# Analog Input Module: Frequency

Measure Frequencies to 1MHz

## Description

The MAQ20 frequency input module offers 8 input channels for measuring frequencies up to 1MHz. All channels are individually configurable for range and alarm limits to match the most demanding applications. Four controllable outputs can be used for sensor excitation or as 5V logic compatible outputs. 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 with positions designated 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.

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 system sampling rate of enabled channels.

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 Input Channels
- 50mV Sensitivity
- Frequency Range: 1Hz to 1MHz plus State Change
- Operating Range: DC + Signal ≤300Vrms
- All Channels Individually Configurable for Range and Alarms
- 4 Excitation Sources to Power Sensors or Provide 5V Logic Compatible Output
- 1500Vrms Input-to-Bus Isolation
- Each Channel Protected up to 240Vrms
- Selective Enabling of Module Channels for Scanning

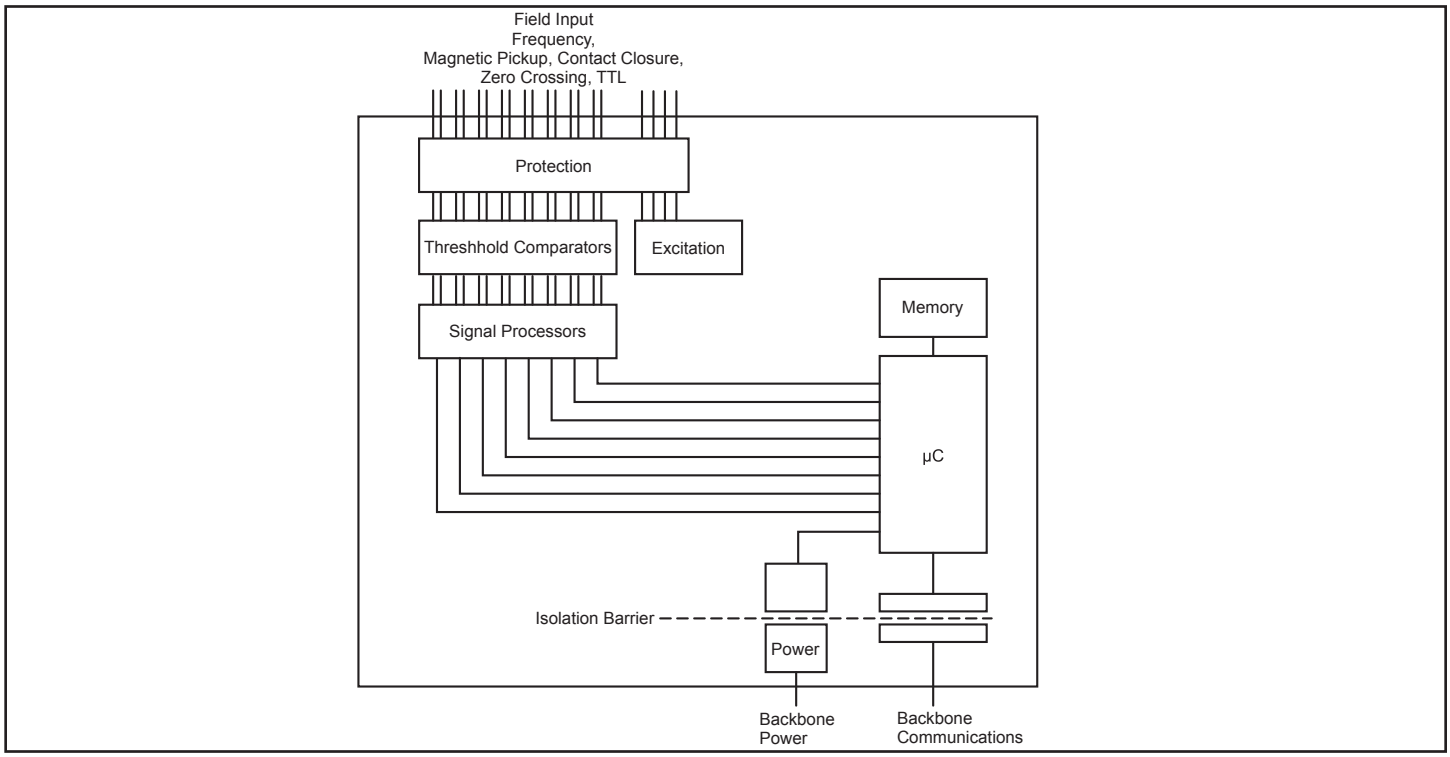


Figure 1: MAQ20 Frequency Input Module Block Diagram

## Specifications

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

| Module | Description |
|---|---|
| MAQ20-FREQ | 8-channel, Frequency Input, 1Hz to 1MHz, plus state change detect |
| Input Signal | 50mV Sensitivity<br>Operating Range: DC + signal 300Vrms |
| Excitation | Four 5V sources at 8mA each<br>Use for sensor excitation or 5V logic compatible output |
| Per Channel Setup | Individually configurable for range, alarms |
| Input Protection | |
| Continuous | 240Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| CMV | |
| Channel-to-Bus | 1500Vrms, 1 min |
| Channel-to-Channel | 0V |
| Transient | ANSI/IEEE C37.90.1 |
| Resolution and Accuracy | 32 bits |
| Clock Accuracy | ±0.003% |
| Clock Accuracy Over Temp | ±0.01%, –40°C to +85°C |
| Scan Rate | 1000 Ch/s |
| Alarms | High / High-High / Low / Low-Low |
| Power Supply Current | 400mA |
| Dimensions (h)(w)(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<br>UL/CUL Listing Pending<br>(Class I, Division 2, Groups A, B, C, D)<br>ATEX Compliance Pending |

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

## Ordering Information

| Model | Description |
|---|---|
| MAQ20-FREQ | Analog Input Module; Frequency, 8-ch |

| Terminal Block Position (top to bottom) | MAQ20-FREQ I/O Connections |
|---|---|
| 1 | CH0 +IN |
| 2 | CH0 -IN |
| 3 | CH1 +IN |
| 4 | CH1 -IN |
| 5 | EXC0 / OUT0 |
| 6 | CH2 +IN |
| 7 | CH2 -IN |
| 8 | CH3 +IN |
| 9 | CH3 -IN |
| 10 | EXC1 / OUT1 |
| 11 | CH4 +IN |
| 12 | CH4 -IN |
| 13 | CH5 +IN |
| 14 | CH5 -IN |
| 15 | EXC2 / OUT2 |
| 16 | CH6 +IN |
| 17 | CH6 -IN |
| 18 | CH7 +IN |
| 19 | CH7 -IN |
| 20 | EXC3 / OUT3 |

**For input connections and full details on module operation, refer to MA1048 – MAQ20 Frequency Input Module Hardware User Manual, available for download at: www.dataforth.com/maq20_download.aspx**