TRANSMILLE :: THE CALIBRATION SPECIALISTS

Transmille has over a decade's experience in calibration and instrumentation design & manufacture. Our products are in use throughout the world in both commercial and military laboratories, service centers and production facilities. Our reputation for innovation, reliability & value is second to none with complete solutions including instrumentation, software, support & training.

UKAS calibration is available for all Transmille products as a optional service.

UKAS CALIBRATION 0324

ORDERING INFORMATION

FUNCTION COMPARISON

FUNCTION	MODEL	
	8081	8071
AC / DC VOLTAGE	x	x
DC CURRENT (0.01pA to 30A) / AC CURRENT (0.1nA to 30A)	x	
DC CURRENT (100pA to 30A) / AC CURRENT (1nA to 30A)		x
RESISTANCE (0.01uOhm to 1 TOhm)	x	
RESISTANCE (1 uOhm to 10 MOhm)		x
FREQUENCY (1Hz to 1MHz)	x	x
TEMPERATURE (PRT / THERMOCOUPLE)	x	
PRESSURE MEASUREMENT	x	
HIGH CURRENT SHUNT MEASUREMENT	x	

GENERAL

DIMENSIONS	Width 45cm : Length 44cm : Height 10cm
WEIGHT	6kg
POWER	110 / 230V : 50/60Hz : 30W
INTERFACES	RS232 • GPIB • USB • LAN
OPERATING TEMPERATURE	0.5°C to 50°C
STORAGE TEMPERATURE	-5°C to 60°C
WARRANTY	1 Year : 3 Year Extended Care Plan Available

ORDER DETAILS

MODEL 8081	8½ DIGIT PRECISION MULTIMETER (4PPM)
CAL8081	UKAS CALIBRATION CERTIFICATE
MODEL 8071	7½ DIGIT PRECISION MULTIMETER (9PPM)
CAL8071	UKAS CALIBRATION CERTIFICATE
MODEL 8500	10 CHANNEL LOW THERMAL SCANNER
8081DC / 8071DC	DC ONLY OPTION (OTHER USER SPECIFIED METERS AVAILABLE)
8000LEAD	8000 SERIES MULTIMETER ANALOGUE LEAD SET
8500LEAD	8500 SERIES SCANNER LOW THERMAL LEAD SET
8000CARE3	3 YEAR CARE PLAN (WITH ANNUAL UKAS CERTIFICATION)
TPA001 TO TPA018	8000 SERIES PRESSURE MEASUREMENT MODULES (SEE WEBSITE FOR LIST)
8000PRT	PLATINUM RESISTANCE THERMOMETER
8000SPRT	STANDARD PLATINUM RESISTANCE THERMOMETER
8000SCASE	SOFT CARRY CASE
8000TCASE	HARD TRANSIT CASE

SOFTWARE

AUTOMATE CALIBRATION WITH PROCAL SOFTWARE - SEE SOFTWARE BROCHURE FOR FULL DETAILS

PROGRAPH	MEASUREMENT ANALYSIS SOFTWARE
PC-SU	PROCAL PROFESSIONAL CALIBRATION SOFTWARE
PROSITE	ON-SITE DATABASE MANAGEMENT SOFTWARE FOR PROCAL
PROWEB	WEB SERVICE DATA EXPORTER FOR PROCAL
PCT-SU	PROCAL-TRACK LABORATORY MANAGEMENT SOFTWARE

EVALUATION VERSIONS OF ALL SOFTWARE PACKAGES ARE AVAILABLE FROM www.transmille.com

TRANSMILLE SOLUTIONS IN CALIBRATION

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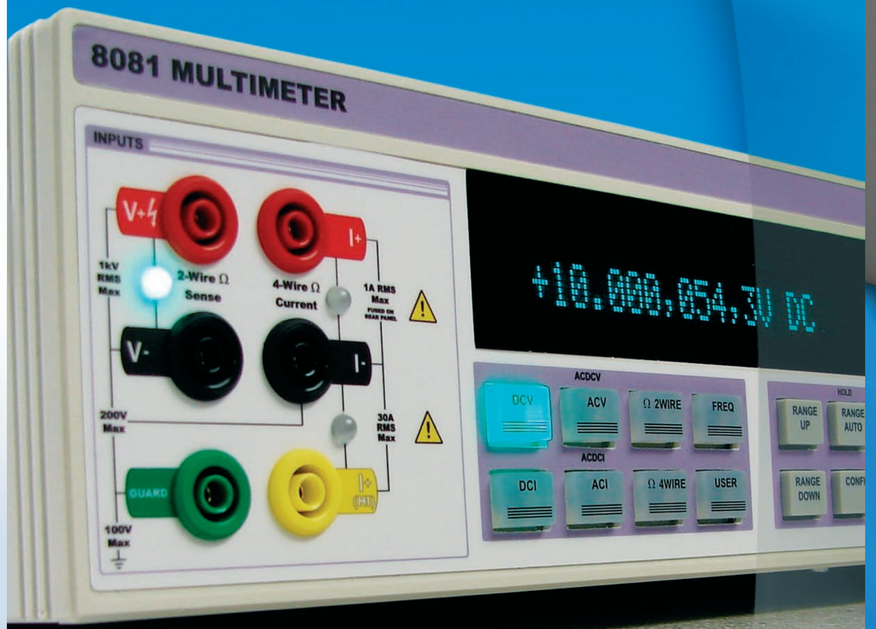
AGENT

