Top of the Rion Range of Sound Level Meters

Sound level meter and 1/3 octave band real-time analyzer NA-28
Rion’s priorities for on-site measurements are speed, ease of use, quality and reliability.
The New NA-28 is the top of the Rion range of sound level meters and analyzers. It combines cutting edge technology with excellent quality and unrivalled ease of use.

Easy to use compact design with comprehensive features

Sound level meter and 1/3 octave band real-time analyzer NA-28

Key Features Include:
- Ease of use - main functions on dedicated, backlit keys
- Superb high-contrast backlit TFT-LCD color display
- Simultaneous measurement and display of 1/1 and 1/3 octaves
- One keystroke to switch between sound level meter and analyzer display
- Massive storage capacity using text files stored to CompactFlash memory cards (CF card)
- Flexible and simple PC connectivity (CF card and USB Virtual Disk)
- Exceptional battery life using standard alkaline batteries, approx. 16 hours
Key Capabilities
- Real Time Octaves (16 Hz to 16 kHz) or 1/3 octaves (12.5 Hz to 20 kHz)
- Real Time Simultaneous Octaves (16 Hz to 8 kHz) and 1/3 Octaves (12.5 Hz to 12.5 kHz)
- Data stored as text files direct to CF card
- Measures and logs $L_{eq}$, $L_{max}$, $L_{min}$ and 5 percentile values ($L_p$) in octaves and/or 1/3 octaves
- Auto Stores 300 000 data sets or 1 000 hours of 1 second 1/3 octaves onto 2 GB CF card
- Auto Stores 1 000 data sets or 10 000 of 1 second 1/3 octaves to internal memory
- Manual Storage for 1 000 data sets internally or 100 000 data sets to 2 GB CF card
- Linearity 110 dB in Sound Level Meter Mode and 95 dB in Analyzer Mode
- 16 hours battery life with 4 Alkaline ‘C’ Cells
- Main and Sub-Channel for simultaneous selection of 2 time or frequency weightings
  - F (Fast), S (Slow), 10 ms Time Weightings plus Peak & Impulse on Sub-Channel
- Data transfer using CF card or USB (meter/CF card appearing as virtual disk)
- Measurement can be started by internal or external trigger
- Comparator output to trigger external devices
- AC and DC outputs of main and/or sub-channel
- Expandable functionality using programme cards

Key Options
- Building Acoustics Programme Card
- Uncompressed WAV file recording Programme Card

Flexible user interface
- CF card slot
- Infrared remote control sensor
- AC adapter terminal
- Two-way trigger input/comparator output terminal
- AC output terminal
- DC output terminal
- USB terminal

Screen display-Example
- Analysis mode screen (Simultaneous 1/1 & 1/3 octave band display)
- Time versus level display with 1/1,1/3 octave analysis
- Sound level meter mode screen (Sound level display)
- Menu list screen

Infrared Remote Control
- NA-27RC1

Memory Card 256 MB
- MC-25LC1

System constitution
- Building Acoustic Card
  - NX-28BA
- Waveform Recording Card
  - NX-28WR
- FFT Analysis Card
  - NX-28FT
- AC adapter (Supplied)
  - NC-94B
- Battery pack
  - BP-21A
- Infrared remote control
  - NA-27RC1
- Sound calibrator
  - NC-75
- NA-28
- Memory card (Supplied)
  - 256 MB
- Interface USB cable (mini B-A)
- Computer
- Data recorder
  - DA-21
- BNC-RCA cable CC-24
- Dual conversion adaptor CC-59S01
- AC-DC out-put
- Sub Interface USB cable (mini B-A)
NX-28BA is a program card used in NA-28 for simple and easy measurement of airborne and floor impact sound insulation of buildings and the reverberation time. The measurements conforming to ISO and single-number quantities can also be calculated by the main body of NA-28. Data is stored as text files. Furthermore, when used in conjunction with the waveform recording card NX-28WR, sound waveforms during measurement can be recorded simultaneously.

Applicable specifications
ISO 140-4 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 4: Field measurements of airborne sound insulation between rooms
ISO 140-7 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 7: Field measurements of impact sound insulation of floors
ISO 717-1 Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation
ISO 717-5 Acoustics – Rating of sound insulation in buildings and of building elements – Part 5: Field measurements of airborne sound insulation of facade elements and facades
ISO 9632* Acoustics – Measurement of sound pressure level from service equipment in buildings – Engineering method

The main body performs measurement only.

