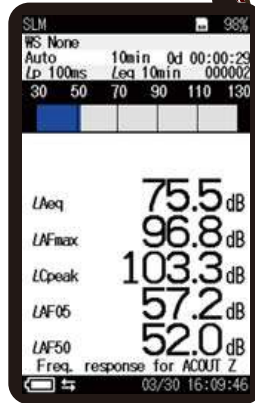
User instructions and a help function can be easily accessed on the device.



Measurement Display (Level-Time graph)



Measurement Display (Simultaneous display of Main and Sub channel)



Parameter Screen



Menu screen



Help screen

## Water-resistant (Except for the microphone)

Guaranteed water-resistant to at least level IP54 (resistant to spraying water). Helps reduce failures caused by sudden rain showers.



\* Mounting the All-weather windscreen or rainproof windscreen helps raise the water-resistant performance of the entire unit, so that the microphone will meet IPX3 specifications.

## Use of rechargeable batteries

In these models it is possible to use rechargeable batteries which make these meters environmentally-friendly. 24 hour continuous measurement is possible (when using eneloop® or dry alkaline batteries).



- Please use the dedicated charger to charged eneloop® batteries.
- When using eneloop batteries, please read the eneloop® battery instruction manual.
- eneloop® is a registered trademark of Panasonic group.

## Continuous detailed measurements for one month

This meter can be used to conduct long-term measurements, such as environmental measurements. (If an AC adapter is used)

Duration of recording

**NL-52/42**

1000 h (approx. one month)

Previous model

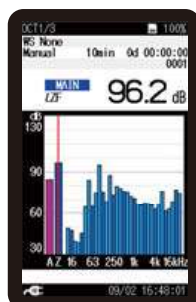
200 h (approx. one week)

Example of detailed recording

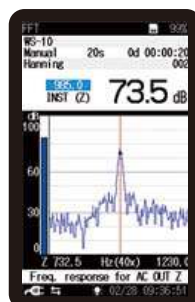
If the  $L_p$  is measured at 100 ms intervals and the  $L_{eq}$  is simultaneously measured at 10 min intervals over a 24 h period, the total size of accumulated data is approximately 74 MB (reference value)

## Functionality can be extended by a range of options

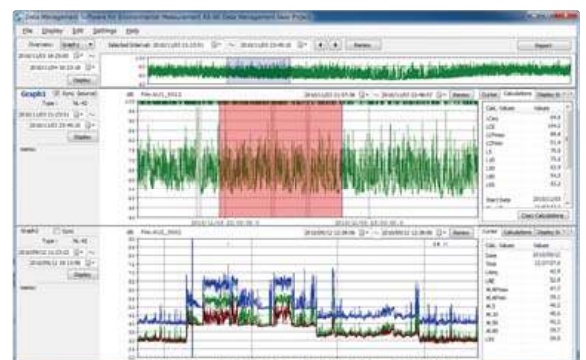
Additional functions can be added, such as simultaneous logging of raw data (100 ms  $L_p$ ) and processed data ( $L_{eq}$  and other indices), frequency analysis reverberation time measurement and long-term data recording.



1/3 octave band analysis screen



FFT analysis screen (x40)



Data management screen of AS-60 software

# Optional program function list

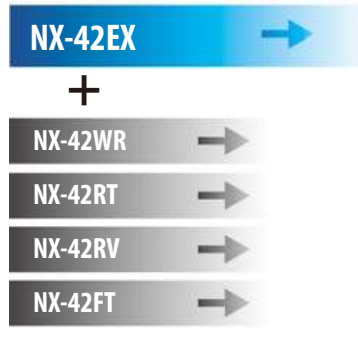
When the optional programs are installed, the following functions are added:

## Extended function program NX-42EX

The NX-42EX is supplied on the 512 MB SD card. The 512 MB SD card can be used as a memory card after installing the program.

### Prepares for other programs

When NX-42EX is installed\*, NX-42WR, NX-42RT, NX-42RV and NX-42FT can be added.



| NX-42EX  |
|--|
| Auto store function (instantaneous value, processed value) |
| Comparator function  |
| Continuous data output function                            |



| Program type                            | NX-42WR | NX-42RT | NX-42FT | NX-42RV |
|---|---------|---------|---------|---------|
| Additional function                     |         |         |         |         |
| Real sound monitor (waveform recording) | ●       |         |         |         |
| Octave, 1/3 octave band analysis        |         | ●       |         |         |
| Octave, 1/3 octave band filter output   |         | ●       |         |         |
| FFT analysis                            |         |         | ●       |         |
| Reverberation Time Measurement          |         |         |         | ●       |

