Resistance Transfer Standards

- **Each device configurable to 10R, 1R, and R/10**
- **Accuracy of transfer better than 1 ppm**
- **Six models, decade values from 1 Ω/step to 100k Ω/step**
- **Establish decade resistances from 0.1 Ω to 1M Ω**
- **Calibration readings traceable to NIST are provided**

The SR1010 meets or exceeds all of the requirements for resistance transfer standards in precision measurement applications. It is easily configured to transfer resistances up or down a decade from their initial resistance value. When used with the connecting networks and shorting bars, it provides 1 ppm transfer accuracies.

Each transfer standard contains twelve equal value precision resistors connected in series by specially designed true 4-terminal junctions. These special junctions assure that a 4-terminal measurement of a series of resistors agrees with the sums of the individual resistors in the series. Accurate parallel connections can be made with the Parallel Compensation Network and the Shorting Bars connected to the junctions.

These standards can be connected to provide three decade values: 10 resistors in series, 10R: 9 resistors in series — parallel, 1R: and 10 resistors in parallel, R/10. The part per million accuracy is assured as the series value is equal to 100 times the parallel value to better than 1 ppm. The series — parallel value relative to either the series value or the parallel value can be found to better than 1 ppm by making a 1:1 comparison with the remaining tenth resistor and a simple calculation.

The accuracy and precision of the individual resistors also make the Model SR1010 ideal for use as a multi-value standard resistor or reference voltage divider.

Specifications

Standard Values
1, 10, 100 Ω/step; 1, 10, 100 k Ω/step

Accuracy

Transfer***	±(1 ppm + 0.1 μΩ) at parallel value for 100:1 transfer	
	±(1 ppm + 1 μΩ) at series-parallel value for 10:1 transfer	
Initial	±20 ppm of nominal value matched with in 10 ppm	
Long-Term	±50 ppm of nominal value	
Calibration	±10 ppm	

Calibration Conditions
23 ºC, low power, four-terminal measurement

Temperature Coefficient
±5 ppm/ºC matched within 3 ppm/ºC for 100 Ω and higher
±1 ppm/ºC for 10 Ω
±15 ppm/ºC matched within 5ppm/ºC for 1 Ω

Power Coefficient
±0.1 ppm/mW per resistor for 100 Ω and higher
±0.02 ppm/mW per resistor for 10 Ω
±0.3 ppm/mW per resistor for 1 Ω

Maximum Power Rating
1Ω/step or 5 W distributed over 10 resistors

Breakdown Voltage
1500 V peak to case

Leakage Resistance
Greater than $10^{12}\,\Omega$ from terminal to case

Calibration Data
Initial calibration readings are affixed to instrument

Dimensions
Height	11.20 cm (4.4 in)
Width	31.00 cm (12.2 in)
Depth	10.15 cm (4.0 in)
Weight	1.5 kg (3.25 lb)

Included Accessories
Manual   P/N 8502
Z540 Compliant Calibration for SR1010 with Certificate and Data   P/N OPT-Z540

Optional Accessories
Shorting Bars   P/N SB103
Series Parallel Compensation Network   P/N SPC102
Parallel Compensation Network   P/N PC101

R Value	(Per Step)	1Ω	10Ω	100Ω	1kΩ	10kΩ	100kΩ
One Resistor Alone	max mA	1000	320	100	32	10	3.2
	max V	1	3.2	10	32	100	321
10 Resistors in Parallel R/10	max mA	7100	2300	710	230	71	23
	max V	0.71	2.3	7.1	23	71	230
10 Resistors in Series 10R	max mA	710	230	71	23	7.1	2.3
	max V	7.1	23	71	230	710	2300**

*10 Ω standard is SR1010/LTC

**Do not exceed 1500 V to case

***With Model SB103 and Model PC101 or SPC102
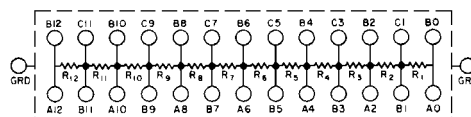
Initial Accuracy:

The specifications stated in the TEGAM instrument catalogs and data sheets are intended as acceptance specifications and are guaranteed for 60 days from the date of shipment. They are typically maintained for a much longer period of time.

Long-Term Accuracy:

These specifications are guaranteed for the standard warranty period, and are typically maintained for the life of the instrument. Long-term accuracy is implied when not otherwise stated.

Calibration Accuracy:

Calibration accuracy is the accuracy of TEGAM calibration data relative to the legal units maintained by the U.S. National Institute of Standards and Technology.