VERSATILE PRECISION



8000 SERIES

PRECISION DIGITAL MULTIMETERS

TRANSMILLE SOLUTIONS IN CALIBRATION

THE VERSATILE PRECISION MULTIMETER

8000 SERIES

TRANSMILLE SOLUTIONS IN CALIBRATION

SUPERIOR DC PERFORMANCE

SUPERIOR AC STABILITY

HIGH RESISTANCE MEASUREMENT

FOLD OUT FOR OVERVIEW

VERSATILE PRECISION

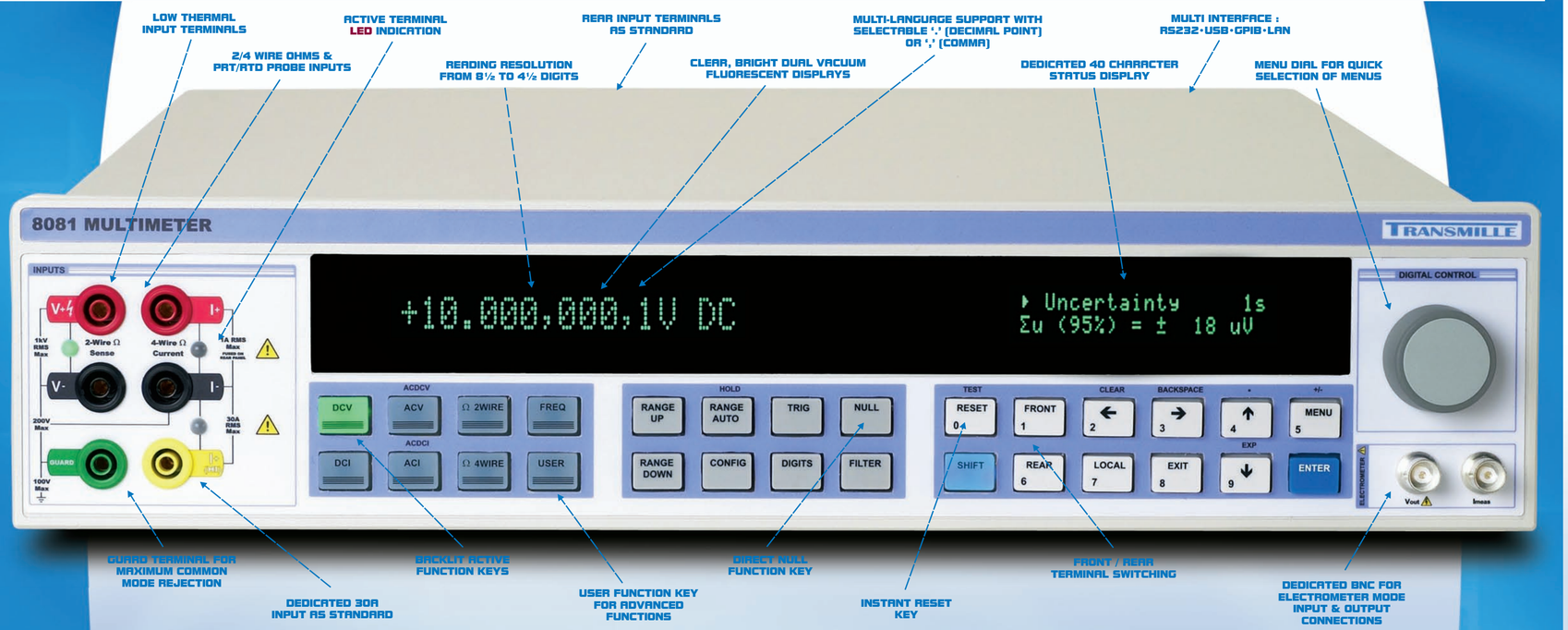
Transmille has been at the forefront of innovative precision metrology products and software for over a decade. Our extensive range provides state of the art, cost effective calibration solutions from precision laboratory instrumentation to production line test systems.

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2008

Internationally, our products are found in all areas of industry, military, aerospace, oil and gas, national laboratories as well as advanced production automated test equipment (ATE) stations, providing reliable, accurate calibration. The technical innovation and commercial success of our products has recently resulted in a coveted Queen's Award for Innovation - a testament to our position as a major force in metrology.

THE VERSATILE PRECISION MULTIMETER

8000 SERIES



DC VOLTAGE

Model 8081
- 5 Ranges
- 1nV to 1050V
- 8½ to 4½ Digit resolution
- Maximum sensitivity : 1nV
- Reading rate 0.12s to 8s
- 0.9 ppm 24 hour stability
- 4 ppm / year accuracy

Model 8071
- 5 Ranges
- 100nV to 1050V
- 7½ to 4½ Digit resolution
- Maximum sensitivity 100nV
- Reading rate 0.12s to 2s
- 2 ppm 24 hour stability
- 9 ppm / year voltage

DC RESISTANCE

Model 8081
- 9 Ranges
- 10 nOhm to 1 TOhm
- 8½ to 4½ Digit resolution
- 2-Wire and 4-Wire ohms
- Offset compensation
- Reading rate 0.12s to 8s
- 1 ppm 24 hour stability
- 8 ppm / year accuracy

Model 8071
- 7 Ranges
- 10 uOhms to 10 MOhm
- 7½ to 4½ Digit resolution
- 2-Wire and 4-Wire ohms
- Offset compensation
- Reading rate 0.12s to 2s
- 2.3 ppm 24 hour stability
- 20 ppm / year accuracy

AC VOLTAGE

Model 8081
- 5 Ranges
- 0.1uV to 1000V
- 6½ to 4½ Digit resolution
- 10Hz to 1MHz Bandwidth
- AC/DC Coupled Mode
- Analogue RMS converter
- 150 ppm / year accuracy

Model 8071
- 5 Ranges
- 1uV to 1000V
- 5½ to 4½ Digit resolution
- 10Hz to 100kHz Bandwidth
- Analogue RMS converter
- 500 ppm / year accuracy

DC CURRENT

Model 8081
- 11 Ranges
- 0.1pA to 30A
- 7½ to 4½ Digit resolution
- Max. sensitivity 0.1pA
- Reading rate 0.12s to 2s
- 5 ppm 24 hour stability
- 7 ppm / year accuracy

Model 8071
- 6 Ranges
- 100pA to 30A
- 6½ to 4½ Digit resolution
- Max. sensitivity 100pA
- Reading rate 0.12s to 0.5s
- 14 ppm 24 hour stability
- 25 ppm / year accuracy

AC CURRENT

Model 8081
- 7 Ranges
- 0.1nA to 30A
- 6½ to 4½ Digit resolution
- 10Hz to 10kHz bandwidth
- AC/DC Coupled Mode
- 200 ppm 24 hour stability
- 300 ppm / year accuracy

Model 8071
- 7 Ranges
- 10nA to 30A
- 5½ to 4½ Digit resolution
- 10Hz to 10kHz bandwidth
- 300 ppm 24 hour stability
- 800 ppm / year accuracy

FREQUENCY

- Frequency : 1Hz to 1MHz
- 7½ to 4½ Digit resolution
- 5 ppm accuracy

TEMPERATURE (8081)

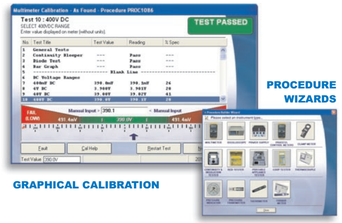
- PRT & Thermocouple
- 8½ to 4½ Digit resolution
- 2-Wire and 4-Wire modes
- ITS-90 Linearisation
- Co-efficient Linearisation

PRESSURE (8081)

- 25 pressure modules
- 25mBar to 100Bar
- 0.04% best accuracy

PROCAL : MULTI DISCIPLINE CALIBRATION SOFTWARE

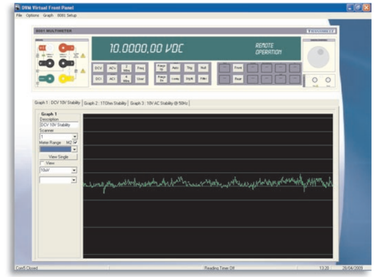
- > UNIVERSAL CALIBRATION SOFTWARE
- > FAST PROCEDURE CREATION - PROCEDURE WIZARDS
- > CREATE & PRINT CERTIFICATES ON PLAIN PAPER
- > M3003 / GUM UNCERTAINTIES
- > SUPPORTS CRYSTAL REPORTS
- > CALIBRATION PRICING SUPPORT

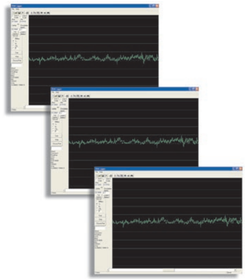


PROCAL PROGRAM SUITE

PROGRAPH : MEASUREMENT ANALYSIS SOFTWARE

- > BUILT-IN DMM VIRTUAL FRONT PANEL
- > SCANNER CONTROL CONFIGURATION BUILT-IN
- > DATA ANALYSIS / TREND ANALYSIS
- > SIMULTANEOUS GRAPHICAL DISPLAY OF UP TO 10 CHANNELS
- > DATA EXPORT FOR USE WITH MICROSOFT® EXCEL©
- > IDEAL FOR TREND ANALYSIS

