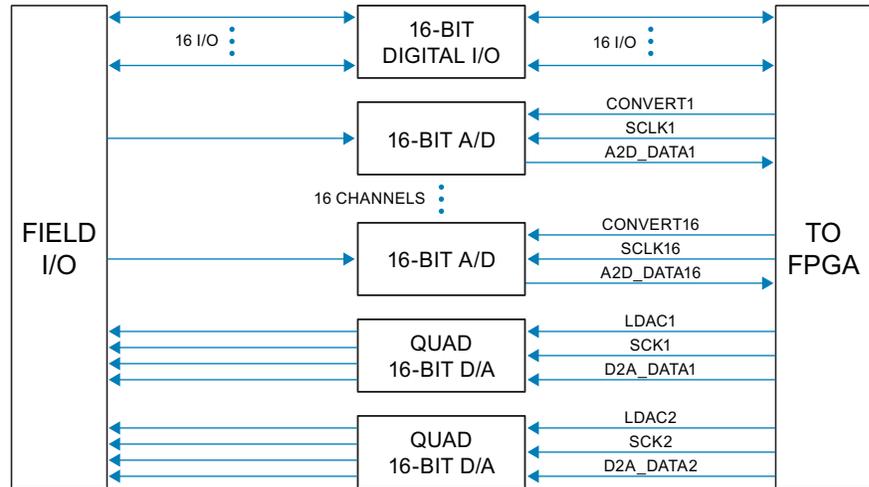


# Extension I/O Modules

## 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  $\pm 10.24$  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 10 $\mu$ s settling time
- Analog output range of  $\pm 10$  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.

**Acromag**   
THE LEADER IN INDUSTRIAL I/O

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# Extension I/O Modules



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

### 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

2 $\mu$ S 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

10 $\mu$ S (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](http://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](http://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



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