Analog Interface Module

Integrates thermocouple, 4-20 mA, and ±10 VDC I/O

Totally integrated temperature control

The Analog Interface Module integrates every aspect of your temperature control application into a single system. When used with CTC’s Model 2220-102 Analog Module, it integrates up to eight independent temperature zones, or loops, per module and 88 loops per controller. Users have the option to choose a different output strategy — analog or PWM (Pulse Width Modulation) — for each loop. The Analog Interface Module combines thermocouple (type J or K), 4-20 mA, and ±10 VDC channels into a unified, easy-to-manage control strategy that can be further integrated with motion, digital, and analog I/O. This enables the Analog Interface Module to fit into many hybrid batch/discrete applications as an integral, off-the-shelf solution that is unmatched by many more costly systems. For further flexibility, several different card configurations are available to meet your application’s unique demands.

The Analog Interface Module extends integration beyond the control box to the operator console and higher systems in the enterprise. The operator’s touch screen interface has direct access to the PID (Proportional Integral Derivative) registers for each temperature loop, for on-the-fly tuning with no programming required. Through Ethernet or RS-232 connections, data from the Analog Interface Modules may be integrated at higher levels — for process validation, quality analysis and other reporting purposes — easily and cost-effectively.

Easy installation, design, and operation

The Analog Interface Module also features easy, DIN rail mountable installation and interface cables that provide “plug and play” connectivity to CTC’s Model 2220 Analog Module. Users have several options for system design and loop tuning: directly from the operator interface, by invoking CTC’s Autotune feature, or by manipulating tuning parameters in the Quickstep™ programming environment. In addition to PID parameters, registers for other aspects of temperature control — such as input and output scaling and emergency shutdown — are also directly accessible from the touch screen, enabling the authorized operator to quickly diagnose and resolve any temperature anomalies.
Analog Interface Module Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Fixed Configurable Inputs</th>
<th>Fixed Configurable Outputs</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thermo-couple (J or K)</td>
<td>Current 4-20 mA</td>
<td>Voltage ±10VDC</td>
</tr>
<tr>
<td>2334-J</td>
<td>J</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2334-K</td>
<td>K</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2335-J</td>
<td>J</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>2335-K</td>
<td>K</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>2335</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Description

Min. Typical Max. Units

Absolute Maximum Ratings
+Vs to -Vs 36 V
Common-Mode Input Voltage (-Vs-0.15) + Vs V
Differential Input Voltage -Vs V
Output Short-Circuit to Common Indefinite
Thermocouple Temperature Range
Type J -200 °C +750 °C
Type K -200 °C +1250 °C
Temperature Measurement (Specified Temperature Range +25°C to +100°C)
Calibration Error -4 +4 °C
Stability vs. Temperature ±0.02 ±0.05 °C/°C
Gain Error -1.5 +1.5 %
Nominal Transfer Function 10 mV/°C
Amplifier Characteristics
Input Offset Voltage
Type J (°Cx53.21)+235 µV
Type K (°Cx41.27)-37 µV
Input Bias Current 0.1 µA
Differential Input Range -10 mV
Common-Mode Range (-Vs-0.15) (+Vs-4) V
Common-Mode Sensitivity-RTO 10 mV/V
Power Supply Sensitivity-RTO 10 mV/V
Usable Output Current ±5 mA
3 dB Bandwidth 15 kHz
Analog Output Specifications
Output Voltage Range -10.000 VDC +10.000 VDC
Output Resolution 2.44 mV
Output Settling Time -10.000 to +10.000 V 0.2 ms 0 to 5.000 V 0.1 ms
Analog Input Specifications
Differential Input Range -10.000000 VDC 10.000000 VDC
Common Mode Voltage Range -10 VDC +10 VDC
Input Resistance 10 MW
Input Resolution (15-Bit) .00305 %FS
Input Accuracy (25°C, 8-Sample Filtering) .00305 %FS
Input Conversion Time (Asynchronous) 2.083 ms
Input Filter Settings (Default = 1 Sample) 2.083 533.248 ms
Dedicated Digital Output Specifications
On Voltage (Io = 500 mA) 1 1.5 VDC
Off Leakage (Applied Voltage = 24 VDC) 1 100 µA DC
Maximum Output Current 500 mA DC

Note:
1. All digital outputs have short-circuit and overcurrent protection.