

RS PRO Data Acquisition System

RS Stock No.: 0235755, 0235756, 0235757, 0235759, 0235761, 0235762

FEATURES

- Large 4.3" TFT Color Display
- 3-slot Mainframe with Built-in 6 ½ Digit DMM
- Basic 0.0035% DCV Accuracy
- 5 Seletable Switch Modules
- Up to 450 Channel/s Scan Rate
- Up to 100 kilo Points Internal Memory
- Measures and Converts 14 Different Input Signals: Temperature with Thermocouple, RTDs and Thermistor; DC/AC Volts; 2- and 4-wire Resistance; Frequency and Period; DC/AC Current and Capacitance; Direct Strain and Bridge Strain
- Command Compatible with the DAQ970A
- USB Storage Supports to Copy/Log Data in Standalone Operation
- Interface: Digit I/O, LAN, USB Host/Device and Mini GPIB(Optional)
- Free PC Software RSDA-Data Logger, Allows Easy Configuration and Control of Tests



DAQ Modules Optional

Stock No. 0235772, 0235774,
0235775, 0235777

Stock No. 0235778, 0235779,
0235780, 0235781

Stock No. 0235788, 0235790,
0235791, 0235793

Stock No. 0235794, 0235796,
0235797, 0235799

Stock No. 0235783, 0235784,
0235785, 0235787



Electrical Specifications

Note :

- All specifications are ensured only under a single display.
- At least 1 hour of warm-up time is required before applying these specifications.
- MAX DC600V, AC 400V

General	
Display	4.3" color WQVGA (480x272) with LED backlight
Interface	USB host/device, LAN, Digital I/O; GPIB(optional)
Power Source	AC 100 V / 120 V / 220 V / 240 V $\pm 10\%$
Power Line Frequency	50 Hz / 60 Hz $\pm 10\%$
Power Consumption	Max. 50VA
Dimensions	220(W) x 88(H) x 348.6(D) mm ~ without bumper 266.9(W) x 107(H) x 357.8(D) mm ~ with bumper
Weight	Approx. 4.5kg

Function	Range (2)	Resolution	Input Resistance etc.	24 Hour TCAL $\pm 1^\circ\text{C}$	90 Day TCAL $\pm 5^\circ\text{C}$	1 Year TCAL $\pm 5^\circ\text{C}$	Temperature Coefficient 0 $^\circ\sim 18^\circ\text{C}$ / 28 $^\circ\sim 55^\circ\text{C}$
DC Characteristics Accuracy : $\pm$ (% of reading + % of range)							
DC Voltage (1)	100.0000 mV	0.1 μV	10M Ω or >10G Ω	0.0030 + 0.0050	0.0040 + 0.0060	0.0050 + 0.0060	0.0005 + 0.0005
	1.000000 V	1 μV	10M Ω or >10G Ω	0.0020 + 0.0006	0.0035 + 0.0007	0.0048 + 0.0007	0.0005 + 0.0001
	10.00000 V	10 μV	10M Ω or >10G Ω	0.0015 + 0.0004	0.0020 + 0.0005	0.0035 + 0.0005	0.0005 + 0.0001
	100.0000 V	0.1mV	10M $\Omega \pm 1\%$	0.0020 + 0.0006	0.0035 + 0.0006	0.0050 + 0.0006	0.0005 + 0.0001
	600.000 V	1mV	10M $\Omega \pm 1\%$	0.0025 + 0.0020	0.0040 + 0.0020	0.0050 + 0.0020	0.0005 + 0.0001
Resistance (1)(3)	100.0000 Ω	100 $\mu\Omega$	1mA	0.003 + 0.0030	0.008 + 0.004	0.010 + 0.004	0.0008 + 0.0005
	1.000000 k Ω	1m Ω	1mA	0.002 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0008 + 0.0001
	10.00000 k Ω	10m Ω	100 μA	0.002 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0008 + 0.0001
	100.0000 k Ω	100m Ω	10 μA	0.002 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0008 + 0.0001
	1.000000 M Ω	1 Ω	5 μA	0.002 + 0.0010	0.008 + 0.001	0.010 + 0.001	0.0010 + 0.0002
	10.00000 M Ω	10 Ω	500nA	0.015 + 0.0010	0.020 + 0.001	0.040 + 0.001	0.0030 + 0.0004
	100.0000 M Ω	100 Ω	500nA//10M Ω	0.300 + 0.0100	0.800 + 0.010	0.800 + 0.010	0.1500 + 0.0004
DC Current (1)	1.000000 μA	1pA	< 0.015 V	0.025 + 0.050	0.050 + 0.050	0.050 + 0.050	0.002 + 0.003
	10.00000 μA	10pA	< 0.15 V	0.020 + 0.010	0.040 + 0.025	0.050 + 0.025	0.002 + 0.003
	100.0000 μA	100pA	< 0.020 V	0.010 + 0.020	0.040 + 0.025	0.050 + 0.025	0.002 + 0.003
	1.000000 mA	1nA	< 0.20 V	0.007 + 0.006	0.030 + 0.006	0.050 + 0.006	0.002 + 0.001
	10.00000 mA	10nA	< 0.15 V	0.007 + 0.020	0.030 + 0.020	0.050 + 0.020	0.002 + 0.002
	100.0000 mA	100nA	< 0.7 V	0.010 + 0.004	0.030 + 0.005	0.050 + 0.005	0.002 + 0.001
	2.000000 A	1 μA	< 0.8 V	0.180 + 0.020	0.200 + 0.020	0.200 + 0.020	0.005 + 0.001



