

CERTIFICATE OF CALIBRATION

Issued By Transmille Ltd.

Certificate Number 30377

Date of Issue 26 February 2016



Approved Signatory



Transmille Ltd.
Unit 4, Select Business Centre
Lodge Road
Staplehurst, Kent. TN12 0QW.
TEL 01580 890700 FAX 01580 890711

A handwritten signature in black ink, appearing to read 'M.A. Bailey'.

G.A. Shapland M.A. Bailey S.A. Hawkins J.A. Bailey

Customer : TRANSMILLE LTD.
UNIT 4 SELECT BUSINESS CENTRE, LODGE ROAD
STAPLEHURST KENT. TN12 0QW

Date Received : 20 February 2016

Instrument :	System ID :	T00005520	Job Number :	58703
	Description :	Advanced Calibrator		
	Manufacturer :	Transmille	Site :	
	Model Number :	4010	Location :	
	Serial Number :	Y1210J15	Last Calibration Certificate :	29992
	Procedure Version :	1.31/N	Last Calibration Date :	18/12/2015

Environmental Conditions

Temperature :	20°C +/- 1°C	Mains Voltage :	230V +/- 12V
Relative Humidity :	50% +/- 20%	Mains Frequency :	50Hz +/- 1Hz

Comments

Instrument was allowed to stabilise for at least 12 hours before calibration.
4 Wire kelvin connections were used for ohms measurements below 10kOhms
The instrument RS232/USB interface was used during calibration
PT100 resistance converted to temperature using BS1904 tables.
Tests marked # are not UKAS accredited but have been included for completeness.

Calibration Information

The instrument was calibrated against laboratory standards whose values are traceable to recognised National Standards. The uncertainty limits quoted refer to the measured values only, with no account being taken of the instruments ability to maintain its calibration.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrated By : M.A. Bailey

Date of Calibration : 26 February 2016

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

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UKAS Accredited Calibration Laboratory No. 0324
AFTER ADJUSTMENT RESULTS

Certificate Number
30377

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Test Title	Applied Value	Reading	Uncertainties
DC Voltage			
200mV Range	0.000 0mV	-0.0003mV	0.6uV
200mV Range	100.000 0mV	99.999 2mV	0.8uV
200mV Range	200.000 0mV	200.000 4mV	0.9uV
200mV Range	-100.0000mV	-99.9995mV	0.8uV
200mV Range	-200.0000mV	-200.0003mV	0.9uV
2V Range	0.220 000 0V	0.219 998 2V	0.9uV
2V Range	1.000 000 0V	0.999 998 8V	2.1uV
2V Range	2.000 000 0V	1.999 999 0V	7uV
2V Range	-0.2200000V	-0.2199997V	0.9uV
2V Range	-1.0000000V	-1.0000077V	2.1uV
2V Range	-2.0000000V	-2.0000028V	7uV
20V Range	2.200 000V	2.199 978V	7uV
20V Range	10.000 000V	9.999 949V	33uV
20V Range	20.000 000V	20.000 008V	66uV
20V Range	-2.200000V	-2.199995V	7uV
20V Range	-10.000000V	-9.999953V	33uV
20V Range	-20.000000V	-20.000015V	66uV
200V Range	100.000 00V	100.000 16V	330uV
200V Range	200.000 00V	200.000 48V	660uV
200V Range	-200.00000V	-200.00020V	660uV
200V Range	-100.00000V	-100.00017V	330uV
1kV Range	220.000 0V	219.998 3V	0.8mV
1kV Range	1 000.000 0V	999.999 5V	3.3mV
1kV Range	-1000.0000V	-999.9994V	3.3mV
1kV Range	-220.0000V	-220.0013V	0.8mV
AC Voltage Output Frequency Tests			
10kHz at 2V	10.000 0kHz	10.000 0kHz	0.01Hz
100kHz at 2V	100.000 0kHz	99.999 9kHz	0.1Hz
AC Voltage Measurements			
200mV A.C. : 10Hz	20.000mV	20.003mV	18uV
200mV A.C. : 206Hz	20.000mV	20.004mV	8uV
200mV A.C. : 1kHz	20.000mV	20.004mV	8uV
200mV A.C. : 500kHz #	20.000mV	19.955mV	140uV
200mV A.C. : 206Hz	50.000mV	50.011mV	8uV
200mV A.C. : 206Hz	100.000mV	100.018mV	8uV
200mV A.C. : 10Hz	200.000mV	200.018mV	18uV
200mV A.C. : 206Hz	200.000mV	200.005mV	8uV
200mV A.C. : 1kHz	200.000mV	200.003mV	8uV
200mV A.C. : 10kHz	200.000mV	200.001mV	140uV
200mV A.C. : 50kHz	200.000mV	200.022mV	140uV
200mV A.C. : 100kHz	200.000mV	200.044mV	140uV
200mV A.C. : 500kHz	200.000mV	200.237mV	140uV
2V Range : 10Hz	0.210 00V	0.209 96V	49uV
2V Range : 206Hz	0.210 00V	0.209 97V	49uV
2V Range : 1kHz	0.210 00V	0.209 96V	49uV
2V Range : 10kHz	0.210 00V	0.209 96V	49uV

