DC bridge

- Measurement uncertainty to ± 0.025 mK
- Uses conventional standard resistors

Several companies manufacture high quality resistance bridges for both AC and DC applications that can take measurements at the 0.1 ppm level. Research has shown that all of them compensate well for any theoretical inaccuracies predicted in their design.

We like the MI bridge because we feel confident about its measurements, and its software gives us more information than we can get from the other instruments. While it's true we do use the other bridges for certain functions we undertake in our lab, including some experimental testing, we use the MI bridge every day for fixed-point calibrations of SPRTs.

The 5581 Bridge performs a true auto-balancing procedure to nine significant digits. As the check proceeds, the bridge steps through an internal comparison of the transformer's windings, the results of which are recorded to track its performance over time.

Another function of this bridge is its real-time uncertainty analysis program. In this mode, you enter external uncertainty factors such as the uncertainty of your resistor, and the 5581 combines your information with its own uncertainties to compute a system uncertainty for your measurement.

The optional Windows® compatible control software offers history logging and regression analysis, along with uncertainty analysis and the auto-self-check feature. The program also calculates standard deviations if you need them. You can enter coefficients for your SPRT and read temperature rather than resistance.

Of course, if you prefer, you can operate the bridge manually. The choice is yours, but either way you'll find this to be a great bridge to use.

The DC Advantage

AC bridges are more susceptible to electrical interference than DC bridges. Therefore, when AC furnaces are used, DC bridges are preferred. The likelihood of electrical interference increases at temperatures above the freezing point of Aluminum (660.323 °C), because the insulation resistance of the furnace and the SPRT decline significantly.

Specifications

Bridge	
Range/ Accuracy	–0.001 Ω to 0.01 Ω: < 5 ppm 0.01 Ω to 0.1 Ω: < 0.5 ppm 0.1 Ω to 1 Ω: < 0.1 ppm 0.1 Ω to 10 KΩ: < 0.1 ppm 10 KΩ to 10 KΩ: < 0.2 ppm
Linearity	0.01 ppm
Max Ratio	13:1
Test Currents	10 µA to 150 mA, 30-Volt compliance
Current Reversal	Automatic 4 to 1000 seconds
Power	100, 120, 220, and 240 V (± 10 %), 47–63 Hz, 180 VA
Weight	60 lb (27.3 kg)
Dimensions (WxHxD)	432 x 279 x 381 mm (17 x 11 x 15 in)
Scanner	
Inputs	20/10
Operation	Matrix
Thermal EMFs	< 500 nanovolts
Error Contribution	< 20 nanovolts
Contact Ratings	Relay 2-coil latching
Max Carrying Current	2 A (ac/dc) (optional 30 A)
Contact Resistance	<0.007 Ω
Insulation Resistance	$>10^{12}$ Ω
Inputs and Outputs	Tellurium Copper (rear panel)
IEEE-488	24-pin IEEE-488
Weight	**5313-001:** 18 kg (40 lb) **5313-002:** 9 kg (20 lb)
Dimensions (WxHxD)	**5313-001:** 432 x 279 x 381 mm (17 x 11 x 15 in) **5313-002:** 127 mm H (5 in)

Ordering Information

5581	MI Bridge
5313-001	Scanner, 20 channels
5313-002	Scanner, 10 channels
5313-003	IOTech 488 Interface Card
5313-004	Windows Software