Building Acoustic Card
NX-28BA

Screen display – Example

Measurement results overlaid with background noise (for octave, 1/3 octave simultaneous analysis)

Single-number quantities of airborne sound insulation between two rooms

Single-number quantities of floor impact sound insulation (light impact source)

Specifications

Measurement of reverberation decay curve

Specifications

Analysis model
Real-time, 1/3 octave band simultaneous analysis

Background noise measurement mode
None (none)/Once (1 point)/Before/During

Calculation
Average measured value, single number quantity, relaxation factor value (Q-value)

Display
Lpeq (Sound level in sound receiving room)

Display
Lpeq (Sound level in sound receiving room)

Measurement of airborne sound insulation between two rooms

Settings
Number of measurement points in sound source room
Number of measurement points in sound receiving room
Number of measurement points in background noise
Number of measurement points in sound source room
Number of measurement points in sound receiving room
Number of measurement points in background noise

Calculation
Average measured value, single number quantity, insulation factor value (Q-value)

Display
Results overlaid with background noise

Measurement of floor impact sound insulation (for light impact source)

Settings
Number of measurement points in sound source room
Number of measurement points in sound receiving room
Number of measurement points in background noise

Calculation
Average measured value, single number quantity, insulation factor value (Q-value)

Display
Results overlaid with background noise

Measurement of floor impact sound insulation (for heavy impact source)

Settings
Number of measurement points in sound source room
Number of measurement points in sound receiving room
Number of measurement points in background noise

Calculation
Average measured value, single number quantity, insulation factor value (Q-value)

Display
Results overlaid with background noise

Other measurements
Measurement of exterior wall sound insulation;
Measurement of equipment noise

Other capabilities
Separated address display and Auto-increment.
Alarm display, Settings change monitoring function, Waveform recording function (NX-28WR is separately needed)

Trigger level
Displays alarm when the SPL difference with background noise is too small (for measurement in sound receiving room)
NX-28WR is a program card that provides the NA-28 with recording functions. Using the NA-28 and NX-28WR in combination makes it possible to measure sound pressure levels together with sound pressure waveforms during frequency analysis. Since the data are recorded in uncompressed WAVE files, they can be handled with software compatible with the WAVE and analyzed.

**Sampling Frequencies & CF Card Recording Time**

<table>
<thead>
<tr>
<th>Sampling Frequency</th>
<th>CF Card Recording Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 kHz</td>
<td>30 m</td>
</tr>
<tr>
<td>24 kHz</td>
<td>9 h 20 m</td>
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<tr>
<td>12 kHz</td>
<td>18 h 50 m</td>
</tr>
<tr>
<td>64 kHz</td>
<td>3 h 30 m</td>
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<tr>
<td>32 kHz</td>
<td>14 h 10 m</td>
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</tbody>
</table>

Recording time would be somewhat changed by the number of files including recording data.

### Software

**Optional accessory**

**Waveform processing software AS-70**

Software may not be compatible depending on sampling frequencies.

1. If the software is not compatible, use a sampling converter to change sampling frequencies.

**Waveform analysis software CAT-WAVE**

(This software is a product of Catec Inc.)

- Software may not be compatible depending on sampling frequencies.
- If the software is not compatible, use a sampling converter to change sampling frequencies.

**FFT Analysis Card NX-28FT**

<table>
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<th>Specifications</th>
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<td>Dynamic range</td>
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<td>Analysis frequency range</td>
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<td>Number of analysis lines</td>
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<tr>
<td>Sampling frequency</td>
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<td>Time window function</td>
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<tr>
<td>Measurement mode (FFT mode)</td>
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<tr>
<td>Measurement items</td>
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<tr>
<td>Measurement time</td>
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<tr>
<td>Analysis frequency range</td>
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<td>Time window function</td>
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<td>Display</td>
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<tr>
<td>Trigger</td>
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<tr>
<td>Level trigger</td>
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<tr>
<td>External trigger</td>
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<tr>
<td>Memory store</td>
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<tr>
<td>Number of data sets</td>
</tr>
<tr>
<td>Offline store</td>
</tr>
</tbody>
</table>

### NX-28FT program card adds FFT analysis capability to NA-28.

- Analysis frequency range: 20 kHz (fixed)
- Number of analysis lines: 8,000 (fixed) (frame time 400 ms, frequency resolution 2.5 Hz)
Specifications

Applicable specifications
Sound level meter: Measurement method precision sound level meter
IEC 61672-1:2013/2002 class 1
ANSI/ASA S1.4-2014/Part 1 class 1
JIS C 1513-2002 class 1
JIS C 1514 - 2002 class 1

Measurement functions
With both a sound level meter mode and analyzer mode, it is capable of simultaneous main channel and sub-channel measurement in either mode. Time and frequency weighting are set separately for the main and sub-channels.

Sound level meter mode
Measurement of all-pass values indicated in the measurement items below in the main or sub-channel. Measurement of either L eq or L A in the sub-channel when using internal memory

Analyzer mode
Peak time of the main and the sub-channel level meter: Maximum 5 time ratio sound levels

Measurement items
Simultaneous measurement of all items in the selected time weighting and frequency weighting characteristics:
1) Instantaneous sound pressure level L A
2) Equivalent continuous sound pressure level L eq
3) Sound exposure level L eq
4) Maximum sound pressure level L max
5) Minimum sound pressure level L min
6) Maximum 5 time ratio sound levels L (1 to 59 sec, 1 to 59 min, 1 to 24 hours)

Frequency weighting characteristics are the same as sub-channel level meter mode:
Peak sound level L eq
Time-weighted sound pressure level L A

