

APC730 Multi-function I/O

- **Analog Input**
- **Analog Output**
- **Digital I/O**
- **Counter/Timer**

APC730 I/O boards provide a variety of I/O functions on a single card. These new high-density boards perform both high-speed and high-resolution A/D and D/A conversion and also handle digital I/O plus counter/timer functions.

Now you can conserve your precious card slots and still get all the I/O functionality you need. The APC730 is designed for extreme versatility with many deluxe features to meet most applications. However, the APC730 is still very budget-friendly.

Features

Analog Inputs

- 16 differential or 32 single-ended inputs ($\pm 3.3V, \pm 5V, \pm 10V, 0-5V$, and $0-10V$ ranges)
- 16-bit ADC with 512 sample RAM
- $10\mu S$ conversion time (100KHz)
- Interrupt upon ADC memory threshold condition (user-programmable data sample threshold)
- User-programmable interval timer

Analog Outputs

- Eight analog output channels ($\pm 10V$ range)
- Individual 16-bit DACs per channel
- 1024 sample FIFO for waveform generation
- $12.375\mu S$ settling time (80.8KHz throughput)
- Interrupt on user-programmable FIFO threshold

Digital I/O

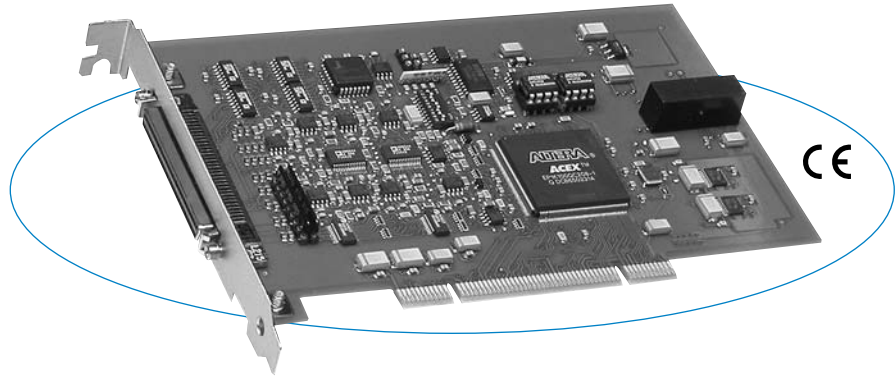
- 16 TTL bidirectional input/outputs

Counter/Timer

- One 32-bit counter/timer

Approvals

- CE marked, FCC Part 15, Class B



The APC730 combines analog I/O, digital I/O, and counter/timer functions on a single high-density module to save PCI slots.

Specifications

Analog Input

Input configuration: 16 differential or 32 single-ended channels multiplexed to a single A/D converter.

A/D resolution: 16 bits.

Input ranges: $\pm 3.3V, \pm 5V, \pm 10V, 0-5V$, and $0-10V$.

Maximum throughput rate:

One channel updated at a time.

1 channel (maximum): $10\mu S$

16 channels (maximum): $160\mu S$

32 channels (maximum): $320\mu S$

Data sample memory: 512 samples shared by all channels.

A/D trigger: Internal timer, external source, software.

On-board timer: One user-programmable timer for analog input acquisition control.

System accuracy: ± 3 LSB typ. (SW calib., gain=1, $25^\circ C$).

Data format: Straight binary or binary two's complement.

Input overvoltage protection: -40 to $55V$ power off.

Common mode rejection ratio (60Hz): 96dB typical.

Channel-to-channel rejection ratio (60Hz): 96dB typical.

Analog Output

Output configuration: 8 single-ended channels, each controlled by its own independent D/A converter.

D/A resolution: 16 bits.

Output range: $\pm 10V$.

Maximum throughput rate:

Outputs updated simultaneously or individually.

1 channel: $12.375\mu S$

8 different channels: $12.375\mu S$

DAC programming: Via independent channel registers or through shared FIFO.

Data sample memory: 1024 sample FIFO shared by all channels.

D/A trigger: Internal timer, external source, software.

On-board timer: One user-programmable timer for analog output control.

System accuracy: 0.0076% of 20V span max. error corrected (i.e. calibrated) at $25^\circ C$ with output unloaded.

Data format: Straight binary.

Output at reset: 0V.

Output current: -10 to $10mA$ (maximum).

Short circuit protection: Indefinite at $25^\circ C$.

Digital I/O

I/O channel configuration: 16 TTL transceivers, input/output direction selectable on an 8-channel basis.

Digital Input

Input voltage range: 0 to 5V DC.

Input signal threshold:

Low to high: 2.0V typical.

High to low: 0.8V typical.

Input response time: 250 nanoseconds.

Interrupts: 16 channels of interrupts for high-to-low, low-to-high, or any change-of-state event types.

Debounce: Individual debounce selectable on each channel. User-selectable ($4\mu S, 64\mu S, 1mS$, or $8mS$).

Digital Output

Output voltage range: 0 to 5V DC.

Output ON current range: -15 to $64mA$.

Output pullups: 4.7K ohm socketed resistors.

Counter/Timers

Counter/timer configuration: one 32-bit counter (requires use of channels 2 through 5 of digital I/O section).

Functions:

Watchdog timer, event counting, pulse measurement, period measurement, output waveform generation (pulse width modulation, continuous pulse, single pulse, continuous waveform).