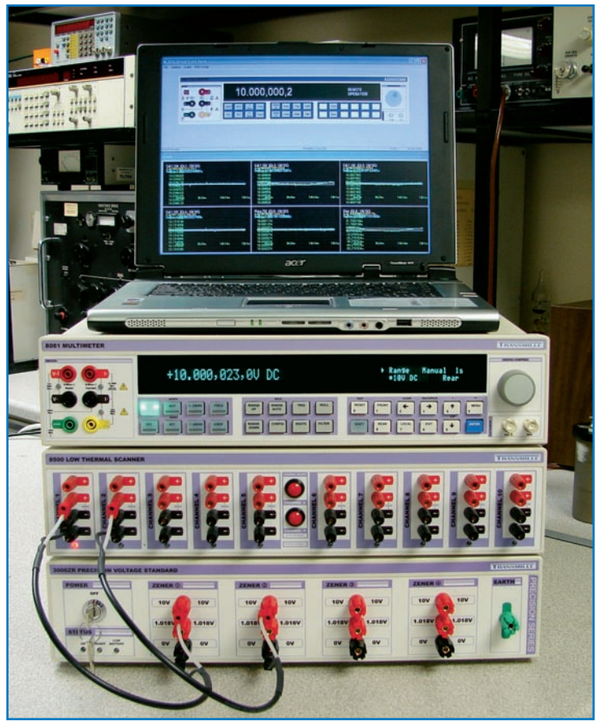




8000 SERIES

THE VERSATILE PRECISION MULTIMETER

10 CHANNEL LOW THERMAL SCANNER (OPTION)



Automation of measurements with the addition of the 10-channel scanner greatly increases the versatility of the 8000 series, and allows a complete measurement system to be easily realised. The scanner together with the ProGraph software for PC makes an ideal combination for evaluating stability of measurements.

Each channel provides very low thermal 4 terminal switching making it ideal for 4 wire resistance measurements in resistance thermometry and for resistance comparisons.

The use of 4mm terminals make connecting the scanner to UUT's easy, allowing the measurement system to be quickly re-configured. With the output from the scanner located on the rear panel connections can be routed efficiently to the rear panel terminals of the 8000 series DMM providing a neat and simple cabling solution.

Applications include scanning of both electronic and standard reference cells, standard resistance comparisons measurements and PRT probe measurements. Special care has taken in the scanner designed to minimize thermal generated EMF voltages. By reducing internal self heating to almost zero by using a very low power circuit, even the power supply is external, using latching relays which only need a single pulse of power to set and using gold plated de-oxygenated copper terminals thermal voltages have been reduced to less than 150nV.

Control is from the Serial RS232 interface or via the front panel control buttons. LED indicator shows the selected channel. The internal firmware ensures that two channels can never be selected at the same and that the switching is break before make.

SPECIFICATIONS

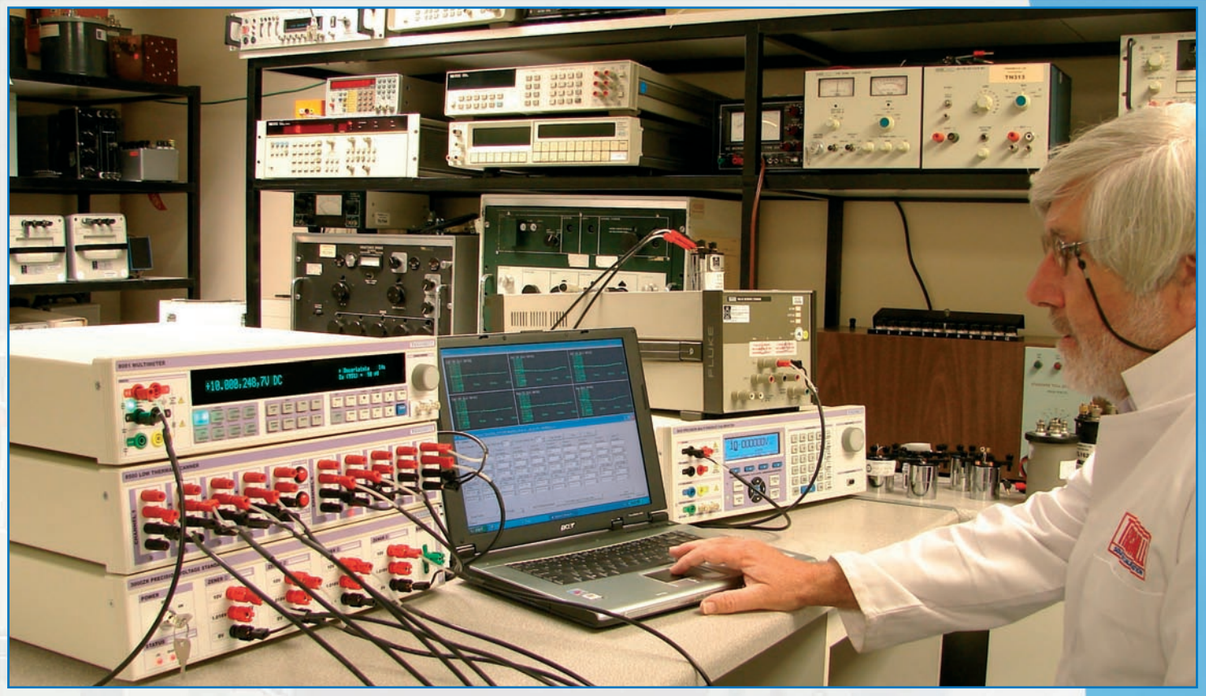
Number of channels	:	10
Switching	:	4 Contact Kelvin switching : 2 Voltage : 2 Current
Maximum Voltage	:	200V
Maximum Current	:	1A
Connection	:	Front panel inputs 4mm terminal low thermal gold on copper
Thermal EMF	:	Typically less than 80nV
Switch Resistance	:	Less than 0.2 ohms
Relay Type	:	Latching
Interface	:	Serial RS232 or LAN (Ethernet)

Built-In Measurement Parameters

Internal Temperature	:	5°C to 35°C : Accuracy ± 0.1°C
Humidity	:	10 to 90%RH : Accuracy 5%
Mains Voltage	:	200V to 260V AC 50Hz

A BREAKTHROUGH IN MEASUREMENT TECHNOLOGY

8000 SERIES



The 8000 series DMM represents another major breakthrough in measurement technology, leaping ahead of older designs by using the latest in ultra powerful digital processors. A single processor can now out-perform a complete processor board from a decade ago. Metrologists recognise the benefits of processing power when it comes to data processing and making corrections, improving accuracy, repeatability and reducing complexity of making a measurement.

Microprocessors used in handling data to perform gain and offset correction first appeared over two decades ago - the 8000 Series updates this technology for the next generation of precision measurement systems to bring you the latest in cost-effective, reliable, easy to use high performance instrumentation.

Automation has always been at the centre of our developments. Transmille have pioneered software to be used by technicians, with no programming skills, yet still includes many advanced features for uncertainty calculations, closed loop calibrations etc. ProCal software developed by Transmille provides a complete software solution for the calibration laboratory, and can be translated into any language. A wide cross-section of equipment from many manufacturers is supported, as well as Transmille calibrators and DMMs.

UKAS CALIBRATION 0324

Traceability of our products to National Standards is from our in house UKAS accredited ISO17025 laboratory (0324), where we maintain some of the best reference standards available. All products can be supplied with a UKAS certificate with low uncertainties calculated for 95% uncertainty.

Please contact your local Transmille representative for more information or visit www.transmille.com

REPRESENTATIVE TERRITORIES

THE VERSATILE PRECISION MULTIMETER

8000 SERIES

THE COMPLETE MEASUREMENT SOLUTION

The 8000 series Digital Multimeter provides outstanding accuracy and linearity measurement performance together with ease of use.

