CERTIFICATE OF CALIBRATION

Issued By Transmille Ltd. **Certificate Number** EXAMPLE

Date of Issue 09/12/2008

UKAS CALIBRATION
0324

Approved Signatory

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

EXAMPLE CERTIFICATE

☐ EXAMPLE ☒ EXAMPLE

Customer :

Date Received : EXAMPLE

Instrument :

System ID :	EXAMPLE
Description :	Multi Product Calibrator
Manufacturer :	Transmille
Model Number :	3010
Serial Number :	EXAMPLE
Procedure Version :	4.3/V104/N

Environmental Conditions

Temperature :	20°C +/- 1°C	Mains Voltage :	240V +/- 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 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 : EXAMPLE **Date of Calibration :** EXAMPLE

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AFTER ADJUSTMENT RESULTS

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Test Title	Applied Value	Reading	Uncertainties
DC Voltage			
200mV Range	0.000 0mV	-0.0009mV	0.6uV
200mV Range	100.000 0mV	99.999 3mV	0.8uV
200mV Range	200.000 0mV	199.999 4mV	0.9uV
200mV Range	-100.0000mV	-100.0006mV	0.8uV
200mV Range	-200.0000mV	-200.0006mV	0.9uV
2V Range	0.220 000 0V	0.219 997 8V	0.9uV
2V Range	1.000 000 0V	0.999 995 3V	2.1uV
2V Range	2.000 000 0V	1.999 998 2V	7uV
2V Range	-0.2200000V	-0.2199994V	0.9uV
2V Range	-1.0000000V	-0.9999977V	2.1uV
2V Range	-2.0000000V	-1.9999973V	7uV
20V Range	2.200 000V	2.199 997V	7uV
20V Range	10.000 000V	10.000 006V	33uV
20V Range	20.000 000V	20.000 010V	66uV
20V Range	-2.200000V	-2.199989V	7uV
20V Range	-10.000000V	-10.000011V	33uV
20V Range	-20.000000V	-19.999988V	66uV
200V Range	100.000 00V	99.999 54V	330uV
200V Range	200.000 00V	199.999 19V	660uV
200V Range	-200.00000V	-199.99980V	660uV
200V Range	-100.00000V	-100.00013V	330uV
1kV Range	220.000 0V	219.999 5V	0.8mV
1kV Range	1 000.000 0V	999.999 7V	3.3mV
1kV Range	-1000.0000V	-999.9998V	3.3mV
1kV Range	-220.0000V	-220.0011V	0.8mV
AC Voltage Output Frequency Tests			
10kHz at 2V	10.000 0kHz	10.000 0kHz	0.01Hz
100kHz at 2V	100.000 0kHz	100.000 0kHz	0.1Hz
AC Voltage Measurements			
200mV A.C. : 40Hz	20.000mV	20.002mV	18uV
200mV A.C. : 10Hz#	200.000mV	200.002mV	60uV
200mV A.C. : 40Hz	200.000mV	199.987mV	34uV
200mV A.C. : 56Hz	200.000mV	199.998mV	34uV
200mV A.C. : 206Hz	200.000mV	200.001mV	34uV
200mV A.C. : 1kHz	200.000mV	200.007mV	46uV
200mV A.C. : 10kHz	200.000mV	200.000mV	46uV
200mV A.C. : 20kHz	200.000mV	199.999mV	70uV
200mV A.C. : 100kHz#	200.000mV	200.004mV	600uV
200mV A.C. : 500kHz#	200.000mV	200.003mV	600uV
2V Range : 40Hz	0.210 00V	0.209 98V	49uV
2V Range : 206Hz	0.210 00V	0.210 00V	49uV
2V Range : 500kHz #	0.210 00V	0.210 93V	580uV
2V Range. : 206Hz	1.000 00V	1.000 02V	120uV
2V Range : 10Hz#	2.000 00V	2.000 00V	600uV
2V Range : 40Hz	2.000 00V	1.999 87V	240uV
2V Range : 56Hz	2.000 00V	1.999 95V	240uV

