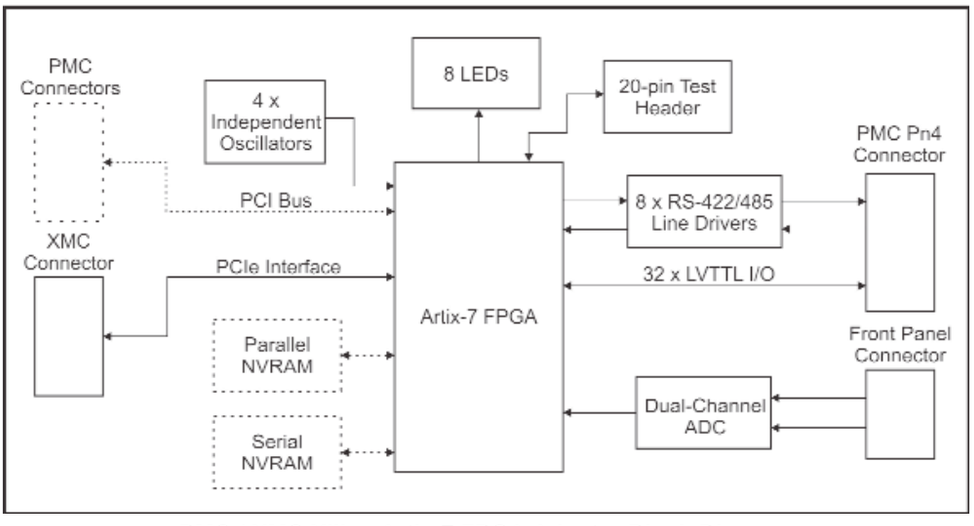
PMC / XMC Xilinx Artix-7 FPGA Adapter

The PMC / XMC Xilinx Artix-7 Field-Programmable Gate Array (FPGA) Adapter offers a user-progammable FPGA on a single PMC or XMC adapter. The User FPGA Adapter can be supplied with a range of Xilinx Artix-7 series FPGAs, including the XC7A15T, XC7A35T, XC7A50T, XC7A75T, XC7A100T and the XC7A200T. The User FPGA Adapter has highly customisable I/O options such as eight RS-422/485 channels and thirty-two Low Voltage Transistor-Transistor Logic (LVTTL) I/O signals routed to the backplane connector. The User FPGA Adapter also offers two high-speed 160 MSps Analog-to-Digital (ADC) converter inputs, optional Serial and Parallel Non-Volatile Random-Access Memory (NVRAM), onboard oscillators and onboard LED indicators.

The adapter design complies with the XMC specification (ANSI/VITA 42.3-2006) and the Conduction-Cooled PMC (CCPMC) specification (ANSI/VITA 20-2001) and is available in ruggedised, industrial and commercial versions. A version with front panel I/O is available as an option.

Architecture

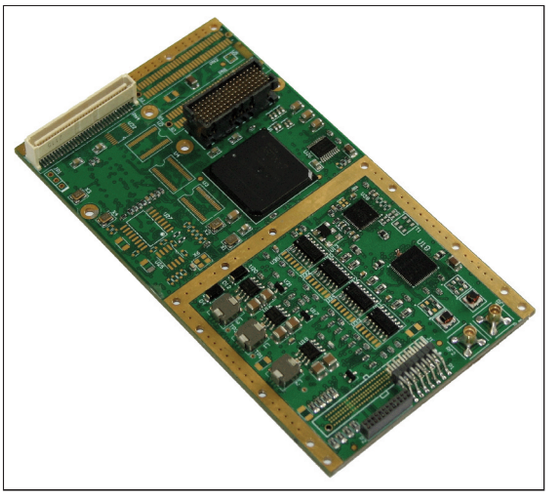
The User FPGA Adapter consists of a user-programmable Xilinx Artix-7 FPGA, with the PMC PCI signals and the XMC PCIe signals routed to the FPGA. Serial and Parallel NVRAM and a high-speed ADC are routed to the FPGA. The Parallel NVRAM can be replaced with Error-Correcting Code (ECC) Memory on request. Eight RS-422/485 line drivers are connected to the FPGA and are routed to either the front panel or rear panel I/O PMC connector. Four independent oscillators for use with the FPGA can be fitted.



