

*Practical and Compact!*



4ch Data Recorder

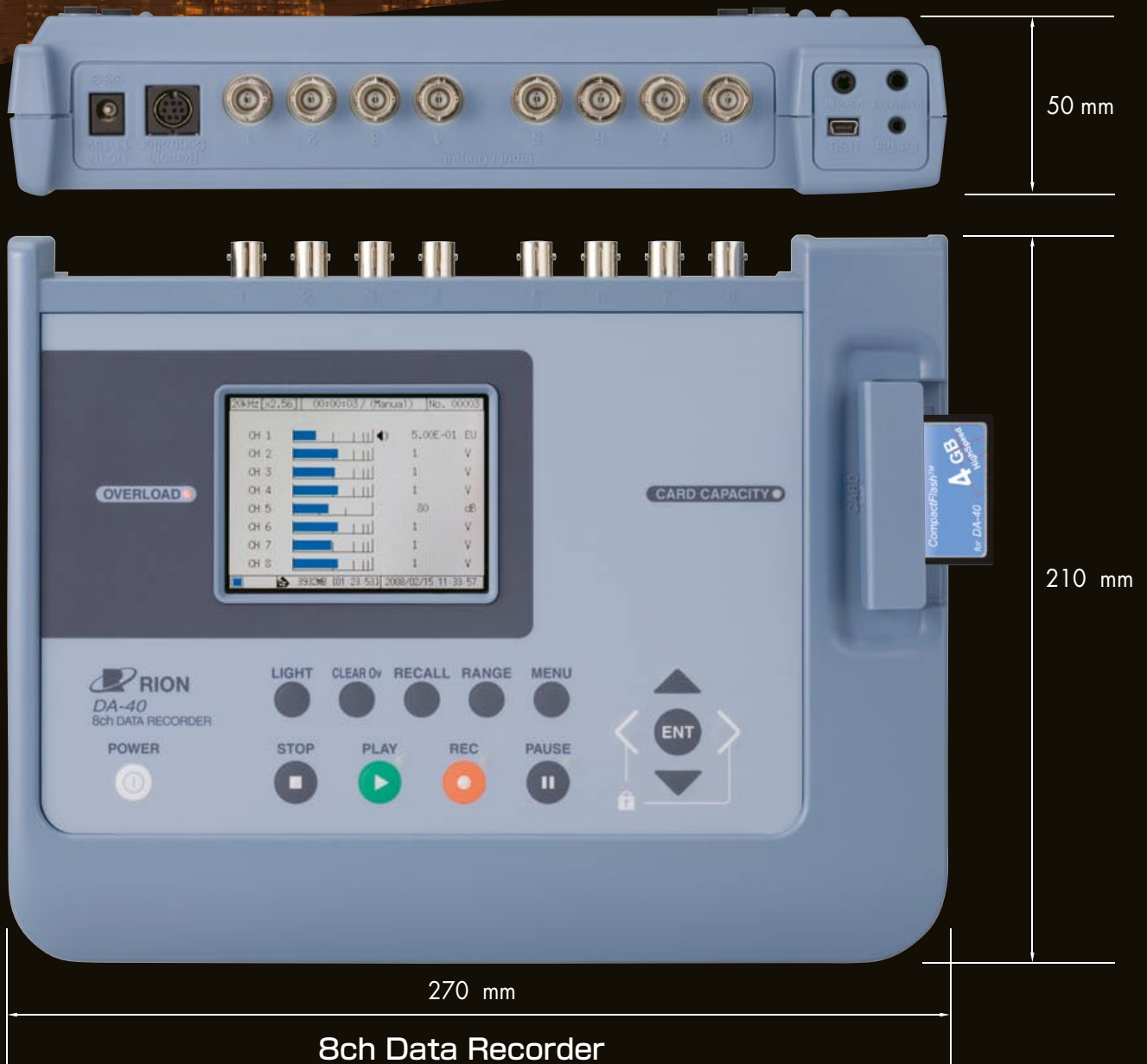
DA-20

8ch Data Recorder

DA-40

# Practical and Compact!

Direct connection of Sound and Vibration Sensors



8ch Data Recorder

# DA-40

Channels

8 ch

Memory Card

2 GB 4 GB

CCLD  
(Constant Current Line Drive)

2 mA 4 mA

[Factory option]

Display

TFT color LCD

[With backlight]