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Test Title	Applied Value	Reading	Uncertainties
2V Range : 206Hz	2.000 00V	1.999 95V	240uV
2V Range: 1kHz	2.000 00V	1.999 97V	240uV
2V Range : 5kHz	2.000 00V	2.000 04V	400uV
2V Range : 10kHz	2.000 00V	2.000 01V	400uV
2V Range : 20kHz	2.000 00V	1.999 97V	400uV
2V Range : 50kHz	2.000 00V	1.999 95V	400uV
2V Range : 100kHz#	2.000 00V	2.000 03V	610uV
2V Range : 500kHz#	2.000 00V	2.000 14V	4.8mV
20V Range : 40Hz	2.100 0V	2.100 0V	260uV
20V Range : 206Hz	2.100 0V	2.100 2V	260uV
20V Range : 100kHz #	2.100 0V	2.101 2V	640uV
20V Range : 206Hz	10.000 0V	9.999 2V	1.2mV
20V Range : 10Hz#	20.000 0V	19.999 9V	4.2mV
20V Range : 40Hz	20.000 0V	19.999 2V	2.4mV
20V Range : 56Hz	20.000 0V	20.000 2V	2.4mV
20V Range : 206Hz	20.000 0V	20.000 2V	2.4mV
20V Range : 1kHz	20.000 0V	20.000 4V	2.4mV
20V Range : 5kHz	20.000 0V	20.000 2V	4mV
20V Range : 10kHz	20.000 0V	19.999 6V	4mV
20V Range : 20kHz	20.000 0V	19.999 9V	4mV
20V Range : 100kHz #	20.000 0V	19.998 6V	6mV
200V Range : 40Hz	21.000V	20.996V	2.6mV
200V Range : 206Hz	21.000V	20.998V	2.6mV
200V Range : 20kHz	21.000V	21.010V	4.2mV
200V Range : 206Hz	100.000V	100.009V	12mV
200V Range : 30Hz#	200.000V	199.999V	42mV
200V Range : 40Hz	200.000V	199.990V	24mV
200V Range : 56Hz	200.000V	200.002V	24mV
200V Range : 206Hz	200.000V	200.001V	24mV
200V Range : 1000Hz	200.000V	200.003V	24mV
200V Range : 10kHz	200.000V	200.007V	40mV
200V Range : 20kHz	200.000V	199.995V	40mV
1kV Range : 40Hz	210.000V	209.969V	45mV
1kV Range : 206Hz	210.000V	209.982V	45mV
1kV Range : 10kHz	210.000V	210.000V	45mV
1kV Range : 30Hz#	700.000V	699.972V	230mV
1kV Range : 40Hz	700.000V	699.933V	91mV
1kV Range : 56Hz	700.000V	699.974V	91mV
1kV Range : 1kHz	700.000V	700.014V	91mV
1kV Range : 5kHz	700.000V	699.985V	148mV
1kV Range : 10kHz	700.000V	699.984V	148mV
1kV Range : 56Hz	1 000.000V	1 000.068V	130mV
Linearity - 20V DC Range			
Linearity	19.000 000V	19.000 033V	63uV
Linearity	18.000 000V	18.000 019V	60uV
Linearity	17.000 000V	17.000 044V	57uV
Linearity	16.000 000V	16.000 058V	53uV
Linearity	15.000 000V	15.000 072V	50uV
Linearity	14.000 000V	14.000 038V	47uV

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Test Title	Applied Value	Reading	Uncertainties
Linearity	13.000 000V	13.000 030V	43uV
Linearity	12.000 000V	12.000 047V	40uV
Linearity	11.000 000V	11.000 012V	37uV
Linearity	9.000 000V	9.000 022V	30uV
Linearity	8.000 000V	8.000 021V	27uV
Linearity	7.000 000V	7.000 025V	24uV
Linearity	6.000 000V	6.000 013V	20uV
Linearity	5.000 000V	5.000 015V	17uV
Linearity	4.000 000V	4.000 009V	14uV
Linearity	3.000 000V	3.000 006V	10uV
Linearity	2.100 000V	2.100 007V	7uV
Linearity	-19.000000V	-18.999985V	63uV
Linearity	-18.000000V	-18.000010V	60uV
Linearity	-17.000000V	-17.000055V	57uV
Linearity	-16.000000V	-16.000040V	53uV
Linearity	-15.000000V	-15.000050V	50uV
Linearity	-14.000000V	-14.000057V	47uV
Linearity	-13.000000V	-13.000050V	43uV
Linearity	-12.000000V	-12.000024V	40uV
Linearity	-11.000000V	-11.000031V	37uV
Linearity	-9.000000V	-9.000042V	30uV
Linearity	-8.000000V	-8.000035V	27uV
Linearity	-7.000000V	-7.000038V	24uV
Linearity	-6.000000V	-6.000032V	20uV
Linearity	-5.000000V	-5.000029V	17uV
Linearity	-4.000000V	-4.000022V	14uV
Linearity	-3.000000V	-3.000018V	10uV
Linearity	-2.100000V	-2.100016V	7uV
DC CURRENT			
200uA Range	0.000 0uA	-0.0004uA	0.2nA
200uA Range	100.000 0uA	99.999 5uA	0.2nA
200uA Range	200.000 0uA	199.999 3uA	2.7nA
200uA Range	-100.0000uA	-99.9991uA	0.2nA
200uA Range	-200.0000uA	-199.9997uA	2.7nA
2mA Range	0.210 000mA	0.209 997mA	2.7nA
2mA Range	1.000 000mA	0.999 997mA	2.7nA
2mA Range	2.000 000mA	2.000 015mA	34nA
2mA Range	-1.000000mA	-0.999995mA	2.7nA
2mA Range	-2.000000mA	-2.000007mA	34nA
20mA Range	5.000 00mA	5.000 01mA	34nA
20mA Range	10.000 00mA	10.000 02mA	34nA
20mA Range	15.000 00mA	15.000 02mA	380nA
20mA Range	20.000 00mA	20.000 03mA	380nA
20mA Range	-5.00000mA	-4.99995mA	34nA
20mA Range	-10.00000mA	-9.99999mA	34nA
20mA Range	-15.00000mA	-15.00000mA	380nA
20mA Range	-20.00000mA	-20.00002mA	380nA
200mA Range	100.000 0mA	99.999 3mA	380nA
200mA Range	200.000 0mA	199.998 3mA	8.7uA

