

2000-20 Scanning Multimeter



- 6½-digit multimeter
- Switch up to 20 (2-pole) or 10 (4-pole) channels
- Scan rates up to 90 ch/s (DCV)
- Quick-disconnect rear panel connector
- Compatible with existing test software

Keithley's new Model 2000-20 Scanning Multimeter is a special version of our popular Model 2000 6½-digit DMM. It's designed especially for switch-and-measure applications involving up to 20 inputs (channels). The DMM comes complete with the 20-channel scanner card already installed in the option slot, so it's easy to create a self-contained multi-point measurement solution. A quick-disconnect connector on the rear panel simplifies system set-up. The switching card can be controlled from the front panel or via the RS-232 or IEEE-488 interface.



High-Performance Multimeter

The Model 2000-20 builds upon the standard Model 2000's high-performance, cost-effective design, combining a broad range of functions with excellent accuracy specifications. As the industry's fastest 6½-digit DMM, the Model 2000 has already established itself in literally thousands of production test applications around the world. Built-in measurement functions include AC and DC voltage and current, 2- and 4-wire ohms, as well as continuity, period, frequency, dB, dBm, temperature and diode testing. A built-in limit testing function can be used to sort or grade components or assemblies based on test results.

Choose 2- or 4-Pole Switching

The Model 2000-20's card can be configured to handle up to 20 channels of 2-pole switching or 10 channels of 4-pole switching. The closed channel is displayed on the multimeter's front panel. Multiple channel closures can be programmed via the multimeter's RS-232 or IEEE-488 interfaces.

Signal Handling Flexibility and Integrity

The card is designed for switching DC signals up to 60V/0.5A, 30VA maximum or AC signals up to 30V/0.5A, 15VA maximum, 100kHz maximum. Each contact pair on the card has $\pm 1\mu\text{V}$ contact potential typical, $2\mu\text{V}$ maximum to ensure measurement integrity.

High Software Compatibility

The Model 2000-20 helps preserve a user's investment in control software when it's used to upgrade the performance of an existing computer-controlled test system. The Model 2000-20 is compatible with system software developed for use with the standard Model 2000. The TestPoint software drivers included with the Model 2000-20 and the available LabVIEW driver provide support for the 20-channel switching capability. For applications with even higher channel counts, the Model 2000-20 is compatible with Keithley's 7000 Series switch mainframes and cards.

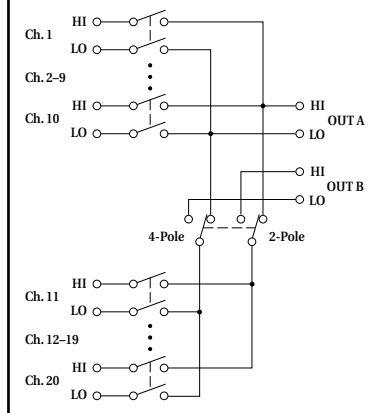
ORDERING INFORMATION

2000-20	6½-Digit Multimeter with factory-installed 20-channel scanner card
2000-MTCD-2	2 meter cable (44-pin to 50-pin)
2000-MTC-2	2 meter cable (44-pin to unterminated) (included with 2000-20)
2000-SCAN-20	Replacement 20-channel scanner card, designed for use exclusively with the Model 2000-20.

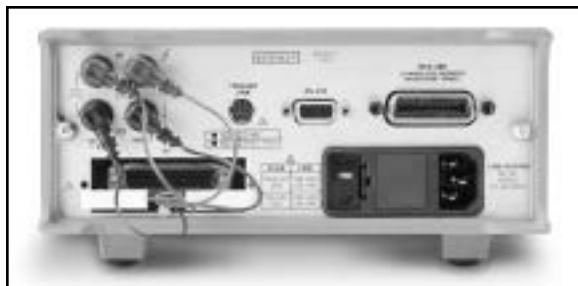
TestPoint Test Development Software

This product is available with an **Extended Warranty**. See page 235 for descriptions of all accessories.

Scanner configuration



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Quick-disconnect clips on the 2000-MTCD-2 or 2000-MTC-2 cables simplify making connections to the card. The red and black leads shown here connect the scanner output to the DMM: two wires for 2-pole switching and four wires for 4-pole switching.

