M1412A PXIe Digital Multimeter

7½ Digit

KEYSIGHT

Keysight's M1412A PXIe Digital Multimeter (DMM) offers a wide range of measurement capabilities with high levels of accuracy, resolution, and speed.

Use your existing programs with E1412A mode

The M1412A PXIe Digital Multimeter (DMM) is an SCPI-compatible replacement for the Keysight E1412A DMM, which allows you to reuse your existing programs to speed up migration to the new technology.

Measure low-power devices

The DMM can measure very low current, 1 µA range with pA resolution, which allows you to make measurements on low-power devices.

Maintain calibrated measurements

The built-in voltage reference and current reference circuitries enable auto-calibration (ACAL) capability, allowing the DMM to compensate for temperature drift so you can maintain measurement accuracy throughout your workday.

Get more insight quickly

The M1412A built-in digitizer lets you capture high-speed signals and transients up to 2M samples/second.

Small package, high-performance format

Designed to benefit from fast data interfaces, the M1412A can be integrated with other test and automation modules in a PXIe chassis. The PXIe format offers high performance in a small, rugged package. It is an ideal deployment platform for many automated test systems.

Broad range of software environments support

Keysight PathWave BenchVue DMM software and soft front panel are available, providing easy-to-use instrument control. The graphical user interface guides you through module setup so you can quickly configure the DMM. Software drivers and application code examples are provided for LabVIEW, C/C++, and C# – demonstrating DMM setup and basic functionality.

BenchVue Digital Multimeter Software

Simplifying data gathering and analysis with PathWave BenchVue DMM software

PathWave BenchVue software for the PC makes it simple to connect, control, capture, and view Keysight DMMs with no additional programming. The PathWave BenchVue software enables you to:

- Easily log data, screenshots, and system state.
- Effortlessly recall the past state for results replication.
- Quickly export measurement data in the desired format.

The DMM Control app in BenchVue allows you to control DMMs to visualize measurements and perform unrestricted data logging and statistical analysis.

Download the BenchVue DMM Control app from www.keysight.com/find/benchvueDMM

Figure 1. Data logging with PathWave BenchVue DMM Control Software

Spec Interpretation Guide

The following pages list the technical specifications for the Keysight M1412A PXIe DMM. The following explanations and examples clarify how to interpret these specifications:

- Measurement accuracy is specified as the percentage of reading plus the percentage of range, where reading is the actual measured value and range is the name of the scale (1 V, 10 V, and so on) — not the full-scale value (1.2 V, 12 V, and so on).
- Accuracies are listed as 24-hour, 90-day, and one-year specifications. This refers to the length of time since the instrument's last calibration.

Example 1: Basic DC voltage accuracy

Calculate the accuracy of the following measurements: 9 V DC input, 10 V DC range, one-year accuracy specifications, and standard operating temperature (18 – 28 °C).

From the following page, the one-year accuracy is 0.0021% of reading + 0.00007% of range.

It translates to this: (0.0021/100 x 9 V) + (0.00007/100 x 10 V) = 0.189 mV + 0.007 mV = 0.196 mV

Total accuracy is **0.196 mV/9 V = 0.0022%**.

Example 2: Extreme operating temperature

When the M1412A operates outside its 18 – 28 °C temperature range, you must consider additional temperature drift errors. Assume the same conditions in Example 1 but at 35 °C operating temperature.

The basic accuracy is again 0.0021% of reading + 0.00007% of range = 0.196 mV.

Now, multiply the 10 V temperature coefficient from the DC voltage specifications table by the number of degrees outside of the operating range for additional error:

(0.0001% reading + 0.0001% range) / °C x (35 – 28 °C)

= (0.0001% reading + 0.0001% range) / °C x 7 °C

= 0.0007% reading + 0.0007% range = 0.063 mV + 0.063 mV = 0.126 mV

Total error is **0.196 mV + 0.126 mV = 0.322 mV or 0.0036%.**

Example 3: AC voltage accuracy

The AC voltage function measures the true RMS value of the input waveform, regardless of waveshape. Listed accuracies assume a sine-wave input.

For this example, assume a ± 1 V sine wave input with a 1 kHz frequency.

Accuracy for 1 V, 1 kHz sinusoid is **0.06% reading + 0.04% range = 1 mV or 0.1%**.

