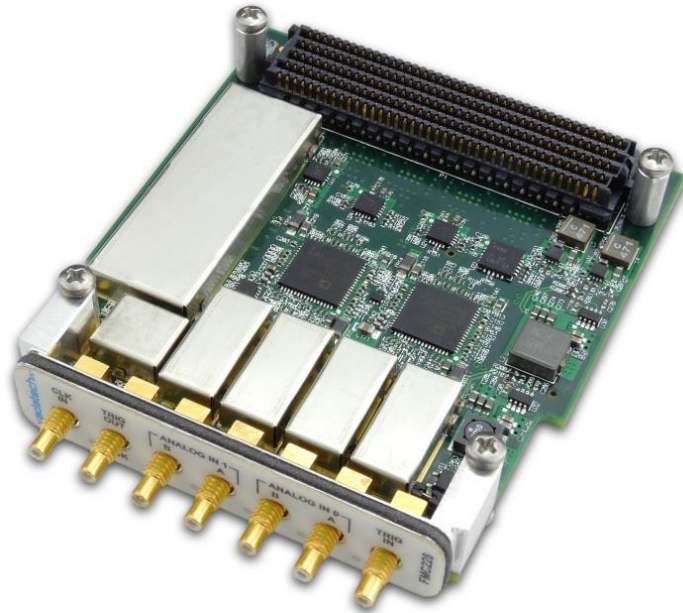


## FMC228 –Quad ADC 12-bit @ 1 GSPS, FMC

FMC, Quad ADC 12-bit



### KEY FEATURES

- FPGA Mezzanine Card (FMC) per VITA 57
- Quad ADC based on AD9234
  - 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 of Choosing VadaTech

- 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

The FMC228 is an FPGA Mezzanine Card (FMC) per VITA 57 specification. The module utilizes dual AD9234 ADCs 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.

## 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.

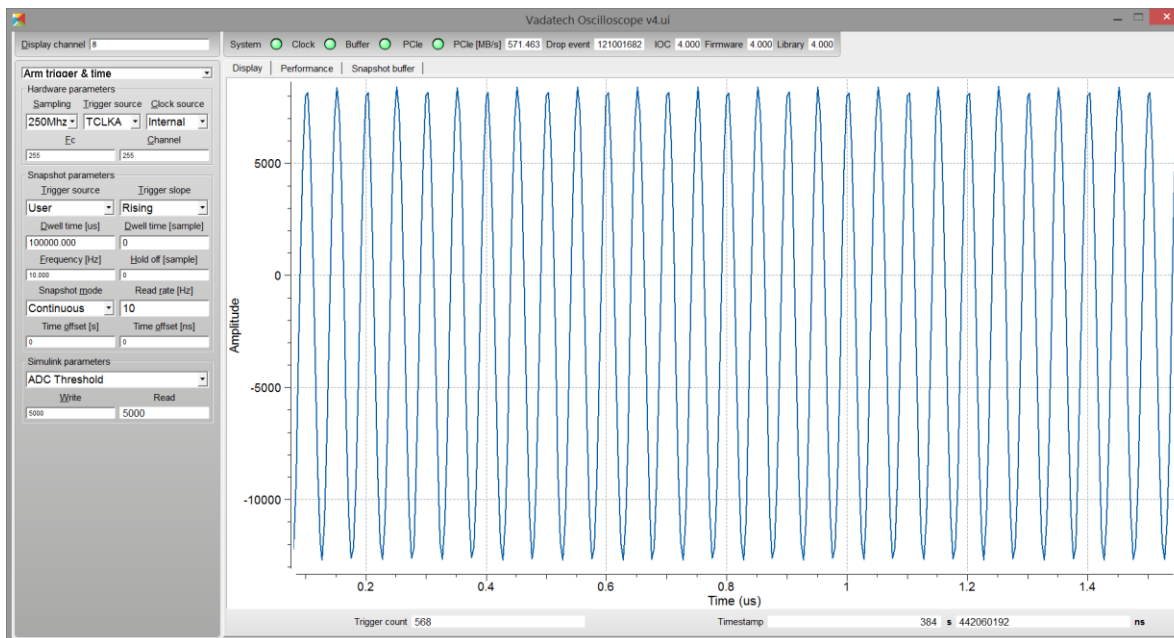


Figure 1: Typical User Interface Display

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)

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

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.