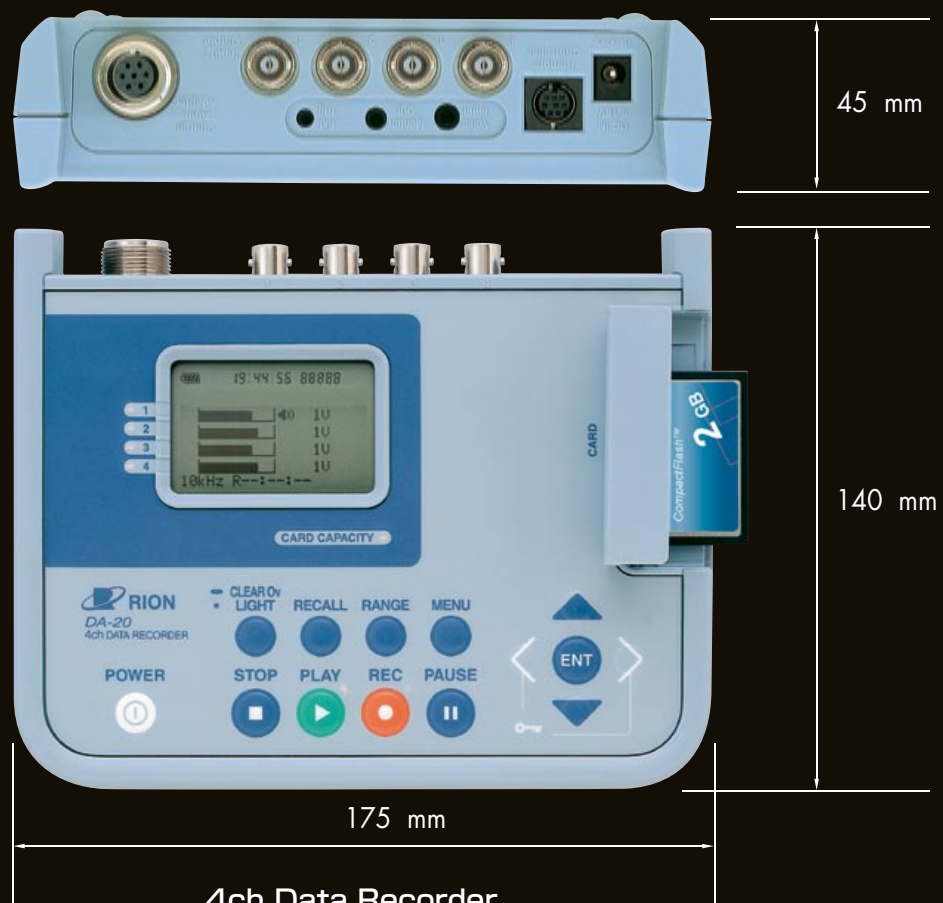
Calibration

Sensitivity calibration of microphones and accelerometers

- Pre-recording
- Level trigger
- Time trigger
- External trigger

The 8-Channel Data Recorder DA-40 and 4-Channel Data Recorder DA-20 are highly compact devices ideal for use in the field. They easily record sound and vibration waveforms as well as a wide variety of electrical signals. Data are saved in WAVE format on memory cards (CF cards) and can be reproduced as analog signals. Data can be imported into a computer for waveform analysis and other processing tasks.

- Analog playback signals can be processed by FFT analyzer.
- No mechanical parts. Stable and silent operation in hostile environments subject to vibration and humidity.
- Voice memo recording function
- User-friendly Key layout.



4ch Data Recorder

# DA-20

Channels

4 ch

Memory Card

1 GB 2 GB

CCLD  
(Constant Current Line Drive)

2 mA

Calibration

Sensitivity calibration of microphones and accelerometers

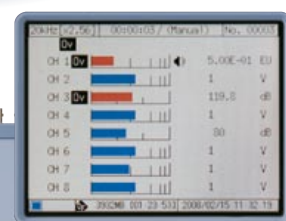
- Pre-recording
- Level trigger
- External trigger

# 8ch DATA RECORDER

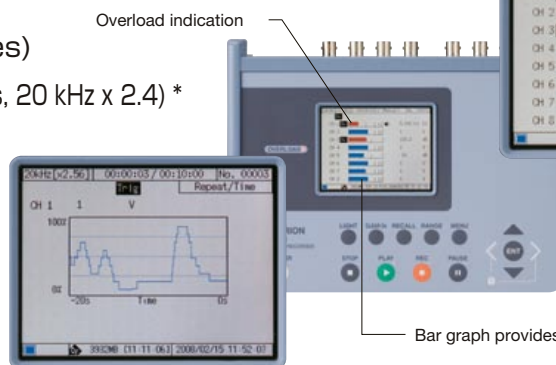


## 8ch Data Recorder DA-40

- CCLD (Constant Current Line Drive) 2 mA, 4 mA (factory option)
- DC to 20 kHz signal frequency range
- Light weight: only 1.2 kg (excl. batteries)
- Recording time: approx. 180 minutes (4 channels, 20 kHz x 2.4) \*  
\* Using 4 GB memory card



Measurement screen



Level fluctuation screen for 1 channel



### Battery Life

- Using six IEC R14 (size C) alkaline batteries

Approx. 6.5 hours \*

\* 20 kHz, 8channels, CCLD OFF

- Maximum recording times for 2 GB CF card (approximate)  
Sampling frequency: frequency range x 2.56 (2.4 also supported)

