Discrete Input / Output Modules

5 Input Channels and 5 Output Channels (MAQ20-DIOL)
4 Input Channels and 4 Output Channels (MAQ20-DIOH)

Description

The MAQ20-DIOL discrete input/output module has 5 isolated discrete input channels and 5 isolated discrete output channels. Input channels accept 3-60VDC signals and output channels switch 3-60VDC signals at up to 3A load.

The MAQ20-DIOH discrete input/output module has 4 isolated discrete inputs and 4 isolated discrete outputs. Input channels accept 90-280VAC/VDC signals and output channels switch 24-280VAC signals at up to 3A AC load. NOTE: DIOH output channels switch AC loads only.

Discrete output channels have user configurable default output states which are set up on power up or module reset. In addition to performing standard discrete I/O, the channels can be configured to perform seven special functions: Pulse/Frequency Counter, Pulse/Frequency Counter with Debounce, Waveform Measurement, Time Between Events, Frequency Generator, Pulse Width Modulation (PWM), and One-Shot Generator. Up to four special functions can run simultaneously. High, Low, High-High and Low-Low alarms provide essential monitoring and warning functions to ensure optimum process flow and fail-safe applications. Field I/O connections are made through a pluggable terminal block.

Input-to-bus isolation is a robust 1500Vrms and channel-to-channel isolation is 300Vrms. Each individual channel has continuous overload and reverse connection protection in case of inadvertent wiring errors.

▶ Features

- Rugged Isolation and Protection for Industrial Control
- User-Defined Default Output and Output Waveform
- 7 High Performance Special Functions
- 1500Vrms Input-to-Bus Isolation
- 300Vrms Channel-to-Channel Isolation
- Continuous Overload and Reverse Protection

IMPORTANT: The DIOH module can only switch AC loads, not DC. The output switch is AC only with zero-crossing detection.
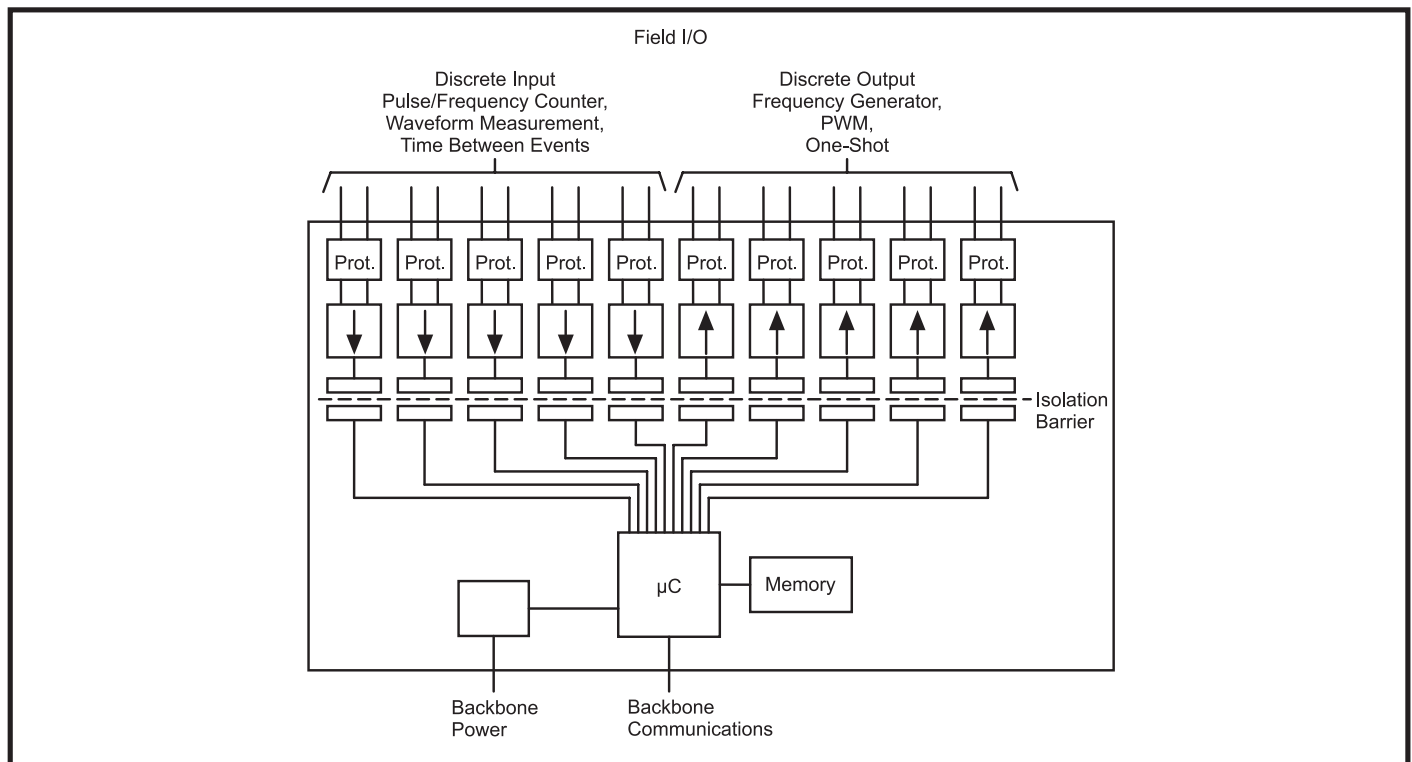

