

2110

5½-Digit Dual-Display Digital Multimeter



The Model 2110 5½-Digit Dual-Display Digital Multimeter combines a compelling price with a comprehensive set of capabilities, superior measurement accuracy, and high speed for a broad range of applications. It features 15 measurement functions and 7 math functions and has dual-line display capability, which allows it to display two different measurements concurrently. The Model 2110 is an unbeatable value for production, R&D, and test engineers, scientists, and students making a wide variety of measurements in portable, bench, and system applications.

High Accuracy, Abundant Capabilities, Low Cost

The Model 2110 provides precision and a rich set of capabilities at a value price. It has 0.012% one-year basic DC voltage accuracy and 0.020% one-year basic resistance accuracy up to the 100k Ω range.

The Model 2110 provides a wide number of measurement ranges and functions:

- DC voltage: 0.1V, 1V, 10V, 100V, and 1000V
- AC voltage: 0.1V, 1V, 10V, 100V, and 750V
- DC current: 10mA, 100mA, 1A, 3A, and 10A
- AC current: 1A, 3A, and 10A
- Two- and four-wire resistance: 100 Ω , 1k Ω , 10k Ω , 100k Ω , 1M Ω , 10M Ω , and 100M Ω
- Frequency: From 10Hz to 300kHz
- Capacitance measurement: 1nF, 10nF, 100nF, 1 μ F, 10 μ F, 100 μ F
- Thermocouple measurement: J-, R-, S-, T-, E-, N-, B-, C-, and K-type thermocouples
- Temperature (RTD and NTC Thermistor) measurements
- Diode measurement
- Continuity test
- Programmable A-D converter and filter settings for signal to noise optimization. Additionally, seven mathematical operations can be performed on measurement readings: percentage, average, min/max, NULL, limits, mX+b, dB, and dBm testing.

Speed

At 5½ digits, the Model 2110 delivers up to 200 readings/s via the USB remote interface. At the fast 4½-digit setting, it reads up to 50,000 readings/s and up to 30,000 readings/s into the buffer, making it ideal for production and monitoring applications in which speed is critical.

APPLICATIONS

Built for Production Testing

The Model 2110 Digital Multimeter is ideal for applications in manual, semi-automatic, and automatic testing of low-cost electronic devices, circuits, modules, electrical components, and semiconductor components. Key features include:

- **Speed: up to 50,000 readings per second**
- **Control: GPIB (optional) and USB interfaces, accepting SCPI (IEEE-488.2) commands**
- **External BNC trigger lines**
- **NIST traceability (with included calibration certificate)**

Built for General Purpose Uses

The Model 2110 Digital Multimeter is also ideal for bench uses such as research, development, service, calibration, and teaching. Bench-oriented features include:

- **Accuracy: 0.012% basic DCV accuracy**
- **Easy-to-operate panel**
- **Easy waveform plotting and data collection with KI-Tool and KI-Link**
- **Store up to 2000 readings**

- **High accuracy, high speed for general purpose measurements**
- **15 measurement functions, including capacitance and thermocouple measurements**
- **Dual-line display allows concurrent measurements**
- **TMC-compliant USB 2.0 interface for use with SCPI test commands**
- **GPIB option for use in system applications**
- **Includes PC software utilities for graphing and data sharing in both Microsoft® Word and Excel**
- **Rugged construction for durability in bench/portable applications**
- **Includes all accessories, such as start-up software, USB cable, power cable, and safety test leads**
- **CE compliant and cUL^{US} listed**
- **Three year warranty**

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2110

5½-Digit Dual-Display Digital Multimeter

Ordering Information

2110-100: 5½-digit USB Digital Multimeter (100V)

2110-120: 5½-digit USB Digital Multimeter (120V)

2110-220: 5½-digit USB Digital Multimeter (220V)

2110-240: 5½-digit USB Digital Multimeter (240V)

2110-100-GPIB: 5½-digit USB and GPIB Digital Multimeter (100V)

2110-120-GPIB: 5½-digit USB and GPIB Digital Multimeter (120V)

2110-220-GPIB: 5½-digit USB and GPIB Digital Multimeter (220V)

2110-240-GPIB: 5½-digit USB and GPIB Digital Multimeter (240V)

Accessories Supplied

Reference Manual on CD, Specifications, LabVIEW® Driver, Keithley I/O Layer, USB Cable, Power Cable, Safety Test Leads, KI-Tool, and KI-Link Add-in (both Microsoft Word and Excel versions), Calibration Certificate



All accessories, such as start-up software, USB cable, power cable, and safety test leads, are included with the Model 2110.

Simplicity

The Model 2110 is operational and intuitive to use right out of the box. The functions on the front panel are user friendly and easy to read. Its KI-Tool and KI-Link software allow users to quickly control the instrument over GPIB (if equipped) or USB, record measurements, and display time-series plots of the data. Its LabView® and IVI drivers give more-advanced customers even more control over the instrument. Both the TMC-compliant USB remote interface and the GPIB interface allow easy re-use of existing SCPI programs.