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Test Title	Applied Value	Reading	Uncertainties
200mA Range	-100.0000mA	-99.9995mA	380nA
200mA Range	-200.0000mA	-199.9999mA	8.7uA
2A Range	1.000 000A	0.999 985A	8.7uA
2A Range	2.000 000A	1.999 997A	96uA
2A Range	-1.000000A	-0.999976A	8.7uA
2A Range	-2.000000A	-2.000002A	96uA
30A Range	10.000 00A	10.001 20A	0.48mA
30A Range	20.000 00A	20.000 28A	0.68mA
30A Range #	30.000 00A	30.003 51A	1.5mA
30A Range #	-30.00000A	-29.99763A	1.5mA
30A Range	-20.00000A	-20.00049A	0.68mA
30A Range	-10.00000A	-10.00111A	0.48mA
AC CURRENT			
200uA Rng: 40Hz	20.000uA	20.011uA	15nA
200uA Rng: 206Hz	20.000uA	20.012uA	15nA
200uA Rng: 10kHz#	20.000uA	19.998uA	49nA
200uA Rng: 10Hz#	200.000uA	200.002uA	260nA
200uA Rng: 40Hz	200.000uA	200.030uA	49nA
200uA Rng: 56Hz	200.000uA	200.027uA	49nA
200uA Rng: 1kHz	200.000uA	200.019uA	49nA
200uA Rng: 10kHz#	200.000uA	200.002uA	247nA
2mA Rng: 40Hz	0.210 00mA	0.210 00mA	55nA
2mA Rng: 206Hz	0.210 00mA	0.210 00mA	55nA
2mA Rng: 10kHz#	0.210 00mA	0.209 91mA	0.19uA
2mA Rng: 10Hz#	2.000 00mA	2.000 03mA	2.6uA
2mA Rng: 40Hz	2.000 00mA	2.000 16mA	400nA
2mA Rng: 56Hz	2.000 00mA	2.000 10mA	400nA
2mA Rng: 1kHz	2.000 00mA	2.000 27mA	400nA
2mA Rng: 10kHz#	2.000 00mA	1.999 00mA	1.8uA
20mA Rng: 40Hz	2.100 0mA	2.100 1mA	430nA
20mA Rng: 206Hz	2.100 0mA	2.100 1mA	430nA
20mA Rng: 10kHz#	2.100 0mA	2.099 3mA	1.9uA
20mA Rng: 56Hz	10.000 0mA	10.002 8mA	2uA
20mA Rng: 10Hz#	20.000 0mA	20.000 2mA	26uA
20mA Rng: 40Hz	20.000 0mA	20.001 2mA	4uA
20mA Rng: 1kHz	20.000 0mA	20.000 0mA	4uA
20mA Rng: 10kHz#	20.000 0mA	20.000 2mA	18uA
200mA Rng: 40Hz	21.000mA	21.002mA	4.2uA
200mA Rng: 206Hz	21.000mA	21.002mA	4.2uA
200mA Rng: 10kHz #	21.000mA	20.982mA	19uA
200mA Rng: 10Hz#	200.000mA	199.996mA	260uA
200mA Rng: 40Hz	200.000mA	200.016mA	40uA
200mA Rng: 56Hz	200.000mA	200.009mA	40uA
200mA Rng: 1kHz	200.000mA	199.998mA	40uA
200mA Rng: 10kHz#	200.000mA	199.999mA	180uA
2A Rng: 40Hz	0.210 00A	0.209 97A	42uA
2A Rng: 206Hz	0.210 00A	0.210 00A	42uA

