

Specifications

Input section	
Input	
Signal input	4ch (BNC)
Voice recording input	1ch (Voice recording microphone φ3.5 mm, 4-pole mini-jack)
External trigger	1 (φ2.5 mm stereo mini-jack)
7-Pin terminal for 3ch vibration input preamplifier	
Remote control terminal (for optional Remote controller 8-pin MINI DIN)	
Signal input	
Input voltage range	±0.01 Vpk, 0.0316 Vpk, 0.1 Vpk, 0.316 Vpk, 1 Vpk, 3.16 Vpk, 10 Vpk
Input impedance	100 kΩ or higher
Max. input voltage	±10 V + overload 2 dB
Input coupling	AC/DC (AC coupling : -3 dB at 0.3 Hz) (DC 1 Vpk or higher)
CCLD	2 mA, 18 V
Filter (analog)	High pass : Off, 10 Hz (2nd) Low pass : Off, 100 Hz, 500 Hz, 1 kHz (2nd)
Frequency range	DC to 20 kHz 20 Hz to 12.5 kHz : within ±0.5 dB 1 Hz to 20 Hz, 12.5 kHz to 20 kHz : within ±1 dB
Dynamic range	80 dB
Voice recording	
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	
Terminal	
Output terminal for reproduction	4ch BNC (Common use as input terminal)
Monitor output terminal	1ch (φ3.5 mm stereo mini-jack)
Data acquisition : Selected 1ch analog signal output	
Data reproduction : Selected 1ch or voice recording	
Output for reproduction	
Output terminal for reproduction	Output impedance : 600 Ω
Output voltage : ±3.16 Vpk at full scale	
Output signal : Reproduction of recorded signals	
Monitor output	±3.16 Vpk
Output selection during reproduction	A: from monitoring output terminal only B: from both BNC and monitoring output terminal (Selectable from A and B)
Recording section (Memory section)	
Medium	CF card [up to 2 GB (FAT 16)] Note: Please use our provided CF memory card with performance guaranteed RION.
The number of bits	16 bit
Format	WAVE format (16 bit uncompressed)
Frequency range	100 Hz, 500 Hz, 1 kHz, 5 kHz, 10 kHz, 20 kHz
Sampling frequency	frequency range × 2.4 or 2.56
Pre-recording	0 s, 1 s and 5 s before pressing a recording start key.
Trigger	
Trigger source	External : Open-collector (for NL-21, 22, 31, 32) Internal : 0.1 % to 9.9 % at full scale range, 10 % to 99 % at linear peak
Trigger mode	Free, Single, Repeat (file separation when Repeat mode)
Pre-trigger	0 s, 1 s, 5 s (pre-time from trigger event)

Calibration	Conversion [linear (EU) or log (dB)] setting available for each channel.
Display	
LCD	128 x 64 dots, 121 segments (with backlight)
Display contents	Setting display, Recording display, Level bar and Level-time display (peak)
LED	
Overload indicator for each channel, Warning indicator, Condition indicator on recording, reproduction and trigger waiting	
Power section	
Power requirement	Batteries or AC adapter (NC-98A optional accessory)
Battery	Four IEC LR6 (alkaline battery)
External DC	5 V to 15 V, current consumption 160 mA (6 V) (Frequency range : 100 Hz, CCLD : off, Backlit : off)
Battery life	
20 kHz, 4ch CCLD on : approx. 4.5 hours CCLD off : approx. 8 hours	
20 kHz, 1ch CCLD on : approx. 7.5 hours CCLD off : approx. 10 hours	
100 Hz, 4ch CCLD on : approx. 5 hours CCLD off : approx. 9.5 hours	
Dimensions and weight	approx. 140 (H) × 175 (W) × 45 (D) mm, approx. 480 g (without batteries)
Ambient conditions	-10 °C to +50 °C, 10 % to 90 % RH (no condensation)
Supplied accessories	Viewer software × 1, Soft case × 1, Voice recording microphone × 1, Monitor earphone × 1, LR6 battery (alkaline batteries) × 4

Optional accessories

Type	Model
Waveform processing software	DA-20PA1
Waveform analysis software	CAT-78WR
3ch vibration preamplifier	VP-80
Memory card (CF card)*	MC-12CF1 (128 MB), MC-25CF1 (256 MB), MC-10CF2 (1 GB), MC-20CF2 (2 GB) (Use our provided CF card.)
Remote controller for 4ch data recorder	DA-20RC1
AC adapter	NC-98A
Cigarette plug adapter	CC-82
Battery pack	BP-21
Comparator output cable (for sound level meters NL-series)	CC-94A
BNC-BNC coaxial cable	EC-90 series (from 2 m)
BNC-BNC cable	NC-39A

* Please use our sales goods that guarantee operation.



