Product specification

Basic Specifications

Recording Function	Memory Recording	High speed event recording to memory	*Any combination of memory recording, SSD recording, and printer recording is possible.
	SSD Recording	Recording of the input signal to the internal SSD	
	Printer Recording	Thermal printing using a thermal head	
Channel	Module Slot	9 slots	
	Analog Measurement	Max 36 channels (when 9 pcs 4-channel voltage modules are installed)	
	Logic Measurement	Max 144 channels (when 9 pcs 16-channel logic modules are installed)	
Sampling Speed	Memory Recording	20MS/s (50ns) to 10S/min	
	SSD Recording	1MS/s (1µs) to 10S/min	
	Printer Recording	1kS/s (100mm/s) to 10S/min (1mm/min)	
Memory Capacity		4GB (2G_points/ch)	
Storage Device		Solid State Drive_ (SSD) 256GB	
		SD card (supporting SD / SDHC / SDXC) for data storage after recording.	
		USB memory using a USB port, for data storage after recording.	
Printer	Printing Method	Thermal printing using a thermal head	
	Paper Width	219.5mm	
	Effective Recording Width	200mm	
	Chart Speed	100mm/s to 1mm/min	
Trigger	Uses	Trigger for starting record operations (Start Trigger), trigger for memory recording (Memory Trigger).	
	Start Trigger	Trigger to start recording operation (selected by manual trigger, external trigger, or measuring channel (arbitrary 1ch))	
	Memory Trigger	Trigger to start memory recording (selected by manual trigger, external trigger, or measuring channel (arbitrary 18ch))	
	Trigger Source	Input signal (analog/logic), manual trigger, external trigger	
	Trigger Detection Method for Measuring Channel	Level trigger, window trigger (memory recording trigger), bit pattern trigger	
	Trigger Mode	Set AND/OR for the measuring channel.	
	Pre-trigger	0 to 100% (1% step)	
	Trigger Mark	The trigger point is indicated with a "T" mark, and the trigger date and hour/minute/second are printed.	
	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: 10 µs or higher at high level, 10µs or higher at low level / at Low response: 10ms or higher at high level, 10ms or higher at low level)	
	Trigger Output	Output signal when trigger conditions are met (Active Low, H: 3.8V or higher, L: 0.5V or less, Pulse width: 1µs at high speed response, 10µs at normal response, 10ms at low-speed response)	
Monitor	Y-T Waveform Monitor	Display amplitude waveform of measuirng signal during time changes.	
	X-Y Waveform Monitor	Input signal 1 is protted in the X axis and input signal 2 is protted in the Y axis to display correlation of those signals.	
	FFT Analysis Monitor	FFT analysis of the measuring signals of any two channels is performed, and the analysis results are displayed in the frequency axis.	
Display		12.1-inch XGA TFT color LCD (1024 x 768 pixels) with capacitive touch panel	
Operation Section	Operation Panel Key	POWER — Power ON/OFF START — Start of measurement STOP — End of measurement TRIG — Manual trigger PRINT — Start of Printer Recording/Screen Copy	
	Rotary Knob	Change of the measuring range, waveform position, etc.	
Interface	LAN	1000BASE-T (1Gbps) — For control with communication command	
	COM	RS-232C — For control by communication command	
	USB	Ver. 3.0 2 port — For storage devices (USB memory)	
	Video Output	DVI-D — Digital output for external display	
Compliance Standards	Safety	IEC 61010-1, IEC 61010-2-30 Overvoltage category (installation category) II Measurement category : Depends on the specifications of each input module.	
	EMC	EN61326-1 ClassA	
Operating Enviroment	Temperature	0 to 40°C	
	Humidity	35 to 85 %RH (without condensation)	
Storage Environment	Temperature	-20 to 60°C	
	Humidity	20 to 85%RH (without condensation)	
Vibration Resistance	Random Vibration Durability Test	Frequency: 5 to 500Hz, Acclelleration: 6.5m/S^2 on X-axis and Y-axis, 10.2m/S^2 on Z-axis	
	Sine Wave Vibration Durability Test	Frequency: 10 to 55 Hz, Acclelleration: 20.0m/S^2, 20 cycles for each of the three axes	
Backup Battery Life (for Clock Backup)		Approx. 10 years (at the surrounding temperature is 25°C)	
Power Consumption		Power-supply voltage: 100 to 240VAC, frequency 50/60Hz Power Consumption: 300VA or less (under the maximum load conditions), 80VA when recording is stopped, 5VA during standby	
Dimensions		394(W) × 334(H) × 199(D) mm *excluding projections	
Weight		9.5kg or less (main body only),	

Recording Function Specifications

Memory Recording	Function	After data is recorded to the internal memory at the set sampling rate, the data is automatically saved to the SSD.

	Channel	Analog measurement —
		  Max. 36 channels (with 9 pcs 4-channel voltage modules are used)
		Logic measurement —
		  Max. 144 channels (with 9 pcs 16-channel logic modulea are used)

	Memory Capacity	4GB (2G points/ch)
	Data Type	Normal data
	Memory Division	1 to 200 Div. (The maximum value changes depending on the channel used and recording length)
	Number of data	2000 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 (1.67µs), Max. 18ch for 20MS/s when simultaneous measurement
	Maximum Recording time	100 days
	Recording Operation	by START/STOP button for Time recording, Interval recording, and START trigger recording
SSD Recording	Function	The measurement data of the input signal is directly recorded to the internal SSD.