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Test Title	Applied Value	Reading	Uncertainties
2V Range : 100kHz	0.210 00V	0.210 11V	49uV
2V Range : 500kHz #	0.210 00V	0.209 46V	49uV
2V Range : 206Hz	0.500 00V	0.500 08V	49uV
2V Range : 206Hz	1.000 00V	1.000 11V	49uV
2V Range : 10Hz	2.000 00V	1.999 94V	49uV
2V Range : 40Hz	2.000 00V	1.999 87V	49uV
2V Range : 206Hz	2.000 00V	2.000 01V	49uV
2V Range : 1kHz	2.000 00V	1.999 99V	49uV
2V Range : 2kHz	2.000 00V	2.000 00V	49uV
2V Range : 10kHz	2.000 00V	2.000 00V	49uV
2V Range : 20kHz	2.000 00V	2.000 00V	49uV
2V Range : 50kHz	2.000 00V	2.000 02V	49uV
2V Range : 100kHz	2.000 00V	2.000 18V	49uV
2V Range : 500kHz	2.000 00V	1.999 92V	49uV
2V Range : 750kHz	2.000 00V	2.000 01V	49uV
2V Range : 1MHz	2.000 00V	1.999 93V	49uV
20V Range : 10Hz	2.100 0V	2.099 9V	260uV
20V Range : 206Hz	2.100 0V	2.099 9V	260uV
20V Range : 1kHz	2.100 0V	2.099 9V	260uV
20V Range : 100kHz #	2.100 0V	2.102 6V	640uV
20V Range : 206Hz	10.000 0V	10.001 2V	260uV
20V Range : 10Hz	20.000 0V	20.000 3V	260uV
20V Range : 206Hz	20.000 0V	19.999 9V	260uV
20V Range : 1kHz	20.000 0V	19.999 7V	260uV
20V Range : 5kHz	20.000 0V	20.000 0V	260uV
20V Range : 10kHz	20.000 0V	20.000 1V	260uV
20V Range : 50kHz #	20.000 0V	19.999 2V	640uV
20V Range : 100kHz #	20.000 0V	20.000 3V	640uV
200V Range : 30Hz	21.000V	20.998V	2.6mV
200V Range : 206Hz	21.000V	20.999V	2.6mV
200V Range : 100kHz	21.000V	20.953V	2.6mV
200V Range : 206Hz	50.000V	50.008V	2.6mV
200V Range : 50kHz	50.000V	49.992V	2.6mV
200V Range : 100kHz	50.000V	49.981V	2.6mV
200V Range : 206Hz	100.000V	100.009V	2.6mV
200V Range : 20kHz	100.000V	100.024V	2.6mV
200V Range : 50kHz	100.000V	99.990V	2.6mV
200V Range : 100kHz	100.000V	100.005V	2.6mV
200V Range : 30Hz	200.000V	200.001V	2.6mV
200V Range : 40Hz	200.000V	200.000V	2.6mV
200V Range : 56Hz	200.000V	199.998V	2.6mV
200V Range : 206Hz	200.000V	199.998V	2.6mV
200V Range : 1kHz	200.000V	199.995V	2.6mV
200V Range : 10kHz	200.000V	199.994V	2.6mV
200V Range : 20kHz	200.000V	199.996V	2.6mV
200V Range : 40kHz	200.000V	199.994V	2.6mV
1kV Range : 30Hz	210.000V	209.979V	45mV
1kV Range : 206Hz	210.000V	209.989V	45mV
1kV Range : 1kHz	210.000V	210.008V	45mV
1kV Range : 20kHz	210.000V	210.040V	45mV

