



# Move Quickly from Prototype to Production with Analog Devices

Analog Devices, the world leader in data conversion and signal conditioning technologies, offers a broad analog product portfolio used in applications across many industries including from wireless communications, aerospace and defense, industrial automation, and test and measurement. ADI makes it easy to connect its high performance components to Xilinx® all programmable SoC platforms and FPGAs through the use of FMC boards, FMC interposers, and Pmod™ compatible boards.

Through collaboration with Xilinx and MathWorks, ADI delivers rapid prototyping and development solutions to reduce risk, speed time to market, and ease design complexities. Design resources such as HDL interface code, device drivers, design and simulation tools, and online communities managed by ADI experts provide additional design support for our customers.

## New ADI Solutions Include:

### RF Agile Transceiver ICs

- Rapid prototyping platforms showcasing RF Agile Transceiver™ ICs for software-defined radio (SDR)

### GPS Data Acquisition

- Rapid prototyping platforms showcasing ADI's GPS data converters for high speed data acquisition

### Sensor Fusion

- Circuits from the Lab® reference designs showcasing various sensor measurements and communications protocols used to transmit the data

### Clocking and Powering FPGAs

- Powering multiple rails within complex FPGA systems



New! 1000+ Hittite Microwave Products from Analog Devices are now available to address your RF and microwave needs.

[www.analog.com/xfest](http://www.analog.com/xfest)



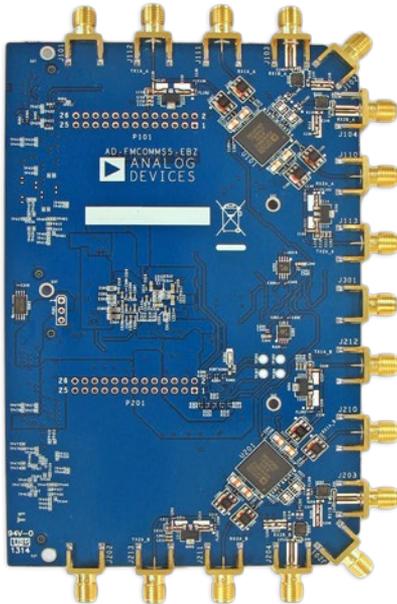
## RF Agile Transceiver ICs

### FMCOMMS5: Dual AD9361 MIMO Prototyping Platform (4 × 4)

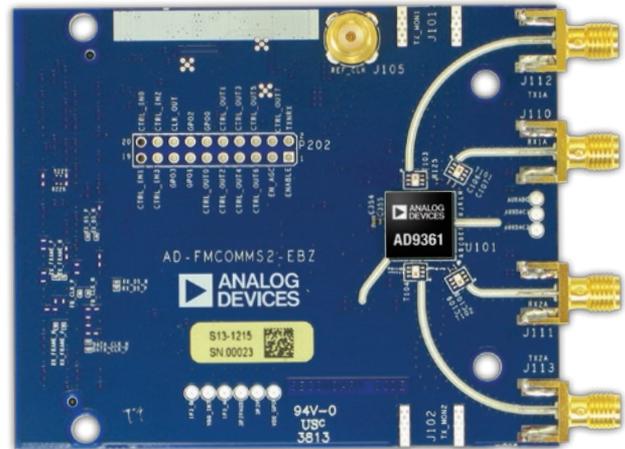
The AD-FMCOMMS5-EBZ is an SDR rapid prototyping kit with dual 2 × 2 AD9361 RF transceivers to simplify and rapidly prototype 4 × 4 multiple input, multiple output (MIMO) wireless transceiver applications on Xilinx's Zynq®-7000 all programmable SoC development platforms. The AD9361 is a high performance, highly integrated transceiver that operates from 70 MHz to 6 GHz, and supports bandwidths from less than 200 kHz to 56 MHz. The AD-FMCOMMS5-EBZ rapid prototyping kit provides a hardware/software ecosystem solution addressing the challenges of SDR transceiver synchronization experienced by RF and analog designers when implementing systems using MIMO architectures.

### FMCOMMS2/FMCOMMS3/FMCOMMS4: Rapid Prototyping Platforms Showcasing RF Agile Transceivers for SDR

The AD-FMCOMMS2-EBZ, AD-FMCOMMS3-EBZ, and AD-FMCOMMS4-EBZ are high speed analog modules designed to showcase ADI's AD9361 and AD9364 RF transceivers. The programmability and wideband capability of the modules make them ideal for a broad range of RF transceiver applications including 3G and 4G base stations, test equipment, and SDRs. The AD9361 and AD9364 transceivers operate in the 70 MHz to 6 GHz range, covering most licensed and unlicensed bands. The RF transceivers support channel bandwidths from less than 200 kHz to 56 MHz by changing sample rate, digital filters, and decimation, which are all programmable within the AD9361 itself. The AD-FMCOMMS2-EBZ is optimized for highest RF performance, while the AD-FMCOMMS3-EBZ is optimized for widest tuning range. The AD-FMCOMMS4-EBZ is a single-channel platform using AD9364 transceiver.