The heart of any precision instrument is its analogue design; the experience and knowledge gained by Transmille over 10 years in the development of its 3000 series precision multi-product calibrators, its innovation and commitment to quality have all been directed towards the design of the 8000 series DMM.

The choice of components is critical in the design - the 8000 series using precision foil resistors, with temperature coefficients less than 0.3ppm / °C, the latest in analogue chopper stabilised op-amps and low leakage switches.
A temperature stabilised Zener reference chip provides better than 1ppm stability / year.

Circuit design at this level is critical, and every effect from thermal EMFs to leakage must be eliminated if 8.5 digit performance is to be achieved. To complement the analogue design the 8000 series DMM digital design is also state of the art. The 8000 Series DMM utilises multi-processor design, making full use of today's low cost digital processing power.

Low-level processors provide the measurement ranging and A to D control duties, while a 32 bit high performance processor handles data management. Circuitry, which would have just a few years ago taken up complete circuit boards, is now available on a single chip, improving reliability, reducing power and also cost, whilst at the same time improving performance.

By bringing together the latest technology in both analogue and digital design Transmille have significantly reduced the parts count and the complexity of an 8.5 digit DMM, achieving unrivaled performance and a breakthough
price / performance balance to meet the requirements of a wider range of users.

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2008

The 8000 Series DMM complements the 3000 Series range of multi product calibrators, 3200 electrical test equipment calibrator and the 3000 Precision range of reference standards.
This comprehensive range of Queen's award winning instrumentation combined with the ProCal calibration software provides a complete solution for the modern calibration laboratory.

**PROCAL REFERENCE SUPPORT :
AUTOMATE CALIBRATION
USING PROCAL SOFTWARE**

- OUTSTANDING STABILITY
- 8½ & 7½ DIGIT MODELS
- MULTI DISCIPLINE MEASUREMENT
  TEMPERATURE • ELECTROMETER
  PRESSURE • SHUNT MEASUREMENT

ELECTROMETER

PRESSURE

8071 CONDENSED SPECIFICATIONS

For extended specifications visit www.transmille.com or contact your local representative

TRANSMILLE SOLUTIONS IN CALIBRATION

DC Voltage: 10nV to 1050V in 5 Ranges				UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	1 YEAR
				± ppm Reading + Range
100mV	120,000,00	10nV	> 10 GOhms	12 + 4.0
1V	1.200,000,0	100nV	> 10 GOhms	9 + 1.4
10V	12.000,000	1uV	> 10 GOhms	9 + 1.4
100V	120.000,00	10uV	10 MOhms, 1%	14 + 1.8
1000V	1.050,000,0	100uV	10 MOhms, 1%	14 + 2.8

DC Current: 100pA to 30 Amps in 7 Ranges				UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	1 YEAR
				± ppm Reading + Range
100uA	120,000,0	100pA	1 Ohm	25 + 14
1mA	1.200,000	1nA	1 Ohm	25 + 14
10mA	12.000,00	10nA	1 Ohm	35 + 14
100mA	120,000,0	100nA	1 Ohm	110 + 22
1A	1.200,000	1uA	0.2 Ohm	550 + 45
10A	10.500,00	10uA	10 mOhms	1500 + 120
30A	30.500,0	100uA	10 mOhms	2000 + 500

Resistance : 1uOhm to10 MOhm in 7 Ranges				UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	1 YEAR
				± ppm Reading + Range
10 Ohm	12.000,000	1 uOhm	10mA	30 + 8
100 Ohm	120.000,00	10 uOhm	10mA	25 + 3
1 kOhm	1.200,000,0	100 uOhm	10mA	20 + 2
10 kOhm	12.000,000	1 mOhm	1mA	25 + 2
100 kOhm	120.000,00	10 mOhm	100uA	30 + 2
1 MOhm	1.200,000,0	100 mOhm	10uA	35 + 5
10 MOhm	12.000,000	1 Ohm	1uA	48 + 20

AC Voltage 1uV to 1050 Volts in 5 Ranges					UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	FREQUENCY	1 YEAR
					± % Reading + Range
100mV	105.000	1uV	>1 GOhm / 90pF	10Hz to 40Hz	0.20 + 0.08
				40Hz to 200Hz	0.08 + 0.05
				200Hz to 2kHz	0.07 + 0.04
				2kHz to 20kHz	0.10 + 0.05
				20kHz to 100kHz	0.30 + 0.20
1V	1.050,00	10uV	>1 GOhm / 90pF	10Hz to 40Hz	0.18 + 0.08
10V	10.500,0	100uV	>1 GOhm / 90pF	40Hz to 200Hz	0.07 + 0.05
				200Hz to 2kHz	0.05 + 0.03
				2kHz to 20kHz	0.10 + 0.05
				20kHz to 100kHz	0.30 + 0.20
100V	105.000	1mV	1 MOhm / 130pF	10Hz to 40Hz	0.18 + 0.09
1000V	1050.00	10mV	1 MOhm / 130pF	40Hz to 200Hz	0.08 + 0.06
				200Hz to 2kHz	0.06 + 0.03
				2kHz to 20kHz	0.10 + 0.05

AC Current 1nA to 30A in 5 Ranges					UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	FREQUENCY	1 YEAR
					± % Reading + Range
100uA	105.000	1nA	10 kOhms	10Hz to 40Hz	0.13 + 0.04
1mA	1.050,00	10nA	1 kOhm	40Hz to 1kHz	0.08 + 0.03
10mA	10.500,0	100nA	100 Ohms	1kHz to 10kHz	0.30 + 0.09
100mA	105.000	1uA	10 Ohms		
1A	1.050,00	10uA	0.5 Ohms	10Hz to 40Hz	0.20 + 0.06
				40Hz to 1kHz	0.10 + 0.05
				1kHz to 10kHz	0.30 + 0.15
10A	10.500,0	100uA	10 mOhms	10Hz to 40Hz	0.30 + 0.10
30A	30.500	1mA	10 mOhms	40Hz to 1kHz	0.40 + 0.10

Uncertainties relative to calibration standards : TCal ± 1°C : Confidence Level 95%.
1 Year accuracy : Due to continuous development specifications may be subject to change.

8071

GENERAL

Power
Voltage 110V / 230V : 50/ 60Hz
Consumption 30 Watts

Dimensions
Height 100mm Length 440mm
Width 450mm Weight 6kg

Interfaces
RS232 • USB • LAN • GPIB

Temperature
Operating 0.5°C to 40°C
Storage -5° to 60°C

Humidity (non-condensing)
Operating <90%
Storage <90%

Warm Up Period
3 Hours from power up

Display Type
Dual Vacuum Fluorescent

Warranty
1 Year
3 year extended care plan available

For extended specifications contact your local representative or visit www.transmille.com

8081 CONDENSED SPECIFICATIONS

For extended specifications visit www.transmille.com or contact your local representative

DC Voltage: 1nV to 1050V in 5 Ranges				UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	1 YEAR
				± ppm Reading + Range
100mV	120,000,000	1nV	> 10GOhms	4.8 + 1.7
1V	1.200,000,00	10nV	> 10GOhms	3.9 + 0.6
10V	12.000,000,0	100nV	> 10GOhms	3.9 + 0.6
100V	120.000,000	1uV	10MOhms, 1%	5.8 + 0.8
1000V	1.050,000,00	10uV	10MOhms, 1%	5.8 + 1.2