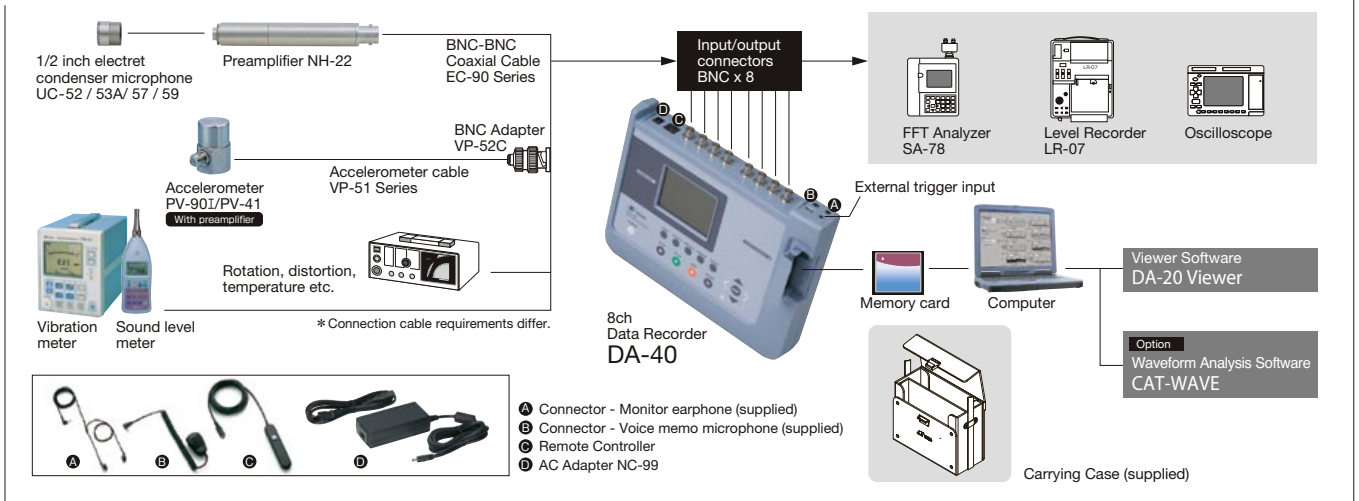
Number of channels	Frequency range (Hz)					
	100	500	1 000	5 000	10 000	20 000
1	1066 h 40 m	213 h 20 m	106 h 40 m	21 h 20 m	10 h 40 m	5 h 20 m
2	533 h 20 m	106 h 40 m	53 h 20 m	10 h 40 m	5 h 20 m	2 h 40 m
4	266 h 40 m	53 h 20 m	26 h 40 m	5 h 20 m	2 h 40 m	1 h 20 m
8	133 h 20 m	26 h 40 m	13 h 20 m	2 h 40 m	1 h 20 m	40 m

- Maximum recording times for 4 GB CF card (approximate)  
Sampling frequency: frequency range x 2.56 (2.4 also supported)

Number of channels	Frequency range (Hz)					
	100	500	1 000	5 000	10 000	20 000
1	2133 h 20 m	426 h 40 m	213 h 20 m	42 h 40 m	21 h 20 m	10 h 40 m
2	1066 h 40 m	213 h 20 m	106 h 40 m	21 h 20 m	10 h 40 m	5 h 20 m
4	533 h 20 m	106 h 40 m	53 h 20 m	10 h 40 m	5 h 20 m	2 h 40 m
8	266 h 40 m	53 h 20 m	26 h 40 m	5 h 20 m	2 h 40 m	1 h 20 m

\* Varies slightly depending on number of data files \* Maximum recording time for one file is approx. 744 hours.  
\* Use only RION supplied cards for assured operation.

# System Configuration (Other equipment is optional)



## Software

Versatile functions for display and analysis of DA-40 data

### Supplied

## Viewer Software DA-40 Viewer

The DA-40 Viewer application handles WAVE format data files produced by the 8ch Data Recorder DA-40. Available functions include waveform display, level display, and file output (WAVE format/CSV format).

### Waveforms

Supported sources for waveform data:

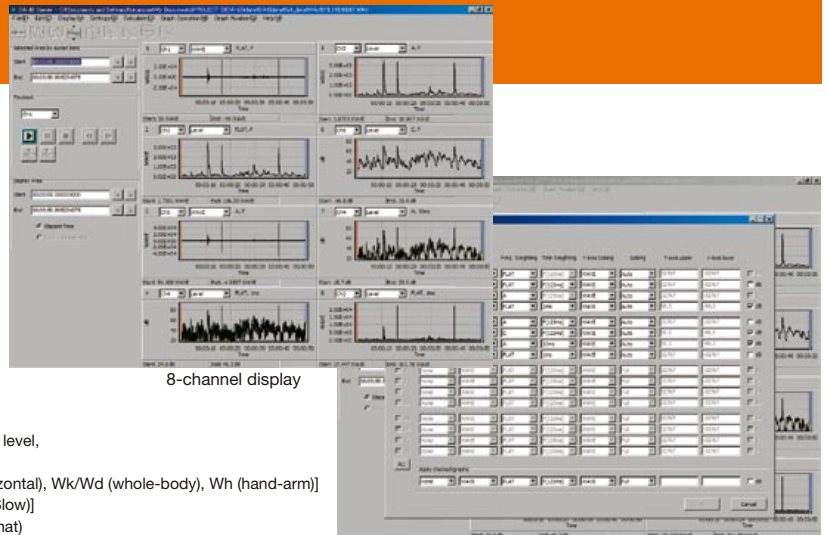
WAVE format data recorded by DA-40/DA-20, NX-28WR, or SA-78WR