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1kV Range : 20kHz	300.000V	300.075V	45mV
1kV Range : 206Hz	500.000V	500.010V	45mV
1kV Range : 46Hz	750.000V	749.933V	45mV
1kV Range : 206Hz	750.000V	749.982V	45mV
1kV Range : 1kHz	750.000V	750.048V	45mV
1kV Range : 10kHz	750.000V	750.134V	45mV
1kV Range : 46Hz	1 000.000V	999.830V	45mV
1kV Range : 206Hz	1 000.000V	999.836V	45mV
1kV Range : 1kHz	1 000.000V	999.896V	45mV
Linearity - 20V DC Range			
Linearity	19.000 000V	19.000 000V	63uV
Linearity	18.000 000V	18.000 015V	60uV
Linearity	17.000 000V	17.000 010V	57uV
Linearity	16.000 000V	15.999 990V	53uV
Linearity	15.000 000V	15.000 020V	50uV
Linearity	14.000 000V	14.000 015V	47uV
Linearity	13.000 000V	13.000 010V	43uV
Linearity	12.000 000V	11.999 980V	40uV
Linearity	11.000 000V	11.000 015V	37uV
Linearity	9.000 000V	8.999 977V	30uV
Linearity	8.000 000V	7.999 965V	27uV
Linearity	7.000 000V	6.999 975V	24uV
Linearity	6.000 000V	5.999 968V	20uV
Linearity	5.000 000V	4.999 976V	17uV
Linearity	4.000 000V	3.999 970V	14uV
Linearity	3.000 000V	2.999 989V	10uV
Linearity	2.100 000V	2.100 007V	7uV
Linearity	-19.000000V	-18.999870V	63uV
Linearity	-18.000000V	-17.999920V	60uV
Linearity	-17.000000V	-16.999940V	57uV
Linearity	-16.000000V	-15.999950V	53uV
Linearity	-15.000000V	-14.999970V	50uV
Linearity	-14.000000V	-13.999940V	47uV
Linearity	-13.000000V	-12.999940V	43uV
Linearity	-12.000000V	-11.999950V	40uV
Linearity	-11.000000V	-10.999940V	37uV
Linearity	-9.000000V	-8.999971V	30uV
Linearity	-8.000000V	-7.999965V	27uV
Linearity	-7.000000V	-6.999983V	24uV
Linearity	-6.000000V	-5.999976V	20uV
Linearity	-5.000000V	-4.999995V	17uV
Linearity	-4.000000V	-3.999982V	14uV
Linearity	-3.000000V	-2.999994V	10uV
Linearity	-2.100000V	-2.099999V	7uV
DC CURRENT			
200uA Range	0.000 0uA	-0.0003uA	0.2nA
200uA Range	20.000 0uA	19.999 7uA	0.2nA
200uA Range	50.000 0uA	49.999 7uA	0.2nA
200uA Range	100.000 0uA	99.998 6uA	0.2nA
200uA Range	150.000 0uA	150.000 1uA	0.2nA
200uA Range	200.000 0uA	199.999 6uA	2.7nA

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200uA Range	-200.0000uA	-199.9990uA	2.7nA
2mA Range	0.210 000mA	0.209 997mA	2.7nA
2mA Range	0.500 000mA	0.499 997mA	2.7nA
2mA Range	1.000 000mA	0.999 993mA	2.7nA
2mA Range	1.500 000mA	1.499 996mA	34nA
2mA Range	2.000 000mA	1.999 998mA	34nA
2mA Range	-2.000000mA	-1.999987mA	34nA
20mA Range	5.000 00mA	4.999 99mA	34nA
20mA Range	10.000 00mA	9.999 94mA	34nA
20mA Range	15.000 00mA	14.999 98mA	380nA
20mA Range	20.000 00mA	19.999 96mA	380nA
20mA Range	-20.00000mA	-20.00000mA	380nA
200mA Range	50.000 0mA	49.999 3mA	380nA
200mA Range	100.000 0mA	99.998 2mA	380nA
200mA Range	150.000 0mA	149.999 8mA	8.7uA
200mA Range	200.000 0mA	200.000 2mA	8.7uA
200mA Range	-200.0000mA	-200.0004mA	8.7uA
2A Range	1.000 000A	1.000 010A	8.7uA
2A Range	2.000 000A	1.999 988A	96uA
2A Range	-1.000000A	-0.999996A	8.7uA
2A Range	-2.000000A	-1.999992A	96uA
30A Range	10.000 00A	9.999 42A	0.48mA
30A Range	20.000 00A	19.999 69A	0.68mA
30A Range	30.000 00A	30.001 99A	4.4mA
30A Range	-30.00000A	-30.00300A	4.4mA
30A Range	-20.00000A	-20.00026A	0.68mA
30A Range	-10.00000A	-9.99980A	0.48mA
AC CURRENT			
200uA Rng: 10Hz #	25.000uA	25.003uA	15nA
200uA Rng: 206Hz	25.000uA	25.003uA	15nA
200uA Rng: 1kHz#	25.000uA	24.992uA	49nA
200uA Rng: 10kHz#	25.000uA	25.046uA	49nA
200uA Rng: 30kHz#	25.000uA	24.533uA	49nA
200uA Rng: 10Hz#	200.000uA	200.002uA	260nA
200uA Rng: 40Hz	200.000uA	200.019uA	49nA
200uA Rng: 56Hz	200.000uA	200.017uA	49nA
200uA Rng: 1kHz	200.000uA	200.000uA	49nA
200uA Rng: 5kHz	200.000uA	200.089uA	49nA
200uA Rng: 10kHz#	200.000uA	200.133uA	247nA
200uA Rng: 20kHz#	200.000uA	200.014uA	247nA
200uA Rng: 30kHz#	200.000uA	200.034uA	247nA
2mA Rng: 40Hz	0.210 00mA	0.209 87mA	55nA
2mA Rng: 206Hz	0.210 00mA	0.209 87mA	55nA
2mA Rng: 1kHz#	0.210 00mA	0.209 89mA	0.19uA
2mA Rng: 10kHz#	0.210 00mA	0.209 92mA	0.19uA
2mA Rng: 30kHz#	0.210 00mA	0.210 32mA	0.19uA
2mA Rng: 10Hz#	2.000 00mA	2.000 01mA	2.6uA

