PCI I/O Products

Our PCI I/O boards are well suited for COTS & industrial projects.
Acromag, Incorporated
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USA

Acromag: The I/O Leader

Acromag is focused on developing embedded computing solutions that provide the best long term value in the industry. Compare and you will find that Acromag offers an unmatched balance of price, performance, and features.

60+ Years of I/O Experience

With over 60 years of industrial I/O design experience, Acromag stands alone in the high-performance bus-board market. Developing VMEbus I/O boards since 1984, we combine our process control expertise with extensive experience in embedded computing. This background gives us unrivaled insight to many unique concerns when interfacing computer systems to various sensors and controllers in a wide range of applications.

Acromag processor, FPGA, and I/O products are commonly used in these industries:

- military/defense
- transportation
- semiconductors
- communication
- aerospace
- manufacturing
- scientific
- research labs

Quality You Can Count On

We take every measure to guarantee dependable operation with ISO9001 and AS9100 certified quality management. State-of-the-art manufacturing with industrial-grade components adds extra ruggedness. Advanced inspection and testing further ensure that Acromag I/O performs at or beyond their rated specs.

Technical Support

Drawing on a wealth of embedded I/O experience, our sales engineers are well qualified to support you in the use of our products in your end-applications. We take pride in our highly experienced staff that excels at after-sale technical support.

Global Representation

Great care has been put into building a team of highly skilled representatives and distributors. They are located around the world to service your needs.

Online Ordering

Find full documentation and pricing information online. You can get quotes and even order directly on our website.

Experience counts – especially when engineering the right embedded solution. And with more than 60 years experience, Acromag can help you reduce your costs and increase your productivity.
APC330
16-bit A/D Analog Input

APC330 boards provide fast, high resolution A/D conversion.

The APC330 has many features to improve your overall system throughput rate. You can scan all channels or define a subset for more frequent sampling. Burst mode scans selected channels at the maximum conversion rate. Uniform mode performs conversions at user-defined intervals. Both modes can scan continuously, or execute a single cycle upon receiving a trigger.

“Mail box” memory allows the CPU to read the latest data in 32 storage buffer registers without interrupting the A/D converter.

Features
- 16-bit A/D converter (ADC)
- 8μS conversion time (125KHz)
- 16 differential or 32 single-ended inputs (±5V, ±10V, 0-5V, and 0-10V input ranges)
- Individual channel mailbox with one or two storage buffer registers per channel
- Programmable scan control
- Four scanning modes
- User-programmable interval timer
- External trigger input and output
- Programmable gain for individual channels
- Post-conversion interrupts

Benefits
- "Mailbox" memory eliminates scanning interruptions for optimum throughput.
- Data register indicates new and missed (overwritten) data values in the mailbox.
- Programmable interrupts simplify data acquisition by providing greater control.

Specifications

Analog Input
Input configuration: 16 differential or 32 single-ended channels.
A/D resolution: 16 bits.
Input ranges: ±5V, ±10V, 0-5V, and 0-10V.
Programmable gains: 1x, 2x, 4x, 8x.
Maximum throughput rate:
- Only one channel can be updated at a time.
- One channel: 125KHz (8μS/conversion)
- 16 channels (differential): 4.2KHz (240μS/16 ch)
- 32 channels (single-ended): 2.1KHz (480μS/32 ch).
Data sample memory: Individual channel mailbox with one or two storage buffer registers per channel
A/D triggers: Internal timer, external source, and software.
Internal timer: One user programmable timer for data acquisition.
System accuracy: ±3 LSB (0.005%) typical
(5V calib., gain=1, 25°C).
Data format: Straight binary or two’s compliment.
Input overvoltage protection: Vss -20V to Vdd 40V with power on, -35V to 55V power off.
Common mode rejection ratio (60Hz): 96dB typical.
Channel-to-channel rejection ratio (60Hz): 96dB typical.

Environmental
Operating temperature: 0 to 70°C
(E version -40 to 85°C).
Storage temperature: -55 to 100°C.
Relative humidity: 5 to 95% non-condensing.
MTBF: Consult factory.
Power: 230mA at +5V (275mA maximum).