Display functions:

Time waveform, Time-weighted level waveform, time percentile sound level, equivalent continuous sound pressure level, sound exposure level

Weighting functions: Frequency weighting [A, C, G, Lv (vertical), Lv (horizontal), Wk/Wd (whole-body), Wh (hand-arm)]  
Time weighting [1 ms, 10 ms, F (Fast), 630 ms, S (Slow)]

File output: Selective time or channel data save (WAVE format, CSV format)



Graph setting screen

Recommended environment ■ CPU: Intel Core™2 Duo 2.4 GHz equivalent or better ■ RAM: 2 GB or more ■ HDD: 60 GB or more (free space) ■ Display: SXGA (1280 x 1024) or better  
■ Supported operating systems: Microsoft Windows XP Professional / Vista Business

### Option

## Waveform Analysis Software CAT-WAVE

CAT-WAVE allows downloading measured data (WAVE file) to a PC, and basic analysis. It handles FFT analysis, Octave band analysis and Spectrum map analysis. In addition cross spectrum and transfer function are displayed.

\*CAT-WAVE can also analyze data from the SA-78 (2ch FFT Analyzer)

### Waveform

Supported sources for waveform data:

WAVE format data created with DA-20-40, SA-78WR, NX-28WR

Display functions: Scaled time axis, Differential and integral calculus available

File output: WAVE format (selective channel or section save), CSV format (section save)

### FFT analysis

Analysis frequencies: According to Data Recorder DA-40/20 settings

Number of analysis points: 64 to 32,768

Averaging functions: Linear averaging, maximum hold

Time window types: Hanning, Rectangular, Flat-top, Exponential, Force

Display functions: Power spectrum, Cross spectrum, Transfer function, Coherence, Spectrum map, octave map, Differential and calculus for spectrum area

### Octave band analysis

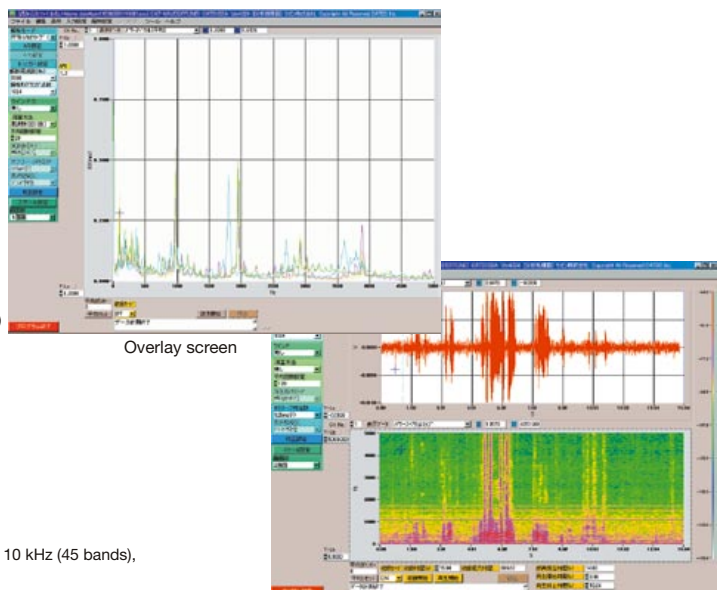
Standard compliance: JIS C 1514 (IEC 61260) Class 1

Analysis types: 1/1 octave band, 1/3 octave band, 1/12 octave band

Analysis frequency ranges: 1/1 octave 0.5 Hz to 8 kHz (15 bands), 1/3 octave 0.4 Hz to 10 kHz (45 bands), 1/12 octave 0.36 Hz to 11 kHz (180 bands)

Time weighting (time constants): 1 ms, 10 ms, 35 ms, F (Fast), 630 ms, S (Slow), 10 s

Frequency weighting: Flat, A, C



Overlay screen

Spectrum map screen

Recommended environment ■ CPU: Intel Core™2 Duo 2.4 GHz or better ■ RAM: 2 GB or more ■ HDD: 60 GB free space ■ DISPLAY: SXGA (1280x1024) or better  
■ Supported operating system: Microsoft Windows XP Professional

