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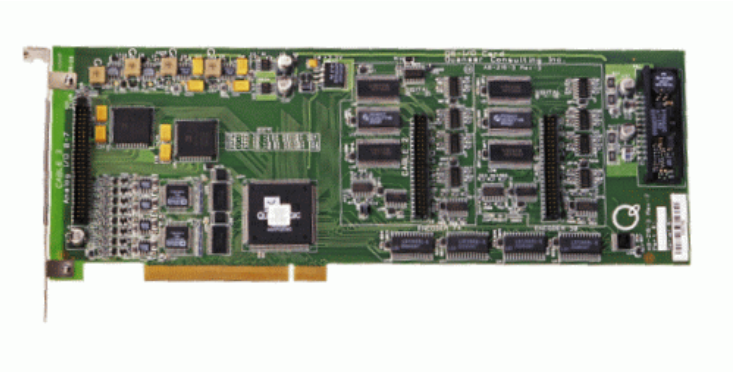
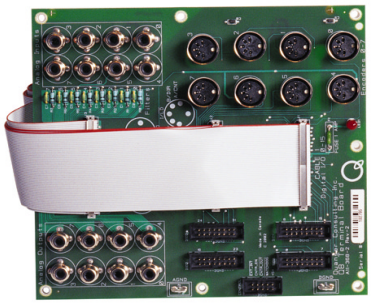


Q8

High Performance Data Acquisition & Control Board

Function	Parameter	Description
Interface	Type	PCI, 32-bit, 33 MHz
A/D	Resolution	14 bits (1.2mV / Count) Sign-extended to 16 bits in hardware
	Input Range	± 10 V
	# Channels	8
	Conversion Time	2.4 µs / channel (on 2 channels concurrently)
	Sampling Frequency	350 kHz Sampling of 2 Channels (100 kHz of all 8) Simultaneous sample and hold of all 8 channels
D/A	Resolution	12 bits (4.8 mV / Count)
	Output Range	Software programmable: ± 10V, ± 5V, 0 - 10V
	# Channels	8 - On-board double buffering - Simultaneous update of all 8 channels
	Settling Time	8 µs
Digital I/O	Output Characteristics	Totem-Pole Output for faster digital output
	Configuration	Individually Programmable (Input / Output)
	Number of I/O lines	32
Encoder Inputs	Input Characteristics	Single-Ended / TTL / CMOS compatible
	Counter Size	24 bits Simultaneous sampling on all 8 channels
Counters / Timers	Number of Counters	8x 24 bit counters 2x 32 bit counters (30 ns resolution)
Watchdog	Configuration	Enabled / disabled through software Automatic reset all analog / digital outputs
PWM	Number of Outputs	2x User programmable PWM outputs

Q8 Individual Component Specifications



Analog Inputs

- 8 analog inputs (two A/D chips, 4 channels per chip with onboard FIFOs).
- +/-10V input range.
- 14-bit resolution (1.2 mV / bit).
- 2.4 usec conversion time per channel, on two channels concurrently.
  Results in 100 kHz sampling per channel when all 8 channels read. 350 kHz on two channels.
- Simultaneous sample and hold of all 8 channels.
- Interrupt on end-of-conversion for each channel.
- Interrupt on end-of-all-conversions.
- Results sign-extended to 16-bits in hardware.
- Read two 16-bit conversions concurrently with a single 32-bit PCI read.

Analog Outputs

- 8 analog outputs (two D/A chips, 4 channels per chip with onboard double-buffering).
- 12-bit resolution (4.8 mV / bit).
- Double-buffering allows output values to be preloaded without affecting actual analog signal.
- Simultaneous update of all 8 channels (transfer from preloaded value to analog signal).
- Programmable voltage ranges: +/-10V, +/-5V, 0-10V.
- Transparent mode available (bypasses double-buffering).
- Set two 12-bit output values concurrently using a single 32-bit PCI write.

Encoders

- 8 single-ended encoder inputs.
- Index pulse supported on all channels. Index pulse can cause count value to be set or latched.
- Index pulse may be enabled or disabled individually on each channel.
- Interrupt on index pulse, error (noise detection), counter overflow, underflow or either.
- 24-bit counters.

Counters

- Two 32-bit general purpose periodic counters: COUNTER and WATCHDOG.
- 30ns resolution (periods from 60ns to more than 2 minutes).
- COUNTER can be enabled or disabled by user hardware (via an extra digital input).
- COUNTER can optionally trigger A/D conversions on selected channels.
- COUNTER expiration causes 60ns pulse on external pin.
- WATCHDOG can be enabled or disabled in software.
- WATCHDOG can optionally reset the analog outputs and set all digital outputs on expiration.
- WATCHDOG expiration causes level change on external pin until reset.
- Read and written using 32-bit PCI accesses.
- Interrupt on either counter's expiration.

Digital I/O

- 32 digital I/O channels.
- Each channel individually programmable as input or output.
- Totem-pole outputs, not open-collector for much faster digital outputs.
- All channels can be read or written in a single 32-bit PCI access.