DC Current : 0.01pA to 30A in 11 Ranges				UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	1 YEAR
				± ppm Reading + Range
10nA	12,000,00	0.01pA	Virtual Ground	5000 + 80
100nA	120.000,0	0.1pA	Virtual Ground	1800 + 34
1uA	1.200,000	1pA	Virtual Ground	200 + 17
10uA	12.000,00	10pA	Virtual Ground	30 + 10
100uA	120.000,00	10pA	1 Ohm	7 + 4
1mA	1.200,000,0	100pA	1 Ohm	7 + 4
10mA	12.000,000	1nA	1 Ohm	9 + 4
100mA	120.000,00	10nA	1 Ohm	30 + 6
1A	1.200,000,0	100nA	0.2 Ohms	150 + 13
10A	12.000,000	1uA	10mOhms	360 + 35
30A	30.500,00	10uA	10mOhms	490 + 145

Resistance : 0.01uOhm to 1 TOhm in 13 Ranges				UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	CURRENT RANGE	1 YEAR
				± ppm Reading + Range
1 Ohm	1.200,000,00	0.01 uOhm	100mA	15.0 + 6.0
10 Ohm	12.000,000,0	0.1 uOhm	10mA	10.0 + 3.0
100 Ohm *	120.000,000	1 uOhm	10mA *	9.0 + 1.0
1 kOhm *	1.200,000,00	10 uOhm	10mA *	8.0 + 0.8
10 kOhm *	12.000,000,0	100 uOhm	1mA *	9.5 + 0.8
100 kOhm	120.000,000	1 mOhm	100uA	10.0 + 0.8
1 MOhm	1.200,000,00	10 mOhm	10uA	11.0 + 2.0
10 MOhm	12.000,000,0	100 mOhm	1uA	15.0 + 8.0

* Low Current Measurement Mode Available

RESISTANCE RANGE (Test Voltage)	CURRENT MEASUREMENT RANGE	TEST VOLTAGE RESOLUTION	ACCURACY / RESOLUTION
5 MOhm (50V) to 300 MOhms (300V)	10uA	50V	From 30ppm / 7.5 Digit resolution dependent on current range in use*
50 MOhms (50V) to 3 GOhms (300V)	1uA	50V	
500 MOhms (50V) to 30 GOhms (300V)	100nA	50V	
5 GOhms (50V) to 1 TOhm (300V)	10nA	50V	

* See extended specifications for full details
BNC Screened Inputs
Electrometer range 5 MOhm to 1 TOhm. Measurement test voltage 50V to 300V (50V Steps).
Accuracy and ranges are dependant upon the current range and measurement voltage in use.

AC Voltage 0.1uV to 1050V in 5 Ranges					UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	FREQUENCY	1 YEAR
					± % Reading + Range
100mV	105.000,0	0.1uV	>1 GOhm / 90pF	10Hz to 40Hz	0.05 + 0.015
				40Hz to 200Hz	0.021 + 0.009
				200Hz to 2kHz	0.017 + 0.008
				2kHz to 20kHz	0.025 + 0.010
				20kHz to 100kHz	0.06 + 0.050
1V	1.050,000	1uV	>1 GOhm / 90pF	10Hz to 40Hz	0.04 + 0.015
10V	10.500,00	10uV	>1 GOhm / 90pF	40Hz to 200Hz	0.019 + 0.006
				200Hz to 2kHz	0.015 + 0.006
				2kHz to 20kHz	0.025 + 0.010
				20kHz to 100kHz	0.06 + 0.050
				100kHz to 1MHz*	1 + 2.5
100V	105.000,0	100uV	1 MOhm / 130pF	10Hz to 40Hz	0.05 + 0.015
1000V	1050.000	1mV	1 MOhm / 130pF	40Hz to 200Hz	0.02 + 0.009
				200Hz to 2kHz	0.018 + 0.007
				2kHz to 20kHz	0.03 + 0.010
				20kHz to 50kHz	0.08 + 0.050

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

AC Current 0.1nA to 30A in 7 Ranges					UNCERTAINTY Relative to Calibration Standards
RANGE	FULL SCALE	RESOLUTION	I/P IMPEDANCE	FREQUENCY	1 YEAR
					± % Reading + Range
100uA	105.000,0	0.1nA	10 kOhms	10Hz to 40Hz	0.05 + 0.015
1mA	1.050,000	1nA	1 kOhm	40Hz to 1kHz	0.03 + 0.012
10mA	10.500,00	10nA	100 Ohms	1kHz to 10kHz	0.07 + 0.03
100mA	105.000,0	100nA	10 Ohms		
1A	1.050,000	1uA	0.5 Ohms	10Hz to 40Hz	0.06 + 0.02
				40Hz to 1kHz	0.04 + 0.015
				1kHz to 10kHz	0.07 + 0.05
10A	10.500,00	10uA	10 mOhms	10Hz to 40Hz	0.08 + 0.04
30A	30.500,0	100uA	10 mOhms	40Hz to 1kHz	0.07 + 0.03

Uncertainties relative to calibration standards : TCal ± 1°C : Confidence Level 95%.
1 Year accuracy : Due to continuous development specifications may be subject to change.

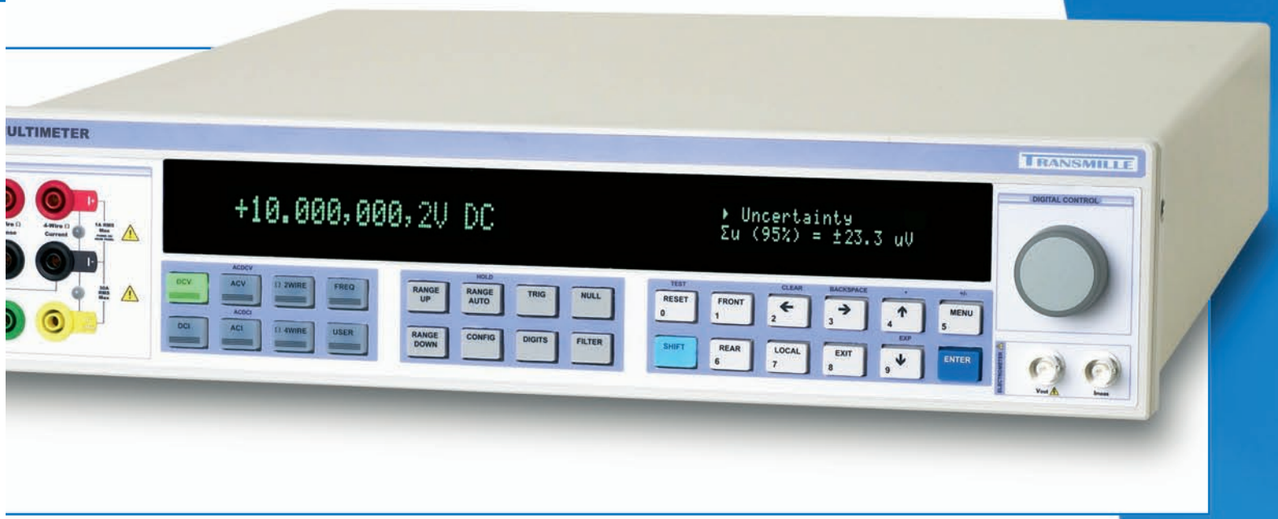
Frequency	
Frequency 1Hz to 1MHz	
Signal Amplitude Range	5%
Resolution	7.5 Digits to 4.5 Digits
Frequency Range	1Hz to 1MHz
Accuracy (1 Year)	5ppm ± 2 Digits
Sample Interval	1s
Phase (V to Current)	0º to 360º