Diode Test (1)(4)	5.00000 V	10μV	1 mA	0.002 + 0.030	0.008 + 0.030	0.01 + 0.030	0.001 + 0.002
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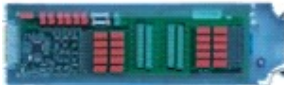
AC Characteristics			Accuracy : ± (% of reading + % of range)				
True RMS AC Voltage (5)(6)(7)(8)	100.0000 mV	0.1μV	3Hz - 5Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004
			5Hz - 10Hz	0.35 + 0.03	0.35 + 0.04	0.35 + 0.04	0.035 + 0.004
			10Hz - 20kHz	0.04 + 0.03	0.05 + 0.04	0.06 + 0.04	0.005 + 0.003
			20kHz - 50kHz	0.10 + 0.05	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
			50kHz - 100kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
			100kHz -300kHz	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020
	1.000000 V to 400.000 V	1μV ~ 1mV	3Hz - 5Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.004
			5Hz - 10Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.035 + 0.004
			10Hz - 20kHz	0.04 + 0.02	0.05 + 0.03	0.06 + 0.03	0.005 + 0.003
			20kHz - 50kHz	0.10 + 0.04	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
			50kHz - 100kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
			100kHz -300kHz	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020
True RMS AC Current (5)(7)(9)	100.0000 μA	< 0.020 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.06	1.00 + 0.06	0.100 + 0.006
			5Hz – 10Hz	0.35 + 0.04	0.35 + 0.06	0.35 + 0.06	0.035 + 0.006
			10Hz – 5kHz	0.10 + 0.04	0.10 + 0.06	0.10 + 0.06	0.015 + 0.006
			5kHz – 10kHz	0.18 + 0.04	0.18 + 0.10	0.18 + 0.10	0.035 + 0.006
	1.000000 mA	< 0.20 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
			5Hz – 10Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.006
			10Hz – 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
			5kHz – 10kHz	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.030 + 0.006
	10.00000 mA	< 0.15 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
			5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.006
			10Hz – 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
			5kHz – 10kHz	0.18 + 0.04	0.18 + 0.04	0.18 + 0.04	0.030 + 0.006
	100.0000 mA	< 0.7 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
			5Hz – 10Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.006
			10Hz – 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
			5kHz – 10kHz	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.030 + 0.006
	2.000000 A	< 0.8 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
			5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.006
			10Hz – 5kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.015 + 0.006
			5kHz – 10kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.030 + 0.006
Frequency and Period Characteristics			Accuracy : ± (% of reading)				
Frequency / Period (9)(10)(11)(12)	100.0000mV to 400.000V	—	3Hz - 5Hz	0.100	0.100	0.100	0.100
			5Hz - 10Hz	0.050	0.050	0.050	0.035
			10Hz - 40Hz	0.030	0.030	0.030	0.015
			40Hz -1MHz	0.006	0.006	0.006	0.015

