Embedded Computing & I/O Solutions

PMC Products Brochure

Analog I/O

Digital I/O

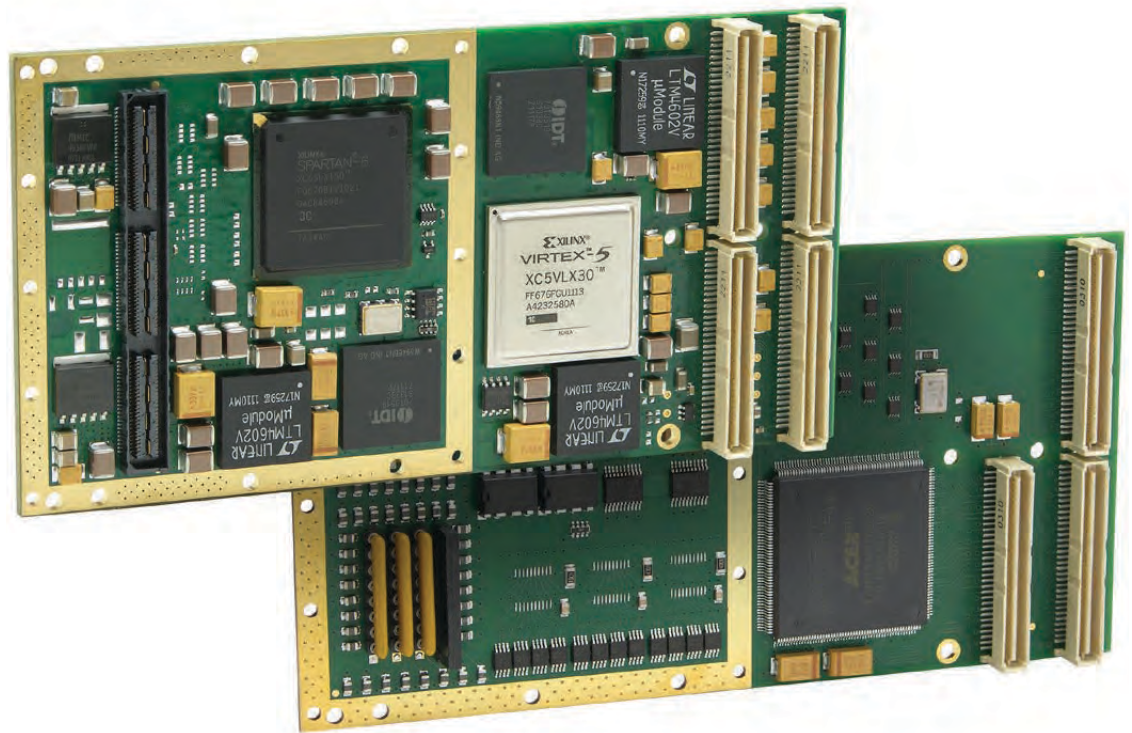**Counters/Timers**

Communication

PMC FPGAs

**FPGA Extension
I/O Modules**

PMC Carrier Cards

PMC Software

Unmatched balance of performance, features & price for your value

Depend on Acromag

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.

2 YEAR WARRANTY

RoHS Compliant

ISO9001 AS9100

MADE IN USA

MEMBER **VITA** — Open Standards, Open Markets

COTS
Experience
Reliability
Extended Temperature
Extended Life Cycle

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THE LEADER IN INDUSTRIAL I/O

PMC230A-8
16-Bit D/A
Analog Output

PMC230A modules have eight 16-bit D/A converters (DACs) to provide highly-accurate analog voltage outputs. A unique two-piece board design brings the proven reliability of Acromag's Industry Pack (IP) A/D modules to a PMC format. An IP230A module is embedded on a PMC interface card that maintains maximum performance and transparent communication to the host.

Jumper-selectable output ranges give you the choice of unipolar or bipolar voltage output. And for greater flexibility, the PMC230 module accepts conversion start triggers from software commands, or from external sources for synchronization to specific events.

Features

■ 8 analog voltage output channels

■ Individual 16-bit D/A converters per channel

■ 10µS settling time (100KHz throughput)

■ Three output ranges: ±5V, ±10V, 0 to 10V (jumper-selectable)

■ Two trigger modes (software or external trigger)

■ External trigger output

■ High load capability (5mA output current)

Benefits

■ High channel density saves card cage slots.

■ Internally stored calibration coefficients ensure accuracy.

■ Flexible output control allows single cycle updating of individual channels or all channels simultaneously.

■ Hardware jumpers allow output range selection on an individual channel basis.
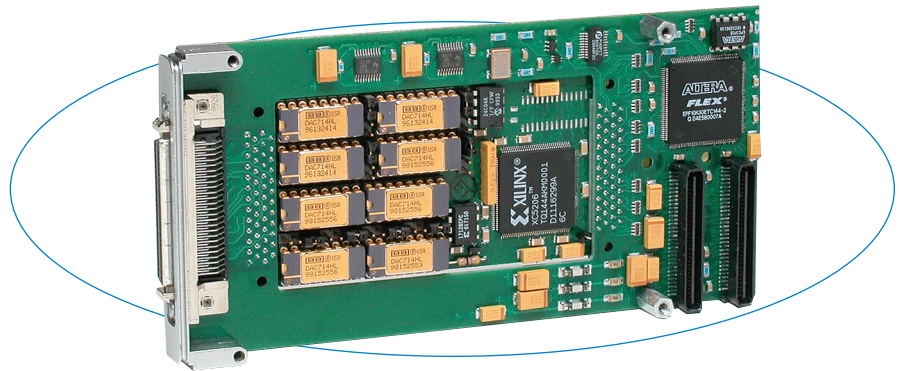
Independent D/A converters on each channel provide better performance and smoother operation.

Specifications

Analog Outputs
Output configuration: 8 voltage output channels.

D/A Resolution: 16 bits.

Output ranges: ±5V, ±10V, 0 to 10V (jumper-selectable).

Maximum throughput rate:
  Outputs can be updated simultaneously or individually.
  One channel: 100KHz (10µS/conversion)
  Eight channels: 100KHz (10µS/8 ch).

DAC programming: Immediate (transparently programmed to DAC output); simultaneous (input latches of DACs are loaded before simultaneously updating outputs).

System accuracy: 0.0061% of 20V span max. corrected error (i.e. calibrated) at 25°C with output unloaded.

Output at reset: 0V for bipolar output, 5V for unipolar.

Output current: -5 to +5mA (maximum).

Short circuit protection: Indefinite at 25°C.

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1 (mechanical height exception).

Electrical/Mechanical Interface: Single-Width Module. Two-piece board design.

32-bit PCI Target: Implemented by Altera FPGA.

4K Memory Space Required: One Base Address Register.

Signaling: 5V Compliant, 3.3V Tolerant.

PMC Module Write Cycle: 1000nS typical measured from falling edge of FRAME# to module write complete.

PMC Module Read Cycle: 1000nS typical measured from falling edge of FRAME# to falling edge of TRDY# providing valid data.

Access Times: 1000nS for all registers.

Environmental
Operating temperature: 0 to 70°C (PMC230A-8) or -40 to 85°C (PMC230A-8E model)

Storage temperature: -55 to 100°C (all models).

Relative humidity: 5 to 95% non-condensing.

Power: 100mA at +5V. 140mA at +12V. 225mA at -12V.

MTBF: 662,291 hrs. at 25°C, MIL-HDBK-217F, notice 2.

Ordering Information

PMC Modules
PMC230A-8
  Eight high-resolution voltage outputs

Software (see software documentation for details)
PMCSW-API-VXW
  VxWorks® software support package

PCISW-API-WIN
  Windows® DLL Driver software package

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

Accessories (see accessories documentation for details)
5028-378
  Termination panel, SCSI-2 connector, 50 screw terminals

5028-438
  Cable, shielded, SCSI-2 connector at both ends

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PMC330
16-Bit A/D
Analog Input

PMC330 mezzanine modules provide fast, high resolution A/D conversion.

The PMC330 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 ($\pm$5V, $\pm$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 mail box.

■ Programmable interrupts simplify data acquisition by providing greater control.
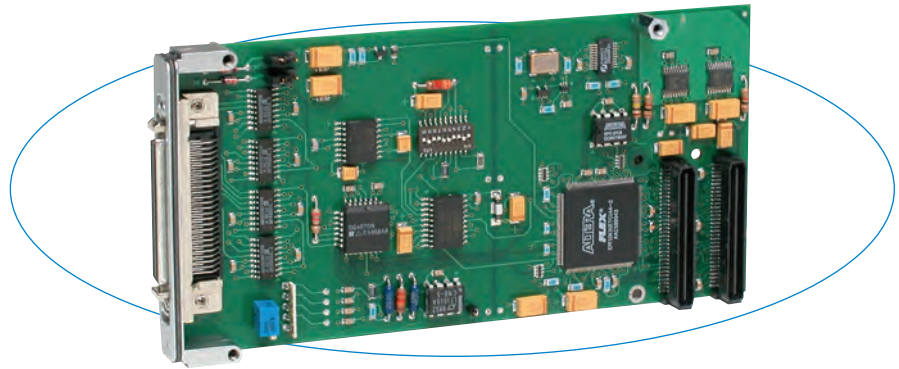
Advanced memory management techniques allow the PMC330 to operate with minimal interruption of the A/D converter.

Specifications

Analog Inputs

Input configuration: 16 differential or 32 single-ended.

A/D resolution: 16 bits.

Input ranges: $\pm$5V, $\pm$10V*, 0-5V, and 0-10V*.
   * Requires $\pm$15V external supplies.

Data sample memory: Individual channel mailbox with one or two storage buffer registers per channel.

Maximum throughput rate:
   Only one channel can be updated at a time.
   One channel: 125KHz (8µS/conversion)
   [66KHz (15µS/conversion) recommended]
   16 channels (differential): 4.2KHz (240µS/16 ch)
   32 channels (single-ended): 2.1KHz (480µS/32 ch).

Programmable gains: 1x, 2x, 4x, 8x.

A/D triggers: External and software.

System accuracy: $\pm$3 LSB (0.005%) typical (SW 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.

PMC Compliance

Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

32-bit PCI Target: Implemented by Altera FPGA.

4K Memory Space Required: One Base Address Register.

Signaling: 5V Compliant, 3.3V Tolerant.

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

Access Times: 8 PCI Clock Cycles for all registers.
   To avoid Mail Box RAM read and write contention, a Mail Box read may be issued a retry termination.

Environmental

Operating temperature: 0 to 70°C (PMC330)
   or -40 to 85°C (PMC330E model)

Storage temperature: -55 to 100°C (all models).

Relative humidity: 5 to 95% non-condensing.

Power: 71mA at +5V. 14mA at +12V. 10mA at -12V.

MTBF: 1,745,521 hrs. at 25°C, MIL-HDBK-217F, notice 2

Ordering Information

PMC Modules
PMC330
   32 single-ended or 16 differential inputs.
PMC330E
   Same as PMC330 plus extended temperature range

Software (see software documentation for details)
PMCSW-API-VXW
   VxWorks® software support package
PCISW-API-WIN
   Windows® DLL Driver software package
PCISW-API-LNX

   Linux™ support (website download only)

Accessories (see accessories documentation for details)
5028-378
   Termination panel, SCSI-2 connector,
   50 screw terminals
5028-438
   Cable, shielded, SCSI-2 connector at both ends

PMC341 Simultaneous A/D Conversion Analog Input

PMC341 modules provide fast, high resolution, simultaneous A/D conversion of eight channels.

These modules have sixteen analog inputs which are sampled as two eight-channel banks. Eight A/D converters (ADCs) permit simultaneous conversion of all eight channels in a bank. All 16 channels share two generous 512-sample memory buffers. Conversion of each bank requires only 8µS, and all 16 channels can be sampled in just 16µs.
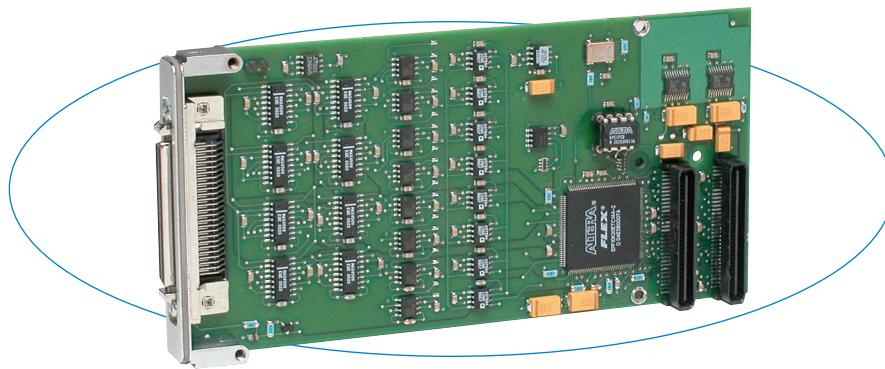
Flexible configuration options give you extensive control over the conversion process. The channels or bank to be converted, timing, scan mode, and other parameters are user-programmable. Interrupt support adds further control to interrupt upon a programmable threshold when the memory is full.

The PMC341 is ideal for high-speed data acquisition. Large memory buffer reduces CPU interactions for increased overall performance.

Features

- 16 differential inputs (±10V DC input range)
- Eight 14-bit A/D converters with simultaneous multi-channel conversion
- 8µS conversion time (125KHz) for 8-channel bank
- Two 512-sample memory buffers
- Data tagging for channel identification
- Programmable conversion timer
- Programmable channel conversion control
- External trigger input and output
- Continuous and single-cycle conversion modes
- Interrupt generation for memory full threshold conditions
- Precision calibration voltages stored on-board

Benefits

- Simultaneous channel conversion and on-board memory enable megahertz throughput rates.

Specifications

Analog Inputs
Input configuration: 16 differential.

A/D resolution: 14 bits.

Input range: ±10V.

Data sample memory: 512 sample FIFO buffer.

Max. throughput rate:
  Eight channels can be simultaneously acquired.
  One channel: 125KHz (8µS/conversion)
  8 channels (same bank): 1MHz (8µS/8 channels)
  16 channels (high & low banks): 1MHz (16µS/16 ch. at maximum 2.2K ohm source resistance).

A/D triggers: Internal timer, external, and software.

System accuracy: 2.4 LSB (0.014%).

Data format: Binary two's compliment.

Input overvoltage protection: ±25V (power on), ±40V (power off).

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

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

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

32-bit PCI Target: Implemented by Altera FPGA.

4K Memory Space Required: One Base Address Register.

Signaling: 5V Compliant, 3.3V Tolerant.

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

Burst Read of Memory Buffer: 3 PCI Clock Cycles per sample read.

Register Access Times: 8 PCI clock cycles, typical.

Environmental
Operating temperature: 0 to 70°C (PMC341) or -40 to 85C° (PMC341E)

Storage temperature: -55 to 100°C .

Relative humidity: 5 to 95% non-condensing.

Power: 100mA at+5V. 15mA at +12V. -10mA at -12V.

MTBF: 2,943,878 hrs. at 25°C, MIL-HDBK-217F, notice 2

Ordering Information

PMC Modules
PMC341
  Analog input module with 16 differential inputs (8 simultaneous sample & hold conversions), 14-bit A/D, 125KHz throughput, front I/O connector.

PMC341E
  Same as PMC341, plus extended temperature range.

Software (see software documentation for details)
PMCSW-API-VXW
  VxWorks® software support package

PCISW-API-WIN
  Windows® DLL Driver software package

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

Accessories (see accessories documentation for details)
5028-378
  Termination panel, SCSI-2 connector, 50 screw terminals

5028-438
  Cable, shielded, SCSI-2 connector at both ends

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PMC408
High Voltage
Digital Input/Output

The PMC408 monitors or controls on/off (high/low) status for up to 32 devices. Each channel can be used as an input or output. A unique two-piece board design brings the proven reliability of Acromag's Industry Pack (IP) modules to a PMC format. An IP408 module is embedded on a PMC interface card that maintains maximum performance and transparent communication to the host.

Input channels can be configured with interrupts for a change of state or level detection of any bit on up to eight channels. The TTL input threshold includes hysteresis for increased noise immunity.

In order to ensure safe, reliable control under all conditions, output operation is "fail-safe." That is, the outputs are always off upon power-up and are automatically cleared following a software reset.
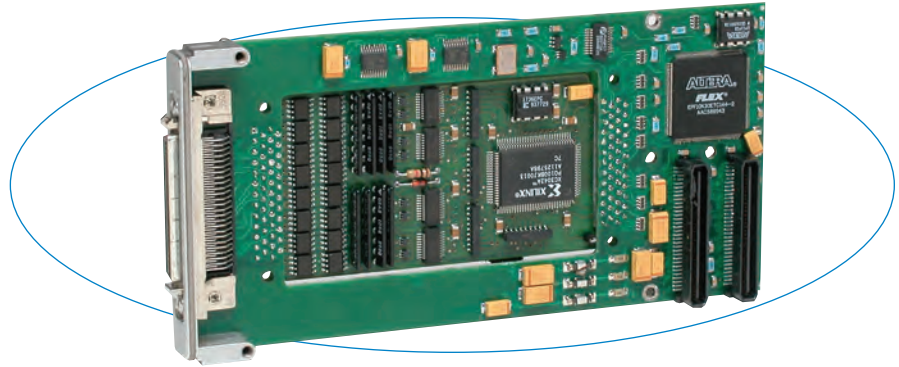
Loopback monitoring of critical control signals is easy since the input and output circuitry are connected in tandem to each channel.

