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Find the *Interface Technology TEC-8* at our website: *Click HERE*

TEC-8
Thermo-Electric Cooler Controller



- GPIB Interface
- Up to 8 Independent Channels
- H Bridge Drive for Bipolar Operation
- -20° C to +85° C Temperature Adjustment
- Programmable per Channel as P, PI, PD, or PID control
- 3.0 A Load Current per Channel
- Programmable Alarms and Status Indicators
- 19-inch Rack Mountable, 3U
- Active X Software Drivers

Description

The TEC-8 is a rack mountable instrument providing bidirectional control for one (1) to eight (8) independent thermoelectric cooling modules (TEC). Each controller offers independent control of all parameters for its respective TEC module. The "H" bridge configuration of the highly efficient, solid state, MOSFET output devices allows for the bidirectional flow of current through the thermoelectric modules.

The instrument is programmable via a GPIB communication port for direct interface with a compatible PC. The easy to use communications link permits a variety of operational configurations. Supplied control software and Active X drivers allow each controller to be independently programmed and measurement values queried.

The instrument is powered from a 110/220 Vac, 50/60 Hz power source. A self-contained power supply provides power to the controller electronics as well as power to the TEC modules themselves. The power to the TEC modules is independently adjustable in the range from 2.75 Vdc to 12 Vdc. The self-contained MOSFET output devices deliver load currents to 3.0 amperes per controller.

The output signal to the thermoelectric module is Pulse Width Modulated and set for 2700 Hz operation. Pulse Width Modulation (PWM) averages the amount of energy provided to the module and reduces the extreme temperature excursions that are experienced with an "on/off" system. This tends to extend the life and reliability of the thermoelectric devices. PWM control minimizes wasted power (heat) that is created through the traditional analog voltage/current control design and affords control accuracy to within ±0.05° C at the control sensor. In addition, the TEC-8 provides a programmable current limit, accurate to within 10% of the programmed threshold, as a safety mechanism for the TEC module should an abnormal operating condition develop.

The controller allows a variety of control features. The computer set value provides for absolute control of the output from -100% to +100% of load power. Proportional bandwidth (P) in degrees, integral reset (I) in repeats per minute, and the derivative rate (D) in resets per minute may be configured for P, PI, PD or PID control. In addition, a deadband control (on/off) with an adjustable hysteresis may be selected.

Several alarm types exist to alert the user to potential problems during operation. Alarms can be generated based on exceeding temperature limits (over temperature and under temperature) with tracking or fixed alarm modes, a defective temperature sensor (open) alarm and a defective TE cooling module alarm (shorted or open). A +5 Vdc output (30 mA) may be used in combination with alarm states to activate external warning devices. The alarm setup also provides for selection of an alarm latching condition. The various alarms have the ability to determine the status of the output power to the thermoelectric module or auxiliary heater. Power may be maintained during an alarm condition or the load power may be shut down.

The temperature set point for each channel may be set in the range of -20° C to +85° C. The temperature sensor for each channel is calibrated for a thermistor with a nominal resistance of 10k ohms at 25° C, and with an R/T equivalent to Fenwall 16. The customer must supply this temperature sensor. The output of each TEC controller channel is driven from a MOSFET "H" bridge allowing both heating and cooling of the TEC module by reversing the polarity of the power applied to the module.

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*TEC-8 SPECIFICATIONS**

Functional Specifications:

Number of Channels	1 to 8
Load Voltage per Chan.	2.75 V to 12 V, programmable
Load Current per Chan.	3.0 A max.
PWM Base Frequency	2700 Hz
Voltage Resolution	250 mV
Voltage Accuracy	1%
Temperature Control Range	-20º C to 85º C
Setpoint Resolution	0.01º C
Control Resolution	0.05º C
Stability	0.1º C
Measurement Accuracy	0.1º C
Temperature Sensors	10k thermistor (NTC) Fenwall 16 R/T or equivalent
Output Type	H-bridge voltage source, pulse width modulation
Control Method	Programmable per channel as P, PI, PD or PID, dead band or computer controlled
Communications Bus	GPIB
Programming	Active X software drivers
Storage of parameters	Non-volatile memory retention

Alarms:

Types of Alarms	Over-temperature, under-temperature, within range, open sensor, open/ shorted TE module
External Output	Open collector; 20V @ 30 mA, max.
Alarm Cancel	Selectable via PC or remote contacts

Controls and Indicators:

Power Connector	
Power Fuse	
Power Switch	
Power Indicator	
GPIB Interface Connector	
GPIB Address Switch	
TEC Interface Connectors	
Alarm Indicators	Over-temperature, under-temperature, normal operation, TE fault

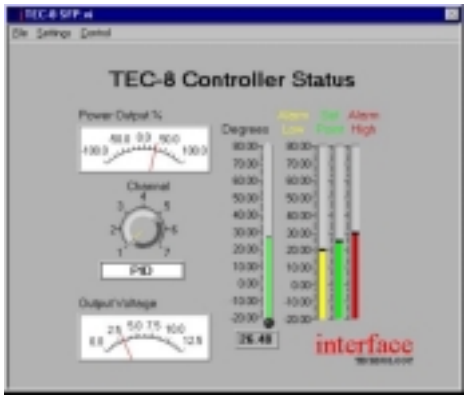
Input Power:

Voltage	110/220 Vac, 50/60 Hz
Power	18 W per channel

Mechanical:

Width	Standard 19 in. rack mount
Height	3U
Depth	12 in.
Rack Mount Flanges	Standard

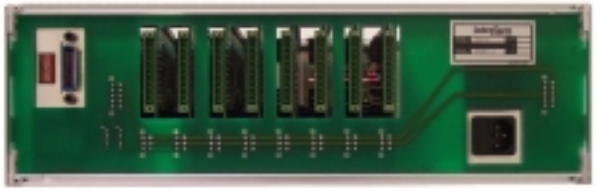
* Specifications subject to change without notice.



Main Display Screen



Controller Display Screen



TEC-8 Rear Panel

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