omniace RA3100

DATA ACQUISITION SYSTEM





All data recorded in Omniace

High-speed, long-term recording of phenomena on large-capacity storage media

Data Acquisition System

omniace RA3100



Omniace RA3100 is a data acquisition system for research, development, and field maintenance, which enables accurate and long-term measurement of high-speed switching waveforms, even in severely noisy environments, in electric automobiles, electronic appliances, railroad cars, and solar power generation systems utilizing inverter control technology that has become widespread in recent years.

Multi-channel input

Max 36ch (analog input)

Max 144ch (logic input)

High speed sampling Max 20MS/s

Long-term recording Memory capacity 4GB

(when 18 channels are used, 20MS/s, 5 seconds)

256GB SSD

(1MS/s, 59 minutes when using 36 channels.)

High-speed and High-definition printing

Maximum chart speed 100mm/s
Back up to SSD even if there is no chart paper.

Various recording method

Recording to Memory, SSD, and Printer.
All data can be measured simultaneously.

Input modules

Voltage, High-Voltage(1,000V), Temperature,
Strain, Acceleration, Pulse and Logic Input Module

Excellent visibility and operability

12.1-inch LCD with touch panel provide you excellent visibility and operability.

Diffty visibility and operability

Back scrolling

Data being measured can be played back without ending the measurement.

ending the measurement.

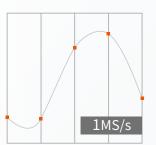
Various Monitor Displays

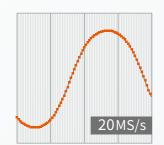
Y-T waveform, X-Y waveform, and FFT analysis can be displayed on the LCD monitor during measurement.

High-speed Sampling and High-definition Measurement

at 20MS/s with 18ch for 5 seconds

"The 2ch High-Speed Voltage Module" is an input module for high-speed sampling at the highest level of the series. Includes the ability for a sampling rate of 20MS/s, input voltage up to ±500V, and 14bit resolution . 9 modules can be installed in the main unit, allowing for 18-channel high-speed memory recording.





Recordable time into memory

	2ch	8ch	18ch		
20 MS/s	50 sec	10 sec	5sec		
10 MS/s	1 min 40 sec	20 sec	10 sec		
5 MS/s	3 min 20 sec	40 sec	20 sec		
2 MS/s	8min 20 sec	1 min 40 sec	50 sec		
1 MS/s	16 min 40 sec	3min 20sec	1 min 40 sec		
500 kS/s	33 min 20 sec	6min 40sec	3 min 20 sec		
		$\sim\sim$			
10 kS/s	27 hrs 46 min 40 sec	5 hrs 33 min 20 sec	2 hrs 46 min 40 sec		
5 kS/s	55 hrs 33 min 20 sec	11 hrs 6 min 40 sec	5 hrs 33 min 20 sec		
2 kS/s	138 hrs 53 min 20 sec	27 hrs 46 min 40 sec	13 hrs 53 min 20 sec		
1 kS/s	277 hrs 46 min 40 sec	55 hrs 33 min 20 sec	27 hrs 46 min 40 sec		

Long-term Recording

Various recording speeds, multiple channels, and a high-capacity storage medium to support a large amount of data are included as standard.

Recording desired signal accurately without missing detailed changes.



4GB (when 18 channels are used, 20MS/s, 5 seconds)



256GB (when 36 channels are used, 1MS/s. 59 minutes)

High-speed, **High-definition Printing**

High-resolution waveform printing at high speeds (100mm/s) is possible.

Even if the chart paper runs out, recorded data is backed up to the SSD and can be printed out later.



Multi-channel Input

"The 4ch Voltage Module" allows 4-channel input with a single unit. 9 modules can be installed in the main unit, allowing 36-channel recording.

"The 16-channel Logic Module" allows 16-channel logic signal input with a single unit. 9 modules can be installed in the main unit, allowing 144-channel logic signal recording.

> Max 36ch with analog input

Max 144ch with logic input

Excellent Visibility and Operability

The LCD display with touch panel allows zoom in and out, and scrolling through the waveform simply, allowing a dynamic waveform drawing and operability like a smartphone.







 ${\sf Pinch-in}({\sf zoom}\,{\sf out})$

 ${\bf Pinch-out}\,({\bf zoom}\,{\bf in})$

Swipe (scroll)

Input Module

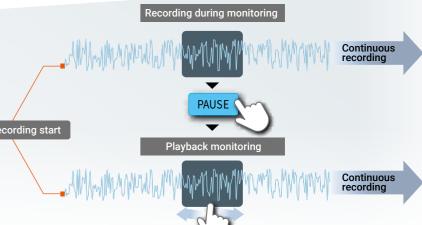
Up to 9 modules can be installed in the main unit. Various modules for high-speed voltage, high-accuracy voltate, logic inut,



Module Name and Model		Channels	Rate	Input	Specifications
2ch Voltage Module	RA30-101	2ch	1MS/s	Voltage ±500V	Measure high-speed voltage measurement with anti-aliasing filters
4ch Voltage Module	RA30-102	4ch	1MS/s	Voltage ±200V	Multi-channel voltage measurement
2ch High-speed Voltage Module	RA30-103	2ch	20MS/s	Voltage ±500V	High-speed voltage measurement
2ch High Voltage Module	RA30-107	2ch	1MS/s	Voltage ±1,000V	Module to measure high voltages of ±1,000V
16ch Logic Module	RA30-105	16ch	1MS/s	Contact, Voltage	Contact, Voltage signal measurement
2ch Temperature Module	RA30-106	2ch	1.5ms	Thermocouple : K, E, J, T, N, R, S, B, C RTD: Pt100, Pt1000	Measurement of temperature with a thermocouple and RTD
2ch AC Strain Module	RA30-104	2ch	100kS/s	Strain gauge, Strain gauge transducer	Module to measure stress, load, displacement, pressure, torque, and acceleration
2ch Acceleration Module	RA30-109	2ch	1MS/s	Piezoelectric acceleration transducer (charge output, built-in amplifier)	Module to measure acceleration, speed and displacement
2ch Frequency Module	RA30-108	2ch	1MS/s	Voltage ±500V	Input module capable of measuring period, rotation speed, number of pulses, etc., of input signals

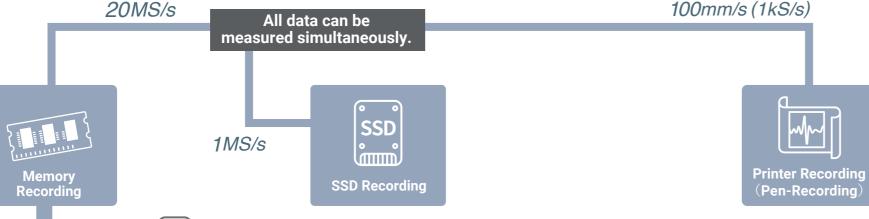
Back Scrolling

Press the [PAUSE] button during recording to playback recorded data while recording.



Various Recording Method

"Memory", "SSD", and "Printer" are provided as data recording destinations. Data recording can be performed at three destinations at the same time. This can be selected freely depending on the measurement purposes.



Memory mode records data in the internal memory (4GB) at high speed (Max: 20MS/s). In addition, measurement can be performed under a variety of conditions using a variety of trigger functions.

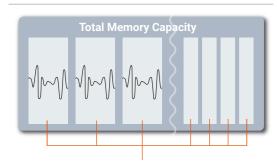
After the input data is recorded in the memory, it is automatically saved to SSD.

Sampling speed : 20MS/s to 10S/min

(depending on the input module)

Memory capacity: 4GB (2G point/ch) Memory divisions: 1 to 200 divisions

Recording length: 2,000 to 2G points/ch (1-2-5 step)



Memory Block Segment 1~200

Recordable Time on Memory

	2ch	8ch	18ch	36ch
20 MS/s	50sec	10sec	5sec	_
10 MS/s	1 min 40 sec	20 sec	10sec	5 sec
5MS/s	3min 20sec	40 sec	20 sec	10sec
2 _{MS/s}	8min 20sec	1 min 40 sec	50 sec	25 sec
1 MS/s	16min 40sec	3min 20 sec	1 min 40 sec	50 sec
500 kS/s	33min 20sec	6min 40 sec	3min 20 sec	1 min 40 sec
	$\sim\sim$	$\sim\sim$		
10 kS/s	27 hrs 46 min 40 sec	5hrs 33 min 20sec	2hrs 46 min 40 sec	1 hrs 23 min 20 sec
5kS/s	55 hrs 33 min 20 sec	11 hrs 6min 40sec	5hrs 33 min 20 sec	2 hrs 46 min 40 sec
2kS/s	138 hrs 53 min 20 sec	27 hrs 46 min 40 sec	13hrs 53 min 20sec	6 hrs 56 min 40 sec
1 kS/s	277 hrs 46 min 40 sec	55 hrs 33 min 20 sec	27 hrs 46 min 40 sec	13 hrs 53 min 20 sec

Long-term of data can be recorded to the internal SSD. High-speed recording of up to 1MS/s is possible when using 36ch.

Since it is stored as digital data, data can be analyzed after recording and data can be managed for a long period of time.

Input data is saved directly to SSD.

Sampling speed: 1MS/s to 10S/min

(depending on the input module)

SSD capacity: 256GB

Maximum recording time: 100 days Data format : Normal data, Peak data

Recordable Time on SSD*1

Sample speed	2ch	8ch	18ch	36ch
*2 1 MS/s	11hrs 46min 40sec	3hrs 55min 33sec	1hrs 51min 34sec	57min 17sec
500 kS/s	23hrs 33min 21sec	7hrs 51min 07sec	3hrs 43min 09sec	1hrs 54min 35sec
200 kS/s	2day 11hrs 20min 02sec	19hrs 37min 48sec	9hrs 17min 54sec	4hrs 46min 29sec
100 kS/s	4day 21hrs 46min 49sec	1day 15hrs 15min 36sec	18hrs 35min 48sec	9hrs 32min 59sec
50 kS/s	9day 19hrs 33min 39sec	3day 06hrs 31min 13sec	1day 13hrs 11min 37sec	19hrs 05min 58sec
20 kS/s	24day 12hrs 54min 09sec	8day 04hrs 18min 03sec	3day 20hrs 59min 04sec	1day 23hrs 44min 55sec
10 kS/s	49day 01hrs 48min 19sec	16day 08hrs 36min 06sec	7day 17hrs 58min 09sec	3day 23hrs 29min 51sec
5kS/s	98day 03hrs 36min 38sec	32day 17hrs 12min 12sec	15day 11hrs 56min 18sec	7day 22hrs 59min 43sec
2 kS/s	100 day	81day 19hrs 00min 31sec	38day 17hrs 50min 46sec	19day 21hrs 29min 19sec
1 kS/s	100 day	100 day	77day 11hrs 41min 33sec	39day 18hrs 58min 38sec
500 s/s	100 day	100 day	100 day	79day 13hrs 57min 16sec
200 s/s	100 day	100 day	100 day	100 day
*1 If you	select neak data as th	ne data type the time	will be 1/2 of the abo	ve time

^{*1} If you select peak data as the data type, the time will be 1/2 of the above time.
*2 A sample rate of 1 MS/s is not available when peak data is selected as the data type.