DC Specifications

- Accuracy specifications: ± (% of reading + % of range)[1].
- DC voltage, resistance, and DC current automatic calibration (ACAL) capable.

Range [2]		24 hours [3] T_{ACAL} ± 1 °C	90 days T_{ACAL} ± 5 °C	1 year T_{ACAL} ± 5 °C	With ACAL[4] Temperature coefficient/°C
DC voltage (7½ digits)					
100 mV		0.0022 + 0.00210	0.0035 + 0.00210	0.0038 + 0.00210	0.0001 + 0.0005
1 V		0.0010 + 0.00025	0.0023 + 0.00025	0.0026 + 0.00025	0.0001 + 0.0001
10 V		0.0005 + 0.00007 [5]	0.0018 + 0.00007	0.0021 + 0.00007	0.0001 + 0.0001
100 V		0.0014 + 0.00025	0.0027 + 0.00025	0.0030 + 0.00025	0.0001 + 0.0001
300 V		0.0019 + 0.00020	0.0032 + 0.00020	0.0035 + 0.00020	0.0001 + 0.0001
Resistance (6½ digits) [6]					
Range [2]	**Test Current**	**24 hours [3] TACAL ± 1 °C**	**90 days TACAL ± 5 °C**	**1 year TACAL ± 5 °C**	**With ACAL[4] Temperature coefficient/°C**
10 Ω [7]	10 mA	0.0025 + 0.00200	0.0080 + 0.00200	0.0100 + 0.00200	0.0002 + 0.0001
100 Ω [8]	1 mA	0.0025 + 0.00120	0.0080 + 0.00120	0.0100 + 0.00120	0.0002 + 0.0001
1 kΩ	1 mA	0.0015 + 0.00015	0.0080 + 0.00015	0.0100 + 0.00015	0.0002 + 0.0001
10 kΩ	100 µA	0.0015 + 0.00015	0.0080 + 0.00015	0.0100 + 0.00015	0.0002 + 0.0001
100 kΩ	10 µA	0.0015 + 0.00025	0.0080 + 0.00025	0.0100 + 0.00025	0.0002 + 0.0001
1 MΩ	5 µA	0.0020 + 0.00100	0.0080 + 0.00100	0.0100 + 0.00100	0.0010 + 0.0002
10 MΩ	500 nA	0.0150 + 0.00100	0.0350 + 0.00100	0.0540 + 0.00100	0.0030 + 0.0004
100 MΩ	500 nA//10 MΩ	0.3000 + 0.00100	0.3500 + 0.00100	0.5400 + 0.00100	0.0500 + 0.0004
1 GΩ (typ)	500 nA//10 MΩ	1.0000 + 0.20000	5.0000 + 0.20000	5.0000 + 0.20000	0.5000 + 0.2000

Range [2]		24 hours [3] T_{ACAL} ± 1 °C	90 days T_{ACAL} ± 5 °C	1 year T_{ACAL} ± 5 °C	With ACAL[4] Temperature coefficient/°C
DC current (6½ digits)					
1 µA (typ)		0.0020 + 0.0100	0.0120 + 0.0100	0.0170 + 0.0100	0.0005 + 0.0005
10 µA (typ)		0.0020 + 0.0020	0.0120 + 0.0020	0.0170 + 0.0020	0.0005 + 0.0001
100 µA (typ)		0.0020 + 0.0020	0.0120 + 0.0020	0.0170 + 0.0020	0.0005 + 0.0001
1 mA		0.0020 + 0.0020	0.0120 + 0.0020	0.0170 + 0.0020	0.0005 + 0.0001
10 mA		0.0020 + 0.0020	0.0120 + 0.0020	0.0170 + 0.0020	0.0005 + 0.0001
100 mA		0.0030 + 0.0020	0.0130 + 0.0020	0.0180 + 0.0020	0.0005 + 0.0001
1 A		0.1000 + 0.0100	0.1000 + 0.0100	0.1000 + 0.0100	0.0010 + 0.0001
3 A		0.3000 + 0.0200	0.3000 + 0.0200	0.3000 + 0.0200	0.0010 + 0.0001
DC: DC ratio (typ)					
(Normalized input accuracy) + (Normalized reference accuracy)					

1. Specifications are for a 60-minute warm-up, integration setting of 100 NPLC, auto-zero on. Null offset enabled. ACAL ran within the last 2 days.
2. 20% over range on all ranges, except 300 DCV, and 3 DCI have 1%.
3. Relative to calibration standards.
4. Add this for each °C outside TACAL ±5°C.
5. 3.3 hours warm-up time before adjustment.
6. Specifications are for the 4-wire ohms or 2-wire ohms function using math null for offset. Without math null, add 0.2 Ω additional error in the 2-wire ohms function.
7. Typical for 2-wire ohms.
8. Add 1.8 mΩ (18 ppm) in the % of range for 2-wire ohms measurement.

