175A 4½-Digit Multimeter

- Battery option
- IEEE-488 interface option
- 100-point data logger
- Digital calibration
- TRMS AC measurement
- Backlit display

ACCESSORIES AVAILABLE

TEST LEADS	
1681	Clip-On Test Lead Set
1751	Safety Test Leads
1754	Safety Universal Test Lead Kit
CABLES	
7007-1	Shielded IEEE-488 Cable, 1m (3.3 ft)
7007-2	Shielded IEEE-488 Cable, 2m (6.6 ft)
7008-3	IEEE-488 Digital Cable, 0.9m (3 ft)
7008-6	IEEE-488 Digital Cable, 1.8m (6 ft)
PROBES/SHUNT	
1600A	High Voltage Probe
1651	50A Current Shunt
1682A	RF Probe
1685	Clamp-On Current Probe
OUTPUTS	
1753A	IEEE-488 Interface
POWER	
1758	Rechargeable Battery Pack
RACK MOUNT KITS	
1010	Single Fixed Rack Mount Kit
1017	Dual Fixed Rack Mount Kit

See page 235 for descriptions of all accessories.

The Keithley Model 175A is a 4½-digit LCD bench/portable DMM with 0.03% basic DCV accuracy. It offers extended measurement capabilities including a 10A current range, 100kHz bandwidth, and resistance measurements from 10mΩ to 200MΩ. Annunciators provide function, range, and feature indication.

With the Model 175A, choose either manual or autoranging. Fast autoranging is available on DC volts, ohms, AC volts, and dB.

ORDERING INFORMATION

All include Instruction Manual and Model 1751 Safety Test Leads.

175A	Autoranging DMM
175A/1753A	Autoranging DMM with IEEE-488 Interface
175A/1758	Autoranging DMM with Rechargeable Battery Pack
175A/53A/58	Autoranging DMM with IEEE-488 Interface and Rechargeable Battery Pack

This product is available with an **Extended Warranty.** See page 635 for complete ordering information.

Data Logging

The Model 175A's 100-point data logger is capable of storing data at six selectable rates from three readings per second to one every hour. Data can be recalled from the front panel. This feature enables collection of response curve data and monitoring of drifts or rates of change without the need for a printer.

The Min/Max hold feature holds both lowest and highest readings over a selected period of time.

Relative Measurements

The dB function makes the Model 175A suitable for audio and communications applications.

Direct dB readings are given throughout a dynamic range from –98 to +62dB, with 0.01dB resolution above 10mV. The 100kHz bandwidth covers well past the audio range. The optional RF probe extends the bandwidth to 250MHz.

The relative reference allows nulling out circuit voltage offsets or lead resistances. By nulling out power supply voltages or circuit outputs, drifts or changes can be displayed. Combined with the dB function, it can be used to make fast gain-stage measurements.

Digital Calibration

With the Model 175A's digital calibration, all calibration factors are stored in non-volatile memory, allowing calibration to be done electronically without manual adjustments. The IEEE-488 interface option offers range programmability on volts and ohms, TALK/LISTEN capability, trigger, SRQ, and other commands. Combined with the digital calibration feature, calibration can be performed on the bus in as little as two minutes.

QUESTIONS?
1-800-552-1115 (U.S. only)
Call toll free for technical assistance, product support or ordering information, or visit our website at **www.keithley.com**.

175A 4½-Digit Multimeter

DC VOLTS

RANGE	RESOLUTION	INPUT RESISTANCE	ACCURACY (1 Year) 18°28°C ±(%rdg + counts)
200 mV	10 µV	>1 GΩ*	0.03 + 2
2 V	100 µV	>1 GΩ*	0.03 + 1
20 V	1 mV	11 MΩ	0.03 + 1
200 V	10 mV	10 MΩ	0.03 + 1
1000 V	100 mV	10 MΩ	0.03 + 1

*With all function buttons in the out position.
NORMAL MODE REJECTION RATIO: >60dB at 50Hz, 60Hz ±0.15%.
MAXIMUM ALLOWABLE INPUT: 1000V DC or peak AC (<10s per minute on 200mV and 2V ranges; 300V rms continuous).
SETTLING TIME: 1s to within 1 count of final reading on range.
dB MODE (ref: 600Ω): Accuracy: ±(0.02dB + 1 count) (above 78dBm).
Resolution: 0.01dB above 5% of range.

OHMS

RANGE	RESOLUTION	ACCURACY (1 Year) 18°–28°C ±(%rdg + counts)	MAX. VOLTAGE ACROSS UNKNOWN ON RANGE
200 Ω	10 mΩ	0.05 + 2*	0.2 V
2 kΩ ▶|	100 mΩ	0.05 + 1	2.0 V
20 kΩ	1 Ω	0.05 + 2	0.2 V
200 kΩ ▶|	10 Ω	0.05 + 1	2.0 V
2 MΩ **	100 Ω	0.05 + 2	0.2 V
20 MΩ **	1 kΩ	0.2 + 1	2.0 V
200 MΩ **	100 kΩ	2.0 + 1	2.0 V

*When properly zeroed.
**Appropriate range selected automatically.
MAXIMUM ALLOWABLE INPUT: 450V DC or peak AC.
OPEN-CIRCUIT VOLTAGE: +5V.
DIODE TEST: Display reads junction voltage up to 2V. Test current: 0.7mA nominal.
SETTLING TIME: 2 seconds to within 1 count of final reading on range.