Window Recording

Endless recording is possible by specifying the ring buffer area (maximum 2G points/ch) as the window recording time. If you do not know when an abnormality will occur, you may miss the abnormal data if you set the recording time and measure. By ringing the recording area, you can always save the latest data.





Input data is printed directly on the chart paper at high speed (Max 100mm/s). Data printed on chart paper is also stored digitally on the SSD, so even if the chart paper runs out, the data can be printed out later.

Pen-Recording

Pen records are only recorded on recording paper; measurement data is not stored. Input module and paper feed rate settings can be configured during recording.

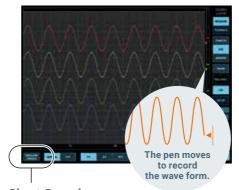


Chart Speed



Recording Specifications

Number of recorded signals: 48 channels Chart speed:

100mm/s(1kS/s)~1mm/min(10S/min) Recording resolution:

20 to 80dots/mm (time axis) 8dots/mm (amplitude axis)

Selectable for SSD Recording

Normal Data and Peak Data

Omniace is a digital recorder that performs analog to digital conversion on all inputs and records those signals. Due to the relationship between the speed of analog to digital conversion and the frequency component of the input signal, the data may or may not be measured correctly.

Normal Data

Normal data is recorded at each designated sampling speed. (☐ points)

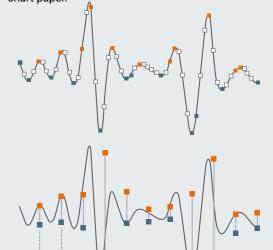
If the signal changes too fast relative to the sampling speed, the data singular point (peak value) may not be recorded. Memory recording can measure this type of data.





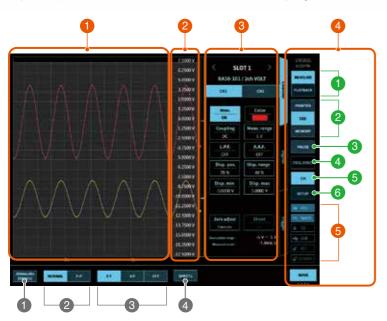
Peak Data

Peak data is sampling (\blacksquare , \blacksquare , and \square points) between the designated recording speed at the fastest AD-conversion rate, and records two data points, the maximum value (points) and the minimum value (points). The amount of data can be compressed without losing the data singular point (peak value). Printer recording records data of this method on the chart paper.



Various Monitor Displays

Input signal and recorded data can be displayed as Y-T waveform display, X-Y display, and FFT.



- Waveform display Area
- Scale area

3 Submenu

- Press the [CH] key in the "Operation key area" to make settings related to the input module.
- 4 Side menu area
- 5 Status display icon Storage medium, interface,
- Chart speed switching
- 2 Data format of waveform display when recording to SSD 6 CH
- Monitor waveform selection Select Y-T waveform, X-Y waveform, or FFT analysis.
- 4 Sheet selection

1 Monitor selection

Measurement: Display the current input signal Playback: Play back saved data

- Monitoring device selection
 - · Data to printer
 - Data to SSD · Data to memory

Pause input monitoring

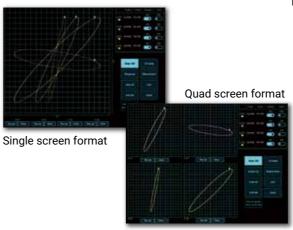
- 4 TRIG.SYNC.
- Monitor synchronized with a trigger

Pause

- nput module settings
- 6 Settings
- Measurement conditions setting screen

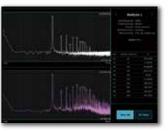
X-Y waveform Display

An X-Y waveform can be drawn by specifying 4 channels for the X-axis and 4 channels for the Y-axis. The screen format can be displayed a large single screen format, or devided four screen formats for the each X and Y axis channels. The pen can also be moved up or down, and the grid can be turned on or off.



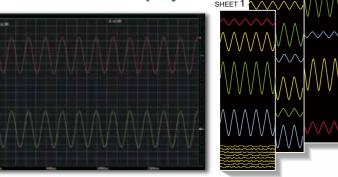
FFT Analysis

FFT analysis is performed for any two signals. The top 10 highest values can be read from the analysis results, and the value of any analysis result can be read using the cursor. (FFT analysis can be performed on normal data recorded in SSD.)



Data selection	Select from the input signal or recorded data
Sampling	1000, 2000, 5000, 10,000
Maximum analysis frequency	1/2 times of the sampling frequency
Display format	1 screen, 2 screens.
Functions	Time-Axis waveform, Linear Spectrum, RMS Spectrum, Power Spectrum, Power spectrum density, 1/1 Octave, 1/3 Octave, Transfer Function, Cross-Power Spectrum, Coherence Function
Window Functions	Hanning window, Hamming window, Rectangular window
Average processing	Time axis simple addition average, Frequency axis simple addition average, Frequency axis exponent weighted average, Frequency axis peak hold
X-axis scale	Time, Linear frequency, Log frequency, 1/1 octave, 1/3 octave
Y-axis scale	Real value area, Imaginary number area, Amplitude, Logarithmic amplitude, Auto scale or manual scale in accordance with the phase analysis results

Y-T Waveform Display



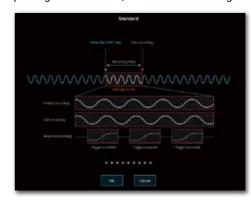
Display the measurement channels split into three sheets. Up to 48 channels of signals can be monitored on a sheet with 20 vertical/horizontal divisions.

Graphs can be divided into 1 to 18 sheets and displayed

Recording Mode Selection

Nine measurement patterns are prepared as Recording modes.

"Recording Mode" can be selected from Measurement starts by manual operation, Measurement starts from a trigger signal or Repeating measurement, etc. When "Recording Mode" is selected, the necessary set-up menu is displayed and can be easily set.

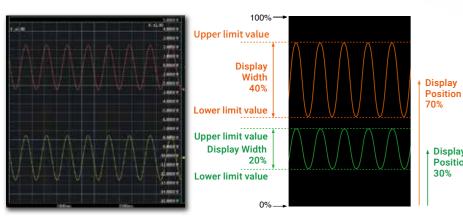






Set the signal display width and display position.

Signals can be drawn at any position on the graph at any width. You can easily draw a 100V signal in the width of 1 div.



Display the signals of each channel at any width. Set the width of the channel to be displayed as % out of the 100% width of the display graph.

Display Position

Set the position of the channel to be displayed as % out of the 100% width of the display graph.

Scale Setting

Display

Position

30%

Set the upper limit/lower limit value of display for the display width of each channel as an input value or a physical

PC Compatibility

Web server function

The RA3100 can be remotely operated from a web browser (operating PC). The web browser displays the same screen as the RA3100 main unit with pseudo operation panel keys (START key, etc.) to make settings and start/stop recording.



Software for displaying measurement data*

"RA3100 Viewer" is software to display recorded data exported to external media from an RA3100 on a PC.

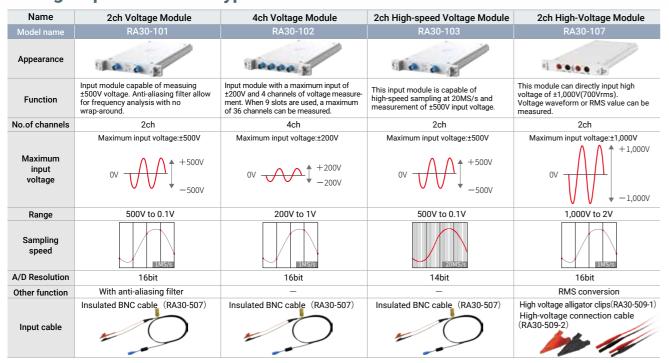
PC software for converting measurement data*

The "File Converter" software can convert recorded data exported to external media from an RA3100 to CSV or ASAM MDF (Ver. 4.1) files on a PC.

*The software can be downloaded from our website https://www.aandd.co.jp/support/soft_download/industrial.html

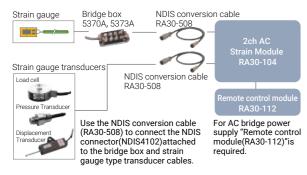
Various input modules

Voltage input modules 4 types Lineup of input modules for measuring many voltage signals from small to high



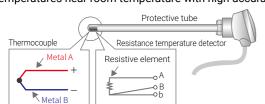
2ch AC Strain Module RA30-104

This input module enables stress measurement using strain gauges as well as strain gauge transducers such as load cells, pressure transducers, and torque transducers. The AC bridge method can be used for measurement that is strong against external noise.



2ch Temperature Module RA30-106

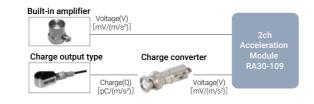
An input module for a thermocouple or resistance temperature detector. Thermocouples can be used for high temperatures and wide temperature ranges, while resistance thermometers can be used to measure temperatures near room temperature with high accuracy.



reatures of Thermocouples and Resistance Temperature Detectors			
Thermocouple	Advantages	Disadvantages	
A sensor utilizing the phenomenon that a voltage is generated when a temperature difference is applied to the contact points at both ends of a circuit created by connecting two different types of metal wires.		Poor accuracy (compared to Resistance temperature detector), reference junction required	
Resistance temperature detector	Advantages	Disadvantages	
A sensor utilizing the phenomenon that the electrical resistance of metals changes with changes in temperature.		Large form factor, slow response, narrower temperature range (-200 to 850°C) than thermocouple, expensive,	

2ch Acceleration Module RA30-109

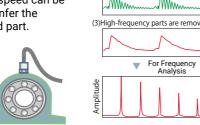
This module can measure acceleration, speed, and displacement of mechanical vibration using a piezoelectric acceleration transducer (built-in amplifier, charge output type). For mathematical functions, RMS conversion, and then envelope processing can be performed.

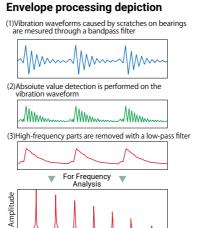


Envelope processing

Envelope processing helps to identify abnormal areas of bearings (inner rings, outer rings, and rollers/balls) by looking at the periodicity of vibrations caused by bearing flaws.

Envelope-processed signals are subjected to frequency analysis and the resulting primary frequency and information such as the size of each bearing part, the number of rollers and balls, and the shaft rotation speed can be used to infer the damaged part.





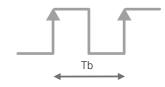
2ch Frequency Module RA30-108

Period, rotation speed, pulse count, etc. can be measured for the input pulse signal. Measurement result data such as period, rotation speed, pulse count, etc., and the input pulse signal can be saved.

