

MODEL 6000B



Automatic High Resistance Ratio Bridge

- **Featuring true ratio self calibration**
- **Range 10kΩ to 1TΩ**
- **Built in 4 channel matrix scanner**
- **Accuracy <math> < 20 \times 10^{-9}</math> for 10kΩ ratios**
- **Accuracy <math> < 0.5 \times 10^{-6}</math> for 100MΩ**
- **Linearity <math> < 5 \times 10^{-9}</math>**
- **Full system solutions and full system integration using MI 1000B 110V Source, 6000B software and 4200 series of Matrix Scanners**

MODEL INFORMATION

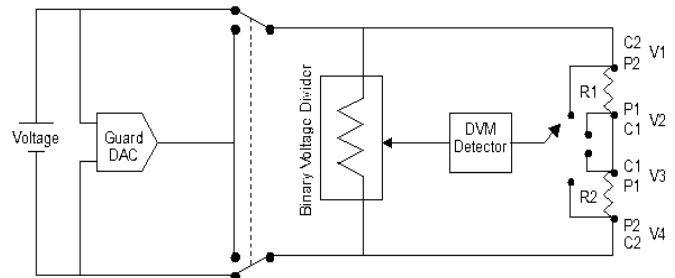
The Model 6000B is a fully automated bridge using the Cutkosky Divider principle. This technology offers new solutions for measuring high value resistors more accurately and at lower currents. The Cutkosky or Binary Voltage Divider Technology, solves all errors normally associated with a direct current comparator while offering significantly improved uncertainties. An internal guard circuit is used to guard the measuring circuit. This guard may also be used to drive the measuring leads, a guarded detector and resistor enclosures to increase the effective insulation resistance and improve overall performance.

The system requires a stable voltage source (Model 1000B) and a DVM Detector (Fluke 8508A, Agilent 3458A, or Keithley 2000). Optimum performance is achieved using the Agilent 3458A as a guarded detector.

The Model 6000B has a four-channel matrix scanner with inputs labeled R1, R2, R3 and R4. The number of inputs can be expanded to 40 when the 6000B is used in conjunction with 4200 Series Low Thermal Four Terminal Matrix Scanners.

Calibration of the 6000B is performed easily and automatically. Calibration data is stored to file for

history analysis. New calibration data is compared to the last calibration data for tracking drift of the BVD.



The principle of the 6000B Automated High Resistance Ratio Bridge is based on the Binary Voltage Divider (BVD). The reference to the BVD is supplied from a stable voltage reference, Model 1000B. The Model 1000B is a low drift, stable, low noise, programmable DC reference. The DC reference is connected to the rear of the 6000B Source input terminals. The DVM detector with an input impedance of 10GΩ or higher is used to measure the difference between the output of the BVD and the test voltage. An isolated guard circuit is provided to guard the BVD and the DVM detector when performing measurements. The guard voltage can also be used to drive the cans and/or shields of resistors under test to reduce leakage problems between the case and the resistor.

>165.65546 67816.12287 577
>198.65546 65612.23-2829 955
>198.65546 65612.23-2829 95556
>152.698016 68818.28-2399 92356
>198.643636 78617.73-2289 783 56
>124.634546 78672 23-7779 683 56
>458.11142 83417.73-2397 876 56
>145.523286 64486.22-2689 986 56
>140.77060 32814.07-7060 328 56-20



System Software and Applications:

The Measurements International's 6000SW controls all of the above automatically. The software features report generation, historical analysis, while tracking and correcting for resistor drift rates. All measurement data is displayed in graph form as the measurement progresses. All uncertainties are calculated at 2 sigma.

For SR104 measurements, the 6000SW allows users to measure the temperature of the SR104 at time of measurement using an external thermistor. The thermistor is placed in the well of the SR104 and is measured against a 1MΩ reference resistor. The 1MΩ standard resistor is used to keep the current in the thermistor as low as possible as not to cause self heating. The software can then apply a correction for 23 or 25°C

The 6000B can also be used in conjunction with Measurements International's 4200 Series Matrix Scanner and 4220-1 interface adapter for calibration of SR1010 series of Hamon resistance boxes.

Combined with the Measurements International Model 9300 or 9300A air bath, alpha and beta calculations can be performed automatically on resistors under test. 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. Resistor baths (oil or air), instrument controllers, printers, system software, IEEE interface, installation and training are all available for complete system packages.