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2mA Rng: 40Hz	2.000 00mA	1.999 98mA	400nA
2mA Rng: 56Hz	2.000 00mA	1.999 97mA	400nA
2mA Rng: 1kHz	2.000 00mA	1.999 84mA	400nA
2mA Rng: 5kHz#	2.000 00mA	2.000 09mA	1.8uA
2mA Rng: 10kHz#	2.000 00mA	2.000 74mA	1.8uA
2mA Rng: 20kHz#	2.000 00mA	1.998 73mA	1.8uA
2mA Rng: 30kHz#	2.000 00mA	1.999 97mA	1.8uA
20mA Rng: 40Hz	2.100 0mA	2.099 7mA	430nA
20mA Rng: 206Hz	2.100 0mA	2.100 2mA	430nA
20mA Rng: 1kHz#	2.100 0mA	2.100 0mA	1.9uA
20mA Rng: 10kHz#	2.100 0mA	2.101 1mA	1.9uA
20mA Rng: 30kHz#	2.100 0mA	2.104 3mA	1.9uA
20mA Rng: 10kHz#	5.000 0mA	5.002 3mA	1.9uA
20mA Rng: 30kHz#	5.000 0mA	5.006 1mA	1.9uA
20mA Rng: 10Hz#	20.000 0mA	20.001 5mA	26uA
20mA Rng: 40Hz	20.000 0mA	19.999 1mA	4uA
20mA Rng: 1kHz	20.000 0mA	19.995 0mA	4uA
20mA Rng: 10kHz#	20.000 0mA	20.003 1mA	18uA
20mA Rng: 20kHz#	20.000 0mA	20.000 2mA	18uA
20mA Rng: 30kHz#	20.000 0mA	20.001 0mA	18uA
200mA Rng: 40Hz	21.000mA	20.999mA	4.2uA
200mA Rng: 206Hz	21.000mA	21.001mA	4.2uA
200mA Rng: 1kHz #	21.000mA	21.001mA	19uA
200mA Rng: 10kHz #	21.000mA	21.009mA	19uA
200mA Rng: 30kHz #	21.000mA	21.121mA	19uA
200mA Rng: 10Hz#	200.000mA	200.001mA	260uA
200mA Rng: 40Hz	200.000mA	200.023mA	40uA
200mA Rng: 56Hz	200.000mA	200.006mA	40uA
200mA Rng: 1kHz	200.000mA	200.017mA	40uA
200mA Rng: 10kHz#	200.000mA	200.003mA	180uA
200mA Rng: 20kHz#	200.000mA	200.007mA	180uA
200mA Rng: 30kHz#	200.000mA	200.011mA	180uA
2A Rng: 40Hz	0.210 00A	0.209 96A	42uA
2A Rng: 206Hz	0.210 00A	0.209 95A	42uA
2A Rng: 1kHz#	0.210 00A	0.209 94A	0.19mA
2A Rng: 10kHz#	0.210 00A	0.209 95A	0.19mA
2A Rng: 30kHz#	0.210 00A	0.212 11A	0.19mA
2A Rng: 1kHz	1.000 00A	1.000 09A	0.5mA
2A Rng: 10kHz #	1.000 00A	0.998 18A	1.8mA
2A Rng: 30kHz #	1.000 00A	0.999 56A	1.8mA
2A Rng: 10Hz#	2.000 00A	1.999 96A	2.6mA
2A Rng: 40Hz	2.000 00A	2.000 03A	0.5mA
2A Rng: 56Hz	2.000 00A	2.000 00A	0.5mA
2A Rng: 1kHz	2.000 00A	1.999 91A	0.5mA
2A Rng: 10kHz #	2.000 00A	1.999 80A	1.8mA
30A Rng: 40Hz	2.100 00A	2.099 93A	530uA
30A Rng: 206Hz	2.100 00A	2.099 33A	530uA
30A Rng: 1kHz	2.100 00A	2.101 83A	530uA
30A Rng: 5kHz #	2.100 00A	2.104 46A	530uA