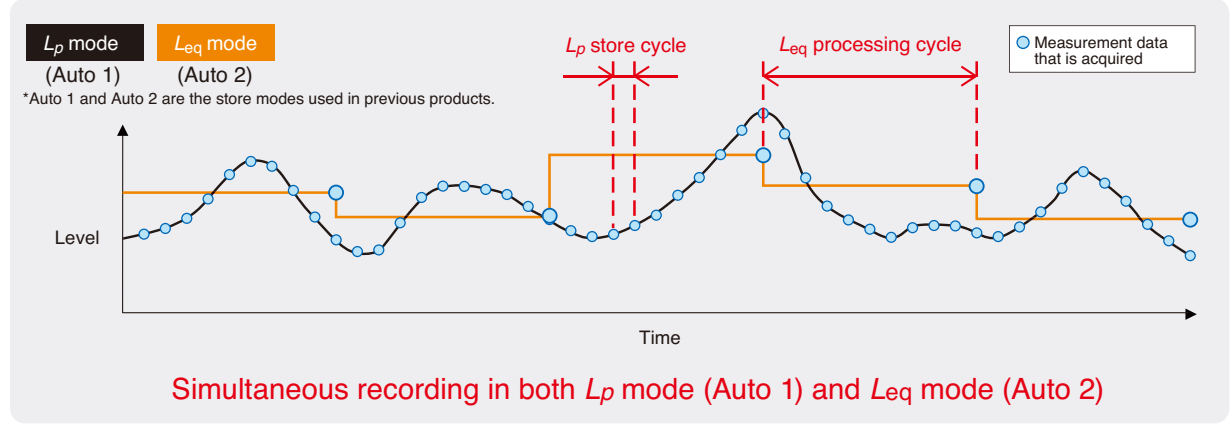
\* The NX-42EX program cannot be uninstalled.

### Auto store function

This function enables continuous measurement in  $L_p$  mode (instantaneous SPL) and  $L_{eq}$  mode (equivalent continuous SPL) to be conducted simultaneously.

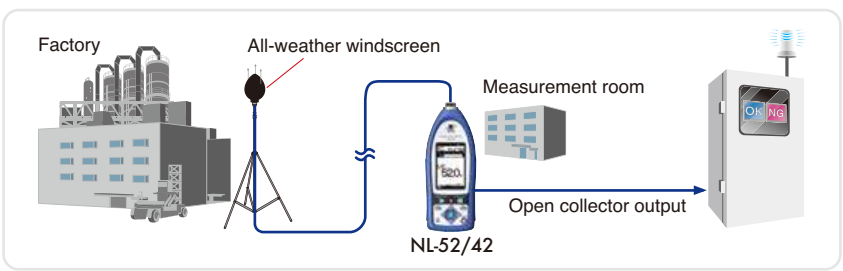
|   |               |                                |
|---|---------------|--------------------------------|
| Total measuring time of Auto store function | Up to 1 000 h | Equipped with a timer function |
|---|---------------|--------------------------------|

$L_p$  mode (instantaneous SPL) and  $L_{eq}$  mode (equivalent continuous SPL) concept



### Comparator function

This function turns on when the open collector output exceeds the set value (max. applied voltage 24 V, max. current 60 mA, allowable dissipation 300 mW).



### Continuous data output function

This function enables the continuous acquisition of instantaneous values and processed values during both USB and RS-232C communication. This is a convenient function for users who can design their own control programs, where data has to be transferred continuously from the sound level meter to the computer.

## Waveform recording program NX-42WR



The NX-42WR is supplied on the 2 GB SD card. The 2 GB SD card can be used as a memory card after installing the program.



This function enables users to record sounds and to process sound levels simultaneously. Recorded data can be played on computer and used for frequency analysis.

(Uncompressed waveform WAVE file)

Sampling at 48 kHz, 24 kHz, 12 kHz, Selection of 24 bit or 16 bit

Maximum recording time (16 bit)

| Sampling frequency | Memory card |      |       |
|--------------------|-------------|------|-------|
|                    | 512 MB      | 2 GB | 32 GB |
| 48 kHz             | 1 h         | 4 h  | 79 h  |
| 24 kHz             | 2 h         | 9 h  | 158 h |
| 12 kHz             | 4 h         | 18 h | 315 h |

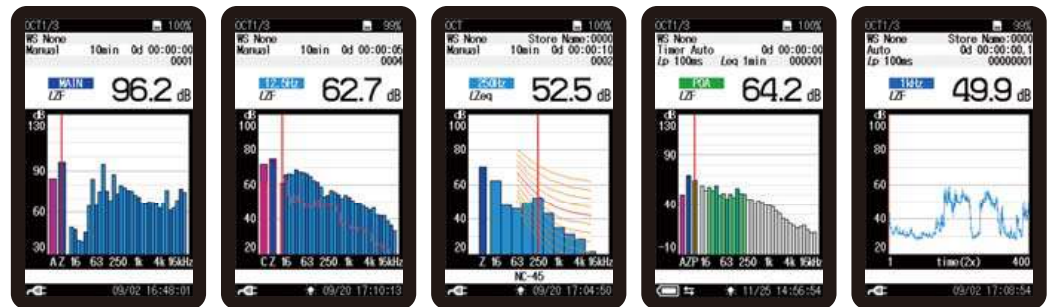
## Octave, 1/3 octave real-time analysis program NX-42RT



The NX-42RT is supplied on the 512 MB SD card. The 512 MB SD card can be used as a memory card after installing the program.