Measurement range
1 to 59 sec, 1 to 59 min, 1 to 24 hours

Microphone and preamplifier
Microphone: UC-59
Preamplifier: NA-27

Measurement range
A 25 dB to 140 dB
C 33 dB to 140 dB
Z 30 dB to 140 dB

Frequency range
10 Hz to 20 kHz

Octave analysis
Frequency range 10 Hz to 20 kHz (simultaneous analysis: up to 8 kHz)
1/3 octave analysis 12.5 Hz to 20 kHz (simultaneous analysis: up to 12.5 kHz)

Frequency weighting
A, C and Z

Time weighting
Main channel
F (Fast), S (Slow), 10 ms
Sub-channel
F (Fast), S (Slow), 10 ms, Impulse

Linear operation range
At A-weight (A-characteristics, 1 kHz)

Total range (A-characteristics, 1 kHz)
25 dB to 140 dB

Maximum peak sound level measurement
143 dB

Inherent noise
A 17 dB or less
C 25 dB or less
Z 30 dB or less

Sampling frequency
Main channel
15.6 μs (20.8 μs for octave, 1/3 octave simultaneous analysis)

100 ms

Correction functions
Windscreen correction
Frequency response correction to ensure standard compliance with windscreen installed correction on/off setting via menu

Diffuse sound field correction
Correction of frequency characteristics in order to comply with standards (ANSI/ASA S1.4.1) in diffuse sound fields

Correction function on/off operation implemented on the menu screen

Display
Color semi-transparent TFT LCD display with backlight (420 × 320 dots)

Refresh cycle
100 ms

Memory store of settings
Maximum 5 sets of settings can be stored in main memory and retrieved. Start-up is possible under the same conditions stored in the CF card in advance.

Manual store
Manual recording of measurement results per address together with the measurement start time

Record data count
Max. 1 000 sets

CF card
Maximum 1 000 sets per CF card, maximum 100 CF cards can be stored

Auto store
Continuous recording of measurement results at the set time interval (it is possible to record 4 types of color data in order to be able to identify events that occur while recording)

Pause does not function during auto-storage

Auto 1

Measurement time
Maximum: 1 000 (hours) when using the CF card, refer to the following if using internal memory

Sound level meter mode
Continuous recording in CF card every 100 ms of L A, L eq and L eq as if it is not possible to record sub-channel measurement results

Sampling cycle
100 ms (L A, L eq, L eq, L eq only)

when using internal memory
Maximum: 1 000 sets (1 sec or, for L eq, L eq, L eq, 2.7 hours)

Auto 2

Sound level meter mode
Continuous recording in CF card of main channel and sub-channel all-pass values and measurement start time for each measurement time

Analyzer mode
Continuous recording in CF card of main channel band levels and all-pass values and sub-channel all-pass values and measurement start time for each measurement time

Record data count
External memory: Maximum 1 000 sets
CF card: Maximum 300 000 sets

Data recall
Stored data access and time/level display (selected frequency band 1 only)

Memory of measurement
Maximum of 100 sets of all-pass and sound level data in main and sub-channel or 20 sets of sound pressure level data in main channel

Input/output
AC output
Selection and output of all-pass signals of either the main channel or sub-channel

Output voltage
1 V (effective value) at range full scale

Output resistance
600 Ω

Load resistance
10 kΩ or more

DC output
Selection and output of all-pass signals of either the main channel or sub-channel

Output voltage
3.0 V, 50 mW at range full scale

Output resistance
50 Ω

Load resistance
10 kΩ or more

Comparator output
Open collector output. Determination is also possible at the band level. The terminal is also used for the external trigger.

Maximum voltage
24 V

Maximum driving current
50 mA

External trigger input
Falling edge is detected at 0V to 5 V logic level. The terminal is also used for the comparator.

USB
In addition to connection to a PC as a storage device, it is also possible to use communication device class and execute control by communication commands (however, settings relating to the transfer of stored data and storage action are not possible with communication commands).

Remote control reception
Control of NA-28 by infrared remote control (remote control NA-27RC1, optional)

Power supply
Four IEC R14P (size C) batteries or external power supply

Operating time (24 C, normal operating conditions)
When following not functioning, sub-channel, backlight:
AC output: 8.4 VDC function, remote-control, autostore:
Alkaline batteries
LR14, 15 hours (10 hours if backlight is continuously activated)

AC adapter
NC-94B

Internal power supply voltage
5 V ± 2% (rated voltage: 5 V)

Consumption current
230 mA (during normal operation at rated voltage)

Ambient conditions for operation
10 °C to +60 °C, 10 %RH to 90 %RH

Dimensions, weight
331 (H) × 89 (W) × 51 (D) mm, approx. 730 g (including batteries)

Supplied accessories
Memory card (512 MB) NC-35LC1 × 1

Soft case × 1, AC adapter NC-48X × 1

Windscreen WS-15 × 1, BNC-PCA cable CC-26 × 1,

Strap × 1, IEC R14P (size C) batteries (alkaline) × 4

Options

name
model

Building acoustic card
NX-28BA

Waveform analysis card
NX-28WR

FFT analysis card
NX-28FT

Remote control
NA-27RC1

Sound calibrator
NC-70

Memory card
256 MB, 2 GB

Battery pack
BP-21A

Dual output adaptor
UC-9961

* Use only RION supplied cards for assured operation.