4 channel Data Recorder DA-21

Support for high-capacity memory cards up to 32 GB

Inter-unit synchronization: max. 8 channels

32 GB & 8 channels
The 4 channel Data Recorder DA-21 is capable of recording acoustic / vibration waveforms and various voltage signals in the field. Recorded data are saved in WAVE format on SD cards and can be imported into a computer for waveform analysis and other processing tasks.

**4 channel Data Recorder DA-21**

- **Playback of recorded data supported**
- **Silent operation without any moving parts. Able to operate also in difficult environments subject to vibration and humidity.**
- **Voice memo recording function**
- **Bar graph provides visual level indication**

**Software**

DA-21 data can be displayed and analyzed in various software packages:

**Viewer Software**

AS-70 Viewer  
Supplied

- 4 channel display screen example
- Operating environment requirements

**Waveform Analysis Software**

AS-70  
Option

- Waveform analysis screen example

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Viewer software AS-70 Viewer / Waveform Analysis Software AS-70  
CPU : Intel Core i5 2 GHz or faster  
RAM : 2 GB or more, 4 GB recommended  
HDD : 20 GB or more  
Waveform analysis software CAT-WAVE  
CPU : Intel Core i5/i7 1.4 GHz or more (Core2 Duo 2 GHz or more)  
RAM : 2 GB or more  
HDD : 60 GB or more (free space required)
System Configuration
(Other equipment is optional)

Specifications
- Inter-unit synchronization (max. 8 channels)
- Separate input and playback output connectors
- Time trigger function added
- Support for high-capacity SD cards (max. 32 GB)
- Use as USB storage supported (recognized as removable disk)
- Battery Life
  - Using four IEC R6 (size AA) alkaline batteries
  - Approx. 8 hours
- Additional rotary signal input (dedicated connector)
- Frequency weighting characteristics: FLAT, A, C
- Time weighting characteristics: 1 ms, 10 ms, 35 ms, F (Fast), 630 ms, S (Slow), 10 s

Waveform Analysis Software CAT-WAVE

- Reads WAVE format files produced by the DA-21 and enables functions such as octave band analysis, 1/3 octave band analysis, and FFT analysis. Inter-channel processing functions such as cross spectrum and transfer function, as well as 1/12 octave band analysis are also possible. (Tracking analysis can be added as an option.)
- Supports 32 to 65,536 points
- FFT Sampling points: 64 to 32,768 points
- Inter-channel processing functions such as cross spectrum and transfer function, as well as 1/12 octave band analysis are also possible. (Tracking analysis can be added as an option.)

Battery Life
- Using Battery Pack BP-21A with four IEC R20 (size D) alkaline batteries
- Approx. 30 hours

Analysis functions to AS-70Viewer
- Option

Waveform Analysis Software CAT-WAVE

- Option

Spectrum map screen example

Information on the battery life and other specifications is not included in this text. Please refer to the original document for detailed information.
**Specifications 4 channel Data Recorder DA-21**

**Input Connectors**
- Signal input: 4 channels (BNC)
- Rotation speed interrupt input: 1 channel (BNC)
- Voice memo input: 1 channel (voice microphone 3.5 mm, 4-pole mini jack)
- External trigger input: 1 (2.5 mm stereo mini jack)
- Remote control: For optional remote controller, 8-pin mini DIN

**USB port**
- Mini B

**Input range**
- ±0.01 V, ±0.03 V, ±0.1 V, ±0.3 V, ±1 V, ±3 V, ±10 V

**Max. input voltage**
- ±1.3 V

**Overload**
- +2.0 dB ±1.0 dB at range full-scale

**Input coupling**
- AC/DC (AC coupling (primary) -3.0 dB ±1.0 dB at 0.315 Hz)
- LC (Cut-off frequency: 2 mA, 24 V)

**Filters (digital)**
- High-pass OFF, 5 Hz (-3 dB ±1.0 dB) (-12 dB / oct), Low-pass OFF, 200 Hz, 1 kHz, 2 kHz (-3 dB ±1.0 dB) (-12 dB / oct)

**Frequency response**
- DC coupling to 1 Hz: ±1.0 dB
- 1 Hz to 12.5 kHz: ±0.5 dB
- 12.5 kHz to 20 kHz: ±0.5 dB

**AC coupling**
- 1 Hz: ±1.0 dB
- 1 Hz to 12.5 kHz: ±0.5 dB
- 12.5 kHz to 20 kHz: ±0.5 dB

**Channel (phase difference)**
- Max. 1 deg (with AC coupling, +90 deg, ±3 dB, same frequency range, 20 kHz range)

**S/N ratio**
- 80 dB or more (input voltage range: 30, 1.0, 3 V; within frequency band (including overload)

**Distortion**
- Max. 0.1 % (within frequency band)

**Voice memo function**
- 2 operation modes
  - A: Recording in open state
  - B: Revolution speed channel is always used as voice memo recording

**Rotary pulse**
- Input impedance: 100 kΩ or more

**Remote control**
- During recording
  - Voice memo input
- During playback
  - Output selection
  - Frequency range: ±0.5 V

**Playback output**
- Max. output voltage: ±0.5 V

**Playback output selection**
- Output from playback output and monitor output

**Recording media**
- SD card (Use only RION supplied cards for assured operation.)
  - Max. capacity 32 GB
- File system: FAT16/FAT32
- AD converter: Quantization: 24 bit, Bit length: 16 bit/24 bit selectable from menu
- File format: WAVE (16-bit/24-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
- Max. recording time: approx. 20 hours, sampling frequency x2, 4 channels, 32 GB card
- 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
- Internal: Level Trigger (Waveform: 0.1 % to 99 %, 1 % to 99 % of range full-scale, linear peak