Temperature Characteristics							
Temperature (RTD) (13)	-200 °C ~ -100 °C	0.001 °C	—	—	—	0.09 °C	0.004 °C / °C
	-100 °C ~ -20 °C	0.001 °C	—	—	—	0.08 °C	0.005 °C / °C
	-20 °C ~ 20 °C	0.001 °C	—	—	—	0.06 °C	0.005 °C / °C
	20 °C ~ 100 °C	0.001 °C	—	—	—	0.08 °C	0.005 °C / °C
	100 °C ~ 300 °C	0.001 °C	—	—	—	0.12 °C	0.007 °C / °C
	300 °C ~ 600 °C	0.001 °C	—	—	—	0.22 °C	0.009 °C / °C
Temperature (Thermocouples) (13)	-200 to +1000 °C	0.002 °C	E	—	—	0.2 °C	0.03 °C / °C
	-210 to +1200 °C	0.002 °C	J	—	—	0.2 °C	0.03 °C / °C
	-200 to +400 °C	0.002 °C	T	—	—	0.3 °C	0.04 °C / °C
	-200 to +1372 °C	0.002 °C	K	—	—	0.3 °C	0.04 °C / °C
	-200 to +1300 °C	0.003 °C	N	—	—	0.4 °C	0.05 °C / °C
	-50 to +1768 °C	0.01 °C	R	—	—	1 °C	0.14 °C / °C
	-50 to +1768 °C	0.01 °C	S	—	—	1 °C	0.14 °C / °C
	+350 to +1820 °C	0.01 °C	B	—	—	1 °C	0.14 °C / °C
Temperature (Thermistor) (13)	-80 ° to 150 °C	0.01 °C	—	—	—	0.01 °C	0.003 °C / °C
Capacitance Characteristics							
Accuracy : ± (% of reading + % of range)							
Capacitance (14)	1.000 nF	—	—	2.00 + 2.00	2.00 + 2.00	2.00 + 2.00	0.05 + 0.01
	10.00 nF	—	—	2.00 + 1.00	2.00 + 1.00	2.00 + 1.00	0.05 + 0.01
	100.0 nF	—	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
	1.000 µF	—	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
	10.00 µF	—	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
	100.0 µF	—	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01

- [1]. DC Specification: In addition to the availability that requires warm-up of 60 minutes, it must be set in 5/s speed rate, A-Zero on.
- [2]. The entire range of measurement will pass the set range by 20% except the tests of 600 V DC, 400 V AC, 2 A DC, 2 A AC and diode.
- [3]. This specifications applies to 4-wire ohms function or 2-wire ohms using math null for offset. Without math null, add 2 Ω additional error in 2-wire ohms function. The 100M and 1G ohm ranges are 2-wire only.
- [4]. This specification applies to the voltage measured from input terminal. 1 mA test current is the typical value. The change of current source leads to the variation in buck of diode junction.
- [5]. AC Specification: It will be available after 60 minutes of warm-up, sine wave as well as 1/s speed rate.
- [6]. Specifications are for sinewave input >5% of range. For inputs from 1% to 5% of range and <50 kHz, add 0.1% of range additional error. For 50 kHz to 100 kHz, add 0.13% of range. The measurement range of 400 VAC is limited within the range of 7.5×10^7 Volt-Hz.
- [7]. Three speed settings provided for low-frequency performance: 1/s (3 Hz), 5/s (20 Hz), 20/s (200 Hz). Additional errors will Not occur for the frequency greater than the filter settings.
- [8]. Specifications are for sinewave input >5% of range, and is beyond 10 µA AC. For inputs from 1% to 5% of range, add 0.1% of range additional error.
- [9]. This specification will be available after 60 minutes of warm-up and sine wave input, unless stated otherwise. This specification applies to 1s gate time.
- [10]. This specification is available when both sine wave and square wave input ≥ 100 mV. For the input of 10 mV to 100 mV, the % of reading error needs to be multiplied by 10 times.
- [11]. The amplitude range is from 10% to 120% and is lower than 400 VAC.
- [12]. The input ≥ 60 mV, for 300 k ~ 1 MHz, within 100mV range.
- [13]. The actual measurement range and test lead error will be constrained by the adopted test lead. The test lead accuracy adder covers all errors of measurements and ITS-90 temperature change.
- [14]. Specifications are for film Capacitance inputs that are greater than 10% range. range.