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30A Rng: 10kHz #	2.100 00A	2.101 75A	530uA
30A Rng: 10kHz #	10.000 00A	10.000 16A	530uA
30A Rng: 40Hz	20.000 00A	20.001 70A	5mA
30A Rng: 56Hz	20.000 00A	19.999 60A	5mA
30A Rng: 100Hz	20.000 00A	20.000 40A	5mA
30A Rng: 1kHz #	20.000 00A	19.988 50A	5mA
30A Rng: 5kHz #	20.000 00A	20.026 50A	5mA
30A Rng: 30Hz	30.000 00A	30.003 80A	13mA
30A Rng: 1kHz	30.000 00A	29.988 30A	13mA
30A Rng: 5kHz #	30.000 00A	30.048 00A	13mA

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Test Title	Applied Value	Reading	Uncertainties
2 Wire Resistance measured as value at terminals.			
ADJ 0.1 Ohms 2 Wire	0.297 0 Ω	0.296 2 Ω	0.01m Ω
0 Ω 2 Wire	0.205 0 Ω	0.204 6 Ω	0.8m Ω
0.1 Ω 2 Wire	0.297 0 Ω	0.299 8 Ω	0.8m Ω
1 Ω 2 Wire	1.287 0 Ω	1.290 8 Ω	0.8m Ω
10 Ω 2 Wire	10.214 Ω	10.217 Ω	1m Ω
100 Ω 2 Wire	100.261 Ω	100.262 Ω	1.3m Ω
1k Ω 2 Wire	1.000 246k Ω	1.000 246k Ω	3.8m Ω
10k Ω 2 Wire	10.000 62k Ω	10.000 61k Ω	21m Ω
100k Ω 2 Wire	99.992 7k Ω	99.992 4k Ω	620m Ω
1M Ω 2 Wire	1.000 033M Ω	1.000 035M Ω	14 Ω
10M Ω 2 Wire	10.000 52M Ω	10.000 01M Ω	150 Ω
100M Ω 2 Wire	99.967 0M Ω	99.958 0M Ω	4.5k Ω
1000M Ω 2 Wire	992.00M Ω	992.00M Ω	390k Ω
Simulated Ohms			
100 R Range	0.000 0 Ω	-0.0074 Ω	220u Ω
100 R Range	30.000 0 Ω	29.995 5 Ω	1m Ω
100 R Range	100.000 0 Ω	99.997 6 Ω	2m Ω
330 R Range	100.000 0 Ω	100.006 0 Ω	2m Ω
330 R Range	300.000 0 Ω	299.998 7 Ω	4.1m Ω
330 R Range	330.000 0 Ω	329.995 2 Ω	4.4m Ω
1k Ω Range	0.330 00k Ω	0.329 98k Ω	21m Ω
1k Ω Range	1.000 00k Ω	0.999 99k Ω	24m Ω
3.3k Ω Range	1.000 00k Ω	1.000 00k Ω	24m Ω
3.3k Ω Range	3.300 00k Ω	3.300 01k Ω	49m Ω
10k Ω Range	3.300 0k Ω	3.299 8k Ω	210m Ω
10k Ω Range	4.000 0k Ω	3.999 8k Ω	210m Ω
10k Ω Range	5.000 0k Ω	4.999 9k Ω	220m Ω
10k Ω Range	6.000 0k Ω	5.999 9k Ω	220m Ω
10k Ω Range	7.000 0k Ω	6.999 9k Ω	230m Ω
10k Ω Range	8.000 0k Ω	8.000 0k Ω	230m Ω
10k Ω Range	9.000 0k Ω	9.000 0k Ω	240m Ω
10k Ω Range	10.000 0k Ω	10.000 0k Ω	240m Ω
33k Ω Range	10.000 0k Ω	9.999 2k Ω	240m Ω
33k Ω Range	33.000 0k Ω	33.000 1k Ω	490m Ω
100k Ω Range	33.000k Ω	32.998k Ω	2.1 Ω
100k Ω Range	100.000k Ω	100.000k Ω	2.4 Ω
330k Ω Range	100.000k Ω	99.996k Ω	2.9 Ω
330k Ω Range	330.000k Ω	330.001k Ω	8.4 Ω
1M Ω Range	0.330 00M Ω	0.329 97M Ω	22 Ω
1M Ω Range	1.000 00M Ω	1.000 00M Ω	29 Ω
3.3M Ω Range	1.000 00M Ω	1.000 00M Ω	29 Ω
3.3M Ω Range	3.300 00M Ω	3.300 04M Ω	310 Ω
10M Ω Range	3.300 0M Ω	3.299 4M Ω	370 Ω
10M Ω Range	10.000 0M Ω	9.999 7M Ω	730 Ω
33M Ω Range	10.000 0M Ω	9.999 8M Ω	730 Ω
33M Ω Range	33.000 0M Ω	33.000 8M Ω	20k Ω
100M Ω Range	33.000 0M Ω	32.955 0M Ω	20k Ω
100M Ω Range	100.000 0M Ω	100.006 3M Ω	59k Ω
330M Ω Range	100.000 0M Ω	99.786 4M Ω	59k Ω
330M Ω Range	330.000 0M Ω	330.000 0M Ω	1.9M Ω
1G Ω Range	0.330 0G Ω	0.324 6G Ω	1.9M Ω
1G Ω Range	0.500 0G Ω	0.497 2G Ω	2.9M Ω