AC Specifications

- Accuracy specifications: ± (% of reading + % of range) [1].
- AC voltage automatic calibration (ACAL) capable.

Range [2]	24 hours [3] T_{ACAL} ± 1 °C	90 days T_{ACAL} ± 5 °C	1 year T_{ACAL} ± 5 °C	With ACAL[4] Temperature coefficient/°C
True RMS AC voltage (6½ digits) [5,6]				
100 mV range				
3 Hz to 5 Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004
5 Hz to 10 Hz	0.35 + 0.03	0.35 + 0.04	0.35 + 0.04	0.035 + 0.004
10 Hz to 20 kHz	0.04 + 0.03	0.05 + 0.04	0.06 + 0.04	0.005 + 0.004
20 kHz to 50 kHz	0.10 + 0.05	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
50 kHz to 100 kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
100 kHz to 300 kHz	5.00 + 0.50	5.00 + 0.50	5.00 + 0.50	0.200 + 0.020
1V, 10 V, 100 V, and 300 V ranges				
3 Hz to 5 Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.003
5 Hz to 10 Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.035 + 0.003
10 Hz to 20 kHz	0.04 + 0.02	0.05 + 0.03	0.06 + 0.03	0.005 + 0.003
20 kHz to 50 kHz	0.10 + 0.04	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
50 kHz to 100 kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
100 kHz to 300 kHz	5.00 + 0.50	5.00 + 0.50	5.00 + 0.50	0.200 + 0.020
Additional low frequency errors ± (% of reading) [7]				
	AC filter			
Frequency	**3 Hz**	**20 Hz**	**200 Hz**	
10 Hz to 20 Hz	0	0.74	-	
20 Hz to 40 Hz	0	0.33	-	
40 Hz to 100 Hz	0	0.06	0.73	
100 Hz to 200 Hz	0	0.01	0.22	
200 Hz to 1 kHz	0	0	0.18	
> 1 kHz	0	0	0	
Additional crest factor errors (non-sinewave) [8]				
Crest factor	**Error ± (% of reading)**			
1 – 2	0.05%			
2 – 3	0.15%			
3 – 4	0.30%			
4 – 5	0.40%			

1. Specifications are for a 60-minute warm-up, Filter = Slow (3 Hz). Sine-wave input.
2. 20% over range on all ranges, except 300 ACV has 1%.
3. Relative to calibration standards.
4. Add this for each °C outside TACAL ± 5°C.
5. Specifications are for sine wave input > 0.3% of range and > 1 mVrms.
6. For inputs from 1% to 5% of range and <50kHz, add 0.1% of range additional error. For inputs from 1% to 5% of range and >50kHz, add 0.13% additional error. For inputs from 3% to 15% of range and <50kHz, add 0.30% of range additional error. For inputs from 3% to 15% of range and >50kHz, add 0.40% of range additional error.
7. Low-frequency performance: three filter settings are available: 3 Hz, 20 Hz, and 200 Hz. Frequencies greater than these filter settings are specified with no additional errors.
8. Crest factor is not specified for non-sinewave inputs < 100 Hz using the slow (3 Hz) AC filter.

AC Specifications cont.

- Accuracy specifications: ± (% of reading + % of range) [1].
- AC current automatic calibration (ACAL) capable.

