FMC228

Quad ADC 12-bit @ 1 GSPS, FMC

FMC228

Key Features

- FPGA Mezzanine Card (FMC) per VITA 57

- Quad ADC based on AD9234 (1GSPS or 500 MSPS)

  - Optional decimate-by-2 DDC per channel

  - JESD204B

  - 2 GHz analog input full power bandwidth

- Option for Direct RF sampling clock via front panel

- Supported by DAQ Series™ data acquisition software

- On board wide-band PLL

- Trig In/Out

- CLK In

Benefits

- Array of FMC's and FMC carriers available from VadaTech

- Design utilizes proven VadaTech subcomponents and engineering techniques

- Electrical, mechanical, software, and system-level expertise in house

- Full system supply from the industry leader

- AS9100 and ISO9001 certified company
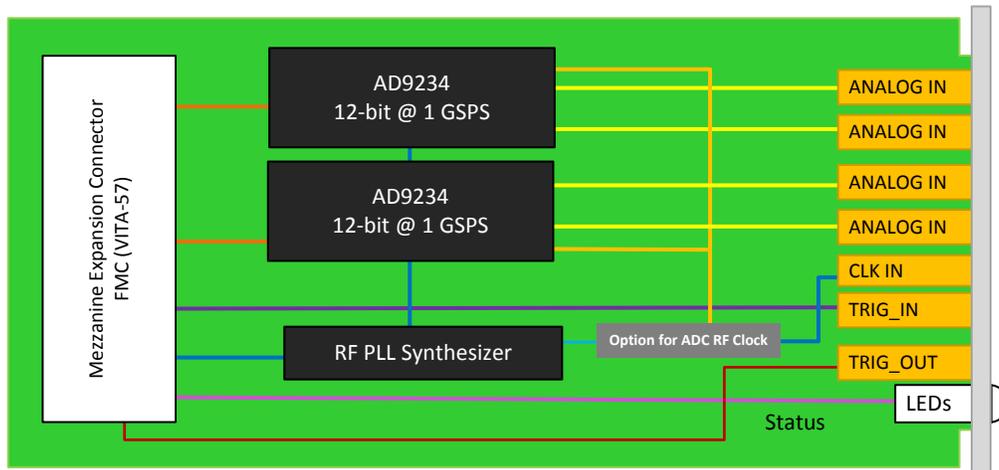
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FMC228

The FMC228 is an FPGA Mezzanine Card (FMC) per VITA 57 specification. The module utilizes dual AD9234 ADCs (1 GSPS or 500 MSPS) providing two inputs per ADC with 12-bit conversion rates of up to 1.0 GSPS.
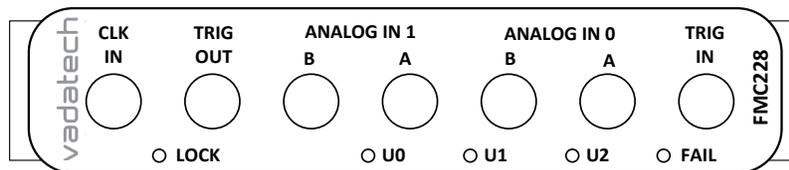
The front panel RF clock is a reference input clock to the PLL or it could input to the ADC direct sampling clock. The PLL can also receive its reference clock from an on board or the FMC Carrier. The front panel also has Trig In/Out and CLK In ports.