By adding the NX-42RT program to the NL-52/NL-42, octave band and 1/3 octave band analysis can be performed. Saved analysis results can be loaded and shown in an overlay graph display together with current analysis data. NC curve graph display and NC value calculation/display are also possible. Using the AS-60RT software, data can be utilized and managed on a computer.



1/3 octave band analysis screen

Overlay analysis screen

NC curve screen

Partial over all screen

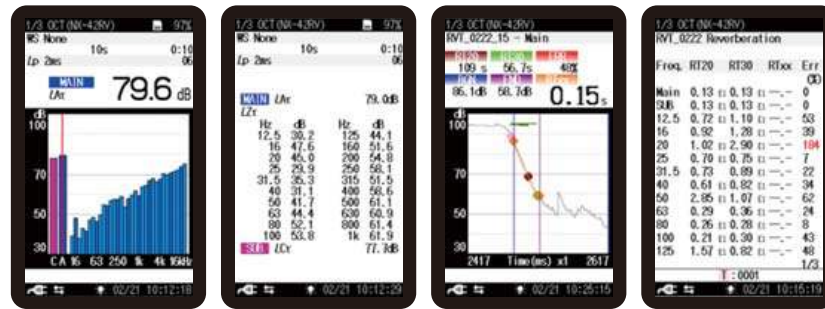
Measurement screen (Level-Time graph)

## Reverberation Time Measurement Program NX-42RV



The NX-42RV is supplied on the 512 MB SD card. The 512 MB SD card can be used as a memory card after installing the program.

By adding the NX-42RV program to the NL-52/42, reverberation time measurements can be performed. The measurement method is the interrupted noise method. This program allows storage of reverberation time decay curves, T20/T30 calculation, Txx calculation (reverberation time calculation based on a user-defined interval) and averaged reverberation time results displayed on the SLM screen.



Measuring screen (graph)

Measuring screen (numeric)

Reverberation time decay curve screen

Result screen (T20/T30/Txx)

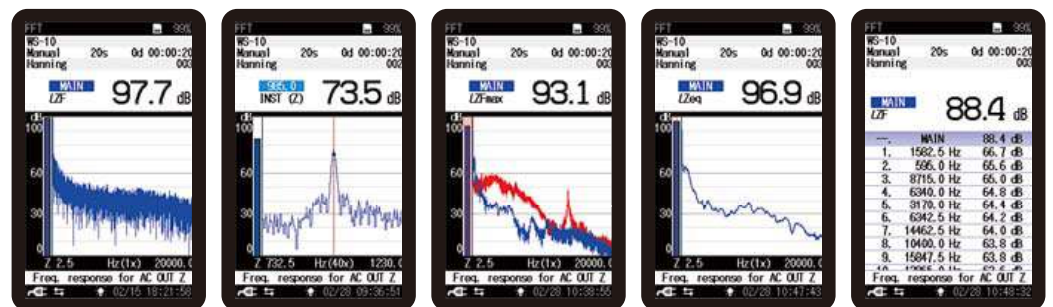
## FFT analysis program NX-42FT



The NX-42FT is supplied on the 512 MB SD card. The 512 MB SD card can be used as a memory card after installing the program.



By adding the NX-42FT program to the NL-52/NL-42, FFT analysis can be performed. The analysis frequency range is 20 kHz, with 8 000 spectrum lines (200 displayed). Saved analysis results can be loaded and shown in an overlay graph display together with current analysis data. Maximum zoom ratio is x40, and the top list screen can show up to 20 lines.



Analysis screen (x1)