The PMC408 provides an easy method to perform loop-back monitoring of your critical control signals.

Features
- 32 digital input and/or output channels
- 0 to 60V DC input range, 60V DC low-side switch outputs
- Outputs sink up to 1A per channel
- TTL-compatible input threshold with hysteresis
- Change-of-state/level interrupts (up to 8)

Benefits
- Buffered inputs include hysteresis to increase noise immunity.
- Interrupts are software-programmable for a change of state or level detection.
- Loopback monitoring enables self-test and fault diagnostics to detect open switches or shorts.
- High impedance inputs prevent loading of the input source and minimize current.

Specifications

Digital Inputs
Input channel configuration: 32 non-inverting buffered inputs with a common connection.

Input voltage: 0 to 60V DC, maximum.

Input signal threshold: TTL compatible. 1.5V DC with 200mV of hysteresis, typ. Limited to TTL levels of 0.8V DC (max. low level) and 2.0V DC (min. high level).

Input response time: 250nS minimum to 375nS maximum.

Interrupt: Change-of-state and level on channels 0-7.

Digital Outputs
Voltage range: 0 to 60V DC, maximum.

Output ON current range: 0 to 1A DC, continuous per channel (10A total for all channels combined).

Turn on time: varies with load (320nS typical).

Turn off time: varies with load (500nS typical).

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1 (mechanical height exception, see Page 102).

Electrical/Mechanical Interface: Single-Width Module. Two-piece board design (see Page 102).

32-bit PCI Target: Implemented by Altera FPGA.

4K Memory Space Required: One Base Address Register

Signaling: 5V Compliant, 3.3V Tolerant

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

PMC Module Write Cycle: 1000nS typical measured from falling edge of FRAME# to module write complete.

PMC Module Read Cycle: 1000nS typical measured from falling edge of FRAME# to falling edge of TRDY# providing valid data.

Environmental
Operating temp.: 0 to 70°C or -40 to 85°C (E version)

Storage temperature: -55 to 100°C.

Relative humidity: 5 to 95% non-condensing

Power: 70mA at +5V. 10mA at +12V. -12V (not used).

MTBF: 958,506 hrs. at 25°C, MIL-HDBK-217F, notice 2.

Ordering Information

PMC Modules
PMC408
32 bidirectional input/output channels.

PMC408E
Same as PMC408 plus extended temperature range

Software (see software documentation for details)
PMCSW-API-VXW
VxWorks®software support package

PCISW-API-WIN
Windows® DLL Driver software package

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

Accessories (see accessories documentation for details)
5028-378
Termination panel, SCSI-2 connector, 50 screw terminals

5028-438
Cable, shielded, SCSI-2 connector at both ends

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PMC424
RoHS Compliant
Digital I/O (Differential & TTL) and Counter/Timers

The PMC424 digital I/O module 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 an input or an output on a 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, 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. A conduction-cooled version is also available.
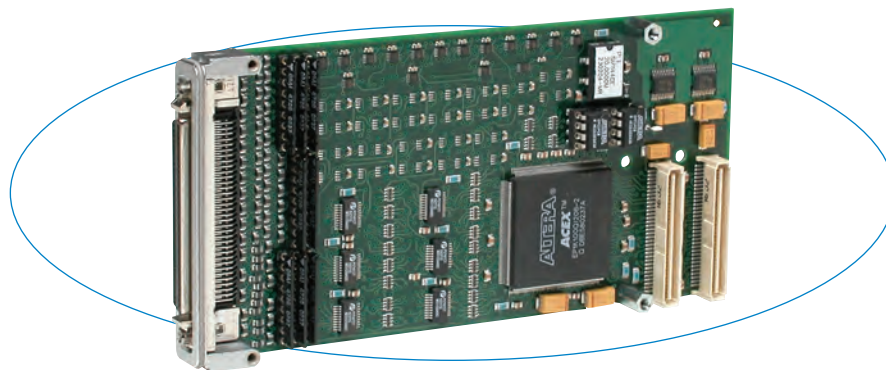

This module saves money and PMC slots by combining differential I/O, TTL I/O, and counter/timer functions on one card.
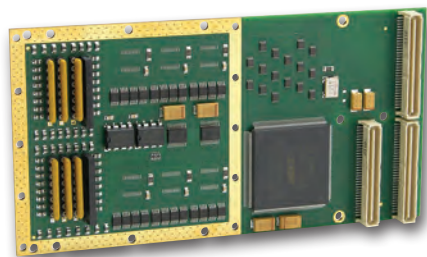
Features

Digital I/O
- 40 digital input/output channels:
  - 24 differential input/outputs
  - 16 TTL input/output channels (15 ch. for 434R)

- 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

PMC424CC for conduction cooling

Specifications

Differential Digital I/O
I/O channel configuration: 24 bidirectional non-isolated RS485/422A 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 (15 for 424R) 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.

Input response time: 10 nanoseconds, typical.

Digital Output
Output voltage range: 0 to 5V DC.

Output ON current range: –32 to 32mA.

Output pullups: 4.7K ohm socketed resistors.

Turn on time: 10nS.

Turn off time: 10nS.

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.

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).
Board crystal oscillator: 20MHz.

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

4K Memory Space Required: One Base Address Register.

Signaling: 5V Compliant, 3.3V Tolerant.

Environmental
Operating temperature: 0 to 70°C (PMC424 / R) or –40 to 85°C (PMC424E / CC)

Storage temperature: –55 to 105°C.
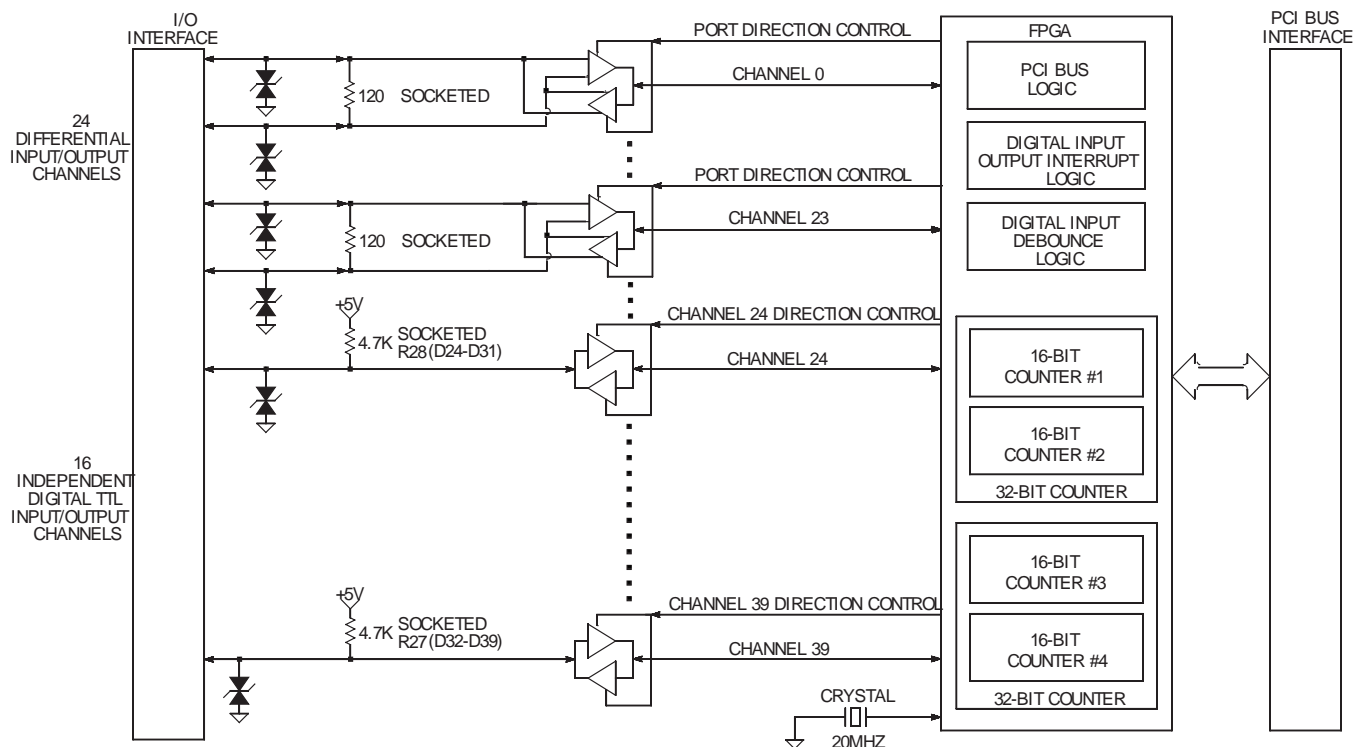
Relative humidity: 5 to 95% non-condensing.

MTBF: 1,596,123 hrs. at 25°C, MIL-HDBK-217F, notice 2.

Power: 216mA at +5V, typical.

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PMC Modules

Block Diagram

Ordering Information

PMC424: Digital I/O and counter/timer module

PMC424E: Same as PMC424 plus extended temp. range

PMC424R: Digital I/O and counter/timer module with
   rear I/O connector.

PMC424CC: Digital I/O and counter/timer module,
   plus extended temperature range and conduction-cooled
   with rear I/O connector.

Software (see software documentation for details)
PMCSW-API-VXW: VxWorks™ software support package
PCISW-API-WIN: Windows® DLL software support
PCISW-API-LNX: Linux™ support (website download only)

Accessories (see accessories documentation for details)
5025-288: Termination panel, SCSI-3 connector,
   68 screw terminals

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

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PMC464
Digital I/O and
Counter/Timers

The PMC464 module provides 64 digital input/ output channels and four 16-bit multifunction counter/timers.

Sixteen digital I/O channels can be programmed as an input or an output on an individual channel basis. The other 48 digital input/output channels are programmed as inputs or outputs on an 8-bit port basis. All inputs support change of state and high/low 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. A conduction-cooled version is also available.
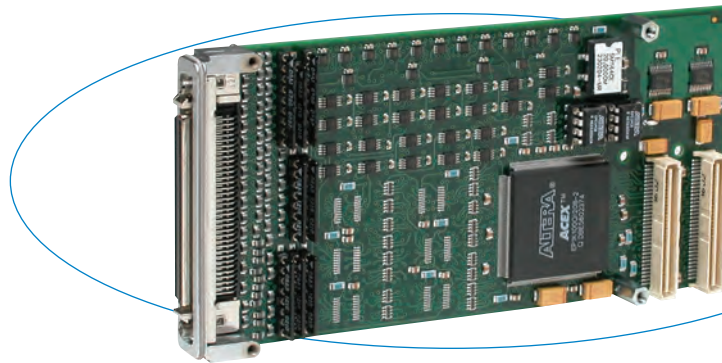
This module saves money and PMC slots by combining digital I/O, and counter/timer functions on a single card.

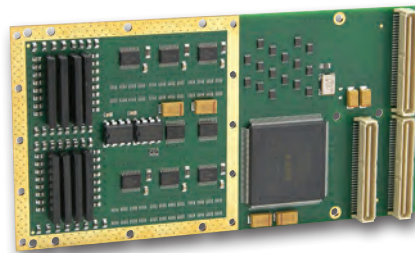PMC464CC for conduction cooling

Features

Digital I/O

■ 64 digital input/output channels:
- 16 individually programmable channels
  (15 channels for 464R
- 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: Direction controlled on a port basis.
    Channels 48-63: Direction controlled independently (shared as counter/timer control signals). (48-62 for 464R)

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.

Input response time: 10 nanoseconds, 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. User-selectable ($5.6\mu S$, $50.4\mu S$, $408.8\mu S$, 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.

Turn on time: 10nS.

Turn off time: 10nS.

Counter/Timers

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

Functions: Pulse width modulation, watchdog timer, event counting, frequency measurement, period measurement, pulse width measurement, and one-shot/repetitive.

Counter input: Each counter has an INA, INB, and INC input 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 $1.6\mu S$ pulse upon counter function completion. Programmable as active high or low.

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).

Board crystal oscillator: 20MHz.

PMC Compliance

Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

4K Memory Space Required: One Base Address Register.

Signaling: 5V Compliant, 3.3V Tolerant.

Environmental

Operating temperature: 0 to 70°C (PMC464 / R) or -40 to 85°C (PMC464E / CC)

Storage temperature: -55 to 105°C.

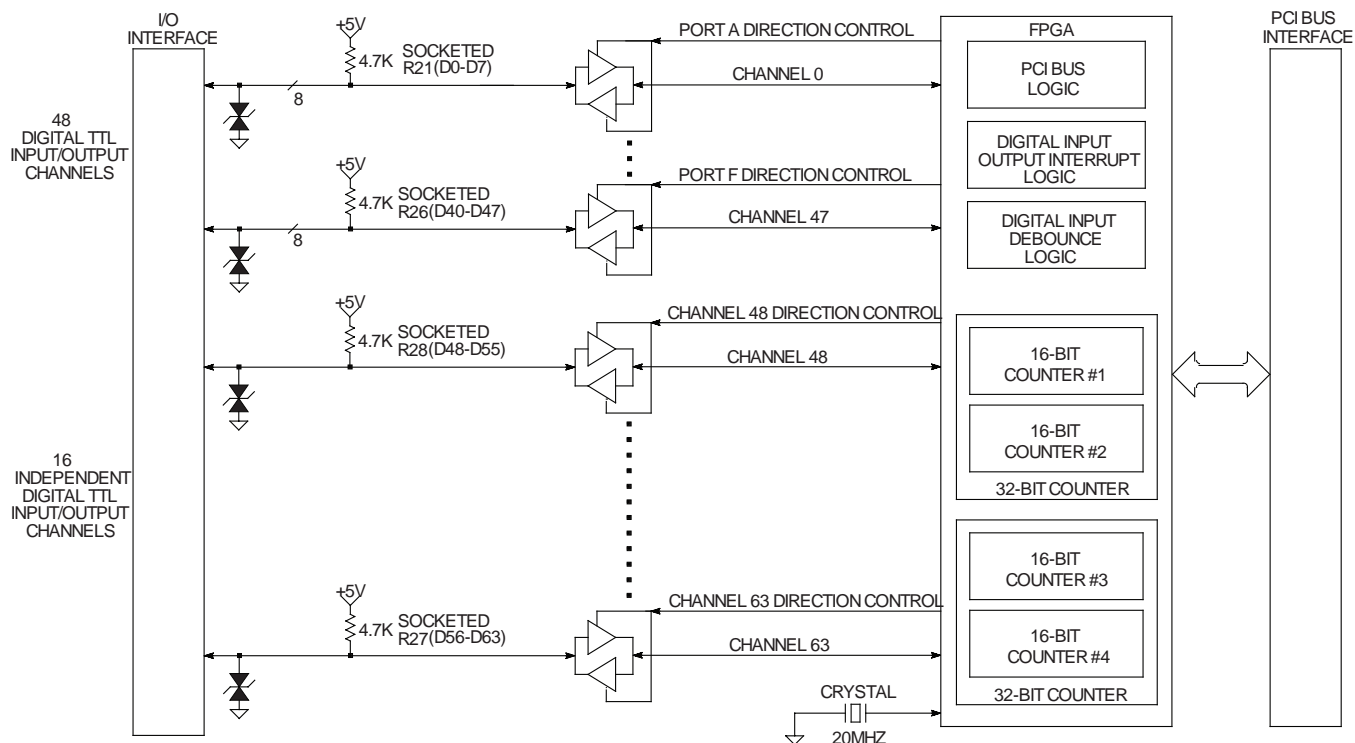Relative humidity: 5 to 95% non-condensing.

MTBF: 1,750,590 hrs. at 25°C, MIL-HDBK-217F, notice 2.

Power: 160mA at +5V, typical.

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Block Diagram

Ordering Information

PMC464: Digital I/O and counter/timer module

PMC464E: Same as PMC464 plus extended temp. range

PMC464R: Digital I/O and counter/timer module with rear I/O connector

PMC464CC: Digital I/O and counter/timer module, extended temperature range and conduction cooled with rear I/O connector

Software (see software documentation for details)
PMCSW-API-VXW: VxWorks® software support package
PCISW-API-WIN: Windows® DLL software support
PCISW-API-LNX: Linux™ support (website download only)

Accessories (see accessories documentation for details)
5025-288: Termination panel, SCSI-3 connector, 68 screw terminals

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

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Acromag
THE LEADER IN INDUSTRIAL I/O ®

PMC48x Counter/Timer with Quadrature

- PMC482: Ten 16-bit counters – TTL

- PMC483: Four 16-bit counters – TTL, and
  Four 32-bit counters – RS422

- PMC484: 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 or periodic rates, measuring quadrature position, and monitoring operations.
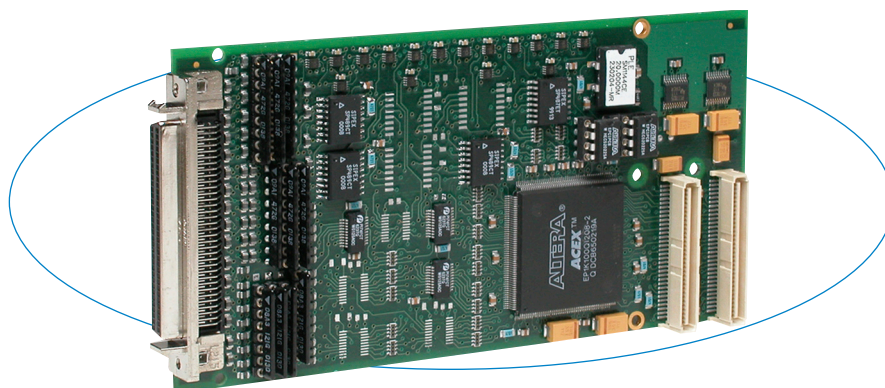
Support for internal or external triggering simplifies the synchronization of operations to specific events. Counter functions can use internally generated clocks or an externally supplied clock.

