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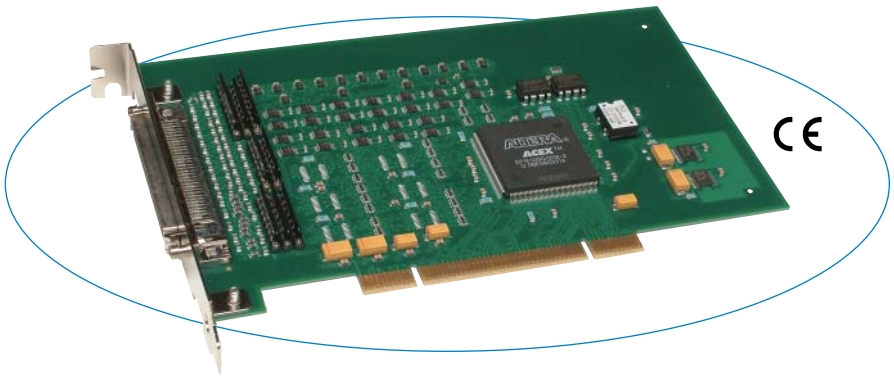
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# APC424
# Digital I/O (Differential & TTL) and Counter/Timers



This module saves money and PCI slots by combining differential I/O, TTL I/O, and counter/timer functions on one card.

The APC424 provides 24 differential input/outputs, 16 TTL input/output channels, and four 16-bit multi-function counter/timers.

The 16 TTL input/output channels can be programmed as inputs or as outputs on an individual channel basis. The 24 differential input/output channels are programmed as inputs or outputs on an 4-channel port basis. All input channels can be enabled for change of state, low, or high level transition interrupts.

Four 16-bit multifunction counters/timers can be configured for pulse width modulated output, watch-dog timer, event counter, frequency measurement, pulse width measurement, period measurement, or one shot pulse output. The four 16-bit counters can also be configured into two 32-bit counter/timers.

## Features

### Digital I/O

- 40 digital input/output channels:
  - 24 differential input/outputs
  - 16 TTL input/output channels
- Programmable change of state/level interrupts
- Input signal filtering debounce logic

### Counter/Timer

- Four 16-bit or two 32-bit counter/timer channels (control lines shared with 16 TTL I/O channels)
- Six operating modes:
  - Pulse width modulation
  - Watchdog timer
  - Event counter
  - Frequency measurement
  - Pulse width or period measurement
  - One-shot and repetitive one-shot
- TTL-compatible thresholds
- Power-up and system reset are failsafe

## Specifications

### Differential Digital I/O

I/O channel configuration: 24 bidirectional differential signals. Direction is controlled as a 4-channel group.

Differential driver output voltage with 50 ohm load: 2V minimum, 5V maximum.

Common mode output voltage: 3V maximum:

Minimum input resistance: 12K ohms.

Termination resistors: 120 ohm termination resistor networks are installed in sockets.

### TTL Digital I/O

I/O channel configuration: 16 bidirectional TTL transceivers with direction controlled independently (shared as counter/timer control signals).

Reset/power-up condition: All channels default to input.

#### Digital Input

Input voltage range: 0 to 5V DC.

Input signal threshold, low to high: 3.5V typical.

Input signal threshold, high to low: 1.5V typical.

#### Digital Output

Output voltage range: 0 to 5V DC.

Output ON current range: -32 to 32mA.

Output pullups: 4.7K ohm socketed resistors.

### Input Interrupts

40 channels of interrupts are available for high-to-low, low-to-high, or any change-of-state event type.

Debounce: Selectable for each channel. User-selectable (5.6µS, 50.4µS, 408.8µS, or 3.276mS).

### Counter/Timers

Counter/timer configuration: Four 16-bit counters can be configured into two 32-bit counters.

Counter input: Each counter has an $IN_A$, $IN_B$, and $IN_C$ port. These TTL input signals control start/stop, reload, event input, external clock, trigger, and up/down operations.

Counter output: Each counter has one output signal. The TTL output is used for waveform output, watchdog active indicator, or 1.6µS pulse upon counter function completion. Programmable as active high or low.

Counter clock frequencies: Selectable for 20MHz, 10MHz, 5MHz, 2.5MHz, 1.25MHz or external up to 8MHz.

Minimum I/P event: 100nS (debounce disabled).

Minimum pulse measurement: 100nS (debounce disabled).

Minimum period measurement: 200nS (debounce disabled).

Minimum gate/trigger pulse: 100nS (debounce disabled).

### PCI Bus Compliance

This device meets or exceeds all written PCI local bus specifications per rev. 2.2 dated December 1998.

System base address: This board operates in memory space. It consumes 4K of memory space.

Data transfer bus: Slave with 32, 16, and 8-bit data transfer operation.

Interrupts (INTA#): Interrupts requested on Interrupt A.

### Environmental

Operating temperature: 0 to 70°C (APC424) or -40 to 85°C (APC424E)

Storage temperature: -55 to 125°C.

Relative humidity: 5 to 95% non-condensing.

MTBF: Consult factory.

Power: 216mA at +5V, typical.

## Ordering Information

### PCI Boards

**APC424**: Digital I/O and counter/timer module

**APC424E**: Same as APC424 plus extended temp. range

### Software

**PMCSW-API-VXW**: VxWorks® software support package

**PCISW-API-WIN32:** 32-bit Windows® DLL Driver software package

**PCISW-API-WIN64:** 64-bit Windows® DLL Driver software package

**PCISW-API-LNX:** Linux™ support (website download only)

### Accessories

**5025-288**: Termination panel, SCSI-3 connector, 68 screw terminals

**5028-432**: Cable, shielded, SCSI-3 connector both ends

Visit web page for more information

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