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1G Ω Range	1.000 0G Ω	1.004 2G Ω	5.8M Ω
4 Wire Ohms Measured relative to Zero			
4-Wire Lead Check	0.000 Ω	0.005 Ω	0.01m Ω
100m Ω 4 Wire	100.00m Ω	100.18m Ω	132u Ω
1 Ω 4 Wire	1.004 30 Ω	1.004 25 Ω	143u Ω
10 Ω 4 Wire	10.010 564 Ω	10.010 492 Ω	150u Ω
100 Ω 4 Wire	100.010 07 Ω	100.009 58 Ω	0.4m Ω
1k Ω 4 Wire	0.999 989 5k Ω	0.999 989 5k Ω	3m Ω
10k Ω 4 Wire	10.000 298k Ω	10.000 298k Ω	30m Ω
100k Ω 4 Wire	99.992 70k Ω	99.993 17k Ω	800m Ω
PT100 Resistance Option			
PT100 PRT Resistance	-99.840 $^{\circ}$ C	-99.842 $^{\circ}$ C	0.01 $^{\circ}$ C
PT100 PRT Resistance	0.169 $^{\circ}$ C	0.170 $^{\circ}$ C	0.01 $^{\circ}$ C
PT100 PRT Resistance	30.134 $^{\circ}$ C	30.135 $^{\circ}$ C	0.01 $^{\circ}$ C
PT100 PRT Resistance	60.079 $^{\circ}$ C	60.079 $^{\circ}$ C	0.01 $^{\circ}$ C
PT100 PRT Resistance	100.083 $^{\circ}$ C	100.084 $^{\circ}$ C	0.01 $^{\circ}$ C
PT100 PRT Resistance	200.090 $^{\circ}$ C	200.089 $^{\circ}$ C	0.01 $^{\circ}$ C
PT100 PRT Resistance	399.910 $^{\circ}$ C	399.913 $^{\circ}$ C	0.01 $^{\circ}$ C
PT100 PRT Resistance	799.260 $^{\circ}$ C	799.262 $^{\circ}$ C	0.01 $^{\circ}$ C
Capacitance @ 1kHz Measured Cp up to 1uF, Cs above			
1nF	0.985 6nF	0.990 4nF	2pF
2nF	1.971 8nF	1.977 2nF	12pF
5nF	4.894 0nF	4.893 5nF	28pF
10nF	10.003nF	10.002nF	35pF
100nF	99.80nF	99.73nF	60pF
1uF	0.995 0uF	0.995 1uF	0.52nF
10uF	10.251uF	10.260uF	6nF
Variable Capacitance			
10uF Rng #	0.950uF	0.950uF	15nF
10uF Rng #	5.000uF	5.009uF	15nF
10uF Rng #	9.500uF	9.512uF	15nF
100uF Rng #	10.000uF	9.991uF	85nF
100uF Rng #	50.000uF	50.040uF	85nF
100uF Rng #	95.000uF	95.050uF	85nF
1mF Rng #	0.100 0mF	0.100 0mF	85nF
1mF Rng #	0.500mF	0.501mF	1.5uF
1mF Rng #	0.950mF	0.951mF	3.3uF
10mF Rng #	1.000mF	1.000mF	3.5uF
10mF Rng #	5.000mF	5.005mF	10uF
10mF Rng #	9.500mF	9.488mF	36uF
100mF Rng #	10.000mF	10.001mF	36uF
100mF Rng #	40.000mF	40.220mF	360uF
A/D Input			
10V A/D Input	10.000 0V	9.999 9V	100uV
5V A/D Input	5.000 0V	4.999 9V	100uV
0V A/D Input	0.000V	0.000 0V	100uV
-5V A/D Input	-5.0000V	-5.000V	100uV
-10V A/D Input	-10.0000V	-10.0000V	100uV
1 ppm Frequency Option			
Frequency	10.000 000MHz	10.000 000MHz	2Hz
Frequency	1.000 000 0MHz	0.999 999 5MHz	0.2Hz
Frequency	100.000 00kHz	99.999 95kHz	0.02Hz