These modules are very flexible and available in several varieties to accommodate a broad range of counter/timer applications.

Features

- Ten 16-bit counter/timers (PMC482 only) or six 32-bit counter/timers (PMC484 only)

- Two 16-bit counters can be combined to create one 32-bit counter

- Available with both TTL and RS422 driver interface (PMC483 only)

- 16 bi-directional digital I/O

- 20MHz clock time base

- Single counter/timer modes:
  - Event counting
  - Frequency measurement
  - Period/pulse-width measurement
  - Quadrature position measurement
  - Square wave/pulse train generation
  - Time/period interrupter
  - 32-bit counter/timer
  - Pulse width generation

- 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:
  PMC482: Ten 16-bit TTL counters
  PMC483: Four 16-bit TTL counters, four 32-bit RS422 counters
  PMC484: Six 32-bit RS422 counters
  Other I/O mixes can be made available as specials.

Clock frequency: 20MHz.

Field I/O: Front panel SCSI-3 connector.

Speed (with 20MHz internal clock):
  Maximum output pulse/square wave freq.: 200nS.
  Minimum event pulse width: 100nS.
  Minimum pulse width measurement: 100nS.
  Minimum period measurement: 200nS.

Mode accuracy (with external clocking):
  Waveform generation: Period is ±62nS.
  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 wave complete (one-shot mode), successive waveform generation (continuous).

Triggering/gate: 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.

TTL compatibility: $V_{IH} = 2.0V$ and $V_{IL} = 0.8V$. inputs are buffered and include 4.7K pull-ups to +5V.

Counter output: Level is TTL or RS422 differential digital.

PMC Compliance

Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

32-bit PCI Target: Implemented by Altera FPGA.

4K Memory Space Required: One Base Address Register.

Signaling: 5V Compliant, 3.3V Tolerant.

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

Register Access Times: 8 PCI clock cycles, typical.

Environmental

Operating temp.: 0 to 70°C or -40 to 85°C (E versions)

Storage temperature: -55 to 105°C.

Relative humidity: 5 to 95% non-condensing.

Power: Consult factory.

MTBF: Hours at 25°C, MIL-HDBK-217F, notice 2
  PMC482 1,744,259; PMC483 1,727,707; PMC484 1,708,729

Ordering Information

PMC Modules

PMC482: Ten 16-bit TTL counters
PMC482E: Same as PMC482 plus extended temp. range
PMC482R: Same as PMC482 with rear I/O connector
PMC482RE*: Same as PMC482E with rear I/O connector
*Consult factory for long-term availability.

PMC483: Four 16-bit TTL counters, Four 32-bit RS422 counters
PMC483E: Same as PMC483 plus extended temp. range
PMC483R: Same as PMC483 with rear I/O connector
PMC483RE: Same as PMC483E with rear I/O connector
PMC484: Six 32-bit RS422 counters
PMC484E: Same as PMC484 plus extended temp. range
PMC484R: Same as PMC484 with rear I/O connector
PMC484RE: Same as PMC484E with rear I/O connector

Software (see software documentation for details)
PMCSW-API-VXW: VxWorks® software support package
PCISW-API-WIN: Windows® DLL software support **PCISW-API-LNX**: Linux™ support (website download only)

Accessories (see accessories documentation for details)
5025-288: Termination panel, SCSI-3 connector, 68 screw terminals
5028-432: Cable, shielded, SCSI-3 connector both ends

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PMC520
Octal Serial 232
Communication

These modules provide eight asynchronous serial communication ports from a single PMC carrier slot. Software-configuration helps you quickly set baud rates, character-sizes, stop bits, and parity. Signal support for RTS/CTS handshaking is also included.

For more efficient data processing, each serial port is equipped with 64-character FIFO buffers on the transmit and receive lines.

The data ports generate individually controlled transmit, receive, line status, and data set interrupts. A global interrupt source register provides interrupt status indication for all eight channels to speed up interrupt parsing.

Features

■ Eight RS232E ports

■ 64-byte transmit FIFO buffers
  64-byte receive FIFO buffers

■ Programmable baud rate (up to 120Kbps)

■ Individual handshake lines (RTS, CTS) on each channel

■ Line-break and false start-bit detection

■ Industry-standard software-compatible 16C550 configuration registers

Benefits

■ High-density design lowers per-port costs and saves PMC carrier card slots for other functions.

■ 64-byte FIFO buffers minimize CPU interaction for improved system performance.

■ Each serial channel provides handshake support to simplify interfacing with modems.
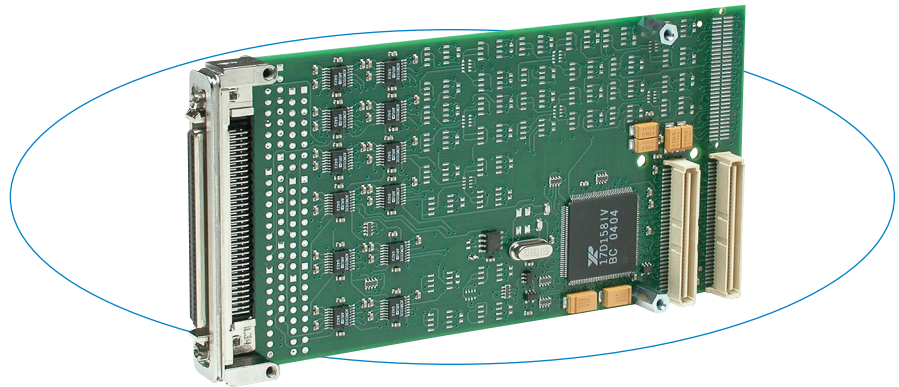
With eight serial ports per module, the PMC520 provides a high-density solution to reduce costs and use fewer card slots.

Specifications

RS232E Serial Ports

Configuration: Independent, non-isolated serial ports with a common single return connection and configured as a DTE device.

Data rate: Programmable up to 120K bits/second using internal baud rate generator.

Max. cable length: 15 meters (50 feet) typical, limited to a cable capacitive load of 2500pF.

Character size: 5 to 8 bits, software-programmable.

Parity: Odd, even, or no parity; software-programmable.

Stop bits: 1, 1-1/2, or 2 bits; software-programmable.

Data register buffers: Double buffered or 64-byte FIFO buffered, mode selectable.

Interrupts: Receiver line status (overrun, parity, framing error, or break interrupt); received data available (FIFO level reached) or character time-out; transmitter (FIFO level reached); or modem status (CTS).

Environmental

Operating temperature: 0 to 70°C (PMC520-64) or -40 to 85°C (PMC520-64E).

Storage temperature: -55 to 125°C.

Relative humidity: 5 to 95% non-condensing.

Power: +5V (±5%), consult factory for current specifications.

MTBF: 2,848,670 hrs at 25°C, MIL-HDBK-217F, notice 2.

PMC Compliance

Conforms to PCI Local Bus Specification, Revision 2.3 and CMC/PMC Specification, P1386.1.

4K Memory Space Required: One Base Address Register.

Signaling: 3.3V and 5V compliant.

Ordering Information

PMC Modules
PMC520
  Eight RS232E serial ports, front I/O connector

PMC520E
  Same as PMC520 plus extended temperature range

PMC520R*
  Same as PMC520 except with rear I/O connector
  *Consult factory for long-term availability.

PMC520RE
  Same as PMC520R plus extended temperature range

Customized PMC Modules
† 5085-x
  Modified PMC520 with user-specified crystal/baud rate.

† Specify x = crystal frequency when ordering.
Minimum quantity per order is two units.

Software (see software documentation for details)
PMCSW-API-VXW
  VxWorks® software support package
PCISW-API-WIN
  Windows® DLL software support
PCISW-API-LNX
  Linux™ support (website download only)

Accessories (see accessories documentation for details)
5025-288
  Termination panel, SCSI-3 connector, 68 screw terminals
5028-432
  Cable, shielded, SCSI-3 connector both ends

PMC521
Octal Serial 422/485
Communication

These modules provide eight asynchronous serial communication ports from a single PMC carrier slot. Software-configuration helps you quickly set baud rates, character-sizes, stop bits, and parity.

For more efficient data processing, each serial port is equipped with 64-character FIFO buffers on the transmit and receive lines.

The data ports generate individually controlled transmit, receive, line status, data set, and flow control interrupts. A global interrupt source register provides interrupt status indication for all eight channels to speed up interrupt parsing.

Features

- Eight asynchronous, full duplex RS422B serial ports (supports RS485)

- 64-byte transmit FIFO buffers
  64-byte receive FIFO buffers

- Programmable baud rate (up to 1.8432Mbps)

- Line-break and false start-bit detection

- Failsafe receivers

- Socketed termination and bias resistors

- Industry-standard software-compatible 16C550 configuration registers

Benefits

- High-density design lowers per-port costs and saves PMC carrier card slots for other functions.

- 64-byte FIFO buffers minimize CPU interaction for improved system performance.

- Extended temperature ranges deliver dependable operation in extreme conditions.
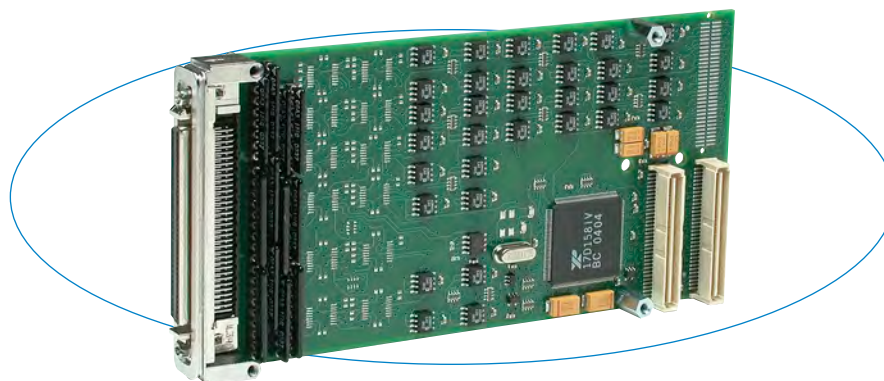
With eight serial ports per module, the PMC521 provides a high-density solution to reduce costs and use fewer card slots.

Specifications

RS422B Serial Ports

Configuration: Independent, non-isolated serial ports with a common single return connection.

Data rate: 20MB /second, maximum.
Standard crystal limits data rate to 1.8432Mbps.

Max. cable length: 1200 meters (4000 feet), typical.

Character size: 5 to 8 bits, software-programmable.

Parity: Odd, even, or no parity; software-programmable.

Stop bits: 1, 1-1/2, or 2 bits; software-programmable.

Data register buffers: Double buffered or 64-byte FIFO buffered, mode selectable.

Interrupts: Receiver line status (overrun, parity, framing error, or break interrupt); receive/transmit FIFO level reached or character time-out; Xon/Xoff or special character detected.

Environmental

Operating temperature: 0 to 70°C (PMC521-64) or
-40 to 85°C (PMC521-64E).

Storage temperature: -55 to 125°C.

Relative humidity: 5 to 95% non-condensing.

Power: +5V (±5%), consult factory for current specifications.

MTBF: 2,321,047 hrs at 25°C, MIL-HDBK-217F, notice 2.

PMC Compliance

Conforms to PCI Local Bus Specification, Revision 2.3 and CMC/PMC Specification, P1386.1.

4K Memory Space Required: One Base Address Register.

Signaling: 3.3V and 5V compliant.

Ordering Information

PMC Modules
PMC521
Eight RS422B serial ports, front I/O connector
PMC521E
Same as PMC521 plus extended temperature range.
PMC521R
Same as PMC521 except with rear I/O connector
PMC521RE
Same as PMC521R plus extended temperature range

Customized PMC Modules
† 5086-x
Modified PMC521 with user-specified crystal/baud rate.
† Specify x = crystal frequency when ordering.
Minimum quantity per order is two units.

Software (see software documentation for details)
PMCSW-API-VXW
VxWorks® software support package
PCISW-API-WIN
Windows® DLL software support
PCISW-API-LNX
Linux™ support (website download only)

Accessories (see accessories software for details)
5025-288
Termination panel, SCSI-3 connector,
68 screw terminals
5028-432
Cable, shielded, SCSI-3 connector both ends

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PMC Modules

PMC730
Multi-function I/O

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

PMC730 mezzanine modules provide a variety of I/O functions on a single plug-in card. These new high-density modules perform both high-speed and high-resolution A/D and D/A conversion and also handle digital I/O and counter/timer functions.

Now you can conserve your precious PMC slots and still get all the I/O functionality you need. The PMC730 is designed for extreme versatility with many deluxe features to meet most applications. However, the PMC730 is still very budget-friendly. A conduction-cooled version is also available.

The PMC730 combines analog I/O, digital I/O, and counter/timer functions on a single high-density module to save PMC slots.

PMC730CC for conduction cooling.

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

- 10µS conversion time (100KHz)

- Interrupt upon ADC memory threshold condition (user-programmable data sample threshold)
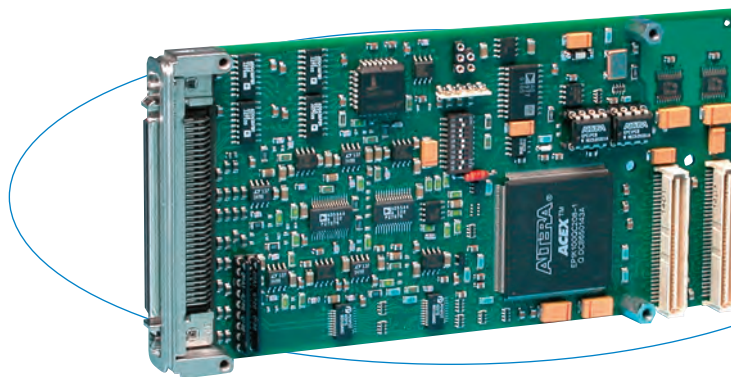
- User-programmable interval timer

Analog Outputs
- Eight analog output channels ($\pm$10V range)

- Individual 16-bit DACs per channel

- 1024 sample FIFO for waveform generation

- 12.375µS settling time (80.8KHz throughput)

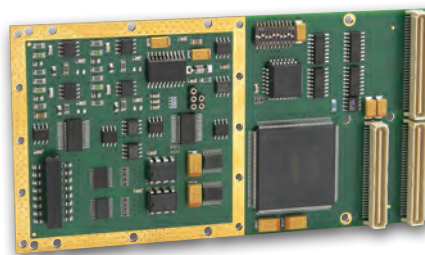- Interrupt on user-programmable FIFO threshold

Digital I/O
- 16 TTL bidirectional input/outputs

Counter/Timer
- One 32-bit counter/timer

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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): 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: $\pm$3 LSB typ. (SW calib., gain=1, 25℃).

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: $\pm$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℃ with output unloaded.

Data format: Straight binary.

Output at reset: 0V.

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

Short circuit protection: Indefinite at 25℃.

