Measurements International

A Metrology Based Company

Model 8000A

Automated Potentiometer

20 Channel Scanner
Accuracy < 0.05 ppm
Voltage Maintenance Programs
Linearity Calibrations of DMM's
IEEE-488 Operation

General Description:

The Model 8000A is a highly versatile, accurate, self-balancing instrument that meets laboratory requirements for scaling between 10-volt references and the 1.018-volt standard cells or any voltage between 1 mV to 10 volts. Automatic self-calibration ensures ratios to nine significant digits with linearity deviations of less than 0.02 ppm. The Model 8000A has a 20 channel "built-in" scanner addressed individually via the windows operating software for performing automatic measurements. Both hardware and software standard cell protection circuits are built in.

The system detector can be any low noise DMM having a resolution of 100nV or less. Control of the DMM detector is achieved over the IEEE-488 interface bus. Several DMM drivers are already built into the software including the HP 3458A, Keithley 182 and Fluke 8842A. Provisions have been made so that the drivers of other DMM detectors can be added at any time. For optimum performance the HP 3458A is recommended.

Measurements International's (8000SW) operating software is available in both windows 95/98 and NT platforms. The system requires a stable 10V source (Model 1000) and a DVM Detector (Fluke 8842A, HP3458A). Optimum performance is achieved using the HP 3458A as a guarded detector.

The Model 8000A source voltage maybe supplied by any stable 10-volt reference. Only the short-term stability of the source is important. To make a direct reading, it is necessary to standardize the system against a known voltage reference calibrated by the Josephson Array for optimum accuracy. For users that maintain a 4-bank standard cell enclosure as their primary reference, the program allows the user to standardize against the four cells and uses the mean as the reference value.

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The Model 8000A ratio can be calibrated directly against the 10V Josephson Array or the ratio can be verified by measuring the normal and inverse ratio of two stable resistors. The Model 8000A's range can be extended to 1200 volts with Measurements International's precision divider extender (Model 8001A).

Operation:

The principle of the 8000A Automatic Potentiometer is based on the Binary Voltage Divider (BVD). The reference to the BVD is supplied from a stable voltage reference, MIL Model 1000 or Fluke Model 732A or B. The source should be a low drift, stable, noise free 10-Volt Source, connected to the rear on the 8000A-source input. All 20-measurement channels are also located on the rear of the potentiometer. The DMM detector with an input impedance of 10 GΩ or higher is then used to measure the difference between the output of the BVD and the voltage under test. An isolated guard circuit is provided to guard the BVD and the DMM detector when performing measurements. The guard voltage can also be used to drive the guards of the cell enclosures under test to reduce leakage problems.

System Software:

The Measurements International's 8000A SW controls all of the above automatically. The software feature reports generation, historical analysis and tracks and corrects for drift rates. Combined with the Measurements International Model 8001A Extender, automatic voltage measurements can be performed to 1000 Volts. All data can be exported directly to Excel for various test patterns or mainframe applications. External atmospheric pressure, humidity and temperature indicators are optional and the entire system can be enclosed in a 4 or 6 ft. rack. Instrument controllers, printers, system software, IEEE interface, installation and training are all available for complete system packages.

System Requirements:

To run the MI Software (8000SW) requires a computer, 486 or higher running at 166 MHz or higher, with 32 MEG of RAM, Windows 95, 98 and an IOTECH IEEE488 Interface Card (not included).

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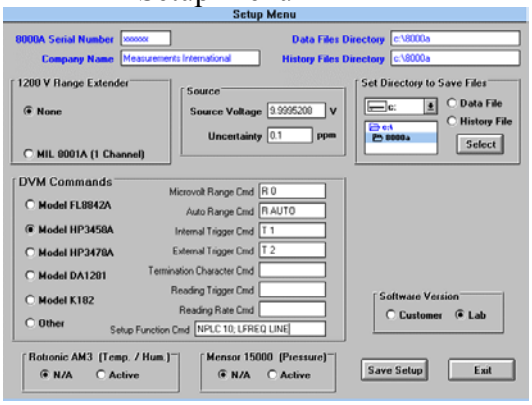
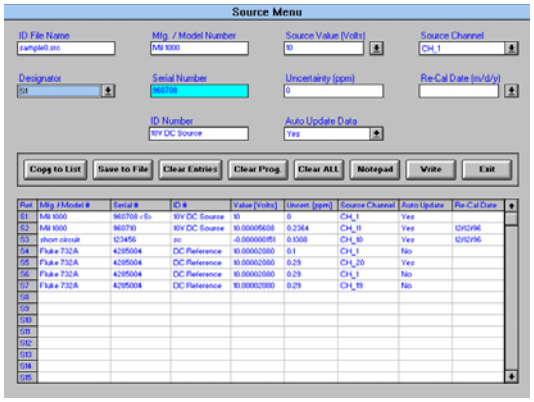
8000SW – Windows Operating Software:

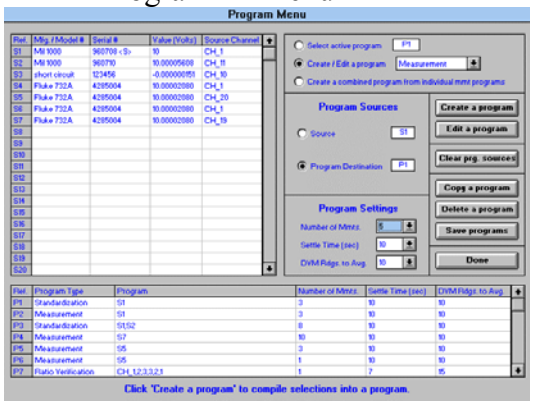
Setup Menu



Source ID Menu



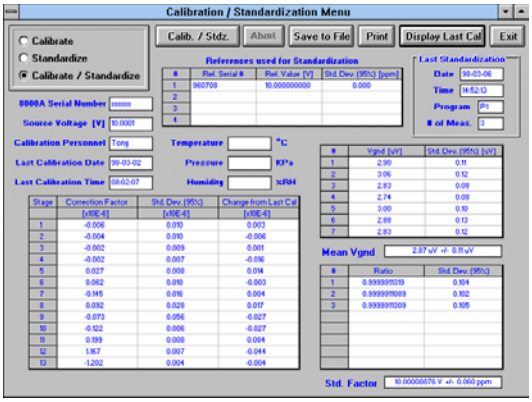
Program ID Menu



Opening Screen

Measurement Options

Calibration & Standardization



Measurements International's 8000SW was developed by metrologists for metrologists. The software features real time uncertainty analysis, graphing, history logging and graphing, data storage, regression analysis and direct exporting to Excel.

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Specifications:

Automatic Self Calibration	Completely Self Checking
Range	100nV to 10 Volts DC
Read Out	Over IEEE488
Insulation Resistance	10^{11} Ohms
Effective Linearity	<0.02 ppm of Full Scale
Long Term Drift	No Effect - Self Calibration Corrected
Measurement Uncertainty	0.05 ppm of Reading (2 sigma)
Short Term Drift	Follows Drift of Source
Operating Environment	18 to 34°C, 10 to 80% RH
Warranty	1 Year Parts & Labor

Dimensions:
265 x 439 x 380 mm

Weight:
14 kg

Shipping Weight:
18 kg

Accessories:
1000
8001A

Operating Power:
100, 120, 220, 240V - 50/60 Hz

Distributed By:

How to Order:
Model 8000A - Automated Potentiometer

Rev. 02/99/08

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