# 4ch DATA RECORDER



4ch Data Recorder

## DA-20 CE

- CCLD 2 mA (Constant Current Line Drive)
- DC to 20 kHz signal frequency range
- Light weight: only 480 g (excl. batteries)
- Recording time: approx. 180 minutes (2 channels, 20 kHz x 2.4)\*

\* Using 2 GB memory card



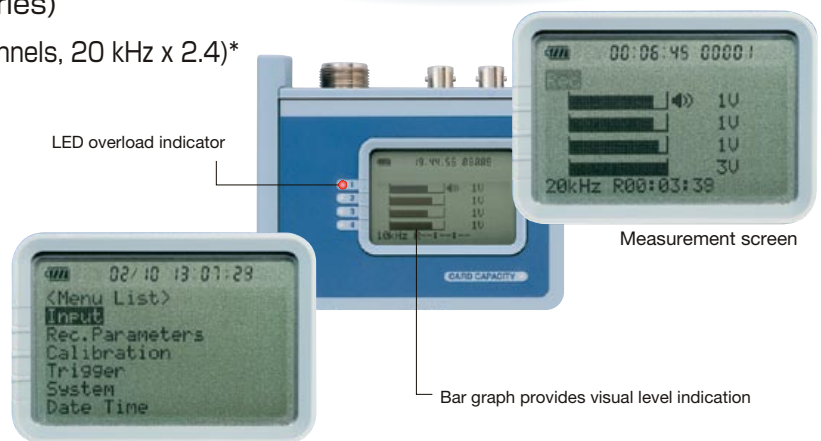
### Battery Life

- Using four IEC R6 (size AA) alkaline batteries  
Approx. 8 hours \*1

- Using Battery Pack BP-21,  
with four IEC R20 (size D) alkaline batteries  
Approx. 30 hours \*2

\*1 20 kHz, 4channels, CCLD OFF \*2 Dependent on recording settings

LED overload indicator



Measurement screen

Bar graph provides visual level indication

Menu list screen

- Maximum recording times for 1 GB CF card (approximate)  
Sampling frequency: frequency range x 2.56 (2.4 also supported)

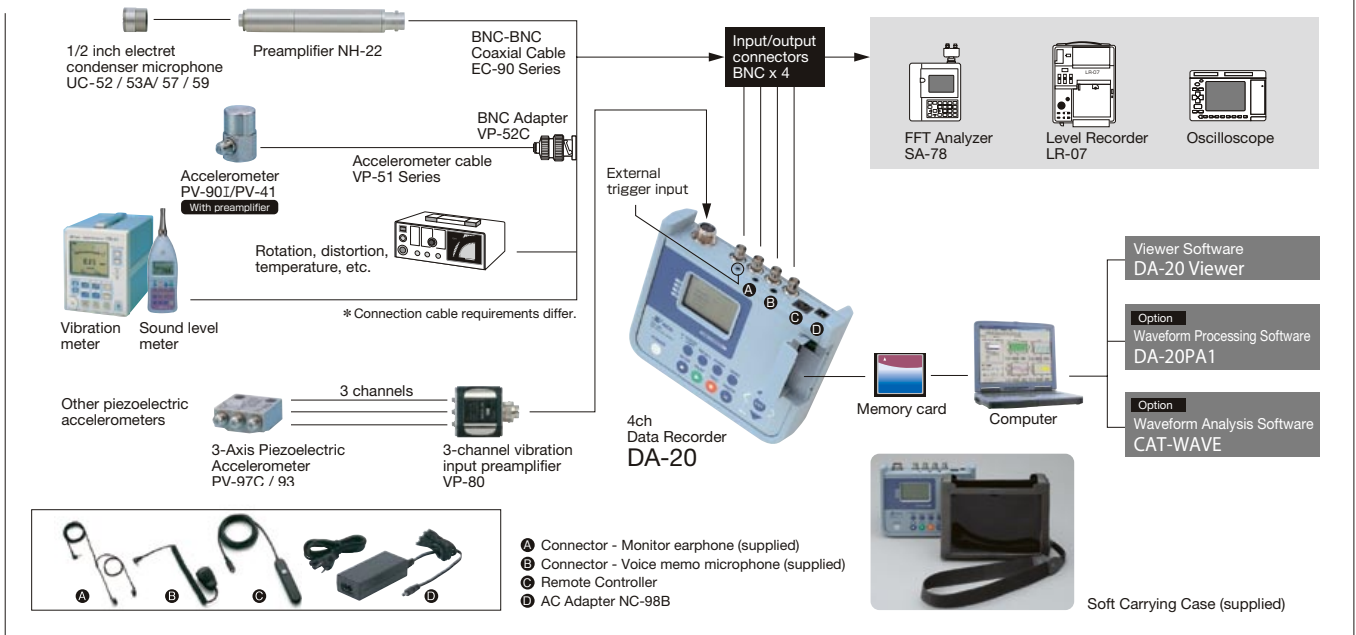
Number of channels	Frequency range (Hz)					
	100	500	1 000	5 000	10 000	20 000
1	533 h 20 m	106 h 40 m	53 h 20 m	10 h 40 m	5 h 20 m	2 h 40 m
2	266 h 40 m	53 h 20 m	26 h 40 m	5 h 20 m	2 h 40 m	1 h 20 m
3	177 h 46 m	35 h 33 m	17 h 46 m	3 h 33 m	1 h 46 m	53 m
4	133 h 20 m	26 h 40 m	13 h 20 m	2 h 40 m	1 h 20 m	40 m