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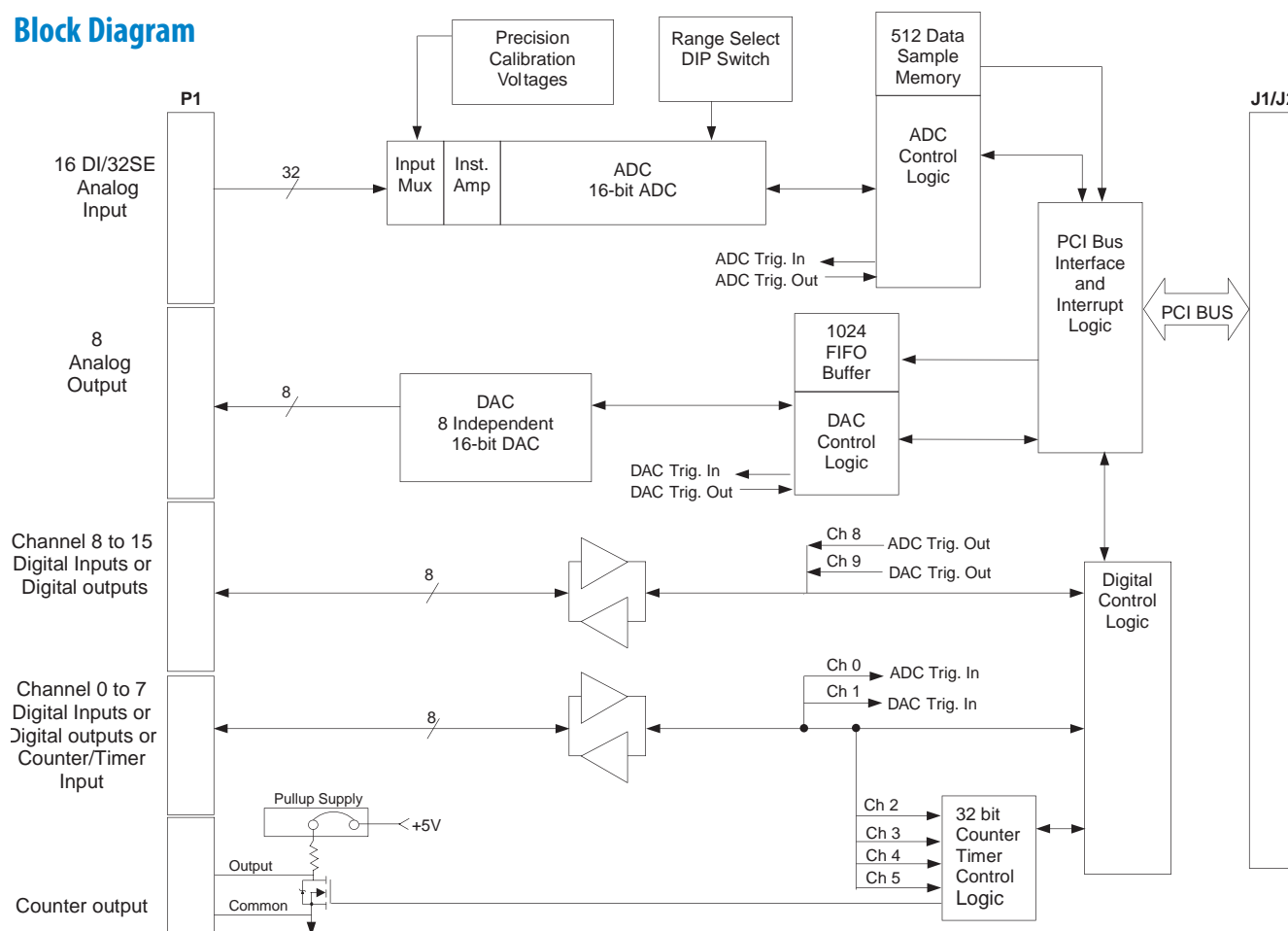
Functions:
   Watchdog timer, event counting, pulse measurement, period measurement, output waveform generation (pulse width modulation, continuous pulse, single pulse, continuous waveform).

PMC Modules

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Block Diagram

Precision Calibration Voltages

Range Select DIP Switch

512 Data Sample Memory

ADC Control Logic

P1

J1/J2

16 DI/32SE Analog Input

32

Input Mux | Inst. Amp | ADC 16-bit ADC

PCI Bus Interface and Interrupt Logic

PCI BUS

ADC Trig. In
ADC Trig. Out

8 Analog Output

8

DAC 8 Independent 16-bit DAC

1024 FIFO Buffer

DAC Control Logic

DAC Trig. In
DAC Trig. Out

Channel 8 to 15 Digital Inputs or Digital outputs

8

Ch 8   ADC Trig. Out
Ch 9   DAC Trig. Out

Digital Control Logic

Channel 0 to 7 Digital Inputs or Digital outputs or Counter/Timer Input

8

Ch 0   ADC Trig. In
Ch 1   DAC Trig. In

Pullup Supply

+5V

Output

Common

Counter output

Ch 2
Ch 3
Ch 4
Ch 5

32 bit Counter Timer Control Logic

Specifications (continued)

Counter/Timers
Continued from the previous page.

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.

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

4K Memory Space Required: One Base Address Register.

Signaling: 5V Compliant, 3.3V Tolerant.

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

Environmental
Operating temperature: 0 to 70°C (PMC730 / R) or
-40 to 85°C (PMC730E / CC)

Storage temperature: -55 to 100°C.

Relative humidity: 5 to 95% non-condensing.

Power: 120mA at +5V. 95mA at +12V. 70mA at -12V.

MTBF: 929,541 hrs. at 25°C, MIL-HDBK-217F, notice 2.

Ordering Information

PMC Modules
PMC730
Multi-function I/O module with front I/O connector

PMC730E
Same as PMC730 plus extended temperature range

PMC730R
Multi-function I/O module with rear I/O connector

PMC730CC
Multi-function I/O module, plus extended temperature range and onduction-cooled with rear I/O connector

Software (see software documentation for details)
PMCSW-API-VXW
VxWorks® software support package

PCISW-API-WIN
Windows® DLL Driver software package

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

Accessories (see accessories documentation for details)
5025-288
Termination panel, SCSI-3 connector, 68 screw terminals.

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

Acromag ®
THE LEADER IN INDUSTRIAL I/O

PMC-LX40/LX60
User-configurable
Virtex-4 FPGA Modules
with plug-in I/O

■ PMC-LX40: 41,472 logic cells (XC4VLX40)

■ PMC-LX60: 59,904 logic cells (XC4VLX60)

Download your own logic programs into the user-configured FPGA to quickly create a custom I/O module. Shown with optional plug-in I/O module.

Description

Acromag's PMC-LX boards use a high-performance Xilinx® Virtex-4™ FPGA, but maintain a relatively low price point. They are optimized for high-performance logic, featuring a high logic-to-feature ratio and a high I/O-to-feature ratio Two modules let you select an FPGA to match your logic requirements.

Although there is no limit to the uses for Acromag's FPGA boards, several applications are ideal for this new technology. Typical uses include hardware simulation, communication processing, in-circuit diagnostics, military servers, and telecommunication.

I/O processing is handled on a separate mezzanine card that plugs into the FPGA base board. A variety of these external I/O cards offer an interface for your analog and digital I/O signals. See the AXM I/O Card for more details. Additionally, 64 I/O lines are supported via the rear (J4) connector.

Plenty of DRAM memory is available for receipt and transfer of high-speed data from the I/O data ports on the front and rear of the board. Dual Ported SRAM memory is supplied for storage of data to be passed, via DMA transfer, to the PCI bus. One of the dual ports is attached to the FPGA and the other to the local bus.

The PCI bus interface is handled by a PLX® PCI 9656 device which provides 64-bit 66MHz bus mastering with dual-channel DMA support.

Take advantage of the optional conduction cooling for use in hostile environments. Conduction cooling provides efficient heat dissipation in environments where there is inadequate cooling air flow.

Acromag provides software utilities and examples to simplify your programming and get you started quickly. A JTAG interface enables on-board VHDL simulation.
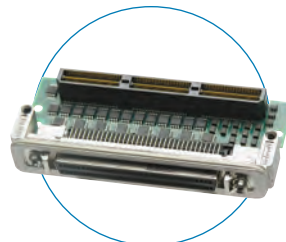
Features

■ Customizable FPGA (Xilinx Virtex-4 XC4VLX40/60) with up to 60K logic cells and 64 XtremeDSP™ slices

■ Supports both front and rear I/O

■ Plug-in I/O modules are available for front mezzanine

■ 64 I/O lines supported with direct connection to FPGA via rear (J4) connector

■ FPGA code loads from PCI bus or flash memory

■ 256K x 36-bit dual-ported SRAM

■ 32Mb x 32-bit DDR DRAM

■ Supports dual DMA channel data transfer to CPU

■ Supports both 5V and 3.3V signalling

■ Conduction cooled or 0 to 70°C operating range

The base board is ready for conduction-cooled applications.

Plug-in AXM modules sold separately for analog and digital I/O.

Specifications

FPGA
FPGA: Xilinx Virtex-4 FPGA
    PMC-LX40: XC4VLX40 FPGA with 41,472 logic cells and 64 DSP slices
    PMC-LX60: XC4VLX60 FPGA with 59,904 logic cells and 64 DSP slices

FPGA configuration: Downloadable via PCI bus or from flash memory.

Example FPGA program: VHDL provided implements interface to PCI bus IC, interface to dual port SRAM, PLL control, ADC, and DAC control. Program requires user proficiency with Xilinx software tools. See Engineering Design Kit.

I/O Processing
AXM modules: for front mezzanine:
    Acromag AXM modules attach to the board to provide I/O. A variety of modules are available and are sold separately.
Rear I/O:
    32 LVDS I/O lines supported with a direct connection between the FPGA and the rear I/O connector (J4).

Engineering Design Kit
Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a PMC-LX module. (see Design Kit for details)

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

PCI bus clock frequency: 66MHz.

64-bit PCI Master: Implemented by PLX PCI 9656 device.

Signaling: 5V and 3.3V compliant.

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

Environmental
Operating temperature: 0 to 70°C

Storage temperature: -55 to 105°C.
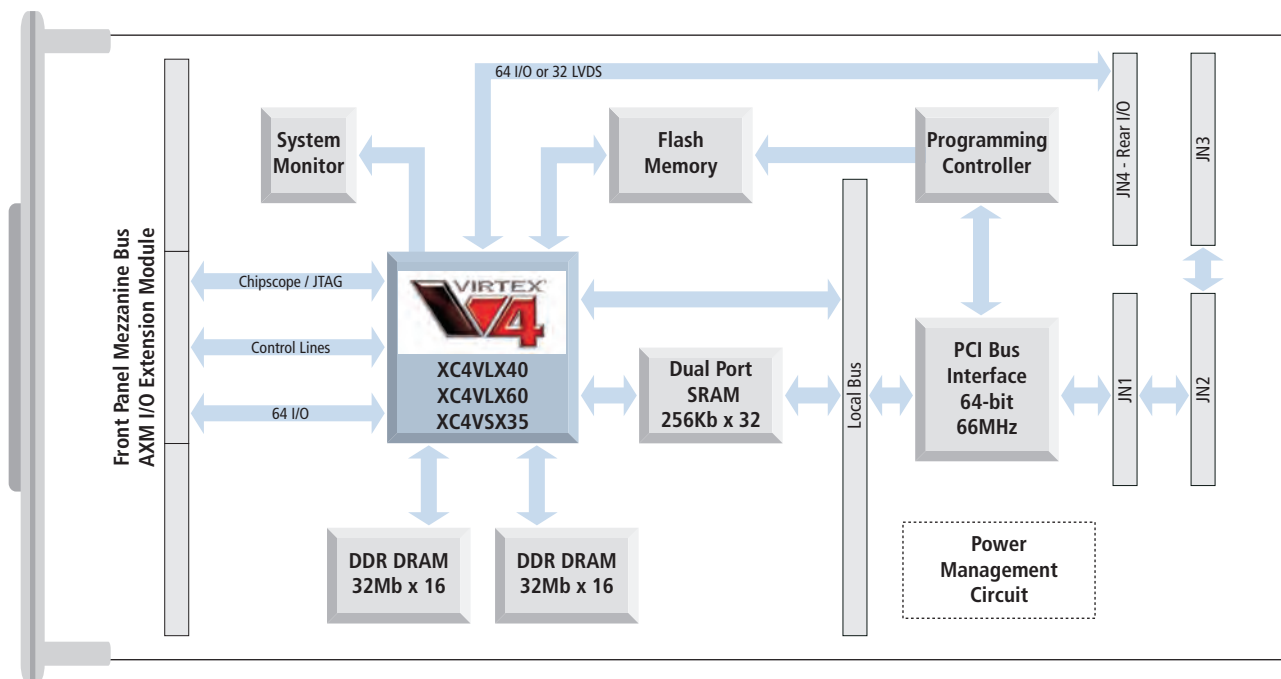
Relative humidity: 5 to 95% non-condensing.

Power: Consult factory. Operates from 3.3V supply.

MTBF: Hours at 25°CMIL-HDBK-217F, Notice 2
    PMC-LX40 773,246; PMC-LX60 870,489

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Acromag, Inc. • **Wixom, MI 48393** • **Phone: 248-295-0310** • **Fax: 248-624-9234** • **solutions@acromag.com** • **www.acromag.com**

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PMC Modules

Ordering Information

PMC Modules

PMC-LX40
User-configurable Virtex-4 FPGA with 41,472 logic cells

PMC-LX60
User-configurable Virtex-4 FPGA with 59,904 logic cells

PMC-LX-EDK
Engineering Design Kit (one kit required)

AXM Plug-In I/O Modules

For more information, see AXM data sheet.

AXM-A30
2 16-bit 100MHz A/D channels

AXM-D02
30 RS485 differential I/O channels

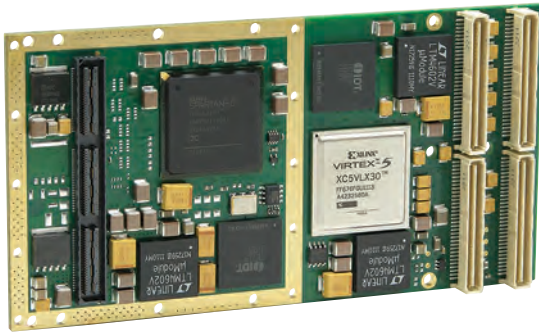**AXM-D03**
16 CMOS and 22 RS485 differential I/O channels

AXM-D04
30 LVDS I/O channels

AXM-??
Custom I/O configurations available, call factory.

Software (see software documentation for details)

PMCSW-API-VXW
VxWorks® software support package

PCISW-API-WIN
Windows® DLL software support

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

PMC Modules

Block diagram labels:
Front Panel Mezzanine Bus AXM I/O Module | 97 I/O | 64 I/O or 32 LVDS | SPARTAN 6 XC6SLX150 | Dual-Port SRAM 256K/1M x 32 | Dual Port SRAM 256K/1M x 32 | Flash Memory 16MB | VIRTEX 5 XC5VLX30 | 1.0V Power Supply | 1.8V Power Supply | 2.5V Power Supply | PCI/PCI-X Bus | Rear 64 I/O Points | PCI/PCI-X Bus | PCI/PCI-X Bus

SPARTAN 6

PMC module with PCI-X interface ◆ Logic-optimized Spartan-6 FPGA ◆ I/O extension mezzanine modules

Description

Acromag's cost-effective PMC-SLX modules feature a user-configurable Xilinx® Spartan®-6 FPGA enhanced with high-speed memory and a high-throughput PCI-X interface. Field I/O interfaces to the FPGA via the rear J4/P4 connector and/or with optional front mezzanine plug-in I/O modules. The result is a powerful and flexible I/O processor module that is capable of executing custom instruction sets and algorithms.

The logic-optimized FPGA is well-suited for a broad range of applications. Typical uses include hardware simulation, communications, in-circuit diagnostics, military servers, signal intelligence, and image processing.

Large, high-speed memory banks enable efficient data handling. The dual-port SRAM facilitates high-speed DMA transfers to the bus or CPU. A high-bandwidth PCI-X interface ensures fast data throughput.

64 I/O lines are accessible through the rear (J4) connector. Additional I/O processing is supported on a separate mezzanine card that plugs into the FPGA base board. A variety of these external AXM I/O cards are available to interface your analog and digital I/O signals.

Take advantage of the conduction-cooled design for use in hostile environments. Conduction efficiently dissipates heat if there is inadequate cooling air flow. Optional extended temperature models operate reliably from -40 to 85°C.

Acromag's Engineering Design Kit provides software utilities and example VHDL code to simplify your program development and get you running quickly. A JTAG interface enables on-board VHDL debugging.

Plug in an AXM analog or digital I/O module for additional I/O signal processing capabilities.

Key Features & Benefits

■ Reconfigurable Xilinx Spartan-6 FPGA with 147,433 logic cells

■ PCI-X bus 100MHz 64-bit interface

■ 256k x 64-bit dual-ported SRAM provides direct links from the PCI bus and to the FPGA (optional 1M x 64-bit)

■ Supports both front and rear I/O connections

■ 64 I/O or 32 LVDS lines direct to FPGA via rear (J4) connector

■ Plug-in I/O extension modules are available for the front mezzanine

■ FPGA code loads from the PCI-X bus or from flash memory

■ Other memory options available (call factory)

■ Supports dual DMA channel data transfer to the CPU/bus

■ Support for Xilinx ChipScope™ Pro interface

■ Designed for conduction-cooled host card or -40 to 85°C operation in air-cooled systems

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PMC Modules

PMC-SLX   User-Configurable Spartan-6 FPGA Modules with Plug-In I/O

Performance Specifications

■ FPGA

FPGA Device
Xilinx Spartan-6 FPGA.

Model XC6SLX150-3FG676 FPGA with 147,433 logic cells and 180 DSP48A1 slices.

FPGA configuration
Download via PCI-X bus or flash memory.

Example FPGA program
VHDL provided for bus interface, front & rear I/O control, SRAM read/write interface logic, and SDRAM memory interface controller. See EDK kit.

■ I/O Processing

Acromag AXM I/O modules:
AXM modules plug into the PMC module's front mezzanine for additional I/O lines. Analog and digital I/O AXM modules are sold separately.

Rear I/O
64 I/O (32 LVDS) lines supported with a direct connection between the FPGA and the rear I/O connector (J4).