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Frequency	50.000 000kHz	49.999 974kHz	0.01Hz
Frequency	20.000 000kHz	19.999 990kHz	0.004Hz
Frequency	10.000 000kHz	9.999 995kHz	2mHz
Frequency	1.000 000 0kHz	0.999 999 4kHz	0.2mHz
Frequency	100.000 00Hz	99.999 95Hz	0.02mHz
Amplitude Output			
2mV/Div	12.000 0mV	12.002 3mV	1uV
5mV/Div	30.000 0mV	30.002 4mV	1uV
20mV/Div	120.000mV	120.000mV	1.3uV
50mV/Div	300.000mV	299.997mV	2.6uV
100mV/Div	600.000mV	599.998mV	5.1uV
200mV/Div	1.200 00V	1.200 01V	10uV
500mV/Div	3.000 00V	3.000 01V	12uV
1V/Div	6.000 00V	6.000 01V	20uV
2V/Div	12.000 00V	12.000 02V	38uV
5V/Div	30.000 0V	30.000 0V	100uV
10V/Div	60.000 0V	60.000 1V	200uV
20V/Div	120.000 0V	119.999 0V	400uV
50V/Div	300.000 0V	299.999 4V	400uV
Timebase Output			
20ns/Div	50.000 00MHz	50.000 01MHz	10Hz
50ns/Div	20.000 00MHz	20.000 00MHz	10Hz
100ns/Div	10.000 00MHz	9.999 98MHz	10Hz
200ns/Div	5.000 000MHz	4.999 993MHz	1Hz
500ns/Div	2.000 000MHz	1.999 997MHz	1Hz
1us/Div	1.000 000MHz	0.999 998MHz	1Hz
2us/Div	500.000 0kHz	499.999 2kHz	100mHz
5us/Div	200.000 0kHz	199.999 7kHz	100mHz
10us/Div	100.000 0kHz	99.999 8kHz	100mHz
20us/Div	50.000 00kHz	49.999 92kHz	10mHz
50us/Div	20.000 00kHz	19.999 97kHz	10mHz
100us/Div	10.000 00kHz	9.999 98kHz	10mHz
200us/Div	5.000 000kHz	4.999 992kHz	1mHz
500us/Div	2.000 000kHz	1.999 997kHz	1mHz
1ms/Div	1.000 000kHz	0.999 998kHz	1mHz
2ms/Div	500.000 0Hz	499.999 2Hz	100uHz
5ms/Div	200.000 0Hz	199.999 7Hz	100uHz
10ms/Div	100.000 0Hz	99.999 8Hz	100uHz
20ms/Div	50.000 00Hz	49.999 92Hz	10uHz
50ms/Div	20.000 00Hz	19.999 97Hz	10uHz
100ms/Div	10.000 00Hz	9.999 98Hz	10uHz
200ms/Div	5.000 00Hz	4.999 99Hz	10uHz
500ms/Div	2.000 00Hz	2.000 00Hz	1uHz
1s/Div	1.000 00Hz	1.000 00Hz	1uHz
6.4GHz Level output into 50Ω Load			
-50dB @ 10MHz #	-50.00dB	-49.52dB	0.3dB
-20dB @ 10MHz #	-20.00dB	-19.15dB	0.3dB
-3dB @ 10MHz #	-3.00dB	-2.19dB	0.3dB
0dB @ 10MHz #	0.00dB	0.85dB	0.3dB
5dB @ 10MHz #	5.00dB	5.82dB	0.3dB
-50dB @ 500MHz #	-50.00dB	-50.83dB	0.3dB

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-20dB @ 500MHz #	-20.00dB	-20.26dB	0.3dB
-3dB @ 500MHz #	-3.00dB	-3.32dB	0.3dB
0dB @ 500MHz #	0.00dB	-0.24dB	0.3dB
5dB @ 500MHz #	5.00dB	4.78dB	0.3dB
-50dB @ 1GHz #	-50.00dB	-51.16dB	0.3dB
-20dB @ 1GHz #	-20.00dB	-20.52dB	0.3dB
-3dB @ 1GHz #	-3.00dB	-3.54dB	0.3dB
0dB @ 1GHz #	0.00dB	-0.46dB	0.3dB
5dB @ 1GHz #	5.00dB	4.64dB	0.3dB
-50dB @ 3GHz #	-50.00dB	-51.06dB	0.3dB
-20dB @ 3GHz #	-20.00dB	-20.56dB	0.3dB
-3dB @ 3GHz #	-3.00dB	-3.55dB	0.3dB
0dB @ 3GHz #	0.00dB	-0.48dB	0.3dB

Power Option: AC Voltage Measurements (Current out = 3A)

20V Range : 56Hz	20.000V	19.999V	2.4mV
200V Range : 60Hz	50.000V	50.006V	6mV
200V Range : 60Hz	100.000V	100.006V	12mV
200V Range : 45Hz	200.000V	199.996V	24mV
200V Range : 60Hz	200.000V	199.998V	24mV
200V Range : 400Hz	200.000V	199.989V	24mV
1000V Range : 60Hz	500.000V	499.996V	105mV

Power Option: AC Current (Voltage out = 20V)