Applications

- Component test applications that require up to 20 channels
- 4-wire ohms resistance measurements
- Benchtop measurements

Easy Scanner Connections

The scanner channel connections for the Model 2000-20 are made through a 44-pin high-density D-subminiature connector. The required (female) mating connector is not included. Instead, Keithley offers two optional cable assemblies with a mating connector.

The **2000-MTCD-2** is a 2-meter long cable with a 44-pin connector on one end that's designed to mate with the scanner card. The other end is equipped with a 50-pin D-subminiature connector, designed to mate with 50-pin female D connectors. Both ends have quick-disconnect clips. The cable contains 20 twisted pairs of #28 stranded wire and an overall shield.

The **2000-MTC-2** is similar to the 2000-MTCD-2, but without the 50-pin connector. The cable is left unterminated for direct connection to the user's fixturing or device. One 2000-MTC-2 is included with the 2000-20.



Model 2000-MTC-2

Specifications These specifications apply to the Model 2000-SCAN-20 card. For multimeter specifications, refer to the Model 2000.

GENERAL:

20 Channels: 20 channels of 2-pole relay input. All channels configurable to 4-pole.

Relay Type: Latching electromechanical.

Actuation Time: <3.5ms.

CAPABILITIES: Multiplex one of twenty 2-pole or one of ten 4-pole signals into DMM.

INPUTS

Maximum Signal Level:

DC Signals: 60V DC, 0.5A switched, 30VA maximum (resistive load).

AC Signals: 30V AC rms or 42.4V AC peak, 100kHz maximum, 0.5A switched, 15VA maximum (resistive load).

Contact Life: >10⁵ operations at maximum signal level; >10⁸ operations cold switching.

Contact Resistance: <1Ω at end of contact life.

Contact Potential: <±1μV typical per contact, 2μV max. <±1μV typical per contact pair, 2μV max.

Connector Type: 44 pin male D-subminiature.

Isolation Between Any Two Terminals: >10⁸Ω, <75pF.

Isolation Between Any Terminal and Earth: >10⁸Ω, <150pF.

Common Mode Voltage: 42.4V AC peak; 60V DC between any terminal and earth.

Maximum Voltage Between Any Two Terminals: 42.4V AC peak, 60V DC.

Maximum Voltage Between Any Terminal and Model 2000 Input LO: 42.4V AC peak, 60V DC.

ENVIRONMENTAL:

Operating Environment: Specified for 0°C to 50°C. Specified to 80% R.H. at 35°C.

Storage Environment: -40°C to 70°C.

DIMENSIONS, WEIGHT: 21mm high × 72mm wide × 221mm deep (0.83 in. × 2.83 in. × 8.7 in.). Adds 0.3kg (7 oz.).

Internal Scanner Speed

Maximum Internal Scanner Rates

RANGE: Channels/s¹

TRIGGER DELAY = 0

DCV ²	ACV ^{2,3}	2 WIRE OHMS ²	4 WIRE OHMS ²	TEMPERATURE ²
All : 100	All : 90	All : 95	<10MΩ : 31	All : 60

TRIGGER DELAY = AUTO

DCV ²	ACV ^{2,3}	2 WIRE OHMS ²	4 WIRE OHMS ²	TEMPERATURE ²
0.1 V : 95	All : 1.8	100 Ω : 81	100 Ω : 28	All : 60
1 V : 100		1 kΩ : 81	1 kΩ : 28	
10 V : 101		10 kΩ : 42	10 kΩ : 21	
100 V : 70		100 kΩ : 28	100 kΩ : 17	
1000 V : 70		1 MΩ : 8	1 MΩ : 7	
		10 MΩ : 5	10 MΩ : 5	
		100 MΩ : 3	100 MΩ : 3	

Internal Scanner Speed Notes

1. Speeds are for 60Hz operation using factory default operating conditions (*RST). Auto Zero off, Auto Range off, Display off, sample count = 1024.
2. NPLC = 0.01.
3. DETector: BANDwidth 300.

Specifications are subject to change without notice.

The Model 2000-20 multimeter is also compatible with the existing 9- and 10-channel scanner cards in the Series 2000 line.