■ Engineering Design Kit

Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a PMC-SLX module (see www.acromag.com for more information).

■ PMC Compliance

Conforms to PCI Local Bus Specification, Revision 3.0 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

PCI Bus Modes: Supports PCI-X at 100MHz, 66MHz and Standard PCI at 66MHz and 33MHz

PCI-X Master/Target: 32-bit or 64-bit interface

Signaling: 3.3V compliant.

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

■ Environmental

Operating temperature
-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
3.3V (±5%): 700mA typical, 840mA maximum.
5V (±5%): 1600mA typical, 2160mA maximum.

MTBF
Contact the factory.

Ordering Information

NOTE: PMC-SLX-EDK is required to configure FPGA.

■ PMC Modules

PMC-SLX150
User-configurable Spartan-6 FPGA, 150k logic cells, 256 x 64-bit dual-port SRAM

PMC-SLX150E
Same as PMC-SLX150 with extended temp. range

PMC-SLX150-1M
User-configurable Spartan-6 FPGA, 150k logic cells, 1M x 64-bit dual-port SRAM

PMC-SLX150E-1M
Same as PMC-SLX150-1M with extended temp. range

■ AXM Plug-In I/O Extension Modules

For more information, see www.acromag.com.

AXM-A30
2 analog input 100MHz 16-bit A/D channels

AXM-D02
30 RS485 differential I/O channels

AXM-D03
16 CMOS and 22 RS485 differential I/O channels

AXM-D04
30 LVDS I/O channels

AXM-??
Custom I/O configurations available, call factory.

■ Software

For more information, see www.acromag.com.

PMC-SLX-EDK
Engineering Design Kit (one kit required)

PMCSW-API-VXW
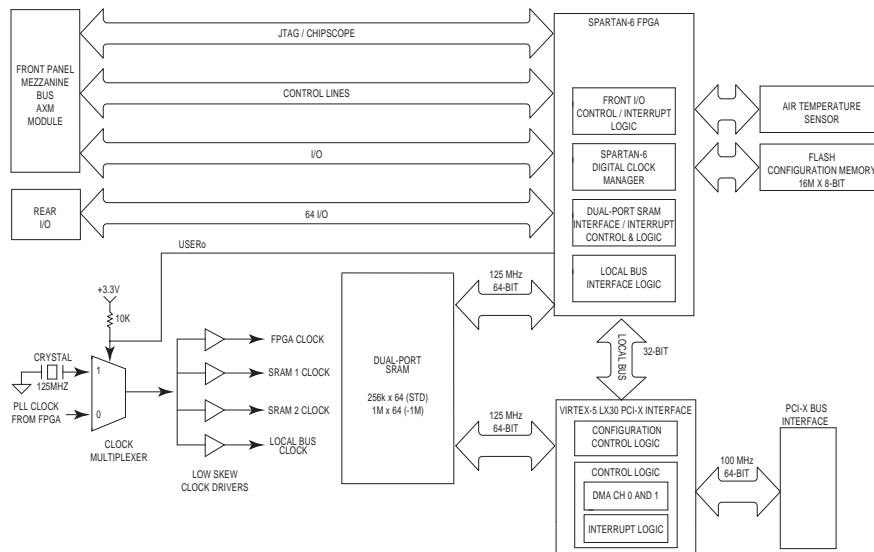VxWorks® software support package

PCISW-API-WIN32
32-bit Windows® driver (DLL) software package

PCISW-API-WIN64
64-bit Windows® driver (DLL) software package

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

ISO9001
AS9100
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PMC-SX35
User-configurable
Virtex-4 FPGA Modules
with plug-in I/O

Description

Acromag's PMC-SX boards use a high-performance Xilinx® Virtex-4™ FPGA, but maintain a relatively low price point. They are optimized for high-performance digital signal processing to help you build custom pre/post/co-processing hardware or high-performance filters. You can create more than 40 different functions (MACs, multipliers, adders, and muxes).

Although there is no limit to the uses for Acromag's FPGA boards, typical applications include sonar and radar processing.

I/O processing is handled on a separate mezzanine card that plugs into the FPGA base board. A variety of these external I/O cards offer an interface for your analog and digital I/O signals. See the AXM I/O Card for more details. Additionally, 64 I/O lines are supported via the rear (J4) connector.

Plenty of DRAM memory is available for receipt and transfer of high-speed data from the I/O data ports on the front and rear of the board. Dual Ported SRAM memory is supplied for storage of data to be passed, via DMA transfer, to the PCI bus. One of the dual ports is attached to the FPGA and the other to the local bus.

The PCI bus interface is handled by a PLX® PCI 9656 device which provides 64-bit 66MHz bus mastering with dual-channel DMA support.

Take advantage of the optional conduction cooling for use in hostile environments. Conduction cooling provides efficient heat dissipation in environments where there is inadequate cooling air flow.

Acromag provides software utilities and examples to simplify your programming and get you started quickly. A JTAG interface enables on-board VHDL simulation.
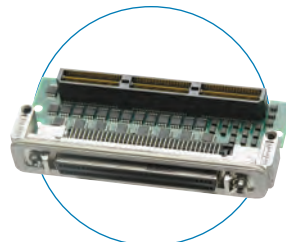
Download your own logic programs into the user-configured FPGA to quickly create a custom I/O module. Shown with optional plug-in I/O module.

Features

■ Customizable FPGA (Xilinx Virtex-4 XC4VSX35) with up to 34K logic cells and 192 XtremeDSP™ slices

■ Supports both front and rear I/O

■ Plug-in I/O modules are available for front mezzanine

■ 64 I/O lines supported with direct connection to FPGA via rear (J4) connector

■ FPGA code loads from PCI bus or flash memory

■ 256K x 36-bit dual-ported SRAM

■ 32Mb x 32-bit DDR DRAM

■ Supports dual DMA channel data transfer to CPU

■ Supports both 5V and 3.3V signalling

■ Conduction cooled or 0 to 70°C operating range

The base board is ready for conduction-cooled applications.

Plug-in AXM modules sold separately for analog and digital I/O.

Specifications

FPGA
FPGA: Xilinx Virtex-4 FPGA XC4VSX35 with 34,560 logic cells and 192 DSP slices.

FPGA configuration: Downloadable via PCI bus or from flash memory.

Example FPGA program: VHDL provided implements interface to PCI bus IC, interface to dual port SRAM, PLL control, ADC, and DAC control. Program requires user proficiency with Xilinx software tools. See Engineering Design Kit.

I/O Processing
AXM modules: for front mezzanine:
  Acromag AXM modules attach to the board to provide I/O. A variety of modules are available and are sold separately.
Rear I/O:
  32 LVDS I/O lines supported with a direct connection between the FPGA and the rear I/O connector (J4).

Engineering Design Kit
Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a PMC-SX module. (see Design Kit for details)

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 2.2 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

PCI bus clock frequency: 66MHz.

32-bit PCI Master: Implemented by PLX PCI 9056 device.

Signaling: 5V and 3.3V compliant.

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

Environmental
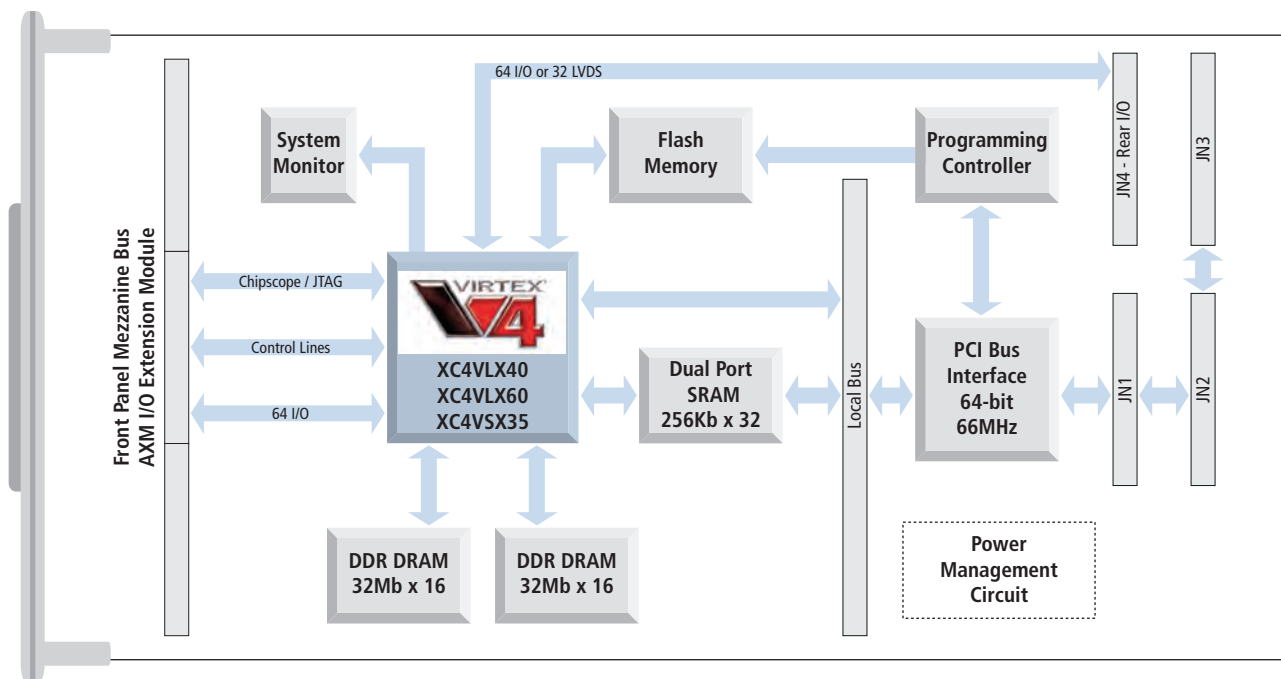Operating temperature: 0 to 70°C
Storage temperature: -55 to 105°C.
Relative humidity: 5 to 95% non-condensing.
Power: Consult factory. Operates from 3.3V supply.
MTBF: 869,686 hrs. at 25°C, MIL-HDBK-217F, Notice 2.

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Ordering Information

PMC Modules

PMC-SX35
User-configurable Virtex-4 FPGA with 34,560 logic cells

PMC-SX-EDK
Engineering Design Kit (one kit required)

AXM Plug-In I/O Modules
For more information, see AXM data sheet.

AXM-A30
2 16-bit 100MHz A/D channels

AXM-D02
30 RS485 differential I/O channels

AXM-D03
16 CMOS and 22 RS485 differential I/O channels

AXM-D04
30 LVDS I/O channels

AXM-??
Custom I/O configurations available, call factory.

Software (see software documentation for details)

PMCSW-API-VXW
VxWorks® software support package

PCISW-API-WIN
Windows® DLL software support

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

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PMC-VFX70 User-Configurable Virtex-5 FPGA Modules with Plug-In I/O

- XC5VFX70T FPGA: 71,680 logic cells and embedded PowerPC 440 processor 32-bit RISC core

Download your own programs into the reconfigurable FPGA to quickly create custom I/O module. Optional I/O modules plug into the front mezzanine.

Description

Acromag's PMC-VFX boards feature a reconfigurable Xilinx® Virtex®-5 FPGA enhanced with multiple high-speed memory buffers and a high-throughput PCI-X interface. Field I/O interfaces to the FPGA via the rear J4/P4 connector and/or with optional front mezzanine plug-in I/O modules. The result is a powerful and flexible I/O processor module that is capable of executing your custom instruction sets and algorithms.

The on-board FPGA has a hard core PowerPC 440 block to handle the most complex and memory-intensive computing applications. Offload your CPU-intensive operations such as video and 3D data processing or fixed-point math for superior system performance. The PowerPC core also enables system-on-chip functionality with real-time processing capabilities.

64 I/O lines are provided via the rear (J4) connector. Additional I/O processing is supported on a separate mezzanine card that plugs into the FPGA base board. A variety of these external I/O cards offer an interface for your analog and digital I/O signals. See the AXM I/O Card data sheet (Bulletin 8400-458) for more details.

Large, high-speed memory banks provide efficient data handling. Generous DDR2 SDRAM buffers store captured data prior to FPGA processing. Afterward, data is moved to dual-port SRAM for high-speed DMA transfer to the system. Our high-bandwidth PCI-X interface ensures fast data throughput.

Take advantage of the module's support of conduction cooling for efficient dissipation of heat in environments with inadequate cooling air flow. Optional extended temperature models operate from -40 to 85°C.

Acromag's Engineering Design Kit provides software utilities and example VHDL code to simplify your program development and get you running quickly. A JTAG interface enables on-board VHDL simulation.

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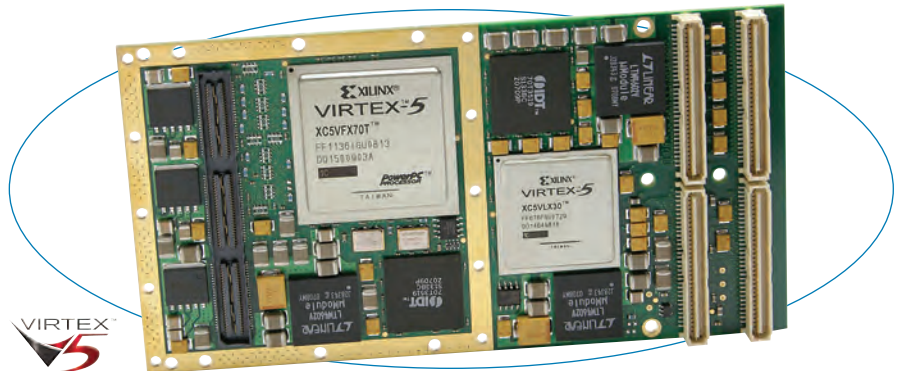
Features

- Reconfigurable Xilinx Virtex-5 FPGA
- PCI-X bus 100MHz 64-bit interface
- Supports both front and rear I/O connections
- 64 I/O or 32 LVDS lines direct to FPGA via rear (J4)
- Plug-in I/O modules available for front mezzanine
- FPGA code loads from PCI bus or 32MB flash memory
- Two banks of 256K x 32-bit dual-ported SRAM
- Two banks of 64M x 16-bit DDR2 SDRAM
- Other memory options available (contact factory)
- Supports dual DMA channel data transfer to CPU/bus
- Supports 3.3V signalling
- Support for Xilinx ChipScope™ Pro interface
- Conduction-cooled or -40 to 85°C operating range
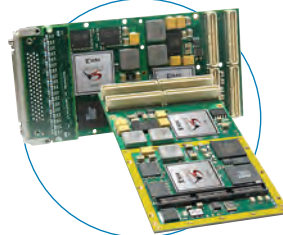
Plug-in AXM I/O or use base board for conduction-cooled applications.

Plug-in modules sold separately for analog and digital I/O functions.

Specifications

FPGA

FPGA: Xilinx Virtex-5 FPGA XC5VFX70T FPGA with 71,680 logic cells and PowerPC processor block

FPGA configuration: Download via PCI bus or flash memory.

Example FPGA program: VHDL provided for local bus interface, control of front & rear I/O, SRAM read/write interface logic, and SDRAM memory interface controller. See EDK kit.

I/O Processing

Acromag AXM I/O modules: for front mezzanine:
AXM modules attach to the board for additional I/O lines. Analog and digital I/O AXM modules are sold separately.

Rear I/O:
64 I/O (32 LVDS) lines supported with a direct connection between the FPGA and the rear I/O connector (J4).
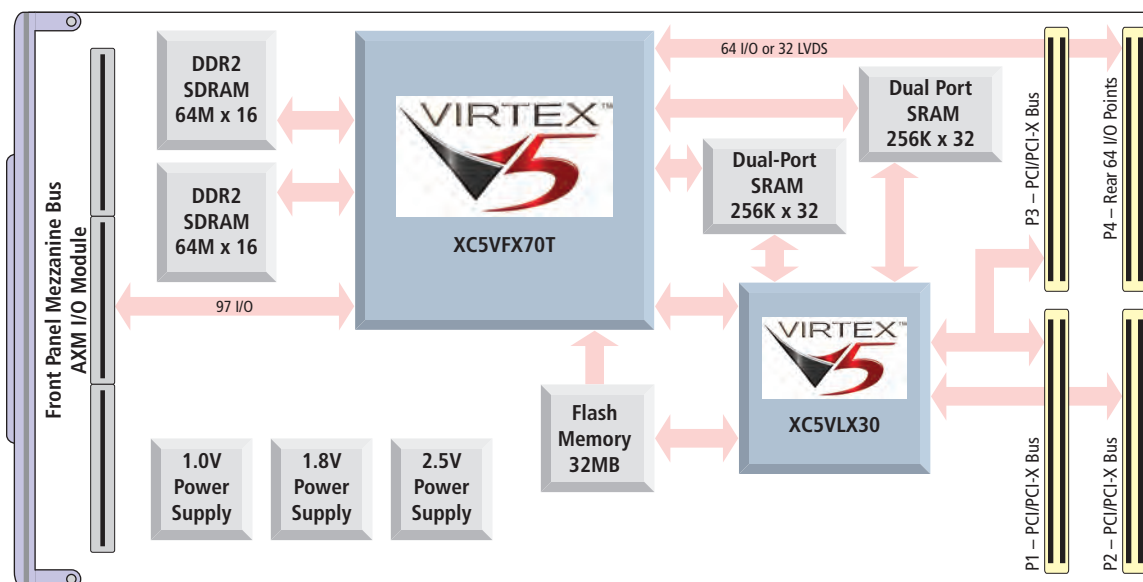
Engineering Design Kit

Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a PMC-VFX module.