- Maximum recording times for 2 GB CF card (approximate)  
Sampling frequency: frequency range x 2.56 (2.4 also supported)

Number of channels	Frequency range (Hz)					
	100	500	1 000	5 000	10 000	20 000
1	1066 h 40 m	213 h 20 m	106 h 40 m	21 h 20 m	10 h 40 m	5 h 20 m
2	533 h 20 m	106 h 40 m	53 h 20 m	10 h 40 m	5 h 20 m	2 h 40 m
3	355 h 32 m	71 h 06 m	35 h 33 m	7 h 06 m	3 h 33 m	1 h 46 m
4	266 h 40 m	53 h 20 m	26 h 40 m	5 h 20 m	2 h 40 m	1 h 20 m

\* Varies slightly depending on number of data files \* Use only RION supplied cards for assured operation.

# System Configuration (Other equipment is optional)



## Software

Versatile functions for display and analysis of DA-20 data

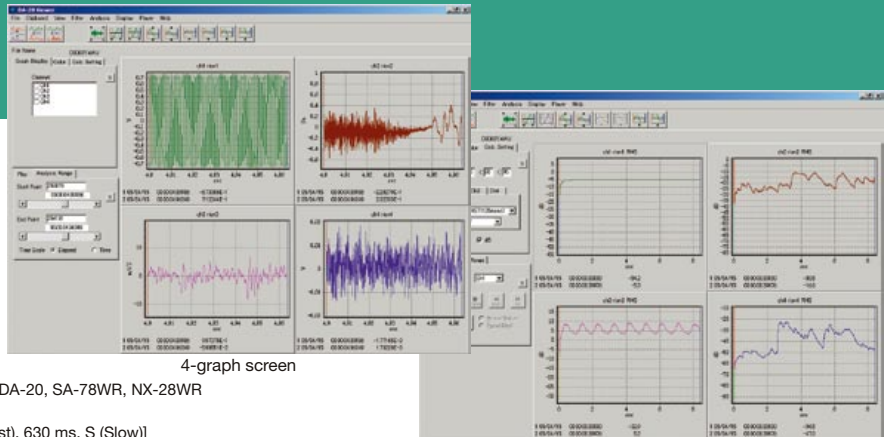
### Supplied

## Viewer Software DA-20 Viewer

The DA-20 Viewer application handles WAVE format data files produced by the 4ch Data Recorder DA-20. Available functions include waveform display, level display, and file output (WAVE format/CSV format).

#### Waveforms

- Supported sources for waveform data: WAVE format data from DA-20, SA-78WR, NX-28WR
- Display functions: Scaled time axis, RMS
- Weighting functions: Time weighting [1 ms, 10 ms, 35 ms, F (Fast), 630 ms, S (Slow)]
- File output: Selective time or channel data save (WAVE format, CSV format)



Recommended environment ■ CPU: Intel Pentium 4 2 GHz or better ■ RAM: 512 MB or more ■ HDD: 10 GB free space ■ Supported operating systems: Microsoft Windows 2000 / XP

### Option

## Waveform Processing Software DA-20PA1

The DA-20PA1 application allows uploading of WAVE format data recorded with the 4ch Data Recorder DA-20 to a computer, for display and basic analysis. Waveforms can be shown either in overall or detail view. FFT analysis and octave band analysis are also possible. The application is suitable for environmental measurements.

#### Waveforms

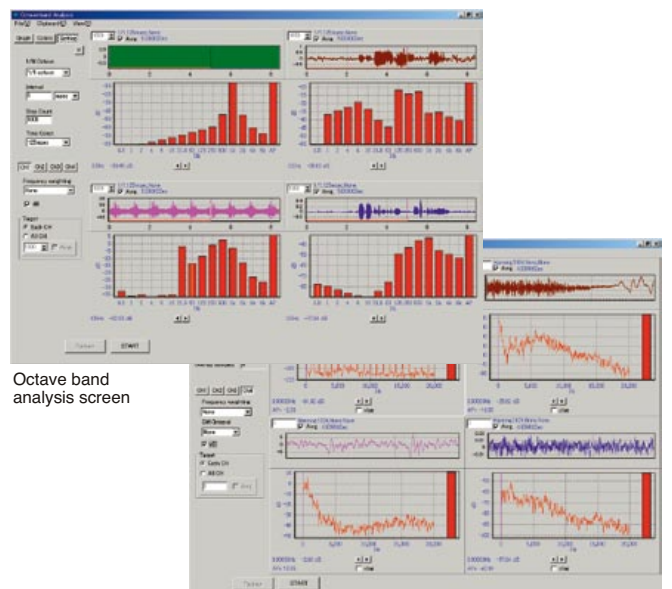
- Supported sources for waveform data: WAVE format data from DA-20, SA-78WR, NX-28WR
- Display functions: Scaled time axis, RMS, time percentile sound level, equivalent continuous sound pressure level, sound exposure level
- Filter processing: High-pass filter, low-pass filter, with selectable parameters, sound playback after filtering
- File output: WAVE format, CSV format (selective channel or section save)