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

Ordering Information

I/O Boards
APC330
Analog input board
APC330E
Same as APC330 plus extended temperature range

Software
PMCSW-API-VXW
VxWorks® software support package
PCISW-API-W32: 32-bit Windows® DLL Driver software package
PCISW-API-W64: 64-bit Windows® DLL Driver software package
PCISW-API-LNX: Linux™ support (website download only)

Accessories
5028-378
Termination panel, SCSI-2 connector, 50 screw terminals.
5028-438
Cable, shielded, SCSI-2 connector at both ends

Visit our web page for more information
APC424
Digital I/O
(Differential & TTL) and Counter/Timers

The APC424 provides 24 differential input/outputs, 16 TTL input/output channels, and four 16-bit multifunction 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 a 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, watchdog 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.

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

References (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

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
APC464
Digital I/O (TTL) and Counter/Timers

The APC464 provides 64 TTL digital input/output channels and four 16-bit multi-function counter/timers.

All 64 I/O channels, when set as inputs, support configuration for interrupts on either a change-of-state or on a high-to-low or low-to-high transition. A debounce timer is selectable to help filter out false transitions.

Four 16-bit multifunction counters/timers are configurable for pulse width modulated output, watchdog 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

- 64 TTL digital input/output channels:
  - 16 individually programmable channels
  - 48 channels configured on an 8-bit port basis
- 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 is failsafe

Specifications

Digital I/O

- I/O channel configuration:
  - 64 bidirectional TTL transceivers.
  - Channels 0-47: Control lines shared with 16 TTL I/O channels.
  - Channels 48-63: 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 (channels 0-47):
  - Low to high: 2.0V typical.
  - High to low: 0.8V typical.
- Input signal threshold (channels 48-63):
  - Low to high: 3.5V typical.
  - High to low: 1.5V typical.
- Interrupts: 64 channels of interrupts for high-to-low, low-to-high, or any change-of-state event types.
  - Debounce: Selectable for each channel. Use-selectable (5.6μs, 50.4μs, 408.8μs, or 3.276ms).

Digital Output

- Output voltage range: 0 to 5V DC.
- Output ON current range (channels 0-47): -15 to 64mA.
- Output ON current range (channels 48-63): -32 to 32mA.
- Output pullups: 4.7K ohm socketed resistors.

Counter/Timers

- Counter/timer configuration: Four 16-bit counters can be configured into two 32-bit countertimers.
- Functions: Pulse width modulation, watchdog timer, event counting, frequency measurement, period measurement, pulse width measurement, and one-shot/repetitive counter.
- 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 1μS 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 (APC464) or -40 to 85°C (APC464E)
- Storage temperature: -55 to 125°C
- Relative humidity: 5 to 95% non-condensing.
- MTBF: Consult factory.
- Power: 160mA at +5V, typical.

Ordering Information

PCI Boards

- APC464: Digital I/O and counter/timer module
- APC464E: Same as APC464 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 conn. both ends

Visit webpage for more information
APC48x Counter/Timer with Quadrature

- APC482: Ten 16-bit counters — TTL
- APC483: Four 16-bit counters — TTL and Four 32-bit counters — RS422
- APC484: Six 32-bit counters — RS422

Several models with a variety of configurations provide up to ten counter/timer channels for counting events, generating waveform control signals, measuring pulse-widths, periodic rates, or quadrature position and monitoring operations.

Support for internal or external triggering simplifies the synchronization of operations to specific events. Counter functions can use internally generated clocks or an externally supplied clock.

Features
- Ten 16-bit counter/timers (APC482 only) or six 32-bit counter/timers (APC484 only)
- Two 16-bit counters can be combined to create one 32-bit counter
- Available with both TTL and RS422 driver interface (APC483 only)
- 16 bi-directional digital I/O
- 20MHz clock time base
- Counter/timer functions:
  - Quadrature position measurement
  - Pulse width modulation
  - Watchdog timer
  - Event counting
  - Frequency measurement
  - Period/pulse-width measurement
  - One-shot/repetitive
- Extended temperature option (-40 to 85°C)

Benefits
- Most configuration is handled by a single register which minimizes programming.
- Pullups are socketed for easy adjustment.