PMC Compliance

Conforms to PCI Local Bus Specification, Revision 3.0 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

PCI Bus Modes: Supports PCI-X at 100MHz, 66MHz and Standard PCI at 66MHz and 33MHz

PCI-X Master/Target: 32-bit or 64-bit interface

Signaling: 3.3V compliant.

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

Environmental

Operating temperature: 0 to 70°C or -40 to 85°C (E versions)

Storage temperature: -55 to 105°C.

Relative humidity: 5 to 95% non-condensing.

Power: Consult factory. Operates from 3.3V supply.

MTBF: Consult factory.

PMC Modules

Front Panel Mezzanine Bus
AXM I/O Module

DDR2 SDRAM 64M x 16

DDR2 SDRAM 64M x 16

97 I/O

XC5VFX70T

64 I/O or 32 LVDS

Dual Port SRAM 256K x 32

Dual-Port SRAM 256K x 32

Flash Memory 32MB

XC5VLX30

1.0V Power Supply

1.8V Power Supply

2.5V Power Supply

P3 – PCI/PCI-X Bus

P4 – Rear 64 I/O Points

P1 – PCI/PCI-X Bus

P2 – PCI/PCI-X Bus

Ordering Information

PMC Modules

PMC-VFX70
User-configurable Virtex-5 FPGA with 71,680 logic cells and PowerPC processor block

PMC-VFX70E
Same as PMC-VFX70 with extended temperature range

PMC-VFX-EDK
Engineering Design Kit (one kit required)

AXM Plug-In I/O Extension Modules
For more information, see AXM data sheet .

AXM-A30
2 analog input 105MHz 16-bit A/D channels

AXM-D02
30 RS485 differential I/O channels

AXM-D03
16 CMOS and 22 RS485 differential I/O channels

AXM-D04
30 LVDS I/O channels

AXM-??
Custom I/O configurations available, call factory.

Software (see software documentation for details)
PMCSW-API-VXW
VxWorks® software support package

PCISW-API-WIN
Windows® DLL software support

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

PMC Modules

Acromag ®
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PMC-VLX85/110/155 User-Configurable Virtex-5 FPGA Modules with Plug-In I/O

- PMC-VLX85: 82,944 logic cells (XC5VLX85T)
- PMC-VLX110: 110,592 logic cells (XC5VLX110T)
- PMC-VLX155: 155,648 logic cells (XC5VLX155T)

Download your own programs into the reconfigurable FPGA to quickly create custom I/O module. Optional I/O modules plug into the front mezzanine.

Description

Acromag's PMC-VLX boards feature a reconfigurable Xilinx® Virtex™-5 FPGA enhanced with multiple high-speed memory buffers and a high-throughput PCI-X interface. Field I/O interfaces to the FPGA via the rear J4/P4 connector and/or with optional front mezzanine plug-in I/O modules. The result is a powerful and flexible I/O processor module that is capable of executing your custom instruction sets and algorithms.

Three models provide a choice of logic-optimized FPGAs to match your performance requirements. Although there is no limit to the uses for these boards, several applications are ideal. Typical uses include hardware simulation, communications, military servers, in-circuit diagnostics, signal intelligence, and image processing.

64 I/O lines are provided via the rear (J4) connector. Additional I/O processing is supported on a separate mezzanine card that plugs into the FPGA base board. A variety of these external I/O cards offer an interface for your analog and digital I/O signals. See the AXM I/O Card data sheet for more details.

Large, high-speed memory banks provide efficient data handling. Generous DDR2 SDRAM buffers store captured data prior to FPGA processing. Afterward, data is moved to dual-port SRAM for high-speed DMA transfer to the bus or CPU. Our high-bandwidth PCI-X interface ensures fast data throughput.

Take advantage of conduction cooling for use in hostile environments. Conduction efficiently dissipates heat in environments with inadequate cooling air flow. Optional extended temperature models operate from -40 to 85°C.

Acromag's Engineering Design Kit provides software utilities and example VHDL code to simplify your program development and get you running quickly. A JTAG interface enables on-board VHDL simulation.
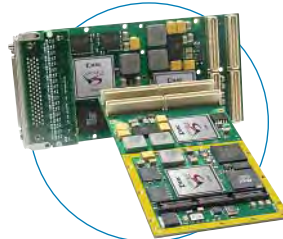
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Features
- Reconfigurable Xilinx Virtex-5 FPGA
- PCI-X bus 100MHz 64-bit interface
- Supports both front and rear I/O connections
- 64 I/O or 32 LVDS lines direct to FPGA via rear (J4)
- Plug-in I/O modules are available for front mezzanine
- FPGA code loads from PCI bus or flash memory
- Two banks of 256Kb x 32-bit dual-ported SRAM
- Two banks of 32Mb x 16-bit DDR2 SDRAM
- Other memory options available (contact factory)
- Supports dual DMA channel data transfer to CPU/bus
- Supports 3.3V signalling
- Support for Xilinx ChipScope™ Pro interface
- Conduction-cooled or -40 to 85°C operating range

Plug-in AXM I/O or use base board for conduction-cooled applications.

Plug-in modules sold separately for analog and digital I/O functions.

Specifications

FPGA
FPGA: Xilinx Virtex-5 FPGA
  PMC-VLX85: XC5VLX85T FPGA with 82,944 logic cells and 48 DSP48E slices
  PMC-LX110: XC5VLX110T FPGA with 110,592 logic cells and 64 DSP48E slices
  PMC-LX155: XC5VLX155T FPGA with 155,648 logic cells and 128 DSP48E slices

FPGA configuration: Download via PCI bus or flash memory.

Example FPGA program: VHDL provided for local bus interface, control of front & rear I/O, SRAM read/write interface logic, and SDRAM memory interface controller. See EDK kit.

I/O Processing
Acromag AXM I/O modules: for front mezzanine:
  AXM modules attach to the board for additional I/O lines. Analog and digital I/O AXM modules are sold separately.
Rear I/O:
  64 I/O (32 LVDS) lines supported with a direct connection between the FPGA and the rear I/O connector (J4).

Engineering Design Kit
Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a PMC-VLX module

PMC Compliance
Conforms to PCI Local Bus Specification, Revision 3.0 and CMC/PMC Specification, P1386.1.
Electrical/Mechanical Interface: Single-Width Module.
PCI Bus Modes: Supports PCI-X at 100MHz, 66MHz and Standard PCI at 66MHz and 33MHz
PCI-X Master/Target: 32-bit or 64-bit interface
Signaling: 3.3V compliant.
Interrupts (INTA#): Interrupt A is used to request an interrupt.

Environmental
Operating temperature: 0 to 70°C or -40 to 85°C (E versions)
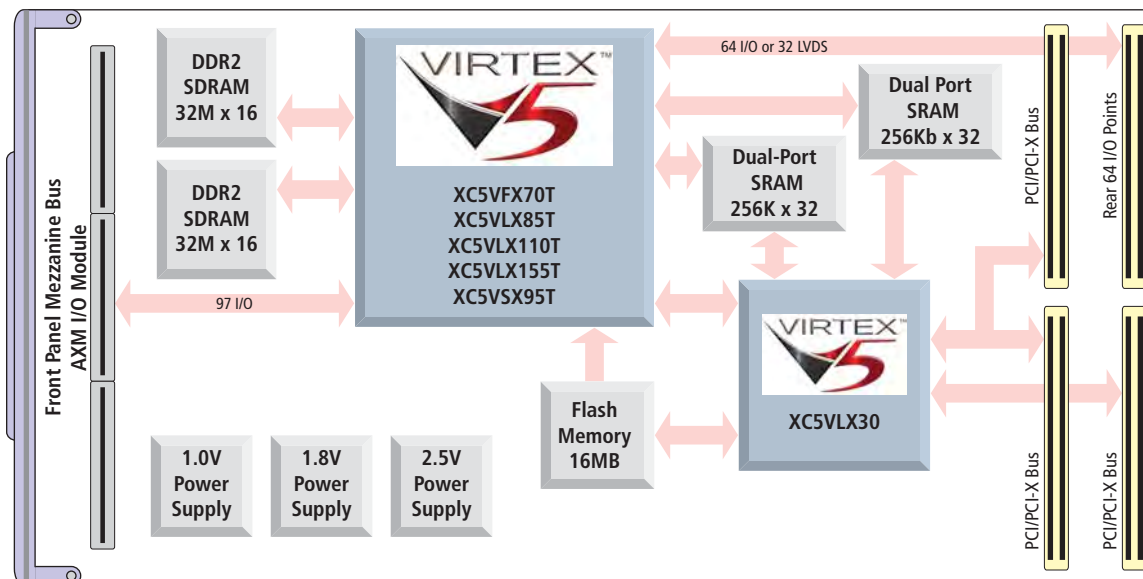Storage temperature: -55 to 105°C.
Relative humidity: 5 to 95% non-condensing.
Power: Consult factory. Operates from 3.3V supply.
MTBF: Hours at 25°C, MIL-HDBK-217F, Notice 2
  VLX-85: 633,360; VLX-10: 624,625; VLX-155: call factory.

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PMC Modules

Ordering Information

PMC Modules

PMC-VLX85
User-configurable Virtex-5 FPGA with 82,944 logic cells

PMC-VLX85E
Same as PMC-VLX85 with extended temperature range

PMC-VLX110
User-configurable Virtex-5 FPGA with 110,592 logic cells

PMC-VLX110E
Same as PMC-VLX110 with extended temperature range

PMC-VLX155
User-configurable Virtex-5 FPGA with 155,648 logic cells

PMC-VLX155-1M
Same as PMC-VLX155 plus 1MB x 64 dual port SRAM

PMC-VLX155E
Same as PMC-VLX155 with extended temperature range

PMC-VLX-EDK
Engineering Design Kit (one kit required)

AXM Plug-In I/O Extension Modules
For more information, see AXM data sheet.

AXM-A30
2 analog input 100MHz 16-bit A/D channels

AXM-D02
30 RS485 differential I/O channels

AXM-D03
16 CMOS and 22 RS485 differential I/O channels

AXM-D04
30 LVDS I/O channels

AXM-??
Custom I/O configurations available, call factory.

Software
(see software documentation for details)

PMCSW-API-VXW
VxWorks® software support package

PCISW-API-WIN32
32-bit Windows driver software package with DLLs and demonstration programs for PMC, XMC, PCI, and cPCI products. Supplied on CD-ROM.
Windows® DLL software support.

PCISW-API-WIN64
64-bit Windows driver software package with DLLs and demonstration programs for PMC, XMC, PCI, and cPCI products. Supplied on CD-ROM.
Windows® DLL software support

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

PMC-VSX95
User-Configurable
Virtex-5 FPGA Modules
with Plug-In I/O

- PMC-VSX95: 94,208 logic cells and 640 DSP48E slices (XC5VSX95T)

Description

Acromag's PMC-VSX boards feature a reconfigurable Xilinx® Virtex™-5 FPGA enhanced with multiple high-speed memory buffers and a high-throughput PCI-X interface. Field I/O interfaces to the FPGA via the rear J4/P4 connector and/or with optional front mezzanine plug-in I/O modules. The result is a powerful and flexible I/O processor module that is capable of executing your custom instruction sets and algorithms.

The on-board FPGA is a DSP-optimized version of the Virtex-5 FPGA. Although there is no limit to the uses for these boards, several applications are ideal. Typical uses include hardware simulation, communications, military servers, in-circuit diagnostics, signal intelligence, and image processing.

64 I/O lines are provided via the rear (J4) connector. Additional I/O processing is supported on a separate mezzanine card that plugs into the FPGA base board. A variety of these external I/O cards offer an interface for your analog and digital I/O signals. See the AXM I/O Card data sheet (Bulletin 8400-458) for more details.

Large, high-speed memory banks provide efficient data handling. Generous DDR2 SDRAM buffers store captured data prior to FPGA processing. Afterward, data is moved to dual-port SRAM for high-speed DMA transfer to the bus or CPU. Our high-bandwidth PCI-X interface ensures fast data throughput.

Take advantage of conduction cooling for use in hostile environments. Conduction efficiently dissipates heat in environments with inadequate cooling air flow. Optional extended temperature models operate from -40 to 85℃.

Acromag's Engineering Design Kit provides software utilities and example VHDL code to simplify your program development and get you running quickly. A JTAG interface enables on-board VHDL simulation.
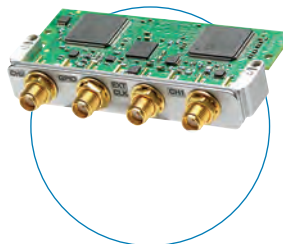
Download your own programs into the reconfigurable FPGA to quickly create custom I/O module. Optional I/O modules plug into the front mezzanine.

Features

- Reconfigurable Xilinx Virtex-5 FPGA (VSX95T)
- PCI-X bus 100MHz 64-bit interface
- Supports both front and rear I/O connections
- 64 I/O or 32 LVDS lines direct to FPGA via rear (J4)
- Plug-in I/O modules are available for front mezzanine
- FPGA code loads from PCI bus or flash memory
- Two banks of 256Kb x 32-bit dual-ported SRAM
- Two banks of 32Mb x 16-bit DDR2 SDRAM
- Other memory options available (contact factory)
- Supports dual DMA channel data transfer to CPU/bus
- Supports 3.3V signalling
- Support for Xilinx ChipScope™ Pro interface
- Conduction-cooled or -40 to 85℃ operating range

Plug-in AXM I/O or use base board for conduction-cooled applications.

Plug-in modules sold separately for analog and digital I/O functions.

Specifications

FPGA

FPGA: Xilinx Virtex-5 FPGA
   PMC-VSX95: XC5VSX95T FPGA with 94,208 logic cells and 640 DSP48E slices

FPGA configuration: Download via PCI bus or flash memory.

Example FPGA program: VHDL provided implements local bus interface, control of front and rear I/O, SRAM read/write interface logic, and SDRAM memory interface controller. Program requires user proficiency with Xilinx software tools. See Engineering Design Kit.

I/O Processing

Acromag AXM I/O modules: for front mezzanine:
   AXM modules attach to the board for additional I/O lines. Analog and digital I/O AXM modules are sold separately.

Rear I/O:
   64 I/O (32 LVDS) lines supported with a direct connection between the FPGA and the rear I/O connector (J4).

Engineering Design Kit

Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a PMC-VSX module.

PMC Compliance

Conforms to PCI Local Bus Specification, Revision 3.0 and CMC/PMC Specification, P1386.1.

Electrical/Mechanical Interface: Single-Width Module.

PCI Bus Modes: Supports PCI-X at 100MHz, 66MHz and Standard PCI at 66MHz and 33MHz

PCI-X Master/Target: 32-bit or 64-bit interface

Signaling: 3.3V compliant.

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

Environmental

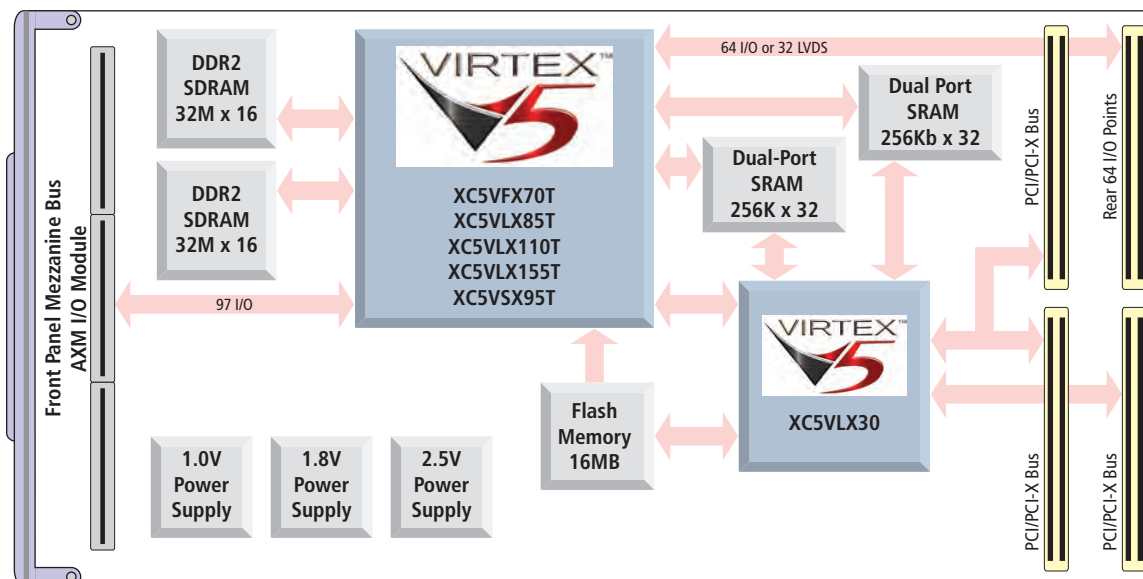Operating temperature: 0 to 70℃ or -40 to 85℃ (E versions)

Storage temperature: -55 to 105℃.

