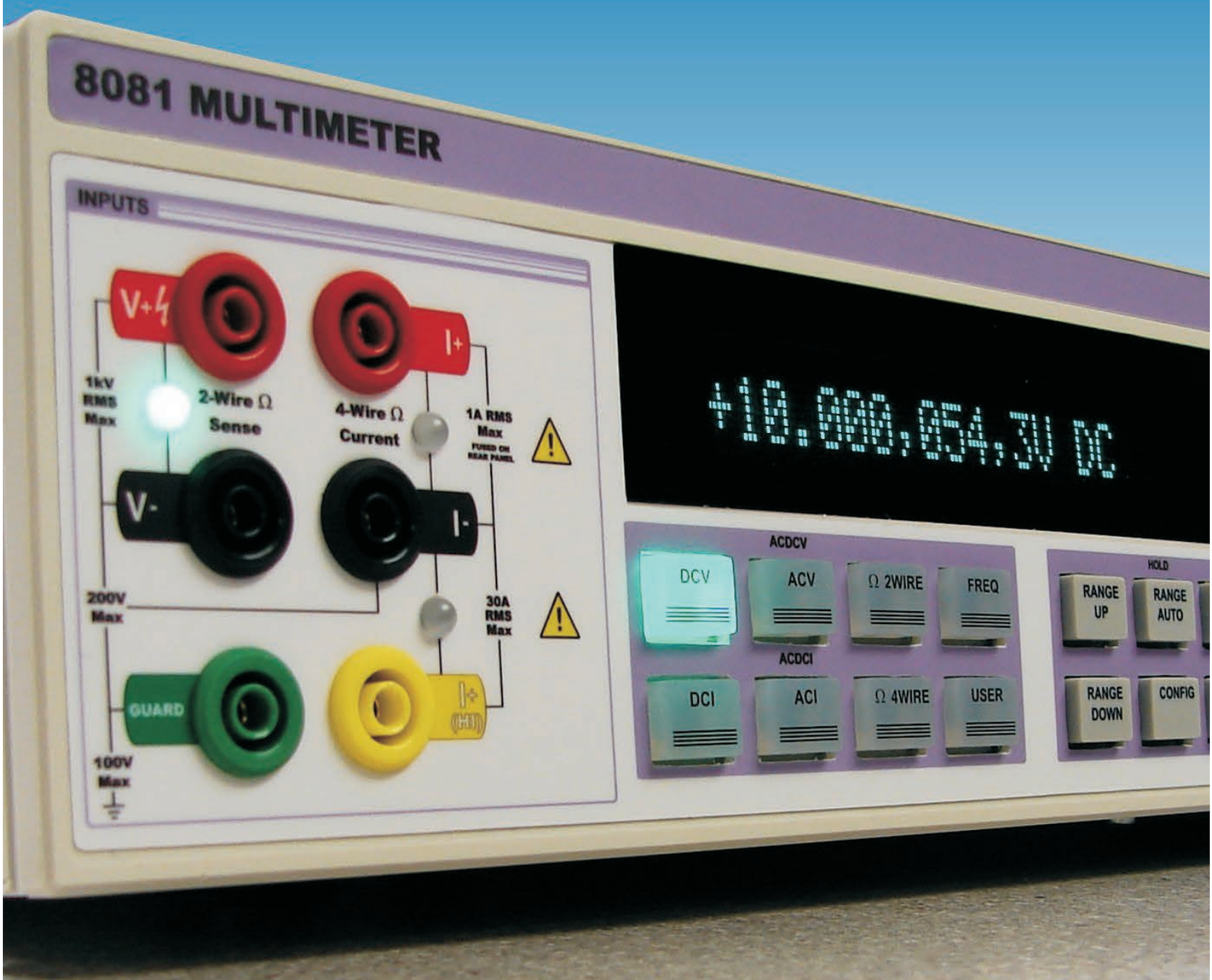
EXTENDED SPECIFICATIONS



MODEL 8081

4 PPM PRECISION DIGITAL MULTIMETER

TRANSMILLE
SOLUTIONS IN CALIBRATION

DC Voltage

Instrument Uncertainty Relative to Calibration Standards

Range	Full Scale	Resolution	Input Impedance	90 Day			180 Day			1 Year			2 Year		
				± ppm Reading + ppm Range											
100mV	120,000,000	1nV	> 10 GOhms	3.8	+	1.7	4.3	+	1.7	4.8	+	1.7	7.0	+	1.7
1V	1.200,000,00	10nV	> 10 GOhms	3.0	+	0.6	3.5	+	0.6	3.9	+	0.6	5.5	+	0.6
10V	12.000,000,0	100nV	> 10 GOhms	3.0	+	0.6	3.5	+	0.6	3.9	+	0.6	5.5	+	0.6
100V	120.000,000	1uV	10 MOhms, 1%	4.6	+	0.8	5.2	+	0.8	5.8	+	0.8	8.0	+	0.8
1000V	1.050,000,00	10uV	10 MOhms, 1%	4.6	+	1.2	5.2	+	1.2	5.8	+	1.2	8.0	+	1.2

Absolute Uncertainty (95% Confidence)

Range	1 Year					
	Tcal ± 1°C			Tcal ± 3°C		
	± ppm Reading + ppm Range					
100mV	7.5	+	1.7	9.0	+	1.7
1V	4.9	+	0.6	6.4	+	0.6
10V	5.4	+	0.6	6.8	+	0.6
100V	7.3	+	0.8	9.5	+	0.8
1000V	7.3	+	1.2	9.5	+	1.2

Input Protection : 1100Volts

Ratio Uncertainty
Same Range : Apply 90 Day Accuracy
Different Ranges : ± (Front Terminal Range Accuracy + Rear Terminal Range Accuracy)

DC Current

Instrument Uncertainty Relative to Calibration Standards

Range	Full Scale	Resolution	Input Impedance	90 Day			180 Day			1 Year			2 Year		