TRMS AC VOLTS

ACCURACY (1 Year)* 18°–28°C ±(%rdg + counts)

RANGE	20Hz–50Hz	50Hz–10kHz	10kHz–20kHz	20kHz–50kHz	50kHz–100kHz
2V–750V	1 + 20	0.5 + 20	1 + 40	2.5 + 75	5 + 200
200 mV	1 + 20	0.5 + 20	1.5 + 40	8 + 75	—

dB MODE (ref: 600Ω): ACCURACY (±dBm)

RANGE	INPUT	20Hz–10kHz	10kHz–20kHz	20kHz–50kHz	50kHz100kHz
2V–750V	200 mV to 750 V (–12 to +59.8dBm)	0.2	0.26	0.56	1.2
200 mV	20 mV to 200 mV (–32 to –12 dBm)	0.2	0.3	1	—
	2 mV to 20 mV (–52 to –32 dBm)	2	3	—	—
	1 mV to 2 mV (–58 to –52 dBm)	2**	—	—	—

Resolution: 0.01dB above 5% of range.
*Above 1800 counts. **Up to 1kHz.
MAXIMUM ALLOWABLE INPUT: 750V rms, 1000V peak (<10 seconds per minute on 200mV range; 300V rms continuous). 10^7V·Hz maximum.
3dB BANDWIDTH: 300kHz typical.
INPUT IMPEDANCE: 10MΩ paralleled by <75pF on 20V, 200V, and 1000V ranges. 11MΩ on 200mV and 2V ranges. Capacitively coupled.
SETTLING TIME: 2 seconds to within 15 counts of final reading on range.

DC AMPS

RANGE	RESOLUTION	MAXIMUM VOLTAGE BURDEN	ACCURACY (1 Year) 18°–28°C ±(%rdg + counts)
200 µA	10 nA	0.3 V	0.15 + 2
2 mA	100 nA	0.3 V	0.15 + 2
20 mA	1 µA	0.3 V	0.15 + 2
200 mA	10 µA	0.3 V	0.2 + 2
2000 mA	100 µA	0.8 V	0.2 + 2
10 A	1 mA	0.3 V	0.5 + 2*

*Above 5A derate 0.15% rdg per amp for self-heating.
OVERLOAD PROTECTION: mA Input: 2A fuse (250V), externally accessible.
10A Input: 20A for 15s, unfused.
SETTLING TIME: 1 second to within 1 count of final reading.

TRMS AC AMPS

RANGE	MAX. VOLTAGE BURDEN	ACCURACY (1 Year)* 18°–28°C ± (%rdg+counts) 20Hz–50Hz	50Hz–10kHz	10kHz–30kHz
200 µA–20 mA	0.3 V	1 + 20	0.8 + 20	2 + 50
200 mA	0.3 V	1 + 20	0.8 + 20	—
2000 mA	0.8 V	1 + 20	0.8 + 20	—
10 A	0.3 V	1.5 + 20**	1 + 20**	—

*Above 1800 counts.
**1kHz max. Above 5A derate 0.15% rdg/amp for self-heating.
SETTLING TIME: 2 seconds to within 15 counts of final reading.

IEEE-488 BUS IMPLEMENTATION

(Model 1753A Option)

MULTILINE COMMANDS: DCL, SDC, GET, GTL, UNT, UNL, SPE, SPD.
UNILINE COMMANDS: IFC, REN, EOI, SRQ, ATN.
INTERFACE FUNCTIONS: SH1, AH1, T5, TE0, L4, LE0, SR1, RL2, PP0, DC1, DT1, C0, E1.
PROGRAMMABLE PARAMETERS: Range (DCV, ACV, Ω only), REL, dB, EOI, Trigger, Calibration, SRQ, Status, Output Format, Terminator.

GENERAL

DISPLAY: Backlit 4½-digit LCD, 0.5 in height; polarity, function, range, and status indication. Backlighting is switch-selectable.
RANGING: Auto or manual on DC volts, AC volts, ohms; manual on AC amps, DC amps.
AUTORANGING TIME: 300ms per range.
RELATIVE: Pushbutton allows zeroing of on range readings. Allows readings to be made with respect to baseline value. Front panel annunciator indicates REL mode.
DATA LOGGER and MIN/MAX: 100 reading storage capacity; records data at one of six selectable rates from 3 readings/second to 1 reading/hour. Also detects and stores maximum and minimum readings continuously in data logger mode.
CONVERSION RATE: 3 readings per second.
OVERRANGE INDICATION: "OL" displayed.
CREST FACTOR (ratio of peak value to rms value), AC FUNCTIONS: 3.
MAXIMUM COMMON MODE VOLTAGE: 500V peak.
COMMON MODE REJECTION RATIO (1kΩ unbalance): >120dB at DC, 50Hz, 60Hz ±0.15%. >60dB in AC volts.
TEMPERATURE COEFFICIENT (0°–18°C & 28°–50°C): ±(0.1 × applicable accuracy specification)/°C except ±(0.07%+2)/°C for 50Hz–10kHz in AC volts.
ENVIRONMENT: Operating: 0° to 50°C; <80% relative humidity up to 35°C; linearly derate 3% RH/°C, 35° to 50°C. **Storage:** –40° to +70°C.
POWER: 105–125V or 210–250V (external switch selected), 90–110V available; 50–60Hz, 12VA. Removable power cord. Optional 6-8 hour battery pack, Model 1758.
DIMENSIONS, WEIGHT: 89mm high × 235mm wide × 275mm deep (3½ in × 9¼ in × 10¾ in). Net weight 1.8kg (3 lb, 14 oz).
ACCESSORIES SUPPLIED: Model 1751 Safety Test Leads, instruction manual.

KEITHLEY