#### FFT analysis

- Analysis frequencies: According to Data Recorder DA-20 settings
- Number of analysis points: 64 to 32,768
- Averaging functions: Linear averaging
- Time window types: Hanning, Rectangular, Flat-top
- Display functions: Power spectrum (with differential/integral processing of spectrum area)

#### Octave band analysis

- Applicable standard IEC 61260 Class 1, JIS C 1514
- Analysis types: 1/1 octave band, 1/3 octave band
- Analysis frequency ranges: 1/1 octave 0.5 Hz to 8 kHz (15 bands), 1/3 octave 0.4 Hz to 16 kHz (47 bands)
- Time weighting (time constants): 1 ms, 10 ms, 35 ms, F (Fast), 630 ms, S (Slow)
- Frequency weighting: Flat, A, C, G, Lv (vertical), Lv (horizontal)

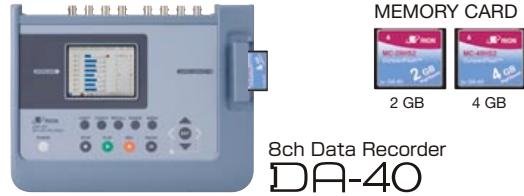



Recommended environment ■ CPU: Intel Pentium 4 2 GHz or better ■ RAM: 512 MB or more ■ HDD: 10 GB (free space) ■ Supported operating systems: Microsoft Windows 2000 / XP

### Option

Waveform Analysis Software **CAT-WAVE** (This software is a product of catec Inc.) For details see page 5

