



Sound Measurement with Audio Recording in a Unit

Sound Monitor Card NX-22J
Provides Expanded Functionality

Sound Level Meter **NL-22/32**
(class2) (class1)



ISO 14001
JQA-EM0488



ISO 9001
JQA-Q0334

Automatic Measurement Capability Facilitates Operation. CF Card Slot Allows Large Volume Data Processing.

The sound level meters NL-22/NL-32 are based on the sound level meters, NL-21/NL-31, with added USB interface and support for a wide variety of program cards. Software for implementing expanded functions such as sound monitoring can be loaded via CompactFlash™ (CF) card. The wide dynamic range of 100 dB makes level range switching unnecessary. Automatic measurement with audio recording is also possible. Measurement results can be stored directly on CF card, making it easy to handle data from long-term measurements and to transfer such data to a computer for further processing.

- Compliant with IEC standards and new IEC/FDIS 61672-1 standard
- Separately available Sound Monitor Card integrates sound monitor function in the sound level meter.
- Sound can be recorded directly onto CF card
- High-capacity memory card allows storage of long-term measurement data
- Filter cards provide expanded settings for various filter functions
- Wide 100 dB dynamic range makes range switching unnecessary
- Simultaneous measurement of Integrating averaging sound pressure level L_{Aeq} , five values L_N , maximum value L_{max} etc.
- Graph display shows sound level fluctuation; back-erase function
- Comparator output function allows setting level evaluation
- Built-in USB interface
- Easy-to-read backlit LCD display
- Power backup capability when using AC adapter

Sound Level Meter NL-22



Card slot



Terminals on the bottom

Card slot

The unit is equipped with a card slot for CompactFlash cards. You can use the Auto Store function by installing a memory card. You can also extend the meter's filter functions by installing a filter card (optional) and loading the software.

I/O Terminals

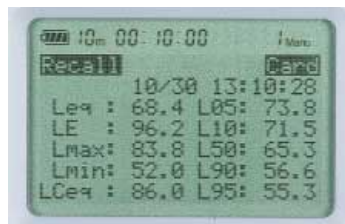
Equipped with a port for sound level meter control from a PC, data output and for comparator output (using optional cable), an AC/DC output terminal and AC adapter socket.



Octave filter screen



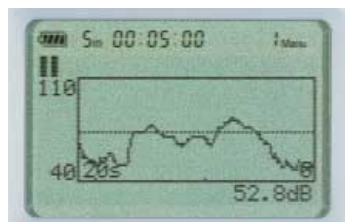
Universal filter screen



List screen



Back erase screen



Comparator level setting screen



Sound monitor screen

Create a Sound Level Meter With Audio Recording Function Using Optional Sound Monitor Card NX-22J

Program Card (option)



NX-22J

Sound Monitor Card

Add audio recording capability to the sound level meter



NX-215A

Octave Filter Card (1/1, 1/3 Octave filter)

1/1 Octave filter: 16 to 8000 Hz
1/3 Octave filter: 12.5 to 16000 Hz



NX-21VA

Universal Filter Card (1/3 Octave step)

3rd-order Butterworth high-pass filter:
10 to 12500 Hz
3rd-order Butterworth low-pass filter:
10 to 12500 Hz



NX-22FT

FFT Card

Add FFT analyzer function to the sound level meter.



NX-22RT

1/1, 1/3 Octave RTA Card

Add 1/1, 1/3 Octave Real Time Analyzer function to the sound level meter.

Analyzing Frequency range: 1/1 Octave: 16 Hz to 8 kHz, AP (A), AP
1/3 Octave: 12.5 Hz to 16 kHz, AP (A), AP

Audio recording

The separately available Real Sound Monitor Card NX-22J lets you add audio recording capability to the unit. During noise measurements, event recording (triggered when a preset level is exceeded) or interval recording (activated at preset time intervals) is possible. Various setting parameters are available to control the audio recording function.

Support for CompactFlash cards (option)

Data is logged directly onto a CompactFlash memory card. Using a 16 MB card, you can store up to 1.3 days of sound level data recorded at 100-millisecond intervals. You can use the optimum card capacity for your purpose of measurement.