Measurement Mode

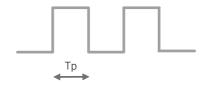
Period

Measures the period of the measured pulse. (s: seconds) Measures the width (Tb) from leading edge to leading edge of the pulse.



Pulse Width Mode

Measures the pulse width (Tp) from leading edge (trailing edge) to trailing edge (leading edge) of the pulse. (s: seconds)



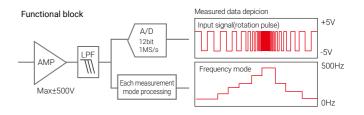
Rotation Speed Mode

Measure the rotation speed of the measured pulse. (rpm: rotations) Rotation speed (rpm) = 60 / (Measured period x No. of pulses per revolution)

* The number of pulses per revolution can be set from 1 to 100.

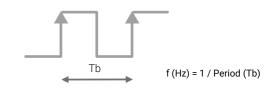


The gear to the left has 11 teeth, so the number of pulses per revolution is 11.



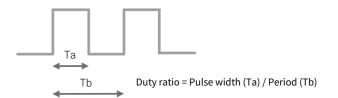
Frequency Mode

Measure the frequency of the measured pulse. (Hz: hertz) Calculates the period from the width (Tb) from leading edge to leading edge of the pulse.



Duty Ratio Mode

Measures the pulse ratio (Ta/Tb) from leading edge (trailing edge) to trailing edge (leading edge) of the



Power Frequency Mode

Measures fluctuations in power supply frequency (50/60/400Hz).

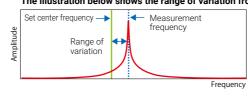


Range of Variation Mode

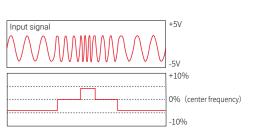
Measures the variation from the measured frequency and the set center frequency. (%)

Range of variation (%) = Measurement frequency / Center frequency

The illustration below shows the range of variation from frequency analysis data.

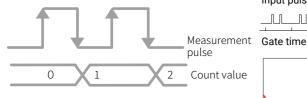


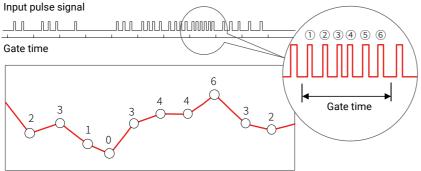
This module detects the frequency from the input pulse and calculates the variation from the set center frequency value. Changes in range of variation can be measured as sequential data.



Pulse Count Mode

Integrates the number of pulses confirmed from pulse leading edge (trailing edge) to trailing edge (leading edge) within the gate time. The count value is cleared at every gate time.



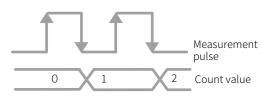


The number of pulse signals input within the gate time is counted and recorded.

· Maximum integration: Up to 40,000 counts can be counted. (Minimum pulse width: 2.5µs)

Pulse Integration Mode

Integrates the number of pulses when the pulse is confirmed from leading edge (trailing edge) to trailing edge (leading edge) of the



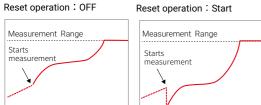
Count value reset operations

OFF: Count value is stopped at the range upper limit.

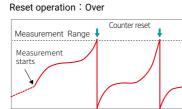
Start: When recording starts, the count value is reset and then stopped at the range upper limit.

Measurement Over: When the count value reaches the upper limit of the range, the count value is reset and measurement starts again from 0.

Start & Over: The count value is reset when recording starts. When the count value reaches the upper limit of the range, the count value is reset and measurement starts again from 0.



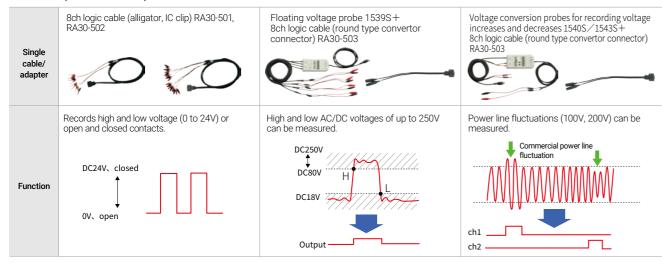






16ch Logic Module RA30-105

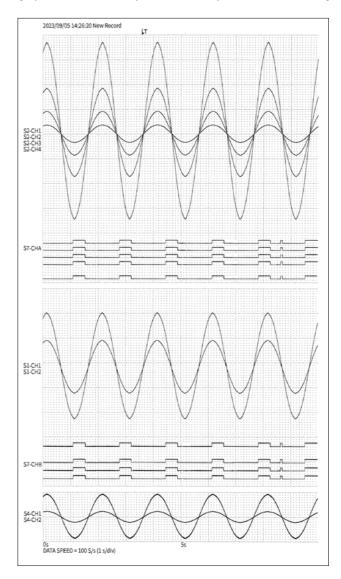
One unit of this input module can input 16 channels of logic signals and when 9 modules are installed in the main unit, 144 channels of logic signals can be measured. Detects and records high and low voltage (0 to 24V) or open and closed contacts. Furthermore, by connecting probes, it is possible to measure high and low AC and DC voltages up to 250V and power line variations (100V and 200V).



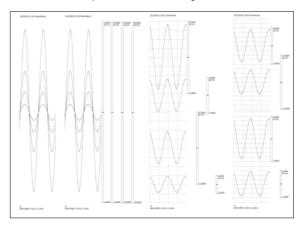
High-speed, high-definition recording

High-speed (100mm/s) and high-definition (80dots/mm at 25mm/s) recording is possible. The maximum number of signals that can be recorded simultaneously is 48.

In addition to signals, the recording name, measurement start time, trigger mark, recording speed, etc., can be printed. You can freely change the number of graphs to record, the width of each graph (2.5mm to 215mm), and the space between graphs. In addition, the position and amplitude of the event signal can be changed every 8 channels.

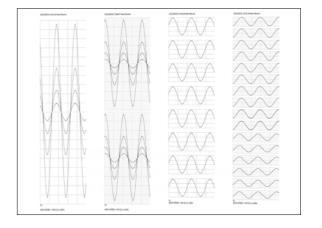


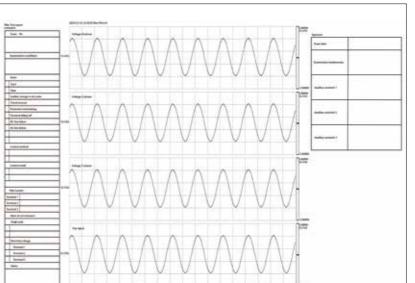
The scale can be printed after recording.



Recording division

Records can be divided from 1 to 18. Recording width can be adjusted from 215mm to 2.5mm.



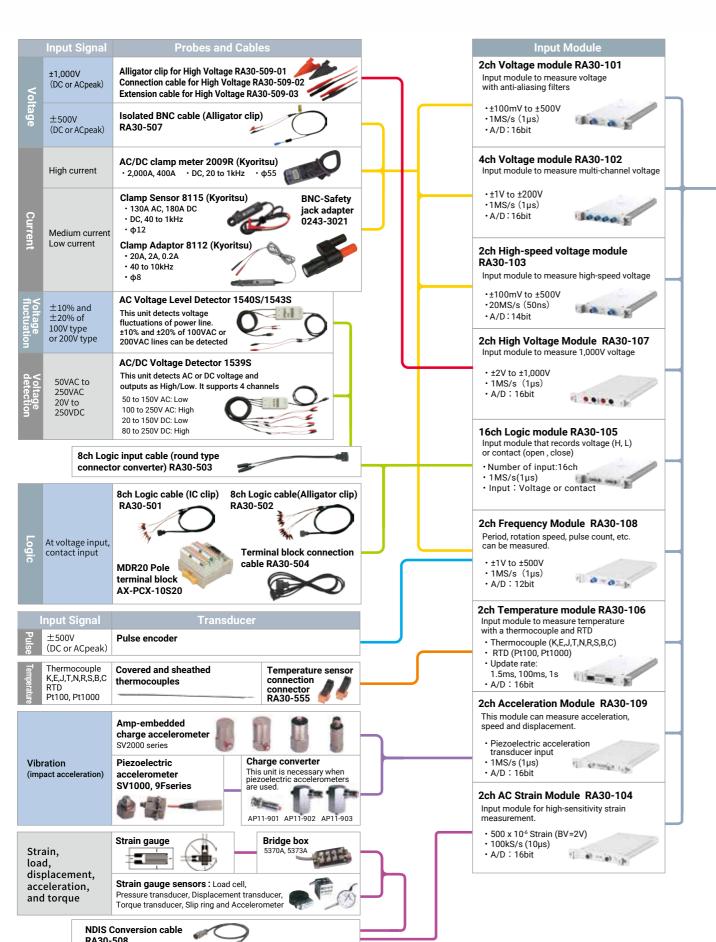


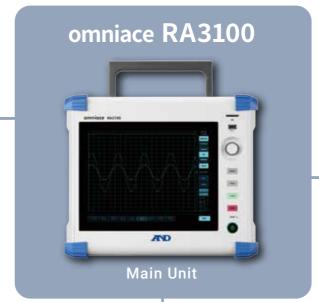
Headers / Annotations / Footers

When recording waveforms to the printer, an arbitrary character string can be printed before (header), during (annotation), and after (footer) the waveform recording.