Internal clock: Programmable 1, 4, 8MHz.

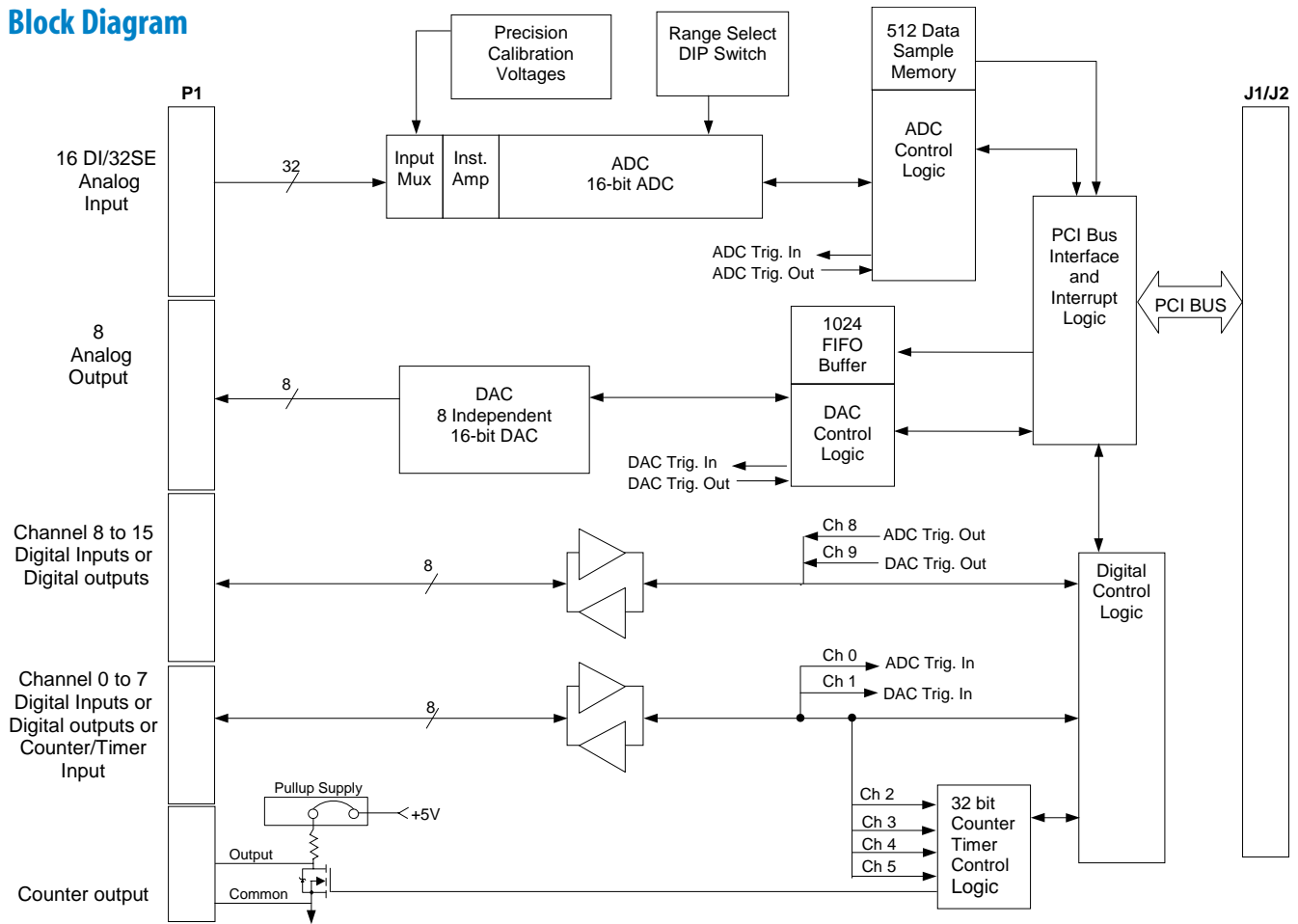
External clock: 3.4MHz.

Input voltage range: 0 to 5V DC.

Output voltage range: 0 to 5V with 4.7 ohm pull-up. Maximum of 0 to 35V with external supply.

Continued on the next page.

Block Diagram



PCI Boards

Specifications (continued)

PCI Bus Compliance

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

System base address: This board operates in memory space. It consumes 1K of memory space.

Data transfer bus: Slave with 32, 16, and 8-bit data transfer operation. 32-bit read or write accesses implemented as two 16-bit transfers.

Interrupts (INTA#): Interrupt A is used to request an interrupt.

Environmental

Operating temperature: 0 to 70°C
(E version -25 to 85°C)

Storage temperature: -40 to 85°C.

Relative humidity: 5 to 95% non-condensing.

Power: 245mA at +5V (290mA maximum).

MTBF: Consult factory.

Ordering Information

I/O Boards

APC730
Multi-function I/O board

APC730E
Same as APC730 plus extended temperature range

Software (see Page 81)

PMCSW-API-VXW
VxWorks® software support package

PCISW-API-QNX
QNX® software support package

PCISW-API-WIN
Windows® DLL Driver software package

Accessories (see Page 87)

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

5028-432
Cable, shielded, SCSI-3 connector at both ends