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
System constitution

- Building Acoustics Card: NX-28BA
- Waveform Recording Card: NX-28WR
- FFT Analysis Card: NX-28FT
- AC adapter (Supplied): NC-94B
- Infrared remote control: NA-27RC1
- Battery pack: BP-21A
- Sound calibrator: NC-74

NA-28

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 \( (L_{PN}) \) 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

Option
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.

Software

Recorded data by NX-28WR can be displayed and analyzed using optional software.

### Waveform Processing Software
- **AS-70**

### Waveform Recording Card NX-28WR

#### Sampling Frequencies & CF Card Recording Time

<table>
<thead>
<tr>
<th>CF Card Size</th>
<th>Recording Time (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>256 MB</td>
<td>48 kHz: 30 m, 24 kHz: 1 h, 12 kHz: 2 h 10 m, 6 kHz: 20 m, 3 kHz: 30 m, 1.5 kHz: 8 h 30 m, 0.75 kHz: 17 h 40 m, 0.375 kHz: 14 h 10 m</td>
</tr>
<tr>
<td>2 GB</td>
<td>48 kHz: 4 h 40 m, 24 kHz: 9 h 20 m, 12 kHz: 18 h 50 m, 6 kHz: 3 h 30 m, 3 kHz: 3 h 30 m, 1.5 kHz: 4 h 40 m, 0.75 kHz: 6 h 40 m, 0.375 kHz: 8 h 30 m</td>
</tr>
</tbody>
</table>

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

#### Specifications
- **Sampling frequency**
  - 48 kHz, 24 kHz, 12 kHz simultaneous analysis
- **Sound meter, octave analysis**
  - 48 kHz, 32 kHz, 16 kHz simultaneous analysis
- **Overwrite limit**
  - 16 bits
- **Data format**
  - WAVE
- **Frequency weighting**
  - Z weighting (flat response) (fixed)
- **Recording functions**
  - Event mode: Level recording, interval recording, manual recording
  - Total mode: Total recording

Replay and reanalysis cannot be made with the NA-28 unit.

![Waveform analysis screen](image1.png)

### FFT Analysis Card NX-28FT

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

#### Specifications
- **Measurement mode**
  - Main channel all-pass value and FFT analysis
  - Sub-channel all-pass value
- **Measurement items**
  - Simultaneous measurement of INST and LIN or MAX
- **Dynamic range**: 100 dB
- **Analysis frequency range**: 20 kHz (fixed)
- **Dynamic range**: 20 kHz (fixed)
- **Number of spectrum lines**: 8,000 (fixed) (frame time 400 ms, frequency resolution 2.5 Hz)
- **Sampling frequency**: 48 kHz (fixed)
- **Display**
  - Measurement screen: Simultaneous display of FFT analysis result and all-pass level
  - Display: Simultaneous display of FFT analysis result and all-pass level
- **Other features**
  - Time window function: Hanning, Rectangular
  - FFT: 8,000 lines, 400 ms, 2.5 Hz resolution
  - Cursor display:
    - x1, x2, x5, x10, x20, x40
  - FFT: 8,000 lines, 400 ms, 2.5 Hz resolution
  - Memory lock
  - FFT lock

- **Precautions**

- **Software**
  - Optional accessory
    - Waveform processing software
      - **AS-70**

- **Software**
  - Recorded data by NX-28WR can be displayed and analyzed using optional software.

- **FFT Analysis Card NX-28FT**

- **Spectrum map screen**

- **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**
  - **Measurement mode**
    - Main channel all-pass value and FFT analysis
    - Sub-channel all-pass value
  - **Measurement items**
    - Simultaneous measurement of INST and LIN or MAX
    - Measurement time: 1 to 999 seconds
  - **Dynamic range**: 100 dB
  - **Analysis frequency range**: 20 kHz (fixed)
  - **Dynamic range**: 20 kHz (fixed)
  - **Number of spectrum lines**: 8,000 (fixed) (frame time 400 ms, frequency resolution 2.5 Hz)
  - **Sampling frequency**: 48 kHz (fixed)
  - **Display**
    - Measurement screen: Simultaneous display of FFT analysis result and all-pass level
    - Display: Simultaneous display of FFT analysis result and all-pass level
  - **Other features**
    - Time window function: Hanning, Rectangular
    - FFT: 8,000 lines, 400 ms, 2.5 Hz resolution
    - Cursor display:
      - x1, x2, x5, x10, x20, x40
    - FFT: 8,000 lines, 400 ms, 2.5 Hz resolution
    - Memory lock
    - FFT lock

- **Precautions**
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.

### 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 140-4** Acoustics – Rating of sound insulation in buildings and of building elements – Part 4: Impact sound insulation

**ISO 140-5** Acoustics – Measurement of sound insulation in buildings and of building elements – Part 5: Field measurements of airborne sound insulation of façade elements and façades

**ISO 140-7** Acoustics – Measurement of sound pressure level from service equipment in buildings – Engineering method

### Measurement of Reverberation Decay Curve

- **Measurement of reverberation decay curve**

  - **Display**: 0 dB / 10 dB / 30 dB / 50 dB
  - **Trigger level**: 1 to 60 sec
  - **Display results overlaid with background noise**
  - **Calculations**: T20, T30 (using the least squares method)

### Measurement of Airborne Sound Insulation Between Two Rooms

- **Specifications**
  - **Display**: None (none)/Once (1 point)/Before/During
  - **Background noise measurement mode**: Displays alarm when the SPL difference with background noise is too small
  - **Number of measurement points in sound source room**: 1 to 10 points
  - **Measurement results overlaid with background noise**
  - **Calculations**: Average measured value, single number quantity, insulation factor value (Lw-value)

### Measurement of Impact Sound Insulation of Floors

- **Specifications**
  - **Display**: None (none)/Once (1 point)/Before/During
  - **Number of measurement points in sound source room**: 1 to 10 points
  - **Display results overlaid with background noise**
  - **Calculations**: Average measured value, single number quantity, insulation factor value (IL-value)

### Other Measurements

- **Display**: Average measured value, single number quantity, measured value
  - **Calculations**: Indoor noise rating value (NC-value or N-value)

### Additional Features

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

Applicable specifications
- Sound level meter: Measurement method precision sound level meter
- IEC 61672-1: 2013/14/2002 class 1
- IEC 61260: 2014 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.