Range [2]	24 hours [3] T_{ACAL} ± 1 °C	90 days T_{ACAL} ± 5 °C	1 year T_{ACAL} ± 5 °C	With ACAL Temperature coefficient/°C [4]
True RMS AC current (6½ digits) [5,6]				
1 A ranges				
3 Hz to 5 Hz	1.05 + 0.04	1.05 + 0.04	1.05 + 0.04	0.100 + 0.004
5 to 10 Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.004
10 Hz to 1 kHz	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.005 + 0.004
1 kHz to 50 kHz (typ)	0.40 + 0.04	0.40 + 0.04	0.40 + 0.04	0.011 + 0.005
3 A range				
3 Hz to 5 Hz	1.70 + 0.06	1.70 + 0.06	1.70 + 0.06	0.100 + 0.004
5 to 10 Hz	0.95 + 0.06	0.95 + 0.06	0.95 + 0.06	0.035 + 0.004
10 Hz to 1 kHz	0.75 + 0.06	0.75 + 0.06	0.75 + 0.06	0.005 + 0.004
1 kHz to 50 kHz (typ)	1.00 + 0.06	1.00 + 0.06	1.00 + 0.06	0.011 + 0.005
Range	**24 hours [3] T_{TCAL} ± 1 °C**	**90 days T_{TCAL} ± 5 °C**	**1 year T_{TCAL} ± 5 °C**	**Temperature coefficient/°C [7]**
Frequency ± (% of reading) [8,9]				
100 mV, 1 V, 10 V, 100 V, and 300 V ranges				
3 Hz to 5 Hz	0.1	0.1	0.1	0.005
5 Hz to 10 Hz	0.05	0.05	0.05	0.005
10 Hz to 40 Hz	0.03	0.03	0.03	0.001
40 Hz to 300 kHz	0.006	0.01	0.01	0.001
Additional low frequency errors ± (% of reading) [8]				
	Gate time			
Frequency	**1 second**	**0.1 second**	**0.01 second**	**0.001 second**
3 Hz to 5 Hz	0	0.12	0.12	0.12
5 Hz to 10 Hz	0	0.17	0.17	0.17
10 Hz to 40 Hz	0	0.2	0.2	0.2
40 Hz to 100 Hz	0	0.06	0.21	0.21
100 Hz to 300 Hz	0	0.03	0.21	0.21
300 Hz to 1 kHz	0	0.01	0.07	0.24
> 1 kHz	0	0	0.02	0.24

1. Specifications are for a 60-minute warm-up, Filter = Slow (3 Hz). Sine-wave input.
2. 20% over range on all ranges, except 3 ACI has 1%.
3. Relative to calibration standards.
4. Add this for each °C outside TACAL ± 5°C.
5. Specifications are for sine wave input > 1% of range and > 10 µArms.
6. Specifications are for sine wave input unless stated otherwise.
7. Add this for each °C outside TCAL ± 5°C.
8. The accuracies are for input > 100 mV. For mV input, multiply % of reading error by 10.
9. High dissipation factor capacitors may show different results than a single frequency measurement. Film capacitors usually have lower dissipation factors than other dielectrics.

Measurement Characteristics

DC voltage	
A/D linearity [1]	0.0001% of reading + 0.0001% of range
Input bias current	< 30 pA at 25 °C
Input protection	12 V on all ranges for Hi S – Lo S terminals 300 V on all ranges for Hi – Lo terminals
Input resistance	
0.1 V, 1 V, 10 V range	Selectable 10 MΩ or >10 GΩ for Hi S – Lo S terminal
100 V, 300 V range	10 MΩ ± 1%
Resistance	
Measurement method	Selectable 4-wire or 2-wire ohms. Current source referenced to Lo input.
Maximum lead resistance (4-wire ohms)	10% of range per lead for 100 Ω, 1 kΩ ranges. 1 kΩ per lead on all other ranges.
Input protection	300 V on all ranges for 2-wire ohms.
DC ratio	
Measurement method	Hi - Lo / Hi S - Lo S
Input Hi-Lo	100 mV to 300 V ranges
Reference Hi (Hi S) to Reference Lo (Lo S)	< 12 V on 100 mV to 10 V ranges (auto ranged)
Reference Lo (Lo S) to Input Lo	< 2 V
True RMS AC voltage	
Measurement method	AC–coupled True RMS. Measures the AC component of the input up to 300 VDC of bias on any range.
Maximum input	AC + DC = 300 Vrms. 300V range limited to 50 kHz.
Crest factor	Maximum 5:1 at full scale
Input impedance	1 MΩ ± 2%, in parallel with < 100 pF
Input protection	300 Vrms on all ranges
DC and True RMS AC current	
Measurement method	Directly coupled to the fuse and shunt. AC-coupled True RMS measurement (Measures the AC component only).
Input protection 3 A	Externally accessible 3.15 A, 600 V fuse (Replacement part number 2110-1857 3.15 A, 600 V fast-acting external fuse)
Frequency and Period	
Measurement method	Reciprocal-counting technique. AC-coupled input using the AC voltage measurement function.
Maximum frequency	300 kHz
Voltage ranges	100 mV RMS full scale to 300 V RMS. Auto or manual ranges.
Gate time	1 ms, 10 ms, 100 ms, or 1 s
Digitizer	
Measurement method	DC coupled
Operating mode	DC voltage, DC current
Maximum sampling rate	2 M samples/s
Measurement noise rejection	
60 Hz (50 Hz) for 1 kΩ Lo lead unbalance	
• DCV CMRR: 140 dB	
• ACV CMRR: 70 dB	
Integration time	Normal mode rejection [2]
≥ 1 PLC	60 dB [3]
< 1 PLC	0 dB