12

Input Module and Peripheral Option Selection Guide





Control Module

Remote control module RA30-112

Start/stop, mark printing,
paper feed, external sampling
by external signal, external
trigger signal input and trigger signal output,
Bridge power supply to 2ch AC strain module

Bridge power supply to 2ch AC strain module

Control Cable

Remote control cable (among main units)
RA30-505



Remote control input cable (loose wire) RA30-506

MDR20 Pole terminal block AX-PCX-10S20

Terminal block connection cable RA30-504



External Storage Medium

SD Memory card (4GB) RM11-453

SD Memory card (8GB) RM11-454

Z-fold Paper Storage Box

Z-fold Paper Storage Box RA30-551

Including Z-fold paper adaptor RA12-301



Dimensions: H97 x W283 x D371 (mm) Weight: 4kg or lower

Z-fold paper adaptor RA12-301



Recording Paper

Recording Paper YPS106

219.5mm × 30m roll paper (5 rolls/box)



219.5mm × 30m roll paper (5 rolls/box)

Recording Paper (Z-fold paper) VPS112

219.5mm × 201m Z-fold paper (1 set/box)

Other

Soft Carrying Case RA23-183



Hard Carrying Case with Casters RA30-552



Dimensions:H635 × W450 x D320(mm) H550 × W450 × D320(mm): Castor wheels not included Weight: 8.5kg or lower

Basic Specifications

	D	High speed event recording to memory	*Any combination (
Recording	Recording	Recording of the input signal to the internal	*Any combination of memory recording, SS	
Function	SSD Recording	SSD	recording, and printer recording is possible.	
	Printer Recording Module Slot	Thermal printing using a thermal head 9 slots		
	Analog	Max 36 channels (when 9 pcs 4-channel	voltage modules are	
Channel	Measurement	installed)		
	Logic Measurement	Max 144 channels (when 9 pcs 16-chan installed)	nel logic modules are	
	Memory Record-	20MS/s(50ns) to 10S/min		
Sampling Speed	SSD Recording	1MS/s(1µs) to 10S/min		
•	Printer Recording	1kS/s(100mm/s) to 10S/min(1mm/min)	
Memory Ca	pacity	4GB(2G points/ch)		
Storage De	vice	Solid State Drive (SSD) 256GB SD card (supporting SD / SDHC / SDXC) recording.		
	Printing Method	USB memory using a USB port, for data Thermal printing using a thermal head	storage after recording.	
	Paper Width	219.5mm		
Printer	Effective Record-	Maximum 215mm		
	ing Width Chart Speed	100mm/s to 1mm/min		
	Uses	Trigger for starting record operations (S memory recording (Memory Trigger).	tart Trigger), trigger for	
	Start Trigger	Trigger to start recording operation (sele external trigger, or measuring channel (a	ected by manual trigger	
	Memory Trigger	Trigger to start memory recording (selection	cted by manual trigger,	
	Trigger Source	external trigger, or measuring channel (a Input signal (analog/logic), manual trigg		
	Trigger type	Level trigger, window trigger (memory re		
	Trigger Mode	pattern trigger Set AND/OR for the measuring channel.		
Trigger	Pre-trigger	0 to 99% (1% step)		
rrigger	Trigger Mark	The trigger point is indicated with a "T" r and hour/minute/second are printed.	mark, and the trigger da	
	Trigger Filter	Filter duration: 0 to 100 seconds		
	External Trigger Input	External signal input (Active Low, High level: 2.1V to 5.0V, Low level: 0V to 0.5V, Pulse width: at High-speed response: 1µs or higher at high level, 1µs or higher at low level / at Normal response: 1ms or higher at high level, 1ms or higher at low level / at Low response: 10ms or higher at high level, 10ms or higher at low level / 10ms or higher at low level).		
	Trigger Output	Output signal when trigger conditions ar 3.8V or higher, L: 0.5V or less, Pulse wid sponse, 1ms at normal response, 10ms	th: 1µs at high speed re	
	Y-T Waveform Monitor	Display amplitude waveform of measuir changes.	ng signal during time	
	X-Y Waveform	Input signal 1 is protted in the X axis and		
Monitor	Monitor	in the Y axis to display correlation of the FFT analysis of the measuring signals or		
	FFT Analysis Monitor	performed, and the analysis results are on axis.		
Display		12.1-inch XGA TFT color LCD (1024 x 76	8 pixels) with capacitiv	
-17		touch panel POWER ··· Power ON/OFF		
	Operation Panel	START ··· Start of measurement		
Operation Section	Key	STOP End of measurement TRIG Manual trigger		
CCCCIOII		PRINT Start of Printer Recording/S	Screen Copy	
	Rotary Knob	Change of the measuring range, wavefo	rm position, etc.	
	COM	1000BASE-T (1Gbps) ··· For control by co RS-232C ··· For control by communication		
Interface	USB	Ver. 3.0 2 port ··· For storage devices (U		
	SD Card	SD standard (SD/SDHC/SDXC supported		
	Video Output	DVI-D ··· Digital output for external displa	ау	
Compliance Standards	Safety	EN 61010-1, EN 61010-2-30 Overvoltage category (installation categ Measurement category: Depends on the input module.		
	EMC	EN61326-1 ClassA		
Operating Environment	Temperature Humidity	0 to 40°C 35 to 85 %RH (without condensation)		
Storage	Temperature	-20 to 60°C		
Environment	Humidity	20 to 85%RH (without condensation)		
V(!b	Random Vibration Durability Test	Frequency: 5 to 500Hz, Accelleration: 6 Y-axis, 10.2m/s ² on Z-axis	.5m/s² on X-axis and	
Vibration Resistance	Cine Waye Vi	Frequency: 10 to 55Hz, Acceleratin: 20. each of the three axes	0m/s², 20 cycles for	
Backup Bat (for Clock I		Approx. 10 years (at the surrounding ten	nperature is 23 ℃)	
Power Consumption		Power-supply voltage: 100 to 240V AC, Power Consumption: 300VA or less (un conditions), 80VA when recording is sto by	der the maximum load	

	cording Function S	pecifications
	Function	After data is recorded to the internal memory at the set sampling rat the data is automatically saved to the SSD.
	Memory Capacity	4GB (2G points/ch)
	Data Type	Normal data
len		1 to 200 Div. (The maximum value changes depending on the chann
3	Memory Division	used and recording length)
есо	Number of data	2,000 to 2G point/ch (1-2-5 step : The maximum value changes depending on the channels and division number used)
	Sampling Speed	20MS/s (50ns) to 10S/min, Max. 18ch for 20MS/s when simultaneo measurement
g	Maximum Recording time	100days
	Recording Operation	by START/STOP button for Time recording, Interval recording, and START trigger recording
	Function	The measurement data of the input signal is directly recorded to the internal SSD.
	Data Logging Capacity	Internal SSD (256GB)
	Data type	Normal data and peak data selectable
	Sampling Speed	1MS/s (1µs) to 10S/min, Max. 500kS/s in case of peak data
	External Synchro- nization Sampling	Synchronous clock: 250kHz or less *Recording by external synchronization can be either SSD recording or print recording (Pen Record recording).
ecord	Maximum Recording Time	100days
	Recording Operation	by START/STOP button for Time recording, Interval recording, STAR trigger recording, window recording
	Window Recording	The data is recorded in the ring buffer area (max. 2G point/ch) spec fied as the window recording time. When the data is exceeded the areea, overwrite from the top the data area and record all data up to the end of measurement. SSD recording can not be used with memorecording and printer recording at the same time. The data format is normal data.
	Function	Outputs the input signal directly to the printer.
	Paper Width	219.5mm
_	Effective Recording Width	Maximum 215mm
Printer	Recording	by START/STOP button for Time recording, Interval recording, STAR trigger recording: Waveform recording on the chart paper while sav the data to the SSD. Playback and copy is possible after recording.
ecordi	Operation	by PRINT button(Pen-Recording): Direct waveform recording to char paper without saving any data. Chart speed and measuring range ca be changed during recording.
ng(Pe	Number of Recording Channels	Max. 48 channels per sheet, Measuring channels can be divided in 3 sheets.
ř	Data Type	Peak data
Printer Recording (Pen-Recording)	Chart Speed	100mm/s (1kS/s) to 1mm/min (10S/min), User Default Setting enabled. Max. 50mm/s (500Hz) at external synchronization *Recording by external synchronization can be either SSD recording or print recording (Pen Record recording).
	Printing Density	Amplitude axis : 8dots/mm Time axis : 80dots/mm (at 20mm/s), 40dots/mm (at 50mm/s), 20dots/mm (at 100mm/s) 40dots/mm (at external synchronization)

		40dots/mm (at external synchronization)
Мо		ns (on recording and replay)
		Displays during memory recording, SSD recording, and printer recording
	Supported Data Type	Normal data, Peak data
	Number of Sheets (Screen)	Max. 48 channels per sheet (screen), Measuring channels can be divided in 3 sheets (screen).
	Number of Graphs	1 to 18 (The height of each graph on the recording paper can be changed in increments of 2.5mm.)
Ť	Grid Count	Vertical: 20div., Horzontal: 20div. (when 1 graph is displayed on screen)
\$	Time Axis Data Count	100data/div
Y-T Waveform	Display Function	Numeric display, Signal Name, Amplitude Axis Scale, Recording Time, Trigger Mark, Cursor, Thumbnail
Ħ	Display Width	The signal of each channel is displayed at an arbitrary width (Set by % as the full display graph width is 100%)
	Display Position	Display the signal of each channel at any position (Set by % as the full display graph width is 100%)
	Scale Setting	Set the upper limit/lower limit values as input values or physical conversion values for each display width.
	Logic Waveform Display	16ch logic waveform display position movable
	Recording Function	Displays during SSD recording
	Supported Data Type	Normal data
×	Sampling Rate	1KS/s or less
₹	Display format	1 screen (up to 4 concurrent waveforms), 4 screens (1 waveform per graph)
۷a۱	Grid Count	Vertical : 20div., Horizontal : 20div.
X-Y Waveform	Display Function	Draw X-Y waveform with dots or lines in X-axis/Y-axis scale, pen up/down setting available.
3	Scale Setting	Set the max/min scale values as input values or physical conversion values for each graph.
	Locas	ON/OFF of locas enabled (pen up & down)
	Printing	Print the plotted X-Y waveform with the printer
	Recording Function	Display during SSD recording
	Supported Data Type	Normal data
	Sampling Points	1,000, 2,000, 5,000, or 10,000points
	Sampling Speed	1MS/s or less
	Max Analysis Frequency	1/2 times of the sampling frequency
_	Display format	1 screen, 2 screens.
FFT Analysis	Function	Time axis waveform, Linear spectrum, RMS spectrum, Power spectrum, Power spectrum dencity, 1/1 octave analysis, 1/3 octave analysis, Cross power spectrum, Transfer function, Coherence
<u> </u>	Window Function	Hanning, Hamming, Rectangular
Sis	Average Processing	Time axis simple addition average, Frequency axis simple addition average, Frequency axis exponentially weighted average, Frequency axis peak hold or off
	Number of Averaging	1 to 10
	X-axis Scale	Time, Linear Frequency, Log Frequency, 1/1 Octave, 1/3 Octave
	Y-axis Scale	Real value area, Imaginary number area, Amplitude, Logarithmic amplitude, Phase Auto scale or manual scale in accordance with the analysis results
	Peak Value Display	Extract the local maximum value or a maximum value of 10 points from the analysis result.