Specifications

Counter/Timers
Counter/timer configuration:
- APC482: Ten 16-bit counters — TTL
- APC483: Four 16-bit counters — TTL
- APC484: Six 32-bit counters — RS422
- Other I/O mixes can be made available as specials.
- Mode accuracy (with external clocking):
  - Waveform generation: ±125nS
  - Watchdog: Timeout occurs within ±1 clock cycle
  - Pulse/period measurement: ±1 clock cycle
- Internal clocks: Programmable 1.25, 2.5, 5, 10 or 20MHz via the counter control register.
- External clocks: Supported on a per-counter basis via clock line. Maximum frequency 8MHz.
- Interrupts: Supported for watchdog timer time-out, event count complete, pulse width or periodic rate measurement complete, pulse width complete (one-shot mode), successful waveform generation (continuous).
- Triggers: Programmable via register write or external trigger. Minimum pulse width 100nS. Line may be used for gating of counter.
- Counter trigger: Interface for triggering counter functions. Input level is TTL or RS422 differential digital.
- Counter input: Interface for events and pulse/period measurements. Also triggers load of watchdog timer register. Level is TTL or RS422 differential digital.

Digital I/O
I/O channel configuration:
- 16 bi-directional TTL transceivers
- Direction controlled as 16 independent channels.

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

Environmental
- Operating temp.: 0 to 70°C or -40 to 85°C (E versions)
- Storage temperature: -55 to 125°C
- Relative humidity: 5 to 95% non-condensing
- Power: 320mA at +5V, typical
- MTBF: Hours at 25°C, MIL-HDBK-217F, notice 2
  - APC482: 1,744,259; APC483: 1,727,707; APC484: 1,708,729

Ordering Information

PCI Boards
- APC482: Ten 16-bit counters — TTL
- APC482E: APC482 with extended temperature range.
- APC483: Four 16-bit counters — TTL
- APC483E: APC483 with extended temperature range.
- APC484: Six 32-bit counters — RS422
- APC484E: APC484 with extended temperature range.

Software
- VxWorks® support (website download only)
- 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
### 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 (±3.3V, ±5V, ±10V, 0-5V, and 0-10V ranges)
- 16-bit ADC with 512 sample RAM
- 10μs conversion time (100kHz)
- Interrupt upon ADC memory threshold condition (user-programmable data sample threshold)
- User-programmable interval timer

**Analog Outputs**
- Eight analog output channels (±10V range)
- Individual 16-bit DACs per channel
- 1024 sample FIFO for waveform generation
- 12.375μS 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

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:** ±3.3V, ±5V, ±10V, 0-5V, and 0-10V.
- **Maximum throughput rate:**
  - One channel updated at a time: 10μS
  - 16 channels (maximum): 160μS
  - 32 channels (maximum): 320μS
- **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°C).
- **Data format:** Straight binary or binary two's compliment.
- **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:** ±10V.
- **Maximum throughput rate:**
  - Outputs updated simultaneously or individually:
    - 1 channel: 12.375μS
    - 8 different channels: 12.375μS
- **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°C with output unloaded.
- **Data format:** Straight binary.
- **Output at reset:** 0V.

#### 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 (4μS, 64μS, 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.
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 -40 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
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 at both ends

Visit our web page for more information
Industry Pack Carriers

APC8620A
PCI Bus
IP Carrier Card

This board interfaces industry-standard Industrial I/O Pack (IP) modules to a PCI bus on a PC-based computer system.

Five IP module slots give you the freedom to mix a variety of I/O functions (A/D, D/A, digital in, digital out, serial I/O, etc.) on a single board. Or, combine modules of the same type for hundreds of channels on a single card. Either way, the APC8620A saves your precious card slots and reduces your costs.

Select I/O modules from Acromag’s offering of more than forty models or use any third-party IP mezzanine ANSI/VITA 4 modules.

Features
- Five industry-standard IP module slots
- Board resides in memory space
- Supports IP module I/O, ID, INT, and MEM spaces
- Plug-and-play carrier configuration and interrupt support
- Two interrupt channels per IP module
- Supervisory circuit reset generation
- Individually filtered and fused power

Benefits
- Quickly create custom I/O boards by mixing and matching I/O functions.
- Conveniently configure and control the I/O modules through software with full IP module register/data access.
- Easily integrate IPs with your software using RTOS VxWorks, QNX, Linux, or Win DLL for Windows® 2000/XP/Vista/7 32-bit systems.