1. Applicable to ±100% of the range.
2. For power-line frequency ±0.1%
3. For power-line frequency ±1%, the NMR is 40 dB. For ±3%, use 30 dB.

Operating Characteristics (Typ)

DC operating characteristics Reading speeds with Autozero off				
Function	**PLC**	**Digits**	**Readings/s 60 Hz (50 Hz)**	**Additional Noise Error**
DCV / DCV E1412A mode	100	7.5 / 6.5	0.6 (0.5)	-
DCI and Ω	100	6.5	0.6 (0.5)	-
DCV, DCI, and Ω	10	6.5	6 (5)	-
DCV, DCI, and Ω	1	5.5	60 (50)	0.001% of range[1]
DCV, DCI, and Ω	0.2	5.5	300	0.001% of range[1]
DCV[2]	0.06	4.5	1000	0.01% of range[1]
DCV, DCI, and Ω	0.02	4.5	3000	0.01% of range[1]
DCV[2]	0.006	4.5	10000	-
DCV[2]	0.002	4.5	30000	-
DCV[2]	0.001	4.5	60000	-
AC operating characteristics Reading speeds with Autozero off				
Function		**Digits**	**Readings/s**	**AC filter**
ACV and ACI		6.5	1/5 (1 per 5 seconds) [3]	Slow (3 Hz). 5 seconds settling time
ACV and ACI		6.5	1 [3]	Medium (20 Hz). 1 second settling time
ACV and ACI		6.5	9.8 [3,4]	Fast (200 Hz). 0.1 second settling time
ACV and ACI		6.5	500 [5]	Fast (200 Hz)

1. For 300V and 3A ranges: use 0.003% of range for 5.5 digits and 0.030% range for 4.5 digits. For all ranges, add 20 mV for DC volts, 4 mA for DC current, or 20 mW for resistance.
2. Not available when operating in E1412A mode.
3. Maximum reading rates for 0.01% of AC step additional error. Additional settling delay is required if the input DC level varies.
4. Using default settling delay (Trigger Delay Auto). Not dependent on trigger source.
5. The maximum useful limit with default settling delays was defeated.

System Characteristics (Nom)

DC voltage (DCV), DC current (DCI), resistance Speeds are for 4.5 digits. Delay 0 and Autozero OFF. Includes measurement and data transfer over a backplane.		
Function change	100/s	
Range change		
DCV	300/s	
DCI	30/s	
Ω-2W	16/s	
Ω-4W	9/s	
Autoranging time [1]		
DCV	1 µs min. 1.5 ms typ.	
DCI	1 µs min. 15.4 ms typ.	
Ω-2W	1 µs min. 61.4 ms typ.	
Ω-4W	1 µs min. 102 ms typ.	
Maximum internal trigger rate [2]	> 2400/s	
Maximum external trigger rate to memory [2]	> 2400/s	
AC voltage (ACV), AC current (ACI) The maximum useful limit with default settling delays is used. Speeds are for 4.5 digits. Delay 0, and Fast AC filter. Includes measurement and data transfer over a backplane.		
Function change (ACV to ACI)	9/s	
Autoranging time [1]		
Bandwidth = 200 Hz	1 µs min. 102 ms typ.	
Bandwidth = 20 Hz	1 µs min. 1020 ms typ.	
Bandwidth = 3 Hz	1 µs min. 5020 ms typ.	
Maximum internal trigger rate	> 450/s (at 200 Hz)	
Maximum external trigger rate to memory	> 450/s (at 200 Hz)	
Frequency, period The maximum useful limit with default settling delays is used. Delay 0, and Fast AC filter. Includes measurement and data transfer over a backplane.		
Reading speed		
@ 6.5 digit (aperture = 1.0 s)	1 reading/s	
@ 5.5 digit (aperture = 0.1 s)	10 readings/s	
@ 4.5 digit (aperture = 0.01 s)	100 readings/s	
Configuration rate	100/s	
Autoranging time	102 ms typ.	
Maximum internal trigger rate (aperture = 1 ms)	900/s	
Maximum external trigger rate to memory (aperture = 1 ms)	900/s	