Modules Specifications

Module Description	Type	Speed (CH/sec)	Max (Volts)	Max (Amps)	Bandwidth	Thermal (Offset)	Comments
0235772, 0235774, 0235775, 0235777 20 ch Multiplexer	2-wire solid-state (4 wire selectable)	450	120V		10MHz	< 4 μ V	Built-In cold Function
0235778, 0235779, 0235780, 0235781 20 ch Multiplexer + 2 ch current	2-wire armature (4 wire selectable)	80	300V	1A	10MHz	< 4 μ V	Built-In Cold Function Ref 2 Additional Current Channel (22 total)
0235788, 0235790, 0235791, 0235793 40 ch Single-Ended Mux	1-wire armature (common low)	80	300V		10MHz	< 1 μ V	No Four-Wire Measurements
0235794, 0235796, 0235797, 0235799 4 x 8 Matrix	2-wire armature		300V	1A	10MHz	< 1 μ V	
RSDA-909 8 ch Multiplexer + 2 ch current	2-wire armature (4 wire selectable)	60	DC 600V AC400V	2A	10MHz	< 4 μ V	2 Additional Current Channel (10 Total)

0235772, 0235774, 0235775, 0235777 	20-Channel Universal Multiplexer (Solid State Relay) * Scanning speed up to 450 channels per second * 2-wire and 4-wire scanning * Built-in temperature cold junction reference * 120 V switching	RSDA-900 is a solid state relay module that provides two groups (A/B) of 10 2-wire channels each. All 20 channels are switchable to high (HI) and low (LO) inputs, providing fully isolated inputs for the built-in digital meter or external instruments. During 4-wire resistance measurements, the channels of group A are automatically paired with the channels of group B to provide power and sense connections. The module has a built-in cold junction reference, which can greatly reduce errors caused by thermal gradients when measuring thermocouples.
0235778, 0235779, 0235780, 0235781 	20+2 Channels Universal Multiplexer (Armature Relay) * The scanning speed can reach 80 channels per second * 2-wire and 4-wire scanning * Built-in temperature cold junction reference * 300 V switching * The extra 2 channels can directly measure the current (1A/per CH)	RSDA-901 is a comprehensive multiplexer for general scanning. The same module can mix 2-wire and 4-wire channels; at the same time, the additional 2 current input channels can be used for AC and DC current measurement without external shunt resistors (maximum 1A per channel). RSDA-901, a total of 22 channels, intensive multi-function switching and a scan rate of up to 80 channels per second, is suitable for various data acquisition applications.
0235788, 0235790, 0235791, 0235793 	40-Channel Single-Ended Multiplexer * The scanning speed can reach 80 channels per second * Single-wire switching is suitable for common-low applications	RSDA-903 can switch 40 single-wire inputs per module. It can be used for common-low applications such as battery testing, component characterization and desktop testing. The low-voltage connection is isolated from ground and can be floated up to 300 V. RSDA-903 also supports all 2-wire internal measurements except current.
0235794, 0235796, 0235797, 0235799 	4 x 8 2-Wire Matrix * The switching speed 3ms * 32 2-wire intersections * 300 V, 1A switching * Up to 96 crosspoints (3 slots)	RSDA-904 module can provide the most flexible connection path between your DUT and the test system, allowing different test instruments to be connected to multiple points on the DUT at the same time. RSDA-904 can connect the rows and columns of multiple modules to build larger matrices, such as 8 x 8, 4 x 16...etc. Up to 96 crosspoints can be built in a single instrument.
0235783, 0235784, 0235785, 0235787 	8+2 Channels High Voltage High Current Multiplexer * The switching speed 3ms * DC 600V / AC 400Vrms voltage, current 2A * 2-wire and 4-wire scanning * Additional 2 channels can directly measure current (2A/per channel)	RSDA-909 is a multiplexer specially designed for high voltage, providing 8 channels for DC 600V / AC 400Vrms voltage measurement. The additional 2 current input channels can be used for AC and DC current measurement, external shunt resistors are not required (maximum 2A / per channel).



Internal DMM Measurement Functions Supported

	0235772, 0235774, 0235775, 0235777	0235778, 0235779, 0235780, 0235781	0235788, 0235790, 0235791, 0235793	0235794, 0235796, 0235797, 0235799	0235783, 0235784, 0235785, 0235787
AC/DC Voltage	√ 2,3	√	√		√
AC/DC Current		√			√
Freq./Period	√	√	√		√
2Wire Resistance	√ 1	√	√		√
4Wire Resistance	√ 1	√			√
Thermocouple	√	√			√ 4
2Wire RTD		√	√		√
4Wire RTD		√			√
Transistor		√	√		√
Capacitance		√	√		√

1. For the measurement of 100 Ω and 1 kΩ resistance ranges, it is recommended to use 4-wire resistance. The maximum resistance range of DAQ-900 is 1 MΩ.