Specifications

**IP Module Compliance (ANSI/VITA 4)**
Meets or exceeds all written IP specifications per ANSI/VITA 4-1995 for 8MHz or 32MHz operation.
- Supports Type I and Type II ID space formats.
- Electrical/mechanical interface: Supports five single-size IP modules (A-E), or two double-size and one single-size IP module.
- IP module I/O space, ID space, INT, and MEM space supported.
- IP module I/O space: 16 and 8-bit, supports 128 byte values per IP module.
- IP module ID space: 16 and 8-bit, Supports Type I 32 bytes per IP (consecutive even byte addresses) and Type II 32 words per IP via D16 data transfers.
- IP module memory space: 16 and 8-bit, supports up to 8M bytes of memory space per IP module.
- Interrupts: Supports two interrupt requests per IP and interrupt acknowledge cycles via access to IP INT space.

**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 PCI memory space. It requires 1K of memory space for mapping the carrier controls, and IP module ID, INT, and I/O space. An optional 64MB of PCI memory space is required to use IP module 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 to IP modules.
- Interrupts (PCI bus INTA# interrupt signal): Up to two requests sourced from each IP mapped to INTA#.
- Interrupt vectors come from IP modules via access to IP module INT space.

Environmental
- Operating temperature: 0 to 70°C (APC8621A) or -40 to 85°C (APC8621AE model).
- Storage temperature: -55 to 100°C (all models).
- Relative humidity: 5-95%non-condensing
- Power: +3.3 Volts (±10%): 130mA, typical; 50mA max.
- +5 Volts (±5%): 30mA, typical; 50mA max.
- ±12 Volts provided to each IP module.
- MTBF: 413,003 hrs. at 25°C, MIL-HDBK-217F, notice 2

Physical
- Physical configuration: PCI universal card (3.3V or 5V)
- Length: 12.283 inches (312.0 mm)
- Height: 4.200 inches (106.68 mm)
- Board thickness: 0.062 inches (1.59 mm)
- Maximum component height: 0.380 in. (9.65 mm)
- Max. height under IP modules: 0.180 in. (4.57 mm).
- Connectors: A-E (carrier field I/O): 50-pin male header

Ordering Information

Industry Pack Carriers
- APC8620A
  - Non-intelligent PCI bus carrier board.
  - Holds five IP modules.
- APC8620AE
  - Same as APC8620A plus extended temperature range.

Software
- IPSW-API-VXW: VxWorks® software support package
- IPSW-API-WIN32: 32-bit Windows® DLL driver software support pkg.
- IPSW-API-WIN64: 64-bit Windows® DLL driver software support pkg.
- IPSW-LINUX: Linux™ support (website download only)

Accessories
- 5025-550: Cable, unshielded, 50-pin header both ends
- 5025-551: Same as 5025-550 except shielded
- 5025-552: Termination panel, 50-pin connector, 50 screw terminals
APC8621A
PCI Bus Half-Length
IP Carrier Card

This board interfaces industry-standard Industrial I/O Pack (IP) modules to a PCI bus on a PC-based computer system. The half-length card is ideal for use in smaller PC chassis.

Three IP module slots give you the freedom to mix a variety of I/O functions (A/D, D/A, digital in, digital out, serial I/O, etc.) on a single board. Or, combine modules of the same type for dozens of channels on a single card. Either way, the APC8621A saves your precious card slots and reduces your costs.

Select I/O modules from Acromag’s offering of more than forty models or use any third-party IP mezzanine ANSI/VITA 4 modules.

Features
- Half-length card for smaller PC chassis
- Three industry-standard IP module slots
- Board resides in memory space
- Supports IP module I/O, ID, INT, and MEM spaces
- Plug-and-play carrier configuration and interrupt support
- Two interrupt channels per IP module
- Supervisory circuit reset generation
- Individually filtered and fused power

Benefits
- Quickly create custom I/O boards by mixing and matching I/O functions.
- Conveniently configure and control the I/O modules through software with full IP module register/data access.
- Easily integrate IPs with your software using RTOS VxWorks, QNX, Linux, or Win DLL for 2000/XP/Vista/7 32-bit operating system.

