Analog Input Modules: Process Voltage & Process Current

Interface to Volt, Millivolt, and Milliamp Sensors and Equipment

DESCRIPTION

MAQ®20 voltage and current analog input modules interface to a wide range of volt, millivolt, and milliamp sensors and equipment used in industrial and test and measurement applications. They offer 8-channel differential input or 16-channel single-ended input for precise measurement of voltage and current signals. 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 a pluggable terminal block 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 240Vrms 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-MVDN, -VDN, and -VSN modules have five user-selectable input ranges; the MAQ20-IDN and -ISN modules have two. Over-range and under-range up to 2% beyond the specified input values is allowed, and accuracy is guaranteed to full scale.

Cables to interface 8B backpanels to the MAQ20-VSN module are available; the 8B modules and backpanel assembly provide 1500Vrms channel-to-channel isolation.

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

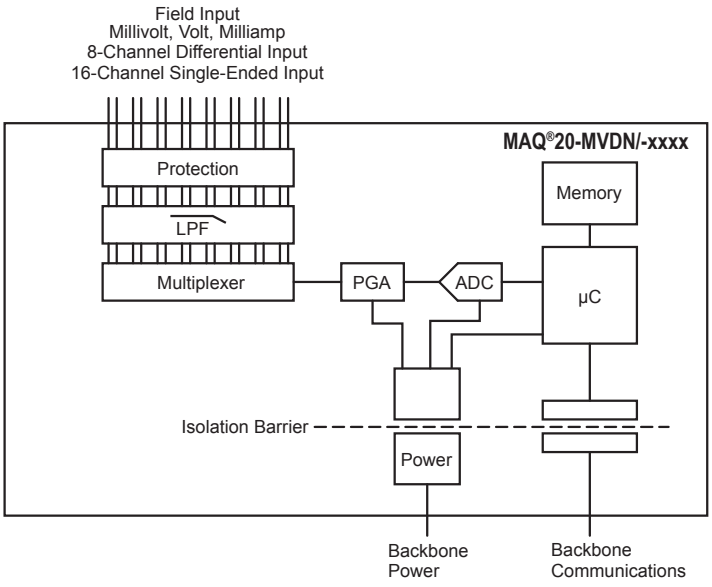
- Interface to Volt, Millivolt, Milliamp Sensors and Equipment
- 8-channel Differential or 16-channel Single-Ended Input
- All Channels Individually Configurable for Range, Alarms, Averaging
- 1500Vrms Input-to-Bus Isolation
- Each Channel Protected up to 240Vrms Continuous Overload
- Selective Enabling 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 Voltage-input and Current-input Module Block Diagram

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Specifications

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

Module	Description
MAQ20-MVDN	8-channel, mV, Differential Input ±50mV, ±100mV, ±250mV, ±1.0V (Default), ±2.0V
MAQ20-VDN	8-channel, Volt, Differential Input ±5V (Default), ±10V, ±20V, ±40V, ±60V
MAQ20-VSN	16-channel, Volt, Single-Ended Input ±5V (Default), ±10V, ±20V, ±40V, ±60V
MAQ20-IDN	8-channel, mA, Differential Input 0-20mA (Default), 4-20mA
MAQ20-ISN	16-channel, mA, Single-Ended Input 0-20mA (Default), 4-20mA
Per Channel Setup	Individually Configurable for Range, Alarms, Averaging
Input Protection	
Continuous	240Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMV	
Channel-to-Bus	1500Vrms, 1 Minute
Channel-to-channel	±28V Peak (-VDN), ±3V Peak (-MVDN, -IDN), 0V (-VSN, -ISN)
Transient	ANSI/IEEE C37.90.1
CMR	100dB at 50/60Hz
NMR	30dB at 50/60Hz
Accuracy(1)	±0.035% Span
Linearity / Conformity	±0.02% Span
Resolution	0.012% Span
Stability	
Zero	±15ppm/°C
Span	±35ppm/°C
Bandwidth, –3dB	3Hz
Scan Rate	200 Ch/s
Alarms	High / High-High / Low / Low-Low
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 linearity, hysteresis and repeatability.

For input connections and full details on module operation, refer to:
MA1041 – MAQ20 mV-V-mA Input Module Hardware User Manual

Ordering Information

Model	Description
MAQ20-MVDN	Analog Input Module; mV, 8-ch, Differential
MAQ20-VDN	Analog Input Module; V, 8-ch, Differential
MAQ20-VSN	Analog Input Module; V, 16-ch, Single Ended
MAQ20-IDN	Analog Input Module; mA, 8-ch, Differential
MAQ20-ISN	Analog Input Module; mA, 16-ch, Single Ended

Cables to Interface 8B Backpanels to MAQ20-VSN Module

Model	Description
MAQ20-8B25-0.3	DB25-to-20 Pos Screw Term Transition Cable, 0.3m (11.8") Long
MAQ20-8B25-0.6	DB25-to-20 Pos Screw Term Transition Cable, 0.6m (23.6") Long
MAQ20-8B25-01	DB25-to-20 Pos Screw Term Transition Cable, 1.0m (39.4") Long
MAQ20-5B26-0.3	IDC26-to-20 Pos Screw Term Transition Cable, 0.3m (11.8") Long
MAQ20-5B26-0.6	IDC26-to-20 Pos Screw Term Transition Cable, 0.6m (23.6") Long
MAQ20-5B26-01	IDC26-to-20 Pos Screw Term Transition Cable, 1.0m (39.4") Long

Terminal Block Position (top to bottom)	MAQ20-MVDN, MAQ20-VDN and MAQ20-IDN Input Connections	MAQ20-VSN and MAQ20-ISN Input Connections
1	CH0 +IN	CH0 +IN
2	CH0 –IN	CH1 +IN
3	SHIELD	CH0, CH1, CH2, CH3 –IN, SHIELD
4	CH1 +IN	CH2 +IN
5	CH1 –IN	CH3 +IN
6	CH2 +IN	CH4 +IN
7	CH2 –IN	CH5 +IN
8	SHIELD	CH4, CH5, CH6, CH7 –IN, SHIELD
9	CH3 +IN	CH6 +IN
10	CH3 –IN	CH7 +IN
11	CH4 +IN	CH8 +IN
12	CH4 –IN	CH9 +IN
13	SHIELD	CH8, CH9, CH10, CH11 –IN, SHIELD
14	CH5 +IN	CH10 +IN
15	CH5 –IN	CH11 +IN
16	CH6 +IN	CH12 +IN
17	CH6 –IN	CH13 +IN
18	SHIELD	CH12, CH13, CH14, CH15 –IN, SHIELD
19	CH7 +IN	CH14 +IN
20	CH7 –IN	CH15 +IN

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