

FMC214 – 70 MHz to 6 GHz Dual Versatile Wideband Transceiver (MIMO), FMC

70 MHz to 6 GHz, RF Synthesizer



KEY FEATURES

- Dual complete transceiver signal chain solution using Analog Devices AD9361 transceiver
- Frequency range 70 MHz to 6 GHz with instantaneous bandwidth from 200 kHz to 56 MHz
- MIMO transceiver is Time Domain Duplex (TDD) and Frequency Domain Duplex (FDD) compatible
- Supported by DAQ Series™ data acquisition software
- FPGA Mezzanine Card (FMC) per VITA 57
- Multiplexed 2x RF inputs on each RF channel
- On-board clocking or external clock with multi-card synchronization capability
- Low Pin Count (LPC) 160-pin connector



Benefits of Choosing VadaTech

- Ideal for LTE and SDR applications with wideband range versatility
- High modulation accuracy with ultralow noise
- 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

The FMC214 is a FPGA Mezzanine Card (FMC) per VITA 57.1 standard, offering small footprint and low power dual fully featured wideband Rx/Tx channels.

The FMC214 combines RF front end, frequency synthesizers for Rx and for Tx, mixed-signal baseband section and flexible digital interface to host processor through the LPC connector. The FMC214 operates within the 70 MHz to 6.0 GHz frequency range, covering most licensed and unlicensed bands, and provides an instantaneous bandwidth programmable from 200 KHz to 56 MHz. The clocking is via the FMC connector or an internal clock. Its features make the FMC214 an ideal choice for the development and/or deployment of advanced RF solutions. This Multiple Input Multiple Output (MIMO), module is the most versatile FMC in the market.

Utilizing an AD9361 RF transceiver, the chip offers high performance noise figure and linearity. Each receive (RX) subsystem includes independent automatic gain control (AGC), quadrature correction, dc offset correction, and digital filtering.

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.

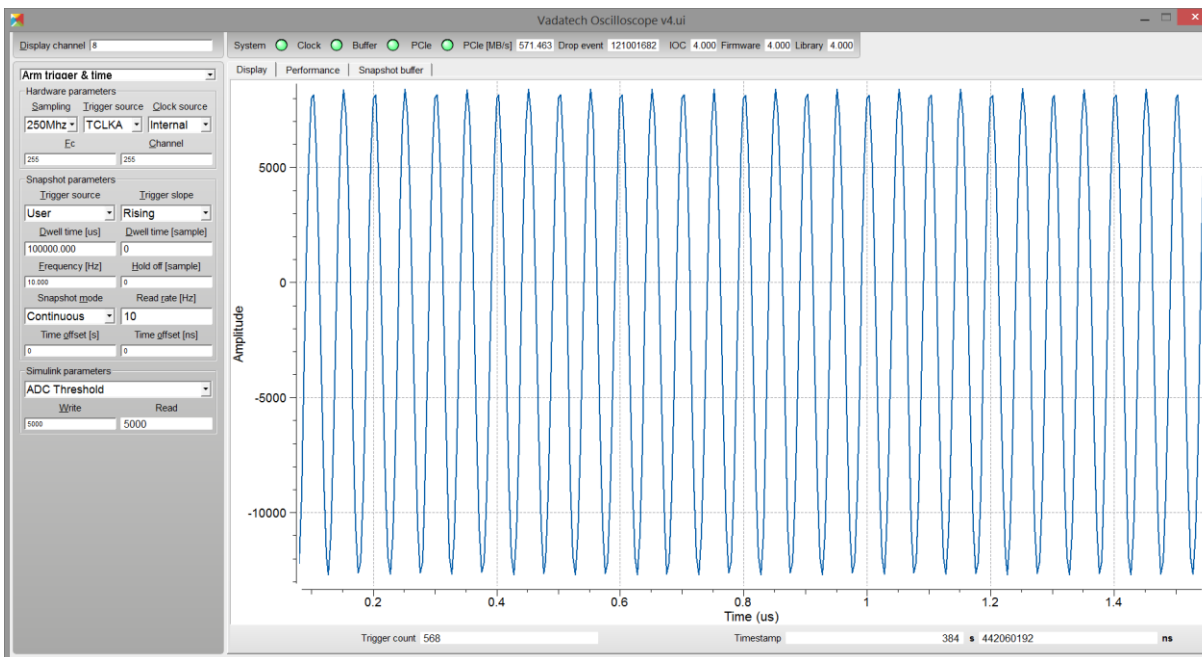


Figure 1: Typical User Interface Display

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)