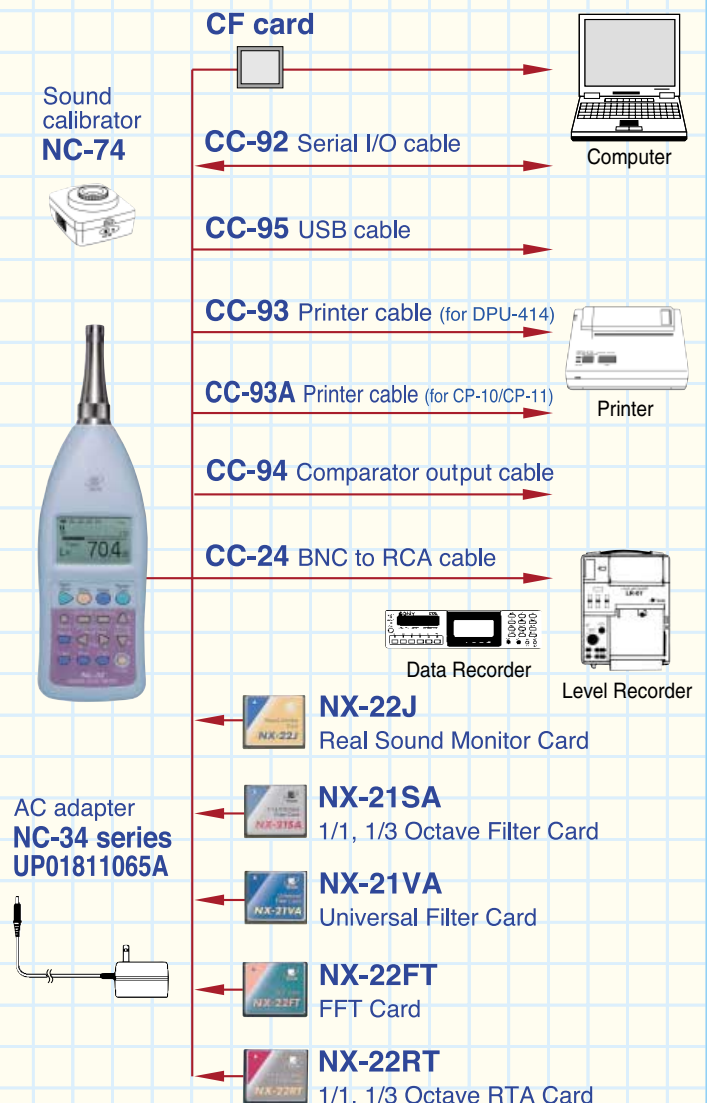
Comparator function

A comparator output function is available using open collector output. The function can be set to values between 30 and 130 dB in 1-dB increments.

Power failure compensation function

If the power supply is interrupted while you are using an external power source (AC adapter), the internal batteries ensure that measurements continue.

System configuration



Specifications

Applicable standards

Sound Level Meter NL-22	Sound Level Meter NL-32
IEC 60651: 1979 Type 2	IEC 60651: 1979 Type 1
IEC 60804: 2000 Type 2	IEC 60804: 2000 Type 1
IEC 61672-1 Class 2	IEC 61672-1 Class 1
JIS C1502: 1990	JIS C1505: 1988

Measurement functions

Main processing functions

- Simultaneous measurement of all items according to selected time weighting and frequency weighting
 - Sound level L_p
 - Integrating averaging sound level L_{eq}
 - Integrating level L_E
 - Maximum sound level L_{max}
 - Minimum sound level L_{min}
 - Percentile sound level L_N (5 selectable settings)

Auxiliary processing functions

One selectable for simultaneous processing with main measurement processing functions

- Peak sound level L_{peak}
 - C-weighted peak sound level L_{Cpeak}
 - C-weighted equivalent continuous sound level L_{Ceq}
 - Power average of maximum sound level 5 s intervals L_{Atm5}
 - Impulse sound level L_{AI}
 - Impulse Integrating averaging sound level L_{Aieq}
- L_{Atm5} , L_{AI} , and L_{Aieq} can only be chosen when A weighting is selected for main processing.
 L_{Ceq} can only be chosen when A weighting or FLAT is selected for main processing.

Measurement time

10 seconds, 1, 5, 10, 15, 30 minutes, 1, 8, 24 hours, and manual (maximum 200 hours)

Measurement range

A weighting: 28 to 138 dB	C-weighted peak sound level: 55 to 141 dB
C weighting: 33 to 138 dB	Peak sound level: 60 to 141 dB
FLAT: 38 to 138 dB	

Inherent noise

NL-22	NL-32
A weighting: 22 dB or less (Typ. 19 dB)	20 dB or less (Typ. 17 dB)
C weighting: 27 dB or less	25 dB or less
FLAT: 32 dB or less	30 dB or less

Linearity range: 100 dB

Reference sound pressure level: 94 dB

Reference level range: 30 to 120 dB

Level range selection

7 ranges in 10-dB steps

(7 ranges when optional 1/1, 1/3 Octave Filter Card NX-21SA or optional Universal Filter Card NX-21VA is in use)

Frequency range

Overall characteristics including microphone:

NL-22: 20 to 8000 Hz	NL-32: 20 to 20000 Hz
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Frequency weighting: A, C, FLAT

RMS detection: Digital processing

Time weighting Characteristics: Fast, Slow, Impulse

(Impulse is selectable only for auxiliary processing functions)

Calibration

Electrical calibration with 1-kHz sine wave signal from built-in oscillator Calibration using sound calibrator or pistonphone

Back-erase function

Processing functions

- Digital processing
- Sampling interval: 20.8 μ s (L_{eq} , L_{max} , L_{min} , L_E)
100 ms (L_N)

Data store functions

Manual store: Internal memory: Up to 100 data sets

With optional CF card: 100 data sets per one file.

Auto store (only available using optional CF card)

Auto store 1: L_p data with 100 ms, 200 ms or 1 s sampling interval or L_{eq} , 1 s data.

Selectable start and stop time.