6000SW – Windows Operating Software:

Measurements International's 6000SW was developed by metrologists for metrologists. The software features real time uncertainty analysis, graphing, history logging and graphing, data storage with export to Excel and regression analysis. The 6000SW provides ultimate programmability and control for all your high value resistor measurements now and in the future.

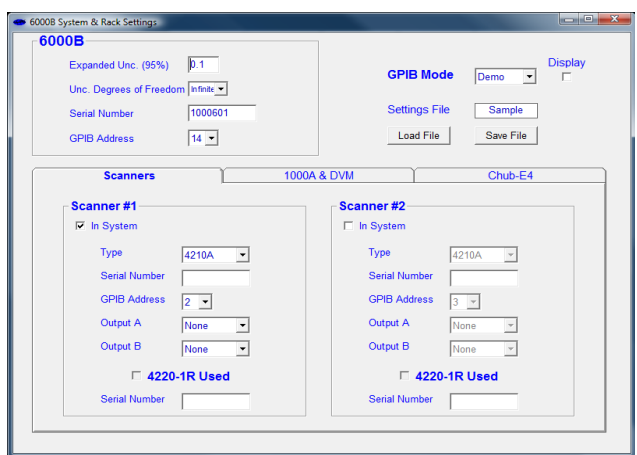


>185.65546 678 16 1 22 87 5 7 7
 >198.65546 656 12 23 2829 955 56
 >152.698016 688 18 28 2399 92356
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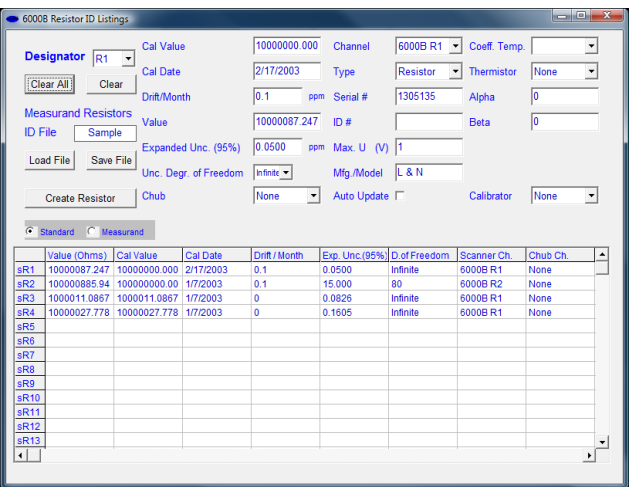
6000SW – Windows Operating Software