Remote Control Module Specifications

		RA30-112 Specifications
Input Connector		half-pitch 20-pin connector
		half-pitch 14-pin connector
External Input		Function : Control by external signal.
Input Level Response Speed		START/STOP, MARK, FEED, PRINT, TRIG
		High level: 2.1V to 5.0V, Low level: 0V to 0.5V (active low)
		Select from High-speed/Normal/Low-speed
	Effective Pulse Width	High-speed response: 1µs or higher during high interval, 1µs or higher during low interval Normal response: High interval 1ms or higher, Low interval 1ms or higher Low-speed response: 10ms or higher during low-speed response
	Max. allowable Input Voltage	30V
External	Output	Function : Control signals can be externally output
	Control Signal	START/STOP, MARK, FEED, PRINT, TRIG, EXT1/EXT2
	Output Level	High level: 3.8V to 5.0V, Low level: 0V to 0.5V (active low)
	Output Pulse Width	START/STOP, FEED, PRINT : Active output during operation TRIG, MARK : High-speed response: 1µs/Normal response : 1ms/Low-speed response: 10ms
External (EXT.SM	Sampling Input PL IN)	Synchronization via external clock signal is possible (simultaneous SSD recording and printer recording are not possible.)
	Input Level	High level : 2.1V to 5.0V, Low level : 0V to 0.5V
	Effective Pulse Width	High-speed (SSD Recording) : 2μs or higher/Low-speed (Printer Recording) : 1ms or higher
	Maximum Input Frequency	High-speed (SSD Recording) : 250kHz/Low-speed (printer recording) : 500Hz, 0.1mm/pulse
External (EXT.SM	Sampling Output PL OUT)	Function: Synchronization clock signal can be output externally
	Output Level	High level: 3.8V to 5.0V, Low level: 0V to 0.5V (active low)
	nization Signal for n Input/Output	Function : Synchronization signal generator for using AC strain
	Carrier Wave	0V to 5V, square wave, 5kHz
	Synchronization	Synchronization possible with other RA3000 product including RA30-112
Reference Calibration	ce Clock for on	Function : Square wave signal output for operation check of voltage input module
	Output Level	0V to 5V (±1%)
	Output Frequency	1kHz (±1%)
	Duty Ratio	50% (±5%)
Withstan	d voltage	AC300V, 1 minute (between input/output and main chassis)
Maximum Rated Voltage to Ground		AC, DC42V
Dimensions		Approx. 140 (input-side W) x 223(D) x 20(H) mm
Weight		Approx. 250g
Compliance Standards		Safety : EN61010-1 EMC : EN61326-1, class A

External Drawing RA3100

Other Specifications

Recording Mode

Playback Processing Cursor

Back Scrolling

Mark Print

and Page Annotations Screen Copy

Screen Image Saving

Keylock Function

Monitor Brightness

Language

Save/Readout of Settings

Physical Value Conversion

There are nine selectable measurement modes. Normal recording/Start time/START trigger/Interval time (N times)/Start time + START trigger/Start time + Interval time (N times)/START trigger + Interval time (N times)/Start time + Interval time (N times)/Window recording

The display position can be changed with pinch-in, pinch-out

Time display between cursors, Max/Min value/Average value
FFT: Cursor position frequency and pulse amplitude
Measured data can be monitored while recording by pressing the [PAUSE] button.

Measurement start time, Recording name, Trigger condition (Trigger point, Trigger date, Trigger time)
Sampling speed, Chart speed, Time axis, etc. are printed at the same time as waveform recording
Printing marks (date/time) on the chart paper or the data on

Save screenshots in PNG format (color) on the main unit or on a

Save settings (input and main unit setting conditions) on SSD Measuring conditions saved in the SSD can be read out.

Physical conversion of input signals, Change of full scale on display, Rregistration of units.

Japanese, English, Chinese (simplified, combined), Korean

Any character can be printed before, during, or after the waveform area during printing (Up to 60 characters horizontally and 86 lines vertically)

scaling, zooming, and swiping.
Y-T : Measured value at the cursor position

Print screen image on chart paper

· Lock operation panel keys · Lock the touch panel

Adjustable



Unit: mm







Peak Value Display Extract the local maximum value or a maximum value of 10 points from the analysis result.

Input Module Specifications

IIIDUL IVI	odule Specifications
2ch Voltage Module I	
Input Channels	2ch
Input Connector	Isolated BNC connector
Input Type	Isolated unbalanced input (Isolation between each channel, between each channel and main chassis)
Input Coupling	AC, DC, and GND coupling
Input Impedance	1ΜΩ
Measurement	±100, 200, 500mV, 1, 2, 5, 10, 20, 50, 100, 200, 500V
Range(RANGE)	
Measurement Accuracy	±0.3% of range (23°C±5°C, DC coupling, LPF 3Hz, after zero offset)
Temperature Coefficient	
Frequency Response	DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF, AAF 0FF) AC coupling: 0.3Hz to 100kHz(-3dB to +1dB)(with LPF, AAF 0FF)
Low-pass Filter(LPF)	Characteristics - 2 pole Bessei type
Anti-aliasing	Cutoff frequency: 20, 40, 80, 200, 400, 800, 2k, 4k, 8k, 20k, 40kHz, OFF
Filter(AAF)	Attenuation : -66dB or less at 1.5 times of cutoff frequency
A/D Converter	A/D resolution: 16bit Sampling rate: 1MS/s (max)
Allowable Input Voltage	·
Maximum Rated Voltage To Groud	300V AC/DC CATII(between channels, between input terminals and chassis)
Withstand Voltage	3kV AC, 1 miute (between input terminal and main chassis, between each channel)
Dimensions	Approx. 140 (input-side W) x 223(D) x 20(H) mm
Weight	Approx. 300g
Compliance	Safety: EN61010-1, EN61010-2-30
Standards	EMC: EN61326-1, class A
4ch Voltage Module	RA30-102
Input Channels	4ch
	14.1
Input Connector	isolated BNC connector
	14.1
Input Connector	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each
Input Connector Input Type	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis)
Input Connector Input Type Input Coupling	isolated BNC connector isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling $1 M\Omega$ or higher
Input Connector Input Type Input Coupling Input Impedance Measurement Range	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling $1 M\Omega$ or higher $\pm 1, 2, 5, 10, 20, 50, 100, 200V$
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient	isolated BNC connector isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling $1M\Omega$ or higher $\pm 1, 2, 5, 10, 20, 50, 100, 200V$ $\pm 0.2\%$ of RANGE ($23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, DC coupling, LPF 3Hz, after zero offset) $\pm (400\text{ppm of range})/^{\circ}\text{C}$
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling $1M\Omega$ or higher $\pm 1, 2, 5, 10, 20, 50, 100, 200V$ $\pm 0.2\%$ of RANGE ($23^{\circ}C \pm 5^{\circ}C$, DC coupling, LPF 3Hz, after zero offset) $\pm (400 \text{ppm} \text{ of range})/^{\circ}C$ DC coupling: DC to $100 \text{kHz}(-3 \text{dB to } +1 \text{dB})(\text{with LPF OFF})$
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient	isolated BNC connector isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz 30Hz 30Hz 30Hz 3kHz DEF (4164B±1dB)
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF 0FF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, 0FF (-1.6dB±1dB)
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF 0FF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, 0FF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, OFF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chas-
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd	isolated BNC connector isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling $1M\Omega \text{ or higher}$ $\pm 1, 2, 5, 10, 20, 50, 100, 200V$ $\pm 0.2\% \text{ of RANGE } (23^{\circ}\text{C} \pm 5^{\circ}\text{C}, DC \text{ coupling, LPF 3Hz, after zero offset})$ $\pm (400\text{ppm of range})/^{\circ}\text{C}$ DC coupling : DC to $100\text{kHz}(-3d\text{B to } +1d\text{B})(\text{with LPF OFF})$ Cutoff frequency : 3Hz , 30Hz , 30Hz , 3KHz , 00FF ($-1.6d\text{B}\pm1d\text{B}$) Characteristics : $2\text{ pole Bessel type}$ A/D resolution : 16bit Sampling rate : 1MS/s (max) $\pm 200V$ peak $300V$ AC/DC CATII(between channels, between input terminals and chassis)
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, 0FF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels or between input terminals and chassis)
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling IMO or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF 0FF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, 0FF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, OFF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels or between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm Approx. 320g
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight Compliance	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1M\(QOLD or higher) \$\frac{\pmathbf{1}}{2}\$, \$\frac{\pmathbf{2}}{2}\$, \$\fr
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, OFF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels or between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm Approx. 320g
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight Compliance Standards	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 30Hz, 0FF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3NV AC, 1 miute(between channels or between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm Approx. 320g Safety: EN61010-1, EN61010-2-30 EMC: EN61326-1, class A
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight Compliance Standards	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, OFF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels or between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm Approx. 320g Safety: EN61010-1, EN61010-2-30 EMC: EN61326-1, class A
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight Compliance Standards 2ch High Speed Volta Input Channels	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF 0FF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, 0FF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels or between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm Approx. 320g Safety: EN61010-1, EN61010-2-30 EMC: EN61326-1, class A
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight Compliance Standards 2ch High Speed Volta Input Connector	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MΩ or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF OFF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, OFF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels or between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm Approx. 320g Safety: EN61010-1, EN61010-2-30 EMC: EN61326-1, class A
Input Connector Input Type Input Coupling Input Impedance Measurement Range (RANGE) Measurement Accuracy Temperature Coefficient Frequency Response Low-pass Filter(LPF) A/D Converter Allowable Input Voltage Maximum Rated Voltage to Gourd Withstand Voltage Dimensions Weight Compliance Standards 2ch High Speed Volta Input Channels	isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and the main chassis) DC and GND coupling 1MO or higher ±1, 2, 5, 10, 20, 50, 100, 200V ±0.2% of RANGE (23°C ±5°C, DC coupling, LPF 3Hz, after zero offset) ±(400ppm of range)/°C DC coupling: DC to 100kHz(-3dB to +1dB)(with LPF 0FF) Cutoff frequency: 3Hz, 30Hz, 30Hz, 3kHz, 0FF (-1.6dB±1dB) Characteristics: 2 pole Bessel type A/D resolution: 16bit Sampling rate: 1MS/s (max) ±200V peak 300V AC/DC CATII(between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels or between input terminals and chassis) Approx. 320g Safety: EN61010-1, EN61010-2-30 EMC: EN61326-1, class A

Standards	EMC: EN61326-1, class A	
2ch High Speed Volta	age Module RA30-103	
Input Channels	2ch	
Input Connector	Isolated BNC connector	
Input Type	Isolated unbalanced input (Isolation:between channels, between each channel and chassis)	
Input Coupling	AC, DC, and GND coupling	
Input Impedance	1MΩ or higher	
Measurement Range (RANGE)	±100, 200, 500mV, 1, 2, 5, 10, 20, 50, 100, 200, 500V	
Measurement Accuracy	± 0.5% of RANGE (23°C ±5°C, DC coupling, LPF 5Hz, after zero offset)	
Temperature Coefficient	± (500ppm of range)/°C	
Frequency Characteristics	DC coupling: DC to 5MHz(-3dB to +1dB) (with LPF 0FF) AC coupling: 6Hz to 5MHz(-3dB to +1dB)(with LPF 0FF)	
Low-pass Filter(LPF)	Cutoff frequency: 5Hz, 50kHz, 500kHz, OFF (-3dB±1dB)	
A/D Converter	A/D resolution: 14bit Sampling rate: 20MS/s (max)	
Common Mode Rejection Ratio	80dB or higher (50/60Hz)	
Allowable Input Voltage	500V peak	
Maximum Rated	300V AC/DC CATII(between channels, between input terminals and chas-	
Voltage to Ground	sis)	
Withstand Voltage	3kV AC, 1 minute(between channels, between input terminals and chassis)	
Dimensions	Approx. 140 (input-side W) x 223(D) x 20(H) mm	
Weight	Approx. 300g	
Compliance Standards	Safety: EN61010-1, EN61010-2-30 EMC: EN61326-1, class A	

