



# RIONOTE

The groundbreaking multi function measuring system from RION

Compact design, easy and intuitive operation

Wireless connections

Use it anytime anywhere!



# Analysis result display examples

## FFT analysis

RIONOTE enables you to perform FFT analysis on multiple channels simultaneously. The results are shown in clear graphs on the large color screen, in real time, or from stored data when using the recall function. A marker allows you to scroll through the data, and enables the readout of the level of a frequency of interest.



## Transfer function

The transfer function represents the relation between an input signal and output signal in the frequency domain, allowing the determination of amplitude and phase. In this mathematical calculation category, the RIONOTE supports coherence function and cross spectrum processing.



## Waveform recording

By using the waveform recording program, it is possible to display and record the time waveform of the incoming signal(s). Available recording time depends on the number of input channels and the selected frequency range. The figure below shows a time waveform displayed on the screen of the Main Control Unit.



## Waveform post processing

After completing waveform recording (as explained above), the stored waveforms can be displayed on the Main Control Unit's large screen, and played back by using the earphone jack output. Moreover, various secondary post processing functions for the waveform data are available in the Main Control Unit, including FFT analysis as shown in the screen example below.



**RIONOTE** is combining the newest quality, ease of use and economical sense, which can be configured to up to 16 channels anywhere wireless. The Main Control Unit is program of your choice. All on a large color screen, both programs and hardware for this mea



# RIONOTE

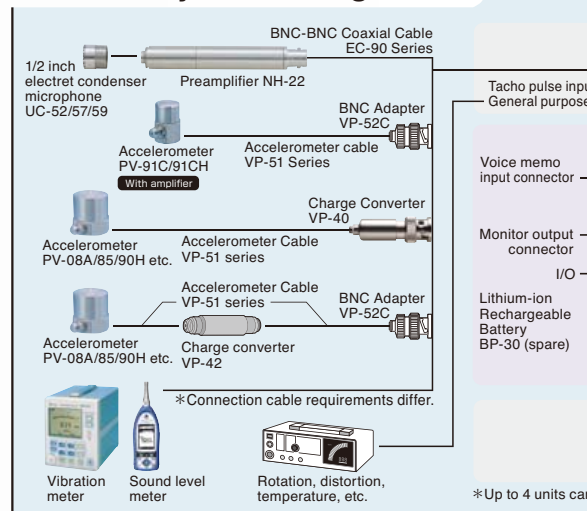
## Main Control Unit and Amplifier

Supports direct connection of microphones and piezoelectric accelerometers.



Sensor amplifier slides into the underside of the Main Control Unit

## RIONOTE System Configuration



technology with the traditional virtues of RION;  
 RIONOTE consists of a Main Control Unit SA-A1  
 channels and allowing you to perform measurements  
 as easy and intuitive to operate, with the dedicated  
 or touch screen. RION will continuously develop  
 measuring system of the future.



## Octave band analysis

Real time analysis of noise or vibration levels for evaluation and designing countermeasures is usually performed by means of octave band analysis (using either octave bands or 1/3 octave bands). The below screen sample of the RIONOTE displays octave analysis results in 4 channels as a graph and numeric values at the same time.



## RIONOTE intuitive user interface

Lets the user select the required program for the respective purpose: SX-A1FT (FFT analysis), SX-A1RT (octave band analysis), or SX-A1WR (waveform recording). The right side of the screen provides access to various settings.



RIONOTE also enables the use of a wireless dock or wireless sensor amplifiers to avoid the cost and hassle of cables. A plurality of wireless docks and wireless sensor amplifiers can be used simultaneously, up to 16 channels, to store the measured data in the Main Control Unit as well as in the memory of wireless dock or wireless sensor amplifiers.

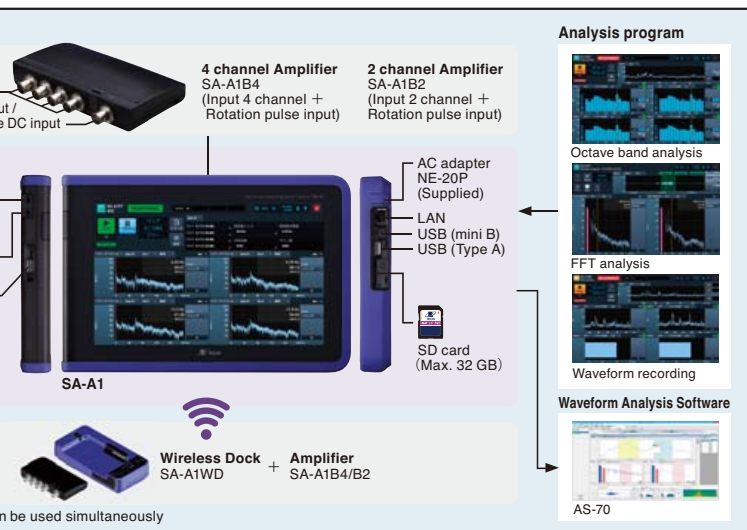
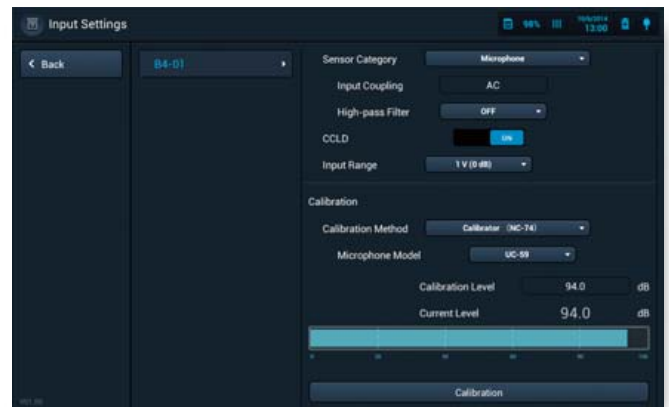


