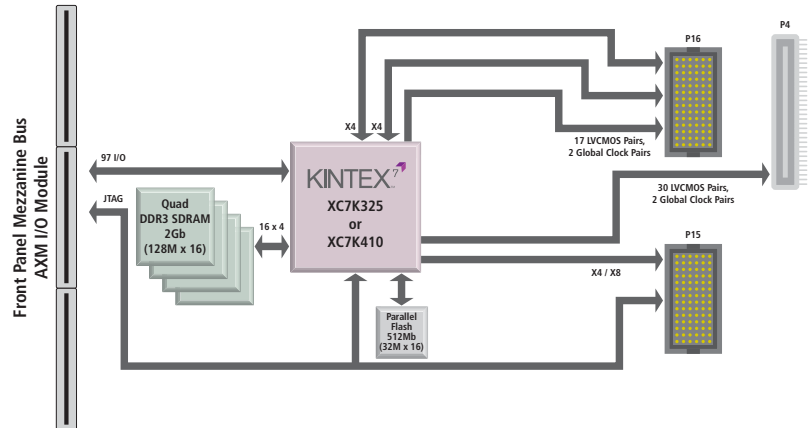
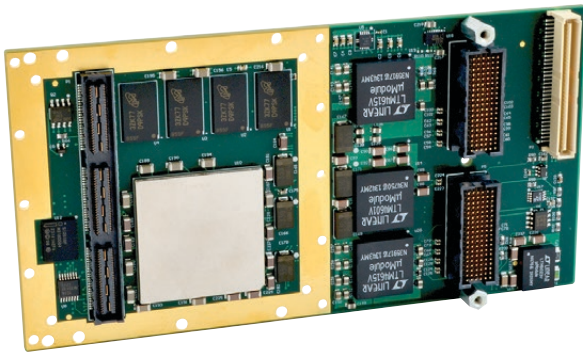


# XMC Modules

## XMC-7K AX User-Configurable Kintex-7 FPGA Modules with Plug-In I/O



KINTEX<sup>7</sup>

### XMC module with PCIe interface ♦ Logic-optimized Kintex-7 FPGA ♦ I/O Extension Mezzanine Modules

#### Description

Acromag's **XMC-7K** modules feature a high-performance user-configurable Xilinx® Kintex®-7 FPGA enhanced with high-speed memory and a high-throughput serial bus interface. 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.

Both front and rear I/O is supported. Front I/O processing is supported with plug-in AXM mezzanine cards. A variety of AXM I/O cards are available to add the flexibility of a wide range of analog and digital I/O to your design.

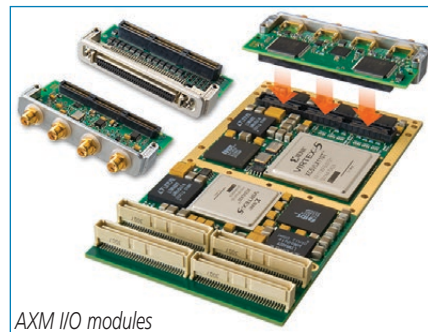
The rear I/O provides an 8-lane high-speed serial interface on the P16 XMC port for customer-installed soft cores. P16 also supports 34 SelectIO channels. The P4 port adds another 60 SelectIO and global clock lines. SelectIO signals are Kintex-7 FPGA I/O pins that support single-ended I/O (LVCMOS, HSTL, SSTL) and differential I/O standards (LVDS, HT, LVPECL, BLVDS, HSTL, SSTL)

Two versions of the Kintex-7 are available, offering a choice of an FPGA device with 325k or 410k logic cells.

With Acromag's Kintex-7 FPGA modules, you can greatly increase DSP algorithm performance for faster throughput using multiple channels and parallel hardware architectures. Free up CPU cycles by offloading algorithmic-intensive tasks to the FPGA co-processor.

These modules are ideal for high-performance customized embedded systems. Optimize your system performance by integrating high-speed programmable logic with the flexibility of software running on MicroBlaze™ soft processors.