Figure 1: MAQ20-DIOL Discrete Input/Output Module Block Diagram

Specifications

Typical* at T_A=+25°C and +24VDC system power

Module	Description
MAQ20-DIOL	5 Isolated Channel Discrete Input, 3-60VDC
	5 Isolated Channel Discrete Output, 3-60VDC
MAQ20-DIOH◇	4 Isolated Channel Discrete Input, 90-280VAC/VDC
	4 Isolated Channel Discrete Output, 24-280VAC

Per Channel Setup	Individually configurable for default output, special function
Input Protection	
Continuous, -DIOL	70VDC max, Reverse Polarity Protected
Continuous, -DIOH	350VAC/VDC max
Transient	ANSI/IEEE C37.90.1
Output Protection	
Continuous, -DIOL	70VDC max, Reverse Polarity Protected
Continuous, -DIOH	350VAC/VDC max
Transient	ANSI/IEEE C37.90.1
CMV	
Channel-to-Bus	1500Vrms, 1 min
Channel-to-Channel	300Vrms, 425VDC
Transient	ANSI/IEEE C37.90.1

Output Load (Combined load, all channels)[1]	
MAQ20-DIOL	
Ta=25°C, Freq=0 to 1500Hz, Duty Cycle=5-100%	3A (2A if adjacent module Tcase>50°C)
Ta=85°C, Freq=0 to 500Hz, Duty Cycle=5-100%	2A (1A if adjacent module Tcase>50°C)
MAQ20-DIOH	
Ta=25°C, Freq=0 to 1500Hz	3Arms
Ta=85°C, Freq=0 to 500Hz	3Arms
Switching Characteristics	
MAQ20-DIOL	
Input Channel Turn-On/ Turn-Off Time	25µs / 55µs
Output Channel Turn-On/ Turn-Off Time	20µs / 40µs
MAQ20-DIOH	
Input Channel Turn-On/ Turn-Off Time	20ms / 30ms (VAC), 1ms / 1ms (VDC)
Output Channel Response Time	0.5 Cycle
I/O Special Functions	
Pulse/Frequency Counter	Freq to 10kHz, Count to 10M, RPM to 65k
Pulse/Frequency Counter w/De-Bounce	Freq to 3kHz, Count to 10M
Waveform Measurement	Freq to 500Hz, # Periods, Pulse Width, Period, Duty Cycle
Time Between Events	Min, Max, Avg, Selectable Timebase
Frequency Generator	Up to 700Hz
PWM Generator	200µs min Period, Selectable Timebase
One-Shot Pulse Generator	100µs min, Programmable Pre- and Post-Delay

Scan/Update Rate	3500 Ch/s
Alarms	High / High-High / Low / Low-Low
Power Supply Current	30mA

Dimensions (h)(w)(d)	4.51" x 0.60" x 3.26" (114.6mm x 15.3mm x 82.8mm)

Ordering Information

Model	Description
MAQ20-DIOL	Digital Input/Output Module; 3 to 60VDC In, 3 to 60VDC Out, 5-ch In, 5-ch Out
MAQ20-DIOH	Digital Input/Output Module; 90 to 280VAC/VDC In, 24 to 280VAC Out, 4-ch In, 4-ch Out

Specifications

Module	Description
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, ATEX Pending UL Class I, Division 2, Groups A, B, C, D Pending

NOTES:
* Contact factory or your local Dataforth sales office for maximum values.

(1) See manual for detailed calculations of load ratings based on ambient temperature, multiple channels, and adjacent modules.