AD-FMCOMMS5-EBZ evaluation board.

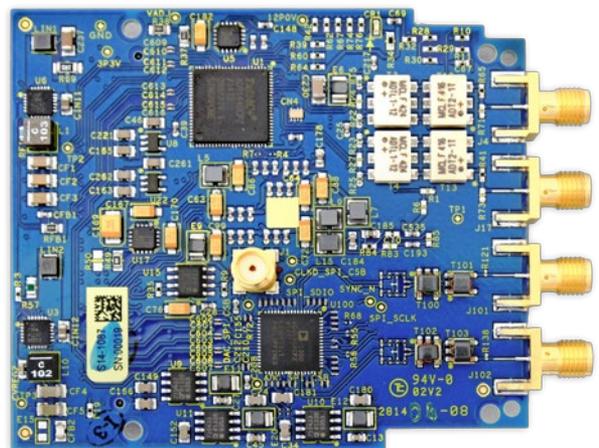


AD-FMCOMMS2-EBZ evaluation board.

## GPS Data Acquisition

### FMCDQA2: 1.0 GPS Data Acquisition and Signal Synthesis Platform

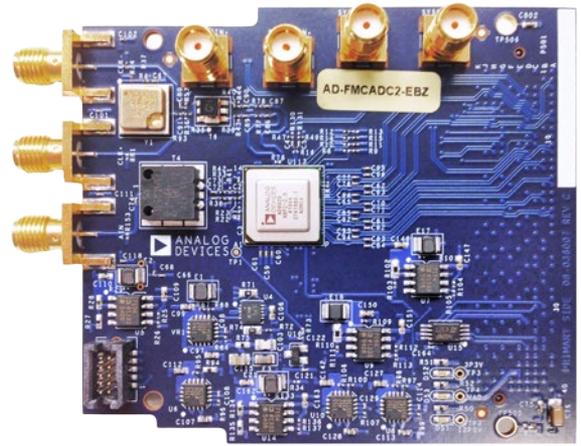
This demo showcases the AD-FMCDQA2-EBZ connected to the Xilinx ZC706 evaluation board. It demonstrates better signal acquisition in congested RF environments over a wider bandwidth than ever before. The on-board ADC is the AD9680, a dual channel, 14-bit, 1 GSPS ADC. It samples wide bandwidth analog signals up to 2 GHz and features the industry's best dynamic range and noise performance over its rated bandwidth range. The DAC in the demo is the 4-channel, 16-bit, 2.8 GSPS AD9144, of which two channels are accessed on the board. It features 82 dBc spurious-free dynamic range (SFDR) and a maximum sample rate of 2.8 GSPS, permitting multicarrier generation up to the Nyquist frequency. With -164 dBm/Hz noise spectral density, the AD9144 enables higher dynamic range transmitters to be built. The AD9523-1 low jitter clock generator provides a low power, multioutput clock distribution function with low jitter performance, along with an on-chip PLL and VCO with two VCO dividers. The on-chip VCO tunes from 2.94 GHz to 3.1 GHz.



AD-FMCDQA2-EBZ evaluation board.

## FMCADC2: Data Acquisition and Signal Processing Platform for Digitizing Wideband RF Signals

The AD-FMCADC2-EBZ demo includes a GSPS ADC with JESD204B serial interface, on-board 2.5 GHz clock oscillator, and power management ICs in its signal chain design. The ADC is the AD9625-2.5 12-bit, 2.5 GSPS ADC. It offers superior wideband dynamic performance and integrated functionality to enable development and prototyping of advanced RF sampling architectures. With its 76 dBc of spurious-free dynamic range at 1.8 GHz  $A_{IN}$ , the AD9625-2.5's breakthrough level of wideband dynamic performance means that designers can capture and process 4× cleaner spectrum than is currently available by competitive devices.