External 10MHz reference input also available

Temperature (PRT)	
Range	PRT -200ºC to 660ºC
Resolution	8.5 Digits to 4.5 Digits
Modes	2-Wire / 4-Wire
	ITS-90 Temperature Scale
	Programmable Current

Temperature (TC)	
Type	**Range**
J	-180°C to 750°C
K	-140°C to 1340°C
T	-250°C to 400°C
R	-50°C to 1700°C
S	-50°C to 1700°C
B	100°C to 1820°C
N	-270°C to 1300°C
E	0°C to 800°C

Pressure	
Range	25mBar to 100Bar
	Add-on pressure modules
Accuracy (1 Year)	0.04%



- *8081 8½* DIGIT 4 PPM & 8071 7½ DIGIT 9 PPM MODELS
- AC / DC VOLTAGE TO 1kV
- AC / DC CURRENT TO 30A AS STANDARD
- RESISTANCE MEASUREMENT FROM 0.1uOhms TO 1TOhms (8081)
- FREQUENCY MEASUREMENT 10Hz TO 1MHz

PRECISION DMM

MODEL 8081

- DEDICATED ELECTROMETER FUNCTIONALITY AS STANDARD
- PROGRAMMABLE OUTPUT TO 300V
- 10nA to 100uA CURRENT RANGES
- SCREENED BNC INPUT/OUTPUT CONNECTIONS FOR LOW NOISE
- EXTREMELY LOW INPUT IMPEDANCE

MODEL 8081

- *PRT -200°C to 660°C : 2 & 4 WIRE*
- *ITS90 CO-EFFICIENT AND CALLENDAR VAN DUSEN LINEARISATION*
- *BUILT-IN 2 PROBE MEASUREMENT (10 CHANNEL SCANNER OPTION)*
- *SIMULTANEOUS TEMPERATURE AND RESISTANCE DISPLAY MODE*
- *THERMOCOUPLE MEASUREMENT : 8 TYPES*

TEMPERATURE

MODEL 8081

- *DEDICATED PRESSURE MODULE INTERFACE*
- *RANGE OF 25 PRESSURE MODULES 25mBar to 100Bar*
- *DISPLAYS MEASUREMENTS DIRECTLY IN PRESSURE UNITS*
- *HAND PRESSURE PUMP OPTION*
- *MULTIPLE UNITS : BAR, PSI, PASCALS ETC.*

8000 SERIES MULTIMETER

DESIGNED FOR THE WORKING METROLOGY ENVIRONMENT

TRANSMILLE SOLUTIONS IN CALIBRATION

KEY FEATURES

RELIABILITY & COST OF OWNERSHIP

The single board construction and use of the latest in low power digital processing has allowed Transmille to significantly reduce the component count, providing an inherent increase in reliability over older, more complex designs. Lower power means lower operating temperatures, allowing the 8000 Series to be used without the need for fan assisted cooling, creating a low noise energy efficient product. Cost of ownership is reduced by higher product reliability and lower initial capital costs.

FAST WARM UP PERIOD

Using the latest in precision references, the 8000 series warm up period is reduced to enable accurate, stable readings quicker than has previously been possible. This expands the role of the 8000 Series beyond the laboratory environment to allow on-site use.

COVERS ON CALIBRATION

Covers on calibration provides easier, faster and more accurate calibration by minimising thermal changes associated with removing covers. Calibration can be easily performed either from the front panel using a password protected calibration menu or via interface control for closed loop calibration.

COMPREHENSIVE SELF TEST FUNCTION

A comprehensive self test function and calibration status check includes testing the digital signal processing circuitry, the analogue circuitry and the interface including displays and keyboard. The internal temperature level is continuously checked as part of the performance monitoring system.

DUAL DISPLAY

A clear, bright and familiar presentation of measurements and settings using dual fluorescent display technology - ideal for reading from a distance. Configuration and settings information is clearly shown on the dedicated status display.

DIRECT NULL FUNCTION

For instant response when performing measurements, the null function can be accessed using a dedicated key at any time - a minor, but important interface consideration. Independant null offsets are stored for the front and rear terminals allowing more accurate ratio measurements to be made.

INTEGRATED MENU DIAL

A unique control method brings simplicity of use to the 8000 Series multimeter. Menu items can be quickly and easily scrolled through and selected without complex keypresses or sequences.

MULTIPLE INTERFACES BUILT-IN AS STANDARD

The 8000 series incorporates interfaces to support any installation, with built-in RS232, USB, GPIB and LAN (Ethernet) ports as standard. The SCPI command protocol is supported using these interfaces.

RS232
USB
GPIB
LAN

INTERNATIONAL LANGUAGE SUPPORT

Designed from the outset for the international metrology community, the 8000 series has built-in multi language menu support. This includes the ability to switch between '.' (decimal point) and ',' (comma) decimal separators.

BUILT-IN TERMINAL INDICATORS

The 8000 series incorporates LED indication of the active terminals, minimising the learning curve for new operators and further enhancing the user interface.

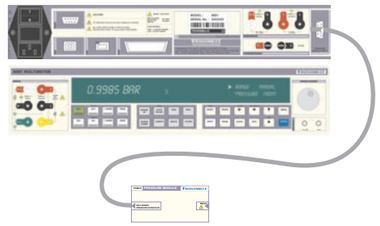
PRESSURE • PRECISION SHUNT MEASUREMENT

PRESSURE MEASUREMENT TO 100 Bar • PRECISE SHUNT MEASUREMENT

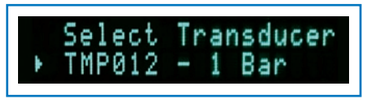
TRANSMILLE SOLUTIONS IN CALIBRATION

PRESSURE MEASUREMENT

The 8000 Series multimeters support pressure measurement using a range of pressure modules, which connect to the dedicated pressure module interface on the rear panel of the multimeter. The pressure modules cover the range from 25mBar to 100 Bar - a 5 PSI differential module and a ± 1Bar vacuum module are also available. A hand pressure / vacuum pump is available as an option to generate pneumatic pressure up to 60Bar and vacuum down to -0.95Bar.

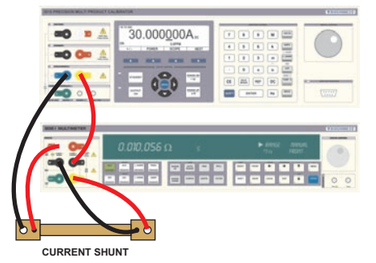


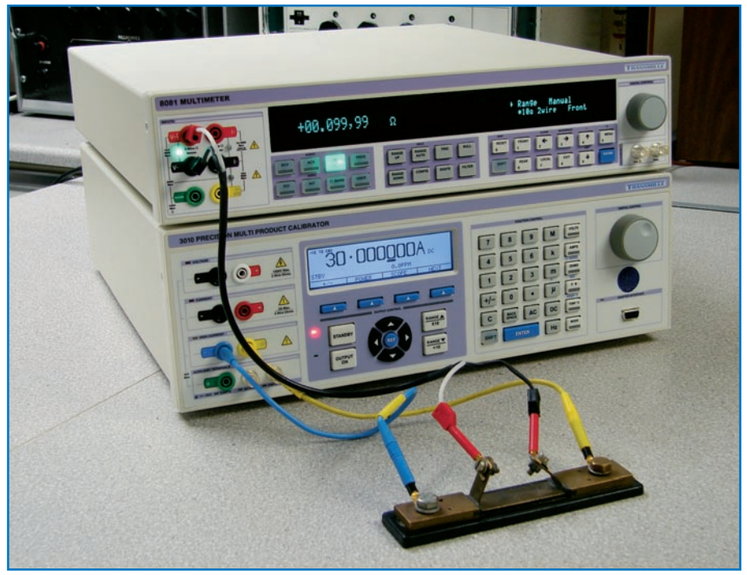
Built-in support for Transmille pressure modules, with a wide range of units supported (Bar, PSI, Pascals etc.)