Relative humidity: 5 to 95% non-condensing.

Power: Consult factory. Operates from 3.3V supply.

MTBF: 630,959 hours at 25℃, MIL-HDBK-217F, Notice 2

All trademarks are the property of their respective owners.

PMC Modules

Ordering Information

PMC Modules

PMC-VSX95
    User-configurable Virtex-5 FPGA with 94,208 logic cells

PMC-VSX95E
    Same as PMC-VSX95 with extended temperature range

PMC-VSX-EDK
    Engineering Design Kit (one kit required)

AXM Plug-In I/O Extension Modules
For more information, see AXM data sheet.

AXM-A30
    2 analog input 100MHz 16-bit A/D channels

AXM-D02
    30 RS485 differential I/O channels

AXM-D03
    16 CMOS and 22 RS485 differential I/O channels

AXM-D04
    30 LVDS I/O channels

AXM-??
    Custom I/O configurations available, call factory.

Software
(see software documentation for details)

PMCSW-API-VXW
    VxWorks® software support package

PCISW-API-WIN
    Windows® DLL software support

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

Extension I/O Modules

AXM-A75 Multi-function I/O extension module for Acromag FPGA cards

2 YEAR WARRANTY
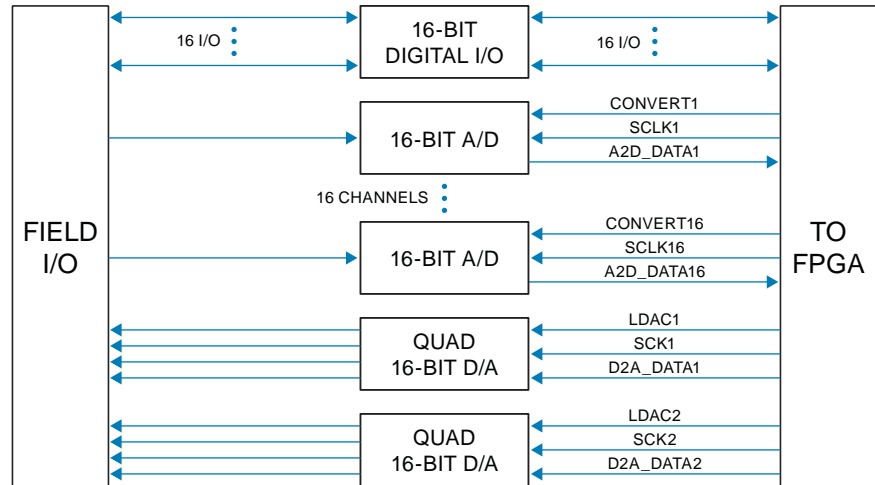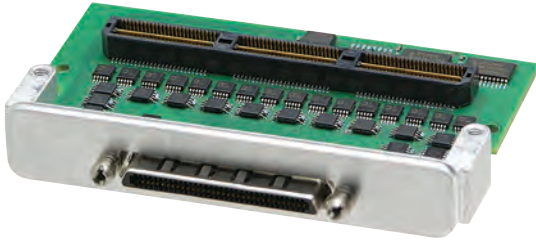
16 analog inputs, simultaneous A/D ◆ 8 analog outputs, simultaneous D/A ◆ 16 digital I/O channels

Description

The AXM-75 is a multi-function I/O module that adds A/D, D/A, and digital I/O signal processing functions to an FPGA board. These extension I/O modules plug directly onto many Acromag reconfigurable FPGA cards equipped with an AXM mezzanine connector.

Analog Input

There are sixteen differential analog input channels on the AXM-A75. Each input has its own high-speed 16-bit A/D converter offering the ability to simultaneously sample all channels.

At the beginning of the analog signal chain is a low-pass filter to remove any unwanted EMI. A programmable gain instrumentation amplifier scales the input and provides giga-ohm input impedance. Serial FLASH memory is included to store factory calibration constants.

Analog Output

Two quad serial input DAC devices drive eight analog output channels. Each channel has its own high-speed 16-bit D/A converter allowing simultaneous updates to all outputs.

Digital I/O

Sixteen bi-directional digital I/O channels provide the ability to monitor and control discrete devices. Each I/O channel is individually configurable as an input or output for great flexibility to match your requirements

Key Features & Benefits

- 16 channels of analog input capable of simultaneous sampling

- 16-bit 500kHz A/D converter on each channel

- Analog input range of ±10.24 volts

- Programmable gain of 1x, 2x, 4x, or 8x

- 8 channels of analog output capable of simultaneous updates

- Each A/D channel includes a 2K sample FIFO

- FIFO status interrupts configurable for half-full or overflow conditions

- Dual quad 16-bit serial input D/A converters with 10µS settling time

- Analog output range of ±10 volts

- 16 channels of general-purpose digital I/O

- Front panel 68-pin VHDCI receptacle for field I/O connections

- Example VHDL code provided in the base board's Engineering Design Kit to control sample rate and gain selection

AXM extension I/O modules plug into a mezzanine connector on many Acromag FPGA boards to provide additional I/O signal processing capabilities.

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Extension I/O Modules

AXM-A75 Multi-function I/O extension module for Acromag FPGA cards

2 YEAR WARRANTY

Performance Specifications

■ Analog Input

Input configuration
16 differential channels with a separate A/D converter on each channel.

A/D resolution
16 bits.

Input range
±10.24 volts.

Programmable gain
1x, 2x, 4x, or 8x.

Input impedance
1 giga-ohm.

Maximum throughput rate
2µS A/D (500kHz).

A/D trigger
FPGA controlled.

Signal-to-noise ratio
69dB (25°C) typical.

Signal-to-noise and distortion
67dB (25°C) typical.

■ Analog Output

Output configuration
8 channels with a separate D/A converter for each channel provided by two quad serial input DACs. Double buffering allows the simultaneous updating of all channels.

D/A resolution
16 bits.

Output range
±10 volts.

Settling time
10µS (100kHz).

■ Digital I/O

I/O configuration
16 bi-directional I/O channels, individually configured.

I/O range
5V TTL.

Output type
Open collector type with open drain outputs.

Pull-up resistor
Digital I/O lines are pulled high via a 4.75k ohm resistor to +5 volts.

■ Physical

Acromag AXM I/O modules plug into a PMC or XMC FPGA module's front mezzanine for additional I/O lines. Analog and digital I/O AXM modules are sold separately.

Size
12.7 mm high x 42.1 mm deep x 74.0 mm wide (0.500 inches x 1.659 inches x 2.913 inches).

The AXM-A75 exceeds the allowable mezzanine envelope as defined in IEEE 1386-2001 and may not be compatible with all PMC/XMC carriers. See user manual for details.

Stacking height
5.0 mm (0.315 in).

Weight
41.3 g (1.46 oz).

Connectors
I/O: 68-pin VHDCI receptacle.
Mezzanine: High-speed 150-pin header.

■ Environmental

Operating temperature
-40 to 85°C.

Storage temperature
-55 to 125°C.

Relative humidity
5 to 95% non-condensing.

Power
+3.3V: 39mA typical, 50mA maximum.
+5V: 54mA typical, 65mA maximum.
+12V: 103mA typical, 115mA maximum.
–12V: 92mA typical, 115mA maximum.

MTBF
Contact the factory.

Electromagnetic Compatibility (EMC)
Minimum immunity per European Norm EN61000-6-2:2005.

Electrostatic Discharge (ESD) Immunity
4KV direct contact and 8KV air-discharge to the enclosure port per IEC61000-4-2.

Radiated Field Immunity (RFI)
10V/m, 80 to 1000MHz AM; 3V/m, 1.4 to 2.0GHz; 1V/m, 2.0 to 2.7GHz, per IEC61000 4 3.

Electrical Fast Transient Immunity (EFT)
2KV to power, and 1KV to signal I/O per IEC61000-4-4.

Conducted RF Immunity (CRFI)
10Vrms, 150KHz to 80MHz, per IEC61000-4-6.

Surge Immunity
0.5KV to power and 1KV to signal per IEC61000-4-5.

Emissions
Per European Norm EN61000-6-4:2007.

Radiated Frequency Emissions
30 to 1000MHz per CISPR16 Class A.

Ordering Information

■ AXM Plug-In I/O Extension Modules

For more information, see www.acromag.com.

AXM-A75
16 analog inputs, 8 analog outputs, and 16 digital I/O

AXM-??
Custom I/O configurations available, call factory.

■ Accessories

For more information, see www.acromag.com.

5025-288
Termination Panel for 68-pin SCSI-3 cable to connect field I/O Signals to the board.

5028-420
Termination shielded cable, 34-wire pairs, ultra SCSI/VHDCI male and SCSI-3 male connectors. Recommended for all I/O connections to model 5025-288 termination panel. 2 meters long.
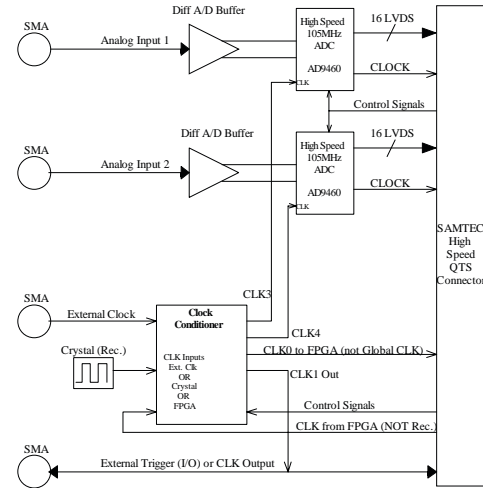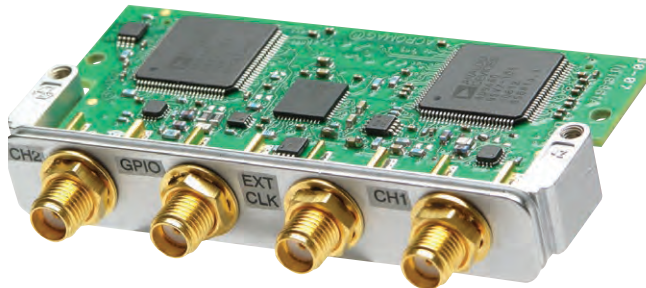
XMC FPGA Modules

PMC FPGA Modules

ISO9001
AS9100
MADE IN USA

Acromag
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Extension I/O Modules

AXM-A30 Analog I/O Extension Modules for PMC FPGA Boards

High Speed Analog Input ◆ 2 Differential Channels ◆ 2 16-bit A/D Channels

Description

AXM Series extension modules offer numerous I/O options for Acromag's PMC modules with configurable FPGAs. These extension modules plug into the front mezzanine on Acromag's PMC-LX/SX (Virtex®-4 FPGA), and PMC-VLX/VSX/VFX (Virtex-5 FPGA) modules.

AXM-A30 Analog Input

This module features two 105MHz 16-bit A/D channels. An external clock and trigger can be used to control sampling.

An internal precision clock conditioner provides the functions of jitter cleaning/reconditioning, multiplication, and distribution of a reference clock.

Each clock distribution block includes a programmable divider, a phase synchronization circuit, and a programmable delay. This allows multiple integer-related and phase-adjusted copies of the reference to be distributed to multiple system components.

Key Features & Benefits

- Analog Input

- Input configuration: Two differential channels using two Analog Devices AD9460 A/D converter

- A/D resolution: 16 bits

- Input range: 3.4V peak-to-peak, centered at 0V, into a 50 ohm load

- External clock input: 3.3V peak-to-peak

- Input clock range:1-105MHz

- Maximum throughput rate:
  1 channel (max.): 9.5nS (105MHz)
  2 channels (max.): 9.5nS (105MHz)
  A/D trigger: External source, FPGA controlled

- Input clock controller:Precision clock conditioner combines the functions of jitter cleaning/reconditioning, multiplication, and distribution of a reference clock

- Signal-to-noise ratio: 69dB (25°C) typical

- Signal-to noise and distortion: 67dB (25°C) typical

- General purpose I/O: Low voltage TTL

AXM modules attach to PMC Modules with user-configurable FPGAs.

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AXM-A30 Analog I/O Extension Modules for PMC FPGA Boards

2 YEAR WARRANTY

Performance Specifications

■ AXM-A30 Analog Input

Input configuration
Two differential channels using two Analog Devices AD9460 A/D converter.

A/D resolution
16 bits.

Input range
3.4V peak-to-peak, centered at 0V, into a 50 ohm load.

External clock input:
3.3V peak-to-peak.

Input clock range:
1-105MHz.

Maximum throughput rate
1 channel (max.): 9.5nS (105MHz).
2 channels (max.): 9.5nS (105MHz).

A/D trigger
External source, FPGA controlled.

Input clock controller:
Precision clock conditioner combines the functions of jitter cleaning/reconditioning, multiplication, and distribution of a reference clock.

Signal-to-noise ratio
69dB (25°C) typical.

Signal-to-noise and distortion
67dB (25°C) typical.
General purpose I/O: Low voltage TTL.

■ Physical

Acromag's AXM Series extension modules offer numerous I/O options for Acromag's PMC modules with configurable FPGA. These extension modules plug into the front mezzanine on Acromag's PMC-LX/SX (Virtex®-4 FPGA), and PMC-VLX/VSX/VFX (Virtex-5 FPGA) modules. Analog and digital I/O AXM modules are sold separately.

Size
11.5 mm high x 31.0 mm deep x 74.0 mm wide (0.453 inches x 1.220 inches x 2.913 inches).

Stacking height
5.0 mm (0.197 inches).

Weight
41.3 g (1.46 oz).

Connectors
Front field I/O: Four SMA PCB jack female receptacle connectors.

Complies with PMC Specification P1386.1 for a single-width PMC module when installed on a supported PMC module.

■ Environmental

Operating temperature
-0 to 70°C.
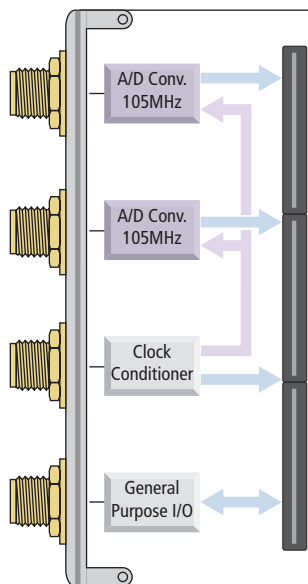
Storage temperature
-55 to 105°C.

Relative humidity
5 to 95% non-condensing.

Power
4.5 Watts typical.

MTBF
1,972,542 hrs. at 25°C, MIL-HDBK-217F, Notice 2.

Ordering Information

■ AXM Plug-In I/O Modules

For more information, see www.acromag.com.
AXM-A30
2 analog input channels

AXM-??

Custom I/O configurations available, call factory.

■ Accessories

For more information, see www.acromag.com.
XMC FPGA Modules

PMC FPGA Modules

ISO9001
AS9100

MADE IN USA

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AXM Series Digital I/O Extension Modules

AXM-D01
64 LVTTL INPUT/OUTPUT CHANNELS
P2 | +5V | +3.3V | Optional +3.3V or +2.5V Pull-up Voltage | P1 | LVTTL I/O TO FPGA
10K Optional Pull-up Resistors
I/O 0 ... I/O 0
10K Optional Pull-down Resistors
GND GND
GND GND
JTAG Optional JTAG from Front I/O Use JTAG

AXM-D02
30 DIFF RS485/422 INPUT/OUTPUT CHANNELS
P2 | DIFF DIRECTION CONTROL | 10K | P1 | LVTTL I/O TO FPGA

AXM-D03
16 CMOS DIGITAL INPUT/OUTPUT CHANNELS
P2 | +5V 10K | DIRECTION CONTROL | 10K | P1 | LVTTL I/O TO FPGA

AXM-D04
30 LVDS INPUT/OUTPUT CHANNELS
P2 | 100 Ohms | DIRECTION CONTROL | 10K | P1 | LVTTL I/O TO FPGA
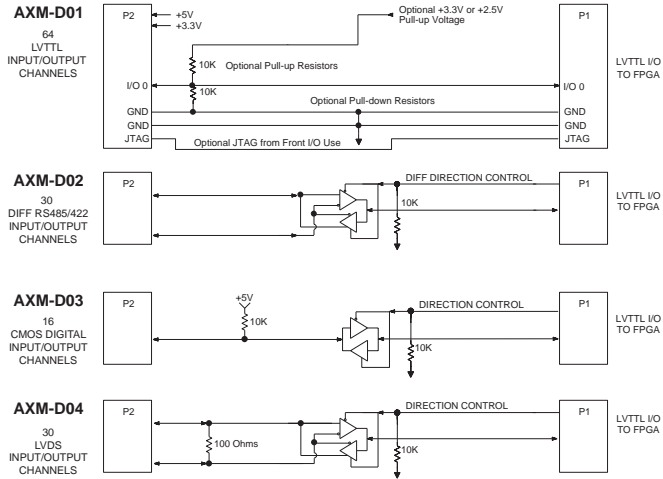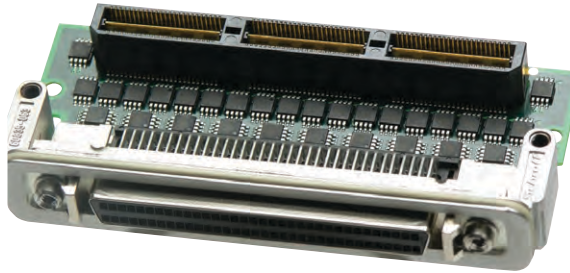
Plug-In I/O Modules ◆ Choose from four I/O Options ◆ JTAG Support Option

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Description

AXM Series extension modules offer numerous I/O options for Acromag's PMC and XMC modules with configurable FPGAs. These extension modules plug into the front mezzanine on Acromag's I/O compatible FPGAs.

