

FMC220

Dual 12-bit 1 GSPS ADC and
16-bit 6 GSPS DAC, FMC



FMC220

Key Features

- Analog Devices AD9234 dual 1 GSPS ADC
- The Analog inputs for the ADC are DC coupled
- Analog Devices AD9162/9164 6 GSPS RF DAC
 - Update rate up to 12 GSPS in some modes
 - Up to 7.5 GHz in 2nd and 3rd Nyquist
 - Fast frequency hopping (AD9164)
- Supported by DAQ Series™ data acquisition software
- FPGA Mezzanine Card (FMC) per VITA 57
- Excellent dynamic performance

Benefits

- High dynamic range for versatility in video/broadcast requirements
- Ideal for Broadband communications systems, Wireless infrastructure, LTE, ATE, RADAR/Jamming
- Array of FMC's and FMC carriers available from VadaTech
- 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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FMC220

The FMC220 is an FPGA Mezzanine Module per VITA 57 specification. The FMC220 has dual 12-bit ADC at 1 GSPS (note the inputs for the ADC are DC coupled) and a 16-bit DAC at 6 GSPS (12 GSPS effective, in some modes) with direct RF synthesis and optional Direct Digital Synthesizer. The output from the DAC is AC coupled.

The FMC220 utilizes Analog Devices AD9234 providing dual ADCs with 12-bit conversion at rates of up to 1 GSPS and an Analog Devices AD9162 DAC providing 16-bit conversion at rates of up to 6 GSPS or AD9164 with Direct Digital Synthesizer. The DAC core is based on a quad-switch architecture coupled with a 2x interpolator filter that enables an effective DAC update rate of up to 12 GSPS in some modes. The high dynamic range and bandwidth makes these DACs ideally suited for the most demanding high speed radio frequency (RF) DAC applications.

The analog inputs, clock input and DAC output are routed via SSMC connectors.



Block Diagram

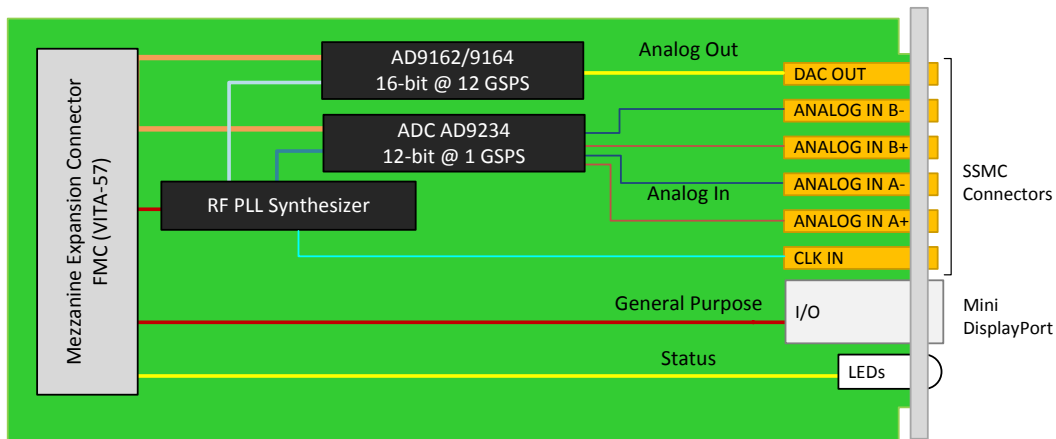


Figure 1: FMC220 Functional Block Diagram

Front Panel

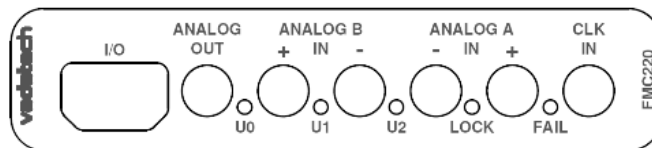


Figure 2: FMC220 Front Panel

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 customize system behavior or develop their own application on the AMC/FMC hardware.