Store capacity 16 MB card: 864000 data. Maximum time 200 hours.

Auto store 1 timer function: Serves to set start and end time for auto store 1 measurement.

Auto store 2: Time history of main and auxiliary results processed over a preset measurement period. Selectable start and stop time and selectable stand by/measure interval to reduce power consumption. Maximum store capacity: 99999 periods (56700 periods on 8 MB card)

Auto store 2 timer function: Serves to set start and end time for auto store 2 measurement.

Microphone and preamplifier

1/2-inch prepolarized condenser type

NL-22	NL-32
Model: UC-52	UC-53A
Sensitivity: -33 dB	-28 dB
Preamplifier NH-21	

Display: Backlit LCD (128 x 64 dots + 121 icons)

Outputs

AC/DC output Key-selectable AC or DC output

I/O connector

- Sound level meter control from and data output to a computer
- Data output to printer DPU-414/CP-11/CP-10
- Comparator output

Power requirements

Four IEC R6P (size "AA") batteries

Battery life (20 °C)

NL-22: Approx. 30 h (alkaline batteries), Approx. 11 h (manganese batteries)	NL-32: Approx. 24 h (alkaline batteries), Approx. 10 h (manganese batteries)
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With backlighting, battery life is reduced by about 50 %.
When auxiliary processing functions are enabled, battery life is reduced by about 20 %.
When the optional filter is enabled, battery life is reduced by about 15 % +0 40 %.

AC adapter (option)

NC-34: 100 V AC, NC-34A: 120 V AC, NC-34B: 220 V AC

UP01811065A: 100 to 250 VA (CE-marked)

Current rating NL-22: Approx. 60 mA, NL-32: Approx. 70 mA

Current consumption in standby mode is reduced to about one third.

Internal backup battery retains clock for about 1.5 months without external power

Ambient conditions: -10 °C to +50 °C, 10 % to 90 % RH (no condensation)

Dimensions: Approx. 260 x 76 x 33 mm

Weight (excluding batteries): Approx. 300 g

Supplied accessories

Windscreen	WS-10	1
Carrying case	NL-21-031	1
Connector cover (mounted on unit)	NL-21-005	1
Hand strap	VM-63-017	1
Batteries	IEC R6P	4
Instruction manuals		1 set

(Instruction Manual, Technical Notes, Serial Interface Manual, 1 each)

Optional equipment

1/1, 1/3 Octave Filter Card	NX-21SA
Universal Filter Card	NX-21VA
Sound Monitor Card	NX-22J
FFT Card	NX-22FT
1/1, 1/3 Octave RTA Card	NX-22RT
AC adapter	NC-34 series
AC adapter with CE mark	UP01811065A (100 to 250 V, 50/60 Hz)
BNC-to-RCA cable	CC-24
Microphone extension cable	EC-04 series
Serial I/O cable	CC-92
USB cable	CC-95
Printer cable	CC-93
Printer	DPU-414
Sound calibrator	NC-74 (Class 1)
Pistonphone	NC-72 (Class 0L)
Level recorder	LR-06/LR-07/LR-20A
Comparator output cable	CC-94
Windscreen	WS-03E
Battery pack	BP-21
Dry-cell batteries(IEC-R20, size"D")	x 4

Optional program card specifications

The program card is a CompactFlash card which contains program data. After these program data have been read off the card by the sound level meter during the software installation process, the new function can be used.

1/1, 1/3 Octave Filter Card	NX-21SA
Linearity range during filter operation is 65 dB.	
Supported standard: IEC 61260 : 1995 Class 1	
1/1 Octave filters (IEC compatible): 16 Hz to 8 kHz	
1/3 Octave filters (IEC compatible): 12.5 Hz to 16 kHz	

Universal Filter Card	NX-21VA
3rd-order Butterworth high-pass filter and 3rd-order Butterworth low-pass filter with freely selectable frequency in 1/3 octave steps	
Linearity range during filter operation is 65 dB.	
HPF cutoff frequencies (-3 dB): 10 Hz to 12.5 kHz	
LPF cutoff frequencies (-3 dB): 10 Hz to 12.5 kHz	

Sound Monitor Card	NX-22J
The recorded sound is compressed stored in memory card. The sound can be converted as WAVE file and played on the computer.	

FFT Card	NX-22FT
Measuring items: FFT processing spectrum, FLAT, C and A weighted sound pressure level	
Frequency Span: 2kHz, 5kHz, 10kHz, and 20kHz	
Window: Rectangular, Hanning	
Analyzing line number: 400	
Processing: Instantaneous value, Linear average and Max value	
Measurement time: 1 to 999 sec. (FFT frame number is determined by the measurement time)	

1/1, 1/3 Octave RTA Card	NX-22RT
Conforms to IEC 61260: 1995 Class 1	
Measurement mode: L_p , L_{eq} , L_E , L_{max}	
Analyzing Frequency range: 1/1 Octave: 16 Hz to 8 kHz, AP(A), AP	
1/3 Octave: 12.5 Hz to 16 kHz, AP(A), AP	

Specifications are subject to change without notice. Windows is registered trademark of Microsoft Corporation.

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