**Wireless Dock (and Amplifier)**  
 Separate type wireless dock and amplifier  
 (2 channel or 4 channel configuration)

\*Selling of Wireless dock (SA-A1WD) differs from each country. Please contact us for further questions

## RIONOTE calibration screen

Serves for calibration of microphones or accelerometers connected to the SA-A1.



can be used simultaneously

## Ordering Information

Product name	Product number
RIONOTE 2 channel FFT Analyzer	SA-A1FTB2
RIONOTE 4 channel FFT Analyzer	SA-A1FTB4
RIONOTE 2 channel Octave Analyzer	SA-A1RTB2
RIONOTE 4 channel Octave Analyzer	SA-A1RTB4
RIONOTE 2 channel Frequency Analyzer (FFT and Octave)	SA-A1FTRTB2
RIONOTE 4 channel Frequency Analyzer (FFT and Octave)	SA-A1FTRTB4
RIONOTE Program for FFT Analysis	SX-A1FT
RIONOTE Program for 1/3 Octave Analysis	SX-A1RT

## Options

Product name	Product number
Wireless Dock	SA-A1WD
Lithium-ion Rechargeable Battery (spare)	BP-30
32 GB SD Card	MC-32SD3
2 GB SD Card	MC-20SD2
Voice Memo Microphone	BSHSM03BK
Monitor Earphone	ATH-C320-BK
Shoulder Belt	VA-12015
LCD Protector	—
CCLD 4 mA Modification (factory option)	—

## Specifications

### RIONOTE Main Control Unit SA-A1, RIONOTE 4 channel / 2 channel Amplifier SA-A1B4/B2

<b>Input section</b>	
Number of channels	4 (2), BNC connectors
Max. input voltage	±13 V
CCLD	2 mA 24 V (4 mA Factory option)
<b>Amplifier section</b>	
Frequency Range	DC to 20 kHz or 0.25 Hz to 20 kHz
Input range	-40 dB to 20 dB, 20-dB steps, 0 dB ref. $V_{rms} = 1 V$
Residual noise	At range full-scale: -85 dB or less (0 dB range, AP level)
Dynamic range	100 dB or better (0 dB range, $f_s = 51.2 kHz$ , 400 line FFT noise level)
Phase difference between channels	±1 deg. or less (1 Hz to 20 kHz, same input range)
<b>A/D converter section</b>	
A/D converter	24 bit, delta-sigma type, simultaneous sampling
Sampling frequencies	51.2 kHz, 25.6 kHz, 12.8 kHz, 5.12 kHz, 2.56 kHz, 1.28 kHz, 512 Hz, 256 Hz
<b>Display</b>	
Touch panel	10.1 inch TFT color LCD, 1 280 x 800 pixels, transmissive type
Touch panel	Multi-touch (2 points), projected capacitive type
<b>Input/output section</b>	
USB	USB A x 1, mini B x 1
Earphone jack	Yes Stereo mini jack, $\phi 3.5$
SD card slot	Yes (SDHC support, max. 32 GB)
<b>Tacho pulse input</b>	
Common	
Number of channels	1, BNC connector
Input voltage range	0 to 12 V
Tacho	
Measurement rotation speed range	5 000 pulse/s
General purpose	
A/D converter	10 bit successive approximation type
Sampling frequency	Approx. 10 Hz
External trigger	
Open collector supported, internal pull-up 3.3 V	
Power supply	
Li-ion battery (battery life approx. 4 hours, depending on usage conditions), AC adapter	
Dimensions, Weight	
40 (H) x 275 (W) x 188 (D) mm SA-A1: 1 200 g (incl. 280 g battery, SA-A1B4 mounted)	
Water-resistant rating	
Equivalent to IPX4	
Operating temperature range	
-10 °C to +50 °C using AC adapter, max. 90 % RH (no condensation)	
Supplied accessories	
Rechargeable Li-ion battery, BP-30 x 1, AC adapter NE-20P x 1	

