Analog Input Modules: Thermocouple

Interface to Types J, K, T, R and S Thermocouples

DESCRIPTION

The MAQ®20 thermocouple analog input modules have 8 differential input channels. Separate models are offered for interfacing to Type J, Type K, Type T, and Types R and S thermocouples. Cold-junction Compensation uses four internal sensors resulting in industry-leading measurement accuracy in any system configuration and over the entire system operating temperature range. All channels are individually configurable for range, alarm limits, and averaging to match the most demanding applications. High, Low, High-High, and Low-Low alarms provide essential monitoring and warning functions to ensure optimum process flow and fail-safe operation. Hardware low-pass filtering in each channel provides rejection of 50Hz and 60Hz line frequencies. Field I/O connections are made through spring cage terminal blocks with four positions provided for the termination of wiring shields.

Input-to-bus isolation is a robust 1500Vrms and each individual channel is protected up to 150Vrms continuous overload in case of inadvertent wiring errors. Overloaded channels do not adversely affect other channels in the module, thereby preserving data integrity.

Channels in a module can be selectively enabled for scanning. All channels are enabled by default; however, non-used channels can be disabled to increase the sampling rate of enabled channels.

Input ranges are selectable on a per-channel basis. The MAQ20-JTC, -KTC, -TTC and -RSTC modules have two to four user-selectable input ranges, depending on the model. Over-range and under-range up to 2% beyond the specified input values is allowed. Sensor linearization is performed in the module, and accuracy is guaranteed to full scale.

All MAQ20 modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise commonly present in heavy industrial environments.

FEATURES

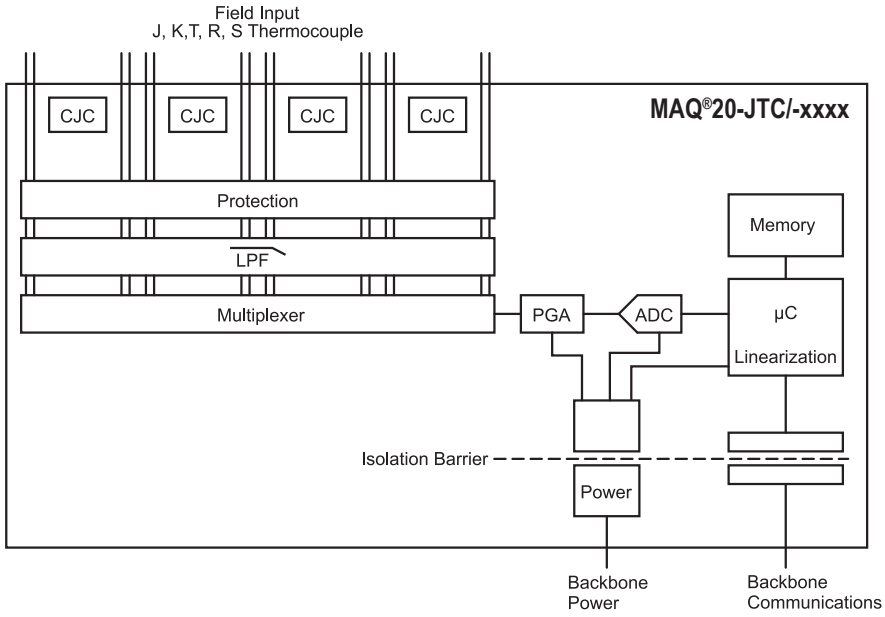
- 8 Differential-Input Channels
- Interface to Types J, K, T , R and S Thermocouples
- All Channels Individually Configurable for Range, Alarms, Averaging
- 1500Vrms Input-to-Bus Isolation
- Each Channel Protected up to 150Vrms Continuous Overload
- Selective Enabling of Module Channels for Scanning
- Heavy Industrial CE Compliant
- UL/cUL (Class I, Div 2, Groups A, B, C, D) File E232858
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Highly Compact
- Low Cost per Channel
- Modular
- On-vehicle/-mobile Use Possible (Wide Power Supply Voltage)
- Open Software Platform Options
- Easy and Fast Setup/Installation

APPLICATIONS

- Process Control
- Factory Measurement and Control
- Machine Automation
- Military and Aerospace
- Scientific Measurement and Monitoring
- Battery Management



MAQ20 Thermocouple-input Module Block Diagram

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

©1984-2024 Dataforth Corporation, All Rights Reserved ISO9001:2015-Registered QMS

Specifications

Typical* at T_A =+25°C and +24VDC System Power

Module	Description
MAQ20-JTC	8-ch., Type JTC, Differential Input –100°C to +760°C (Default) –100°C to +393°C, –100°C to +199°C
MAQ20-KTC	8-ch., Type KTC, Differential Input –100°C to +1350°C (Default) –100°C to +651°C, –100°C to +332°C
MAQ20-TTC	8-channel, Type TTC, Differential Input –100°C to +400°C (Default), –100°C to +220°C
MAQ20-RSTC	8-channel, Type RTC and Type STC, Differential Input Type R: 0°C to +1750°C (Default), 0°C to +990°C Type S: 0°C to +1750°C, 0°C to +970°C
Per Channel Setup	Individually Configurable for Range, Alarms, Averaging
Input Protection	
Continuous	150Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMV	
Channel-to-Bus	1500Vrms, 1 Minute
Channel-to-channel	$\pm 3V_{PEAK}$
Transient	ANSI/IEEE C37.90.1
CMR	100dB at 50/60Hz
NMR	26dB at 50/60Hz
Accuracy(1)	±0.06% Span
Conformity	±0.035% Span
Cold-junction Compensation	±0.25°C at +25°C, ±1.0°C at –40°C to +85°C
Resolution	0.020% Span
Stability	
Zero	±15ppm/°C
Span	±35ppm/°C
Bandwidth, –3dB	3Hz
Scan Rate	200 Ch/s
Alarms	High/ High-High / Low / Low-Low
Open Input Response	Downscale, <5s, Flag Set
Power Supply Current	30mA
Dimensions (h)x(w)x(d)	4.51" x 0.60" x 3.26" (114.6mm x 15.3mm x 82.8mm)
Environmental	
Operating Temperature	–40°C to +85°C
Storage Temperature	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions, EN61000-6-4	ISM Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B
Certifications	Heavy Industrial CE Compliant UL/cUL (Class I, Division 2, Groups A, B, C, D) File E232858 ATEX Compliance Pending

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes conformity, hysteresis and repeatability. Does not include CJC accuracy.

For input connections and full details on module operation, refer to:
MA1047 – MAQ20 Thermocouple-input Module Hardware User Manual

Ordering Information

Model	Description
MAQ20-JTC	Analog Input Module; Type J Thermocouple, 8-ch
MAQ20-KTC	Analog Input Module; Type K Thermocouple, 8-ch
MAQ20-TTC	Analog Input Module; Type T Thermocouple, 8-ch
MAQ20-RSTC	Analog Input Module; Type R and Type S Thermocouple, 8-ch

Terminal Block Position (top to bottom)	MAQ20-xTC Input Connections
1	CH0 +IN
2	CH0 –IN
3	SHIELD
4	CH1 +IN
5	CH1 –IN
6	CH2 +IN
7	CH2 –IN
8	SHIELD
9	CH3 +IN
10	CH3 –IN
11	CH4 +IN
12	CH4 –IN
13	SHIELD
14	CH5 +IN
15	CH5 –IN
16	CH6 +IN
17	CH6 –IN
18	SHIELD
19	CH7 +IN
20	CH7 –IN

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

©1984-2024 Dataforth Corporation, All Rights Reserved ISO9001:2015-Registered QMS