2ch l	−liah \	/oltage Mo	dule RA30-107			
			2ch			
Input	Conr	nector	Safety banana socket			
Input	Туре		Isolated unbalanced input (Isolation between each channel, between each channel and main chassis)			
Input	Coup	oling	AC, DC, and GND coupling			
Input	Impe	edance	4ΜΩ			
Meas	surem	ent mode	Voltage measurement mode / RMS measurement mode			
Response time (when RMS mea- surement mode)			High speed : 0.1s (within $\pm 10\%$), Medium speed : 0.25s (within $\pm 10\%$), Low speed : 1s (within $\pm 10\%$) = 1.1 All of the above are leading edge (9.1) 9.0 % of RANGE, trailing edge 100% $\rightarrow 10\%$ of RANGE			
	surem e(RAI		± 2, 5, 10, 20, 50, 100, 200, 500, 1,000V			
Mea		ge mea- nent mode:	$\pm 0.3\%$ of range (DC coupling, LPF 3Hz)(23°C ± 5 °C, DC coupling, LPF 3Hz, after zero offset)			
Measurement Accuracy	RMS measurement mode	When DC coupled	$\pm 0.3\%$ of range (DC coupling, LPF 3Hz)(23°C ± 5 °C, DC coupling, LPF 3Hz, after zero offset)			
		When AC coupled (Sine wave input)	For low speed response: ±0.5% of RANGE (10Hz to 1kHz input), ±1.5% of RANGE (1kHz to 10kHz input) for medium speed response: ±0.5% of RANGE (40Hz to 1kHz input), ±1.5% of RANGE (1kHz to 10kHz input) For high speed response: ±0.5% of RANGE (100Hz to 1kHz input), ±1.5% of RANGE (1kHz to 10kHz input) * All of the above are at 23°C ±5°C, after zero cancellation.			
Temperature Coefficient			± (300ppm of range)/°C			
Frequency Response			DC coupling: DC to 100kHz (-3dB to +1dB) (with voltage measurement mode, LPF 0FF) AC coupling: 0.3Hz to 100kHz (-3dB to +1dB) (with voltage measurement mode: LPF 0FF)			
Low-pass Filter(LPF)			Cutoff frequency: 3Hz, 30Hz, 300Hz, 3kHz, 0FF (-1.6dB±1dB) Characteristics: 2 pole Bessel type			

	Converter			bit Sampling ra	ate: 1MS/s (max)		
AllOW	able Input Voltage		V peak / AC/DC CAT	11			
	mum Rated		een channels, AC/DC CATIII		terminals and chassis)		
VOIL	ige to droud				terminals and chassis)		
	stand Voltage				r between input terminals and chassis)		
Weig	ensions oht		k. 140 (Input-s k. 300g	side W) x 223(D)) X 2U(H) mm		
Com	pliance	Safety	: EN61010-1	, EN61010-2-30			
Stan	dards	EMC:	EN61326-1, 0	class A			
16ch	Logic Module	RA30-	105				
	t Channels	16ch					
	Connector		2 ports innut commo	on innut (non-is	olated), isolated between input signal		
Inpu	t Type	and m	ain chassis		olated), lociated Settleon input olgital		
			ange:0 to 24 nold value:1		V (±0.5V)/4V (±0.6V) (selectable from		
Volta	age Detection	3 level	3 levels)				
			mpedance : 1 nold (selectal	ble from below :	3 levels)		
Cont	act Detection	Clos	se (High level)	: 250 Ω or less	/Open (Low level) : 2kΩ or more		
Cont	act Detection	Clos	e (High level)	: 3kΩ or less/0	/Open (Low level) : 5kΩ or more Open (Low level) : 9kΩ or more		
Daar	anaire Dulas			A (typ.) at load	resistance 0 to 18kΩ		
	onsive Pulse able Input Voltage		higher C				
Maxi	mum Rated	42V A					
	age to Ground stand Voltage			tween channels	between input terminals and chassis)		
Pow	er Output for		nnecting our		22 con impactornimaio ana onassis)		
Optio	ons ensions) v 20/H) mm		
Weig			k. 140 (input-s k. 250g	side W) x 223(D)) ^ 40(II) IIIIII		
Com	pliance	Safety	: EN61010-1	, EN61010-2-30			
Stan	dards	EMC:	EN61326-1, 0	ciass A			
2ch	Temperature Mo	dule R	A30-106				
	t Channels	2ch		n			
Inpu	t Connector		able socket (fro rature sensor c		g wire: 0.2 SQ to 1.5 SQ (AWG24 to AWG16)		
Inpu	t Type	Isolate	ed unbalance	l input (isolation	n: between channels, between each		
	t Impedance		el and chassi: r higher	s)			
	otive Sensor	Therm	ocouple : K, I		C (JIS C1602:2015)		
, taup	Cold Junction				RTD): Pt100, Pt1000 (JIS C1604:2013)		
	Compensation	Interna	al/external sw	ritching type			
	Internal Cold Junction Compensation Temp.	±1°C (23°C ±5°C), ±	1.5°C (overall te	emperature range)		
	Disconnection	ONIZO	F switchable				
	Detection	UN/UI					
		T/C Type	Measure- ment Range	Measuring range (°C)	Measurement Accuracy		
		Турс	(RANGE) 200°C	-200 to 200	000 + 000 + (0.10) (DANIOT - 000)		
		K	600°C	-200 to 600	-200 to 0°C± (0.1% of RANGE + 2°C) 0 to 1370°C± (0.1% of RANGE + 1°C)		
			1370℃ 200℃	-200 to 1370 -200 to 200	-200 to 0°C±(0.1% of RANGE + 2°C)		
		E	600°C 1000°C	-200 to 600 -200 to 1000	0 to 1000°C±(0.1% of RANGE + 1°C)		
≠			200°C	-200 to 200	-200 to 0°C±(0.1% of RANGE + 2°C)		
ler'n		J	400°C 1100°C	-200 to 400 -200 to 1100	0 to 1100℃±(0.1% of RANGE + 1℃)		
200		Т	100°C 200°C	-100 to 100 -200 to 200	-200 to 0°C±(0.1% of RANGE + 2°C)		
Thermocouple	Measurement Range/	L.	400°C	-200 to 400	0 to 400°C±(0.1% of RANGE + 1°C)		
е	Accuracy	N	200°C 600°C	-200 to 200 -200 to 600	-200 to 0°C±(0.1% of RANGE + 2°C)		
			1300°C 200°C	-200 to 1300 0 to 200	0 to 1300°C±(0.1% of RANGE + 1°C)		
		R	1000°C	0 to 1000	0 to 400°C±(0.1% of RANGE + 3.5°C) 400 to 1760°C±(0.1% of RANGE + 3°C)		
			1760°C 200°C	0 to 1760 0 to 200	, ,		
		S	1000℃ 1700℃	0 to 1000 0 to 1700	0 to 400°C±(0.1% of RANGE + 3.5°C) 400 to 1760°C±(0.1% of RANGE + 3°C)		
		_	600°C	400 to 600	400 to 100000 (0.10)		
		В	1000°C 1800°C	400 to 1000 400 to 1800	400 to 1800°C±(0.1% of RANGE + 3°C)		
		С	600°C 1200°C	0 to 600	0 to 400°C±(0.1% of RANGE + 3.5°C)		
		C	2300°C	0 to 1200 0 to 2300	400 to 2300°C±(0.1% of RANGE + 3°C)		
	Temperature Coefficient	(Meas	urement Acci	uracy × 0.1)/°C			
_	Measurement	3-wire	tvne				
Resi	Type Measurement						
sta	Coefficient Measurement Type Measurement Current Measurement Range	0.5mA		able (at Pt100),	fixed at 0.1mA (at Pt1000)		
nce			Measure- ment	Measuring			
Hen Ten		Type	Range	range (°C)	Measurement Accuracy		
T ber	Measurement		(RANGE) 200°C	-200 to 200			
atu	Range	Pt100	400°C	-200 to 400	-200 to 850℃		
re D			850°C 200°C	-200 to 850 -200 to 200	± (0.1% of RANGE ±0.5°C)		
ete		Pt100	Pt1000 400°C -200 to 400				
ctor	Temperature	850°C -200 to 850					
,	Coefficient	(Measurement Accuracy × 0.1)/°C A/D resolution : 16bit					
A/D Converter		A/D resolution: 16bit Data update rates: high speed (1.5ms), normal speed (100ms), low speed (1s)					
Common Mode		100dB (Data update: normal speed, low speed), 80dB (Data update: High speed)					
	ction Ratio able Input Voltage	at 50/60Hz, Signal source resistance 1kΩ 30V peak					
Maxi	imum Rated						
	age To Earth	300V AC/DC (between channels, between input terminals and chassis)					
Withstand Voltage Dimensions		3kV AC, 1 miute(between channels, between input terminals and chassis) Approx. 140 (input-side W) x 223(D) x 20(H) mm					
Weight		Approx. 300g					
Compliance Standards		Safety: EN61010-1, EN61010-2-30					
Stan		EMC: EN61326-1, class A Temperature sensor connection connector(RA30-555) 2pcs/sets					
	essories	Temperature sensor connection connector(RA30-555) 2pcs/sets					