## BLOCK DIAGRAM

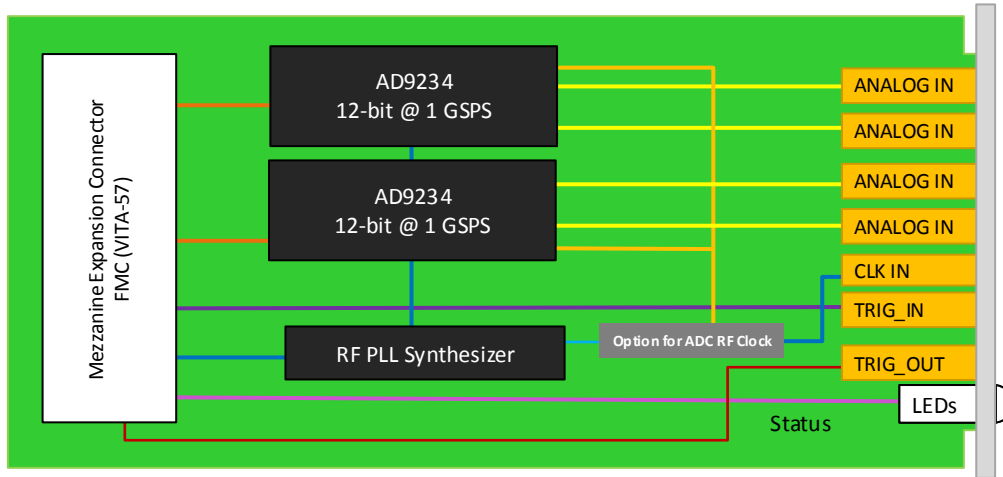


Figure 2: FMC228 Functional Block Diagram

## FRONT PANEL

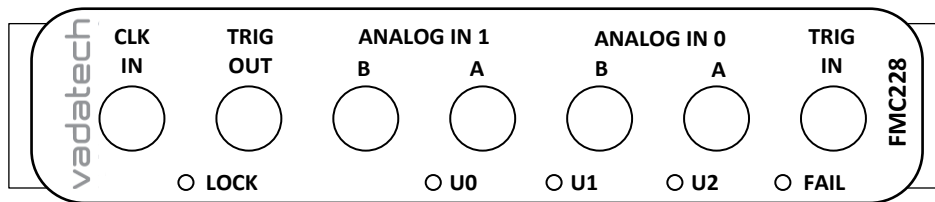


Figure 3: FMC228 Front Panel

## SPECIFICATIONS

Architecture		
Physical	Dimensions	Single module
		Width 2.71" (69 mm)
		Depth 3.01" (76.5 mm)
Type	FMC	Quad Analog to Digital Converter (ADC)
		FMC connector
Standards		
FMC	VITA-57	ANSI/VITA 57.1-2008
Configuration		
Power	FMC228	5W
Environmental	Temperature	Operating Temperature: -5° to 55° C (air flow requirements >400 LFM))
		Storage Temperature: -40° to +85° C
	Vibration	1G, 5 to 500 Hz on each axis
	Shock	30Gs each axis
	Relative Humidity	5 to 95 percent, non-condensing
Front Panel	Interface Connectors	7 SSMC
	LEDs	Status
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  $\mu$ TCA 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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# FMC228 – Quad ADC 12-bit @ 1 GSPS, FMC

## ORDERING OPTIONS

### FMC228 – 0B0 – 000 – G0J

#### B = RF Sampling clock

- 0 = Via on Board wide band PLL
- 1 = Direct RF Sampling

#### G = FMC Board Spacing

- 0 = 10 mm (per VITA-57 specification)
- 1 = 17.5 mm \*

#### J = Temperature Range and Coating

- 0 = Commercial, No coating
- 1 = Commercial, Humiseal 1A33 Polyurethane
- 2 = Commercial, Humiseal 1B31 Acrylic
- 3 = Industrial, No coating
- 4 = Industrial, Humiseal 1A33 Polyurethane
- 5 = Industrial, Humiseal 1B31 Acrylic
- 6 = Extended, Humiseal 1A33 Polyurethane\*\*
- 7 = Extended, Humiseal 1B31 Acrylic\*\*

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

\*\* Edge of module for conduction cooled boards

## RELATED PRODUCTS



AMC516 Virtex-7  
FPGA



AMC532 Stratix-V  
FPGA



FMC109 Quad  
SFP+ FMC

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