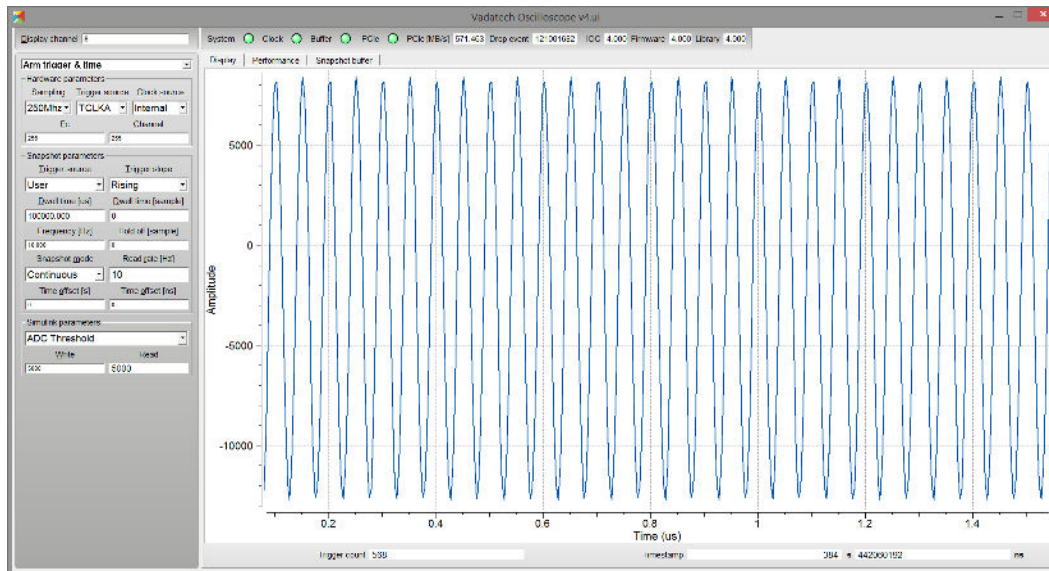


Figure 3: Typical User Interface Display

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.

Full source code is provided for the libraries, sequencer, DMA, Linux driver and GUI, allowing users to easily customize or brand to their own requirements at the exception of a low level PCIe IP from Xilinx provided only as Netlist (this low level block doesn't require modification/customization from integrators or end-users).

Specifications

Architecture		
Physical	Dimensions	Single module
		Width: 2.71" (69 mm)
		Depth 3.01" (76.5 mm)
Type	FMC	Dual ADC and Single DAC
Standards		
FMC	VITA-57	ANSI/VITA 57.1-2008
Configuration		
Power	FMC220	TBD
Environmental	Temperature	Operating temperature: -5° to 45° C (55°C for limited time, performance restrictions may apply), industrial versions also available (See environmental spec sheet)
		Storage Temperature: -40° to +85°C
		Vibration
	Shock	Operating 30G on each axis
	Relative Humidity	5 to 95 per cent, non-condensing
Front Panel	Interface Connectors	6x SSMC
		1x Mini DisplayPort
	LEDs	5x Status
Software Support	Operating System	Agnostic
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 μ 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.

Ordering Options

FMC220 – A00-000-G0J

A = ADC Clock		G = FMC Board Spacing
0 = Reserved 1 = On Board wide band PLL		0 = 10 mm (per VITA-57 specification) 1 = 17.5 mm *
B = DAC Type		
0 = AD9162 1 = AD9164 (DDS)		
		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

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

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

AMC530



- Altera Stratix IV Device EP4S100Gx in 1517 pin count (40mm x 40mm)
- On board PLL for buffering/multiplying and jitter cleaner
- Three banks of QDR-II+ each 72-bit wide

FMC210



- FPGA Mezzanine Card (FMC) per VITA-57
- Single ADC EV10AS150B @ 2.6 GSPS
- 5 GHz Full Power Input Bandwidth (–3dB)

Contact

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DOC NO. 4FM737-12 REV 01 | VERSION 1.3- MAR/17



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