### RIONOTE Wireless Dock, SA-A1WD (and Amplifier SA-A1B4/B2)

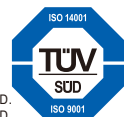
Input	4 or 2 channels (Amplifier SA-A1B4/B2 needed)
Signal transfer to	LAN port Ethernet 100 base-TX
main platform	Wireless WLAN (IEEE802.11a/b/g/n, 2.4/5 GHz)
Distance of wireless transfer	about 50 m*
Memory	SD card (SDHC support, max 32 GB)
Power supply	8 IEC R6 (sizeAA) batteries(alkaline or nickel-hydrate), AC adapter
Dimensions, Weight	Approx. 42 (H) x 193 (W) x 95 (D) mm, Approx. 500 g (incl. battery)
Water-resistant rating	IP grade IPX4 equivalent (same as main unit)

\* Depending on usage conditions



RION Co., Ltd. is recognized by the JCSS which uses ISO/IEC 17025 (JIS Q 17025) as an accreditation standard and bases its accreditation scheme on ISO/IEC 17011. JCSS is operated by the accreditation body (IA Japan) which is a signatory to the Asia Pacific Laboratory Accreditation Cooperation (APLAC) as well as the International Laboratory Accreditation Cooperation (ILAC). The Quality & Environmental Management system Center of RION Co., Ltd. is an international MRA compliant JCSS operator with the accreditation number JCSS 0197.

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ISO 9001 RION CO., LTD.



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

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## SX-A1FT, RIONOTE Program for FFT Analysis

<b>General real-time analysis processing</b>		
Processing outline	FFT analysis (non-continuous frames when used in real time)	
Number of channels	Max. 4 channels	
Trigger	Trigger modes	Free, Single, Repeat
	Trigger source	Waveform, External, Rotation speed
	Trigger position	$\pm \frac{N}{2}$ (N: number of analysis points)
Arithmetic functions	Time domain waveform for 1 frame, Power spectrum, Cross spectrum, Transfer function, Coherence	
Window functions	Rectangular, Hanning, Flat-top, Exponential, Force	
Analysis frequencies	20 kHz, 10 kHz, 5 kHz, 2 kHz, 1 kHz, 500 Hz, 200 Hz, 100 Hz	
Number of analysis points	256, 512, 1 024, 2 048, 4 096, 8 192, 16 384	
Averaging and other processing functions	Linear, Exponential, Max Hold	
Number of averaging runs	1 to 1 024	
<b>General post-analysis processing</b>		
Outline	FFT analysis of WAVE files recorded with WR function	
Number of channels	Max. 4 channels	
Arithmetic functions	Time waveform for 1 frame, Power spectrum, Cross spectrum, Transfer function, Coherence, Partial overall	
Window functions	Rectangular, Hanning, Flat-top, Exponential, Force	
Number of analysis points	1 024, 2 048, 4 096, 8 192, 16 384, 32 768	
Overlap ratio	0 %, 25 %, 50 %, 75 %	
Averaging and other processing functions	Linear, Exponential, Max Hold	
Number of averaging runs	1 to 1 024	

## SX-A1RT, RIONOTE Program for 1/3 Octave Analysis

Standard compliance	JIS C1513 Class 1, JIS C1514 Class1, IEC 61260:1995 Class1, ANSI S1.11-2004 Class1	
<b>Band filter center frequencies and number of bands</b>		
Octave bands	0.5 to 16 000 Hz, 16 bands Max. 4 channels	
1/3 octave bands	0.4 to 20 000 Hz, 48 bands Max. 3 channels	
Instantaneous value data (every 100 ms)	Time weighted level $L_p$ , Time averaged level $L_{eq}$ , Time weighted maximum level $L_{max}$	
Processing value data	Time averaged level $L_{eq}$ , Sound exposure level $L_E$ , Time weighted maximum level $L_{max}$ , Time weighted minimum level $L_{min}$ , Time percentile level $L_N$ (5, 10, 50, 90, 95, 33.3), max. 5 values	
Store function	Auto/Manual	
Time weighting characteristics	F (Fast) 125 ms, 630 ms, S (Slow) 1 s, 10 s	
Frequency weighting characteristics	A, C, Z	
Trigger	Trigger modes	Free, Single, Repeat
	Trigger source	AP level, Band level, External signal, Time

## SX-A1WR, RIONOTE Program for Waveform recording (Installed in SA-A1 main unit)

Number of recording channels	1 to 4 channels + rotation or General purpose DC	
Frequency range	20 kHz, 10 kHz, 5 kHz, 1 kHz, 500 Hz, 100 Hz	
Quantization	16 bit/24 bit	
Trigger	Trigger modes	Free, Single, Repeat
	Trigger source	Waveform, Time, External, Rotation speed
Voice memo marker function	Yes	
Monitor output (playback)	Allows listening to recorded data (51.2 kHz, 25.6 kHz, 12.8 kHz only)	
Recorded data	WAVE format	

### Precautions regarding waterproofing

Before use, verify that the connector cover on the side of the unit is firmly closed. To maintain the water-resistant rating, the internal packing of the enclosure must be replaced every two years (at cost).

This product is environment-friendly. It does not include toxic chemicals on our policy.  
This product is certified to an International Protection rating of IP54 (dust protected and resistant to splashing water).  
This leaflet is printed with environmentally friendly UV ink on recycled paper.

**RION CO., LTD.**  
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