AXM-D01 LVTTL I/O

This module provides 64 LVTTL I/O channels for straight though I/O. custom modules are available for optional pull-ups, pull-downs, JTAG, and fusted power for front I/O use.

AXM-D02 RS-485 Differential I/O

This module provides 30 differential I/O channels. Data direction, either input or output, on each channel is independently controlled. Eight of the channels support programmable change-of-state interrupts. JTAG option.

ACR5264 LVDS and RS-485 Differential I/O

This module provides 30 differential I/O channels. Data direction, either input or output, on each channel is independently controlled. Eight of the channels support programmable change-of-state interrupts. 16 LVDS and 14 RS-485 differential I/O channels.

AXM-D03 CMOS and RS-485 Differential I/O

This module provides 16 CMOS and 22 RS-485 differential I/O channels. Data direction, either input or output, on each channel is independently controlled. Eight of the channels support programmable change-of-state interrupts.

AXM-DX03 CMOS and RS-485 Differential I/O

Same as AXM-D03 above except 16 CMOS and 24 RS-485 differential I/O channels. Provides a replacement for legacy PMC-DX503/2003 FPGA modules when used with PMC/XMC-SLX.

AXM-D04 LVDS

This module provides 30 channels of low voltage differential signaling with independently configured direction. Interrupts are programmable on eight of the channels for any bit change of state or level. JTAG option

Key Features & Benefits

- Various modules allows users to select the Front I/O required for their application.

- Differential RS485/RS422 can be configured for input or output with independent direction control.

- Interface with 5V compliant input/output CMOS channels which can be configured as input or output with independent direction control.

- Low voltage differential signaling can be configured for input or output with independent direction control.

- The EDK board provides the standard Xilinx JTAG interface to allow direct programming of the FPGA and an interface with ChipScope®.

- Example code provides interrupts that are software programmable for any bit Change-Of-State or level on 8 channels.

- Example Design – The example VHDL design, provided in the base board EDK, includes control of all I/O, and eight Change-Of-State interrupts.

AXM modules attach to PMC Modules with user-configurable FPGAs.

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Extension I/O Modules

AXM Series Digital I/O Extension Modules

<div>2 YEAR WARRANTY</div>

Performance Specifications

AXM-D01
Channel configuration: 64 channel bi-directional LVTTL signals are independently direction controlled. LVTTL I/O characteristics: all I/O characteristics are determined by the FPGA.

AXM-D02
Channel configuration: 30 bi-directional differential signals with independently configured direction. Channels to the FPGA are buffered using EIA RS485/RS422 line transceivers. Optional JTAG access via front connector.

Differential driver output voltage:
1.5V minimum., 3.3V maximum with 54 ohm load.

ACR5364
Channel configuration: 16 channels of low voltage differential signaling with independently configured I/O direction and 14 bi-directional differential signals with independently configured direction.

RS485 channels: Same as AXM-D02

LVDS channels: Same as AXM0-D04

AXM-D03
Channel configuration: 16 bi-directional CMOS transceivers (input/output direction controlled as pairs of channels) and 22 bi-directional differential signals with independently configured direction.

Differential channels: Same as AXM-D02.

CMOS I/O electrical characteristics:

V_{OH}:	3.8V minimum	V_{OL}:	0.55V maximum
I_{OH}:	-32.0mA	I_{OH}:	32.0mA
V_{IH}:	3.5V minimum	V_{IL}:	1.5V maximum

AXM-DX03
Same as AXM-D03 above except 16 CMOS and 24 RS-485 differential I/O channels. Provides a replacement for legacy PMC-DX503/2003 FPGA modules when used with PMC/XMC-SLX.

AXM-D04
Channel configuration: 30 channels of low voltage differential signaling with independently configured I/O direction. Optional JTAG access via front connector.

LVDS I/O electrical characteristics:
LVDS driver output voltage: 247m V min., 454mV max.
Common mode output voltage: 1.37 V max.
LVDS Input Threshold Voltage: -50mV min.,50mV max.

■ Physical Dimensions

Size
11.5 mm high x 31.0 mm deep x 74.0 mm wide
(0.453 inches x 1.220 inches x 2.913 inches)

Stacking height
8.0 mm (0.315 inches).

PMC Compliance
Complies with PMC Specification P1386.1 for a single-width PMC module when attached to the PMC front mezzanine.

Connectors
Front field I/O: 68-pin, SCSI-3, female receptacle header (AMP 5787394-7 or equivalent).

■ Environmental

Operating temperature
 -40 to 85°C

Storage temperature
 -55 to 150°C

Relative humidity
5 to 95% non-condensing

Power:
1.5W typical (AXM-D02, AXM-D03)
0.6W typical (AXM-D04)

MTBF
Hours are at 25°C, MIL-HDBK-217F, Notice 2

AXM-D01: TBD
AXM-D02: 3,559,276 hours
AXM-D03: 3,921,522 hours
AXM-DX03: TBD
AXM-D04: 6,534,197 hours

Ordering Information

■ AXM Plug-In I/O Modules

AXM-D01
64 bi-directional LVTTL I/O channels

AXM-D02
30 RS-485 Differential I/O channels

ACR5364
Same as AXM-D02 except 16 LVDS and 14 RS485 I/O channels

AXM-D02-JTAG
Same as AXM-D02 plus JTAG support

AXM-D03
16 CMOS and 22 RS485 differential I/O channels

AXM-DX03
16 CMOS and 24 RS485 differential I/O channels

AXM-D04
30 LVDS I/O channels

AXM-D04-JTAG
Same as AXM-D04 plus JTAG support

AXM-??
Custom I/O configurations available, call factory.

■ Accessories

5025-288
Termination Panel for 68-pin SCSI-3 cable to connect field I/O Signals to the board.

5028-432
Round shielded cable, 34 twisted pairs, SCSI-3 male connector at both ends. Connects model 5025-288 termination panel to the board. 2 meters long.

XMC FPGA Modules

PMC FPGA Modules

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PMC Module Carriers

24 HOUR STOCK ITEM **2 YEAR WARRANTY**
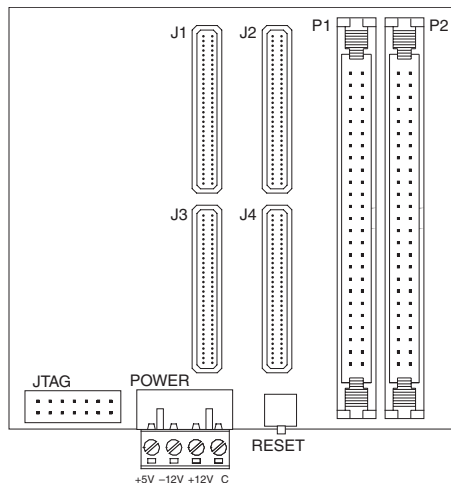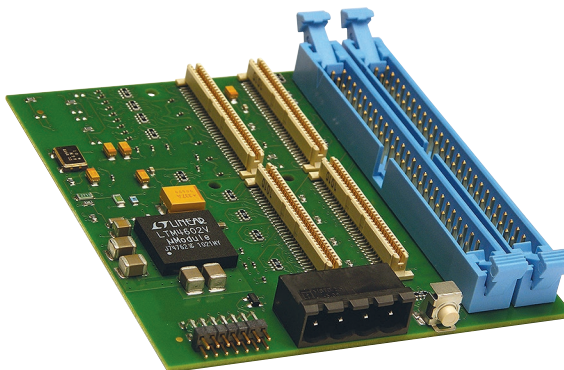
Holds one PMC module ◆ Delivers power to PMC module ◆ Enables a trouble-free start-up sequence

Description

This PMC module carrier card allows use of a PMC module in an independent stand-alone mode. The carrier card delivers power to the PMC module and regulates the PCI bus start-up sequence to prevent a system lock-up by the connection to the local bus.

As a non-intelligent carrier, the board acts simply as an adapter to route signals to and from the PMC module. The user has full access to the field I/O via two 50-pin ribbon cable connectors.

Using an external power supply, this carrier card allows use of any industry-standard PMC module. The on-board DC-DC converter creates +3.3VDC from the external +5VDC source, lowering the number of external power connections required.

For troubleshooting, a 14-pin Xilinx JTAG connector facilitates boundary scan debugging. Also, a manual reset button allows the user to force an RST# signal when needed.

Key Features & Benefits

- Single-slot PMC carrier card

- Stand-alone design does not require expensive card cage or other computer chassis

- Ideal for custom computing solutions based on configurable FPGA modules

- On-board DC-DC converter provides +3.3V DC to the PMC module from a +5V power source

- Users can optionally provide a ±12V DC source

- Manual reset button initiates a PCI reset at user's discretion

- Voltage monitor designed to prevent code execution errors during power-up, power-down, or potential brown-out conditions when +5V DC supply dips too low

- A standard 14-pin Xilinx JTAG connection is available for utilizing the TDI, TDO, TCK, and TMS signals

- Front or rear connection I/O access

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PMC Module Carriers

APMC4110 Busless PMC Module Carrier Card

Performance Specifications

■ PMC Compatibility

Pin assignment conforms to PCI Bus Specification, Revision 3.0.

■ Physical

Physical Configuration
Height: 3.300 inches (83.820 mm).

Depth: 3.520 inches (89.408 mm).

Board Thickness: 0.063 inches (1.600 mm).

Unit Weight: 0.107 lbs. (0.053 kg).

Connectors
P1, P2 (Field I/O): 50-pin, ribbon cable, male receptacle headers.

P3: 4-pin power header.

P4: 14-pin Xilinx JTAG port.

J1 - J4: 64-pin PMC module connectors.

■ Environmental

Operating temperature
-40 to 85°C.

Storage temperature
-55 to 120°C.

Relative humidity
5 to 95% non-condensing.

Power
+5V (±5%): 66mA, typical.

+12V (±10%): 0mA, used by PMC module only.

-12V (±10%): 0mA, used by PMC module only.

Note that 3.3V is generated from the 5V supply. Power requirements do not include the PMC module.

±12.0V DC is optional based on user's needs.

Isolation
Non-Isolated. PCI interface and field commons have a direct electrical connection.

MTBF
Contact the factory.

Ordering Information

Carrier Card
APMC4110
Stand-alone powered PMC module carrier card.

Accessories
5025-550-x
Flat ribbon cable, non-shielded, 50-pin connector at both ends. Specify x = length, in feet (12ft. max.).

5025-552
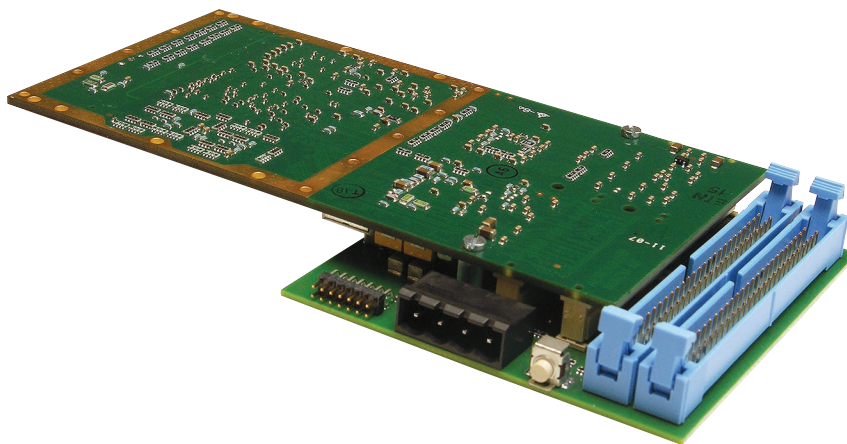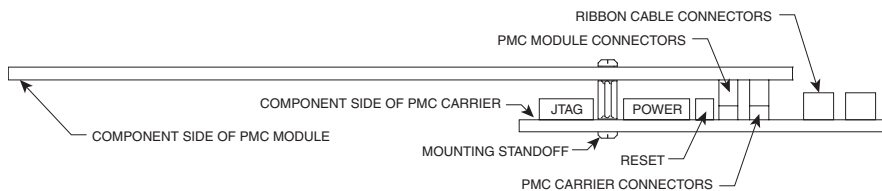Termination panel, DIN rail-mount, 50 screw terminals, 50-pin ribbon cable connector.

PMC Modules
See www.acromag.com for more information.

Software Development Tools
See www.acromag.com for more information.

VxWorks® Libraries I/O Function Routines

VxWorks®

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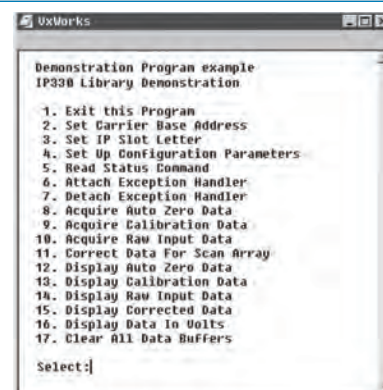
The VxWorks software libraries provide a simple API to quickly integrate Acromag's I/O boards with your application program.

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
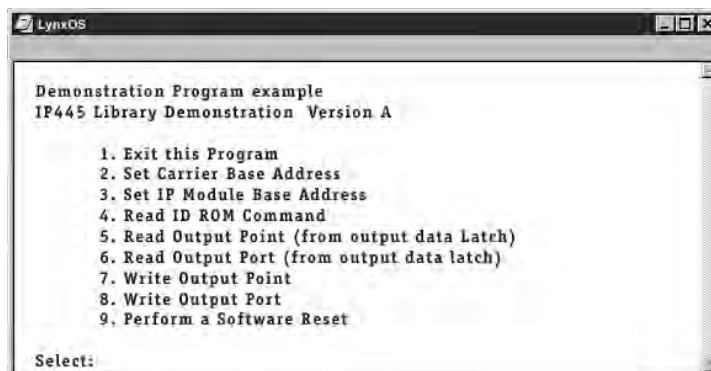VxWorks software support package for Industry Pack modules and carriers.

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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Support Software

MADE IN USA

Linux® Libraries   I/O Function Routines

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

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 PCI/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
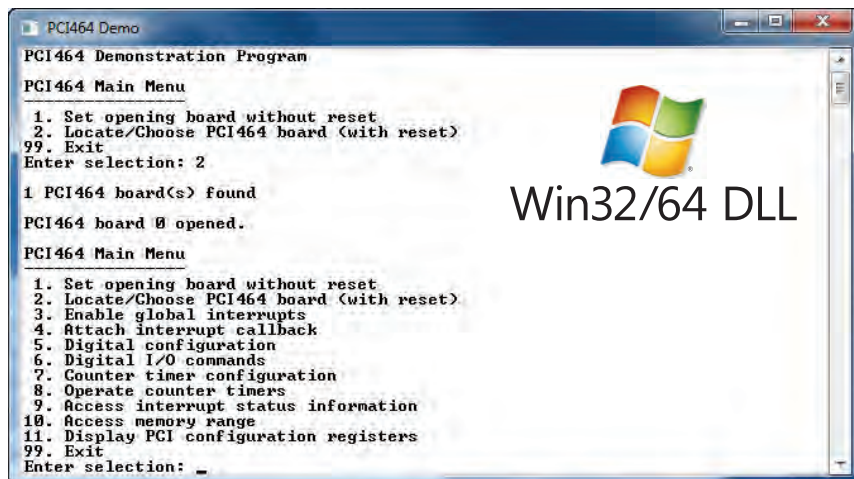Linux example libraries for AcroPack® modules and carriers.

IPSW-VME-LNX
Linux example libraries, works with TSI148 chipset for models XVME-6300, XVME-6400, Industry Pack modules, and VME carriers.

IPSW-A7VME-LNX
VxWorks® 7.0 64-bit, software support package for Acromag Series XVME6500 and XVME6700 SBC when used with Industry Pack modules and VME carriers. Supplied on CD-ROM.

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Software Support

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

Win32/64 DLL

For Windows 10 / 8 / 7 / Vista ◆ **Supports Acromag XMC, PMC, PCI, CompactPCI cards** ◆ **Includes DLLs**

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

Windows® Embedded Standard

Microsoft® Visual Studio®

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)
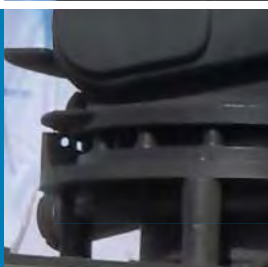
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