Thermocouple Reader Datasheet *SA13931*

General Description

The Subinitial Thermocouple Reader allows for easy multi-channel thermocouple readings. Electrically isolated channels prevent hard-to-diagnose issues such as ground loops, ground offsets, and errors or damage due to excessive common mode voltages at thermocouple locations, which can occur with non-isolated setups.

Measurements are displayed in a continuous graph on a self-hosted website, accessible via mobile or desktop browsers. The Thermocouple Reader can be used exclusively using a web browser with no software installation, or can be controlled entirely by Python from a host computer via USB or Ethernet.

All 8 channels may be sampled simultaneously for coordinated measurements and increased acquisition speed, and each channel has built-in open detection to identify broken or missing thermocouples. Each channel has independent cold junction compensation (CJC) to improve accuracy.

A full bodied anodized aluminum enclosure provides physical protection for the Thermocouple Reader, and mounting holes assist in field deployment.

Applications

- Environmental Testing
- Design Verification
- Rapid Prototyping

Features

- 8 Thermocouple Channels
- Channel-to-Channel Isolation
- USB or Ethernet Control, LXI-Compatible
- 32 Measurements per Second (4 SPS / ch)
- Open Thermocouple Detection
- 8 Cold Junction Compensation (CJC) Sensors
- Per Channel Out-of-Range Alarm
- Integrated Alarm Relays for Automated Setups
- Rugged Aluminum Enclosure

Specifications

Number of Channels	8
Input Connectors	Miniature Thermocouple
Temperature Accuracy [2]	±0.1% ±2°C at 2 Samples per Second (SPS)
Thermocouple Type	K, J, T, N, S, E, B, R
Measurement Range	Type K: -200°C to +1372°C Type J: -150°C to +1200°C Type T: -200°C to +400°C Type N: -150°C to +1300°C

	Type E: -200°C to +1000°C
	Type S: 250°C to +1664°C
	Type B: 1000°C to +1800°C
	Type R: 250°C to +1664°C
Resolution	18-bit or 16-bit, user-selectable
Measurement Rate	32 measurements per second with 16-bit resolution (4 SPS on each channel)
	16 measurements per second with 18-bit resolution (2 SPS on each channel)
Conversion Time	250ms in 16-bit mode, simultaneous on all channels
	500ms in 18-bit mode, simultaneous on all channels
Open Thermocouple Detection	Configurable, All channels
Channel-to-Channel Common Mode Isolation	±250V Peak
Maximum Thermocouple Resistance [3]	3kOhms
Differential Maximum Thermocouple Input Voltage	±3.3VDC
Relay Channels	8
Relay Control	Enable/Disable on Alarm
	Enable/Disable on Open Thermocouple Detect
Relay Maximum Voltage	150V DC or AC
Relay-to-Relay Isolation	150V AC RMS or ±150V DC Peak
Relay Maximum Current [4]	2A
Power Input	12V 0.5A via 5.5 x 2.1mm Barrel Jack (center positive)
	OR
	5V 1.5A via Micro-USB
Connectivity	Micro-USB
	Ethernet: 10/100 Auto-MDIX

Computer Requirements	Windows or Linux, with USB connectivity or connectivity to Ethernet
	OR
	Mobile device with connectivity to the same network which the Thermocouple Reader is connected to via Ethernet
Operating Temperature	0 to 45°C (32 to 113°F)
Dimensions	6.75" x 6.65" x 1.175"

(1) Specifications valid after 30-min warm-up.
(2) Accuracy specification are for the Thermocouple Reader and do not include any error present in the thermocouple wire itself.
(3) Higher resistance thermocouples may be used but will result in reduced accuracy.
(4) Carry current and switching current. Switching current rating is for a resistive load. Switching current must be derated for voltages over 25V as follows:
　　　DC: Rating from 25-50V is 1.0A; Rating from 50V-100V is 0.5A; Rating from 100V – 150V is 0.25A.
　　　AC: Rating from 25-50V is 1.5A; Rating from 50V-100V is 0.75A; Rating from 100V – 150V is 0.5A.