1. Duration that will be consumed by best range search. Min: the case of the best range is already selected. Typ: the time consumed by one range change event.
2. 0.02 NPLC, delay 0, Autozero off.

General Characteristics

Environment	
Operating environment	Full accuracy for 0 °C to 55 °C
	Full accuracy to 65% RH at 40 °C, decreases linearly to 30% RH at 55 °C, non-condensing
Operating altitude	Up to 3,000 m
Pollution Degree	2
Storage temperature	–40 °C to 70 °C
Power consumption	
+ 3.3 V	700 mA
+ 12 V	500 mA
Connectors	
Hi – Lo	Triaxial connector
Hi S – Lo S	Triaxial connector
I - Lo	Triaxial connector
VM Complete	SMB jack
Trigger In	SMB jack
Regulatory	
Safety and EMC Regulatory	Measurement Category II to 300 V
	Other non-MAINS circuits to 300 Vpk
	Refer to Declaration of Conformity for the latest revisions of regulatory compliance at www.keysight.com/go/conformity
Shock and vibration	
Operating random vibration	Type-tested at 5 to 500 Hz, 0.30 g rms
Survival random vibration	Type-tested at 5 to 500 Hz, 2.41 g rms
Functional shock	Type-tested at half-sine, 30 g, 11 ms
Test method	IEC 60068-2 and MIL-PRF-28800F Class 3
Software and drivers	
Supported operating systems	Microsoft Windows 10 (64-bit), Windows 11 (64-bit)
Standard compliant drivers	IVI-C, IVI.NET, LabVIEW
Supported application development environment (ADE)	Visual Studio (VB.NET, C#, C/C++), LabVIEW, MATLAB, VEE
.NET Framework	Microsoft .NET Framework 4.8 or later
Keysight IO libraries	Keysight IO Libraries Suite 2022 or later
PathWave BenchVue	BenchVue Digital Multimeter Control App
Math functions	
Per function null, min/max/avg, dB, dBm, limit test	
Mechanical	
Dimension	3U/1-slot PXIe standard (Height 131 mm x Depth 210 mm x Width 20.1 mm)
Weight	0.38 kg

Options and Accessories

Options and upgrades

Option (at purchase)	Description
1A7	Calibration + Uncertainties + Guardbanding (Not Accredited)
A6J	ANSI Z540-1-1994 Calibration
UK6	Commercial Calibration Certificate with Test Data

Accessories

Optional Accessories available	
M1401A	Triaxial-to-banana adapter Dimension: 115.2 mm H x 91.5 mm D x 21.3 mm W
N1412A	Triaxial cable, 1.5 m
N1412B	Triaxial cable, 3 m

M1412A with the optional M1401A Triaxial-to-Banana Adapter

Definitions

Specification (spec)

The warranted performance of a calibrated instrument that has been stored for a minimum of 2 hours within the operating temperature range of 0 °C to 55 °C and after a 90-minute warm-up period. All specifications include measurement uncertainty and were created in compliance with ISO-17025 methods. Data published in this document are specifications (spec) only where specifically indicated.

Typical (typ)

The characteristic performance, which 80% or more of manufactured instruments will meet. This data is not warranted, does not include measurement uncertainty, and is valid only at room temperature (approximately 23 °C).

Nominal (nom)

The mean or average characteristic performance or the value of an attribute that is determined by design, such as a connector type, physical dimension, or operating speed. This data is not warranted and is measured at room temperature (approximately 23 °C).

Measured (meas)

An attribute measured during development for purposes of communicating the expected performance. This data is not warranted and is measured at room temperature (approximately 23 °C).

T_{CAL}

The temperature at which the instrument was calibrated.

For more information

For more information about Keysight's Digital Multimeters, please visit:
https://www.keysight.com/us/en/products/digital-multimeters-dmm.html