30A Rng: 56Hz	3.000 00A	2.999 59A	0.8mA
30A Rng: 56Hz	5.000 00A	5.001 84A	1.3mA
30A Rng: 45Hz	10.000 00A	10.006 23A	2.5mA
30A Rng: 56Hz	20.000 00A	20.002 40A	2.5mA
30A Rng: 400Hz	10.000 00A	9.997 41A	4.1mA
30A Rng: 56Hz	30.000 00A	30.017 07A	3.8mA
2A Rng: 56Hz	2.000 00A	2.000 12A	0.5mA
2A Rng: 56Hz	0.500 00A	0.500 07A	125uA
100mA Rng: 56Hz	100.000mA	99.997mA	10uA
100mA Rng: 56Hz	20.000mA	20.007mA	10uA
100mA Rng: 400Hz	100.000mA	99.962mA	10uA
10mA Rng: 56Hz	10.000 0mA	9.997 3mA	1uA
10mA Rng: 56Hz	2.000 0mA	2.000 1mA	1uA
10mA Rng: 400Hz	10.000 0mA	9.994 4mA	1uA
1mA Rng: 56Hz	1.000 00mA	0.999 78mA	100nA
1mA Rng: 56Hz	0.300 00mA	0.300 20mA	100nA
1mA Rng: 400Hz	1.000 00mA	0.999 56mA	100nA

DC Current output on Power (DC Voltage out = 20V)

30A Range / 20V DC	20.000 00A	20.000 38A	1mA
30A Range / 110V DC	20.000 00A	20.000 30A	1mA
30A Range / 220V DC	20.000 00A	20.000 09A	1mA
30A Range / 500V DC	20.000 00A	19.999 37A	1mA
30A Range / 1kV DC	20.000 00A	19.992 41A	1mA
30A Range / 20V DC	3.000 00A	3.002 05A	144uA
30A Range / 110V DC	3.000 00A	3.002 12A	144uA
30A Range / 220V DC	3.000 00A	3.002 04A	144uA
2A Range / 20V DC	2.000 00A	1.999 77A	96uA
2A Range / 110V DC	2.000 00A	1.999 75A	96uA
2A Range / 220V DC	2.000 00A	1.999 72A	96uA
2A Range / 500V DC	2.000 00A	1.999 59A	96uA

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2A Range / 20V DC	0.300 00A	0.299 89A	8.7uA
2A Range / 110V DC	0.300 00A	0.299 90A	8.7uA
2A Range / 220V DC	0.300 00A	0.299 89A	8.7uA
100mA Range / 20V DC	100.000mA	99.997mA	10uA
100mA Range/110V DC	100.000mA	99.998mA	10uA
100mA Range/220V DC	100.000mA	99.998mA	10uA
100mA Range/500V DC	100.000mA	99.997mA	10uA
10mA Range / 20V DC	10.000 0mA	10.000 9mA	100nA
10mA Range / 110V DC	10.000 0mA	10.000 9mA	100nA
10mA Range / 220V DC	10.000 0mA	10.000 9mA	100nA
10mA Range / 500V DC	10.000 0mA	10.000 8mA	100nA
1mA Range / 20V DC	1.000 00mA	1.000 00mA	10nA
1mA Range / 110V DC	1.000 00mA	1.000 00mA	10nA
1mA Range / 220V DC	1.000 00mA	0.999 99mA	10nA
1mA Range / 500V DC	1.000 00mA	0.999 98mA	10nA
DC Voltage output on Power (DC Current = 3Amp)			
20V Range DC	10.000 0V	9.999 9V	66uV
20V Range DC	20.000 0V	19.999 9V	66uV
200V Range DC	200.000V	200.000V	660uV
1000V Range DC	500.000V	500.000V	1.7mV
1000V Range DC	1 000.000V	999.999V	1.7mV
Phase Angle, Measured at 200V/5A 50Hz AC			
0° Phase Angle	0.00°	-0.05°	0.17°
60° Phase Angle	60.00°	59.95°	0.17°
90° Phase Angle	90.00°	89.96°	0.17°
Phase Angle Mains Volts			
0°:220V:10A: 50Hz	0.00°	-0.02°	0.17°
180°:220V:10A: 50Hz	180.00°	179.96°	0.17°
Phase Angle Full Range			
0°:20V:0.3A: 50Hz	0.00°	0.02°	0.17°
0°:20V:2A: 50Hz	0.00°	0.07°	0.17°
0°:220V:2A: 50Hz	0.00°	0.10°	0.17°
60°:220V:2A: 50Hz	60.00°	59.98°	0.17°
90°:220V:2A: 50Hz	90.00°	90.04°	0.17°
0°:220V:2A: 400Hz#	0.00°	-0.15°	0.2°
0°:220V:3A: 50Hz	0.00°	-0.04°	0.17°
90°:220V:20A: 50Hz	90.00°	90.01°	0.17°
0°:220V:5A: 400Hz#	0.00°	0.30°	0.2°

End of test results