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2A Rng: 5kHz#	0.210 00A	0.210 04A	0.19mA
2A Rng: 10Hz#	2.000 00A	2.000 07A	2.6mA
2A Rng: 40Hz	2.000 00A	1.999 98A	0.5mA
2A Rng: 56Hz	2.000 00A	2.000 15A	0.5mA
2A Rng: 1kHz	2.000 00A	2.000 10A	0.5mA
2A Rng: 5kHz #	2.000 00A	2.000 00A	1.8mA
30A Rng: 40Hz	2.100 00A	2.098 31A	530uA
30A Rng: 206Hz	2.100 00A	2.100 09A	530uA
30A Rng: 40Hz	20.000 00A	19.994 02A	5mA
30A Rng: 56Hz	20.000 00A	19.994 50A	5mA
30A Rng: 100Hz	20.000 00A	19.994 74A	5mA
30A Rng: 1kHz #	20.000 00A	19.990 65A	5mA
30A Rng: 56Hz#	30.000 00A	29.987 33A	8mA

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Test Title	Applied Value	Reading	Uncertainties
2 Wire Resistance measured as value at terminals.			
0Ω 2 Wire	0.156 0Ω	0.156 6Ω	0.8mΩ
0.1Ω 2 Wire	0.261 0Ω	0.261 6Ω	0.8mΩ
1Ω 2 Wire	1.256 0Ω	1.256 2Ω	0.8mΩ
10Ω 2 Wire	10.170Ω	10.170Ω	1mΩ
100Ω 2 Wire	100.163Ω	100.163Ω	1.3mΩ
1kΩ 2 Wire	1.000 175kΩ	1.000 174kΩ	3.8mΩ
10kΩ 2 Wire	10.000 53kΩ	10.000 54kΩ	21mΩ
100kΩ 2 Wire	100.000 0kΩ	99.999 7kΩ	620mΩ
1MΩ 2 Wire	1.000 000MΩ	0.999 994MΩ	14Ω
10MΩ 2 Wire	9.999 14MΩ	9.999 15MΩ	150Ω
100MΩ 2 Wire	100.265 0MΩ	100.264 9MΩ	4.5kΩ
1000MΩ 2 Wire	997.39MΩ	997.57MΩ	390kΩ
4 Wire Ohms Measured relative to Zero			
100mΩ 4 Wire	100.00mΩ	100.12mΩ	132uΩ
1Ω 4 Wire	1.000 00Ω	0.999 89Ω	143uΩ
10Ω 4 Wire	10.002 043Ω	10.002 064Ω	150uΩ
100Ω 4 Wire	100.000 00Ω	100.000 78Ω	0.4mΩ
1kΩ 4 Wire	1.000 007 7kΩ	1.000 007 7kΩ	3mΩ
10kΩ 4 Wire	10.000 361kΩ	10.000 361kΩ	12mΩ
100kΩ 4 Wire	100.000 00kΩ	99.999 05kΩ	800mΩ
Capacitance @ 1kHz Measured Cp up to 1uF, Cs above			
1nF	1.059 4nF	1.059 3nF	2pF
10nF	9.998nF	9.998nF	12pF
20nF	19.731nF	19.731nF	28pF
50nF	51.060nF	51.060nF	35pF
100nF	100.35nF	100.34nF	60pF
1uF	0.988 2uF	0.988 2uF	0.52nF
10uF	10.246uF	10.246uF	6nF
Reference Frequency Output			
Frequency	10.000 000MHz	9.999 983MHz	2Hz
Frequency	1.000 000 0MHz	0.999 999 5MHz	0.2Hz
Frequency	100.000 00kHz	99.999 95kHz	0.02Hz
Frequency	50.000 000kHz	49.999 976kHz	0.01Hz
Frequency	20.000 000kHz	19.999 992kHz	0.004Hz
Frequency	10.000 000kHz	9.999 995kHz	2mHz
Frequency	1.000 000 0kHz	0.999 999 5kHz	0.2mHz
Frequency	100.000 00Hz	99.999 98Hz	0.02mHz

End of test results