

TES

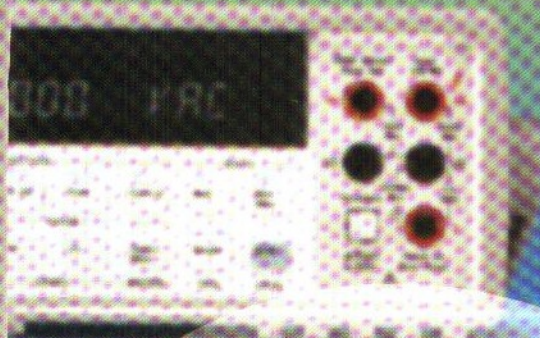
Dual Channels Input

901 / 903 Precision Multimeter

- Cost & Space Saving / Mobil Bench-Top DMM
- It is Real



- 0.02% DC and 0.1% AC basic accuracy
- 60,000 counts resolution (4 5/6 digits)
- 200KHz (max.) bandwidth
- True RMS with fast ACV/ACA response
- Two channels measurement availability
- Hz + duty cycle dual display
- RS-232C ASCII interface / Software
- Data logging (model 903 with 10,708 records for both channels)
- Capacitance measurement



"Space Saving"



Specification (23°C ± 5°C)

The following accuracy is specified for one single channel (channel 1 or channel 2). If dual channels are used at the same time, additional % of accuracy should be added to the listed accuracy. Please refer to the supplemental dual channels specification. The following accuracy is also specified for the ZEROED (relative) value. The accuracy is given as ±% of reading ± number of least significant digits.

DC Voltage:(Input Impedance: 10M) (Overload Protection AC 1000V)

Range	Resolution	Accuracy	Range	Resolution	Accuracy
60.000mV	0.001mV	± 0.1% ± 5dgt ¹	60.000V	0.001V	± 0.03% ± 3dgt ^s
600.00mV	0.01mV	± 0.03% ± 3dgt ^s	600.00V	0.01V	± 0.03% ± 3dgt ^s
6.0000V	0.0001V	± 0.03% ± 3dgt ^s	1000.0V	0.1V	± 0.04% ± 3dgt ^s

AC Voltage :

The accuracy of ACV or AC mV is specified for 5%-100% of range from 20Hz - 200KHz, True RMS, crest factor < 3 at full scale, and < 6 at half scale except 1000V range where it is 1.5 at full scale and 3 at half scale. Input Impedance is 10M, and overloaded protection is AC 1000V for all range. Accuracy is only specified for channel 1. If dual channels measurements are performed, additional specification of accuracy will be introduced. Please refer to the supplemental dual channels specification. Due to the wide bandwidth, the reading might not be zero when no inputs present. But the residual reading does not affect the listed accuracy. If the AC reading is less than 100 least significant counts, it is set to zero by the unit.

Range (ACV)	Resolution	Accuracy (50/60Hz)	Accuracy (45Hz - 1KHz)	Accuracy (20Hz - 45Hz)	Accuracy (1KHz - 10KHz)
60.000mV	0.001mV	± 0.1% ± 20dgt ^s	± 0.3% ± 20dgt ^s	± 0.8% ± 25dgt ^s	± 2% ± 20dgt ^s
600.00mV	0.01mV	± 0.1% ± 20dgt ^s	± 0.3% ± 20dgt ^s	± 0.8% ± 25dgt ^s	± 1% ± 20dgt ^s
6.0000V	0.0001V	± 0.1% ± 20dgt ^s	± 0.3% ± 20dgt ^s	± 0.8% ± 25dgt ^s	± 1% ± 20dgt ^s
60.000V	0.001V	± 0.1% ± 20dgt ^s	± 0.3% ± 20dgt ^s	± 0.8% ± 25dgt ^s	± 1% ± 20dgt ^s
600.00V	0.01V	± 0.1% ± 20dgt ^s	± 0.5% ± 20dgt ^s	± 0.8% ± 25dgt ^s	± 5% ± 20dgt ^s
1000.0V (0-400V)	0.1V	± 0.1% ± 20dgt ^s	± 2% ± 30dgt ^s	± 0.8% ± 25dgt ^s	± 2% ± 40dgt ^s
1000.0V (400-1000V)	0.1V	± 0.1% ± 20dgt ^s	(45Hz - 400Hz) ± 2% ± 30dgt ^s	± 0.8% ± 25dgt ^s	Not Specified

