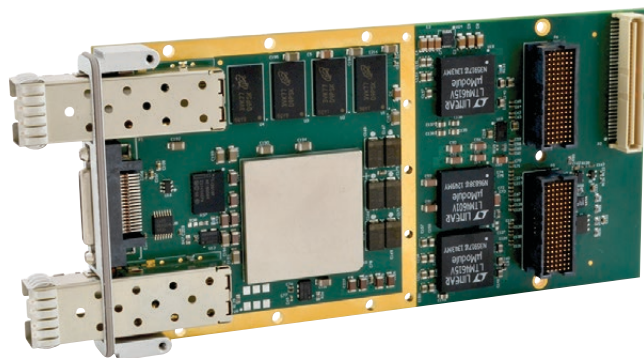
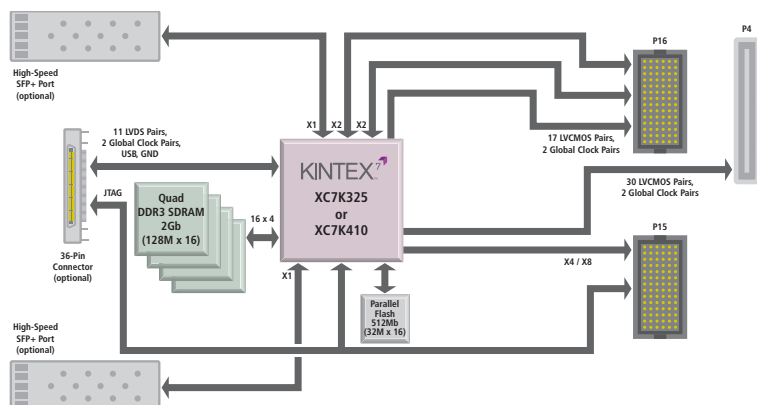


# XMC Modules

## XMC-7K F User-Configurable Kintex-7 FPGA Modules with Dual SFP+ Ports



KINTEX<sup>7</sup>



XMC module with PCIe and SFP+/Aurora interface ♦ Logic-optimized Kintex-7 FPGA ♦ 10-Gigabit Ethernet

### 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 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.

Two versions of this module are available, offering a choice of an FPGA device with 325k or 410k logic cells.

Front I/O adds dual SFP+ ports and a VHDCR connector. The two SFP+ ports each provide a copper or fibre interface of up to 10.3125Gbps. They also support a Gigabit Ethernet interface. The VHDCR connector interfaces JTAG, USB, and 22 SelectIO.

The rear I/O provides an 4-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).

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

### 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 RapidIO, 10Gb Ethernet, Xilinx Aurora
- 4-lane high-speed interfaces on rear P16 connector for customer-installed soft cores
- Dual SFP+ ports for Fibre Channel or 10GbE
- 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
- 22 SelectIO, 2 global clock pairs, JTAG, USB, and ground signals via front 36-pin connector
- DMA support provides data transfer between system memory and the on-board memory
- Support for Xilinx ChipScope™ Pro interface

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

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## XMC-7K F User-Configurable Kintex-7 FPGA Modules w Dual SFP+ Ports

### 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

Front high-speed I/O

Two x1 lanes via SFP+ connectors for Gigabit Ethernet and Fibre Channel interface

Front user I/O

36-pin connector provides JTAG connection, USB signals, 2 global differential clock pairs, 11 LVDS signal pairs, and 2 ground signals.

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 for system management.

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 SelectIO 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.

VHDCR connector

36-position connector (Samtec VHDCR-36-01-M-RA) mates with industry-standard VHDCI cable assemblies.

SFP+ host connector

SFP transceiver signals route directly to Kintex-7 FPGA. 10.3125Gb/s maximum data rate.

SFP+ copper (Gigabit Ethernet) or fibre optic modules available from Acromag.

#### ■ Environmental

Operating temperature

XMC-7K325F-LF: -40 to 55°C.

XMC-7K410F-LF: -40 to 55°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 typical.

MTBF

Contact the factory.

### Ordering Information

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

#### ■ XMC Modules

[XMC-7K325F-LF](#)

User-configurable Kintex-7 FPGA, 325k logic cells plus SFP front I/O

[XMC-7K410F-LF](#)

User-configurable Kintex-7 FPGA, 410k logic cells plus SFP front I/O

#### ■ Accessories

[5025-921](#)

Cable, VHDCI 36-pin to SCSI-2, 6 feet long.

[5028-449](#)

Cable, copper twin-ax, SFP to SFP, 1 meter long.

[5028-455](#)

Transceiver, 10/100/1000BASE-T copper SFP, up to 1.25Gb/s bi-directional data links.

[5028-452](#)

Transceiver, short-wavelength SFP, up to 2.125Gb/s bi-directional data links.

#### ■ 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-7K325F-LF shown with heatsink