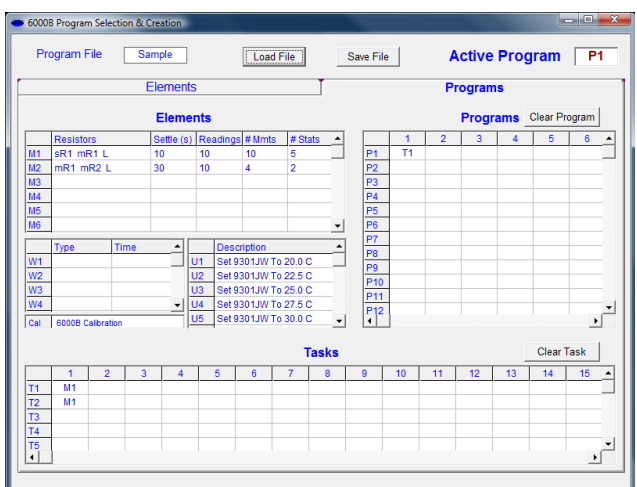
Intro Screen



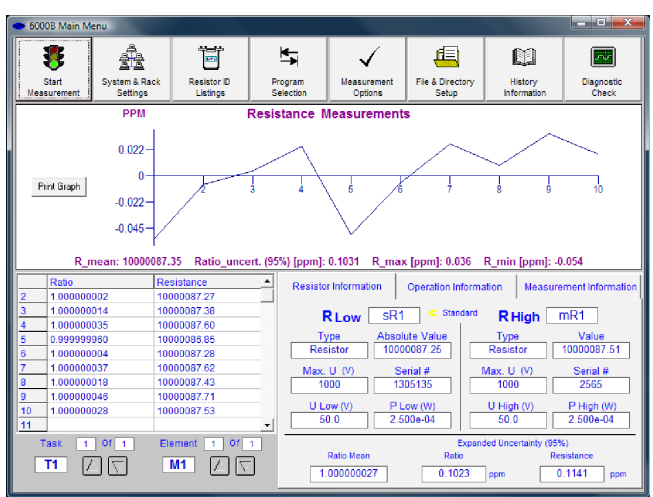
System & Rack Setting



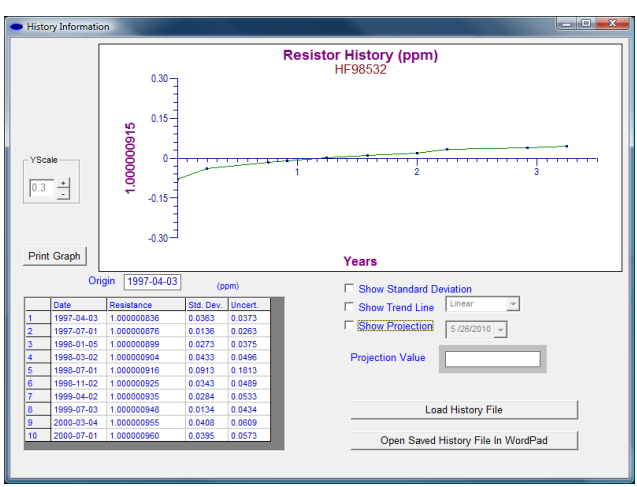
Resistor ID Screen



Program Selection



Main Menu



Resistor History



>163,65546 67810,72337 977
 >198,65546 65612,23-2829 955
 >198,65546 65612,23-2829 95556
 >152,698016 68818,28-2399 92356
 >198,643636 78617,73-2289 783 56
 >124,634546 78672,23-7779 683 56
 >458,11142 83417,73-2397 876 56
 >145,523286 64486,22-2889 986 56
 >140,77060 32814,07-7060 328 56-20



Specifications:

Resistor Range	Accuracy (95%) (2s) Ratio 0.1 Through 10	Applied Voltage
10kΩ to 10kΩ	<0.02 ppm	10V to 20V
10kΩ to 100kΩ	<0.1 ppm	10V to 50V
100kΩ to 1MΩ	<0.1 ppm	10V to 110V
1MΩ to 10MΩ	<0.1 ppm	10V to 110V
10MΩ to 100MΩ	<0.5 ppm	10V to 110V
100MΩ to 1GΩ	<5 ppm	10V to 110V
<i>Measurements Above 1GΩ Require Special Resistor Configurations</i>		
10GΩ	<20 ppm	10V to 110V
100GΩ	<200 ppm	10V to 110V
1TΩ	<500 ppm	10V to 110V
Ratio 100:1	<2 ppm	10 to 110V
Ratio 1000:1	<20 ppm	10 to 110V
Note: specifications are achievable with the resistors in MIL 9400A oil bath at 25°C ± 20m°C for 10kΩ & 100kΩ measurements and MIL 9300A Air Bath at 23°C ± 10m°C for 1MΩ to 1TΩ measurements.		
Linearity	0.005 ppm	
Short Term Drift (2 hours) Stabilization	< 0.2 ppm for 8 hours	
Operating Environment	18 to 34 °C, 10 to 80%	
Warranty	1 Year Parts & Labor	

Dimensions (L x W x H):
 378 x 439 x 267 mm

Weight:
 15 kg max

Shipping Weight:
 20 kg

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

Accessories:

- 1000B - Programmable Voltage Source - 110V
- 1000A - Precision Voltage Source
- 4200 - Series Scanners - 10, 16, and 20 Channel
- 9400 - Standard Resistor Oil Bath
- 9300A - Standard Resistor Air Bath/GPIB

How to Order:

Model: 6000B - Automatic High Resistance Ratio Bridge

Disributed By:

Corporate Headquarters

Measurements International
 PO Box 2359, 118 Commerce Drive
 Prescott, Ontario, Canada K0E 1T0
 Phone: (613) 925-5934
 Fax: (613) 925-1195
 Email: sales@mintl.com
 Toll Free: 1-800-324-4988

Worldwide Offices

MI-USA
 Phone: (407) 706-0328
 Fax: (407) 706-0318
 Email: sales@mintl.com
 Toll Free: 1-866-684-6393

MI-China
 Phone: 86-10-64459890
 Fax: 86-10-64459871
 Email: sales@mintl.com

MI-Europe
 Phone: (420) 731-440-663
 Fax: (420) 572-572-358
 Email: sales@mintl.com

