



5011 Resistance / Temperature Calibrator

Time Electronics

Calibration, Test & Measurement

- 1 Ω to 120 M Ω
- RTD Simulation
- Thermocouple Simulation
- DCV & DCI Options
- 10MHz Frequency Option
- RS232/GPIB/USB
- Front Panel Operation



EasyCal
Software Compatible

The **5011** is primarily a programmable resistance / RTD source. With the ability to add DC Voltage, Thermocouple Simulation and DC Current the 5011 is truly a versatile temperature calibrator.

High performance resistance is offered as standard with an accuracy of 0.01% and 1m Ω resolution from 50 Ω to 1k Ω .

Simple front panel operation allows the user to quickly set the function and output required.

Using the jog / shuttle dial deviation the user can finely adjust the output value as a percentage (+/- 9.99%). All this information is shown on a clear, easy to read LED display.

As standard the 5011 uses a SCPI command structure for programming. The 5011 also supports the older 9811/19/20 command set making it an ideal replacement for these models.

The DCV / Thermocouple option provides a DC voltage source (+/- 20V) and simulates thermocouple types K, J, T, R, S, N, E and B.

A DC Current option is available which sources up to 220mA. This makes the 5011 ideal for accurate process control calibration.

A 0.1 Hz to 10 MHz frequency (Period 100nS to 10s) option is also available. The output is variable with a best resolution setting of 0.1Hz.

Calibration Made Easy

Connect the 5011 to a PC/Laptop (via RS232, GPIB or USB) installed with Time Electronics EasyCal and automate the calibration process. Increase speed of calibration and consistency of results; produce calibration certificates and reports to ISO 9001 quality standards.

5011 Technical Specifications

Accuracies quoted are for 1 year at 22 °C +/- 3 °C

RESISTANCE

Range	Accuracy	Resolution
1Ω – 20Ω	0.01% +/- 5mΩ	1Ω
20Ω – 99.999Ω	0.01% +/- 5mΩ	1mΩ/5mΩ*
100Ω – 999.999Ω	0.01% +/- 5mΩ	1mΩ
1kΩ – 9.999kΩ	0.02% +/- 20mΩ	1Ω
10kΩ – 99.999kΩ	0.01% +/- 1Ω	1Ω
100kΩ – 999.99kΩ	0.01% +/- 10Ω	10Ω
1MΩ – 9.9999MΩ	0.02% +/- 100Ω	100Ω
10MΩ – 120MΩ	0.1% +/- 1kΩ	1kΩ

Temp Coefficient: less than 50 ppm per °C
Power Rating: 0.1 Watt per resistor
Maximum Voltage: 250 V
Resistance Switch Time: < 250us
Operation Time: < 300ms
End Resistance Variation: < 2.5mΩ

*Output Setting Resolution below 50Ω is 5mΩ

PRT SIMULATION

RTD Type	Alpha Coeff	Range	Accuracy
Pt100	0.003850	-180 to -100°C	0.1°C
Pt100	0.003850	-100 to 850°C	0.05°C

It should be noted that the accuracy of the PRT simulation is determined by the accuracy of the PRT tables (BS EN 60751) published by the British Standards Institute. The 5011 uses precise digital interpretation of the tables to output resistance values that are within the accuracies specified in the table.

FREQUENCY / PERIOD (2V pk/pk approx)

0.1Hz to 10MHz / 100nS to 10s Accuracy 20ppm

THERMOCOUPLE SIMULATION

Type	Range °C	Acc. °C
J	-210 to 150 / 150 to 1200	0.15 / 0.3
K	-270 to 190 / 190 to 1250	0.5 / 0.6
T	-200 to 150 / 150 to 400	0.4 / 0.5
R	-50 to 800 / 800 to 1750	0.8 / 2.0
S	-50 to 850 / 850 to 1750	0.9 / 2.0
B	100 to 1200 / 1200 to 1800	1.0 / 2.0
N	-270 to 260 / 260 to 1300	0.5 / 0.4
E	-50 to 1000	0.3

Cold Junction Compensation +/- 0.5°C (applies to ambient changes of less than +/- 1°C at 23 °C)

The accuracy of the thermocouple simulation is determined by the accuracy of the 5011's DC Voltage function and the accuracy of the standard thermocouple tables (BS EN 60584-1) published by the British Standards Institute.

The 5011 uses precise digital interpretation of the tables to output voltage levels that are within the accuracies specified in the table.

DC VOLTAGE*

Range	Accuracy	Resolution
20mV	100ppm + 4uV	100nV
200mV	30ppm + 6uV	1uV
2V	25ppm + 20uV	1uV
20V	25ppm + 150uV	10uV

DC CURRENT* (Compliance Voltage: 11V)

Range	Accuracy	Resolution
200uA	150ppm + 15nA	1 nA
2mA	100ppm + 40nA	10 nA
20mA	80ppm + 200nA	10 nA
200mA	80ppm + 3uA	100 nA

*(Specification apply from 10 to 100% of range. 10% over range)

General Specification

Power: 110 V to 240 V AC 50/60 Hz. 30 VA
Operating Temperatures: 0-45 °C. 22 °C +/- 3 °C for full specification.
Dimensions: W 450 x D 272 x H 152 mm (18x11x7").
Weight: 7 Kg
Optional Extras: DC Voltage and Thermocouple Simulation, DC Current, 10MHz Frequency.
 NPL or UKAS Calibration Certificates
 Rack Mount Kit

Ordering Information

Code	Description
5011	Resistance / Temperature Calibrator
9711	DC Voltage and Thermocouple Simulation
9718	DC Current 220mA (Only available if 9711 DC Voltage option fitted)
9729	Frequency Option (10MHz digital)
9728	Rack Mount Kit
9115	UKAS Calibration Certificate (ISO 17025)
9171	Factory (NPL Traceable) Calibration Certificate
9747	EasyCal Calibration Software

Due to continuous development Time Electronics reserves the right to change specifications without prior notice.

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