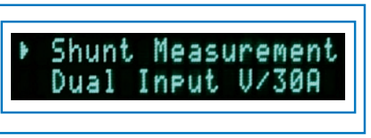
HIGH CURRENT SHUNT MEASUREMENT

To save time and reduce errors when calibrating high current, low resistance shunts the 8081 has a unique function, where both the current being passed through the shunt and the voltage drop across it are both automatically measured. The measurement display shows the calculated value of resistance for the shunt, and the status display showing both the measured voltage and current. This greatly simplifies the calibration of high current shunts at currents up to 30Amps avoiding lead changing.





Dedicated shunt measurement function simplifies high current shunt measurement.



PRECISION TEMPERATURE

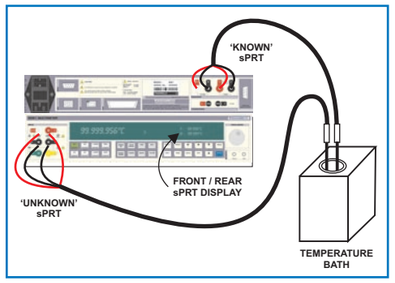
PRECISION TEMPERATURE MEASUREMENT WITH ITS90 LINEARISATION

TRANSMILLE SOLUTIONS IN CALIBRATION

PRECISION PRT MEASUREMENT

The 8081 DMM has been designed from the outset for precision temperature measurement of PRTs and thermocouples. It is ideally suited for use in a precision temperature system. Supporting 25 and 100 Ohm PRTs, with linearisation to both ITS-90 co-efficients and Callendar van Dusen (IEC710).

Built-in support for dual probe configuration, with automated front / rear terminal switching and co-efficient data storage functions.



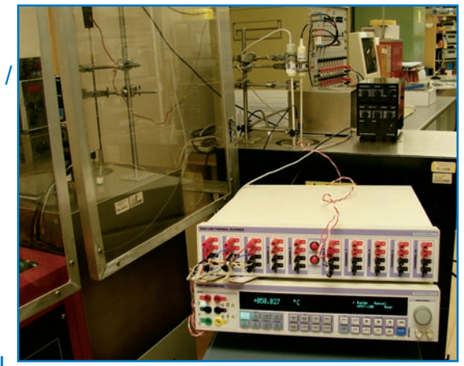
The 8500 low thermal scanner expands capabilities to provide up to 10 channels for multiple PRT measurements.

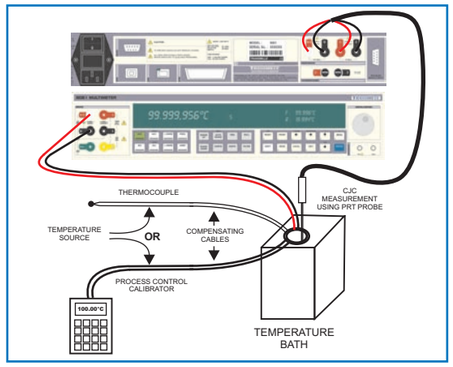
THERMOCOUPLE MEASUREMENT

The 8000 series provides an easy to use accurate method for the calibration of thermocouples and thermocouple simulation / process control calibrators with thermocouple output. Direct temperature display for 8 types of thermocouple types are supported over a wide temperature range. The sensitive low noise / drift input of the 8000 series makes it ideal for measuring the low uV output voltages from thermocouples (TC).

Uniquely to the 8000 series the cold junction compensation temperature (CJC) can be accurately measured using an external PT100 probe connected to the 8000 series rear panel inputs. The CJC temperature is often the most significant source of uncertainty when calibrating thermocouple sources. Using the 8000 series dual measurement function to measure both the TC voltage and the temperature of the CJC point greatly reduces this uncertainty. This method is also preferred by accreditation bodies as it provides traceability on both the voltage and CJC measurement, whilst simplifying these types of measurements, greatly reducing time to calibrate thermocouple sources.

The 8500 low thermal scanner expands capabilities to provide up to 10 channels for multiple thermocouple measurements.





8000 SERIES MULTIMETER

ADVANCED MATHEMATICAL FUNCTIONS

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2008

TRANSMILLE SOLUTIONS IN CALIBRATION

MATHEMATICAL FUNCTIONS :: EXPANDED CAPABILITIES

The 8000 series features a comprehensive set of math computational functions designed to aid the metrologist for enhanced measurement capabilities, data analysis and scaling.

STANDARD DEVIATION

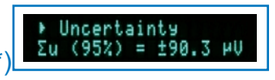
The 8000 series can calculate and display the standard deviation for measurements made between the selected filter time period. This is useful in the metrology environment to identify underlying noise in measurements.

UNCERTAINTY (OF MEASUREMENT)

Performs uncertainty calculation as per the Guide to Uncertainty Measurement (GUM) for k=2 (95%) - calculation using contributions below:

Imported Uncertainty : Constant stored in memory (set during calibration*)
Instrument specification : Constant stored in memory (set during calibration*)
Resolution of measurement : Determined by 8000 series resolution settings
Noise/Flicker : Calculated value determined during measurement

*The Imported uncertainty and instrument specification constants can be edited using software supplied with the 8081 multimeter

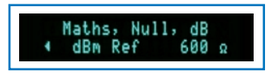


POWER DISSIPATION (RESISTANCE RANGES)

The 8000 series calculates and displays power dissipation when in resistance measurement mode.

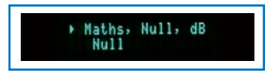
dB AND dBm CALCULATIONS

dBm measurement calculates the power using a user entered resistance value referenced to 1mW. dB measurement is the difference between the signal and a stored relative value.



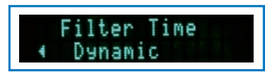
MEASUREMENT SCALING

Measurements can be scaled by entering constants into an MX+C formula. This allows measurements from transducers and other external devices to be scaled to appropriate units.



PROGRAMMABLE DIGITAL FILTER

A programmable digital filter allows the user to set the time period over which readings are averaged up to 64s. Alternatively a dynamic filter mode can be selected which automatically increases/decreases filter time based on reading stability.



MINIMUM / MAXIMUM

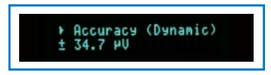
Minimum / maximum readings are store in memory for use in monitoring factors such as drift of a source over a period of time. These values can be selected for display along side the main reading value at any time.

RATIO

References can be connected to the rear panel terminals and compared against an 'unknown' connected to the front panel terminals. The value of the reference is entered into memory and an auto scan mode will then compare the reference to the 'unknown' displaying a calculated value for the unknown - ideal for standard resistor comparison using the 8000 series as a transfer standard.

DYNAMIC ACCURACY DISPLAY

The 8000 series can dynamically perform a calculation to display the accuracy of the measurement as % of range + Floor. This spot-point calculation is based on data stored in memory and can be configured to meet user requirements.