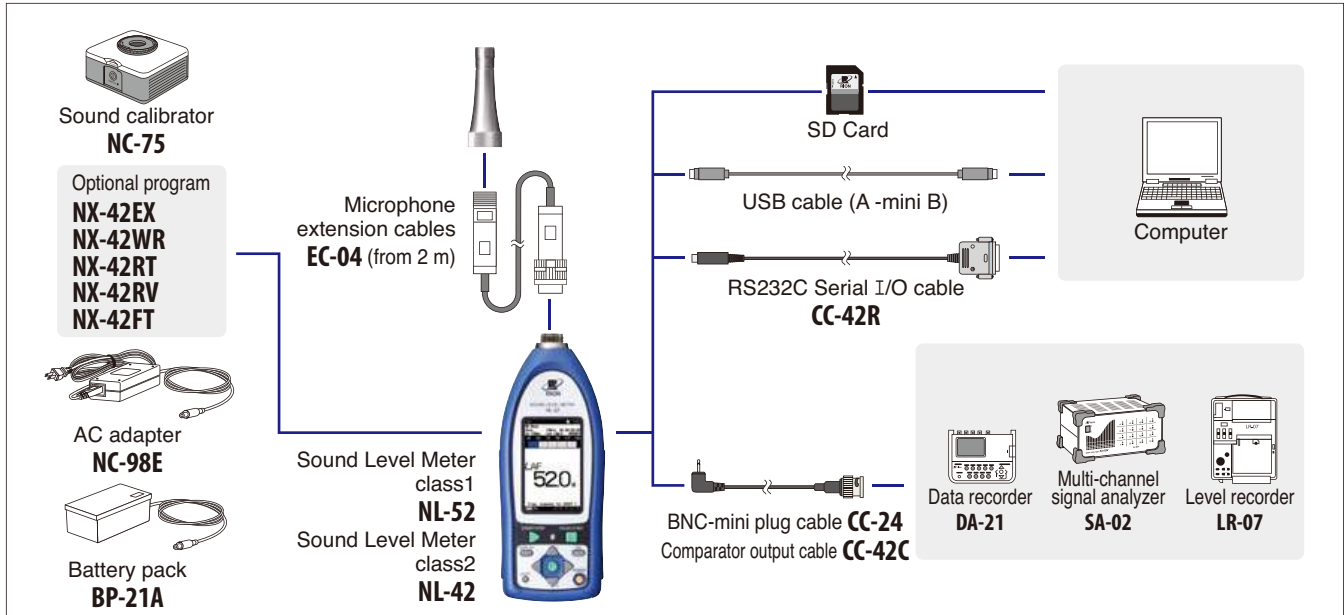
Analysis screen (x40)

Overlay analysis screen

Linear average screen

Top list screen

## System construction



## Peripheral devices

### All-weather windscreen **WS-15**



This windscreen is designed for outdoor installations. It helps to reduce wind noise and is equipped with rainproof features that satisfy the **IPX3 water-resistant** specifications. It is used with a microphone extension cable.

(Mounting adapter WS15006 required separately)  
 (For All-weather windscreen WS-15, use of ST-81 is recommended.)

### Rain-protection windscreen **WS-16**



This screen protects the microphone against rain for a short period of time. The rainproof performance of this windscreen is designed to satisfy the **IPX3 water-resistant** specifications.

### Sound calibrator **NC-75**

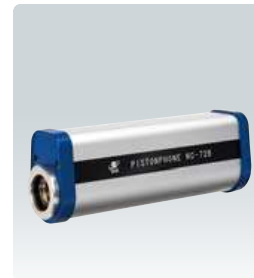


This Sound calibrator conforms to IEC 60942 (JIS C 1515), class 1, providing a level of performance sufficient for calibrating the precision sound level meter.

#### Specifications

|                                 |       |
|---------------------------------|-------|
| Nominal acoustic pressure level | 94 dB |
| Nominal frequency               | 1 kHz |

### PISTONPHONE **NC-72B**



Compliant with JIS C 1515: 2020 (IEC 60942: 2017) class LS/M, class 1/M  
 Allows calibration with accuracy of  $\pm 0.10$  dB.

#### Specifications

|                                 |        |
|---------------------------------|--------|
| Nominal acoustic pressure level | 114 dB |
| Nominal frequency               | 250 Hz |

### Tripod **ST-80**



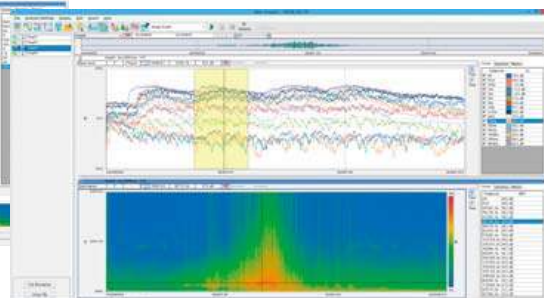
This stand can be used for general acoustic measurements. The sound level meter and microphone can be mounted on the stand.

## Waveform analysis software **AS-70**

This software allows you to load stored WAVE files from a RION sound level meter, vibration meter or data recorder. Octave, 1/3 octave, and FFT analyses can then be performed. Playback of the real sound files is also possible.