Soft case (Supplied)



Battery pack BP-21
Holds four IEC R20 alkaline batteries



Direct! and Compact!

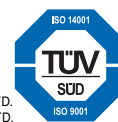
DA-20

4ch Data Recorder

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



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ISO 14001 RION CO., LTD.
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Distributed by:

Direct! and Compact!



Direct Plug-in with sound and vibration sensors

DA-20 is a compact data recorder that provides the user a light weight and high quality instrument to record various types of electronic signals and waveform data for on-site measurement of sound and vibration. Measured data are stored on memory card (CF card) in WAVE format. Stored data can be reproduced as analog signals and output to external signal processing devices for detailed analysis. The CF card enables easy access to download stored data processing on PC with optional software line-up.



Battery Life Operating time

Approx. **8 hours***1 [When using four IEC LR6 alkaline batteries
battery pack BP-21
Approx. **30 hours***1 [Holds four IEC R20 alkaline batteries

- CCLD (Constant Current Line Drive) available
- Signal frequency range: DC to 20 kHz
- Lightweight 480 g (not including batteries)
- Recording time: approx. 180 minutes (2ch, 20 kHz × 2.4 sampling)*2

*1_lifetime varies on settings measurement of DA-20 *2_When using 2 GB memory card

Reference for maximum recording time with 1 GB CF card
Sampling frequency: frequency range × 2.56 (or 2.4)

Numbers of ch	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

Reference for maximum recording time with 2 GB CF card
Sampling frequency: frequency range × 2.56 (or 2.4)

Numbers of ch	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

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



- Reproduced analog signals can be analyzed by FFT analyzer.
- Can be used under high vibration, high humidity environment. Silent operation.
- Pre-record function records data 1 sec or 5 sec before trigger is activated.
- Voice recording function.
- User-friendly key layout.