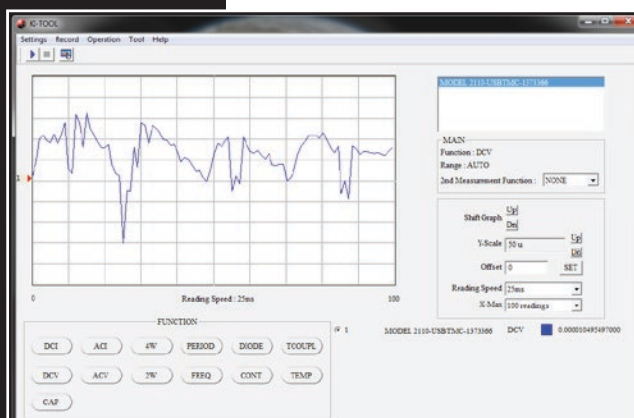
Startup Software, PC Utilities Included

The KI-Tool application provides charting and graphing capabilities without programming to simplify setup, checkout, and basic measurement applications requiring graphical data representation. Scale, offset, and level can be adjusted to fine-tune images for visual evaluation of signal and noise elements over time. It also includes tabular data and SCPI command prompt windows for maximum flexibility. Data sets can also be saved to disk files.

The Microsoft Excel Add-In utility is also included and provides quick data import into a standard Microsoft Excel spreadsheet, including selectable graphing, instrument settings, and number of data points collected. Data can then be analyzed through standard or optional Microsoft Excel functions,

including graphical, statistical, and trend charting. A version supporting Microsoft Word is also included for direct data import into reports.

LabView, IVI-C, and IVI-COM drivers are also supplied to allow for increased flexibility in integrating the Model 2110 into new and existing systems and test routines.



KI-Tool simplifies basic measurement applications through every setup and graphical data representation.

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Low-cost 5½-digit DMM for system, bench, or portable applications

DIGITAL MULTIMETERS & SYSTEMS

AC CHARACTERISTICS

FREQUENCY AND PERIOD		Accuracy ¹	Temperature Coefficient
Range	Frequency (Hz)	±(% of reading + % of range) 1 Year, 23° ±5°C	0°–18°C & 28°–40°C
100.000 mV to	10–40	0.03	0.002
750.000 V ²	40–300k	0.02	0.002

ACV (AC TRMS VOLTAGE)			Accuracy ¹	Temperature Coefficient
Range	Resolution	Frequency	±(% of reading + % of range) 1 Year, 23° ±5°C	0°–18°C & 28°–40°C
100.000 mV to 750.000 V ²	1 μV to 10 mV	10 Hz–20 kHz	0.12 + 0.05	0.01 + 0.01
		20 kHz–50 kHz	0.25 + 0.05	0.02 + 0.02
		50 kHz–100 kHz	0.65 + 0.08	0.04 + 0.02
		100 kHz–300 kHz	5.00 + 0.50	0.2 + 0.02

ACI (AC TRMS CURRENT)			Accuracy ¹	Temperature Coefficient
Range	Resolution	Frequency	±(% of reading + % of range) 1 Year, 23° ±5°C	0°–18°C & 28°–40°C
1.0000 A to	10 μA to	10 Hz–900 Hz	0.30 + 0.06	0.02 + 0.01
3.00000 A	100 μA	900 Hz–5 kHz	1.50 + 0.15	0.02 + 0.01
		10 Hz–900 Hz	0.50 + 0.12	0.02 + 0.01
10.0000 A	100 μA	900 Hz–5 kHz	2.50 + 0.20	0.02 + 0.01

- Specifications valid after two hour warm-up.
 - Slow AC filter (3Hz bandwidth).
 - Pure sine wave input greater than 5% of range.
- 750VAC range is limited to 100kHz.

GENERAL

Input bias current: <30pA at 25°C.
 Input protection: 1000V all ranges (2W input).
 AC CMRR: 70dB (for 1kΩ unbalance LO lead).
 Power Supply: 100V/120V/220V/240V.
 Power Line Frequency: 50/60Hz auto detected.
 Power Consumption: 25VA max.
 Digital I/O interface: USB-compatible Type B connection, GPIB (option).
 Environment: For indoor use only.
 Operating Temperature: 0° to 40°C.
 Operating Humidity: Maximum relative humidity 80% for temperature up to 31°C.
 Storage Temperature: –40° to 70°C.
 Operating Altitude Up to 2000 m above sea level.
 Bench Dimensions (with handles and bumpers): 107 mm high × 252.8 mm wide × 305 mm deep (3.49 in. × 9.95 in. × 12.00 in.).
 Weight: 2.23 kg (4.92 lbs.).
 Safety: Conforms to European Union Low Voltage Directive, EN61010-1. Measurement Cat I 1000V and CAT II 600V.
 EMC: Conforms to European Union Directive 89/336/EEC, EN61326-1.
 Warranty: Three years.



Model 2110 rear panel.

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