Specifications

IP Module Compliance (ANSI/VITA 4)
Meets or exceeds all written IP specifications per ANSI/VITA 4-1995 for 8MHz or 32MHz operation.
Supports Type I and Type II ID space formats.
Electrical/mechanical interface: Supports three single-size IP modules (A-C), or one double and one single-size IP module. 32-bit IP modules are not supported.
IP module I/O space, ID space, INT, and MEM space supported.
IP module I/O space: 16 and 8-bit; supports 128 byte values per IP module.
IP module ID space: 16 and 8-bit; Supports Type I 32 bytes and Type II 32 words per IP via D16 data transfers.
IP module memory space: 16 and 8-bit; supports up to 8M bytes of memory space per IP module.
Interrupts: Supports two interrupt requests per IP and interrupt acknowledge cycles via access to IP INT space.

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 PCI memory space. It requires 1K of memory space for mapping the carrier controls, and IP module-ID, INT, and I/O space. An optional 64MB of PCI memory space is required to use IP module 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 to IP modules.
Interrupts (PCI bus INTA# interrupt signal): Up to two requests sourced from each IP mapped to INTA#. Interrupt vectors come from IP modules via access to IP module INT space.

Environmental
Operating temperature: 0 to 70°C (APC8621) or -40 to 85°C (APC8621E model).
Storage temperature: -55 to 100°C (all models).
Relative humidity: 5-95% non-condensing
Power: +3.3 Volts (±10%): 130mA, typical; 50mA max.
+5 Volts (±5%): 30mA, typical; 50mA, max.
±12 Volts provided to each IP module.
MTBF: 413,003 hrs. at 25°C, MIL-HDBK-217F, notice 2

Physical
Physical configuration: PCI universal card (3.3V or 5V)
Length: 6.600 inches (167.64 mm)
Height: 4.200 inches (106.68 mm)
Board thickness: 0.062 inches (1.59 mm)
Maximum component height: 0.380 in. (9.65 mm)
Max. height under IP modules: 0.180 in. (4.57 mm).
Connectors: A-C (carrier field I/O): 50-pin male header

Ordering Information

Industry Pack Carriers
APC8621A
Non-intelligent PCI bus carrier board.
Holds three IP modules.
APC8621AE
Same as APC8621A plus extended temperature range.

Software
IPSW-API-VXW: VxWorks® software support package
IPSW-API-WIN32: 32-bit Windows® DLL driver software support pkg.
IPSW-API-WIN64: 64-bit Windows® DLL driver software support pkg.
IPSW-LINUX: Linux™ support (website download only)

Accessories
5025-550: Cable, unshielded, 50-pin header both ends
5025-551: Same as 5025-550 except shielded
5025-552: Termination panel, 50-pin connector, 50 screw terminals

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APC-PMC
PCI Non-intelligent
PMC Carrier Card

Description
This board provides an easy and low cost solution that enables use of a PMC mezzanine I/O module in a standard PCI computer system. The carrier card acts simply as an adapter to route PCI bus signals to and from the PMC module through the PCI card slot edge connector. All Acromag PMC modules and those from other vendors are supported.

Features
- Half-length PCI card
- Holds one PMC card
- 32-bit 66 MHz; PCI Interface
- Front or rear connection I/O access
- Supports both 5V and 3.3V signalling

Specifications

Environmental
Operating temperature: -40 to 85°C.
Storage temperature: -55 to 100°C.
Relative humidity: 5-95% non-condensing

Physical
Physical configuration: PCI Card
Length: 6.600 inches (167.64 mm)
Height: 4.200 inches (106.68 mm)
Board thickness: 0.062 inches (1.59 mm)
Maximum component height: 0.380 in. (9.65 mm)
Max. height under IP modules: 0.180 in. (4.57 mm).
Rear connector (carrier field I/O): 64-pin male header

PCI Bus Compliance
The carrier card may compromise signal integrity at 66 MHz (due to longer trace lengths).

Ordering Information
Carrier Card
APC-PMC
PCI bus carrier card for one PMC module

All trademarks are the property of their respective owners.
Support Software

Linux® Libraries  I/O Function Routines

Simplify interfacing between Acromag I/O boards and your software ◆ Demonstration Program

Description

IPSW-API-LNX
Support for Industry Pack modules and carriers

PCISW-API-LNX
Support for PC/CompactPCI boards and PMC modules

APSW-API-LNX
Support for AcroPack® modules and carriers

Application Programming Interface (API)

Acromag's software development tools greatly simplify the interface between the I/O boards and your software application program. The Linux libraries are supplied as "C" source code. These libraries provide easy-to-use function routines that quickly integrate with your application. Function routines are ready for use "as-is," but they are also easily customized for your unique application.