Frequency analysis screen



Frequency analysis screen

#### Specifications

|                      |                      |  |
|----------------------|----------------------|--|
| Waveform analysis    | Calculations         | Maximum value, Minimum value, Average value, RMS, Variance, Differential and integral calculus, HPF, LPF |
| Frequency weighting  |                      | Z, A, C, G, C to A, $L_v$ (vertical) (JIS C 1510), $L_h$ (horizontal) (JIS C 1510)                       |
| FFT analysis         | Analysis points      | 32 to 65 536 points  |
|                      | Display data         | Power spectrum, Power spectral density, Spectrogram  |
| Time weighting       |                      | 10 ms, F, 630 ms, S, 10 s  |
| Octave band analysis | Applicable standards | IEC 61260-1: 2014 class 1  |
|                      | Analysis frequency   | Octave band 0.5 Hz to 16 kHz (16 bands)  |
|                      | range                | 1/3 octave band 0.4 Hz to 20 kHz (48 bands)  |

#### Recommended computer specifications

|         |  |
|---------|--|
| CPU     | Intel Core i5 2 GHz or higher                      |
| RAM     | 2 GB or more<br>(4 GB recommended)                 |
| HDD     | 20 GB free or more<br>(100 GB or more recommended) |
| DISPLAY | XGA (1 024 × 768) or more                          |
| OS      | Microsoft Windows<br>8.1 Pro 64 bit, 10 Pro 64 bit |

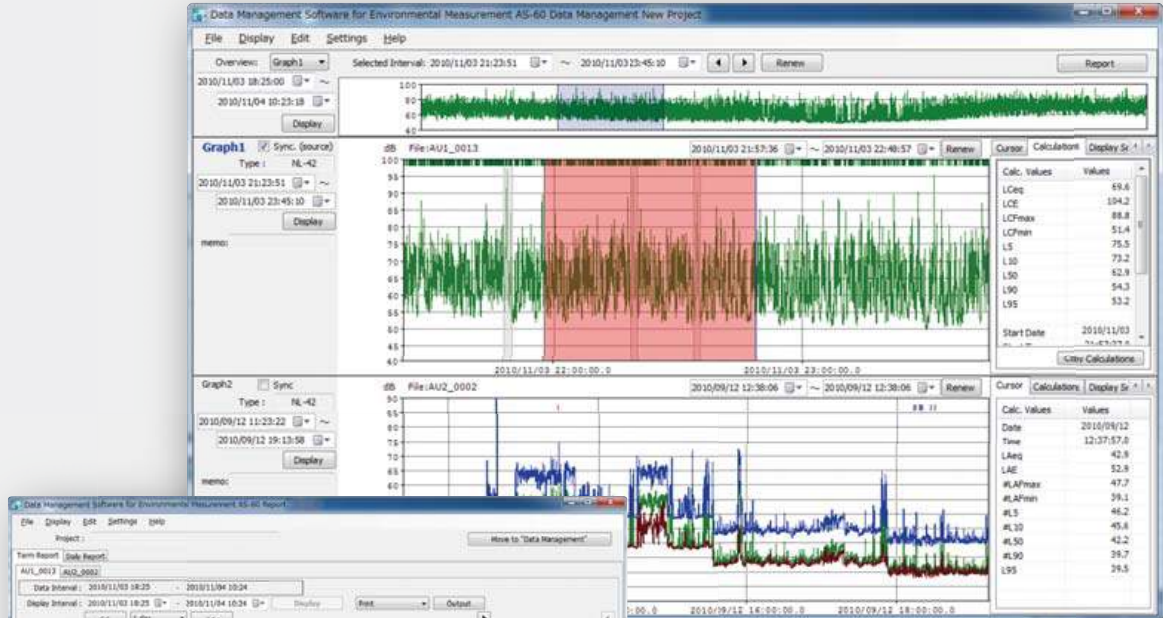
# Complete software for environmental measurements



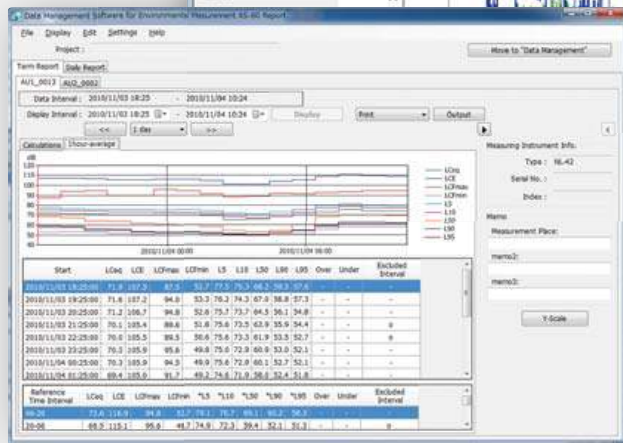
## Data management software for environmental measurement AS-60

Data management software for environmental measurement AS-60 enables the graph display of measurement data, arithmetic processing, excluded sound processing, preparation of reports, output of files, and playback of real sound files.