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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

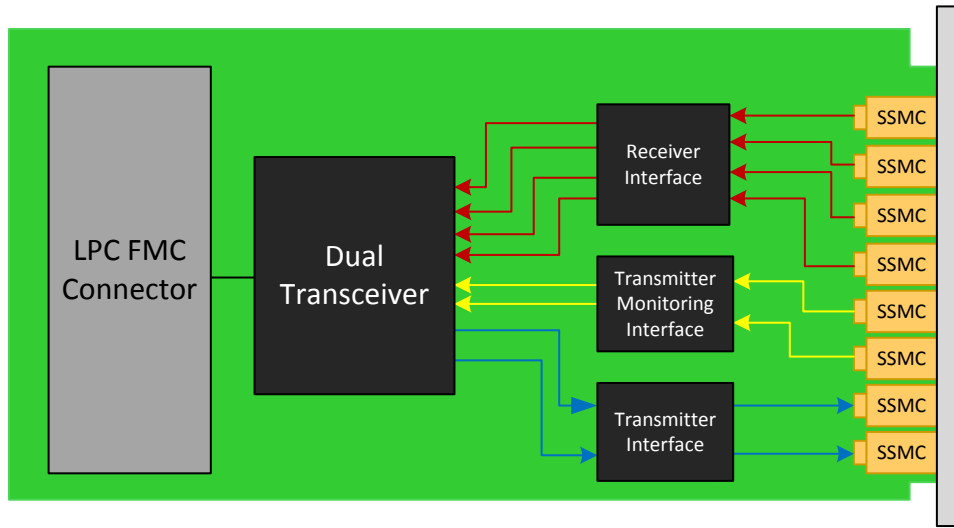


Figure 2: Block Diagram

FRONT PANEL

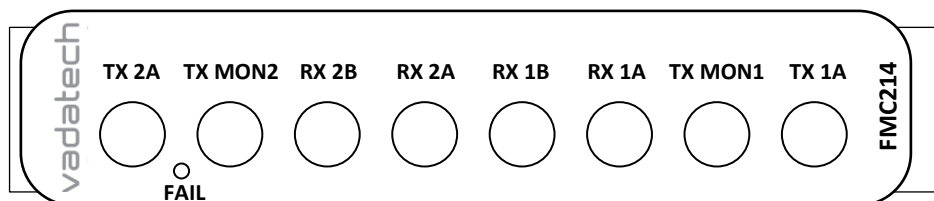


Figure 3: FMC214 Front Panel

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SPECIFICATIONS

Architecture		
Physical	Dimensions	Single module
		Width 2.71" (69 mm) Depth 3.01" (76.5 mm)
Type	FMC	Dual wideband transceiver, AD9361 FMC connector
Standards		
FMC	VITA 57	ANSI/VITA 57.1-2008
Configuration		
Power	FMC214	2W
Performance	Broadband transmitter	TX EVM: \leq -40dB
		TX noise: \leq -17dBm/Hz noise floor
		TX monitor: \geq 66 dB dynamic range with 1 dB accuracy
	Integrated synthesizers	2.4 Hz maximum LO step size
Environmental	Vibration	1G, 5 to 500 Hz on each axis
	Shock	30Gs each axis
	Temperature	Operating Temperature: -5° to 55° C (air flow requirements >400 LFM)) Storage Temperature: -40° to +85° C
	Relative Humidity	5 to 95 percent, non-condensing
Front Panel	Interface Connectors	8x SSMC Front Panel Connector
	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 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

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ORDERING OPTIONS

FMC214 – 000 – 000 – 0HJ

H = Operating Temperature

0 = Commercial

1 = Industrial

J = Conformal Coating

0 = None

1 = Humiseal 1A33 Polyurethane

2 = Humiseal 1B31 Acrylic

RELATED PRODUCTS



AMC515 Virtex-7
FPGA



FMC108 Dual
QSFP+ FMC



FMC223 Dual
14-bit D/A

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