Demonstration Program

This powerful program lets you fully exercise the libraries and your hardware before running the actual application. These diagnostics will save you hours troubleshooting and debugging your applications. You can set addresses, set up registers, read real-world inputs, or drive outputs. The demonstration program steps you through the exact functions that are called in your application.

Key Features & Benefits

■ Easy installation procedure
■ Readme files with step-by-step instructions
■ Programming tools for most Acromag I/O boards (excludes serial I/O and VME products)
■ Demonstration program
■ Downloadable at no charge from the Acromag website
■ Source code provided to ensure maximum flexibility in implementing your driver
■ Verify operation of your I/O modules and carrier cards with a demonstration program to ensure proper hardware operation before attaching your application

Ordering Information

NOTE: This unsupported software is available ONLY by download from Acromag's website.

IPSW-API-LNX
Linux example libraries for Industry Pack modules and PCI/CompactPCI carrier cards

PCISW-API-LNX
Linux example libraries for PCI, CompactPCI, and PMC modules.

APSW-API-LNX
Linux example libraries for AcroPack® modules and carriers.

This free software utility is available for download from Acromag's website.
Support Software

**VxWorks® Libraries**  I/O Function Routines

![VxWorks®](image)

The VxWorks software libraries provide a simple API to quickly integrate Acromag’s I/O boards with your application program.

**Supports any CPU target with quick modification**  ◆ **API easily convertible for any operating system**

**Description**

**Application Programming Interface (API)**

Acromag’s software development tools greatly simplify the interface between the I/O boards and your software application program. VxWorks libraries are supplied as “C” source code. These libraries provide easy-to-use function routines that quickly integrate with your application. Function routines are ready for use “as-is,” but they are also easily customized for your unique application.

This powerful program lets you fully exercise the libraries and your hardware before running the actual application. These diagnostics will save you hours troubleshooting and debugging your applications. You can set addresses, set up registers, read real-world inputs, or drive outputs. The demonstration program steps you through the exact functions that are called in your application.

**Target any CPU**

Acromag provides direct support for VxWorks when using PowerPC, x86 and 68000 CPU boards. The VxWorks C Library includes support for x86 PCI, MV167 and MV2700 CPU boards. Each library contains detailed information on integrating with the CPU’s Board Support Package (BSP). The libraries also include instructions for implementing this software with other manufacturer’s CPU board BSPs. Use with Industry Pack carriers from third-party board vendors is also supported.

The IPSW-API-VXW library package offers support for Acromag carriers. Other carriers are compatible, but require some minor modifications. Acromag uses a very innovative modular programming technique. This allows new carrier files to be created without affecting any of the complex IP module files or interrupt service routines.

**User-Friendly Licensing**

Acromag’s VxWorks software libraries are provided with a full site license. This allows anyone at your location to use this software without any additional charges. Additionally, no run-time license is required either.

The VxWorks software libraries include support for the full family of boards or modules, not just certain models unless otherwise noted.

**Key Features & Benefits**

- Easy installation procedure
- Readme files with step-by-step instructions
- Quickly creates libraries
- Targeted support for Power PC, x86, and 68000 series CPUs
- Supports any CPU target with quick modification
- API easily convertible for any operating system
- Source code provided to ensure maximum flexibility in implementing your application
- Ability to verify operation of your modules and carriers with a demonstration program to ensure proper hardware operation before attaching your application

**Ordering Information**

**APSW-API-VXW**

VxWorks software support package for AcroPack modules and carriers.

**IPSW-A7VME-VXW**

VxWorks software support package for Acromag VME SBC Series XVME6500 and XVME6700 when used with Industry Pack modules.

**IPSW-API-VXW**

VxWorks software support package for Industry Pack modules and carriers.

**PMCSW-API-VXW**

VxWorks software support package for XMC, PMC, PCI, and CompactPCI products (supports all Acromag PMC modules and PCI or cPCI boards except IP carriers).