8000 SERIES MULTIMETER : IN DEPTH

ADVANCED MEASUREMENT CAPABILITIES USING MODERN TECHNIQUES

RESOLUTION / MEASUREMENT SPEED

Wide range resolution from 4 digits to 8 digits can easily be set depending on the measurement accuracy and speed required mode.

Mode	Reading Time
4 Digit	0.12s
5 Digit	0.25s
6 Digit	0.5s
7 Digit	2s
8 Digit	8s

INPUT AMPLIFIER

A carefully designed input stage incorporates input protection using a low noise chopper amplifier to provide input impedance above 10GOhms. This allows direct measurement of standard cells, and avoids any errors due to loading on ranges below 10V. Higher ranges use a specially matched 10MOhm divider network.

NOISE, THERMAL EMF AND SENSITIVITY

The zero stability of the 8000 series is better than 200nV over a 48-hour period. The Input terminals are low thermal gold plated copper and the low power design keeps self heating and internal thermal gradients to a minimum, permitting full use of the 1nV resolution.

AC INPUT IMPEDANCE

The 8000 series is unique in offering high input impedance (>10MOhms) on voltage ranges up to 10V. This allows AC current to be measured using AC/DC standard resistors (Wilkinson) without loading effects.

PROGRAMMABLE FRONT / REAR INPUTS

The ability to auto scan between the front / rear inputs extends the capabilities of the 8000 series. Techniques including reference ratio comparison and measurement of PRT probes. Inputs can be remotely switched and are isolated with independent zero correction.

FREQUENCY MEASUREMENT WITH SPOT FREQUENCY CALIBRATION

The frequency of the input signal is automatically measured and can be displayed on the dual line display. The frequency measurement is also used to calculate the calibration constant from the digitally stored frequency compensation factors.

VERSATILE RESISTANCE FUNCTIONS

2 and 4 wire ohms measurement modes are available with offset compensation to remove errors from thermal emf's in lead and connections. Low current mode can also be selected for measurement where self heating may be a problem, for example when measuring an SPRT probe, where the measurement current can be set to 1mA, giving a 10uW power dissipation. The power dissipation in the resistor being measured can be easily displayed on the configuration display.

SENSITIVITY & RANGE

Resistance measurement covers a range from micro Ohms to Tera Ohms. The 8081 is the only DMM to meet this challenge, capable of measuring from 1uOhm on the 1Ohm range to 1TOhm, see electrometer function for more details.

CURRENT TO 30A AS STANDARD

Full range AC/DC current up to 30Amps allows calibration of multi product calibrators, high current sources etc. without the need for separate shunts. The special low T/C foil shunt uses the aluminium case as a heat sink - by using the large heat capacity of the case the heat is well dissipated, leaving the performance of other ranges unaffected.

LINE ISOLATION AND GUARDING

To eliminate capacitive coupling to line which cause errors and noise on floating measurements, the 8000 series use an innovative power supply design incorporating dual transformers, allowing low noise measurements to be made without any special guarding. A guard connection allows screening of the analogue section, which can also be switched to measurement ground.

OVERLOAD PROTECTION

The 8000 series is fully protected against accidental damage on all ranges. Up to 1000V AC/DC can be applied to any voltage range and current ranges are protected by fuses.

LINE FREQUENCY MEASUREMENT LOCK

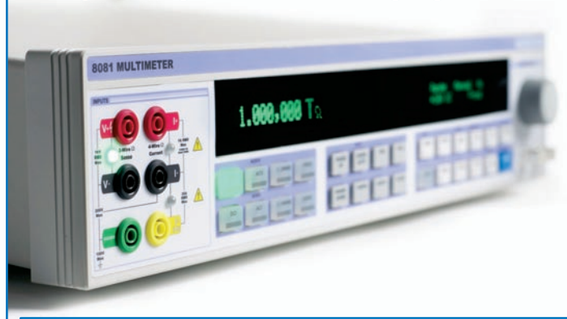
The 8000 Series measurement cycle is phase locked to the line frequency for optimum interference rejection.

ELECTROMETER

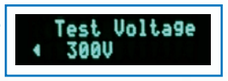
MEASURE TO 1TOhm WITH PROGRAMMABLE VOLTAGE TO 300V

PRECISION HIGH RESISTANCE MEASUREMENT

Precision high resistance measurement - with programmable high voltage testing makes measuring high value resistance simple.



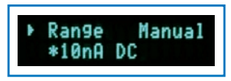
Precision programmable voltage output to 300V in 50V steps. This provides high voltage for lower noise measurements as well as support for resistor with lower voltage ratings.

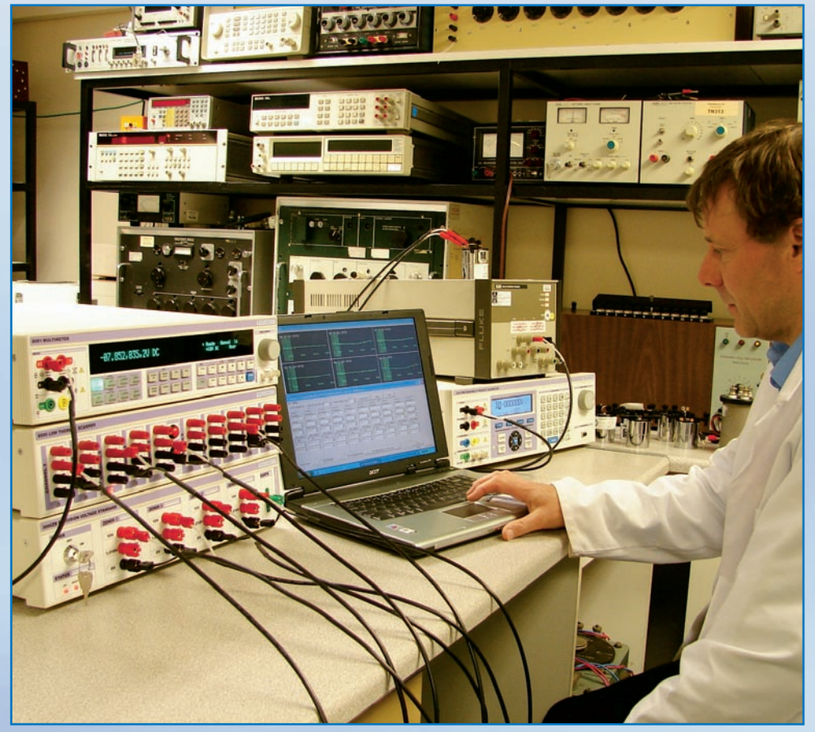


The 8081 provides a low noise, high resistance measurement capability via a dedicated screened BNC input. A multi pole, low pass filter removes significant line noise for the ultimate in precision.

PRECISION LOW CURRENT (pA) MEASUREMENT

The 8081 also provides dedicated ranges for precision low current measurement to pA levels.





HIGH OHMS & pA

The 8081 provides a true electrometer function, making the 8081 even better value for the metrologist wanting to measure low currents and high value resistance.

Evaluation of leakage and semiconductor measurements can also be made using this function. Screened BNC input for the current ranges 10nA to 100uA is provided, which is essential when working with low currents to minimise noise and pickup from the measurement leads.

The input has almost zero input impedance, avoiding errors caused when attempting to measure low currents with high value shunts. Many DMM's have input impedances up to several hundred kOhms, which will give errors due to compliance voltage limitations of the current source being measured.