4ch Data Recorder DA-20



140 mm

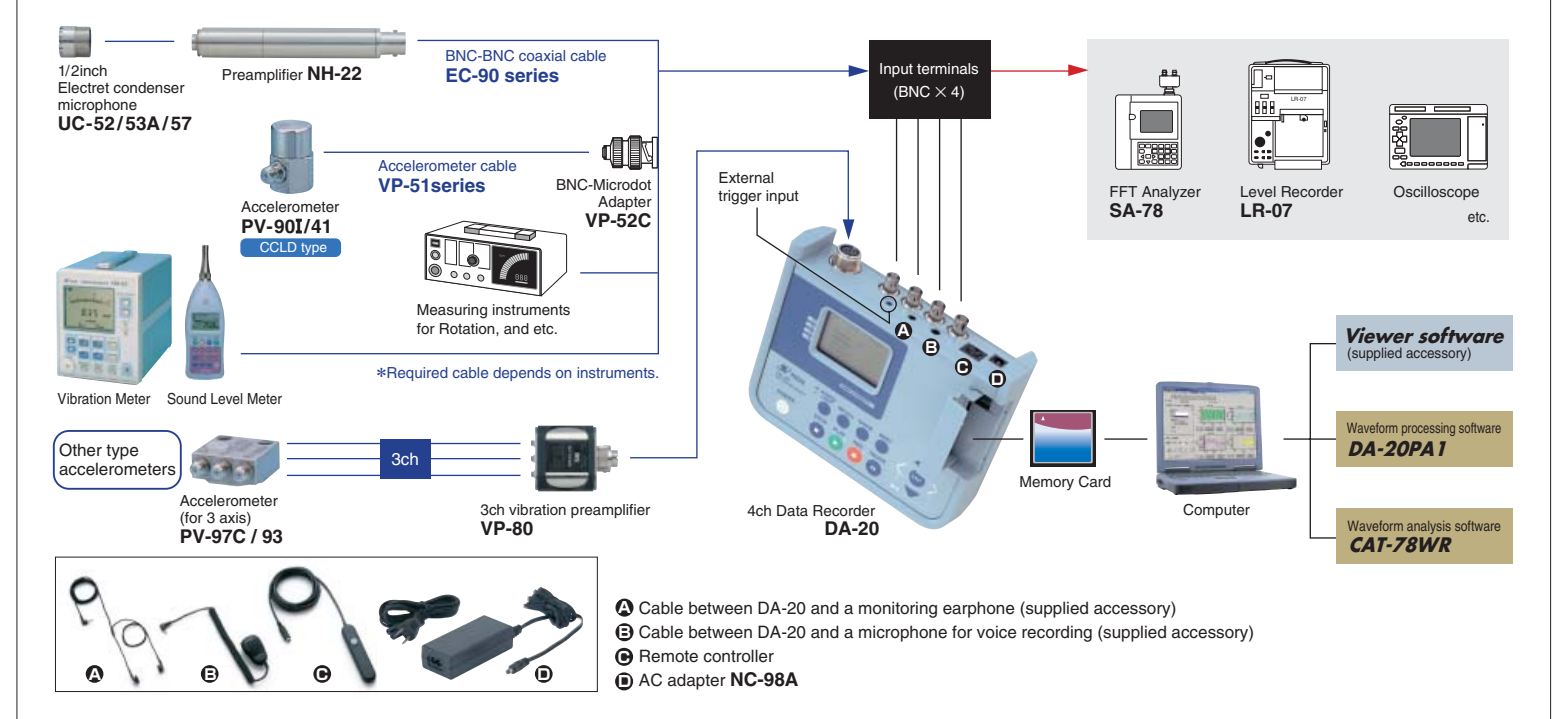
45 mm

175 mm

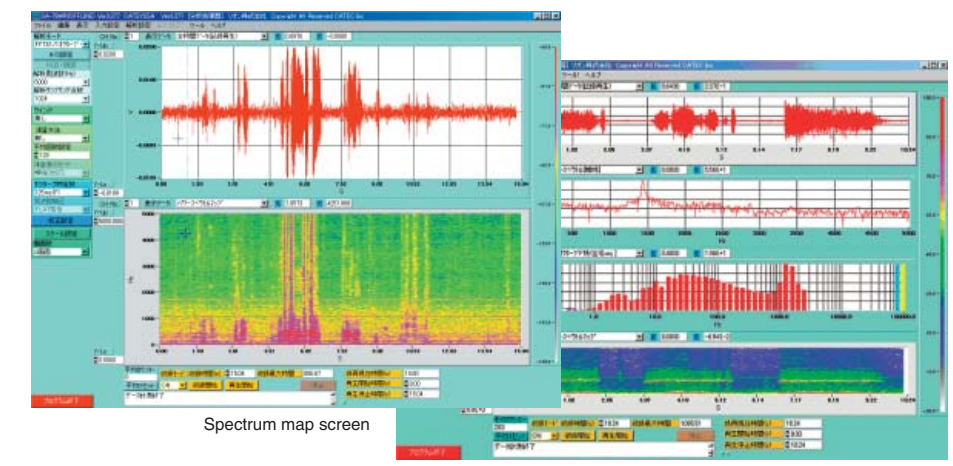
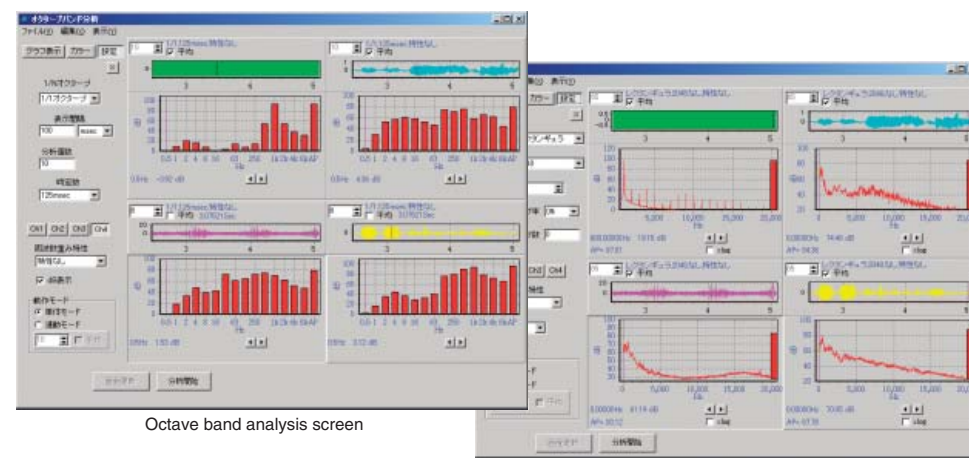
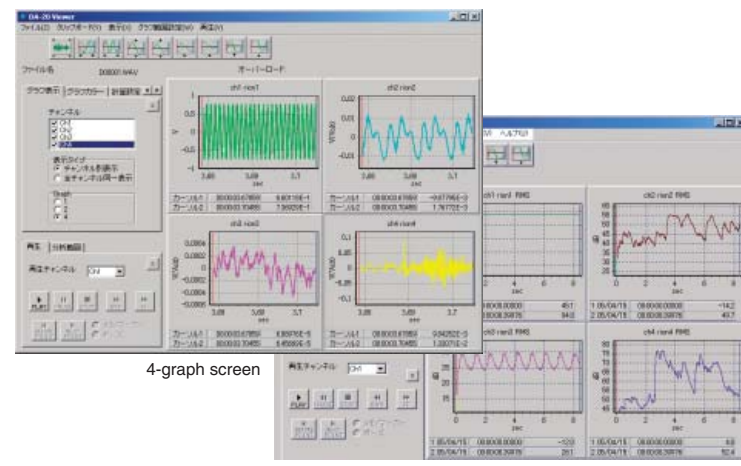