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Software Support

**PCISW-API-WIN**  PCI Driver Software for Windows® Operating Systems

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**Description**

Application Programming Interface
Acromag's software development tools greatly simplify the interface between the I/O boards and your Windows-based application program. This package provides DLL driver level support for Acromag's complete line of PMC, XMC, PCI and cPCI products. In addition, "C" source demonstration programs provide easy-to-use tools to test the operation of the module.

Demonstration Programs
Powerful programs let you fully exercise your hardware before developing the actual application. These diagnostics will save you hours troubleshooting and debugging your applications. You can set addresses, set up registers, read real-world inputs, or drive outputs. The demonstration programs step you through the exact functions that are called in your application.

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**Key Features & Benefits**

- Easy installation procedure
- Documentation with step-by-step instructions
- Support for all active Acromag I/O PMC, XMC, PCI and CompactPCI boards and all Acromag FPGA PMC, XMC, PCI and CompactPCI boards except PMC CX family Virtex-II boards.
- Support for 32-bit and 64-bit systems
- Demonstration Programs
- Driver level support for desktop and embedded Windows level programming environments
- Compatible with Windows Embedded Standard applications
- Verifies operation of your I/O boards with a demonstration program to ensure proper hardware performance before attaching your application

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**Ordering Information**

- **Software**
  For more information, see www.acromag.com.
  **PCISW-API-WIN**
  32 or 64-bit Windows driver software package with DLLs and demonstration programs for PMC, XMC, PCI, and cPCI products. Supplied on CD-ROM.

  **NOTE:** For Industry Pack module and carrier card support software, please refer to IPSW-API-WIN.

- **User-Friendly Licensing**
  Acromag's PCI Windows driver software is provided with a full site license. This allows anyone at your location to use this software without any additional charges. No run-time license is required.

  Each package supports all active PCI-based (PMC, XMC, PCI, CompactPCI) products. You do not need to order additional software for different models within the family. (does not support PMC CX family Virtex-II boards)

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**For Windows 10 / 8 / 7 / Vista**

- Supports Acromag XMC, PMC, PCI, CompactPCI cards
- Includes DLLs

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**PCISW-API-WIN**

PCI Windows Driver Software

10/6/7/Vista


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Software Support

PCISW-API-WIN  PCI Driver Software for Windows® Operating Systems

Description
Application Programming Interface
Acromag's software development tools greatly simplify the interface between the I/O boards and your Windows-based application program. This package provides DLL driver level support for Acromag's complete line of PMC, XMC, PCI and cPCI products. In addition, "C" source demonstration programs provide easy-to-use tools to test the operation of the module.

Demonstration Programs
Powerful programs let you fully exercise your hardware before developing the actual application. These diagnostics will save you hours troubleshooting and debugging your applications. You can set addresses, set up registers, read real-world inputs, or drive outputs. The demonstration programs step you through the exact functions that are called in your application.

Key Features & Benefits
- Easy installation procedure
- Documentation with step-by-step instructions
- Support for all active Acromag I/O PMC, XMC, PCI and CompactPCI boards and all Acromag FPGA PMC, XMC, PCI and CompactPCI boards except PMC CX family Virtex-II boards.
- Support for 32-bit and 64-bit systems
- Demonstration Programs
- Driver level support for desktop and embedded Windows level programming environments
- Compatible with Windows Embedded Standard applications
- Verifies operation of your I/O boards with a demonstration program to ensure proper hardware performance before attaching your application

Ordering Information

Software
For more information, see www.acromag.com.

PCISW-API-WIN
32 or 64-bit Windows driver software package with DLLs and demonstration programs for PMC, XMC, PCI, and cPCI products. Supplied on CD-ROM.

User-Friendly Licensing
Acromag's PCI Windows driver software is provided with a full site license. This allows anyone at your location to use this software without any additional charges. No run-time license is required.

Each package supports all active PCI-based (PMC, XMC, PCI, CompactPCI) products. You do not need to order additional software for different models within the family. (does not support PMC CX family Virtex-II boards)
Visit us on the web! Acromag.com

- Product data sheets, manuals, and price information
- Order online with your credit card or purchase order
- Technical support, tutorials, and application notes
- Subscribe to our monthly e-newsletter

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