Small Instrumentation Modules

SIM922A and SIM923A — Diode and Pt RTD temperature monitors with analog outputs

- Single-channel LED display
- 1.4 K to 475 K with Si, GaAs or GaAlAs diodes
- 20 K to 873 K with platinum RTDs
- Two analog outputs:
  Linearized V proportional to T
  Sensor voltage (buffered)

- SIM922A ... $1695 (U.S. list)
- SIM923A ... $1695 (U.S. list)

SIM922A and SIM923A Temperature Monitors

The SIM922A Diode Monitor and the SIM923A RTD Monitor continuously read a single sensor and provide both digital and analog outputs. Based on the modular SIM platform, they provide high performance capability in a small footprint.

SIM922A

The SIM922A has a programmable, precision 10 µA current source to provide sensor excitation. Results can be displayed in either kelvins or volts.

SIM923A

The SIM923A has selectable 10 µA and 1 mA current sources to provide sensor excitation. Sensor resistance is determined ratiometrically with a half-bridge circuit consisting of the sensor and an internal reference resistor. The current to the sensor can be reversed by the user to test for any offset. Measurement results can be displayed in either kelvins or ohms.

Common Features

Both the SIM922A and SIM923A employ four-wire measurement circuits (±I excitation leads, ±V sense leads), making readings insensitive to series lead resistance. Sensor excitations can be disabled to reduce power dissipation at sensitive cryogenic stages. Measurements are performed at five readings per second.

The scaled analog output (±10 V) produces a voltage proportional to measured temperature, with a full-scale range from 10 K to 1000 K. A relative-mode button subtracts the last absolute reading prior to scaling to provide expanded resolution for temperature deviations. The second (monitor) output is the buffered, low-noise raw sensor voltage without any additional processing.

Either analog output may be coupled to the SIM960 Analog PID Controller for closed-loop temperature control.

A factory-standard calibration curve is pre-programmed for each model. Non-volatile memory also permits storage of a 256-point custom calibration curve to convert sensor units (V or Ω) to temperature units (K).

Results are displayed on an easy-to-read, 4-digit LED display. Full remote operation is available over the serial interface.

SIM922A & SIM923A rear panels

	SIM922A	SIM923A
Number of inputs	1	1
Sensor type	Si, GaAs or GaAlAs diode	Platinum and other RTDs
Measurement type	4-wire	4-wire
Excitation	10 µA ± 0.01 %, ±5 ppm/°C	1.0 mA ± 0.1 %, ±5 ppm/°C or 10 µA ± 0.1 %, ±5 ppm/°C
Sensor units	Volts	Ohms
Input range	0 to 7.5 V	0 Ω to 1400 Ω (1 mA excitation) 0 Ω to 140 kΩ (10 µA excitation) (includes excitation lead resistance)
Calibration curves	1 std. plus 1 user-defined curve, 256 points	DIN 43760 plus 1 user-defined curve, 256 points
Temperature range	1.4 K to 475 K (typ.) (Sensor dependent)	1.4 K to 873 K (typ.) (Sensor dependent)
Display resolution	4 digits	4 digits
Interface resolution	1 µV	1 mΩ / 100 mΩ (1 mA / 10 µA)
Measurement resolution	4 µVrms	1.2 mΩ rms / 120 mΩ rms (1 mA / 10 µA)
Accuracy, (23 ± 1) °C	20 µV + 0.01 % of reading	5 mΩ / 0.5 Ω + 0.01 % (1 mA / 10 µA)
Temperature coefficient	±5 ppm/°C	±5 ppm/°C

Common Specifications

Measurement rate	5 readings per second
Scaled analog output	±10 VDC full-scale range
Full scale	10 K, 100 K or 1000 K
Resolution	300 µV
Accuracy	1 mV
Monitor analog output	
Offset	<20 µV (typ.)
Bandwidth	4 kHz
Operating temperature	0 °C to 40 °C, non-condensing
Interface	Serial via SIM interface
Connectors	
Sensor	Two DB9 (female)
SIM	DB15 (male) SIM interface
Power (max.)	Powered by SIM900 Mainframe, or by user-provided DC power supply (±15 V and +5 V)
Dimensions	1.5" × 3.6" × 7.0" (WHD)
Weight	1.4 lbs.
Warranty	One year parts and labor on defects in materials and workmanship

Ordering Information

SIM922A	Diode temperature monitor	$1695
SIM923A	Pt RTD temperature monitor	$1695