- Easy to use
- Reports easy to prepare
- Simultaneous display of multiple data items (up to 8 data items)
- Data stored in a data recorder can be loaded (CSV file for DA-40 Viewer)
- Data combination



Data management screen



Report preparation screen

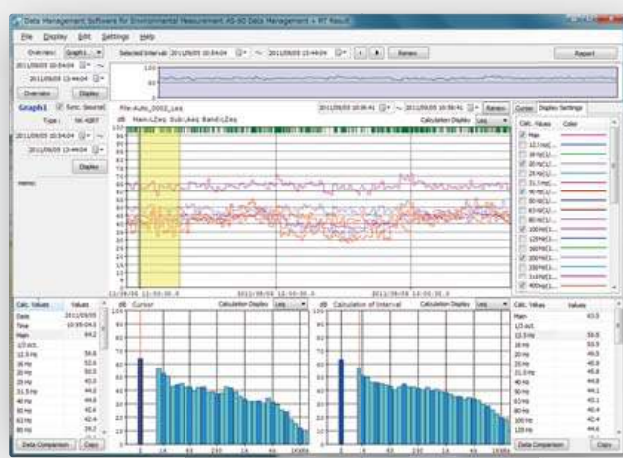
### Supported models

- NL-62\*
  - NL-52/42\*
  - NL-32/31/22/21\*
  - DA-40Viewer
- \*Only auto store data are supported.

### Recommended computer specifications (Common for AS-60/60RT/60VM)

- CPU Intel Core i5 2 GHz or higher
  - RAM 2 GB or more (4 GB or more recommended)
  - DISPLAY XGA (1024 x 768) or more, at least 65 536 colors
  - OS Microsoft Windows 8.1 Pro 64 bit, 10 Pro 64 bit
- If AS-60/60RT/60VM is used for NL-52/42 data, the NX-42EX is also needed.

## Data management software for environmental measurement AS-60RT (Includes the octave and 1/3 octave data management software)



Data management screen

### Adds support for handling octave band analysis data to AS-60

AS-60RT is for managing NX-62RT/42RT or NA-28 data on a computer.

### Supported models

- SX-A1RT\*
  - NX-62RT\*
  - NX-42RT\*
  - NA-28\*
- \*Only auto store data are supported.

## Data management software for environmental measurement AS-60VM (Includes the vibration level data management software)

Adds support for handling data measured with VM-55EX/53A to AS-60

### Supported models

- VM-55EX\*
  - VM-53A\*
- \*Only auto store data are supported.