PMC / XMC Xilinx Artix-7 FPGA Adapter Block Diagram

Features

- Xilinx Artix-7 FPGA
- 4-Lane PCIe interface (XMC)
- 32-bit, 33/66 MHz PCI Bus (PMC, optional)
- 160 MSps Analog-to-Digital Converter
- up to 16 Mbit Parallel NVRAM (optional)
- up to 1 Mbit Serial NVRAM (optional)
- eight user-controlled LEDs
- eight RS-422/485 line driver channels
- four independent oscillators routed to FPGA
- 32 x LVTTL I/O signals routed to PMC connector Pn4
- 20-pin test header



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User FPGA Adapter

Board-Level

PMC / XMC Xilinx Artix-7 FPGA Adapter

Specifications	
FPGA	Xilinx Artix-7 FPGA : XC7A15T, XC7A35T, XC7A50T, XC7A75T, XC7A100T or XC7A200T
PCIe	4-Lane PCIe, 2,5 GHz PCIe Electrically : PCI Express Rev. 2.0
PCI	32-bit, 33/66 MHz Electrically : PCI Rev. 2.2; 3,3 V or 5 V signalling
ADC	Two independent 14-bit ADC channels, sampling rate up to 160 MSps per channel, signal amplitude up to 2,5 Vpeak-peak
Parallel NVRAM	up to 16 Mbit (optional)
Serial NVRAM	up to 1 Mbit (optional)
LEDs	eight user LEDs
Line Drivers	eight RS-422/485 line drivers routed to Pn4
Clocks	4 independent oscillators routed to FPGA
LVTTL I/O	32 signals routed to Pn4
Test Header	20-pin test header

Reliability			
MTBF	Figures according to MIL-HDBK-217F, Parts Stress Method		
	Commercial Grade	Ground Benign, Controlled, 25 C	780 000 hours
	Industrial Grade	Ground, Mobile, 45 C	95 000 hours
		Naval, Sheltered, 40 C	225 000 hours
		Airborne, Inhabited Cargo, 55 C	103 000 hours
		Airborne, Uninhabited Cargo, 70 C	33 000 hours
		Airborne, Rotary Wing, 55 C	32 000 hours
		Airborne, Inhabited Fighter, 55 C	82 000 hours
		Airborne, Uninhabited Fighter, 70 C	27 000 hours
	Ruggedised Grade	Ground, Mobile, 45 C	103 000 hours
		Naval, Sheltered, 40 C	245 000 hours
		Airborne, Inhabited Cargo, 55 C	110 000 hours
		Airborne, Uninhabited Cargo, 70 C	37 000 hours
		Airborne, Rotary Wing, 55 C	36 000 hours
		Airborne, Inhabited Fighter, 55 C	88 000 hours
		Airborne, Uninhabited Fighter, 70 C	29 000 hours

PMC / XMC Xilinx Artix-7 FPGA Adapter

Environmental Specifications

Grade	Commercial	Industrial	Ruggedised
Temperature - Operating - Storage	 0 C to +55 C -40 C to +85 C	 -15 C to +75 C -40 C to +85 C	 -40 C to + 85 C -55 C to +125 C
Humidity	0% - 90%	0% - 95%	0% - 95%
Shock	N/A	30 g peak for 11 ms	40 g peak for 11 ms
Vibration - Sine - Random	 2 g (peak) at 10 Hz to 100 Hz 0,04 g²/Hz at 15 Hz to 2 kHz	 10 g (peak) at 5 Hz to 2 kHz 0,1 g²/Hz at 15 Hz to 2 kHz	 10 g (peak) at 5 Hz to 2 kHz 0,1 g²/Hz at 15 Hz to 2 kHz

Physical Characteristics

Formfactor	Dimensions	Mass
CCPMC (ANSI/VITA 20-2001)	143,75 mm x 74,00 mm (+ 0,0 / -0,5 mm), conforming to VITA 20 height envelope	55 g +/- 10 g

Part Selector

Part Designation	Formfactor	I/O	Cooling	Grade
CCII/FPGA/PMC/002/BP/COM	PMC	Back Panel	Air	Commercial
CCII/FPGA/PMC/002/BP/IND	PMC	Back Panel	Air	Industrial
CCII/FPGA/PMC/002/BP/RGD	PMC	Back Panel	Air	Ruggedised
CCII/FPGA/PMC/002/BP/CC	PMC	Back Panel	Conduction	Ruggedised
CCII/FPGA/PMC/002/FP/COM	PMC	Front Panel	Air	Commercial
CCII/FPGA/PMC/002/FP/IND	PMC	Front Panel	Air	Industrial
CCII/FPGA/PMC/002/FP/RGD	PMC	Front Panel	Air	Ruggedised
CCII/FPGA/XMC/002/BP/COM	XMC	Back Panel	Air	Commercial
CCII/FPGA/XMC/002/BP/IND	XMC	Back Panel	Air	Industrial
CCII/FPGA/XMC/002/BP/RGD	XMC	Back Panel	Air	Ruggedised
CCII/FPGA/XMC/002/BP/CC	XMC	Back Panel	Conduction	Ruggedised
CCII/FPGA/XMC/002/FP/COM	XMC	Front Panel	Air	Commercial
CCII/FPGA/XMC/002/FP/IND	XMC	Front Panel	Air	Industrial
CCII/FPGA/XMC/002/FP/RGD	XMC	Front Panel	Air	Ruggedised