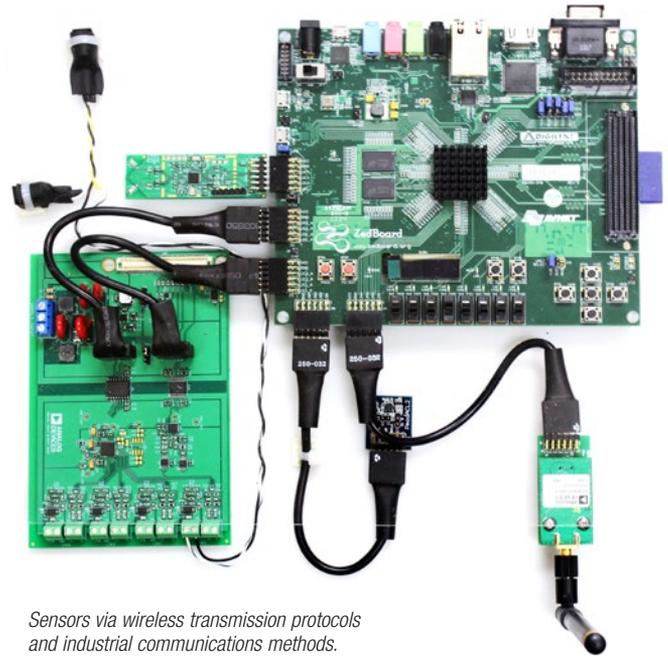


AD-FMCADC2-EBZ evaluation board.

## Sensor Fusion

### Circuits from the Lab Reference Designs Showcasing Various Sensor Measurements and Communications Protocols to Transmit the Data

This demo showcases multiple sensor measurements and various communications protocols used across many popular applications. Shown is the transmission of sensor data over two wireless communications protocols: an open-source wireless operating system via a 2.4 GHz frequency band, and a proprietary, security conscious wireless protocol in the sub-GHz frequency band. Also demonstrated is how a smart HART (highway addressable remotetransducer) transmitter sends modulated digital information along a 4 mA to 20 mA loop, using the HART Foundation Communication Protocol for error detection, fault detection, and more.



Sensors via wireless transmission protocols and industrial communications methods.

This demo includes the following Circuits From the Lab reference designs and ADI products:

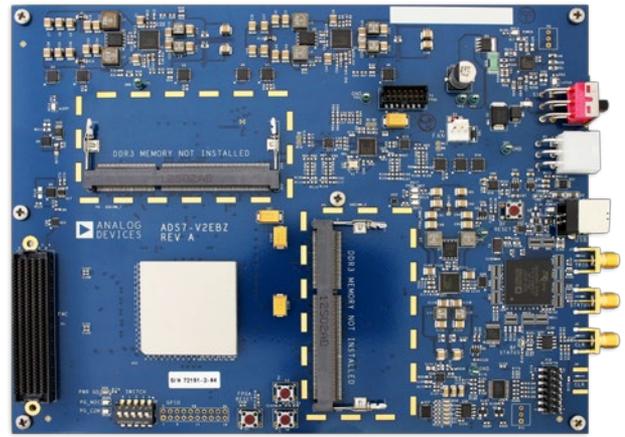
Reference Designs	Products Included	Features and Benefits
CN0337: 12-Bit, 300 kSPS, Single-Supply, Fully Isolated RTD Temperature Measurement System with 3-Wire Compensation	AD7091R: 1 MSPS, ultralow power, 12-bit ADC with on-chip reference	Flexible RTD conditioning and conversion; temperature compensated; fully isolated
	AD8608: rail-to-rail input and output, single-supply amplifier ADuM5401: quad-channel digital isolator with ADI <i>isoPower</i> , <sup>®</sup> an integrated, isolated dc-to-dc converter	
CN0267: Complete 4 mA to 20 mA Loop-Powered Field Instrument with HART Interface	AD5421: complete, loop-powered, 4 mA to 20 mA DAC ADuCM360: analog microcontroller with ARM <sup>®</sup> Cortex <sup>®</sup> -M3 and dual 24-bit $\Sigma$ - $\Delta$ ADCs	Complete 4 mA to 20 mA loop-powered field instrument; HART compliant interface registered by HART Communication Foundation; low power, small footprint
	AD5700: modem IC for HART communications	
	AD5700-1: modem IC for HART communications with precision internal oscillator	
CN0364: PLC/DCS Quad-Channel Voltage and Current Input with HART Interface	AD7173-8: fast settling, highly accurate, low power, 8-channel/16-channel, multiplexed ADC	PLC/DCS universal analog input; HART compatible; fully isolated
	AD5700: modem IC for HART communications	
	ADP2441: constant frequency, current mode control, synchronous, step-down dc-to-dc regulator	

Technology Type	Products
Sensors	ADIS16000: wireless gateway node for remote sensor
	ADIS16229: <i>iSensor</i> <sup>®</sup> wireless vibration sensor node
	ADXL362: 3-axis, MEMS accelerometer
Transceiver	ADF7242: RF transceiver for operation in the global 2.4 GHz ISM band
Digital Isolators	ADuM3482: quad-channel digital isolator based on ADI's <i>iCoupler</i> <sup>®</sup> technology
	ADuM5401: quad-channel digital isolator with ADI <i>isoPower</i> , an integrated, isolated dc-to-dc converter

## Clocking and Powering FPGAs

### ADS7-V2: Clocking and Powering Multiple Rails Within Complex FPGA Systems

The ADS7-V2 evaluation board was developed to support the evaluation of ADI's high speed ADCs, DACs, and transceivers with JESD204B bit rates up to 12.5 Gbps. This includes the Xilinx Virtex-7 (690T), and is completely powered by ADI switchers, LDOs and undervoltage lockouts, hot swap controllers, and clock generation and fanout devices.