easurement Signal	2ch Isolated BNC connector Isolated unbalanced input (Isolation between each channel, between each channel and main chassis AC, DC, and GND coupling 1ΜΩ	Maximum Rated Voltage To Groud Withstand Voltage Dimensions Weight	300V AC/DC CATII (between channels, between input terminals and chassis) 3kV AC, 1 miute(between channels, between input terminals and chass Approx. 140 (input-side W) x 223(D) x 20(H) mm Approx. 300g
put Type put Coupling put Impedance easurement Range ANGE) easurement Probability easurement Signal	Isolated unbalanced input (Isolation between each channel, between each channel and main chassis AC, DC, and GND coupling $1 M\Omega$	Withstand Voltage Dimensions Weight	3kV AC, 1 miute(between channels, between input terminals and chass Approx. 140 (input-side W) x 223(D) x 20(H) mm
put Coupling put Impedance easurement Range (ANGE) easurement Probability easurement Signal	channel and main chassis AC, DC, and GND coupling 1MQ	Dimensions Weight	Approx. 140 (input-side W) x 223(D) x 20(H) mm
put Impedance easurement Range (ANGE) easurement Probability easurement Signal	1ΜΩ		Approx 200g
easurement Range ANGE) easurement Probability easurement Signal			
ANGE) easurement Probability easurement Signal		Compliance Standards	Safety: EN61010-1, EN61010-2-30 EMC: EN61326-1, class A
easurement Signal	Range for the input signal: 1, 2, 5, 10, 20, 50, 100, 200, 500V	Stallualus	LING : LING 1320 1, Class A
	±3% of RANGE (23°C±5°C, DC coupling, LPF 300Hz)	2ch AC Strain Modul	e RA30-104
	4 signals Signal 1:1ch measurement mode, Signal 3:1ch input signal	Input Channels	2ch
	Signal 2 : 2ch measurement mode, Signal 4 : 2ch input signal	Input Connector Bridge Voltage (BV)	NDIS4109 Connector (conversion cable sold separately) 0.5V AC, 2V AC, 5kHz Sine Wave
sponse Speed	OFF, 1 to 1,000ms (1ms steps)	Applicable Strain	120Ω to 350Ω
प्रशिक्ष Range Hysteresis	Variable from -200V to +200V 1 to 10% of RANGE (1% steps)	Gauge Resistance	
riyotereolo	Period, frequency, rotation speed, pulse width, duty ratio, power supply	Gauge Rate Equilibrium adjust-	2
	frequency, frequency deviation, pulse count, pulse integration	ment range and	Within 10,000 x 10 ⁻⁶ strain, within 2,000pF capacitance
	Available measurement range: 5us to 100s Measurement range (RANGE): 1, 2, 5, 10, 20, 50, 100, 200, 500ms, 1, 2, 5,	adjustment method Equilibrium adjust-	
Davis d Made	10, 20, 50, 100s	ment accuracy	±0.3% of RANGE
Period Mode	Measurement probability: ±0.5%rdg (1ms RANGE), ±0.3%rdg (2ms RANGE), ±0.1%rdg (5ms RANGE), ±0.05%rdg (10ms to 100s RANGE)	Temperature coeffi-	±(400ppm of RANGE)/°C
	Pulse averaging process : 2 to 4,096	cient Measurement range	500, 1,000, 2,000, 5,000, 10,000, 20,000 x 10 ⁻⁶ strain (at 2Vrms bridge pow
	Smoothing process: 0FF, 2 to 100 Available measurement range: 0 to 200kHz	(RANGE)	2,000, 4,000, 8,000, 20,000, 40,000, 80,000 x 10 ⁻⁶ strain (at 0.5Vrms bridge po
	Measurement range (RANGE): 2, 5, 10, 20, 50, 100, 200, 500Hz, 1, 2, 5, 10,	Non-linearity	±0.1% of RANGE
Frequency	20, 50, 100, 200kHz Measurement probability: ±0.5%rdg (200kHz RANGE), ±0.3%rdg (100kHz	Frequency Characteristics	DC to 2kHz ±10%
mode	RANGE), ±0.1%rdg (50kHz RANGE), ±0.05%rdg (2Hz to 20kHz RANGE)	Simple Bridge Check	It can detect short-circuits on bridge sides and disconnections of sor
	Pulse averaging process : 2 to 4,096 Smoothing process : 0FF, 2 to 100	Low-Pass Filter	cables and bridge sides. Cutoff frequency: 10Hz, 30Hz, 100Hz, 300Hz, 0FF (-3dB±1dB)
	Available measurement range: 0 to 1,000krpm	(LPF)	Characteristics: Secondary Butterworths
	Measurement range (RANGE): 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1,000krpm	Internal Calibrator	±1 to 9,999 x 10 ⁻⁶ strain
Rotation speed mode	Measurement probability: ±0.05%rdg	A/D Converter	Accuracy within ±0.5% of RANGE (at 23°C±5°C) A/D resolution: 16bit Sampling rate: 100kS/s (max)
mode	Pulse averaging process : 2 to 4,096 Pulse/Rev : 1 to 100	Maximum Rated	100V (DC+ACpeak)
	Smoothing process: OFF, 2 to 100	Voltage to Ground	, , ,
	Available measurement range: 2.5µs to 100s (min. pulse width: 2.5µs)	Withstand voltage Dimensions	300V AC, 1 minute (between channels, between input terminals and chast Approx. 140 (input-side W) x 223(D) x 20(H) mm
	Measurement range (RANGE): 1, 2, 5, 10, 20, 50, 100, 200, 500ms, 1, 2, 5, 10, 20, 50, 100s	Weight	Approx. 300g
Pulse width	Measurement probability: ±0.25%rdg (1ms RANGE), ±0.15%rdg (2ms	Compliance	Safety: EN61010-1, EN61010-2-30
mode	RANGE), ±0.05%rdg (5ms to 100s RANGE) Pulse polarity: Positive, Negative	Standards	EMC: EN61326-1, class A
	Pulse averaging process: 2 to 4,096	2ch Acceleration Mo	dule RA30-109
	Smoothing process: OFF, 2 to 100 Measurable frequency range:	Input Channels	2ch
	1Hz to 20Hz: 100% (20Hz) RANGE (min. pulse width 500μs)	Input Connector	Metal BNC connector
	10Hz to 200Hz: 100% (200Hz) RANGE (min. pulse width 50µs) 100Hz to 2kHz: 100% (2kHz) RANGE (min. pulse width 5µs)	Input Type	Isolated unbalanced input (Isolation between each channel, between channel and main chassis)
	1kHz to 20kHz: 100% (20kHz) RANGE (min. pulse width 2.5µs)		4.2mA±5%, 22.5V±5%
	Measurement range (RANGE): 100% (20Hz), 100% (200Hz), 100% (2kHz), 100% (20kHz)	Sensor sensitivity setting range	0.100 to 100.000mV/(m/s ²)
	Measurement probability:		Acceleration, speed, displacement
Duty ratio	±0.05% (1Hz) to ±1% (20Hz) of 100% (20Hz) RANGE *±1% x input frequency / 20Hz		Measurement range varies depending on sensor sensitivity.
mode	±0.05% (10Hz) to ±1% (200Hz) of 100% (200Hz) RANGE		Acceleration: 1, 2, 3.16, 5, 10, 20, 31.6, 50, 100, 200, 316, 500m/s ² , 1, 3.16, 5, 10, 20, 31.6, 50km/s ²
	*±1% x input frequency / 200Hz ±0.05% (100Hz) to ±1% (2kHz) of 100% (2kHz) RANGE	Measurement range (RANGE)	Speed: 10, 20, 31.6, 50, 100, 200, 316, 500mm/s, 1, 2, 3.16, 5, 10, 20, 3
	* ±1% x input frequency / 2 kHz	,	50, 100, 200, 316, 500m/s Displacement: 100, 200, 316, 500µm, 1, 2, 3.16, 5, 10, 20, 31.6, 50, 100
	±0.25% (1kHz) to ±5% (20kHz) of 100% (20kHz) RANGE * ±5% x input frequency / 20kHz		200, 316, 500mm, 1, 2, 3.16, 5m
	Measurable duty ratio range: 0 to 100%	Measurement	±1% of rdg (In acceleration mode) ±2% of rdg (In speed mode)
	Pulse polarity: Positive, Negative Pulse averaging process: 2 to 4,096	Probability	±3% of rdg (In displacement mode)
	Smoothing process: OFF, 2 to 100	Temperature coefficient	*23°C±5°C, sine wave 80Hz, when LPF and AAF are OFF) ±(300ppm of RANGE) / °C (at acceleration)
Power	Measurement range (RANGE): 50Hz (30 to 70Hz), 60Hz (40 to 80Hz), 400Hz (360 to 440Hz)	remperature occinional	Acceleration: 5Hz to 20kHz (±0.5dB), 1.5Hz to 50kHz (±1dB), 1Hz to 70kHz (-3dB, +
Power frequency	Measurement probability: ±0.002%rdg (50Hz RANGE), ±0.003%rdg (60Hz	Frequency Characteristics	Speed: 15.9Hz (0dB±1dB) to 1.59kHz (-40dB±1dB), logarithmic decrement: -6d Displacement: 15.9Hz (0dB±1dB) to 159Hz (-40dB±1dB),
mode	RANGE), ±0.005%rdg (400Hz RANGE) Pulse averaging process: 2 to 4,096	Cildiacteristics	logarithmic decrement: -12dB/oct
	Smoothing process: OFF, 2 to 100	Low-Pass Filter	Cutoff frequency: 20Hz, 200Hz, 2kHz, 20kHz, OFF (-3dB±1dB)
	Available measurement range: 3.3Hz to 19,800Hz Measurement range (RANGE): ±50% (center frequency range 6.6Hz to 13.2kHz)	(LPF) Anti-aliasing Filter	Characteristics: Tertiary Butterworths Cutoff frequency: 20, 40, 80, 200, 400, 800, 2k, 4k, 8k, 20k, 40kHz, 0f
Range of	Measurement probability: ±0.05%rdg	(AAF)	Attenuation: At 1.5 times the cutoff frequency, -66dB max.
variation mode	Center frequency: 3.3Hz to 19,800Hz Pulse averaging process: 2 to 4,096	A/D conversion	Resolution: 16bit Sampling rate: 1MS/s (max)
	Smoothing process: OFF, 2 to 100	Response Speed Mea-	High speed: 0.3s ±10% / medium speed: 0.6s ±10% / low speed: 2.4s ±
	Measurement range (RANGE): Fixed at 40,000 Measurement probability: ±0.003%rdg	A Speed Mea- surement Probability Envelope	At low speed: ±1% of RANGE (10Hz to 1kHz), ±1.5% of RANGE (1kHz to 5k
Pulse count mode	Available measurement range: 16.6666mHz to 200kHz (min. pulse width 2.5µs)	surement Probability	At medium speed: ±1% of RANGE (30Hz to 1kHz), ±1.5% of RANGE (1kHz to 5k At high speed: ±1% of RANGE (50Hz to 1kHz), ±1.5% of RANGE (1kHz to 5k
mode	Gate time: 200, 500ms, 1, 2, 5, 10, 20, 30, 60s Pulse polarity: Positive, Negative		Processing details: Bandpass filter (1kHz to 20kHz) → Absolute val
	Measurement range (RANGE): 50, 100, 200, 500k, 1, 2, 5, 10, 20, 50, 100,	processing	detection → Low-pass filter (1kHz)
Pulse	200, 500M, 1, 2G Measurement probability: ±0.002%rdg	TEDS	IEEE 1451.4 Class1 compliant (Template ID : 25, automatic setting c sensor sensitivity)
integration	Available measurement range: 5mHz to 200kHz (min. pulse width 2.5µs)	Maximum Rated	42V (DC+AC peak) (between channels, between input terminals and chassis
mode	Pulse polarity: Positive, Negative	Voltage To Groud Dimensions	Approx. 140 (input-side W) x 223(D) x 20(H) mm
Decelera-	Integration auto-reset: OFF, Start, Over, Start & Over	Weight	Approx. 300g
tion Stop	If the pulse input is interrupted the develoption	Compliance	Safety: EN61010-1, EN61010-2-30
Processing Function	If the pulse input is interrupted, the deceleration state is calculated in real time and the measured value is set to 0 or OVER RANGE in steps.	Standards	EMC: EN61326-1, class A
(Excluding pulse count mode and pulse		Charge Converter A	AP11-901, AP11-902, AP11-903
integration mode) Pulse/Rev	Specify the number of pulses per revolution. (Rotation speed mode function)	Gain	1.0mV/pC ±5% (AP11-901, AP11-902), 0.1mV/pC ±5% (AP11-903)
i dise/Nev	Specify the pulse determination method. (Pulse width mode, Pulse count	Max Input Charge Max Input Charge	5,000pC (AP11-901, AP11-902), 50,000pC (AP11-903) Approx 1.6Hz to 50Hz
Pulse polarity	mode and pulse integration mode only)	Max Output Voltage	
i uise poidfit	Positive: Detects and determines a measured pulse from its leading edge to trailing edge. Negative: Detects and determines a measured pulse from its trailing edge to leading edge.	Drive Voltage	12V to 25V DC
i uise poiafit	Auto-resets measurement data in pulse integration mode. Sets the count	Drive Current	0.5 to 5mA
Integration	to zero at the start of recording (Start) and at the upper range limit (Over).	Rated Noise	20μVrms or less (AP11-902), 100μVrms or less (AP11-901, AP11-903
Integration auto-reset		Phase	100
Integration auto-reset Pulse averag- ing process	Takes the average of the set number of measurement data as the data to		-20 to 80°C(AP11-901), -20 to 110°C(AP11-902, AP11-903)
Integration auto-reset Pulse averag- ing process function (Excluding pulse	Takes the average of the set number of measurement data as the data to be output. Effective for taking out irregularities in the input signal.	Operating Temperature	-20 to 80°C(AP11-901), -20 to 110°C(AP11-902, AP11-903) Input: Miniature connector (10-32UNF)
Integration auto-reset Pulse averag- ing process	Takes the average of the set number of measurement data as the data to be output. Effective for taking out irregularities in the input signal.		Input: Miniature connector (10-32UNF) Output: Male BNC terminal (AP11-901)
Integration auto-reset Pulse averag- ing process function (Excluding pulse count mode and puls integration mode)	Takes the average of the set number of measurement data as the data to be output. Effective for taking out irregularities in the input signal. However, data is not output until the set number of pulses is measured. The data detected in each measurement mode will change to a cascading	Operating Temperature	Input : Miniature connector (10-32UNF)
Integration auto-reset Pulse averag- ing process function (Excluding pulse count mode and ouls	Takes the average of the set number of measurement data as the data to be output. Effective for taking out irregularities in the input signal. However, data is not output until the set number of pulses is measured.	Operating Temperature Connector	Input : Miniature connector (10-32UNF) Output : Male BNC terminal (AP11-901) Female BNC connector (AP11-902, AP11-903)
Integration auto-reset Pulse averag- ing process function (Excluding pulse count mode and pulsi integration mode)	Takes the average of the set number of measurement data as the data to be output. Effective for taking out irregularities in the input signal. However, data is not output until the set number of pulses is measured. The data detected in each measurement mode will change to a cascading waveform according to the response speed value.	Operating Temperature Connector Dimensions	Input : Miniature connector (10-32UNF) Output : Male BNC terminal (AP11-901) Female BNC connector (AP11-902, AP11-903) Ф12 x 38mm (AP11-901), 21Hex x 34mm (AP11-902, AP11-903)