				± (ppm Reading + Range)											
10nA	12.000,00	0.01pA	Virtual Ground	4000	+	80	4500	+	80	5000	+	80	7000	+	80
100nA	120.000,0	0.1pA	Virtual Ground	1440	+	34	1620	+	34	1800	+	34	2520	+	34
1uA	1.200,000	1pA	Virtual Ground	160	+	17	180	+	17	200	+	17	280	+	17
10uA	12,000,00	10pA	Virtual Ground	24	+	10	27	+	10	30	+	10	42	+	10
100uA	120,000,00	10pA	10 kOhms	5.5	+	4	6	+	4	7	+	4	10	+	4
1mA	1.200,000,0	100pA	1 kOhms	5.5	+	4	6	+	4	7	+	4	10	+	4
10mA	12.000,000	1nA	100 Ohms	7.2	+	4	8.1	+	4	9	+	4	13	+	4
100mA	120,000,00	10nA	10 Ohms	24	+	6	27	+	6	30	+	6	42	+	6
1A	1.200,000,0	100nA	0.5 Ohms	120	+	13	135	+	13	150	+	13	210	+	13
10A	12.000,000	1uA	10 mOhms	290	+	35	320	+	35	360	+	35	500	+	35
30A	30.500,00	10uA	10 mOhms	390	+	145	440	+	145	490	+	145	690	+	145

Absolute Uncertainty (95% Confidence)

Range	1 Year					
	Tcal ± 1°C			Tcal ± 3°C		
	± ppm Reading + Range					
10nA	14227	+	80	15148	+	80
100nA	2454	+	34	3087	+	34
1uA	268	+	17	339	+	17
10uA	40	+	10	50	+	10
100uA	11	+	4	14	+	4
1mA	11	+	4	14	+	4
10mA	13	+	4	16	+	4
100mA	36	+	6	47	+	6
1A	174	+	13	234	+	13
10A	418	+	35	561	+	35
30A	569	+	145	764	+	145

Input Protection

Front/Rear Current Terminals	1A QB Fuse
Front Hi Current Terminal	30A

Due to continuous development specifications may be subject to change.

