RION Portable Multi-function Measuring System

GREEN

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 chann
anywhere wireless. The Main Control Unit is
program of your choice. All on a large colo
both programs and hardware for this mea

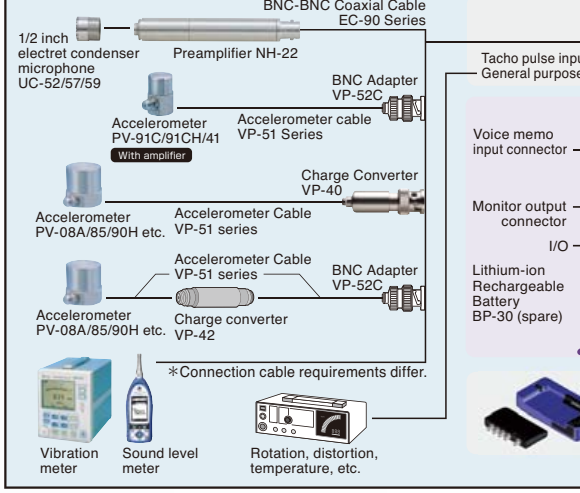
RIONOTE

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
nels and allowing you to perform measurements
s easy and intuitive to operate, with the dedicated
or touch screen. RION will continuously develop
asuring system of the future.

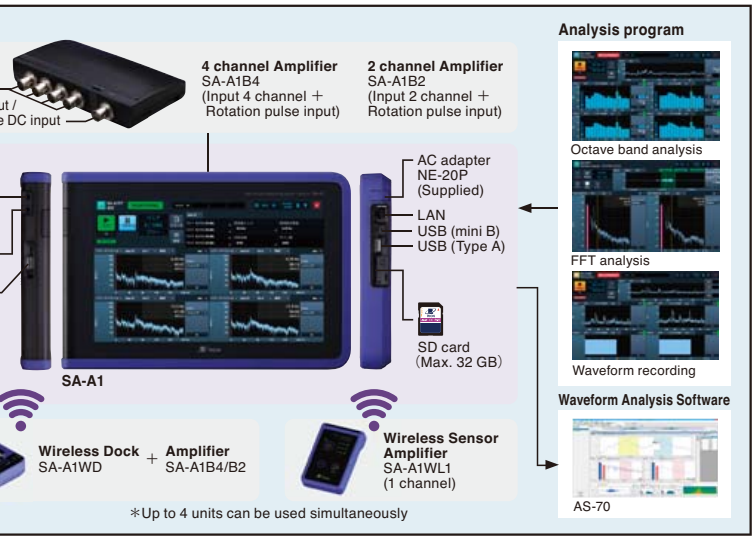
RIONOTE also enables the use of a wireless dock or wireless sensor amplifiers to avoid the cost and hassle of cables. A plurality of wireless docks and wireless sensor amplifiers can be used simultaneously, up to 16 channels, to store the measured data in the Main Control Unit as well as in the memory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

Wireless Dock (and Amplifier)

Separate type wireless dock and amplifier
(2 channel or 4 channel configuration)

Wireless Sensor Amplifier

Integrated type wireless dock and amplifier (single channel configuration)



*Up to 4 units can be used simultaneously

Octave band analysis

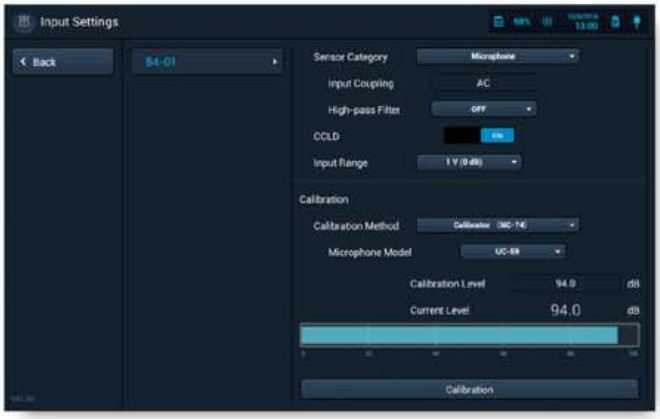
Real time analysis of noise or vibration levels for evaluation and designing countermeasures is usually performed by means of octave band analysis (using either octave bands or 1/3 octave bands). The below screen sample of the RIONOTE displays octave analysis results in 4 channels as a graph and numeric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

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



■ 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 (Under Development)
Wireless Sensor Amplifier	SA-A1WL1 (Under Development)
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

Input section		
	Number of channels	4 (2), BNC connectors
	Max. input voltage	±13 V
	CCLD	2 mA 24 V (4 mA Factory option)
Amplifier section		
	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. Vrms = 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, fs = 51.2 kHz, 400 line FFT noise level)
	Phase difference between channels	±1 deg. or less (1 Hz to 20 kHz, same input range)
A/D converter section		
	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
Display		10.1 inch TFT color LCD, 1 280 x 800 pixels, transmissive type
	Touch panel	Multi-touch (2 points), projected capacitive type
Input/output section		
	USB	USB A x 1, mini B x 1
	Earphone jack	Yes Stereo mini jack, ϕ3.5
	SD card slot	Yes (SDHC support, max. 32 GB)
Tacho pulse input		
	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 main platform	LAN port	Ethernet 100 base-TX
	Wireless	WLAN (IEEE802.11a/b/g/n, 2.4/5 GHz), ZigBee (IEEE802.15.4, 2.4 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-hydride), AC adapter
Dimensions, Weight		Approx. 42 (H) × 193 (W) × 95 (D) mm, Approx. 500 g (incl. battery)
Water-resistant rating		IP grade IPX4 equivalent (same as main unit)

* Depending on usage conditions

RIONOTE Wireless Sensor Amplifier, SA-A1WL1

Input	1 channel (Microdot connector)
Signal transfer to platform	
Wireless	WLAN (IEEE802.11a/b/g/n, 2.4/5 GHz), Zigbee (IEEE802.15.4, 2.4 GHz)
Distance of wireless transfer	about 50 m*
Interface	USB2.0 (miniB, data output to PC and power supply)
Memory	Internal memory (2 GB)
Power supply	Li-Ion battery, AC adapter
Dimensions, Weight	Approx. 21 (H) × 54 (W) × 84 (D) mm, Approx. 100 g (incl.battery)

* Depending on usage conditions

SX-A1FT, RIONOTE Program for FFT Analysis

General real-time analysis processing		
	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
General post-analysis processing		
	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
Band filter center frequencies and number of bands		
	Octave bands	0.5 to 16 000 Hz, 16 bands Max. 3 channels
	1/3 octave bands	0.4 to 20 000 Hz, 48 bands Max. 4 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).

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

ISO 14001 RION CO., LTD.
ISO 9001 RION CO., LTD.

Distributed by:

RION CO., LTD.
http://svmeas.rion.co.jp/
3-20-41, Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan
Tel: +81-42-359-7888 Fax: +81-42-359-7442

This product is environment-friendly. It does not include toxic chemicals on our policy.
This product is certified to an International Protection rating of IPX4 (resistant to splashing water).
This leaflet is printed with environmentally friendly UV ink on recycled paper.

1405-2 1411.P.D