

# 7014 39-Channel Thermocouple

The 7014 can multiplex up to 39 cold junction compensated thermocouple channels. The built-in reference junction can be measured to determine the temperature of the isothermal connection board for accurate temperature measurements. The reference junction sensing device outputs a calibrated reference voltage that is linearly related to the temperature of the isothermal connection board.

The 7014 card with the 7001 or 7002 mainframe is designed to be used with the Keithley Model 2001 DMM. The 2001 uses the reference junction output from the 7014 to display properly compensated and linearized temperature readings from the thermocouples.

The 7014 is an excellent general purpose multiplexer that can be used for a wide variety of signals in addition to thermocouples. The 1 $\mu$ V–110V and 100pA–1A signal range of the card makes it well suited for both low and high level signals.

The 7014 has four independent banks of 2-pole multiplexer switching—three 1 $\times$ 10 and one 1 $\times$ 9 (the 10th channel on this bank is the reference junction sensor) configurations. These four banks can be combined for a wide variety of switching configurations. Each of the four multiplexer outputs can be connected to the 7001 and 7002 analog backplane through removable jumpers for even greater flexibility.

Thermocouple signals can be mixed with other measurement signals such as voltage, resistance, and current. Mixed signals can be switched on adjacent channels within the same bank, or separate banks can be allocated for different signal types.

This card will automatically configure the 7001 and 7002 mainframes.

#### USE WITH 7001 AND 7002 SCANNER MAINFRAMES

This product is available with an **Extended Warranty**. See [section C](#) for complete ordering information.

**MULTIPLEX CONFIGURATION:** Four independent 1 $\times$ 10 2-pole multiplex banks. Adjacent banks can be connected together. Jumpers can be removed to isolate any bank from the backplane. Channel one in the bank A multiplexer is used for the cold junction sensor.

**CONTACT CONFIGURATION:** 2-pole Form A (Hi, Lo).

**CONNECTOR TYPE:** Screw terminal, #16AWG maximum wire size, with .092 inch O.D. 28 conductors per card maximum. #22AWG typical wire size per conductor, with .062 inch O.D. 86 conductors per card maximum.

**TOTAL REFERENCE JUNCTION MEASUREMENT ACCURACY (1 Year):**  
 $\pm 0.45^\circ\text{C}$  (18 $^\circ\text{C}$  to 28 $^\circ\text{C}$ );  $\pm 0.7$  (0 $^\circ\text{C}$  to 18 $^\circ\text{C}$  and 28 $^\circ\text{C}$  to 50 $^\circ\text{C}$ ).

**REFERENCE OUTPUT:** +200 $\mu\text{V}/^\circ\text{C}$  (+54.63mV at 0 $^\circ\text{C}$ ).

**WARMUP:** 2 hours to rated accuracy in mainframe.

**MAXIMUM SIGNAL LEVEL:**

**DC Signals:** 110V DC between any two pins, 1A switched, 30VA (resistive load).

**AC Signals:** 125V rms and 175V AC peak, between any two pins, 1A switched, 60VA (resistive load).

**COMMON MODE VOLTAGE:** 175V peak, any pin to chassis.

**CONTACT LIFE: Cold Switching:** 10<sup>8</sup> closures.

At Maximum Signal Levels: 10<sup>5</sup> closures.

**CHANNEL RESISTANCE (per conductor):** < 1 $\Omega$ .

**CONTACT POTENTIAL:** <1 $\mu\text{V}$  per channel contact pair; <2 $\mu\text{V}$  typical per single contact.

**OFFSET CURRENT:** < 100pA.

**ACTUATION TIME:** 3ms.

**ISOLATION:**

**Bank:** >10<sup>9</sup> $\Omega$ , <25pF.

**Channel to Channel:** >10<sup>9</sup> $\Omega$ , <50 pF.

**Differential:** Configured as 1 $\times$ 10: >10<sup>9</sup> $\Omega$ , <100pF.

Configured as 1 $\times$ 40: >10<sup>9</sup> $\Omega$ , <200pF.

**Common Mode:** Configured as 1 $\times$ 10: >10<sup>9</sup> $\Omega$ , <300pF.

Configured as 1 $\times$ 40: >10<sup>9</sup> $\Omega$ , <900pF.

**CROSSTALK (1MHz, 50 $\Omega$  Load): Bank:** <-40dB.

**Channel:** <-40dB.

**INSERTION LOSS (50 $\Omega$  Source, 50 $\Omega$  Load):** <0.1dB below 1MHz, <3dB below 2MHz.

**RELAY DRIVE CURRENT (per relay):** 20mA.

**ENVIRONMENT: Operating:** 0 $^\circ$  to 50 $^\circ\text{C}$ , up to 35 $^\circ\text{C}$  <80% RH.

**Storage:** -25 $^\circ\text{C}$  to 65 $^\circ\text{C}$ .

- Built-in temperature reference for thermocouple cold junction compensation

- 39 channel 2-pole multiplexer

- 1 $\mu\text{V}$ , 100pA offset

- 110V, 1A signal levels

- Connects to 7001 and 7002 analog backplane