ADS7-V2 evaluation board.

This demo includes the following ADI products:

Technology Type	Products
Switcher	ADP5054: quad, high current buck regulator
LDOs and Undervoltage Lockout	ADP121: 150 mA, low quiescent current, CMOS linear regulator
	ADP151: ultralow noise, 200 mA CMOS linear regulator
	ADP1715: 500 mA low dropout CMOS linear regulator
	ADP7105: 20 V, 500 mA, low noise LDO regulator
	ADCMP671-1: low power adjustable UV and OV monitor
	ADM6306: dual voltage supervisor
Hot Swap Controller	ADM1170: 1.6 V to 16.5 V hot swap controller
	ADM1178: integrated hot swap controller and current sense amplifier
	ADM1276: hot swap controller and digital power and energy monitoring with PMBus interface
Clock Generation and Fanout	ADM1293: high accuracy integrated digital power monitor
	AD9577: clock generator with dual PLLs
	ADCLK944: ultrafast clock fanout buffer

### ADI Products for Pmod-Compatible Boards

Analog Devices Pmod-compatible peripheral modules offer a wide variety of solutions that provide quick and easy access to leading analog and mixed-signal reference designs.

For more information and to order Analog Devices Pmod-compatible peripheral boards, visit [wiki.analog.com/resources/tools-software/uc-drivers-all](http://wiki.analog.com/resources/tools-software/uc-drivers-all) or [wiki.analog.com/resources/alliances/Xilinx#pmods](http://wiki.analog.com/resources/alliances/Xilinx#pmods).



ADI Pmod-compatible peripheral board.

## ADI Design Resources and Support

### FPGA Reference Designs

Get HDL interface code, device drivers, and FPGA reference design examples from ADI. Visit [wiki.analog.com](http://wiki.analog.com).

### RF Design Tools

ADI's comprehensive suite of RF design tools help reduce design risk and time to market by enabling a simpler, faster, more accurate, and more robust design process. Featured tools include: ADIsimRF™, ADIsimPLL™, ADIsimSRD™ Design Studio, and ADIsimCLK™. Visit [www.analog.com/en/rf-tools/topic.html](http://www.analog.com/en/rf-tools/topic.html).

### SimRF™ by MathWorks

Now you can build models of Analog Devices wideband agile RF transceivers based on data sheet parameters and integrate them into your wireless system designs using MathWork's MATLAB, SimRF, and Simulink design environment. Watch the webcast to learn how: [www.mathworks.com/products/simrf](http://www.mathworks.com/products/simrf).

### RF Transceiver FIR Filter Design

Perform FIR (finite impulse response) filter design using MATLAB from MathWorks using a model of the AD9361 and AD9364 RF transceivers. Watch the webcast: [www.analog.com/en/content/WC\\_Digital\\_Filter\\_Design/webcast.html](http://www.analog.com/en/content/WC_Digital_Filter_Design/webcast.html).

### Featured Solutions

#### Software-Defined Radio

Visit the Analog Devices software-defined radio page to explore our technology, prototyping platform solutions, system simulation tools, and design resources. Your SDR journey begins here: [www.analog.com/SDR](http://www.analog.com/SDR).

#### Wideband RF

Analog Devices wideband RF solutions provide dc to 2 GHz+ bandwidth signal processing with the industry's highest level of ac linearity and noise performance, enabling advanced RF and IF sampling transceiver and data acquisition architectures. Visit [www.analog.com/widebandRF](http://www.analog.com/widebandRF).

#### Motor Control

Analog Devices innovative motor and power control solutions make intelligent and more efficient motor control systems a reality. To learn how ADI can help you in your next motor control design, go to [www.analog.com/motorcontrol](http://www.analog.com/motorcontrol).



Engineered and tested Circuits from the Lab reference designs. Design files and hardware available. Visit [www.analog.com/circuits](http://www.analog.com/circuits).



Connect with engineers and ADI product experts. Join our FPGA community. Visit [ez.analog.com](http://ez.analog.com).

For more information on the ADI solutions showcased at X-fest, please visit [www.analog.com/xfest](http://www.analog.com/xfest).

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