Block Diagram

Front Panel

FMC228 – Quad ADC 12-bit @ 1 GSPS, FMC

Data Acquisition

VadaTech offers a wide range of FPGA AMCs, RTMs, FMC Carriers and FMCs that can be combined to build a Data Acquisition (DAQ) sub-system. The DAQ Series software, when used with a supported hardware configuration, provides all that is needed to configure the system, acquire data and transfer it to a host processor. It also includes a user-configurable Graphical User Interface (GUI) which includes real-time display of acquired data. The host can be within the MTCA system or, via PCI113 or PCI123, in a separate PC. Full documentation is provided to allow users to customise system behaviour or develop their own application on the AMC/FMC hardware.
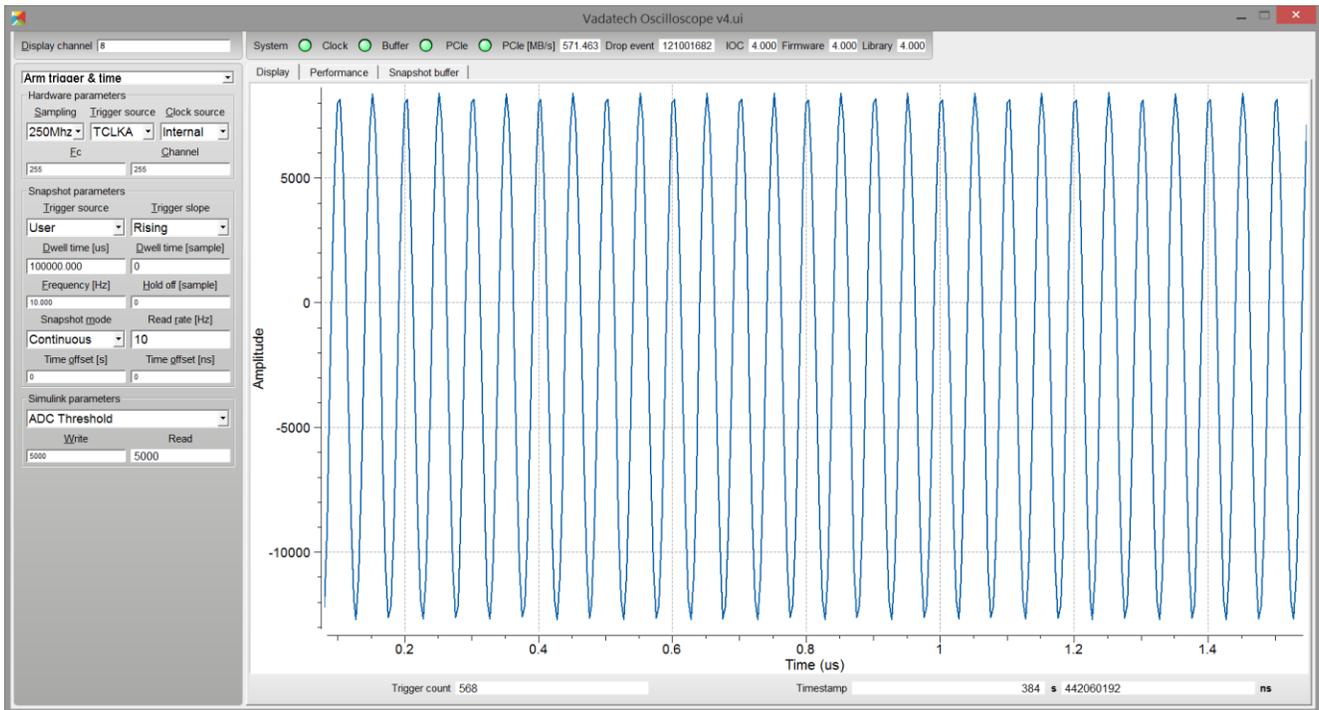

Figure 1: Typical User Interface Display

The DAQ includes data acquisition software that allows users to get up and running quickly and easily, while providing a high level of performance and allowing the user to extend functionality by adding their own FPGA code. Please contact VadaTech sales for the latest information on supported combinations of VadaTech hardware. (Note that the DAQ Series software is not currently supported for 3rd party hardware).

