VPX Boards

VPX-VLX Board with User-Configurable Virtex-5 FPGA

**Description**

VPX-VLX85: 85k logic cells
VPX-VLX110: 110k logic cells
VPX-VLX155: 155k logic cells

Acromag’s VPX-VLX 3U VPX boards feature a configurable Xilinx® Virtex®-5 FPGA enhanced with multiple high-speed memory buffers and a high-throughput PCIe interface. The result is a powerful and flexible logic processor module that is capable of executing your custom instruction sets and algorithms.

Three models provide a choice of logic-optimized FPGAs to match your performance requirements. Although there is no limit to the uses for these boards, several applications are ideal. Typical uses include hardware simulation, military servers, communications, in-circuit diagnostics, signal intelligence, and image processing.

Large, high-speed memory banks provide efficient data handling. Generous DDR2 SDRAM buffers store captured data prior to FPGA processing. Afterward, data is moved to dual-port SRAM for high-speed DMA transfer to/from the rest of the system. A high-bandwidth PCIe interface ensures fast data throughput.

64 I/O lines are accessible through the rear (P2) connector. Additional I/O processing is supported on a separate mezzanine card that plugs into the FPGA base board. A variety of these external AXM I/O cards are available to interface your analog and digital I/O signals.

Take advantage of the conduction-cooled version for use in hostile environments. Conduction efficiently dissipates heat if there is inadequate cooling air flow.

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 VHDL debugging.

**Key Features & Benefits**

- Reconfigurable Xilinx Virtex-5 FPGA
- PCIe bus 4-lane Gen 1 interface
- Supports both front and rear I/O connections
- 64 I/O or 32 LVDS lines direct to FPGA via rear (P2) connector
- Plug-in I/O extension modules are available for the front mezzanine
- FPGA code loads from the PCIe bus or from on-board flash memory
- 1M x 64-bit dual-ported SRAM provides direct links from the PCIe bus and to the FPGA
- 32M x 32-bit DDR2 SDRAM is directly accessed through the FPGA
- Supports dual DMA channel data transfer to/from the rest of the system
- Support for Xilinx ChipScope™ Pro interface
- Designed for conduction-cooled host card or -40 to 85°C operation in air-cooled systems

**Conduction-cooled version**

Plug in an AXM analog or digital I/O module for additional I/O signal processing capabilities.
VPX Board with User-Configurable Virtex-5 FPGA

VPX-Board

Performance Specifications

- **General**
  - **Form Factor**
    - 3U VPX bus 6.299” (160mm) x 3.937” (100.0mm).
  - **Pitch**
    - VPX-VLXxxx (air-cooled): 0.80” pitch.
    - VPX-VLXxxx-CC (conduction-cooled): 0.85” pitch.
  - **Chassis Compatibility**
    - Compatible VITA 65 module / slot profiles:
      - MOD3-PER-2F-16.3.2-2 / SLT3-PER-2F-14.3.2
      - MOD3-PAY-1D-16.2.6-1 / SLT3-PAY-1D-14.2.6
  - **FPGA**
    - VXI-46.4 fat pipe (x4) PCIe Gen 1 interface.
    - FRU EEPROM with temperature monitor.
    - No hosting capabilities.
  - **Note 1:** Board is compatible with payload profiles but note that no hosted FPGA solution is provided.
    - MOD3-PAY-2F-16.2.7-11 / SLT3-PAY-2F-14.2.7
    - MOD3-PER-1F-16.3.2-2 / SLT3-PER-1F-14.3.2
    - MOD3-PER-2F-16.3.1-3 / SLT3-PER-2F-14.3.1

- **Example FPGA program**
  - Download via PCIe bus or flash memory.
  - Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a VPX-VLX module (see www.acromag.com for more information).

- **Environmental**
  - Air-Cooled Operating Temperature
    - 0 to 70°C (air flow requirement as measured to be greater than 200 LFM).
  - Conduction-Cooled Operating Temperature (board must operate in a fully-installed conduction-cooled rack).
  - Storage Temperature Range
    - -40°C to 85°C
  - Relative Humidity
    - 5 to 95% non-condensing.
  - Vibration
  - 0.05g RMS (20 - 2000Hz) random, 10g RMS per Hz spectrum.
  - Shock
    - 30g each axis, 11ms.
  - MTBF
  - Consult factory.

- **I/O Processing**
  - Acromag AXM I/O modules:
    - AXM modules plug into the FPGA board's front mezzanine for additional I/O lines. Analog and digital I/O AXM modules are sold separately.
  - Rear I/O
    - 64 I/O (32 LVDS) lines supported with a direct connection between the FPGA and the rear I/O connector (P2).

- **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 VPX-VLX module (see www.acromag.com for more information).

- **Power Requirements**
  - Carrier-Only Power Requirements
    - +3.3V DC: 0.9A typical plus any additional power consumed by PMC/XMC (4A max).
    - +5V DC: 0.9A typical plus any additional power consumed by PMC/XMC (4A max).
    - +12V DC and –12V DC provided to PMC site from PCIe backplane.

- **Ordering Information**
  - **NOTE:** XMC-VLX-EDK is required to configure FPGA.

- **FPGA**
  - VXI-46.4 fat pipe (x4) PCIe Gen 1 interface.

- **Software**
  - Linux™ support (website download only)
  - Windows® DLL software support package
  - VxWorks® software support package
  - XMC-VLX-EDK

- **AXM Plug-In I/O Extension Modules**
  - For more information, see www.acromag.com.
  - 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.

- **Carrier-Only Power Requirements**
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  - +3.3V DC: 0.9A typical plus any additional power consumed by PMC/XMC (4A max).
  - +12V DC and –12V DC provided to PMC site from PCIe backplane.

- **FRU EEPROM**
  - Provides FRU EEPROM for temperature monitoring.

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