- On-site recording of sound level and vibration AC output signals
- **Analog reproduction of recorded waveforms**
- Easy in-vehicle measurements

System Configuration (peripheral devices shown below are optional order accessories except for viewer software, A and B)



Software lineup



Software Viewer software DA-20 Viewer Supplied accessory

It displays time-history of wave data on PC and enables to output wave file or CSV file.

Waveform	Applicable	: WAVE format created DA-20 or SA-78WR
Display	Display	: Scaled time axis, RMS.
File output	File output	: WAVE format and CSV format (Channel separation and interval designation are possible on each format)

OS: Microsoft Windows 2000 / XP

Software Waveform processing software DA-20PA1 Optional accessory

DA-20PA1 allows download of measured data (WAVE file) to PC and to make basic analysis on PC. Zoom display is possible for selected time interval. Analysis type is chosen from FFT analysis and octave band analysis. It provides an effective solution for environmental noise and vibration analysis.

Operating environment requirements	
CPU	: Intel Pentium 4, 2 GHz or more
RAM	: 512 MB or more
Hard disk	: 10 GB (free space) or more
OS	: Microsoft Windows 2000/XP

Waveform	Applicable	: WAVE format created by DA-20 or SA-78WR
Display	Display	: Scaled time axis, RMS, Percentile sound level (L_N), Equivalent continuous sound level (L_{eq}) and Sound exposure level L_E .
Filter	Filter	: High pass, Low pass, and band pass, Reproduction of sound after filtering
File output	File output	: WAVE format and CSV format (Channel separation and interval designation are possible each format)
FFT analysis	Frequency range	: Decided by settings on Data Recorder DA-20
	Sampling points	: 64 to 32 768 points
	Averaging function	: Linear average
	Window function	: Hanning, Rectangular, Flattop
	Display	: Power spectrum (Differential and integral calculus available for spectrum area)
Octave band analysis	Applicable standard	: IEC 61260 Class 1 JIS C 1514
	Mode	: 1/1 octave band and 1/3 octave band
	Frequency range	: 1/1 octave band : 0.5 Hz to 8 kHz (15 bands) 1/3 octave band : 0.4 Hz to 16 kHz (47 bands)
	Time weighting	: 1 ms, 10 ms, 35 ms, 125 ms (Fast), 630 ms, 1s (Slow), 10 s
	Frequency weighting	: FLAT, A, C, G and Lv

Software Waveform analysis software CAT-78WR Optional accessory

CAT-78WR allows download of measured data (WAVE file) to PC, and to make basic analysis on PC. It serves FFT analysis, Octave band analysis and Spectrum map analysis. In addition cross spectrum and transfer function are displayed.

*CAT-78WR can also analyze measuring data of SA-78 (2ch FFT Analyzer)

Operating environment requirements	
CPU	: Intel Pentium M 1 GHz or more
RAM	: 512 MB or more
HDD	: 5 GB (free space) or more
OS	: Microsoft Windows 98SE/2000/XP

Waveform	Applicable	: WAVE format created by DA-20 or SA-78WR
Display	Display	: Scaled time axis, Differential and integral calculus available
File output	File output	: WAVE format (Channel separation and interval designation are possible) CSV format (Interval designation is possible) and JPEG
FFT analysis	Frequency range	: Decided by settings on Data Recorder DA-20
	Sampling points	: 64 to 32 768 points
	Average function	: Linear average, maximum hold
	Window function	: Hanning, Rectangular, Flattop, Exponential, Force
	Display	: Power spectrum, Cross spectrum, Transfer function, Coherence, Spectrum map, Differential and integral calculus for spectrum area
Octave band analysis	Applicable standard	: IEC 61260 Class 1 JIS C 1514
	Mode	: 1/1 octave band and 1/3 octave band and 1/12 octave band
	Frequency range	: 1/1 octave band : 0.5 Hz to 8 kHz (15 bands) 1/3 octave band : 0.4 Hz to 10 kHz (45 bands) 1/12 octave band : 0.36 Hz to 11 kHz (180 bands)
	Time weighting	: 1 ms, 10 ms, 35 ms, 125 ms (Fast), 630 ms, 1s (Slow), 10 s
	Frequency weighting	: FLAT, A, C