**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.

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**Key Features & Benefits**

- 16 channels of analog input capable of simultaneous sampling
- 16-bit 250kHz 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

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**AXM extension I/O modules plug into a mezzanine connector on many Acromag FPGA boards to provide additional I/O signal processing capabilities.**
### 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**: 4µS A/D (250kHz).
- **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
- **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).
- **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**: Specifications not yet available. Contact factory.
  - 3.3V (±5%): ?? mA typical, 840mA maximum.
  - +12V (±5%): ?? mA typical, 804mA maximum.
  - -12V (±5%): ?? mA typical, ?? mA maximum.
  - 5V (±5%): ?? mA typical, ?? mA 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 (CRI)**: 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.
- **5028-420**: Cable, VHDCI 68-Pin to SCSI-3 MD68, 2 meters
- **5028-288**: Termination panel