**Conversion**
- Linear (8.5, Log (dB)

**Display items**
- Setting screen, recording screen, level bars, level history

**LEDs**
- Status indication (record, playback, trigger standby, etc.)
- Overload indication, SD card low space warning,

**Saving settings**
- Five sets of settings can be saved in internal memory, startup files on 50 card

**USB**
- Mass storage class: Recognized as removable disk

**Battery life**
- Alkaline batteries 20 kHz, 1 channel: CCLD ON: approx. 4.5 hours
- CCLD OFF: approx. 7 hours
- 10 kHz, 1 channel: CCLD ON: approx. 11 hours
- CCLD OFF: approx. 12 hours

**Power supply**
- 3 to 20 V, current consumption 190 mA (±5 V)

**Dimensions and Weight**
- External: Approx. 110 x 72 x 45 mm, approx. 140g (w/ batteries)
- Internal: approx. 140 x 20 x 30 mm, approx. 14g (w/ batteries)

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

**Supplied Accessories**
- RION II (size AA) alkaline battery x 4, AS-70/leaf x 1

**Specifications subject to change without notice.**

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**Option**

<table>
<thead>
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<th>Designation</th>
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<td>AS-70</td>
</tr>
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<td>CAT-WAVE</td>
</tr>
<tr>
<td>Charge Converter</td>
<td>VP-40</td>
</tr>
<tr>
<td>Memory card</td>
<td>2 GB, MC-20SD2</td>
</tr>
<tr>
<td>Memory card</td>
<td>32 GB, MC-32SD3</td>
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<tr>
<td>AD converter</td>
<td>NC-98E</td>
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<tr>
<td>Battery pack</td>
<td>SP-21A</td>
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<tr>
<td>Cigarette lighter adapter</td>
<td>CC-92</td>
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<tr>
<td>4-channel data recorder remote controller</td>
<td>DA-20RC1</td>
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<tr>
<td>Voice memo microphone</td>
<td>MH-34B4B</td>
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<tr>
<td>Monitor earphone</td>
<td>ATH-C332</td>
</tr>
<tr>
<td>Soft Carrying Case (with shoulder strap)</td>
<td>DA-2007</td>
</tr>
<tr>
<td>BNC-BNC coaxial cable</td>
<td>EC-90 series (2 m up)</td>
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<tr>
<td>BNC-BNC cable</td>
<td>NC-39A</td>
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<tr>
<td>BNC-mini plug Cable</td>
<td>CC-44</td>
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<tr>
<td>Comparator output cable (for NL-40/50/41)</td>
<td>CC-42C</td>
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<tr>
<td>Inter-unit sync cable</td>
<td>CC-43</td>
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<tr>
<td>USB A-Mini B Cable</td>
<td>—</td>
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</tbody>
</table>

*1: Use only RION supplied cards for assured operation.
*2: When used with the DA-21, BNC mini plug cable CC-24 and joint connector VP-54C are required.

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**Maximum recording times on memory card (SD card) (Approximate)**

**32 GB SD card**
- Sampling frequency: x2.56 (2.4 also supported), Quantization: 16 bit
- Memory card: 2 GB, 32 GB card
- Frequency range (Hz)

<table>
<thead>
<tr>
<th>100 Hz</th>
<th>500 Hz</th>
<th>1 kHz</th>
<th>5 kHz</th>
<th>10 kHz</th>
<th>20 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15706 h 40 m</td>
<td>3141 h 20 m</td>
<td>760 h 40 m</td>
<td>153 h 20 m</td>
<td>38 h 40 m</td>
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<tr>
<td>2</td>
<td>15706 h 40 m</td>
<td>3141 h 20 m</td>
<td>760 h 40 m</td>
<td>153 h 20 m</td>
<td>38 h 40 m</td>
</tr>
<tr>
<td>3</td>
<td>568.8 h 40 m</td>
<td>1137 h 36 m</td>
<td>568 h 48 m</td>
<td>113 h 36 m</td>
<td>56 h 48 m</td>
</tr>
<tr>
<td>4</td>
<td>4266 h 40 m</td>
<td>853 h 20 m</td>
<td>426 h 40 m</td>
<td>85 h 20 m</td>
<td>42 h 40 m</td>
</tr>
</tbody>
</table>

**2 GB SD card**
- Sampling frequency: x2.56 (2.4 also supported), Quantization: 16 bit
- Memory card: 2 GB, 32 GB card
- Frequency range (Hz)

<table>
<thead>
<tr>
<th>100 Hz</th>
<th>500 Hz</th>
<th>1 kHz</th>
<th>5 kHz</th>
<th>10 kHz</th>
<th>20 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1066 h 40 m</td>
<td>213 h 20 m</td>
<td>106 h 40 m</td>
<td>21 h 20 m</td>
<td>10 h 40 m</td>
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<tr>
<td>2</td>
<td>1066 h 40 m</td>
<td>213 h 20 m</td>
<td>106 h 40 m</td>
<td>21 h 20 m</td>
<td>10 h 40 m</td>
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<tr>
<td>3</td>
<td>355 h 32 m</td>
<td>71 h 06 m</td>
<td>353 h 33 m</td>
<td>7 h 06 m</td>
<td>3 h 33 m</td>
</tr>
<tr>
<td>4</td>
<td>266 h 40 m</td>
<td>53 h 20 m</td>
<td>26 h 40 m</td>
<td>5 h 20 m</td>
<td>2 h 40 m</td>
</tr>
</tbody>
</table>

*1: Varies slightly on number of data files
*2: Maximum recording time for one file is approx. 1000 hours.
*3: Use only RION supplied cards for assured operation.

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