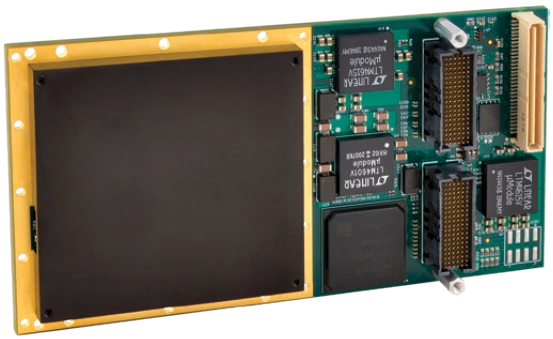
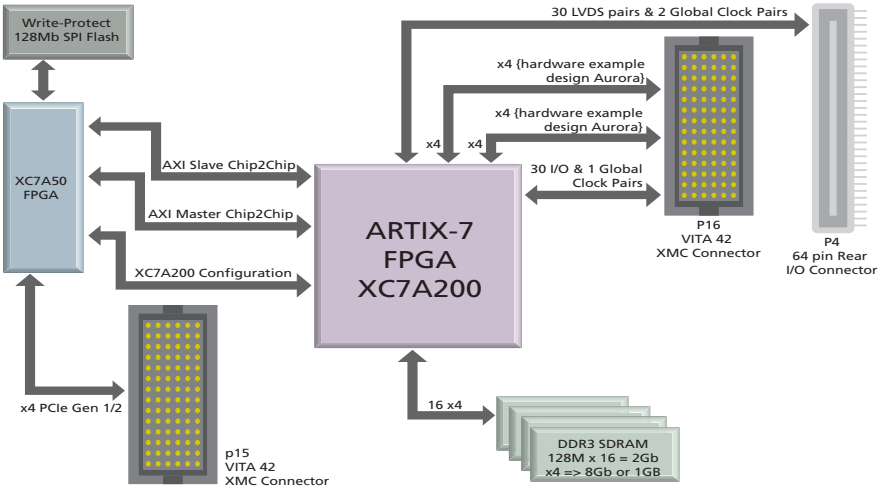
XMC Modules

XMC-7AWP User-Configurable Artix®-7 FPGA Modules





ARTIX-7

XMC module with PCIe interface ◆ Logic-optimized Artix-7 FPGA ◆ Write-protected flash

Description

Acromag's XMC-7AWP modules feature a high-performance user-configurable Xilinx® Artix®-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.

For security, the FPGA's configuration flash is write-protected. The XC7A200 is only configurable via PCIe bus or JTAG. There is no configuration memory.

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 Artix-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 Artix-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 Integrated Logic Analyzer, you can rapidly debug logic and serial interfaces.

Key Features & Benefits

- Reconfigurable Xilinx Artix-7 FPGA with 200k logic cells
- 128M x 64-bit DDR3 SDRAM
- XC7A50 FPGA bitstream storage flash is write protected via DIP switch selection.
- 4-lane high-speed serial interface on rear P15 connector for PCIe Gen 1/2 (standard), Serial RapidI/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

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XMC-7AWP User-Configurable Artix-7 FPGA Modules

Performance Specifications

FPGA

FPGA device

Xilinx® Artix®-7 FPGA.

Model XC7A200T FPGA with 215,360 logic cells and 740 DSP48E1 slices.

FPGA configuration

XC7A200 is configurable via PCIe bus or JTAG.
XC7A50 is configured from flash memory or JTAG.
Flash is write protected by default.

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

Rear high-speed I/O

12 high-speed serial lanes.
x8 lanes via P15 and x8 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-7AWP module (see 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 x4 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

8 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).

FPGA Vcco pins powered by 2.5V and support 2.5V I/O standards. Optionally can be powered by 3.3V to support 3.3V I/O standards.

Environmental

Operating temperature

XMC-7AWP: -40 to 75°C cold-plate.

Storage temperature

-55 to 125°C.

Relative humidity

5 to 95% non-condensing.

Power

+3.3 Volts	2.1 A typical
+3.3 Aux Volts	17 uA typical
+12/5 Volts (VPWR)	150 mA @ +12V typical
+12 Volts	0.1 mA typical

MTBF

Contact the factory.

Ordering Information

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

XMC Modules

Go to on-line ordering page >

XMC-7AWP
User-configurable Artix-7 FPGA, 200k logic cells

Software

XMC-7AWP-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)

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