Range (ACV)	Accuracy (10KHz - 20KHz)	Accuracy (20KHz - 50KHz)	Accuracy (50KHz - 100KHz)	Accuracy (100kHz - 200KHz)
60.000mV	± 2.5% ± 20dgt ^s	± 4% ± 40dgt ^s	± 4% ± 40dgt ^s	Not Specified
600.00mV	± 2.5% ± 20dgt ^s	± 2% ± 40dgt ^s	± 2% ± 40dgt ^s	± 2% ± 40dgt ^s
6.0000V	± 2.0% ± 20dgt ^s	± 2% ± 40dgt ^s	± 2% ± 40dgt ^s	± 2% ± 40dgt ^s
60.000V	± 2.0% ± 20dgt ^s	± 4% ± 40dgt ^s	Not Specified	Not Specified
600V (0-400V)	Not Specified	Not Specified	Not Specified	Not Specified
600.00V (400-600V)	Not Specified	Not Specified	Not Specified	Not Specified
1000.0V (0-400V)	Not Specified	Not Specified	Not Specified	Not Specified
1000.0V (400-1000V)	Not Specified	Not Specified	Not Specified	Not Specified

Supplemental Dual Channels Specification (DC - 400Hz):

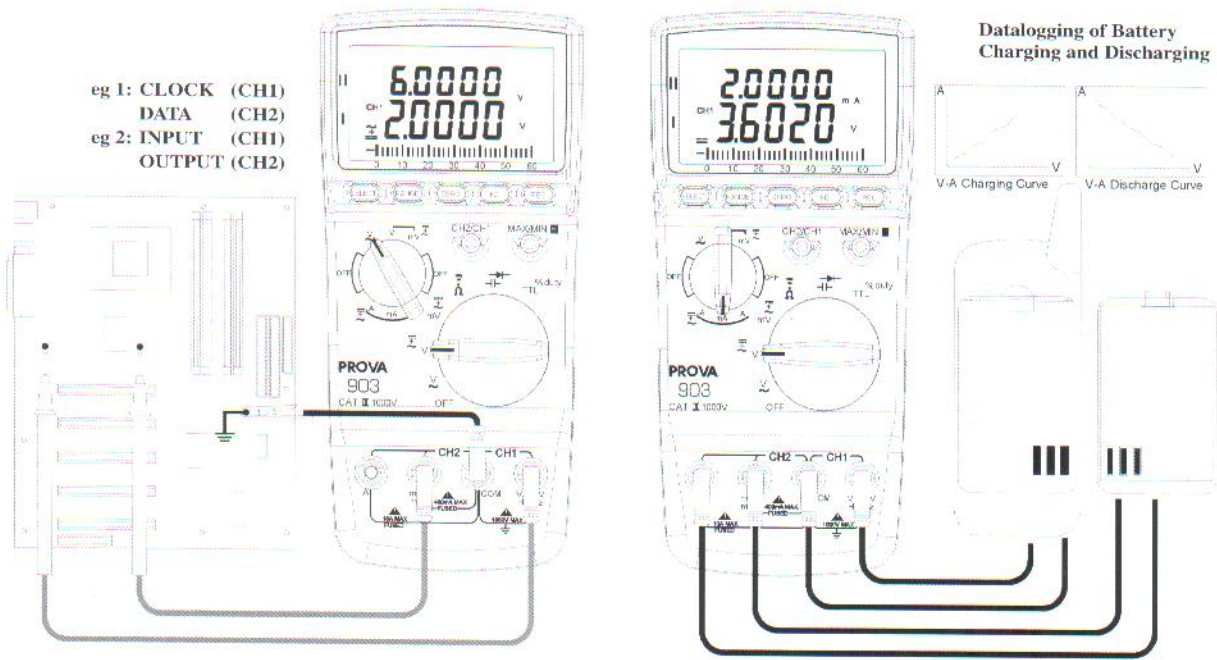
The following accuracy should be added to all the listed accuracy if dual channels measurements are performed.