AC Voltage

Instrument Uncertainty Relative to Calibration Standards

Range	Full Scale	Resolution	Input Impedence	Frequency	90 Day			180 Day			1 Year			2 Year		
					± % Reading + Range											
100mV	105,000,0	0.1uV	>1 GOhm / 90pF	10Hz to 40Hz	0.040	+	0.015	0.045	+	0.015	0.05	+	0.015	0.070	+	0.015
				40Hz to 200Hz	0.017	+	0.009	0.019	+	0.009	0.021	+	0.009	0.029	+	0.009
				200Hz to 1KHz	0.014	+	0.008	0.015	+	0.008	0.017	+	0.008	0.024	+	0.008
				1kHz to 2kHz	0.014	+	0.008	0.015	+	0.008	0.017	+	0.008	0.024	+	0.008
				2kHz to 20kHz	0.020	+	0.01	0.023	+	0.01	0.025	+	0.010	0.035	+	0.010
				20kHz to 100kHz	0.048	+	0.05	0.054	+	0.05	0.06	+	0.050	0.080	+	0.050
1V	1.050,000	1uV	>1 GOhm / 90pF	10Hz to 40Hz	0.030	+	0.015	0.036	+	0.015	0.04	+	0.015	0.060	+	0.015
10V *	10.500,00	10uV	>1 GOhm / 90pF	40Hz to 200Hz	0.015	+	0.006	0.017	+	0.006	0.019	+	0.006	0.027	+	0.006
				200Hz to 1KHz	0.012	+	0.006	0.014	+	0.006	0.015	+	0.006	0.021	+	0.006
				1KHz to 2KHz	0.012	+	0.006	0.014	+	0.006	0.015	+	0.006	0.021	+	0.006
				2kHz to 20kHz	0.020	+	0.01	0.023	+	0.01	0.025	+	0.010	0.035	+	0.010
				20kHz to 100kHz	0.048	+	0.05	0.054	+	0.05	0.06	+	0.050	0.084	+	0.050
				100kHz to 1MHz*	0.800	+	2.5	0.900	+	2.5	1	+	2.5	1.400	+	2.5
100V	105.000,0	100uV	1 MOhm / 130pF	10Hz to 40Hz	0.040	+	0.015	0.045	+	0.015	0.05	+	0.015	0.070	+	0.015
1000V [+]	1050.000	1mV	1 MOhm / 130pF	40Hz to 200Hz	0.016	+	0.009	0.018	+	0.009	0.02	+	0.009	0.028	+	0.009
				200Hz to 1kHz	0.014	+	0.007	0.016	+	0.007	0.018	+	0.007	0.025	+	0.007
				1kHz to 2kHz	0.014	+	0.007	0.016	+	0.007	0.018	+	0.007	0.025	+	0.007
				2kHz to 20kHz	0.024	+	0.01	0.027	+	0.01	0.03	+	0.010	0.042	+	0.010
				20kHz to 50kHz	0.064	+	0.05	0.072	+	0.05	0.08	+	0.050	0.112	+	0.050

Absolute Uncertainty (95% Confidence)