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 debugging. Additional Xilinx tools help finish your system faster. Maximize FPGA performance with Vivado® or ISE® Design Suite. And with ChipScope™ Pro tools, you can rapidly debug logic and serial interfaces



AXM I/O modules

#### Key Features & Benefits

- Reconfigurable Xilinx Kintex-7 FPGA with 325k or 410k logic cells
- 128M x 64-bit DDR3 SDRAM
- 32M x 16-bit parallel flash memory for MicroBlaze FPGA program code storage
- 8-lane high-speed serial interface on rear P15 connector for PCIe Gen 1/2 (standard), Serial Rapid/I/O, 10Gb Ethernet, Xilinx Aurora
- 8-lane high-speed interfaces on rear P16 connector for customer-installed soft cores
- 60 SelectIO or 30 LVDS pairs plus 2 global clock pairs direct to FPGA via rear P4 port
- 34 SelectIO or 17 LVDS pairs plus 2 global clock pairs direct to FPGA via rear P16 port
- DMA support provides data transfer between system memory and the on-board memory
- Support for Xilinx ChipScope™ Pro interface



## XMC-7K AX User-Configurable Kintex-7 FPGA Modules w Plug-In I/O

### Performance Specifications

#### ■ FPGA

##### FPGA device

Xilinx Kintex-7 FPGA.

Model XC7K325T FPGA with 326,080 logic cells and 840 DSP48E1 slices or Model XC7K410T with 406,720 logic cells and 1540 DSP48E1 slices.

##### FPGA configuration

Download via JTAG or flash memory.

##### Example FPGA program

IP integrator block diagram provided for bus interface, front & rear I/O control, and SDRAM memory interface controller. See EDK kit.

#### ■ I/O Processing

##### Acromag AXM I/O Modules:

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

##### Rear high-speed I/O

12 high-speed serial lanes.  
x8 lanes via P15 and x4 lanes via P16.

##### Rear user I/O

P16: 17 LVDS pairs (34 LVCMOS), 2 global clock pairs.  
P4: 30 LVDS pairs (60 LVCMOS), 2 global clock pairs.

#### ■ 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 XMC-7K module (see [www.acromag.com](http://www.acromag.com) for more information).

#### ■ XMC Compliance

Complies with ANSI/VITA 42.0 specification for XMC module mechanicals and connectors.

Complies with ANSI/VITA 42.3 specification for XMC modules with PCI Express interface.

Electrical/Mechanical Interface: Single-Width Module.

#### ■ Electrical

##### XMC PCIe bus interface (P15 and P16)

One 114-pin male connector (Samtec ASP-103614-05 or equivalent).

##### P15 primary XMC connector

8 differential pairs (PCIe standard, Serial RapidIO, 10-Gigabit Ethernet, or Xilinx Aurora). JTAG.

System Management (XMC provides hardware definition information read by an external controller using IPMI commands and I2C serial bus transactions.)

3.3V power: 4 pins at 1A/pin.

3.3V auxiliary power: 1 pin, powers volatile memory to store the bitstream encryption key.

Variable power (5V or 12V): 8 pins at 1A per pin.

##### P16 XMC connector

4 differential pairs (PCIe, Serial RapidIO, or Xilinx Aurora).

17 LVDS pairs or 34 SelectI/O signals (differential pairs grouped per VITA 46.0 X38s).

2 global clock pairs.

Vcco pins are powered by 2.5V and support the 2.5V I/O standards.

##### P4 PMC rear I/O connector

64-pin female receptacle header (AMP 120527-1 or equivalent).

64 I/O connections (30 LVDS pairs plus two global clocks).

Vcco pins powered by 2.5V and support the 2.5V I/O standards.

#### ■ Environmental

##### Operating temperature

XMC-7K325AX-LF: -40 to 45°C.

XMC-7K410AX-LF: -40 to 40°C

##### Storage temperature

-55 to 125°C.

##### Relative humidity

5 to 95% non-condensing.

##### Power

3.3V (±5%): 7.8W typical.

12V (±5%): 2.7W typical

3.3V AUX (±5%): 57µW

##### MTBF

Contact the factory.

### Ordering Information

NOTE: XMC-7K-EDK is required to configure FPGA.

#### ■ XMC Modules

##### [XMC-7K325AX-LF](#)

User-configurable Kintex-7 FPGA, 325k logic cells with AXM support

##### [XMC-7K410AX-LF](#)

User-configurable Kintex-7 FPGA, 410k logic cells with AXM support

#### ■ Accessories

##### [AXM-A75](#)

16 analog inputs, 8 analog outputs, and 16 digital I/O

##### [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

##### [XMC-7KA-EDK](#)

Engineering Design Kit (one kit required)

##### [PMCSW-API-VXW](#)

VxWorks® 32-bit software support package

##### [PCISW-API-WIN](#)

Windows® DLL software support package

##### [PCISW-API-LNX](#)

Linux™ support (website download only)

XMC-7K325AX-LF shown with optional AXM-A75