The DAQ Series software provides ability to easily implement system modelling and automatic code generation from Simulink® and MATLAB® (The Mathworks, Inc.) into Vivado FPGA project via System Generator® (Xilinx). This allows the programmer to interface with the hardware, program the FPGA at high level and benefit from:

- Vivado integration

- DSP modelling

- Bit and cycle accurate floating and fixed-point implementation

- Automatic code generation of VHDL or Verilog from Simulink

- Hardware co-simulation

Components provided in the DAQ software include:

- System libraries to configure clocking and triggers

- Sequencer to configure the acquisition (duration, start, stop)

- High-performance DMA firmware for acquiring ADC outputs and transferring to host processor

- Linux driver for host processor (e.g. AMC72x)

- EPICS channel access client API

- Pre-configured GUI (based on Qt Creator)

This software set allows the user to acquire, transfer and display data without the need for any user programming of the hardware. Status information is included in the GUI display, to ease integration and debugging activity.

The data acquisition software provided as part of the DAQ can be used as-delivered without the user needing to develop any FPGA code.

Note that VHDL source code is not provided for the DMA engine and memory block (provided as Netlists).

Full source code is provided for the libraries, sequencer, Linux driver and GUI, allowing users to easily customize or brand to their own requirements.

Specifications

Architecture		
Physical	**Dimensions**	Width: 2.71" (69 mm)
		Depth: 3.01" (76.5 mm)
Type	**FMC**	Quad Analog to Digital Converter (ADC)

Standards		
FMC	**VITA-57**	ANSI/VITA 57.1-2008

Configuration		
Power	**FMC228**	5 W
Environmental	**Temperature**	Operating temperature: -5° to 45° C (55°C for limited time, performance restrictions may apply), industrial and extended versions also available (See environmental spec sheet)
		Storage Temperature: –40° to +85°C
	Vibration	1G, 5 to 500 Hz on each axis
	Shock	30Gs on each axis
	Relative Humidity	5 to 95 per cent, non-condensing
Front Panel	**Interface Connectors**	7x SSMC
	LEDs	Status and user defined (total 5)
Software Support	**Operating System**	Linux (consult VadaTech for other options)
Conformal Coating		Humiseal 1A33 Polyurethane (Optional)
		Humiseal 1B31 Acrylic (Optional)

Other		
MTBF	MIL Hand book 217-F@ TBD hrs	
Certifications	Designed to meet FCC, CE and UL certifications, where applicable	
Standards	VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards	
Warranty	Two (2) years	

INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of ATCA and µTCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTM), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.

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Ordering Options

FMC228 – ABC-000-G0J

A = ADC Speed		G = FMC Board Spacing
0 = 1 GSPS 1 = 500 MSPS		0 = 10 mm (per VITA-57 specification) 1 = 17.5 mm *
B = RF Sampling Clock		
0 = Via on-board wide band PLL 1 = Direct RF Sampling		
C = Front End Analog Input		**J = Temperature Range and Coating**
0 = Frequencies of up to 500 MHz 1 = Frequencies greater than 500 MHz		0 = Commercial (–5° to +55° C), No coating 1 = Commercial (–5° to +55° C), Humiseal 1A33 Polyurethane 2 = Commercial (–5° to +55° C),Humiseal 1B31 Acrylic 3 = Industrial (–20° to +70° C), No coating 4 = Industrial (–20° to +70° C), Humiseal 1A33 Polyurethane 5 = Industrial (–20° to +70° C), Humiseal 1B31 Acrylic 6 = Extended (–40° to +85° C), Humiseal 1A33 Polyurethane** 7 = Extended (–40° to +85° C), Humiseal 1B31 Acrylic**

* For use with carriers that require higher mating clearance, such as VadaTech AMC595. Requires full size AMC

** Conduction cooled, temperature is at edge of module. Consult factory for availability

Related Products

AMC516

- AMC FPGA carrier for FMC per VITA-57

- Xilinx Virtex-7 690T FPGA in FFG-1761 package with optional P2040

- Supported by DAQ Series™ data acquisition software

AMC532

- AMC FPGA based on Altera Stratix-V (5SGXEA) in F1932 package

- VITA 57.1 FMC HPC Connector (compatible with LPC)

- All FMC LA, HA, HB pairs routed bi-directionally

FMC109

- FPGA Mezzanine Card (FMC) per VITA-57

- Single module

- Quad SPF/SPF+ cages for quad ports

Contact

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