Range	Frequency	1 Year					
		Tcal ± 1°C			Tcal ± 3°C		
		± % Reading + Range					
100mV	10Hz to 40Hz	0.04	+	0.009	0.08	+	0.009
	40Hz to 200Hz	0.03	+	0.008	0.03	+	0.008
	200Hz to 1kHz	0.03	+	0.008	0.03	+	0.008
	1kHz to 2kHz	0.04	+	0.008	0.03	+	0.008
	2kHz to 20kHz	0.04	+	0.01	0.04	+	0.01
	20kHz to 100kHz	0.08	+	0.050	0.09	+	0.05
1V	10Hz to 40Hz	0.05	+	0.015	0.06	+	0.015
10V *	40Hz to 200Hz	0.03	+	0.006	0.03	+	0.006
	200Hz to 1kHz	0.02	+	0.006	0.02	+	0.006
	1kHz to 2kHz	0.02	+	0.006	0.02	+	0.006
	2kHz to 20kHz	0.04	+	0.01	0.04	+	0.01
	20kHz to 100kHz	0.08	+	0.050	0.09	+	0.05
	100kHz to 1MHz*	1.16	+	2.5	1.56	+	2.5
100V	10Hz to 40Hz	0.07	+	0.015	0.08	+	0.015
1000V [+]	40Hz to 200Hz	0.03	+	0.009	0.03	+	0.009
	200Hz to 1kHz	0.02	+	0.007	0.03	+	0.007
	1kHz to 2kHz	0.04	+	0.007	0.03	+	0.007
	2kHz to 20kHz	0.05	+	0.010	0.05	+	0.01
	20kHz to 50kHz	0.10	+	0.05	0.12	+	0.05

*1V Range to 1MHz : 10V Range to 200kHz

[+] 100V Range to 50kHz :1000V Range to 10kHz

AC Current

Instrument Uncertainty Relative to Calibration Standards

Range	Full Scale	Resolution	Input Impedance	Frequency	90 Day			180 Day			1 Year			2 Year		
					± % Reading + Range											
100uA	100.500,0	0.1nA	10 kOhms	10Hz to 40Hz	0.040	+	0.015	0.045	+	0.015	0.05	+	0.015	0.07	+	0.015
1mA	1.050,000	1nA	1 kOhm	40Hz to 1kHz	0.024	+	0.012	0.027	+	0.012	0.03	+	0.012	0.042	+	0.012
10mA	10.500,00	10nA	100 Ohms	1KHz to 10kHz	0.056	+	0.030	0.063	+	0.030	0.07	+	0.030	0.098	+	0.030
100mA	105.000,0	100nA	10 Ohms													
1A	1.050,000	1uA	0.5 Ohms	10Hz to 40Hz	0.048	+	0.020	0.054	+	0.020	0.06	+	0.020	0.084	+	0.020
				40Hz to 1kHz	0.032	+	0.015	0.036	+	0.015	0.04	+	0.015	0.056	+	0.015
				1KHz to 10kHz	0.056	+	0.050	0.063	+	0.050	0.07	+	0.050	0.098	+	0.050
10A	10.500,00	10uA	10 mOhms	10Hz to 40Hz	0.064	+	0.040	0.072	+	0.040	0.08	+	0.040	0.112	+	0.040
30A	30.500,0	100uA	10 mOhms	40Hz to 1kHz	0.056	+	0.030	0.063	+	0.030	0.07	+	0.030	0.098	+	0.030

Absolute Uncertainty (95% Confidence)

Range	Frequency	1 Year					
		Tcal ± 1°C			Tcal ± 3°C		
		± % Reading + Range					
100uA	10Hz to 40Hz	0.07	+	0.015	0.09	+	0.015
1mA	40Hz to 1kHz	0.04	+	0.012	0.05	+	0.012
10mA	1kHz to 10kHz	0.09	+	0.03	0.12	+	0.03
100mA							
1A	10Hz to 40Hz	0.09	+	0.02	0.11	+	0.02
	40Hz to 1kHz	0.06	+	0.015	0.07	+	0.015
	1kHz to 10kHz	0.10	+	0.05	0.13	+	0.05
10A	10Hz to 40Hz	0.14	+	0.04	0.16	+	0.04
30A	40Hz to 1kHz	0.10	+	0.03	0.12	+	0.03