	ACV (Ch2)	DCV (Ch2)	ACA (Ch2)	DCA (Ch2)
ACV (Ch1)	± 1% ± (V1-V2) * 200 PPM (Ch1, Ch2)	± 0.5% ± (V1-V2) * 20 PPM (Ch1, Ch2)	± 0.1 μA / V (μA, Ch2) ± 1 μA / V (mA, Ch2) ± 0.2mA / V (A, Ch2) ± 2mV / A (mV, Ch1) ± 5mV / A (V, Ch1)	± 0.25% (Ch1, Ch2)
DCV (Ch1)	± 0.5% ± (V1-V2) * 20 PPM (Ch1, Ch2)	± 0.25% (Ch1, Ch2)	± 0.25% (Ch1, Ch2)	± 0.25% (Ch1, Ch2)

The result of (V1-V2) * PPM is of volts.

901/903 Precision Multimeter

60000
60000



DC Current :

(10A terminal is protected by a 20A fast blown, high energy fuse, and the terminal of μ A and mA is protected by 1A fast blown, high energy fuse)

Range	Resolution	Accuracy
600.00 μ A	0.01 μ A	$\pm 0.2\% \pm 10$ dgts
6000.0 μ A	0.1 μ A	$\pm 0.1\% \pm 10$ dgts
60.000mA	0.001mA	$\pm 0.2\% \pm 10$ dgts

Range	Resolution	Accuracy
600.00mA	0.01mA	$\pm 0.1\% \pm 10$ dgts
1.0000A	0.0001A	$\pm 0.1\% \pm 10$ dgts
10.000A ¹	0.001A	$\pm 0.3\% \pm 10$ dgts

AC Current :

(The accuracy is specified for a single channel for 5%-100% of range for 45Hz - 20KHz, True RMS, 10A terminal is protected by a 20A fast blown, high energy fuse, and the terminal of μ A and mA is protected by 1A fast blown, high energy fuse)

Range (ACA)	Resolution	Accuracy (50/60Hz)	Accuracy (45Hz - 1KHz)	Accuracy (20Hz - 45Hz)	Accuracy (1KHz - 10KHz)	Accuracy (10KHz - 20KHz)
600.00 μ A	0.01mA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts	$\pm 2\% \pm 0$ dgts	$\pm 1\% \pm 20$ dgts
6000.0 μ A	0.1mA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts	$\pm 2\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts
60.000mA	0.001mA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts	$\pm 0.5\% \pm 0$ dgts	$\pm 1\% \pm 20$ dgts
600.00mA	0.01mA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts	$\pm 0.5\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts
1.0000A	0.0001A	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts	$\pm 1.5\% \pm 20$ dgts	Not Specified
10.000A ¹	0.001A	$\pm 0.5\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts	$\pm 2\% \pm 20$ dgts	$\pm 1.5\% \pm 20$ dgts	Not Specified

Resistance:(Ω) (Overload Protection AC 1000V)

Range	Resolution	Accuracy
999.99 Ω	0.01 Ω	$\pm 0.15\% \pm 8$ dgts
9.9999K Ω	0.0001K Ω	$\pm 0.09\% \pm 3$ dgts
99.999K Ω	0.001K Ω	$\pm 0.09\% \pm 3$ dgts
999.99K Ω	0.01K Ω	$\pm 0.09\% \pm 3$ dgts
9.9999M Ω	0.0001M Ω	$\pm 0.2\% \pm 6$ dgts
40.000M Ω	0.001M Ω	$\pm 1\% \pm 6$ dgts