2. When measuring AC voltage, the input impedance will decrease with frequency. A source impedance of 5 Ω or less will maintain specification over frequency. A source impedance of 50 Ω or less will maintain specification in the 5 kHz range.

3. For DC voltage measurement, if the integration time is short and the source impedance is high, more stabilization time may be required.

4. Need to use an extension cable moving the cold junction outside the chassis and manually set the reference temperature value

Safety Approval

Directive: EMC; LVD; WEEE; RoHS

The product is in conformity with the following standards or other normative documents:

© EMC	
EN 61326-1 :	Electrical equipment for measurement, control and laboratory use — EMC requirements
Conducted & Radiated Emission EN 55011 / EN 55032	Electrical Fast Transients EN 61000-4-4
Current Harmonics EN 61000-3-2 / EN 61000-3-12	Surge Immunity EN 61000-4-5
Voltage Fluctuations EN 61000-3-3 / EN 61000-3-11	Conducted Susceptibility EN 61000-4-6
Electrostatic Discharge EN 61000-4-2	Power Frequency Magnetic Field EN 61000-4-8
Radiated Immunity EN 61000-4-3	Voltage Dip/ Interruption EN 61000-4-11 / EN 61000-4-34
© Safety	
EN 61010-1 :	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

Order Information

0235755, 0235756, 0235757, 0235759, 0235761, 0235762 Data Acquisition System
(USB/LAN/Digital IO)

0235755, 0235756, 0235757, 0235759, 0235761, 0235762 with GPIB Data Acquisition System
(USB/LAN/Digital IO and opt. GPIB)

ACCESSORIES :

Power Cord x 1, Screw Driver x 1, GTL-246 USB Cable x 1

OPTIONAL ACCESSORIES

0235772, 0235774, 0235775, 0235777 20-Channel Universal Multiplexer

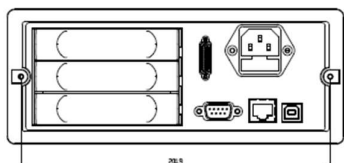
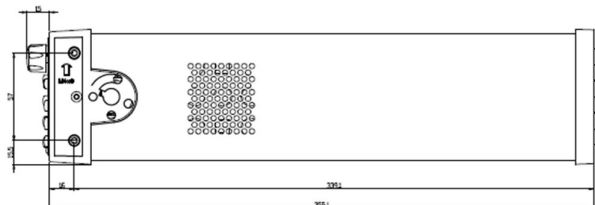
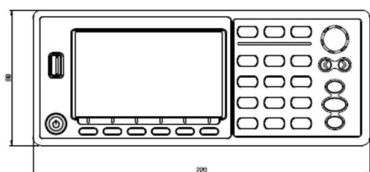
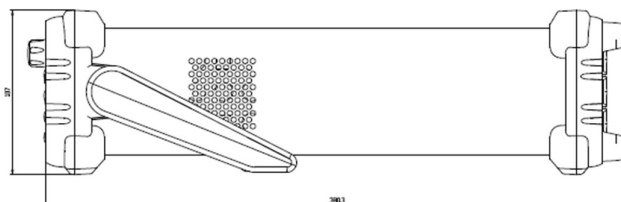
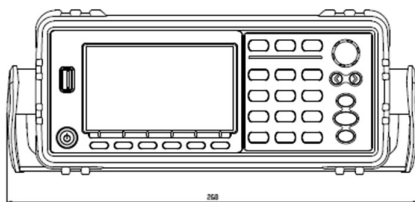
0235778, 0235779, 0235780, 0235781 20+2 Channels Universal Multiplexer

0235788, 0235790, 0235791, 0235793 40-Channel Single-Ended Multiplexer

0235794, 0235796, 0235797, 0235799 4 x 8 Matrix

0235783, 0235784, 0235785, 0235787 8+2 Channels High Voltage High Current Multiplexer

Dimension



All dimensions are shown in millimeters.