Measurement modes
- Sound level meter mode: Measurement of all-pass values indicated in the measurement items below in the main or sub-channel. Setting of either Level or Level in the sub-channel
- Analyzer mode: Near time online and offline data analysis and pass-all measurement in the main channel, i.e., all-pass measurement in the sub-channel

Measurement items
- Time setting: Time Sets start time and trigger repeat interval.
- the external trigger
- Level 2: Only all-pass measurement in the sub-channel
- C  25 dB or less
- Inherent noise measurement
- Internal memory has 1 block and it is possible to select either manual or auto-store mode. Data is recorded either in the internal memory or CF card.

Sub-channel
- 1/3 octave analysis
- C  33 dB to 140 dB
- Measurement range
- Level range
- Spectrum
- Frequency weighting
- F (Fast), S (Slow), 10 ms, Impulse
- A, C, and Z
- Time weighting
- Main channel: F (Fast), S (Slow), 10 ms
- Sub-channel: F (Fast), S (Slow), 10 ms, Impulse
- Multi-channel: A, C, and Z
- Spectrum
- Bar graph display range: 90 dB
- 10-dB step
- Microphone and preamplifier
- Microphone: UC-59
- Sensitivity: -27 dB
- 1 A-weighting (A) or 1/3 octave weighting
- 1 Hz to 16 kHz (simultaneous analysis: up to 8 kHz)
- 12.5 Hz to 20 kHz (simultaneous analysis: up to 12.5 kHz)
- Comparator output
- Measuring range of comparator output: 0.0 dB to 110 dB

Sound level meter mode measurement
- Total range (A-characteristics, 1 kHz)
- 25 dB to 140 dB
- 20 dB to 140 dB
- 10 dB to 140 dB
- 10 dB to 140 dB
- Frequency range
- 10 Hz to 20 kHz
- High pass filter
- Analysis range frequency
- Center frequency
- 16 Hz to 16 kHz
- 1/3 octave analysis (simultaneous analysis: up to 8 kHz)
- 12.5 Hz to 20 kHz (simultaneous analysis: up to 12.5 kHz)

Analyzer mode
- Analyzer mode: Continuous recording in CF card instantaneous sound pressure level (min) in each band level and all-pass values
- Microphone and  Microphone: UC-59
- Sensitivity: -27 dB
- Sampling frequency
- 16 Hz to 16 kHz (simultaneous analysis: up to 8 kHz)
- 12.5 Hz to 20 kHz (simultaneous analysis: up to 12.5 kHz)

Analyzer mode
- Measurement time
- 1 sec to 59 sec, 1 to 59 min, 1 to 24 hours

Memory store of settings
- Maximum 5 sets of settings can be stored in internal memory and retrieved. Step Up is possible under file setting conditions stored in the CF card in advance.
- Memory card: Maximum 300 000 sets

Options
- name
- model
- Building acoustic nad
- Waveform recording
- FFT analysis
- Remote control
- Sound calibrator
- Memory card
- Battery pack
- Output adaptor
- * Use only RION supplied cards for assured operation.

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

Record data count
- Internal memory: Maximum 1 000 sets
- CF card: Maximum 1 000 sets per one name, maximum 100 store names can be stored

Auto store
- Continuous recording of measurement results at the set time interval (it is possible to append 4 types of marker 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 time: 1 hour (times when the CF card, refer to the following if using internal memory)
- CF card: Maximum 5000 sets
- Level 1: Continuous recording in the CF card every 100 ms of Lp, Leq, Lmax, BNDmax at the start. It is not possible to record sub-channel measurement results.
- Sampling cycle: 100 ms (Leq, Lmax, Lmin) only
- when using internal memory
- Maximum time: 3 hours
- Channel: All-pass bands and level values
- Sub-channel: All-pass only values
- Sampling cycle: 1 ms to 7 sec
- when using internal memory
- Maximum 10 000 sets (1 sec or, for Lmax, 2.7 hours)

Auto 2
- Level 2: 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

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, 25 mA at range full scale
- Output resistance
- 50 Ω
- Load resistance
- 10 kΩ or more

Connector output
- Open collector output. Determination is also possible at the band level. The terminal is also used for the external trigger.
- Power supply
- Power source: Four IEC R14P (size “C”) batteries or external power supply
- Operating time (24 h, normal operating conditions)
- When following not functioning , sub-channel, backlight,
- AC output, DC output, USB function, remote control, auto-store
- Power output
- 150 mA
- Consumption current
- 230 mA (during normal operation at rated voltage)

Ambient conditions for operation
- Temperature: 10 °C to +40 °C, 10 % Rh to 90 % RH
- Dimensions, weight
- 331 (H) x 80 (W) x 51 (D) mm, approx. 730 g (including batteries)

Supplied accessories
- Memory card (256 MB) MC-25LC1  x 1, Storage case 1 x 1, Soft case 1 x 1, AC adapter NC-485-B 1 x 1,
- Windscreen WS-10  x 1, BNC-RCA cable CC-24  x 1,
- Strap 1, IEC R14P (size “C”) batteries (alkaline) 4 x 1

Distributed by:
This leaflet is printed with environmentally friendly UV ink on recycled paper.