# Specifications



|                       |                                | NL-52  | NL-42  |
|-----------------------|--------------------------------|--|--|
| Applicable standards  |                                | IEC 61672-1: 2013/2002 class 1<br>ANSI/ASA S1.4-2014/Part1 class 1<br>JIS C 1509-1: 2017 class 1   | IEC 61672-1: 2013/2002 class 2<br>ANSI/ASA S1.4-2014/Part1 class 2<br>JIS C 1509-1: 2017 class 2 |
| Measurement functions |                                | Simultaneous measurement of the following items, with selected time weighting and frequency weighting<br>Instantaneous sound pressure level: $L_p$<br>Equivalent continuous sound pressure level: $L_{eq}$<br>Sound exposure level: $L_E$<br>Maximum sound pressure level: $L_{max}$<br>Minimum sound pressure level: $L_{min}$<br>Percentile sound levels: $L_N$ (0.1 to 99.9 %, 0.1-increment steps, max. 5 values)  |  |
| Processing (main ch)  |                                | Instantaneous sound pressure level: $L_p$<br>C-weighted equivalent continuous sound level: $L_{Ceq}$<br>C-weighted peak sound level: $L_{Cpeak}$<br>Z-weighted peak sound level: $L_{Zpeak}$<br>I-time-weighted equivalent continuous sound level: $L_{A1eq}^{*2}$<br>Maximum I-time-weighted equivalent continuous sound level: $L_{A1max}^{*2}$<br>The power average of the maximum level of each 5 second interval: $L_{A1ms}$<br>The frequency weighting for the additional processing synchronizes with the frequency weighting of the sub-channel, so when the sub-channel has A-weighting, $L_{A1ms}$ can be selected.<br>When C-weighting (Z-weighting) is selected, the additional processing $L_{Ceq}$ and $L_{Cpeak}$ ( $L_{Zpeak}$ ) are selectable.   |  |
| Processing (sub ch)   |                                | Instantaneous sound pressure level: $L_p$  |  |
| Additional processing |                                | In addition to main processing items, one of the following can be selected for simultaneous processing:<br>C-weighted equivalent continuous sound level: $L_{Ceq}$<br>C-weighted peak sound level: $L_{Cpeak}$<br>Z-weighted peak sound level: $L_{Zpeak}$<br>I-time-weighted equivalent continuous sound level: $L_{A1eq}^{*2}$<br>Maximum I-time-weighted equivalent continuous sound level: $L_{A1max}^{*2}$<br>The power average of the maximum level of each 5 second interval: $L_{A1ms}$<br>The frequency weighting for the additional processing synchronizes with the frequency weighting of the sub-channel, so when the sub-channel has A-weighting, $L_{A1ms}$ can be selected.<br>When C-weighting (Z-weighting) is selected, the additional processing $L_{Ceq}$ and $L_{Cpeak}$ ( $L_{Zpeak}$ ) are selectable. |  |
| Microphone            | Type                           | UC-59  | UC-52  |
|                       | Sensitivity level              | -27 dB   | -33 dB   |
| Measurement range     |                                | A-weighting: 25 dB to 138 dB<br>C-weighting: 33 dB to 138 dB<br>Z-weighting: 38 dB to 138 dB<br>C-weighting peak sound level: 55 dB to 141 dB<br>Z-weighting peak sound level: 60 dB to 141 dB   |  |
| Inherent noise        | A-weighting                    | 17 dB or less  | 19 dB or less  |
|                       | C-weighting                    | 25 dB or less  | 27 dB or less  |
|                       | Z-weighting                    | 30 dB or less  | 32 dB or less  |
| Frequency range       |                                | 10 Hz to 20 kHz  | 20 Hz to 8 kHz   |
| Frequency weighting   |                                | A, C, and Z  |  |
| Time weighting        |                                | F (Fast) and S (Slow)  |  |
| Level range           |                                | Single range (Linearity range: 113 dB)   |  |
|                       | Bar graph display range max    | Max. 110 dB (20 to 130 dB)   |  |
|                       | Switching of bar graph display | Set the upper/ lower limit in 10 dB increments.  |  |
| RMS detection circuit |                                | Digital processing method  |  |
| Sampling cycle        |                                | 20.8 $\mu$ s ( $L_p$ , $L_{eq}$ , $L_E$ , $L_{max}$ , $L_{min}$ , $L_{peak}$ : sampling frequency: 48 kHz)<br>100 ms ( $L_N$ )   |  |
| Calibration           |                                | Electrical calibration performed according to IEC and JIS standards, using internally generated signals: acoustic calibration performed with the NC-75.  |  |
| Correction functions  |                                | Windscreen correction:<br>Compliant with IEC 61672-1 and JIS C 1509-1 standards when the windscreen is installed.<br>Diffuse sound field correction:<br>Correction of frequency characteristics in order to comply with standards (ANSI S1.4) in diffuse sound field.  |  |
| Delay time            |                                | The meter can be set to start measuring a specified time (OFF, 1, 3, 5 or 10 s) after the start button has been pressed or when a user-set trigger is exceeded.  |  |
| Back erase function   |                                | When the PAUSE key is pressed to pause measurement, the preceding (user selectable) 0, 1, 3 or 5 s data are excluded from processing.  |  |
| Display               |                                | Backlit semitransparent color TFT LCD display WQVGA (400 x 240 dots)<br>* LCD with touch panel (Capacitive Touch Panel)<br>Numerical display update frequency: 1 s Bar graph update frequency: 100 ms  |  |
| Store                 | Manual                         | Data for measurement results are stored manually in single address increments.   |  |
|                       | Number of data                 | Internal memory: max. 1 000 sets<br>SD Card: depends on the capacity of the SD Card*1  |  |
|                       | Auto*2                         | Instantaneous values ( $L_p$ mode) and processed values ( $L_{eq}$ mode) are stored continuously and automatically at preset intervals.  |  |
|                       | $L_p$ sampling cycle           | 100 ms, 200 ms, 1 s, $L_{eq}$ 1s   |  |
|                       | $L_{eq}$ sampling cycle        | 10 s, 1, 5, 10, 15, 30 min, 1, 8, 24 h, and user selected time (up to 24 hours)  |  |
|                       | Measurement Time               | Max. 1 000 h in Auto $L_p$ storage mode, max. 100 000 addresses in Auto $L_{eq}$ storage mode(depends on the capacity of the SD card)*1  |  |