Resistance

Instrument Uncertainty Relative to Calibration Standards

Range	Full Scale	Resolution	Measurment Current	90 Day			180 Day			1 Year			2 Year		
				± ppm Reading + Range											
1 Ohm	1.200,000,00	0.01 uOhm	100mA	12.0	+	6.0	13.0	+	6.0	15.0	+	6.0	21.0	+	6.0
10 Ohm	12.000,000,0	0.1 uOhm	10mA	8.0	+	3.0	9.0	+	3.0	10.0	+	3.0	14.0	+	3.0
100 Ohm	120.000,000	1 uOhm	10mA	7.0	+	1.0	8.0	+	1.0	9.0	+	1.0	13.0	+	1.0
100 Ohm Low Current	120.000,000	1 uOhm	1mA	8.0	+	7.0	9.0	+	7.0	10.0	+	7.0	14.0	+	7.0
1 kOhm	1.200,000,00	10 uOhms	10mA	6.5	+	0.8	7.0	+	0.8	8.0	+	0.8	11.0	+	0.8
1 kOhm Low Current	1.200,000,00	10 uOhms	1mA	7.5	+	3.0	8.0	+	3.0	9.0	+	3.0	12.0	+	3.0
10 kOhm	12.000,000,0	100 uOhms	1mA	7.5	+	0.8	8.5	+	0.8	9.5	+	0.8	13.0	+	0.8
10 kOhm Low Current	12.000,000,0	100 uOhms	100uA	8.5	+	8.0	9.5	+	8.0	10.5	+	8.0	14.0	+	8.0
100 kOhm	120.000,000	1 mOhms	100uA	8.0	+	0.8	9.0	+	0.8	10.0	+	0.8	14.0	+	0.8
1 MOhm*	1.200,000,00	10 mOhms	10uA	9.0	+	2.0	10.0	+	2.0	11.0	+	2.0	15.0	+	2.0
10 MOhm*	12.000,000,0	100 mOhms	1uA	12.0	+	8.0	13.5	+	8.0	15.0	+	8.0	21.0	+	8.0

Absolute Uncertainty (95% Confidence)

Range	1 Year					
	Tcal ± 1°C			Tcal ± 3°C		
	± ppm Reading + Range					
1 Ohm	17.6	+	6	23.5	+	6
10 Ohm	11.9	+	3	15.8	+	3
100 Ohm	10.6	+	1.0	14.1	+	1
100 Ohm Low Current	11.7	+	7	15.7	+	7
1 kOhm	9.4	+	0.8	12.5	+	0.8
1 kOhm Low Current	10.5	+	3	14.1	+	3
10 kOhm	11.1	+	0.8	14.9	+	0.8
10 kOhm Low Current	12.2	+	8	16.4	+	8
100 kOhm	11.8	+	8	15.7	+	8
1 MOhm *	14.1	+	2	18.2	+	2
10 MOhm*	18.0	+	8	23.9	+	8

* 2 Wire measurement only

Temperature

Thermocouple Thermocouple Type	Range	1 Year Accuracy *To Cal Standards
K	-140°C to 1340°C	0.08°C
J	-210°C to 1200°C	0.08°C
B	300°C to 500°C	0.25°C
	500°C to 1820°C	0.15°C
E	0°C to 800°C	0.05°C
R	-50°C to 600°C	0.25°C
	600°C to 1760°C	0.15°C
S	0°C to 1760°C	0.15°C
N	-200°C to 1300°C	0.09°C
T	-200°C to 400°C	0.08°C

Cold Junction Compensation
Using calibrated PT100 probe in rear terminal connections = 0.05°C
Using TCLEAD = 0.1°C

PRT

Refer to 100 and 1kOhm resistance ranges

Frequency

Signal Amplitude Range	5% of range to full scale
Resolution	0.1Hz (after 5 samples)
Frequency Range	1Hz to 1MHz
Accuracy (1 Year)*	2ppm ± 2 Digits
Sample Interval	1s

Phase Specifications (Option)

Phase Angle	Resolution	Accuracy
0° to 359.9°	0.1°	0.5° + 6us*

*6us represents 0.109° at 50Hz or 0.87° at 400Hz

Note : Phase accuracy specification applies for levels above 5V/0.2A