Capacitance: (F), auto range, and for film capacitor or better)

Range	Resolution	Accuracy ¹
60.00nF	0.01nF	$\pm 0.8\% \pm 5$ dgts
600.0nF	0.1nF	$\pm 1.5\% \pm 5$ dgts
6.000 μ F	0.001 μ F	$\pm 1.5\% \pm 5$ dgts
60.00 μ F	0.01 μ F	$\pm 2.0\% \pm 5$ dgts
600.0 μ F	0.1 μ F	$\pm 3.5\% \pm 5$ dgts

Continuity: (H), open voltage 3V approx.) (Overload Protection AC 1000V)

Range	Resolution	Beeper
999.99 Ω	0.01 Ω	< 40 Ω approx.

Diode Test: (open voltage 3V approx.) (Overload Protection AC 1000V)

Range	Resolution	Short Circuit Current
3.0000V	0.0001V	0.8 mA typical

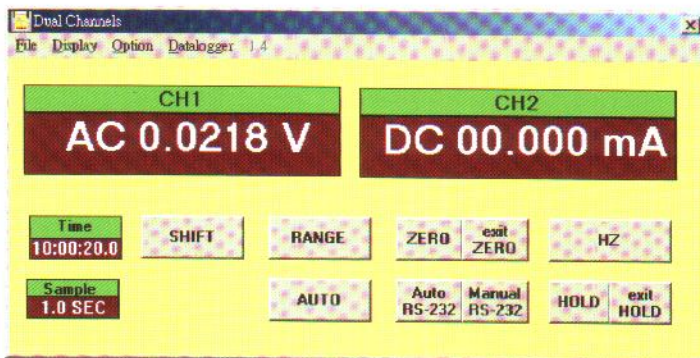
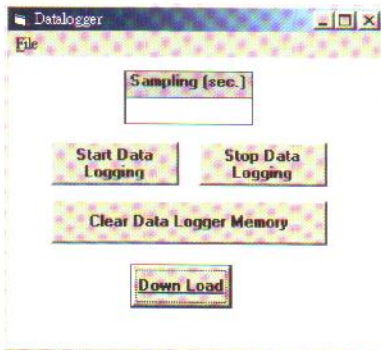
Frequency: (Overload Protection AC 1000V)

Range (Auto)	Resolution	Accuracy
1Hz - 200KHz(sine wave)	0.0001Hz - 100Hz	$\pm 0.02\% \pm 4$ dgts
1Hz - 2MHz (TTL)	0.0001Hz - 0.0001MHz	$\pm 0.005\% \pm 4$ dgts

Duty Cycle: (% , TTL, 1Hz - 600KHz) (Overload Protection AC 1000V)

Range	Resolution	Accuracy
0.001% - 9.999%	0.001%	± 30 d/KHz ± 30 dgts
10.00% - 100.00%	0.01%	± 3 d/KHz ± 3 dgts

901/903 Precision Multimeter



General Specification

Battery Type	9V
Display	5+5 digits LCD with 30 segments bar graph
Range Selection	auto and manual
Overload Indication	OL
Power Consumption	6 mA (approx.)
Low battery Indication	
Operating Temperature	-10C to 50C
Operating Humidity	less than 85% relative

Altitude	up to 2000M
Storage Temperature	-20C to 60C
Storage Humidity	less than 75% relative
Dimension	207mm(L) x 101mm (W) x 47mm (H) 8.15" (L) x 4" (W) x 1.85" (H)
Weigh	430g / 15.2oz (battery included)
Accessories	Users manual x 1 9V battery x 1 RS-232C interface cable

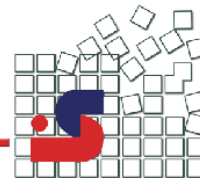
Dual Channel DMM :

- ▶ Taiwan Patent 178436
- ▶ China Patent ZL 99 2 48711.
- ▶ US Patent 6,271,654

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