Low-pass Filter(LPF) Cutoff frequency: 300Hz, 3kHz, 30kHz, 0FF (-1.6dB±1dB Characteristics: 2 pole Bessel type

A/D Converter A/D resolution: 12bit Sampling rate: 1MS/s (max) 18

Main Unit & Accessories

Main Unit				
Item	Model	Specifications		
Omniace	RA3100	Standard accessories: AC power cable × 1, recording paper × 1, paper holder × 1 pair, input module slot cover plate × 1 set, quick operation guide × 1, Instruction manual CD-ROM × 1		

Input Module		
Item	Model	Specifications
2ch Voltage Module*1	RA30-101	Sampiling 1MS/s, Input ±100mV to ±500V, A/D resolution 16bit, Anti-aliasing filter
4ch Voltage Module*1	RA30-102	Sampiling 1MS/s, Input ±1V to ±200V, A/D resolution 16bit
2ch High Speed Voltage Module*1	RA30-103	Sampiling 20MS/s, Input ±100mV to ±500V, A/D resolution 14bit
2ch AC Strain Module*3	RA30-104	2ch, Max. strain input 500 x 10 ⁻⁶ strain, AC bridge method, Frequency response DC to 2kHz
16ch Logic Module*5	RA30-105	Input 16ch (voltage or contact)
2ch Temperature Module*4	RA30-106	Data update rate 1.5ms, Thermocouple/RTD, 2 temperature sensor connectors (RA30-555) included
2ch High Voltage Module*2	RA30-107	2ch, max. input ±1,000V, sample rate 1MS/s, RMS conversion
2ch Frequency Module*1	RA30-108	2ch, Pulse input, Input ±500V
2ch Acceleration Module*6	RA30-109	2ch, acceleration transducer (charge output type, voltage output type) input, acceleration, speed, displacement, TEDS compatible

- *1 Use Isolated BNC cable (Alligator clip) RA30-507
 *2 Use Alligator clip for High Voltage (RA30-509-01), Connection cable for High Voltage (RA30-509-02).
- *2 Use A High Tot Figh To High Tot High Tot

Control Module				
Item	Model	Specifications		
Remote Control Module*7 RA30-112 Remote control, TRIG IN and OUT, and synchronization signal output when AC strain module is used				
*7 Use a remote control module cable (RA30-505, RA30-506) to connect the remote control module to other devices.				

Signal Input Related Options		
Item	Model	Specifications
Isolated BNC Cable (Alligator clip)	RA30-507	1.5m length with an insulated BNC - safety alligator clip (+red,-black), connected to RA30-101, -102, -103, -108
Alligator clip for High Voltage	RA30-509-01	High voltage alligator clips, CAT III 1,000V, 1 red and 1 black per channel
Connection cable for High Voltage	RA30-509-02	High voltage connection cable 2m, CAT III 1,000V, S-banana plug to S-banana plug, 1 red and 1 black per channel
Extension cable for High Voltage	RA30-509-03	High voltage extension cable 2m, CAT III 1,000V, S-banana jack to S-banana plug, 1 red and 1 black per channel
Signal cable	RA30-508	2m length, Metal BNC to Metal BNC, connect to RA30-109 and AP11-902/903 charge converter
NDIS Conversion cable	AS30-504	Conversion cable to connect NDIS connector (NDIS4102) of bridge box and strain gage type transducers. For 1ch, length 60cm
8ch Logic Cable (IC clip)	RA30-501	1.5m length for logic input, IC terminal clip (8ch), connected to RA30-105
8ch Logic Cable (Alligator clip)	RA30-502	1.5m length for logic input, electrical terminal clip (8ch), connected to RA30-105
8ch Logic Cable (round type connector converter)	RA30-503	30cm length conversion cable for connection to the RA30-105 from the 1539S
Cable for Terminal Block	RA30-504	2m length, connecedt to the RA30-105 or RA30-112, attach the MDR20 terminal block AX-PCX-10S20
Remote Control Cable (to connect between main units)	RA30-505	2m length, connect the RA30-112 to connect with another RA3100 unit each other
Remote Control Cable (without another connector)	RA30-506	2m length, connect to the RA30-112 to control the RA3100 main unit
Temperature Sensor Connection Connector	RA30-555	Connector attached to the terminal of temperature sensor connected to the RA30-106, 2 pcs/sets
MDR20 Terminal Block for AD4430C	AX-PCX-10S20	Used as terminal block for IN/OUT of RA30-105, RA30-112 signals
BNC Adaptor*8	0243-3021	Isolated BNC connector and Safety terminal plug, When using Clamp Adaptor (8112), AC/DC Clamp Sensor (8115)

*8 When 2ch AC Strain Module (RA30-102) is installed in an adjacent slot, BNC Adaptor (0243-3021) cannot be installed for all channels.

Options Related to Current and Voltage Measurement			
Model	Specifications		
1539S	4 inputs, AC/DC voltage detector that detects presence of selected low or high voltages and outputs Hi/Lo logic signal		
1540S	Detects 100/120V AC voltage sags & surges exceeding selected 10% or 20% of AC peak value and outputs as pulse		
1543S	Detects 220/240V AC voltage sags & surges exceeding selected 10% or 20% of AC peak value and outputs as pulse		
2009R*9	For high current (2000A/400A, DC/40 to 1kHz), Φ55, 0311-5184 signal input cable required		
8112*10	For low current (20A/2A/0.2A, 40 to 10kHz), Φ8, 0243-3021 BNC adaptor required		
8115* ¹⁰	For low current (AC130A/DC180A, DC/40 to 1kHz), Φ12, 0243-3021 BNC adaptor required		
0311-5184*11	Length: 2m, miniature plug for microphone and insulated BNC connector		
	Model 1539S 1540S 1543S 2009R*9 8112*10 8115*10		

- *9 Use signal input cable (0311-5184) if connecting output from 2009R to RA3100.
 *10 Use BNC adaptor (0243-3021) if connecting output from 8112 or 8115 to RA3100.
 *11 Signal input cable to connect 2009R clamp meter to RA3100 insulated BNC connector.

Recording Paper				
Item		Model	Specifications	
	Roll Paper	YPS106	219.5mm × 30m roll paper (5 rolls/box), Drawing No. 0511-3167	
Recording Paper*12	Roll Paper (with perforation)	YPS108	219.5mm × 30m roll paper (5 rolls/box), perforation 300mm pitch, numbering 99 to 01, Drawing No. 0511-3166	
гареі	Z-fold Paper	YPS112	219.5mm × 201m Z-fold paper (1 set/box), folding width 300mm pitch, total of 670 sheets, Drawing No. 0511-3182	

*12 Quality not assured if paper other than above is used.

Peripheral Options				
Item	Model	Specifications		
SD memory card 4G	RM11-453	4GB, industrial use (for saving setting conditions & mesured data)		
SD memory card 8G	RM11-454	8GB, industrial use (for saving setting conditions & mesured data)		
Z-fold Paper Storage Box	RA30-551	Including Z-fold paper adaptor RA12-301		
Z-fold Paper Adaptor	RA12-301			
Recording paper holder	5633-1794	2 pcs/sets		
Soft Carrying Case	RA23-183			
Hard Carrying Case with Casters	RA30-552			



Discover Precision

A&D Company, Ltd.

3-23-14 Higashi-Ikebukuro, Toshima-Ku, Tokyo, 170-0013, Japan Tel: +81 3-5391-6132 Fax: +81 3-5391-1566 http://www.aandd.jp



ADM Messtechnik GmbH & Co. KG · Zum Wartturm 9 · 63571 GeInhausen Tel. (06051) 916557-1 sales@adm-messtechnik.de www.adm-messtechnik.de

GERÄTE UND SYSTEME FÜR FORSCHUNG • ENTWICKLUNG • VERSUCH • SERVICE