|   |  |  |
|---|--|--|
| Data recall                               | Allows viewing of stored data  |  |
| Setup memory                              | Up to five setup configurations can be saved in internal memory, for later recall<br>Start up via file settings previously stored on SD card possible                              |  |
| Waveform recording*2*3                    |  |  |
|   | File format  | Uncompressed waveform WAVE file  |
|   | Sampling frequency   | Select 48 kHz, 24 kHz or 12 kHz  |
|   | Data length  | Select 24 bit or 16 bit  |
| Outputs                                   | DC output  | Output DC signals using a frequency weighting characteristic selected by processing.<br>Output voltage<br>2.5 V, 25 mV / dB at bar graph display full scale                        |
|   | AC output  | Output AC signals using a frequency weighting characteristic selected by processing or by A, C, Z-weighting.<br>Output voltage<br>1 V (rms values) at bar graph display full scale |
|   | Comparator output*2  | Turns on when the open-collector output exceeds the set value (max. applied voltage 24 V, max. current 60 mA, allowable dissipation 300 mW).                                       |
| USB                                       | Allows USB to be connected to a computer and recognized as a removable disk<br>Allows USB to be controlled via communication commands  |  |
| RS-232C communication                     | Allows for RS-232C communication via use of a dedicated cable  |  |
| Data continuous output*2                  |  |  |
|   | Type of data   | Instantaneous value<br>Processed value<br>$L_p$<br>$L_{eq}$ , $L_{max}$ , $L_{min}$ , $L_{peak}$   |
|   | Output interval  | 100 ms   |
| Power requirements                        | Four IEC R6 (size AA) batteries (alkaline or rechargeable batteries) or external power supply  |  |
|   | Battery life (23 °C)   | Alkaline battery LR6 (AA): 26 h Ni-MH secondary battery: 25 h<br>At the maximum *Depends on the setting  |
|   | AC adapter   | NC-98E   |
|   | External power voltage   | 5 to 7 V (rated voltage: 6 V)  |
|   | Current consumption  | Approximately 90 mA (normal operation, rated voltage)  |
| Ambient conditions                        | Temperature  | -10 to +50 °C  |
|   | Humidity   | 10 to 90 % RH (non-condensing)   |
| Dustproof / water-resistant performance*4 | IP code: IP54 (except for microphone)<br>See precautions regarding waterproofing   |  |
| Dimensions, weight                        | Approx. 250 (H) x 76 (W) x 33 mm(D), approx. 400 g (with batteries)  |  |
| Supplied accessories                      | Storage case x 1, Windscreen WS-10 x 1, Windscreen fall prevention rubber x 1, Hand strap x 1, LR6 (AA) alkaline batteries x 4, SD card 512 MBx1 (NX-42EX preinstalled model only) |  |

## Options

| Product name   | Product number                |
|--|-------------------------------|
| Extended function program (Inst.on 512 MB SD card)   | NX-42EX                       |
| Waveform recording program*2 (Inst.on 2 GB SD card)  | NX-42WR                       |
| Octave, 1/3 octave real-time analysis program*2 (Inst.on 512 MB SD card)   | NX-42RT                       |
| Reverberation time measurement program*2 (Inst.on 512 MB SD card)  | NX-42RV                       |
| FFT analysis program*2 (Inst.on 512 MB SD card)  | NX-42FT                       |
| Data management software for environmental measurement   | AS-60                         |
| Data management software for environmental measurement (Includes the octave and 1/3 octave data management software) | AS-60RT                       |
| Data management software for environmental measurement (Includes the vibration level data management software)       | AS-60VM                       |
| Waveform analysis software   | AS-70                         |
| SD Card 512 MB   | MC-51SD1                      |
| SD Card 2 GB   | MC-20SD2                      |
| SD Card 32 GB  | MC-32SP3                      |
| AC adapter (100 V to 240 V)  | NC-98E                        |
| Battery pack   | BP-21A                        |
| Microphone extension cables  | EC-04 (from 2 m)              |
| BNC-Pin output code  | CC-24                         |
| Comparator output cable  | CC-42C                        |
| RS 232C serial I/O cable   | CC-42R                        |
| USB cable  | Generic USB cable can be used |
| Sound calibrator   | NC-75                         |
| All-weather windscreen   | WS-15                         |
| Windscreen mounting adapter  | WS-15006                      |
| Rain-protection windscreen   | WS-16                         |
| Sound level meter tripod   | ST-80                         |
| All-weather windscreen tripod  | ST-81                         |

\*1 Use Rion fully guaranteed products. \*2 NX-42EX required (sold separately). \*3 NX-42WR required (sold separately).  
\*4 Protection against harmful dust and water splashing from any direction.

### Precautions regarding waterproofing

Before use, verify that the rubber bottom cover and the battery compartment lid are firmly closed.  
To maintain the water and dust proof rating, internal packing replacement is required every two years (at cost).



**JCSS**  
JCSS 0197

RION CO., LTD. is recognized by the JCSS which uses ISO/IEC 17025 as an accreditation standard and bases its accreditation scheme on ISO/IEC 17011. JCSS is operated by the accreditation body (IA Japan) which is a signatory to the Asia Pacific Accreditation Cooperation (APAC) as well as the International Laboratory Accreditation Cooperation (ILAC). The Quality Assurance Section of RION CO., LTD. is an international MRA compliant JCSS operator with the accreditation number JCSS 0197.



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\* Windows is a trademark of Microsoft Corporation. \* Specifications subject to change without notice.

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