■ Specifications

		8ch Data Recorder DA-40	4ch Data Recorder DA-20	
				
Input Section	Inputs	Signal input: 8 channels (BNC) Voice memo input: 1 channel (voice memo microphone 3.5 mm. 4-pole mini jack) External trigger: 1 (2.5 mm. stereo mini jack) 3ch vibration input: _____	4 channels (BNC) 7-pin terminal for 3ch vibration preamplifier	
	Signal input	Remote control: For optional remote controller, 8-pin mini DIN		
		USB port: Mini B		
		Input voltage range: ±0.01 V, 0.03 V, 0.1 V, 0.3 V, 1 V, 3 V, 10 V		
		Input impedance: 100 kΩ or more		
		Max. input voltage: ±13 V		
		Overload: +2.0 dB ±1.0dB at range full-scale		
		Input coupling: AC/DC (AC coupling (primary) -3 dB ±1.0 dB at 0.315 Hz)		
		CCLD (Constant Current Line Drive)	2 mA, 18 V (4 mA supported as a factory option)	2 mA, 18 V
		Analog filter	High-pass OFF, 5 Hz (-3 dB) (-12 dB / oct) / Low-pass OFF, 200 Hz, 1 kHz, 2 kHz (-3 dB) (-12 dB / oct)	
Frequency response		DC coupling DC to 1 Hz: ±1 dB 1 Hz to 12.5 kHz: ±0.5 dB 12.5 kHz to 20 kHz: ±1 dB AC coupling 1 Hz to 20 Hz: ±1 dB 20 Hz to 12.5 kHz: ±0.5 dB 12.5 kHz to 20 kHz: ±1 dB		
SNR	80 dB or more (input voltage range: 10, 3, 1, 0.3 V; within band width; includes overload)			
Voice memo	A: Voice recording during no-measurement operation (with power-on) B: Continuous voice recording on channel 1 during measurements C: Channel 1 can be changed for data recording or voice recording during measurements	A: Voice recording during no-measurement operation (with power-on) B: Continuous voice recording on channel 4 during measurements C: Channel 4 can be changed for data recording or voice recording during measurements		
Output Section	Connectors	Playback output: 8 channels, BNC (using input connectors)	4 channels, BNC (using input connectors)	
	Playback output	Monitor output: 1 channel (3.5 mm. stereo mini jack); carries analog signal for 1 selected channel during recording; carries signal/voice memo of 1 selected channel during playback.		
	Playback output	Output impedance: 600 Ω; output voltage: ±3.16 V at range full-scale		
	Playback output selection	Output impedance: 100 Ω; output voltage: ±3.16 V at range full-scale		
Recorder Section	Media	CF card (2 GB, 4 GB, FAT32)	CF card (~2 GB, FAT16) (Use only RION supplied cards for assured operation.)	
	AD converter	Quantization: 16 bit		
	File format	WAVE (16-bit, linear, non-compressed)		
	Frequency range	100 Hz, 500 Hz, 1 kHz, 5 kHz, 10 kHz, 20 kHz		
	Sampling frequency	Frequency range x 2.4 / 2.56		
	Pre-recording	Data captured since 0 s, 1 s, or 5 s before recording key was pressed, or triggered		
	Trigger source	External: Open-collector trigger (NL-21, NL-22, NL-31, NL-32 supported) Internal: 0.1% to 9.9%, 10% to 99% of range full-scale, linear peak, time trigger	External: Open-collector trigger (NL-21, NL-22, NL-31, NL-32 supported) Internal: 0.1% to 9.9%, 10% to 99% of range full-scale, linear peak	
Trigger Section	Trigger mode	Free, single, repeat (file division for repeat)		
	Pre-trigger	0 s, 1 s, 5 s (prior to trigger time)		
	Calibration	Conversion [Linear (EU), Log (dB)] (selectable for each channel), microphone sensitivity, vibration accelerometer sensitivity, depending on sound level meter/vibration level meter settings		
Display Section	LCD	TFT color LCD, 320 x 240 dots (with backlight)	128 x 64 dots, 121 segments (with backlight)	
	Display items	Setting screen, recording screen, level bars (linear, log), level history, overload		
	LEDs	Overload indication, CF card low space warning, status indication (record, playback, trigger standby, etc.)		
Power Supply Section	Power requirements	Battery power or AC adapter (NC-99, option), cigarette lighter adapter (CC-82, option)		
	Batteries	IEC R14 (size C) alkaline x 6	IEC R6 (size AA) alkaline x 4	
	External DC	11 to 15 V, current consumption 250 mA (12 V) (Frequency range 100 Hz, CCLD OFF, backlight OFF)	5 to 15 V, current consumption 160 mA (6 V) (Frequency range 100 Hz, CCLD OFF, backlight OFF)	
	Battery life (using alkaline batteries in cont. operation at 23°C)	20 kHz, 8 channels, CCLD ON: approx. 4.5 hours CCLD OFF: approx. 6.5 hours 20 kHz, 1 channel, CCLD ON: approx. 5.5 hours CCLD OFF: approx. 9.0 hours 100 Hz, 8 channels, CCLD ON: approx. 6.5 hours CCLD OFF: approx. 10.5 hours	20 kHz, 4 channels, CCLD ON: approx. 4.5 hours CCLD OFF: approx. 8 hours 20 kHz, 1 channel, CCLD ON: approx. 7.5 hours CCLD OFF: approx. 10 hours 100 Hz, 4 channels, CCLD ON: approx. 5 hours CCLD OFF: approx. 9.5 hours	
	Dimensions and Weight	Approx. 270 (H) x 210 (W) x 50 (D) mm, approx. 1.2 kg (excl. batteries), approx. 2.0 kg (incl. batteries)	Approx. 140 (H) x 175 (W) x 45 (D) mm, approx. 480 g (excl. batteries), approx. 800 g (incl. batteries)	
Ambient conditions for operation	-10 °C to +50 °C, 10 % to 90 % RH (no condensation)			
Supplied Accessories	Viewer software x 1, Carrying case x 1, Voice memo microphone x 1, Monitor earphone x 1, IEC R14 (size C) alkaline battery x 6			
		Viewer software x 1, Soft carrying case x 1, Voice memo microphone x 1, Monitor earphone x 1, IEC R6 (size AA) alkaline battery x 4		

■ Options

Product	Designation	Compatibility	
		DA-40	DA-20
Waveform processing software	DA-20PA1	—	●
Waveform analysis software	CAT-WAVE	●	●
3-channel vibration input preamplifier	VP-80	—	●
Memory card (CF card)*	128 MB	MC-12CF1	—
	256 MB	MC-25CF1	—
	1 GB	MC-10CF2	—
	2 GB	MC-20CF2	—
	4 GB (for DA-40)	MC-20HS2	●
	4 GB (for DA-40)	MC-40HS2	●
4-channel data recorder remote controller	DA-20RC1	●	●

\*Use only RION supplied cards for assured operation.

Product	Designation	Compatibility	
		DA-40	DA-20
CCLD 4 mA modification (factory option)	—	●	—
AC adapter	NC-98B	—	●
	NC-99	●	—
Battery pack	BP-21	—	●
Comparator output cable (for NL-21/22/31/32 series)	CC-94A	●	●
	CC-82	●	●
BNC-BNC coaxial cable	EC-90 series (2 m and up)	●	●
BNC-BNC cable	NC-39A	●	●

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



Distributed by:



3-20-41, Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan  
Tel: +81-42-359-7888 Fax: +81-42-359-7442