

8 Channel VME Module

Low Noise Digital to Analog Converter

VM8DAC VMEbus digital to analog converter (DAC) boards from Frequency Devices Inc. offer eight channels of precision low distortion/low noise, digital to analog converters that operate with a sample clock frequency derived from a master external clock and a programmable time base divider. The boards are available in a single width B-size (6U) VME form factor that conforms to VMEbus Revision C.1 as an A32/D32 Data Transfer Bus Slave.

VM8DAC boards provide high (24-bit) and low (16-bit) resolution data access to on-board DAC's. The boards interpret the received parallel data from the VMEbus as binary-2's complement. This data is serialized and transferred to any selected DAC channel at a fixed master time base where it is converted to analog signals at a software programmable sampling rate. The DAC channels may be configured to 16,384, 8,192, 4,096, or 2,048 samples per second.

Features/Benefits

- Eight discrete channels with programmable sampling that provide a 24-bit DAC stage for each channel offers the user versatile and convenient digital to analog conversion.
- Outputs synchronized to the front panel external clock allow for multi-card synchronicity.
- Designed for Real Time Operating Systems (RTOS) to provide minimal pipeline delay (less than 5 microseconds). i.e. Linux or Vx Works.
- Interrupt free operation provides glitch energy of $<5\text{nV-sec}$ and extremely low noise density ($\leq 100\text{nV}/\sqrt{\text{Hz}}$).
- VME backplane is galvanically isolated from the analog section to reduce system integration problems.



VM8DAC Ordering Guide

To order, simply specify the part number below.

VM8DAC-8



Specifications
25°C and Rated Power Input

**8 Channel Low Noise
Digital to Analog Converter**

Module Size/Dimensions

- 1. Standard 6U VME, single slot module 9.17" X 6.3", (233mm X 160 mm)
- 2. Weight ~ 1 lb.

Connectors

- 3. Input clock connector Lemo EPG.OB.302.HLN
- 4. Analog output connector Male DB25
- 5. Matching output connector Female DB25

External Clock Input

- 6. Configuration Differential, TTL compatible
- 7. Isolation Transformer isolated
- 8. Frequency 2²² Hz (4.194305 MHz)

Analog Output

- 9. Number of channels per board 8
- 10. Analog output configuration Differential
- 11. Minimum output load 500 ohm
- 12. Maximum output voltage +/- 10V into 10 kΩ
- 13. Output amplifier 3 dB bandwidth >50KHz
- 14. Output impedance 50 Ω per leg
- 15. Anti-image filter None
- 16. Inter-channel crosstalk < -90dB (frequencies less than 50KHz)

DAC Specifications

- 17. Number of bits 24 bits
- 18. Binary number format Binary 2's complement
- 19. Sampling rate 16,384, 8192, 4096, 2048 samples per second
- 20. Bipolar zero error ±2% F.S. maximum
- 21. Bipolar zero error drift ± 5 ppm of FS/ °C
- 22. Glitch energy < 5nV-sec
- 23. Output-referred noise <100nV/√Hz (40 Hz to 8192 Hz with FS 1000 Hz sine wave)
- 24. Amplitude match and accuracy ± 0.1 dB
- 25. Harmonic spikes <-100 dB (referred to a full scale output signal)
- 26. Output settling time to 1% < 5 microseconds (From output clock edge)

Power Requirements

- 27. From the + 5V VME backplane supply 1.0 A Max.
- 28. From the +/- 12V VME backplane supply 1.0 A

VME Interface

- 29. Interface configuration A32/D32 VME Data Transfer Bus (DTB) Slave
- 30. Address modifier lines decoding Full decode (0x09, 0x0A, 0x0D, and 0x0E valid)
- 31. Data word size Long word (Quad Byte) and aligned word (Double Byte)
- 32. Bus cycle compatibility AO, RMW, bus cycles address pipelining
- 33. Addressing modes A32 (Extended) addressing only

Environmental

- 34. Operating Temperature range 0°C to +70°C
- 35. Storage Temperature range -25°C to +85°C
- 36. Humidity 0-95% non-condensing

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