	Channel	Analog measurement —
		  Max. 36 channels (with 9 pcs 4-channel voltage modules are used)
		Logic measurement —
		  Max. 144 channels (with 9 pcs 16-channel logic modulea are used)

	Data Logging Capacity	Internal SSD (256GB)
	Data type	Normal data and peak data selectable
	Sampling Speed	1MS/s (1µs) to 10S/min (1.67µs), Max. 500kS/s in case of peak data
	External Synchronization Sampling	Synchronous clock: 250 kHz or less
	Maximum Recording time	100 days
	Recording Operation	by START/STOP button for Time recording, Interval recording, START trigger recording, window recording
	Window Recording	The data is recorded in the ring buffer area (max. 2G point/ch) specified as the window recording time. When the data is exceeded the data 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 memory recording and printer recording at the same time. The data format is normal data.
Printer Recording	Function	Outputs the input signal directly to the printer (waveform output).
	Paper Width	219.5mm
	Effective Recording Width	200mm
	Recording Operation	by PRINT button: Direct waveform recording to chart paper without saving any data. Chart speed and measuring range can be changed during recording. by START/STOP button for Time recording, Interval recording, START trigger recording:Waveform recording on the chart paper while saving the data to the SSD. Playback and copy is possible after recording.
	Number of Recording Channels	Max. 48 channels per sheet, Measuring channels can be divided in 3 sheets.
	Data Type	Peak data
	Chart Speed	100 mm/s (1 kS/s) to 1 mm/min (10 S/min), User Default Setting enabled. Max. 50mm/s (500Hz) at external synchronization
	Printing Density	Amplitude axis: 8 dots/mm Time axis: 80 dots/mm (at 25mm/s), 40 dots/mm (50mm/s and higher), 20 dots/mm (100mm/s and higher), 40 dots/mm (at external synchronization)

Monitor Specifications (on recording and replay)

Y-T Waveform	Recording Function	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).
	Displayed Graphs	1 graph
	Grid Count	Vertical: 20 div., Horizontal: 20 div.
	Time Axis Data Count	100 data/div
	Display Function	Numeric display, Signal Name, Amplitude Axis Scale, Recording Time, Trigger Mark, Cursor, Thumbnail
	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
X-Y Waveform	Recording Function	Displays during SSD recording
	Supported Data Type	Normal data
	Sampling Rate	1KS/s or less
	Displayed Graphs	1 graph (up to 4 concurrent waveforms), 4 graphs (1 waveform per graph)
	Grid Count	Vertical: 20 div., Horizontal: 20 div.
	Display Function	Draw X-Y waveform with dots or lines in X-axis/Y-axis scale, pen up/down setting available.
	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
FFT Analysis	Recording Function	Display during SSD recording
	Supported Data Type	Normal data
	Sampling Points	1,000, 2,000, 5,000, or 10,000 points
	Sampling Speed	1MS/s or less
	Max Analysis Frequency	1/2 times of the sampling frequency
	Displayed Graphs	1 graph, 2 graphs. The Y-T waveform can also be displayed
	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
	Window Function	Hanning, Hamming, Rectangular
	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
	Peak Value Display	Extract the local maximum value or a maximum value of 10 points from the analysis result.

Other Specifications

Recording Mode		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
Playback Processing	Scaling	The display position can be changed with pinch-in, pinch-out scaling, zooming, and swiping.
	Cursor	Y-T: Measured value at the cursor position Time display between cursors, Max/Min value/Average value FFT: Cursor position frequency and pulse amplitude
	Back Scrolling	Measured data can be monitored while recording by pressing the [PAUSE] button.
Printer Section	System Annotations	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
	Mark Print	Printing marks (date/time) on the chart paper or the data on SSD
	Header, Footer, and Page Annotations	Any character can be printed before, during, or after the waveform area during printing (Up to 60 characters horizontally and 86 lines vertically)
	Screen Copy	Print screen image on chart paper
Screen Image Saving		Save screenshots in PNG format (color) on the main unit or on a storage medium
Save/Readout of Settings		Save settings (input and main unit setting conditions) on SSD Measuring conditions saved in the SSD can be read out.
Keylock Function		• Lock operation panel keys • Lock the touch panel
Backlight Auto OFF		Select from OFF/1 minute/5 minutes/10 minutes/30 minutes/60 minutes.
Monitor Brightness		Adjustable
Physical Value Conversion		Physical conversion of input signals, Change of full scale on display, Registration of units.

Remote Control Module RA30-112 Specifications

Input Connector		Half-pitch 20-pin connector
Output Connector		Half-pitch 14-pin connector
External Input		Function: Control by external signal.
	Control Signal	START/STOP, MARK, FEED, PRINT, TRIG
	Input Level	High level: 2.1V to 5.0V, Low level: 0V to 0.5V (active low)
	Response Speed	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 high, 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
	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: 1 µs/Normal response: 1 ms/ Low-speed response: 10 ms
External Sampling Input (EXT.SMPL 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): 250 kHz/Low-speed (printer recording): 500Hz
External Sampling Output (EXT.SMPL OUT)		Synchronization clock signal can be output externally
	Output Level	High level: 3.8V to 5.0V, Low level: 0V to 0.5V (active low)
Reference Clock for Calibration		Function: Clock output for operation check
	Output Level	0V to 5V (±1%)
	Output Frequency	1kHz (±1%)
	Duty Ratio	50% (±5%)
Withstand 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: IEC61010-1 EMC: IEC61326-1, class A

External Drawing

Unit: mm

394

199

334

410